

PRODUCT

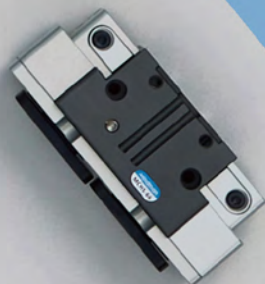
2020

2021

C A T A L O G U E

3

AIR CYLINDER
GRIPPER
ELECTRIC ACTUATOR
HYDRAULIC CYLINDER



 Mindman

MINDMAN. SMART AUTOMATION

| | | | |
|--|---|--|--|
| <p>Core Business : Manufacture and sale for varieties of high quality automation components.</p> |  <p>QUALITY POLICY Quality advancement & Exceeding customers' demands</p> | <p>No.1 Quantity supplied of pneumatic components in Taiwan.</p> |  <p>SALES NETWORK 97 Countries</p> |
|  <p>PRESIDENT CHING-CHENG HUANG</p> | <p>1979 FOUNDED</p> | <p>MANUFACTURE BASE IN TAINAN CITY, TAIWAN</p> | <p>HEADQUARTERS IN TAIPEI CITY, TAIWAN</p> |
|  <p>CAPITAL USD 12,558,000</p> |  <p>EMPLOYEES 750 People</p> |  <p>PLANT SIZE 90,000 m²</p> | |

Mindman Industrial Co., Ltd. was established in 1979 with a destination to provide high quality automation components for a wide variety of industries.

During the past 40 years, Mindman has devoted to the expansion of our product range. Thanks to our R&D department, we are proud to possess the diversified product lineup includes solenoid valves, air treatment units, pneumatic cylinders, electric actuators and all different types of fluid power accessories.

We always believe that fast delivery of automation components is the key of success in the market. Through the complete vertical integration of all manufacturing processes and automated warehouse, we are confident to achieve on time delivery.

To keep quality high during the whole production process, we implement the strict quality control standard. We thoroughly control the process via standard operation procedure (SOP), statistical process control system (SPC) and total productive management (TPM). Most important of all, Mindman commits to providing the products with 100% inspection after assembly.

Currently, Mindman products are exported to more than 90 countries around the world. We devoted ourselves to building the relationship with customers worldwide and provide them with the strong support, such as online 3D drawing, inventory check and promotional program... etc. In the vast automation market, Mindman will spare no effort in establishing a brand – a world-class premium automation components supplier.



| |
|--|
| <p>ISO 9001 Quality </p> |
| <p>ISO 14001 Environmental protection </p> |
| <p>OHSAS 18001 Health and safety </p> |







TA PHONE trading co., Ltd.

- Authorized distributor of NITTO, VESSEL and AIRMAN.
- Founded in 1968
- Capital: USD 1,000,000
- Employees: 8 people



www.taphone.com.tw



WAY FU industrial co., Ltd.

- The first time recorder manufacturer in Taiwan.
- Founded in 1980
- Capital: USD 780,000
- Employees: 40 people



www.wayfu.com.tw



ATAM Taiwan

- An Italian world-class manufacturer in the field of electrical coil
- Founded in 2013
- Capital: USD 1,660,000
- Employees: 12 people



www.atam.it/en



PISCO Taiwan

- A Japanese world leader of high quality pneumatic components manufacturer.
- Founded in 1992
- Capital: USD 3,000,000
- Employees: 41 people



www.pisco.co.jp



UNIMECH hydro-pneumatic co., Ltd.

- A hydraulic - pneumatic actuators manufacturer based in Taiwan Kaohsiung.
- Founded in 1993
- Capital: USD 1,300,000
- Employees: 30 people



www.unimec.com.tw

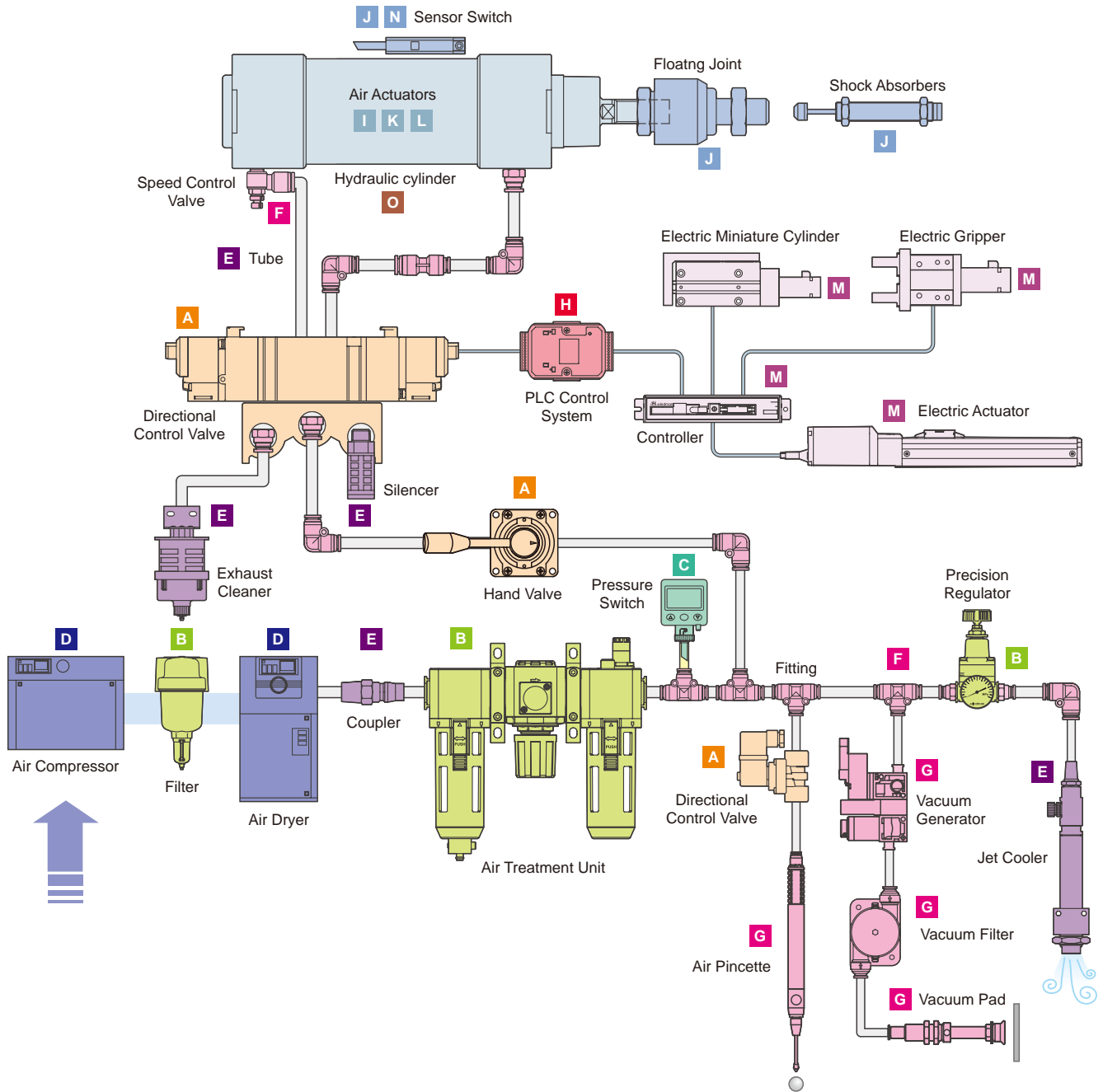


MEDAN GmbH

- A German professional manufacturer in the field of pneumatic and electric linear technology.
- Founded in 1990
- Capital: EUR 26,000
- Employees: 12 people



www.medan-gmbh.com



Vol. 1

Vol. 2

Vol. 3

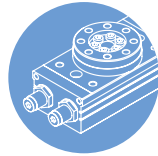
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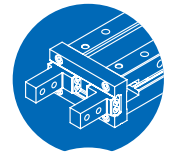
1 ROTARY ACTUATOR



Rotary Actuator

1-2

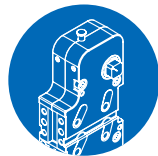
3 GRIPPER



Paraller gripper
Angular gripper

3-2
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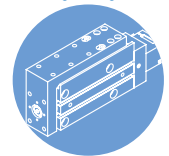
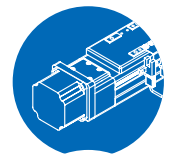
2 CLAMP CYLINDER



Clamp Cylinder

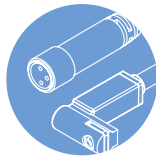
2-2

4 ELECTRIC ACTUATOR



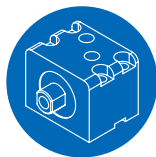
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5 AUXILIARY EQUIPMENT



| | |
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6 HYDRAULIC CYLINDER



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| | |
|--------------------|-----|
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INNOVATION

Department of R&D

Mindman R&D team develops the product through the concept of mechatronics and IoT with the higher level of precision improvement. We apply PLM system to facilitate the sorting and analysis of complicated 3D drawings and product data. Furthermore, we implement multiple testing to insure the product lifespan, load capacity, flow rate, and response time consist with our product catalog.



Automation

Mindman founded the department to design and provide the solution of automation. Besides, the team designs our own automated machine which enhances our productivity and increases liability of quality.



1 ROTARY ACTUATOR

| | |
|-----------------|------|
| MCRA | 1-4 |
| MCRB | 1-8 |
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2 CLAMP CYLINDER

| | |
|---------------------|------|
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| MCKG* | 2-20 |
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F Fast delivery

Our goal is to achieve 3-day lead time, if there is stock of component set. For more information, please go to our MINDMAN website (www.mindman.com.tw) and click on the "Component Set Inventory" button.

3 GRIPPER

| | | |
|-------------------------|--|------|
| Paraller Gripper | | |
| MCHB F | | 3-3 |
| MCHC F | | 3-8 |
| MCHD F | | 3-22 |
| MCHH | | 3-31 |
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| | | |
|------------------------|--|------|
| Angular Gripper | | |
| MCHA F | | 3-64 |
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4 ELECTRIC ACTUATOR

| | | |
|---|--|------|
| Slider Electric Cylinder – Belt Driven | | |
| METFb New | | 4-2 |
| METB | | 4-20 |

| | | |
|--|--|------|
| Slider Electric Cylinder – Ball Screw Drive | | |
| METG New | | 4-38 |
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| METS | | 4-63 |

| | | |
|-----------------------------------|--|------|
| Rod Type Electric Actuator | | |
| MEQG New | | 4-74 |
| MEQI New | | 4-82 |

| | | |
|------------------------------------|--|------|
| Miniature Electric Cylinder | | |
| MESS2 New | | 4-92 |
| MESH2 New | | 4-95 |

| | | |
|-------------------------|--|------|
| Electric Gripper | | |
| MEHC2 New | | 4-98 |

| | | |
|----------------------------------|--|-------|
| Electric Stopper Actuator | | |
| MESBE New | | 4-102 |

| | | |
|--------------------|--|-------|
| Motor Drive | | |
| MECQ1 New | | 4-106 |
| MECP New | | 4-108 |



5 AUXILIARY EQUIPMENT

Sensor Switch

| | |
|----------------|------|
| RC* | 5-2 |
| RD* New | 5-10 |
| LN* New | 5-16 |

Cable with Connector

| | |
|----------------|------|
| M8* New | 5-21 |
|----------------|------|

6 HYDRAULIC CYLINDER

Double Acting Cylinder

| | |
|------|-----|
| MDH* | 6-2 |
| MDM* | 6-2 |

Compact Hydraulic Cylinder

| | |
|--------|------|
| MHC* | 6-15 |
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Hydraulic with Piston Sensing Cylinder

| | |
|------|------|
| MDO* | 6-44 |
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Hydraulic Rotary Actuator

| | |
|------|------|
| MRPH | 6-51 |
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Hydraulic Lever – type Cylinder

| | |
|------|------|
| MHCK | 6-54 |
|------|------|

Hydraulic – Swing Clamp Cylinder

| | |
|------------|------|
| MTH* | 6-56 |
| MHS/MHSD | 6-63 |
| MHTS/MHTSD | 6-63 |
| MFS/MFT | 6-66 |
| MDS/MDT | 6-66 |

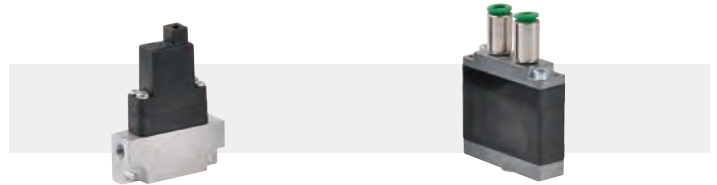
Threaded – body Cylinder

| | |
|-----------|------|
| MTC-**A/B | 6-69 |
|-----------|------|

Hydraulic Work Support

| | |
|-----------|------|
| MSP-**A/B | 6-70 |
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Solenoid Valve

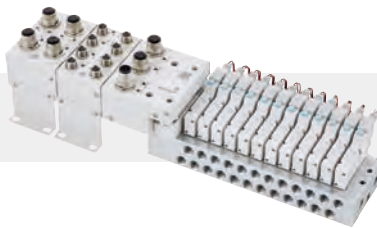


MVDA-80 series
Direct acting type

P. 1-96

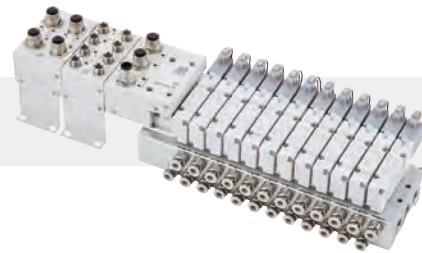
MVDA-120 series
Direct acting type

P. 1-98



MVE-100 series
Fieldbus system

P. 1-120



MVE-156 series
Fieldbus system

P. 1-126

Auxiliary Equipment



M83C-M
series

P. 7-17



M124C-MA
series

P. 7-18



M124C-MD
series

P. 7-18

- ◀ Connector
- ▼ Cable with Connector



M83R-F
series

P. 7-13



M125R-WB
series

P. 7-14



M124R-FA
series

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M124R-RJD
series

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M124R-MD
series

P. 7-16

Air Treatment Unit



MAHR200 series
High Pressure
Regulator
P. 4-100



MAER series
Electro Pneumatic
Regulator
P. 4-105



MAIR300 series
Precision
Regulator
P. 4-115



MAM*-25 series
Precision Filter /
Water Separator
P. 4-138

Flow & Pressure Sensor



MF01 series
P. 5-45



MFP01 series
P. 5-50



MSBE series
P. 7-4

- ◀ **Stopper Cylinder**
- ▼ **Standard Cylinder**



MCQV3 series
P. 1-48



MCQI3 series
P. 1-80

Compact Cylinder



MCJU series

Add: 21,22 double rod

P. 2-65

Miniature Cylinder



MCMIS series

Stainless steel

P. 3-52

High Speed Cylinder



MCCH series

P. 3-99



MCKD series

Powerful clamp

P. 2-24

◀ Clamp Cylinder

Rotary ▶ Actuator



MCRC series

Vane type

P. 1-16

Sensor Switch ▼



RDP8 series

Proximity sensor

P. 5-14



RNKD series

for MCKD series

P. 5-15

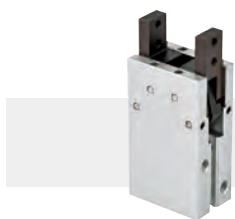


LN65 series

for MRT* series

P. 5-20

Parallel Gripper



MCHB series

Add: Single acting N.O.

P. 3-3



MCHC series

Add: ø6, long stroke & flat type

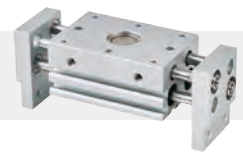
P. 3-8



MCHD series

Add: medium & long stroke

P. 3-22



MCHX series

Add: ø40

P. 3-47

Electric Actuator

▶ Slider Electric Cylinder (Without motor)



METFB-25 series

P. 4-2

METFB-32 series

P. 4-8

METFB-40 series

P. 4-14



METG-8 series

P. 4-46

METS2-10 series

P. 4-50

METS2-14 series

P. 4-54

METS2-17 series

P. 4-59

▶ Rod Type Electric Actuator (Without motor)



MEQG-5 series

P. 4-74

MEQG-8 series

P. 4-78

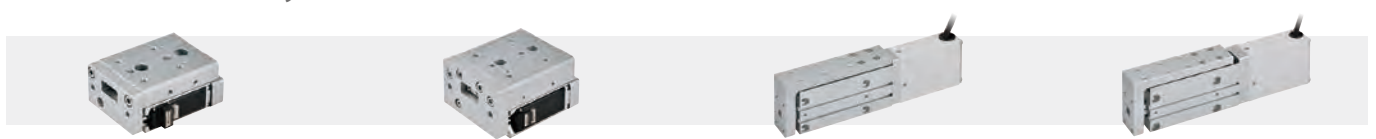
MEQI-50 series

P. 4-82

MEQI-63 series

P. 4-82

▶ Mini. Electric Cylinder (Without motor)



MESS2-16 series

P. 4-92

MESS2-25 series

P. 4-92

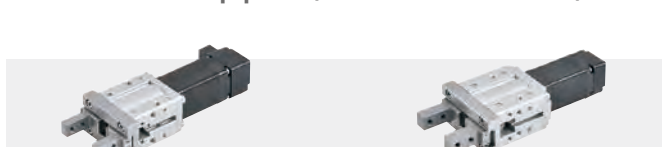
MESH2-16 series

P. 4-95

MESH2-20 series

P. 4-95

▶ Electric Gripper (Without motor)



MEHC2-16 series

P. 4-98

MEHC2-25 series

P. 4-98

▼ Controller



MECQ1 series

P. 4-106

▼ Driver



MECP series

P. 4-108



1 Sitio web Mindman

2 Key in model.

www.mindman.com.tw

Product Search

About Us | Product Information | Customer Support | Media & Press | Contact Us | Language

MCJA

Tube I.D. ϕ 12, 16, 20, 25, 32, 40, 50, 63, 80, 100 (mm), Ultra Compact, light weight and space saving cylinder. Single and double acting available.

Features | Specification | Order Example | CAD Download | Accessory

Please log-in | **Anonymous login** | Error Report

3 Caution

- Video Guide : 2D / 3D downloading procedure demonstration.
- PDF file : 2D / 3D downloading procedure demonstration.



Sitio Web Mindman

6 Formats

Choose desired formats.

Search... Show 2D formats Show 3D formats

- DXF AUTOCAD VERSION 2010-2012 (2D)
- DXF AUTOCAD VERSION 2010-2012 (3D)
- DXF AUTOCAD VERSION 2013 (2D)
- DXF AUTOCAD VERSION 2013 (3D)
- STEP AP203 (3D)
- STEP AP214 (3D)
- STL (3D)
- SVG (2D)

7 Generate CAD

Generate CAD file and download.

MCJA-11-32-35(0_0)...

Download | Information | Delete

Download all files

4 Select the specification.

Selectable products: 10

| | | |
|-----------------------------|--|----|
| Company | MINDMAN | |
| Description | MCJA - Compact cylinders | |
| Bill of material | MCJA-11-32-35(0_0) | |
| MODEL Model | MCJA | |
| STYLE Style | 11 Double acting / Male thread / Stroke acting / Female thread / Single acting / Automatic | |
| TUBE Tube I.D. | 32 | mm |
| STROKE Stroke | 5 (35) | mm |
| ASTROKE Adjustable stroke | 0 | mm |
| POS Position of stroke | 0 | mm |
| MG Magnet | Blank without magnet | |
| PT Port thread | Blank PT thread | |
| SWITCH Sensor switch | Blank without sensor | |
| NSW Number of sensor switch | None | |
| C | 3.0 | mm |
| D | 12 | mm |

5 Update preview

Preview the profile.

Update preview

The preview does not represent the part configuration anymore. You have to generate a new preview.

1. Please confirm the accurate product model number before generating.

2. Also check the dimensions and tolerances from our new website for faster generating.

3. If there is any specific dimension or tolerance not related to the standard, please contact our sales.

Cylinders' theoretic force



Unit: N

| Bore (mm) | | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 150 | 200 | |
|--------------------------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|-------|-------|-------|-------|
| Rod (mm) | | 6 | 6 | 8 | 10 | 12 | 16 | 20 | 20 | 25 | 25 | 35 | 40 | 50 | |
| Area (mm ²) | A | 113 | 201 | 314 | 491 | 804 | 1257 | 1963 | 3117 | 5027 | 7854 | 12272 | 17671 | 31416 | |
| | B | 85 | 173 | 264 | 412 | 691 | 1056 | 1649 | 2803 | 4536 | 7363 | 11310 | 16414 | 29453 | |
| Operating pressure (MPa) | 0.1 | A | 11 | 20 | 31 | 49 | 80 | 126 | 196 | 312 | 503 | 785 | 1227 | 1767 | 3142 |
| | | B | 9 | 17 | 26 | 41 | 69 | 106 | 165 | 280 | 454 | 736 | 1131 | 1641 | 2945 |
| | 0.2 | A | 23 | 40 | 63 | 98 | 161 | 251 | 393 | 623 | 1005 | 1571 | 2454 | 3534 | 6283 |
| | | B | 17 | 35 | 53 | 82 | 138 | 211 | 330 | 561 | 907 | 1473 | 2262 | 3283 | 5891 |
| | 0.3 | A | 34 | 60 | 94 | 147 | 241 | 377 | 589 | 935 | 1508 | 2356 | 3682 | 5301 | 9425 |
| | | B | 26 | 52 | 79 | 124 | 207 | 317 | 495 | 841 | 1361 | 2209 | 3393 | 4924 | 8836 |
| | 0.4 | A | 45 | 80 | 126 | 196 | 322 | 503 | 785 | 1247 | 2011 | 3142 | 4909 | 7068 | 12566 |
| | | B | 34 | 69 | 106 | 165 | 276 | 422 | 660 | 1121 | 1814 | 2945 | 4524 | 6566 | 11781 |
| | 0.5 | A | 57 | 101 | 157 | 246 | 402 | 629 | 982 | 1559 | 2514 | 3927 | 6136 | 8836 | 15708 |
| | | B | 43 | 87 | 132 | 206 | 346 | 528 | 825 | 1402 | 2268 | 3682 | 5655 | 8207 | 14727 |
| | 0.6 | A | 68 | 121 | 188 | 295 | 482 | 754 | 1178 | 1870 | 3016 | 4712 | 7363 | 10603 | 18850 |
| | | B | 51 | 104 | 158 | 247 | 415 | 634 | 989 | 1682 | 2722 | 4418 | 6786 | 9848 | 17672 |
| | 0.7 | A | 79 | 141 | 220 | 344 | 563 | 880 | 1374 | 2182 | 3519 | 5498 | 8590 | 12370 | 21991 |
| | | B | 59 | 121 | 185 | 288 | 484 | 739 | 1154 | 1962 | 3175 | 5154 | 7917 | 11490 | 20617 |
| | 0.8 | A | 90 | 161 | 251 | 393 | 643 | 1006 | 1570 | 2494 | 4022 | 6283 | 9818 | 14137 | 25133 |
| | | B | 68 | 138 | 211 | 330 | 553 | 845 | 1319 | 2242 | 3629 | 5890 | 9048 | 13131 | 23562 |
| | 0.9 | A | 102 | 181 | 283 | 442 | 724 | 1131 | 1767 | 2805 | 4524 | 7069 | 11045 | 15904 | 28274 |
| | | B | 77 | 156 | 238 | 371 | 622 | 950 | 1484 | 2523 | 4082 | 6627 | 10179 | 14773 | 26508 |
| | 1.0 | A | 113 | 201 | 314 | 491 | 804 | 1257 | 1963 | 3117 | 5027 | 7854 | 12272 | 17671 | 31416 |
| | | B | 85 | 173 | 264 | 412 | 691 | 1056 | 1649 | 2803 | 4536 | 7363 | 11310 | 16414 | 29453 |

The method of calculation (Cylinders' force)

$$F = P \times A - f$$

F: Cylinder's force (N)

P: Air pressure (MPa)

A: Piston area (mm²)

f: Friction drag (N)

Pressure conversion chart

| Pa | kPa | MPa | bar | mbar | kgf/cm ² | cmH ₂ O | mmH ₂ O | mmHg | p.s.i. |
|---------|---------|------------|------------|---------|---------------------|--------------------|--------------------|---------|----------|
| 1 | 0.001 | 0.000001 | 0.00001 | 0.01 | 0.0000102 | 0.0102 | 0.10197 | 0.0075 | 0.000145 |
| 1000 | 1 | 0.001 | 0.01 | 10 | 0.0102 | 10.2 | 101.97 | 7.5 | 0.145 |
| 1000000 | 1000 | 1 | 10 | 10000 | 10.2 | 10200 | 101970 | 7500 | 145 |
| 100000 | 100 | 0.1 | 1 | 1000 | 1.02 | 1020 | 10200 | 750.06 | 14.5 |
| 100 | 0.1 | 0.0001 | 0.001 | 1 | 0.00102 | 1.02 | 10.2 | 0.75 | 0.0145 |
| 98066.5 | 98.07 | 0.09807 | 0.98 | 980.67 | 1 | 1000 | 10000 | 735.56 | 14.22 |
| 98.0665 | 0.9807 | 0.0009807 | 0.00098 | 0.98 | 0.001 | 1 | 10 | 0.74 | 0.01422 |
| 9.80665 | 0.09807 | 0.00009807 | 0.00009807 | 0.09807 | 0.0001 | 0.1 | 1 | 0.07356 | 0.00142 |
| 133.32 | 0.13332 | 0.00013332 | 0.00133 | 1.33 | 0.00136 | 1.36 | 13.6 | 1 | 0.01934 |
| 6895 | 6.895 | 0.006895 | 0.06895 | 68.95 | 0.07031 | 70.31 | 703.07 | 51.71 | 1 |

Compressed air consumption



Unit: ℓ/min

| Bore (mm) | 12 | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 | 150 | 200 | |
|--------------------------|-----|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| Rod (mm) | 6 | 6 | 8 | 10 | 12 | 16 | 20 | 20 | 25 | 25 | 35 | 40 | 50 | |
| Area (mm ²) | A | 113 | 201 | 314 | 491 | 804 | 1257 | 1963 | 3117 | 5027 | 7854 | 12272 | 17671 | 31416 |
| | B | 85 | 173 | 264 | 412 | 691 | 1056 | 1649 | 2803 | 4536 | 7363 | 11310 | 16414 | 29453 |
| Operating pressure (MPa) | 0.1 | 0.039 | 0.074 | 0.115 | 0.180 | 0.298 | 0.460 | 0.719 | 1.178 | 1.903 | 3.028 | 4.693 | 6.783 | 12.114 |
| | 0.2 | 0.059 | 0.111 | 0.172 | 0.269 | 0.446 | 0.689 | 1.076 | 1.764 | 2.850 | 4.535 | 7.028 | 10.158 | 18.140 |
| | 0.3 | 0.079 | 0.148 | 0.229 | 0.359 | 0.594 | 0.918 | 1.434 | 2.350 | 3.797 | 6.042 | 9.363 | 13.533 | 24.167 |
| | 0.4 | 0.098 | 0.186 | 0.287 | 0.448 | 0.742 | 1.147 | 1.792 | 2.937 | 4.744 | 7.548 | 11.698 | 16.908 | 30.193 |
| | 0.5 | 0.118 | 0.223 | 0.344 | 0.537 | 0.890 | 1.376 | 2.149 | 3.523 | 5.690 | 9.055 | 14.032 | 20.282 | 36.220 |
| | 0.6 | 0.137 | 0.260 | 0.401 | 0.627 | 1.038 | 1.605 | 2.507 | 4.109 | 6.637 | 10.562 | 16.367 | 23.657 | 42.247 |
| | 0.7 | 0.157 | 0.297 | 0.458 | 0.716 | 1.186 | 1.834 | 2.865 | 4.695 | 7.584 | 12.068 | 18.702 | 27.032 | 48.273 |
| | 0.8 | 0.177 | 0.334 | 0.516 | 0.806 | 1.334 | 2.063 | 3.222 | 5.281 | 8.531 | 13.575 | 21.037 | 30.407 | 54.300 |
| | 0.9 | 0.196 | 0.371 | 0.573 | 0.895 | 1.482 | 2.292 | 3.580 | 5.867 | 9.478 | 15.081 | 23.372 | 33.781 | 60.327 |
| | 1.0 | 0.216 | 0.408 | 0.630 | 0.984 | 1.630 | 2.521 | 3.937 | 6.453 | 10.425 | 16.588 | 25.707 | 37.156 | 66.353 |

• The table is for a complete cycle 100mm stroke in one minute.

The method of calculation (Compressed air consumption)

$$Q_n = (A_a + A_b) \times L \times \frac{P + 0.101}{0.101} \times n \times 10^{-6}$$

| | | |
|------------|----------------------------|--------------------|
| Qn: | Compressed air consumption | (ℓ/min) |
| Aa: | Piston area of A | (mm ²) |
| Ab: | Piston area of B | (mm ²) |
| L: | Stroke of cylinder | (mm) |
| P: | Air pressure | (MPa) |
| n: | Cycle of operation | (cycle/min) |

Flow rate conversion chart

| m ³ /s | l/s | cm ³ /s | m ³ /h | m ³ /min | l/h | l/min | ft ³ /min (scfm) | gallon min UK | gallon min USA |
|-------------------|---------|--------------------|-------------------|---------------------|---------|---------|-----------------------------|---------------|----------------|
| 1 | 1000 | 1000000 | 3600000 | 60 | 3600000 | 60000 | 2120 | 13200 | 15850 |
| 0.001 | 1 | 1000 | 3.6 | 0.06 | 3600 | 60 | 2.12 | 13.2 | 15.85 |
| 0.000001 | 0.001 | 1 | 0.0036 | 0.00006 | 3.6 | 0.06 | 0.0212 | 0.0132 | 0.01585 |
| 0.00028 | 0.28 | 280 | 1 | 0.01667 | 1000 | 16.67 | 0.59 | 3.67 | 4.4 |
| 0.01667 | 16.67 | 16670 | 60 | 1 | 60000 | 1000 | 35.31 | 219.97 | 264.17 |
| 0.00000028 | 0.00028 | 0.28 | 0.001 | 0.00001667 | 1 | 0.01667 | 0.00059 | 0.00367 | 0.0044 |
| 0.00001667 | 0.01667 | 16.67 | 0.06 | 0.001 | 60 | 1 | 0.03531 | 0.21997 | 0.264 |
| 0.00047 | 0.47 | 470 | 1.699 | 0.02832 | 1699 | 28.32 | 1 | 6.23 | 7.48 |
| 0.00007579 | 0.07577 | 75.77 | 0.273 | 0.00455 | 273 | 4.55 | 0.16 | 1 | 1.2 |
| 0.00006309 | 0.06309 | 63.09 | 0.227 | 0.00379 | 227 | 3.79 | 0.13 | 0.83 | 1 |

Order example

ROTARY / CLAMP CYLINDER



Order example of rotary cylinder * Please refer to the product page for complete model number.

MCRA - 63 R - 90 - LB - G

| Model | Tube I.D. | Angle adjuster | Rotary angle | Mounting type | Port thread |
|--------|-----------|------------------|--------------|---------------|----------------|
| MCRA | 6-63 | A Adjusting bolt | 90 90° | - | - Rc thread |
| MCRB | | R Shock absorber | 180 180° | LB | G G thread |
| MCRC | | | | | NPT NPT thread |
| MCRJ-S | | | | | |
| MCRQ | | | | | |
| MCRQ-S | | | | | |
| MRT* | | | | | |

| Connecting port position and rotation | Mounting type |
|---------------------------------------|--------------------|
| 1 Connecting oprt → 180° | - Standard type |
| 2 Connecting oprt → 90° | FR Flange rod type |

* Only for MCRC

| Shaft | End rod type |
|----------------|-----------------------|
| W Double shaft | D Double end rod type |

* Only for MCRQ-S

| Vane |
|---------------|
| S Single vane |

* Only for MCRC

* Code 1) M: Mindman
Code 2) C: Cylinder
Code 3) R: Rotary
Code 4) A: Series

Order example of clamp cylinder * Please refer to the product page for complete model number.

(Continued)

MCKC A - 20 M - 10 - CW - 40 × 90 - LN - B - G

| Model | Tube I.D. | Magnet | Stroke | Rotating direction | Piston (ø) | Rotating angle (°) | Rotating direction | Arm | Clamping arm type | Port thread |
|-------|------------------|--------------|--------|-----------------------|------------|--------------------|--------------------|------------|----------------------|---------------|
| MCKC | 16-63 | M Magnet | 10~ | CCW Counter clockwise | 25 | 0 90 | L Left | - With arm | - Standard | - Rc/M thread |
| MTA* | Clamping stroke | | | CW Clockwise | 32 | 15 105 | R Right | | B Extention | G G thread |
| MAS* | | | | | 40 | 30 120 | | N Without | NPT NPT thread | |
| MATS* | | - Standard | | | | 50 | 45 135 | | Adjustable | |
| MCKA | | L Lengthened | | | | 63 | 60 180 | | - Adjustable cushion | |
| MCKG* | | | | | | 75 | | | A Flow adjustable | |
| MCKD | Swivel direction | | | | | | | FA | Lever type | |
| MCKB | R CW | | | | | | | FC | - Without lever | |
| | L CCW | | | | | | | | L Left side lever | |
| | P Non-swing | | | | | | | | R Right side lever | |

| Accessories | Sensor switch | Sensor number |
|------------------------|-----------------------------------|---------------|
| - Without | - Without | 1, 2, N... |
| I I connector with pin | RCA Sensor with BGA** | |
| Y Y connector with pin | RDKP Sensor with installation set | |

* Only for MCKG*

* Only for MCKC

* Only for MCKA, MCKG*

* Only for MCKD

* Code 1) M: Mindman
Code 2) C: Cylinder
Code 3) K: Clamp
Code 4) A: Series

Order example

GRIPPER



Order example of gripper * Please refer to the product page for complete model number.

MCHD — **20** **R** — **50** **M** — **N**

| Model | Tube I.D. | Piping type | Stroke | Style | Type | |
|-------|------------|---|---------------------------|----------------------|-------------------------------------|--|
| MCHB | 6~125 | — Axial piping | — Short | — Double acting | — Standard | |
| MCHC | Body spec. | R Side piping | 1 Medium | S Single acting N.O. | 1 Side tapped mounting | |
| MCHD | | Finger option | | C Single acting N.C. | 2 Standard (Through hole) | |
| MCHH | 50~300 | — Standart tap mounting | * Only for MCHD 20~200 | Magnet | | |
| MCHU | | 1 Opening / closing direction through hole. | * Only for MCHX | M Magnet | 3 Flat | |
| MCHS | | | | | N Narrow | |
| MCHX | | | | | N1 Narrow type side tapped mounting | |
| MCHG2 | | | | | N1 Narrow (Through hole) | |
| MCHJ | | * Only for MCHY | | | Port thread | |
| MCHA | | | | | — Rc/M thread | |
| MCHY | | | | | G G thread | |
| | | | | | NPT NPT thread | |

* Code 1) M: Mindman
Code 2) C: Cylinder
Code 3) H: Gripper
Code 4) A: Series

Order example

HYDRAULIC CYLINDER



Order example of hydraulic cylinder

* Please refer to the product page for complete model number.

1 - MDHB L - 50 - CW - 23A × 90 M - N (Continued)

| Seal material | | Model | Clamping stroke | Tube I.D. | Rotating direction | Piston (∅) | Rotating | Magnet | Cushion | |
|-----------------------|-------|--------|--|-----------|------------------------|----------------------------------|--|----------|-------------------------|--|
| 1 | NBR | MDH* | - Standard type | 20~150 | CCW Counter clockwise | 20A, 25B 32A, 32B 40A, 40B | 0 0° | M Magnet | R Rod end with cushion | |
| 2 | PU | MDM* | L Lengthened | | CW Clockwise | | 45 45° | | H End end with cushion | |
| 3 | VITON | MHC* | * Only for MTH* | | * Only for MTH* | | 60 60° | | B Both end with cushion | |
| * Only for MDH*, MDM* | | MHCB-M | | | R Clockwise | | 90 90° | | N No cushion | |
| | | MHCB* | | | L Counter clockwise | | 180 180° | | * Only for MDH*, MDM* | |
| | | MDO* | | | P Non-swing | | * Only for MRPH, MTH*, MHS*, MHTS*, MF*, MD* | | | |
| | | MRPH | | | * Only for MHS*, MHTS* | | | | | |
| | | MHCK | | | | | | | | |
| | | MTH* | | | | | | | | |
| | | MHS* | | | | | | | | |
| | | MHTS* | | | | | | | | |
| | | MF* | | | | | | | | |
| | | MD* | * Code 1) M: Mindman Code 2) H: Hydraulic Code 3) Series | | | | | | | |
| | | MTC* | * Please refer to the product page for complete model number. | | | | | | | |
| | | MSP* | | | | | | | | |

- 100 - BC - FC - Z D A - LB - Y

| Stroke | Port & cushion adj. location | Manifold type | Rod end type | Rod type | Adjustable stroke | Mounting type |
|--------|--|-------------------|------------------------------------|-------------------|------------------------|---------------|
| 50~500 | Standard (A) (B) (AB) | FC | - Female thread | D Double rod type | - Standard type | FA |
| | | MF | Z Male thread | * Only for MHC* | | FB |
| | | F | R,L One male and one female thread | | A Adjustable 25mm | LA |
| | ex. BC 1st code: Port location 2nd code: Cushion adjustment location | * Only for MTH* | | | B Adjustable 50mm | LB |
| | * Change port & cushion adj. location. | Manifold type | | | * Only for MDO*, MHC*. | |
| | * Only for MDH*, MDM*. | - Standard type | | | | |
| | | F Manifold type | | | | |
| | | * Only for MHCK | | | | |
| | | Clamping arm type | | | | |
| | | - Standard type | | | | |
| | | B Extension type | | | | |
| | | * Only for MTH* | | | | |
| | | | | CA | | |
| | | | | CB | | |
| | | | | TC | | |
| | | | | Y | | |
| | | | | I | | |

Order example

ELECTRIC ACTUATOR



Order example of Electric actuator

* Please refer to the product page for complete model number.

METS2 – **5** **N** – **L02** – **100** **BC** – **CQ1** (Continued)

| Model | Size | Guide installation | Ball screw lead | Stroke | Motor position | Controller | | | | | | | | |
|--------------|--------------|---|------------------------|----------------|-------------------------|---|--------------|--|-----------|-------|-----------|-----|-----------|-----|
| MEAT | 16 | N Without guide | L02 2 mm | 30~6000 | M Built-in | CQ1 MECQ1 | | | | | | | | |
| METFB | 25 | GR Guide right side | L05 5 mm | | BA Turned | | | | | | | | | |
| METB | 32 | GL Guide left side | L06 6 mm | | BC Exp3osed | <table border="1"> <thead> <tr> <th colspan="2">Cable length</th> </tr> </thead> <tbody> <tr> <td>01</td> <td>1.5 m</td> </tr> <tr> <td>03</td> <td>3 m</td> </tr> <tr> <td>05</td> <td>5 m</td> </tr> </tbody> </table> | Cable length | | 01 | 1.5 m | 03 | 3 m | 05 | 5 m |
| Cable length | | | | | | | | | | | | | | |
| 01 | 1.5 m | | | | | | | | | | | | | |
| 03 | 3 m | | | | | | | | | | | | | |
| 05 | 5 m | | | | | | | | | | | | | |
| METG | 40 | * Only for METFB | | | BM Bottom side | | | | | | | | | |
| METS2 | 42 | Spec. and type | | | BW Top side | | | | | | | | | |
| METS | 50 | – Standard | L10 10 mm | | BR On right side | | | | | | | | | |
| MEQG | 55 | 1 Standard type with side tapped | L12 12 mm | | BL On left side | | | | | | | | | |
| MEQI | 63 | N Narrow | L20 20 mm | | | | | | | | | | | |
| MESS2 | 80 | N1 Narrow type with side tapped | | | | | | | | | | | | |
| MESH2 | Spec. | Motor cable entry | | | | | | | | | | | | |
| MEHC2 | | – Parallel | | | | | | | | | | | | |
| | | 4 | F Perpendicular | | | | | | | | | | | |
| | | 5 | | | | | | | | | | | | |
| | | 8 | | | | | | | | | | | | |
| | 10 | | | | | | | | | | | | | |
| | 14 | | | | | | | | | | | | | |
| | 17 | | | | | | | | | | | | | |
| | 22 | | | | | | | | | | | | | |

* Code 1) **M**: Mindman
Code 2) **E**: Electric
Code 3) Series

Controller / Driver

MECQ1 – **20L**

| Controller | Motor size |
|---------------|--|
| MECQ1 | 20L <input type="checkbox"/> 20 |
| Driver | 28L <input type="checkbox"/> 28 |
| | 35L <input type="checkbox"/> 35 |
| | 42L <input type="checkbox"/> 42 |
| | 56L <input type="checkbox"/> 56 |
| MECP | |

Accessoires

MECQ1 – **S03**

| Controller | Cable length |
|---------------|-------------------------|
| MECQ1 | I/O signalcable |
| Driver | S015 1.5 m |
| | S03 3 m |
| MECP | Actuator cable |
| | M015 1.5 m |
| | M03 3 m |
| | M05 5 m |
| | Power connection |
| | P |

Order example

ELECTRIC ACTUATOR



— **M10** **B** — **A3** **D** — **XA00**

| Motor band | | Power output | |
|------------|------------|--------------|-----------------------------|
| M | Mitsubishi | Servo | |
| P | Panasonic | 05 | 50W |
| Y | Yaskawa | 10 | 100W |
| D | Delta | 20 | 200W |
| E | Else | 40 | 400W |
| S | Mindman | 75 | 750W |
| | | Step | |
| | | 35 | <input type="checkbox"/> 35 |
| | | 42 | <input type="checkbox"/> 42 |
| | | 56 | <input type="checkbox"/> 56 |

| Shaft versions | | | |
|----------------|-------------------|----|------------|
| Size | Type | ∅ | Part No. |
| 42 | Female shaft | 8 | F08 |
| | Male shaft | 12 | M12 |
| | Double male shaft | 12 | D12 |
| 55 | Female shaft | 8 | F08 |
| | Male shaft | 16 | M16 |
| | Double male shaft | 16 | D16 |
| 80 | Female shaft | 19 | F19 |
| | Male shaft | 19 | M19 |
| | Double male shaft | 19 | D19 |

* Only for METB

| Brakes | |
|------------|-------------|
| — | No brake |
| B | With brake |
| Male shaft | |
| L | Left shaft |
| R | Right shaft |

| Limit sensor | |
|--------------|-----------|
| — | No sensor |
| A1 | 1 pc |
| A2 | 2 pcs |
| A3 | 3 pcs |

| Accessory | |
|-----------------------------------|------------------------|
| E | End cap mounting |
| M <input type="checkbox"/> | Mid section mounting |
| | — 1 set (2 pcs) |
| | 2 2 set (4 pcs) |
| n | n set (n*2 pcs) |
| A <input type="checkbox"/> | Limit switch adapters |
| | — 1 pc |
| | 2 2 pcs |
| n | n pcs |

* Only for METB.

| Sensor | |
|-----------------------------------|---------------------|
| E5 | No sensor |
| In side | |
| A <input type="checkbox"/> | Motor side |
| | 1 1 pc |
| | 2 2 pcs |
| B <input type="checkbox"/> | Opposite motor side |
| | 1 1 pc |
| 2 | 2 pcs |
| Out side | |
| C <input type="checkbox"/> | Motor side |
| | 3 1 pc |
| 4 | 2 pcs |
| D <input type="checkbox"/> | Opposite motor side |
| | 3 1 pc |
| 4 | 2 pcs |

| Sensor type | |
|-------------|--------|
| D | 2 wire |
| N | NPN |
| P | PNP |

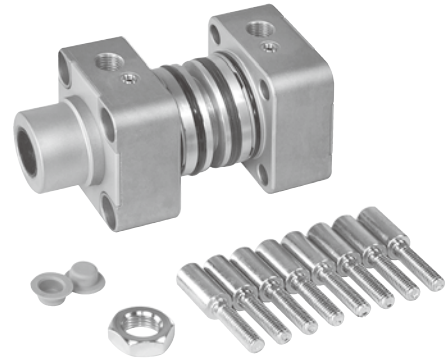
| I/O cable length | |
|------------------|-------|
| 01 | 1.5 m |
| 03 | 3 m |

| Special order no. | |
|-------------------|---------------|
| I/O card | |
| — | Standard |
| 1 | With I/O card |

* Only for MEAT

Cylinders kits

- We can supply your company with full cylinder assembly kits which meet NFPA, ISO-VDMA and JIS internationally recognizable standards.
- Assembly kits include all necessary components to enable rapid assembly and despatch in order that you can meet your customers delivery schedules.
- Piston rod, tie rod and tubes are also available.



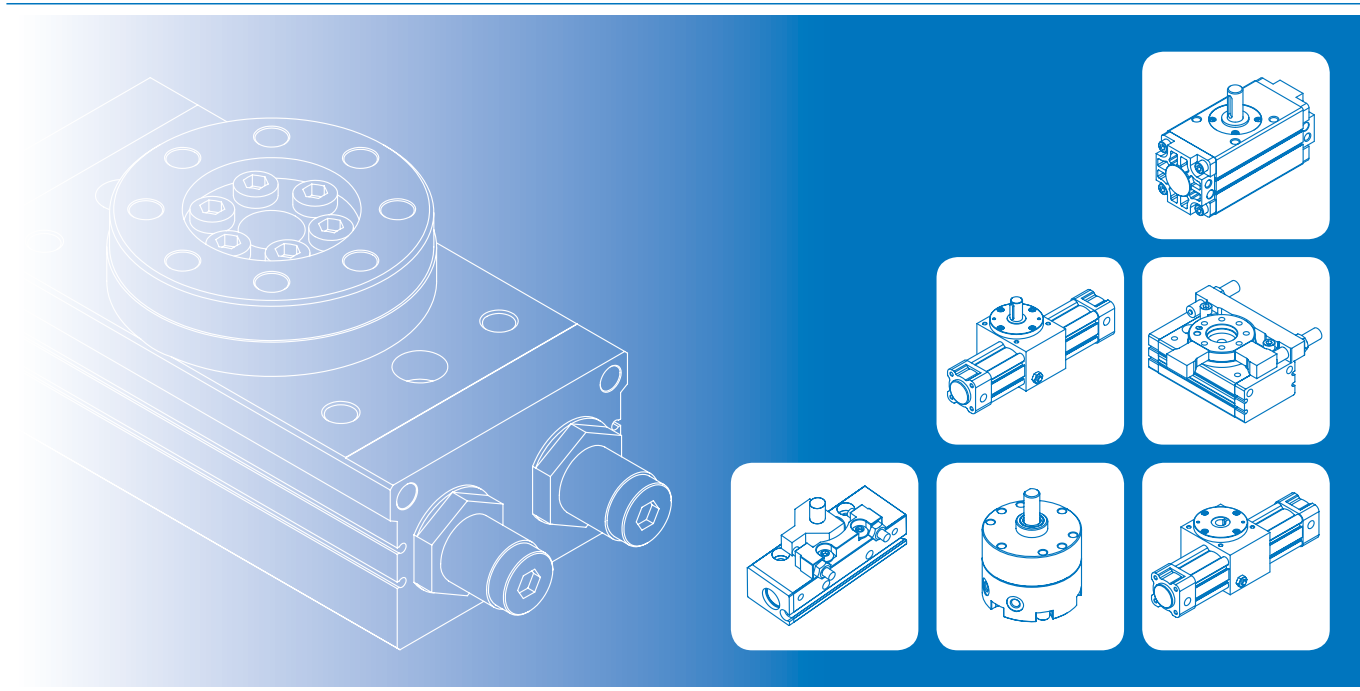
| Model | Tube I.D. (mm) | Type | Description |
|---|----------------|-----------------|--------------------------------------|
| CP - MCQA - <input type="checkbox"/> | ø6~ø200 | Component parts | Air cylinder |
| PS - MCQA - <input type="checkbox"/> | | Repair kits | |
| MDO SK <input type="checkbox"/> | ø20~ø150 | Repair kits | Rotary actuator / Hydraulic cylinder |

| Model | Component parts | Repair kits |
|---|-----------------|-------------|
| (Vol.2) Standard cylinder | | |
| MCQA | ● | ● |
| MCQN | ● | ● |
| (Vol.2) ISO-VDMA Standard profile cylinder | | |
| MCQV | ● | ● |
| MCQV2 | ● | ● |
| MCQV3 | ● | ● |
| MCQI2 | ● | ● |
| MCQI3 | ● | ● |
| MCKQI2 | ● | ● |
| (Vol.2) Compact cylinder | | |
| MCJA | ● | ● |
| MCJQ | ● | ● |
| MCJQ2 | ● | ● |
| MCKJQ | ● | ● |
| MCJI | ● | ● |
| MCJU | | ● |
| MCJI | ● | ● |
| MCFB | ● | ● |
| (Vol.2) Miniature cylinder | | |
| MCMA | ● | ● |
| MCMB | ● | ● |
| MCKMB | ● | |
| MCMBRA | ● | ● |
| MCMBRB | ● | ● |
| (Vol.2) ISO-6432 / Non-pivot type mini. cylinder | | |
| MCKMI | ● | ● |
| MCMIS | ● | |
| MCKMI | ● | |
| (Vol.2) Pen cylinder | | |
| MCMJ | ● | |
| MCMJP | | ● |

| Model | Component parts | Repair kits |
|------------------------------------|-----------------|-------------|
| (Vol.2) Round cylinder | | |
| MCCG | ● | ● |
| MCCN | ● | ● |
| (Vol.2) High speed cylinder | | |
| MCCH | ● | ● |
| (Vol.2) Guide cylinder | | |
| MCGA | | ● |
| MCGS | | ● |
| MCGI | ● | ● |
| MCGJ | | ● |
| MGTB / K / U / X | ● | ● |
| MCGD | | ● |
| MCG3 | | ● |
| MCDA | | ● |
| MCDJ | | ● |
| Rotary actuator | | |
| MCRA | | ● |
| MCRQ | | ● |
| MRTF / H | | ● |
| Clamp cylinder | | |
| MCKB | | ● |
| Gripper | | |
| MCHB | | ● |
| MCHC | | ● |
| MCHD | | ● |
| MCHH | | ● |
| MCHU | | ● |
| MCHS | | ● |
| MCHX | | ● |
| MCHG2 | | ● |
| MCHJ | | ● |
| MCHA | | ● |

| Model | Component parts | Repair kits |
|-------------------------|-----------------|-------------|
| Gripper | | |
| MCHY | | ● |
| Hydraulic cylinder | | |
| MDHB / D / N | | ● |
| MDMB / D / N | | ● |
| MHCB / Q | | ● |
| MHCB-M | | ● |
| MDOA / C / D / N | | ● |
| MRPH | | ● |

ROTARY ACTUATOR




| | | |
|---------------|---------------------------|------|
| | Moment of inertia | 1-2 |
| MCRA | ø63 | 1-4 |
| MCRB | ø16~ø32 | 1-8 |
| MCRJ-S | ø6, ø8 | 1-13 |
| MCRC | 30 New | 1-16 |
| F MCRQ | ø12~ø40 | 1-20 |
| MCRQ-S | ø16~ø25 | 1-27 |
| MRT* | ø40~ø80 MRTH / MRTF | 1-31 |

F Fast delivery

Our goal is to achieve 3-day lead time, if there is stock of component set. For more information, please go to our **MINDMAN** website (www.mindman.com.tw) and click on the "Component Set Inventory" button.

- The load will create inertial forces (kinetic energy) when moving the load with Rotary Actuator. In order to stop the moving load, it is necessary to use stopper or Shock Absorbers to absorb the kinetic energy of load.
- The moving load with actuator can be distinguished as following
 1. Linear motion (air cylinder), Fig.(1)
 2. Rotation motion (rotary actuator), Fig.(2)
- Calculate the kinetic energy by using the formula in FIG.

Linear motion

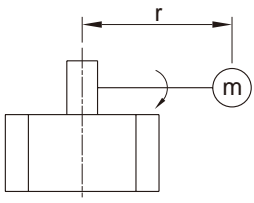


E : Kinetic energy
 m : Load mass
 V : Speed

$$E = \frac{1}{2} \cdot m \cdot V^2 \dots (1)$$

Fig. (1) Linear motion

Rotation motion



E : Kinetic energy
 I : Moment of inertia(= $m \cdot r^2$)
 ω : Speed
 m : Mass
 r : Radius of rotation

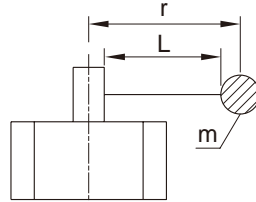
$$E = \frac{1}{2} \cdot I \cdot \omega^2 = \frac{1}{2} \cdot m \cdot r^2 \cdot \omega^2 \dots (2)$$

Fig. (2) Rotation motion

- For linear motion, if the velocity V of formula (1) is constant, the kinetic energy E and mass m is proportional; The rotation motion, formula (2) shows even the angular velocity ω and mass m is constant, kinetic energy E will also be proportional with r^2 . Therefore, even the mass is small but the rotation radius r is large, when the moment of Inertia $I = m \cdot r^2$ is large, kinetic energy E will become larger, it will cause bearing damage or other accidents.
- Therefore when there is a rotation motion, the product selection should be based on moment of inertia instead of mass.

Moment of inertia

- Moment of inertia shows, it is not easy to rotate the stationary object; the same which means it is difficult to stop the rotating object.
- Rotary Actuators in the allowable kinetic energy has its limitations, it can be calculated moment of inertia to calculate minimum rotation of moment of inertia described as following.

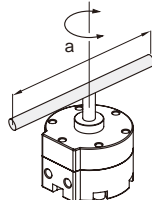


$I = m \cdot r^2$
 m : Mass
 r : Radius of rotation

Above figure represents the moment of inertia for the distance r from rotary shaft to mass m of the object. The formula for moment of Inertia is not the same if the shapes of the object are different. The following examples are calculated on the basis of specific moment of inertia.

1. Thin shaft

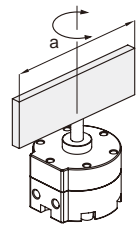
Position of rotational axis: Perpendicular to the shaft through the shaft through the center of gravity.



$I = m \cdot \frac{a^2}{12}$

2. Thin rectangular plate

Position of rotational axis: Parallel to side b and through the center of gravity.



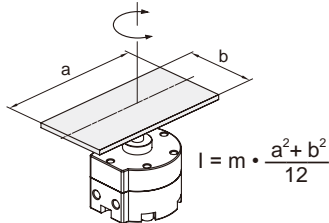
$I = m \cdot \frac{a^2}{12}$

Moment of inertia

ROTARY ACTUATOR

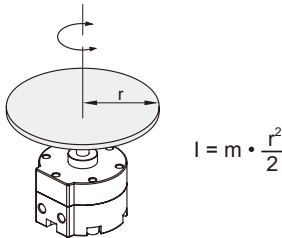
3. Thin rectangular plate (Including rectangular parallelepiped)

Position of rotational axis: Perpendicular to the plate through the center of gravity.



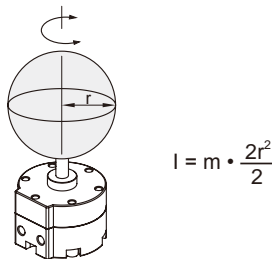
4. Round plate (Including column)

Position of rotational axis: Through the center axis.



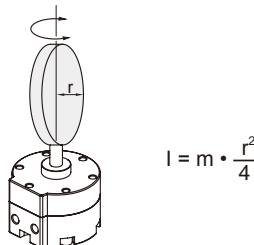
5. Solid sphere

Position of rotational axis: Through the center of diameter.

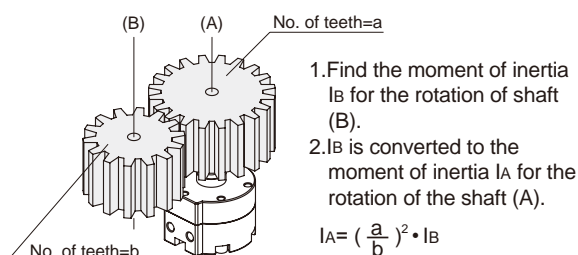


6. Thin round plate

Position of rotational axis: Through the center of diameter.



7. Gear transmission



Use the following formula to calculate the rotation time

$$t \geq \sqrt{\frac{2 \cdot I \cdot \theta^2}{E}}$$

t : Rotation time (s)
E : Kinetic energy (J)
I : Moment of inertia (kg.m²)
θ : Rotation angle (rad)

The meaning of this formula is the critical rotation time for not cause damage of the cylinder. Therefore the rotation time must be set on or over the t seconds calculated in above formula.

After calculated the moment of inertia by load shape, use the following formula to calculate the kinetic energy of the load.

$$E = 1/2 \cdot I \cdot \omega^2$$

E : Kinetic energy (J)
I : Moment of inertia (kg.m²)
ω : Angle speed (rad/s)

Angle speed

$$\omega = 2 \theta / t \dots (1)$$

$$\omega = \theta / t \dots (2)$$

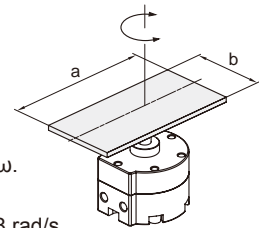
t : Rotation time (s)
I : Moment of inertia (kg.m²)
θ : Rotation angle (rad)

However, when the rotation time for 90° becomes longer than 2 seconds, use formula (2).

Calculation example

Load form: Cuboid
Rotation angle θ: 180° Length of a part: 0.12 m
Rotation time t: 1 s/180° Length of b part: 0.06 m
Mass (m) : 0.1 kg

$$I = m \cdot \frac{a^2 + b^2}{12}$$



(Step 1) Find the angle speed ω.

$$\omega = \frac{2\theta}{t} = \frac{2}{1} \times \pi = 6.28 \text{ rad/s}$$

(Step 2) Find the moment of inertia I.

$$I = m \cdot \frac{a^2 + b^2}{12}$$

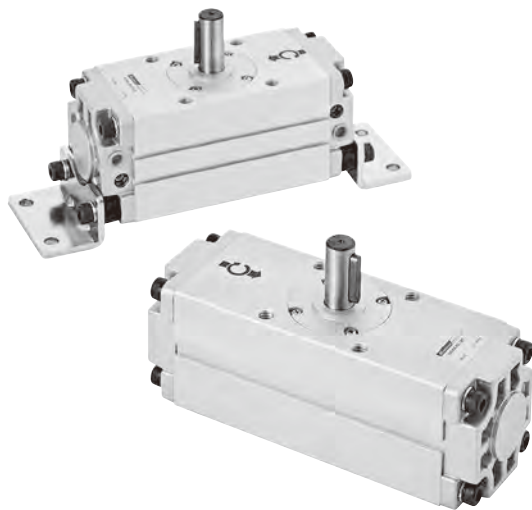
$$= 0.1 \times \frac{144 \times 10^{-4} + 36 \times 10^{-4}}{12}$$

$$= 1.5 \times 10^{-4} \text{ kg.m}^2$$

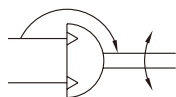
(Step 3) Find the kinetic energy E.

$$E = \frac{1}{2} \cdot I \cdot \omega^2 = \frac{1}{2} \times 1.5 \times 10^{-4} \times 6.28^2$$

$$= 0.002958 \text{ J}$$



Symbol



Features

- Compact body.
- Functional design with clean appearance.
- Simple mounting of sensors.
- Magnetic as standard.

Specification

| Model | MCRA | | |
|--------------------------|------------------------|------|-----|
| Acting type | Double acting | | |
| Tube I.D. (mm) | ø63 | | |
| Port size | Rc1/8 | | |
| Medium | Air | | |
| Operating pressure range | 0.1~1 MPa | | |
| Proof pressure | 1.5 MPa | | |
| Ambient temperature | -5~+60°C (No freezing) | | |
| Acting angle tolerance | 0~+4° | | |
| Lubrication | Not required | | |
| Cushion | Air cushion | | |
| Allowable kinetic energy | 1.5J (Air cushion) | | |
| Sensor switch (*) | RCB, RCE, RCE1, RDEP | | |
| Weight (kg) | 90° | 180° | LB |
| | 2.7 | 3.1 | 0.4 |

* RCB, RCE, RCE1, RDEP specification, please refer to page 5-4, 6, 7, 10.

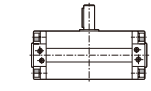
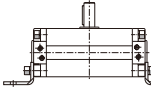
Order example

MCRA — 63 — 90 — LB — □

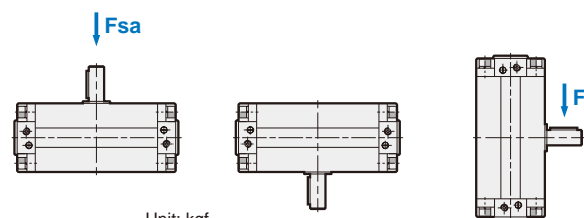
MODEL TUBE I.D. ROTARY ANGLE MOUNTING TYPE PORT THREAD

Blank: Rc thread
G: G thread
NPT: NPT thread

| Code | Rotary angle |
|------|--------------|
| 90 | 90° |
| 180 | 180° |

| Mounting Type | Diagram |
|---------------|---|
| Blank |  |
| LB |  |

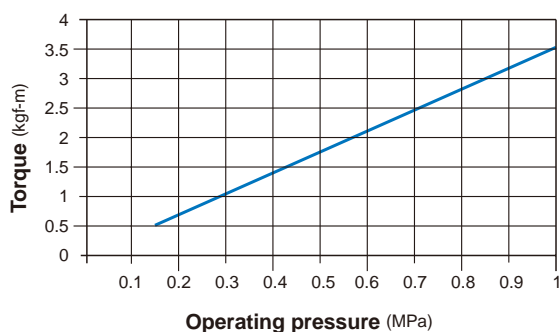
Shaft loading

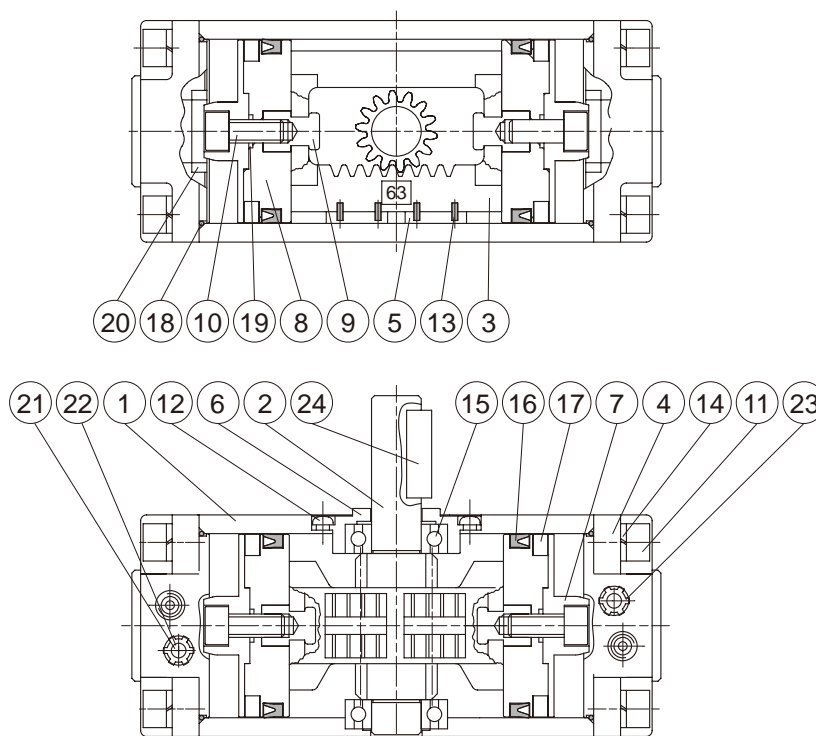


Unit: kgf

| Load direction | | |
|----------------|-----|----|
| Fsa | Fsb | Fr |
| 60 | 20 | 30 |

Torque diagram





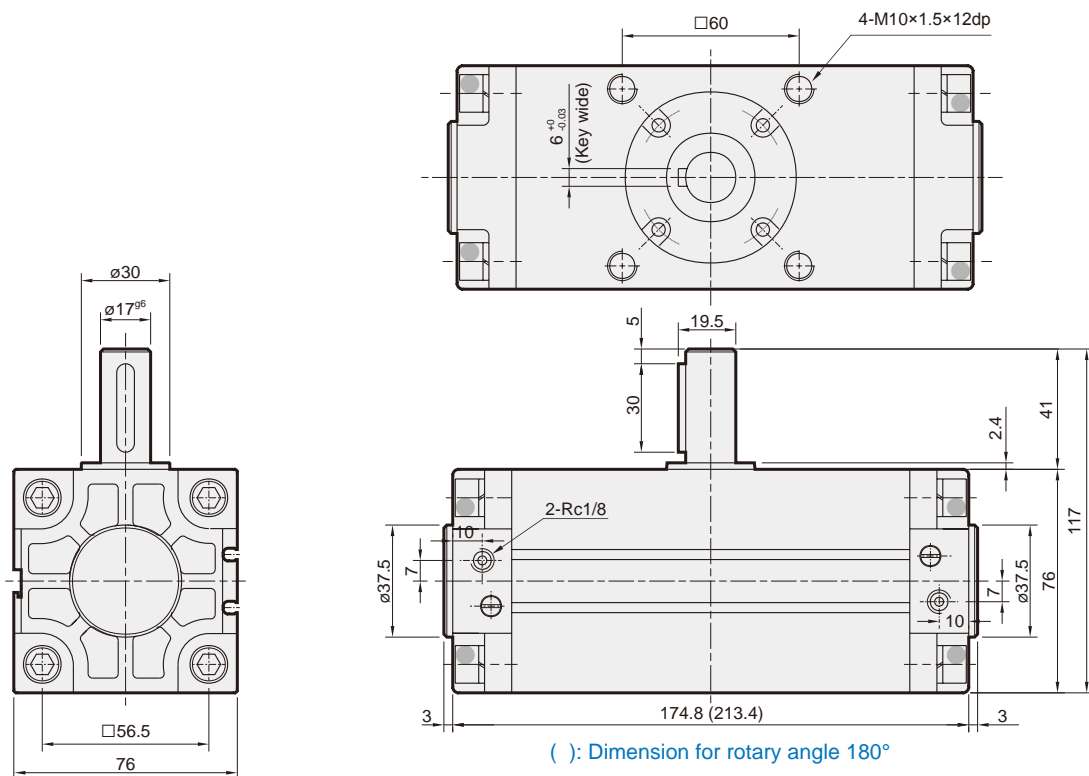
Material

| No. | Part name | Material | Q'y | Repair kits (inclusion) |
|-----|------------------|----------------|-----|-------------------------|
| 1 | Body | Aluminum alloy | 1 | |
| 2 | Shaft | Carbon steel | 1 | |
| 3 | Rack | Carbon steel | 1 | |
| 4 | Cover | Aluminum alloy | 2 | |
| 5 | Slider | Plastic | 2 | |
| 6 | Bearing retainer | Aluminum alloy | 1 | |
| 7 | Piston #1 | Aluminum alloy | 2 | |
| 8 | Piston #2 | Aluminum alloy | 2 | |
| 9 | Screw #1 | Carbon steel | 2 | |
| 10 | Screw #2 | SCM | 2 | |
| 11 | Bolt | SCM | 8 | |
| 12 | Screw | SCM | 4 | |
| 13 | Spring pin | Spring steel | 4 | |
| 14 | Spring washer | SCM | 8 | |
| 15 | Bearing | Bearing steel | 2 | |
| 16 | Piston packing | NBR | 2 | ● |

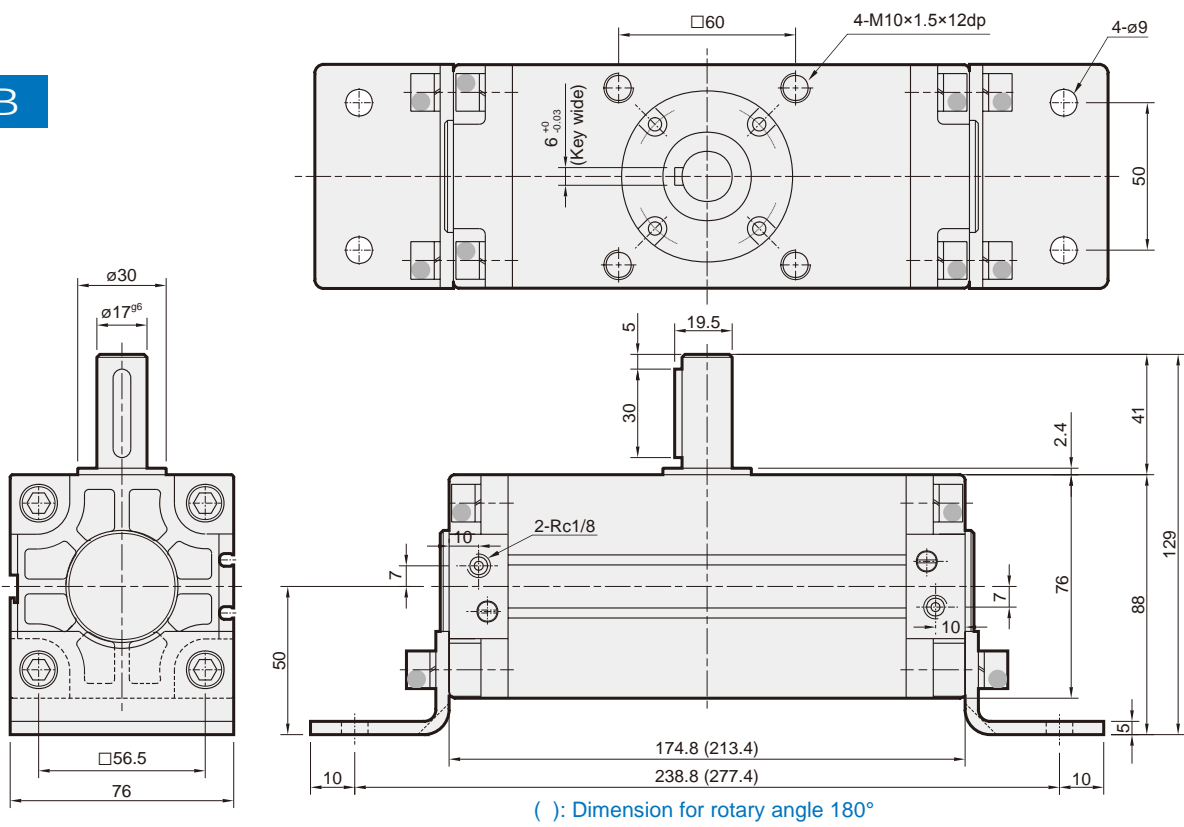
| No. | Part name | Material | Q'y | Repair kits (inclusion) |
|-----|---------------------|-----------------|-----|-------------------------|
| 17 | Magnet ring | Magnet material | 2 | |
| 18 | Gasket | NBR | 2 | ● |
| 19 | O-ring | NBR | 2 | ● |
| 20 | Cushion packing | NBR | 2 | |
| 21 | Needle valve | Copper | 2 | |
| 22 | Needle valve gasket | NBR | 2 | ● |
| 23 | Needle valve washer | Aluminum alloy | 2 | |
| 24 | Parallel key | Carbor steel | 1 | |

Order example of repair kits

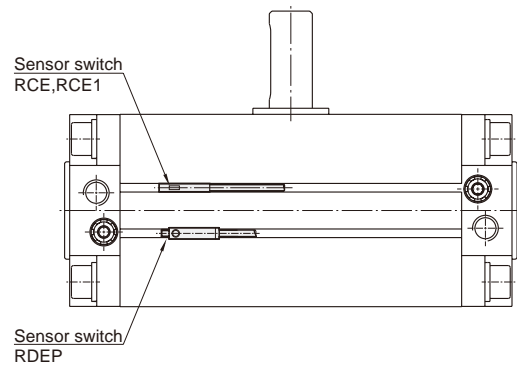
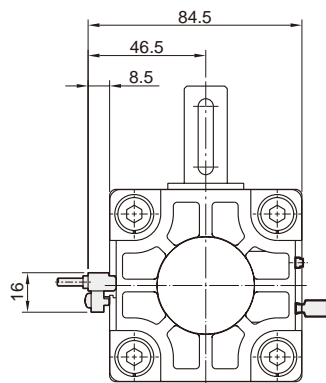
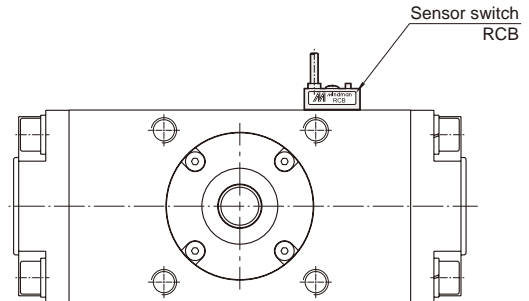
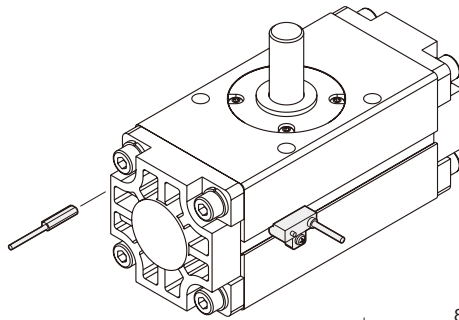
| Tube I.D. | Repair kits |
|-----------|-------------------|
| ø63 | PS-MCRA-63 |

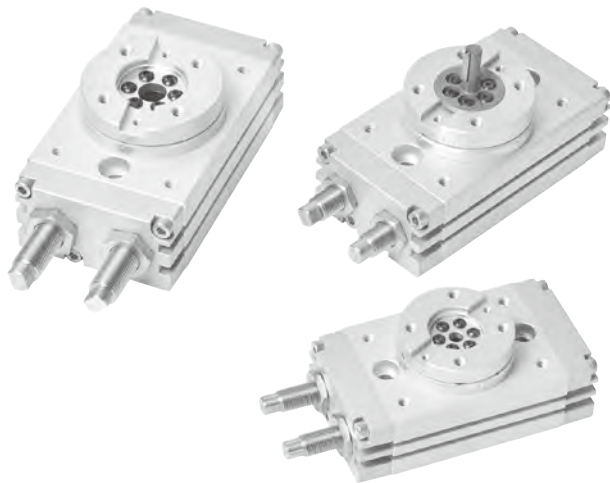


LB



Installation of sensor switch





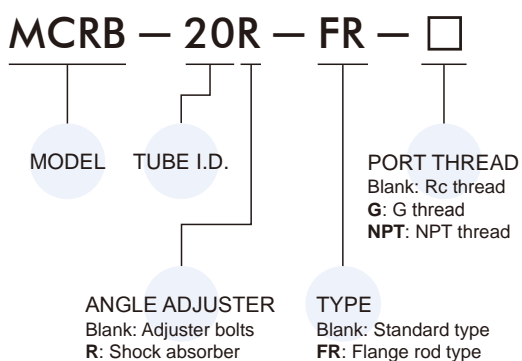
Features

- Twin rack and pinion fitted as standard.
- Can be adjusted between 0 and 190 degrees.
- Simple mounting of sensors.
- Magnetic as standard.

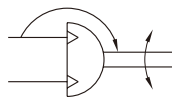
Specification

| Model | MCRB | | | | |
|---------------------------------------|--------------------------------|--------|--------|--------|-------|
| Acting type | Double acting | | | | |
| Tube I.D. (mm) | 16 | 20 | 25 | 32 | |
| Port size | Rc1/8 | | | | |
| Medium | Air | | | | |
| Operating pressure range | 0.1~1 MPa | | | | |
| Proof pressure | 1.5 MPa | | | | |
| Ambient temperature | -5~+60°C (No freezing) | | | | |
| Lubrication | Not required | | | | |
| Cushion | NBR spacer | | | | |
| Allowable kinetic energy | Cushion pad | 0.007J | 0.040J | 0.081J | 0.32J |
| | Cushion | 0.039J | 0.116J | 0.294J | 1.6J |
| Stable rotation time regulation range | 0.2~1.0 s/90° | | | | |
| Sensor switch | RCD (Please refer to page 5-5) | | | | |
| Weight (kg) | 0.7 | 1.16 | 1.57 | 3.07 | |

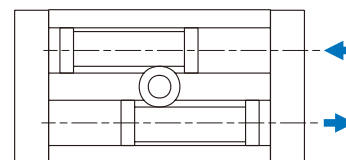
Order example



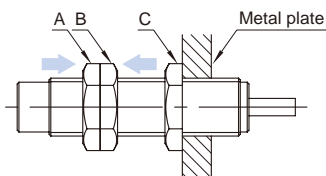
Symbol



Action profile

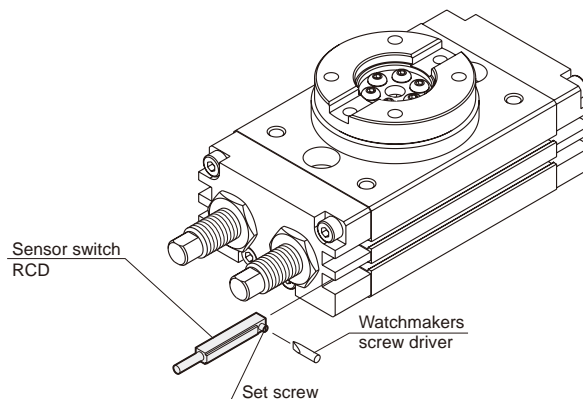


Installation guide of shock absorber

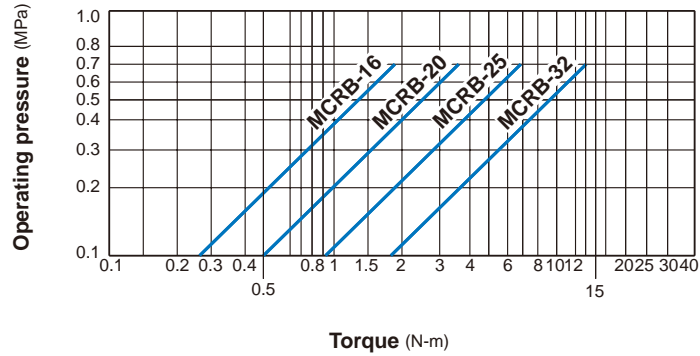


- 1 Install 3 nuts on the shock absorber as the picture shown.
- 2 Bind the A nut and B nut together via tightening them with different rotating direction.
- 3 Hold B nut and rotate C nut to bind the plate and C nut together.
- 4 Unbind the A nut and B nut. The installation is complete.

Installation of sensor switch



Torque diagram



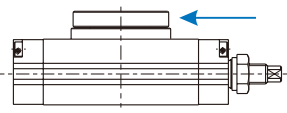
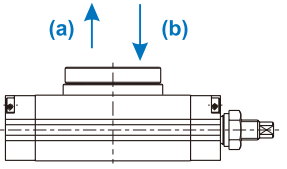
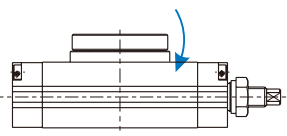
Theoretic force

Unit: N-m

| Model | | MCRB | | | |
|--------------------------|-----|------|------|------|-------|
| Tube I.D. | | 16 | 20 | 25 | 32 |
| Operating pressure (MPa) | 0.1 | 0.26 | 0.5 | 0.91 | 1.88 |
| | 0.2 | 0.52 | 1 | 1.81 | 3.78 |
| | 0.3 | 0.78 | 1.5 | 2.72 | 5.66 |
| | 0.4 | 1.04 | 2.01 | 3.62 | 7.56 |
| | 0.5 | 1.31 | 2.51 | 4.55 | 9.44 |
| | 0.6 | 1.57 | 3 | 5.45 | 11.32 |
| | 0.7 | 1.83 | 3.5 | 6.36 | 13.23 |

Allowable load

Set the load and moment to be applied to the table within the allowable values shown in the table below. (Values outside of limitations will cause excessive play, deteriorate accuracy, and shorten service life.)

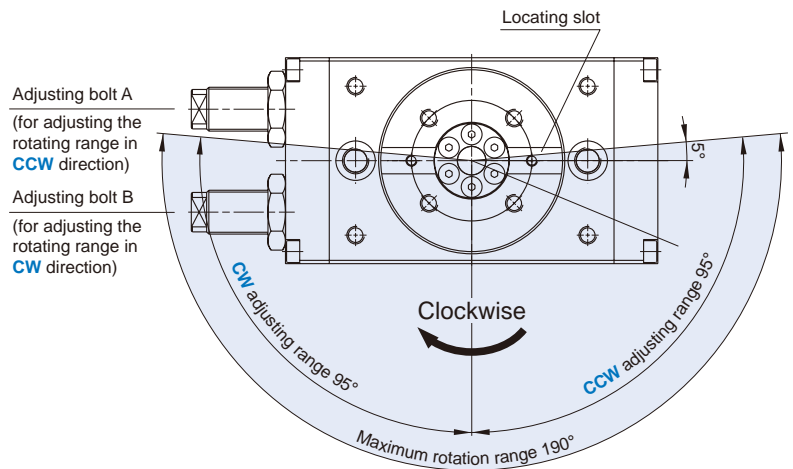
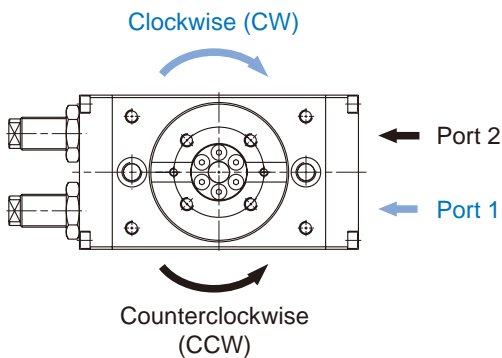
| Pictures |  | |  | |  | |
|----------|---|---------------------------|---|-----|---|------------------------|
| | Tube I.D. | Allowable radial load (N) | Allowable thrust load (N) | | | Allowable moment (N.m) |
| | | | (a) | (b) | | |
| 16 | 78 | 74 | 78 | 2.4 | | |
| 20 | 196 | 197 | 363 | 5.3 | | |
| 25 | 314 | 296 | 451 | 9.7 | | |
| 32 | 390 | 493 | 708 | 18 | | |

ROTARY ACTUATOR

Rotating direction and angle

- When the port 1 is pressurized, the flange rotates in clockwise (CW) direction.
- When the port 2 is pressurized, the flange rotates in counter-clockwise (CCW) direction.

The rotating angle range can be adjust by the method shown as right figure.



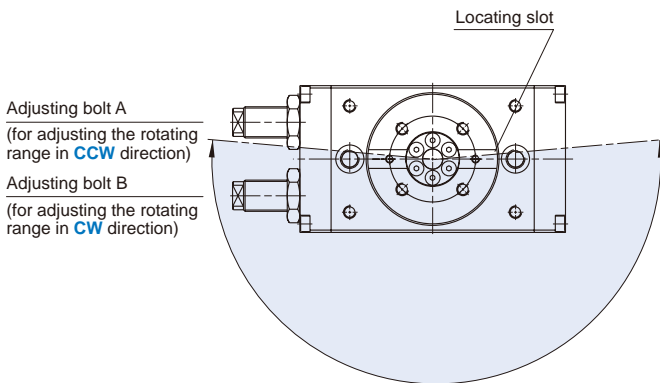
NOTE

- The figure shows the rotating range and use the pin hole as indicator.
- The locating slot in the figure locates at the situation which the CCW & CW rotating range are both adjusted at 90°.

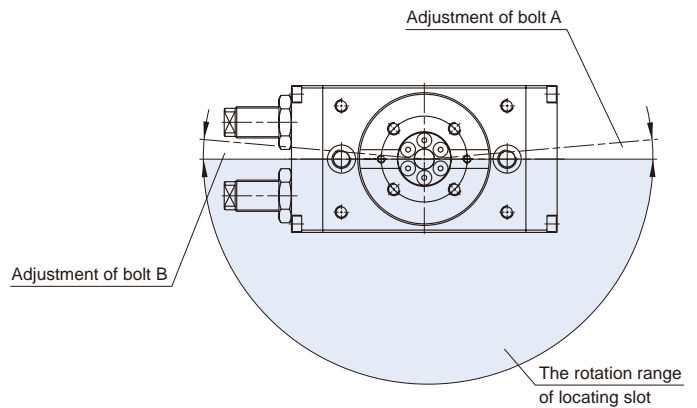
Rotating range adjusting example

- The followed figures show the rotating range of different adjustment via bolt A and B. (The drawings also show the rotation ranges of the locating slot.)

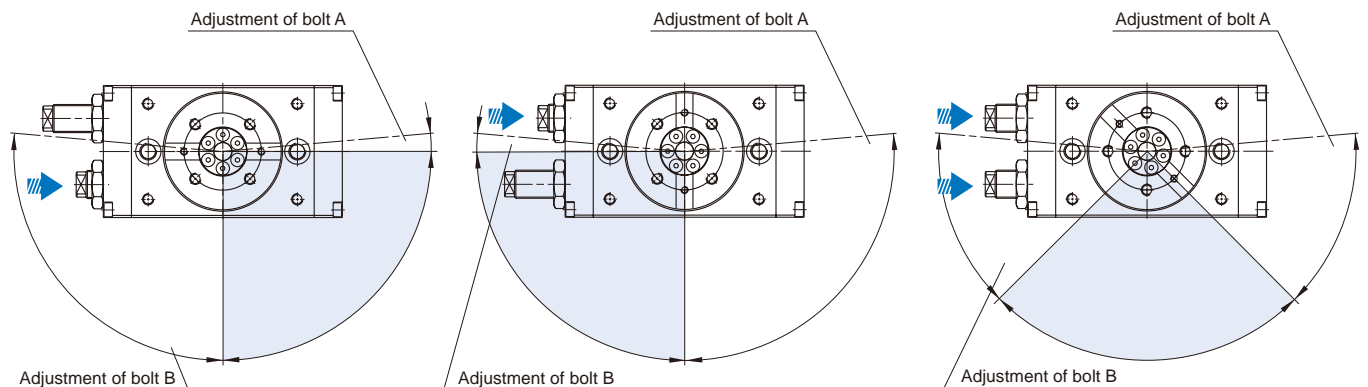
190° (Max) Rotation



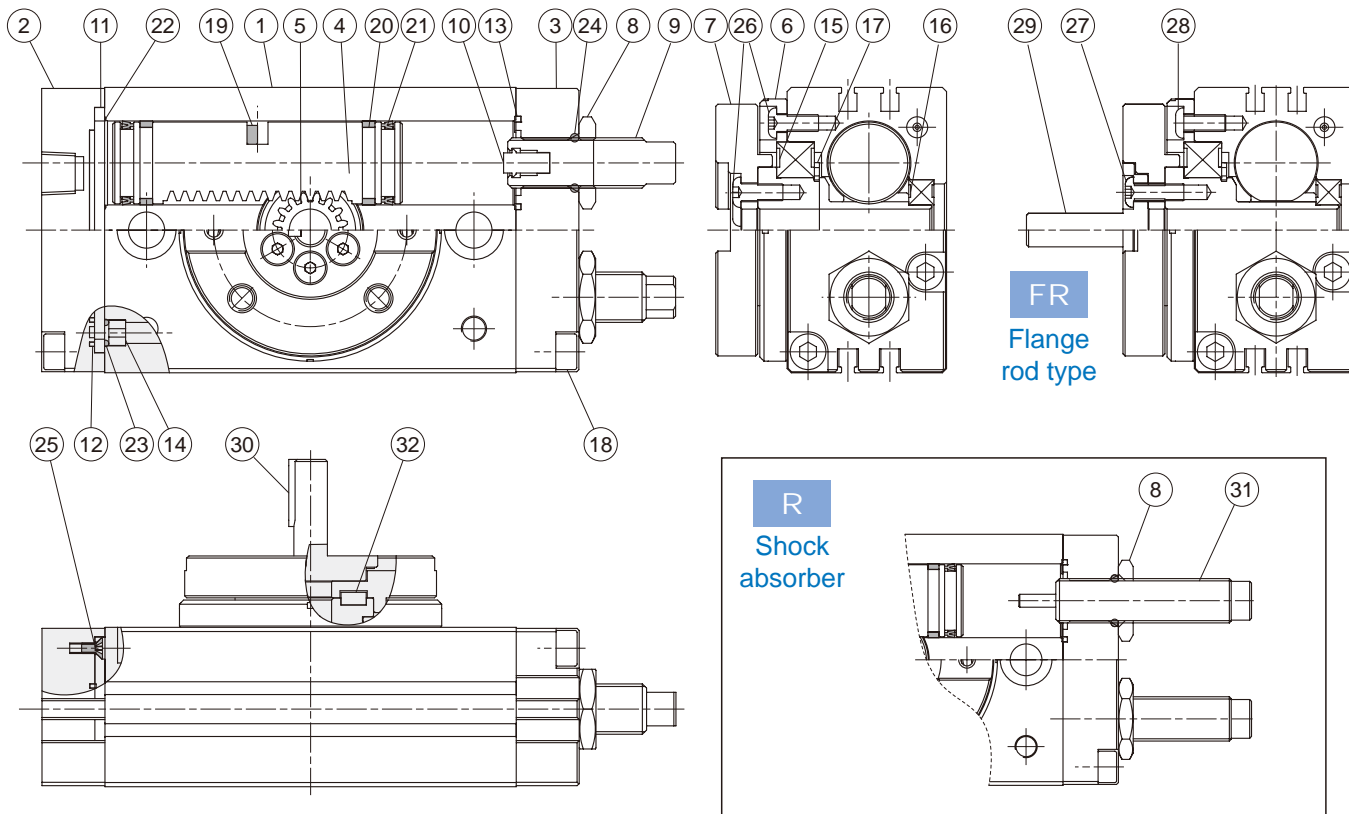
180° Rotation



90° Rotation



ROTARY ACTUATOR



Material

| No. | Part name | Material | Q'y | Repair kits (inclusion) |
|-----|------------------|-----------------|-----|-------------------------|
| 1 | Body | Aluminum alloy | 1 | |
| 2 | Cover | Aluminum alloy | 1 | |
| 3 | End cover | Aluminum alloy | 1 | |
| 4 | Piston | Stainless steel | 2 | |
| 5 | Pinion | SCM | 1 | |
| 6 | Bearing retainer | Aluminum alloy | 1 | |
| 7 | Table | Aluminum alloy | 1 | |
| 8 | Seal nut | Stainless steel | 2 | |
| 9 | Adjusting bolt | Stainless steel | 2 | |
| 10 | Cushion pad | NBR | 2 | ● |
| 11 | Plate | Aluminum alloy | 1 | |
| 12 | Packing | NBR | 1 | ● |
| 13 | Packing | NBR | 2 | ● |
| 14 | Fixed | Copper | 2 | |
| 15 | Ball bearing | Bearing steel | 1 | |
| 16 | Ball bearing | Bearing steel | 1 | |
| 17 | Snap ring | Spring steel | 1 | |
| 18 | Bolt | Stainless steel | 8 | |
| 19 | Magnet | Magnet material | 2 | |
| 20 | Wear ring | Resin | 4 | |

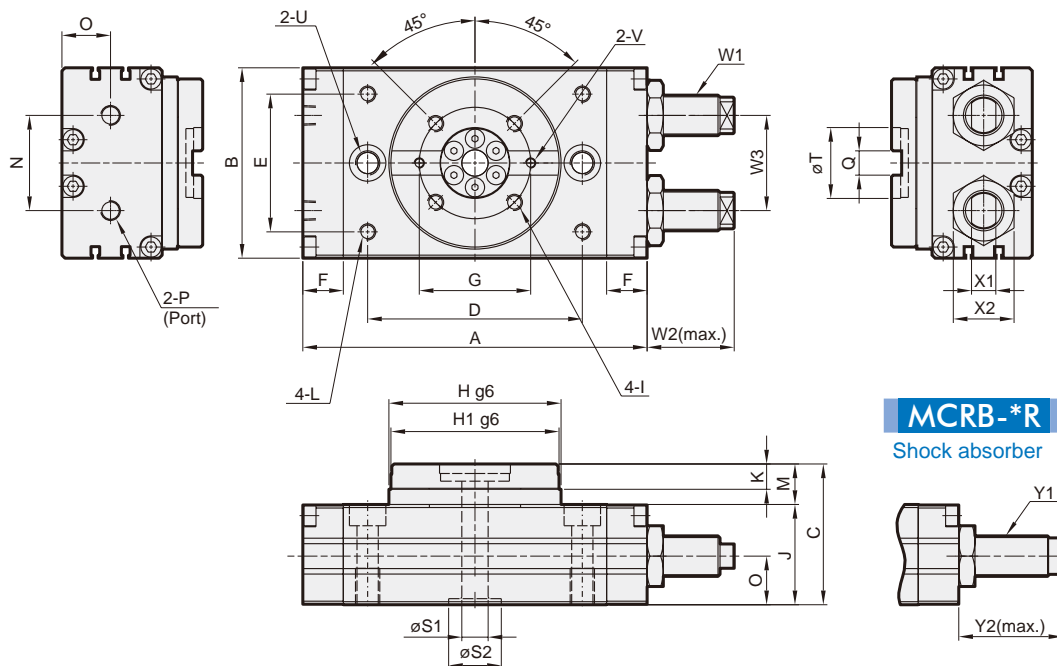
| No. | Part name | Material | Q'y | Repair kits (inclusion) |
|-----|-------------------|--------------|-----|-------------------------|
| 21 | Piston packing | NBR | 4 | ● |
| 22 | O-ring | NBR | 2 | ● |
| 23 | O-ring | NBR | 2 | ● |
| 24 | O-ring | NBR | 2 | ● |
| 25 | Screw | Carbon steel | 2 | |
| 26 | Bolt | Carbon steel | 10 | |
| 27 | Bolt *1 | Carbon steel | 6 | |
| 28 | Bolt *1 | Carbon steel | 4 | |
| 29 | Rotate shaft *1 | Carbon steel | 1 | |
| 30 | Round key *1 | Carbon steel | 1 | |
| 31 | Shock absorber *2 | - | 2 | |
| 32 | Round key | Carbon steel | 1 | |

Order example of repair kits

| Tube I.D. | Repair kits |
|-----------|-------------------|
| ø16 | PS-MCRB-16 |
| ø20 | PS-MCRB-20 |
| ø25 | PS-MCRB-25 |
| ø32 | PS-MCRB-32 |

*1. No.27~30 for (FR) flange rod type.

*2. Only suit for option (R) shock absorber.



MCRB-*R
Shock absorber

| Code Tubr I.D. | A | B | C | D | E | F | G | H | H1 | I | J | K | L | M | N | O | P |
|-------------------|-------|----|------|-----|----|------|----|------|----|-----------------|------|------|----------|----|----|------|-------|
| 16 | 108 | 58 | 47 | 62 | 38 | 15 | 38 | 50 | 48 | M5×7dp,P.C.D38 | 33 | 8 | M5×8dp | 14 | 26 | 15.5 | Rc1/8 |
| 20 | 128 | 68 | 55 | 78 | 47 | 15 | 46 | 62.5 | 60 | M6×7dp,P.C.D46 | 38 | 10 | M6×8dp | 17 | 27 | 18.5 | Rc1/8 |
| 25 | 135.5 | 77 | 58.5 | 84 | 55 | 15.5 | 48 | 67 | 65 | M6×9dp,P.C.D48 | 41.5 | 10 | M6×8dp | 17 | 37 | 20 | Rc1/8 |
| 32 | 170 | 94 | 69.5 | 106 | 68 | 20 | 55 | 85 | 83 | M8×10dp,P.C.D55 | 49.5 | 12.5 | M8×8.5dp | 20 | 47 | 24 | Rc1/8 |

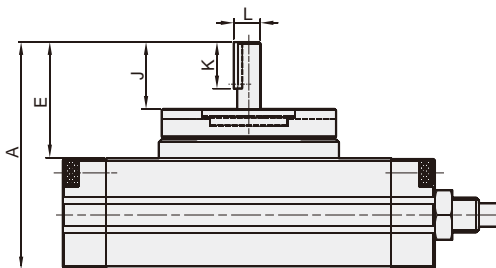
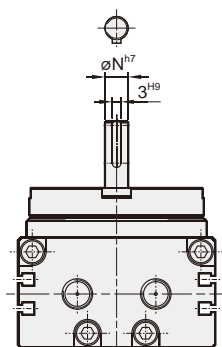
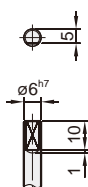
| Code Tubr I.D. | Q | S1 | S2 | T | U | V | W1 | W2 |
|-------------------|--|----|---------------|---------------|--|--------|---------|----|
| 16 | 8 ^{+0.03} ₋₀ (wide)×3.3dp | 6 | 17 (H7)×2.5dp | 24 (H7)×3dp | 2- $\phi 6.8$ thru, $\phi 11 \times 6.5$ dp,M8×12dp(sink) | M3×4dp | M10×1.0 | 27 |
| 20 | 10 ^{+0.03} ₋₀ (wide)×3.5dp | 10 | 22 (H7)×2.5dp | 32 (H7)×3dp | 2- $\phi 8.6$ thru, $\phi 14 \times 8.5$ dp,M10×15dp(sink) | M4×6dp | M12×1.0 | 23 |
| 25 | 12 ^{+0.03} ₋₀ (wide)×4dp | 13 | 22 (H7)×3dp | 32 (H7)×3.7dp | 2- $\phi 8.6$ thru, $\phi 14 \times 8.5$ dp,M10×15dp(sink) | M4×5dp | M14×1.5 | 36 |
| 32 | 12 ^{+0.03} ₋₀ (wide)×5dp | 13 | 26 (H7)×3dp | 35 (H7)×4.7dp | 2- $\phi 10.5$ thru, $\phi 18 \times 10.5$ dp,M12×18dp(sink) | M5×5dp | M20×1.5 | 43 |

| Code Tubr I.D. | W3 | X1 | X2 | Y1 | Y2 |
|-------------------|----|----|----|------------|------|
| 16 | 26 | 7 | 17 | FK-1008L-S | 24 |
| 20 | 32 | 8 | 19 | FK-1210L-S | 36.5 |
| 25 | 37 | 8 | 22 | FK-1412L-S | 41 |
| 32 | 47 | 12 | 30 | FK-2016L-S | 55 |

Flange rod type

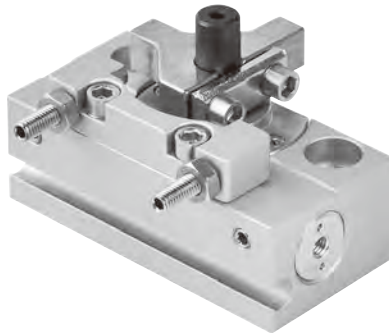
$\phi 16$

$\phi 20 \sim \phi 32$

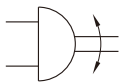


| Code Tubr I.D. | A | E | J | K | L | N |
|-------------------|-------|------|------|----|------|----|
| 16 | 64.5 | 31.5 | 17.5 | - | - | - |
| 20 | 78 | 40 | 23 | 16 | 9.2 | 8 |
| 25 | 81.5 | 40 | 23 | 20 | 11.2 | 10 |
| 32 | 109.5 | 60 | 40 | 20 | 13.2 | 12 |

* Other dimensions are the same as standard type.

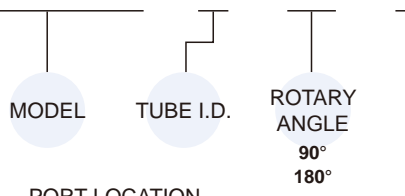


Symbol

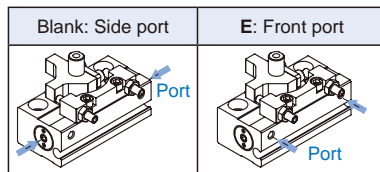


Order example

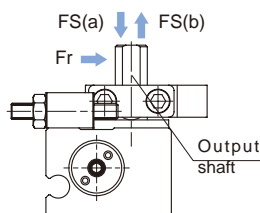
MCRJ – S – 6 – 90 – E



PORT LOCATION



Allowable load



| Tube I.D. (mm) | Allowable load (N) | | | Output shaft size (mm) |
|----------------|--------------------|--------|--------|------------------------|
| | Fr | FS (a) | FS (b) | |
| 6 | 25 | 20 | 20 | ø5 |
| 8 | 30 | 25 | 25 | ø6 |

Features

- Rack and pinion type with external stoppers.
- Rotary angle 90°, 180°.
- Compact and lightweight, mounting from 3 directions.
- Standard with magnet.

Specification

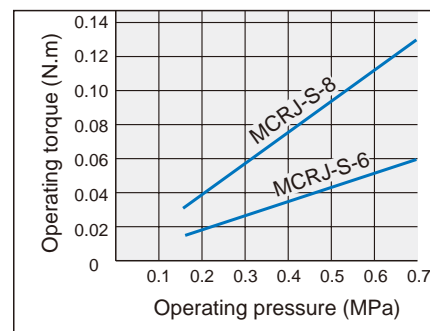
| Model | MCRJ-S | |
|--------------------------|-----------------------|--|
| Tube I.D. (mm) | 6 | 8 |
| Port size | M3 × 0.5 | |
| Rotation | 90°, 180° | |
| Medium | Air (Non-lube) | |
| Operating pressure range | 0.15~0.7 MPa | |
| Ambient temperature | 0~+60°C (No freezing) | |
| Angle adjustment range | Each rotation end ±5° | |
| Sensor switch (*) | 2 wire | RDVE(V): Non-contact |
| | 3 wire | RNFE(V): NPN, RPFE(V): PNP |
| Weight (g) | 90° | 47.2 |
| | 180° | 53.4 |

* R*FE(V) specification, please refer to page 5-11.

Operating torque

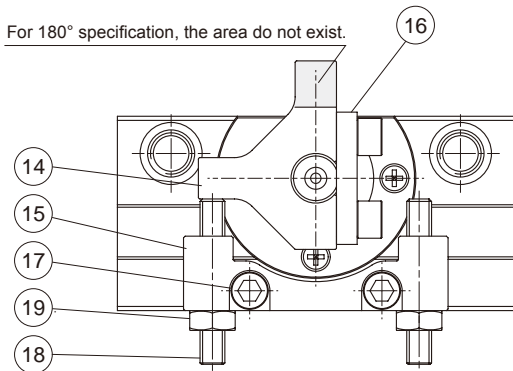
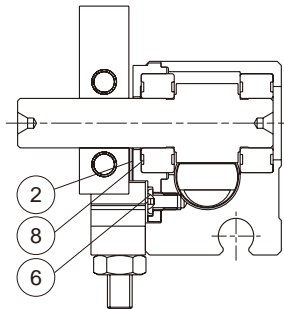
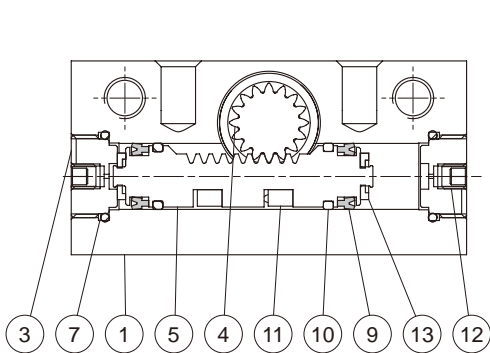
| Tube I.D. (mm) | Operating pressure (MPa) | | | | | | |
|----------------|--------------------------|-------|-------|-------|-------|------|-------|
| | 0.15 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 |
| 6 | 0.013 | 0.017 | 0.026 | 0.034 | 0.042 | 0.05 | 0.059 |
| 8 | 0.029 | 0.038 | 0.057 | 0.076 | 0.095 | 0.11 | 0.13 |

Note. Effective torque values are representative values. They are not guaranteed values. Use them only as a guide.



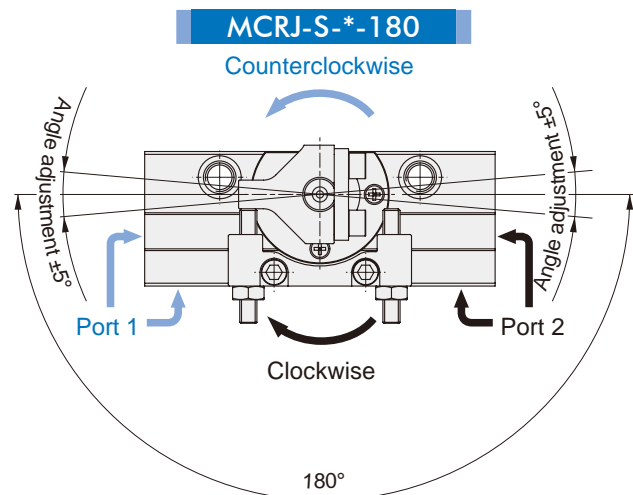
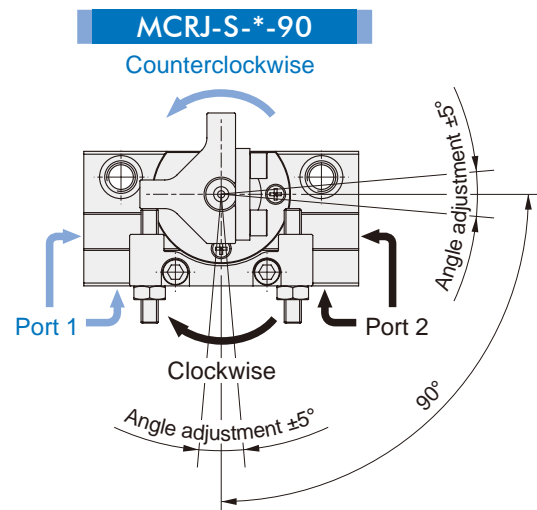
Allowable kinetic energy / Rotation time adjustment range

| Tube I.D. (mm) | Allowable kinetic energy (J) | Rotation time adjustment range for stable operation (s/90°) |
|----------------|------------------------------|---|
| 6 | 0.001 | 0.1~0.5 |
| 8 | 0.002 | |



Rotating direction and angle

- The shaft rotates counterclockwise when the input air is from port 1. The shaft rotates clockwise when the input air is from port 2.
- The rotation range can be adjusted by adjustment screws.

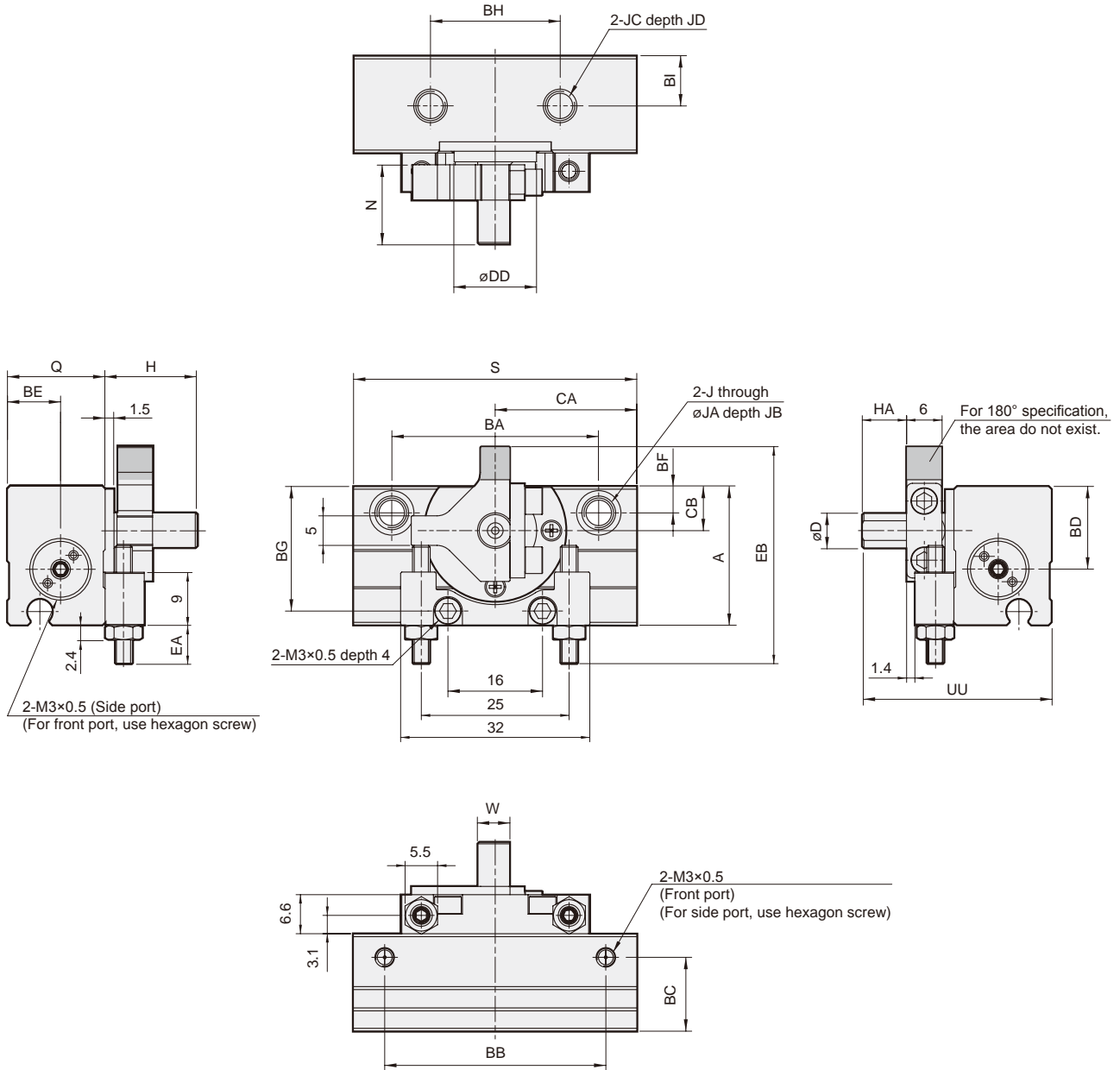


Material

| No. | Tube I.D. Part name | 6 | 8 | Q'y |
|-----|------------------------|------------------|---|-----|
| 1 | Body | Aluminum alloy | | 1 |
| 2 | Bearing holder | Aluminum alloy | | 1 |
| 3 | Cover | Aluminum alloy | | 2 |
| 4 | Pinion | Stainless steel | | 1 |
| 5 | Piston | Stainless steel | | 1 |
| 6 | Screw | Stainless steel | | 3 |
| 7 | O ring | NBR | | 2 |
| 8 | Ball bearing | Bearing steel | | 2 |
| 9 | Piston seal | NBR | | 2 |
| 10 | Wear ring | Resin | | 2 |
| 11 | Magnet | Magnet material | | 2 |
| 12 | Screw | Steel | | 2 |
| 13 | Gasket | NBR | | 2 |
| 14 | Stopper | Alloy steel | | 1 |
| 15 | Holder | Aluminum alloy | | 1 |
| 16 | Stopper retainer | Low carbon steel | | 1 |
| 17 | Hexagon screw | Stainless steel | | 4 |
| 18 | Hexagon screw | Stainless steel | | 2 |
| 19 | Hexagon nut | Low carbon steel | | 2 |

MCRJ-S Dimensions $\varnothing 6, \varnothing 8$

MINI-ROTARY ACTUATOR



| Code Tubr I.D. | A | BA | BB | BC | BD | BE | BF | BG | BH | BI | CA | CB | D | DD | EA | EB | HA | J | JA | JB | JC | JD | H | N | Q | S | UU | W |
|-------------------|------|----|-------------|------|----|-----|-----|------|----|-----|----------|-----|-----|------|-----|------|-----|--------|-----|-----|--------|----|------|------|------|--------|----|-----|
| 6 | 19.5 | 30 | 32.4 (43.4) | 9.5 | 11 | 6.5 | 3.5 | 17.1 | 20 | 7 | 21.5(27) | 5.5 | 5g6 | 10h9 | 4.5 | 32.7 | 6.5 | M4×0.7 | 5.8 | 3.5 | M4×0.7 | 5 | 14.5 | 12.5 | 13.5 | 43(54) | 28 | 4.5 |
| 8 | 23.5 | 35 | 37.4 (50.4) | 12.5 | 14 | 9 | 4.5 | 21.1 | 22 | 8.5 | 24(30.5) | 7.5 | 6g6 | 14h9 | 6.5 | 36.7 | 7.5 | M5×0.8 | 7.5 | 4.5 | M5×0.8 | 6 | 15.5 | 13.5 | 16.5 | 48(61) | 32 | 5.5 |

* () for 180° specification.



Features

- Compact and lightweight, mounting from 3 directions.
- Rotary angle 90°, 180°, 270°.
- Both rods have locating plane.
- Spin the rod with built-in vane mechanism.

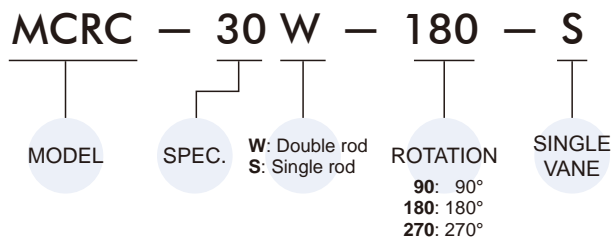
Specification

| Model | MCRC | | |
|--|----------------|------|------|
| Acting type | Double acting | | |
| Specification | 30 | | |
| Port size | M5×0.8 | | |
| Rotation | 90° | 180° | 270° |
| Acting angle tolerance | 0~+4° | | |
| Medium | Air (Non-lube) | | |
| Max. operating pressure | 1 MPa | | |
| Min. operating pressure | 0.15 MPa | | |
| Proof pressure | 1.5 MPa | | |
| Ambient temperature | +5~+60°C | | |
| Allowable kinetic energy (J) | 0.02 | | |
| Load (N) | Radial | 30 | |
| | Axial | 25 | |
| Rotation time adjustment range (s/90°) | 0.04~0.3 (*) | | |
| Weight (g) | 200 | 195 | 190 |

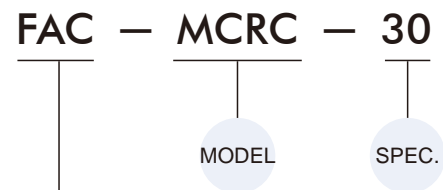
* When the operation speed is lower than the lower speed limit, the rod may jitter or stop.

Please use the product in the range as table shown.

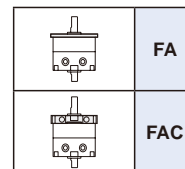
Order example



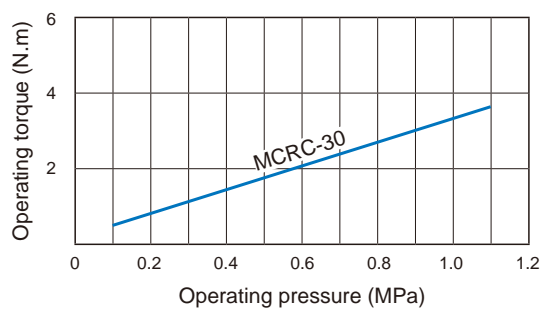
Mounting accessories

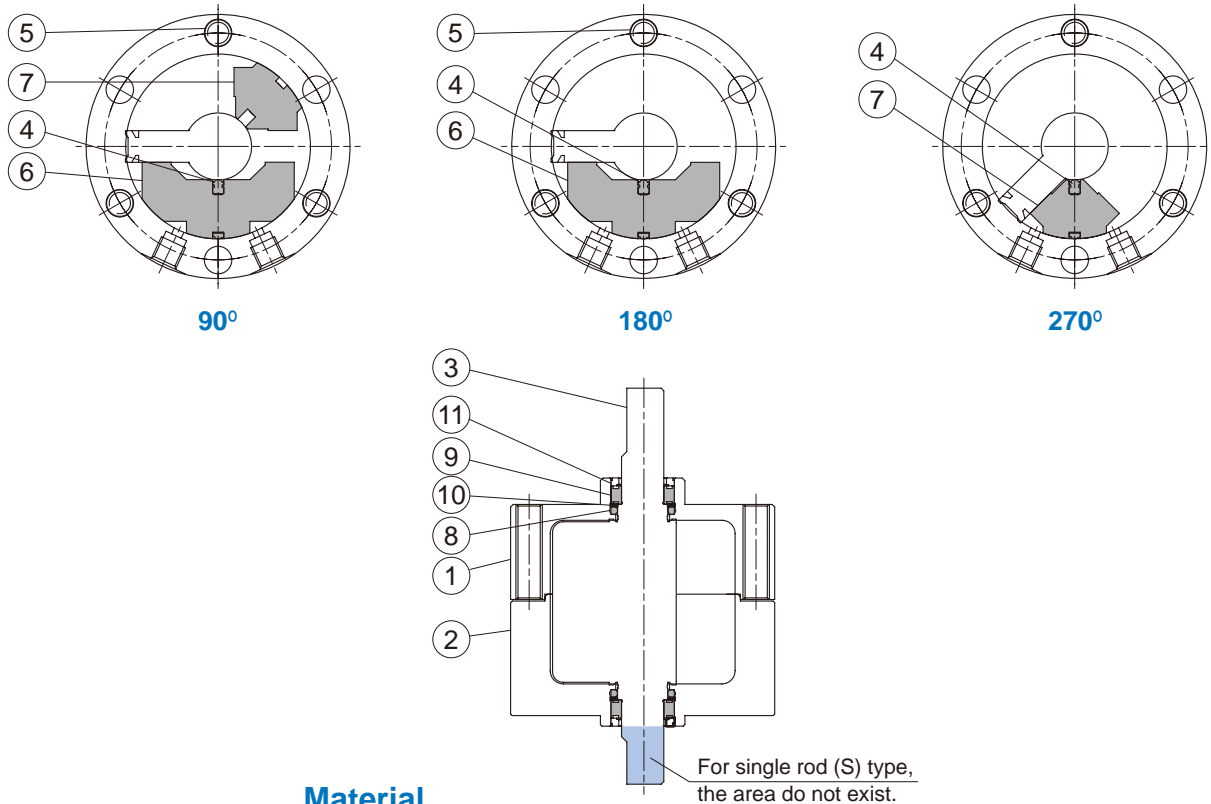


MOUNTING TYPE



Torque diagram

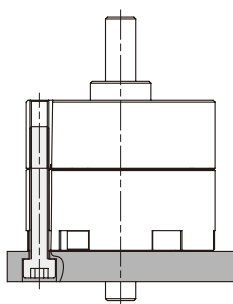




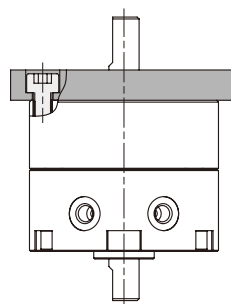
Material

| No. | Part name | Material | Q'y | | |
|-----|-----------------|-----------------|-----|------|------|
| | | | 90° | 180° | 270° |
| 1 | Upper body | Aluminum | 1 | | |
| 2 | Lower body | Aluminum | 1 | | |
| 3 | Shaft | Carbon | 1 | | |
| 4 | Packing | NBR | 1 | | |
| 5 | Bolt | Stainless steel | 3 | | |
| 6 | Adjusting block | Plastic | 1 | 1 | 0 |
| 7 | Adjusting block | Plastic | 1 | 0 | 1 |
| 8 | O-ring | NBR | 2 | | |
| 9 | Ball bearing | Bearing steel | 2 | | |
| 10 | Gasket | Stainless steel | 2 | | |
| 11 | Retaining ring | Stainless steel | 2 | | |

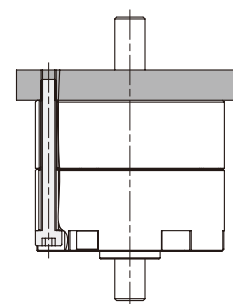
Mounting methods



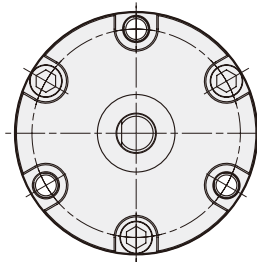
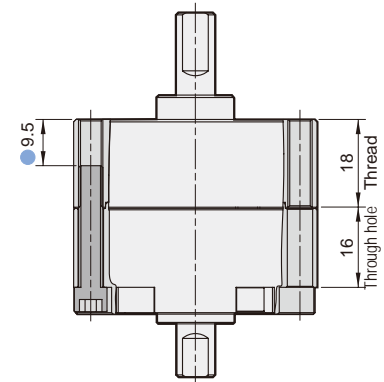
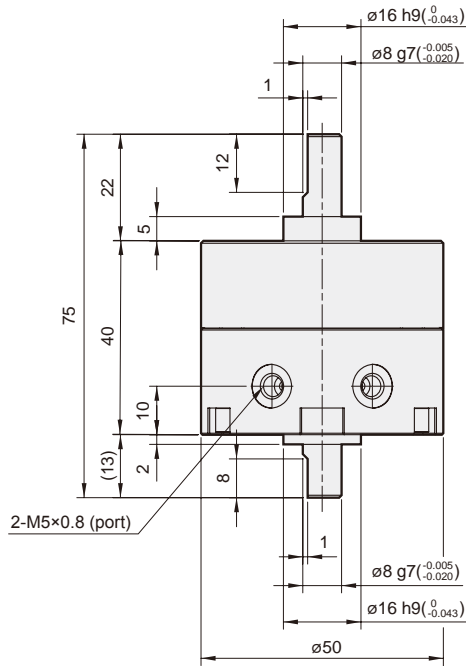
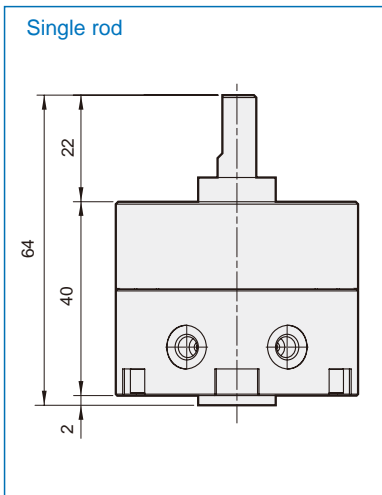
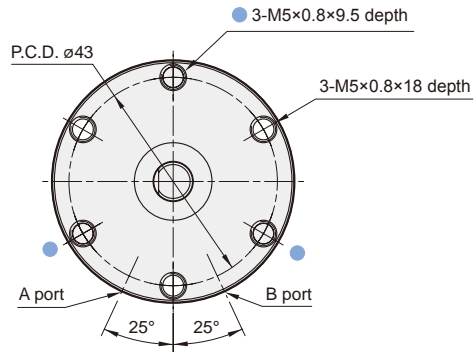
Body tapped



Body tapped



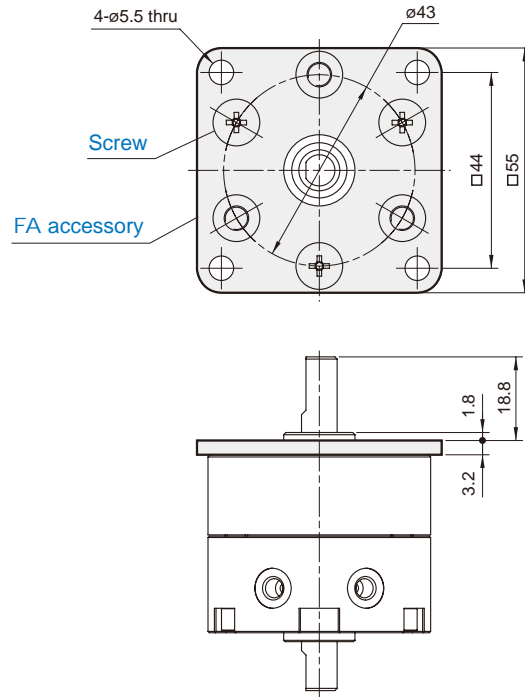
Body through-hole
(Fixed with the customer's plate)



ROTARY ACTUATOR

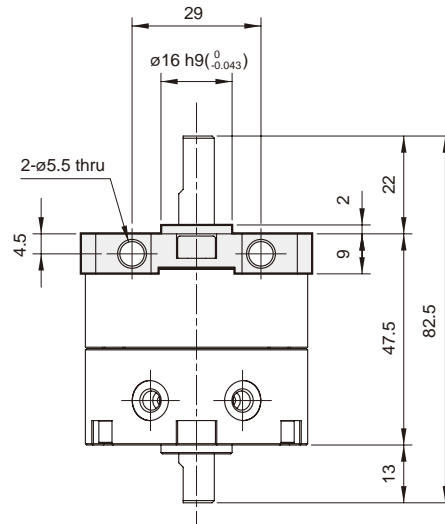
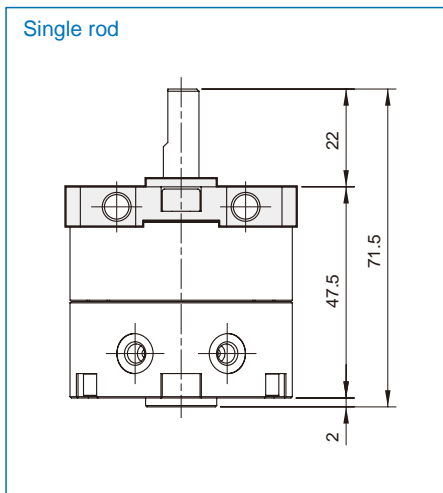
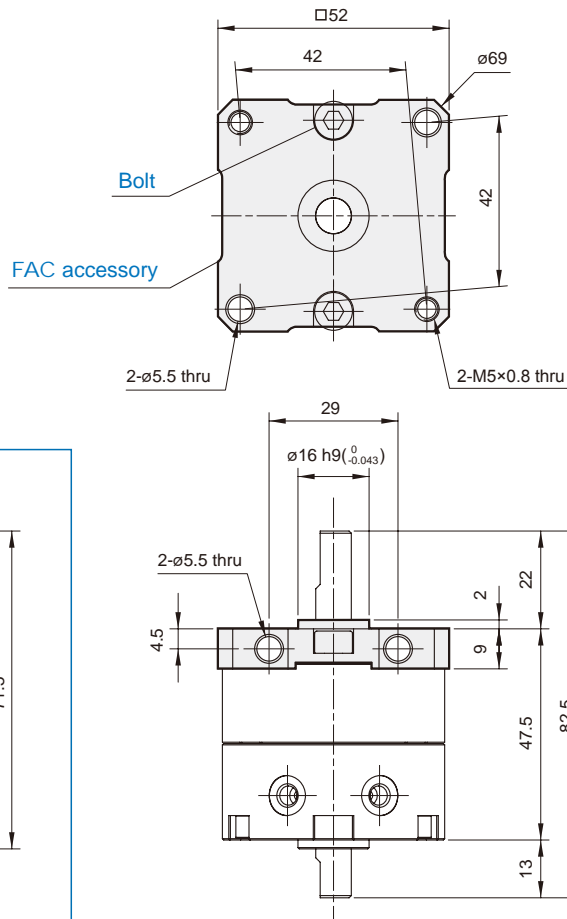
FA

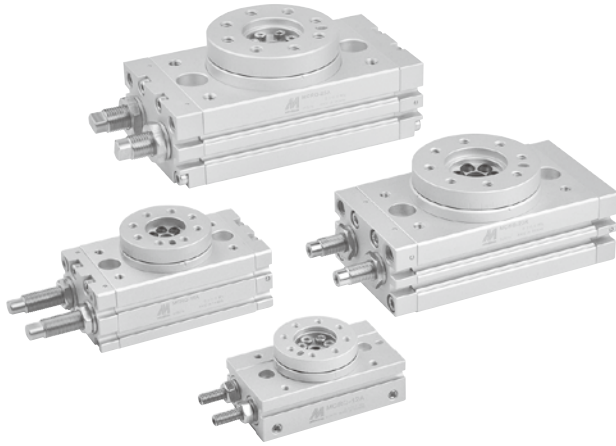
Material
FA: Carbon steel
Screw: Carbon steel



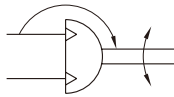
FAC

Material
FAC: Aluminum alloy
Bolt: Carbon steel





Symbol



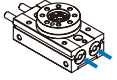
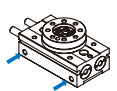
Order example

MCRQ - 20R - [] - []

MODEL TUBE I.D.

ANGLE ADJUSTER
A: With adjusting bolt
R: With shock absorber
 * $\phi 12$ without shock absorber.

PORT LOCATION (*)

Blank: End port

E: Front port


PORT THREAD

Blank: M5×0.8 (for $\phi 12, \phi 16$)
 Blank: Rc thread
G: G thread
NPT: NPT thread (for $\phi 20\sim\phi 40$)

* $\phi 12$ only option.
 * Port location cannot be changed after delivery.

Features

- Centering boss and locating hole for accurate positioning.
- Operating range of table is 0°~190° by angle adjusting screw.
- Compact design using double rack and single pinion.
- Hollow shaft standard for wiring and piping.
- Possible to fit shock absorbers as stops.
- Ease of mounting with integral table.
- Magnetic as standard.

Specification

| Model | MCRQ | | | | | | |
|--|-----------------------|----------------------------|----------------|------|------|------|------|
| Acting type | Double acting | | | | | | |
| Tube I.D. (mm) | 12 | 16 | 20 | 25 | 32 | 40 | |
| Port size | M5×0.8 | | Rc1/8 | | | | |
| Medium | Air | | | | | | |
| Max. operating pressure | adjusting bolt | 0.7MPa | 1 MPa | | | | |
| | shock absorber | — | 0.6 MPa (*1) | | | | |
| Min. operating pressure | 0.1 MPa (*2) | | | | | | |
| Ambient temperature | 0~+60°C (No freezing) | | | | | | |
| Cushion | adjusting bolt | Rubber bumper | | | | | |
| | shock absorber | — | Shock absorber | | | | |
| Angle adjustment range | 0° to 190°(max.) (*3) | | | | | | |
| Sensor switch (*4) | 2 wire | RDVE(V): Non-contact | | | | | |
| | 3 wire | RNVE(V): NPN, RPVE(V): PNP | | | | | |
| Weight (kg) | adjusting bolt | 0.25 | 0.60 | 1.24 | 2.10 | 4.18 | 7.67 |
| | shock absorber | — | 0.61 | 1.31 | 2.12 | 4.19 | 7.72 |
| Minimum rotation that will not allow decrease of energy absorption ability | — | 72° | 58° | 69° | 77° | 82° | |

*1. The maximum operating pressure of the actuator is restricted by the maximum allowable thrust of the shock absorber.

*2. No-load conditions.

*3. Be careful if the rotation angle of a type with internal shock absorber is set below the value in the table below, the piston stroke will be smaller than the shock absorber's effective stroke, resulting in decreased energy absorption ability.

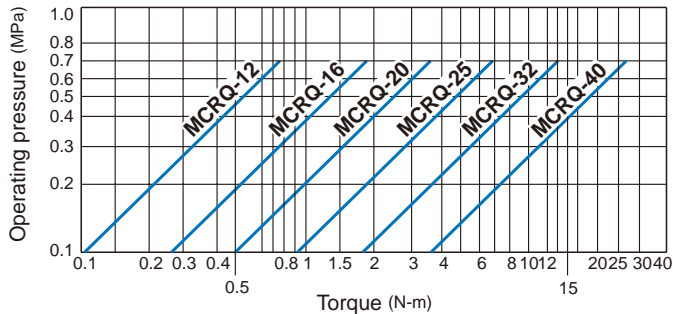
*4. R*FE(V) specification, please refer to page 5-11.

Allowable kinetic energy and rotation time adjustment range

| Model | Allowable kinetic energy (J) | | Rotation time adjustment range for stable operation(s/90°) | |
|---------|------------------------------|-------------------------|--|-------------------------|
| | Adjustment bolt | Internal shock adsorber | Adjustment bolt | Internal shock adsorber |
| MCRQ-12 | 0.006 | — | 0.2 to 1.0 | — |
| MCRQ-16 | 0.007 | 0.039 | | 0.2 to 0.7 |
| MCRQ-20 | 0.048 | 0.116 | | |
| MCRQ-25 | 0.081 | 0.294 | 0.2 to 2.0 | 0.2 to 1.0 |
| MCRQ-32 | 0.32 | 1.6 | | |
| MCRQ-40 | 0.53 | 2.9 | | |

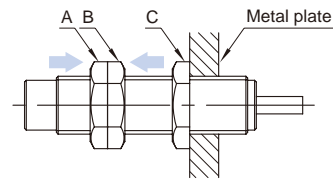
* Be careful if a type with internal absorber is used below the minimum speed, the energy absorption ability will decrease drastically.

Torque diagram



Installation guide of shock absorber

- ❶ Install 3 nuts on the shock absorber as the picture shown.
- ❷ Bind the A nut and B nut together via tightening them with different rotating direction.
- ❸ Hold B nut and rotate C nut to bind the plate and C nut together.
- ❹ Unbind the A nut and B nut. The installation is complete.



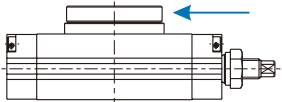
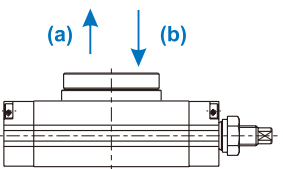
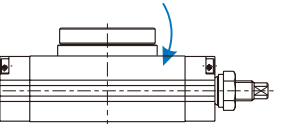
Theoretic force

Unit: N-m

| Model | | MCRQ | | | | | |
|--------------------------|-----|------|------|------|------|-------|-------|
| Tube I.D. | | 12 | 16 | 20 | 25 | 32 | 40 |
| Operating pressure (MPa) | 0.1 | 0.1 | 0.26 | 0.5 | 0.91 | 1.88 | 3.78 |
| | 0.2 | 0.21 | 0.52 | 1 | 1.81 | 3.78 | 7.53 |
| | 0.3 | 0.31 | 0.78 | 1.5 | 2.72 | 5.66 | 11.31 |
| | 0.4 | 0.41 | 1.04 | 2.01 | 3.62 | 7.56 | 15.09 |
| | 0.5 | 0.52 | 1.31 | 2.51 | 4.55 | 9.44 | 18.87 |
| | 0.6 | 0.63 | 1.57 | 3 | 5.45 | 11.32 | 22.62 |
| | 0.7 | 0.73 | 1.83 | 3.5 | 6.36 | 13.23 | 26.4 |

Allowable load

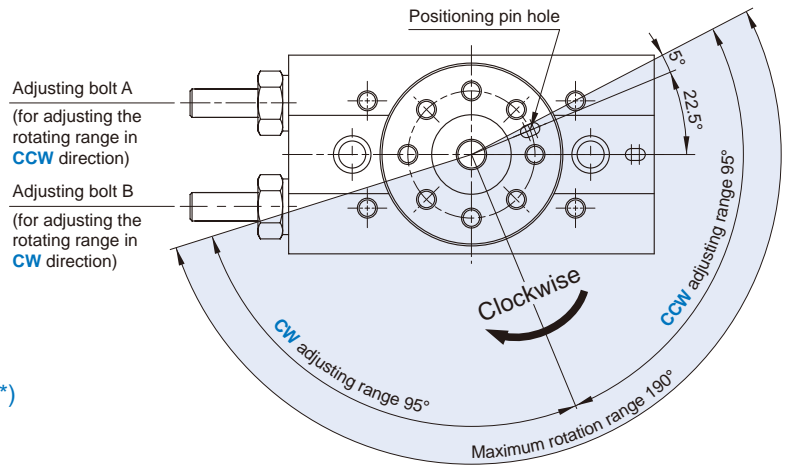
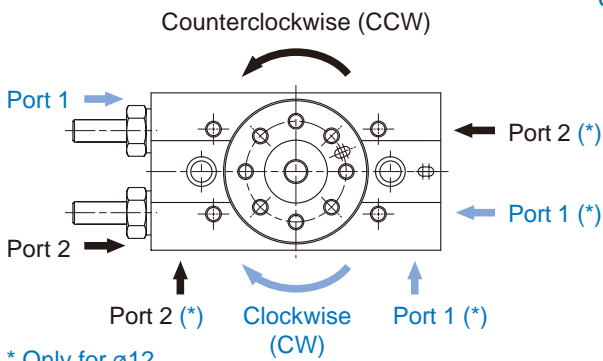
Set the load and moment to be applied to the table within the allowable values shown in the table below. (Values outside of limitations will cause excessive play, deteriorate accuracy, and shorten service life.)

| Pictures |  | |  | |  | |
|----------|---|---------------------------|---|------|--|------------------------|
| | Tube I.D. | Allowable radial load (N) | Allowable thrust load (N) | | | Allowable moment (N.m) |
| | | | (a) | (b) | | |
| | 12 | 54 | 71 | 71 | 1.5 | |
| | 16 | 78 | 74 | 78 | 2.4 | |
| | 20 | 196 | 197 | 363 | 5.3 | |
| | 25 | 314 | 296 | 451 | 9.7 | |
| | 32 | 390 | 493 | 708 | 18 | |
| | 40 | 543 | 740 | 1009 | 25 | |

Rotating direction and angle

- When the port 1 is pressurized, the flange rotates in clockwise (CW) direction.
- When the port 2 is pressurized, the flange rotates in counter-clockwise (CCW) direction.

The rotating angle range can be adjust by the method shown as right figure.



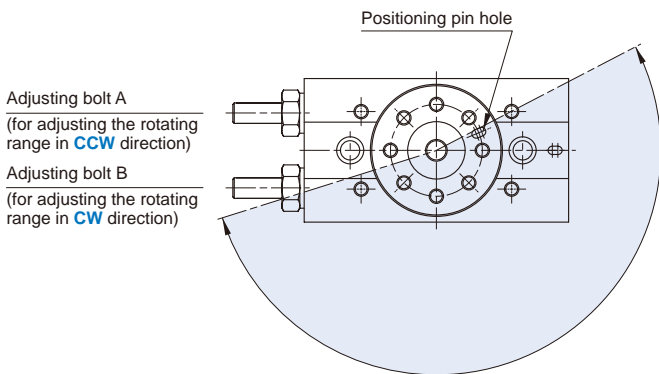
NOTE

- The figure shows the rotating range and use the pin hole as indicator.
- The pin hole position in the figure locates at the situation which the CCW & CW rotating range are both adjusted at 90°.

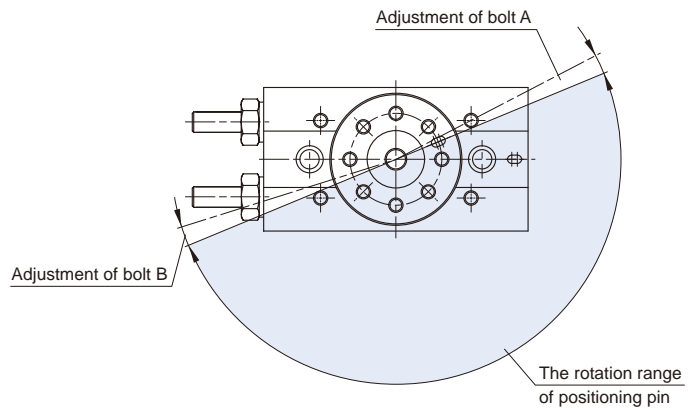
Rotating range adjusting example

- The followed figures show the rotating range of different adjustment via bolt A and B. (The drawings also show the rotation ranges of the positioning pin hole.)

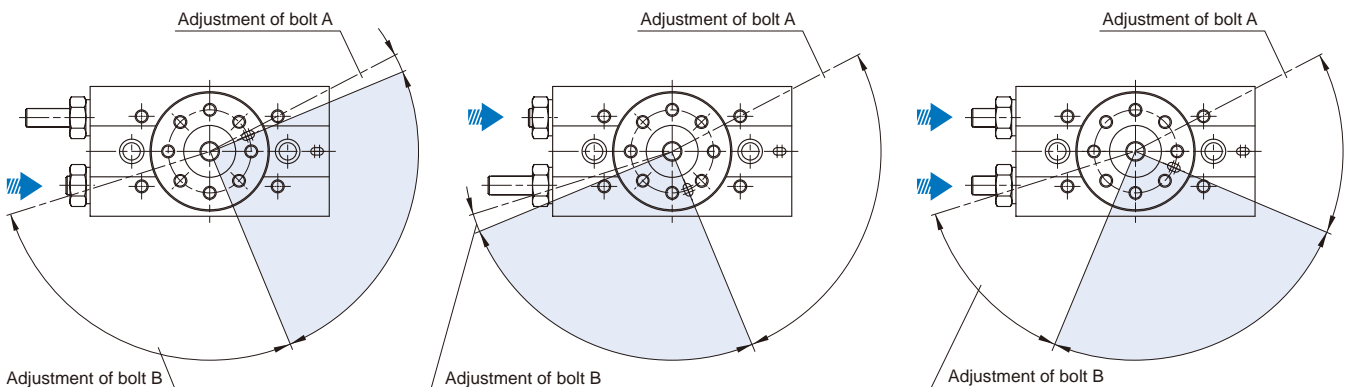
190° (Max) Rotation



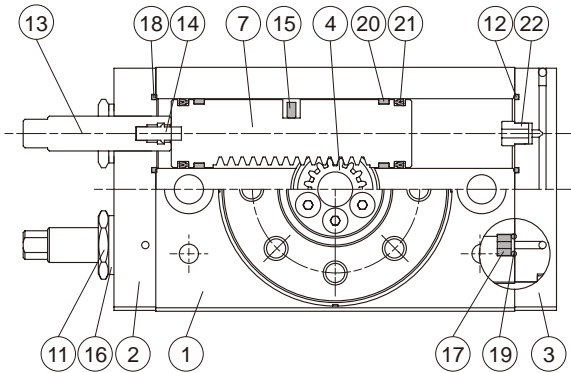
180° Rotation



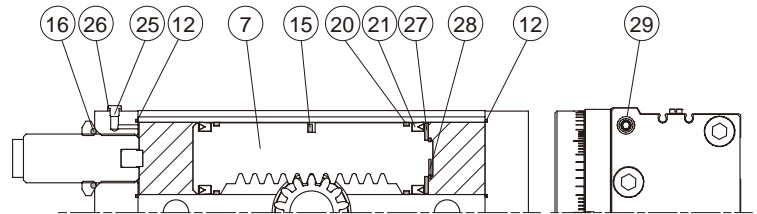
90° Rotation



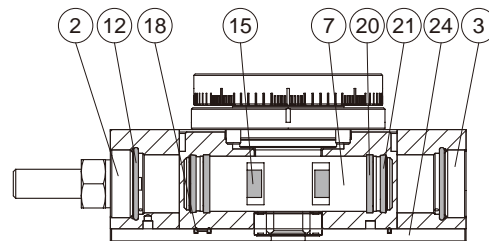
ø16~ø32



ø40



ø12



Material

| No. | Part name | Material | Tube I.D. & Q'y | | | Repair kits (inclusion) |
|-----|-------------------|--------------------|-----------------|----|-------|-------------------------|
| | | | 12 | 16 | 20~32 | |
| 1 | Body | Aluminum alloy | 1 | | | |
| 2 | Cover | Aluminum alloy | 2 | 1 | | |
| 3 | End cover | Aluminum alloy | 2 | 1 | | |
| 4 | Pinion | SCM | 1 | | | |
| 5 | Bearing retainer | Aluminum alloy | 1 | | | |
| 6 | Table | Aluminum alloy | 1 | | | |
| 7 | Piston | Stainless steel | 2 | | | |
| 8 | Rolling bearing | Bearing steel | 1 | | | |
| 9 | Rolling bearing | Bearing steel | 1 | | | |
| 10 | Snap ring | Spring steel | - | 1 | - | |
| 11 | Seal nut | Carbon steel | 2 | | | |
| 12 | O-ring | NBR | 4 | 2 | 4 | ● |
| 13 | Adjusting bolt *1 | Stainless steel *2 | 2 | | | |
| | Shock absorber | - | - | 2 | | |
| 14 | Cushion pad *1 | NBR | 2 | | | |
| 15 | Magnet | Magnet material | 4 | 2 | | |
| 16 | Seal washer | *3 | 2 | | | ● |
| 17 | Fixed | Copper | - | 4 | 2 | - |
| 18 | Piston packing | NBR | 1 | - | 2 | - |
| 19 | O-ring | NBR | - | 4 | 2 | - |

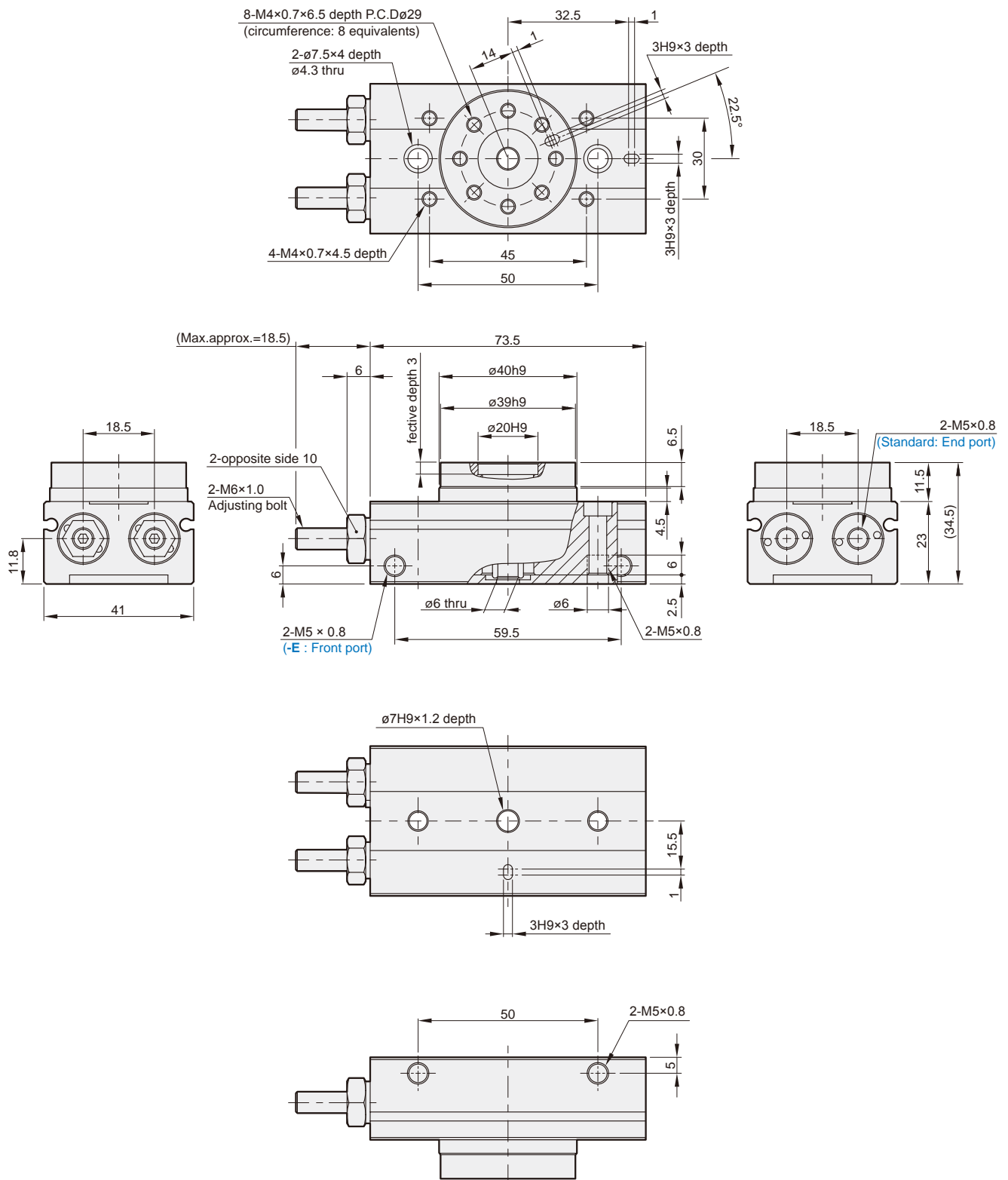
| No. | Part name | Material | Tube I.D. & Q'y | | | | Repair kits (inclusion) |
|-----|------------------|----------------|-----------------|----|-------|----|-------------------------|
| | | | 12 | 16 | 20~32 | 40 | |
| 20 | Wear ring | Resin | 4 | | | | |
| 21 | Piston Seal | NBR | 4 | | | | ● |
| 22 | Stop chunk | Aluminum alloy | - | 2 | - | | |
| 23 | Pin *4 | SCM | 1 | | | | |
| 24 | Plate | Aluminum alloy | 1 | - | | | |
| 25 | Plug | Copper | - | 1 | | | |
| 26 | Plug washer | PET | - | 1 | | | |
| 27 | Piston retainer | Aluminum alloy | - | 2 | | | |
| 28 | Piston snap ring | Spring steel | - | 2 | | | |
| 29 | Plug | Carbon steel | - | 2 | | | |

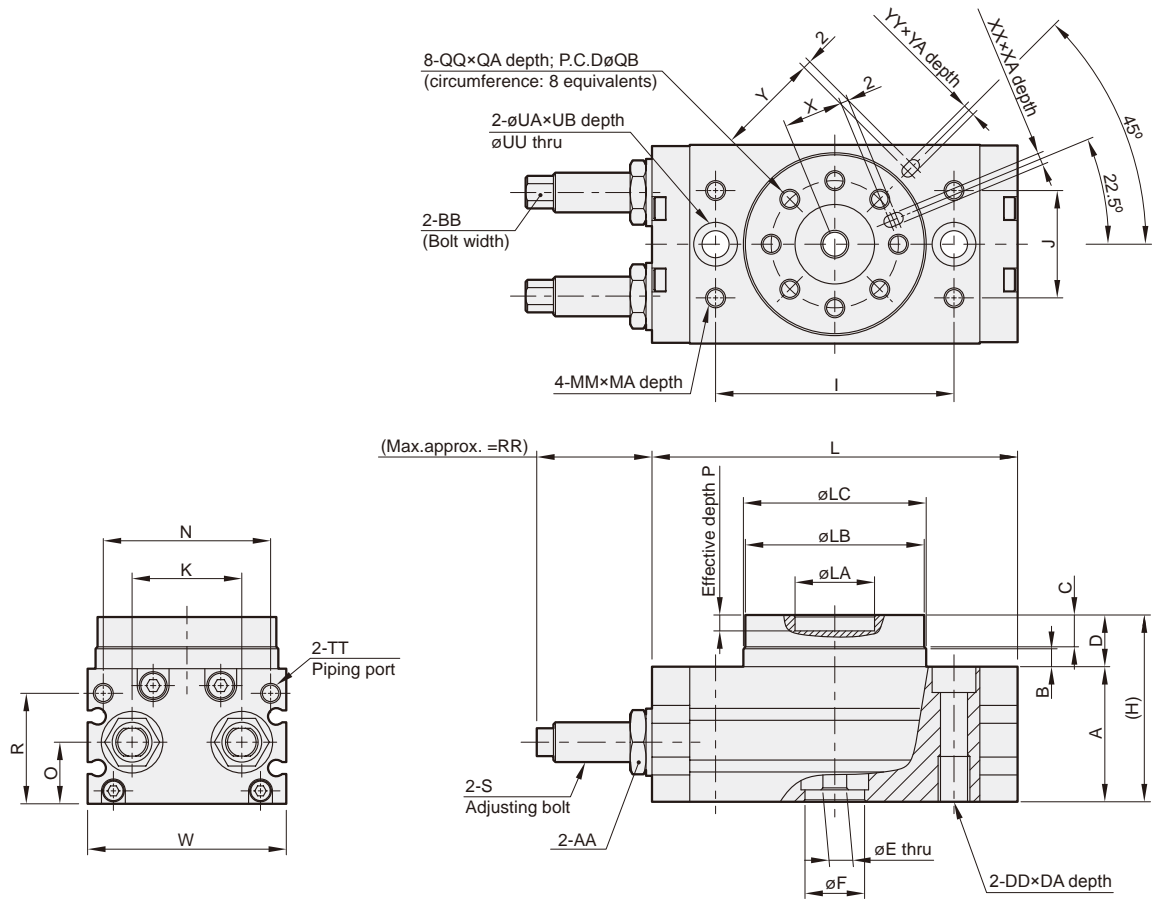
*4. ø20~ø40: Key

Order example of repair kits

| Tube I.D. | Repair kits |
|-----------|-------------|
| ø12 | PS-MCRQ-12 |
| ø16 | PS-MCRQ-16 |
| ø20 | PS-MCRQ-20 |
| ø25 | PS-MCRQ-25 |
| ø32 | PS-MCRQ-32 |
| ø40 | PS-MCRQ-40 |

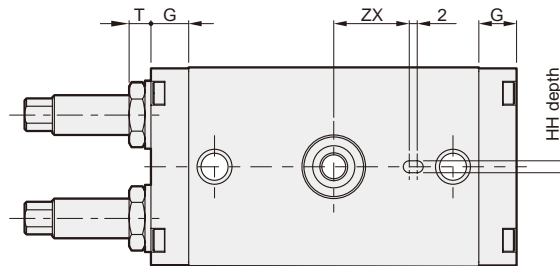
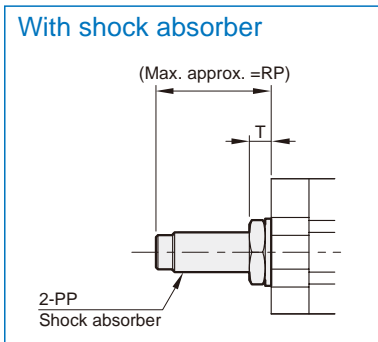
*1. Only for (A) with adjusting bolt. *2. ø40: Carbon steel
 *3. ø12~ø32: NBR+Carbon steel; ø40: NBR





MCRQ-16~25R

With shock absorber



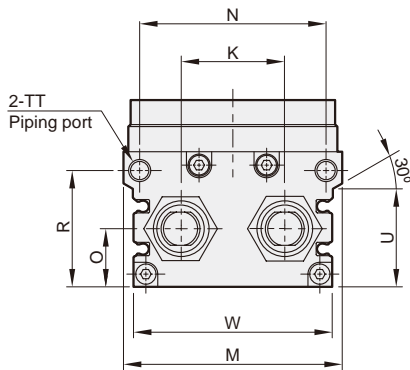
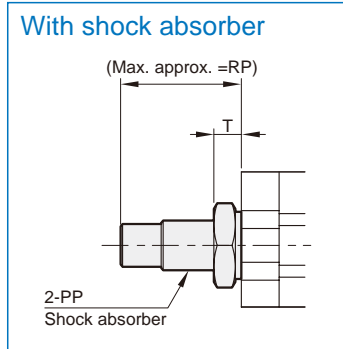
| Code Tub. I.D. | A | AA | B | BB | C | D | DA | DD | E | F | G | H | HH | I | J | K | L | LA | LB | LC | MA | MM | N |
|-------------------|----|----|-----|----|----|----|----|----------|----|------|------|----|---------|-----|----|----|-----|------|------|------|----|---------|----|
| 16 | 34 | 14 | 4.5 | 7 | 8 | 13 | 12 | M8×1.25 | 6 | 15H9 | 9.5 | 47 | 3H9×3.5 | 60 | 27 | 26 | 92 | 20H9 | 45h9 | 46h9 | 8 | M5×0.8 | 37 |
| 20 | 40 | 17 | 6.5 | 7 | 10 | 17 | 15 | M10×1.5 | 10 | 22H9 | 12 | 57 | 4H9×4.5 | 84 | 37 | 32 | 127 | 32H9 | 65h9 | 67h9 | 8 | M6×1 | 54 |
| 25 | 46 | 22 | 7.5 | 8 | 12 | 20 | 18 | M12×1.75 | 13 | 26H9 | 15.5 | 66 | 5H9×5.5 | 100 | 50 | 37 | 152 | 35H9 | 75h9 | 77h9 | 8 | M8×1.25 | 63 |

| Code Tub. I.D. | O | P | PP | QA | QB | QQ | R | RP | RR | S | T | TT | UA | UB | UU | W | X | XA | XX | Y | YA | YY | ZX |
|-------------------|------|-----|------------|----|----|---------|------|------|------|---------|-----|--------|----|------|------|----|------|-----|-----|----|-----|-----|----|
| 16 | 15.5 | 4 | FK-1008L-S | 8 | 32 | M5×0.8 | 29 | 29 | 31 | M10×1.0 | 5.5 | M5×0.8 | 11 | 6.5 | 6.8 | 50 | 15 | 3.5 | 3H9 | 27 | 3.5 | 3H9 | 19 |
| 20 | 19.5 | 4.5 | FK-1008L-S | 10 | 48 | M6×1.0 | 33 | 23.5 | 26 | M10×1.0 | 4.5 | Rc1/8 | 14 | 8.5 | 8.6 | 70 | 23 | 4.5 | 4H9 | 39 | 4.5 | 4H9 | 28 |
| 25 | 22 | 5 | FK-1412L-S | 12 | 55 | M8×1.25 | 37.5 | 33 | 31.2 | M14×1.5 | 7.5 | Rc1/8 | 18 | 10.5 | 10.5 | 80 | 26.5 | 5.5 | 5H9 | 45 | 5.5 | 5H9 | 33 |

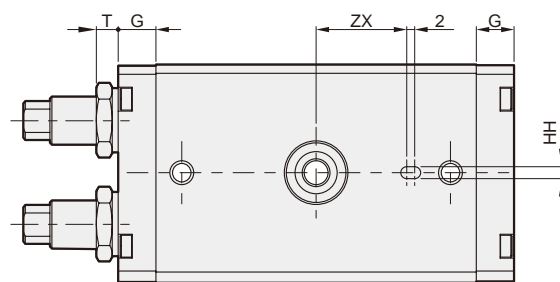
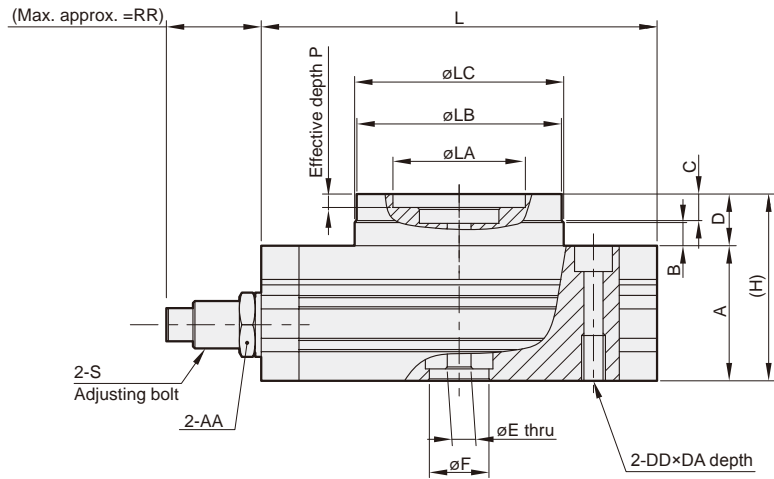
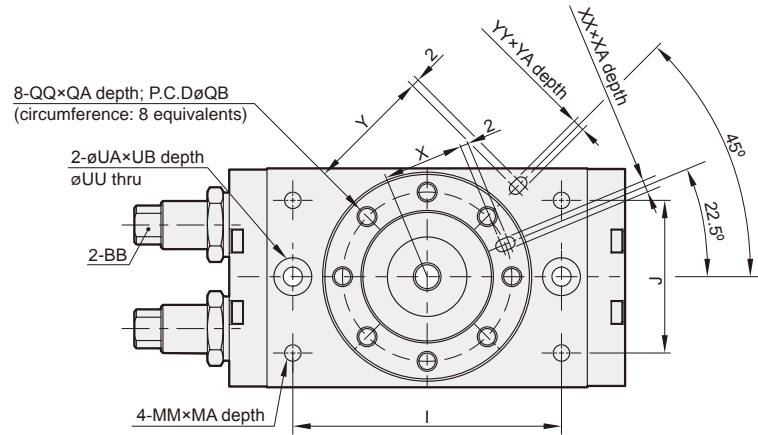
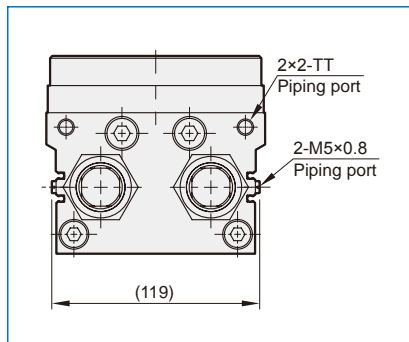
ROTARY ACTUATOR

MCRQ-32R, 40R

With shock absorber



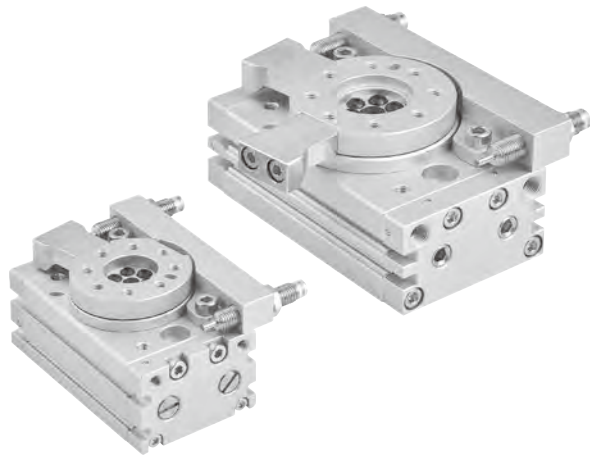
MCRQ-40



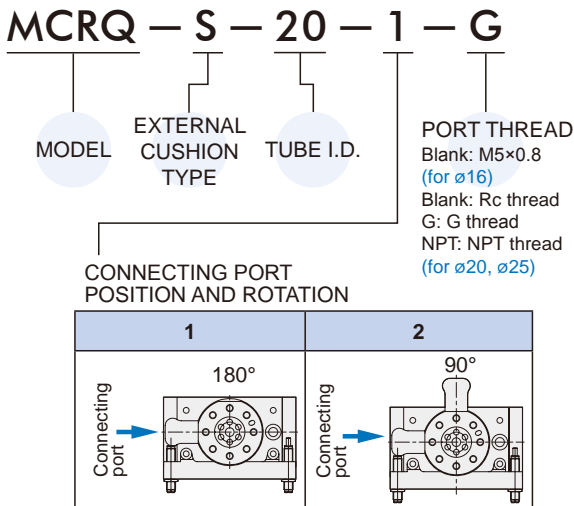
| Code Tubr I.D. | A | AA | B | BB | C | D | DA | DD | E | F | G | H | HH | I | J | K | L | LA | LB | LC | M | MA |
|-------------------|----|----|----|---------------|------|----|----|----------|----|------|----|-----|------------|-----|----|----|-----|------|-------|-------|-----|----|
| 32 | 59 | 30 | 12 | Bolt width 12 | 14.5 | 27 | 18 | M12x1.75 | 13 | 24H9 | 17 | 86 | 6H9x4.5 dp | 130 | 66 | 47 | 189 | 56H9 | 98h9 | 100h9 | 102 | 10 |
| 40 | 74 | 36 | 15 | Bolt width 21 | 16.5 | 32 | 25 | M16x2.0 | 24 | 32H9 | 24 | 106 | 8H9x6.5 dp | 150 | 80 | 60 | 240 | 64H9 | 116h9 | 118h9 | 120 | 13 |

| Code Tubr I.D. | MM | N | O | P | PP | QA | QB | QQ | R | RP | RR | S | T | TT | U | UA | UB | UU | W | X | XA |
|-------------------|----------|-----|------|---|------------|------|----|----------|------|----|------|---------|------|-------|----|----|------|------|-----|------|-----|
| 32 | M8x1.25 | 85 | 27.5 | 6 | FK-2016L-S | 14.5 | 77 | M10x1.5 | 50.5 | 46 | 38.1 | M20x1.5 | 10.5 | Rc1/8 | 42 | 18 | 10.5 | 10.5 | 95 | 37.5 | 6.5 |
| 40 | M12x1.75 | 100 | 37 | 9 | FK-2725L-S | 16.5 | 90 | M12x1.75 | 65.5 | 68 | 45 | M27x1.5 | 7 | Rc1/8 | 57 | 20 | 12.5 | 14.2 | 113 | 44 | 8.5 |

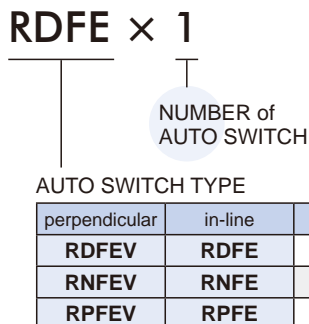
| Code Tubr I.D. | XX | Y | YA | YY | ZX |
|-------------------|-----|----|-----|-----|----|
| 32 | 6H9 | 59 | 4.5 | 6H9 | 49 |
| 40 | 8H9 | 69 | 4.5 | 8H9 | 54 |



Order example



Auto switch type



Notice for shock absorber

- The threaded orifices shown below are not connecting ports. Never remove the plugs as this will cause malfunction.
- Never rotate the bottom screw of the shock absorber. (It is not an adjustment screw.) This may cause oil leakage.

Features

- **4 to 10 times more allowable kinetic energy** (compared with internal shock absorber type)
- **Total length shortened**
Longitudinal mounting space is reduced because there is no protrusion from adjustment bolts or internal shock absorbers.

Specification

| Model | MCRQ-S | | |
|--|------------------------|----------------------------|--------------|
| Acting type | Double acting | | |
| Tube I.D. (mm) | 16 | 20 | 25 |
| Port size | M5×0.8 | Rc1/8 | |
| Rotation | 90°, 180° | | |
| Medium | Air (Non-lube) | | |
| Max. operating pressure | 1 MPa (*1) | | |
| Min. operating pressure | 0.2 MPa | | |
| Ambient temperature | 0~+60°C (No freezing) | | |
| Allowable kinetic energy (J) | 0.231 | 1.21 | 1.82 |
| Rotation time adjustment range (s/90°) | 0.2~1.0 (*2) | | |
| Cushion | Shock absorber | | |
| Shock absorber type | MDSC-0806-3N | MDSC-1008-3N | MDSC-1412-3N |
| Angle adjustment range | Each rotation end ± 3° | | |
| Weight (kg) | 90° | 0.67 | 1.55 |
| | 180° | 0.64 | 1.48 |
| Sensor switch (*3) | 2 wire | RDFE(V): Non-contact | |
| | 3 wire | RNFE(V): NPN, RPFE(V): PNP | |

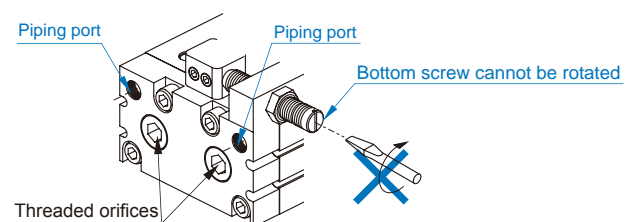
*1. The maximum operating pressure of the actuator is restricted by the maximum allowable thrust of the shock absorber.

*2. For stable operation the time required for the rotary table to reach the rotation end after deceleration differs depending on the operating conditions (inertial moment of the load, rotation speed, and operating pressure), however, approximately 0.2 to 2 seconds are required.

*3. R*FE(V) specification, please refer to page 5-11.
MDSC specification, please refer to page 8-24 (Vol.2).

Range of shock absorber operates

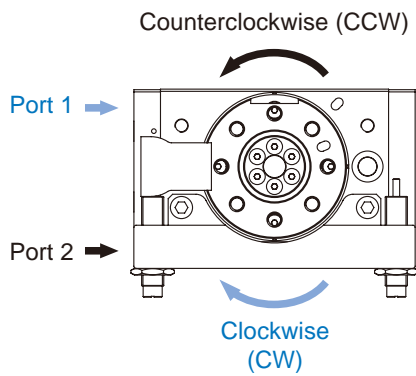
| Model | Adjustment angle per rotation of angle adjustment screw | Range of angle the shock absorber operates (single side) |
|-----------|---|--|
| MCRQ-S-16 | 1.5° | 12° |
| MCRQ-S-20 | 1.1° | 9° |
| MCRQ-S-25 | 1.3° | 11° |



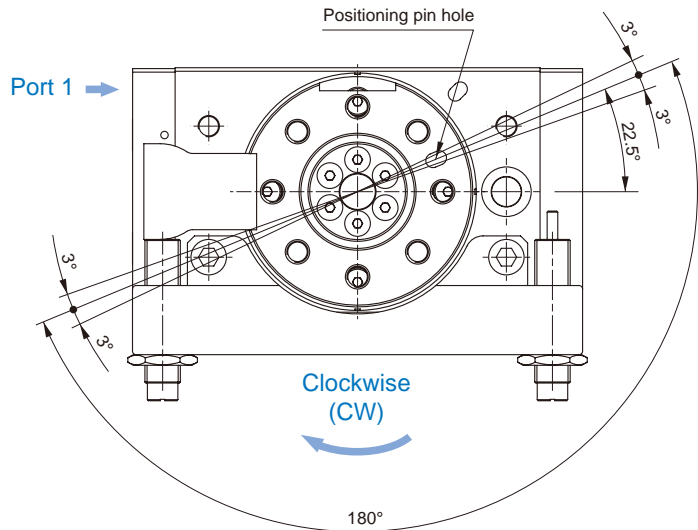
Rotating direction and angle

- When the port 1 is pressurized, the flange rotates in clockwise (CW) direction.
- When the port 2 is pressurized, the flange rotates in counter-clockwise (CCW) direction.

The rotating angle range can be adjust by the method shown as right figure.

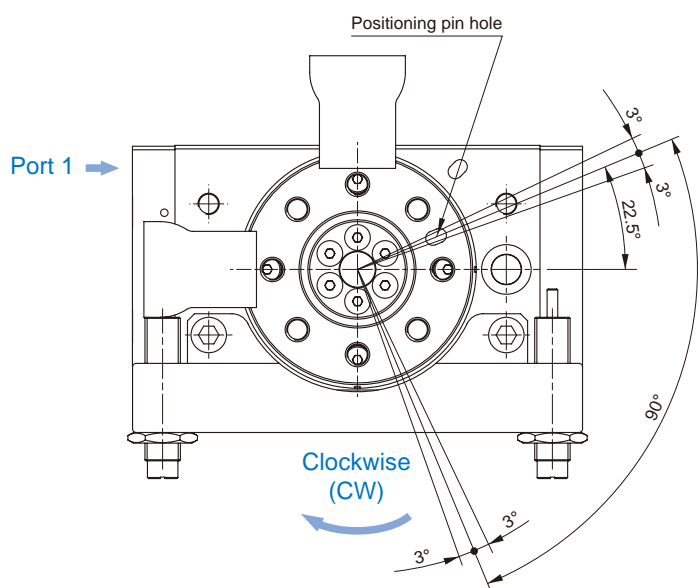


MCRQ-S-*-1 180°

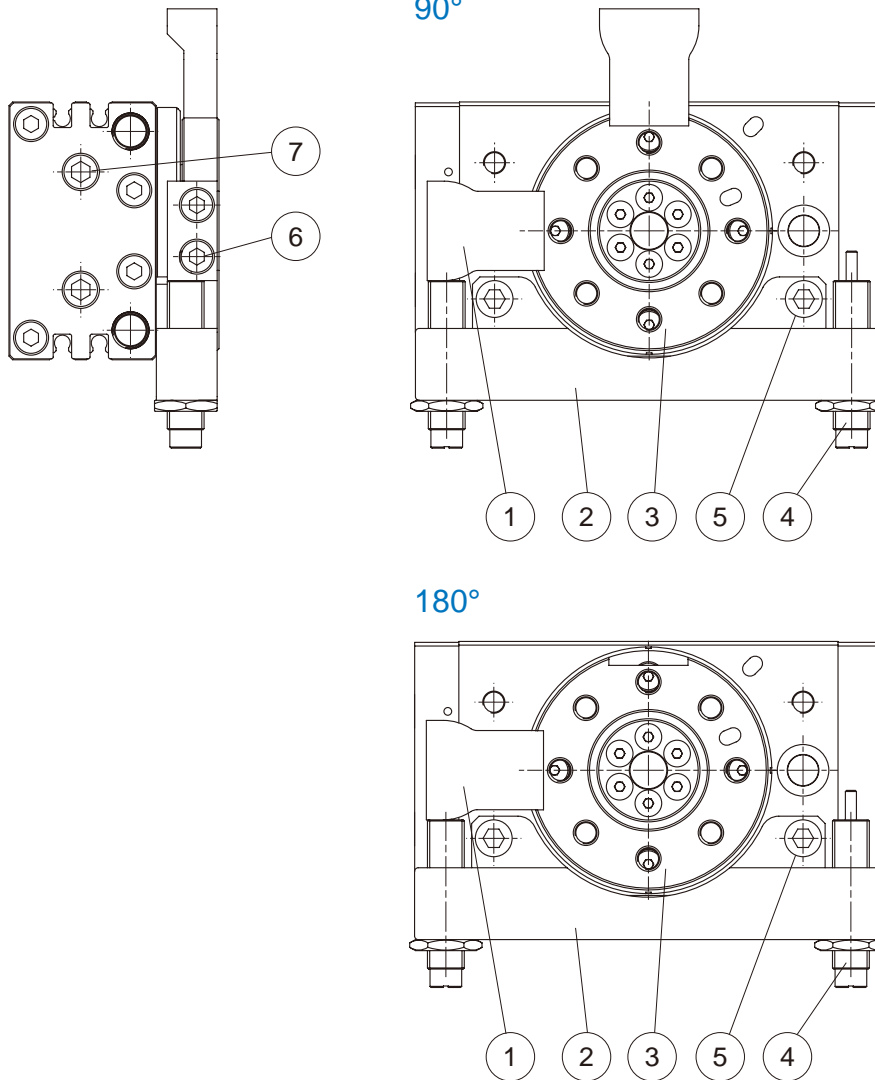


Minimum rotating range 174°
Maximum rotating range 186°

MCRQ-S-*-2 90°



Minimum rotating range 84°
Maximum rotating range 96°

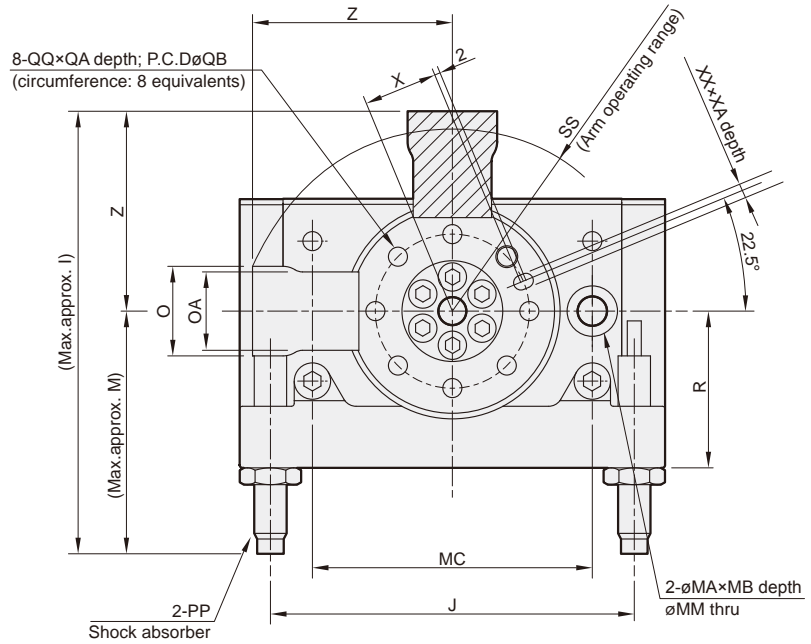
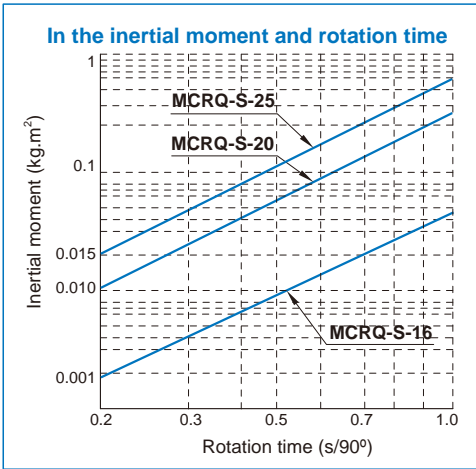


Material

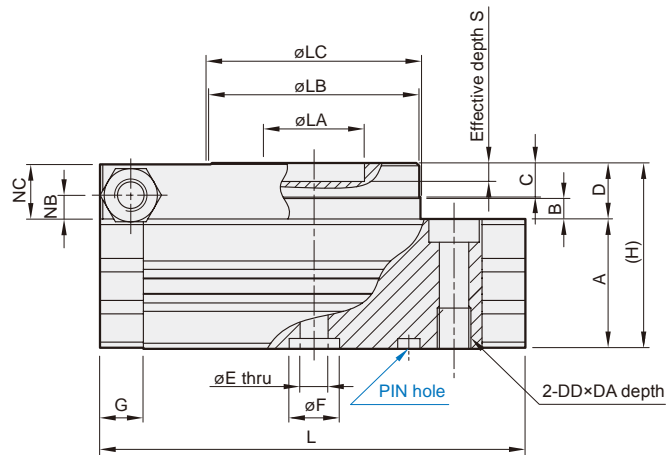
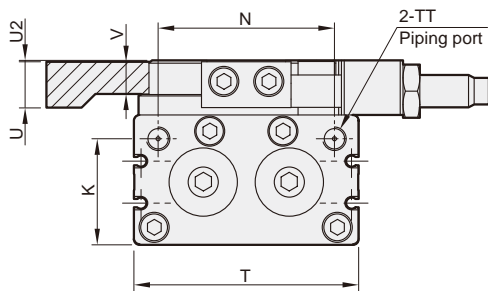
| No. | Part name | Material | Rotation & Q'y | |
|-----|----------------|-----------------|----------------|------|
| | | | 90° | 180° |
| 1 | Fixing plate | Carbon steel | 2 | 1 |
| 2 | Cushion mount | Aluminum alloy | 1 | 1 |
| 3 | Flange table | Aluminum alloy | 1 | 1 |
| 4 | Shock absorber | — | 2 | 2 |
| 5 | Bolt | Stainless steel | 2 | 2 |
| 6 | Bolt | Stainless steel | 4 | 2 |
| 7 | Plug | Stainless steel | 2 | 2 |

ROTARY ACTUATOR

mindman



| Code Tubr I.D. | PP |
|-------------------|--------------|
| 16 | MDSC-0806-3N |
| 20 | MDSC-1008-3N |
| 25 | MDSC-1412-3N |

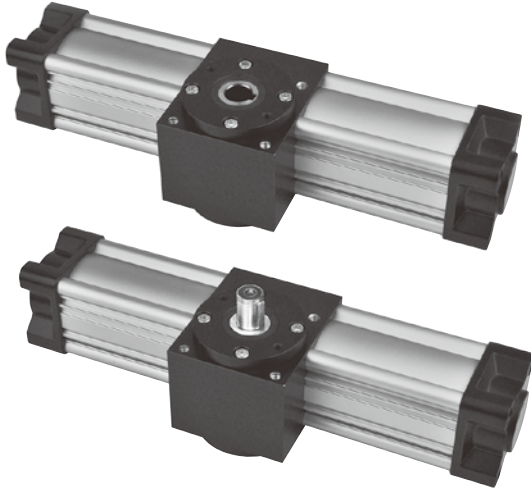


PIN hole size

| Code Tubr I.D. | HH | ZX |
|-------------------|---------|----|
| 16 | 3H9×3.5 | 19 |
| 20 | 4H9×4.5 | 28 |
| 25 | 5H9×5.5 | 33 |

| Code Tubr I.D. | A | B | C | D | DA | DD | E | F | G | H | I | J | K | L | LA | LB | LC | M | MA | MB | MC |
|-------------------|----|-----|----|----|----|----------|----|------|------|----|-------|------|------|-----|------|------|------|------|----|------|-----|
| 16 | 34 | 4.5 | 8 | 13 | 12 | M8×1.25 | 6 | 15H9 | 9.5 | 47 | 92.8 | 80.6 | 29 | 92 | 20H9 | 45h9 | 46h9 | 48.5 | 11 | 6.5 | 60 |
| 20 | 40 | 6.5 | 10 | 17 | 15 | M10×1.5 | 10 | 22H9 | 12 | 57 | 119.3 | 110 | 33 | 127 | 32H9 | 65h9 | 67h9 | 59 | 14 | 8.5 | 84 |
| 25 | 46 | 7.5 | 12 | 20 | 18 | M12×1.75 | 13 | 26H9 | 15.5 | 66 | 154.8 | 130 | 37.5 | 152 | 35H9 | 75h9 | 77h9 | 83.3 | 18 | 10.5 | 100 |

| Code Tubr I.D. | MM | N | NB | NC | O | OA | QA | QB | QQ | R | S | SS | T | TT | U | U2 | V | X | XA | XX | Z |
|-------------------|------|----|-----|------|----|------|----|----|---------|------|-----|------|----|--------|------|-----|-----|------|-----|-----|------|
| 16 | 6.8 | 37 | 5.5 | 12.5 | 20 | 15.6 | 8 | 32 | M5×0.8 | 33 | 4 | 45.4 | 50 | M5×0.8 | 11.5 | 0.3 | 7.5 | 15 | 3.5 | 3H9 | 44.3 |
| 20 | 8.6 | 54 | 8 | 16.5 | 27 | 21.5 | 10 | 48 | M6×1 | 46 | 4.5 | 61.8 | 70 | Rc1/8 | 13.5 | 0.5 | 9 | 23 | 4.5 | 4H9 | 60.3 |
| 25 | 10.5 | 63 | 8.5 | 19.5 | 32 | 28 | 12 | 55 | M8×1.25 | 54.5 | 5 | 73.3 | 80 | Rc1/8 | 18 | 0.5 | 11 | 26.5 | 5.5 | 5H9 | 71.5 |



MRTH

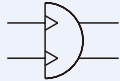
Male pivot gear
(standard type)

MRTH-D

Male pivot gear
(double end rod type)

MRTF

Female pivot gear



Features

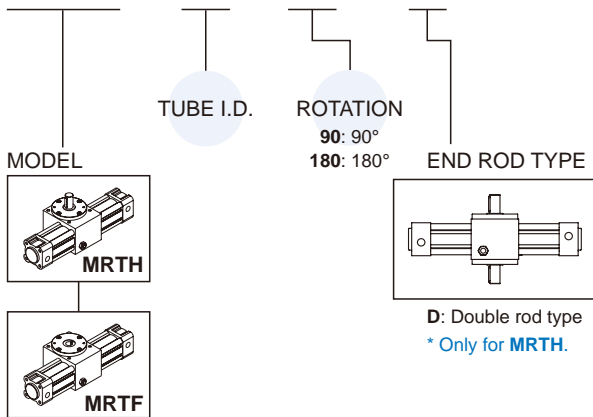
- The body is manufactured in anodized aluminium alloy, and has been designed looking at the harmonious aesthetic development.
- Pinion and rack produced from carbon steel reduces backlash within the mechanism.
- Rotation adjustment screw.
- Magnetic as standard.

Specification

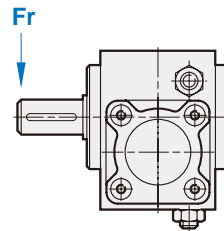
| Model | MRTF, MRTH, MRTH-D | | | |
|----------------------------------|--|---------|---------|-------|
| Tube I.D. (mm) | 40 | 63 | 80 | |
| Standard rotation | 90±5°, 180±5° | | | |
| Rotating shaft dia. (mm) | 16 | 24 | 28 | |
| Initial position of slot (mm) | See dimensional feature | | | |
| Medium | Filtered air with or without lubrication | | | |
| Operating pressure range | 0.13~0.7 MPa | | | |
| Ambient temperature | -5~+60°C (No freezing) | | | |
| Max. allowable axial thrust (kg) | 10 | 12 | 20 | |
| Cushion angle | 74° | 75° | 80° | |
| Max. allowable kinetic energy | 90° | 0.266J | 0.675J | 1.34J |
| | 180° | 0.58J | 1.54J | 3.03J |
| Max. allowable radial trust (Fr) | 514.5 N | 725.2 N | 896.7 N | |
| Sensor switch | LN65 (Please refer to page 5-20) | | | |

Order example

MRTH - 40 - 90 - D



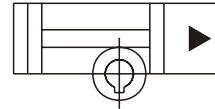
Max. allowable radial trust



Cylinder weight

Unit: kg

| Model | MRTH | | MRTH-D | | MRTF | | LN65 |
|-----------------|-------|-------|--------|-------|------|-------|---------------|
| Fig | | | | | | | |
| Tube I.D./Angle | 90° | 180° | 90° | 180° | 90° | 180° | Sensor switch |
| 40 | 3.30 | 3.40 | 3.35 | 3.45 | 3.14 | 3.24 | 0.03 |
| 63 | 5.80 | 6.20 | 5.95 | 6.35 | 5.47 | 5.87 | |
| 80 | 10.25 | 10.80 | 10.49 | 11.00 | 9.69 | 10.24 | |



Compressed air consumption for a complete cycle

Unit: L/cycle

| Model | Rotation | Operating pressure (MPa) | | | | | | | | | |
|------------------|----------|--------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 | 1.0 |
| MRTH40 MRTF40 | 90° | 0.1571 | 0.2352 | 0.3133 | 0.3915 | 0.4696 | 0.5477 | 0.6259 | 0.7040 | 0.7821 | 0.8603 |
| | 180° | 0.3141 | 0.4704 | 0.6267 | 0.7829 | 0.9392 | 1.0955 | 1.2517 | 1.4080 | 1.5643 | 1.7205 |
| MRTH63 MRTF63 | 90° | 0.4383 | 0.6564 | 0.8744 | 1.0925 | 1.3105 | 1.5286 | 1.7466 | 1.9647 | 2.1828 | 2.4008 |
| | 180° | 0.8766 | 1.3127 | 1.7488 | 2.1850 | 2.6211 | 3.0572 | 3.4933 | 3.9294 | 4.3655 | 4.8016 |
| MRTH80 MRTF80 | 90° | 0.8480 | 1.2698 | 1.6917 | 2.1135 | 2.5354 | 2.9572 | 3.3791 | 3.8009 | 4.2228 | 4.6447 |
| | 180° | 1.6959 | 2.5396 | 3.3834 | 4.2271 | 5.0708 | 5.9145 | 6.7582 | 7.6019 | 8.4456 | 9.2893 |

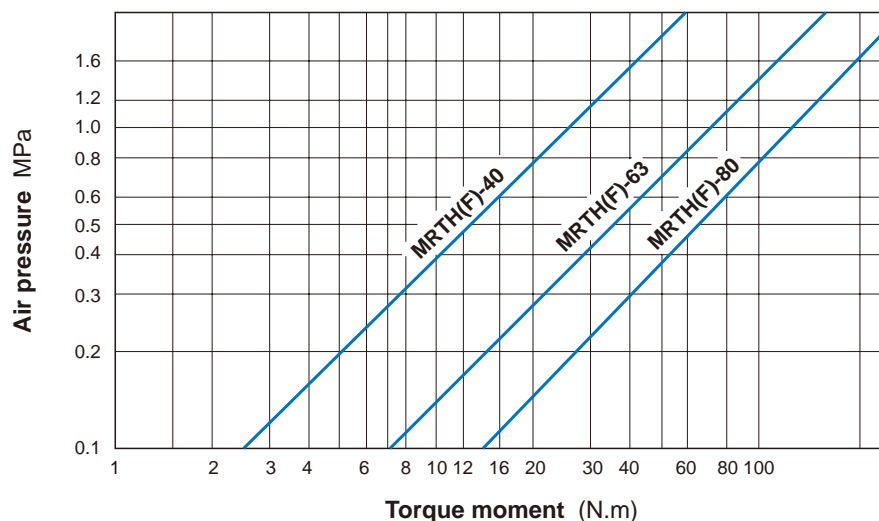
| Model | MRTH, MRTF | | |
|---------------|------------|--------|--------|
| Tube I.D.(mm) | 40 | 63 | 80 |
| Constant K | 0.3491 | 0.3927 | 0.4712 |

The method of calculation (Compressed air consumption)

$$Q = 2 \times K \times A \times n \times Dg \times \frac{P+0.101}{0.101} \times 10^{-6}$$

| | |
|------------|--------------------------------------|
| Q: | Compressed air consumption (L/cycle) |
| A: | Piston area (mm ²) |
| Dg: | Rotation |
| P: | Air pressure (MPa) |
| K: | Constant |
| n: | Cycle of operation (cycle/min) |

Output torque table



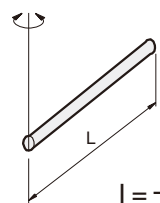
Kinetic energy of rotation motion

$$E = \frac{1}{2} \times I \omega^2$$

| | | |
|-----------|-------------------|----------------------|
| E: | Kinetic energy | (J) |
| I: | Moment of inertia | (Kg·m ²) |
| ω: | Angle speed | (rad/s) |

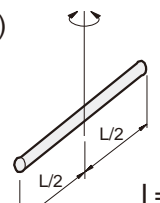
Equation table moment of inertia

(1)



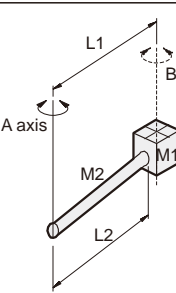
$I = \frac{ML^2}{3}$

(2)



$I = \frac{ML^2}{12}$

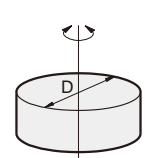
(5)



$I = I_1 + M_1 L_1^2 + \frac{M_2 L_2^2}{3}$

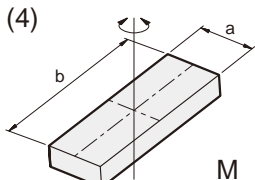
I₁ = Obtain the center of gravity of the load (M₁) as I₁, a provisional shaft (B).

(3)



$I = \frac{MD^2}{8}$

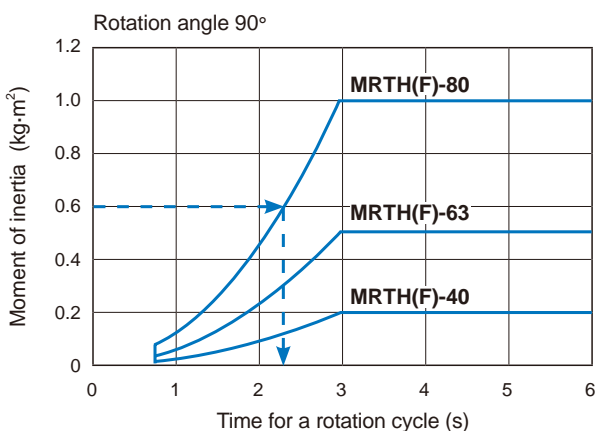
(4)



$I = \frac{M}{12} (a^2 + b^2)$

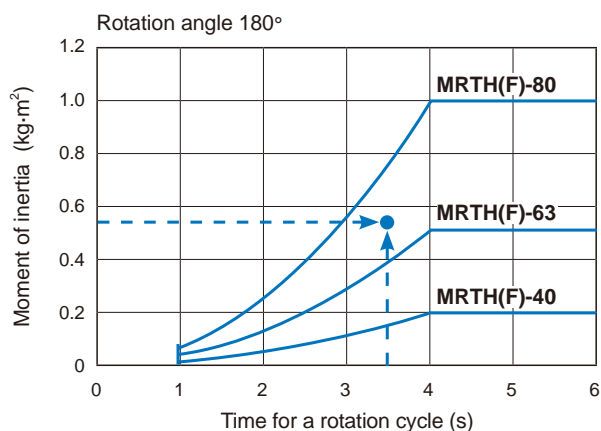
| | | |
|--|-------------------|----------------------|
| I (I₁): | Moment of inertia | (Kg·m ²) |
| M (M₁, M₂): | Load mass | (Kg) |
| L, a, b: | Side length | (m) |
| D: | Diameter | (m) |

Moment of inertia



Example 1

When there are constraints for the moment of inertia of load, but not for rotation time. From "rotation angle = 90°", MRTH(F)-80, to operate at the load moment of inertia 0.6 kg·m²: MRTH(F)-80 will be 2.3 seconds or higher.



Example 2

When there are constraints for the moment of inertia of load, but not for rotation time. From "rotation angle = 180°", to operate at the load moment of inertia 0.5 kg·m² and at the rotation time setting of 3.5 seconds: The model will be MRTH(F)-80.

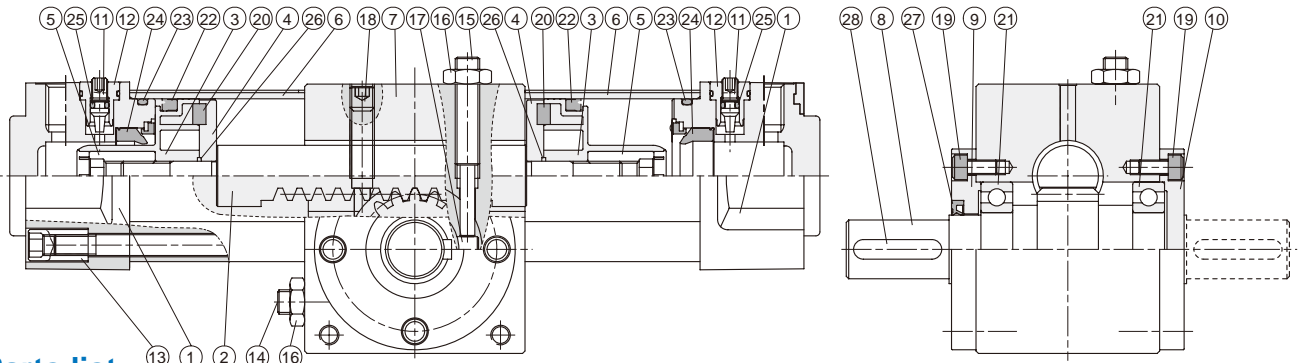
ROTARY ACTUATOR

How to order the seal kit

| MRT <input type="checkbox"/> SK <input type="checkbox"/> | <table border="1"> <tr> <th>Tube I.D.</th> <th>Seal kit</th> </tr> <tr> <td>40</td> <td>MRTHSK40 - Including No.22,23,24,25,26,27</td> </tr> <tr> <td>63</td> <td>MRTHSK63 - Including No.22,23,24,25,26,27</td> </tr> <tr> <td>80</td> <td>MRTHSK80 - Including No.22,23,24,25,26,27</td> </tr> </table> | Tube I.D. | Seal kit | 40 | MRTHSK40 - Including No.22,23,24,25,26,27 | 63 | MRTHSK63 - Including No.22,23,24,25,26,27 | 80 | MRTHSK80 - Including No.22,23,24,25,26,27 | <table border="1"> <tr> <th>Tube I.D.</th> <th>Seal kit</th> </tr> <tr> <td>40</td> <td>MRTFSK40 - Including No.22,23,24,26,27</td> </tr> <tr> <td>63</td> <td>MRTFSK63 - Including No.22,23,24,26,27</td> </tr> <tr> <td>80</td> <td>MRTFSK80 - Including No.22,23,24,26,27</td> </tr> </table> | Tube I.D. | Seal kit | 40 | MRTFSK40 - Including No.22,23,24,26,27 | 63 | MRTFSK63 - Including No.22,23,24,26,27 | 80 | MRTFSK80 - Including No.22,23,24,26,27 |
|---|---|---|----------|----|---|----|---|----|---|--|-----------|----------|----|--|----|--|----|--|
| | Tube I.D. | Seal kit | | | | | | | | | | | | | | | | |
| | 40 | MRTHSK40 - Including No.22,23,24,25,26,27 | | | | | | | | | | | | | | | | |
| 63 | MRTHSK63 - Including No.22,23,24,25,26,27 | | | | | | | | | | | | | | | | | |
| 80 | MRTHSK80 - Including No.22,23,24,25,26,27 | | | | | | | | | | | | | | | | | |
| Tube I.D. | Seal kit | | | | | | | | | | | | | | | | | |
| 40 | MRTFSK40 - Including No.22,23,24,26,27 | | | | | | | | | | | | | | | | | |
| 63 | MRTFSK63 - Including No.22,23,24,26,27 | | | | | | | | | | | | | | | | | |
| 80 | MRTFSK80 - Including No.22,23,24,26,27 | | | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <td>H</td> </tr> <tr> <td>F</td> </tr> </table> | H | F | | | | | | | | | | | | | | | | |
| H | | | | | | | | | | | | | | | | | | |
| F | | | | | | | | | | | | | | | | | | |

MRTH

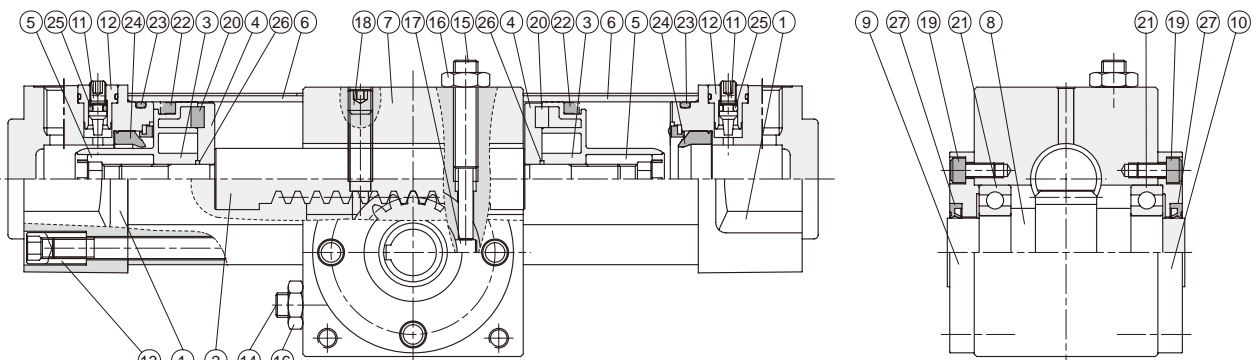
MRTH-D



Parts list

| No. | Part name | Q'y | No. | Part name | Q'y | No. | Part name | Q'y |
|-----|---------------|-----|-----|---------------------------|-----|-----|-----------------|-----|
| 1 | End cap | 2 | 11 | Cushion needle | 2 | 21 | Ball bearing | 2 |
| 2 | Rack | 1 | 12 | Washer | 2 | 22 | Piston packing | 2 |
| 3 | Piston | 2 | 13 | Tie bolt | 8 | 23 | Cylinder gasket | 2 |
| 4 | Magnet holder | 2 | 14 | Adjusting screw | 1 | 24 | Cushion packing | 2 |
| 5 | Piston nut | 2 | 15 | Adjusting screw | 1 | 25 | O-ring | 2 |
| 6 | Cylinder tube | 2 | 16 | Lock nut | 2 | 26 | Piston gasket | 2 |
| 7 | Housing | 1 | 17 | Stopper pin | 1 | 27 | Rod packing | 1 |
| 8 | Pinion shaft | 1 | 18 | Set screw | 1 | 28 | Key (MRTH-D=2) | 1 |
| 9 | End cover | 1 | 19 | Hexagon socket head screw | 8 | | | |
| 10 | End cover | 1 | 20 | Magnet | 2 | | | |

MRTF



Parts list

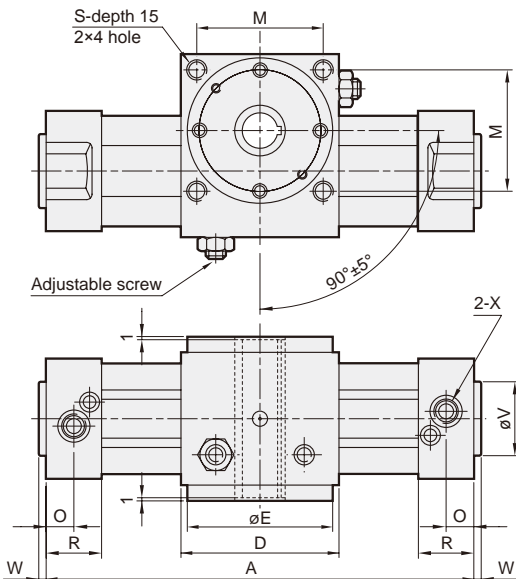
| No. | Part name | Q'y | No. | Part name | Q'y | No. | Part name | Q'y |
|-----|---------------|-----|-----|-----------------|-----|-----|---------------------------|-----|
| 1 | End cap | 2 | 10 | End cover | 1 | 19 | Hexagon socket head screw | 8 |
| 2 | Rack | 1 | 11 | Cushion needle | 2 | 20 | Magnet | 2 |
| 3 | Piston | 2 | 12 | Cushion plug | 2 | 21 | Ball bearing | 2 |
| 4 | Magnet holder | 2 | 13 | Tie bolt | 8 | 22 | Piston packing | 2 |
| 5 | Piston nut | 2 | 14 | Adjusting screw | 1 | 23 | Cylinder gasket | 2 |
| 6 | Cylinder tube | 2 | 15 | Adjusting screw | 1 | 24 | Cushion packing | 2 |
| 7 | Housing | 1 | 16 | Lock nut | 2 | 25 | O-ring | 2 |
| 8 | Pinion shaft | 1 | 17 | Stopper pin | 1 | 26 | Piston gasket | 2 |
| 9 | End cover | 1 | 18 | Set screw | 1 | 27 | Rod packing | 2 |

MRTH / MRTF Dimensions $\varnothing 40 \sim \varnothing 80$

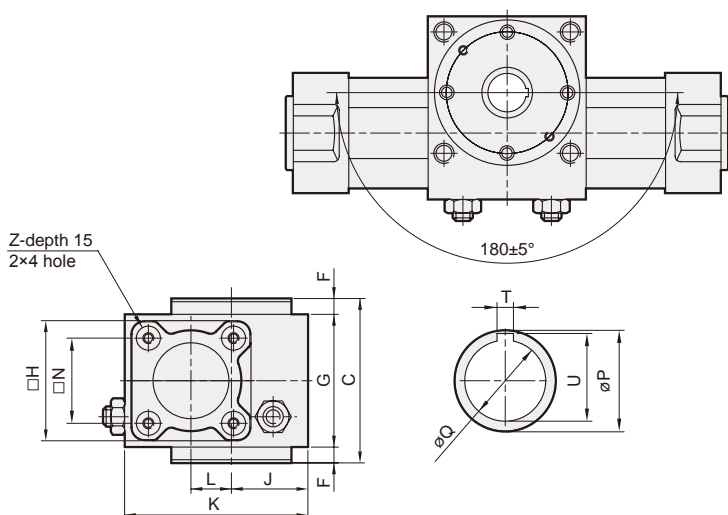


ROTARY ACTUATOR

MRTF Angle of rotation 90°

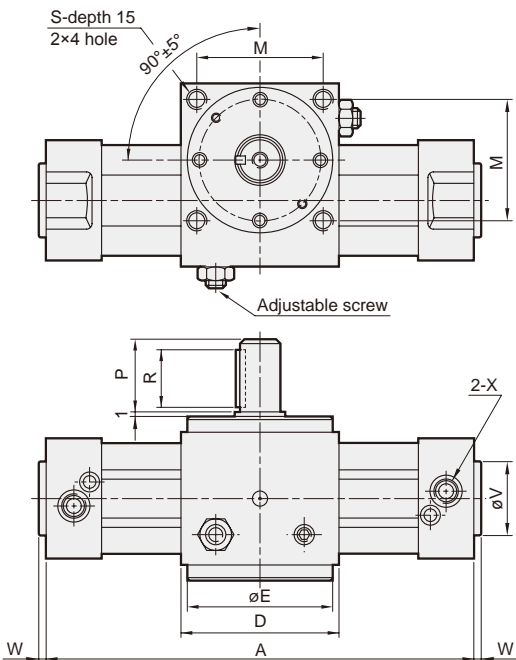


MRTF Angle of rotation 180°

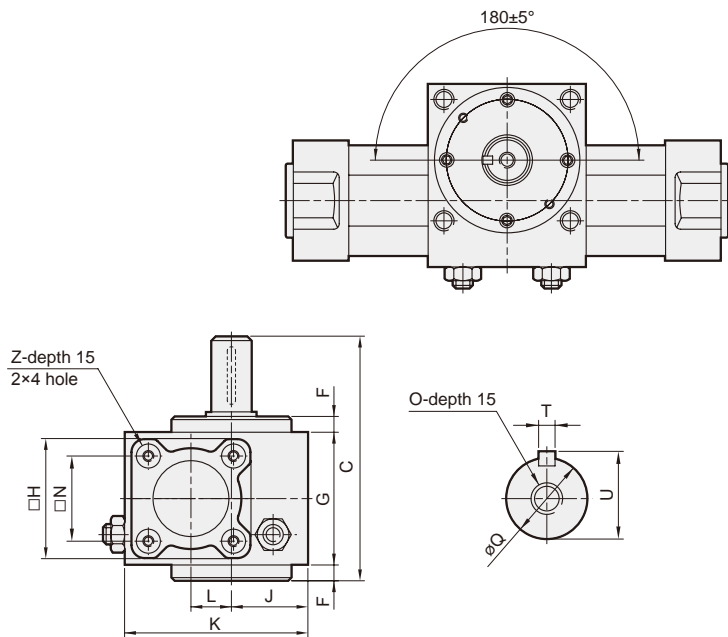


| Model | A | | C | D | E | F | G | H | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Z |
|---------|-----|------|-----|-----|----|----|----|----|------|-----|------|----|------|----|----|----|----|-----|---|------|----|---|------|-----|
| | 90° | 180° | | | | | | | | | | | | | | | | | | | | | | |
| MRTF-40 | 263 | 326 | 81 | 75 | 72 | 8 | 65 | 53 | 37.5 | 93 | 27.5 | 60 | 38 | 15 | 25 | 14 | 30 | M6 | 5 | 16.5 | 35 | 5 | G1/4 | M6 |
| MRTF-63 | 306 | 377 | 95 | 90 | 82 | 10 | 75 | 75 | 42.5 | 110 | 30 | 70 | 56.5 | 16 | 30 | 19 | 32 | M8 | 6 | 22 | 45 | 4 | G3/8 | M8 |
| MRTF-80 | 343 | 428 | 119 | 105 | 96 | 12 | 95 | 95 | 51.5 | 135 | 36 | 82 | 72 | 19 | 35 | 24 | 38 | M10 | 6 | 27 | 45 | 5 | G3/8 | M10 |

MRTH Angle of rotation 90°



MRTH Angle of rotation 180°

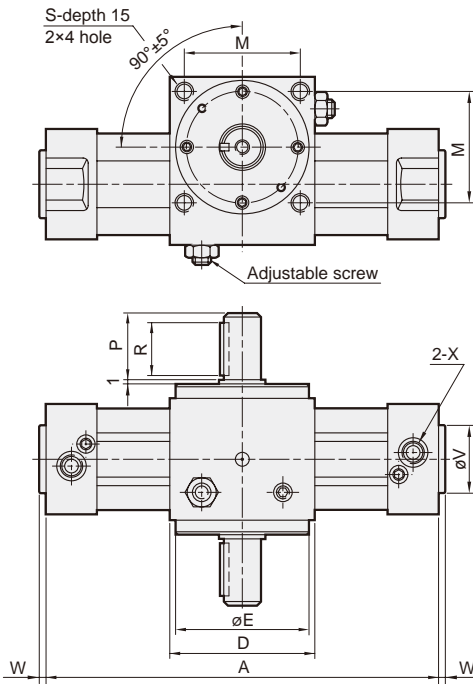


| Model | A | | C | D | E | F | G | H | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Z |
|---------|-----|------|-----|-----|----|----|----|----|------|-----|------|----|------|----|----|----|----|-----|---|----|----|---|------|-----|
| | 90° | 180° | | | | | | | | | | | | | | | | | | | | | | |
| MRTH-40 | 263 | 326 | 112 | 75 | 72 | 8 | 65 | 53 | 37.5 | 93 | 27.5 | 60 | 38 | M5 | 30 | 16 | 25 | M6 | 5 | 18 | 35 | 5 | G1/4 | M6 |
| MRTH-63 | 306 | 377 | 138 | 90 | 82 | 10 | 75 | 75 | 42.5 | 110 | 30 | 70 | 56.5 | M8 | 42 | 24 | 36 | M8 | 8 | 27 | 45 | 4 | G3/8 | M8 |
| MRTH-80 | 343 | 428 | 170 | 105 | 96 | 12 | 95 | 95 | 51.5 | 135 | 36 | 82 | 72 | M8 | 50 | 28 | 45 | M10 | 8 | 31 | 45 | 5 | G3/8 | M10 |

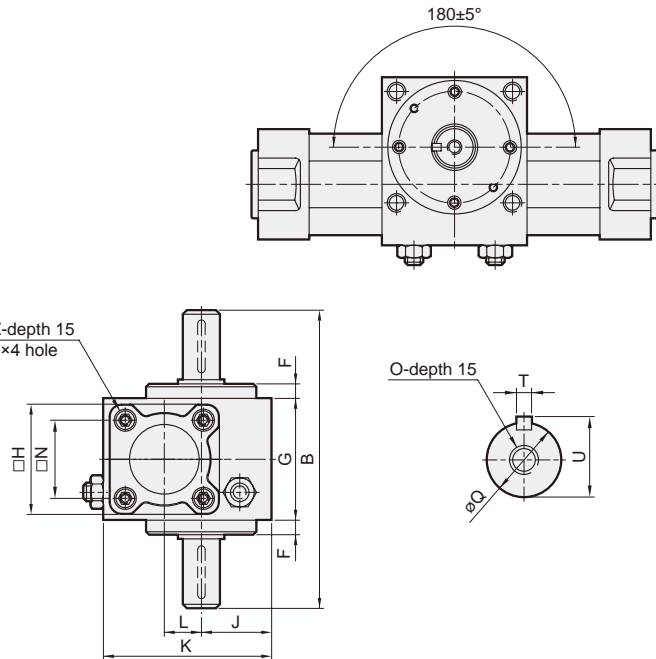
ROTARY ACTUATOR

mindman

MRTH-D Angle of rotation 90°

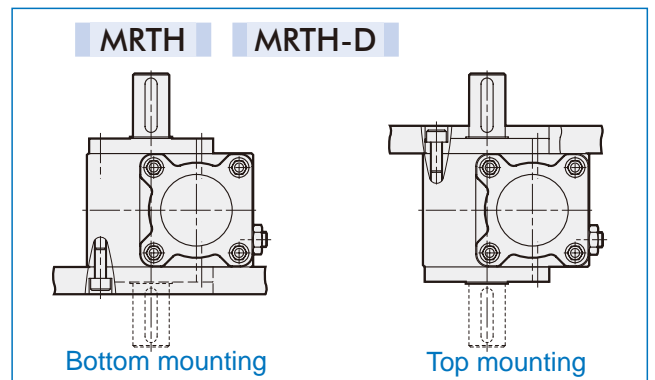
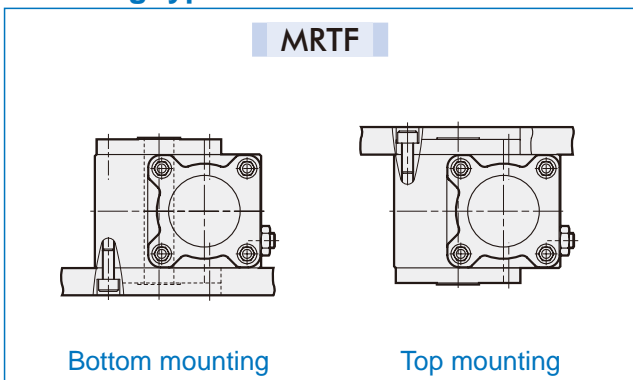


Angle of rotation 180°

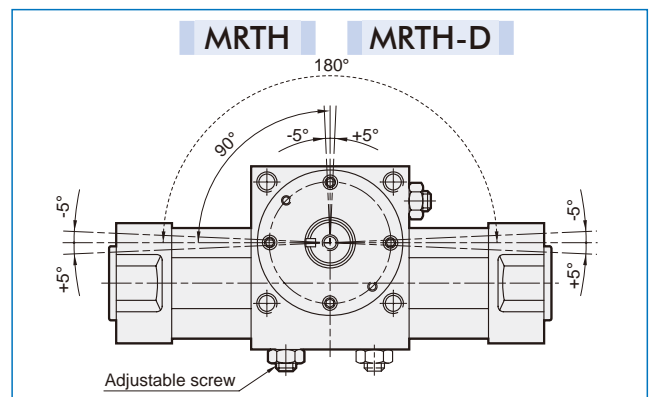
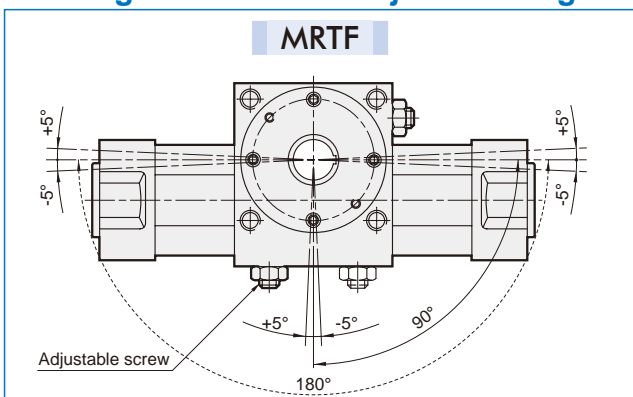


| Model | A | | B | D | E | F | G | H | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Z |
|-----------|-----|------|-----|-----|----|----|----|----|------|-----|------|----|------|----|----|----|----|-----|---|----|----|---|------|-----|
| | 90° | 180° | | | | | | | | | | | | | | | | | | | | | | |
| MRTH-40-D | 263 | 326 | 143 | 75 | 72 | 8 | 65 | 53 | 37.5 | 93 | 27.5 | 60 | 38 | M5 | 30 | 16 | 25 | M6 | 5 | 18 | 35 | 5 | G1/4 | M6 |
| MRTH-63-D | 306 | 377 | 181 | 90 | 82 | 10 | 75 | 75 | 42.5 | 110 | 30 | 70 | 56.5 | M8 | 42 | 24 | 36 | M8 | 8 | 27 | 45 | 4 | G3/8 | M8 |
| MRTH-80-D | 343 | 428 | 221 | 105 | 96 | 12 | 95 | 95 | 51.5 | 135 | 36 | 82 | 72 | M8 | 50 | 28 | 45 | M10 | 8 | 31 | 45 | 5 | G3/8 | M10 |

Mounting type



Rotating direction and adjustable angle



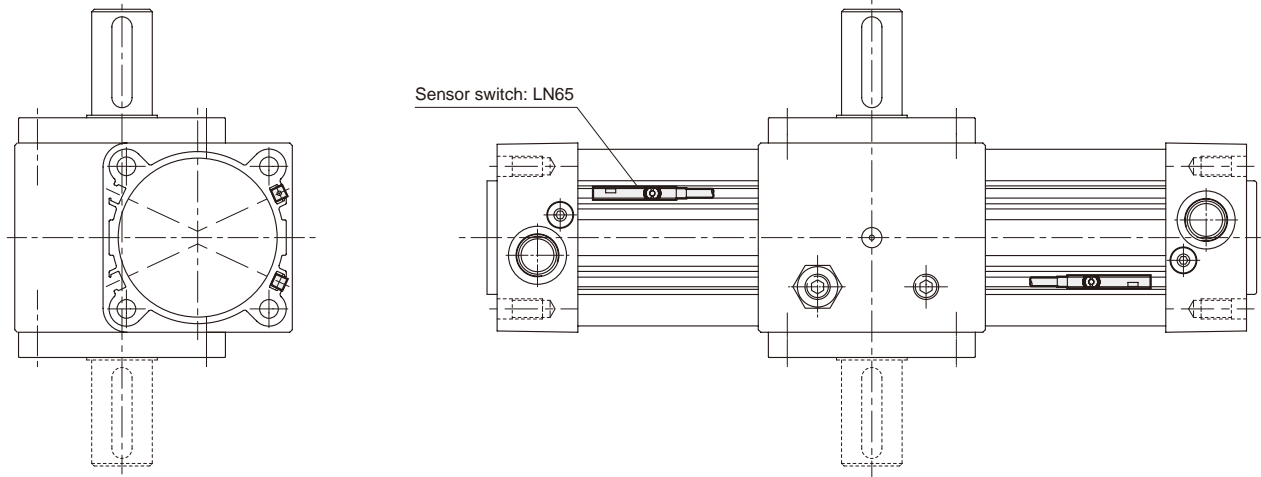
MRTH / MRTF Installation of sensor switches $\varnothing 40\sim\varnothing 80$



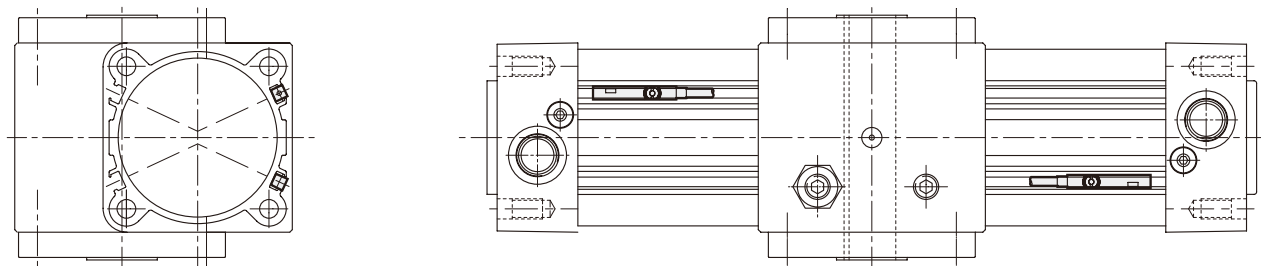
ROTARY ACTUATOR

MRTH

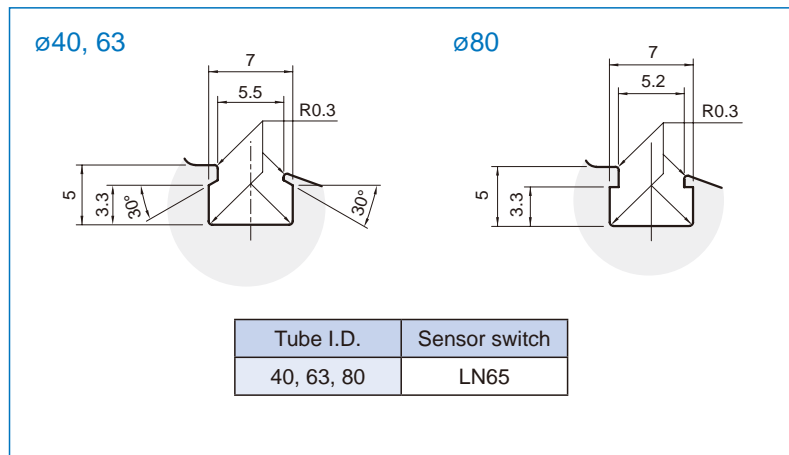
MRTH-D

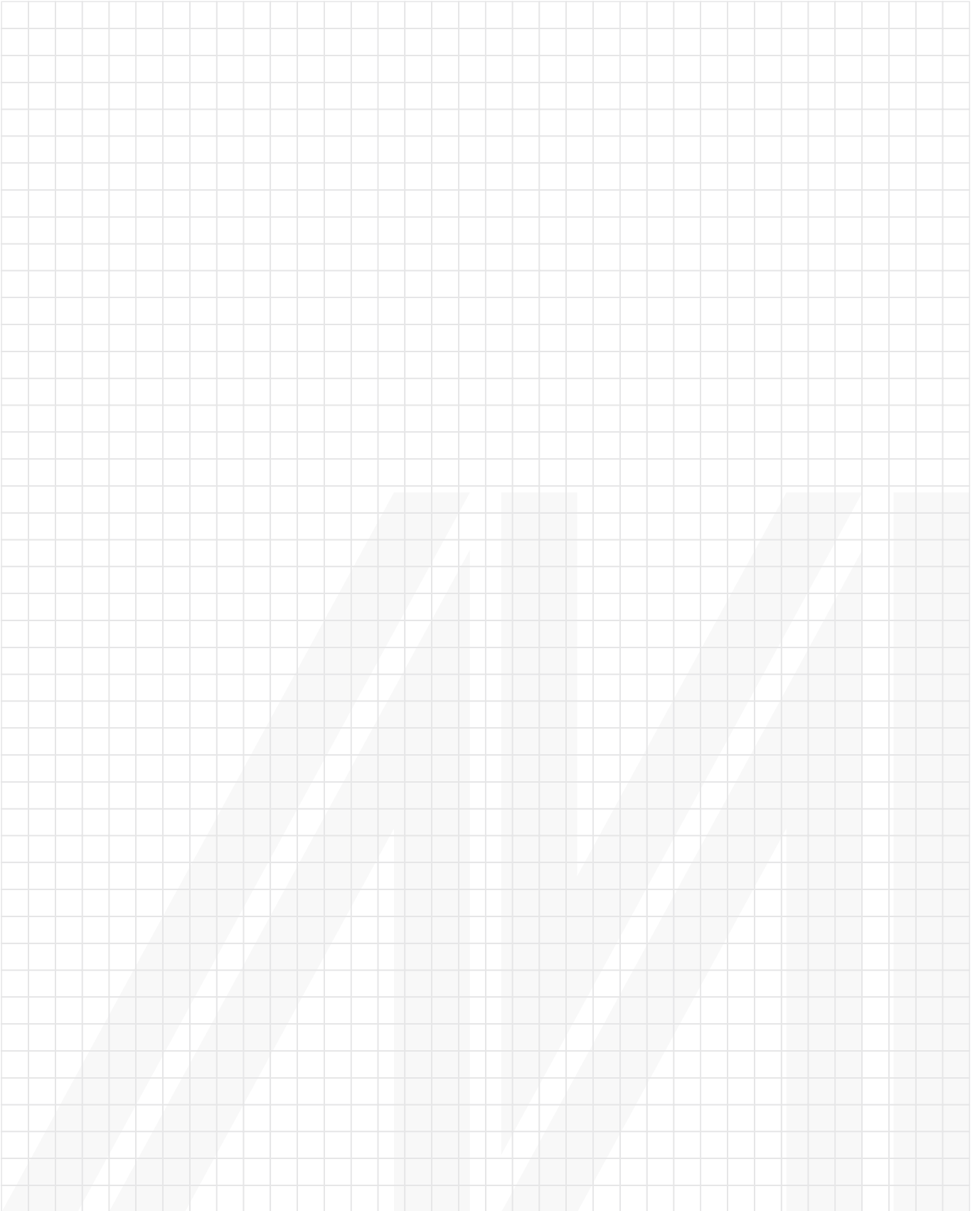


MRTF

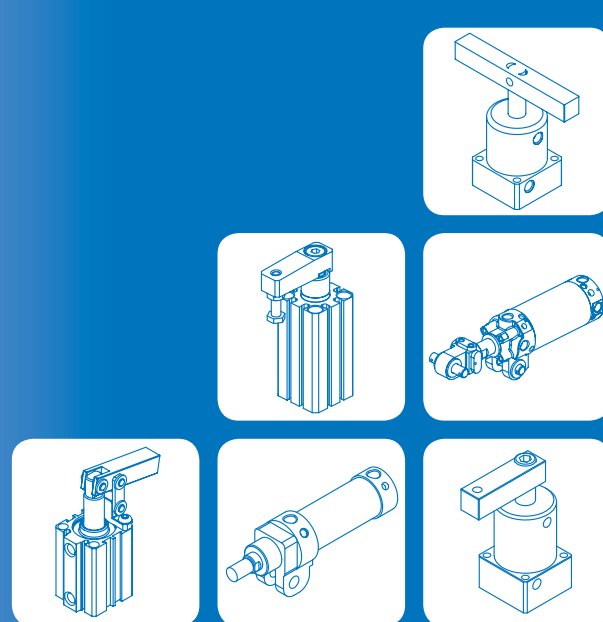
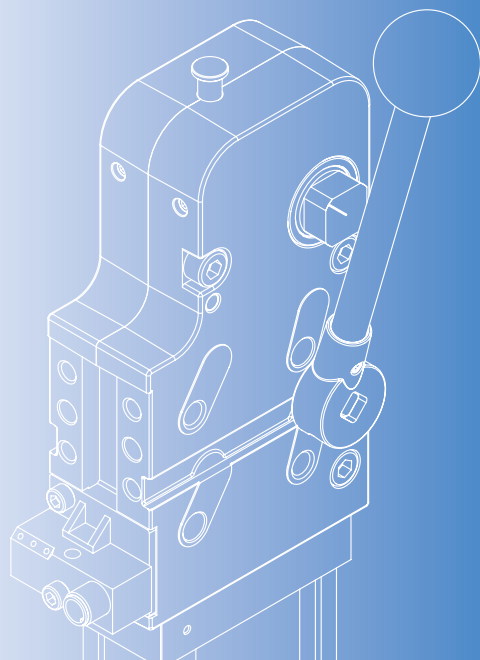


Sensor switch mounting groove

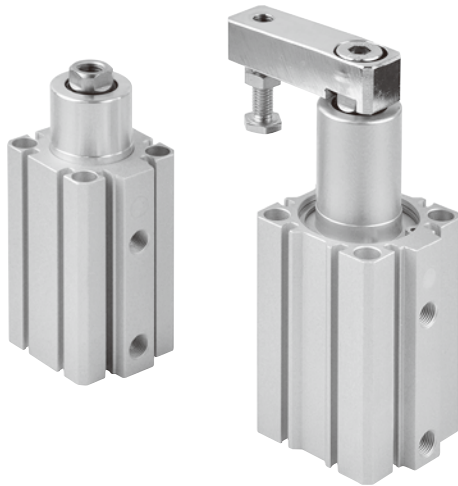




CLAMP CYLINDER



| | | |
|--------------|---------------------------|------|
| MCKC | ø12~ø40 | 2-2 |
| MTA* | MTAS / MTAD | 2-6 |
| MA* | MAS / MATS | 2-14 |
| | MASD / MATSD | 2-14 |
| MCKA | ø40 | 2-17 |
| MCKG* | ø50, ø63 | 2-20 |
| MCKD | ø50, ø63 New | 2-24 |
| MCKB | ø25, ø32 | 2-31 |



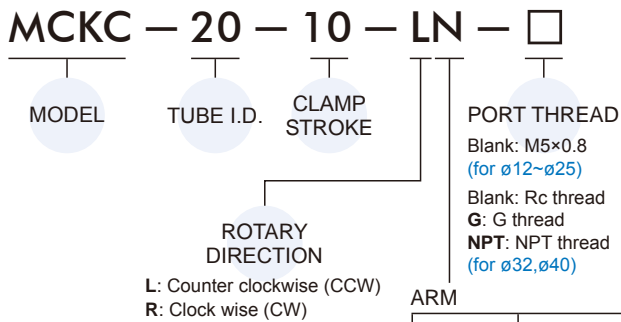
Features

- Ultra compact, light weight and space saving cylinder.
- Ideal for use in machinery where space is limited and incorporating sensor groove which enables flush fitting of sensors.
- The sensor can freely mounted the four sides.
- Magnetic as standard.

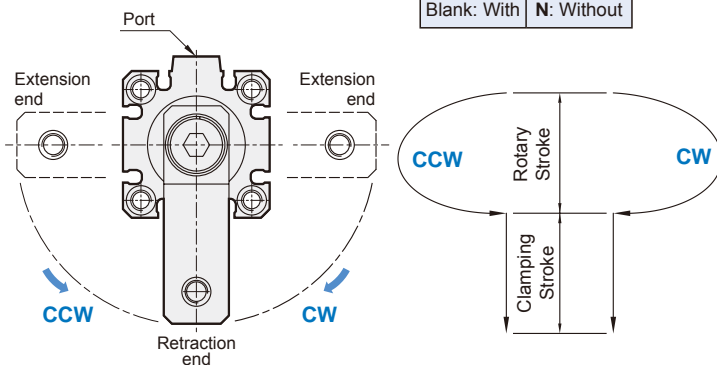
Specification

| Model | MCKC | | | | | |
|----------------------------|--------------------------|-------|-----------------|-------|----|----|
| Acting type | Double acting | | | | | |
| Tube I.D. (mm) | 12 | 16 | 20 | 25 | 32 | 40 |
| Port size | M5x0.8 | | | Rc1/8 | | |
| Rotary angle | 90°±10° | | | | | |
| Rotary direction | CCW (L), CW (R) | | | | | |
| Rotary stroke (mm) | 7.5 | | 9.5 | | 15 | |
| Clamp stroke (mm) | 10, 20 | | 10, 20, 30 | | | |
| Medium | Air | | | | | |
| Operating pressure range | 0.1~0.9 MPa | | | | | |
| Ambient temperature | -5°C~+60°C (No freezing) | | | | | |
| Available speed range | 50~200 mm/sec | | | | | |
| Non-rotating accuracy (*1) | ±2° | ±1.3° | ±1.2° | ±1° | | |
| Lubrication | Not required | | | | | |
| Sensor switch (*2) | RDE | | RCE, RCE1, RDEP | | | |

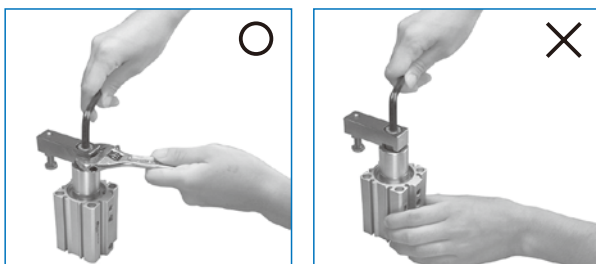
Order example



Rotary direction



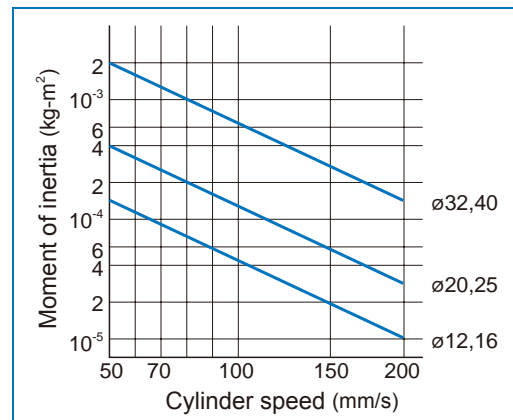
Clamping arm mounting methods



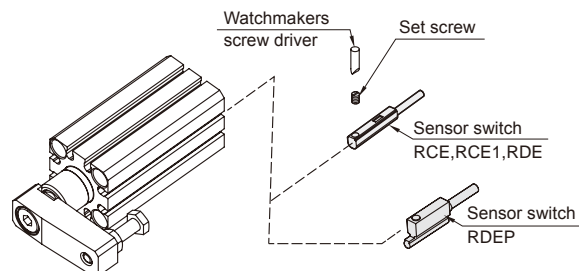
*1. Arm during clamping (Clamp part).

*2. RCE, RCE1, RDE, RDEP specifications please refer to page 5-6, 7, 10.

Moment of inertia



Installation of sensor switch



CAUTION

Do not use the cylinder under the following environments

- Areas that contain splashing cutting oil.
- Areas that contain foreign objects such as cutting chips or heavy-dust.
- Areas that environment temperature exceeds the operating range.
- Areas that expose to direct sunlight.
- Areas that contain corrosion risk.

A cylinder could malfunction or the non-rotating accuracy could be reduced if a rotational force is applied to the piston rod. Therefore, check the particular examples below before operating the cylinder.

- 1 Make sure to mount the cylinder vertically to the ground. (Fig.1)
- 2 Do not apply external rotary force on the piston rod. (Fig.2)
- 3 Make sure that the clamping surface of the workpiece is perpendicular to the axial line of cylinder. (Fig.3)
- 4 Clamping the workpiece in the clamping stroke of cylinder only. Do not clamp the workpiece in the rotary stroke. (Fig.4)
- 5 Make sure that the workpiece is not moved by external force while clamping. (Fig.5)

- 1 Do not mount the cylinder horizontally.

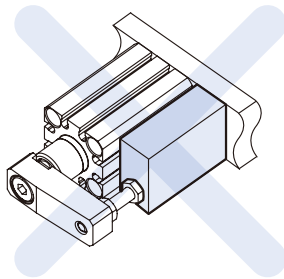


Fig.1

- 2 Do not apply external rotary force on the piston rod.

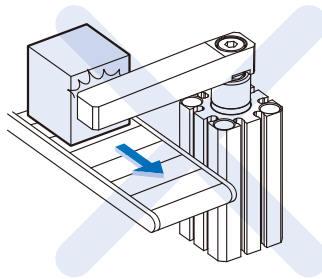


Fig.2

- 3 Do not clamp on a slope.

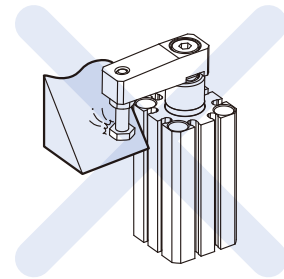


Fig.3

- 4 Do not clamp the workpiece in the rotary stroke.

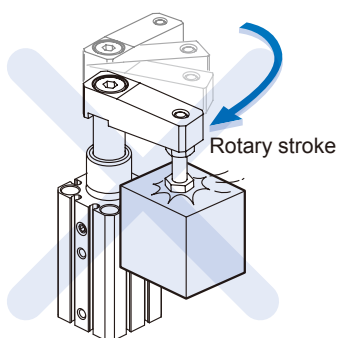
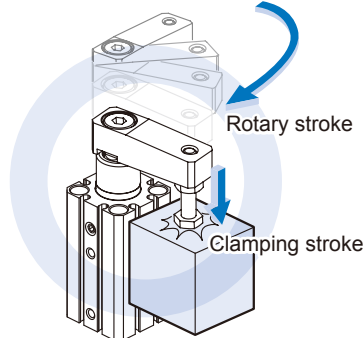


Fig.4



- 5 Make sure that the workpiece have no external force applied besides the cylinder while clamping.

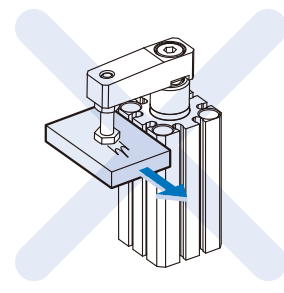
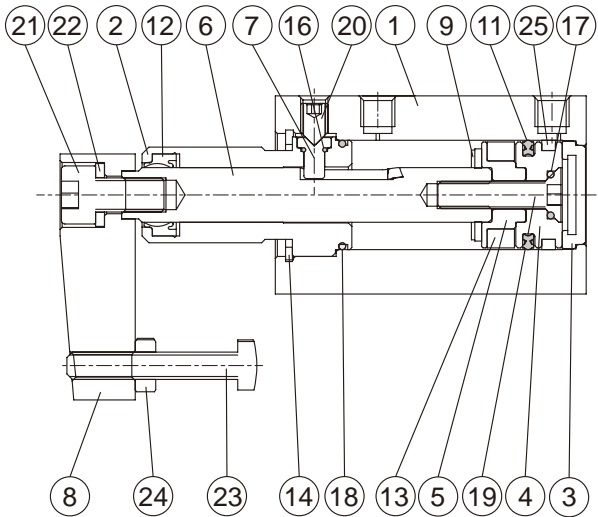
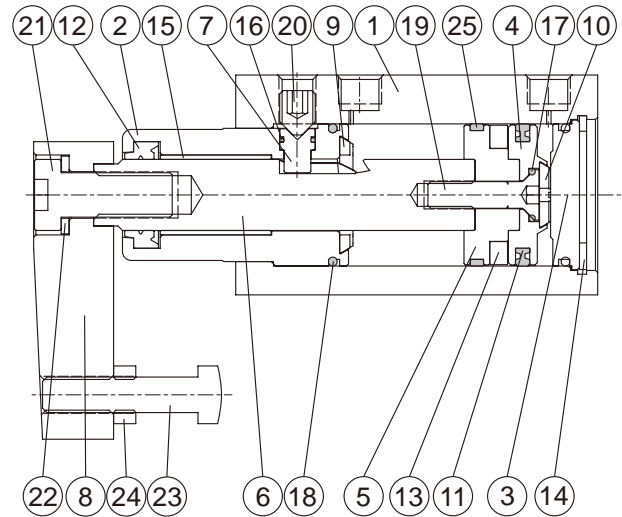


Fig.5

ø12, ø16, ø40



ø20, ø25, ø32



Material

| No. | Part name | Material | Note |
|-----|------------------------|-----------------|-------------|
| 1 | Body | Aluminum alloy | |
| 2 | Rod cover | Aluminum alloy | |
| 3 | End cover | Aluminum alloy | |
| 4 | Piston | Aluminum alloy | |
| 5 | Piston for magnet ring | Aluminum alloy | |
| 6 | Piston rod | SCM | |
| 7 | Guide pin | SCM | |
| 8 | Arm | Carbon steel | |
| 9 | Rod cushion | NBR | |
| 10 | End cushion | NBR | For ø20~ø40 |
| 11 | Piston packing | NBR | |
| 12 | Rod packing | NBR | |
| 13 | Magnet ring | Magnet material | |

| No. | Part name | Material | Note |
|-----|---------------|-----------------|-------------|
| 14 | Snap ring | Stainless steel | *1 |
| 15 | Bush | Copper | For ø32,ø40 |
| 16 | O-ring | NBR | |
| 17 | O-ring | NBR | |
| 18 | O-ring | NBR | |
| 19 | Bolt | Stainless steel | |
| 20 | Set screw | SCM | |
| 21 | Bolt | SCM | |
| 22 | Spring washer | Spring steel | |
| 23 | Bolt | SCM | |
| 24 | Nut | Carbon steel | |
| 25 | Wear ring | Resin | |

*1. ø12,ø16: Carbon steel

Theoretical force






Unit: N

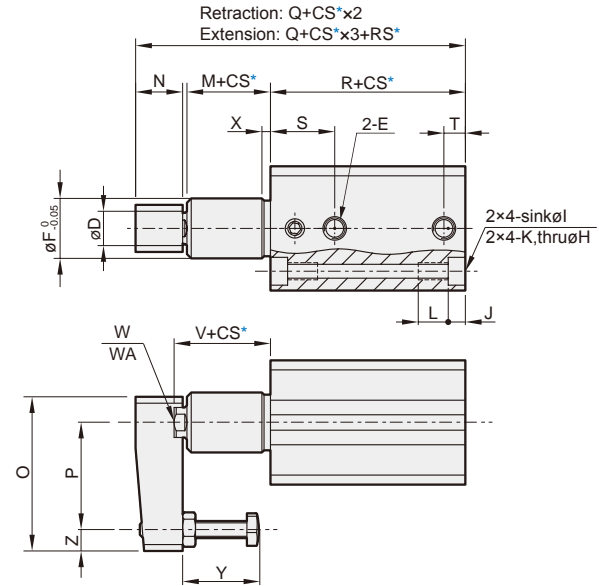
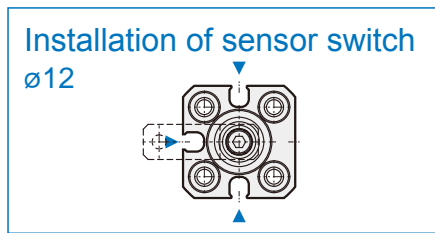
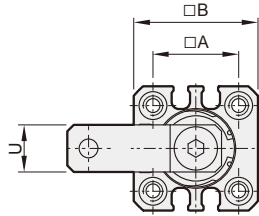
| Tube I.D. (mm) | Piston rod (mm) | Operating direction | Piston area (mm ²) | Operating pressure (MPa) | | | | | | | | |
|----------------|-----------------|---------------------|--------------------------------|--------------------------|-------|-------|-------|-------|-------|-------|--------|--------|
| | | | | 0.1 | 0.2 | 0.3 | 0.4 | 0.5 | 0.6 | 0.7 | 0.8 | 0.9 |
| 12 | 6 | A | 113 | 11.3 | 22.6 | 33.9 | 45.2 | 56.5 | 67.8 | 79.1 | 90.4 | 101.7 |
| | | B | 85 | 8.5 | 17.0 | 25.5 | 34.0 | 42.5 | 51.0 | 59.5 | 68.0 | 76.5 |
| 16 | 8 | A | 201 | 20.1 | 40.2 | 60.3 | 80.4 | 100.5 | 120.6 | 140.7 | 160.8 | 181.0 |
| | | B | 151 | 15.1 | 30.2 | 45.2 | 60.3 | 75.4 | 90.5 | 105.6 | 120.6 | 135.7 |
| 20 | 12 | A | 314 | 31.4 | 62.8 | 94.2 | 125.7 | 157.1 | 188.5 | 219.9 | 251.3 | 282.7 |
| | | B | 201 | 20.1 | 40.2 | 60.3 | 80.4 | 100.5 | 120.6 | 140.7 | 160.8 | 181.0 |
| 25 | 12 | A | 491 | 49.1 | 98.2 | 147.3 | 196.4 | 245.4 | 294.5 | 343.6 | 392.7 | 441.8 |
| | | B | 378 | 37.8 | 75.6 | 113.3 | 151.1 | 188.9 | 226.7 | 264.4 | 302.2 | 340.0 |
| 32 | 16 | A | 804 | 80.4 | 160.8 | 241.3 | 321.7 | 402.1 | 482.5 | 563.0 | 643.4 | 723.8 |
| | | B | 603 | 60.3 | 120.6 | 181.0 | 241.3 | 301.6 | 361.9 | 422.2 | 482.5 | 542.9 |
| 40 | 16 | A | 1257 | 125.7 | 251.4 | 377.1 | 502.8 | 628.5 | 754.2 | 879.9 | 1005.6 | 1131.3 |
| | | B | 1056 | 105.6 | 211.2 | 316.8 | 422.4 | 528.0 | 633.6 | 739.2 | 844.8 | 950.4 |

Cylinder weight

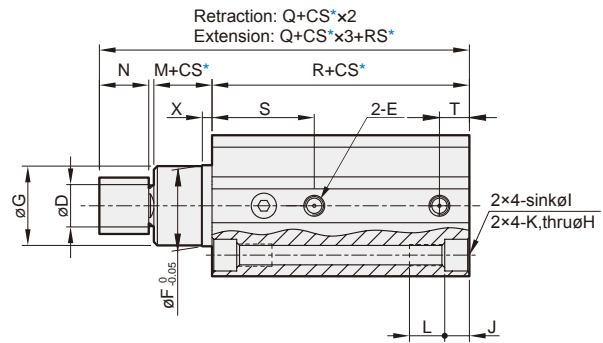
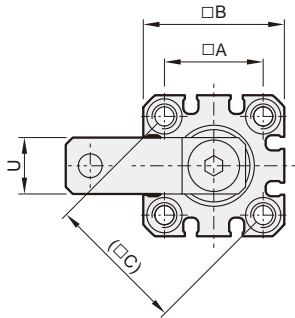
Unit: g

| Model | Basic weight MCKC | Basic weight MCKC-N | Stroke 10 mm MCKC |
|-----------|---|---|---|
| Tube I.D. |  |  |  |
| ø12 | 66 | 52 | 16 |
| ø16 | 100 | 66 | 23 |
| ø20 | 266 | 176 | 38 |
| ø25 | 319 | 229 | 46 |
| ø32 | 573 | 382 | 69 |
| ø40 | 652 | 461 | 74 |

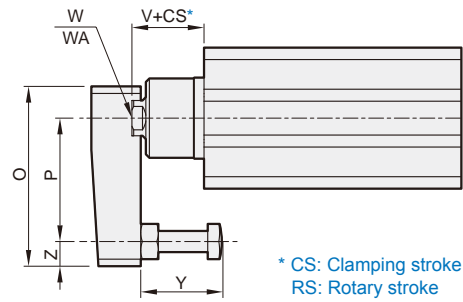
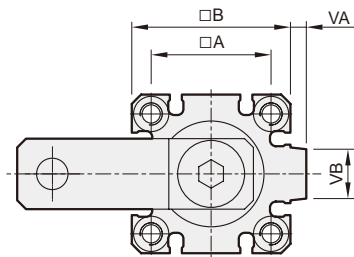
$\phi 12, \phi 16$



$\phi 20, \phi 25$



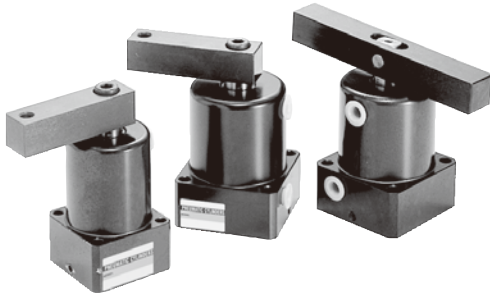
$\phi 32, \phi 40$



* CS: Clamping stroke
RS: Rotary stroke

| Code Tube I.D. | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | RS | S | T |
|----------------|------|----|------|----|--------|----|------|-----|-----|---|--------|----|------|----|----|----|-----|------|-----|----|-----|
| 12 | 15.5 | 25 | - | 6 | M5x0.8 | 11 | - | 3.5 | 6.5 | 4 | M4x0.7 | 7 | 9.5 | 8 | 29 | 20 | 54 | 35.5 | 7.5 | 15 | 5 |
| 16 | 20 | 29 | - | 8 | M5x0.8 | 14 | - | 3.5 | 6.5 | 4 | M4x0.7 | 7 | 9.5 | 11 | 36 | 25 | 57 | 35.5 | 7.5 | 15 | 5 |
| 20 | 25.5 | 36 | 36 | 12 | M5x0.8 | 18 | 17.9 | 5.4 | 9 | 7 | M6x1.0 | 10 | 6.5 | 14 | 51 | 35 | 84 | 62 | 9.5 | 28 | 8.7 |
| 25 | 28 | 40 | 39.6 | 12 | M5x0.8 | 23 | 22.5 | 5.4 | 9 | 7 | M6x1.0 | 10 | 6.5 | 14 | 51 | 35 | 85 | 63 | 9.5 | 29 | 8.5 |
| 32 | 34 | 45 | - | 16 | Rc1/8 | 30 | 29.5 | 5.5 | 9 | 7 | M6x1.0 | 10 | 15.5 | 18 | 67 | 45 | 107 | 71.5 | 15 | 28 | 11 |
| 40 | 40 | 52 | - | 16 | Rc1/8 | 30 | 29.5 | 5.5 | 9 | 7 | M6x1.0 | 10 | 23 | 18 | 67 | 45 | 108 | 65 | 15 | 27 | 8 |

| Code Tube I.D. | U | V | VA | VB | W (ROD thread) | WA | X | Y | Z |
|----------------|----|------|-----|----|----------------|----------------------|---|-------|----|
| 12 | 8 | 12.5 | - | - | M3x0.5x5.5L | Across flats 5x2.5L | 2 | 7-18 | 4 |
| 16 | 11 | 12.5 | - | - | M5x0.8x6.5L | Across flats 7x2.5L | 2 | 7-20 | 5 |
| 20 | 16 | 10.5 | - | - | M8x1.25x14L | Across flats 10x3L | 3 | 12-25 | 7 |
| 25 | 16 | 10.5 | - | - | M8x1.25x14L | Across flats 10x3L | 3 | 12-25 | 7 |
| 32 | 20 | 22 | 4.5 | 14 | M10x1.5x19L | Across flats 14x5.5L | 3 | 12-25 | 10 |
| 40 | 20 | 29.5 | 5 | 14 | M10x1.5x19L | Across flats 14x5.5L | 3 | 12-25 | 10 |











Features

- These swing clamps are used when it is required to keep the fixture workpiece area free of straps and clamping components for unrestricted workpiece loading and un-loading.
- This pneumatic clamping element is a pull type cylinder, There are five standard sizes, and for each size two versions of standard clamping arms, mounting of these clamping arms at any angle within 360.

Note

- Please don't exceed 1.5 times of the original length, if it is necessary to increase the length of the clamping arm.
- Suggested to install a flow control valve protect cylinder barrel and internal components against fretting wear.

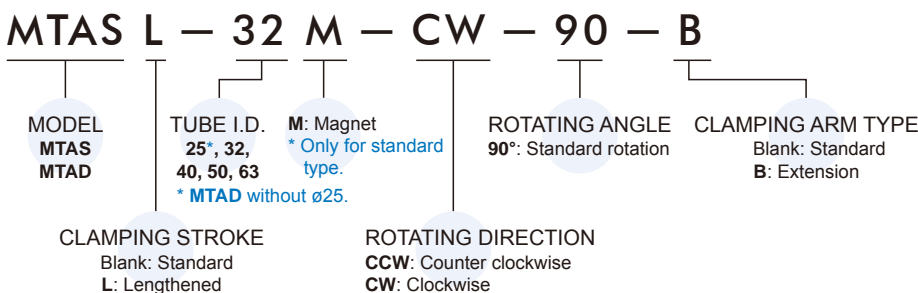
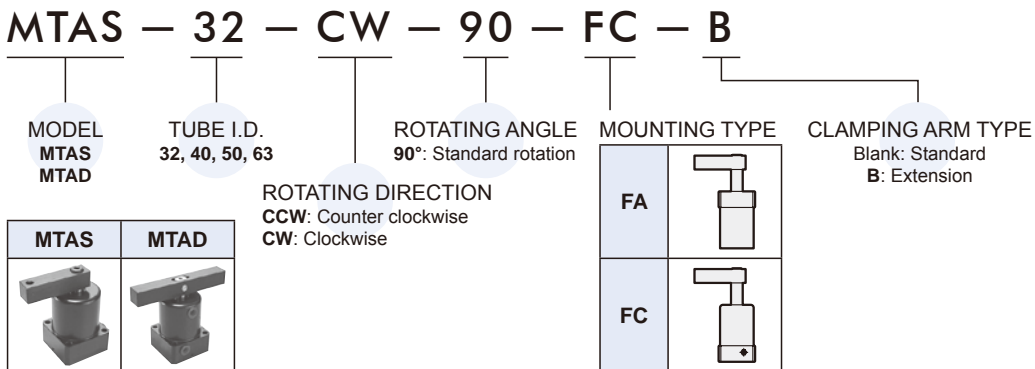
Double acting

| | | |
|-----------------|--|---|
| MTAS | Single side clamping arm |  |
| MTAD | Double sides clamping arm |  |
| MTAS..M | Single side clamping arm (Piston with magnet) |  |
| MTAD..M | Double sides clamping arm (Piston with magnet) |  |
| MTAS..FC | Single side clamping arm (Manifold With flow control) |  |
| MTAD..FC | Double sides clamping arm (Manifold With flow control) |  |
| MTAS..FA | Single side clamping arm (Flange type) |  |
| MTAD..FA | Double sides clamping arm (Flange type) |  |

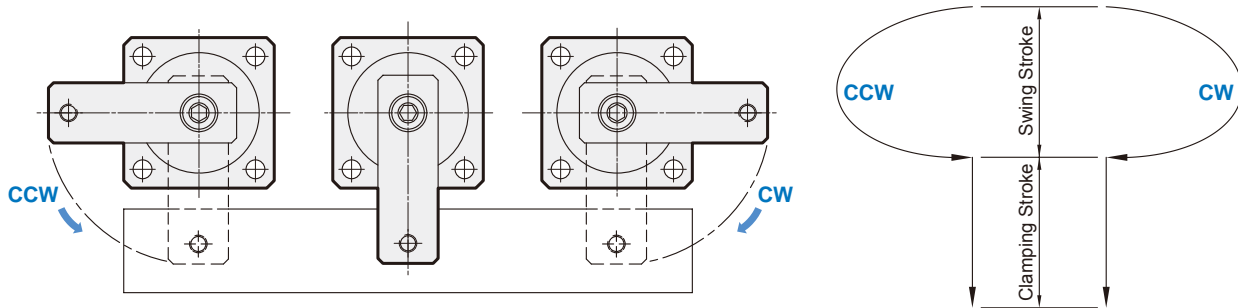
Specification

| Model | MTAS | MTAD |
|-----------------------------|--|----------------|
| Acting type | Double acting | |
| Tube I.D. (mm) | 25, 32, 40, 50, 63 | 32, 40, 50, 63 |
| Power fluid | Filtered air with or without lubrication | |
| The range of pressure | 0.1~1 MPa | |
| Max. pressure | 1.47 MPa | |
| Material of cylinder barrel | Anodised aluminum alloy | |
| Standard angle of rotation | 90°±2° (Angle of 0°, 45° and 60° are optional) | |
| Rotating direction | Clockwise or counter clockwise | |
| Sensor switch | LN40R (Please refer to page 5-19) | |

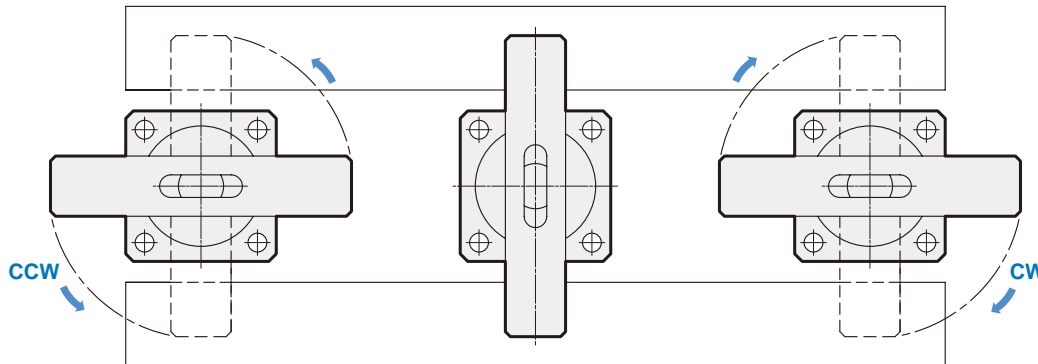
Order example



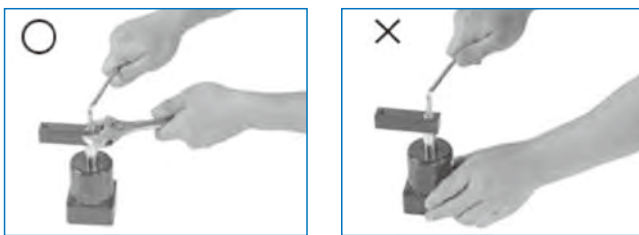
Single side swing clamp



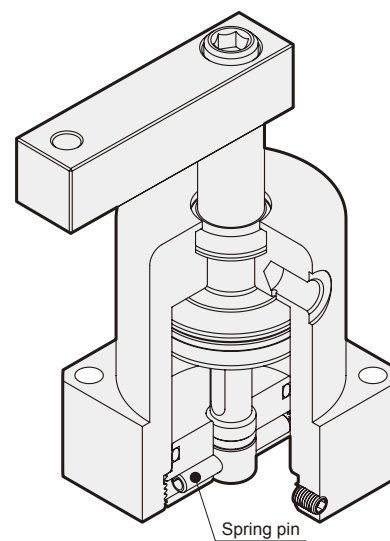
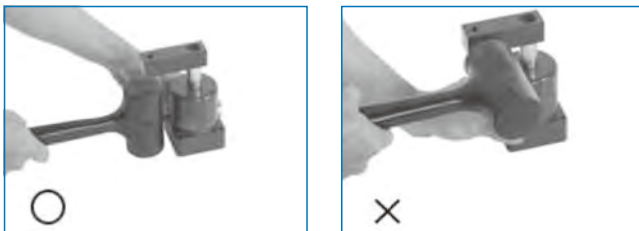
Double side swing clamp



Clamping arm mounting methods



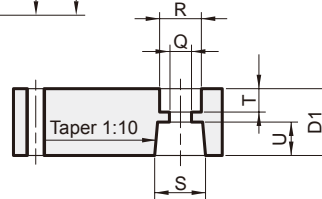
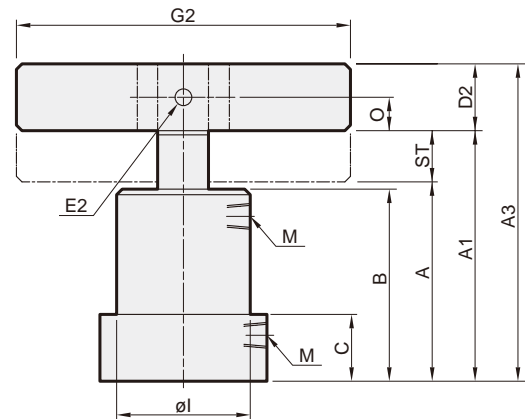
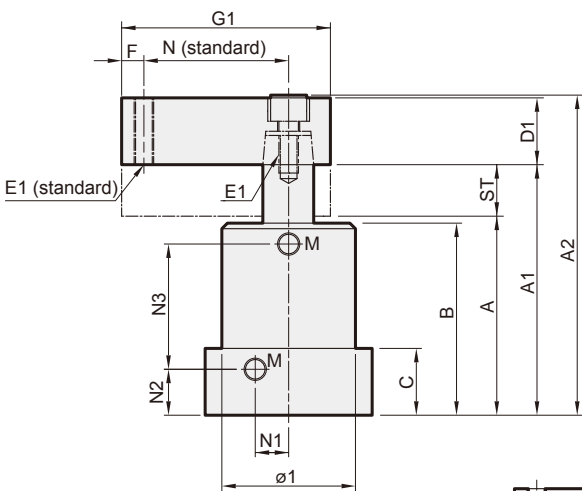
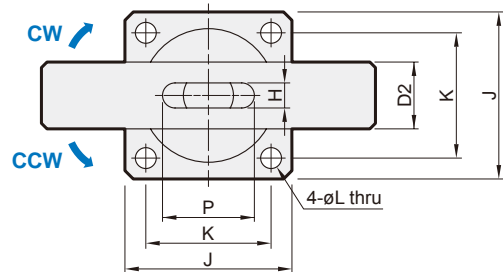
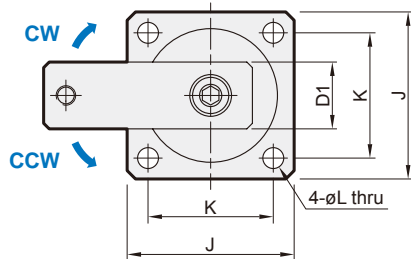
Clamping arm removing methods



Note. If the clamping arm is wrong mounting and removing, the spring pin is broken easily. Then the rotation angle is deviation or the action is not smooth when the cylinder works.

MTAS / MTASL

MTAD / MTADL



Single side clamping arm

* Clamping stroke lengthened type.

| Model | Tube I.D. (mm) | Piston rod (mm) | Swing stroke (mm) | Clamping stroke (mm) | | Pressure area push/pull (mm ²) | Clamping force N (0.6 MPa) | Clamping arm type | | | | |
|---------|----------------|------------------|-------------------|----------------------|---------|--|----------------------------|-------------------|-----------|----------|-----------|-----|
| | | | | Standard | L type* | | | G1 | | G2 | | |
| | | | | | | | | Standard | Extension | Standard | Extension | |
| MTAS-25 | — | $\varnothing 25$ | $\varnothing 14$ | 9 | 13 | — | 491 / 337 | 200 | 50 | 70 | — | — |
| MTAS-32 | MTAD-32 | $\varnothing 32$ | $\varnothing 16$ | 11 | 15 | 30 | 804 / 603 | 360 | 70 | 100 | 140 | 200 |
| MTAS-40 | MTAD-40 | $\varnothing 40$ | $\varnothing 16$ | 11 | 15 | 30 | 1257 / 1056 | 630 | 75 | 100 | 140 | 200 |
| MTAS-50 | MTAD-50 | $\varnothing 50$ | $\varnothing 20$ | 13 | 17 | 34 | 1963 / 1649 | 980 | 85 | 130 | 160 | 230 |
| MTAS-63 | MTAD-63 | $\varnothing 63$ | $\varnothing 20$ | 13 | 17 | 34 | 3117 / 2803 | 1680 | 95 | 130 | 160 | 230 |

| Code Model | Standard type | | | | | | Clamping stroke lengthened type | | | | | | C | D1 | D2 | E1 | E2 | F | |
|------------|---------------|----|-----|---------|-------|----|---------------------------------|-----|-----|---------|-------|-----|----|----|----------------|----------------|---------|-----------------|----|
| | A | A1 | A2 | A3 | B | ST | A | A1 | A2 | A3 | B | ST | | | | | | | |
| MTAS-25 | — | 67 | 89 | (105.9) | — | 65 | 22 | — | — | — | — | — | — | 23 | $\square 15.9$ | — | M6x1.0 | — | 6 |
| MTAS-32 | MTAD-32 | 82 | 108 | (128) | 127 | 78 | 26 | 97 | 138 | (158) | 157 | 93 | 41 | 28 | $\square 19$ | $\square 19$ | M8x1.25 | $\varnothing 8$ | 8 |
| MTAS-40 | MTAD-40 | 82 | 108 | (128) | 127 | 78 | 26 | 97 | 138 | (158) | 157 | 93 | 41 | 28 | $\square 19$ | $\square 19$ | M8x1.25 | $\varnothing 8$ | 8 |
| MTAS-50 | MTAD-50 | 94 | 124 | (150.4) | 146.2 | 90 | 30 | 111 | 158 | (184.4) | 180.2 | 107 | 47 | 31 | $\square 25.4$ | $\square 22.2$ | M10x1.5 | $\varnothing 8$ | 10 |
| MTAS-63 | MTAD-63 | 94 | 124 | (150.4) | 146.2 | 90 | 30 | 111 | 158 | (184.4) | 180.2 | 107 | 47 | 31 | $\square 25.4$ | $\square 22.2$ | M10x1.5 | $\varnothing 8$ | 10 |

| Code Model | H | I | J | K | L | M | N | N1 | N2 | N3 | | O | P | Q | R | S | T | U | |
|------------|---------|----|------------------|----|----|-------------------|--------|----|------|----------|----------|----|------|----|-------------------|------------------|------------------|---|------|
| | | | | | | | | | | Standard | L type* | | | | | | | | |
| MTAS-25 | — | — | $\varnothing 35$ | 38 | 30 | $\varnothing 4.6$ | M5x0.8 | 35 | 8 | 16.5 | Standard | — | — | — | $\varnothing 6.8$ | $\varnothing 11$ | $\varnothing 14$ | 5 | 8.5 |
| MTAS-32 | MTAD-32 | 9 | $\varnothing 46$ | 50 | 40 | $\varnothing 5.6$ | Rc1/8 | 50 | 11.5 | 19 | 45 | 60 | 9.5 | 25 | $\varnothing 9$ | $\varnothing 14$ | $\varnothing 16$ | 7 | 9.5 |
| MTAS-40 | MTAD-40 | 9 | $\varnothing 55$ | 60 | 48 | $\varnothing 6.8$ | Rc1/8 | 55 | 14 | 19 | 45 | 60 | 9.5 | 25 | $\varnothing 9$ | $\varnothing 14$ | $\varnothing 16$ | 7 | 9.5 |
| MTAS-50 | MTAD-50 | 10 | $\varnothing 65$ | 70 | 57 | $\varnothing 6.8$ | Rc1/8 | 60 | 17 | 21 | 54 | 71 | 11.1 | 29 | $\varnothing 11$ | $\varnothing 17$ | $\varnothing 20$ | 9 | 12.5 |
| MTAS-63 | MTAD-63 | 10 | $\varnothing 78$ | 83 | 67 | $\varnothing 9$ | Rc1/8 | 70 | 20 | 21 | 54 | 71 | 11.1 | 29 | $\varnothing 11$ | $\varnothing 17$ | $\varnothing 20$ | 9 | 12.5 |

MTAS-25M With magnet type $\phi 25$

PNEUMATIC - SWING CLAMP CYLINDER



Rotary Actuator

Clamp Cylinder

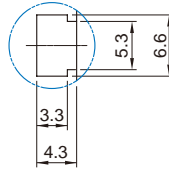
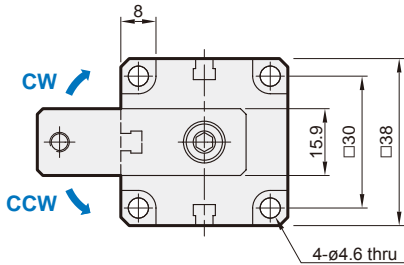
Gripper

Electric Actuator

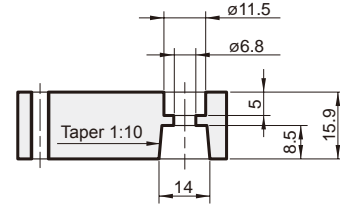
Auxiliary Equipment

Hydraulic Cylinder

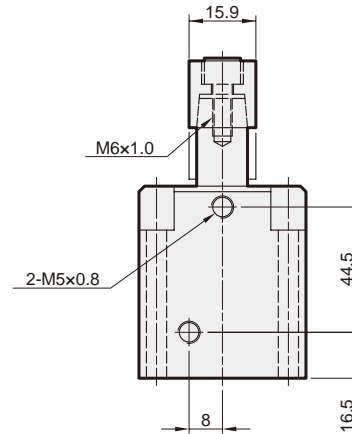
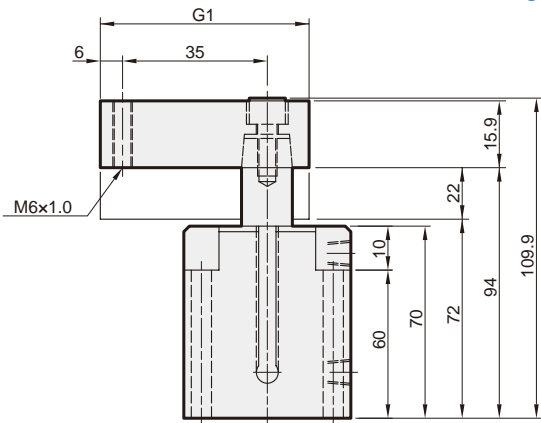
MTAS



Auto switch mounting groove position



Single side clamping arm



| Model | Tube I.D. (mm) | Piston rod (mm) | Swing stroke (mm) | Clamping stroke (mm) | Pressure area push/ pull (mm ²) | Clamping force N (0.6MPa) | Clamping arm type G1 | |
|-----------------|----------------|-----------------|-------------------|----------------------|---|---------------------------|----------------------|-----------|
| | | | | | | | Standard | Extension |
| MTAS-25M | $\phi 25$ | $\phi 14$ | 9 | 13 | 491 / 337 | 200 | 50 | 70 |

Cylinder weight

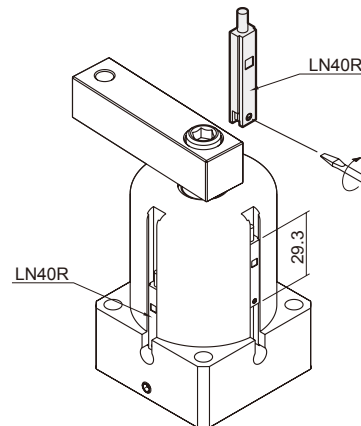
Standard type

| Model | Weight (kg) |
|----------------|-------------|
| MTAS-25 | 0.3 |
| MTAS-32 | 0.7 |
| MTAD-32 | 0.9 |
| MTAS-40 | 0.9 |
| MTAD-40 | 1.1 |
| MTAS-50 | 1.6 |
| MTAD-50 | 1.8 |
| MTAS-63 | 2.1 |
| MTAD-63 | 2.3 |

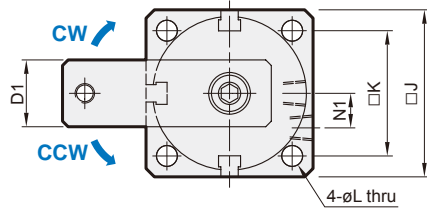
With magnet type

| Model | Weight (kg) |
|-----------------|-------------|
| MTAS-25M | 0.4 |
| MTAS-32M | 0.73 |
| MTAD-32M | 0.93 |
| MTAS-40M | 0.95 |
| MTAD-40M | 1.15 |
| MTAS-50M | 1.65 |
| MTAD-50M | 1.85 |
| MTAS-63M | 2.22 |
| MTAD-63M | 2.42 |

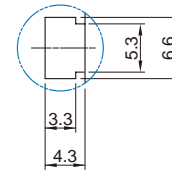
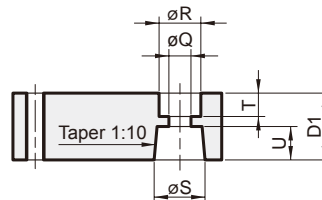
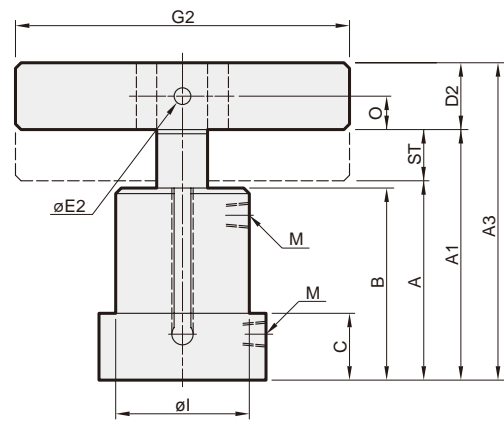
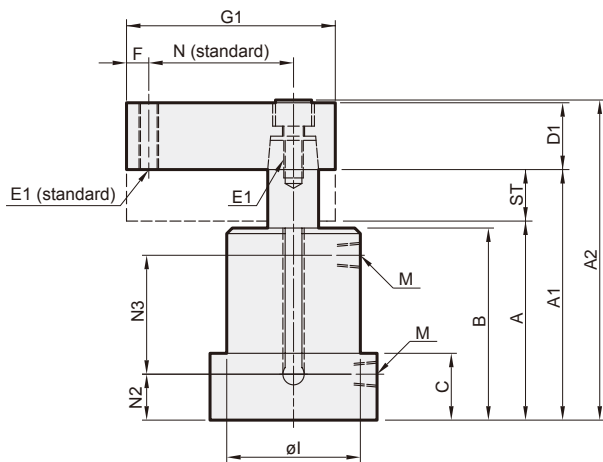
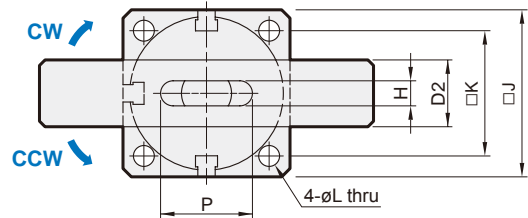
Installation of sensor switch



MTAS



MTAD



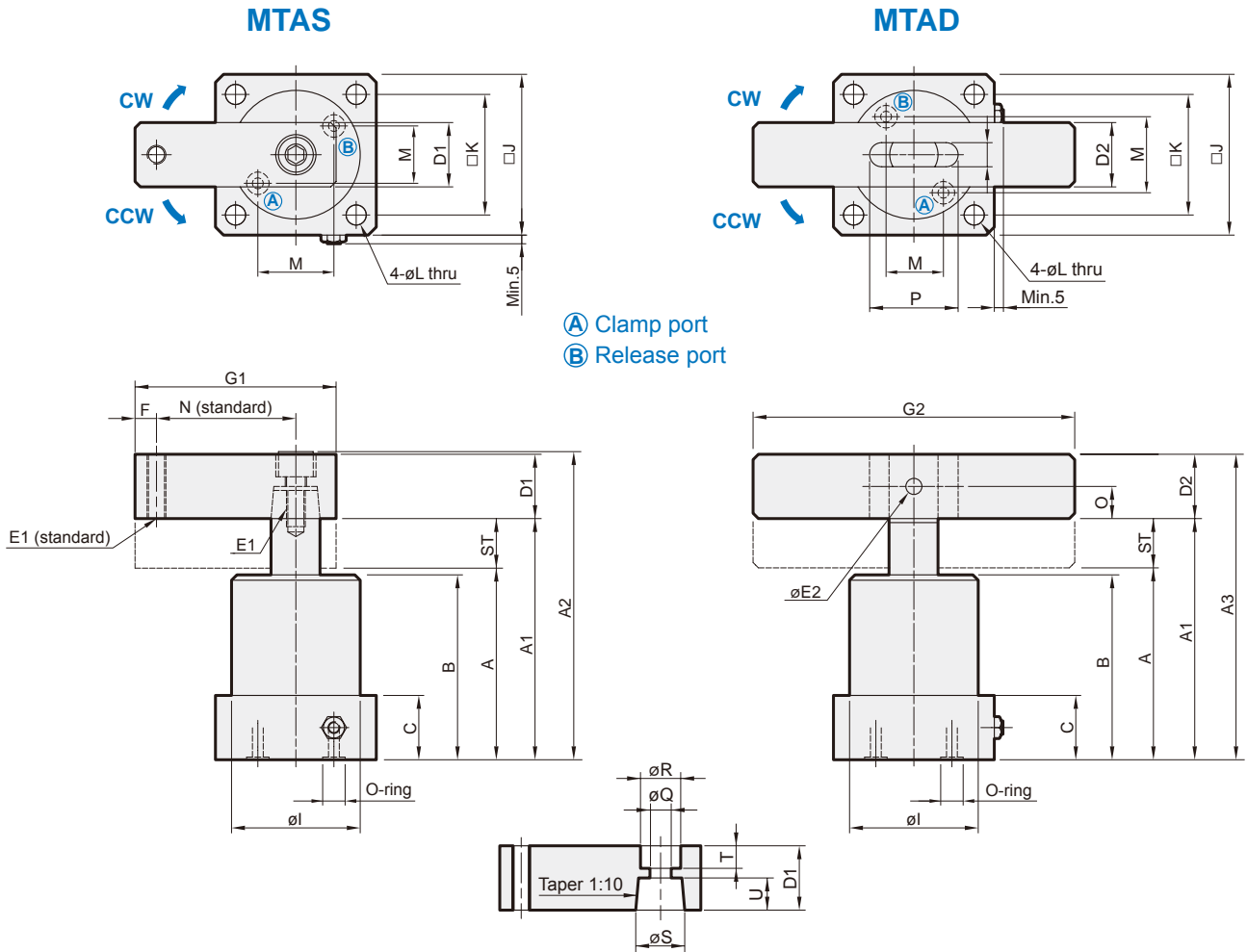
Single side clamping arm Auto switch mounting groove position

| Model | Tube I.D. (mm) | Piston rod (mm) | Swing stroke (mm) | Clamping stroke (mm) | Pressure area push/pull (mm ²) | Clamping force N (0.6 MPa) | Clamping arm type | | | | |
|----------|----------------|------------------|-------------------|----------------------|--|----------------------------|-------------------|-----------|----------|-----------|-----|
| | | | | | | | G1 | | G2 | | |
| | | | | | | | Standard | Extension | Standard | Extension | |
| MTAS-32M | MTAD-32M | $\varnothing 32$ | $\varnothing 16$ | 11 | 15 | 804 / 603 | 360 | 70 | 100 | 140 | 200 |
| MTAS-40M | MTAD-40M | $\varnothing 40$ | $\varnothing 16$ | 11 | 15 | 1257 / 1056 | 630 | 75 | 100 | 140 | 200 |
| MTAS-50M | MTAD-50M | $\varnothing 50$ | $\varnothing 20$ | 13 | 17 | 1963 / 1649 | 980 | 85 | 130 | 160 | 230 |
| MTAS-63M | MTAD-63M | $\varnothing 63$ | $\varnothing 20$ | 13 | 17 | 3117 / 2803 | 1680 | 95 | 130 | 160 | 230 |

| Code Model | A | A1 | A2 | A3 | B | C | D1 | D2 | E1 | E2 | F | H | I | J | K | |
|------------|----------|----|-----|---------|-------|----|----|----------------|----------------|---------|-----------------|----|----|------------------|----|----|
| MTAS-32M | MTAD-32M | 87 | 113 | (133) | 132 | 83 | 28 | $\square 19$ | $\square 19$ | M8x1.25 | $\varnothing 8$ | 8 | 9 | $\varnothing 46$ | 50 | 40 |
| MTAS-40M | MTAD-40M | 87 | 113 | (133) | 132 | 83 | 28 | $\square 19$ | $\square 19$ | M8x1.25 | $\varnothing 8$ | 8 | 9 | $\varnothing 55$ | 60 | 48 |
| MTAS-50M | MTAD-50M | 99 | 129 | (155.4) | 151.2 | 95 | 31 | $\square 25.4$ | $\square 22.2$ | M10x1.5 | $\varnothing 8$ | 10 | 10 | $\varnothing 65$ | 70 | 57 |
| MTAS-63M | MTAD-63M | 99 | 129 | (155.4) | 151.2 | 95 | 31 | $\square 25.4$ | $\square 22.2$ | M10x1.5 | $\varnothing 8$ | 10 | 10 | $\varnothing 78$ | 83 | 67 |

| Code Model | L | M | N | N1 | N2 | N3 | O | P | Q | R | S | ST | T | U | |
|------------|----------|-------------------|-------|----|------|----|----|------|----|------------------|------------------|------------------|----|---|------|
| MTAS-32M | MTAD-32M | $\varnothing 5.6$ | Rc1/8 | 50 | 11.5 | 19 | 50 | 9.5 | 25 | $\varnothing 9$ | $\varnothing 14$ | $\varnothing 16$ | 26 | 7 | 9.5 |
| MTAS-40M | MTAD-40M | $\varnothing 6.8$ | Rc1/8 | 55 | 14 | 19 | 50 | 9.5 | 25 | $\varnothing 9$ | $\varnothing 14$ | $\varnothing 16$ | 26 | 7 | 9.5 |
| MTAS-50M | MTAD-50M | $\varnothing 6.8$ | Rc1/8 | 60 | 17 | 21 | 59 | 11.1 | 29 | $\varnothing 11$ | $\varnothing 17$ | $\varnothing 20$ | 30 | 9 | 12.5 |
| MTAS-63M | MTAD-63M | $\varnothing 9$ | Rc1/8 | 70 | 20 | 21 | 59 | 11.1 | 29 | $\varnothing 11$ | $\varnothing 17$ | $\varnothing 20$ | 30 | 9 | 12.5 |

FC



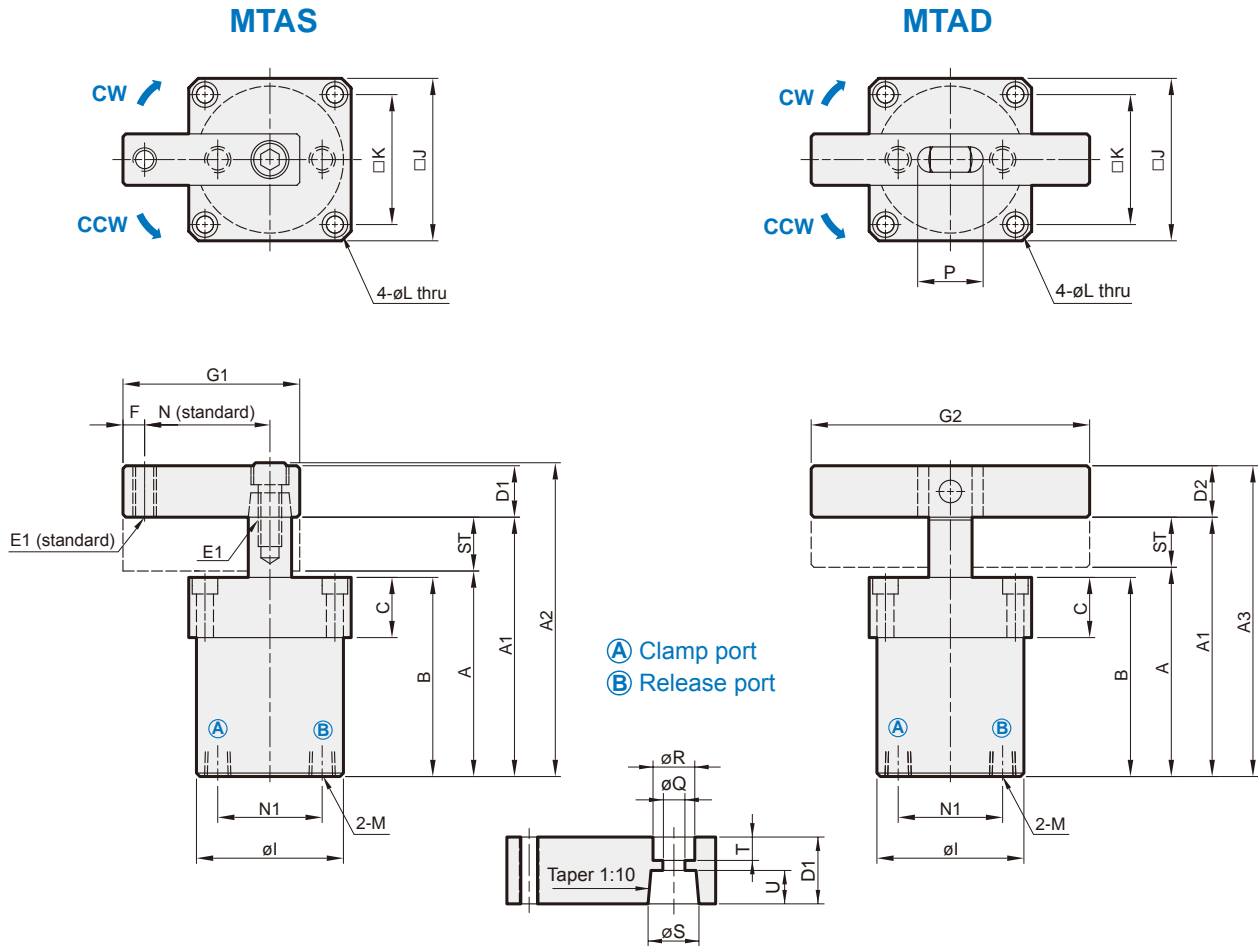
Single side clamping arm

| Model | Tube I.D. (mm) | Piston rod (mm) | Swing stroke (mm) | Clamping stroke (mm) | Pressure area push/ pull (mm ²) | Clamping force N (0.6 MPa) | Clamping arm type | | | | |
|------------|----------------|-----------------|-------------------|----------------------|---|----------------------------|-------------------|-----------|----------|-----------|-----|
| | | | | | | | G1 | | G2 | | |
| | | | | | | | Standard | Extension | Standard | Extension | |
| MTAS-32 FC | MTAD-32 FC | ø32 | ø16 | 11 | 15 | 804 / 603 | 360 | 70 | 100 | 140 | 200 |
| MTAS-40 FC | MTAD-40 FC | ø40 | ø16 | 11 | 15 | 1257 / 1056 | 630 | 75 | 100 | 140 | 200 |
| MTAS-50 FC | MTAD-50 FC | ø50 | ø20 | 13 | 17 | 1963 / 1649 | 980 | 85 | 130 | 160 | 230 |
| MTAS-63 FC | MTAD-63 FC | ø63 | ø20 | 13 | 17 | 3117 / 2803 | 1680 | 95 | 130 | 160 | 230 |

| Code Model | A | A1 | A2 | A3 | B | C | D1 | D2 | E1 | E2 | F | H | I | J | K | |
|------------|------------|----|-----|---------|-------|----|----|-------|-------|---------|----|----|----|-----|----|----|
| MTAS-32 FC | MTAD-32 FC | 82 | 108 | (129.5) | 127 | 78 | 22 | □19 | □19 | M8x1.25 | ø8 | 8 | 9 | ø46 | 50 | 40 |
| MTAS-40 FC | MTAD-40 FC | 82 | 108 | (129.5) | 127 | 78 | 22 | □19 | □19 | M8x1.25 | ø8 | 8 | 9 | ø55 | 60 | 48 |
| MTAS-50 FC | MTAD-50 FC | 94 | 124 | (152.4) | 146.2 | 90 | 25 | □25.4 | □22.2 | M10x1.5 | ø8 | 10 | 10 | ø65 | 70 | 57 |
| MTAS-63 FC | MTAD-63 FC | 94 | 124 | (152.4) | 146.2 | 90 | 25 | □25.4 | □22.2 | M10x1.5 | ø8 | 10 | 10 | ø78 | 83 | 67 |

| Code Model | L | M | N | O | P | Q | R | S | ST | T | U | O-ring | |
|------------|------------|------|----|----|------|----|-----|-----|-----|----|---|--------|----|
| MTAS-32 FC | MTAD-32 FC | ø5.6 | 19 | 50 | 9.5 | 25 | ø9 | ø14 | ø16 | 26 | 7 | 9.5 | P7 |
| MTAS-40 FC | MTAD-40 FC | ø6.8 | 23 | 55 | 9.5 | 25 | ø9 | ø14 | ø16 | 26 | 7 | 9.5 | P7 |
| MTAS-50 FC | MTAD-50 FC | ø6.8 | 28 | 60 | 11.1 | 29 | ø11 | ø17 | ø20 | 30 | 9 | 12.5 | P9 |
| MTAS-63 FC | MTAD-63 FC | ø9 | 32 | 70 | 11.1 | 29 | ø11 | ø17 | ø20 | 30 | 9 | 12.5 | P9 |

FA



Single side clamping arm

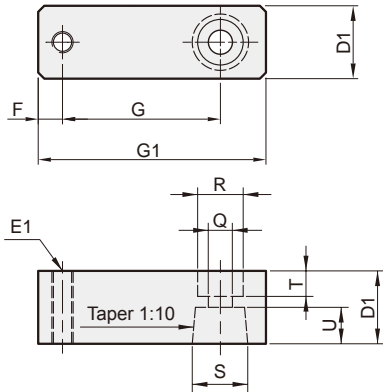
| Model | Tube I.D. (mm) | Piston rod (mm) | Swing stroke (mm) | Clamping stroke (mm) | Pressure area push/pull (mm ²) | Clamping force N (0.6 MPa) | Clamping arm type | | | |
|-------------------------|------------------|------------------|-------------------|----------------------|--|----------------------------|-------------------|-----------|----------|-----------|
| | | | | | | | G1 | | G2 | |
| | | | | | | | Standard | Extension | Standard | Extension |
| MTAS-32 FA / MTAD-32 FA | $\varnothing 32$ | $\varnothing 16$ | 11 | 15 | 804 / 603 | 360 | 70 | 100 | 140 | 200 |
| MTAS-40 FA / MTAD-40 FA | $\varnothing 40$ | $\varnothing 16$ | 11 | 15 | 1257 / 1056 | 630 | 75 | 100 | 140 | 200 |
| MTAS-50 FA / MTAD-50 FA | $\varnothing 50$ | $\varnothing 20$ | 13 | 17 | 1963 / 1649 | 980 | 85 | 130 | 160 | 230 |
| MTAS-63 FA / MTAD-63 FA | $\varnothing 63$ | $\varnothing 20$ | 13 | 17 | 3117 / 2803 | 1680 | 95 | 130 | 160 | 230 |

| Code Model | A | A1 | A2 | A3 | B | C | D1 | D2 | E1 | E2 | F | H | I | J | K |
|-------------------------|----|-----|---------|-------|----|----|----------------|----------------|---------|-----------------|----|----|------------------|----|----|
| MTAS-32 FA / MTAD-32 FA | 82 | 108 | (129.5) | 127 | 78 | 22 | $\square 19$ | $\square 19$ | M8x1.25 | $\varnothing 8$ | 8 | 9 | $\varnothing 46$ | 50 | 40 |
| MTAS-40 FA / MTAD-40 FA | 82 | 108 | (129.5) | 127 | 78 | 22 | $\square 19$ | $\square 19$ | M8x1.25 | $\varnothing 8$ | 8 | 9 | $\varnothing 55$ | 60 | 48 |
| MTAS-50 FA / MTAD-50 FA | 94 | 124 | (152.4) | 146.2 | 90 | 25 | $\square 25.4$ | $\square 22.2$ | M10x1.5 | $\varnothing 8$ | 10 | 10 | $\varnothing 65$ | 70 | 57 |
| MTAS-63 FA / MTAD-63 FA | 94 | 124 | (152.4) | 146.2 | 90 | 25 | $\square 25.4$ | $\square 22.2$ | M10x1.5 | $\varnothing 8$ | 10 | 10 | $\varnothing 78$ | 83 | 67 |

| Code Model | L | M | N | N1 | O | P | Q | R | S | ST | T | U |
|-------------------------|--|-------|----|----|------|----|------------------|------------------|------------------|----|---|------|
| MTAS-32 FA / MTAD-32 FA | $\varnothing 5.6, \varnothing 9 \times 5.5dp$ | Rc1/8 | 50 | 32 | 9.5 | 25 | $\varnothing 9$ | $\varnothing 14$ | $\varnothing 16$ | 26 | 7 | 9.5 |
| MTAS-40 FA / MTAD-40 FA | $\varnothing 6.8, \varnothing 10.5 \times 6.5dp$ | Rc1/8 | 55 | 40 | 9.5 | 25 | $\varnothing 9$ | $\varnothing 14$ | $\varnothing 16$ | 26 | 7 | 9.5 |
| MTAS-50 FA / MTAD-50 FA | $\varnothing 6.8, \varnothing 10.5 \times 6.5dp$ | Rc1/8 | 60 | 50 | 11.1 | 29 | $\varnothing 11$ | $\varnothing 17$ | $\varnothing 20$ | 30 | 9 | 12.5 |
| MTAS-63 FA / MTAD-63 FA | $\varnothing 9, \varnothing 14 \times 9dp$ | Rc1/8 | 70 | 63 | 11.1 | 29 | $\varnothing 11$ | $\varnothing 17$ | $\varnothing 20$ | 30 | 9 | 12.5 |

Single side clamping arm

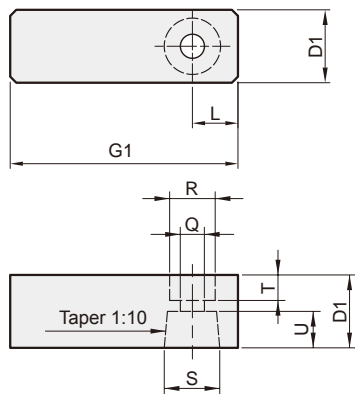
(Standard type with thread)



| Code Model | D1 | F | G | G1 | E1 | Q | R | S | T | U |
|----------------|-------|----|----|----|---------|------|-----|-----|---|------|
| MTAS-25 | □15.9 | 6 | 35 | 50 | M6×1.0 | ∅6.8 | ∅11 | ∅14 | 5 | 8.5 |
| MTAS-32 | □19 | 8 | 50 | 70 | M8×1.25 | ∅9 | ∅14 | ∅16 | 7 | 9.5 |
| MTAS-40 | □19 | 8 | 55 | 75 | M8×1.25 | ∅9 | ∅14 | ∅16 | 7 | 9.5 |
| MTAS-50 | □25.4 | 10 | 60 | 85 | M10×1.5 | ∅11 | ∅17 | ∅20 | 9 | 12.5 |
| MTAS-63 | □25.4 | 10 | 70 | 95 | M10×1.5 | ∅11 | ∅17 | ∅20 | 9 | 12.5 |

Single side clamping arm B type

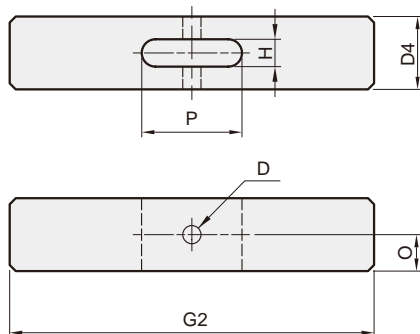
(Extension type without thread)



| Code Model | D1 | F | G1 | L | Q | R | S | T | U |
|------------------|-------|----|-----|----|------|-----|-----|---|------|
| MTAS-25 B | □15.9 | 6 | 70 | 15 | ∅6.8 | ∅11 | ∅14 | 5 | 8.5 |
| MTAS-32 B | □19 | 8 | 100 | 20 | ∅9 | ∅14 | ∅16 | 7 | 9.5 |
| MTAS-40 B | □19 | 8 | 100 | 20 | ∅9 | ∅14 | ∅16 | 7 | 9.5 |
| MTAS-50 B | □25.4 | 10 | 130 | 25 | ∅11 | ∅17 | ∅20 | 9 | 12.5 |
| MTAS-63 B | □25.4 | 10 | 130 | 25 | ∅11 | ∅17 | ∅20 | 9 | 12.5 |

Double side clamping arm

(Standard & Extension type)



Double side clamping arm (Standard type)

| Code Model | Tube I.D. | D | D4 | G2 | H | O | P |
|----------------|-----------|----|-------|-----|----|------|----|
| MTAD-32 | ∅32 | ∅8 | □19 | 140 | 9 | 9.5 | 25 |
| MTAD-40 | ∅40 | ∅8 | □19 | 140 | 9 | 9.5 | 25 |
| MTAD-50 | ∅50 | ∅8 | □22.2 | 160 | 10 | 11.1 | 29 |
| MTAD-63 | ∅63 | ∅8 | □22.2 | 160 | 10 | 11.1 | 29 |

Double side clamping arm B type (Extension type)

| Code Model | Tube I.D. | D | D4 | G2 | H | O | P |
|------------------|-----------|----|-------|-----|----|------|----|
| MTAD-32 B | ∅32 | ∅8 | □19 | 200 | 9 | 9.5 | 25 |
| MTAD-40 B | ∅40 | ∅8 | □19 | 200 | 9 | 9.5 | 25 |
| MTAD-50 B | ∅50 | ∅8 | □22.2 | 230 | 10 | 11.1 | 29 |
| MTAD-63 B | ∅63 | ∅8 | □22.2 | 230 | 10 | 11.1 | 29 |



Features

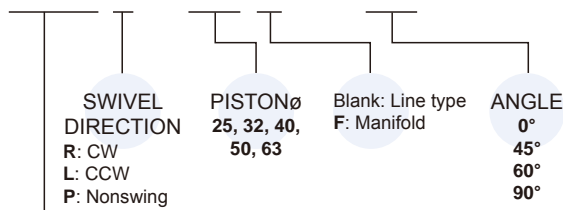
- Double clamp retracting, the piston rod rotates, causing the clamping arm to swing in either a clockwise or counterclockwise direction. Clamping then takes place as the rod continues to retract in a straight line, pulling the arm against the workpieces.
- Pull cylinder type, Available models offer angles of rotation of 0°, 45°, 60° or 90°.
- The cylinder body is made of aluminum alloy and the surface is hard membrane treated.
- Mounting methods: Square base type, threaded type, upper flange type.

Note

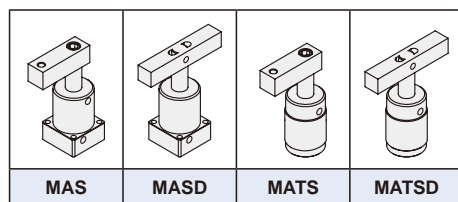
- When it is necessary to change the length of the clamping arm, it should be noted that do not exceed 1.5 times of the original G value in order to avoid the serious slanting of the piston rod.
- Suggested to add a flow control valve to the hydraulic inlet to control the motion of the swing angle in order to prevent the inertial impact.
- A workpiece should not be clamped within a swing stroke, and it should be clamped within the vertical downward clamping stroke.
- Whenever placing and taking off a workpiece, it is necessary to use an air gun to clean the piston and the seal for removing the iron slag or foreigner objects attached thereon in order to prevent the foreigner objects from entering the seal to cause oil leakage.

Order example

MAS L - 40 F - 90



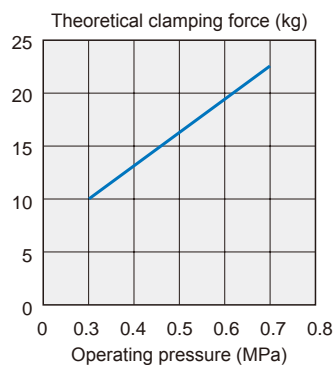
MODEL



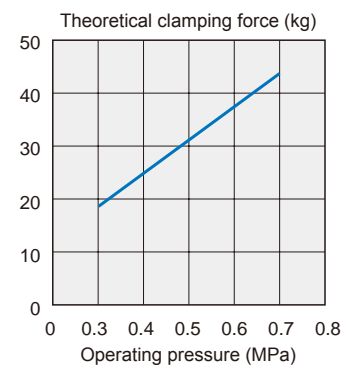
* MATS and MATSD produced by order.

Schematic view showing a theoretical clamping force under different pneumatic pressure.

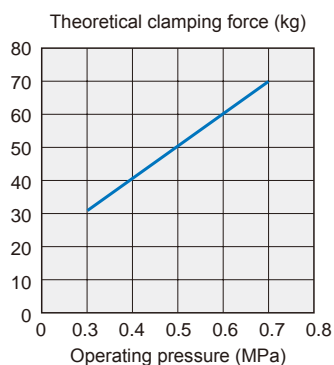
MAS-25



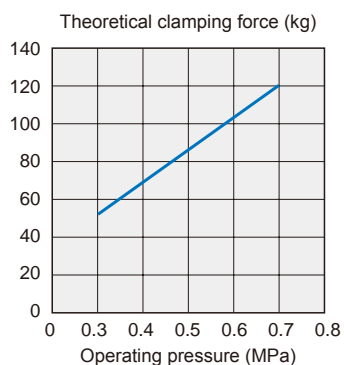
MAS-32



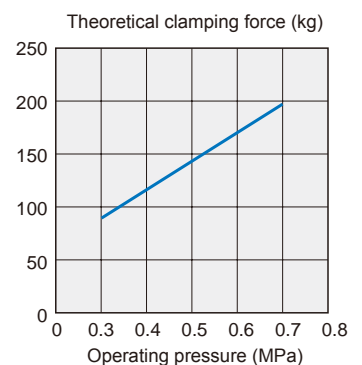
MAS-40



MAS-50

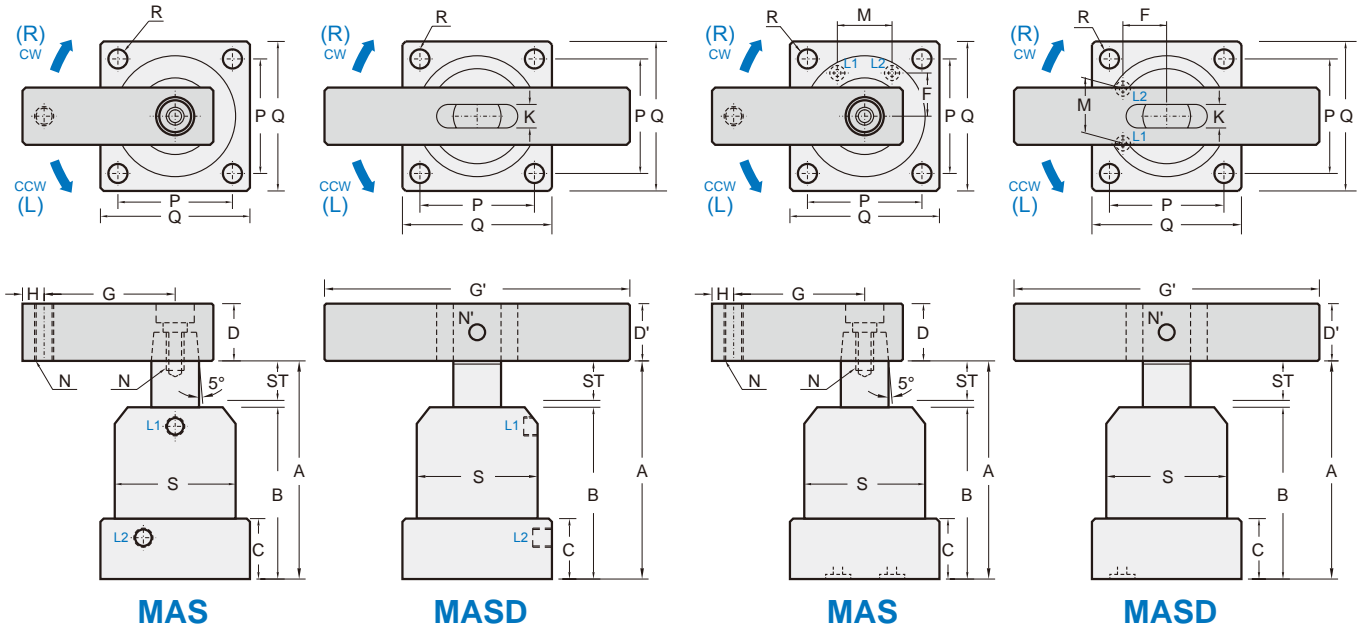


MAS-63



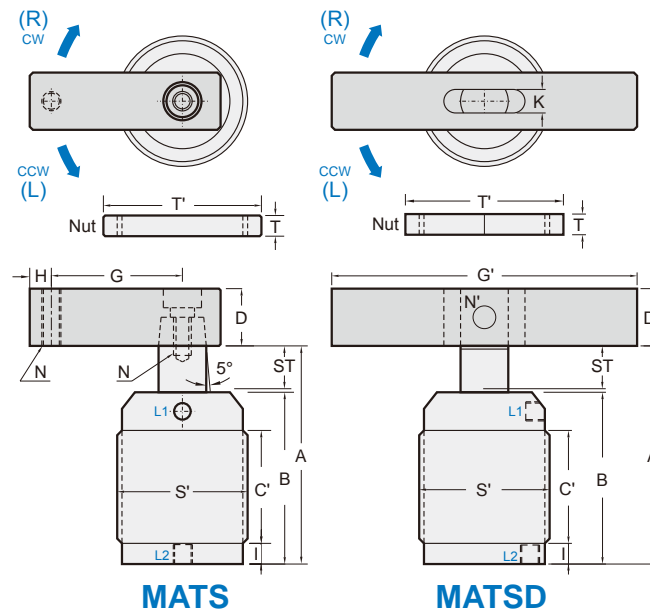
MAS*

MAS*-F

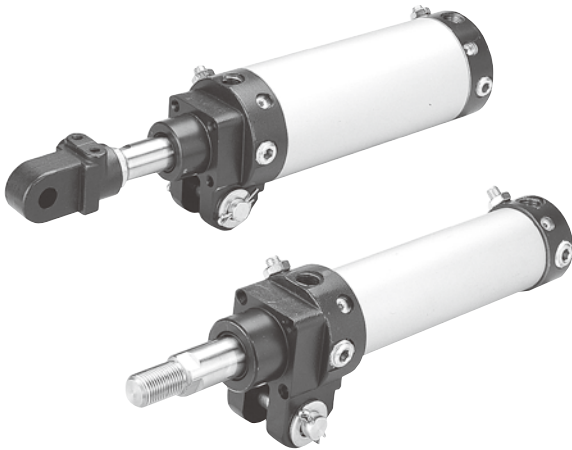


| Flange type | MAS-25 | MAS-32 MASD-32 | MAS-40 MASD-40 | MAS-50 MASD-50 | MAS-63 MASD-63 |
|-------------------------------|---|-------------------|-------------------|-------------------|-------------------|
| Max. operating pressure | 1 MPa | | | | |
| Normal operating pressure | 0.4~0.6 MPa | | | | |
| Cylinder operating | Double acting | | | | |
| Swivel angle | $90^\circ(60^\circ, 45^\circ, 0^\circ) \pm 2^\circ$ | | | | |
| Swivel stroke (mm) | 12 | 12 | 12 | 14 | 14 |
| Clamping stroke (mm) | 14 | 14 | 15 | 15 | 15 |
| Piston \varnothing (mm) | 25 | 32 | 40 | 50 | 63 |
| Piston rod \varnothing (mm) | 14 | 16 | 16 | 20 | 20 |
| Theoretical force (0.5 MPa) | 16kg | 30kg | 50kg | 85kg | 140kg |
| A (unclamp) (mm) | 95.5 | 102.5 | 106 | 113 | 119 |
| B (mm) | 65.5 | 71 | 75 | 80 | 86 |
| C (mm) | 23 | 23 | 26 | 26 | 30 |
| D (mm) | $\square 16$ | $\square 19$ | $\square 19$ | $\square 25.4$ | $\square 25.4$ |
| D' (mm) | — | $\square 19$ | $\square 19$ | $\square 22$ | $\square 22$ |
| G (mm) | 30 | 50 | 50 | 70 | 70 |
| G' (mm) | — | 100 | 100 | 120 | 120 |
| H (mm) | 8 | 9 | 9 | 10 | 10 |
| K (mm) | — | 9 | 9 | 10 | 10 |
| L1 (clamp) L2 (unclamp) | M5x0.8 | Rc1/8 | Rc1/8 | Rc1/8 | Rc1/8 |
| O-ring manifold | S3 | S4 | S4 | S4 | S4 |
| N (mm) | M6x1 | M8x1.25 | M8x1.25 | M10x1.5 | M10x1.5 |
| N' (mm) | — | $\varnothing 8$ | $\varnothing 8$ | $\varnothing 8$ | $\varnothing 8$ |
| P (mm) | 30 | 44 | 48 | 55 | 64 |
| Q (mm) | 40 | 54 | 58 | 68 | 80 |
| R (mm) | $\varnothing 4.5$ | $\varnothing 6.5$ | $\varnothing 6.5$ | $\varnothing 8.5$ | $\varnothing 8.5$ |
| S (mm) | $\varnothing 35$ | $\varnothing 50$ | $\varnothing 55$ | $\varnothing 65$ | $\varnothing 75$ |
| M (mm) | 18 | 22 | 26 | 30 | 40 |
| F (mm) | 12.5 | 17 | 19.5 | 24 | 29 |
| Weight (kg) | 0.4 | 0.7 | 0.85 | 1.3 | 1.8 |

MATS*



| Threaded type (produced by order) | MATS-25 | MATS-32 MATSD-32 | MATS-40 MATSD-40 | MATS-50 MATSD-50 | MATS-63 MATSD-63 |
|--------------------------------------|-------------------------------|---------------------|---------------------|---------------------|---------------------|
| Max. operating pressure | 1 MPa | | | | |
| Normal operating pressure | 0.4~0.6 MPa | | | | |
| Cylinder operating | Double acting | | | | |
| Swivel angle | 90°(60°,45°,0°) $\pm 2^\circ$ | | | | |
| Swivel stroke (mm) | 12 | 12 | 12 | 14 | 14 |
| Clamping stroke (mm) | 14 | 14 | 15 | 15 | 15 |
| Piston \varnothing (mm) | 25 | 32 | 40 | 50 | 63 |
| Piston rod \varnothing (mm) | 14 | 16 | 16 | 20 | 20 |
| Theoretical force (0.5 MPa) | 16kg | 30kg | 50kg | 85kg | 140kg |
| A (unclamp) (mm) | 95.5 | 102.5 | 106 | 113 | 119 |
| B (mm) | 66.5 | 71 | 75 | 80 | 86 |
| C' (mm) | 35 | 40 | 45 | 50 | 56 |
| D (mm) | $\square 16$ | $\square 19$ | $\square 19$ | $\square 25.4$ | $\square 25.4$ |
| D' (mm) | — | $\square 19$ | $\square 19$ | $\square 22$ | $\square 22$ |
| G (mm) | 30 | 50 | 50 | 70 | 70 |
| G' (mm) | — | 100 | 100 | 120 | 120 |
| H (mm) | 8 | 9 | 9 | 10 | 10 |
| I (mm) | 7 | 9 | 9 | 9 | 10 |
| K (mm) | — | 9 | 9 | 10 | 10 |
| L1 (clamp) L2 (unclamp) | M5x0.8 | Rc1/8 | Rc1/8 | Rc1/8 | Rc1/8 |
| N (mm) | M6x1 | M8x1.25 | M8x1.25 | M10x1.5 | M10x1.5 |
| N' (mm) | — | $\varnothing 8$ | $\varnothing 8$ | $\varnothing 8$ | $\varnothing 8$ |
| S' (mm) | M40x1.5 | M50x1.5 | M55x1.5 | M65x1.5 | M80x1.5 |
| T ($\times 2$ pcs nut) (mm) | 9 | 11 | 11 | 12 | 12 |
| T' (mm) | $\varnothing 58$ | $\varnothing 70$ | $\varnothing 75$ | $\varnothing 85$ | $\varnothing 100$ |
| Weight (kg) | 0.8 | 1.1 | 1.25 | 1.7 | 2 |



Features

- Aluminium alloy tube provides both smooth lines and high corrosion resistance.
- Self lubricated nose bush gives long life.
- Versatile porting position available.
- End cushioning at both ends reduces impact loads.

Specification

| Model | MCKA |
|--------------------------|--------------------------------------|
| Acting type | Double acting |
| Tube I.D. (mm) | 40 |
| Medium | Air |
| Operating pressure range | 0.05~1 MPa |
| Proof pressure | 1.5 MPa |
| Temperature range | -5~+60°C (No freezing) |
| Lubrication | Not required |
| Available speed range | 50~500 mm/sec |
| Cushion | With adjustable cushion at both ends |
| Sensor switch | RCA (Please refer to page 5-2) |
| Sensor switch band | PN-A40 |

Order example

MCKA — 40 — 100 M — A

MODEL

TUBE I.D.

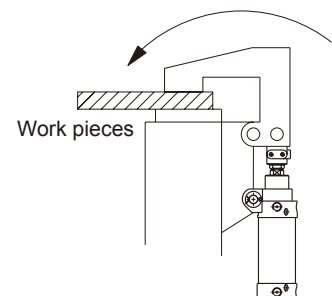
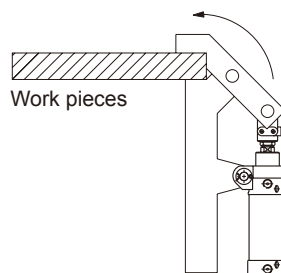
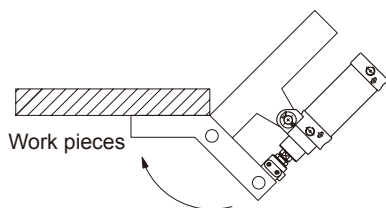
STROKE

50
75
100
125
150

M: Magnet

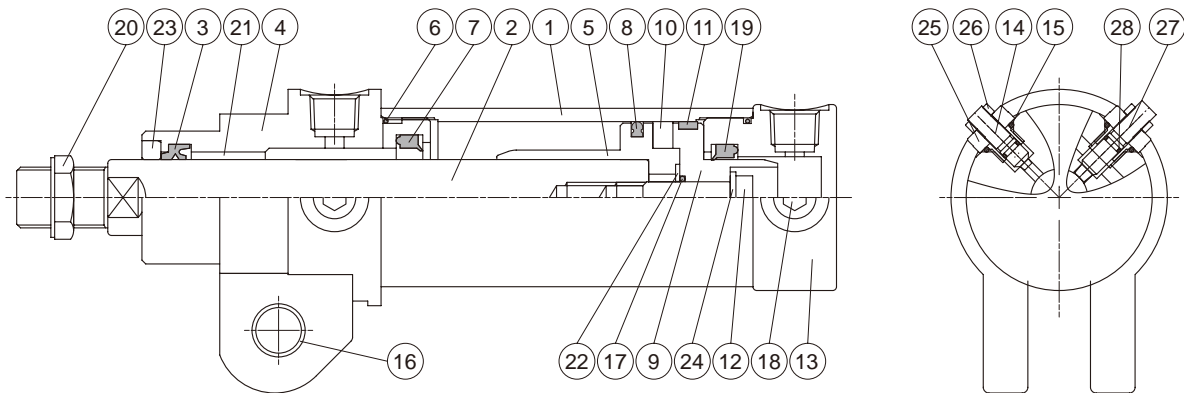
Blank: With adjustable cushion
A: With flow adjustable

Application examples



CLAMP CYLINDER

mindman

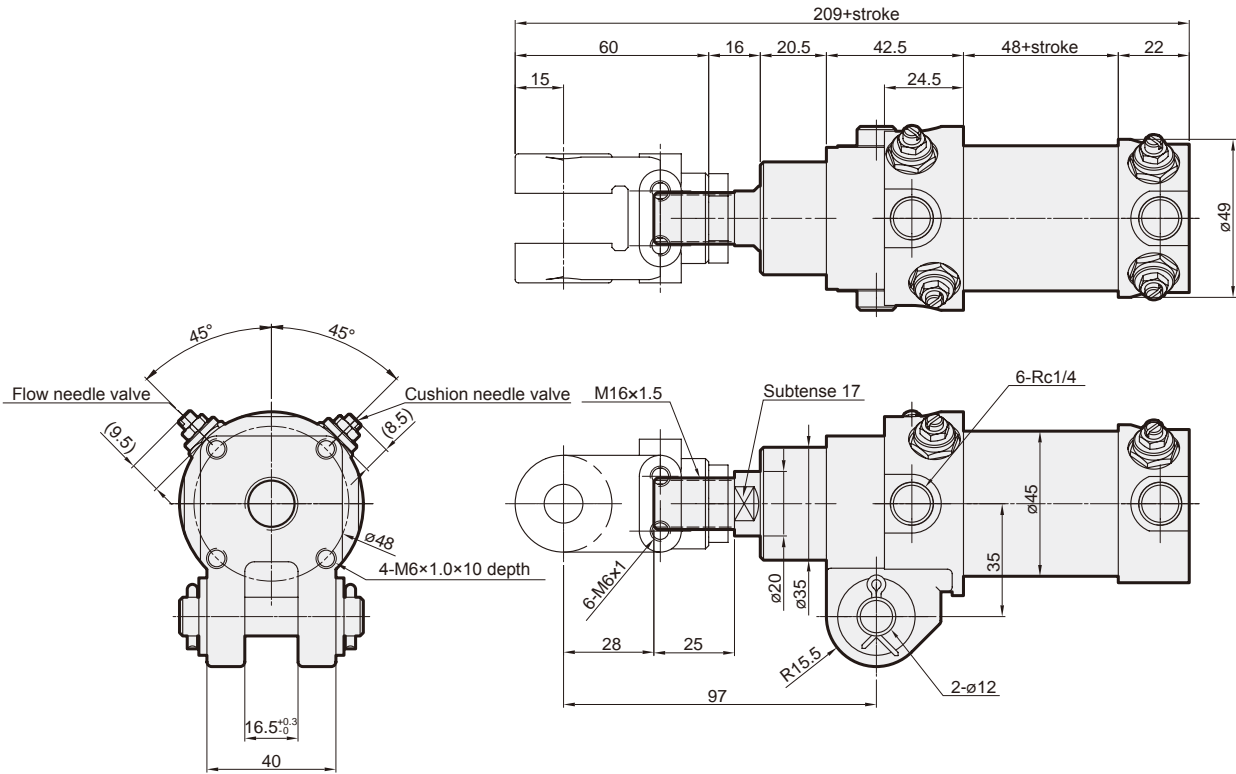


Material

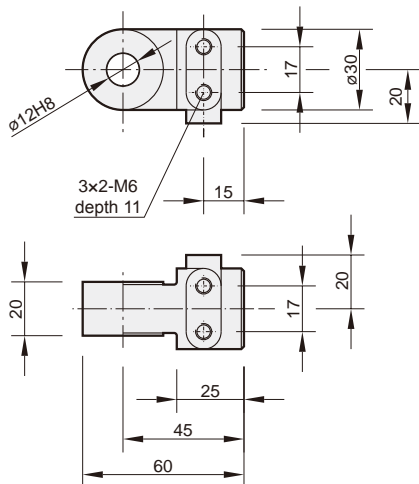
| No. | Part name | Material | Q'y | Component parts (inclusion) | Repair kits (inclusion) |
|-----|-------------------------|-----------------|-----|-----------------------------|-------------------------|
| 1 | Tube | Aluminum alloy | 1 | | |
| 2 | Piston rod | Carbon steel | 1 | | |
| 3 | Rod packing | NBR | 1 | ● | ● |
| 4 | Rod cover | Carbon steel | 1 | ● | |
| 5 | Piston-R | Aluminum alloy | 1 | ● | |
| 6 | Cover ring | NBR | 2 | ● | ● |
| 7 | Cushion packing-R | NBR | 1 | ● | ● |
| 8 | Piston packing | NBR | 1 | ● | ● |
| 9 | Piston-H | Aluminum alloy | 1 | ● | |
| 10 | Magnet ring | Magnet material | 1 | ● | |
| 11 | Wear ring | Resin | 1 | ● | |
| 12 | Piston bolt | SCM | 1 | ● | |
| 13 | Head cover | Aluminum alloy | 1 | ● | |
| 14 | Cushion needle valve | Copper | 2 | ● | |
| 15 | Need valve packing | NBR | 4 | ● | ● |
| 16 | Bush | Copper | 2 | ● | |
| 17 | Piston gasket | NBR | 1 | ● | ● |
| 18 | Seal screw | Carbon steel | 4 | ● | |
| 19 | Cushion packing-H | NBR | 1 | ● | ● |
| 20 | Rod front nut | Carbon steel | 1 | ● | |
| 21 | Rod bush | Copper | 1 | ● | |
| 22 | Washer | Carbon steel | 1 | ● | |
| 23 | Scraper | Copper | 1 | ● | |
| 24 | Washer | Carbon steel | 1 | ● | |
| 25 | Lock nut for need valve | Copper | 4 | ● | |
| 26 | Adj. nut for need valve | Copper | 4 | ● | |
| 27 | Flow needle valve | Copper | 2 | ● | |
| 28 | Need valve packing | NBR | 4 | ● | ● |

Order example of component parts / repair kits

| Tube I.D. | Component parts | Repair kits |
|-----------|-------------------|-------------------|
| ø40 | CP-MCKA-40 | PS-MCKA-40 |

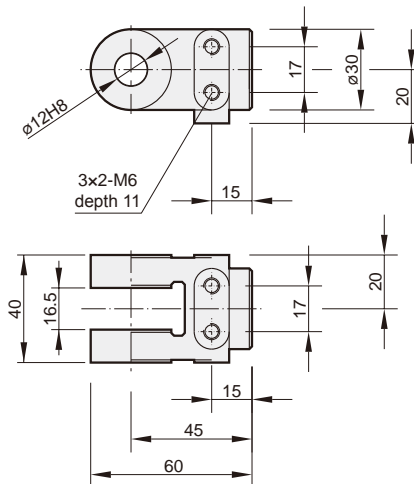


I connector



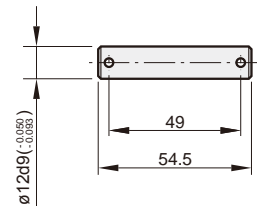
Order example
I — MCKA

Y connector



Order example
Y — MCKA

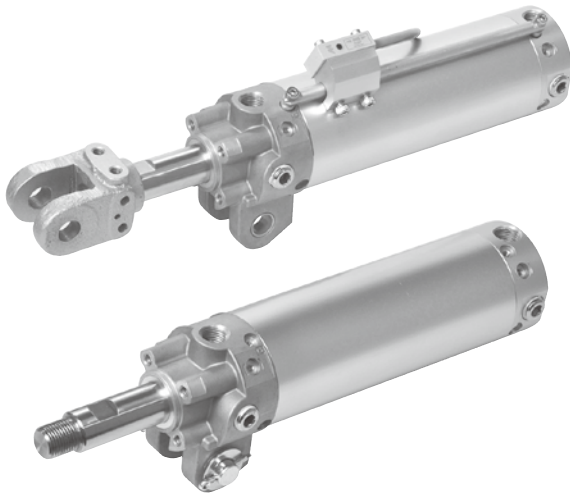
Pin



Split pin: $\phi 1/8" \times 3/4" L$
(1set: 2pcs)

Order example
PIN — MCKG

* Use the same pin with MCKG



Features

- Aluminium alloy tube provides both smooth lines and high corrosion resistance.
- Self lubricated nose bush gives long life.
- Versatile porting position available.
- End cushioning at both ends reduces impact loads.
- Available with magnetic piston and sensors.

Specification

| Model | MCKGA / B | | |
|---------------------------|------------------------|---------|-------|
| Acting type | Double acting | | |
| Tube I.D. (mm) | 50 | 63 | |
| Medium | Air | | |
| Operating pressure range | 0.05~1 MPa | | |
| Proof pressure | 1.5 MPa | | |
| Ambient temperature | -5~+60°C (No freezing) | | |
| Lubrication | Not required | | |
| Available speed range | 50~500 mm/sec | | |
| Sensor switch (*) | RCA, RDKP | | |
| Sensor switch accessories | RCA | BGA50 | BGA63 |
| | RDKP | PMB-040 | |

Table for standard stroke

| Tube I.D. | Stroke (mm) |
|-----------|-----------------------|
| ø50, 63 | 50, 75, 100, 125, 150 |

* RCA, RDKP specification, please refer to page 5-2, 13.

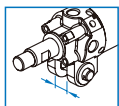
Order example

MCKGA — 50 — 100 M A — G — I — RDKP2

MODEL

TUBE I.D.
50
63

CLEVIS WIDTH
A: 16.5 mm
B: 19.5 mm



STROKE
50,75,100
125,150

M: Magnet

PORT THREAD
Blank: Rc thread
G: G thread
NPT: NPT thread

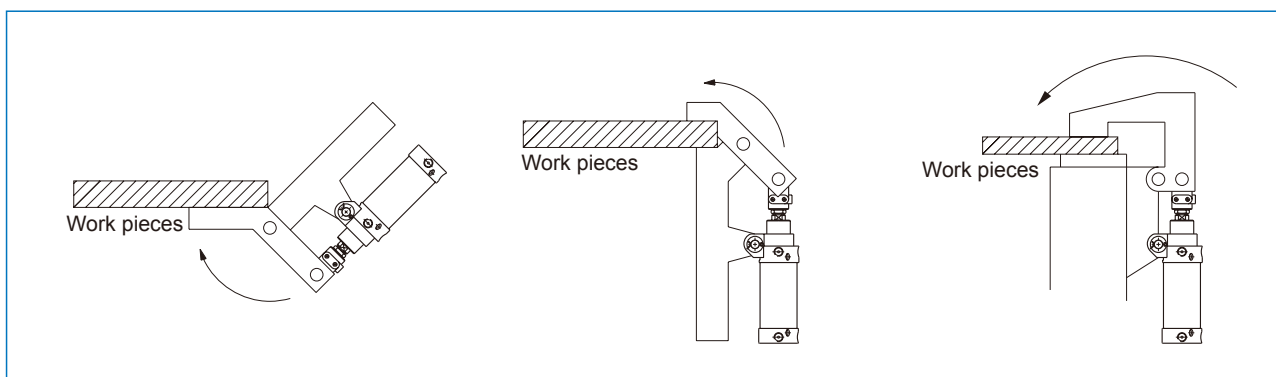
ACCESSORIES
Blank: Without
I: I connector with pin
Y: Y connector with pin

SENSOR NUMBER
1, 2, N...

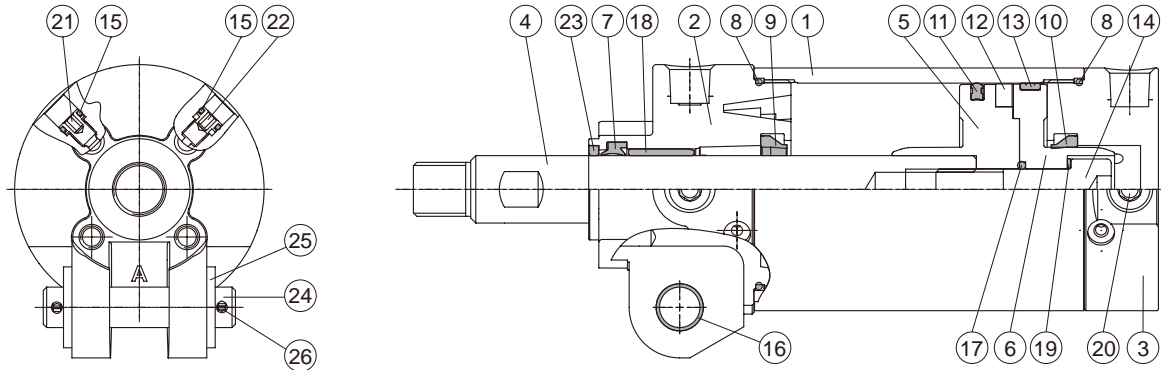
| Adjustable type | Flow adjustable | | Adjustable cushion | |
|-----------------|-----------------|------------|--------------------|------------|
| | Rod cover | Head cover | Rod cover | Head cover |
| Blank: Standard | ○ | ○ | × | ○ |
| A: A type | ○ | ○ | ○ | ○ |

SENSOR SWITCH
Blank: Without
RDKP: Sensor with installation set
RCA: Sensor with BGA**

Application examples



CLAMP CYLINDER



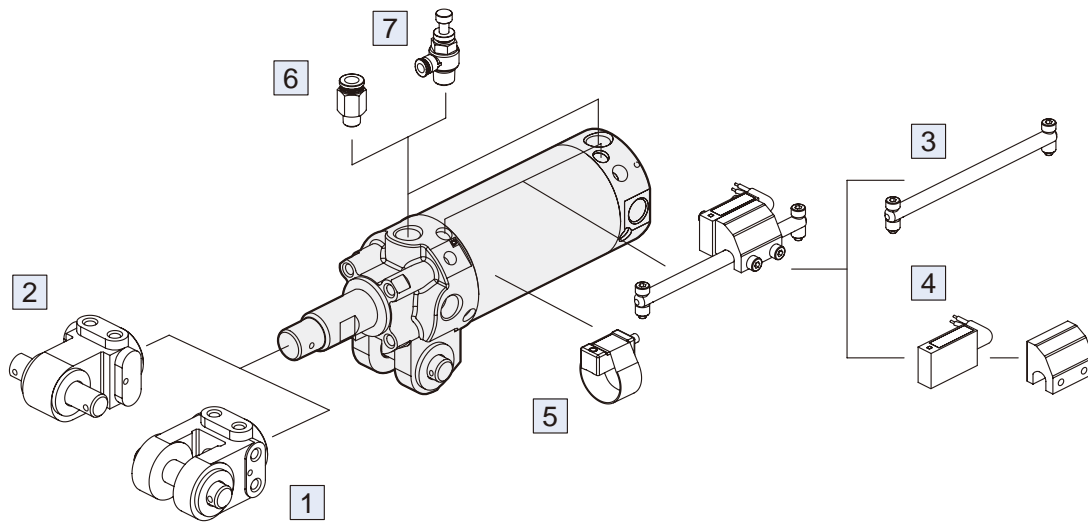
Material

| No. | Part name | Material | Q'y | Component parts(inclusion) | Repair kits (inclusion) |
|-----|-----------------------|---------------------|-----|----------------------------|-------------------------|
| 1 | Tube | Aluminum alloy | 1 | | |
| 2 | Rod cover | Aluminum alloy | 1 | ● | |
| 3 | Head cover | Aluminum alloy | 1 | ● | |
| 4 | Piston rod | Medium carbon steel | 1 | | |
| 5 | Piston-R | Aluminum alloy | 1 | ● | |
| 6 | Piston-H | Aluminum alloy | 1 | ● | |
| 7 | Rod packing | NBR | 1 | ● | ● |
| 8 | Cover ring | NBR | 2 | ● | ● |
| 9 | Cushion packing-R (*) | NBR | 1 | ● | ● |
| 10 | Cushion packing-H | NBR | 1 | ● | ● |
| 11 | Piston packing | NBR | 1 | ● | ● |
| 12 | Magnet ring | Magnet material | 1 | ● | |
| 13 | Wear ring | Resin | 1 | ● | |
| 14 | Piston bolt | SCM | 1 | ● | |
| 15 | Need valve packing | NBR | 4 | ● | ● |
| 16 | Bush | Copper | 2 | ● | |
| 17 | Piston gasket | NBR | 1 | ● | ● |
| 18 | Rod bush | Copper | 1 | ● | |
| 19 | Washer | Carbon steel | 1 | ● | |
| 20 | Seal screw | Carbon steel | 4 | ● | |
| 21 | Flow needle valve | Copper | 2 | ● | |
| 22 | Cushion needle valve | Copper | 2 | ● | |
| 23 | Scraper | Copper | 1 | ● | |
| 24 | Pin | Carbon steel | 1 | ● | |
| 25 | Washer | Carbon steel | 2 | ● | |
| 26 | Split pin | Carbon steel | 2 | ● | |

* Flow adjustable type without cushion packing-R.

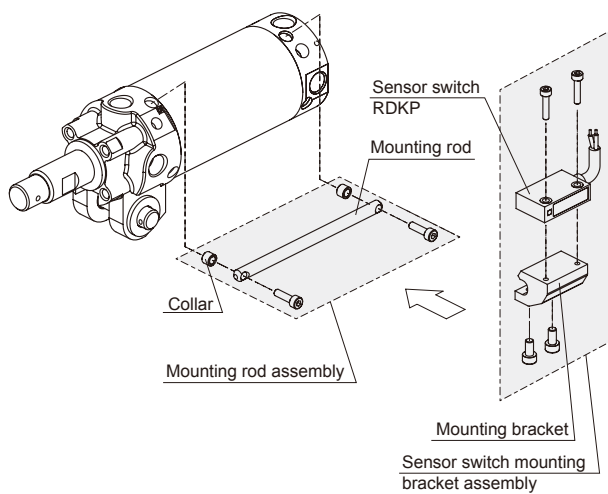
Order example Component parts / Repair kits

| Tube I.D. | Component parts | Repair kits |
|-----------|-----------------|--------------|
| ø50 | CP-MCKG*-50 | PS-MCKG-50 |
| | CP-MCKG*-50-A | PS-MCKG-50-A |
| ø63 | CP-MCKG*-63 | PS-MCKG-63 |
| | CP-MCKG*-63-A | PS-MCKG-63-A |



| No. | Accessories | Page |
|-----|------------------------------|--------------|
| 1 | Accessories Y+PIN | 2-23 |
| 2 | Accessories I+PIN | 2-23 |
| 3 | Mounting rod assembly | 2-22 |
| 4 | Sensor switch RDKP+PMB-040 | 5-13 |
| 5 | Sensor switch RCA+BGA** | 5-2 |
| 6 | Fitting PC (PISCO) | 8-3 (Vol.1) |
| 7 | Speed controller JSC (PISCO) | 8-15 (Vol.1) |

Installation of sensor switch

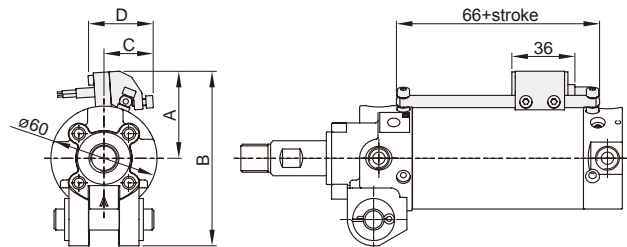


Order example of mounting rod assembly

RZ – MCKG – 50

MODEL

STROKE
(mm)



| Code Tube I.D. | A | B | C | D |
|-------------------|------|-------|------|------|
| 50 | 49.7 | 99.7 | 28.2 | 37.3 |
| 63 | 56.3 | 106.3 | 30.6 | 36.6 |

CLAMP CYLINDER

Rotary Actuator

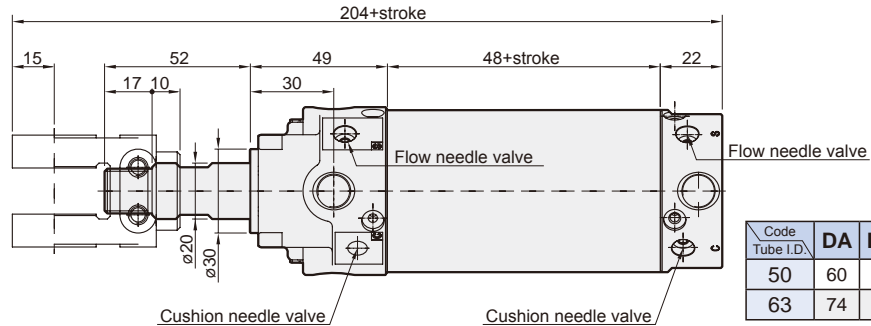
Clamp Cylinder

Gripper

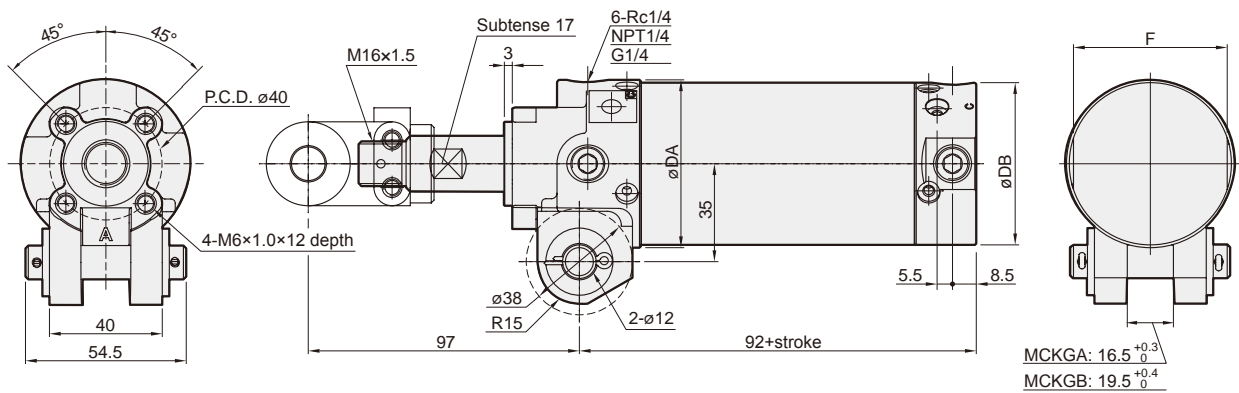
Electric Actuator

Auxiliary Equipment

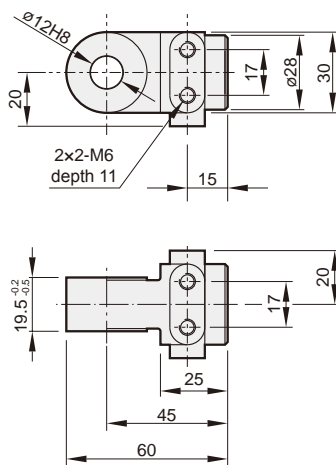
Hydraulic Cylinder



| Code Tube I.D. | DA | DB | F |
|-------------------|----|----|----|
| 50 | 60 | 58 | 55 |
| 63 | 74 | 72 | 69 |

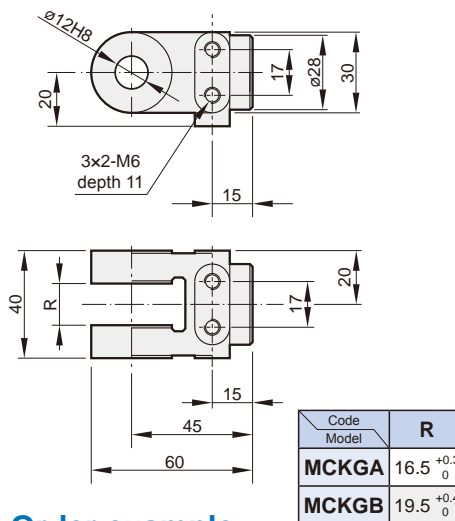


I connector



Order example
I – MCKG

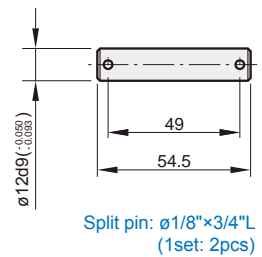
Y connector



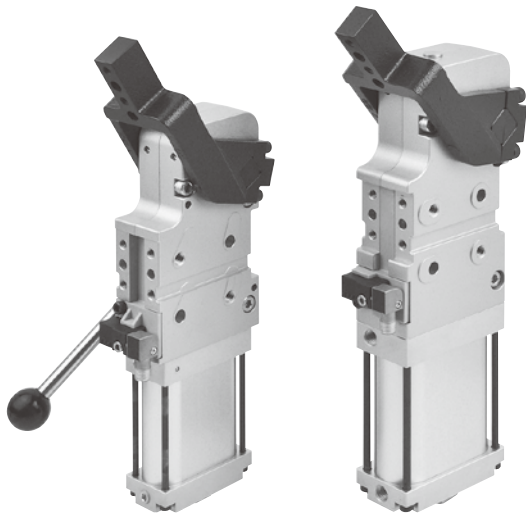
Order example
Y – MCKGA

CLEVIS
WIDTH
A, B

Pin



Order example
PIN – MCKG



Order example of cylinder

MCKD — 50 — 120 □ — □ — RNKD

MODEL

TUBE I.D.

50
63

PORT THREAD

Blank: Rc thread
G: G thread
NPT: NPT thread

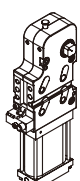
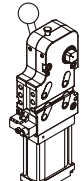
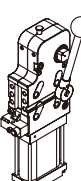
SENSOR SWITCH

Blank: Without
RNKD: NPN
RPKD: PNP

Available release angle range (*1)

15: 15°
30: 30°
45: 45°
60: 60°
75: 75°
90: 90°
105: 105°
120: 120°
135: 135° (*2)

HANDLE

| Blank: Non-handle | L: Left side | R: Right side |
|---|---|---|
|  |  |  |

*1. Please check dimensions page for the clamping angle of reverse mounting type.

*2. Only available for non-handle type.

*3. The order number of cylinder does not contain the arm. The order number of arm is shown below.

Order example of clamping arm

AM — MCKD — 50 — 15 R S

MODEL

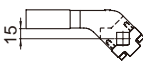
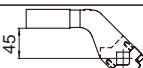
TUBE I.D.

50
63

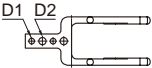


PORT SIZE

S: D1: $\phi 6$, D2: $\phi 9$
B: D1: $\phi 8$, D2: $\phi 10.2$

OFFSET

| | |
|----|---|
| 15 |  |
| 45 |  |

MOUNTING POSITION

| | |
|-----------|---|
| C: Center |  |
| L: Left |  |
| R: Right |  |

Features

- Oval piston design for space saving.
- Clamping arm angle is adjustable via adjusting bolt with ease.
- 12 types of clamping arm for various usage.
- 15° minimum release angle for lowering clamping time.
- Welding slag and magnetic field proof sensor available.
- Cylinder remains clamping position with self-locking mechanism even if there is no air input.

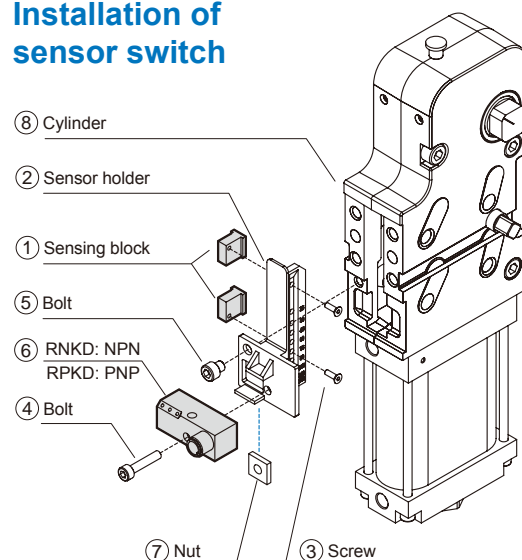
Specification

| Model | MCKD | |
|--------------------------|--|--|
| Acting type | Double acting | |
| Tube I.D. (mm) | 50 | 63 |
| Port size | Rc1/8 | Rc1/4 |
| Release angle range | 15°, 30°, 45°, 60°, 75°, 90°, 105°, 120°, 135° | |
| Medium | Filted air | |
| Operating pressure range | 0.3~0.8 MPa | |
| Proof pressure | 1.2 MPa | |
| Ambient temperature | -10~+60°C (No freezing) | |
| Cushion | Cushion pad (*1) | |
| Min. operating time | At least 1.0 second to clamp and unclamp | |
| Sensor switch | RNKD (Please refer to page 5-15) | |
| Weight | Cylinder (*1) | 2800 g 3400 g |
| | Arm | 15 type: 1050 g 15 type: 1250 g 45 type: 1150 g 45 type: 1400 g |

*1. Need to install speed controller. Please refer to page 8-15~17 (Vol.1).

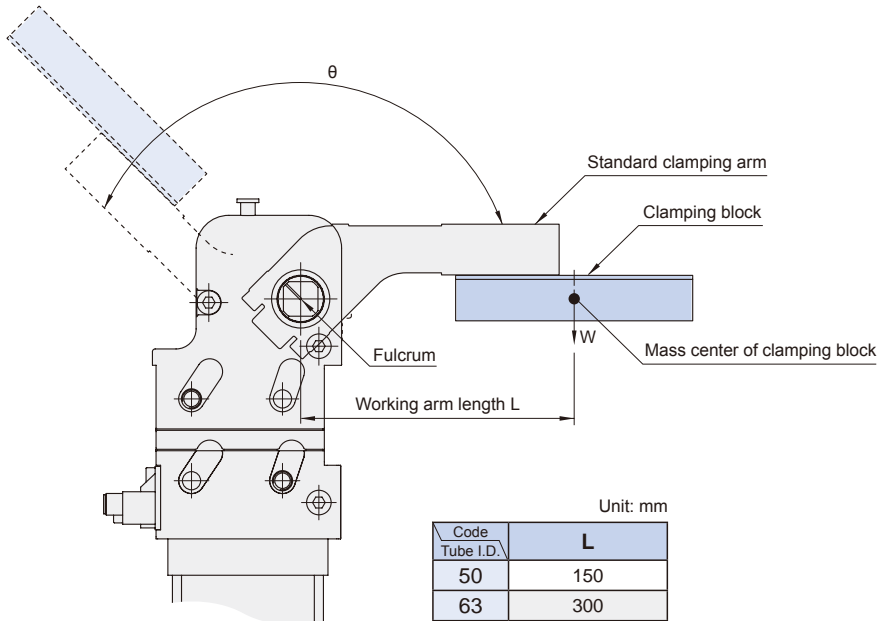
*2. The cylinder weight includes handle.

Installation of sensor switch



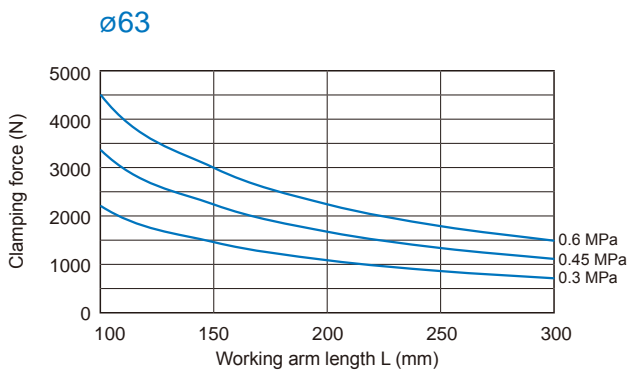
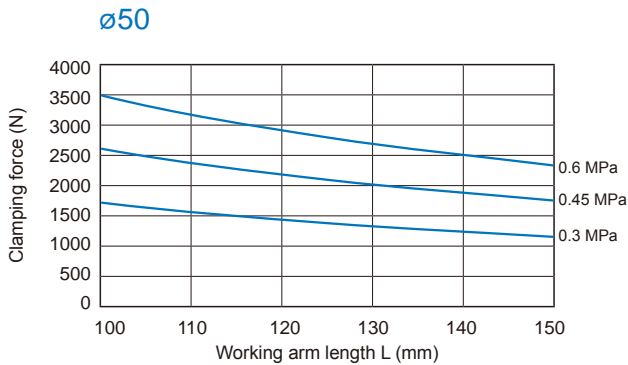
Installation step

1. Use ③ to mount ① on ②.
2. Use ④ and ⑦ to mount ⑥ on ②.
3. Use ⑤ to mount ② on ⑧.



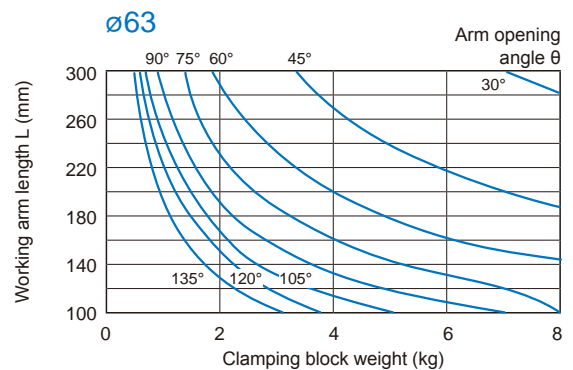
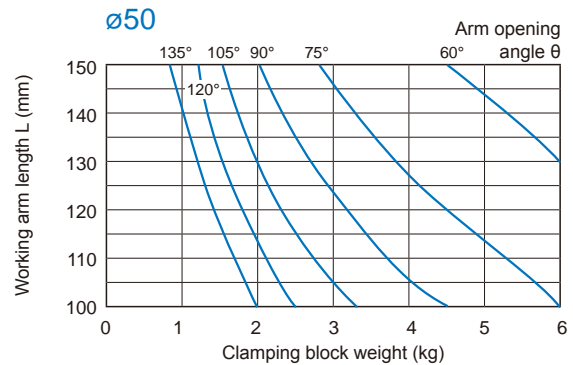
Force & Working arm length chart

- The length of the working arm length "L" has to be the value given below or less.
- Please use the standard clamping arm in the catalog with your clamping block.



Available clamp block weight & Clamp angle chart

- The arm opening angle is inversely proportional to available clamping block weight.
- Only the weight of clamping block has to be considered.

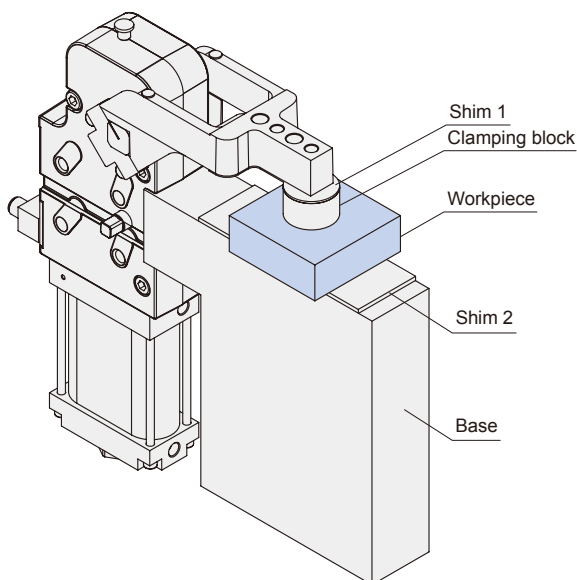


Common precautions

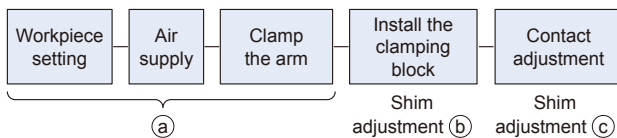
- ① Use F.R.L. unit with 5 μm element filter.
- ② Clean the power clamp cylinder with air blow before piping.
- ③ Use standard arm in Mindman catalog only.
- ④ Use two speed controller at both ports. Clamping and releasing speed both must be more than 1 second.

Mounting guide

① Basic clamping method



② Mounting sequence

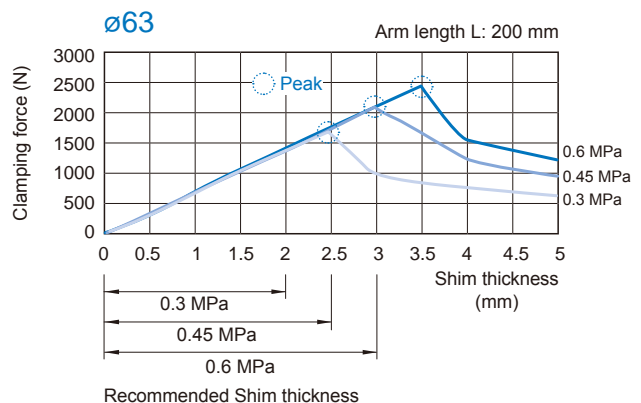
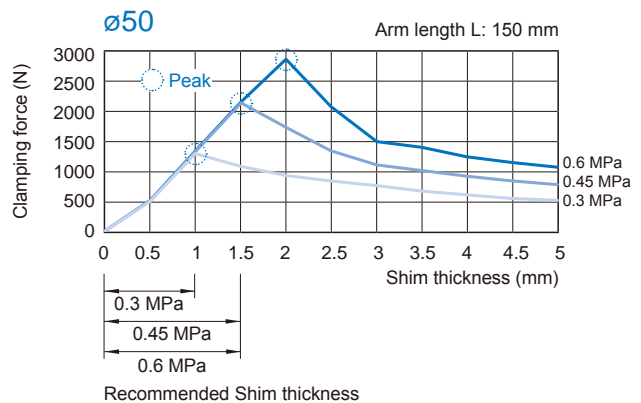
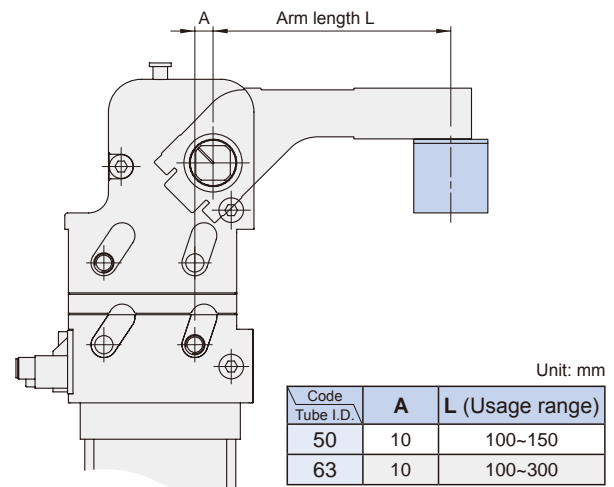


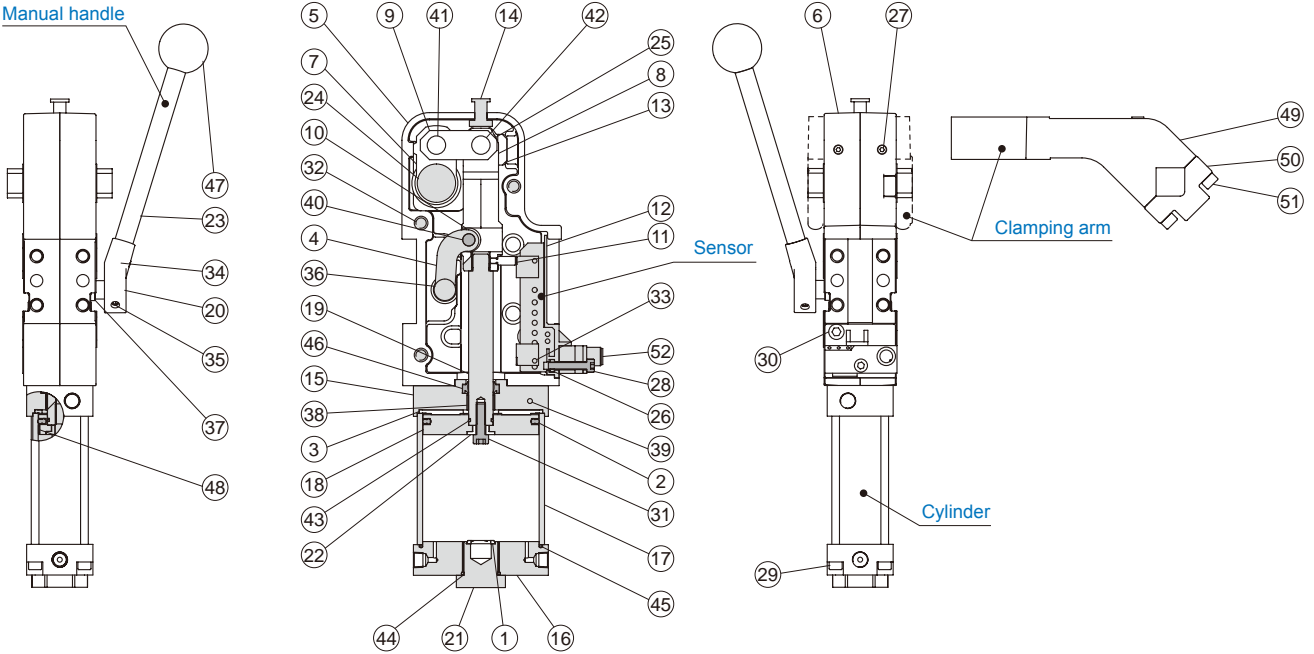
③ Details

- (a) Place the workpiece on the base. Clamp the arm to the end of stroke without installing the clamping block.
- (b) Place the clamping block between arm and workpiece. Find suitable shim to insert into the gap between arm and clamping block. Make the gap is nearly 0. Theoretically there is no clamping force.
- (c) Check the clamping force curve and find the needed clamping force and operation pressure. Insert a second shim with corresponding thickness between workpiece and base and adjust the pressure. The setting is done. (There is a 10% tolerance in our clamping force chart due to the tolerance of each part.)
- (d) Release the compressed air and check the self-locking function is working or not before usage.

Clamping force and mounting details

- ① The pictures below show the clamping force curve. There is always a peak for highest clamping force in every curve. When the thickness of inserted second shim exceeds the peak of the force curve, the self-locking mechanism doesn't work.
- ② The arm length is defined as picture below.



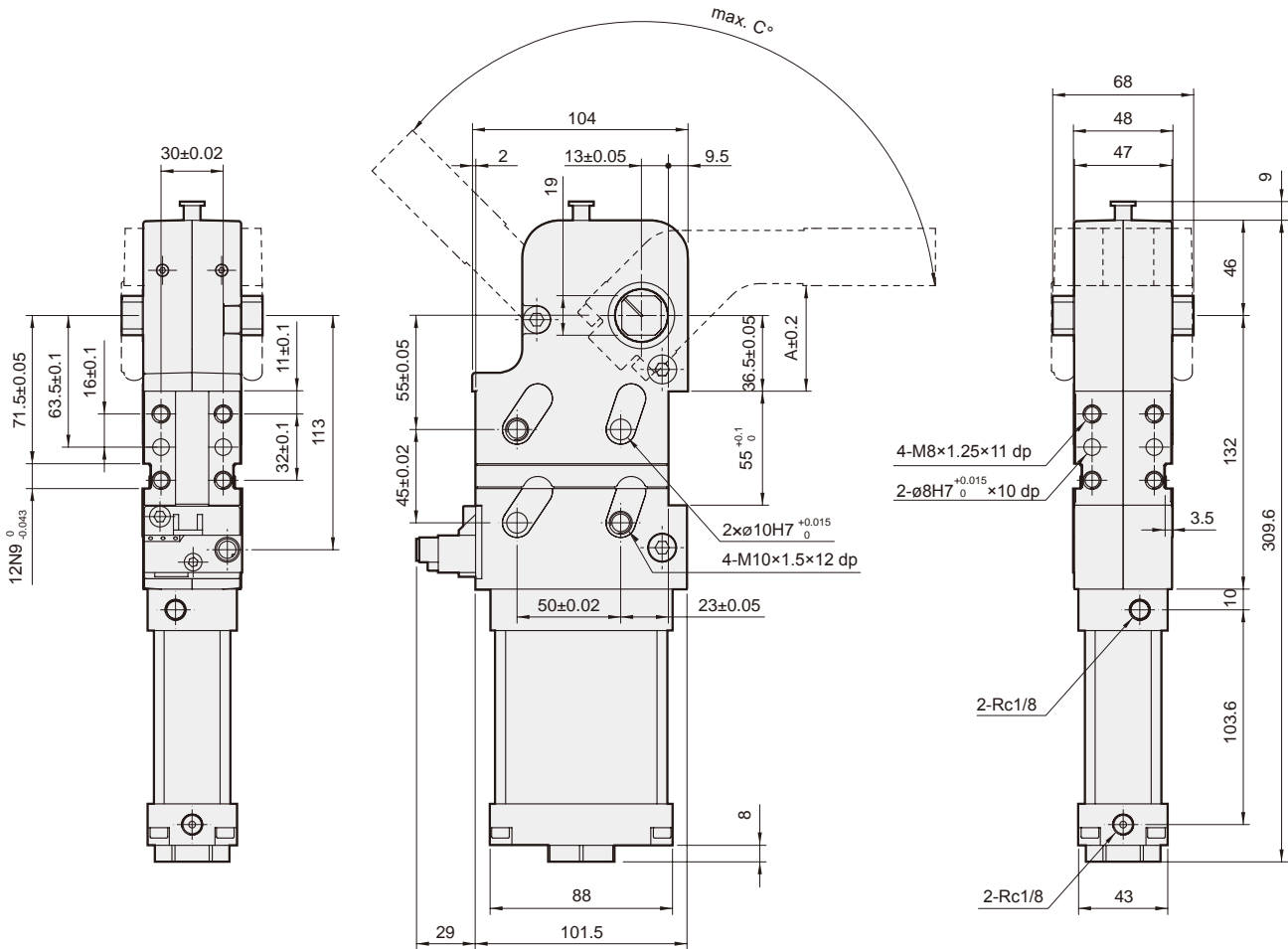


Material

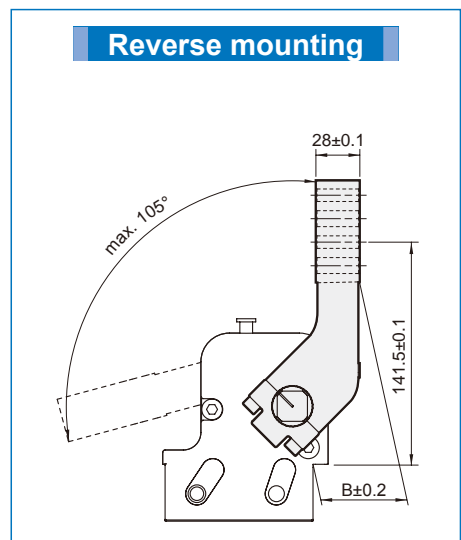
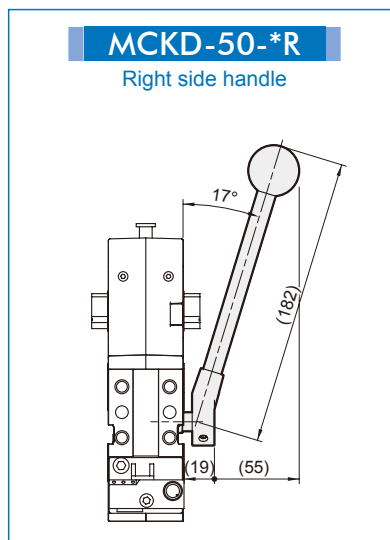
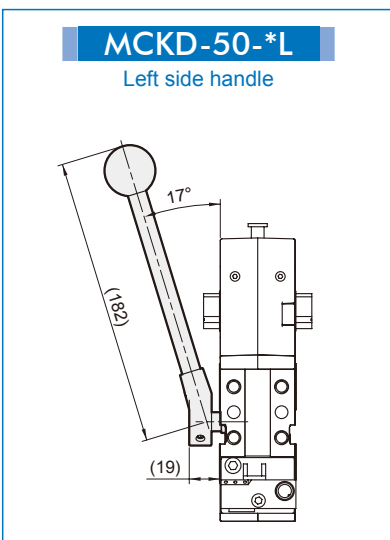
N: Without handle, L: Left side handle , R: Right side handle

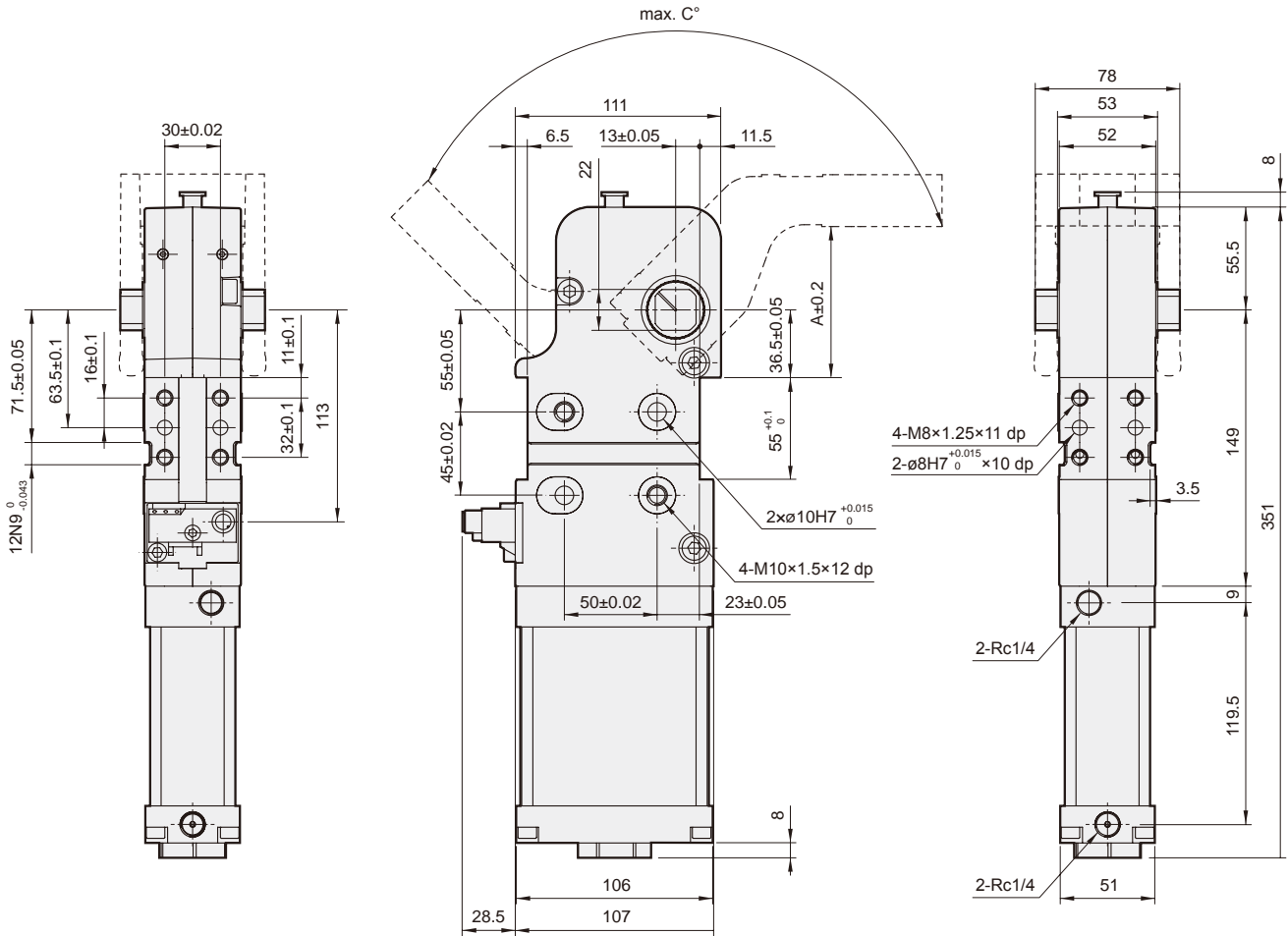
| No. | Part name | Material | Q'y | |
|-----|------------------|-----------------|-----|-----|
| | | | N | L,R |
| 1 | Cushion pad | TPU | 1 | |
| 2 | Piston ring | HNBR | 1 | |
| 3 | Cushion pad | TPU | 1 | |
| 4 | Manual shaft | Carbon steel | 0 | 1 |
| 5 | Right side cover | Aluminum alloy | 1 | |
| 6 | Left side cover | Aluminum alloy | 1 | |
| 7 | Drive shaft | Carbon steel | 1 | |
| 8 | Y connector | Carbon steel | 1 | |
| 9 | Connecting bar | Carbon steel | 1 | |
| 10 | Wheel | Carbon steel | 0 | 2 |
| 11 | Sensing stick | Carbon steel | 1 | |
| 12 | Sensor holder | Plastic | 1 | |
| 13 | Stopper | Carbon steel | 2 | |
| 14 | Bump pin | Carbon steel | 1 | |
| 15 | Rod cover | Aluminum alloy | 1 | |
| 16 | End cover | Aluminum alloy | 1 | |
| 17 | Cylinder | Aluminum alloy | 1 | |
| 18 | Piston | Aluminum alloy | 1 | |
| 19 | Piston rod | Stainless steel | 1 | |
| 20 | Handle holder | Carbon steel | 0 | 1 |
| 21 | Adj. bolt | Iron | 1 | |
| 22 | Locking rod | Carbon steel | 1 | |
| 23 | Rod | Stainless steel | 0 | 1 |
| 24 | Needle bearing | - | 2 | |
| 25 | Needle bearing | - | 2 | |
| 26 | Square nut | Carbon steel | 1 | |

| No. | Part name | Material | Q'y | |
|-----|-----------------|-----------------|-----|-----|
| | | | N | L,R |
| 27 | Bolt | Carbon steel | 2 | |
| 28 | Bolt | Carbon steel | 1 | |
| 29 | Bolt | Carbon steel | 4 | |
| 30 | Bolt | Carbon steel | 1 | |
| 31 | Bolt | Carbon steel | 1 | |
| 32 | Bolt | Carbon steel | 3 | |
| 33 | Bolt | Carbon steel | 2 | |
| 34 | Screw | Carbon steel | 0 | 1 |
| 35 | Screw | Carbon steel | 0 | 2 |
| 36 | Bush | Bearing alloy | 0 | 1 |
| 37 | Bush | Bearing alloy | 0 | 1 |
| 38 | Bush | Bearing alloy | 1 | |
| 39 | Ball | Stainless steel | 1 | |
| 40 | Pin | Bearing steel | 0 | 1 |
| 41 | Pin | Bearing steel | 1 | |
| 42 | Pin | Bearing steel | 1 | |
| 43 | O-ring | NBR | 1 | |
| 44 | O-ring | NBR | 1 | |
| 45 | O-ring | NBR | 1 | |
| 46 | Rod packing | NBR | 1 | |
| 47 | Ball | Bakelite | 0 | 1 |
| 48 | Wear ring plate | Resin | 2 | |
| 49 | Clamping arm | Carbon steel | 1 | |
| 50 | Arm holder | Carbon steel | 2 | |
| 51 | Bolt | Carbon steel | 4 | |
| 52 | Sensor switch | - | 1 | |

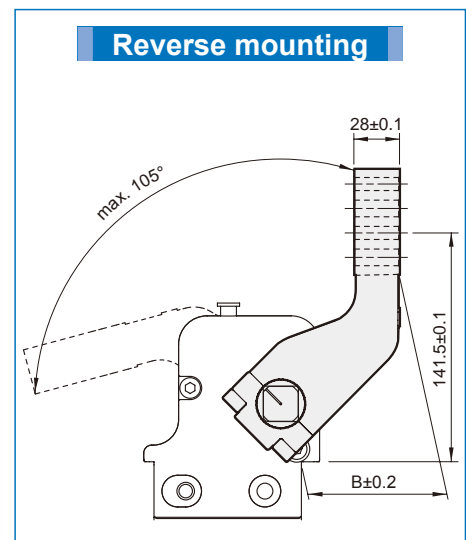
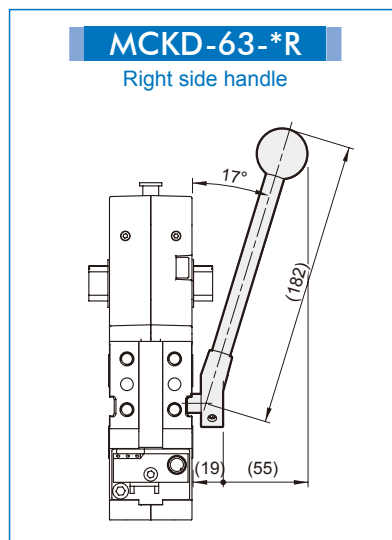
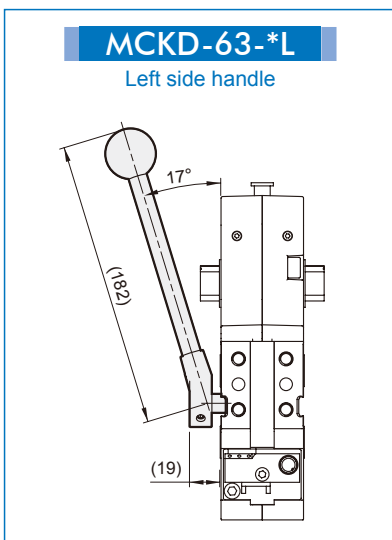


| Code | Offset | A | B | C | |
|------|--------|------|----|----------|--------|
| | | | | Standard | Handle |
| 50 | 15 | 51.5 | 30 | 135 | 120 |
| | 45 | 81.5 | 60 | 135 | 120 |



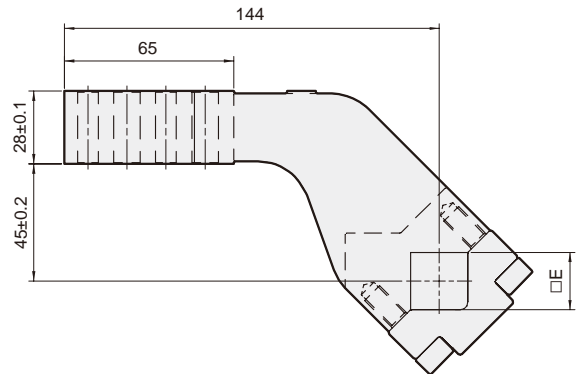
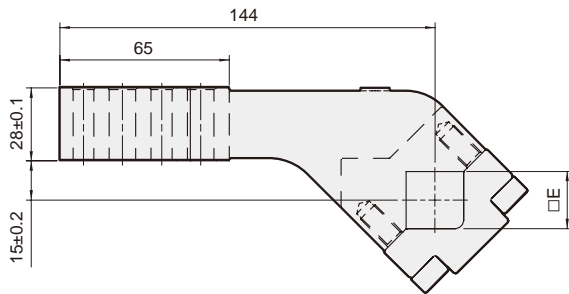
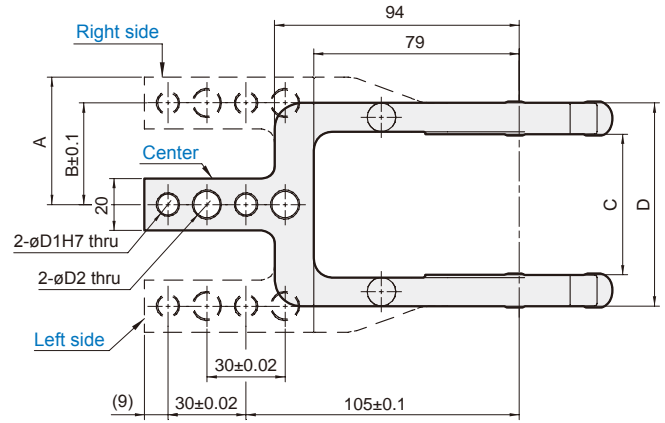
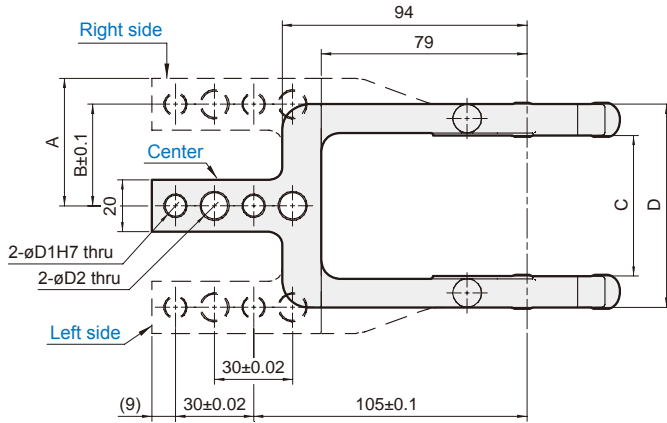


| Code Tube I.D. | Offset | A | B | C | |
|-------------------|--------|------|----|----------|--------|
| | | | | Standard | Handle |
| 63 | 15 | 51.5 | 30 | 135 | 120 |
| | 45 | 81.5 | 60 | 135 | 120 |



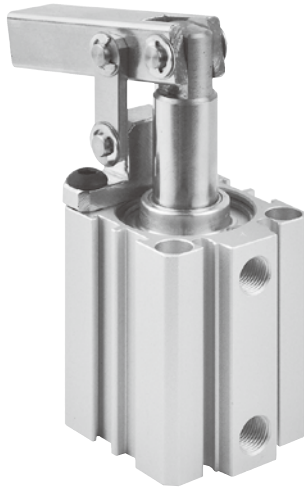
15 type

45 type

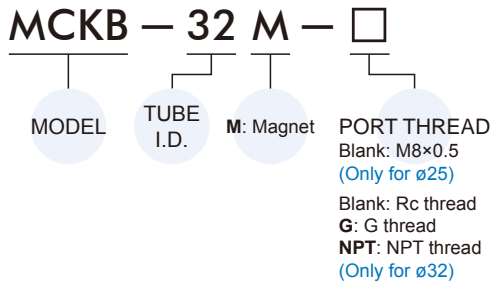


| Code Tube I.D. | A | B | C | D | D1 | | D2 | | E |
|-------------------|----|----|----|----|----|----|----|------|----|
| | | | | | S* | B* | S* | B* | |
| 50 | 44 | 34 | 48 | 68 | 6 | 8 | 9 | 10.2 | 19 |
| 63 | 47 | 37 | 54 | 78 | 6 | 8 | 9 | 10.2 | 22 |

* S, B was the port size code of clamping arm.



Order example



Features

- Lever type clamp cylinder gives high clamping force.
- Simple mounting of sensors on all four sides of body.
- Hard anodised body gives smooth lines and high corrosion resistance.

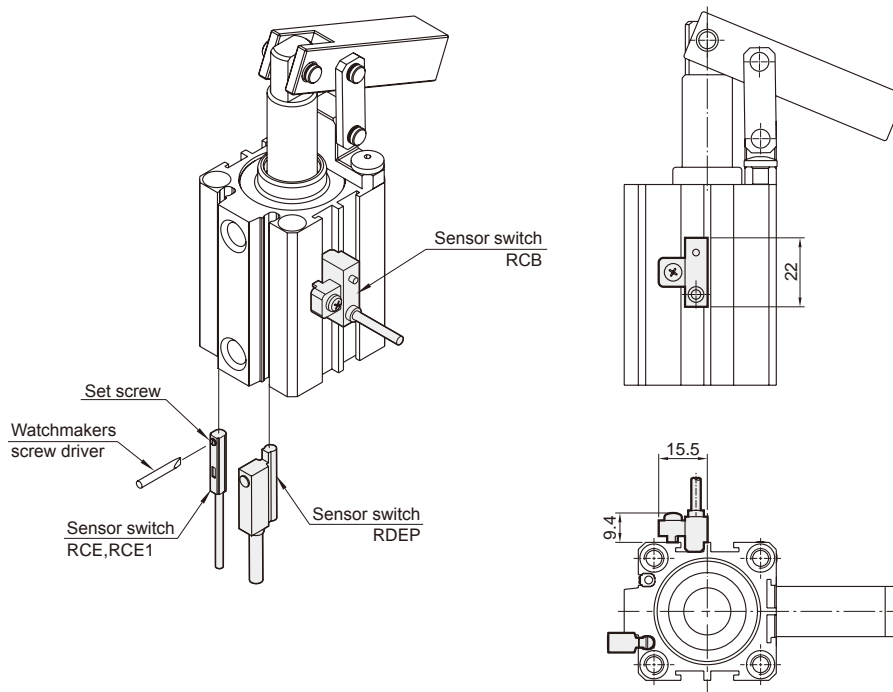
Specification

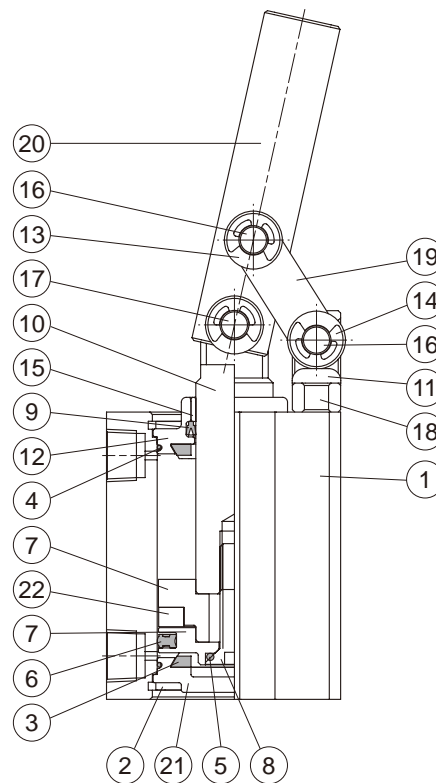
| Model | MCKB | |
|--------------------------|------------------------|--------------|
| Acting type | Double acting | |
| Tube I.D. (mm) | 25 | 32 |
| Port size | M5×0.8 | Rc1/8 |
| Operating fluid | Air | |
| Operating pressure range | 0.1~1 MPa | |
| Proof pressure | 1.5 MPa | |
| Ambient temperature | -5~+60°C (No freezing) | |
| Lubrication | Cylinder | Not required |
| | Lever | Grease |
| Available speed range | 50~500 mm/sec | |
| Sensor switch *1 | RCB, RCE, RCE1, RDEP | |
| Weight (g) *2 | 233 (270) | 411 (456) |

*1. RCB, RCE, RCE1, RDEP specification, please refer to page 5-4, 6, 7, 10.

*2. () for with magnet.

Installation of sensor switch





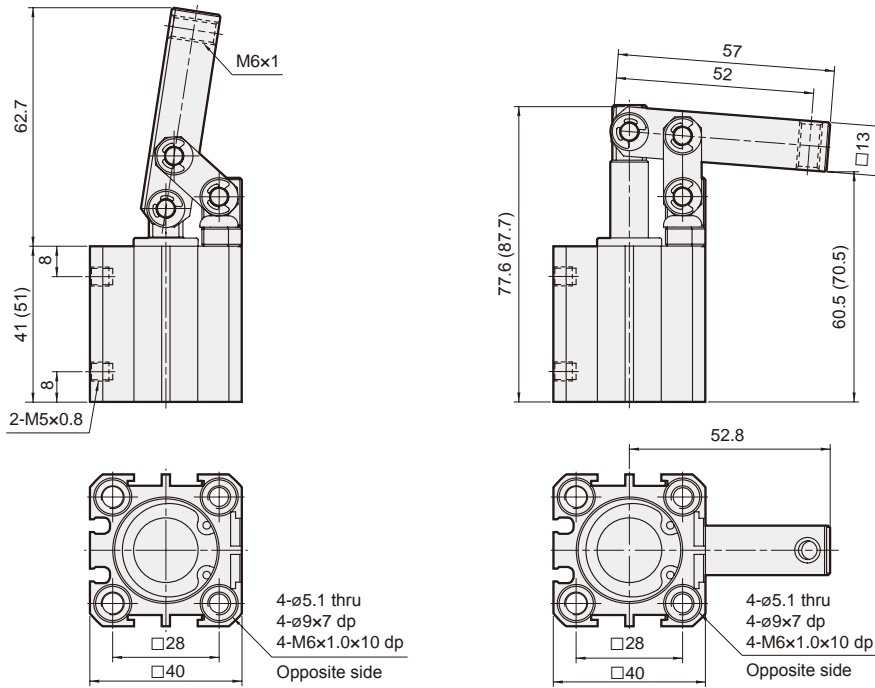
Material

| No. | Part name | Material | Q'y | Repair kits (inclusion) | Note |
|-----|------------------|-----------------|-----|-------------------------|----------------------|
| 1 | Body | Aluminum alloy | 1 | | |
| 2 | Snap ring | Spring steel | 2 | | |
| 3 | Cushion | NBR | 2 | ● | |
| 4 | Cover gasket | NBR | 2 | ● | |
| 5 | Piston gasket | NBR | 1 | ● | |
| 6 | Piston packing | NBR | 1 | ● | |
| 7 | Piston | Aluminum alloy | 1 | | |
| 8 | Piston bolt | SCM | 1 | | |
| 9 | Rod packing | NBR | 1 | ● | |
| 10 | Piston rod | Carbon steel | 1 | | |
| 11 | Screw | SCM | 2 | | |
| 12 | Rod cover | Aluminum alloy | 1 | | |
| 13 | Washer | Carbon steel | 6 | | |
| 14 | Snap ring | Spring steel | 6 | | |
| 15 | Rod bush | Bearing alloy | 1 | | ø25 without No.15 |
| 16 | Connecting pin | Stainless steel | 2 | | |
| 17 | Lever pin | Stainless steel | 1 | | |
| 18 | Holder | Carbon steel | 1 | | |
| 19 | Connecting plate | Carbon steel | 2 | | |
| 20 | Lever | Carbon steel | 1 | | |
| 21 | Head cover | Aluminum alloy | 1 | | |
| 22 | Magnet ring | Magnet material | 1 | | for magnet type only |

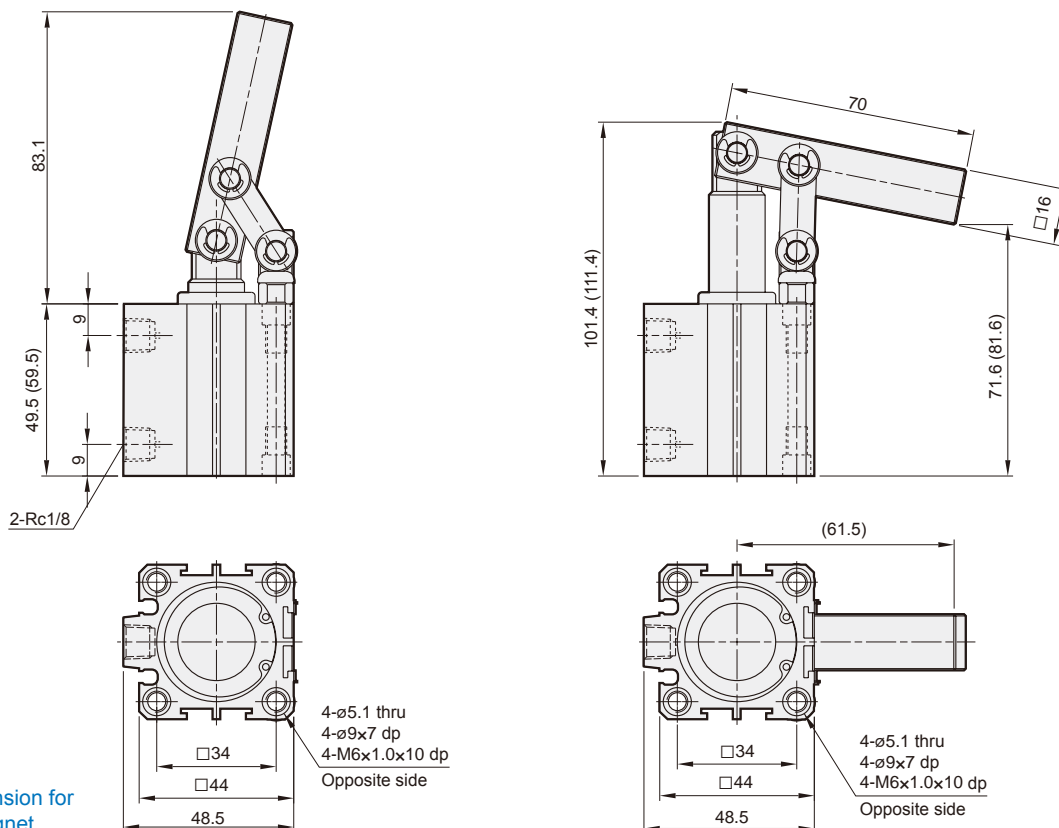
Order example of repair kits

| Tube I.D. | Repair kits |
|-----------|-------------------|
| ø25 | PS-MCKB-25 |
| ø32 | PS-MCKB-32 |

ø25



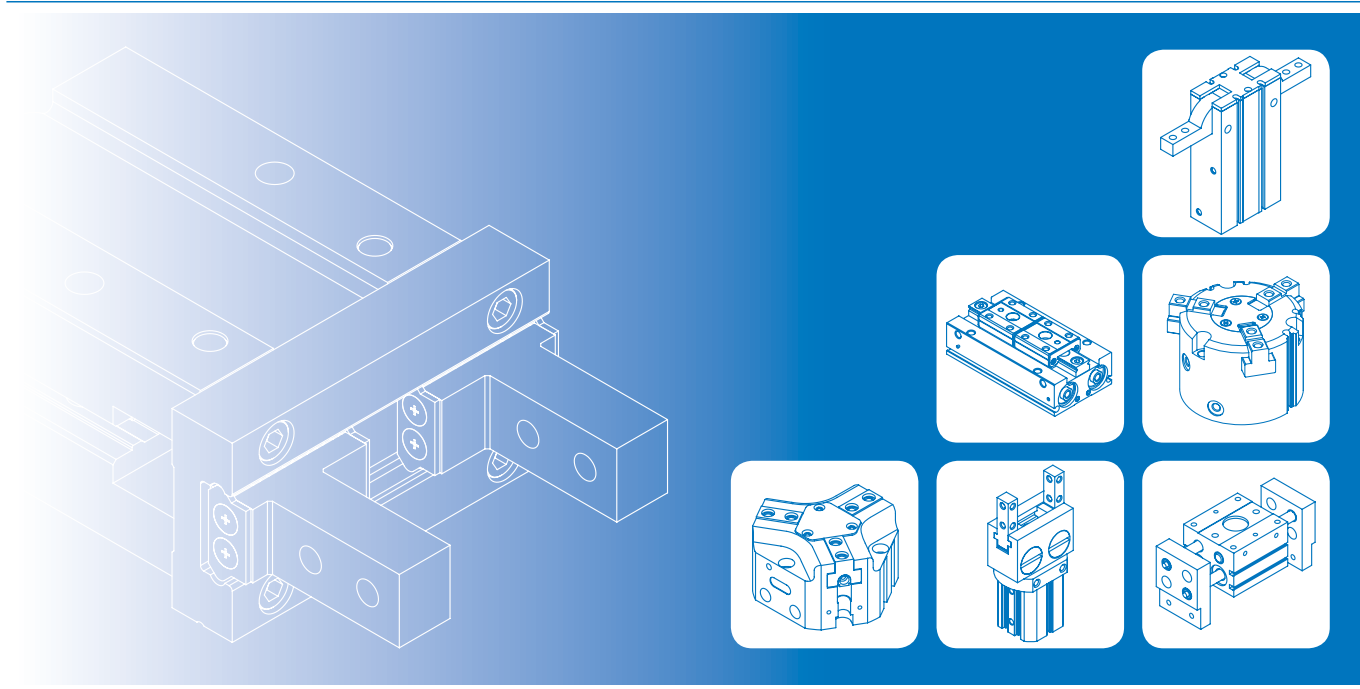
ø32



*() Dimension for with magnet.



GRIPPER



Model Selection..... 3-2

PARALLEL GRIPPER (2-Finger)

| | | |
|---------------|--------------------------|------|
| F MCHB | ø12~ø32..... | 3-3 |
| F MCHC | ø6~ø25..... | 3-8 |
| F MCHD | ø8~ø20 | 3-22 |
| MCHH | ø20~ø40..... | 3-31 |
| MCHU | ø12~ø20..... | 3-35 |
| F MCHS | 50~300 | 3-38 |
| F MCHX | ø10~ø40 (Wide type)..... | 3-47 |

PARALLEL GRIPPER (3-Finger)

| | | |
|----------------|---------------|------|
| F MCHG2 | ø16~ø125..... | 3-52 |
| F MCHJ | 50~300 | 3-58 |

30° ANGULAR GRIPPER

| | | |
|---------------|--------------|------|
| F MCHA | ø12~ø32..... | 3-64 |
|---------------|--------------|------|

180° ANGULAR GRIPPER

| | | |
|------|--------------------------|------|
| MCHY | ø10~ø25 (Cam style)..... | 3-68 |
|------|--------------------------|------|

F Fast delivery

Our goal is to achieve 3-day lead time, if there is stock of component set. For more information, please go to our MINDMAN website (www.mindman.com.tw) and click on the "Component Set Inventory" button.

GRIPPER

Gripper selection

- Depends on the coefficient of friction and the gripping conditions between soft fingers and work piece.

When gripping a workpiece as in the figure as shown above:

F: Gripping force of single finger (N)

n: Number of finger

μ : Coefficient of friction between the attachments and the workpiece

m: Workpiece mass (kg)

g: Gravitational acceleration (=9.8m/s²)

a: Safe factor

the conditions under which the workpiece will not drop are,

$$n \times \mu F > m \times g$$

Therefore,

$$F \geq \frac{m \times g}{n \times \mu}$$

With "a" representing the extra margin, "F" is determined by the following formula:

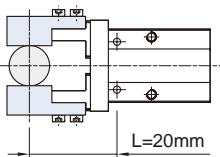
$$F \geq \frac{m \times g}{n \times \mu} \times a$$

Model selection suggestions

1. For normal gripping and carrying usage, the recommended safe factor (a) is 4.
2. The value of gripping force of single finger can be found at the gripping force table.
3. The safe factor (a) have to be higher if the gripper is using with a great accelerated velocity or impaction condition.

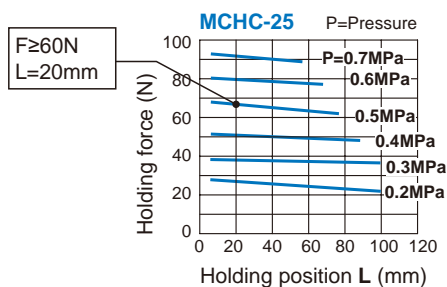
Model selection example

In the motion process did not produce high acceleration, deceleration or impact forces, Workpiece mass: 0.3kg, Gripping method: External gripping, Operating pressure: 0.5 MPa, Coefficient of friction (μ): 0.1, Holding position: L=20mm (no overhang)

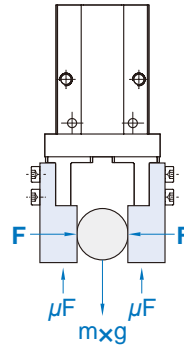


1. Based on the above formula, the required gripping force can be derived:

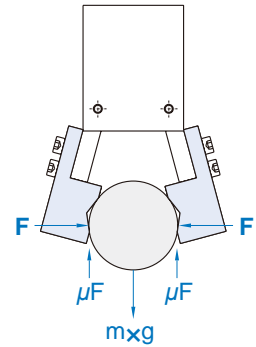
$$F \geq \frac{0.3 \times 9.8}{2 \times 0.1} \times 4 \geq 60(N)$$
2. From Effective Gripping Force Fig, Operating pressure: 0.5 MPa; Holding position: 20 mm Effective gripping force is greater than 60 (N) So selected **MCHC-25** grippers.



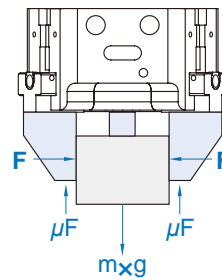
Parallel gripper (2-Finger)



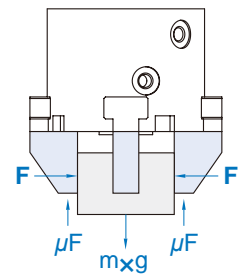
Angular gripper



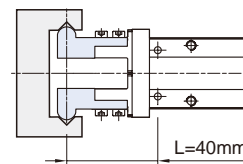
Parallel gripper (3-Finger)



Parallel gripper (4-Finger)

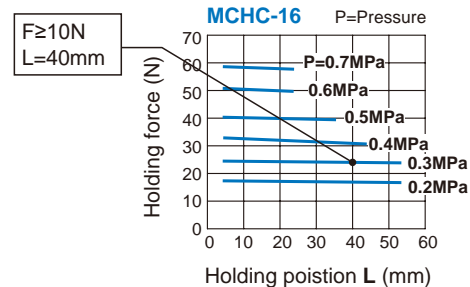


In the motion process did not produce high acceleration, deceleration or impact forces, Workpiece mass: 0.05kg, Gripping method: External gripping, Operating pressure: 0.3 MPa, Coefficient of friction (μ): 0.1, Holding position: L=40mm (no overhang)



1. Based on the above formula, the required gripping force can be derived:

$$F \geq \frac{0.05 \times 9.8}{2 \times 0.1} \times 4 \geq 10(N)$$
2. From Effective Gripping Force Fig, Operating pressure: 0.3 MPa; Holding position: 40 mm Effective gripping force is greater than 10 (N) So selected **MCHC-16** grippers.





Features

- Available with comprehensive range of Tube I.D. 12~32 mm.
- Highly accurate air driven device for holding work-piece.
- Magnetic as standard.

Specification

| Model | | MCHB | | | | |
|----------------------------------|---------------|-------------------------|--------|-----|-----|-----|
| Acting Type | | Double / Single acting | | | | |
| Tube I.D. (mm) | | 12 | 16 | 20 | 25 | 32 |
| Port size | | M3x0.5 | M5x0.8 | | | |
| Medium | | Air | | | | |
| Operating pressure range | Double acting | 0.15~0.7 MPa | | | | |
| | Single acting | 0.2~0.7 MPa | | | | |
| Ambient temperature | | -5~+60°C (No freezing) | | | | |
| Max. operating frequency (c.p.m) | | 180 | | | | |
| Lubrication | Cylinder | Not required | | | | |
| | Lever | Grease (Actuation at) | | | | |
| Max. arm length (L) (mm) | | 30 | 40 | 60 | 70 | 85 |
| Lever open / close stroke | | 6 | 8 | 12 | 14 | 16 |
| Sensor switch (*) | | RDE, RDE-D: Non-contact | | | | |
| Weight (g) | Double acting | 66 | 144 | 255 | 419 | 719 |
| | Single acting | 66.5 | 145 | 257 | 422 | 722 |

* RDE, RDE-D specification, please refer to page 5-6.

Order example

MCHB - 16 - S

MODEL

TUBE I.D.

ACTING

12

16

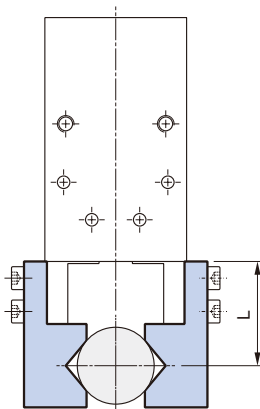
20

25

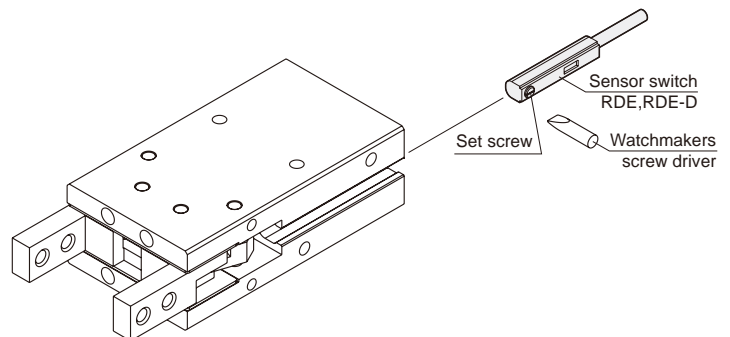
32

Blank: Double acting
S: Single acting
(Normally open)

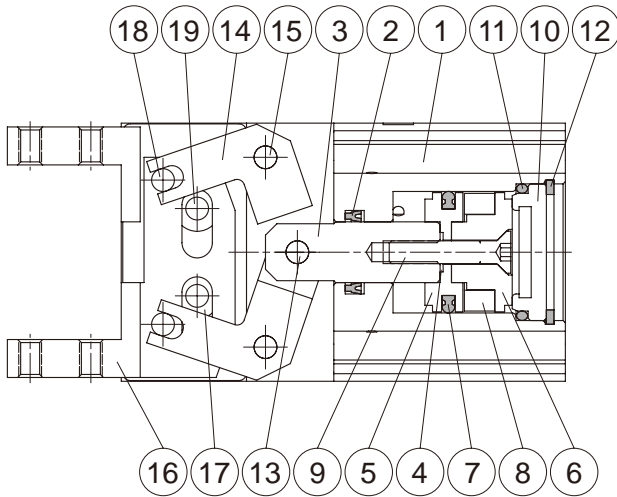
Length of gripping point



Installation of sensor switch

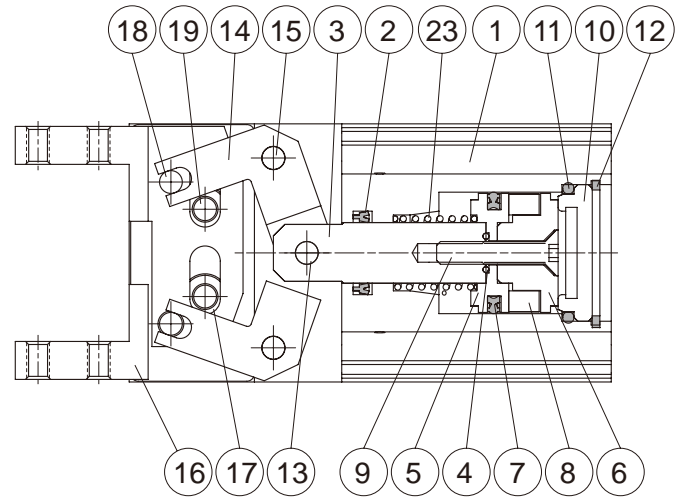


Double acting



Single acting

Normally open



Material

| No. | Part name | Material | Q'y | Repair kits (inclusion) |
|-----|-----------------|-----------------|-----|-------------------------|
| 1 | Body | Aluminum alloy | 1 | |
| 2 | Rod packing | NBR | 1 | ● |
| 3 | Piston rod | Stainless steel | 1 | |
| 4 | Gasket | NBR | 1 | ● |
| 5 | Piston-R | Aluminum alloy | 1 | |
| 6 | Piston-H | Aluminum alloy | 1 | |
| 7 | Piston packing | NBR | 1 | ● |
| 8 | Magnet ring | Magnet material | 1 | |
| 9 | Screw | Stainless steel | 1 | |
| 10 | Head cover | Carbon steel | 1 | |
| 11 | Cover ring | NBR | 1 | ● |
| 12 | Stop ring | Spring steel | 1 | |
| 13 | Spindle river | Bearing steel | 1 | |
| 14 | Grip per | Carbon steel | 2 | |
| 15 | Grip rivet | Carbon steel | 2 | |
| 16 | Grip per | Carbon steel | 2 | |
| 17 | Bush | Stainless steel | 4 | |
| 18 | Grip rivet | Bearing steel | 2 | |
| 19 | Grip rivet | Carbon steel | 2 | |
| 20 | Screw | SCM | 4 | |
| 21 | Screw | SCM | 4 | |
| 22 | Washer for grip | Stainless steel | 2 | |
| 23 | Spring | Spring steel | 1 | |

Order example of repair kits

| Tube I.D. | Repair kits |
|-----------|-------------------|
| ø12 | PS-MCHB-12 |
| ø16 | PS-MCHB-16 |
| ø20 | PS-MCHB-20 |
| ø25 | PS-MCHB-25 |
| ø32 | PS-MCHB-32 |

MCHB Capacity – Double acting

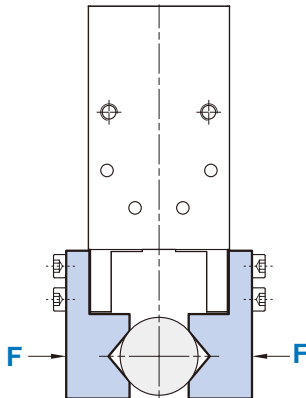
PARALLEL GRIPPER (2-Finger)



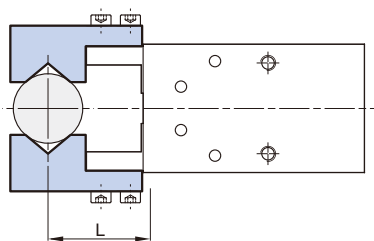
Effective gripping force (Double acting)

Indication of effective force.

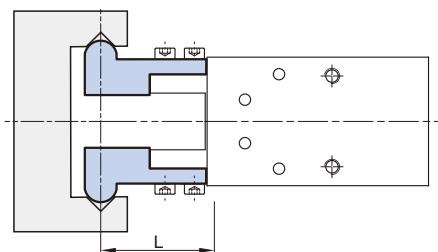
The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.



1N=0.102 kgf
1MPa=10.2 kgf/cm²

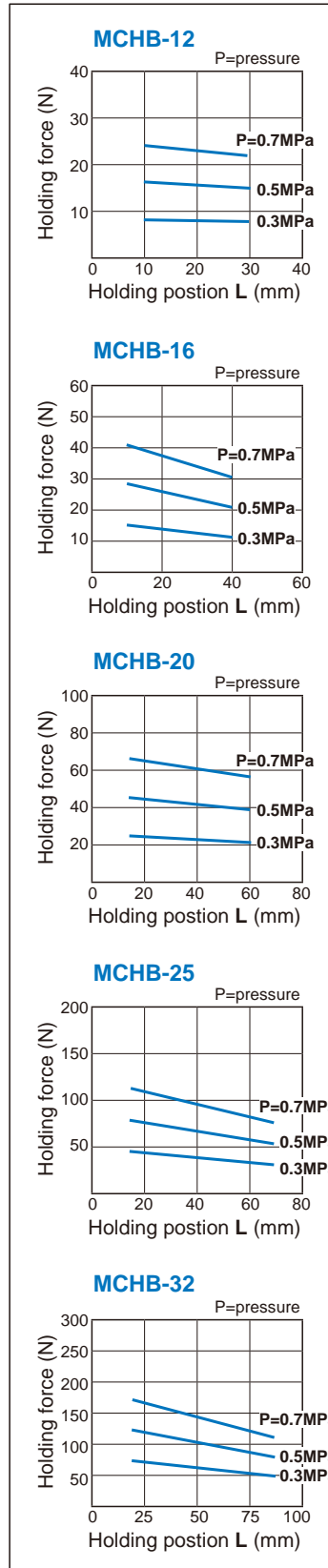


External grip

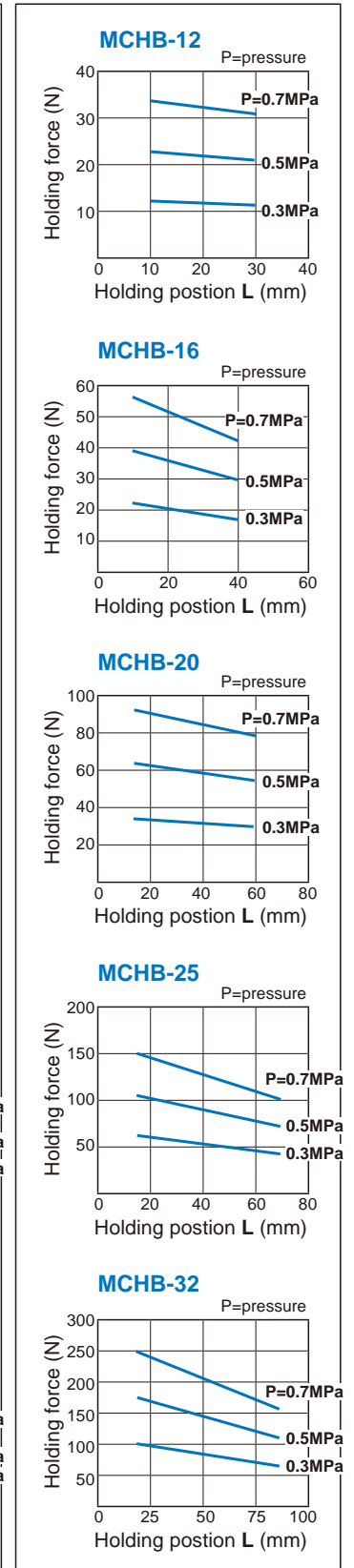


Internal grip

External gripping force Double acting



Internal gripping force Double acting

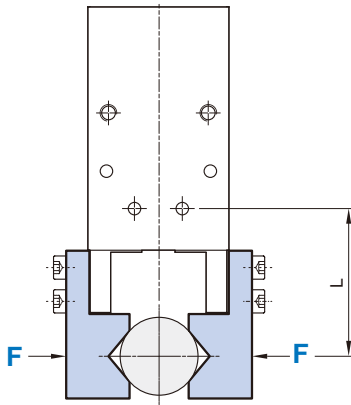


Effective gripping force (Single acting)

Indication of effective force.

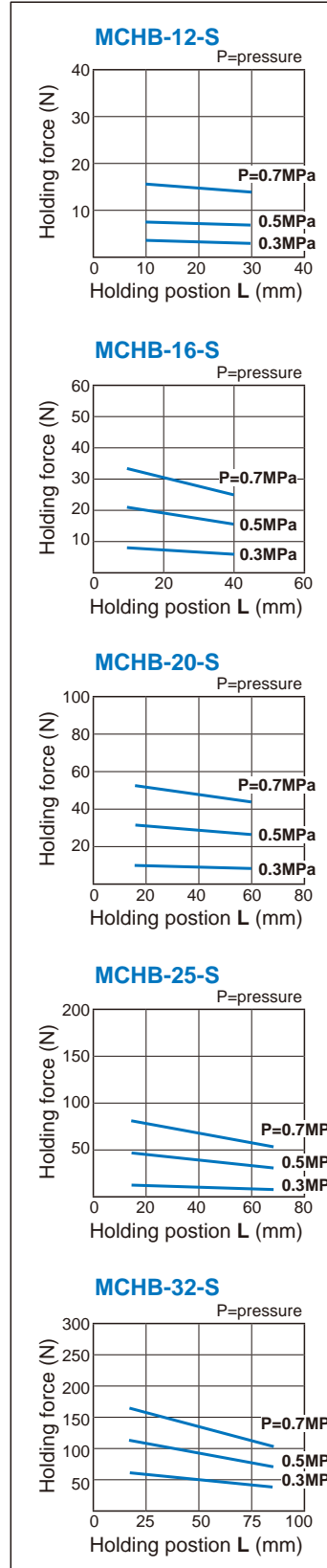
The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

1N=0.102 kgf
1MPa=10.2 kgf/cm²

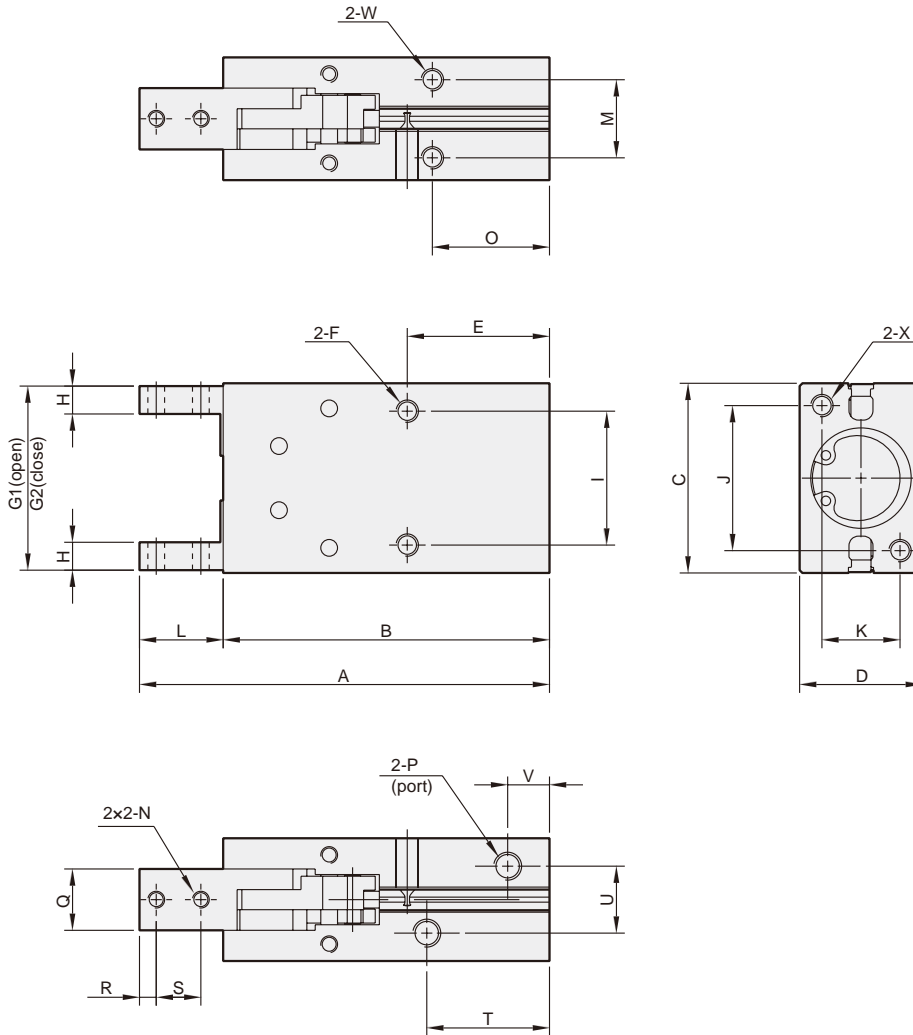


External grip
(Single acting / Normally open)

External gripping force Single acting / N.O.



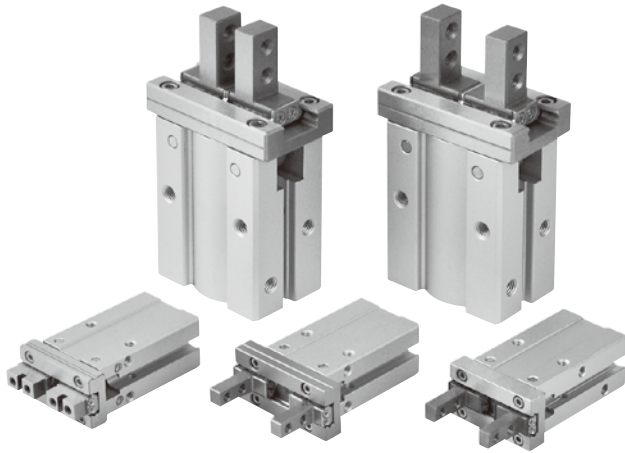
PARALLEL GRIPPER (2-Finger)



| Code Tube I.D. | A | B | C | D | E | F | G1 | G2 | H | I | J | K | L | M | N | O |
|-------------------|---------------|-------------|----|----|-------------|-----------------|----|----|----|----|----|----|----|----|--------|---------|
| 12 | 63.5 (68.5) | 50.5 (55.5) | 28 | 16 | 20 (25) | M3x0.5x5 depth | 27 | 21 | 4 | 18 | 17 | 10 | 13 | 10 | M3x0.5 | 16 (21) |
| 16 | 73.5 (78.5) | 58.5 (63.5) | 34 | 22 | 25.5 (30.5) | M4x0.7x11 depth | 33 | 25 | 5 | 24 | 26 | 14 | 15 | 14 | M3x0.5 | 21 (26) |
| 20 | 88.5 (93.5) | 69.5 (74.5) | 45 | 26 | 25 (30) | M5x0.8x8 depth | 44 | 32 | 6 | 30 | 35 | 16 | 19 | 16 | M4x0.7 | 19 (24) |
| 25 | 102.5 (107.5) | 78.5 (83.5) | 52 | 32 | 28 (33) | M6x1.0x10 depth | 51 | 37 | 8 | 36 | 40 | 20 | 24 | 20 | M5x0.8 | 22 (27) |
| 32 | 120.5 (125.5) | 90.5 (95.5) | 60 | 40 | 34 (39) | M6x1.0x10 depth | 59 | 43 | 10 | 44 | 46 | 24 | 30 | 26 | M6x1.0 | 26 (31) |

| Code Tube I.D. | P | Q | R | S | T | U | V | W | X |
|-------------------|----------------|----|---|----|----|------|------|-----------------|-----------------|
| 12 | M3x0.5x5 depth | 7 | 3 | 6 | 23 | 10.2 | 7.5 | M3x0.5x5 depth | M3x0.5x5 depth |
| 16 | M5x0.8x5 depth | 11 | 3 | 8 | 22 | 12 | 7.5 | M4x0.7x7 depth | M4x0.7x7 depth |
| 20 | M5x0.8x5 depth | 12 | 4 | 10 | 26 | 13 | 8 | M5x0.8x8 depth | M5x0.8x8 depth |
| 25 | M5x0.8x5 depth | 14 | 5 | 12 | 29 | 18 | 8.5 | M6x1.0x10 depth | M6x1.0x10 depth |
| 32 | M5x0.8x5 depth | 20 | 7 | 15 | 35 | 24 | 10.5 | M6x1.0x10 depth | M6x1.0x10 depth |

* Values in () are for single acting.






Order example

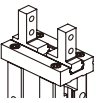
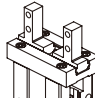
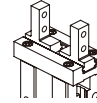

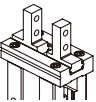
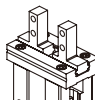
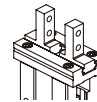
MCHC □ – 20 – □ N

| Model | Tube ID. | Style (*1) | Type (*2) |
|----------------------------------|----------------------|--|---|
| MCHC (Standard stroke) | 6 | Blank: Double acting | Blank: Standard 1: Side tapped mounting 2: Standard (Through hole) |
| | 10 | Blank: Double acting S: Single acting / Normally open C: Single acting / Normally closed | Blank: Standard 1: Side tapped mounting 2: Standard (Through hole) 3: Flat N: Narrow N1: Narrow type side tapped mounting N2: Narrow (Through hole) |
| | 16 | | |
| | 20 | | |
| | 25 | | |
| MCHCL (Long stroke) | 10 16 20 25 | Blank: Double acting | Blank: Standard 1: Side tapped mounting 2: Standard (Through hole) |

*1. STYLE

| Blank: Double acting | S: Single acting / Normally open | C: Single acting / Normally closed |
|---|---|---|
|  |  |  |

*2. TYPE

| Blank: Standard | 1: Side tapped mounting | 2: Standard (Through hole) | 3: Flat |
|---|---|---|---|
|  |  |  |  |
| N: Narrow | N1: Narrow type side tapped mounting | N2: Narrow (Through hole) | |
|  |  |  | |

Features

- Integral linear guide used for high rigidity and high precision.
- The material of finger is martensitic stainless steel.
- Body thickness tolerance $\pm 0.05\text{mm}$.
- Bottom pin holes for accurate re-locating.
- Grooves on the body for sensor switch to be inserted into.
- The gripping stroke of long-stroke type is approximately double compare with standard type.
- Magnetic as standard.

Specification

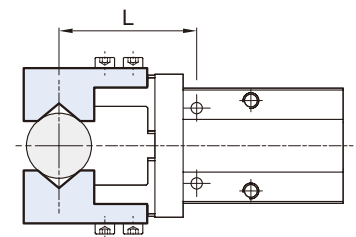
| Model | MCHC | | | | | | |
|----------------------------------|-------------------------------|-------------------------|----------|----------|--------|-----|-----|
| Acting type | Double acting / Single acting | | | | | | |
| Tube I.D. (mm) | 6 | 10 | 16 | 20 | 25 | | |
| Opening / Closing stroke (mm) | 4 | 4(8) | 6(12) | 10(18) | 14(22) | | |
| Port size | M3x0.5 | | M5x0.8 | | | | |
| Medium | Air | | | | | | |
| Operating pressure range (MPa) | Double acting | 0.15-0.7 | 0.2-0.7 | 0.1-0.7 | | | |
| | Single acting | — | 0.35-0.7 | 0.25-0.7 | | | |
| Ambient temperature | -10~+60°C (No freezing) | | | | | | |
| Repeatability | $\pm 0.01\text{ mm}$ | | | | | | |
| Max. operating frequency (c.p.m) | 180 (120) | | | | | | |
| Lubricator | Not required | | | | | | |
| Sensor switch (*2) | *1 | RDE, RDE-D: Non-contact | | | | | |
| Weight (g) | Double acting | Standard | 27 | 55 | 124 | 250 | 461 |
| | | Long stroke | — | 56 | 125 | 252 | 463 |
| | Single acting | Flat type | — | 53 | 124 | 244 | 450 |
| | | Standard | — | 70 | 145 | 270 | 490 |

*1. Tube I.D. $\phi 6$ use RDFE(V) sensor switch.

2. RDE, RDFE(V) specification, please refer to page 5-6, 11.

*3. () value for long stroke.

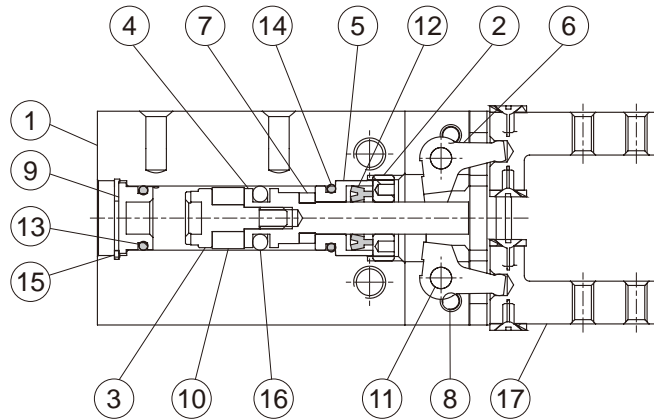
Gripping force



| Tube I.D. (mm) | | 6 | 10 | 16 | 20 | 25 |
|---------------------------------|----------|----------|----------|---------|---------|-----------|
| Double acting | External | 3.3(0.3) | 11(1.1) | 34(3.5) | 42(4.3) | 65(6.6) |
| | Internal | 6.1(0.6) | 17(1.7) | 45(4.6) | 66(6.7) | 104(10.6) |
| Single acting / Normally open | External | — | 7.1(0.7) | 27(2.8) | 33(3.4) | 45(4.6) |
| Single acting / Normally closed | Internal | — | 13(1.3) | 38(3.9) | 57(5.8) | 83(8.5) |

* Operation pressure 0.5 MPa, gripping length 20mm, the effective gripping force for each finger is *** N(kgf).

Double acting



Material

| No. | Part name | Material | Q'y | Repair kits (inclusion) |
|-----|----------------|---------------------|-----|-------------------------|
| 1 | Body | Aluminum alloy | 1 | |
| 2 | Front cap | Stainless steel | 1 | |
| 3 | Magnet holder | Stainless steel | 1 | |
| 4 | Piston rod | Stainless steel | 1 | |
| 5 | Rod cover | Stainless steel | 1 | |
| 6 | Lever | Stainless steel | 2 | |
| 7 | Cushion pad | PU | 1 | ● |
| 8 | Screw | Stainless steel | 4 | |
| 9 | Head cover | Aluminum alloy | 1 | |
| 10 | Magnet ring | Magnet material | 1 | |
| 11 | Pin | Steel | 2 | |
| 12 | Rod packing | NBR | 1 | ● |
| 13 | O-ring | NBR | 1 | |
| 14 | O-ring | NBR | 1 | |
| 15 | Snap ring | Carbon steel | 1 | ● |
| 16 | Piston packing | NBR | 1 | ● |
| 17 | Gripping set | Stainless steel (*) | 1 | |

* Bearing steel balls as standard.

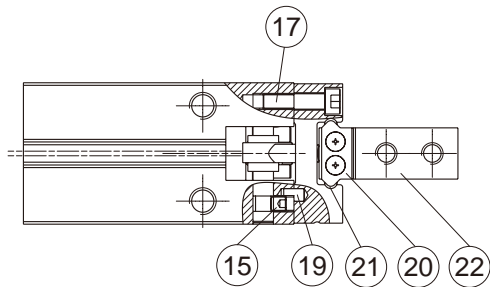
Order example of repair kits

| Tube I.D. | Repair kits |
|-----------|------------------|
| ø6 | PS-MCHC-6 |

PARALLEL GRIPPER (2-Finger)

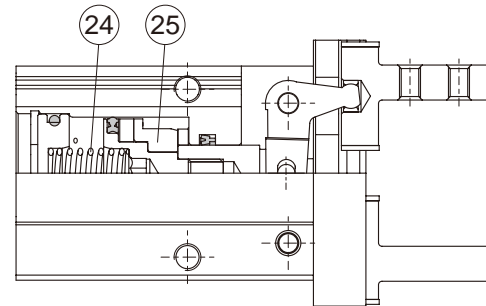
Mindman

Double acting



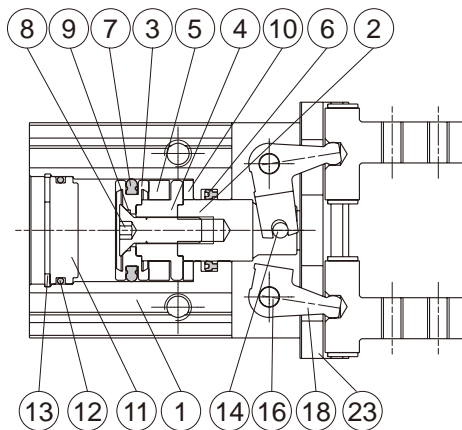
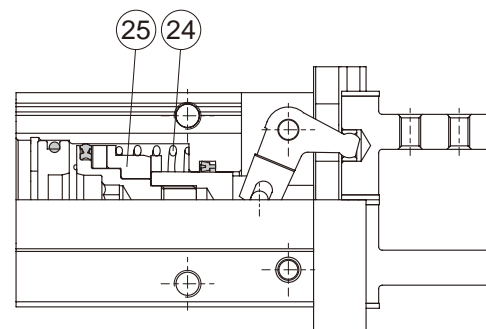
Single acting

Normally open



Single acting

Normally closed



Material

| No. | Tube I.D. Part name | 10 | 16 | 20 | 25 | Q'y | Repair kits (inclusion) |
|-----|------------------------|-----------------|-----------------|----|----|-----|----------------------------|
| 1 | Body | Aluminum alloy | | | | 1 | |
| 2 | Piston rod | Stainless steel | | | | 1 | |
| 3 | Piston | Aluminum alloy | | | | 1 | |
| 4 | Piston R | *1 | Aluminum alloy | | | 1 | |
| 5 | Magnet ring | Magnet material | | | | 1 | |
| 6 | Rod packing | NBR | | | | 1 | ● |
| 7 | Piston packing | NBR | | | | 1 | ● |
| 8 | Screw | — | Stainless steel | | | 1 | |
| 9 | O-ring | — | NBR | | | 1 | ● |
| 10 | Cushion pad | PU | | | | 1 | ● |
| 11 | Head cover | Aluminum alloy | | | | 1 | |
| 12 | Cover ring | NBR | | | | 1 | ● |
| 13 | Stop ring | *2 | Stainless steel | | | 1 | |
| 14 | Spindle river | Carbon steel | | | | 1 | |
| 15 | Screw | Carbon steel | | | | 4 | |
| 16 | Grip rivet | Carbon steel | | | | 2 | |
| 17 | Bolt | Stainless steel | | | | 4 | |
| 18 | Lever | Stainless steel | | | | 2 | |

| No. | Tube I.D. Part name | 10 | 16 | 20 | 25 | Q'y | Repair kits (inclusion) |
|-----|------------------------|-----------------|----|----|----|-----|----------------------------|
| 19 | Pin | Carbon steel | | | | 2 | |
| 20 | Roller stopper | Stainless steel | | | | 4 | |
| 21 | Steel balls | Bearing steel | | | | 24 | |
| 22 | Finger | Stainless steel | | | | 2 | |
| 23 | Guide | Stainless steel | | | | 1 | |
| 24 | Magnet holder | Stainless steel | | | | 1 | |
| 25 | Stop ring | Stainless steel | | | | 1 | |

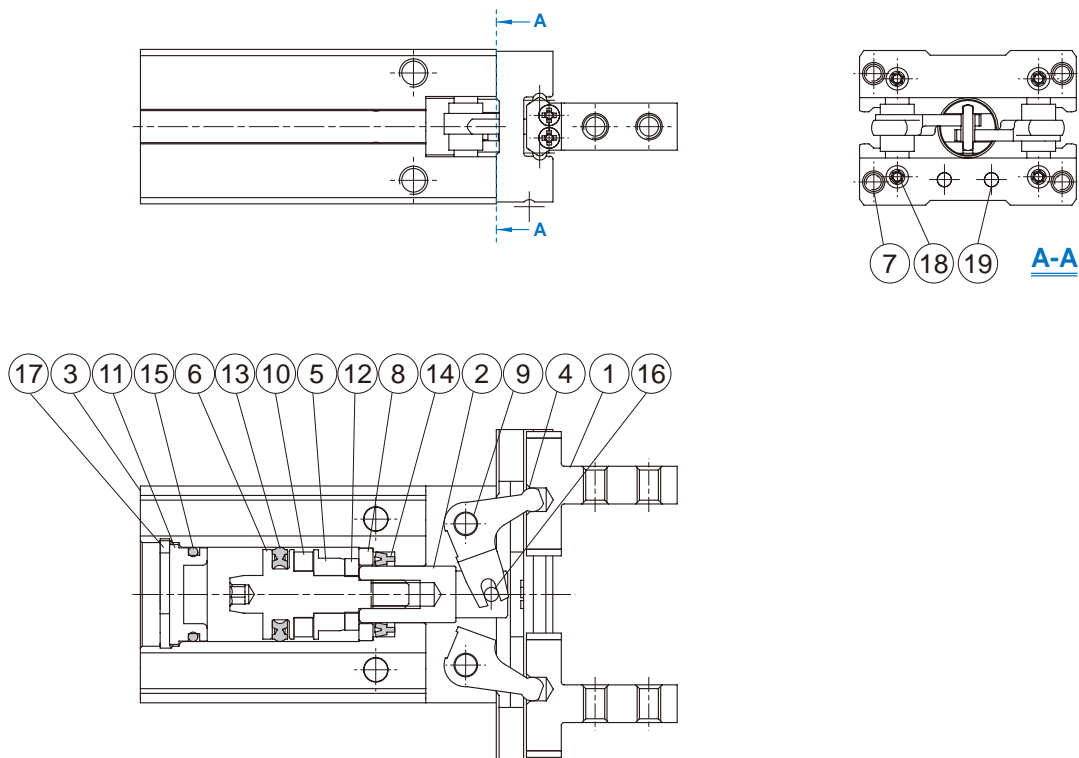
*1. Stainless steel *2. Carbon steel

Order example of repair kits

| Tube I.D. | Repair kits |
|------------------|-------------------|
| $\varnothing 10$ | PS-MCHC-10 |
| $\varnothing 16$ | PS-MCHC-16 |
| $\varnothing 20$ | PS-MCHC-20 |
| $\varnothing 25$ | PS-MCHC-25 |

PARALLEL GRIPPER (2-Finger)

Double acting



Material

| No. | Tube I.D. Part name | 10 | 16 | 20 | 25 | Q'y | Repair kits (inclusion) |
|-----|------------------------|----------------------|-----------------|----|----|-----|----------------------------|
| 1 | Gripping set | Stainless steel (*1) | | | | 1 | |
| 2 | Piston rod | Stainless steel | | | | 1 | |
| 3 | Body | Aluminum alloy | | | | 1 | |
| 4 | Lever | Stainless steel | | | | 2 | |
| 5 | Spring holder | Stainless steel | | | | 1 | |
| 6 | Piston | Stainless steel | | | | 1 | |
| 7 | Bolt | Stainless steel | | | | 4 | |
| 8 | Stop ring | *2 | | - | | 1 | |
| 9 | Grip rivet | Mild carbon steel | | | | 2 | |
| 10 | Magnet ring | Magnet material | | | | 1 | |
| 11 | Head cover | Aluminum alloy | | | | 1 | |
| 12 | Gasket | NBR | | | | 1 | ● |
| 13 | Piston packing | NBR | | | | 1 | ● |
| 14 | Rod packing | NBR | | | | 1 | ● |
| 15 | O-ring | NBR | | | | 1 | ● |
| 16 | Spindle river | Carbon steel | | | | 1 | |
| 17 | Snap ring | *3 | Stainless steel | | | 1 | |
| 18 | Hexgon screw | Stainless steel | | | | 4 | |
| 19 | Pin | Carbon steel | | | | 2 | |

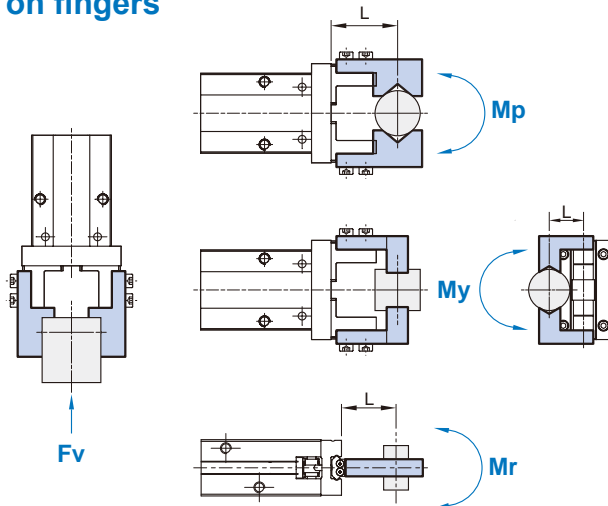
*1. Bearing steel balls as standard.

2. Stainless steel 3. Carbon steel

Order example of repair kits

| Tube I.D. | Repair kits |
|------------------|-------------|
| $\varnothing 10$ | PS-MCHCL-10 |
| $\varnothing 16$ | PS-MCHCL-16 |
| $\varnothing 20$ | PS-MCHCL-20 |
| $\varnothing 25$ | PS-MCHCL-25 |

Confirmation of external force on fingers

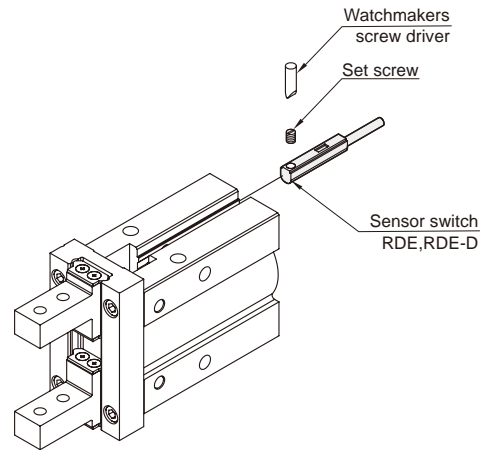


L: distance to the point at which the load is applied (mm)

| Tube I.D. (mm) | Allowable vertical load Fv (N) | Maximum allowable moment | | |
|----------------|--------------------------------|--------------------------|---------------------|----------------------|
| | | Pitch moment Mp (N-m) | Yaw moment My (N-m) | Roll moment Mr (N-m) |
| 6 | 10 | 0.04 | 0.04 | 0.08 |
| 10 | 58 | 0.26 | 0.26 | 0.53 |
| 16 | 98 | 0.68 | 0.68 | 1.36 |
| 20 | 147 | 1.32 | 1.32 | 2.65 |
| 25 | 255 | 1.94 | 1.94 | 3.88 |

* Values for load and moment in the table indicate static values.

Installation of sensor switch



Allowable load calculation

$$\text{Allowable load } F(N) = \frac{M(\text{maximum allowable moment})(N \cdot m)}{L(m)}$$

Example

When a static load of $f=20N$ is operating, which applies pitch moment to point $L=25mm$ from the **MCHC-16** guide.

$$\begin{aligned} \text{Allowable load } F(N) &= \frac{0.68 (N \cdot m)}{25 \times 10^{-3} (m)} \\ &= 27.2 (N) \end{aligned}$$

Load $f=20 (N) < 27.2 (N)$, so can be used.

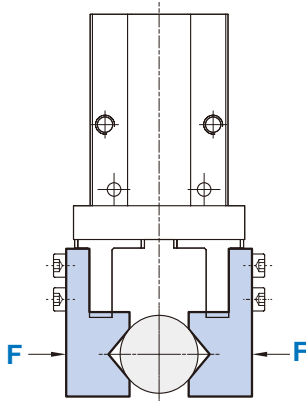
Model selection suggestions

1. For normal gripping and carrying usage, the recommended safe factor (a) is 4.
2. The value of gripping force of single finger can be found at the gripping force table.
3. The safe factor (a) have to be higher if the gripper is using with a great accelerated velocity or impaction condition.

Effective gripping force (Double acting)

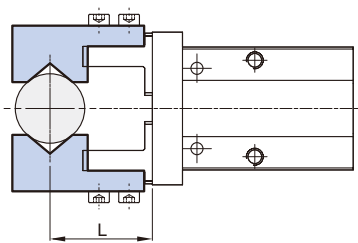
Indication of effective force.

The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

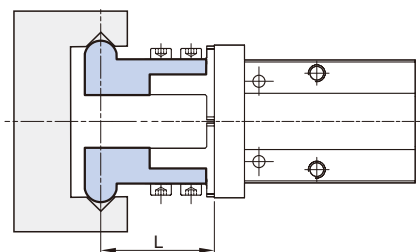


$$1\text{N}=0.102\text{ kgf}$$

$$1\text{MPa}=10.2\text{ kgf/cm}^2$$



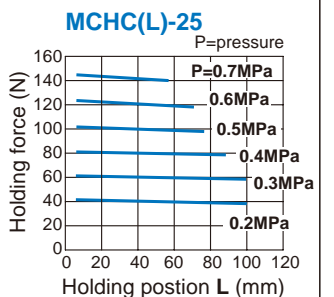
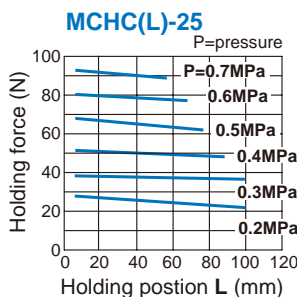
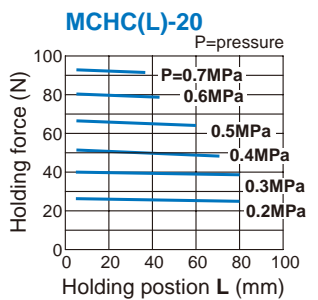
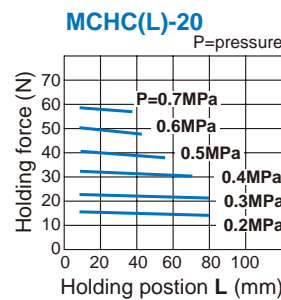
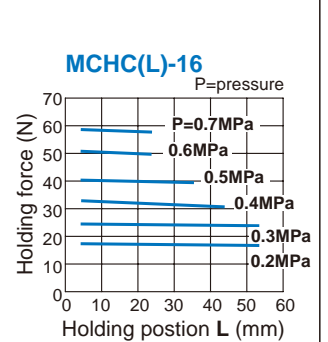
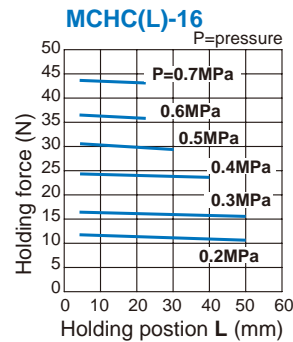
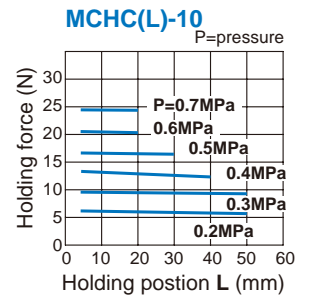
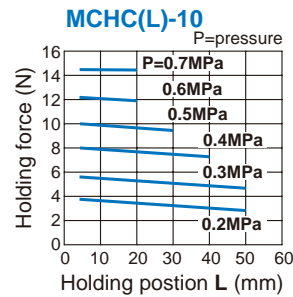
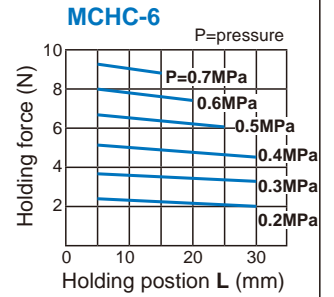
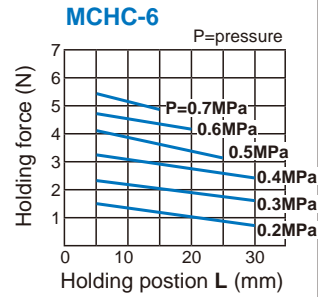
External grip



Internal grip

External gripping force

Internal gripping force

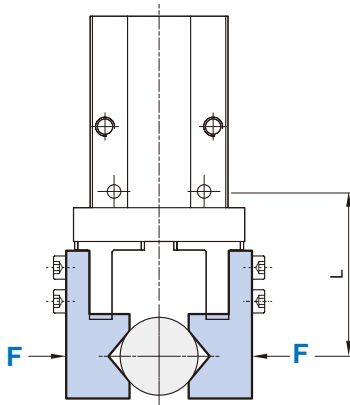


Effective gripping force (Single acting)

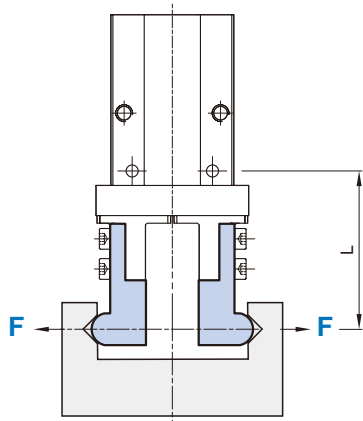
Indication of effective force.

The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

1N=0.102 kgf
1MPa=10.2 kgf/cm²

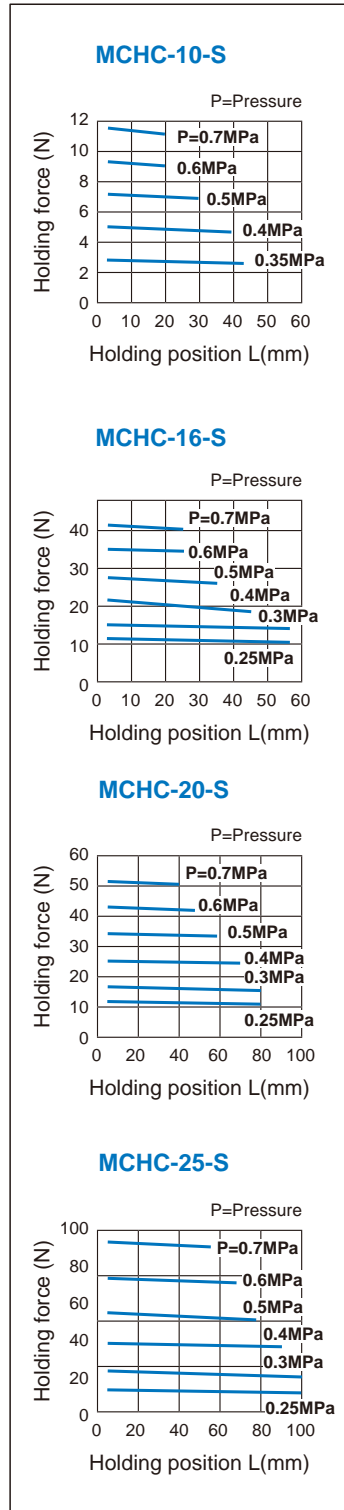


External grip
(Single acting / Normally open)

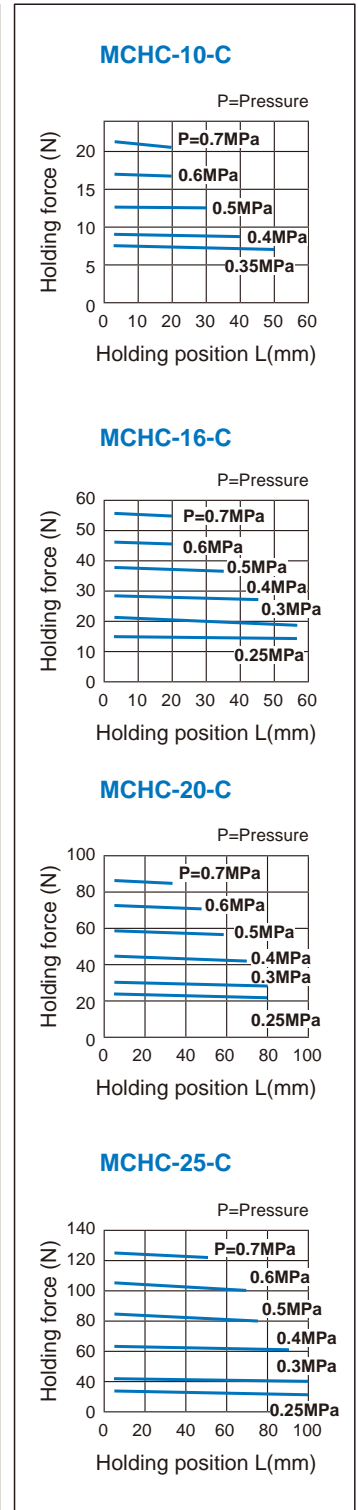


Internal grip
(Single acting / Normally closed)

External gripping force Single acting / N.O.

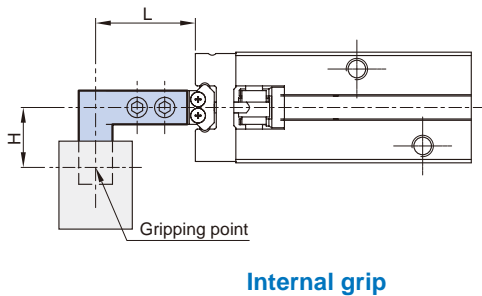
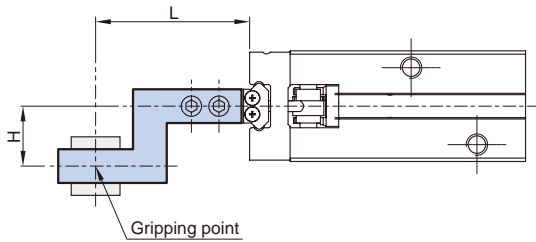


Internal gripping force Single acting / N.C.

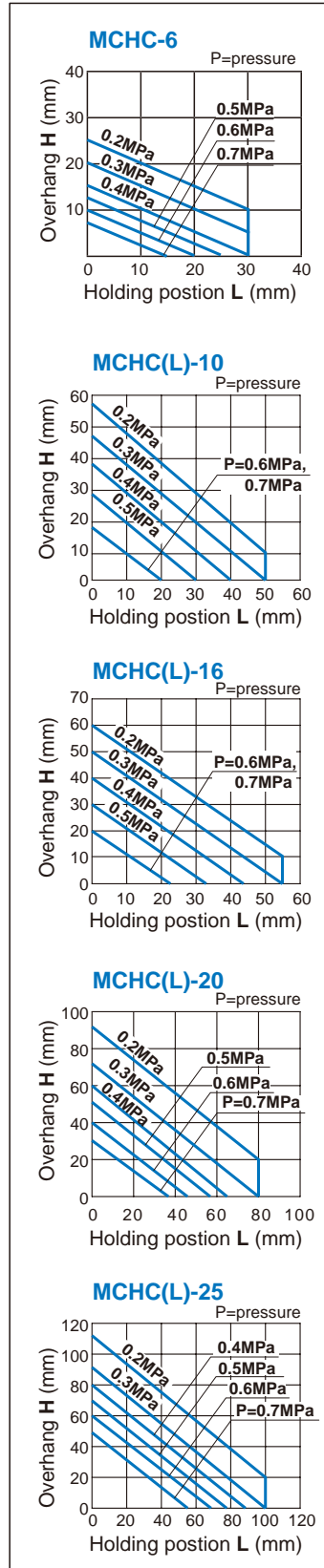


Confirmation of gripping point

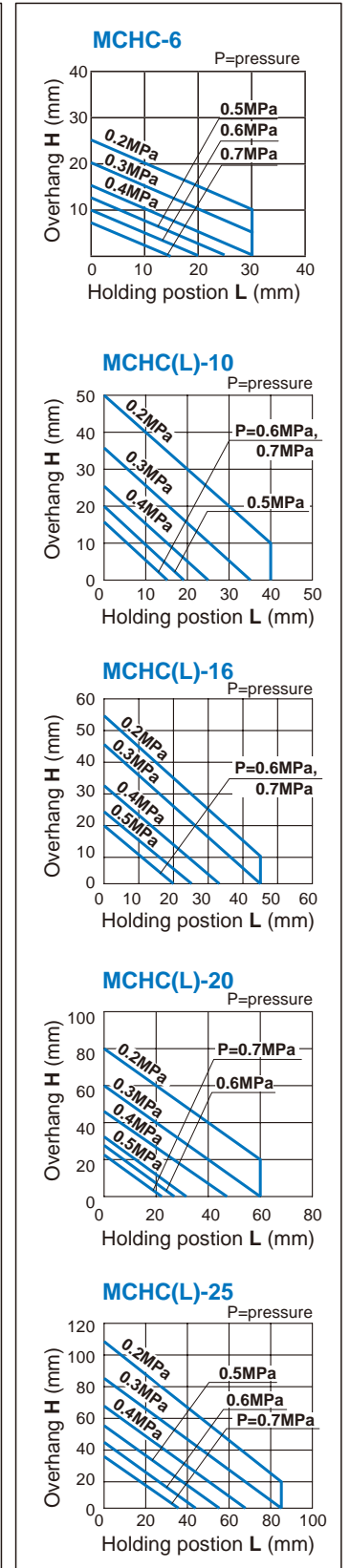
- The air gripper should be operated so that the workpiece gripping point "L" and the amount of overhang "H" stay within the range shown for each operating pressure given in the graphs to the right.
- If the workpiece gripping point goes beyond the range limits, this will have an adverse effect on the life the air gripper.

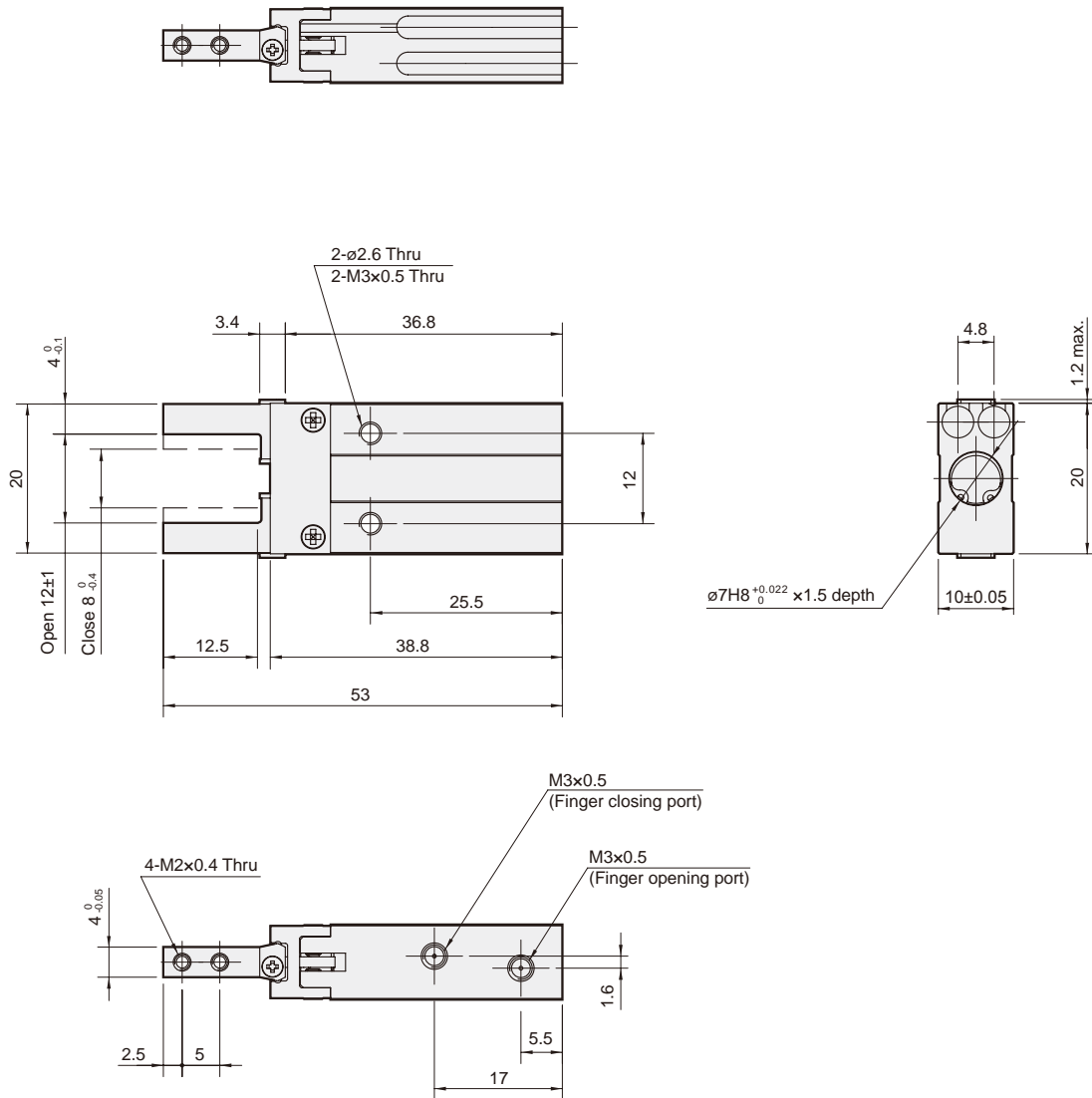


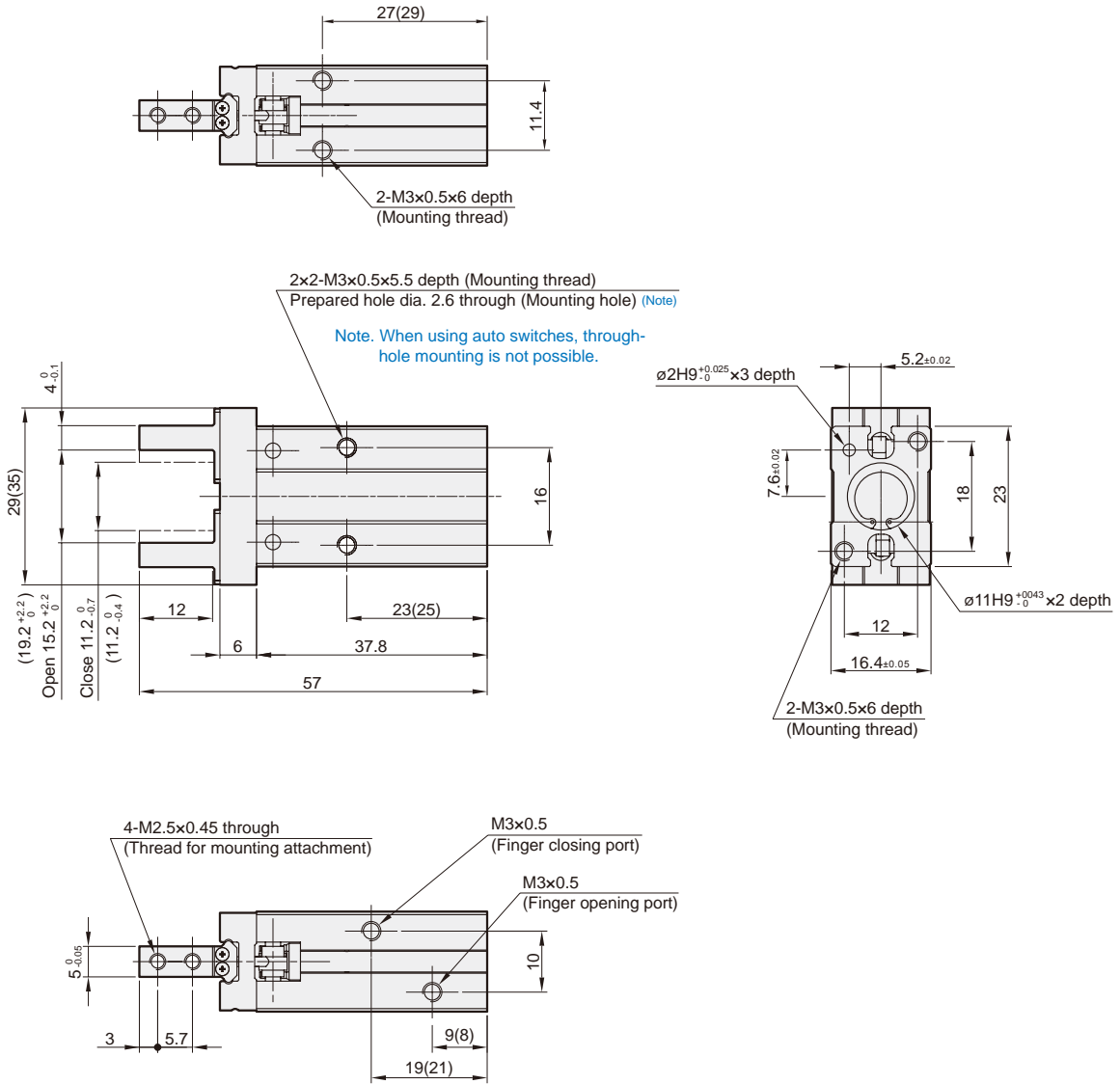
External gripping



Internal gripping

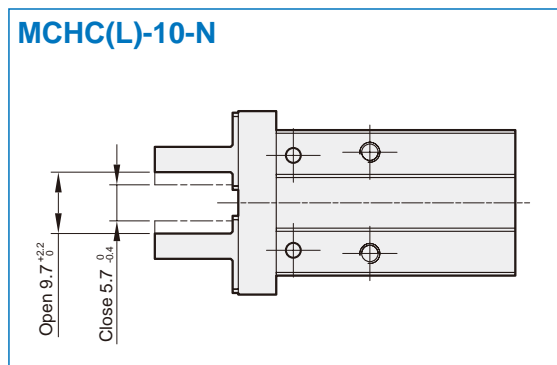


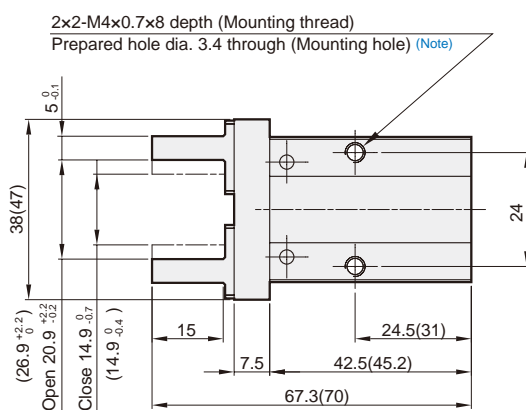
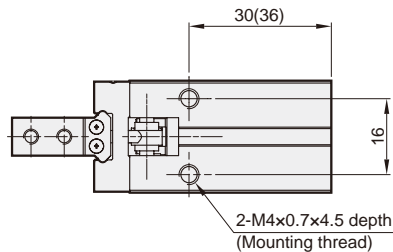




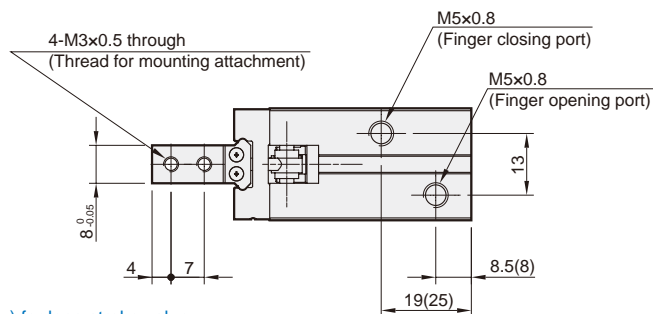
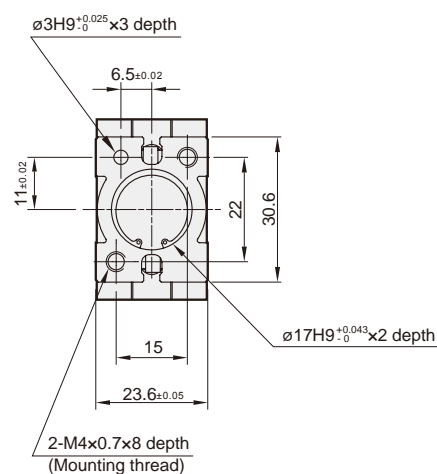
*() for long stroke value.

Finger position – Narrow type



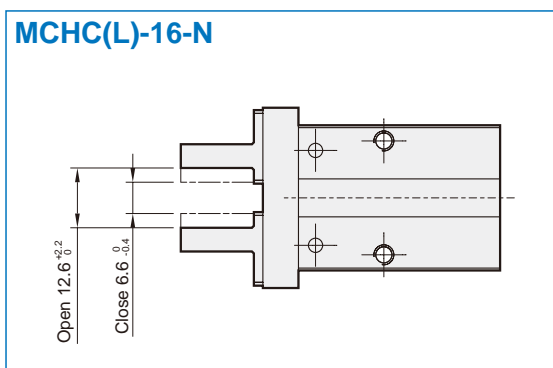


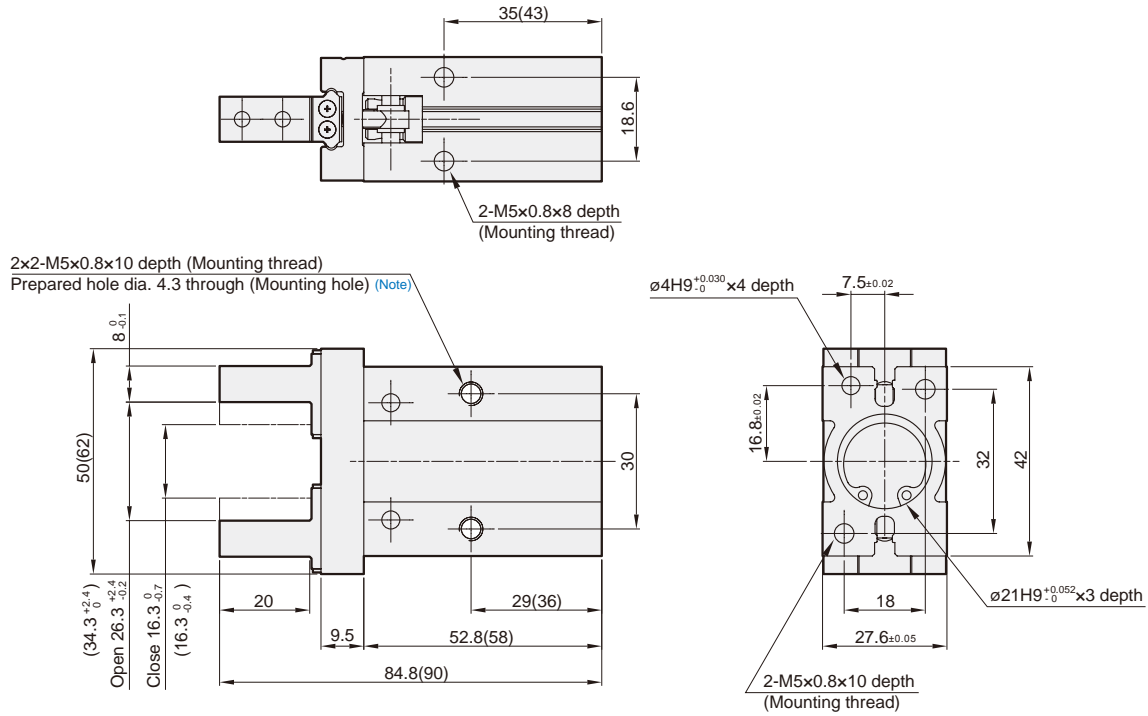
Note. Through-hole mounting is not possible when using the auto switch at the square groove.



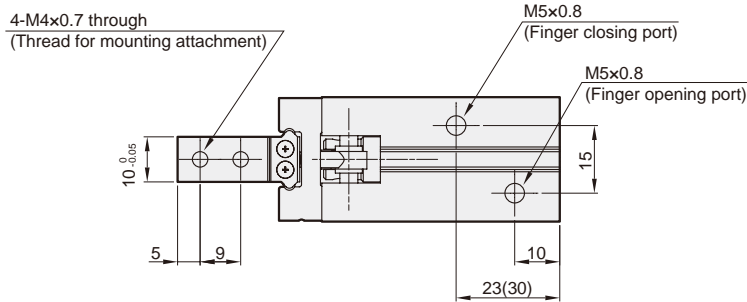
*() for long stroke value.

Finger position – Narrow type



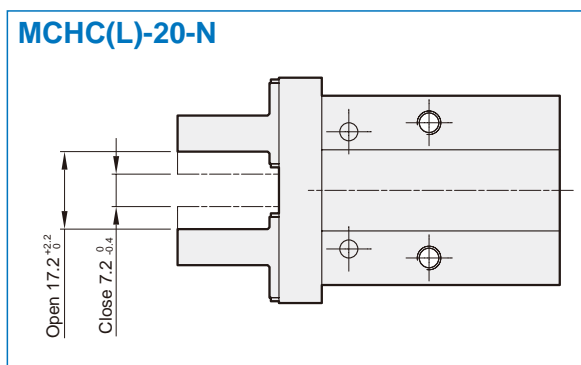


Note. Through-hole mounting is not possible when using the auto switch at the square groove.

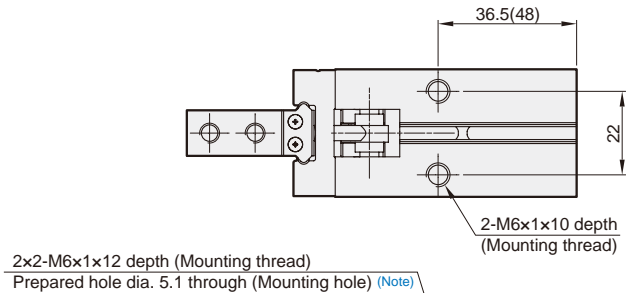


*() for long stroke value.

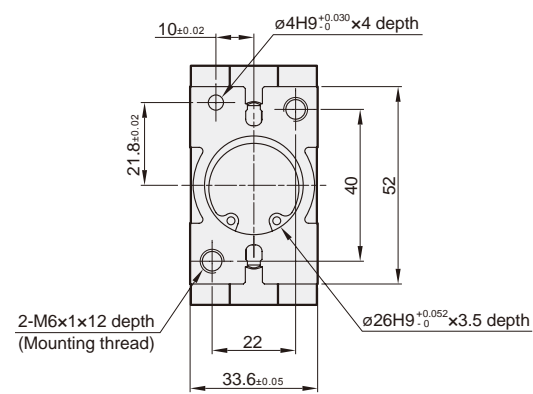
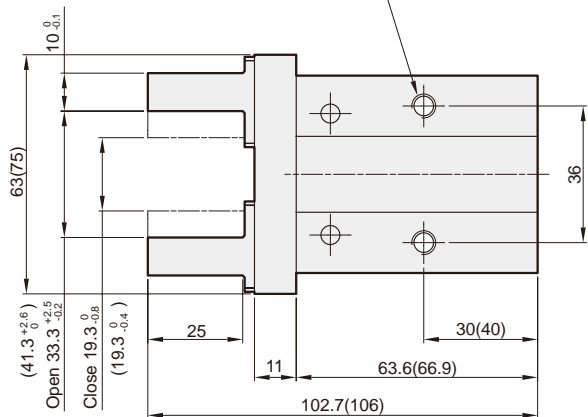
Finger position – Narrow type



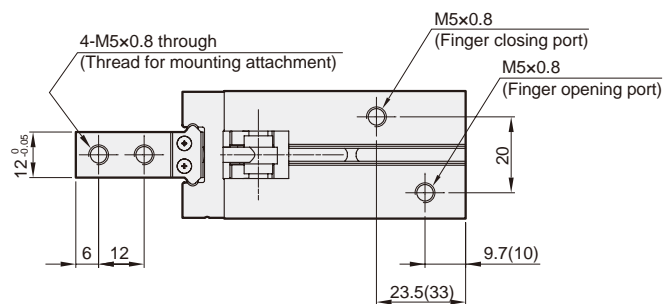
PARALLEL GRIPPER (2-Finger)



2x2-M6x1x12 depth (Mounting thread)
Prepared hole dia. 5.1 through (Mounting hole) (Note)

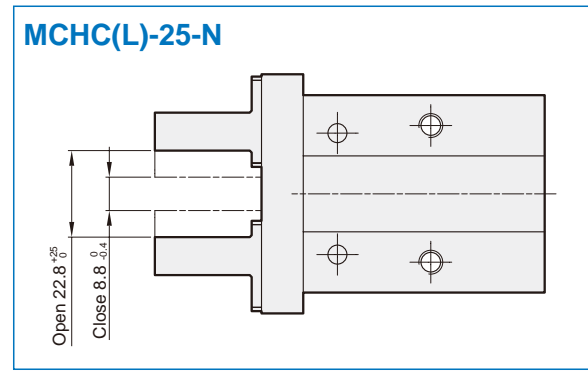


Note. Through-hole mounting is not possible when using the auto switch at the square groove.



* () for long stroke value.

Finger position – Narrow type

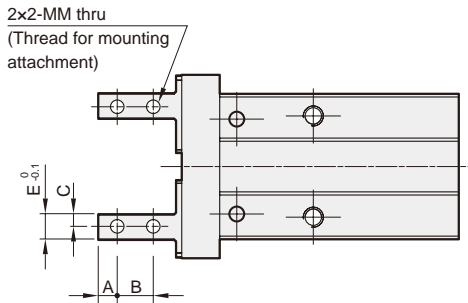


MCHC Finger option $\phi 6 \sim \phi 25$

PARALLEL GRIPPER (2-Finger)

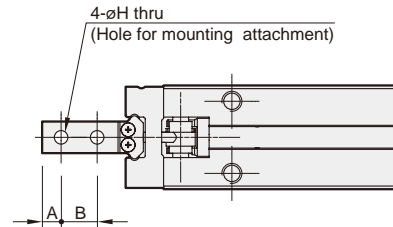


MCHC*-1, N1 Side tapped mounting



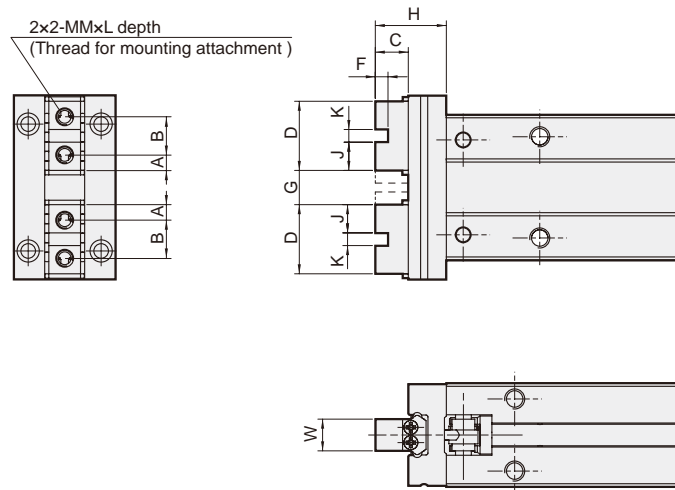
| Code Tube I.D. | A | B | C | E | MM |
|-------------------|-----|-----|-----|----|-----------|
| 6 | 2.5 | 5 | 2 | 4 | M2x0.4 |
| 10 | 3 | 5.7 | 2 | 4 | M2.5x0.45 |
| 16 | 4 | 7 | 2.5 | 5 | M3x0.5 |
| 20 | 5 | 9 | 4 | 8 | M4x0.7 |
| 25 | 6 | 12 | 5 | 10 | M5x0.8 |

MCHC*-2, N2 Through hole type

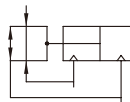
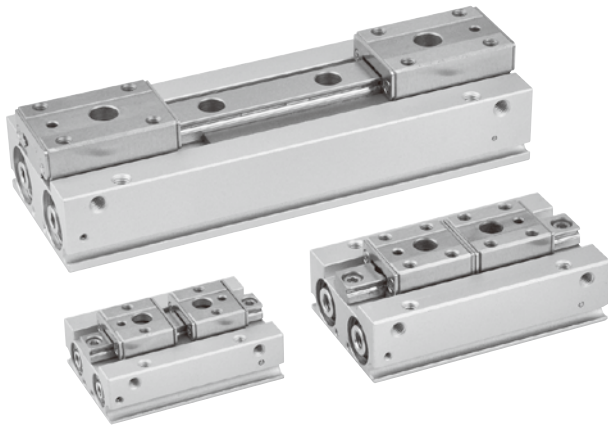


| Code Tube I.D. | A | B | H |
|-------------------|-----|-----|------------|
| 6 | 2.5 | 5 | $\phi 2.4$ |
| 10 | 3 | 5.7 | $\phi 2.9$ |
| 16 | 4 | 7 | $\phi 3.4$ |
| 20 | 5 | 9 | $\phi 4.5$ |
| 25 | 6 | 12 | $\phi 5.5$ |

MCHC*-3 Flat type



| Code Tube I.D. | A | B | C | D | F | G | | H | J | K | MM | L | W |
|-------------------|------|----|------|------|-----|-----------------------------------|----------------------------------|------|------|--------------------------------------|-----------|----|----------------------------------|
| | | | | | | Open | Closed | | | | | | |
| 10 | 2.45 | 6 | 5.2 | 10.9 | 2 | 5.4 ^{+2.2} ₀ | 1.4 ⁰ _{-0.2} | 11.2 | 4.45 | 2H9 ^{+0.025} ₀ | M2.5x0.45 | 5 | 5 ⁰ _{-0.05} |
| 16 | 3.05 | 8 | 8.3 | 14.1 | 2.5 | 7.4 ^{+2.2} ₀ | 1.4 ⁰ _{-0.2} | 15.8 | 5.8 | 2.5H9 ^{+0.025} ₀ | M3x0.5 | 6 | 8 ⁰ _{-0.05} |
| 20 | 3.95 | 10 | 10.5 | 17.9 | 3 | 11.6 ^{+2.3} ₀ | 1.6 ⁰ _{-0.2} | 20 | 7.45 | 3H9 ^{+0.025} ₀ | M4x0.7 | 8 | 10 ⁰ _{-0.05} |
| 25 | 4.90 | 12 | 13.1 | 21.8 | 4 | 16 ^{+2.5} ₀ | 2 ⁰ _{-0.2} | 24.1 | 8.9 | 4H9 ^{+0.03} ₀ | M5x0.8 | 10 | 12 ⁰ _{-0.05} |



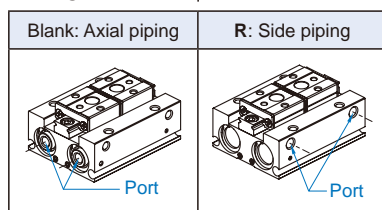
Order example

MCHD – 20R – □




MODEL TUBE I.D.
8, 12, 16, 20

STROKE *
Blank: Short
1: Medium
2: Long

PIPING TYPE



* Stroke selection

| Tube I.D. Stroke (mm) | 8 | 12 | 16 | 20 |
|---|----|----|----|----|
| Short stroke  | 8 | 12 | 16 | 20 |
| Medium stroke  | 16 | 24 | 32 | 40 |
| Long stroke  | 32 | 48 | 64 | 80 |

Features

- Low profile design saves space and reduces bending moments, improved accuracy with smooth operation.
- Improved mounting repeatability, easy positioning for mounting.
- Double piston construction achieves compact design with strong gripping force.
- High rigidity and high precision with martensitic stainless steel.
- Grooves on the body for sensor switch to be inserted into.
- Magnetic as standard.

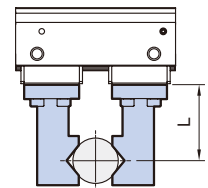
Specification

| Model | MCHD | | | |
|----------------------------------|-------------------------|----------------------------|----|----|
| Acting type | Double acting | | | |
| Tube I.D. (mm) | 8 | 12 | 16 | 20 |
| Port size | M3x0.5 | M5x0.8 | | |
| Medium | Air | | | |
| Operating pressure range | 0.15~0.7 | 0.1~0.7 MPa | | |
| Ambient temperature | -10~+60°C (No freezing) | | | |
| Repeatability | ± 0.05 mm (*1) | | | |
| Max. operating frequency (c.p.m) | Short | 120 | | |
| | Medium | 120 | | |
| | Long | 60 | | |
| Lubricator | Not required | | | |
| Sensor switch (*2) | 2 wire | RDFE(V): Non-contact | | |
| | 3 wire | RNFE(V): NPN, RPFE(V): PNP | | |
| Attached bolt | 2 pcs | — | | |

* 1. This is the value when no offset load is applied to the finger. When an offset load is applied to the finger, the maximum value is ±0.15mm due to the influence of backlash of the rack and pinion.

* 2. R*FE(V) specification, please refer to page 5-11.

Gripping force

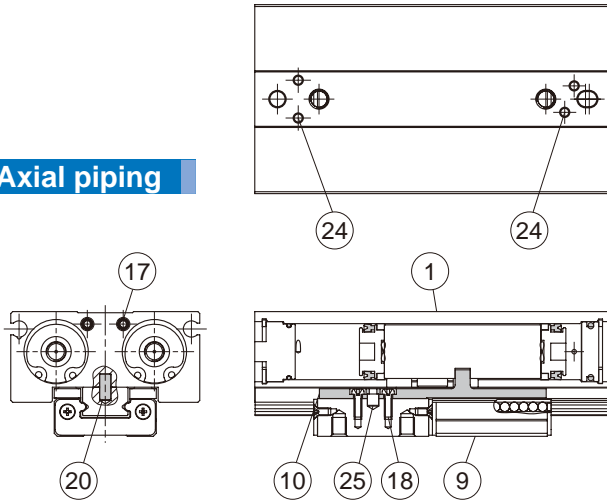


| Model | Gripping force per finger effective value (N) (*) | Weight (g) |
|-----------|---|------------|
| MCHD-8 | 19 | 65 |
| MCHD-8-1 | | 79.1 |
| MCHD-8-2 | | 113.3 |
| MCHD-12 | 48 | 150 |
| MCHD-12-1 | | 191.3 |
| MCHD-12-2 | | 291.2 |
| MCHD-16 | 90 | 350 |
| MCHD-16-1 | | 454.2 |
| MCHD-16-2 | | 678.3 |
| MCHD-20 | 141 | 660 |
| MCHD-20-1 | | 869 |
| MCHD-20-2 | | 1310.6 |

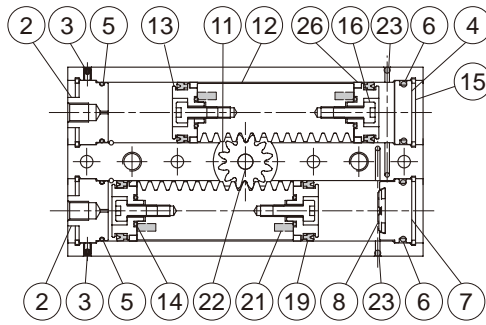
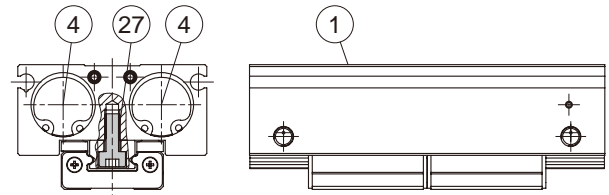
* Values based on pressure of 0.5 MPa, gripping point L=20mm, at center of stroke.

PARALLEL GRIPPER (2-Finger)

Axial piping



Side piping



Order example of repair kits

| Tube I.D. | Repair kits | Tube I.D. | Repair kits |
|-----------|-------------|-----------|-------------|
| ø8 | PS-MCHD-8 | ø16 | PS-MCHD-16 |
| | PS-MCHD-8R | | PS-MCHD-16R |
| ø12 | PS-MCHD-12 | ø20 | PS-MCHD-20 |
| | PS-MCHD-12R | | PS-MCHD-20R |

Material

| No. | Tube I.D. Part name | Material | | | | Q'y | | Repair kits (inclusion) |
|-----|------------------------|-----------------|-----------------|----|----|-------|------|----------------------------|
| | | 8 | 12 | 16 | 20 | Axial | Side | |
| 1 | Body | Aluminum alloy | | | | 1 | 1 | |
| 2 | Cover A | Aluminum alloy | | | | 2 | 0 | |
| 3 | Hexgon screw | Stainless steel | | | | 2 | 0 | |
| 4 | Cover B | Aluminum alloy | | | | 1 | 3 | |
| 5 | O-ring | NBR | | | | 2 | 0 | ● |
| 6 | O-ring | NBR | | | | 2 | 4 | ● |
| 7 | Cover C | Aluminum alloy | | | | 1 | 1 | |
| 8 | Cushion pad | TPU | | | | 1 | 1 | ● |
| 9 | Guide set | Stainless steel | | | | 1 | 1 | |
| 10 | Lever | Stainless steel | | | | 2 | 2 | |
| 11 | Pinion | SCM | | | | 1 | 1 | |
| 12 | Pinion piston | Stainless steel | | | | 2 | 2 | |
| 13 | Piston | *1 | Aluminum alloy | | | 4 | 2 | |
| 14 | O-ring | NBR | | | | 4 | 4 | ● |
| 15 | Snap ring | Stainless steel | | | | 4 | 4 | |
| 16 | Bolt | - | Stainless steel | | | 4 | 4 | |
| 17 | Screw | Stainless steel | | | | 4 | 4 | |
| 18 | Screw | Stainless steel | | | | 4 | 4 | |

| No. | Tube I.D. Part name | Material | | | | Q'y | | Repair kits (inclusion) |
|-----|------------------------|-----------------|----|----|----|-------|------|----------------------------|
| | | 8 | 12 | 16 | 20 | Axial | Side | |
| 19 | Piston packing | NBR | | | | 4 | 4 | ● |
| 20 | Pin | Stainless steel | | | | 2 | 2 | |
| 21 | Magnet | Magnet material | | | | 4 | 4 | |
| 22 | Needle | Stainless steel | | | | 1 | 1 | |
| 23 | Ball | Stainless steel | | | | 2 | 2 | |
| 24 | Ball | Stainless steel | | | | 4 | 4 | |
| 25 | Needle | Stainless steel | | | | 2 | 2 | |
| 26 | Wear ring *2 | Resin | | | | 4 | 4 | |
| 27 | Bolt *3 | Stainless steel | | | | K | K | |

*1. Stainless steel

*2. Model MCHD-8(R)(-1), MCHD-12(R)(-1) without wear ring.

*3. Bolt Q'y

| Model | K | Model | K |
|-----------|---|-----------|---|
| MCHD-8 | 2 | MCHD-16 | 2 |
| MCHD-8-1 | 2 | MCHD-16-1 | 4 |
| MCHD-8-2 | 4 | MCHD-16-2 | 4 |
| MCHD-12 | 2 | MCHD-20 | 2 |
| MCHD-12-1 | 4 | MCHD-20-1 | 4 |
| MCHD-12-2 | 4 | MCHD-20-2 | 4 |

Model selection

Please select your model according to the weight of workpiece

- Although conditions differ according to the work piece shape and the coefficient of friction between the attachments and the workpiece, select a model that can provide a gripping force of 10 to 20 times the workpiece weight, or more.
- If high acceleration, deceleration or impact forces are encountered during motion, a further margin of safety should be considered.

When gripping a workpiece as in the figure as shown above:

F: Gripping force (N)

μ : Coefficient of friction between the attachments and the workpiece

m: Workpiece mass (kg)

g: Gravitational acceleration (=9.8m/s²)

mg: Workpiece weight (N)

the conditions under which the workpiece will not drop are,

$$2 \times \mu F > mg$$

Number of fingers

Therefore,

$$F > \frac{mg}{2 \times \mu}$$

With "a" representing the extra margin, "F" is determined by the following formula:

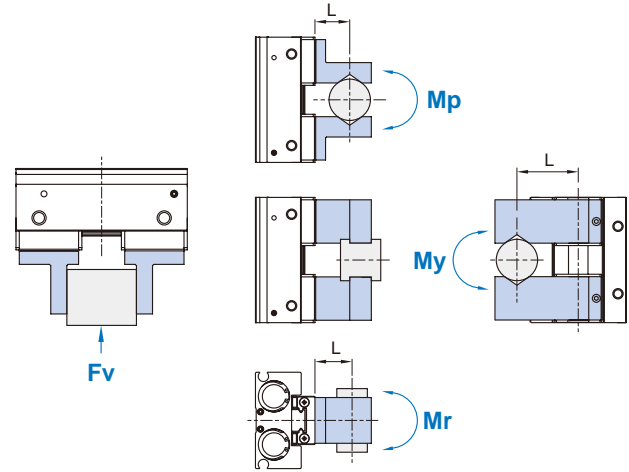
$$F = \frac{mg}{2 \times \mu} \times a$$

The "10 to 20 times or more of the workpiece weight" is calculated with a safety margin of a=4, which allows for impacts that occur during normal transportation, etc.

| $\mu=0.2$ | $\mu=0.1$ |
|---|---|
| $F = \frac{mg}{2 \times 0.2} \times 4$ $= 10 \times mg$ | $F = \frac{mg}{2 \times 0.1} \times 4$ $= 20 \times mg$ |
| 10×workpiece weight | 20×workpiece weight |

- * 1. Even in cases where the coefficient of friction is greater than $\mu=0.2$, for reasons of safety, please select a gripping force which is at least 10 to 20 times greater than the workpiece weight.
- * 2. If high acceleration, deceleration or impact forces are encountered during motion, a further margin of safety should be considered.

Confirmation of external force on fingers



L: Distance to the point at which the load is applied (mm)

| Tube I.D. (mm) | Allowable vertical load Fv(N) | Maximum allowable moment | | |
|----------------|-------------------------------|--------------------------|--------------------|---------------------|
| | | Pitch moment Mp(N·m) | Yaw moment My(N·m) | Roll moment Mr(N·m) |
| 8 | 58 | 0.26 | 0.26 | 0.53 |
| 12 | 98 | 0.68 | 0.68 | 1.4 |
| 16 | 176 | 1.4 | 1.4 | 2.8 |
| 20 | 294 | 2 | 2 | 4 |

* Values for load and moment in the table indicate static values.

Allowable load calculation

$$\text{Allowable load } F(N) = \frac{M(\text{maximum allowable moment})(N \cdot m)}{L(m)}$$

Example

When a static load of f=20N is operating, which applies pitch moment to point L=25mm from the MCHD-16 guide.

$$\text{Allowable load } F(N) = \frac{1.4 (N \cdot m)}{25 \times 10^{-3} (m)}$$

$$= 56 (N)$$

Load f=20 (N) < 56 (N), so can be used.

Model selection example

In the motion process did not produce high acceleration, deceleration or impact forces,
 Workpiece mass: 300g, Gripping method: External gripping,
 Operating pressure: 0.5 MPa, Coefficient of friction (μ): 0.1,
 Holding position: 20mm (no overhang)

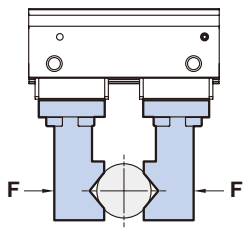
1. The conditions under which the workpiece will not drop are,

$$F = \frac{0.3}{2 \times 0.1} \times 4 = 6 \text{ (kgf)} \approx 60 \text{ (N)}$$

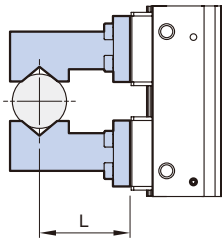
2. From Effective Gripping Force Fig,
 Operating pressure: 0.5 MPa; Holding position: 20 mm
 Effective gripping force is greater than 60 (N)
 So selected **MCHD-16** grippers.

Effective gripping force (Double acting)

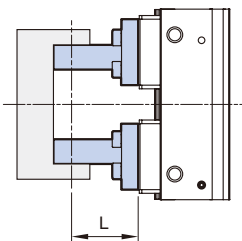
Indication of effective force.
The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.



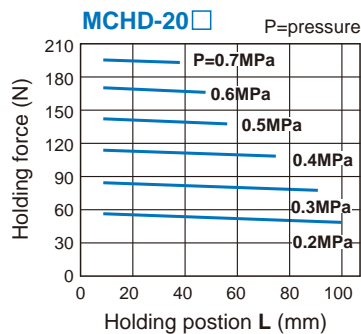
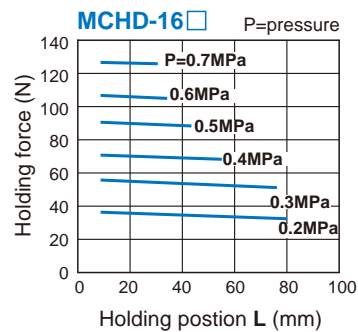
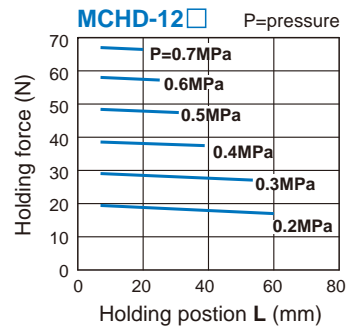
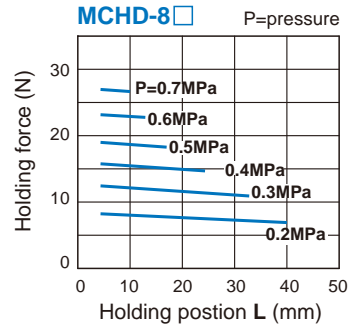
1N=0.102 kgf
1MPa=10.2 kgf/cm²



External grip

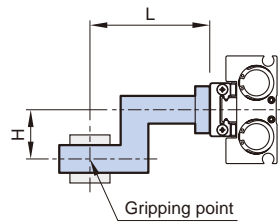


Internal grip

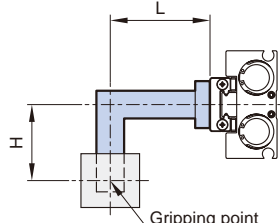


Confirmation of gripping point

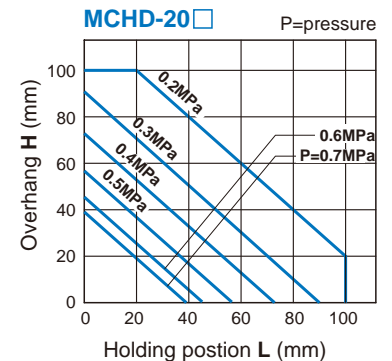
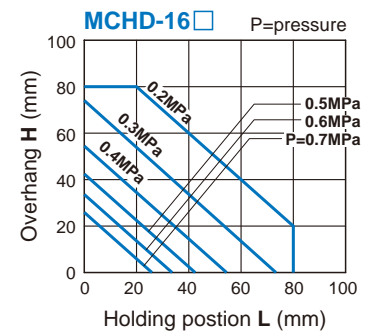
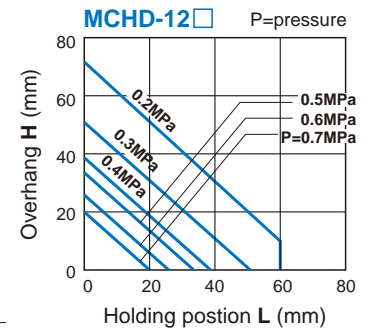
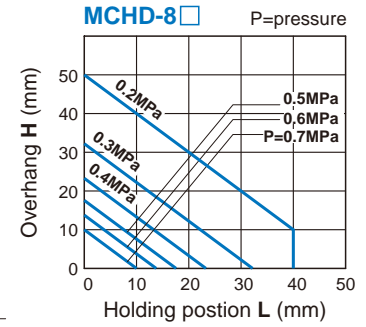
- The air gripper should be operated so that the workpiece gripping point "L" and the amount of overhang "H" stay within the range shown for each operating pressure given in the graphs.
- If the workpiece gripping point goes beyond the range limits, this will have an adverse effect on the life the air gripper.



External grip



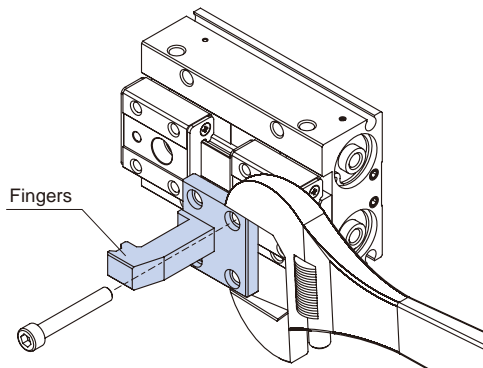
Internal grip



Product precautions

Before mount the fingers, sure be refer the tightening torque values in the table below.

| Tube I.D. (mm) | Bolt | Max. tightening torque (N.m) |
|----------------|-----------|------------------------------|
| 8 | M2.5x0.45 | 0.36 |
| 12 | M3x0.5 | 0.63 |
| 16 | M4x0.7 | 1.5 |
| 20 | M4x0.7 | 1.5 |



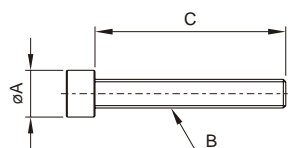
Order example of attached bolt

* One set includes 2 pcs, long stroke type need two sets (4 pcs).

BOLT — MCHD — 8

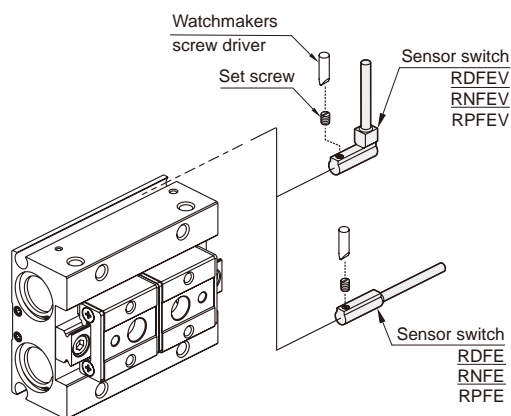
ATTACHED BOLT

TUBE I.D.
8
12



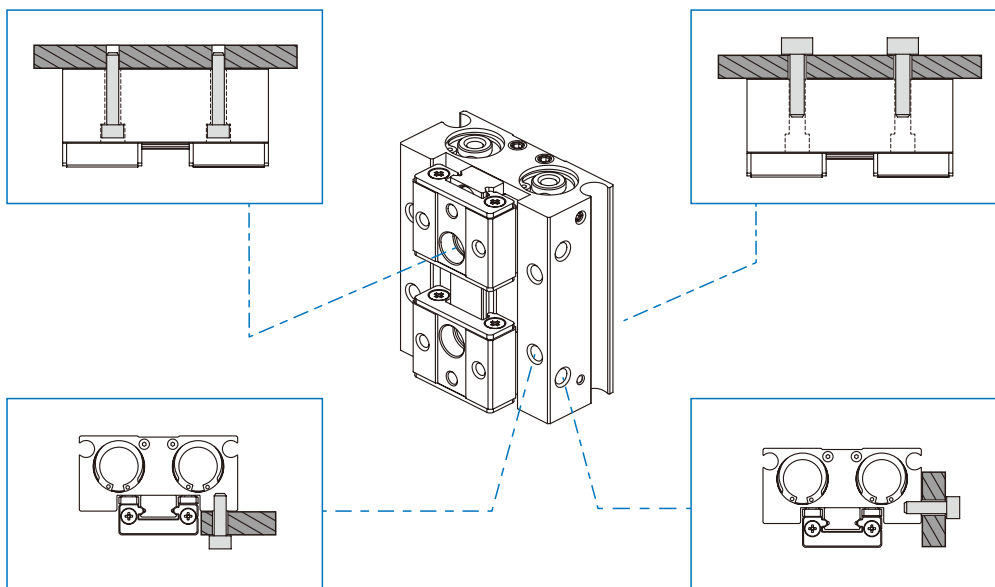
| Code Tube I.D. | A | B | C |
|-------------------|-----|-----------|----|
| 8 | 3.8 | M2.5x0.45 | 15 |
| 12 | 4.9 | M3x0.5 | 20 |

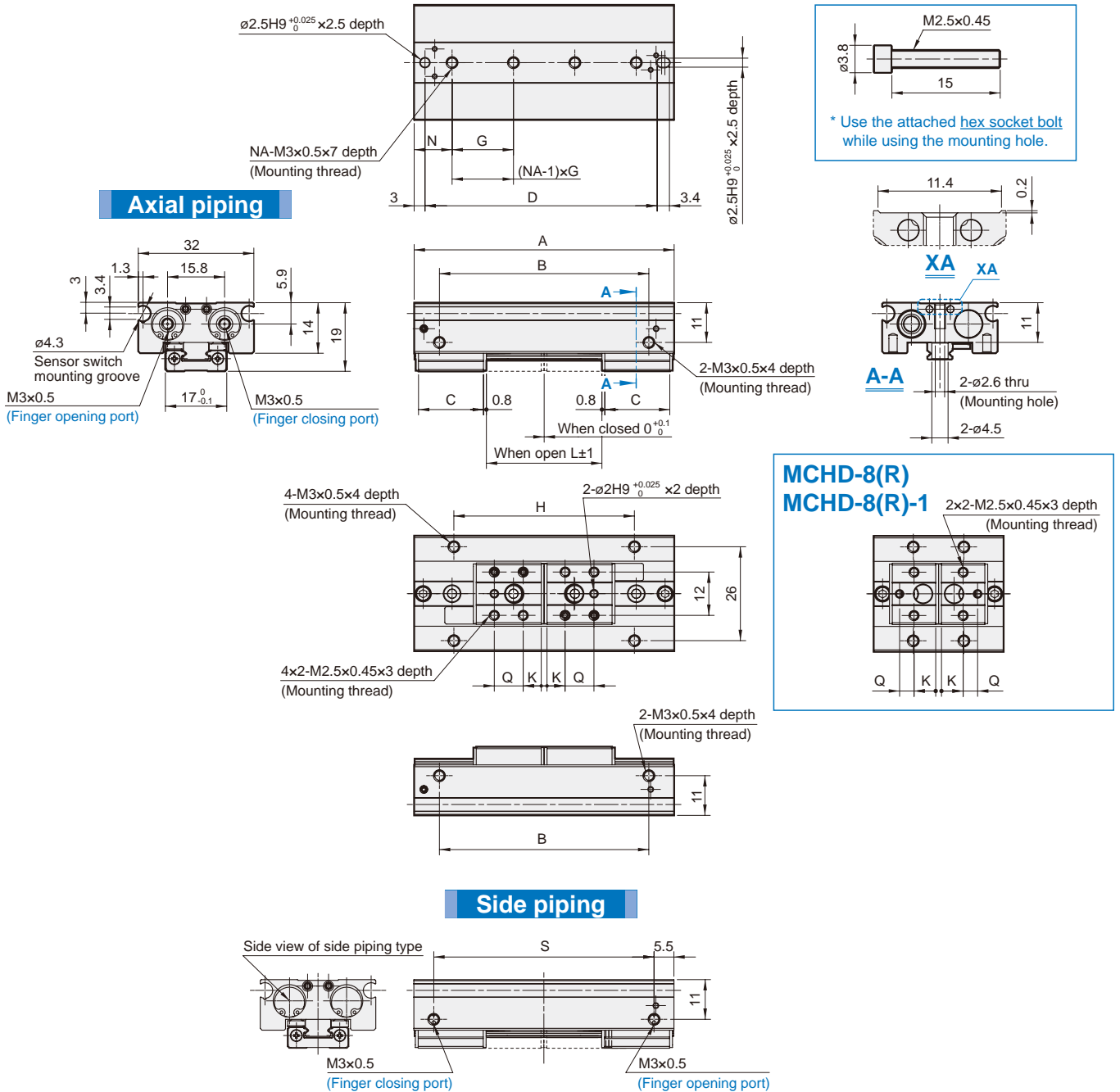
Installation of sensor switch



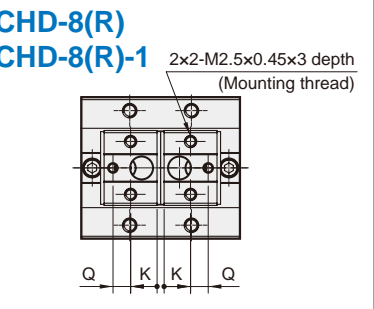
High degree of mounting flexibility

* Use the attached bolt for mounting in tube I.D. $\varnothing 8$, $\varnothing 12$.



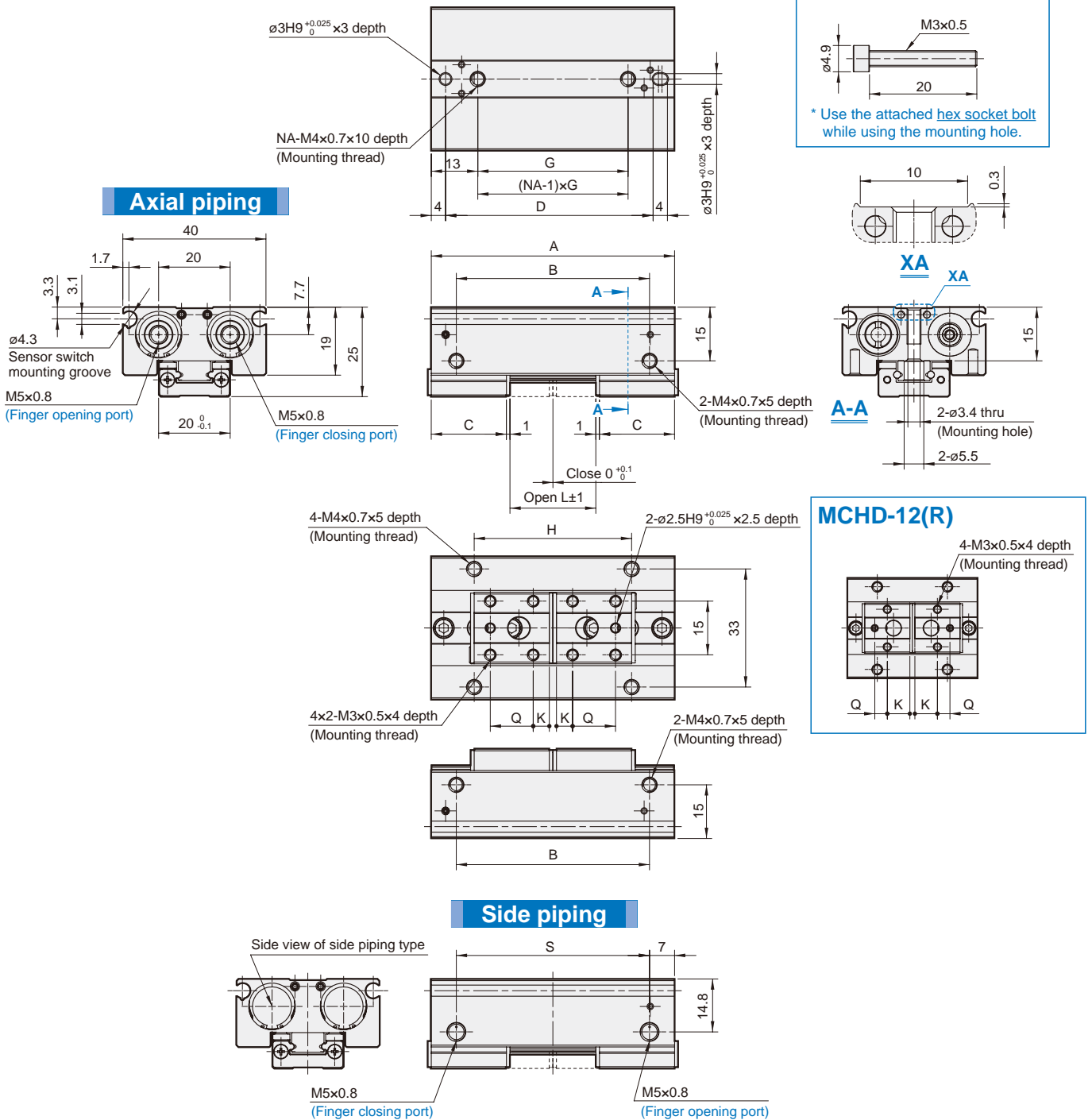


* Use the attached hex socket bolt while using the mounting hole.



Unit: mm

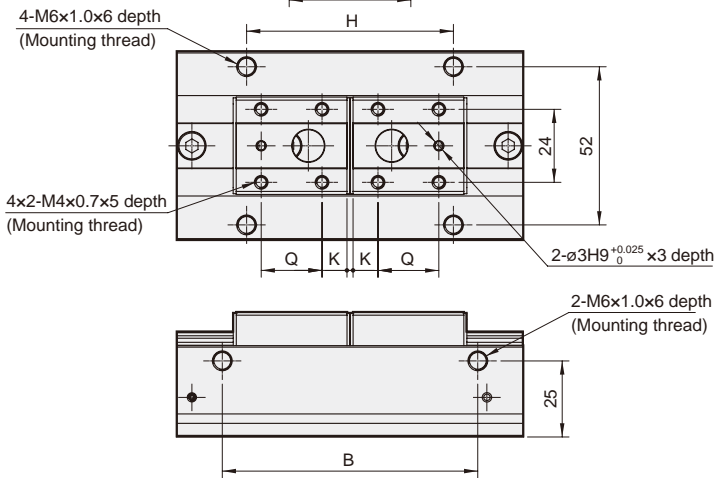
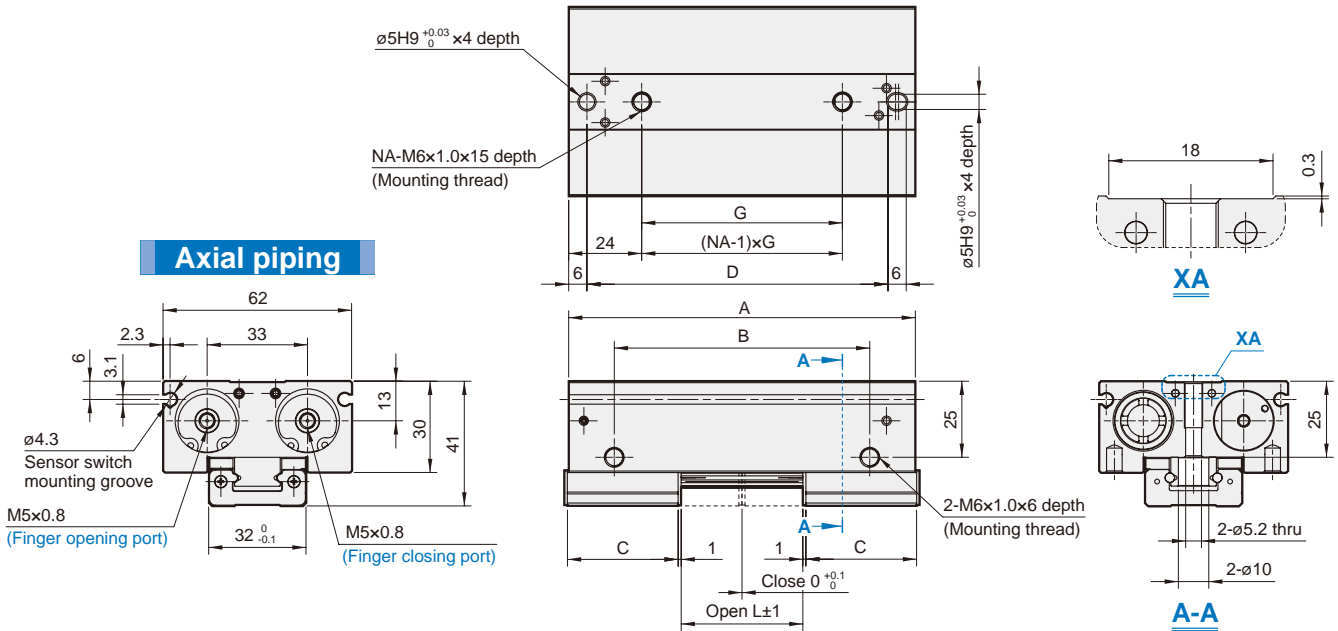
| Code Model | A | B | C | D | G | H | K | L | N | NA | Q | S |
|-------------|----|----|----|------|----|----|---|----|------|----|---|----|
| MCHD-8(R) | 36 | 22 | 12 | 28.3 | 16 | 14 | 6 | 8 | 10 | 2 | 4 | 25 |
| MCHD-8(R)-1 | 48 | 34 | 14 | 40.3 | 28 | 26 | 7 | 16 | 10 | 2 | 4 | 37 |
| MCHD-8(R)-2 | 72 | 58 | 18 | 64.3 | 17 | 50 | 5 | 32 | 10.5 | 4 | 8 | 61 |



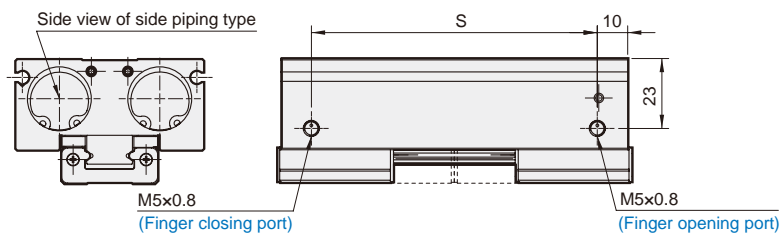
Unit: mm

| Code Model | A | B | C | D | G | H | K | L | NA | Q | S |
|---------------|-----|----|----|----|----|----|-----|----|----|----|----|
| MCHD-12(R) | 52 | 38 | 18 | 42 | 26 | 28 | 9 | 12 | 2 | 5 | 38 |
| MCHD-12(R)-1 | 68 | 54 | 21 | 58 | 42 | 44 | 4.5 | 24 | 2 | 12 | 54 |
| MCHD-12(R)-2 | 104 | 90 | 27 | 94 | 26 | 80 | 4.5 | 48 | 4 | 18 | 90 |

Axial piping

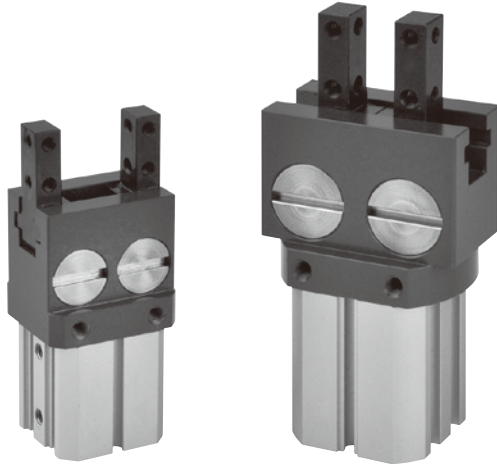


Side piping



Unit: mm

| Code Model | A | B | C | D | G | H | K | L | NA | Q | S |
|---------------|-----|-----|------|-----|----|-----|-----|----|----|----|-----|
| MCHD-20(R) | 86 | 56 | 31.4 | 71 | 38 | 40 | 7.7 | 20 | 2 | 16 | 66 |
| MCHD-20(R)-1 | 114 | 84 | 36.4 | 99 | 66 | 68 | 8.2 | 40 | 2 | 20 | 94 |
| MCHD-20(R)-2 | 174 | 144 | 46.4 | 159 | 42 | 128 | 8.2 | 80 | 4 | 30 | 154 |



Order example

MCHH – 25 M

MODEL

TUBE I.D.

M: Magnet

20
25
40

* Magnetic as standard.

Features

- With the same tube I.D., the gripping stroke is longer compare with other grippers.
- The plain bearing parts are hardened for longer effective life time.
- Three mounting directions are available.
- Magnetic as standard.

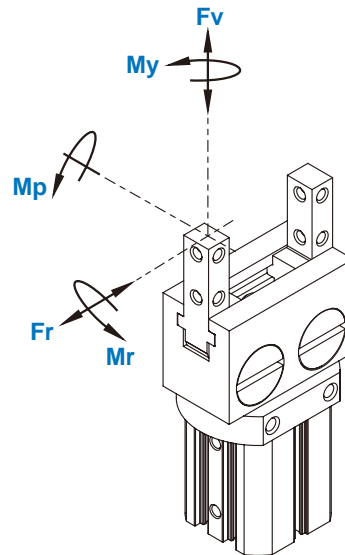
Specification

| Model | MCHH | | |
|--------------------------|-------------------------|----------------------------|------|
| Acting type | Double acting | | |
| Tube I.D. (mm) | 20 | 25 | 40 |
| Stroke | 16 | 26 | 41 |
| Medium | Air | | |
| Operating pressure range | 0.3~0.7 MPa | | |
| Ambient temperature | -10~+60°C (No freezing) | | |
| Lubrication (*1) | Not required | | |
| Repeatability | ± 0.03 mm | | |
| Max. operating frequency | 60 c.p.m | | |
| Sensor switch (*2) | 2 wire | RDVE(V): Non-contact | |
| | 3 wire | RNFE(V): NPN, RPFE(V): PNP | |
| Weight (kg) | 0.27 | 0.59 | 1.46 |

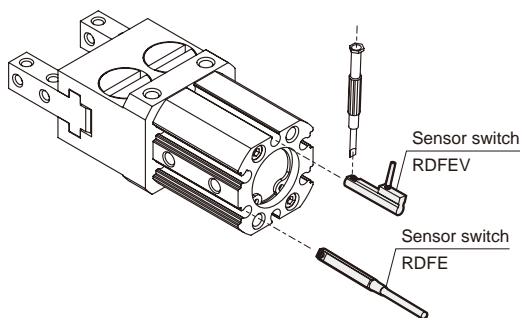
*1. Sliding area of jaws need scheduled relubrication.

*2. R*FE(V) specification, please refer to page 5-11.

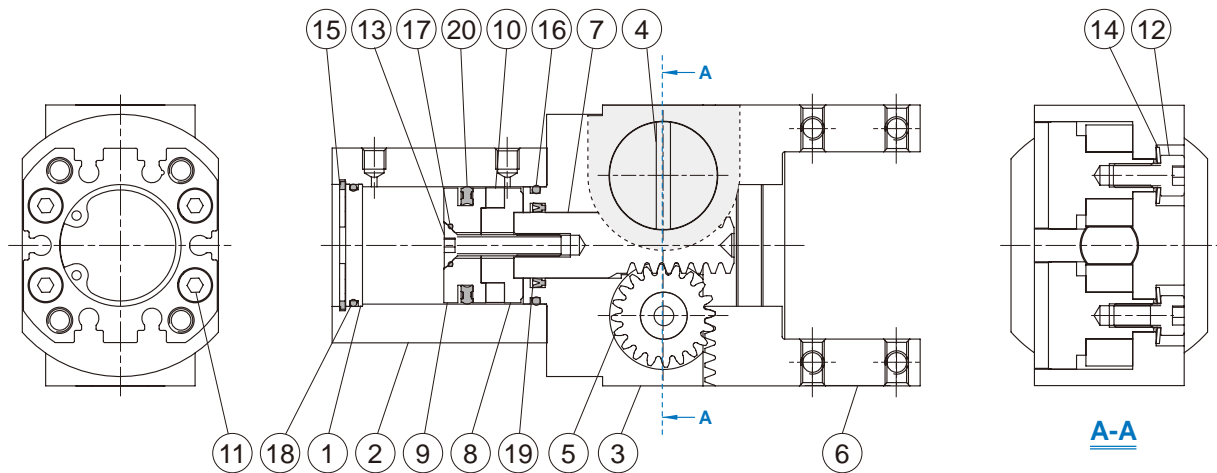
Load limit



Installation of sensor switch



| Code Tube I.D. | Mr max. (Nm) | Mp max. (Nm) | My max. (Nm) | Fv max. (N) | Fr max. (N) |
|-------------------|-----------------|-----------------|-----------------|----------------|----------------|
| 20 | 0.83 | 0.41 | 0.41 | 56.55 | 37.70 |
| 25 | 1.56 | 0.78 | 0.78 | 80.86 | 53.91 |
| 40 | 9.17 | 4.58 | 4.58 | 371.56 | 247.71 |



Material

| No. | Part name | Material | Q'y | Repair kits (inclusion) |
|-----|------------------|-----------------|--------|-------------------------|
| 1 | End cover | Aluminum alloy | 1 | |
| 2 | Body | Aluminum alloy | 1 | |
| 3 | Finger rail | Aluminum alloy | 1 | |
| 4 | Pinion holder | Carbon steel | 2 | |
| 5 | Pinion | Alloy steel | 2 | |
| 6 | Finger | Alloy steel | 2 | |
| 7 | Piston rod | Alloy steel | 1 | |
| 8 | Magnet holder | Aluminum alloy | 1 | |
| 9 | Piston | Aluminum alloy | 1 | |
| 10 | Magnet ring | Magnet material | 1 | |
| 11 | Hexgon bolt (*) | Steel | 2 or 4 | |
| 12 | Hexgon bolt | Steel | 2 | |
| 13 | Countersink bolt | Steel | 1 | |
| 14 | Washer | Spring steel | 2 | |
| 15 | Snap ring | Spring steel | 1 | |
| 16 | O-ring | NBR | 1 | ● |
| 17 | O-ring | NBR | 1 | ● |
| 18 | O-ring | NBR | 1 | ● |
| 19 | Rod packing | NBR | 1 | ● |
| 20 | Piston packing | NBR | 1 | ● |

* ø20 Q'y: 2 pcs, ø25 & ø40 Q'y: 4 pcs

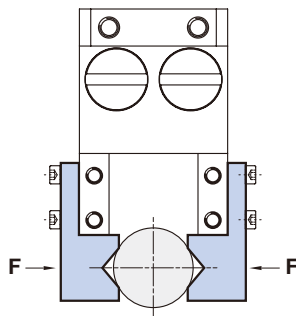
Order example of repair kits

| Tube I.D. | Repair kits |
|-----------|-------------------|
| ø20 | PS-MCHH-20 |
| ø25 | PS-MCHH-25 |
| ø40 | PS-MCHH-40 |

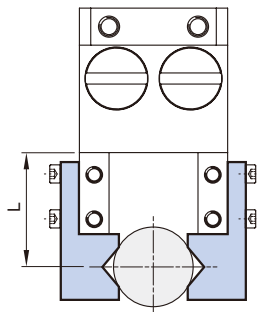
Effective gripping force

Indication of effective force.

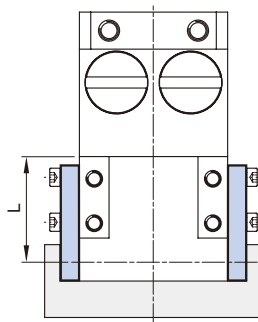
The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.



1N=0.102 kgf
1MPa=10.2 kgf/cm²

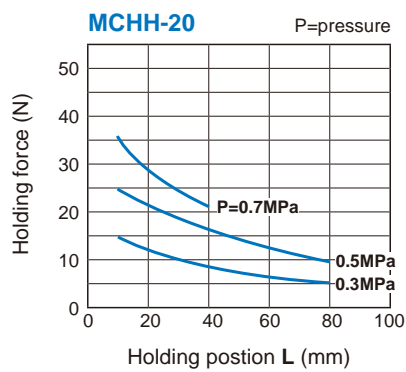


External grip

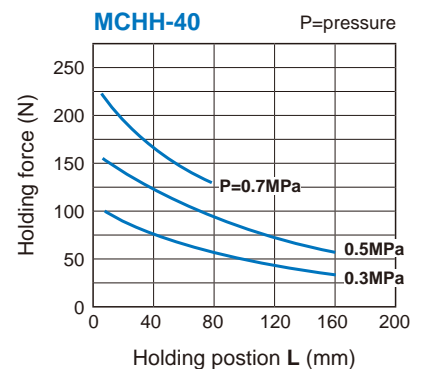
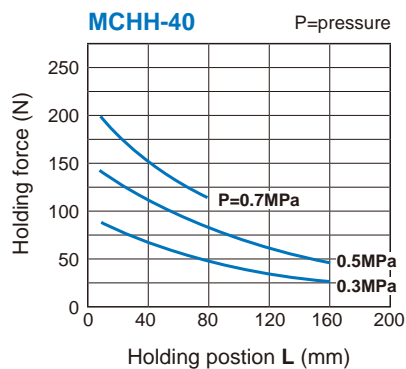
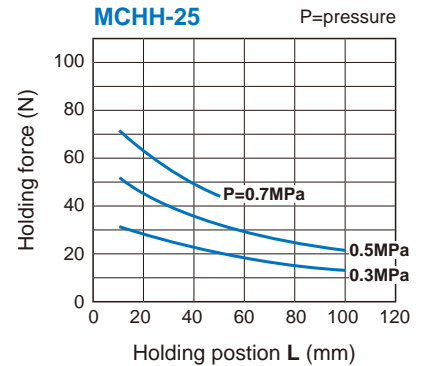
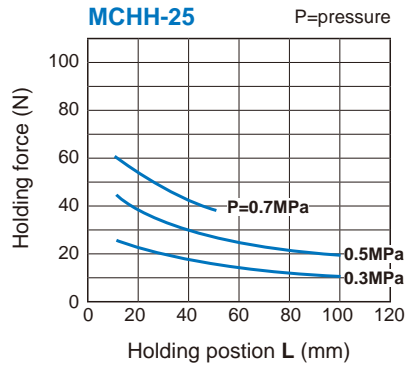
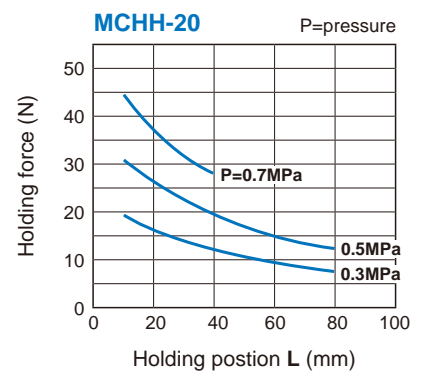


Internal grip

External grip

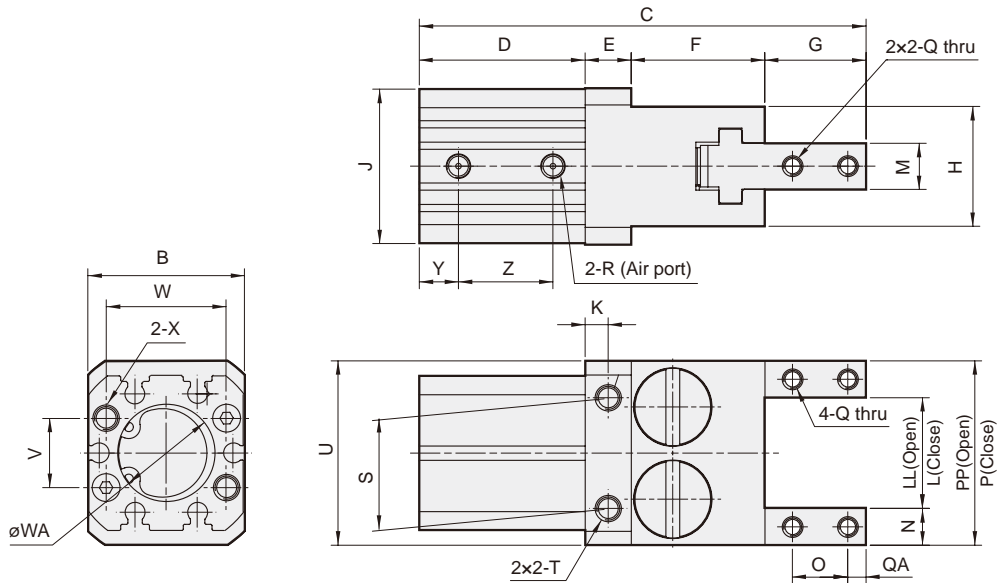


Internal grip

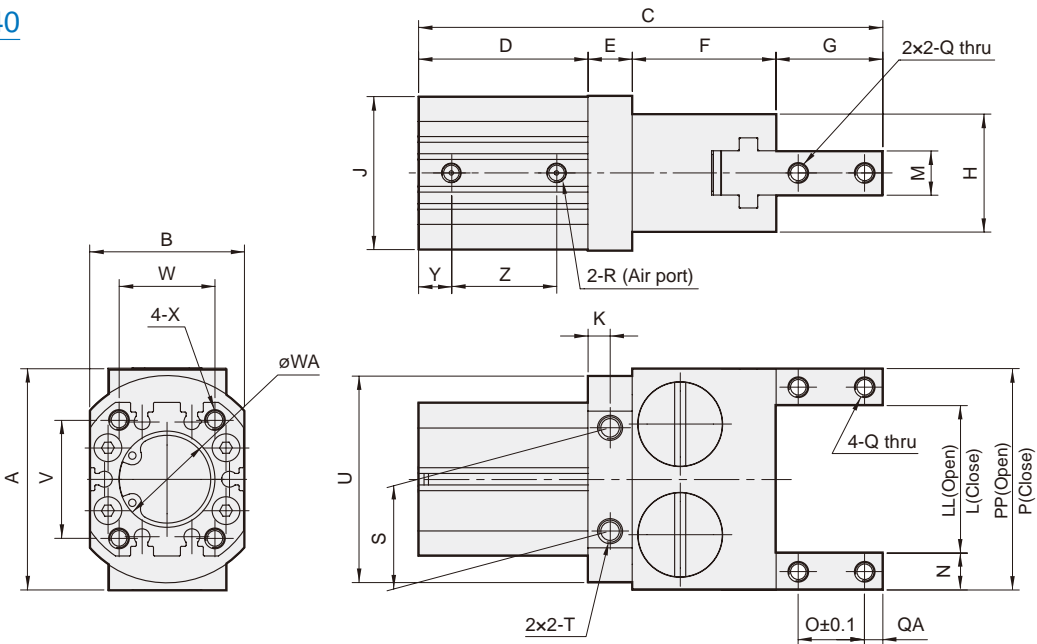


PARALLEL GRIPPER (2-Finger)

$\phi 20$

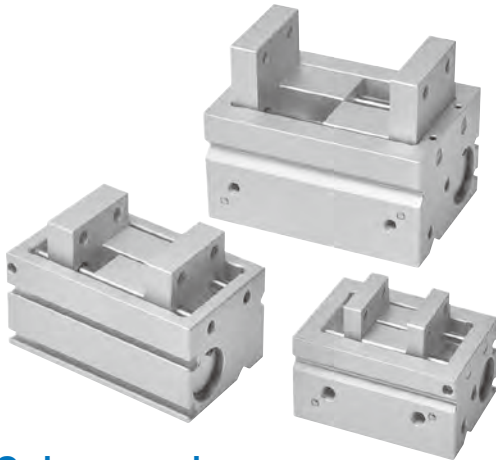


$\phi 25, \phi 40$



| Code Model | A | B | C | D | E | F | G | H | J | K | L | LL | M | N | O | P | PP | Q | QA | R | S | T | U |
|------------|----|----|-----|----|----|----|----|----|------|---|----|----|---------------------------|----|----|----|----|--------|----|--------|----|---------------|-----------|
| MCHH-20 | - | 34 | 97 | 36 | 10 | 29 | 22 | 26 | 33.5 | 5 | 8 | 24 | 10 ^{-0.01/-0.06} | 8 | 12 | 24 | 40 | M4x0.7 | 4 | M5x0.8 | 24 | M5x0.8x12 dp | 40 |
| MCHH-25 | 60 | 42 | 126 | 46 | 12 | 39 | 29 | 32 | 41.5 | 6 | 14 | 40 | 12 ^{-0.01/-0.06} | 10 | 18 | 34 | 60 | M5x0.8 | 5 | M5x0.8 | 28 | M6x1.0x14 dp | $\phi 56$ |
| MCHH-40 | 92 | 60 | 167 | 57 | 15 | 58 | 37 | 38 | 58 | 8 | 26 | 68 | 14 ^{-0.01/-0.06} | 12 | 20 | 50 | 92 | M6x1.0 | 7 | Rc1/8 | 42 | M8x1.25x14 dp | $\phi 82$ |

| Code Model | V | W | WA | X | Y | Z |
|------------|----|----|-----------------------------------|--------------|-----|------|
| MCHH-20 | 15 | 26 | $\phi 22^{+0.05}_0 \times 1.5$ dp | M5x0.8x10 dp | 8.5 | 20.5 |
| MCHH-25 | 32 | 26 | $\phi 26^{+0.05}_0 \times 1.5$ dp | M5x0.8x10 dp | 9 | 28.5 |
| MCHH-40 | 44 | 34 | $\phi 42^{+0.05}_0 \times 2$ dp | M6x1.0x12 dp | 11 | 28.5 |



Features

- Compact design, light weight with rugged construction.
- Jaws mounted to wear resistant bush guides.
- Magnetic as standard.

Specification

| Model | MCHU | | |
|---------------------|----------------------------|------|------|
| Acting type | Double acting | | |
| Tube I.D. (mm) | 12 | 16 | 20 |
| Stroke | 15 | 20 | 25 |
| Fluid | Air 0.2~0.7 MPa | | |
| Ambient temperature | -10~+60°C (No freezing) | | |
| Lubrication (*1) | Not required | | |
| Repeatability | ±0.03 mm | | |
| Sensor switch (*2) | RDFE(V): Non-contact | | |
| | RNFE(V): NPN, RPFE(V): PNP | | |
| Weight (kg) | 0.16 | 0.29 | 0.58 |

*1. Sliding area of jaws need scheduled relubrication.
 *2. R*FE(V) specification, please refer to page 5-11.

Order example

MCHU – 12 M

MODEL

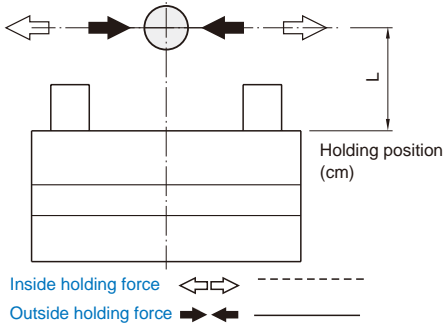
TUBE I.D.

M: Magnet

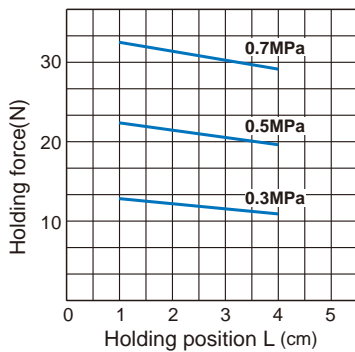
* Magnetic as standard.

12
16
20

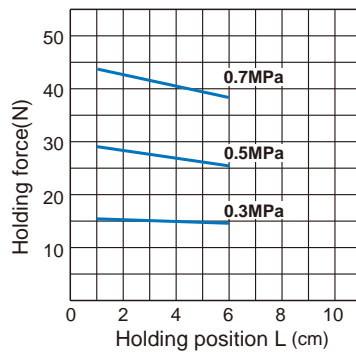
Capacity



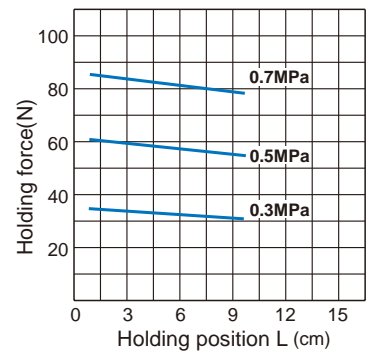
MCHU-12



MCHU-16



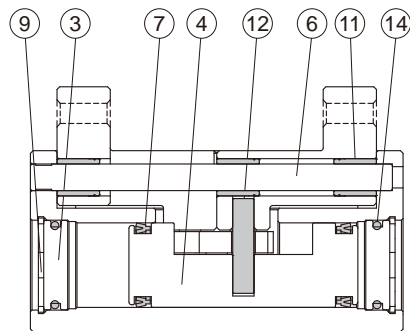
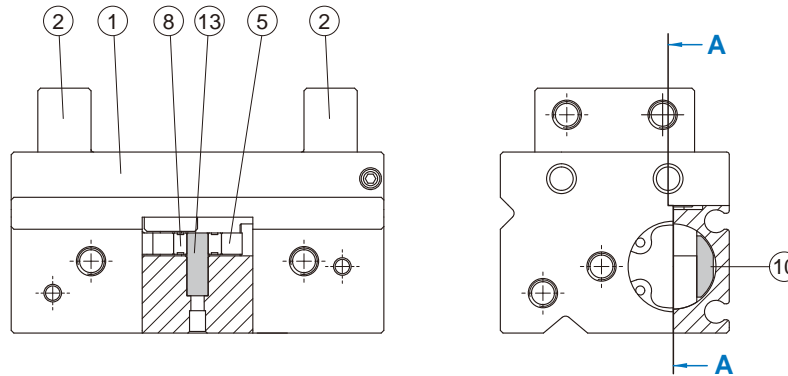
MCHU-20



Model selection suggestions

* Finger selection please refer to page 3-2.

1. For normal gripping and carrying usage, the recommended safe factor (a) is 4.
2. The value of gripping force of single finger can be found at the gripping force table.
3. The safe factor (a) have to be higher if the gripper is using at high acceleration or impact condition.



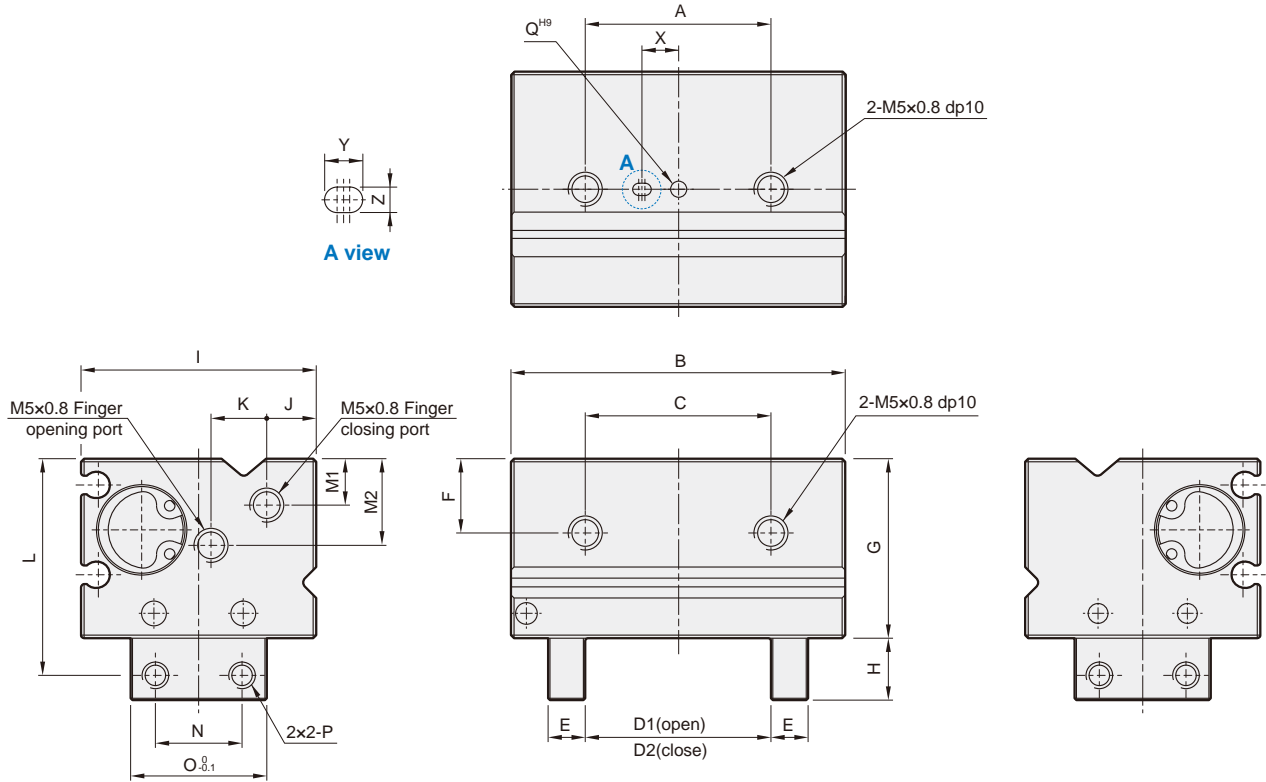
A-A

Material

| No. | Tube I.D. Part name | 12 | 16 | 20 | Q'y | Repair kits (inclusion) |
|-----|------------------------|-----------------|--------------|----|-----|----------------------------|
| 1 | Body | Aluminum alloy | | | 1 | |
| 2 | Finger | Aluminum alloy | | | 2 | |
| 3 | Cover | Aluminum alloy | | | 2 | |
| 4 | Piston | Stainless steel | | | 1 | |
| 5 | Cam | SCM | | | 1 | |
| 6 | Guide rod | SUS | Carbon steel | | 2 | |
| 7 | Piston packing | NBR | | | 2 | ● |
| 8 | Bearing | Bearing steel | | | 1 | |
| 9 | Snap ring | Spring steel | | | 2 | |
| 10 | Magnet | Magnet material | | | 1 | |
| 11 | Bush | Carbon steel | | | 6 | |
| 12 | Pin | Carbon steel | | | 2 | |
| 13 | Pin | Carbon steel | | | 1 | |
| 14 | O-ring | NBR | | | 2 | ● |

Order example Repair kits

| Tube I.D. | Repair kits |
|-----------|-------------------|
| ø12 | PS-MCHU-12 |
| ø16 | PS-MCHU-16 |
| ø20 | PS-MCHU-20 |



| Code Tube I.D. | A | B | C | D1 | D2 | E | F | G | H | I | J | K | L | M1 | M2 | N | O | P | Q ^{H9} | X | Y | Z ^{H9} |
|-------------------|----|----|----|----|----|----|------|----|----|----|----|----|----|-----|------|----|----|--------|---------------------------------------|----|---|---------------------------|
| 12 | 30 | 54 | 30 | 30 | 15 | 6 | 12 | 29 | 10 | 38 | 8 | 9 | 35 | 7.5 | 14 | 14 | 22 | M4x0.7 | $\varnothing 2^{+0.025}_0 \times 2dp$ | 6 | 3 | $2^{+0.025}_0 \times 2dp$ |
| 16 | 40 | 70 | 40 | 40 | 20 | 10 | 13.5 | 34 | 12 | 43 | 8 | 11 | 41 | 7.5 | 12.5 | 18 | 30 | M5x0.8 | $\varnothing 3^{+0.025}_0 \times 4dp$ | 10 | 4 | $3^{+0.025}_0 \times 4dp$ |
| 20 | 60 | 82 | 60 | 50 | 25 | 10 | 15 | 43 | 22 | 56 | 10 | 15 | 59 | 9 | 20 | 20 | 35 | M5x0.8 | $\varnothing 3^{+0.025}_0 \times 6dp$ | 15 | 4 | $3^{+0.025}_0 \times 6dp$ |



Features

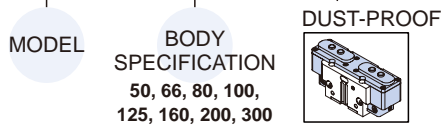
- Compact design to ensure minimum interference while operating; robust T rail design, ensure accurate gripping.
- Can reach maximum torque suitable for long jaws design.
- Oval piston-driven design ensure maximum gripping force.
- Hose-free direct connection: Air supply channel can connect directly without piping or through tread to assure the flexibility of supplying compressed air on any kind of automation system.
- Magnetic as standard.

Specification

| Model | MCCHS | | | | | | | |
|--|--------------------------------|----------------------------------|-------|------|-----|-----|------|------|
| Acting type | Double acting | | | | | | | |
| Body specification | 50 | 66 | 80 | 100 | 125 | 160 | 200 | 300 |
| Stroke per-jaw(mm) | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 30 |
| Effective external gripping force (N) (*1) | 77 | 135 | 285 | 359 | 600 | 884 | 1606 | 3411 |
| Close/Open time(s) | 0.02 | 0.03 | 0.04 | 0.07 | 0.1 | 0.1 | 0.35 | 0.4 |
| Medium | Air | | | | | | | |
| Operating pressure range | 0.3~0.8 MPa | | | | | | | |
| Compressed air consumption(cm³) | 4.1 | 10.1 | 23.6 | 39.3 | 85 | 85 | 330 | 1000 |
| Ambient temperature | +5°C~ +80°C | | | | | | | |
| Lubrication | Not required | | | | | | | |
| Sensor switch (*2) | 2 wire | RDVE(V): Non-contact | | | | | | |
| | 3 wire | RNFE(V): NPN, RPFE(V): PNP | | | | | | |
| Proximity sensor | — | RDP8 (Please refer to page 5-14) | | | | | | |
| Accessories | Mounting block, Accessory kits | | | | | | | |
| Weight (kg) | 0.14 | 0.27 | 0.495 | 0.85 | 1.6 | 3.0 | 5.7 | 14.2 |

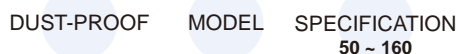
Order example

MCCHS — 50 — SD

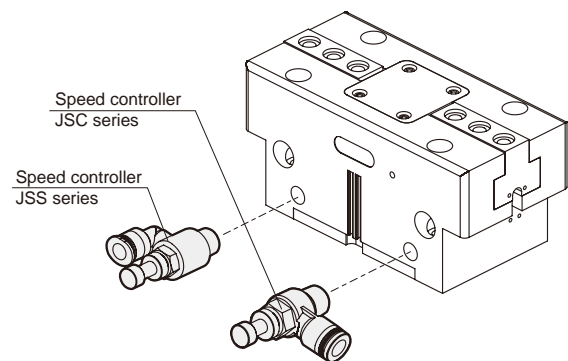
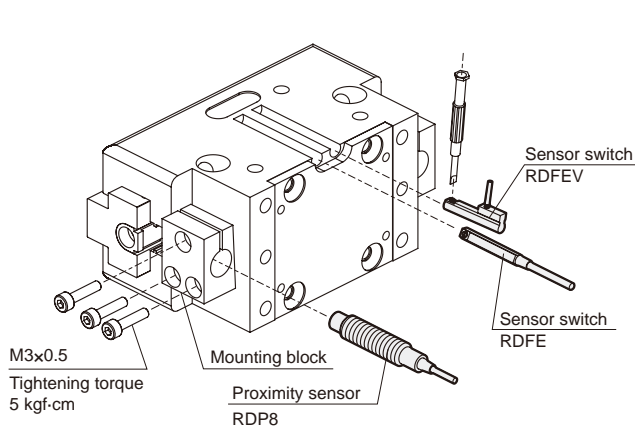


Dust-proof

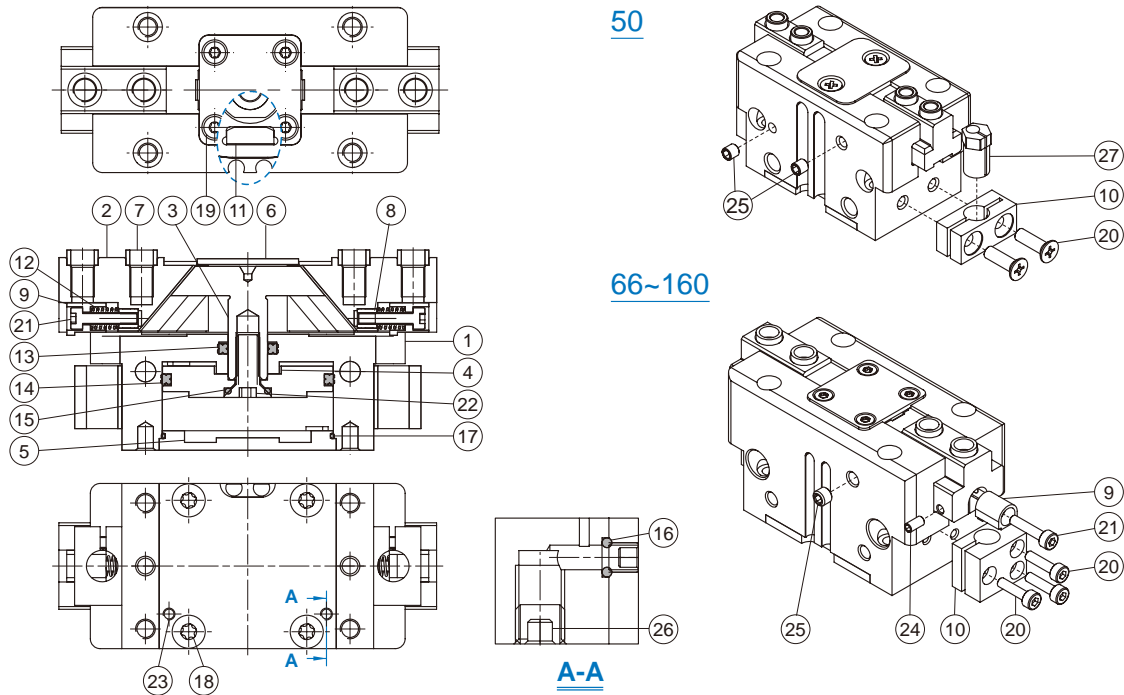
SD — MCCHS — 50



Installation of sensor switch & speed controller



* Each gripper needs at least two speed control valves to control speed.
* Speed controller specification, please refer to page 8-15~17 (Vol.1).



Material





| No. | Part name | Material | Body spec & Q'y | | | | | | Repair kits (inclusion) |
|-----|------------------|------------------|-----------------|----|----|-----|-----|-----|-------------------------|
| | | | 50 | 66 | 80 | 100 | 125 | 160 | |
| 1 | Body | Aluminum alloy | 1 | | | | | | |
| 2 | Finger | Mid carbon steel | 2 | | | | | | |
| 3 | Rod | Mid carbon steel | 1 | | | | | | |
| 4 | Piston | Aluminum alloy | 1 | | | | | | |
| 5 | End cover | Aluminum alloy | 1 | | | | | | |
| 6 | Plate cover | Stainless steel | 1 | | | | | | |
| 7 | Centering sleeve | Stainless steel | 4 | | | | | | |
| 8 | Thread insert | Brass | - | | | 2 | | | |
| 9 | Sensor adj block | Aluminum alloy | - | | | 2 | | | |
| 10 | Sensor holder | PBT+30%GF | 2 | | | | | | |
| 11 | Magnet | Magnet material | 1 | | | | | | |
| 12 | Spring | SWP | - | | | 2 | | | |
| 13 | Rod packing | NBR | 1 | | | | | | ● |
| 14 | Piston packing | NBR | 1 | | | | | | ● |
| 15 | O-ring | NBR | 1 | | | | | | ● |
| 16 | O-ring | NBR | 3 | 4 | 2 | | | ● | |
| 17 | O-ring | NBR | 1 | | | | | | ● |
| 18 | Screw | Carbon steel | 4 | | | | | | |
| 19 | Screw | Carbon steel | 2 | 4 | | | | | |
| 20 | Bolt | Stainless steel | 4 | 6 | | | | | |
| 21 | Hex bolt | Stainless steel | - | | | 2 | | | |
| 22 | Hex bolt | Stainless steel | 1 | | | | | | |
| 23 | Hex screw | Stainless steel | 2 | | | | | | |
| 24 | Hex screw | Carbon steel | 4 | | | | | | |
| 25 | Hex screw | Stainless steel | 2 | | | | | | |
| 26 | Hex screw | Stainless steel | 2 | | | | | | |
| 27 | Adjust socket | Stainless steel | 2 | - | | | | | |

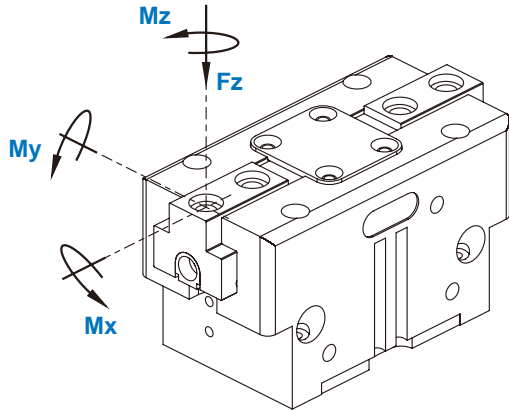
Order example of repair kits

| Model | Repair kits |
|----------|--------------------|
| MCHS-50 | PS-MCHS-50 |
| MCHS-66 | PS-MCHS-66 |
| MCHS-80 | PS-MCHS-80 |
| MCHS-100 | PS-MCHS-100 |
| MCHS-125 | PS-MCHS-125 |
| MCHS-160 | PS-MCHS-160 |

Order example of accessory kits

| Model | Accessory kits |
|----------|--------------------|
| MCHS-50 | AK-MCHS-50 |
| MCHS-66 | AK-MCHS-66 |
| MCHS-80 | AK-MCHS-80 |
| MCHS-100 | AK-MCHS-100 |
| MCHS-125 | AK-MCHS-125 |
| MCHS-160 | AK-MCHS-160 |

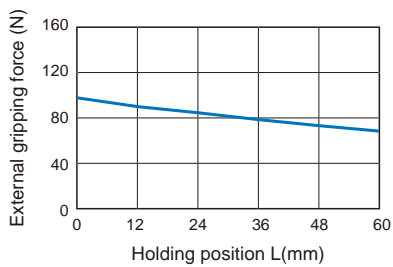
| | |
|---|---|
|  |  |
| O-ring (x2) | Iron plug (x2) |
|  |  |
| PIN (x2) | Centering sleeve (x4) |



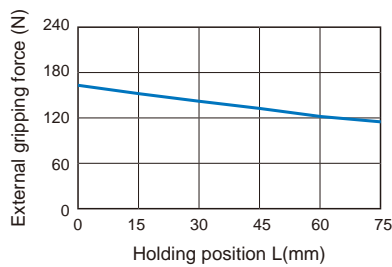
| Code Model | Mx max. (Nm) | My max. (Nm) | Mz max. (Nm) | Fz max. (N) |
|-----------------|--------------|--------------|--------------|-------------|
| MCHS-50 | 15 | 15 | 8 | 700 |
| MCHS-66 | 50 | 45 | 35 | 1200 |
| MCHS-80 | 80 | 60 | 50 | 1800 |
| MCHS-100 | 100 | 90 | 75 | 2500 |
| MCHS-125 | 120 | 120 | 100 | 3200 |
| MCHS-160 | 160 | 180 | 140 | 5000 |
| MCHS-200 | 180 | 220 | 170 | 7000 |
| MCHS-300 | 275 | 300 | 200 | 9000 |

Holding force

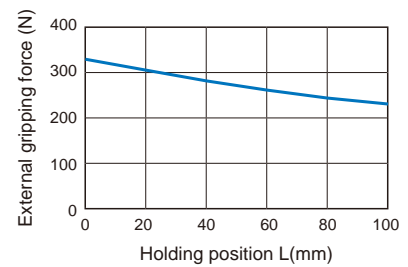
MCHS-50



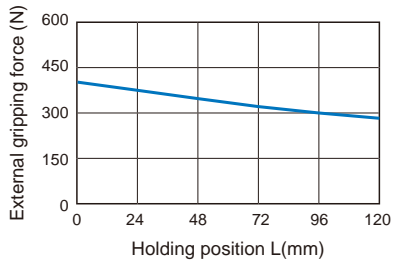
MCHS-66



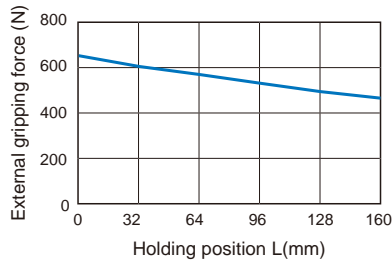
MCHS-80



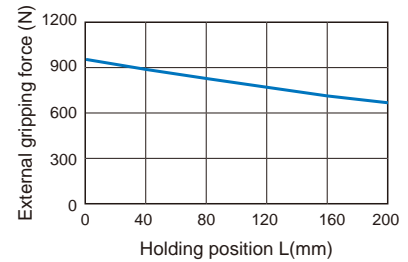
MCHS-100



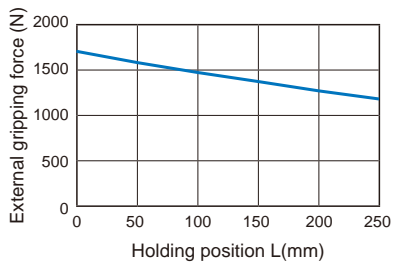
MCHS-125



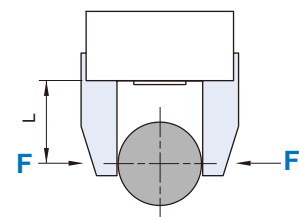
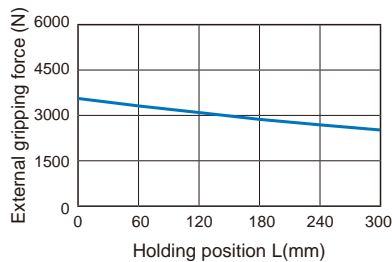
MCHS-160



MCHS-200

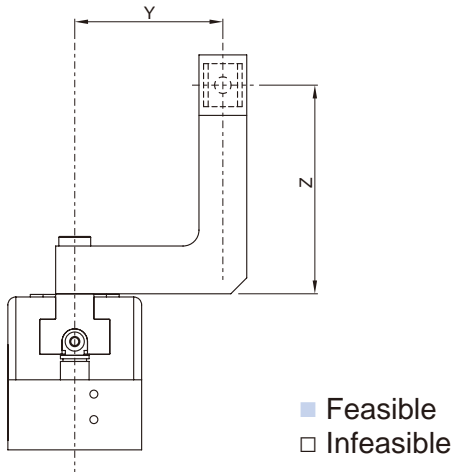


MCHS-300

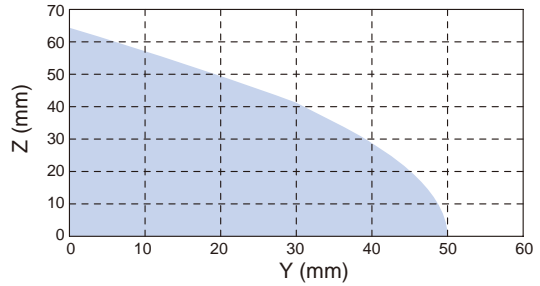


* Operating pressure 0.6 MPa.

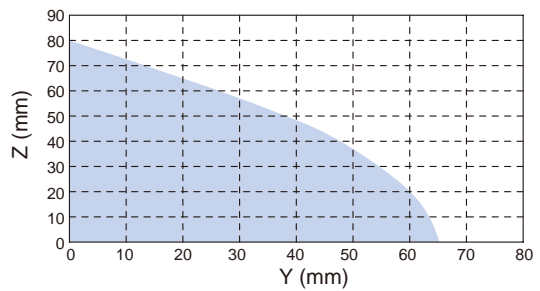
Max. feasible centrifugal degree



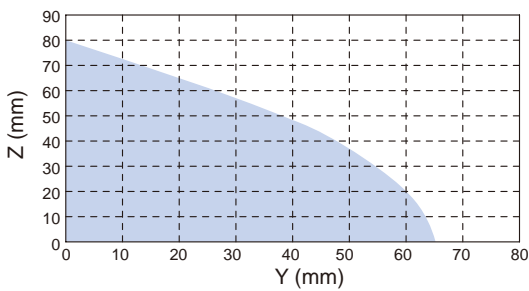
MCHS-50



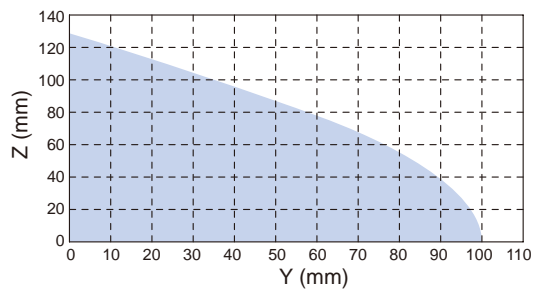
MCHS-66



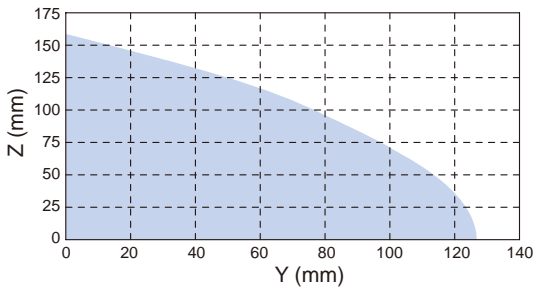
MCHS-80



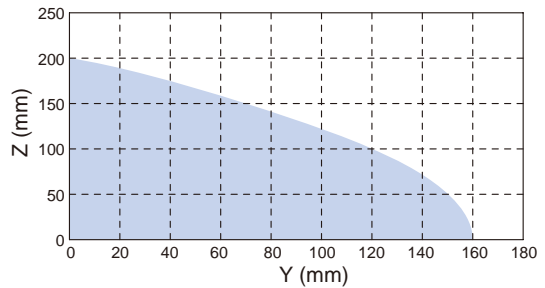
MCHS-100



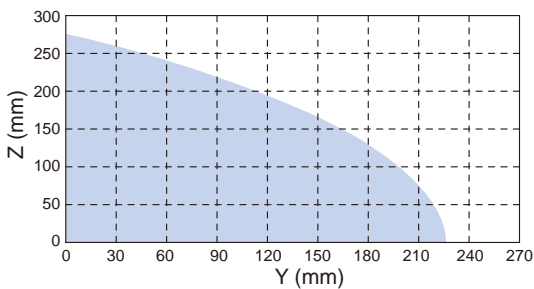
MCHS-125



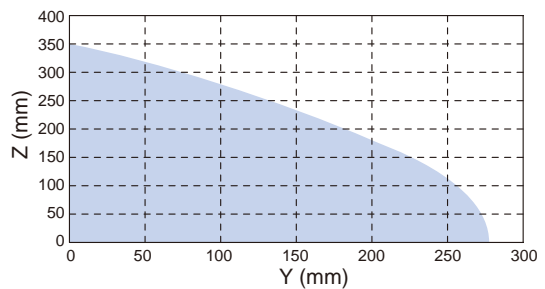
MCHS-160



MCHS-200



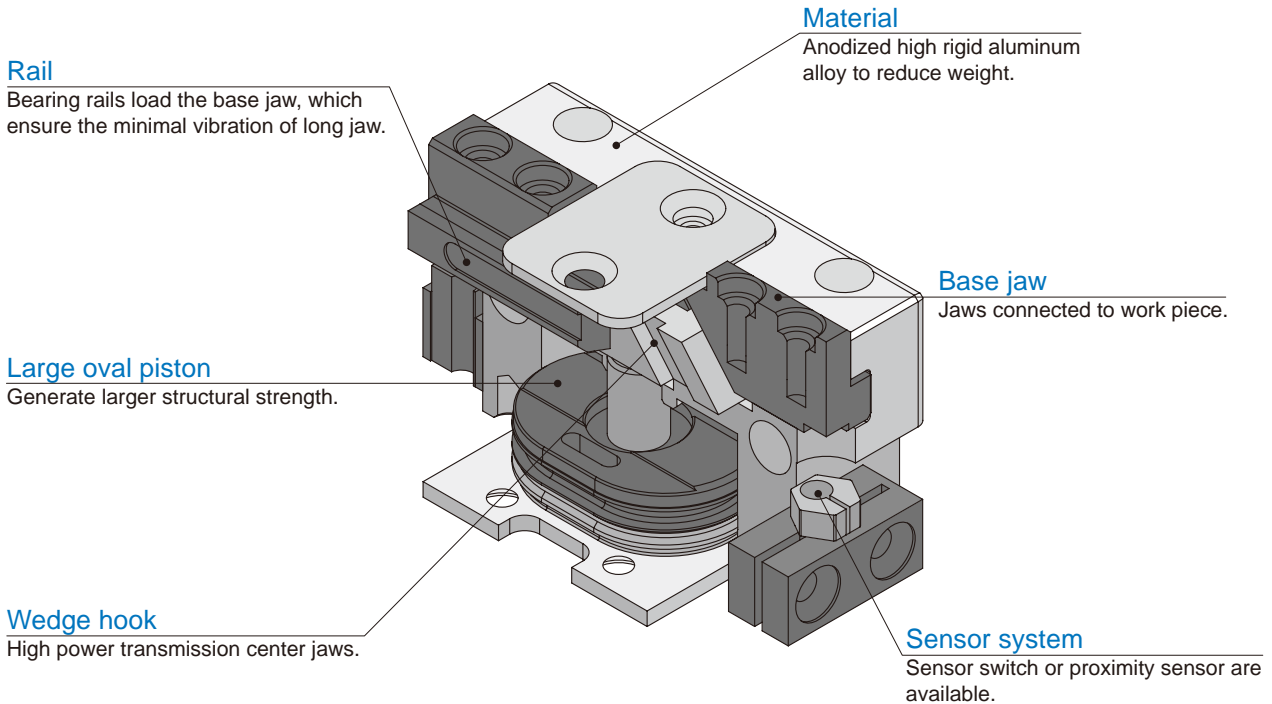
MCHS-300



PARALLEL GRIPPER (2-Finger)

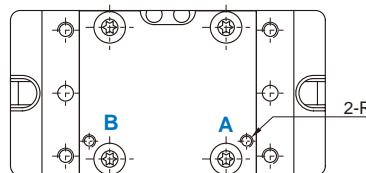
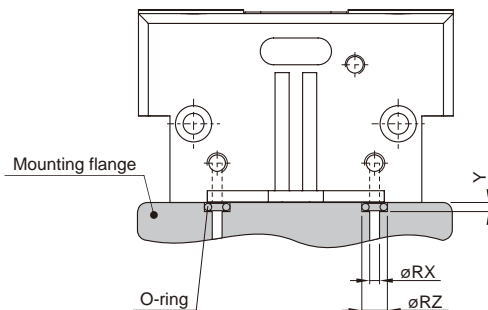
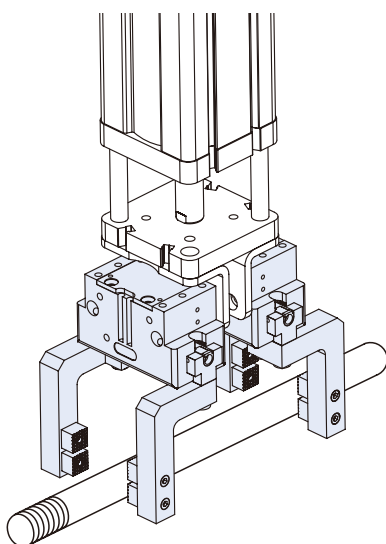
Internal structure & Movement description

Compressed air will push or press the oval piston.
By tilting the working surface, the wedge hook will transfer the movement to side movement, and initiate the action of the two base jaws simultaneously.



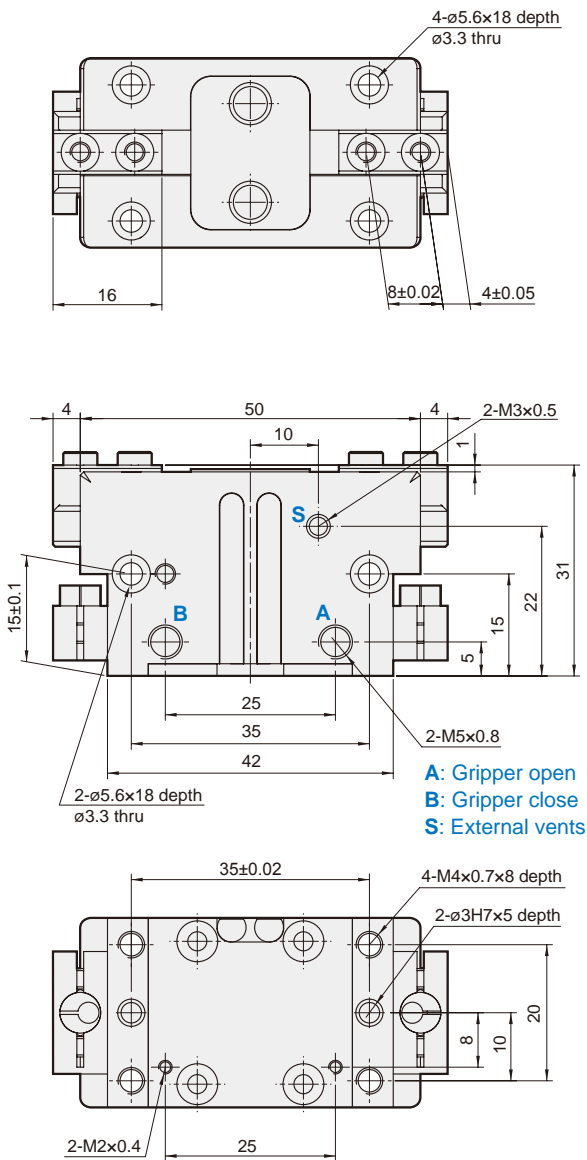
Application examples

Hose-free direct connection

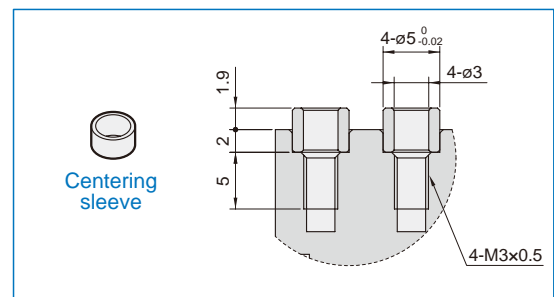


| Code Model | R | RX | RZ | Y |
|------------|----|----|----|-----|
| MCHS-50 | M2 | 2 | 4 | 0.7 |
| MCHS-66 | M3 | 3 | 5 | 0.7 |
| MCHS-80 | M3 | 3 | 5 | 0.7 |
| MCHS-100 | M5 | 5 | 8 | 1.1 |
| MCHS-125 | M5 | 5 | 8 | 1.1 |
| MCHS-160 | M5 | 5 | 8 | 1.1 |
| MCHS-200 | M5 | 5 | 8 | 1.1 |
| MCHS-300 | M5 | 5 | 8 | 1.1 |

A : Gripper open
B : Gripper close



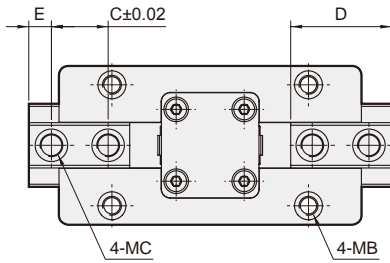
Centering sleeve



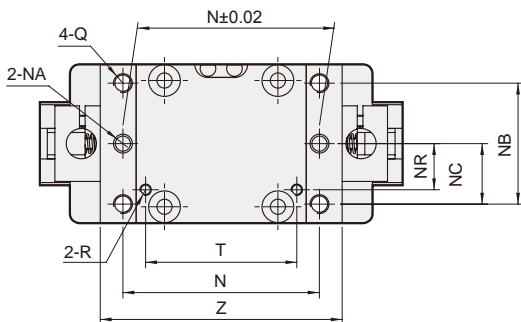
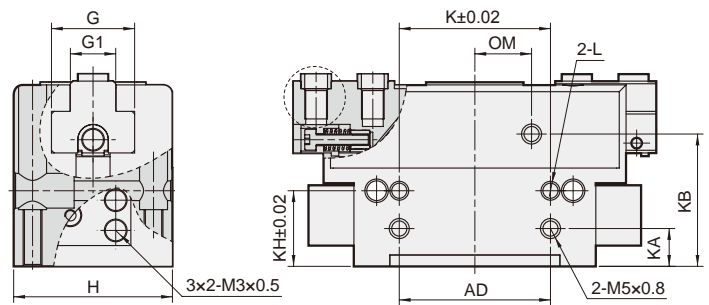
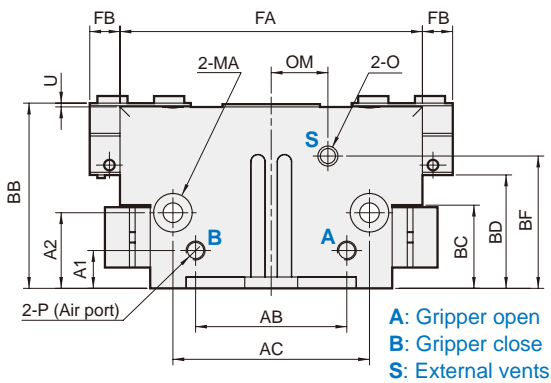
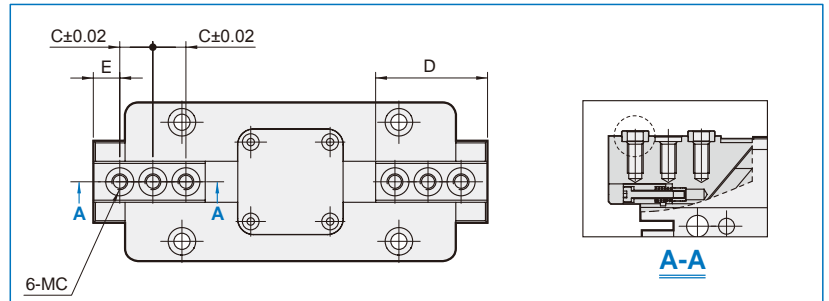
PARALLEL GRIPPER (2-Finger)

mindman

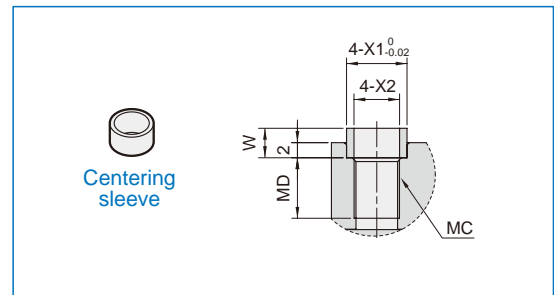
66~100



125~160

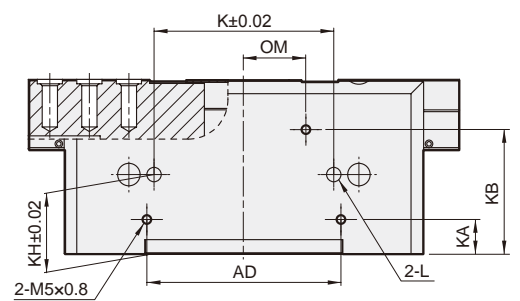
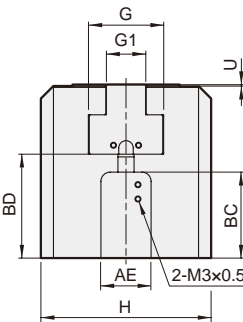
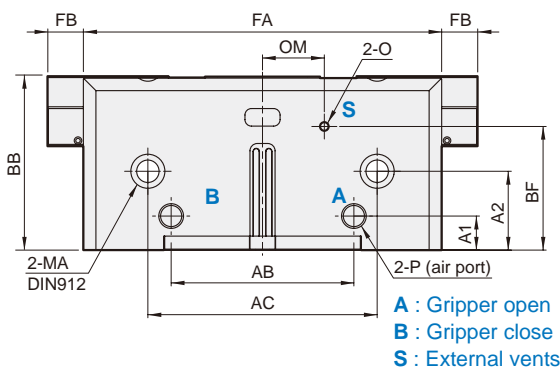
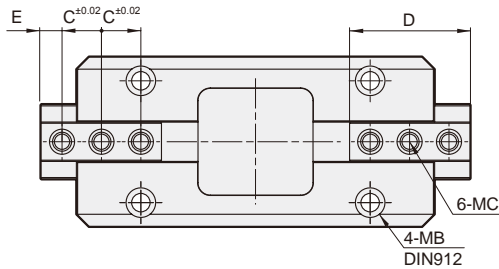


Centering sleeve

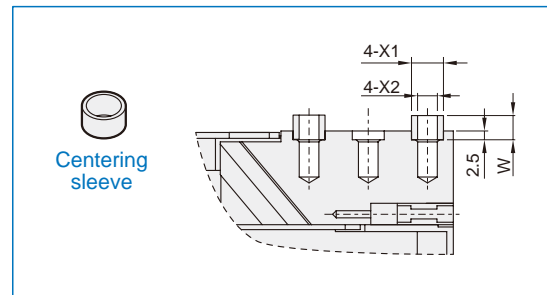
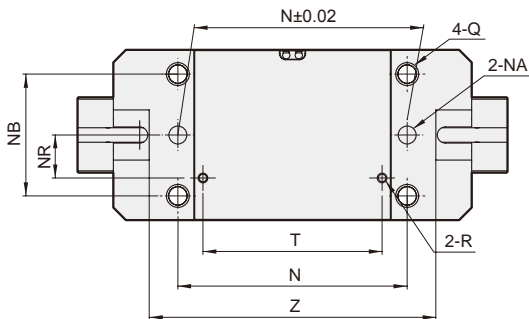


| Code Spec. | A1 | A2 | AB | AC | AD | BB | BC | BD | BF | C | D | E | FA | FB | G | G1 | H | K | KA | KB | KH | L | MA |
|------------|------|----|----|-----|----|----|------|------|------|------|------|----|-----|----|----|------|----|----|------|------|----|-----------|-----------------------|
| 66 | 5 | 18 | 28 | 42 | 28 | 39 | 18.5 | 23 | 27.5 | 12 | 22 | 5 | 64 | 6 | 17 | 10 | 36 | 20 | 5 | 27.5 | 18 | ø4H7x4dp | ø7.4x13dp, ø4.2 thru |
| 80 | 10 | 20 | 40 | 52 | 40 | 49 | 22 | 30 | 35 | 15 | 26.7 | 6 | 80 | 8 | 22 | 12 | 42 | 40 | 10 | 35 | 20 | ø4H7x6dp | ø9.2x16dp, ø5.2 thru |
| 100 | 12 | 25 | 48 | 66 | 54 | 55 | 28 | 33 | 38 | 18 | 34.2 | 10 | 100 | 10 | 26 | 14 | 50 | 50 | 12 | 38 | 25 | ø5H7x7dp | ø10.4x28dp, ø6.2 thru |
| 125 | 13 | 30 | 62 | 82 | 65 | 64 | 32 | 38.5 | 45 | 12.5 | 42.3 | 10 | 125 | 12 | 31 | 15.5 | 60 | 60 | 13 | 45 | 30 | ø6H7x8dp | ø13.5x34dp, ø8.4 thru |
| 160 | 15.5 | 28 | 78 | 100 | 82 | 78 | 39 | 46 | 53 | 18 | 54.8 | 10 | 160 | 16 | 39 | 20 | 72 | 76 | 15.5 | 53 | 28 | ø6H7x10dp | ø13.5x47dp, ø8.4 thru |

| Code Spec. | MB | MC | MD | N | NA | NB | NC | NR | O | OM | P | Q | R | T | U | W | X1 | X2 | Z |
|------------|-----------------------|---------|----|-----|----------|----|------|------|--------|----|--------|--------------|--------|----|---|-----|-----|----|-----|
| 66 | ø7.4x24dp, ø4.2 thru | M4x0.7 | 6 | 42 | ø4H7x6dp | 27 | 13.5 | 11 | M5x0.8 | 12 | M5x0.8 | M5x0.8x10dp | M3x0.5 | 28 | 1 | 3.9 | ø6 | ø4 | 52 |
| 80 | ø7.4x33dp, ø4.3 thru | M6x1.0 | 8 | 52 | ø4H7x6dp | 32 | 16 | 12.2 | M5x0.8 | 15 | M5x0.8 | M5x0.8x10dp | M3x0.5 | 40 | 1 | 3.9 | ø8 | ø6 | 64 |
| 100 | ø9x21.5dp, ø5.1 thru | M6x1.0 | 10 | 66 | ø5H7x8dp | 38 | 19 | 16 | M5x0.8 | 16 | G1/8 | M6x1.0x10dp | M5x0.8 | 48 | 1 | 3.9 | ø10 | ø6 | 80 |
| 125 | ø10.4x40dp, ø6.8 thru | M6x1.0 | 12 | 82 | ø6H7x8dp | 45 | 22.5 | 18 | M5x0.8 | 20 | G1/8 | M8x1.25x10dp | M5x0.8 | 60 | 1 | 3.9 | ø10 | ø6 | 100 |
| 160 | ø10.4x37dp, ø6.8 thru | M8x1.25 | 12 | 100 | ø6H7x8dp | 56 | 28 | 22 | M5x0.8 | 27 | G1/8 | M8x1.25x10dp | M5x0.8 | 76 | 1 | 3.9 | ø12 | ø8 | 125 |



Centering sleeve



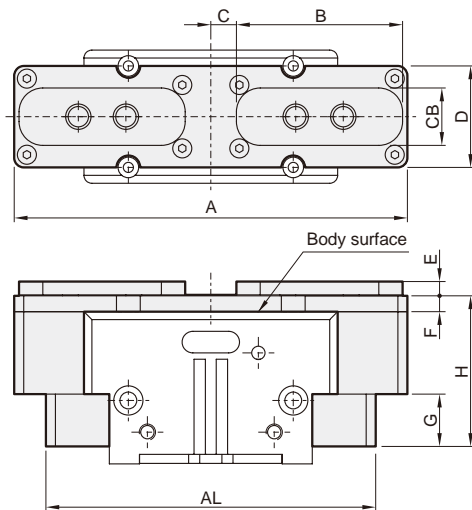
| Code Spec. | A1 | A2 | AB | AC | AD | AE | BB | BC | BD | BF | C | D | E | FA | FB | G | G1 | H | K | KA | KB | KH | L |
|------------|----|----|-----|-----|-----|----|-----|----|----|----|----|------|----|-----|----|----|----|-----|-----|----|----|----|-------------|
| 200 | 19 | 44 | 102 | 128 | 108 | 28 | 97 | 48 | 58 | 69 | 22 | 67.5 | 12 | 200 | 20 | 42 | 22 | 95 | 100 | 19 | 69 | 44 | ø8H7x8 dp |
| 300 | 19 | 66 | 150 | 180 | 152 | 30 | 130 | 67 | 78 | 92 | 30 | 91.0 | 15 | 260 | 30 | 66 | 32 | 139 | 140 | 19 | 92 | 66 | ø10H7x12 dp |

| Code Spec. | MA | MB | MC | MD | N | NA | NB | NR | O | OM | P |
|------------|--------------------------|-------------------------|----------------|----|-----|-------------|-----|----|--------|------|------|
| 200 | ø19x55 dp, ø12.5 thru | ø16.5x62 dp, ø10.2 thru | M10x1.5x20 dp | 20 | 128 | ø10H7x10 dp | 68 | 24 | M5x0.8 | 34.5 | G1/4 |
| 300 | ø18.5x100 dp, ø12.4 thru | ø16.5x72 dp, ø10.2 thru | M12x1.75x20 dp | 20 | 180 | ø10H7x12 dp | 100 | 24 | M5x0.8 | 43 | G1/4 |

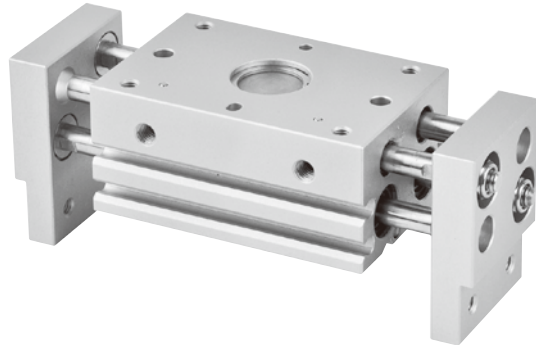
| Code Spec. | Q | R | T | U | W | X1 | X2 | Z |
|------------|----------------|--------|-----|-----|-----|-------|-------|-----|
| 200 | M12x1.75x17 dp | M5x0.8 | 100 | 0.8 | 4.9 | ø14h7 | ø11 | 160 |
| 300 | M12x1.75x16 dp | M5x0.8 | 150 | 0.8 | 4.9 | ø18h7 | ø12.5 | 220 |

PARALLEL GRIPPER (2-Finger)

- For dusty environment usage.
- When installing soft-jaws, the length of jaws are measured from the the body surface.
- Heat resistance type of modules are also available. Please contact our sales department.



| Code Spec. | A | AL | B | C | CB | D | E | F | G | H |
|------------|------|------|------|------|------|----|-----|---|------|------|
| 50 | 81.2 | 58.6 | 30 | 6 | 13 | 24 | 4.5 | 5 | 12 | 32 |
| 66 | 104 | 92 | 41 | 6.5 | 16.2 | 30 | 4.5 | 5 | 16.5 | 41 |
| 80 | 124 | 104 | 52.4 | 8.3 | 18.1 | 32 | 4.5 | 5 | 16.5 | 47.5 |
| 100 | 144 | 124 | 61 | 10.5 | 22 | 38 | 4.5 | 5 | 16.5 | 49 |
| 125 | 177 | 157 | 72 | 16 | 22 | 45 | 4.5 | 5 | 23 | 59 |
| 160 | 231 | 182 | 93 | 21.5 | 25 | 56 | 4.5 | 6 | 18 | 62 |



Order example

MCHX – 16 – 30 M

| MODEL | TUBE I.D. | STROKE | M: Magnet |
|-------|-----------|---------------|-------------------------|
| | 10 | 20, 40, 60 | * Magnetic as standard. |
| | 16 | 30, 60, 80 | |
| | 20 | 40, 80, 100 | |
| | 25 | 50, 100, 120 | |
| | 32 | 70, 120, 160 | |
| | 40 | 100, 160, 200 | |

Features

- Rack and pinion construction enable synchronisation of both jaws enabling smooth and consistent gripping force.
- Wide range of strokes available.
- Dust seals protect all internal parts from ingress of dirt.
- Proximity and reed switches can be used with this unit.
- Magnetic as standard.

Specification

| Model | MCHX | | | | | |
|--------------------------|--|----|----|----|----|----|
| Acting type | Double acting | | | | | |
| Tube I.D. (mm) | 10 | 16 | 20 | 25 | 32 | 40 |
| Medium | Air | | | | | |
| Operating pressure range | 0.2~0.6 MPa | | | | | |
| Ambient temperature | -5~+60°C (No freezing) | | | | | |
| Lubrication | Not required | | | | | |
| Repeatability | ±0.1 mm | | | | | |
| Sensor switch (*) | RDVE(V): Non-contact RNFE(V): NPN, RPFE(V): PNP | | | | | |

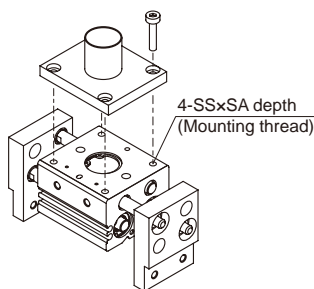
* R*FE(V) specification, please refer to page 5-11.

Weight

| Model | MCHX-10 | | | MCHX-16 | | | MCHX-20 | | | MCHX-25 | | | MCHX-32 | | | MCHX-40 | | |
|----------------------------------|---------|------|------|---------|-----|------|---------|-----|------|---------|-----|-----|---------|------|------|---------|-----|-----|
| Stroke (mm) | 20 | 40 | 60 | 30 | 60 | 80 | 40 | 80 | 100 | 50 | 100 | 120 | 70 | 120 | 160 | 100 | 160 | 200 |
| Max. operating frequency (c.p.m) | 60 | 40 | 40 | 60 | 40 | 40 | 60 | 40 | 40 | 60 | 40 | 40 | 30 | 20 | 20 | 30 | 20 | 20 |
| Weight (kg) | 0.28 | 0.35 | 0.44 | 0.56 | 0.8 | 0.94 | 1.0 | 1.5 | 1.68 | 1.69 | 2.8 | 3.0 | 3.15 | 4.36 | 5.02 | 5.3 | 6.8 | 8.6 |

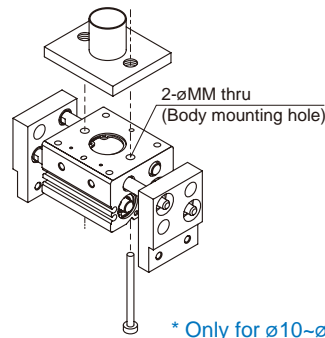
Mounting

Axial mounting



| Tube I.D. | SA | SS | Max. tightening torque (N.m) |
|-----------|----|---------|------------------------------|
| 10 | 8 | M4x0.7 | 2.1 |
| 16 | 10 | M5x0.8 | 4.3 |
| 20 | 12 | M6x1.0 | 7.3 |
| 25 | 16 | M8x1.25 | 17.7 |
| 32 | 16 | M8x1.25 | 18 |
| 40 | 20 | M10x1.5 | 36 |

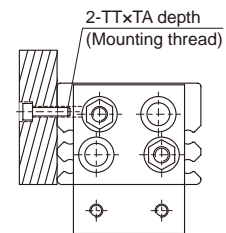
Axial mounting



* Only for ø10~ø25.

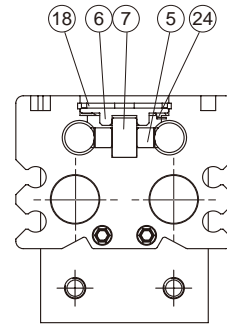
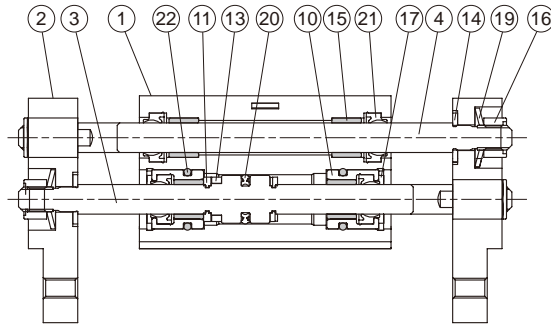
| Tube I.D. | MM | Bolt | Max. tightening torque (N.m) |
|-----------|-----|---------|------------------------------|
| 10 | 4.5 | M4x0.7 | 2.1 |
| 16 | 5.5 | M5x0.8 | 4.3 |
| 20 | 6.6 | M6x1.0 | 7.3 |
| 25 | 9 | M8x1.25 | 17.7 |
| 32 | – | – | – |
| 40 | – | – | – |

Lateral mounting

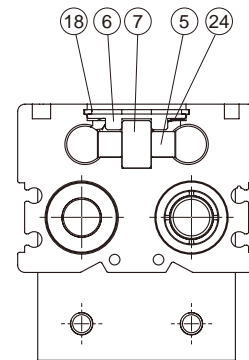
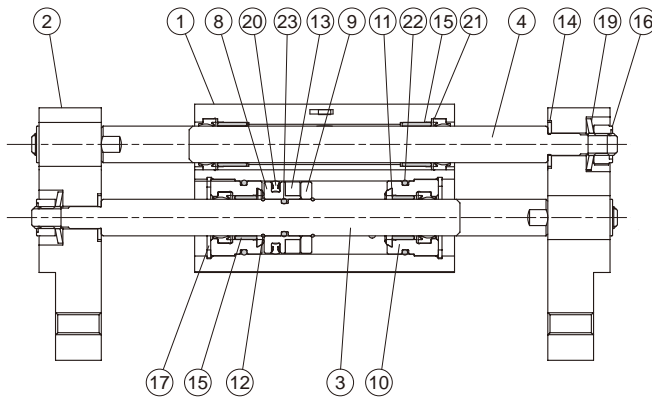


| Tube I.D. | TA | TT | Max. tightening torque (N.m) |
|-----------|----|---------|------------------------------|
| 10 | 5 | M4x0.7 | 1.4 |
| 16 | 7 | M5x0.8 | 2.8 |
| 20 | 7 | M6x1.0 | 4.8 |
| 25 | 7 | M8x1.25 | 12 |
| 32 | 11 | M8x1.25 | 12 |
| 40 | 12 | M10x1.5 | 24 |

ø10



ø16-ø40



Material

| No. | Tube I.D. Part name | Tube I.D. | | | | | Q'y | Repair kits (inclusion) |
|-----|------------------------|---|--------------|--------------|----|----|-----|----------------------------|
| | | 10 | 16 | 20 | 25 | 32 | | |
| 1 | Body | Aluminum alloy | | | | | 1 | |
| 2 | Finger | Aluminum alloy | | | | | 2 | |
| 3 | Piston rod | Stainless steel | | | | | 2 | |
| 4 | Rack | Stainless steel | | | | | 2 | |
| 5 | Pinion | Carbon steel | | | | | 1 | |
| 6 | Pinion cover | Carbon steel | | | | | 1 | |
| 7 | Pinion axis | Stainless steel | | | | | 1 | |
| 8 | Piston | – | Brass | | | 2 | | |
| 9 | Magnet holder | – | Brass | | | 2 | | |
| 10 | Rod cover | Aluminum alloy | | | | | 4 | |
| 11 | Damper | NBR | PU | NBR | | 4 | ● | |
| 12 | Stop ring | – | Spring steel | *1 | *2 | 4 | | |
| 13 | Magnet | Magnet material | | | | | 2 | |
| 14 | Washer | Stainless steel | | Carbon steel | | 4 | | |
| 15 | Bearing | Oil containing polyacetal with back metal | | | | | 8 | |
| 16 | U nut | Carbon steel | | | | | 4 | |
| 17 | R-shape snap ring | *3 | *1 | Carbon steel | | *1 | 4 | |
| 18 | C-shape snap ring | Carbon steel | | | | | 1 | |
| 19 | Conical spring washer | Stainless steel *4 | | | | | 4 | |
| 20 | Piston packing | NBR | | | | | 2 | ● |
| 21 | Rod packing | NBR | | | | | 8 | ● |
| 22 | O-ring | NBR | | | | | 4 | ● |
| 23 | O-ring | – | NBR | | | 2 | | |
| 24 | Wave washer | Carbon steel | | | | | 1 | |

Order example of repair kits

| Tube I.D. | Repair kits |
|-----------|-------------------|
| ø10 | PS-MCHX-10 |
| ø16 | PS-MCHX-16 |
| ø20 | PS-MCHX-20 |
| ø25 | PS-MCHX-25 |
| ø32 | PS-MCHX-32 |
| ø40 | PS-MCHX-40 |

*1. Stainless steel

*2. Spring steel

*3. Carbon steel

*4. ø40: Stainless steel 2 pcs + Carbon steel 2 pcs

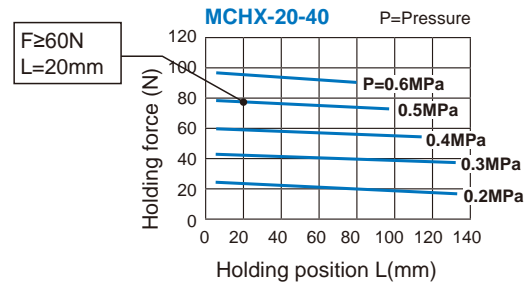
Model selection example

* Finger selection please refer to page 3-2.

In the motion process did not produce high acceleration, deceleration or impact forces, Workpiece mass: 0.3kg , Gripping method: External gripping, Operating pressure: 0.5 MPa, Coefficient of friction (μ): 0.1, Holding position: L=20mm (no overhang)

- Based on the above formula, the required gripping force can be derived:

$$F \geq \frac{0.3 \times 9.8}{2 \times 0.1} \times 4 \geq 60(N)$$
- From Effective Gripping Force Fig, Operating pressure: 0.5 MPa; Holding position: 20 mm Effective gripping force is greater than 60 (N) So selected **MCHX-20-40** grippers.

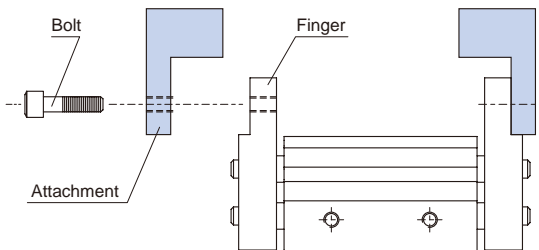


Model selection suggestions

- For normal gripping and carrying usage, the recommended safe factor (a) is 4.
- The value of gripping force of single finger can be found at the gripping force table.
- The safe factor (a) have to be higher if the gripper is using with a great accelerated velocity or impaction condition.

Mounting precautions

- To prevent bending the piston rod, please mount the attachment when finger is closing.
- Do not scratch or dent the sliding portion of the piston rod, or it may cause air leaks or faulty operation.
- Refer to the table below for the proper tightening torque on the bolt used for securing the attachment to the finger.

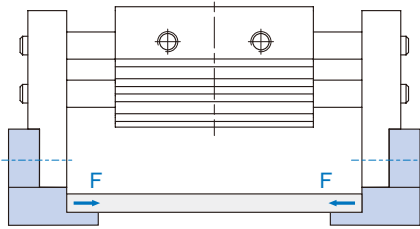


| Tube I.D. | Bolt | Max. tightening torque (N.m) |
|-----------|----------|------------------------------|
| 10 | M4x0.7 | 1.4 |
| 16 | M5x0.8 | 2.8 |
| 20 | M6x1.0 | 4.8 |
| 25 | M8x1.25 | 12 |
| 32 | M10x1.5 | 24 |
| 40 | M12x1.75 | 42.2 |

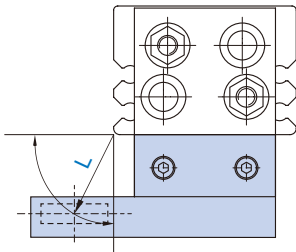
Effective gripping force

Indication of effective force.

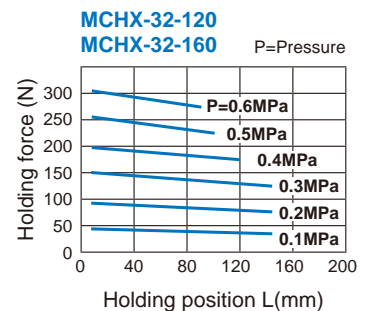
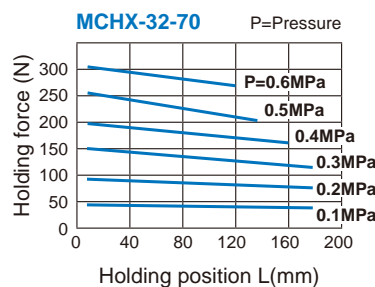
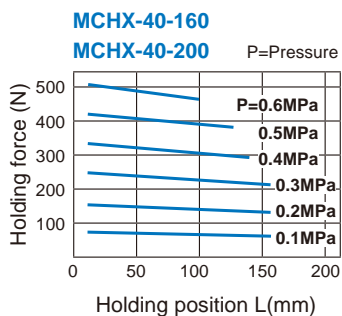
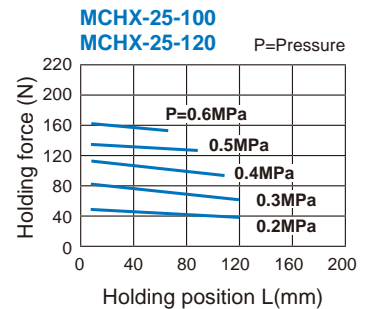
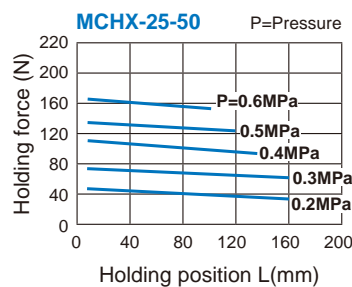
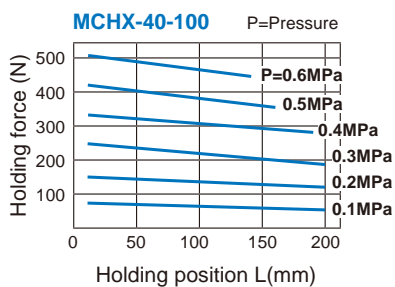
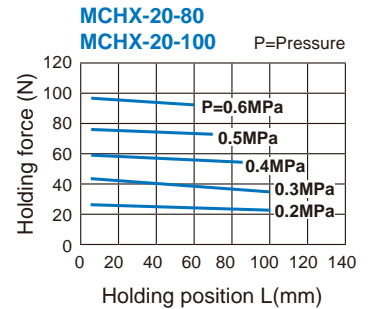
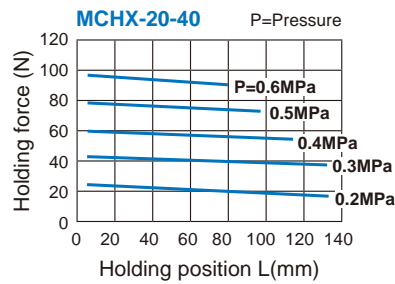
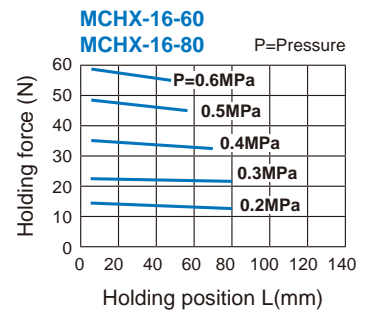
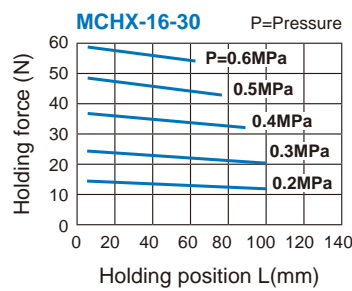
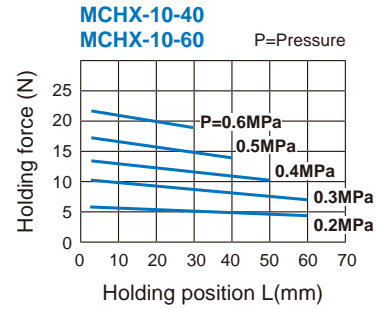
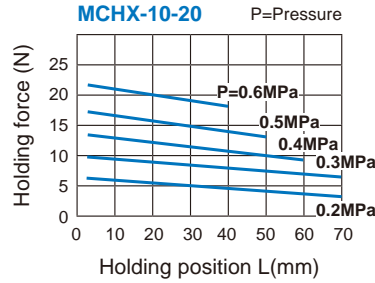
The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.

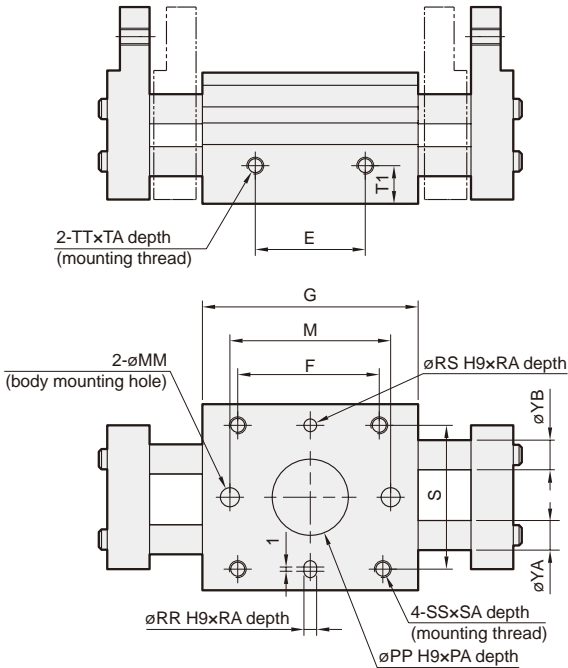


1N=0.102 kgf
1MPa=10.2 kgf/cm²

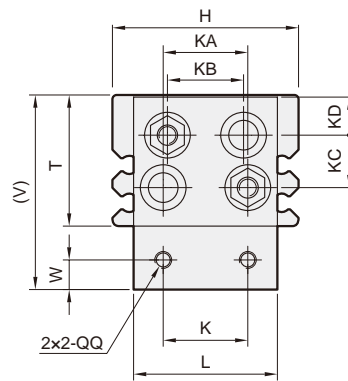
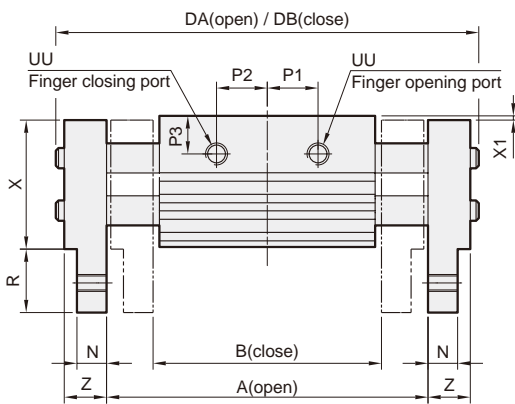


L: Holder position (mm)



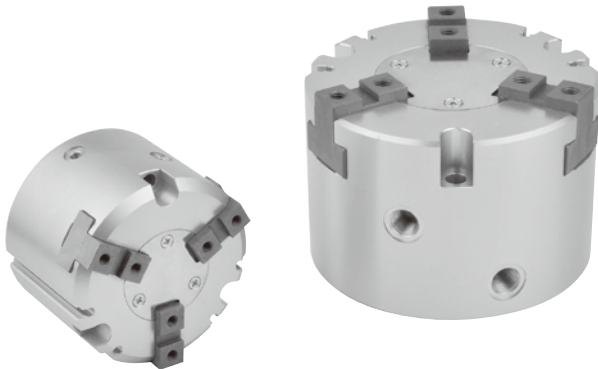


| Code Tube I.D. | Stroke | A | B | DA | DB | E | F | G | M | P1 | P2 |
|-------------------|--------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|
| 10 | 20 | 76 | 56 | 100 | 80 | 26 | 36 | 51 | 38 | 11.5 | 11.5 |
| | 40 | 118 | 78 | 142 | 108 | 42 | 52 | 67 | 54 | 19.5 | 19.5 |
| | 60 | 156 | 96 | 180 | 146 | 60 | 70 | 85 | 72 | 28.5 | 28.5 |
| 16 | 30 | 98 | 68 | 128 | 98 | 28 | 45 | 60 | 40 | 13 | 13 |
| | 60 | 170 | 110 | 200 | 152 | 58 | 75 | 90 | 70 | 25 | 25 |
| | 80 | 210 | 130 | 240 | 192 | 78 | 95 | 110 | 90 | 35 | 35 |
| 20 | 40 | 122 | 82 | 160 | 120 | 38 | 58 | 71 | 54 | 16 | 16 |
| | 80 | 222 | 142 | 260 | 194 | 80 | 100 | 113 | 96 | 34 | 34 |
| | 100 | 262 | 162 | 300 | 234 | 100 | 120 | 133 | 116 | 44 | 44 |
| 25 | 50 | 150 | 100 | 196 | 146 | 48 | 70 | 88 | 66 | 19 | 19 |
| | 100 | 282 | 182 | 328 | 244 | 102 | 124 | 142 | 120 | 43 | 43 |
| | 120 | 320 | 200 | 366 | 282 | 120 | 142 | 160 | 138 | 52 | 52 |
| 32 | 70 | 220 | 150 | 272 | 202 | 60 | 86 | 110 | — | 28 | 28 |
| | 120 | 318 | 198 | 370 | 282 | 108 | 134 | 158 | — | 52 | 52 |
| | 160 | 402 | 242 | 454 | 366 | 152 | 178 | 202 | — | 74 | 74 |
| 40 | 100 | 288 | 188 | 348 | 252 | 80 | 116 | 148 | — | 36 | 36 |
| | 160 | 406 | 246 | 466 | 370 | 138 | 174 | 206 | — | 65 | 65 |
| | 200 | 486 | 286 | 546 | 450 | 178 | 214 | 246 | — | 85 | 85 |



| Code Tube I.D. | H | K | KA | KB | KC | KD | L | N | MM | PA | PP | P3 | QQ | R | RA | RR | RS | S | SA | SS |
|-------------------|----|----|----|------|------|------|----|------|-----|-----|----|----|----------|----|-----|----|----|----|----|---------|
| 10 | 44 | 20 | 20 | 18.2 | 12.5 | 8 | 34 | 7 | 4.5 | 1.5 | 18 | 9 | M4x0.7 | 15 | 3 | 3 | 3 | 34 | 8 | M4x0.7 |
| 16 | 55 | 25 | 25 | 22.6 | 16.5 | 9 | 43 | 9 | 5.5 | 1.5 | 23 | 10 | M5x0.8 | 19 | 3 | 3 | 3 | 42 | 10 | M5x0.8 |
| 20 | 65 | 30 | 30 | 28.2 | 20 | 10 | 54 | 12.5 | 6.6 | 1.5 | 24 | 11 | M6x1.0 | 24 | 4 | 4 | 4 | 52 | 12 | M6x1.0 |
| 25 | 76 | 40 | 38 | 33.2 | 23.5 | 11.5 | 64 | 14 | 9 | 1.5 | 32 | 16 | M8x1.25 | 29 | 4.5 | 4 | 4 | 62 | 16 | M8x1.25 |
| 32 | 82 | 50 | 40 | 32.2 | 30 | 14.5 | 70 | 15 | — | 2.5 | 35 | 16 | M10x1.5 | 32 | 8 | 6 | 6 | 64 | 16 | M8x1.25 |
| 40 | 98 | 60 | 48 | 40.2 | 37 | 16 | 86 | 18 | — | 2.5 | 40 | 18 | M12x1.75 | 38 | 8 | 6 | 6 | 76 | 20 | M10x1.5 |

| Code Tube I.D. | T | T1 | TA | TT | UU | V | W | X | X1 | YA | YB | Z |
|-------------------|----|------|----|---------|--------|-----|----|------|-----|----|----|----|
| 10 | 31 | 9 | 5 | M4x0.7 | M5x0.8 | 46 | 7 | 30.5 | 0.5 | 6 | 6 | 10 |
| 16 | 39 | 10 | 7 | M5x0.8 | M5x0.8 | 58 | 8 | 38.5 | 0.5 | 8 | 8 | 13 |
| 20 | 46 | 11 | 7 | M6x1.0 | M5x0.8 | 70 | 10 | 45 | 1 | 10 | 10 | 17 |
| 25 | 52 | 12.5 | 7 | M8x1.25 | M5x0.8 | 81 | 12 | 51 | 1 | 12 | 12 | 21 |
| 32 | 68 | 22 | 11 | M8x1.25 | Rc1/8 | 100 | 15 | 67 | 1 | 14 | 16 | 24 |
| 40 | 79 | 28 | 12 | M10x1.5 | Rc1/8 | 117 | 18 | 78 | 1 | 16 | 20 | 28 |



Features

- Through holes in body enable simple mounting.
- Body manufactured from high tensile, anodised aluminum giving good resistance to corrosion.
- Available with sensors.
- Magnetic as standard.

Order example

MCHG2 – 16 M – □

MODEL

TUBE I.D.
16, 20, 25, 32, 40,
50, 63, 80, 100, 125

M: Magnet
* Magnetic as standard.

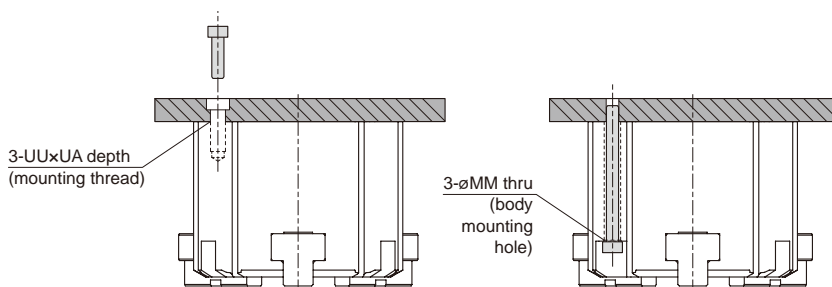
PORT THREAD
Blank: M thread
(only for $\phi 16$ – $\phi 63$)
Blank: Rc thread
G: G thread
NPT: NPT thread
(only for $\phi 80$ – $\phi 125$)

Specification

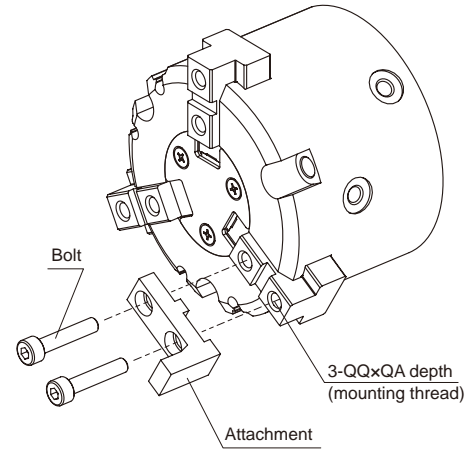
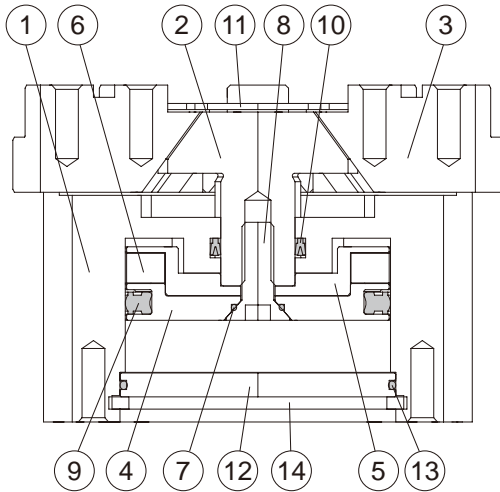
| Model | | MCHG2 | | | | | | | | | |
|---|----------|--|---------|----------|----------|-----------|---------|---------|----------|----------|-----------|
| Acting type | | Double acting | | | | | | | | | |
| Tube I.D. (mm) | | 16 | 20 | 25 | 32 | 40 | 50 | 63 | 80 | 100 | 125 |
| Stroke (mm) | | 4 | 4 | 6 | 8 | 8 | 12 | 16 | 20 | 24 | 32 |
| Port size | | M3x0.5 | M5x0.8 | | | | | Rc1/8 | Rc1/4 | Rc3/8 | |
| Medium | | Air | | | | | | | | | |
| Operating pressure (MPa) | | 0.2~0.6 | | | | 0.1~0.6 | | | | | |
| Ambient temperature | | -10~+60°C (No freezing) | | | | | | | | | |
| Repeatability | | ±0.01 mm | | | | | | | | | |
| Max. operating frequency (c.p.m) | | 120 | | | | 60 | | | | 30 | |
| Lubrication | | Not required | | | | | | | | | |
| Effective gripping force N (lbf) at (0.5 MPa) (*) | External | 14(3.1) | 25(5.6) | 42(9.4) | 74(16.6) | 118(26.5) | 187(42) | 335(75) | 500(112) | 750(169) | 1270(285) |
| | Internal | 16(3.6) | 28(6.3) | 47(10.6) | 82(18.4) | 130(29) | 204(46) | 359(81) | 525(118) | 780(175) | 1320(297) |
| Sensor switch | 2 wire | RDVE(V): Non-contact (Please refer to page 5-11) | | | | | | | | | |
| | 3 wire | RNFE(V): NPN, RPFE(V): PNP | | | | | | | | | |
| Weight (g) | | 80 | 110 | 150 | 240 | 400 | 540 | 1020 | 1880 | 3300 | 6200 |

* Values for $\phi 16$ – $\phi 25$ are with gripping length(L) = 20 mm, for $\phi 32$ – $\phi 63$ with gripping length(L) = 30 mm, and for $\phi 80$ – $\phi 125$ with gripping length(L) = 50 mm. Refer to "Effective Gripping Force" data for the gripping force at each gripping position.

Installation



| Model | MM | UUxUA | Bolt |
|-----------|-----|------------|---------|
| MCHG2-16 | 3.4 | M3x0.5x4.5 | M3x0.5 |
| MCHG2-20 | 3.4 | M3x0.5x6 | M3x0.5 |
| MCHG2-25 | 4.5 | M4x0.7x6 | M4x0.7 |
| MCHG2-32 | 4.5 | M4x0.7x6 | M4x0.7 |
| MCHG2-40 | 5.5 | M5x0.8x7.5 | M5x0.8 |
| MCHG2-50 | 5.5 | M5x0.8x10 | M5x0.8 |
| MCHG2-63 | 6.6 | M6x1.0x9 | M6x1.0 |
| MCHG2-80 | 6.6 | M6x1.0x12 | M6x1.0 |
| MCHG2-100 | 9 | M8x1.25x16 | M8x1.25 |
| MCHG2-125 | 11 | M10x1.5x20 | M10x1.5 |



Material

| No. | Part name | Material | Repair kits (inclusion) |
|-----|----------------|-----------------|-------------------------|
| 1 | Body | Aluminum alloy | |
| 2 | Lever | Carbon steel | |
| 3 | Slider | Carbon steel | |
| 4 | Piston | Aluminum alloy | |
| 5 | Piston-R | Aluminum alloy | |
| 6 | Magnet ring | Magnet material | |
| 7 | O-ring | NBR | ● |
| 8 | Piston bolt | Carbon steel | |
| 9 | Piston packing | NBR | ● |
| 10 | Rod packing | NBR | ● |
| 11 | Table | Stainless steel | |
| 12 | End plate | Aluminum alloy | |
| 13 | O-ring | NBR | ● |
| 14 | Snap ring | Carbon steel | |

Mounting precautions

The tightening torque of slider mounting bolt, please refer to the table below.

| Model | QQxQA | Bolt | Max. tightening torque (N.m) |
|------------------|------------|---------|------------------------------|
| MCHG2-16 | M3x0.5x5 | M3x0.5 | 0.59 |
| MCHG2-20 | M3x0.5x6 | M3x0.5 | 0.59 |
| MCHG2-25 | M3x0.5x6 | M3x0.5 | 0.59 |
| MCHG2-32 | M4x0.7x8 | M4x0.7 | 1.4 |
| MCHG2-40 | M4x0.7x8 | M4x0.7 | 1.4 |
| MCHG2-50 | M5x0.8x8 | M5x0.8 | 2.8 |
| MCHG2-63 | M5x0.8x8 | M5x0.8 | 2.8 |
| MCHG2-80 | M6x1.0x12 | M6x1.0 | 4.8 |
| MCHG2-100 | M8x1.25x16 | M8x1.25 | 12 |
| MCHG2-125 | M10x1.5x20 | M10x1.5 | 24 |

Order example of repair kits

| Tube I.D. | Repair kits | Tube I.D. | Repair kits |
|-----------|--------------------|-----------|---------------------|
| ø16 | PS-MCHG2-16 | ø63 | PS-MCHG2-63 |
| ø20 | PS-MCHG2-20 | ø80 | PS-MCHG2-80 |
| ø25 | PS-MCHG2-25 | ø100 | PS-MCHG2-100 |
| ø32 | PS-MCHG2-32 | ø125 | PS-MCHG2-125 |
| ø40 | PS-MCHG2-40 | | |
| ø50 | PS-MCHG2-50 | | |

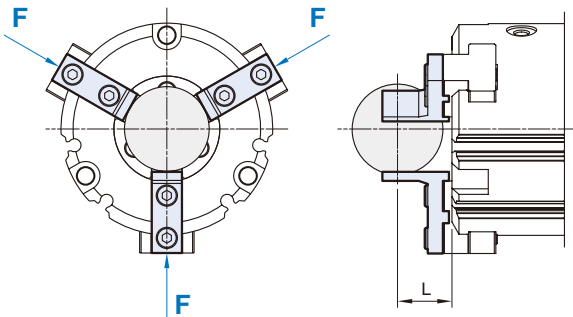
Effective gripping force

* Finger selection please refer to page 3-2.

Indication of effective gripping force.

The effective gripping force shown in the graphs to the right is expressed as F , which is the thrust of one finger, when three fingers and attachments are in full contact with the workpiece as shown in the figure below.

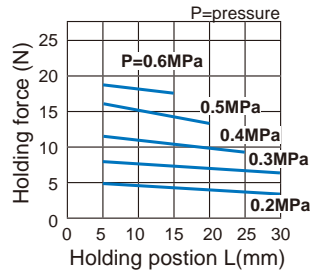
1N=0.102 kgf
1MPa=10.2 kgf/cm²



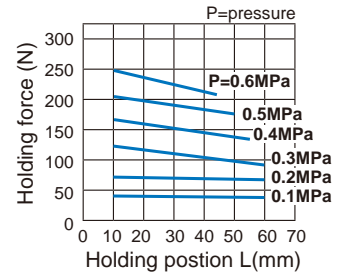
External grip

External gripping force

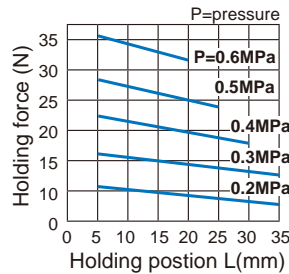
MCHG2-16



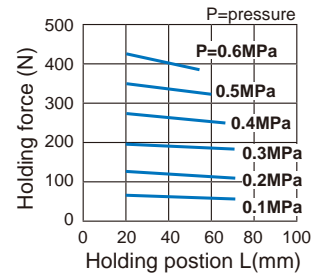
MCHG2-50



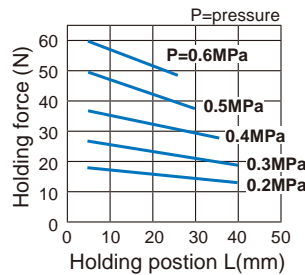
MCHG2-20



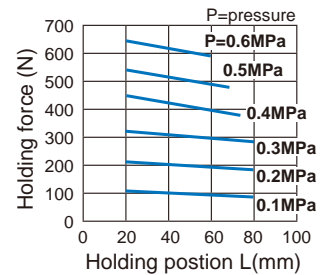
MCHG2-63



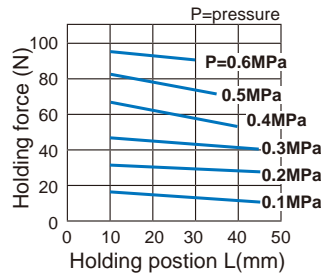
MCHG2-25



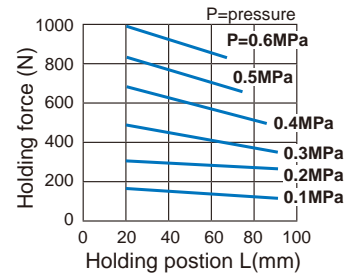
MCHG2-80



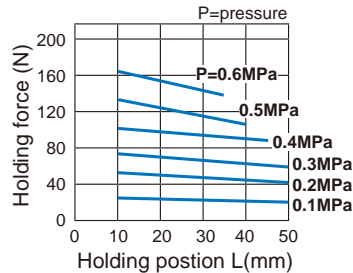
MCHG2-32



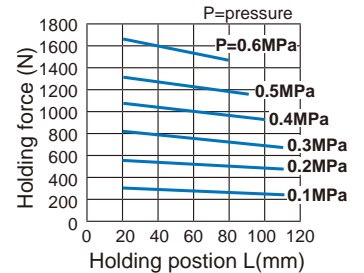
MCHG2-100



MCHG2-40



MCHG2-125



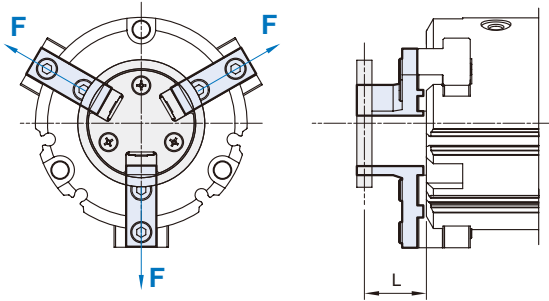
Effective gripping force

* Finger selection please refer to page 3-2.

Indication of effective gripping force.

The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when three fingers and attachments are in full contact with the workpiece as shown in the figure below.

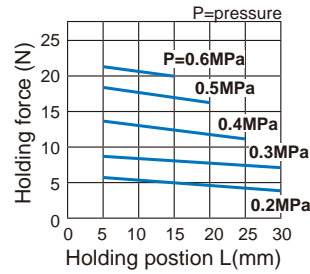
1N=0.102 kgf
1MPa=10.2 kgf/cm²



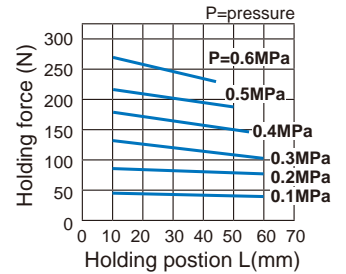
Internal grip

Internal gripping force

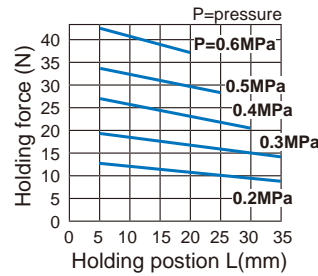
MCHG2-16



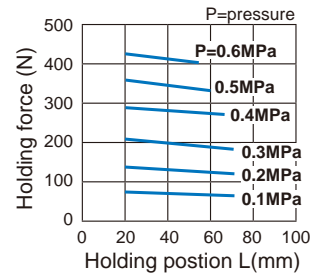
MCHG2-50



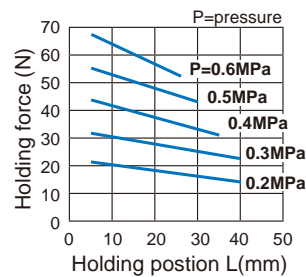
MCHG2-20



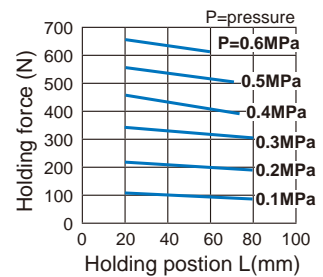
MCHG2-63



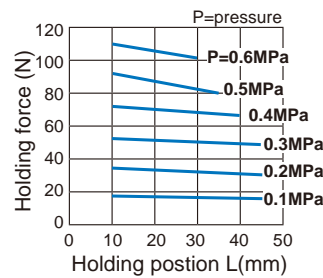
MCHG2-25



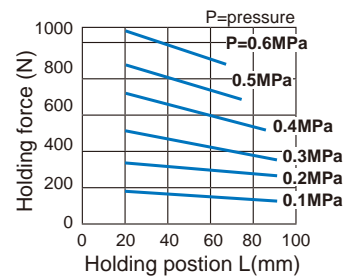
MCHG2-80



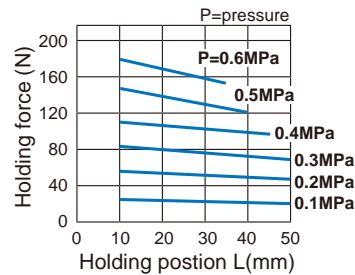
MCHG2-32



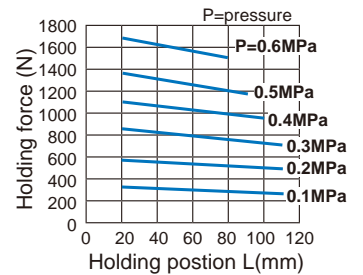
MCHG2-100



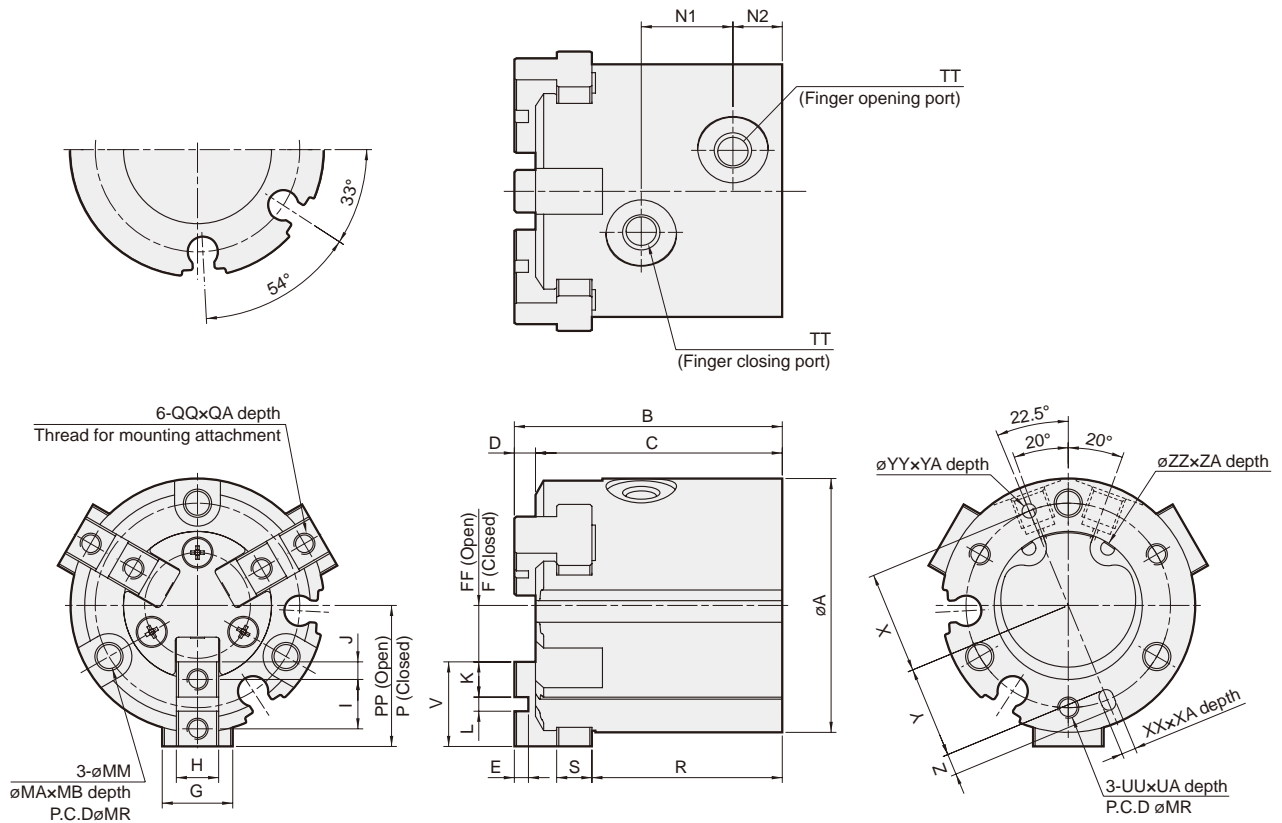
MCHG2-40



MCHG2-125



PARALLEL GRIPPER (3-Finger)

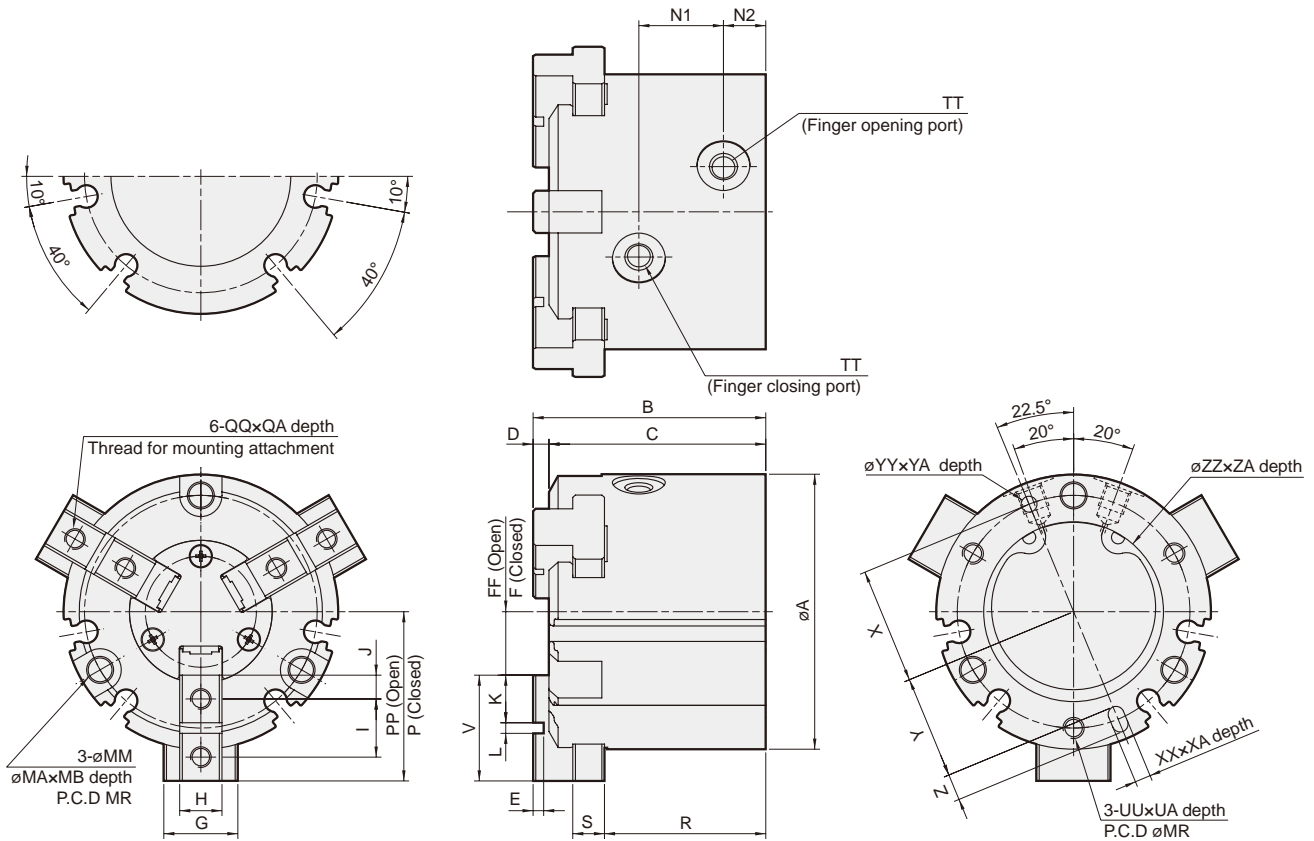


| Code Tube I.D. | A | B | C | D | E | F | FF | G | H | I | J | K | L | MA | MB | MM | MR | N1 | N2 | P | PP | QA | QQ | R | S | TT |
|-------------------|----|----|----|---|---|---|----|----|-------------------------------------|---|-----|---|------------------------------------|-----|-----|-----|----|----|----|----|----|----|--------|----|---|--------|
| 16 | 30 | 35 | 32 | 3 | 2 | 5 | 7 | 8 | 5h9 ⁺⁰ _{-0.030} | 6 | 2 | 4 | 2H9 ^{+0.025} ₀ | 6.5 | 8 | 3.4 | 25 | 11 | 7 | 15 | 17 | 5 | M3x0.5 | 25 | 4 | M3x0.5 |
| 20 | 36 | 38 | 35 | 3 | 2 | 6 | 8 | 10 | 6h9 ⁺⁰ _{-0.030} | 7 | 2.5 | 5 | 2H9 ^{+0.025} ₀ | 6.5 | 9.5 | 3.4 | 29 | 13 | 7 | 18 | 20 | 6 | M3x0.5 | 27 | 5 | M5x0.8 |
| 25 | 42 | 40 | 37 | 3 | 2 | 7 | 10 | 12 | 6h9 ⁺⁰ _{-0.030} | 8 | 3 | 6 | 2H9 ^{+0.025} ₀ | 8 | 10 | 4.5 | 34 | 15 | 7 | 21 | 24 | 6 | M3x0.5 | 28 | 5 | M5x0.8 |

| Code Tube I.D. | UA | UU | V | X | XA | XX | Y | YA | YY | Z | ZA | ZZ |
|-------------------|-----|--------|----|------|----|------------------------------------|------|----|------------------------------------|---|-----|-------------------------------------|
| 16 | 4.5 | M3x0.5 | 10 | 12.5 | 2 | 2H9 ^{+0.025} ₀ | 11 | 2 | 2H9 ^{+0.025} ₀ | 3 | 1.5 | 17H9 ^{+0.043} ₀ |
| 20 | 6 | M3x0.5 | 12 | 14.5 | 2 | 2H9 ^{+0.025} ₀ | 13 | 2 | 2H9 ^{+0.025} ₀ | 3 | 1.5 | 21H9 ^{+0.052} ₀ |
| 25 | 6 | M4x0.7 | 14 | 17 | 3 | 3H9 ^{+0.025} ₀ | 14.5 | 3 | 3H9 ^{+0.025} ₀ | 5 | 1.5 | 26H9 ^{+0.052} ₀ |

PARALLEL GRIPPER (3-Finger)

mindman



| Code Tube I.D. | A | B | C | D | E | F | FF | G | H | I | J | K | L | MA | MB | MM | MR | N1 | N2 | P | PP | QA | QQ |
|-------------------|-----|-----|-----|---|---|------|------|----|--------------------------------------|----|------|----|--------------------------------------|------|----|-----|-----|------|------|------|------|----|---------|
| 32 | 52 | 44 | 41 | 3 | 2 | 8 | 12 | 14 | 8h9 ⁺⁰ _{-0.036} | 11 | 4.5 | 9 | 2H9 ^{+0.025} ₋₀ | 8 | 9 | 4.5 | 44 | 16 | 8 | 28 | 32 | 8 | M4x0.7 |
| 40 | 62 | 47 | 44 | 3 | 2 | 10 | 14 | 16 | 8h9 ⁺⁰ _{-0.036} | 12 | 4.5 | 9 | 3H9 ^{+0.025} ₋₀ | 9.5 | 9 | 5.5 | 53 | 17 | 9 | 31 | 35 | 8 | M4x0.7 |
| 50 | 70 | 55 | 52 | 3 | 2 | 11 | 17 | 18 | 10h9 ⁺⁰ _{-0.036} | 14 | 5 | 10 | 4H9 ^{+0.030} ₋₀ | 9.5 | 12 | 5.5 | 62 | 20 | 9 | 35 | 41 | 10 | M5x0.8 |
| 63 | 86 | 66 | 62 | 4 | 3 | 15 | 23 | 24 | 12h9 ⁺⁰ _{-0.043} | 17 | 5.5 | 11 | 6H9 ^{+0.030} ₋₀ | 11 | 14 | 6.6 | 76 | 22 | 12 | 43 | 51 | 10 | M5x0.8 |
| 80 | 106 | 82 | 77 | 5 | 4 | 21.5 | 31.5 | 28 | 14h9 ⁺⁰ _{-0.043} | 20 | 6 | 12 | 8H9 ^{+0.036} ₋₀ | 11 | 19 | 6.6 | 95 | 27 | 13.5 | 53.5 | 63.5 | 12 | M6x1.0 |
| 100 | 134 | 96 | 90 | 6 | 4 | 28 | 40 | 34 | 18h9 ⁺⁰ _{-0.043} | 23 | 7.5 | 15 | 8H9 ^{+0.036} ₋₀ | 14 | 21 | 9 | 118 | 30.6 | 18 | 66 | 78 | 16 | M8x1.25 |
| 125 | 166 | 122 | 114 | 8 | 6 | 30 | 46 | 40 | 22h9 ⁺⁰ _{-0.052} | 31 | 10.5 | 21 | 10H9 ^{+0.036} ₋₀ | 17.5 | 34 | 11 | 148 | 38 | 23.5 | 82 | 98 | 20 | M10x1.5 |

| Code Tube I.D. | R | S | TT | UU | UA | V | X | XA | XX | Y | YY | YA | Z | ZA | ZZ |
|-------------------|------|----|--------|---------|-----|----|------|----|--------------------------------------|------|--------------------------------------|----|----|-----|---------------------------------------|
| 32 | 30.5 | 6 | M5x0.8 | M4x0.7 | 6 | 20 | 22 | 3 | 3H9 ^{+0.025} ₋₀ | 19.5 | 3H9 ^{+0.025} ₋₀ | 3 | 5 | 2 | 34H9 ^{+0.062} ₋₀ |
| 40 | 32 | 7 | M5x0.8 | M5x0.8 | 7.5 | 21 | 26.5 | 4 | 4H9 ^{+0.030} ₋₀ | 23.5 | 4H9 ^{+0.030} ₋₀ | 4 | 6 | 2 | 42H9 ^{+0.062} ₋₀ |
| 50 | 37.5 | 9 | M5x0.8 | M5x0.8 | 10 | 24 | 31 | 4 | 4H9 ^{+0.030} ₋₀ | 28 | 4H9 ^{+0.030} ₋₀ | 4 | 6 | 2 | 52H9 ^{+0.074} ₋₀ |
| 63 | 44 | 11 | M5x0.8 | M6x1.0 | 9 | 28 | 38 | 5 | 5H9 ^{+0.030} ₋₀ | 34.5 | 5H9 ^{+0.030} ₋₀ | 5 | 7 | 2.5 | 65H9 ^{+0.074} ₋₀ |
| 80 | 56 | 12 | Rc1/8 | M6x1.0 | 12 | 32 | 47.5 | 6 | 6H9 ^{+0.030} ₋₀ | 43.5 | 6H9 ^{+0.030} ₋₀ | 6 | 8 | 3 | 82H9 ^{+0.087} ₋₀ |
| 100 | 63 | 15 | Rc1/4 | M8x1.25 | 16 | 38 | 59 | 6 | 8H9 ^{+0.036} ₋₀ | 54 | 8H9 ^{+0.036} ₋₀ | 6 | 10 | 4 | 102H9 ^{+0.087} ₋₀ |
| 125 | 84 | 18 | Rc3/8 | M10x1.5 | 20 | 52 | 74 | 8 | 10H9 ^{+0.036} ₋₀ | 68 | 10H9 ^{+0.036} ₋₀ | 8 | 12 | 6 | 130H9 ^{+0.100} ₋₀ |



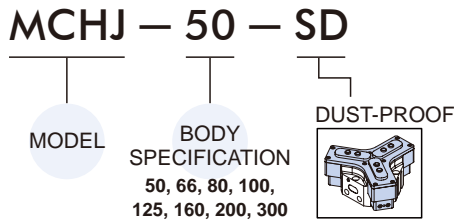
Features

- Compact design to ensure minimum interference while operating; robust T rail design, ensure accurate gripping.
- Can reach maximum torque suitable for long jaws design.
- Circular piston-driven design ensure maximum clamping force.
- Hose-free direct connection: Air supply channel can connect directly without piping or through tread to assure the flexibility of supplying compressed air on any kind of automation system.
- Magnetic as standard.

Specification

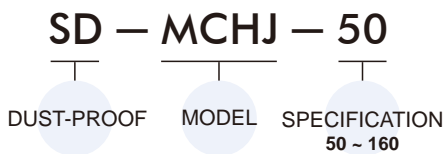
| Model | MCHJ | | | | | | | |
|---|--------------------------------|------|----------------------------------|-----|-----|------|------|------|
| Acting type | Double acting | | | | | | | |
| Body specification | 50 | 66 | 80 | 100 | 125 | 160 | 200 | 300 |
| Stroke per-jaw (mm) | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 30 |
| Effective external gripping force (N) (*1) | 113 | 188 | 292 | 483 | 906 | 1747 | 2851 | 5247 |
| Close/Open time (1/s) | 0.025 | 0.03 | 0.05 | 0.1 | 0.2 | 0.25 | 0.35 | 0.8 |
| Medium | Air | | | | | | | |
| Operating pressure range | 0.2~0.8 MPa | | | | | | | |
| Compressed air consumption (cm ³) | 9.2 | 21.5 | 47 | 100 | 195 | 485 | 850 | 2300 |
| Ambient temperature | +5°C~ +80°C | | | | | | | |
| Lubrication | Not required | | | | | | | |
| Sensor switch (*3) | 2 wire | *2 | RDFE(V): Non-contact | | | | | |
| | 3 wire | *2 | RNFE(V): NPN, RPFE(V): PNP | | | | | |
| Proximity sensor | - | | RDP8 (Please refer to page 5-14) | | | | | |
| Accessories | Mounting block, Accessory kits | | | | | | | |
| Weight (kg) | 0.22 | 0.5 | 0.85 | 1.6 | 2.8 | 5.2 | 10.8 | 26.5 |

Order example

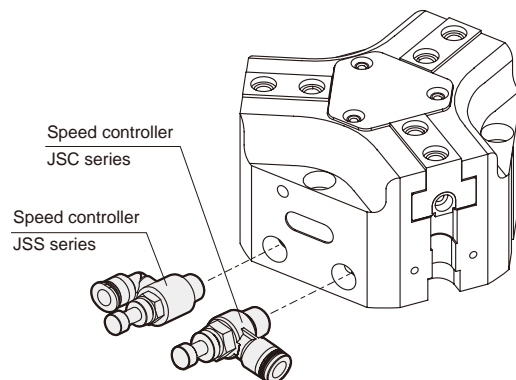
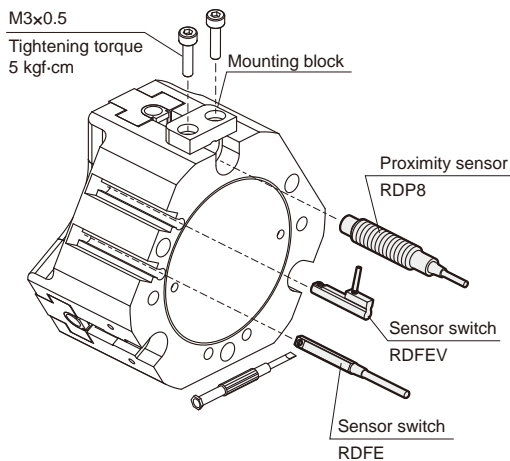


* The body specification 50~160 with pressure piece is also available, please consult our sales department.

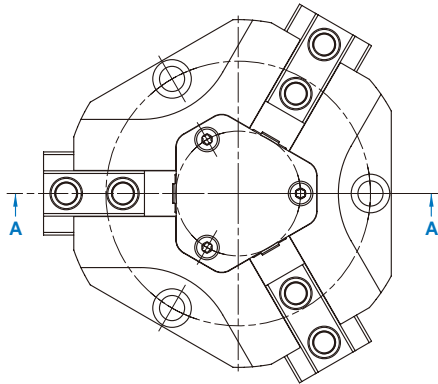
Dust-proof



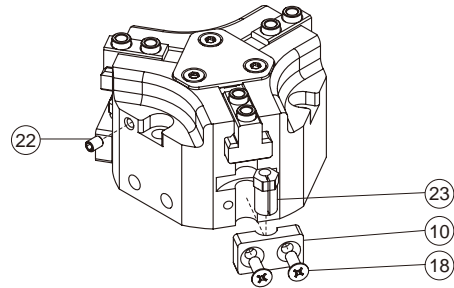
Installation of sensor switch & speed controller



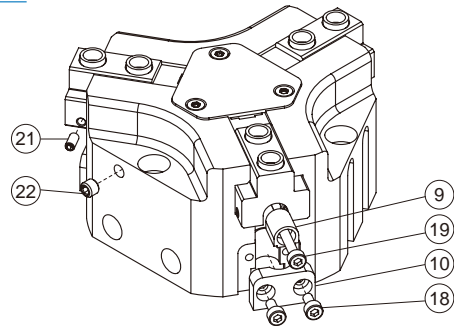
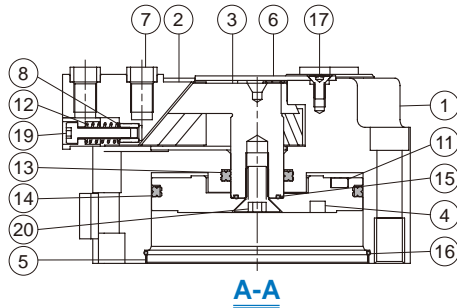
* Each gripper needs at least two speed control valves to control speed.
* Speed controller specification, please refer to page 8-15~17 (Vol.1).



50



66~160



Material

| No. | Body spec Part name | 50 | 66 | 80 | 100 | 125 | 160 | Q'y | Repair kits (inclusion) | |
|-----|------------------------|------------------|-----------------|----|-----|-----|-----|-----|----------------------------|--|
| 1 | Body | Aluminum alloy | | | | | | 1 | | |
| 2 | Finger | Mid carbon steel | | | | | | 3 | | |
| 3 | Rod | Mid carbon steel | | | | | | 1 | | |
| 4 | Piston | Aluminum alloy | | | | | | 1 | | |
| 5 | End cover | Stainless steel | | | | | | 1 | | |
| 6 | Plate cover | Stainless steel | | | | | | 1 | | |
| 7 | Centering sleeve | Stainless steel | | | | | | 6 | | |
| 8 | Thread insert | - | Brass | | | | | | 3 | |
| 9 | Sensor adj block | - | Aluminum alloy | | | | | | 2 | |
| 10 | Magnet holder | *1 | PBT+30%GF | | | | | | 2 | |
| 11 | Magnet | Magnet material | | | | | | 1*2 | | |
| 12 | Spring | - | SWP | | | | | | 2 | |
| 13 | Rod packing | NBR | | | | | | 1 | ● | |
| 14 | Piston packing | NBR | | | | | | 1 | ● | |
| 15 | O-ring | NBR | | | | | | 1 | ● | |
| 16 | O-ring | NBR | | | | | | 1 | ● | |
| 17 | Screw | Carbon steel | | | | | | 3 | | |
| 18 | Bolt | Stainless steel | | | | | | 4 | | |
| 19 | Hex bolt | - | Stainless steel | | | | | | 2 | |
| 20 | Bolt | Stainless steel | | | | | | 1 | | |
| 21 | Hex screw | - | Stainless steel | | | | | | 4 | |
| 22 | Hex screw | Stainless steel | | | | | | 3 | | |
| 23 | Adjust socket | SUS | - | | | | | | 2 | |





*1. Aluminum alloy *2. Body spec 125 Q'y: 2 pcs

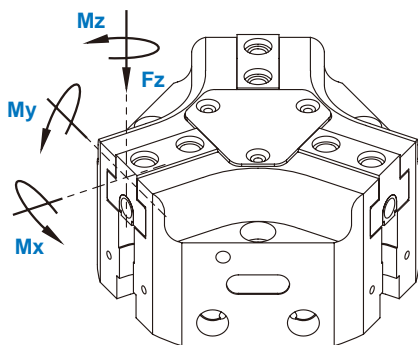
Order example of repair kits

| Model | Repair kits |
|----------|--------------------|
| MCHJ-50 | PS-MCHJ-50 |
| MCHJ-66 | PS-MCHJ-66 |
| MCHJ-80 | PS-MCHJ-80 |
| MCHJ-100 | PS-MCHJ-100 |
| MCHJ-125 | PS-MCHJ-125 |
| MCHJ-160 | PS-MCHJ-160 |

Order example of accessory kits

| Model | Accessory kits |
|----------|--------------------|
| MCHJ-50 | AK-MCHJ-50 |
| MCHJ-66 | AK-MCHJ-66 |
| MCHJ-80 | AK-MCHJ-80 |
| MCHJ-100 | AK-MCHJ-100 |
| MCHJ-125 | AK-MCHJ-125 |
| MCHJ-160 | AK-MCHJ-160 |

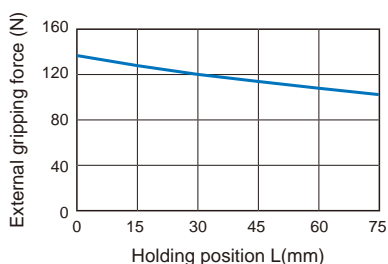
| | |
|---|---|
|  |  |
| O-ring (x2) | Iron plug (x2) |
|  |  |
| PIN (x2) | Centering sleeve (x6) |



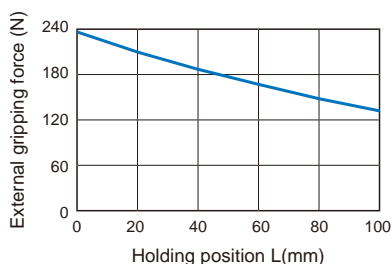
| Code Model | Mx max. (Nm) | My max. (Nm) | Mz max. (Nm) | Fz max. (N) |
|------------|--------------|--------------|--------------|-------------|
| MCHJ-50 | 15 | 15 | 8 | 700 |
| MCHJ-66 | 50 | 45 | 35 | 1200 |
| MCHJ-80 | 80 | 60 | 50 | 1800 |
| MCHJ-100 | 100 | 90 | 75 | 2500 |
| MCHJ-125 | 120 | 120 | 100 | 3200 |
| MCHJ-160 | 160 | 180 | 140 | 5000 |
| MCHJ-200 | 180 | 220 | 170 | 7000 |
| MCHJ-300 | 275 | 300 | 200 | 9000 |

Holding force

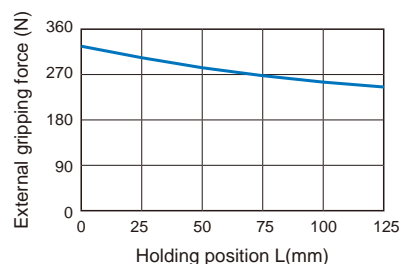
MCHJ-50



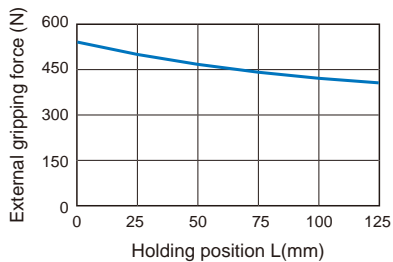
MCHJ-66



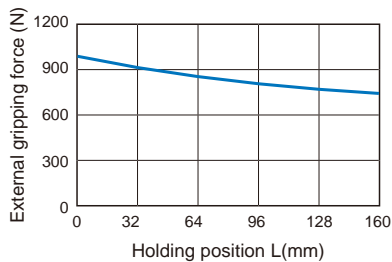
MCHJ-80



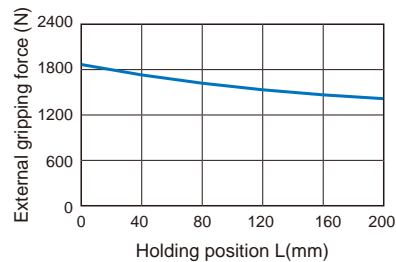
MCHJ-100



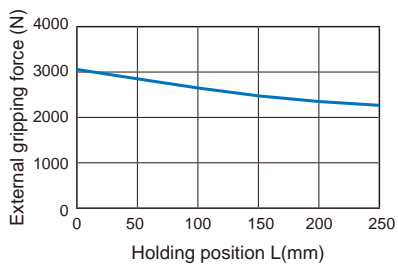
MCHJ-125



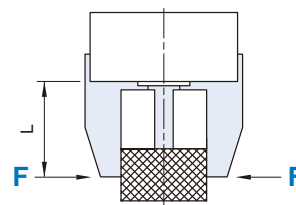
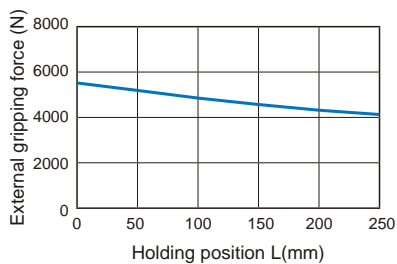
MCHJ-160



MCHJ-200



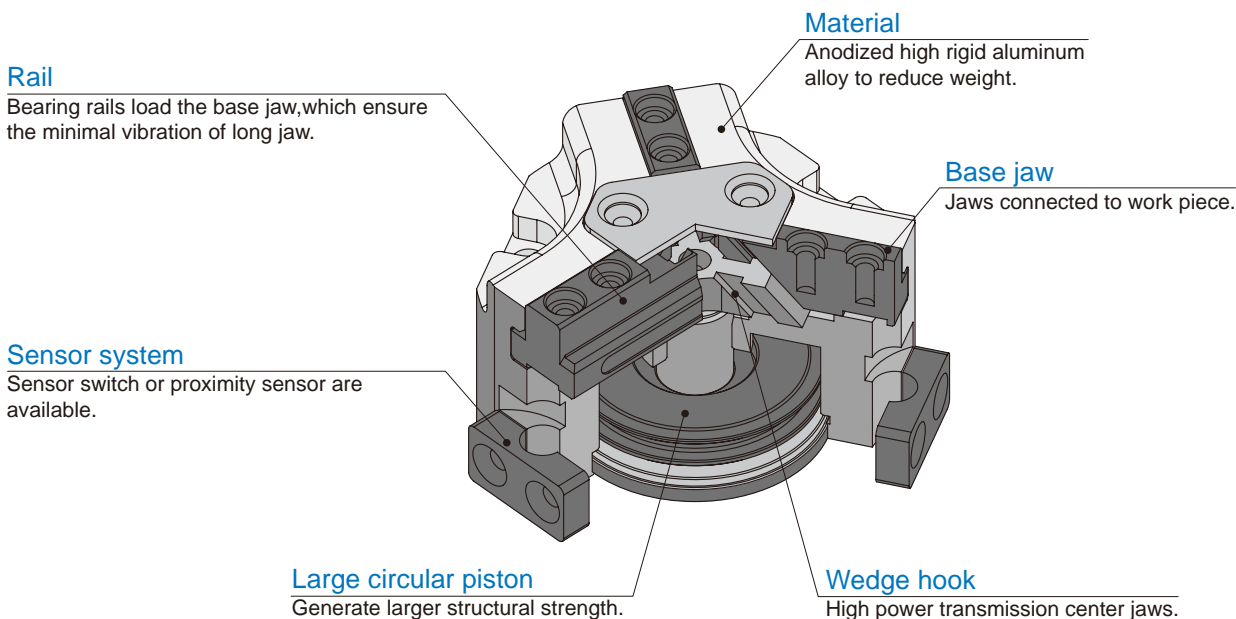
MCHJ-300



* Operating pressure 0.6 MPa.

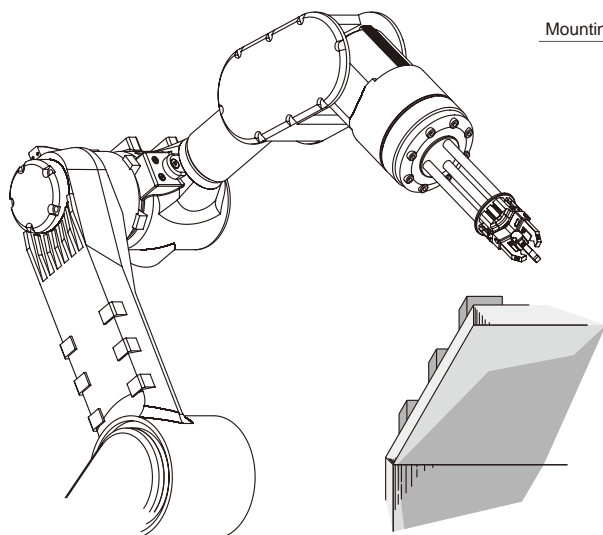
Internal structure & Movement description

Compressed air will push or press the circular piston.
By tilting the working surface, the wedge hook will transfer the movement to side movement, and initiate the action of the three base jaws simultaneously.

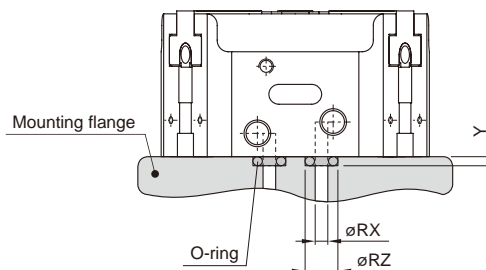


Application examples

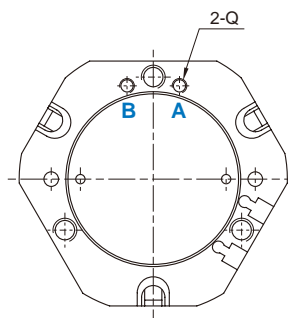
The wedge hook can pass through the inclined working surface, change the action to sideways and simultaneously actuate the three-jaw clamping movement. It can be used in the robot arm system environment when matched with various accessory.



Hose-free direct connection

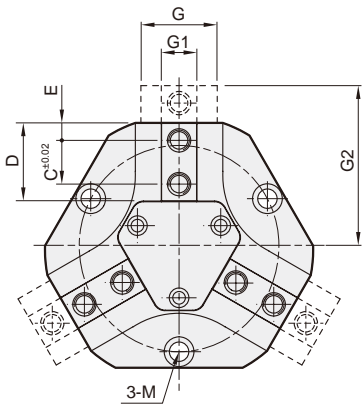


| Code Spec. | Q | RX | RZ | Y |
|------------|------|-----|------|-----|
| 50 | M3 | 3 | 5 | 0.7 |
| 66 | M5 | 5 | 8 | 1.2 |
| 80 | M5 | 5 | 8 | 1.2 |
| 100 | M5 | 5 | 8 | 1.2 |
| 125 | M5 | 5 | 8 | 1.2 |
| 160 | M5 | 5 | 8 | 1.2 |
| 200 | M6 | 6 | 9 | 1.2 |
| 300 | G1/8 | 8.5 | 12.1 | 1.8 |

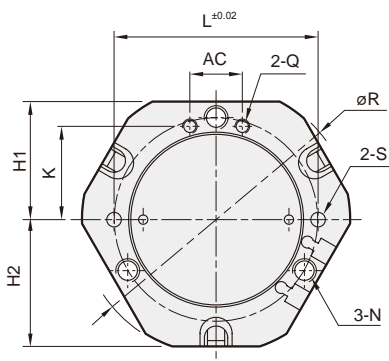
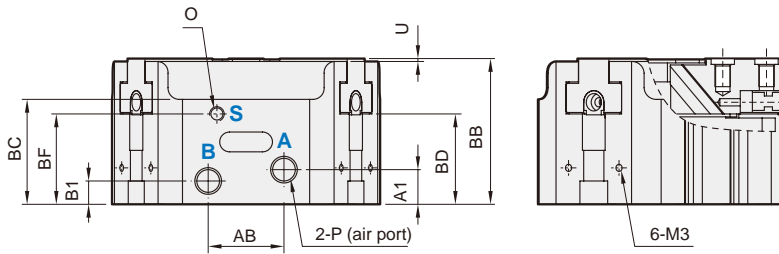


A hole: Gripper close
B hole: Gripper open

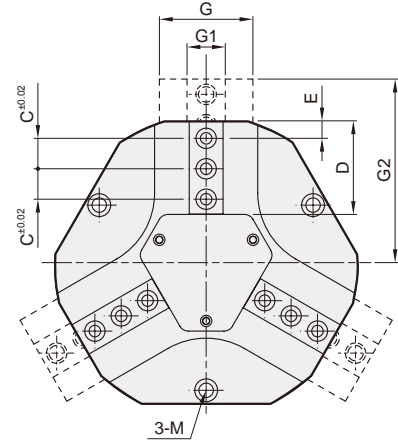
PARALLEL GRIPPER (3-Finger)



A hole: Gripper close
B hole: Gripper open
S hole: External vents

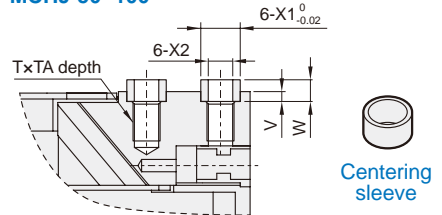


MCHJ-125~300

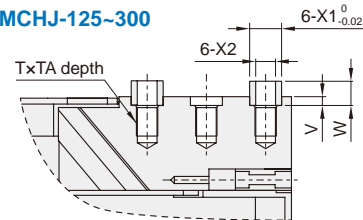


Centering sleeve

MCHJ-50~100



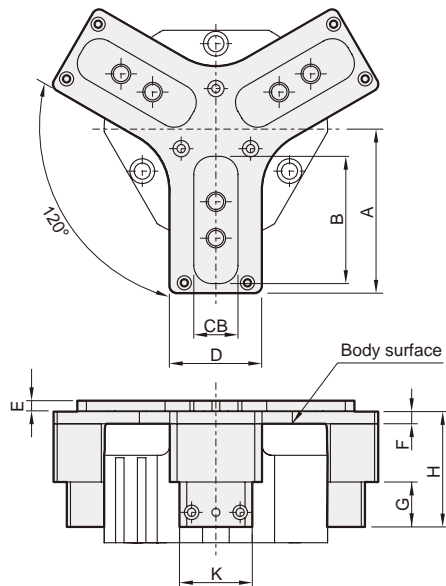
MCHJ-125~300



| Code Spec. | A1 | AB | AC | B1 | BB | BC | BD | BF | C | D | E | G | G1 | G2 | H1 | H2 | K | L |
|------------|------|----|----|------|-------|-------|-------|------|------|------|----|----|------|------|-------|------|------|-----|
| 50 | 5 | 12 | 12 | 5 | 35 | 26 | 23 | 23 | 8 | 16 | 4 | 12 | 6.5 | 31 | 26 | 27 | 19 | 45 |
| 66 | 11.5 | 12 | 18 | 5 | 43 | 32 | 27 | 27 | 12 | 22 | 5 | 17 | 10 | 41 | 33 | 35 | 25 | 56 |
| 80 | 8 | 26 | 18 | 8 | 50 | 36 | 31 | 31 | 15 | 26.7 | 6 | 22 | 12 | 51.5 | 40.5 | 43.5 | 32 | 70 |
| 100 | 13.5 | 24 | 24 | 10 | 60 | 41 | 38 | 34 | 18 | 34.2 | 10 | 26 | 14 | 64 | 51 | 54 | 42 | 90 |
| 125 | 17 | 30 | 30 | 10 | 68 | 49 | 42.5 | 37 | 12.5 | 42.3 | 10 | 31 | 15.5 | 79 | 64 | 67 | 53 | 112 |
| 160 | 20 | 44 | 38 | 10.5 | 80 | 55 | 48 | 45 | 18 | 54.8 | 10 | 39 | 20 | 102 | 81 | 86 | 67.5 | 146 |
| 200 | 29 | 54 | 54 | 19.5 | 107 | 82 | 68 | 64 | 22 | 67.5 | 12 | 42 | 22 | 126 | 100 | 106 | 75 | 180 |
| 300 | 36.1 | 80 | 80 | 29.1 | 153.1 | 105.1 | 101.1 | 87.1 | 30 | 91 | 15 | 66 | 32 | 172 | 132.5 | 142 | 105 | 240 |

| Code Spec. | M | N | O | P | Q | R | S | T | TA | U | V | W | X1 | X2 |
|------------|--------------------------------------|----------------|----|--------|------|-----|----------|------------|----|---|-----|-----|-----|-----|
| 50 | ø7.3x4.1dp, ø4.3 thru, P.C.D.ø45 | M5x0.8x8dp | M3 | M5x0.8 | M3 | 57 | ø4H7x5 | 6-M3x0.5 | 7 | 1 | 2 | 3.9 | ø5 | ø3 |
| 66 | ø9x5.1dp, ø5.1 thru, P.C.D.ø56 | M6x1.0x10dp | M5 | M5x0.8 | M5 | 74 | ø4H7x8 | 6-M4x0.7 | 8 | 1 | 2 | 3.9 | ø6 | ø4 |
| 80 | ø10.2x6.1dp, ø6.8 thru, P.C.D.ø70 | M8x1.25x12dp | M5 | G1/8 | M5 | 92 | ø5H7x8 | 6-M6x1.0 | 10 | 1 | 2 | 3.9 | ø8 | ø6 |
| 100 | ø10.5x6.5dp, ø6.8 thru, P.C.D.ø90 | M8x1.25x12dp | M5 | G1/8 | M5 | 114 | ø5H7x8 | 6-M6x1.0 | 12 | 1 | 2 | 3.9 | ø10 | ø6 |
| 125 | ø13.5x8.1dp, ø8.6 thru, P.C.D.ø112 | M10x1.5x15dp | M5 | G1/8 | M5 | 139 | ø6H7x10 | 9-M6x1.0 | 14 | 1 | 2 | 3.9 | ø10 | ø6 |
| 160 | ø13.5x8.1dp, ø8.5 thru, P.C.D.ø146 | M10x1.5x24dp | M5 | G1/8 | M5 | 179 | ø6H7x10 | 9-M8x1.25 | 14 | 1 | 2 | 3.9 | ø12 | ø8 |
| 200 | ø17x10.5dp, ø10.3 thru, P.C.D.ø180 | M12x1.75x25dp | M5 | G1/4 | M5 | 218 | ø10H7x19 | 9-M10x1.5 | 20 | 1 | 2.5 | 4.9 | ø14 | ø10 |
| 300 | ø18.5x12.2dp, ø12.5 thru, P.C.D.ø240 | M16x2.0x39.1dp | M5 | G1/4 | G1/8 | 292 | ø10H7x19 | 9-M12x1.75 | 20 | 2 | 2.5 | 4.9 | ø18 | ø12 |

- For dusty environment usage.
- When installing soft-jaws, the length of jaws are measured from the the body surface.
- Heat resistance type of modules are also available. Please contact our sales department.



| Code Spec. | A | B | CB | D | E | F | G | H | K |
|------------|------|------|------|----|-----|---|------|------|----|
| 50 | 43 | 30 | 13 | 17 | 4.5 | 5 | 16 | 35.5 | 17 |
| 66 | 51 | 41 | 16.2 | 24 | 4.5 | 5 | 19.5 | 45.5 | 24 |
| 80 | 67.5 | 52.4 | 18.1 | 38 | 4.5 | 5 | 19 | 48 | 30 |
| 100 | 80 | 61 | 22 | 37 | 4.5 | 5 | 11.5 | 41 | 37 |
| 125 | 95 | 72 | 22 | 50 | 4.5 | 5 | 14.5 | 47.5 | 37 |
| 160 | 121 | 93 | 25 | 60 | 4.5 | 6 | 13 | 55 | 50 |



Features

- Hardened gripping fingers for longer service life.
- Simple structure with high stability.
- Magnetic as standard.

Specification

| Model | | MCHA | | | | |
|----------------------------------|---------------|--------------------------------------|-------------|--------|-----|-----|
| Acting type | | Double acting / Single acting (N.O.) | | | | |
| Tube I.D. (mm) | | 12 | 16 | 20 | 25 | 32 |
| Port size | | M3×0.5 | | M5×0.8 | | |
| Medium | | Air | | | | |
| Operating pressure range | Double acting | 0.15~0.7 MPa | | | | |
| | Single acting | 0.3~0.7 | 0.2~0.7 MPa | | | |
| Ambient temperature | | -5~+60°C (No freezing) | | | | |
| Max. operating frequency (c.p.m) | | 180 | | | | |
| Lubrication | Cylinder | Not required | | | | |
| | Lever | Grease (Joint parts) | | | | |
| Max. arm length (L) (*1) | | 30 | 40 | 60 | 70 | 85 |
| Clamp / Release angle | | -10~+30° | | | | |
| Sensor switch (*2) | | RDE, RDE-D: Non-contact | | | | |
| Weight (g) | | 53 | 103 | 193 | 327 | 525 |

Order example

MCHA - 20 - □

MODEL

TUBE I.D.

ACTING TYPE

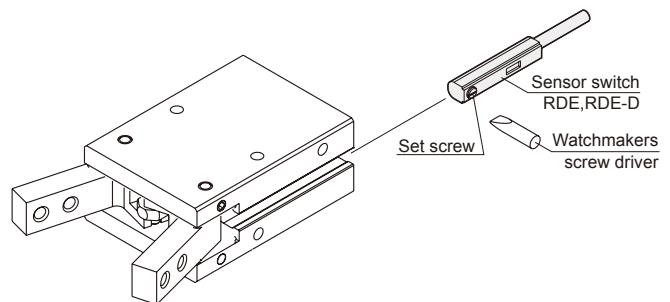
Blank: Double acting
S: Single acting (Normally open)

12
16
20
25
32

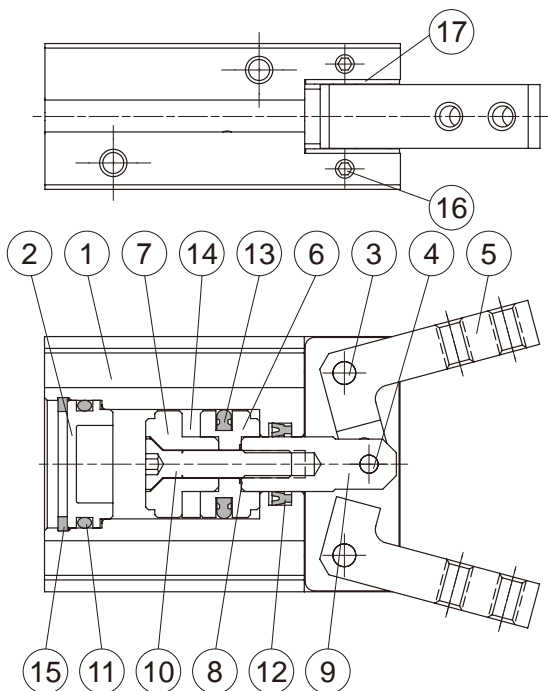
*1. L: Arm length (mm)

*2. RDE, RDE-D specification, please refer to page 5-6.

Installation of sensor switch

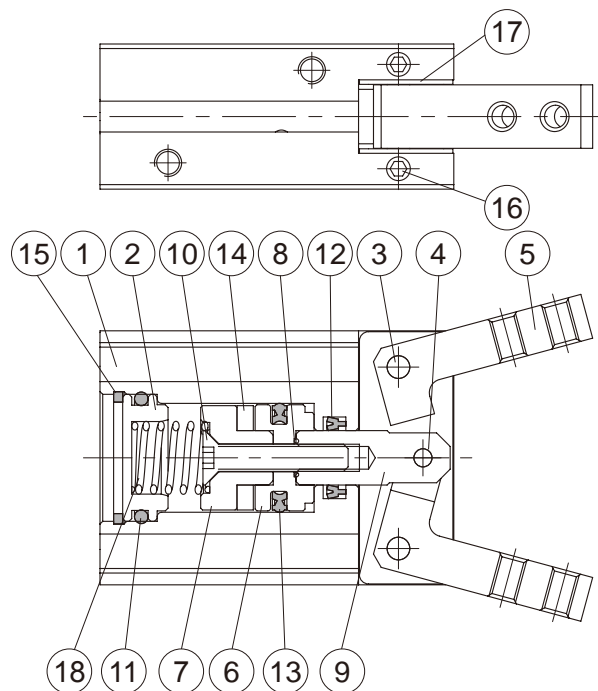


Double acting



Single acting

Normally Open



Material

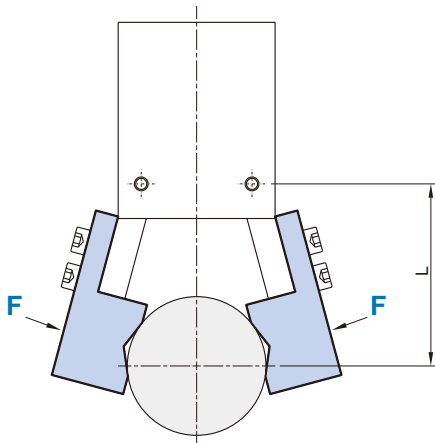
| No. | Part name | Material | Q'y | Repair kits (inclusion) |
|-----|----------------|---------------------|-----|-------------------------|
| 1 | Body | Aluminum alloy | 1 | |
| 2 | Head cover | Aluminum alloy | 1 | |
| 3 | Grip rivet | Carbon steel | 2 | |
| 4 | Spindle rivet | Bearing steel | 1 | |
| 5 | Y-finger | Medium carbon steel | 2 | |
| 6 | Piston-R | Aluminum alloy | 1 | |
| 7 | Piston-H | Aluminum alloy | 1 | |
| 8 | Gasket | NBR | 1 | ● |
| 9 | Piston rod | Stainless steel | 1 | |
| 10 | Screw | Stainless steel | 1 | |
| 11 | Cover ring | NBR | 1 | ● |
| 12 | Rod packing | NBR | 1 | ● |
| 13 | Piston packing | NBR | 1 | ● |
| 14 | Magnet ring | Magnet material | 1 | |
| 15 | Stop ring | Spring steel | 1 | |
| 16 | Screw | SCM | 4 | |
| 17 | Washer | Stainless steel | 2 | |
| 18 | Spring | SWB-P | 1 | |

Order example of repair kits

| Tube I.D. | Repair kits |
|-----------|-------------------|
| ø12 | PS-MCHA-12 |
| ø16 | PS-MCHA-16 |
| ø20 | PS-MCHA-20 |
| ø25 | PS-MCHA-25 |
| ø32 | PS-MCHA-32 |

Effective gripping force

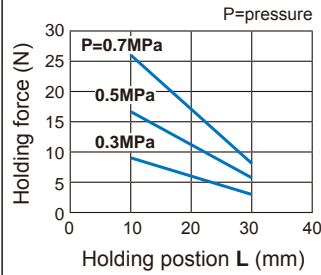
Indication of effective force.
The effective gripping force shown in the graphs to the right is expressed as F, which is the thrust of one finger, when both fingers and attachments are in full contact with the workpiece as shown in the figure below.



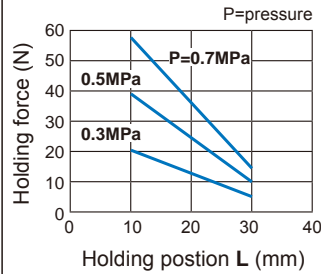
1N=0.102 kgf
1MPa=10.2 kgf/cm²

Double acting

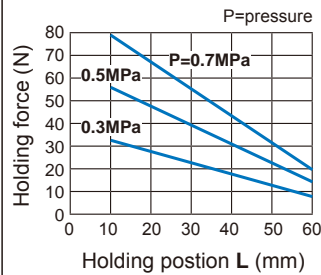
MCHA-12



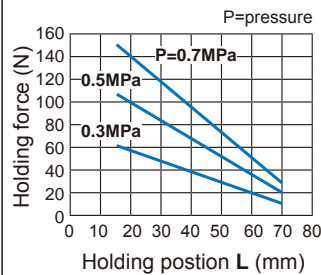
MCHA-16



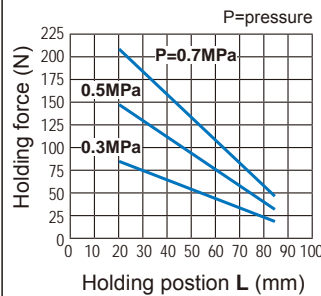
MCHA-20



MCHA-25

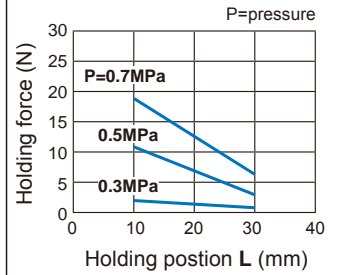


MCHA-32

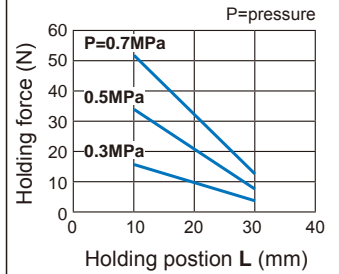


Single acting (Normally open)

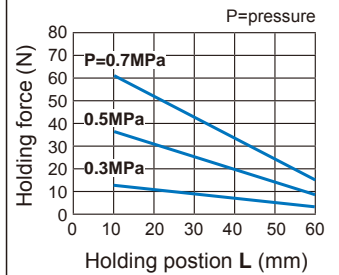
MCHA-12-S



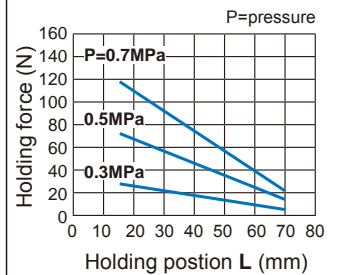
MCHA-16-S



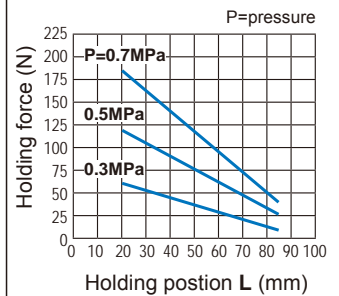
MCHA-20-S

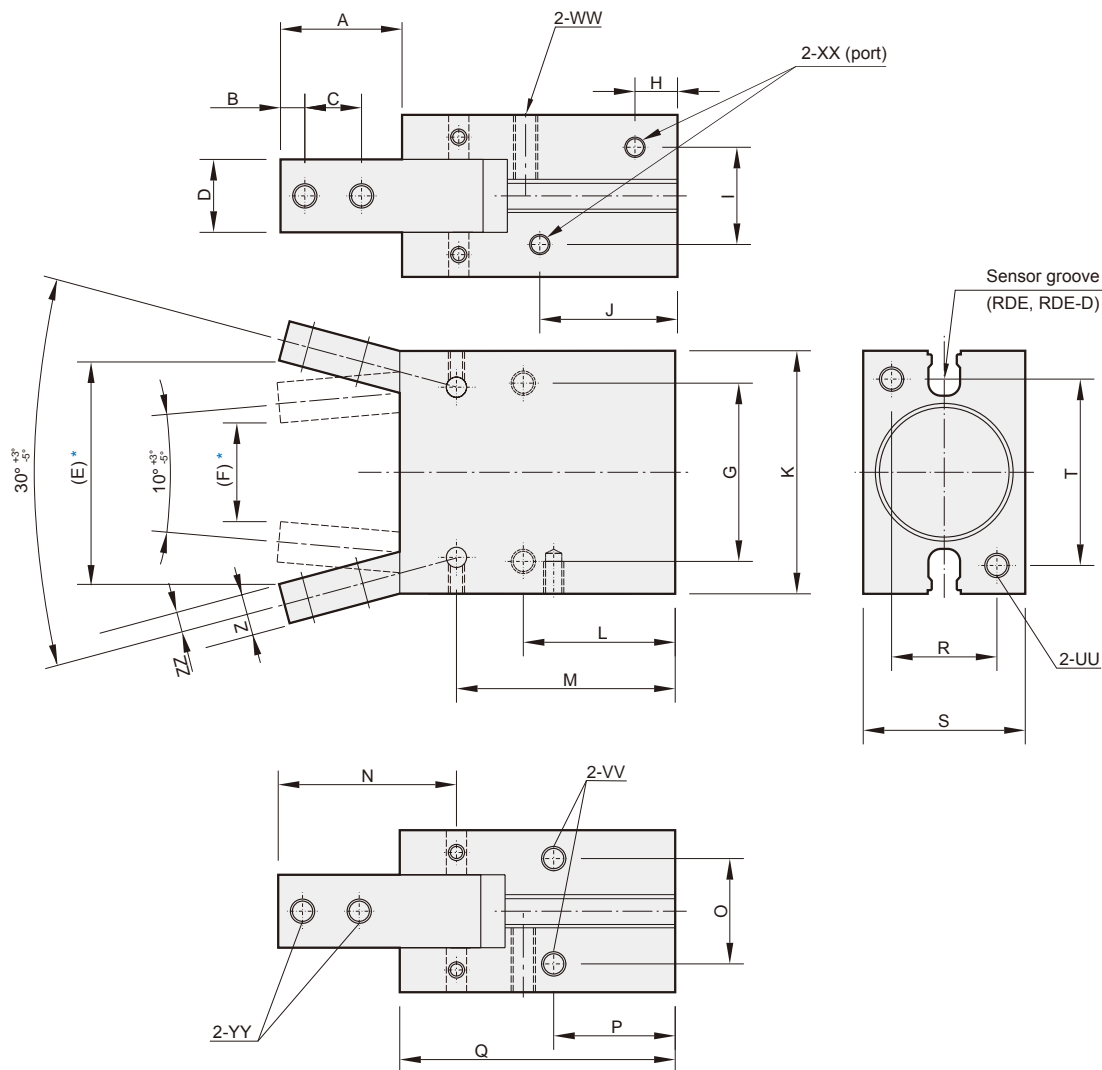


MCHA-25-S



MCHA-32-S

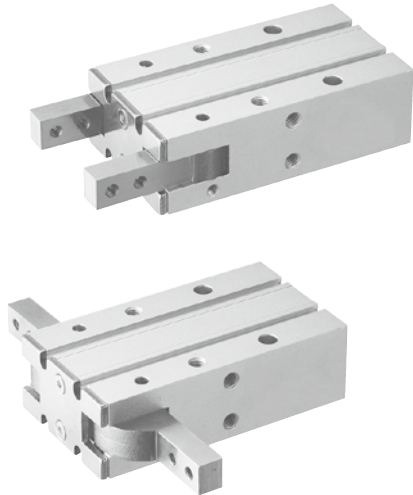




* Reference value.

| Code Tube I.D. | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | UU | VV |
|-------------------|------|---|----|----|------|----|----|------|------|----|----|------|------|------|------|------|------|----|----|----|------------|-----------|
| 12 | 15.4 | 3 | 6 | 7 | 26.3 | 9 | 20 | 7.5 | 10.2 | 23 | 28 | 20 | 32.9 | 21.5 | 10.2 | 16 | 39 | 10 | 16 | 22 | M3×5depth | M3×5depth |
| 16 | 17.5 | 3 | 8 | 9 | 31.1 | 14 | 24 | 7.5 | 12 | 22 | 34 | 22.5 | 35 | 25 | 14 | 18 | 42.5 | 14 | 22 | 26 | M4×7depth | M4×7depth |
| 20 | 22 | 4 | 10 | 12 | 40.1 | 18 | 30 | 8.0 | 13 | 25 | 45 | 25 | 39.5 | 32.5 | 16 | 19 | 50 | 16 | 26 | 35 | M5×8depth | M5×8depth |
| 25 | 26 | 5 | 12 | 14 | 47.9 | 21 | 36 | 8.5 | 18 | 28 | 52 | 28.5 | 45.5 | 38.5 | 20 | 21.5 | 58 | 20 | 32 | 40 | M6×10depth | M6×8depth |
| 32 | 30 | 6 | 14 | 18 | 55.1 | 24 | 44 | 10.5 | 24 | 34 | 60 | 37.5 | 54 | 44 | 26 | 30 | 68 | 26 | 40 | 46 | M6×10depth | M6×8depth |

| Code Tube I.D. | WW | XX | YY | Z | ZZ |
|-------------------|------------|------------|----|----|-----|
| 12 | M3×8depth | M3×5 depth | M3 | 5 | 2.5 |
| 16 | M4×11depth | M5×5 depth | M3 | 6 | 3 |
| 20 | M5×12depth | M5×5 depth | M4 | 7 | 3.5 |
| 25 | M6×16depth | M5×5 depth | M5 | 9 | 4 |
| 32 | M6×20depth | M5×5 depth | M6 | 10 | 5 |



Order example

MCHY – 16 D 1

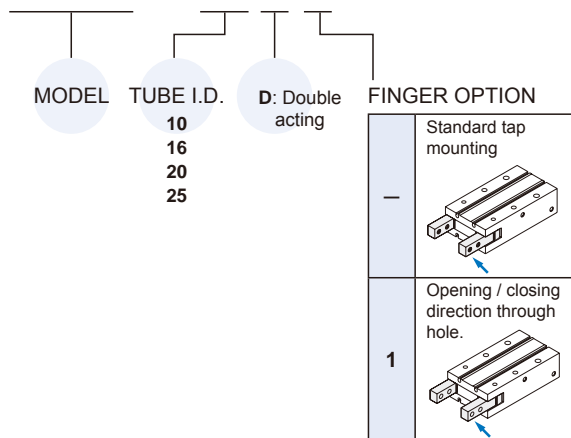
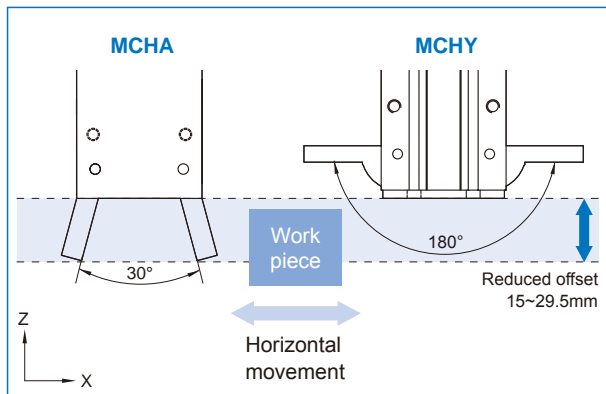


Fig1. Reduced required offset while moving gripper



Features

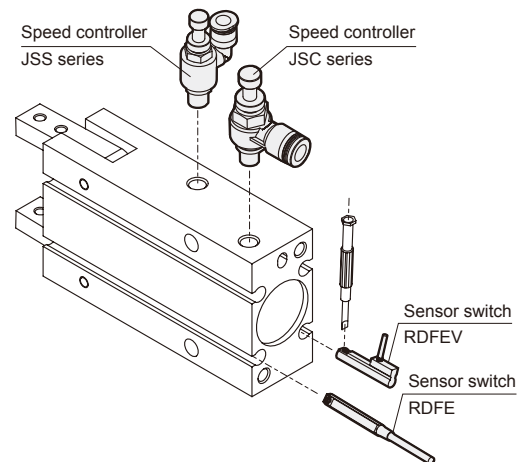
- Compact design and lightweight construction.
- High gripping forces achieved via internal cams. Reduced required offset while moving gripper. (Fig1).
- Reference points on gripping fingers are standard.
- Sensors can be mounted in any one of four positions.
- Rod seal prevents foreign objects to enter piston.
- Magnetic as standard.

Specification

| Model | MCHY | | | |
|-----------------------------------|-------------------------|----------------------------|-----|------|
| Acting Type | Double acting | | | |
| Tube I.D. (mm) | 10 | 16 | 20 | 25 |
| Medium | Air | | | |
| Operating pressure range | 0.2~0.6 MPa | | | |
| Ambient temperature | -10~+60°C (No freezing) | | | |
| Repeatability | ±0.2 mm | | | |
| Max. operating frequency (c.p.m) | 60 (*1) | | | |
| Lubrication (*2) | Not required | | | |
| Effective force (Nm) at (0.5 MPa) | 0.16 | 0.54 | 1.1 | 2.28 |
| Operating angle (both sides) | Opened side | 180°~182° | | |
| | Closed side | -3° | | |
| Sensor switch (*3) | 2 wire | RDVE(V): Non-contact | | |
| | 3 wire | RNFE(V): NPN, RPFE(V): PNP | | |
| Weight (g) | 80 | 150 | 320 | 600 |

- *1. Speed adjust components are required while in use.
- *2. Sliding area of jaws need scheduled relubrication.
- *3. R*FE(V) specification, please refer to page 5-11.

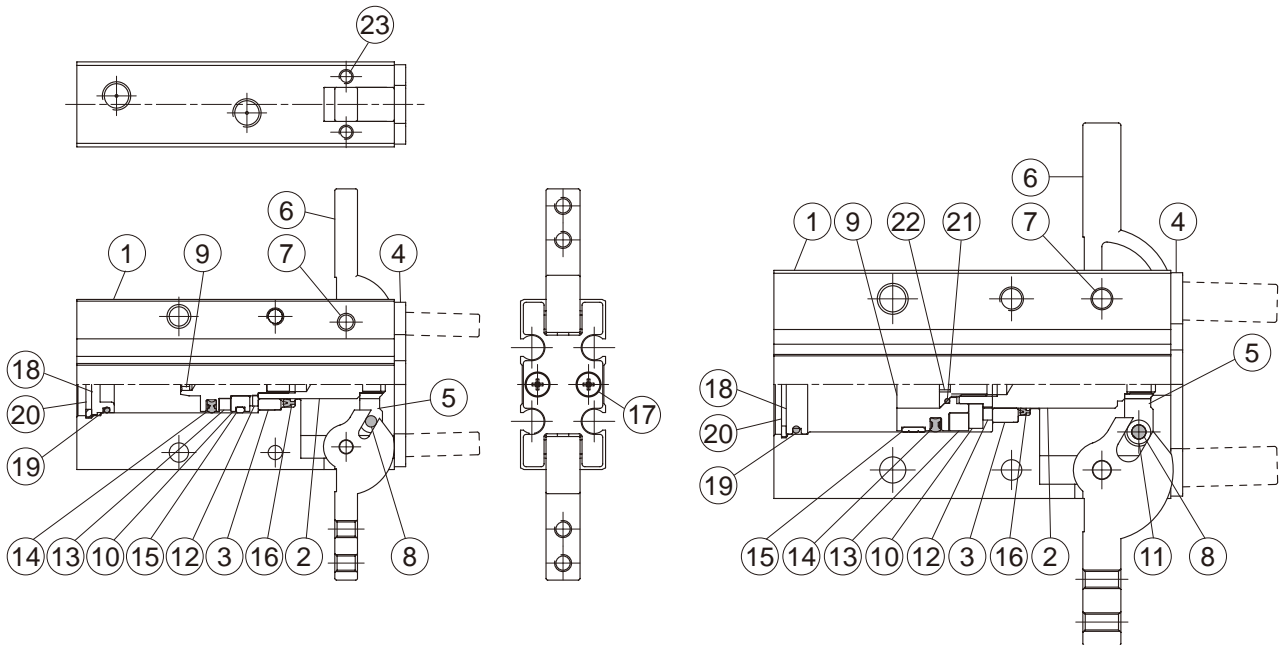
Installation of sensor switch & speed controller



- * Each gripper needs at least two speed control valves to operate.
- * Speed controller specification, please refer to page 8-15~17 (Vol.1).

ø10

ø16~ø25



Material

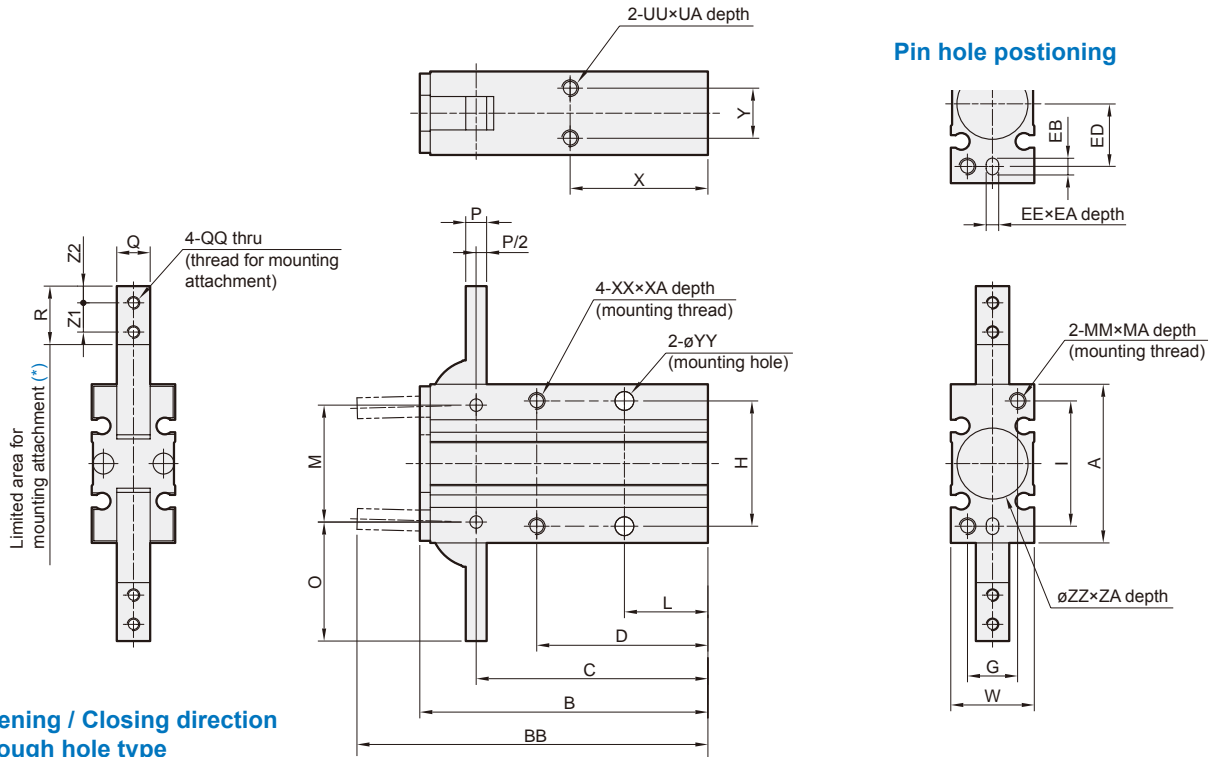
| No. | Tube I.D. Part name | 10 | 16 | 20 | 25 | Q'y | Repair kits (inclusion) |
|-----|------------------------|-----------------|----------------|-----|----|-----|----------------------------|
| 1 | Body | Aluminum alloy | | | | 1 | |
| 2 | Piston rod | Stainless steel | | | | 1 | |
| 3 | Bushing | Brass | | | | 1 | |
| 4 | Head cover | Stainless steel | | | | 1 | |
| 5 | Lever | Stainless steel | | | | 1 | |
| 6 | Gripper | Stainless steel | | | | 2 | |
| 7 | Grip rivet | Carbon steel | | | | 2 | |
| 8 | Pin | Carbon steel | | | | 2 | |
| 9 | Piston | *1 | Aluminum alloy | | | 1 | |
| 10 | Magnet holder | Stainless steel | | | | 1 | |
| 11 | Pin bushing | - | | SCM | | 2 | |
| 12 | Cushion pad | NBR | PU | | | 1 | ● |
| 13 | Magnet ring | Magnet material | | | | 1 | |
| 14 | Piston packing | NBR | | | | 1 | ● |
| 15 | Wear ring | Resin | | | | 1 | |
| 16 | Rod packing | NBR | | | | 1 | ● |

| No. | Tube I.D. Part name | 10 | 16 | 20 | 25 | Q'y | Repair kits (inclusion) |
|-----|------------------------|-----------------|-----------------|-----------------|----|-----|----------------------------|
| 17 | Screw | Stainless steel | | | | 2 | |
| 18 | Rod cover | Aluminum alloy | | | | 1 | |
| 19 | O-ring | NBR | | | | 1 | ● |
| 20 | Snap ring | *2 | Stainless steel | | | 1 | |
| 21 | O-ring | - | | NBR | | 1 | ● |
| 22 | Hexagon Bolt | - | | Stainless steel | | 1 | |
| 23 | Scew | Stainless steel | | | | 4 | |

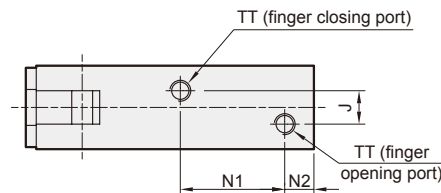
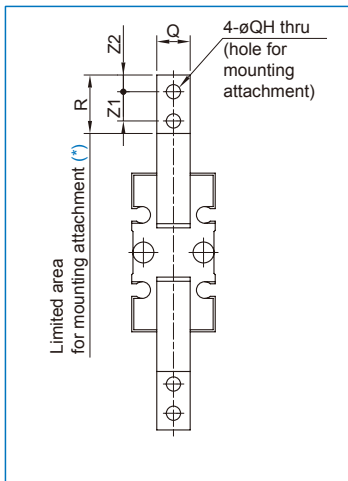
*1. Stainless steel *2. Carbon steel

Order example of repair kits

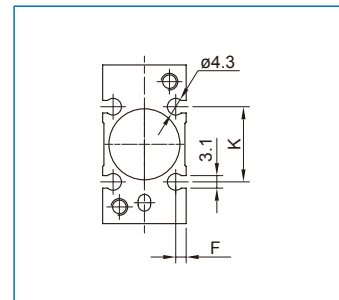
| Tube I.D. | Repair kits |
|-----------|-------------------|
| ø10 | PS-MCHY-10 |
| ø16 | PS-MCHY-16 |
| ø20 | PS-MCHY-20 |
| ø25 | PS-MCHY-25 |



Opening / Closing direction through hole type



Auto switch mounting groove position



* Do not extend the attachment from limited area for mounting to avoid interference with the attachment or main body.

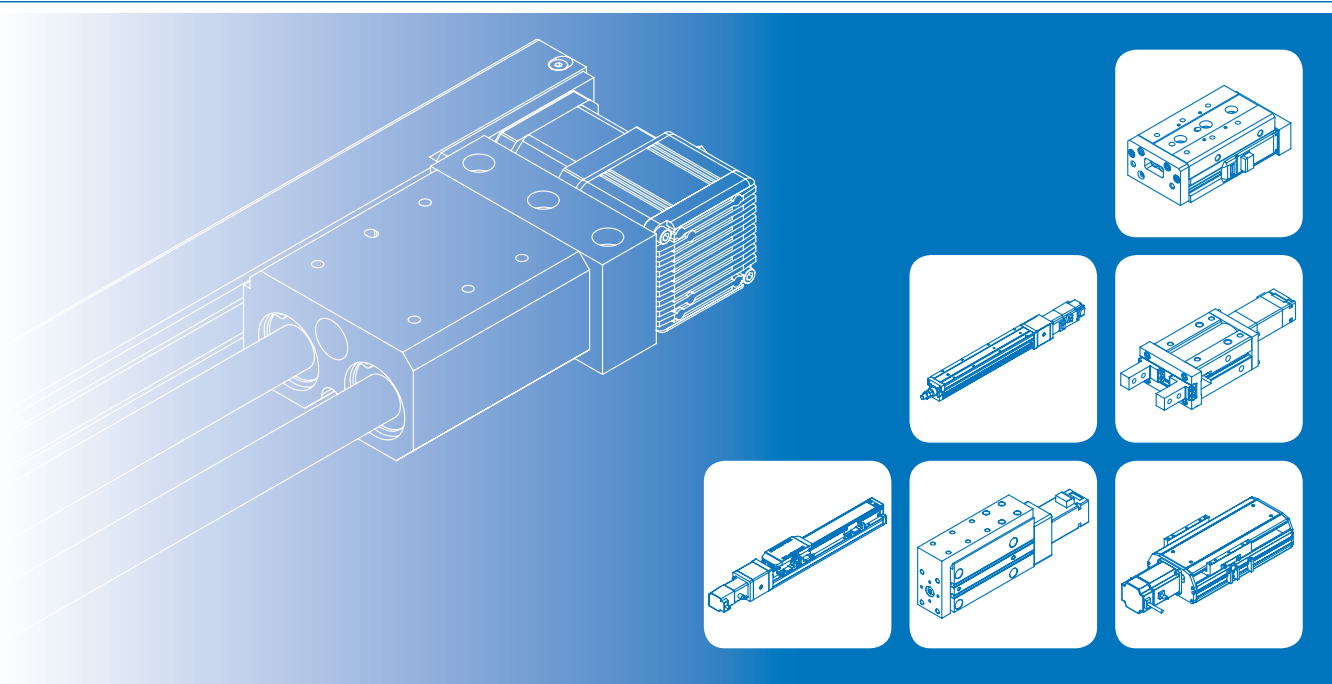
| Code Tube I.D. | A | B | BB | C | D | EE | EA | EB | ED | F | G | H | I | J | K | L | M | MA | MM | N1 | N2 | O | P | Q | QH | QQ |
|----------------|----|-----|-----|------|----|-------------------------------------|----|----|----|-----|----|----|----|----|----|----|----|----|--------|----|----|------|----|--|-----|--------|
| 10 | 30 | 58 | 71 | 47.5 | 35 | 3H9 ^{+0.025} ₋₀ | 3 | 4 | 9 | 2 | 9 | 24 | 24 | 3 | 13 | 18 | 22 | 6 | M3×0.5 | 23 | 7 | 23.5 | 4 | 6 ^{-0.005} _{-0.025} | 3.4 | M3×0.5 |
| 16 | 38 | 69 | 84 | 55.5 | 41 | 3H9 ^{+0.025} ₋₀ | 3 | 4 | 15 | 2.5 | 12 | 30 | 30 | 8 | 18 | 20 | 28 | 8 | M4×0.7 | 25 | 7 | 28.5 | 5 | 8 ^{-0.005} _{-0.025} | 3.4 | M3×0.5 |
| 20 | 48 | 86 | 106 | 69 | 50 | 4H9 ^{+0.030} ₋₀ | 4 | 5 | 19 | 3 | 16 | 36 | 38 | 12 | 20 | 25 | 36 | 10 | M5×0.8 | 32 | 8 | 37 | 8 | 10 ^{-0.005} _{-0.025} | 4.5 | M4×0.7 |
| 25 | 58 | 107 | 131 | 86 | 60 | 4H9 ^{+0.030} ₋₀ | 4 | 5 | 23 | 3 | 18 | 42 | 46 | 14 | 24 | 30 | 45 | 12 | M6×1 | 42 | 8 | 45 | 10 | 12 ^{-0.005} _{-0.025} | 5.5 | M5×0.8 |

| Code Tube I.D. | R | TT | UA | UU | W | X | XA | XX | Y | YY | ZA | ZZ | Z1 | Z2 |
|----------------|------|--------|----|--------|----|----|----|--------|----|-----|-----|--------------------------------------|----|----|
| 10 | 12 | M5×0.8 | 4 | M3×0.5 | 15 | 30 | 6 | M3×0.5 | 9 | 3.4 | 1.5 | 11H9 ^{+0.043} ₋₀ | 6 | 3 |
| 16 | 14 | M5×0.8 | 5 | M4×0.7 | 20 | 33 | 8 | M4×0.7 | 12 | 4.5 | 1.5 | 17H9 ^{+0.043} ₋₀ | 7 | 4 |
| 20 | 18 | M5×0.8 | 8 | M5×0.8 | 26 | 42 | 10 | M5×0.8 | 14 | 5.5 | 1.5 | 21H9 ^{+0.052} ₋₀ | 9 | 5 |
| 25 | 22.5 | M5×0.8 | 10 | M6×1 | 30 | 50 | 12 | M6×1 | 16 | 6.6 | 1.5 | 26H9 ^{+0.052} ₋₀ | 12 | 6 |





ELECTRIC ACTUATOR

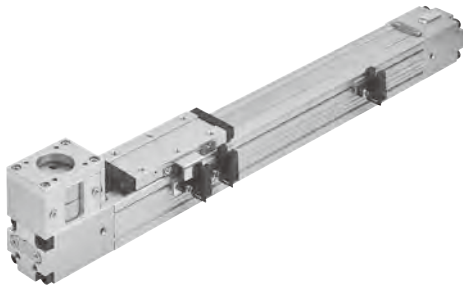


| | | |
|--------------|---|------|
| | SLIDER ELECTRIC CYLINDER- BELT DRIVEN | |
| METFB | (Without Motor) | |
| | METFB-25 New | 4-2 |
| | METFB-32 New | 4-8 |
| | METFB-40 New | 4-14 |
| METB | (Without Motor) □42~□80 | 4-20 |
| | SLIDER ELECTRIC CYLINDER- BALL SCREW DRIVE | |
| | Selector Table | 4-24 |
| | Applications..... | 4-28 |
| | Inner Structure | 4-32 |
| METG | (Without Motor) | |
| | METG-4 | 4-38 |
| | METG-5 | 4-42 |
| | METG-8 New | 4-46 |
| METS2 | (Without Motor) | |
| | METS2-10 New | 4-50 |
| | METS2-14 New | 4-54 |
| | METS2-17 New | 4-59 |
| METS | (Without Motor) | |
| | METS-22 | 4-63 |
| | Measuring Tools | 4-68 |
| | Technical Wording Reference .. | 4-70 |
| | Ball screw information | 4-72 |

| | | |
|--------------|--|-------|
| | ROD TYPE ELECTRIC ACTUATOR | |
| MEQG | (Without Motor) | |
| | MEQG-5 New | 4-74 |
| | MEQG-8 New | 4-78 |
| MEQI | (Without Motor) | |
| | MEQI-50 New | 4-82 |
| | MEQI-63 New | 4-82 |
| | MINIATURE ELECTRIC CYLINDER | |
| MESS2 | (With Motor) | |
| | MESS2-16 New | 4-92 |
| | MESS2-25 New | 4-92 |
| MESH2 | (With Motor) | |
| | MESH2-16 New | 4-95 |
| | MESH2-20 New | 4-95 |
| | ELECTRIC GRIPPER | |
| MEHC2 | (With Motor) | |
| | MEHC2-16 New | 4-98 |
| | MEHC2-25 New | 4-98 |
| | ELECTRIC STOPPER ACTUATOR | |
| MESBE | (With Motor) | |
| | MESBE-50 New | 4-102 |
| | MOTOR DRIVE | |
| MECQ1 | New | 4-106 |
| MECP | New | 4-108 |

METFB-25 series

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



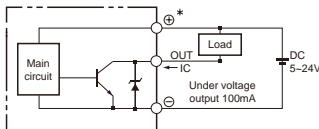
Specification

| Model | | METFB-25 |
|------------------------|----------|-------------------|
| Position repeatability | (mm) | ±0.05 |
| Lead | (mm/rev) | 50 |
| Belt pitch | (mm) | 2 |
| Stroke | (mm) | 100~1000/50 pitch |
| No-load torque | (N.m) | 0.1 |
| Sensor switch | | EE-SX672 (NPN) |

| Motor type | AC servo | Step |
|---------------------|-----------------|------|
| Power output / size | 100W | □35 |
| Max. speed *1 | (mm/s) | 1500 |
| Work load *2,3 | Horizontal (kg) | 5 |
| | Vertical (kg) | — |

| | | | |
|-------------|--------------|--------------|--------------|
| Motor type | Servo / Step | Transmission | Timing belt |
| Environment | Standard | Guide type | Linear guide |

Sensor layout



- *1. Acceleration and deceleration value is set 0.5 second.
- *2. The operating speed under work load is less than maximum speed.
- *3. Not available for vertical condition.

Order example

METFB-25 N - 1000 BW - S35 B - A3 - XA00

| Model | Size | Stroke | Special order No. |
|----------|------|--------|-------------------|
| METFB-25 | N | 1000 | XA00 |

100~1000 mm
50 mm pitch

| Guide installation | Motor position | Motor band | Power output | Brakes | Limit sensor |
|----------------------------|---------------------|---------------------|----------------------|---------------------|--------------------|
| N Without guide | BW Top side | M Mitsubishi | 10 100W Servo | - No brake | - No sensor |
| GR Guide right side | BM Down side | P Panasonic | | B With brake | A1 1 pc |
| GL Guide left side | | Y Yaskawa | | | A2 2 pcs |
| | | D Delta | | A3 3 pcs | |
| | | S Mindman | 35 □35 Step | | |

Weight

Unit: kg

| Model | Basic weight METFB-25N | Stroke 100 mm METFB-25N | Basic weight (with guide) METFB-25G* | Stroke 100 mm (with guide) METFB-25G* |
|-------|---------------------------|----------------------------|---|--|
| Size | | | | |
| 25 | 0.97 | 0.18 | 1.3 | 0.27 |

* The form is the weight of the type of motor top side.

METFB-25 Motor specification

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

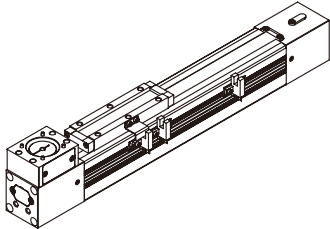
Gripper

Electric Actuator

Auxiliary Equipment

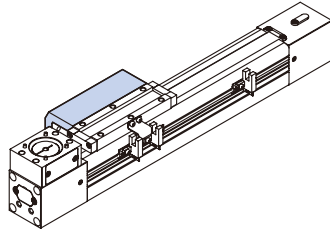
Hydraulic Cylinder

Guide installation



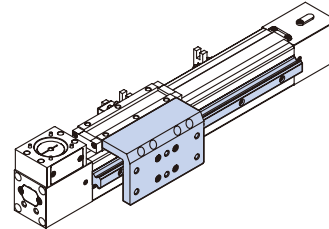
N

Without guide



GR

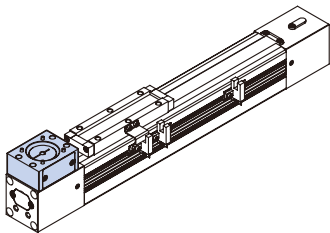
Guide right side



GL

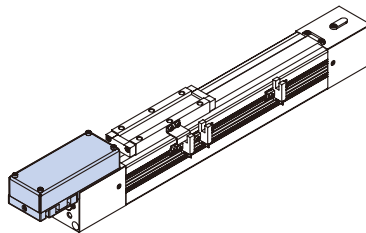
Guide left side

Motor position



BW

Top side



BM

Down side

Standard motors

| Brand | Mark | Power output | Motor model (Without brake) | Motor model (With brake) | Motor rod dia. (mm) | Motor mount P.C.D (mm) | Mounting port (mm) |
|------------|----------|--------------|-----------------------------|--------------------------|---------------------|------------------------|--------------------|
| Mitsubishi | M | 100W | HG-KN13J | HG-KN13B J | ø8 | ø46 | 2-ø4.5 |
| Panasonic | P | 100W | MSMF012L1U2M | MSMF012L1V2M | ø8 | ø45 | 4-ø3.4 |
| Yasukawa | Y | 100W | SGM7J-01A7A21 | SGM7J-01A7A2C | ø8 | ø46 | 2-ø4.3 |
| Delta | D | 100W | ECMA-C20401PS | ECMA-C20401FS | ø8 | ø46 | 2-ø4.5 |
| Mindman | S | □35 | - | - | ø5 | □26 | 4-M3x4.5L |

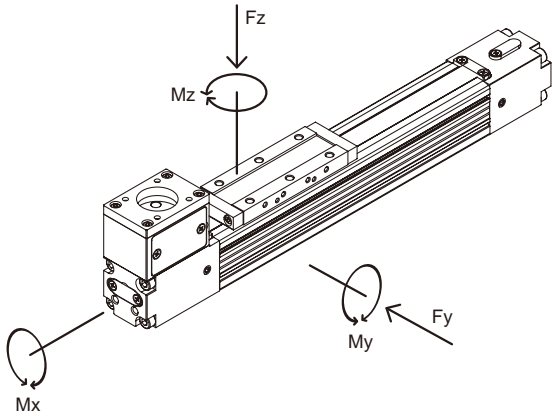
* If your inquiry is not included in above table, please kindly contact us.

METFB-25 Capacity

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Mindman



Forces & Moments

| Model | Mx | My | Mz | Fy | Fz | |
|----------|---------------------------|----|----|----------------------|------|------|
| | Max. allowed moment (N.m) | | | Max. allowed load(N) | | |
| METFB-25 | Without guide | 5 | 12 | 12 | - | 300 |
| | With guide | 38 | 42 | 42 | 2400 | 2700 |

Attention: In case of undefinable situations the above max. values have to be reduced by 10--20%.

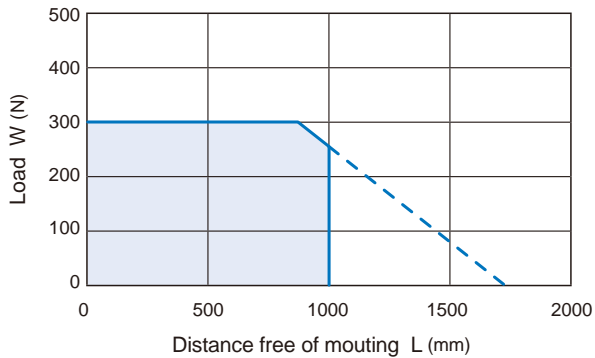
Please refer to the following formula when combined loads are applied.

$$\frac{M_{xA}}{M_x} + \frac{M_{yA}}{M_y} + \frac{M_{zA}}{M_z} + \frac{F_{yA}}{F_y} + \frac{F_{zA}}{F_z} \leq 1$$

* The A letters show the calculated value.

Positioning of cylinder mountings

METFB-25 Without guide



METFB-25 With guide

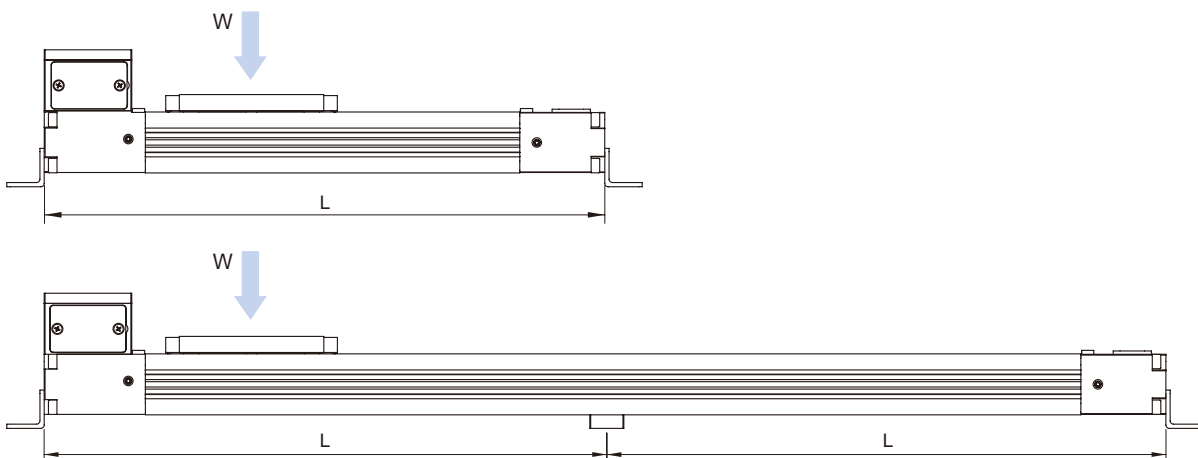
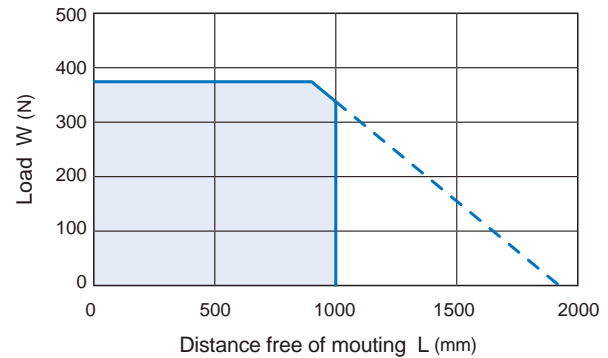


Diagram information

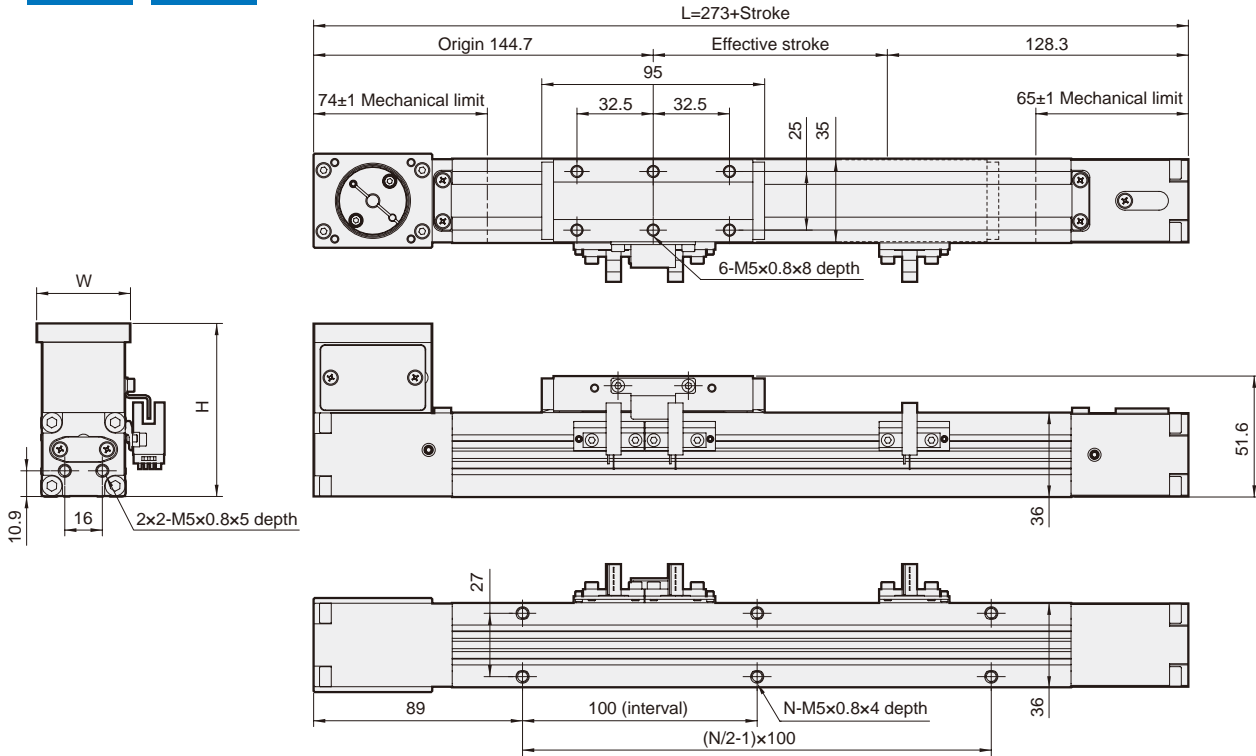
- Calculated deflections without support of 0.5~1 mm allow exceeding of the approved limits.
- Calculated deflections without support of > 1~1.5 mm require reduction of approved limits.

METFB-25 Dimensions

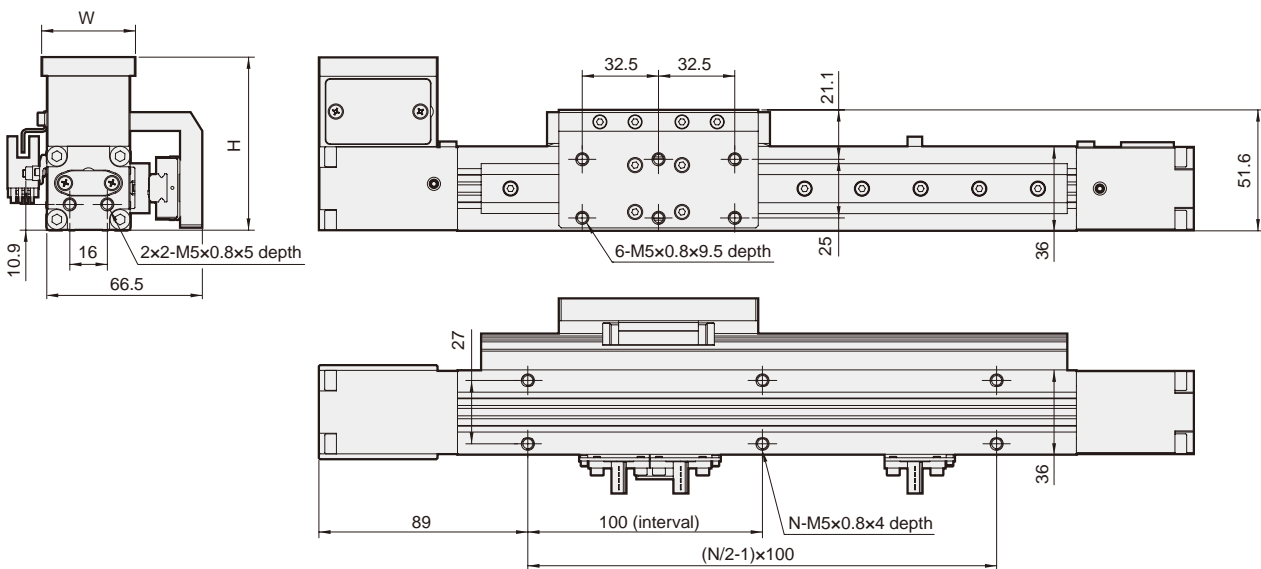
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



N **BW** Without guide • Motor top side



GL **BW** Guide left side • Motor top side



Unit: mm

| Stroke Code | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| L | 373 | 423 | 473 | 523 | 573 | 623 | 673 | 723 | 773 | 823 | 873 | 923 | 973 | 1023 | 1073 | 1123 | 1173 | 1223 | 1273 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 | 22 | 24 |

| Stroke Code | Servo | Step |
|-------------|-------|------|
| W | 40 | 35.5 |
| H | 73.8 | 71.8 |

METFB-25 Dimensions

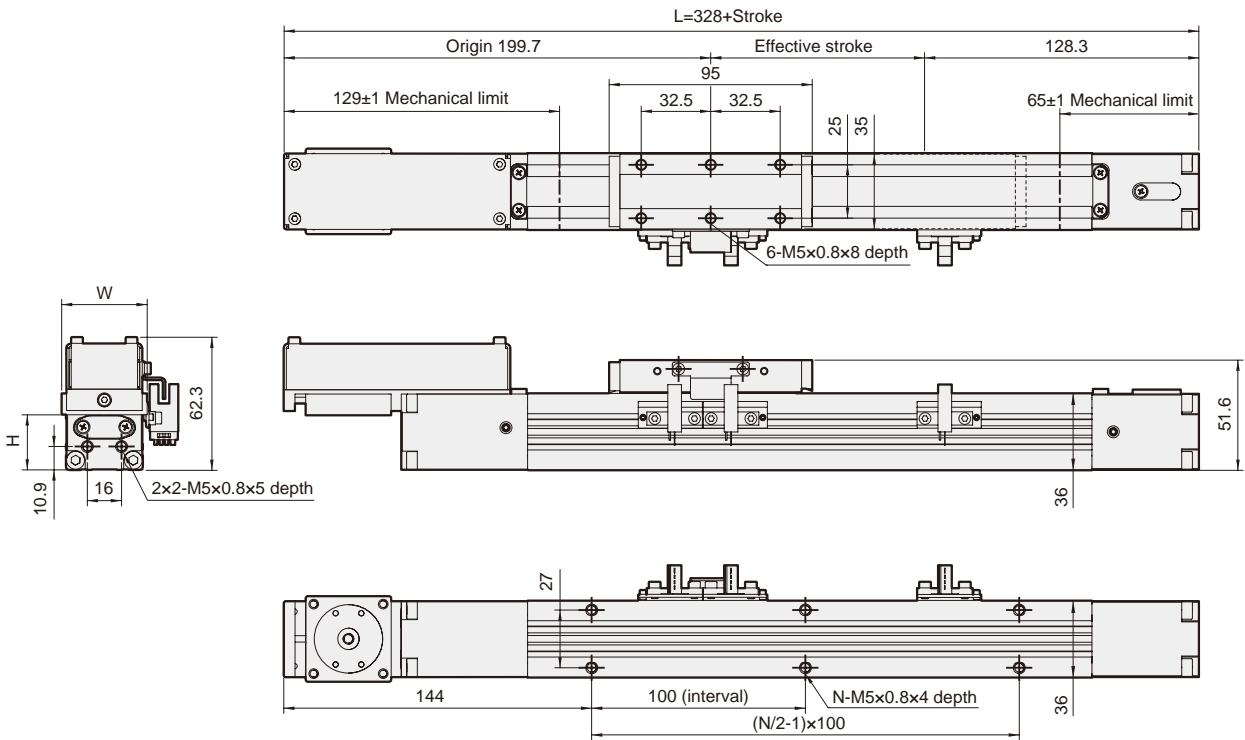
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



N

BM

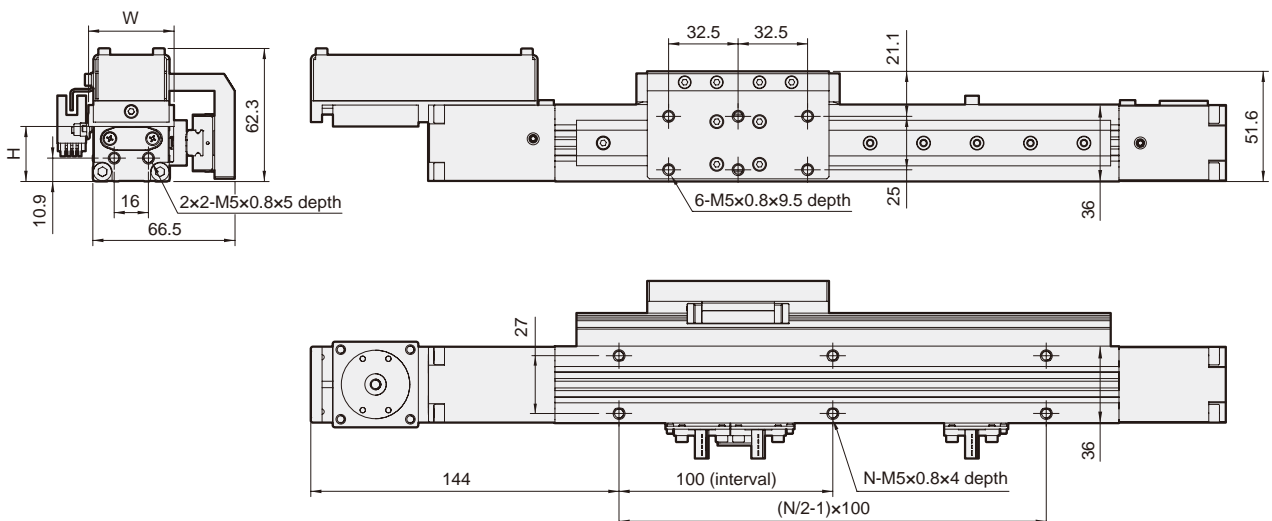
Without guide • Motor down side



GL

BM

Guide left side • Motor down side



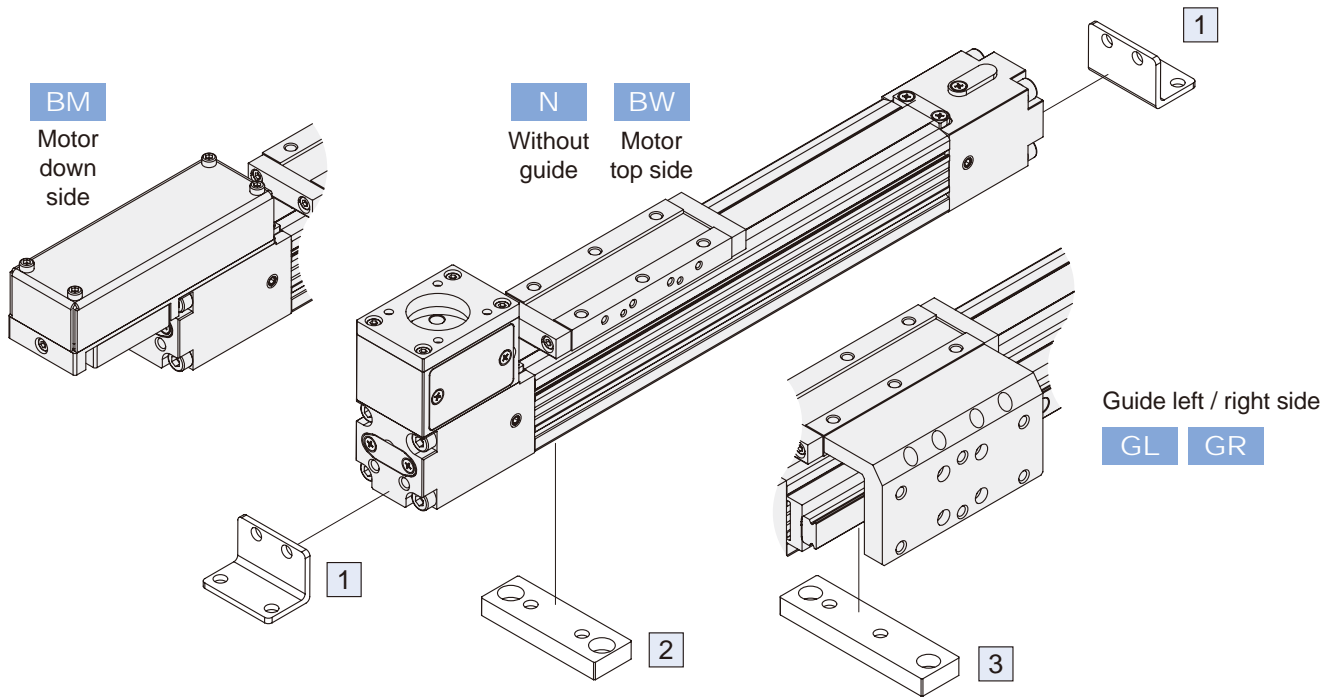
Unit: mm

| Stroke Code | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|-------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|
| L | 428 | 478 | 528 | 578 | 628 | 678 | 728 | 778 | 828 | 878 | 928 | 978 | 1028 | 1078 | 1128 | 1178 | 1228 | 1278 | 1328 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 | 22 | 24 |

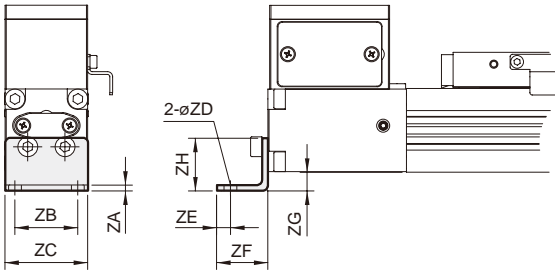
| Stroke Code | Servo | Step |
|-------------|-------|------|
| W | 40 | 35.5 |
| H | 25.8 | 25.8 |

METFB-25 Mounting accessories

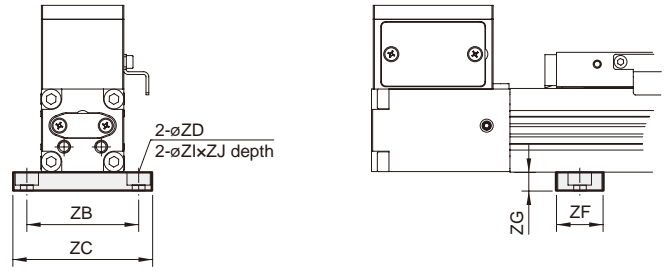
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



1 End cover bracket (2pcs/set)

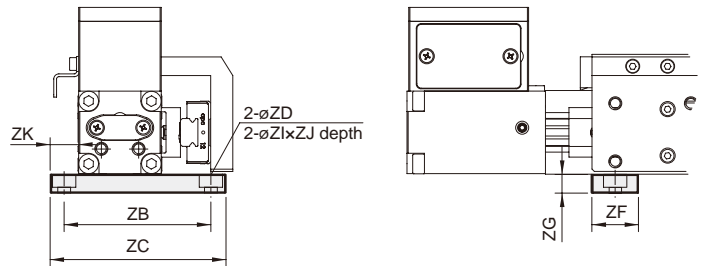


2 Mid section support *Applicable for (N) without guide.



* Not applicable for (BM) motor down side.

3 Mid section support *Applicable for (GR / GL) with guide.



| Item | ZA | ZB | ZC | ZD | ZE | ZF | ZG | ZH | ZI | ZJ | ZK | Weight (g) | Order number |
|------|-----|----|------|-----|----|----|----|------|----|-----|----|------------|--------------|
| 1 | 2.5 | 27 | 35.5 | 5.5 | 6 | 22 | 8 | 22.6 | - | - | - | 27 | ETFB25-1 |
| 2 | - | 48 | 60 | 5.5 | - | 20 | 8 | - | 10 | 5.5 | - | 21 | ETFB25-2 |
| 3 | - | 63 | 75 | 5.5 | - | 20 | 8 | - | 10 | 5.5 | 12 | 27 | ETFB25-3 |

Unit: mm

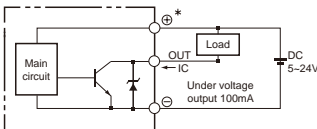
METFB-32 series

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



| | | | |
|-------------|--------------|--------------|--------------|
| Motor type | Servo / Step | Transmission | Timing belt |
| Environment | Standard | Guide type | Linear guide |

Sensor layout



Specification

| Model | | METFB-32 |
|------------------------|----------|-------------------|
| Position repeatability | (mm) | ±0.05 |
| Lead | (mm/rev) | 72 |
| Belt pitch | (mm) | 3 |
| Stroke | (mm) | 100~2000/50 pitch |
| No-load torque | (N.m) | 0.2 |
| Sensor switch | | EE-SX672 (NPN) |

| Motor type | AC servo | Step |
|---------------------|-----------------|------|
| Power output / size | 200W | □42 |
| Max. speed *1 | (mm/s) | 2400 |
| Work load *2,3 | Horizontal (kg) | 9 |
| | Vertical (kg) | — |

- *1. Acceleration and deceleration value is set 0.5 second.
- *2. The operating speed under work load is less than maximum speed.
- *3. Not available for vertical condition.

Order example

METFB-32 N - 1000 BW - S42 B - A3 - XA00

| | | | |
|--------------|-------------|----------------------------|--------------------------|
| Model | Size | Stroke | Special order No. |
| METFB-32 | N | 1000 | XA00 |
| | | 100~2000 mm 50 mm pitch | |

| Guide installation | | Motor position | | Motor band | | Power output | | Brakes | | Limit sensor | |
|--------------------|------------------|----------------|-----------|------------|------------|--------------|---------------|----------|------------|--------------|-----------|
| N | Without guide | BW | Top side | M | Mitsubishi | 20 | 200W Servo | - | No brake | - | No sensor |
| GR | Guide right side | BM | Down side | P | Panasonic | | | | | | |
| GL | Guide left side | | | Y | Yaskawa | | | B | With brake | A1 | 1 pc |
| | | | | D | Delta | | | | | A2 | 2 pcs |
| | | | | S | Mindman | 42 | □42 Step | | | A3 | 3 pcs |

Weight

Unit: kg

| Model | Basic weight METFB-32N | Stroke 100 mm METFB-32N | Basic weight (with guide) METFB-32G* | Stroke 100 mm (with guide) METFB-32G* |
|-------|---------------------------|----------------------------|---|--|
| Size | | | | |
| 32 | 2.06 | 0.36 | 2.7 | 0.49 |

* The form is the weight of the type of motor top side.

METFB-32 Motor specification

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

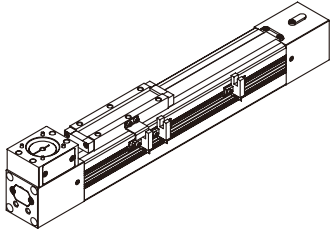
Gripper

Electric Actuator

Auxiliary Equipment

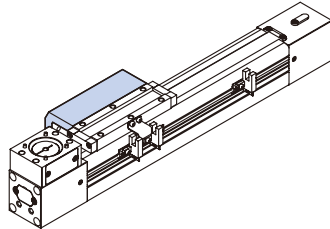
Hydraulic Cylinder

Guide installation



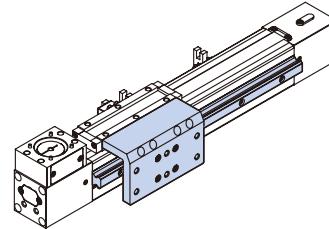
N

Without guide



GR

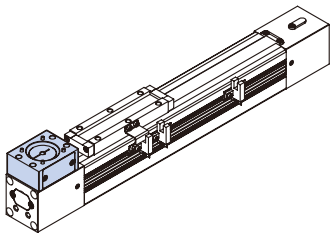
Guide right side



GL

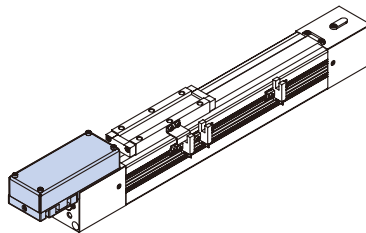
Guide left side

Motor position



BW

Top side



BM

Down side

Standard motors

| Brand | Mark | Power output | Motor model (Without brake) | Motor model (With brake) | Motor rod dia. (mm) | Motor mount P.C.D (mm) | Mounting port (mm) |
|------------|----------|--------------|-----------------------------|--------------------------|---------------------|------------------------|--------------------|
| Mitsubishi | M | 200W | HG-KN23J | HG-KN23B J | ø14 | ø70 | 4-ø5.8 |
| Panasonic | P | 200W | MHMF022L1U2M | MHMF022L1V2M | ø11 | ø70 | 4-ø4.5 |
| Yasukawa | Y | 200W | SGM7J-02A7A21 | SGM7J-02A7A2C | ø14 | ø70 | 4-ø5.5 |
| Delta | D | 200W | ECMA-C20602PS | ECMA-C20602FS | ø14 | ø70 | 4-ø5.5 |
| Mindman | S | □42 | - | - | ø5 | □31 | 4-M3×4.5L |

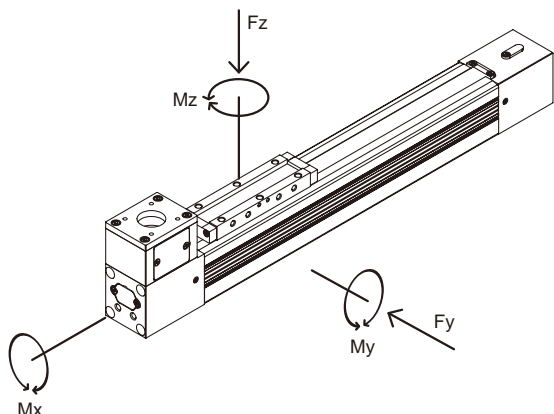
* If your inquiry is not included in above table, please kindly contact us.

METFB-32 Capacity

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Mindman



Forces & Moments

| Model | Mx | My | Mz | Fy | Fz | |
|----------|---------------------------|------|----|----------------------|------|------|
| | Max. allowed moment (N.m) | | | Max. allowed load(N) | | |
| METFB-32 | Without guide | 5.5 | 22 | 22 | - | 500 |
| | With guide | 47.5 | 48 | 48 | 2800 | 3300 |

Attention: In case of undefinable situations the above max. values have to be reduced by 10--20%.

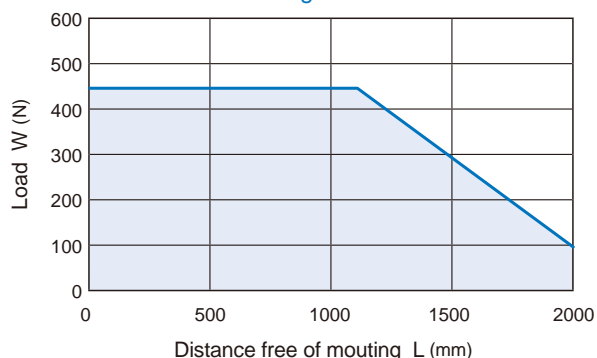
Please refer to the following formula when combined loads are applied.

$$\frac{M_{xA}}{M_x} + \frac{M_{yA}}{M_y} + \frac{M_{zA}}{M_z} + \frac{F_{yA}}{F_y} + \frac{F_{zA}}{F_z} \leq 1$$

* The A letters show the calculated value.

Positioning of cylinder mountings

METFB-32 Without guide



METFB-32 With guide

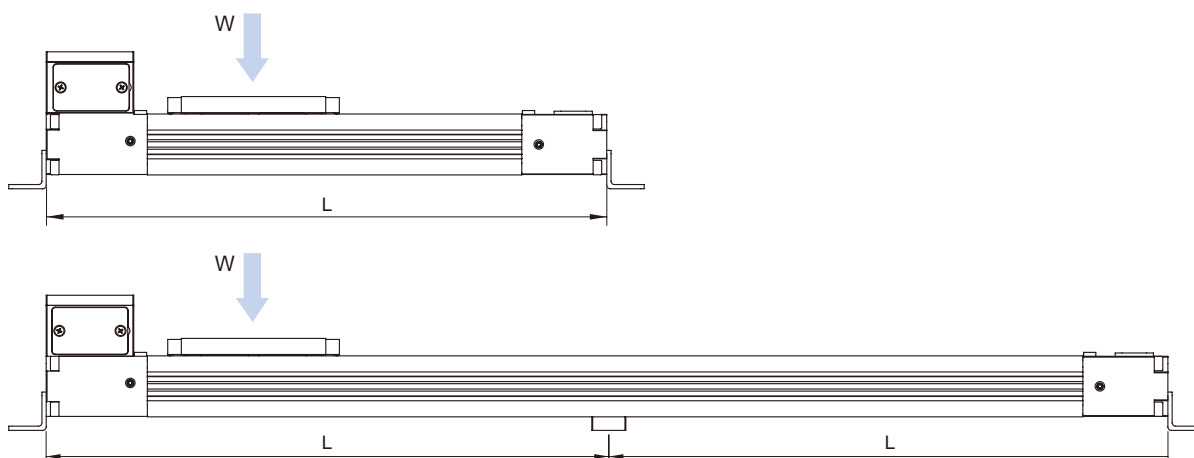
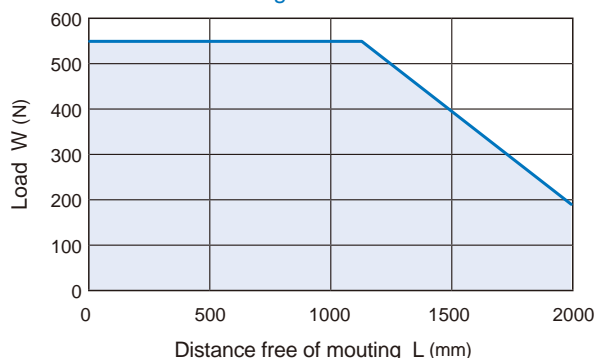


Diagram information

- Calculated deflections without support of 0.5~1 mm allow exceeding of the approved limits.
- Calculated deflections without support of > 1~1.5 mm require reduction of approved limits.

METFB-32 Dimensions

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

Gripper

Electric Actuator

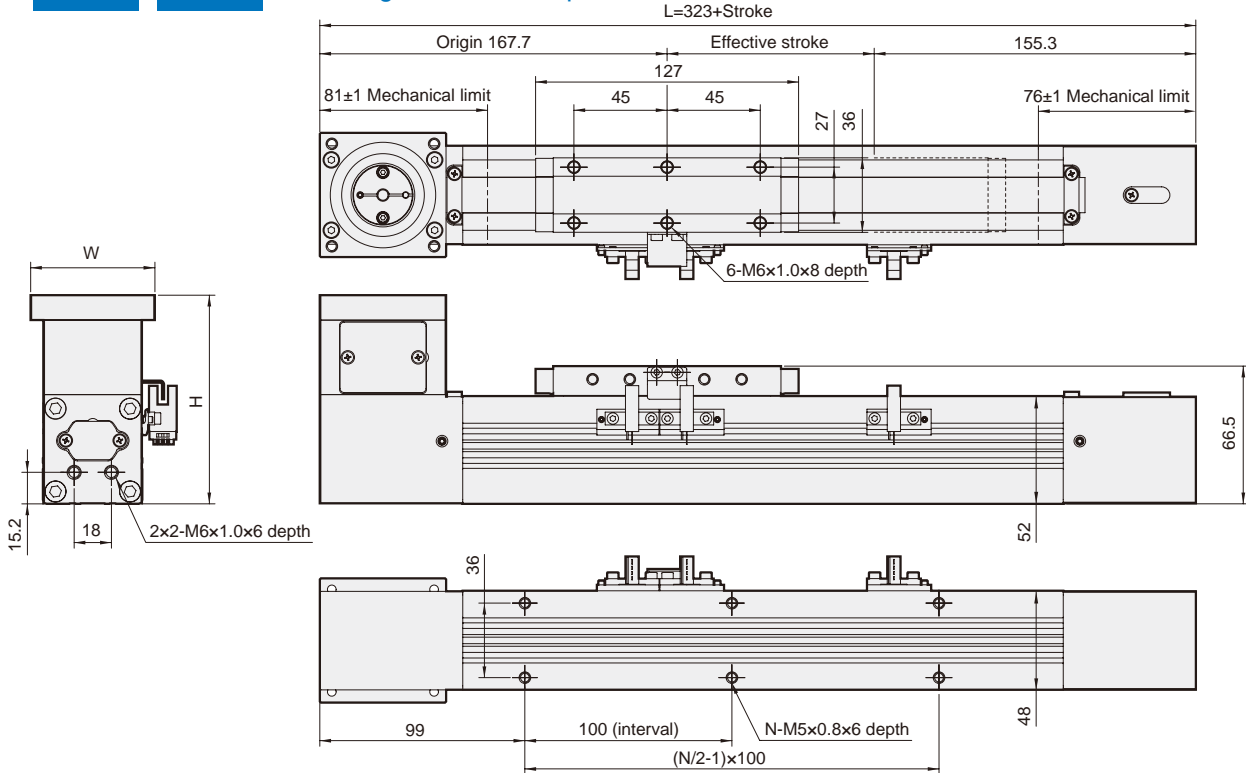
Auxiliary Equipment

Hydraulic Cylinder

N

BW

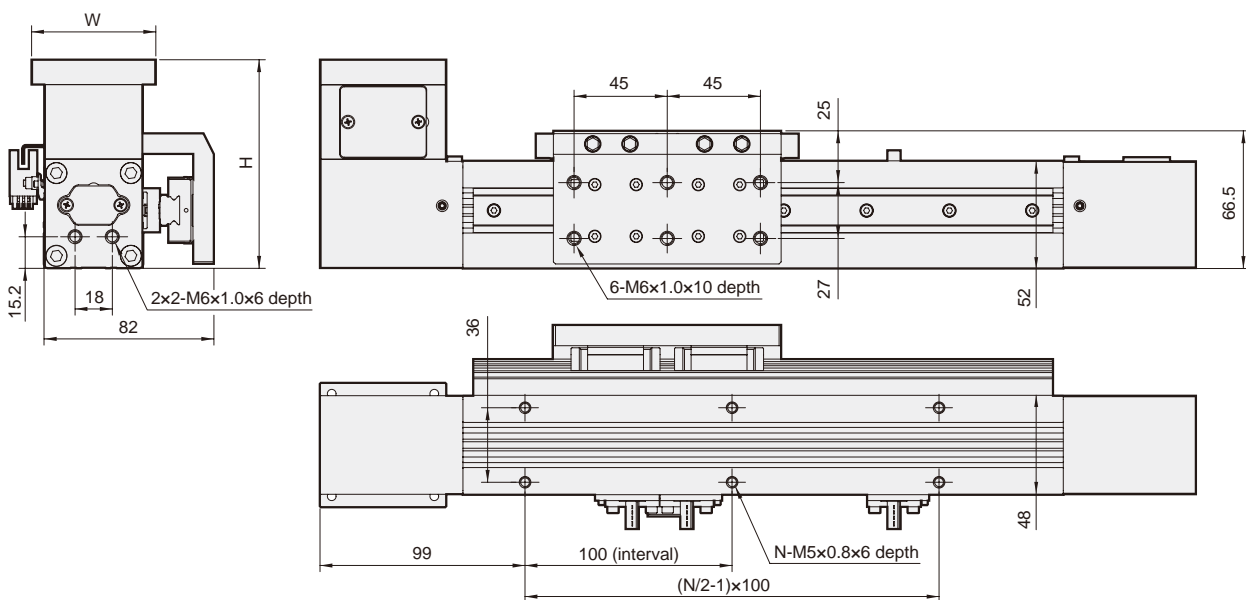
Without guide • Motor top side



GL

BW

Guide left side • Motor top side



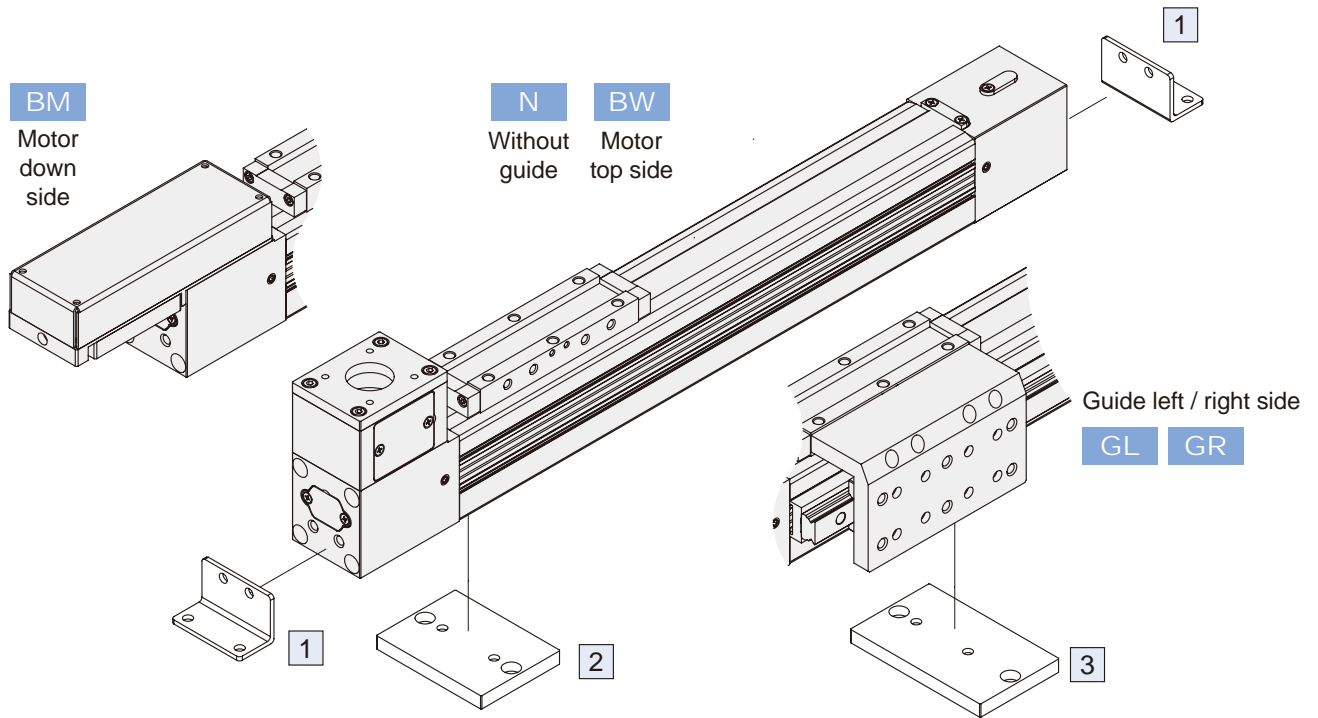
Unit: mm

| Stroke Code | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 |
|-------------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| L | 423 | 523 | 623 | 723 | 823 | 923 | 1023 | 1123 | 1223 | 1323 | 1423 | 1523 | 1623 | 1723 | 1823 | 1923 | 2023 | 2123 | 2223 | 2323 |
| N | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 44 |

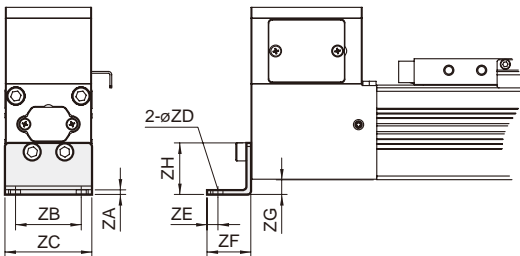
| Stroke Code | Servo | Step |
|-------------|-------|------|
| W | 60 | 47.6 |
| H | 100.8 | 94.8 |

METFB-32 Mounting accessories

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

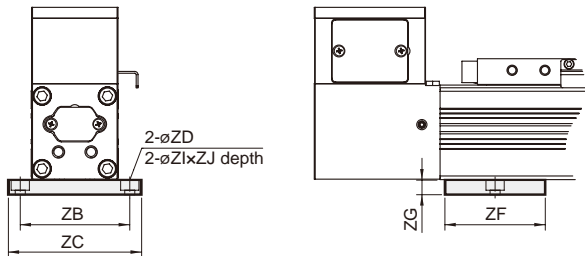


1 End cover bracket (2pcs/set)

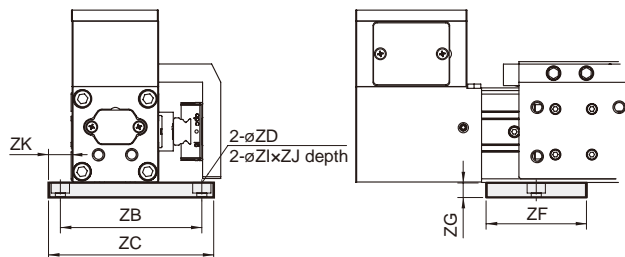


* Not applicable for (BM) motor down side.

2 Mid section support *Applicable for (N) without guide.



3 Mid section support *Applicable for (GR / GL) with guide.



| | | | | | | | | | | | | | Unit: mm | |
|------|-----|----|------|-----|----|----|----|------|----|-----|------|------------|--------------|--|
| Item | ZA | ZB | ZC | ZD | ZE | ZF | ZG | ZH | ZI | ZJ | ZK | Weight (g) | Order number | |
| 1 | 2.5 | 36 | 47.6 | 5.5 | 6 | 24 | 8 | 28.3 | - | - | - | 46 | ETFB32-1 | |
| 2 | - | 60 | 72 | 5.5 | - | 55 | 8 | - | 10 | 5.5 | - | 82 | ETFB32-2 | |
| 3 | - | 78 | 90 | 5.5 | - | 55 | 8 | - | 10 | 5.5 | 12.5 | 103 | ETFB32-3 | |

METFB-40 series

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



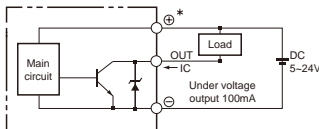
Specification

| Model | METFB-40 | |
|-----------------------------|-------------------|--|
| Position repeatability (mm) | ±0.05 | |
| Lead (mm/rev) | 72 | |
| Belt pitch (mm) | 3 | |
| Stroke (mm) | 100~2000/50 pitch | |
| No-load torque (N.m) | 0.6 | |
| Sensor switch | EE-SX672 (NPN) | |

| | | | |
|-------------|--------------|--------------|--------------|
| Motor type | Servo / Step | Transmission | Timing belt |
| Environment | Standard | Guide type | Linear guide |

| Motor type | AC servo | Step |
|----------------------|-----------------|------|
| Power output / size | 400W | □56 |
| Max. speed *1 (mm/s) | 2400 | 720 |
| Work load *2,3 | Horizontal (kg) | 15 |
| | Vertical (kg) | — |

Sensor layout



- *1. Acceleration and deceleration value is set 0.5 second.
- *2. The operating speed under work load is less than maximum speed.
- *3. Not available for vertical condition.

Order example

METFB-40 N-1000 BW-S56 B-A3-XA00

- Model:** METFB-40
- Size:** N
- Stroke:** 1000 (100~2000 mm, 50 mm pitch)
- Motor band:** BW
- Power output:** S56
- Brakes:** B
- Limit sensor:** A3
- Special order No.:** XA00

| Guide installation | Motor position | Motor band | Power output | Brakes | Limit sensor |
|----------------------------|---------------------|---------------------|---------------|---------------------|--------------------|
| N Without guide | BW Top side | M Mitsubishi | 40 400W Servo | - No brake | - No sensor |
| GR Guide right side | BM Down side | P Panasonic | | B With brake | A1 1 pc |
| GL Guide left side | | Y Yaskawa | | | A2 2 pcs |
| | | D Delta | | A3 3 pcs | |
| | | S Mindman | 56 □56 Step | | |

Weight

Unit: kg

| Model | Basic weight METFB-40N | Stroke 100 mm METFB-40N | Basic weight (with guide) METFB-40G* | Stroke 100 mm (with guide) METFB-40G* |
|-------|------------------------|-------------------------|--------------------------------------|---------------------------------------|
| Size | | | | |
| 40 | 2.96 | 0.5 | 3.73 | 0.62 |

* The form is the weight of the type of motor top side.

METFB-40 Motor specification

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

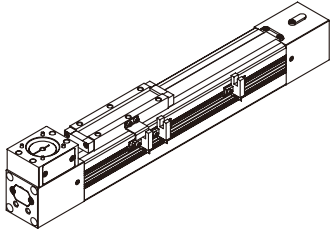
Gripper

Electric Actuator

Auxiliary Equipment

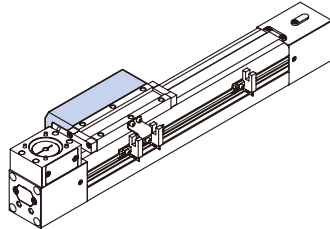
Hydraulic Cylinder

Guide installation



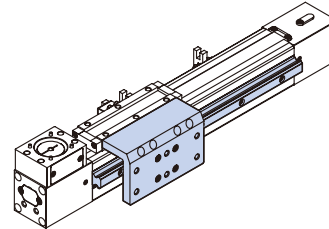
N

Without guide



GR

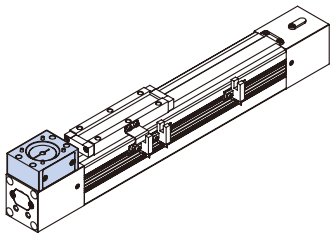
Guide right side



GL

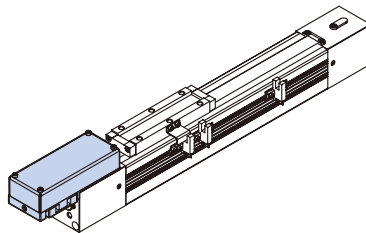
Guide left side

Motor position



BW

Top side



BM

Down side

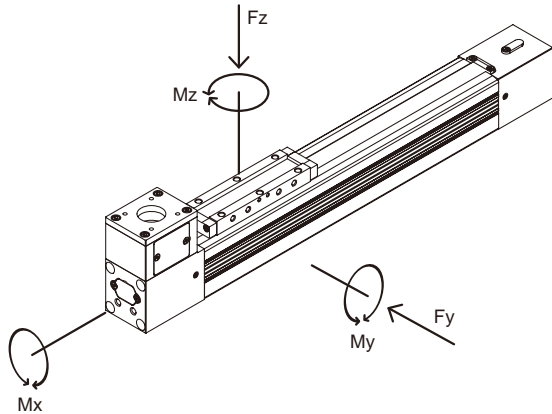
Standard motors

| Brand | Mark | Power output | Motor model (Without brake) | Motor model (With brake) | Motor rod dia. (mm) | Motor mount P.C.D (mm) | Mounting port (mm) |
|------------|----------|--------------|-----------------------------|--------------------------|---------------------|------------------------|--------------------|
| Mitsubishi | M | 400W | HG-KN43J | HG-KN43B J | ø14 | ø70 | 4-ø5.8 |
| Panasonic | P | 400W | MHMF042L1U2M | MHMF042L1V2M | ø14 | ø70 | 4-ø4.5 |
| Yasukawa | Y | 400W | SGM7J-04A7A21 | SGM7J-04A7A2C | ø14 | ø70 | 4-ø5.5 |
| Delta | D | 400W | ECMA-C20604PS | ECMA-C20604QS | ø14 | ø70 | 4-ø5.5 |
| Mindman | S | □56 | - | - | ø6.35 | □47.14 | 4-ø5 |

* If your inquiry is not included in above table, please kindly contact us.

METFB-40 Capacity

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Forces & Moments

| Model | Mx | My | Mz | Fy | Fz | |
|----------|---------------------------|----|----|----------------------|------|------|
| | Max. allowed moment (N.m) | | | Max. allowed load(N) | | |
| METFB-40 | Without guide | 10 | 30 | 30 | - | 600 |
| | With guide | 78 | 90 | 90 | 4000 | 4600 |

Attention: In case of undefinable situations the above max. values have to be reduced by 10--20%.

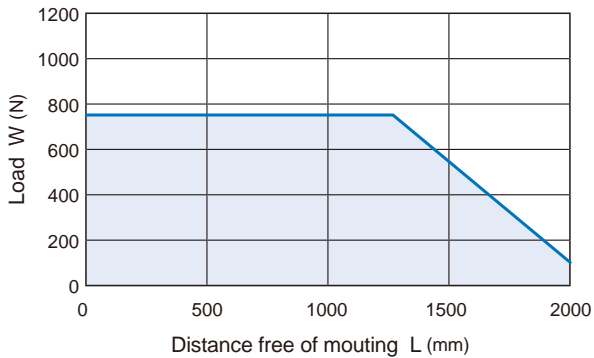
Please refer to the following formula when combined loads are applied.

$$\frac{M_{xA}}{M_x} + \frac{M_{yA}}{M_y} + \frac{M_{zA}}{M_z} + \frac{F_{yA}}{F_y} + \frac{F_{zA}}{F_z} \leq 1$$

* The A letters show the calculated value.

Positioning of cylinder mountings

METFB-40 Without guide



METFB-40 With guide

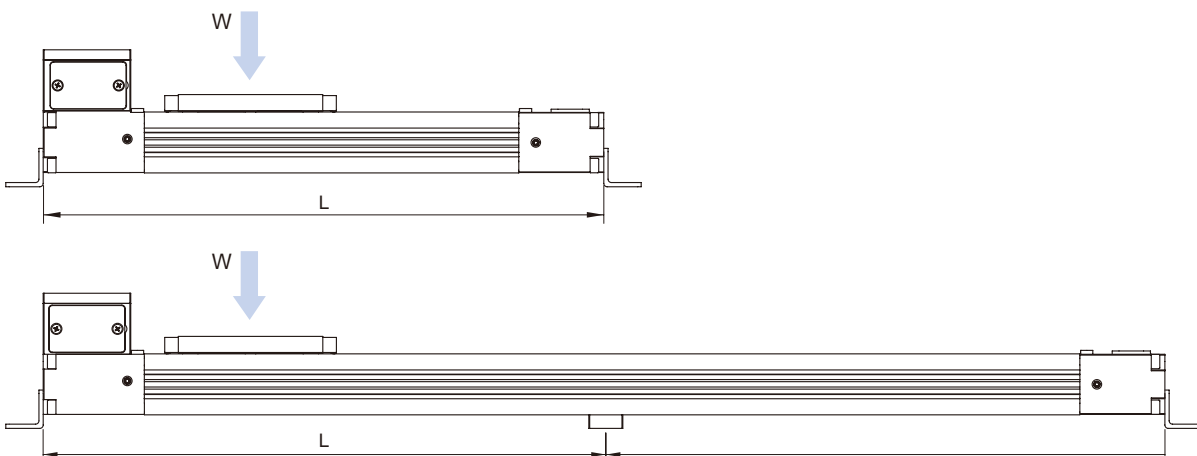
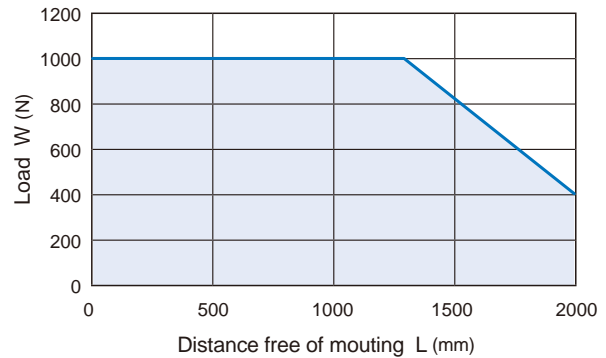


Diagram information

- Calculated deflections without support of 0.5~1 mm allow exceeding of the approved limits.
- Calculated deflections without support of > 1~1.5 mm require reduction of approved limits.

METFB-40 Dimensions

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

Gripper

Electric Actuator

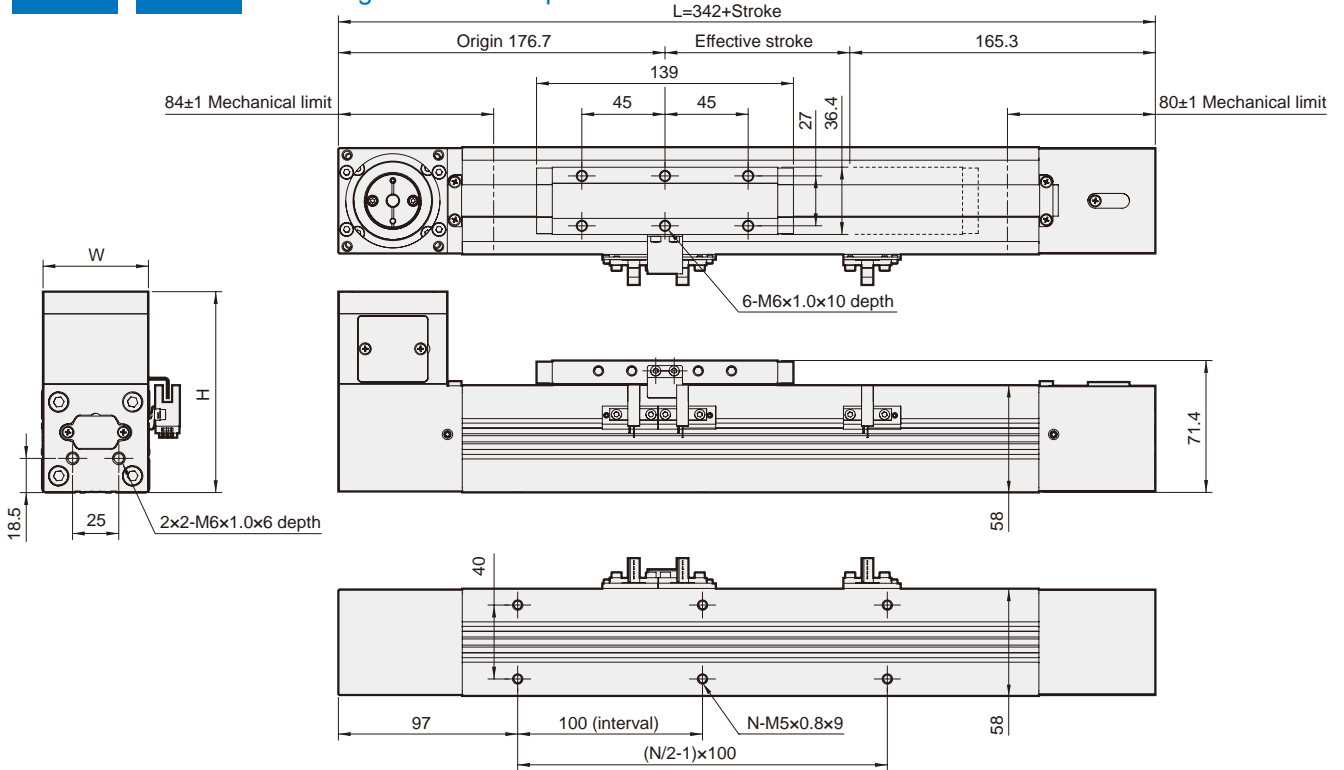
Auxiliary Equipment

Hydraulic Cylinder

N

BW

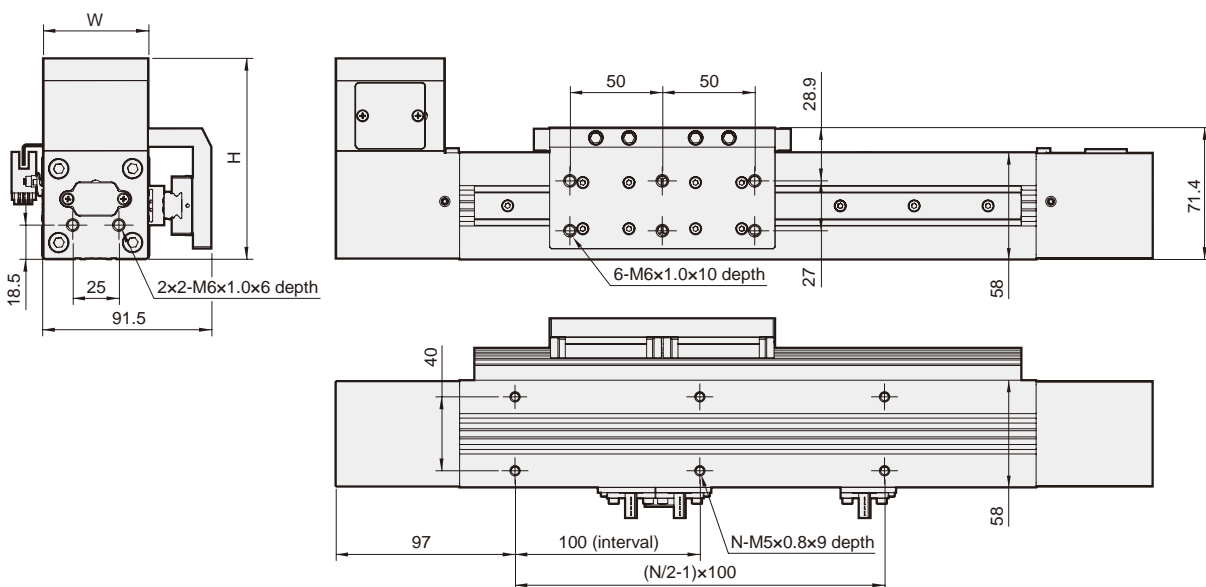
Without guide • Motor top side



GL

BW

Guide left side • Motor top side



Unit: mm

| Stroke Code | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 |
|-------------|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| L | 442 | 542 | 642 | 742 | 842 | 942 | 1042 | 1142 | 1242 | 1342 | 1442 | 1542 | 1642 | 1742 | 1842 | 1942 | 2042 | 2142 | 2242 | 2342 |
| N | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 44 |

| Stroke Code | Servo | Step |
|-------------|-------|-------|
| W | 57 | 57 |
| H | 108.7 | 102.7 |

METFB-40 Dimensions

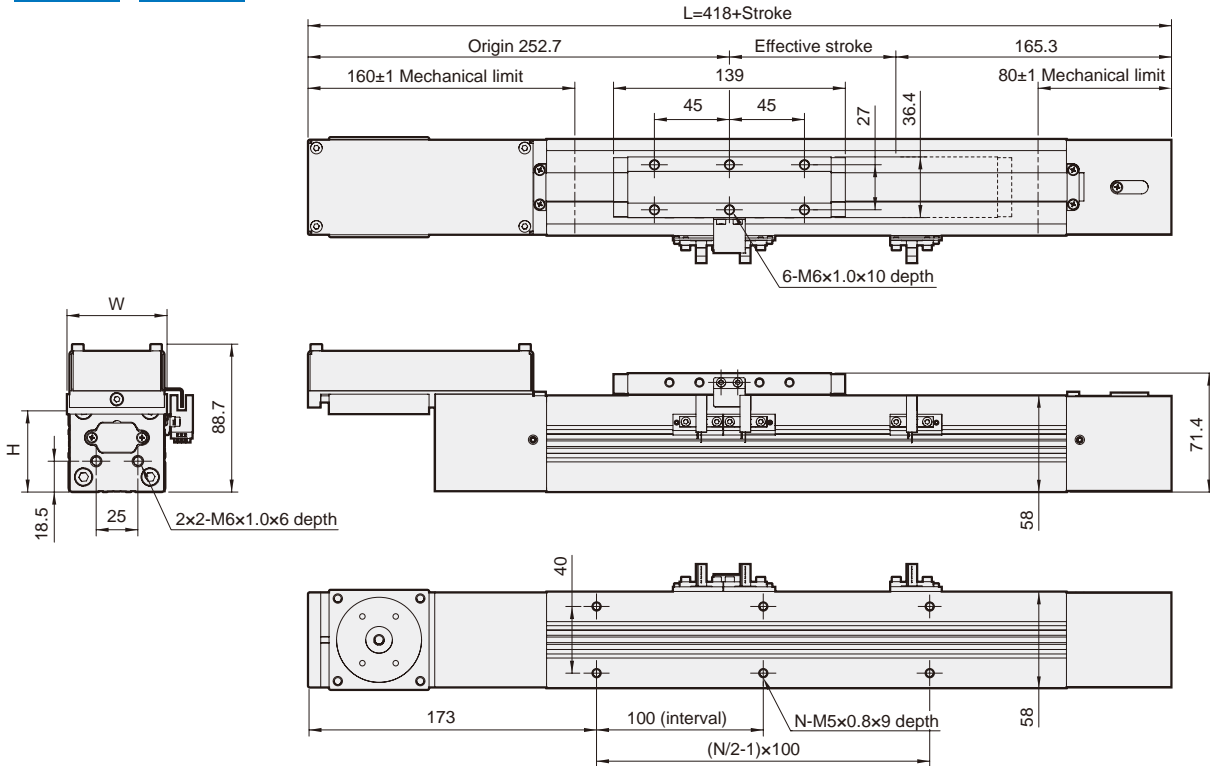
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



N

BM

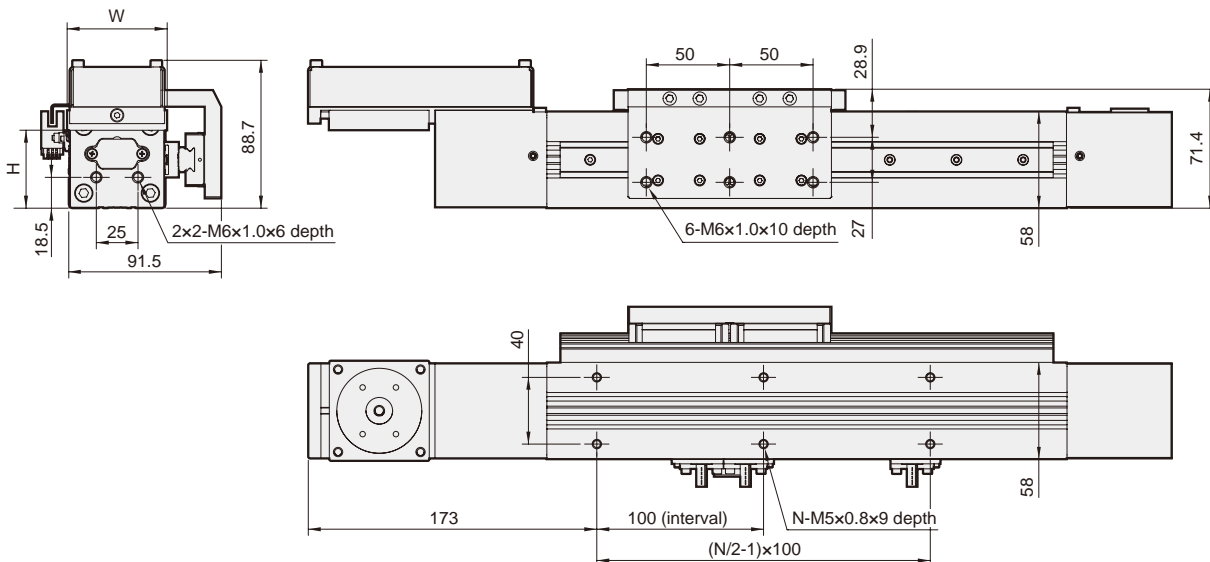
Without guide • Motor down side



GL

BM

Guide left side • Motor down side



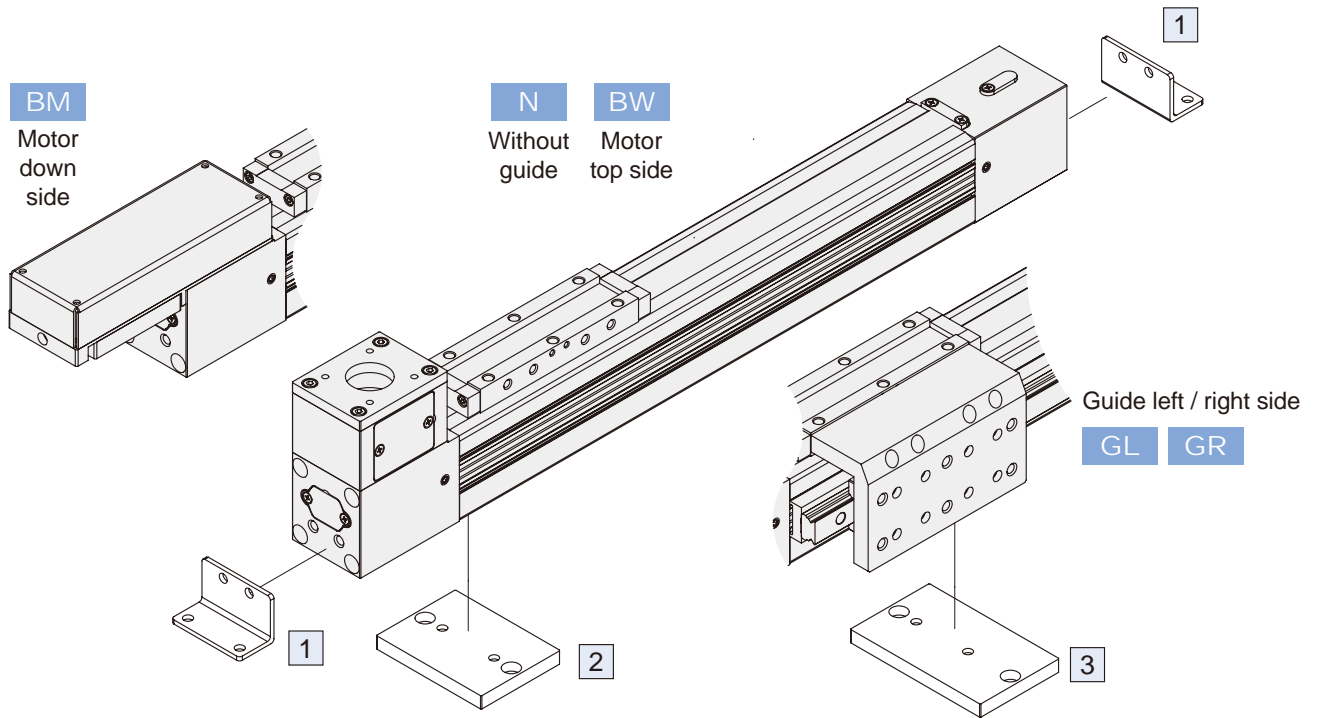
Unit: mm

| Stroke Code | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 | 900 | 1000 | 1100 | 1200 | 1300 | 1400 | 1500 | 1600 | 1700 | 1800 | 1900 | 2000 |
|-------------|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| L | 518 | 618 | 718 | 818 | 918 | 1018 | 1118 | 1218 | 1318 | 1418 | 1518 | 1618 | 1718 | 1818 | 1918 | 2018 | 2118 | 2218 | 2318 | 2418 |
| N | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 | 32 | 34 | 36 | 38 | 40 | 42 | 44 |

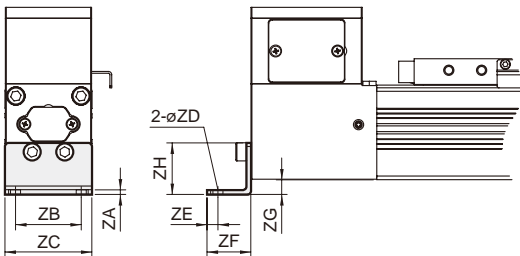
| Stroke Code | Servo | Step |
|-------------|-------|------|
| W | 60 | 57 |
| H | 46.7 | 48.7 |

METFB-40 Mounting accessories

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

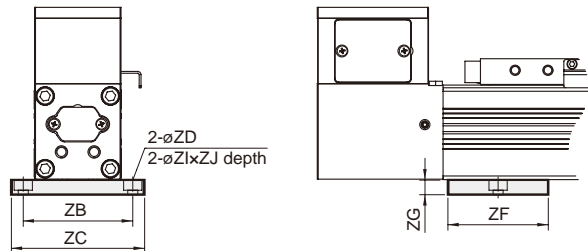


1 End cover bracket (2pcs/set)

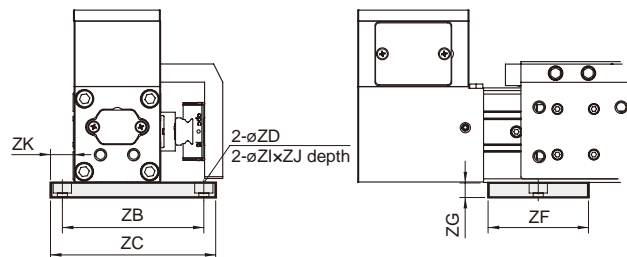


* Not applicable for (BM) motor down side.

2 Mid section support *Applicable for (N) without guide.



3 Mid section support *Applicable for (GR / GL) with guide.



Unit: mm

| Item | ZA | ZB | ZC | ZD | ZE | ZF | ZG | ZH | ZI | ZJ | ZK | Weight (g) | Order number |
|------|-----|----|-----|-----|----|----|----|------|----|-----|------|------------|--------------|
| 1 | 2.5 | 40 | 57 | 5.5 | 6 | 24 | 8 | 31.5 | - | - | - | 59 | ETFB40-1 |
| 2 | - | 70 | 85 | 5.5 | - | 60 | 8 | - | 10 | 5.5 | - | 105 | ETFB40-2 |
| 3 | - | 88 | 103 | 5.5 | - | 60 | 8 | - | 10 | 5.5 | 13.5 | 128 | ETFB40-3 |

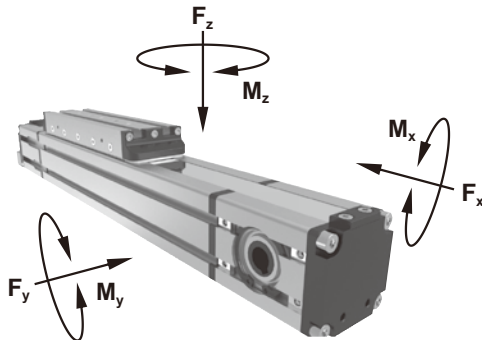


Max values for dynamic conditions.

Please refer to the following formula when combined loads are applied.

$$\frac{F_{yA}}{F_y} + \frac{F_{zA}}{F_z} + \frac{M_{xA}}{M_x} + \frac{M_{yA}}{M_y} + \frac{M_{zA}}{M_z} \leq 1$$

* The A letters show the calculated value.



Features

- Belt driven unit with railway integrated.
- Extruded aluminum anodized 6060 alloy, tempered stainless steel protection band.
- Carriage with sealed system to protect against pollution.

Specification

| Model | | METB | | |
|--|-----------------------|-------|-------|-------|
| Size | (mm) | 42 | 55 | 80 |
| Max. speed | (m/s) | 3 | 3 | 3 |
| Max. stroke length | (mm) | 6000 | 6000 | 6000 |
| Min. stroke length | (mm) | 100 | 100 | 100 |
| Pulley drive ratio | (mm) | 90 | 120 | 160 |
| Number of teeth of pulley | (mm) | 18 | 24 | 32 |
| Teeth belt with steel reinforced polyurethane ATL 5 profile clearance 0, width | (mm) | 12 | 16 | 25 |
| Max rpm | (g/min) | 2000 | 1500 | 1150 |
| Base weight | (kg) | 1.6 | 4.4 | 6 |
| Add for 100 mm of stroke | (kg) | 0.25 | 0.37 | 0.9 |
| Max. load | Fx (N) | 460 | 820 | 1650 |
| | Fy (N) | 1560 | 1850 | 4500 |
| | Fz (N) | 1560 | 1850 | 4500 |
| Moments | Mx (Nm) | 20 | 25 | 80 |
| | My (Nm) | 55 | 120 | 450 |
| | Mz (Nm) | 55 | 120 | 450 |
| Inertia moment aluminum profile | Ix (cm ⁴) | 11.8 | 36 | 183 |
| | Iy (cm ⁴) | 14.2 | 45 | 226 |
| Repeatability | (mm) | ±0.05 | ±0.05 | ±0.05 |
| Max. radial load on input shaft | (N) | 220 | 300 | 300 |
| No load torque | (Nm) | >0.1 | >0.5 | 0.9 |
| Sensor switch (*) | | RCI | | |

* RCI specification, please refer to page 5-7.

Order example

METB - 42 - 0100 - F08 L - EM2A

| Model | Size (mm) | Stroke | Shaft versions | | | | Male shaft | | Accessory | | |
|-------------------|-----------|--------|----------------|-------------------|----|------------|------------|-------------|------------------|-----------------------|--|
| METB | | | Size | Type | ø | Part No. | L | Left shaft | E | End cap mounting | |
| Female shaft | 42 | 42x42 | 42 | Female shaft | 8 | F08 | R | Right shaft | M□ ^{*1} | Mid section mounting | |
| | 55 | 55x55 | | Male shaft | 12 | M12 | | | A□ ^{*2} | Limit switch adapters | |
| | 80 | 80x80 | | Double male shaft | 12 | D12 | | | | | |
| Male shaft | | | 55 | Female shaft | 8 | F08 | | | Blank | 1 set (2 pcs) | |
| | | | | Male shaft | 16 | M16 | | | 2 | 2 set (4 pcs) | |
| | | | | Double male shaft | 16 | D16 | | | n | "n" set (nx2 pcs) | |
| Double male shaft | | | 80 | Female shaft | 19 | F19 | | | | | |
| | | | | Male shaft | 19 | M19 | | | Blank | 1 pc | |
| | | | | Double male shaft | 19 | D19 | | | 2 | 2 pcs | |
| | | | | | | | | n | "n" pcs | | |

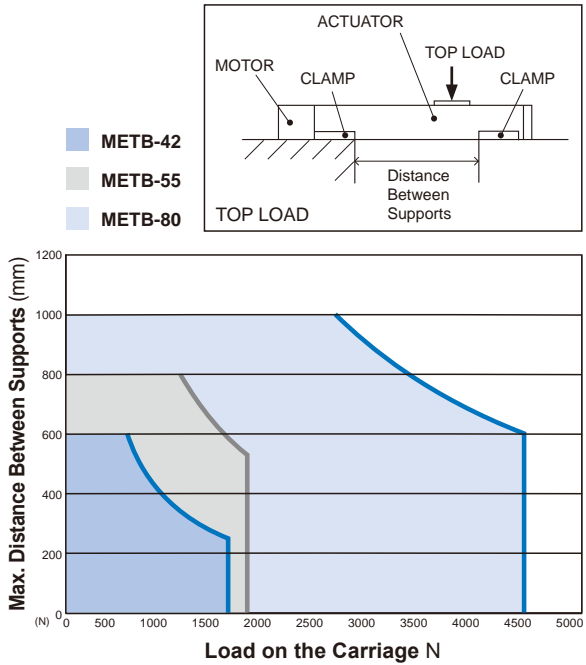
* Minimum stroke unit 1mm.

* A type only for size 80.

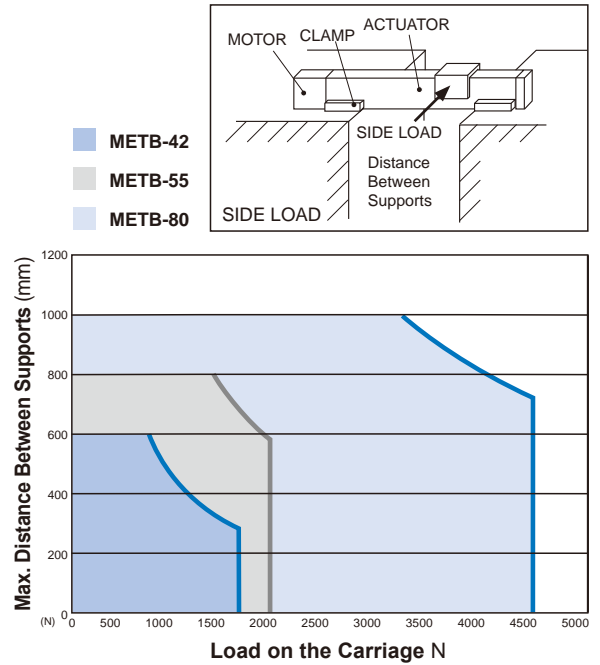
*1. Number of accessory

*2. Number of accessory

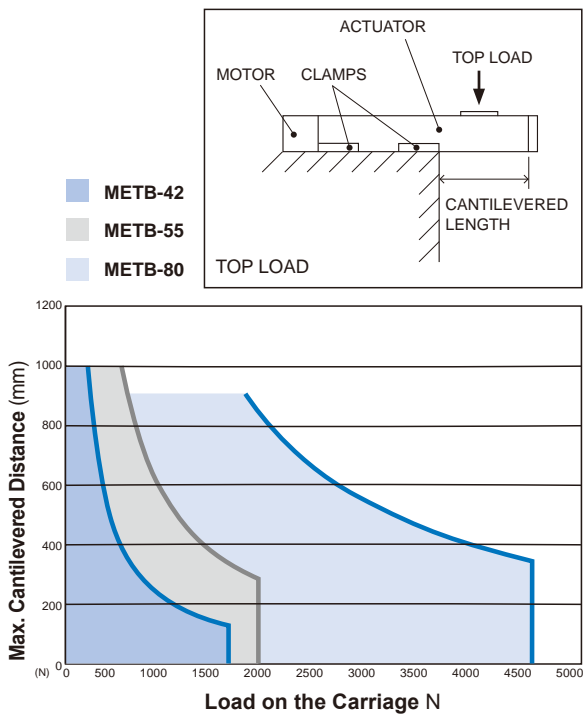
End supported top load



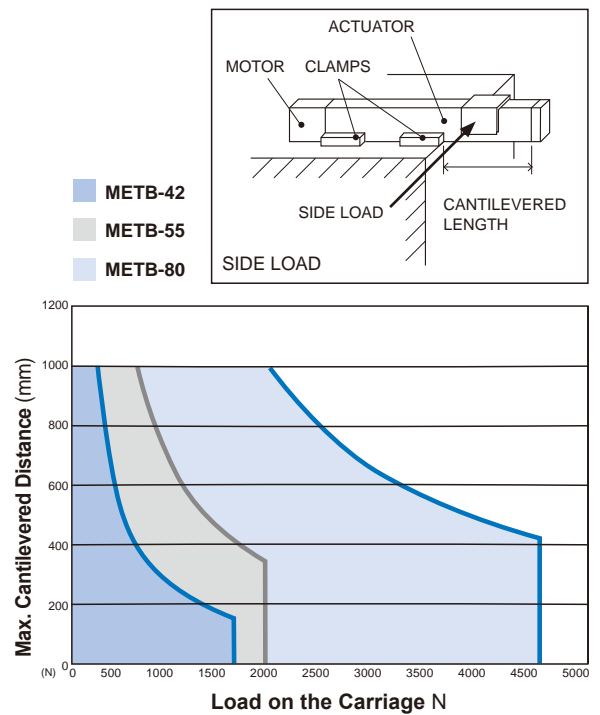
End supported side load



Cantilevered top load

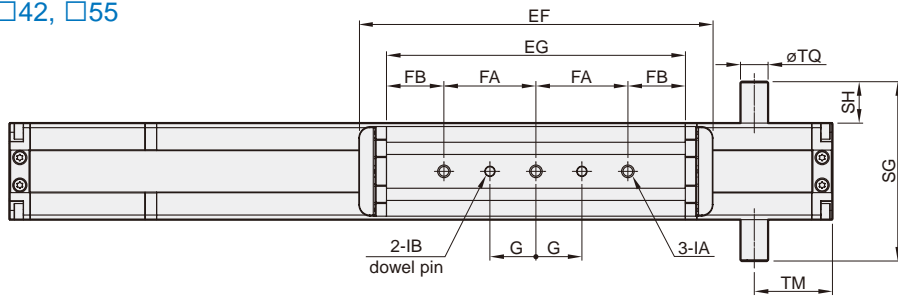


Cantilevered side load

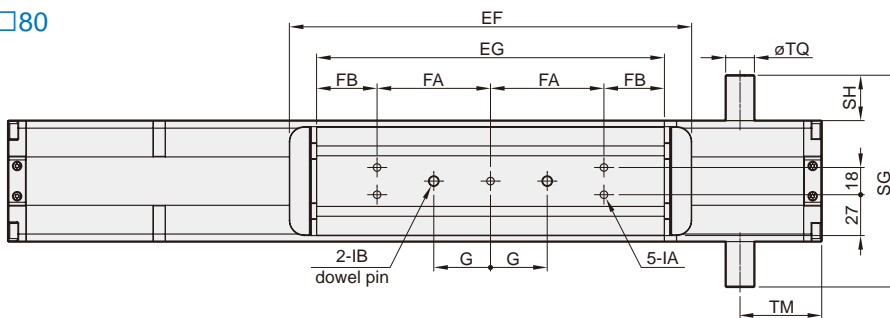


SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

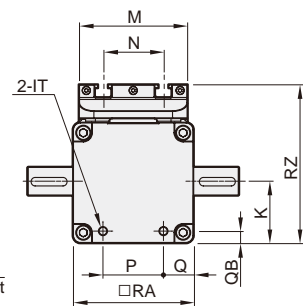
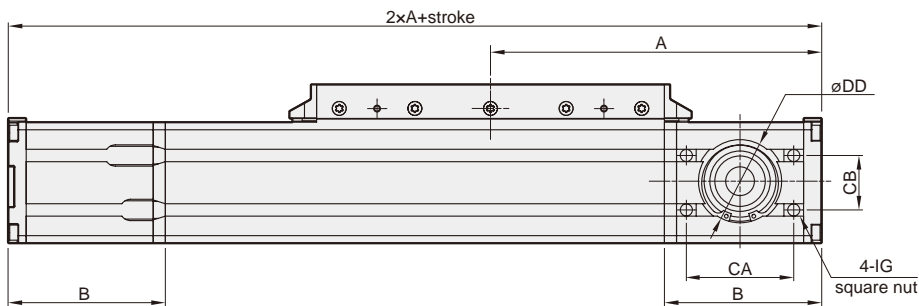
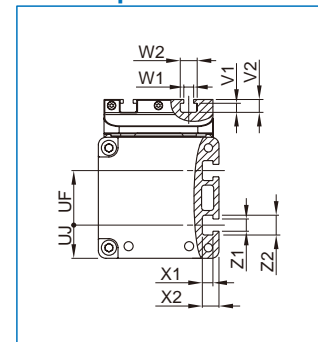
□42, □55



□80

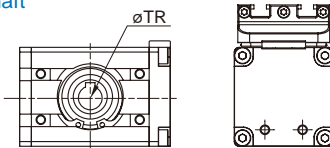


Groove position

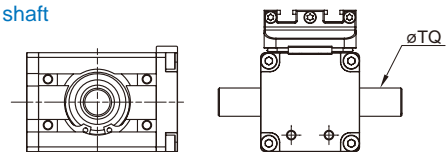


Shaft versions

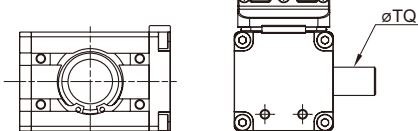
Female shaft



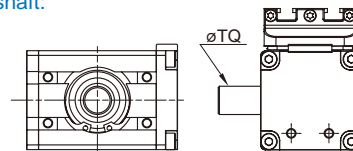
Double male shaft



Single male shaft:
side right



Single male shaft:
side left

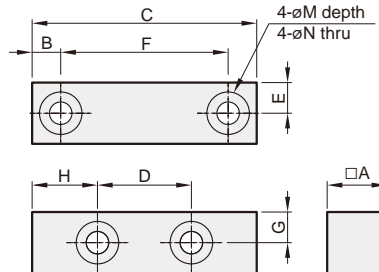


| Code Tube I.D. | A | B | CA | CB | DD | EF | EG | FA | FB | G | IA | IB | IG |
|-------------------|-----|-----|---------|------|------------------|-----|-----|----|----|------|------------------|----------------|-----------------|
| 42 | 129 | 64 | max. 42 | 19.5 | ∅28xH7x1.5 depth | 154 | 130 | 40 | 25 | 20 | M5x0.8x5 depth | ∅4xH7x5 depth | M5x0.8 DIN 562 |
| 55 | 166 | 88 | max. 55 | 22 | ∅32xH7x1.5 depth | 190 | 150 | 55 | 20 | 30 | M5x0.8x7.5 depth | ∅5xH7x5 depth | M5x0.8 DIN 562 |
| 80 | 219 | 104 | max. 71 | 35.9 | ∅55xH7x1.5 depth | 266 | 230 | 75 | 40 | 37.5 | M6x1.0x10 depth | ∅6xH7x10 depth | M8x1.25 DIN 562 |

| Code Tube I.D. | IT | K | M | N | P | Q | QB | RA | RZ | SG | SH | TM | TQ | TR | UF | UJ | V1 | V2 | W1 | W2 | X1 | X2 | Z1 | Z2 |
|-------------------|------------|----|----|----|----|----|----|----|-----|-----|------|------|----|----|------|------|-----|-----|-----|------|-----|-----|-----|------|
| 42 | M4x7 depth | 21 | 39 | 20 | 16 | 13 | 7 | 42 | 60 | 82 | 20 | 34 | 12 | 8 | 19.5 | 11 | 3.2 | 4.9 | 5.3 | 8.6 | 3.2 | 4.9 | 5.3 | 8.6 |
| 55 | M5x7 depth | 25 | 50 | 28 | 23 | 16 | 8 | 55 | 76 | 92 | 18.5 | 48.5 | 16 | 8 | 22 | 16.5 | 4.2 | 6.2 | 5.2 | 8.4 | 4.3 | 6.3 | 5.3 | 8.6 |
| 80 | M6x8 depth | 41 | 72 | 40 | 40 | 20 | 8 | 80 | 105 | 140 | 30 | 54 | 19 | 19 | 36 | 22 | 6 | 8.5 | 6.5 | 11.2 | 7 | 11 | 8.2 | 13.2 |

End cap mounting

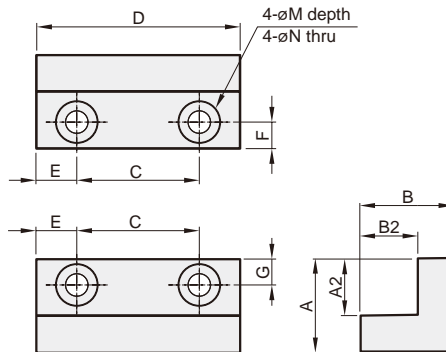
(2 pcs/set)



| Code Size | A | B | C | D | E | F | G | H | M | N | Order number |
|----------------|----|---|----|----|-----|----|---|----|-------------|-----|----------------|
| METB-42 | 14 | 5 | 42 | 16 | 7 | 32 | 7 | 13 | 8x4.4 depth | 4.5 | ETB42-1 |
| METB-55 | 15 | 7 | 55 | 23 | 7.5 | 41 | 7 | 16 | 10x5 depth | 5.5 | ETB55-1 |
| METB-80 | 16 | 8 | 80 | 40 | 8 | 64 | 8 | 20 | 11x6 depth | 6.6 | ETB80-1 |

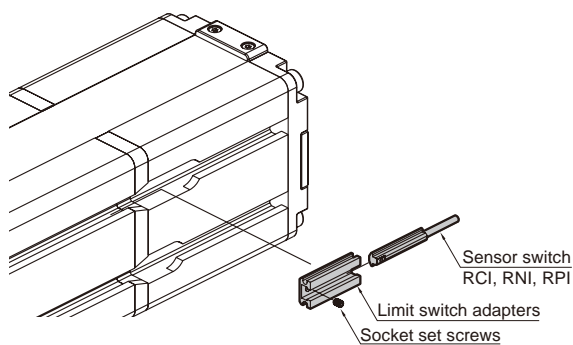
Mid section mounting

(2 pcs/set)



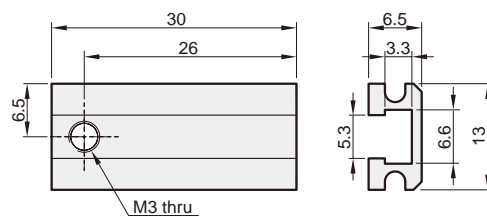
| Code Size | A | A2 | B | B2 | C | D | E | F | G | M | N | Order number |
|----------------|----|----|----|----|----|----|-----|-----|-----|--------------|-----|----------------|
| METB-42 | 17 | 12 | 17 | 12 | 25 | 40 | 7.5 | 6 | 6 | 10x3.5 depth | 5.5 | ETB42-2 |
| METB-55 | 23 | 14 | 23 | 14 | 30 | 50 | 10 | 6.5 | 6.5 | 10x5.5 depth | 5.5 | ETB55-2 |
| METB-80 | 32 | 19 | 34 | 21 | 40 | 60 | 10 | 8 | 10 | 15x8.6 depth | 9 | ETB80-2 |

Installation of sensor switch



Limit switch adapters

ETB80-3 (Only for size 80)



METG / METS2 / METS / MEQG / MEQI

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

| Use where | Drive mode | Model | Motor output (W) | Width (mm) | Repeatability (mm) | Ball screw spec | | Ball screw spec (kg) | | Max. speed *1 (mm/s) | | |
|-----------|------------|----------|------------------|------------|--------------------|---------------------|-----------|----------------------|---------------|----------------------|------|------|
| | | | | | | Outer diameter (mm) | Lead (mm) | Horizontal (mm) | Vertical (mm) | | | |
| Standard | Ball screw | METG-4 | 50W | 44 | ±0.01 | 10 | 2 | 25 | 8 | 100 | | |
| | | | 100W | | | | 6 | 20 | 5 | 300 | | |
| | | 12 | | 12 | 2 | | 600 | | | | | |
| | | 2 | | 25 | 8 | | 100 | | | | | |
| | | 6 | | 20 | 8 | | 300 | | | | | |
| | | 12 | | 12 | 3.5 | | 600 | | | | | |
| | | METG-5 | | 100W | 54 | ±0.01 | 12 | 2 | 30 | 10 | 100 | |
| | | | 5 | | | | | 30 | 10 | 250 | | |
| | | | 10 | | | | | 15 | 5 | 500 | | |
| | | | 20 | | | | | 10 | 2.5 | 1000 | | |
| | | METG-8 | 200W 400W | 82 | ±0.01 | 16 | | 5 | 50 | 15 | 250 | |
| | | | | | | | | 10 | 30 | 8 | 500 | |
| | | | | | | | | 20 | 18 | 3 | 1000 | |
| | | METS2-10 | 100W | 102 | ±0.01 | | | 16 | 5 | 50 | 12 | 250 |
| | | | | | | | | | 10 | 30 | 8 | 500 |
| | | | | | | | | | 20 | 18 | 3 | 1000 |
| | | 200W | 102 | ±0.01 | 16 | | | | 5 | 50 | 12 | 250 |
| | | | | | | | | | 10 | 30 | 8 | 500 |
| | | | | | | | 20 | | 18 | 3 | 1000 | |
| | | METS2-14 | 200W | 135 | | ±0.01 | 16 | 5 | 95 | 27 | 250 | |
| | | | | | | | | 10 | 75 | 18 | 500 | |
| | | | | | | | | 20 | 35 | 6 | 1000 | |
| | | 400W | 135 | ±0.01 | | 16 | | 5 | 110 | 33 | 250 | |
| | | | | | | | | 10 | 88 | 22 | 500 | |
| | | | | | | | | 20 | 40 | 8 | 1000 | |
| | | METS2-17 | 400W | 170 | ±0.01 | | 20 | 5 | 120 | 40 | 250 | |
| | | | | | | | | 10 | 110 | 30 | 500 | |
| | | | | | | | | 20 | 75 | 14 | 1000 | |
| | | 750W | 170 | ±0.01 | 20 | | | 5 | 120 | 50 | 250 | |
| | | | | | | | | 10 | 120 | 40 | 500 | |
| | | | | | | | | 20 | 83 | 25 | 1000 | |
| | | METS-22 | 750W | 220 | | ±0.01 | 25 | 5 | 150 | 55 | 250 | |
| | | | | | | | | 10 | 150 | 45 | 500 | |
| | | | | | | | | 25 | 120 | 20 | 1250 | |
| | | MEQG-5 | 100W | 54 | | ±0.01 | | 12 | 20 | 40 | 10 | 2000 |
| | | | | | | | | | 2 | 30 | 10 | 100 |
| | | | | | | | | | 5 | 30 | 10 | 250 |
| | | MEQG-8 | 200W 400W | 82 | ±0.01 | 16 | 10 | | 15 | 5 | 500 | |
| | | | | | | | 20 | | 10 | 2.5 | 1000 | |
| | | | | | | | 5 | | 50 | 15 | 250 | |
| | | MEQI-50 | 400W | 50 | ±0.02 | | 16 | 10 | 30 | 8 | 500 | |
| | | | | | | | | 20 | 18 | 3 | 1000 | |
| | | | | | | | | 5 | 110 | 33 | 250 | |
| | | 10 | 88 | | | | | 22 | 500 | | | |
| | | 20 | 40 | | | | | 10 | 1000 | | | |
| | | □56 | 400W | | | | | 63 | ±0.02 | 20 | 5 | 110 |
| | | 10 | | 88 | 22 | 250 | | | | | | |
| | | 20 | | 40 | 10 | 500 | | | | | | |
| MEQI-63 | 400W | 63 | ±0.02 | 20 | 5 | 110 | | | | | 33 | 250 |
| | | | | | 10 | 88 | | | | | 22 | 500 |
| | | | | | 20 | 40 | | | | | 10 | 1000 |
| □56 | 400W | | | | 63 | ±0.02 | | 20 | 5 | | 110 | 33 |
| 10 | | | | | | | 88 | | 22 | | 250 | |
| 20 | | | | | | | 40 | | 10 | | 500 | |

*1. The highest speed is based on the maximum servo motor's rpm (3000).

MESS2 / MESH2 / MEHC2

MINIATURE ELECTRIC CYLINDER / ELECTRIC GRIPPER (WITH MOTOR)

MESS2 / MESH2 Miniature electric cylinder

| Use where | Drive mode | Model | Motor dimension (mm) | Width of profile (mm) | Position repeatability (mm) | Ball screw spec (Accuracy C7) | | Max. payload(kg) | | Rated thrust (N) |
|-----------|------------|----------|----------------------|-----------------------|-----------------------------|-------------------------------|-----------|------------------|---------------|------------------|
| | | | | | | Outer diameter (mm) | Lead (mm) | Horizontal (mm) | Vertical (mm) | |
| Standard | Ball screw | MESS2-16 | □ 20 | 65 | ±0.02 | ø6 | 2 | 3 | 0.8 | 18~60 |
| | | MESS2-25 | □ 28 | 95 | ±0.02 | ø8 | 2 | 6 | 1.8 | 64~195 |
| | | | | | | ø8 | 8 | 1.5 | 0.8 | 18~48 |
| | | MESH2-16 | □ 20 | 54 | ±0.02 | ø6 | 2 | 3 | 0.8 | 24~68 |
| | | MESH2-20 | □ 28 | 65 | ±0.02 | ø8 | 2 | 6 | 1.8 | 64~195 |
| ø8 | 8 | | | | | 1.5 | 0.8 | 18~48 | | |

*1. The working condition of max. speed is restricted limited.
Please refer to the curve graph of speed and loading in this catalog.

MEHC2 Electric gripper

| Use where | Drive mode | Model | Motor dimension (mm) | Width of profile (mm) | Position repeatability (mm) | Open/close stroke *1 (mm/s) | Gripping force (N) | Main body weight *2 (g) |
|-----------|------------|----------|----------------------|-----------------------|-----------------------------|-----------------------------|--------------------|-------------------------|
| Standard | Lead screw | MEHC2-16 | □ 20 | 38 | ±0.02 | 6 | 19.5 | 222 |
| | | MEHC2-25 | □ 28 | 63 | ±0.02 | 14 | 26 | 662 |

*1. Total stroke of both sides.
*2. Weight of model with motor.

| | Max. speed *1 (mm/s) | Stroke (mm) & Max. speed (mm/s) *2 | | | | | | Page |
|--|-------------------------|------------------------------------|----|----|----|-----|-----|------|
| | | Stroke | 30 | 50 | 75 | 100 | 150 | |
| | 50 | 50 | | | | | | 4-92 |
| | 100 | 100 | | | | | | |
| | 400 | 400 | | | | | | |
| | 50 | 50 | | | | | | 4-95 |
| | 100 | 100 | | | | | | |
| | 400 | 400 | | | | | | |

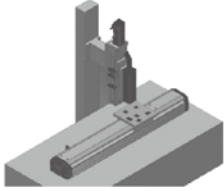
| | Gripping force (N) | | | | | | Page |
|--|--------------------|--------|-------|----|----|----|------|
| | 5 | 10 | 15 | 20 | 25 | 30 | |
| | | 6~19.5 | | | | | 4-98 |
| | | | 12~26 | | | | 4-98 |

Applications for single axis

SLIDER ELECTRIC CYLINDER



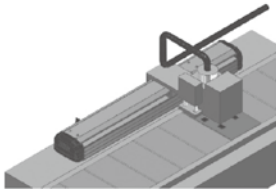
Suitable industry: PCB / CD / DVD / Semi-conductor / Packaging / Testing



Spray-Printing device for PCB substrate boards

Fixes the substrate board onto the electric cylinder. Use the character of equal-speed sliding to execute the spray printing.

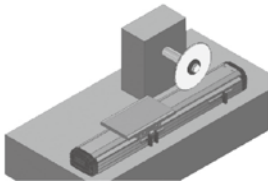
Use specifications
METG-8 / METS2-10 / METS2-14



Surface cleaning device for circuit boards

Fixes the plasma on to the motor slide and moves back and forth on top of the conveyor to clean surface for circuit boards.

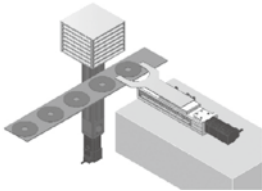
Use specifications
METG-8 / METS2-14



Cutting device for PCB circuit boards

Place the PCB board on the electric cylinder and do the cutting by using external cutting devices.

Use specifications
METG-8 / METS2-14 / METS2-17



Compact disc receiving device

Use the feature "multi-positioning" of electric cylinder to do loading and unloading of the disc box.

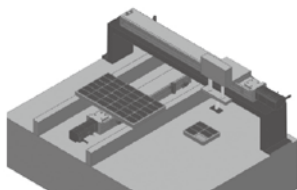
Use specifications
METG-5 / METG-8 / METS2-14 / MEQG-8



IC printer device

Place the IC device on the electric cylinder. Use the character of equal-speed sliding and capable to adapt servo motor and stepping motor to execute the laser printing.

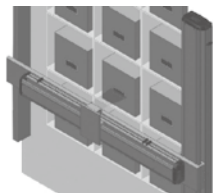
Use specifications
METG-5



Aligning device for pick-and-place of IC boards

Install two single electric cylinder to combine a simple IC pick-and-place system.

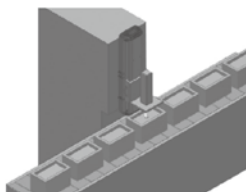
Use specifications
METG-5 / METS2-14



Barcode scanning device

Install the X-Y multi-axis system to automated warehouse to execute the scanning of barcode.

Use specifications
METS2-14 / METS2-17 / METS-22



Fillings device

In order to adapt to filling of different products, we can execute the filling at different height of position by programmable feature.

Use specifications
METG-5 / METG-8 / METS2-14

Applications for single axis



SLIDER ELECTRIC CYLINDER

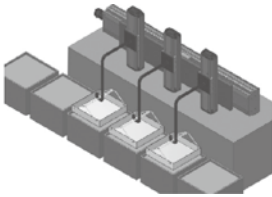
Suitable industry: Automotive / Component processing / Assembling / Surface processing / Mobile phones / Traditional manufacturing / Food / Raw material



Tire surface check machine

Mount the C.C.D on the electric cylinder. Use the character of equal-speed sliding to check the defects on the tire surface and report to the on-site worker immediately.

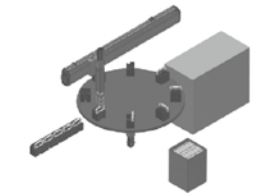
Use specifications
METG-5 / METG-8



Mobile device for surface processing

Mount the working piece on the electric cylinder and dip it into the solvents. Use the character of moving up and down, left and right at high speed to do the surface treatment processing.

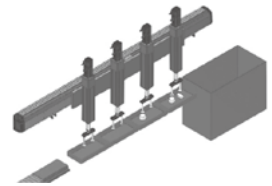
Use specifications
METS2-14 / METS2-17 / METS-22



Assembling device on disc machine

Install two single electric cylinders to combine an X-Y system. Then mount it onto the disc machine to do the components assembly.

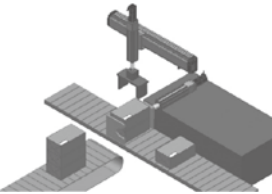
Use specifications
METG-8 / METS2-10 / METS2-14 / MEQG-5



Assembling device for small components

Use the feature multi-positioning of the electric cylinder to drive the sucker and cylinder to do the assembly of small components.

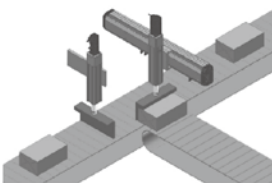
Use specifications
METG-5 / METG-8 / MEQG-5



Conveyance device for assembly lines

Utilizes uniaxial motor slides to assemble into a XY mechanism and performs conveyance of items on top of the conveyor.

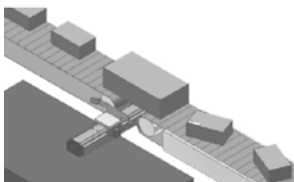
Use specifications
METG-8 / METS2-14 / METS2-17 / MEQI-50



Separator device for assembly lines

Utilizes motor slides to categorize products on the assembly line with conveyors.

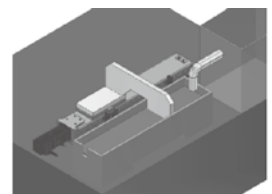
Use specifications
METG-8 / METS2-14 / MEQI-50



Aligning device for packaging

Utilizes slides with servo motors to align products of different sizes on the moving conveyors, which substantially saves the working time.

Use specifications
METG-8 / METS2-14 / METS2-17

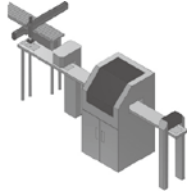


Leveling mechanism for solvent surfaces

Utilizes the characteristics of motor slides moving at equal speeds to level the surface of glutinous solvents.

Use specifications
METG-5

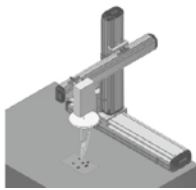
Suitable industry: PCB circuit boards / CD / DVD / Mobile phones



Conveyance device for circuit boards

Assembles two uniaxial motor slides into a X-Z biaxial mechanism and conveys the circuit board across left and right as well as up and down.

Use specifications
X axis METS2-14 / Z axis METG-8



Auto-soldering device

Fixes soldering device onto the X-Y-Z axes assembled from uniaxial motor slides, which can solder for circuit board components.

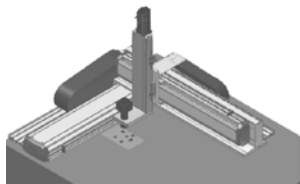
Use specifications
X axis METS2-14 / Y axis METG-8 / Z axis METS2-14



Piling device for circuit boards

Utilizes uniaxial motor slides to assemble into X-Y-Z axes, which can be used on receiver mechanism for circuit board assembly lines.

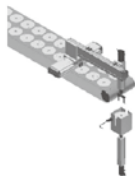
Use specifications
X axis METS2-14 / Y axis METG-8 / Z axis METG-5



Visual checking device for CCD imaging

Fixes the visual system onto the X-Y-Z axes and performs AOI checks on the appearance of PCB boards.

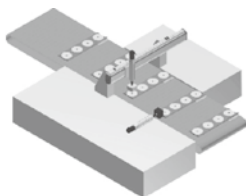
Use specifications
X axis METS2-14 / Y axis METG-8 / Z axis METG-5



Piling device for compact discs

Utilizes uniaxial motor slides to assemble into a X-Y-Z axes, which can be used on receiver mechanism for compact disc assembly lines.

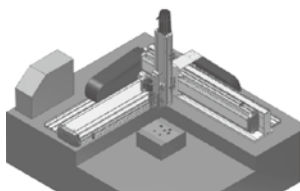
Use specifications
X axis METS2-14 / Y axis METG-8 / Z axis METG-5



Ultra-violet exposure device for compact discs

Utilizes uniaxial motor slides to assemble into a X-Z bi-axial mechanism, which can be used on ultra-violet exposure devices for compact discs.

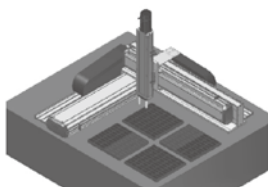
Use specifications
X axis METG-8 / Z axis METG-5



Screw-tightening device

Utilizes the X-Y-axis mechanism for pick-and-place of screws.

Use specifications
X axis METG-8 / Y axis METG-5



Pick-and-place device for small components

Utilizes uniaxial motor slides to assemble into X-Y-Z axes, which can be used on pick-and-place devices for small components.

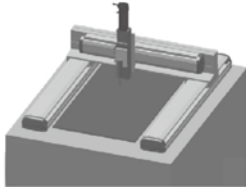
Use specifications
X axis METS2-14 / Y axis METG-8 / Z axis METG-5

Applications for multi axis

SLIDER ELECTRIC CYLINDER



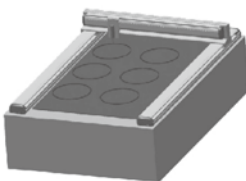
Suitable industry: LCD / Automotive / Machine processing / Solar / Food



Rubberizing device for large-size LCD glass substrate boards

Utilizes two synchronous X-axis motor slides and one Y-axis slide along with Z-axis to assemble into one package of high-speed rubberizing devices for LCD glass substrate boards.

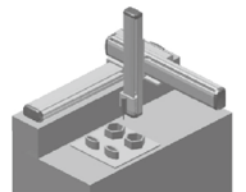
Use specifications
X axis METS2-14-2 pcs / Y axis METG-8 / Z axis METG-5



Cutting for glass substrate boards

Utilizes two synchronous X-axis motor slides with one Y-axis slide to assemble into one package of simple cutting mechanism for glass boards.

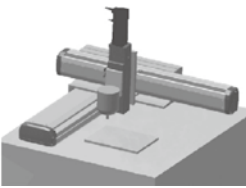
Use specifications
X axis METS2-17-2 pcs / Y axis METS2-14



Coating device for various small components

Assembles three uniaxial motor slides into a X-Y-Z mechanism that can perform dispensing and rubberizing operations with costs way cheaper than one rubberizing machine and utilize the rubberizing operation on the assembly line.

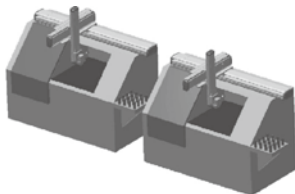
Use specifications
X axis METS2-14, METS2-17 / Y axis METG-8 / Z axis METG-5



Mobile device for spray coating

Utilizes X-Y-Z axes to clean or spray coating.

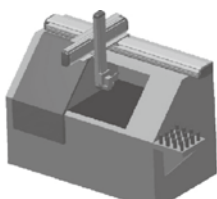
Use specifications
X axis METS2-14, METS2-17 / Y axis METG-8, METS2-14 / Z axis METG-5



Pick-and-place device for processed parts from machine tools

Utilizes uniaxial motor slides to assemble into X-Y-Z axes that can be installed onto two or three CNC machine tools as the pick-and-place mechanism for loading and unloading of processed parts from multiple processing.

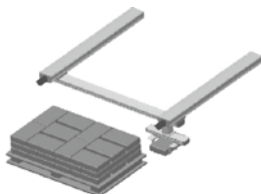
Use specifications
X axis METS-22 / Y axis METS2-17 / Z axis METS2-14



Pick-and-place device for processed parts from machine tools

Utilizes uniaxial motor slides to assemble into a X-Y-Z axes that can be installed onto CNC machine tools as the pick-and-place mechanism for loading and unloading of processed parts, with a cost saving more than 6-axis mechanical arms.

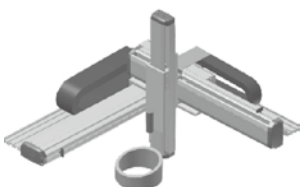
Use specifications
X axis METS-22 / Y axis METS2-17 / Z axis METS2-14



Conveyance device for large items

Utilizes two synchronous X-axis motor slides with one Y-axis motor slide to assemble into one package of conveyance device for large-size items, with a cost saving more than 6-axis mechanical arms.

Use specifications
X axis METS-22-2 pcs / Y axis METS2-17



3-Dimensional rubberizing device

Utilizes X-Y-Z axes to assemble into a cantilever rubberizing mechanism that can perform 3-dimensional rubberizing.

Use specifications
X axis METS2-14, METS2-17 / Y axis METG-8, METS2-14 / Z axis METG-5

Rotary Actuator

Clamp Cylinder

Gripper

Electric Actuator

Auxiliary Equipment

Hydraulic Cylinder

METG Inner structure

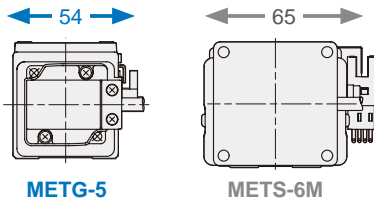
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

Point 1 Rigidity improved

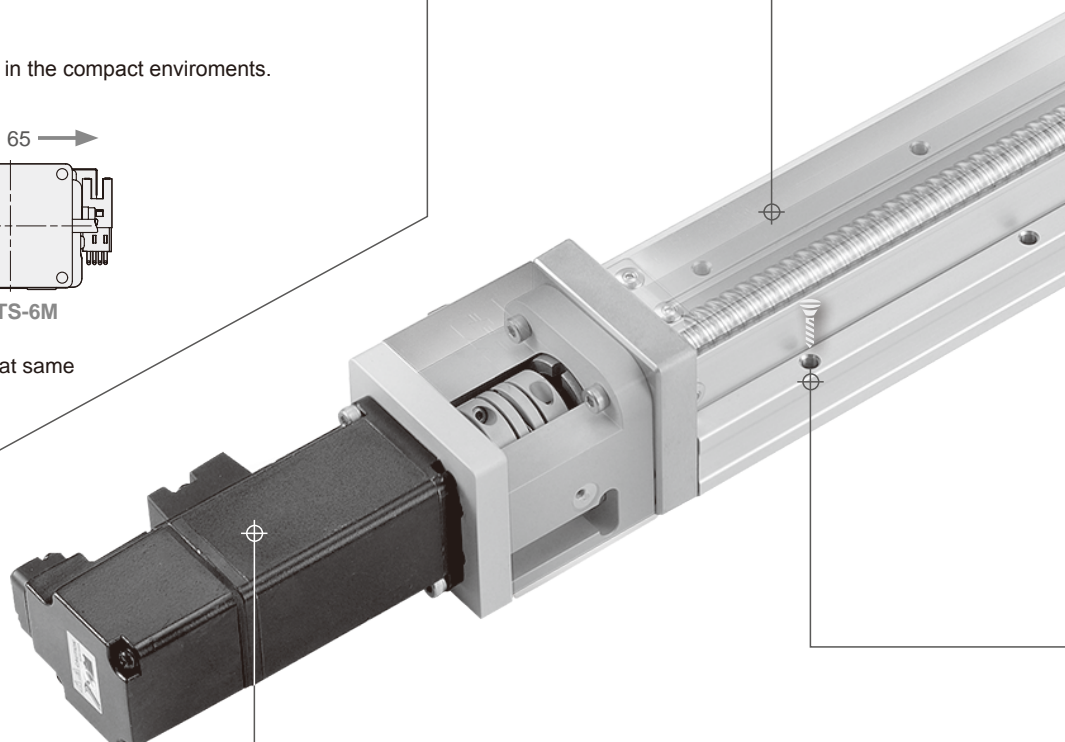
Actuator body and carriage are made from steel that can improve the rigidity of body and carriage.

Point 2 Smaller size

Reduced width that can fitting in the compact enviroments.



* Compare with METS series at same condition (30 kg padload).



Point 3 Motor brand

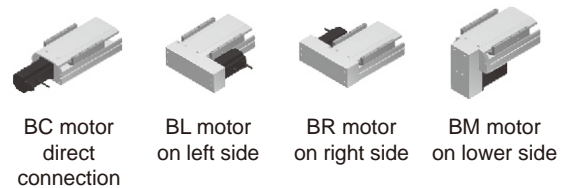
Customer specified servo motor.

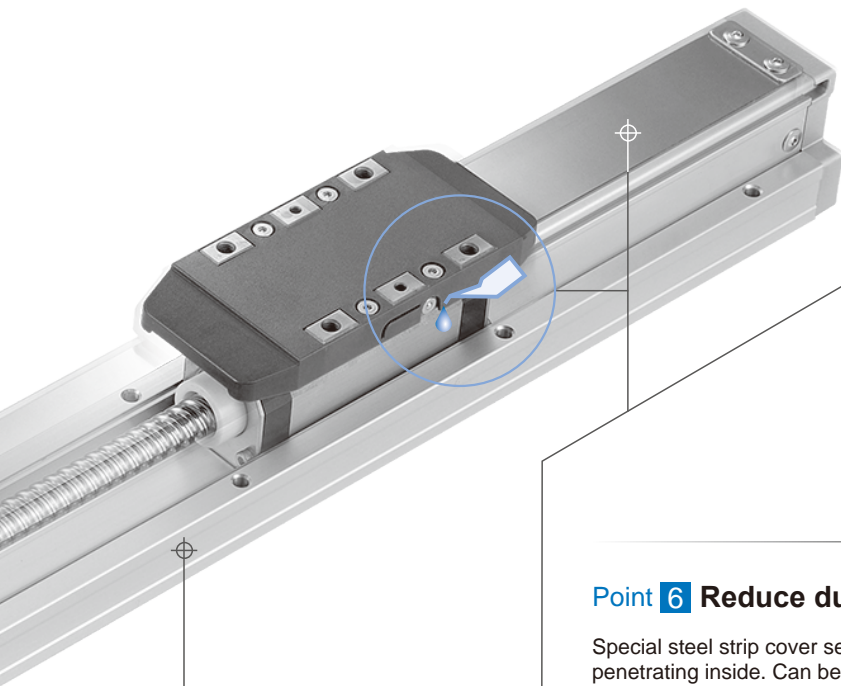
| Standard suitable motor brands | | | |
|--------------------------------|-----------|---------|-------|
| Mitsubishi | Panasonic | Yaskawa | Delta |

© Please consult our sales personnel for other motor specifications.

Point 4 Motor assembly location

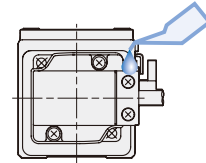
Multiple motor installation positions for added flexibility in tool design.





Point 5 Easy to maintain

External greasing design, easy maintenance without removing the cover.

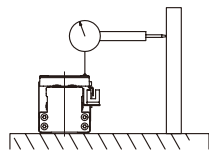


Point 6 Reduce dust

Special steel strip cover sealing design can prevent dirt and foreign objects from penetrating inside. Can be used in clean room environment.

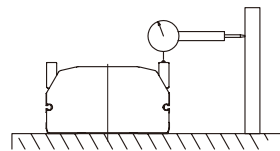
Point 7 Flat straightness

Built in linear rail design, straightness and flatness are highly improved to $\pm 0.02\text{mm}$.



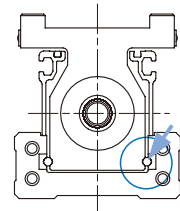
Straightness of **METG-5** is $\pm 0.02\text{mm}$.

* Measure length is 800mm.



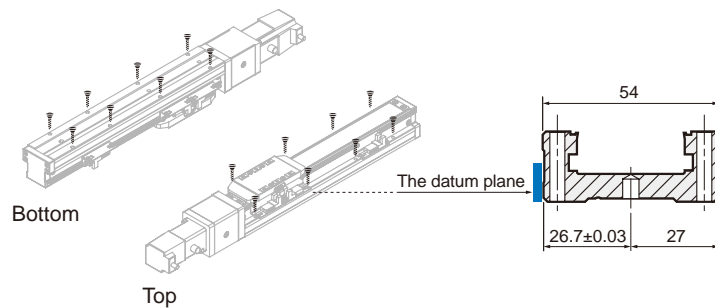
Straightness of **METS-10** is $\pm 0.05\text{mm}$.

* Measure length is 1000mm.



Point 8 Easy assemble

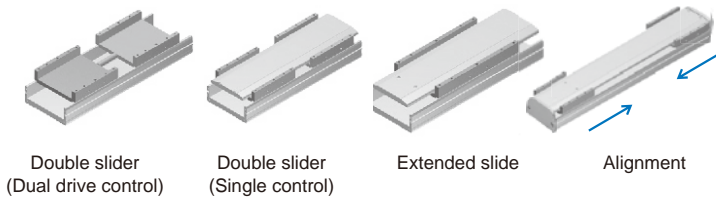
1. Can be fixed from the top and bottom without removing the cover.
2. Mounting datum plane designed on the side of the body.
3. Built in pin holes.



METS2 Inner structure

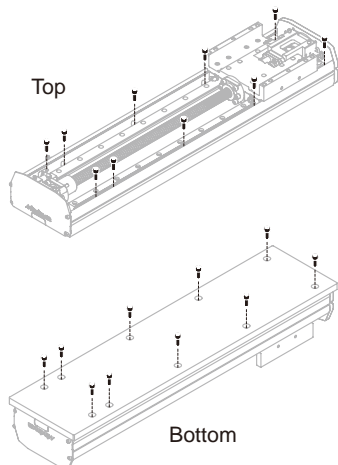
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

Point 1 Various slide options



Point 2 Easy assemble

Can be fixed from the top and bottom without removing the cover.



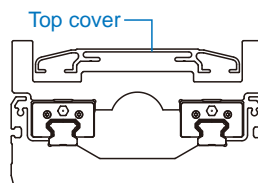
Point 3 High rigidity body and cover

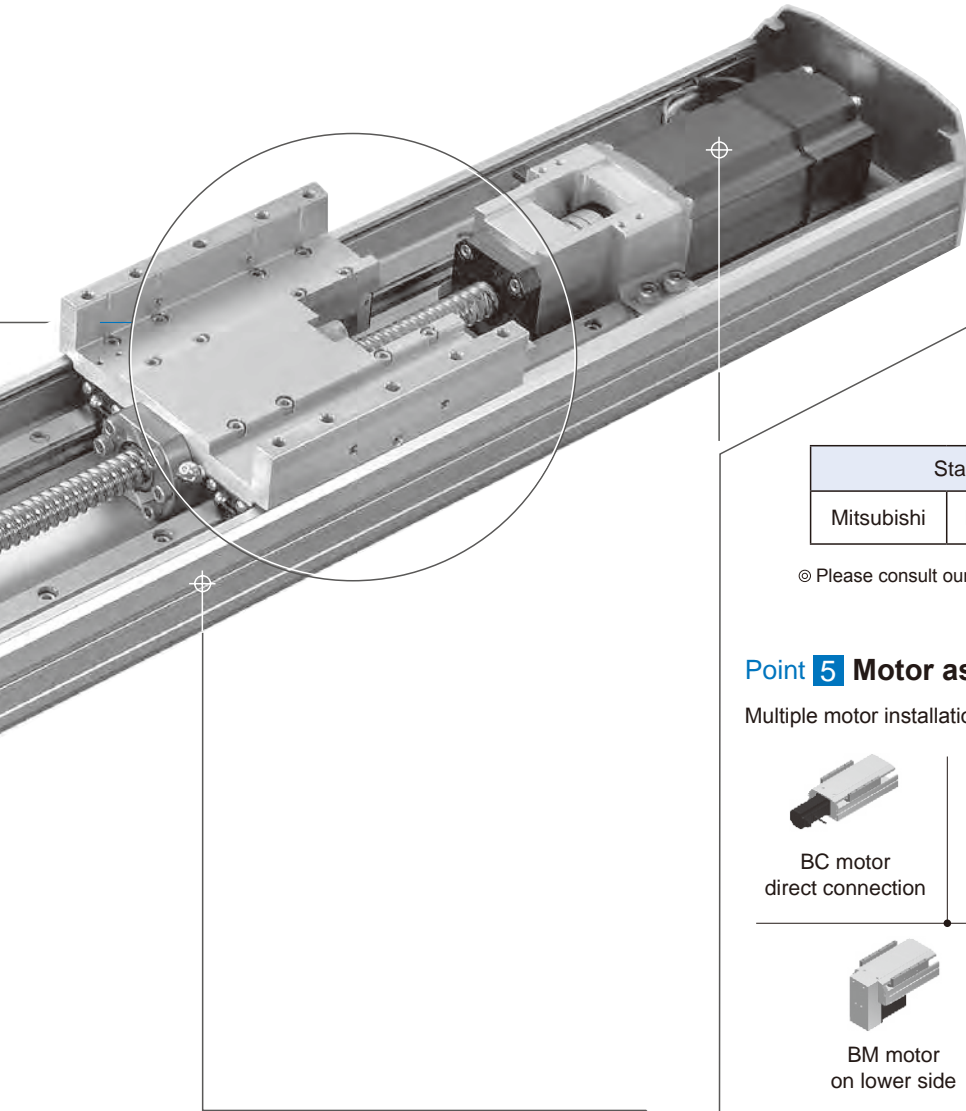
High rigidity mainframe and cover

One piece extruded aluminum structure for optimal rigidity and weight ratio.

Torsion resist top lid

Special torsion-resistant top lid design to prevent deformation during long stroke.





Point 4 Motor brand

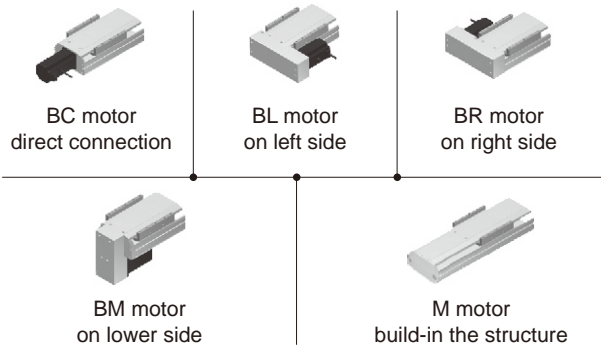
Customer specified servo motor.

| Standard suitable motor brands | | | |
|--------------------------------|-----------|---------|-------|
| Mitsubishi | Panasonic | Yaskawa | Delta |

© Please consult our sales personnel for other motor specifications.

Point 5 Motor assembly location

Multiple motor installation positions for added flexibility in tool design.



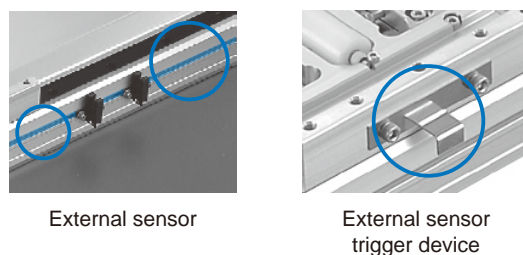
Point 7 Ball screw lead

Can customize screw specification and brand to match different precision and speed.

| Screw lead pitch | |
|------------------|-------|
| 05 | 5 mm |
| 10 | 10 mm |
| 16 | 16 mm |
| 20 | 20 mm |
| 25 | 25 mm |
| 40 | 40 mm |

Point 6 Sensor switch

- Adjustable plug-in set up, can be installed on both sides.
- Sensors' position are adjustable in designed grooves.



MEQG Inner structure

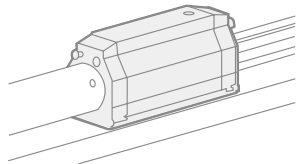
ROD TYPE ELECTRIC CYLINDER (WITHOUT MOTOR)

Point 1 Rigidity improved

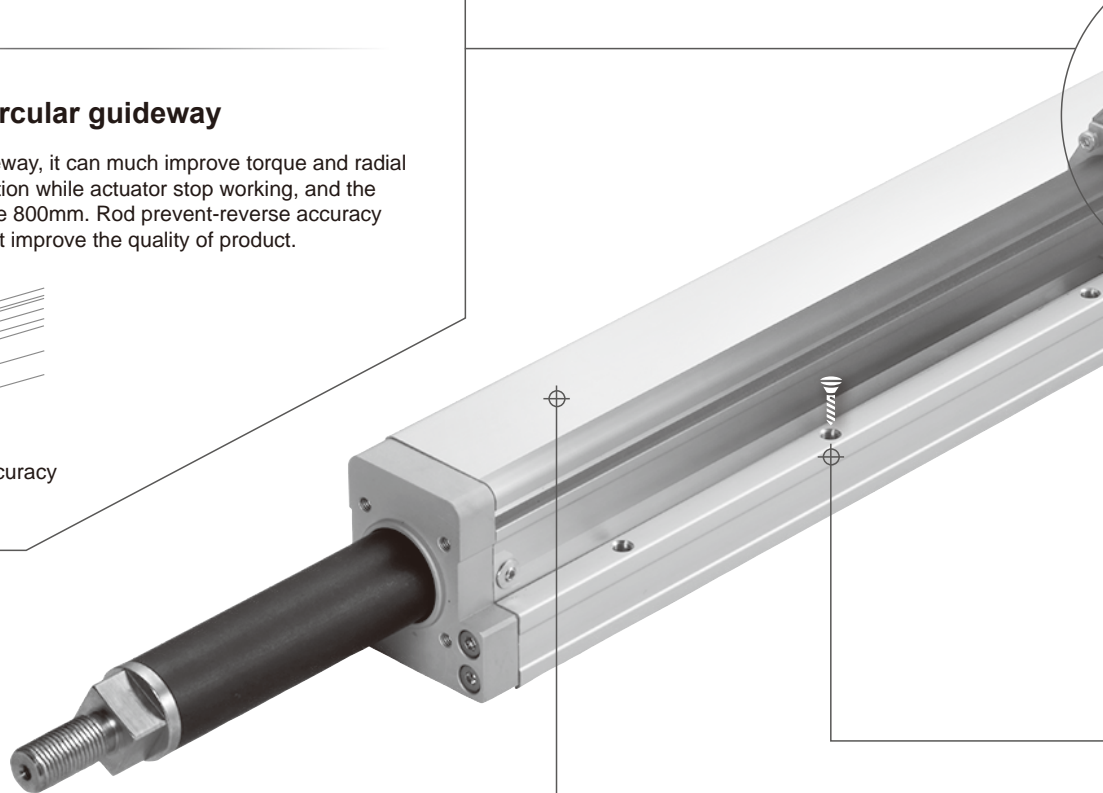
Actuator body and carriage are made from steel that can improve the rigidity of body and carriage.

Point 2 Built-in circular guideway

With built-in circular guideway, it can much improve torque and radial load. It can improve vibration while actuator stop working, and the maximum of stroke can be 800mm. Rod prevent-reverse accuracy can be 0 degree and high improve the quality of product.

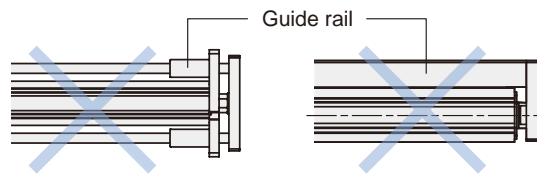


* Rod prevent-reverse accuracy can be 0 degree.

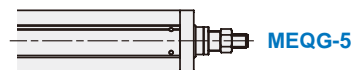


Point 3 Smaller

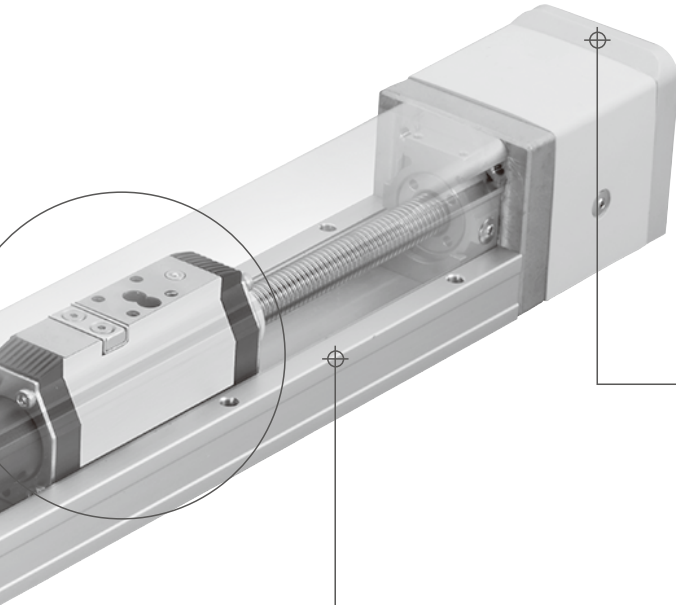
No need to add additional ancillary guide, decreasing space for location.



Additional guide rail structure is needed for anti-rotating accuracy. Rod prevent-reverse accuracy can be $\pm 0.05^\circ$.



Rod prevent-reverse accuracy can be 0° .



Point 4 Motor brand

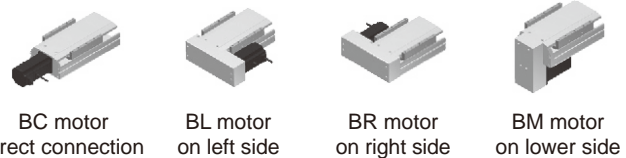
Customer specified servo motor.

| Standard suitable motor brands | | | |
|--------------------------------|-----------|---------|-------|
| Mitsubishi | Panasonic | Yaskawa | Delta |

© Please consult our sales personnel for other motor specifications.

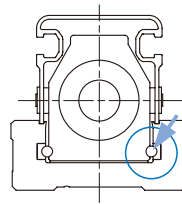
Point 5 Motor assembly location

Multiple motor installation positions for added flexibility in tool design.



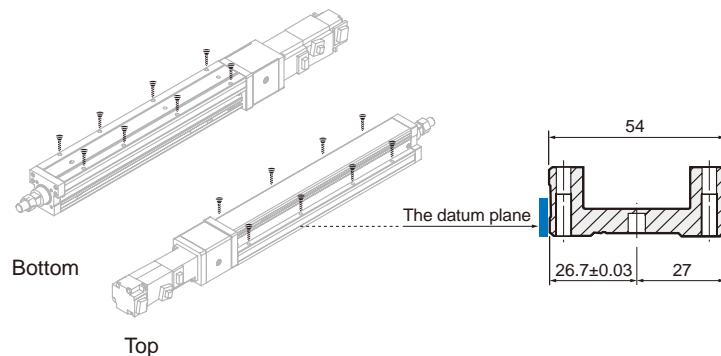
Point 6 Flat straightness

Built in linear rail design, straightness and flatness are highly improved to $\pm 0.02\text{mm}$.



Point 7 Easy assemble

1. Can be fixed from the top and bottom without removing the cover.
2. Mounting datum plane designed on the side of the body.
3. Built in pin holes.





Specification

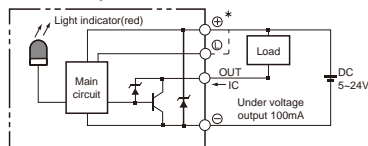
| Model | | METG-4 | | |
|-------------------|-----------------|-------------------|-------|---------|
| Repeatability | (mm) | ±0.005 | | |
| Ball screw lead | (mm) | 2 | 6 | 12 |
| Max. speed (*1) | (mm/s) | 100 | 300 | 600 |
| AC servo motor | (W) | 50, 100 | | |
| Max. payload (*2) | Horizontal (kg) | 25 | 20 | 12 |
| | Vertical (kg) | 8 (8) | 5 (8) | 2 (3.5) |
| Rated thrust | (N) | 424 | 414 | 71 |
| Stroke (*3) | (mm) | 50~800 / 50 pitch | | |
| Ball screw | (mm) | C7ø8 | | |
| Coupling | (mm) | 7×8 | | |
| Home sensor | | EE-SX674 (NPN) | | |

*1. Acceleration and deceleration value is set 0.2 second.

*2. () The value for power output 100W.

*3. When the stroke is over 550mm, the run-out of the ballscrew will occur. We recommend to low down the working speed under this circumstance.

Sensor layout



Order example

METG – 4 – L02 – 100 – BC – M05 B – C4 – 0001

| Model | Size | Stroke | Brakes | Special order no. | | | | | | | | | | | | | | |
|------------------------|-----------------------|---|---|--------------------------|----------|---|------------|----------------|---|-----------|---|---------|---|-------|--|--|---|---|
| METG-4 | L02 | 100 | B | 0001 | | | | | | | | | | | | | | |
| | | 50~800 mm 50 mm pitch | <table border="1"> <tr> <td>-</td> <td>No brake</td> </tr> <tr> <td>B</td> <td>With brake</td> </tr> </table> | - | No brake | B | With brake | | | | | | | | | | | |
| - | No brake | | | | | | | | | | | | | | | | | |
| B | With brake | | | | | | | | | | | | | | | | | |
| Ball screw lead | Motor position | Motor brand, power output | Home sensor | Limit sensor | | | | | | | | | | | | | | |
| L02 | BC | <table border="1"> <tr> <th colspan="3">SERVO motor</th> </tr> <tr> <td>M</td> <td>Mitsubishi</td> <td rowspan="5">05 10 50W 100W</td> </tr> <tr> <td>P</td> <td>Panasonic</td> </tr> <tr> <td>Y</td> <td>Yaskawa</td> </tr> <tr> <td>T</td> <td>Delta</td> </tr> <tr> <td></td> <td></td> </tr> </table> | SERVO motor | | | M | Mitsubishi | 05 10 50W 100W | P | Panasonic | Y | Yaskawa | T | Delta | | | C | 3 |
| SERVO motor | | | | | | | | | | | | | | | | | | |
| M | Mitsubishi | | 05 10 50W 100W | | | | | | | | | | | | | | | |
| P | Panasonic | | | | | | | | | | | | | | | | | |
| Y | Yaskawa | | | | | | | | | | | | | | | | | |
| T | Delta | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | |
| L06 | BM | | D | 4 | | | | | | | | | | | | | | |
| L12 | BR | | No sensor | | | | | | | | | | | | | | | |
| | BL | | E | 5 | | | | | | | | | | | | | | |
| | | | No sensor | | | | | | | | | | | | | | | |

* When the stroke is 50mm, the sensor installation has the following restrictions.

1. Home sensor and limit sensor has to be installed on the different side of body.
2. Both sides of slider need to install the sensor trigger device.

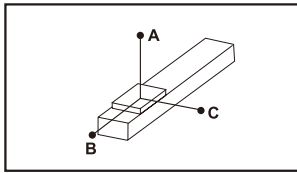
METG-4 Performance charts



SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)

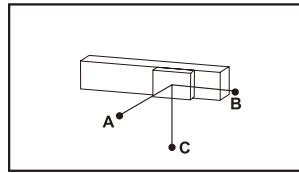
mindman

Allowable overhang



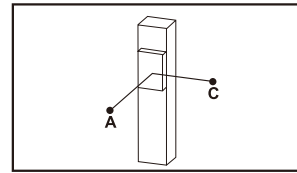
Unit: mm

| Horizontal installation | | A | B | C |
|-------------------------|------|------|----|----|
| Lead 2 | 12kg | 1000 | 55 | 80 |
| | 18kg | 750 | 35 | 50 |
| | 25kg | 500 | 23 | 32 |
| Lead 6 | 10kg | 550 | 53 | 70 |
| | 15kg | 350 | 32 | 45 |
| | 20kg | 250 | 22 | 31 |
| Lead 12 | 8kg | 305 | 59 | 75 |
| | 10kg | 240 | 45 | 57 |
| | 12kg | 195 | 37 | 47 |



Unit: mm

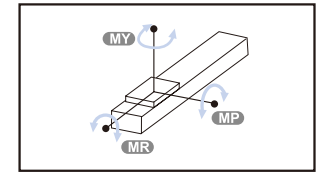
| Wall installation | | A | B | C |
|-------------------|------|----|----|------|
| Lead 2 | 12kg | 80 | 55 | 1000 |
| | 18kg | 50 | 35 | 750 |
| | 25kg | 32 | 23 | 500 |
| Lead 6 | 10kg | 72 | 52 | 550 |
| | 15kg | 45 | 32 | 345 |
| | 20kg | 31 | 22 | 250 |
| Lead 12 | 8kg | 75 | 59 | 300 |
| | 10kg | 45 | 32 | 240 |
| | 12kg | 31 | 22 | 250 |



Unit: mm

| Vertical installation | | A | C |
|-----------------------|-------|--------------|--------------|
| Lead 2 | 4kg | 200 (195) | 200 (195) |
| | 8kg | 100 | 100 |
| Lead 6 | 3kg | 200 (150) | 200 (150) |
| | 5kg | 120 (75) | 120 (75) |
| Lead 12 | 1.5kg | 350 (260) | 350 (260) |
| | 2kg | 260 (150) | 260 (150) |

Static loading moment



Unit: N.m

| | |
|----|-----|
| MY | 79 |
| MP | 79 |
| MR | 116 |

- The torque value in the chart indicate the center of gravity.
- Operation life is 10000km when the product is using under the specified conditions.
- Data information is not for ceiling-mount inverse use.
Contact us for the details if you want to apply ceiling-mount inverse usage.
- () The value for power output 100W.

Standard servo motors

| Brand | Mark | Brake | Watt | AC-Voltage | Motor model | Compatible driver model |
|------------|------|---------------------------|------|------------|---------------|-------------------------|
| Mitsubishi | M | No brake(Horizontal type) | 50 | 220 | HG-KR053 | MR-J4-10A |
| | | | 100 | 220 | HG-KR13 | |
| | | With brake(Vertical type) | 50 | 220 | HG-KR053B | |
| | | | 100 | 220 | HG-KR13B | |
| Panasonic | P | No brake(Horizontal type) | 50 | 220 | MSMD5A2G1U | MADHT1505 |
| | | | 100 | 220 | MSMD012G1U | |
| | | With brake(Vertical type) | 50 | 220 | MSMD5A2G1V | |
| | | | 100 | 220 | MSMD012G1V | |
| Delta | T | No brake(Horizontal type) | 50 | 220 | ECMA-C1040FES | ASD-B20121-B |
| | | | 100 | 220 | ECMA-C20401ES | |
| | | With brake(Vertical type) | 50 | 220 | ECMA-C1040FFS | |
| | | | 100 | 220 | ECMA-C20401FS | |

METG-4 Dimensions

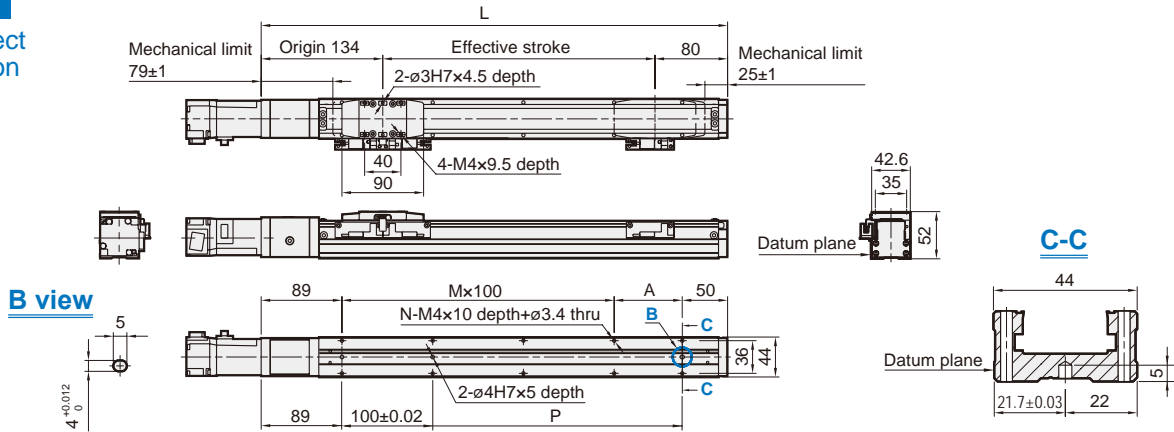


SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)

mindman

BC

Motor direct connection

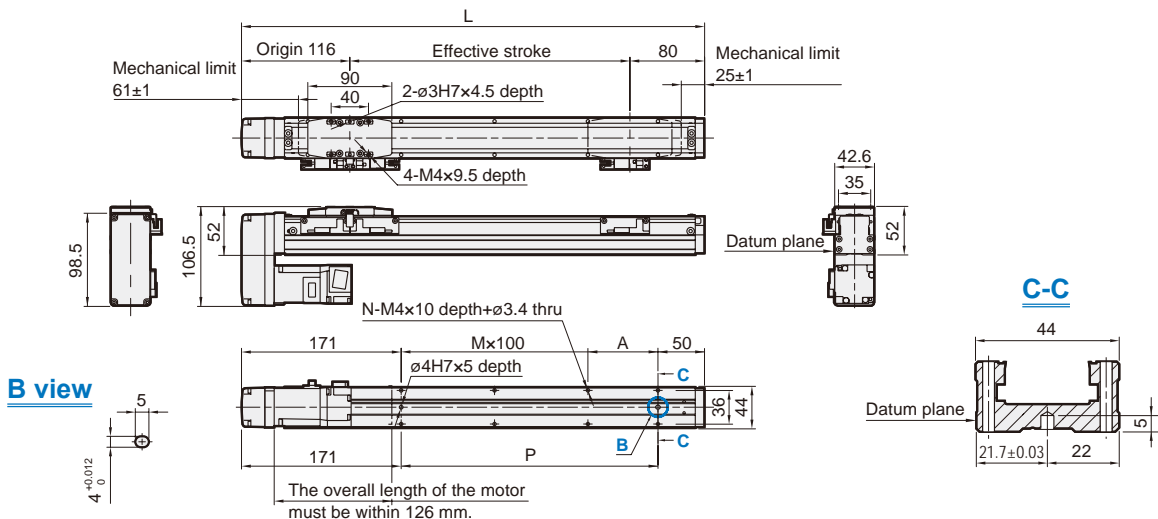


Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|--------|------|------|------|------|------|-----|------|-----|------|------|------|------|------|------|------|------|
| L | 264 | 314 | 364 | 414 | 464 | 514 | 564 | 614 | 664 | 714 | 764 | 814 | 864 | 914 | 964 | 1014 |
| A | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 |
| M | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 |
| P | 25 | 75 | 125 | 175 | 225 | 275 | 325 | 375 | 425 | 475 | 525 | 575 | 625 | 675 | 725 | 775 |
| KG | 1.36 | 1.61 | 1.86 | 2.11 | 2.35 | 2.6 | 2.85 | 3.1 | 3.34 | 3.59 | 3.84 | 4.09 | 4.34 | 4.59 | 4.84 | 5.09 |

BM

Motor on lower side



Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|--------|------|------|------|-----|------|-----|------|------|------|------|------|------|------|------|------|------|
| L | 246 | 296 | 346 | 396 | 446 | 496 | 546 | 596 | 646 | 696 | 746 | 796 | 846 | 896 | 946 | 996 |
| A | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 |
| M | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 |
| N | 4 | 4 | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 15 | 14 | 16 | 16 | 18 | 18 |
| P | 25 | 75 | 125 | 175 | 225 | 275 | 325 | 375 | 425 | 475 | 525 | 575 | 625 | 675 | 725 | 775 |
| KG | 1.66 | 1.91 | 2.16 | 2.4 | 2.65 | 2.9 | 3.14 | 3.39 | 3.64 | 3.89 | 4.14 | 4.39 | 4.64 | 4.89 | 5.14 | 5.39 |

* When motor with brake assembled on down side, or the total length over than spec limit, it may not use standard pinhole. Please contact us if you need more information and requirement.

METG-4 Dimensions

SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

Gripper

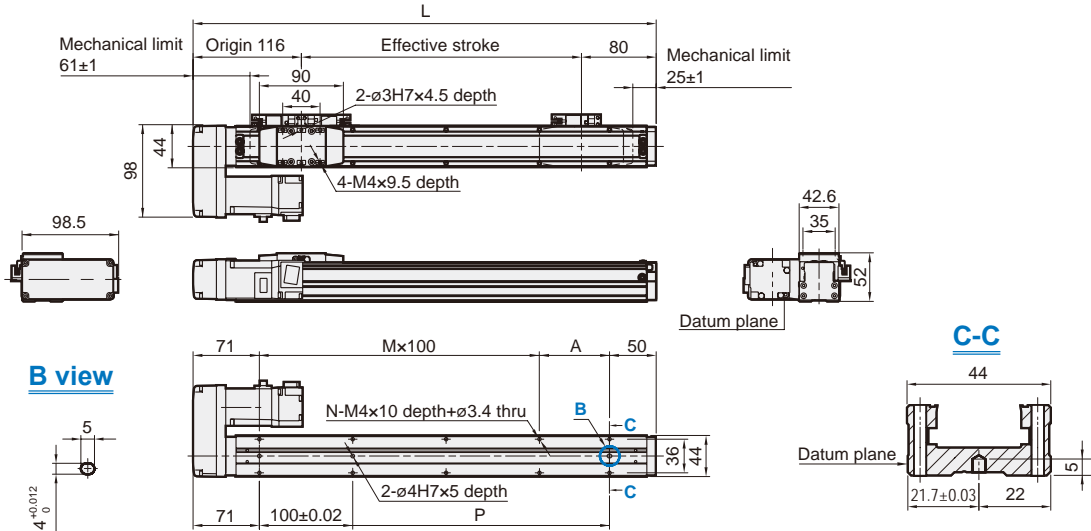
Electric Actuator

Auxiliary Equipment

Hydraulic Cylinder

BL

Motor on left side

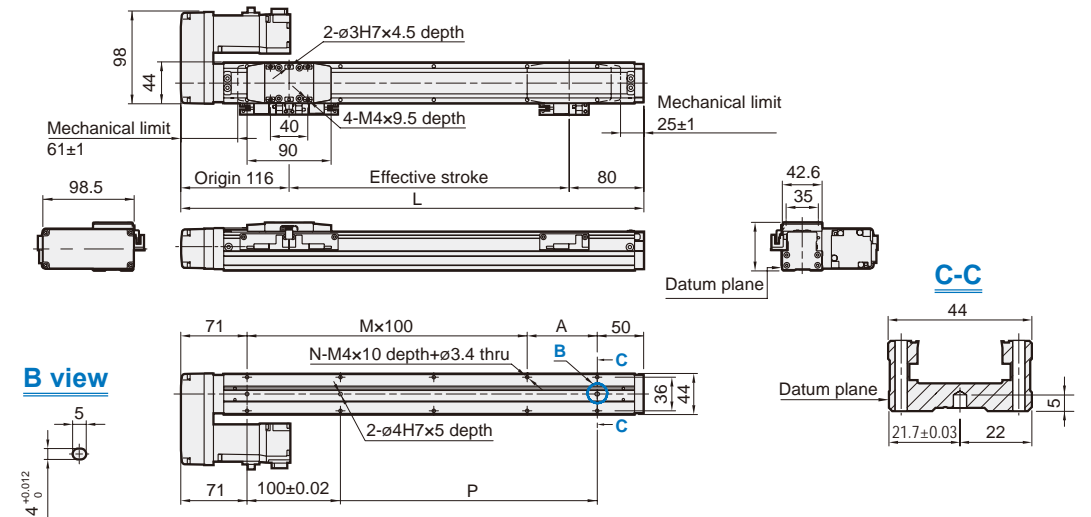


Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|-----------|------|------|------|-----|------|-----|------|------|------|------|------|------|------|------|------|------|
| L | 246 | 296 | 346 | 396 | 446 | 496 | 546 | 596 | 646 | 696 | 746 | 796 | 846 | 896 | 946 | 996 |
| A | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 |
| M | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 |
| P | 25 | 75 | 125 | 175 | 225 | 275 | 325 | 375 | 425 | 475 | 525 | 575 | 625 | 675 | 725 | 775 |
| KG | 1.66 | 1.91 | 2.16 | 2.4 | 2.65 | 2.9 | 3.14 | 3.39 | 3.64 | 3.89 | 4.14 | 4.39 | 4.64 | 4.89 | 5.14 | 5.39 |

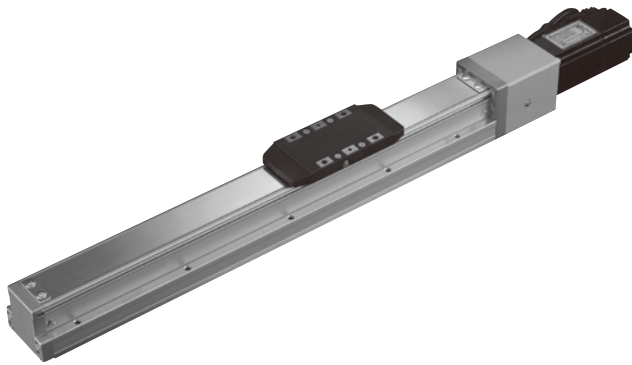
BR

Motor on right side



Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|-----------|------|------|------|-----|------|-----|------|------|------|------|------|------|------|------|------|------|
| L | 246 | 296 | 346 | 396 | 446 | 496 | 546 | 596 | 646 | 696 | 746 | 796 | 846 | 896 | 946 | 996 |
| A | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 |
| M | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 |
| P | 25 | 75 | 125 | 175 | 225 | 275 | 325 | 375 | 425 | 475 | 525 | 575 | 625 | 675 | 725 | 775 |
| KG | 1.66 | 1.91 | 2.16 | 2.4 | 2.65 | 2.9 | 3.14 | 3.39 | 3.64 | 3.89 | 4.14 | 4.39 | 4.64 | 4.89 | 5.14 | 5.39 |



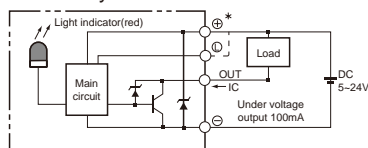
Specification

| Model | | METG-5 | | | |
|-----------------|-----------------|-------------------|-----|-----|------|
| Repeatability | (mm) | ±0.005 | | | |
| Ball screw lead | (mm) | 2 | 5 | 10 | 20 |
| Max. speed (*1) | (mm/s) | 100 | 250 | 500 | 1000 |
| AC servo motor | (W) | 100W | | | |
| Max. payload | Horizontal (kg) | 30 | 30 | 15 | 10 |
| | Vertical (kg) | 10 | 10 | 5 | 2.5 |
| Rated thrust | (N) | 854 | 341 | 170 | 85 |
| Stroke (*2) | (mm) | 50~800 / 50 pitch | | | |
| Ball screw | (mm) | C7Ø12 | | | |
| Coupling | (mm) | 7x8 | | | |
| Home sensor | | EE-SX674 (NPN) | | | |

*1. Acceleration and deceleration value is set 0.2 second.

*2. When the stroke is over 600mm, the run-out of the ballscrew will occur. We recommend to low down the working speed under this circumstance.

Sensor layout



Order example

METG – 5 – L02 – 100 – BC – M10 B – C4 – 0001

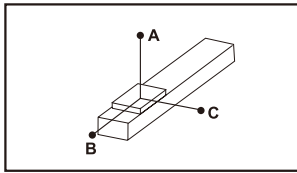
| | | | | | | | | |
|--------------|-------------|--------------------------|---|--------------------------|----------|---|------------|------|
| Model | Size | Stroke | Brakes | Special order no. | | | | |
| METG | 5 | 50~800 mm 50 mm pitch | <table border="1"> <tr> <td>-</td> <td>No brake</td> </tr> <tr> <td>B</td> <td>With brake</td> </tr> </table> | - | No brake | B | With brake | 0001 |
| - | No brake | | | | | | | |
| B | With brake | | | | | | | |

| Ball screw lead | Motor position | Motor brand, power output | Home sensor | Limit sensor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----------------------|----------------------------------|--------------------|---------------------|-----|-------|-----|-------|---|----|-------------------|----|------------|----|------------|----|-----------|---|-------------|--|--|---|------------|---------|---|-----------|---|---------|---|-------|---|----------|--|---|------------|---|---------------------|-----------|--|---|------|---|----------|--|---|------|---|-------|-----------|--|---|------|
| <table border="1"> <tr> <td>L02</td> <td>2 mm</td> </tr> <tr> <td>L05</td> <td>5 mm</td> </tr> <tr> <td>L10</td> <td>10 mm</td> </tr> <tr> <td>L20</td> <td>20 mm</td> </tr> </table> | L02 | 2 mm | L05 | 5 mm | L10 | 10 mm | L20 | 20 mm | <table border="1"> <tr> <td>BC</td> <td>Direct connection</td> </tr> <tr> <td>BM</td> <td>Lower side</td> </tr> <tr> <td>BR</td> <td>Right side</td> </tr> <tr> <td>BL</td> <td>Left side</td> </tr> </table> | BC | Direct connection | BM | Lower side | BR | Right side | BL | Left side | <table border="1"> <tr> <th colspan="3">SERVO motor</th> </tr> <tr> <td>M</td> <td>Mitsubishi</td> <td rowspan="4">10 100W</td> </tr> <tr> <td>P</td> <td>Panasonic</td> </tr> <tr> <td>Y</td> <td>Yaskawa</td> </tr> <tr> <td>T</td> <td>Delta</td> </tr> </table> | SERVO motor | | | M | Mitsubishi | 10 100W | P | Panasonic | Y | Yaskawa | T | Delta | <table border="1"> <tr> <th colspan="2">Out side</th> </tr> <tr> <td>C</td> <td>Motor side</td> </tr> <tr> <td>D</td> <td>Opposite motor side</td> </tr> <tr> <th colspan="2">No sensor</th> </tr> <tr> <td>E</td> <td>None</td> </tr> </table> | Out side | | C | Motor side | D | Opposite motor side | No sensor | | E | None | <table border="1"> <tr> <th colspan="2">Out side</th> </tr> <tr> <td>3</td> <td>1 Pc</td> </tr> <tr> <td>4</td> <td>2 Pcs</td> </tr> <tr> <th colspan="2">No sensor</th> </tr> <tr> <td>5</td> <td>None</td> </tr> </table> | Out side | | 3 | 1 Pc | 4 | 2 Pcs | No sensor | | 5 | None |
| L02 | 2 mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L05 | 5 mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L10 | 10 mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L20 | 20 mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BC | Direct connection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BM | Lower side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BR | Right side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BL | Left side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SERVO motor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | Mitsubishi | 10 100W | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P | Panasonic | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y | Yaskawa | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T | Delta | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Out side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | Motor side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D | Opposite motor side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No sensor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Out side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 1 Pc | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 2 Pcs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No sensor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* When the stroke is 50mm, the sensor installation has the following restrictions.

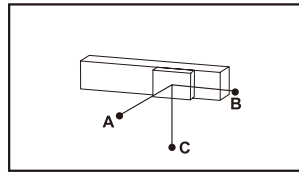
- Home sensor and limit sensor has to be installed on the different side of body.
- Both sides of slider need to install the sensor trigger device.

Allowable overhang



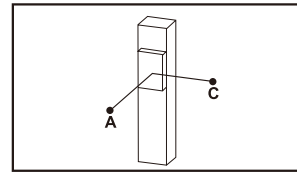
Unit: mm

| Horizontal installation | | A | B | C |
|-------------------------|------|-----|-----|-----|
| Lead 2 | 10kg | 900 | 100 | 135 |
| | 20kg | 700 | 45 | 60 |
| | 30kg | 550 | 25 | 35 |
| Lead 5 | 10kg | 650 | 75 | 100 |
| | 20kg | 440 | 32 | 45 |
| | 30kg | 270 | 19 | 25 |
| Lead 10 | 5kg | 600 | 145 | 185 |
| | 10kg | 370 | 70 | 85 |
| | 15kg | 250 | 42 | 52 |
| Lead 20 | 5kg | 320 | 120 | 130 |
| | 8kg | 220 | 70 | 80 |
| | 10kg | 175 | 55 | 60 |



Unit: mm

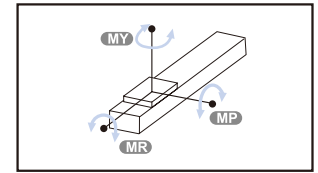
| Wall installation | | A | B | C |
|-------------------|------|-----|-----|-----|
| Lead 2 | 10kg | 135 | 100 | 900 |
| | 20kg | 60 | 45 | 700 |
| | 30kg | 37 | 27 | 550 |
| Lead 5 | 10kg | 100 | 75 | 650 |
| | 20kg | 45 | 32 | 420 |
| | 30kg | 25 | 19 | 260 |
| Lead 10 | 5kg | 180 | 145 | 600 |
| | 10kg | 85 | 68 | 370 |
| | 15kg | 52 | 42 | 250 |
| Lead 20 | 5kg | 130 | 120 | 320 |
| | 8kg | 75 | 70 | 220 |
| | 10kg | 60 | 55 | 170 |



Unit: mm

| Vertical installation | | A | C |
|-----------------------|-------|-----|-----|
| Lead 2 | 6kg | 180 | 180 |
| | 8kg | 135 | 135 |
| | 10kg | 110 | 110 |
| Lead 5 | 6kg | 145 | 145 |
| | 8kg | 110 | 110 |
| | 10kg | 90 | 90 |
| Lead 10 | 1kg | 800 | 800 |
| | 3kg | 260 | 260 |
| | 5kg | 155 | 155 |
| Lead 20 | 1kg | 600 | 600 |
| | 2kg | 300 | 300 |
| | 2.5kg | 250 | 250 |

Static loading moment



Unit: N.m

| | |
|----|-----|
| MY | 103 |
| MP | 103 |
| MR | 144 |

- The torque value in the chart indicate the center of gravity.
- Operation life is 10000km when the product is using under the specified conditions.
- Data information is not for ceiling-mount inverse use.
Contact us for the details if you want to apply ceiling-mount inverse usage.

Standard servo motors

| Brand | Mark | Brake | Watt | AC-Voltage | Motor model | Compatible driver model |
|------------|------|---------------------------|------|------------|---------------|-------------------------|
| Mitsubishi | M | No brake(Horizontal type) | 100 | 220 | KG-KR13 | MR-J4-10A |
| | | With brake(Vertical type) | 100 | 220 | HG-KR13B | MR-J4-10A |
| Panasonic | P | No brake(Horizontal type) | 100 | 220 | MSMD012G1U | MADHT1505 |
| | | With brake(Vertical type) | 100 | 220 | MSMD012G1V | MADHT1505 |
| Delta | T | No brake(Horizontal type) | 100 | 220 | ECMA-C20401ES | ASD-B20121-B |
| | | With brake(Vertical type) | 100 | 220 | ECMA-C20401FS | ASD-B20121-B |

METG-5 Dimensions

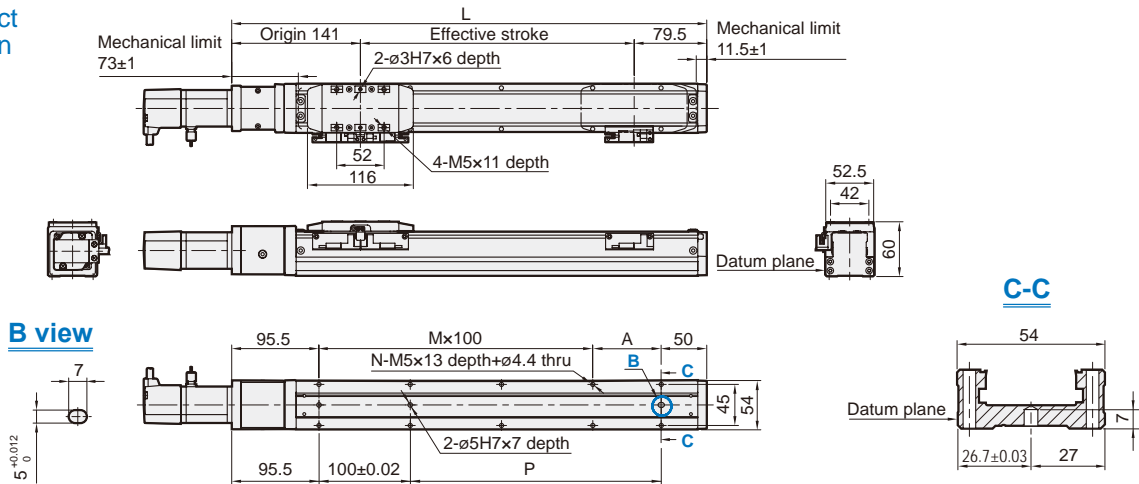


SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)

mindman

BC

Motor direct connection

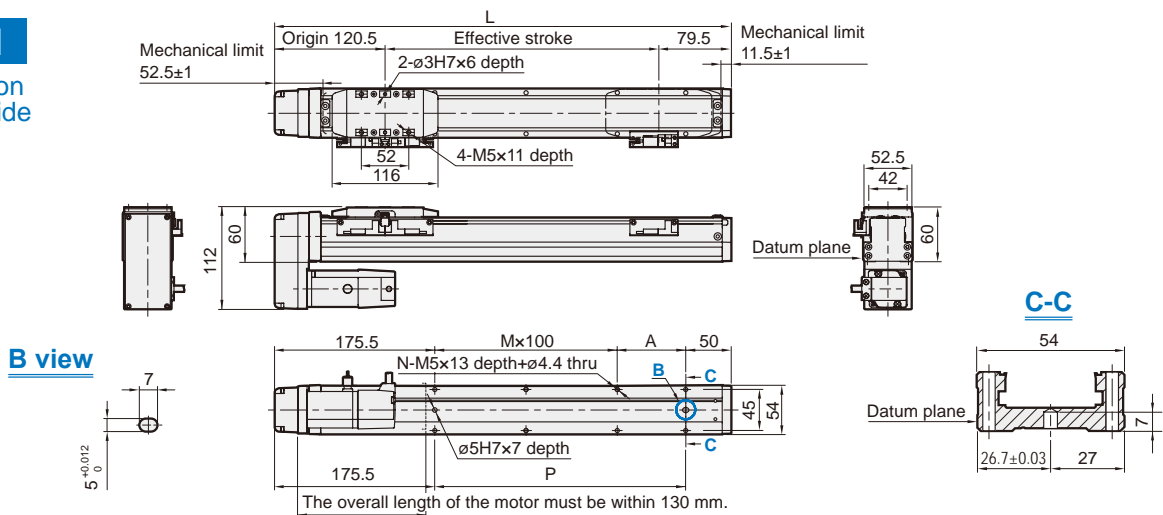


Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| L | 270.5 | 320.5 | 370.5 | 420.5 | 470.5 | 520.5 | 570.5 | 620.5 | 670.5 | 720.5 | 770.5 | 820.5 | 870.5 | 920.5 | 970.5 | 1020.5 |
| A | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 |
| M | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 |
| P | 25 | 75 | 125 | 175 | 225 | 275 | 325 | 375 | 425 | 475 | 525 | 575 | 625 | 675 | 725 | 775 |
| KG | 2.23 | 2.42 | 2.62 | 2.82 | 3.01 | 3.21 | 3.41 | 3.6 | 3.8 | 4 | 4.19 | 4.39 | 4.59 | 4.78 | 4.98 | 5.18 |

BM

Motor on lower side



Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|--------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| L | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
| A | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 |
| M | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 |
| N | 4 | 4 | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 |
| P | 25 | 75 | 125 | 175 | 225 | 275 | 325 | 375 | 425 | 475 | 525 | 575 | 625 | 675 | 725 | 775 |
| KG | 2.4 | 2.59 | 2.79 | 2.99 | 3.18 | 3.38 | 3.58 | 3.77 | 3.97 | 4.17 | 4.36 | 4.56 | 4.76 | 4.95 | 5.15 | 5.35 |

* When motor with brake assembled on down side, or the total length over than spec limit, it may not use standard pinhole. Please contact us if you need more information and requirement.

METG-5 Dimensions

SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

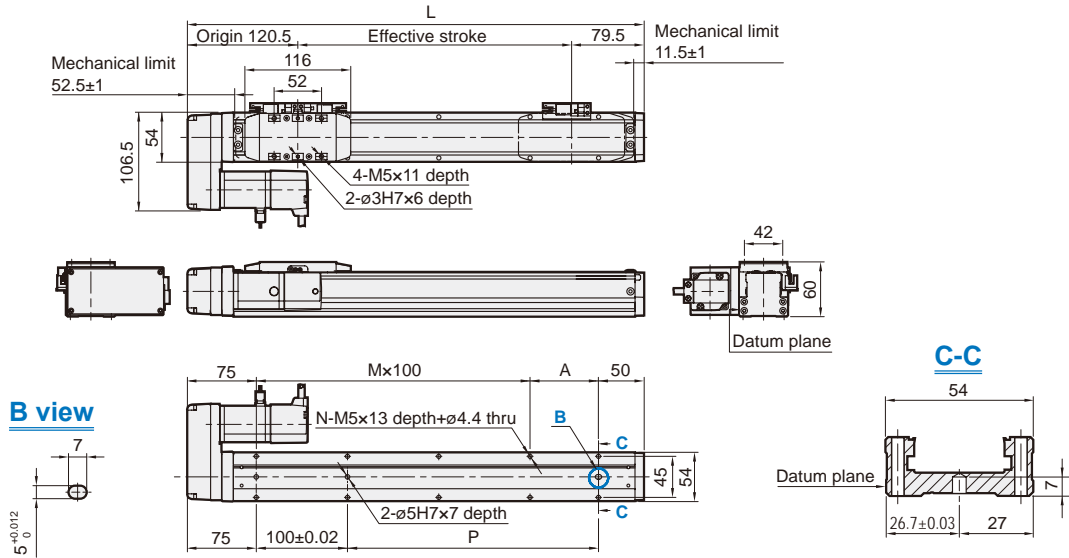
Gripper

Electric Actuator

Auxiliary Equipment

Hydraulic Cylinder

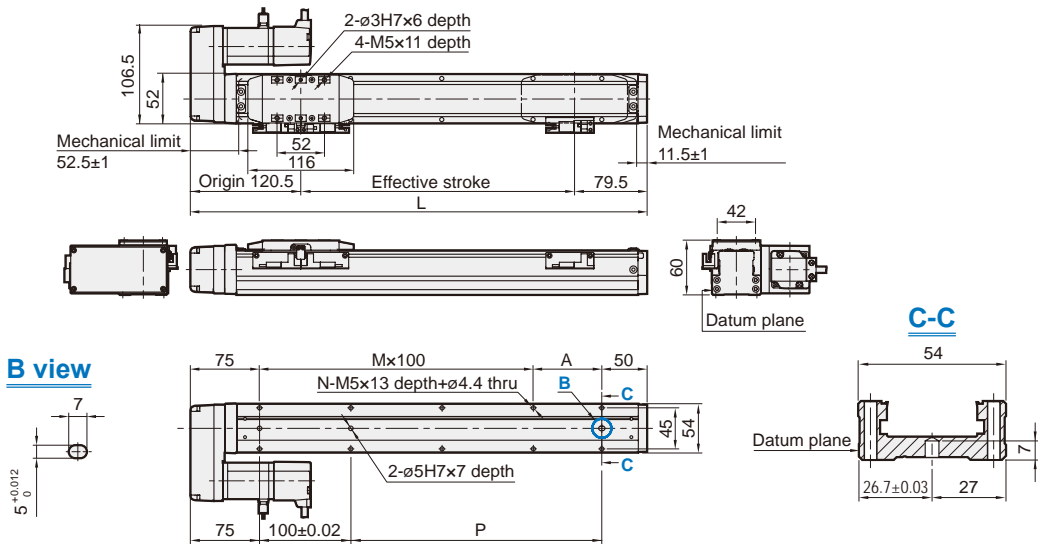
BL
Motor on left side



Unit: mm

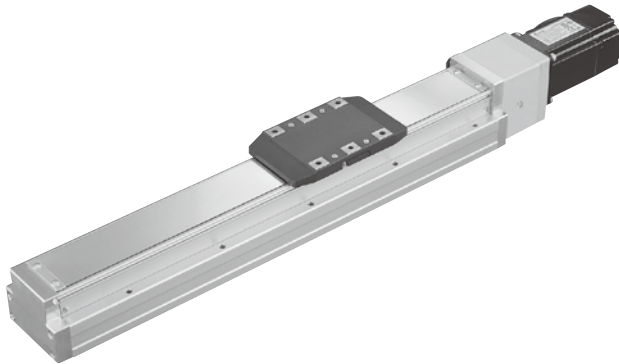
| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|-----------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| L | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
| A | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 |
| M | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 |
| P | 25 | 75 | 125 | 175 | 225 | 275 | 325 | 375 | 425 | 475 | 525 | 575 | 625 | 675 | 725 | 775 |
| KG | 2.4 | 2.59 | 2.79 | 2.99 | 3.18 | 3.38 | 3.58 | 3.77 | 3.97 | 4.17 | 4.36 | 4.56 | 4.76 | 4.95 | 5.15 | 5.35 |

BR
Motor on right side



Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|-----------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| L | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
| A | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 |
| M | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 |
| P | 25 | 75 | 125 | 175 | 225 | 275 | 325 | 375 | 425 | 475 | 525 | 575 | 625 | 675 | 725 | 775 |
| KG | 2.4 | 2.59 | 2.79 | 2.99 | 3.18 | 3.38 | 3.58 | 3.77 | 3.97 | 4.17 | 4.36 | 4.56 | 4.76 | 4.95 | 5.15 | 5.35 |



Specification

| Model | | METG-8 | | |
|-------------------|-----------------|--------------------|-----------|-----------|
| Repeatability | (mm) | ±0.005 | | |
| Ball screw lead | (mm) | 5 | 10 | 20 |
| Max. speed (*1) | (mm/s) | 250 | 500 | 1000 |
| AC servo motor | (W) | 200W, 400W | | |
| Max. payload | Horizontal (kg) | 50 | 30 | 18 |
| | Vertical (kg) | 15 | 8 | 3 |
| Rated thrust (*2) | (N) | 683 (1388) | 341 (694) | 174 (347) |
| Stroke (*3) | (mm) | 50~1100 / 50 pitch | | |
| Ball screw | (mm) | C7ø16 | | |
| Coupling | (mm) | 10x14/11 (*4) | | |
| Home sensor | | EE-SX674 (NPN) | | |

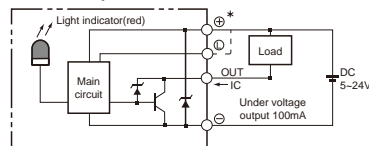
*1. Acceleration and deceleration value is set 0.2 second.

*2. () The value for power output 400W.

*3. When the stroke is over 750mm, the run-out of the ballscrew will occur. We recommend to low down the working speed under this circumstance.

*4. Motor 200W shaft diameter: Panasonic: 11mm, Other: 14 mm.

Sensor layout



Order example

METG – 8 – L10 – 100 – BC – M20 B – C4 – 0001

| | | | | | | | | |
|--------------|-------------|---------------------------|---|--------------------------|----------|---|------------|--|
| Model | Size | Stroke | Brakes | Special order no. | | | | |
| | | 50~1100 mm 50 mm pitch | <table border="1"> <tr> <td>-</td> <td>No brake</td> </tr> <tr> <td>B</td> <td>With brake</td> </tr> </table> | - | No brake | B | With brake | |
| - | No brake | | | | | | | |
| B | With brake | | | | | | | |

| Ball screw lead | Motor position | Motor brand, power output | Home sensor | Limit sensor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----------------------|----------------------------------|--------------------|---------------------|-----|-------|---|----|-------------------|----|------------|----|------------|----|-----------|--|-------------|--|--|--|---|------------|----------|--------------|---|-----------|---|---------|---|-------|---|----------|--|---|------------|---|---------------------|-----------|--|---|------|---|----------|--|---|------|---|-------|-----------|--|---|------|
| <table border="1"> <tr> <td>L05</td> <td>5 mm</td> </tr> <tr> <td>L10</td> <td>10 mm</td> </tr> <tr> <td>L20</td> <td>20 mm</td> </tr> </table> | L05 | 5 mm | L10 | 10 mm | L20 | 20 mm | <table border="1"> <tr> <td>BC</td> <td>Direct connection</td> </tr> <tr> <td>BM</td> <td>Lower side</td> </tr> <tr> <td>BR</td> <td>Right side</td> </tr> <tr> <td>BL</td> <td>Left side</td> </tr> </table> | BC | Direct connection | BM | Lower side | BR | Right side | BL | Left side | <table border="1"> <tr> <th colspan="4">SERVO motor</th> </tr> <tr> <td>M</td> <td>Mitsubishi</td> <td rowspan="4">20 40</td> <td rowspan="4">200W 400W</td> </tr> <tr> <td>P</td> <td>Panasonic</td> </tr> <tr> <td>Y</td> <td>Yaskawa</td> </tr> <tr> <td>T</td> <td>Delta</td> </tr> </table> | SERVO motor | | | | M | Mitsubishi | 20 40 | 200W 400W | P | Panasonic | Y | Yaskawa | T | Delta | <table border="1"> <tr> <th colspan="2">Out side</th> </tr> <tr> <td>C</td> <td>Motor side</td> </tr> <tr> <td>D</td> <td>Opposite motor side</td> </tr> <tr> <td colspan="2">No sensor</td> </tr> <tr> <td>E</td> <td>None</td> </tr> </table> | Out side | | C | Motor side | D | Opposite motor side | No sensor | | E | None | <table border="1"> <tr> <th colspan="2">Out side</th> </tr> <tr> <td>3</td> <td>1 Pc</td> </tr> <tr> <td>4</td> <td>2 Pcs</td> </tr> <tr> <td colspan="2">No sensor</td> </tr> <tr> <td>5</td> <td>None</td> </tr> </table> | Out side | | 3 | 1 Pc | 4 | 2 Pcs | No sensor | | 5 | None |
| L05 | 5 mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L10 | 10 mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L20 | 20 mm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BC | Direct connection | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BM | Lower side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BR | Right side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BL | Left side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SERVO motor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | Mitsubishi | 20 40 | 200W 400W | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| P | Panasonic | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y | Yaskawa | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T | Delta | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Out side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C | Motor side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| D | Opposite motor side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No sensor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| E | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Out side | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 1 Pc | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 2 Pcs | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No sensor | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | None | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

* When the stroke is 50mm, the sensor installation has the following restrictions.

- Home sensor and limit sensor has to be installed on the different side of body.
- Both sides of slider need to install the sensor trigger device.

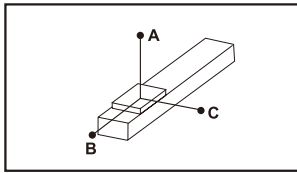
METG-8 Performance charts



SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)

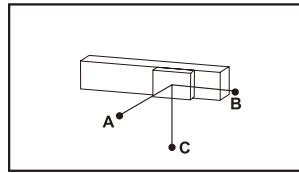
mindman

Allowable overhang



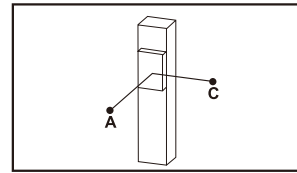
Unit: mm

| Horizontal installation | | A | B | C |
|-------------------------|------|------|-----|-----|
| Lead 5 | 20kg | 1560 | 153 | 237 |
| | 35kg | 890 | 81 | 126 |
| | 50kg | 550 | 53 | 82 |
| Lead 10 | 10kg | 1730 | 286 | 412 |
| | 20kg | 839 | 136 | 196 |
| | 30kg | 541 | 86 | 124 |
| Lead 20 | 6kg | 1213 | 403 | 493 |
| | 9kg | 800 | 264 | 323 |
| | 18kg | 592 | 194 | 238 |



Unit: mm

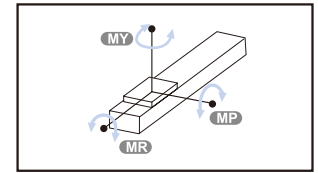
| Wall installation | | A | B | C |
|-------------------|------|-----|-----|------|
| Lead 5 | 20kg | 214 | 153 | 1435 |
| | 35kg | 113 | 81 | 845 |
| | 50kg | 74 | 53 | 506 |
| Lead 10 | 10kg | 370 | 286 | 1400 |
| | 20kg | 176 | 136 | 800 |
| | 30kg | 112 | 86 | 495 |
| Lead 20 | 6kg | 444 | 403 | 760 |
| | 9kg | 292 | 264 | 277 |
| | 18kg | 214 | 194 | 544 |



Unit: mm

| Vertical installation | | A | C |
|-----------------------|------|-----|-----|
| Lead 5 | 10kg | 331 | 331 |
| | 15kg | 220 | 220 |
| | – | – | – |
| Lead 10 | 5kg | 589 | 589 |
| | 8kg | 368 | 368 |
| | – | – | – |
| Lead 20 | 3kg | 935 | 935 |
| | – | – | – |
| | – | – | – |

Static loading moment



Unit: N.m

| | |
|----|-----|
| MY | 318 |
| MP | 318 |
| MR | 626 |

- The torque value in the chart indicate the center of gravity.
- Operation life is 10000km when the product is using under the specified conditions.
- Data information is not for ceiling-mount inverse use.
Contact us for the details if you want to apply ceiling-mount inverse usage.

Standard servo motors

| Brand | Mark | Brake | Watt | AC-Voltage | Motor model | Compatible driver model |
|------------|------|---------------------------|------|------------|---------------|-------------------------|
| Mitsubishi | M | No brake(Horizontal type) | 200 | 220 | HG-KR23 | MR-J4-20A |
| | | | 400 | 220 | HG-KR43 | MR-J4-40A |
| | | With brake(Vertical type) | 200 | 220 | HG-KR23B | MR-J4-20A |
| | | | 400 | 220 | HG-KR43B | MR-J4-40A |
| Panasonic | P | No brake(Horizontal type) | 200 | 220 | MHMD022G1U | MADHT1507 |
| | | | 400 | 220 | MHMD042G1U | MBDHT2510 |
| | | With brake(Vertical type) | 200 | 220 | MHMD022G1V | MADHT1507 |
| | | | 400 | 220 | MHMD042G1V | MBDHT2510 |
| Delta | T | No brake(Horizontal type) | 200 | 220 | ECMA-C20602ES | ASD-B20221-B |
| | | | 400 | 220 | ECMA-C20604ES | ASD-B20421-B |
| | | With brake(Vertical type) | 200 | 220 | ECMA-C20602FS | ASD-B20221-B |
| | | | 400 | 220 | ECMA-C20604FS | ASD-B20421-B |

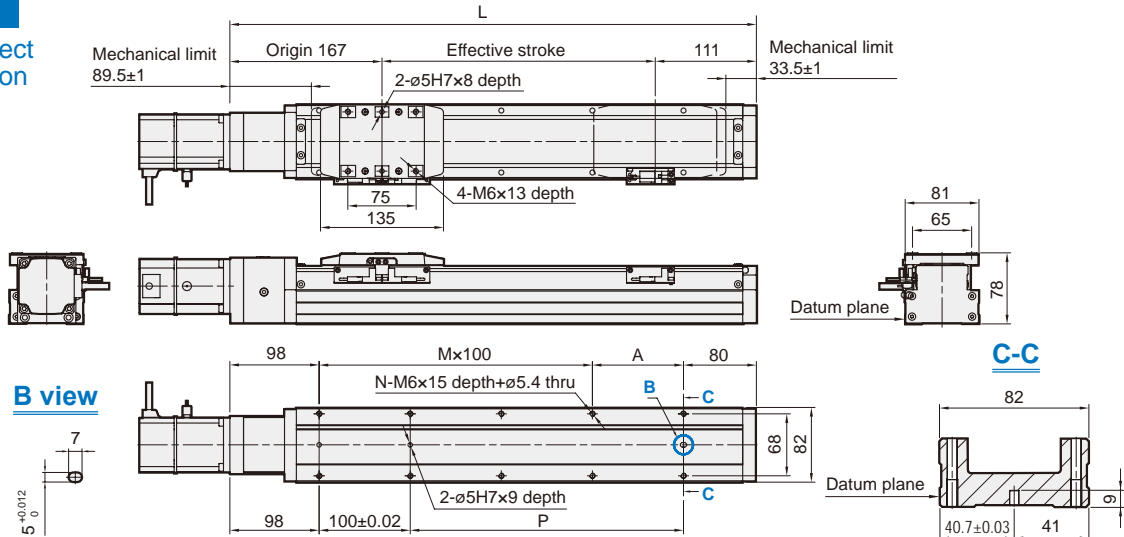
METG-8 series

SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)



BC

Motor direct connection

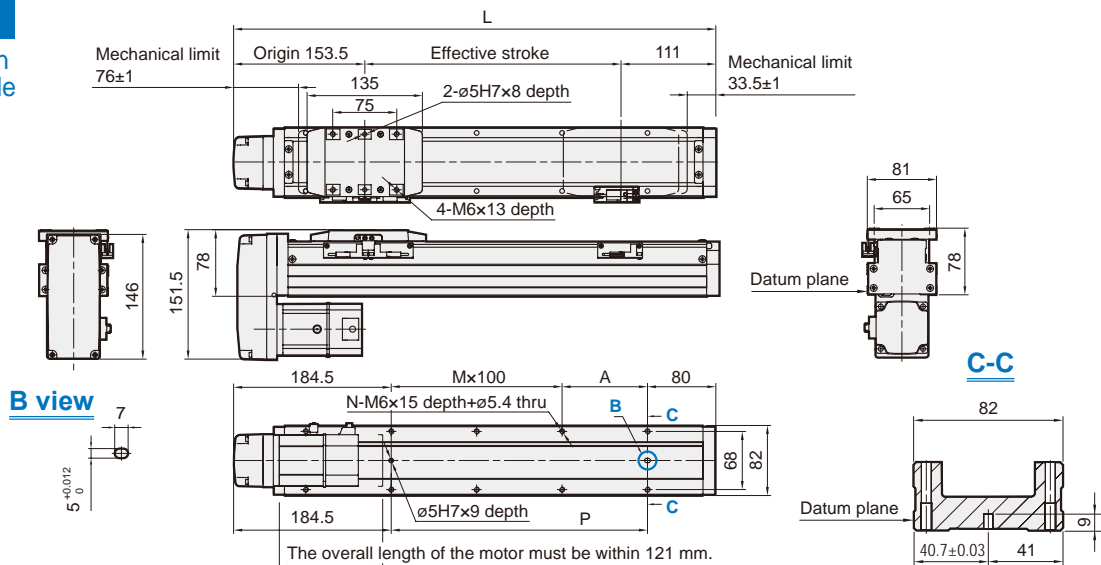


Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 |
|--------|------|------|------|------|------|-----|------|------|-----|------|------|------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|
| L | 328 | 378 | 428 | 478 | 528 | 578 | 628 | 678 | 728 | 778 | 828 | 878 | 928 | 978 | 1028 | 1078 | 1128 | 1178 | 1228 | 1278 | 1328 | 1378 |
| A | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 |
| M | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 10 | 11 | 11 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 | 22 | 24 | 24 | 26 | 26 |
| P | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 |
| KG | 5.18 | 5.54 | 5.91 | 6.27 | 6.64 | 7 | 7.37 | 7.73 | 8.1 | 8.46 | 8.83 | 9.19 | 9.56 | 9.92 | 10.29 | 10.65 | 11.02 | 11.38 | 11.75 | 12.11 | 12.48 | 12.85 |

BM

Motor on lower side



Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 |
|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| L | 314.5 | 364.5 | 414.5 | 464.5 | 514.5 | 564.5 | 614.5 | 664.5 | 714.5 | 764.5 | 814.5 | 864.5 | 914.5 | 964.5 | 1014.5 | 1064.5 | 1114.5 | 1164.5 | 1214.5 | 1264.5 | 1314.5 | 1364.5 |
| A | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 |
| M | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 10 |
| N | 4 | 4 | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 | 22 | 24 | 24 |
| P | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 |
| KG | 5.19 | 5.6 | 6.12 | 6.64 | 7.16 | 7.68 | 8.2 | 8.72 | 9.24 | 9.76 | 10.28 | 10.8 | 11.32 | 11.84 | 12.36 | 12.88 | 13.4 | 13.92 | 14.44 | 14.96 | 15.48 | 16 |

* When motor with brake assembled on down side, or the total length over than spec limit, it may not use standard pinhole. Please contact us if you need more information and requirement.

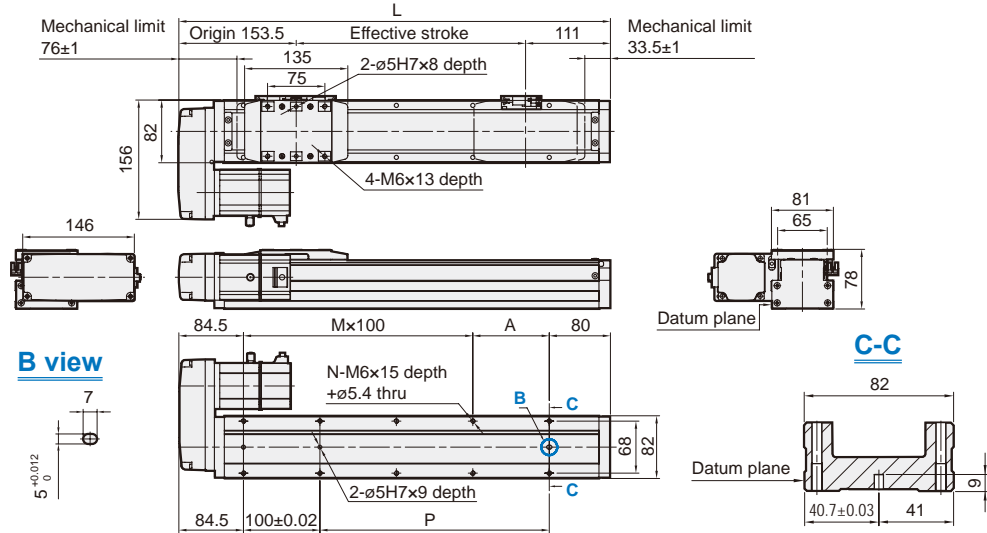
METG-8 Performance charts



SLIDER ELECTRIC CYLINDER – BUILT-IN GUIDEWAY (WITHOUT MOTOR)

BL

Motor on left side

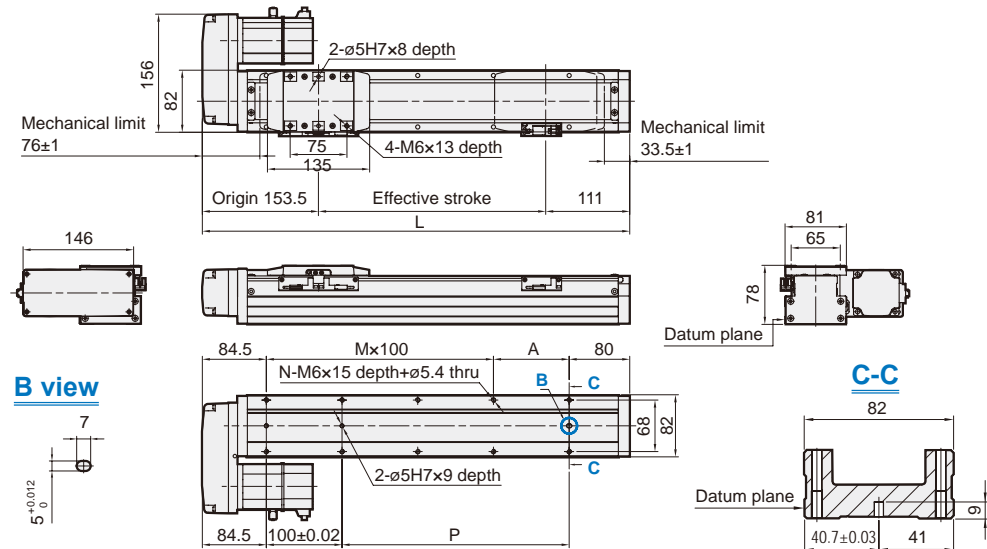


Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| L | 314.5 | 364.5 | 414.5 | 464.5 | 514.5 | 564.5 | 614.5 | 664.5 | 714.5 | 764.5 | 814.5 | 864.5 | 914.5 | 964.5 | 1014.5 | 1064.5 | 1114.5 | 1164.5 | 1214.5 | 1264.5 | 1314.5 | 1364.5 |
| A | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 |
| M | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 10 | 11 | 11 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 | 22 | 24 | 24 | 26 | 26 |
| P | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 |
| KG | 5.19 | 5.6 | 6.12 | 6.64 | 7.16 | 7.68 | 8.2 | 8.72 | 9.24 | 9.76 | 10.28 | 10.8 | 11.32 | 11.84 | 12.36 | 12.88 | 13.4 | 13.92 | 14.44 | 14.96 | 15.48 | 16 |

BR

Motor on right side



Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|
| L | 314.5 | 364.5 | 414.5 | 464.5 | 514.5 | 564.5 | 614.5 | 664.5 | 714.5 | 764.5 | 814.5 | 864.5 | 914.5 | 964.5 | 1014.5 | 1064.5 | 1114.5 | 1164.5 | 1214.5 | 1264.5 | 1314.5 | 1364.5 |
| A | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 |
| M | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 | 9 | 9 | 10 | 10 | 11 | 11 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 | 22 | 22 | 24 | 24 | 26 | 26 |
| P | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 |
| KG | 5.19 | 5.6 | 6.12 | 6.64 | 7.16 | 7.68 | 8.2 | 8.72 | 9.24 | 9.76 | 10.28 | 10.8 | 11.32 | 11.84 | 12.36 | 12.88 | 13.4 | 13.92 | 14.44 | 14.96 | 15.48 | 16 |

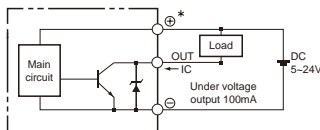
METS2-10 series

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



| | | | |
|----------------|------------|-------------|--------------|
| Environment | Standard | Servo motor | 100W / 200W |
| Actuation type | Ball screw | Guide type | Linear guide |

Sensor layout



Specification

| Model | METS2-10 | | |
|-----------------------------|---------------------|-----|------|
| Position repeatability (mm) | ±0.01 | | |
| Lead (mm) | 5 | 10 | 20 |
| Max. speed (mm/s) | 250 | 500 | 1000 |
| Stroke (mm) | 100~1000 / 50 pitch | | |
| Ball screw O.D. (mm) | C7 ø16 | | |
| Home sensor | EE-SX672 (NPN) | | |

| AC servo motor | 100W | | | |
|------------------|-----------------|-----|----|----|
| Coupling (mm) | 10x8 | | | |
| Max. payload | Horizontal (kg) | 50 | 30 | 18 |
| | Vertical (kg) | 12 | 8 | 3 |
| Rated thrust (N) | 341 | 170 | 85 | |

| AC servo motor | 200W | | | |
|------------------|----------------------------|-----|-----|----|
| Coupling (mm) | 10x14 / 11 ^(*1) | | | |
| Max. payload | Horizontal (kg) | 50 | 30 | 18 |
| | Vertical (kg) | 12 | 8 | 3 |
| Rated thrust (N) | 683 | 341 | 174 | |

*1. Panasonic motor 200W shaft diameter: ø11, others ø14.

*2. When the stroke is over 750mm, the run-out of the ballscrew will occur. We recommend to low down the working speed under this circumstance.

*3. Acceleration and deceleration value are set to 0.2 second.

Order example

METS2-10 - L05 - 100 - BC - M20 B - A3 - XA00

| Model | Size | Stroke | Motor position | Motor brand | Power output | Brakes | Limit sensor |
|-------|-------|----------------------------|----------------------|--------------|--------------|--------------|--------------|
| L05 | 5 mm | 100~1000 mm 50 mm pitch | M Built-in (*) | M Mitsubishi | 10 20 | - No brake | - No sensor |
| L10 | 10 mm | | BC Direct connection | P Panasonic | | B With brake | A1 1 pc |
| L20 | 20 mm | | BM Lower side | Y Yaskawa | | A2 2 pcs | |
| | | BR Right side | D Delta | A3 3 pcs | | | |
| | | BL Left side | E Else | | | | |

* Not applicable for 200W servo.

Standard servo motors

| Brand | Mark | Power output | Motor model (Without brake) | Motor model (With brake) | Motor rod dim. (mm) | Motor mount P.C.D (mm) | Mounting port (mm) |
|------------|------|--------------|-----------------------------|--------------------------|---------------------|------------------------|--------------------|
| Mitsubishi | M | 100 W | HG-KN13J | HG-KN13B J | ø8 | ø46 | 2-ø4.5 |
| | | 200 W | HG-KN23J | HG-KN23B J | ø14 | ø70 | 4-ø5.8 |
| Panasonic | P | 100 W | MSMF012L1U2M | MSMF012L1V2M | ø8 | ø45 | 4-ø3.4 |
| | | 200 W | MHMF022L1U2M | MHMF022L1V2M | ø11 | ø70 | 4-ø4.5 |
| Yaskawa | Y | 100 W | SGM7J-01A7A21 | SGM7J-01A7A2C | ø8 | ø46 | 2-ø4.3 |
| | | 200 W | SGM7J-02A7A21 | SGM7J-02A7A2C | ø14 | ø70 | 4-ø5.5 |
| Delta | D | 100 W | ECMA-C20401PS | ECMA-C20401FS | ø8 | ø46 | 2-ø4.5 |
| | | 200 W | ECMA-C20602PS | ECMA-C20602FS | ø14 | ø70 | 4-ø5.5 |

* If your inquiry is not included in above table, please kindly contact us.

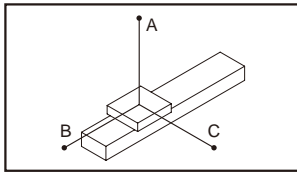
METS2-10 Performance charts & Dimensions



SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

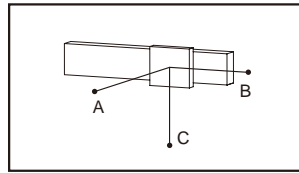
mindman

Allowable overhang



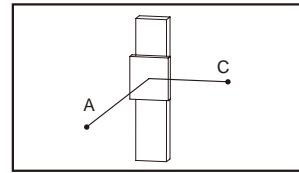
Unit: mm

| Horizontal installation | A | B | C |
|----------------------------|------|-----|-----|
| AC servo motor 100W / 200W | | | |
| Lead 5 | 30kg | 547 | 42 |
| | 40kg | 391 | 29 |
| | 50kg | 298 | 22 |
| Lead 10 | 15kg | 521 | 84 |
| | 25kg | 298 | 47 |
| | 30kg | 242 | 37 |
| Lead 20 | 5kg | 675 | 224 |
| | 10kg | 330 | 107 |
| | 18kg | 175 | 55 |



Unit: mm

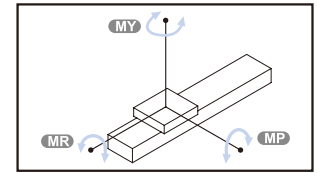
| Wall installation | A | B | C |
|----------------------------|------|-----|-----|
| AC servo motor 100W / 200W | | | |
| Lead 5 | 25kg | 52 | 53 |
| | 35kg | 35 | 35 |
| | 50kg | 21 | 22 |
| Lead 10 | 10kg | 124 | 131 |
| | 20kg | 58 | 61 |
| | 30kg | 35 | 37 |
| Lead 20 | 6kg | 160 | 185 |
| | 12kg | 76 | 88 |
| | 18kg | 48 | 55 |



Unit: mm

| Vertical installation | A | C |
|----------------------------|------|-----|
| AC servo motor 100W / 200W | | |
| Lead 5 | 5kg | 310 |
| | 8kg | 192 |
| | 12kg | 129 |
| Lead 10 | 4kg | 344 |
| | 8kg | 172 |
| | - | - |
| Lead 20 | 2kg | 546 |
| | 3kg | 364 |
| | - | - |

Static loading moment

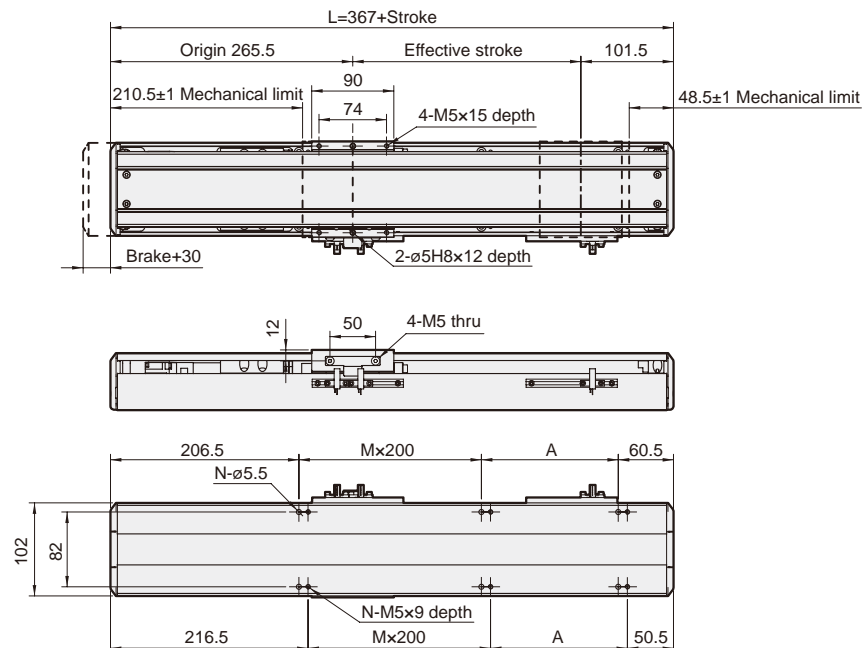
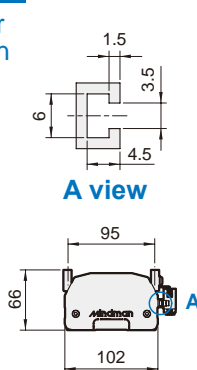


Unit: N.m

| Horizontal | |
|----------------------------|-----|
| AC servo motor 100W / 200W | |
| MY | 110 |
| MP | 110 |
| MR | 120 |

Dimensions

M
Motor built-in



| Stroke | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|
| L | 467 | 517 | 567 | 617 | 667 | 717 | 767 | 817 | 867 | 917 | 967 | 1017 | 1067 | 1117 | 1167 | 1217 | 1267 | 1317 | 1367 |
| A | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 |
| M | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 |
| N | 4 | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 |

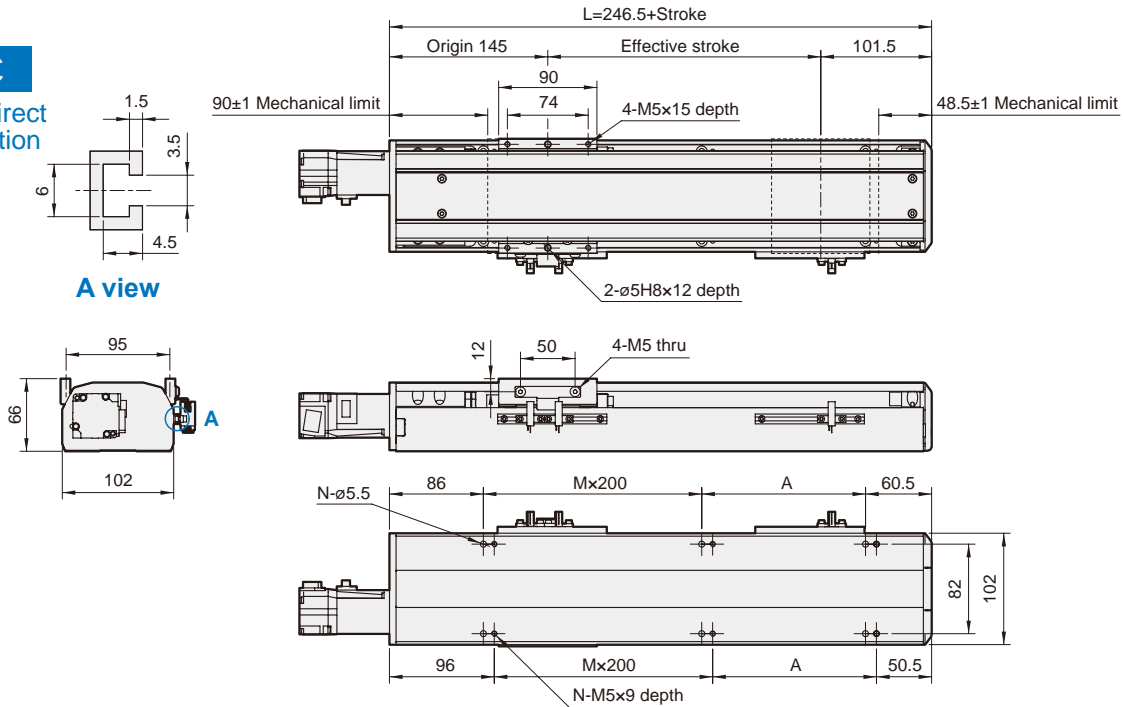
* When delta 100W, brake +40.

METS2-10 Dimensions

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

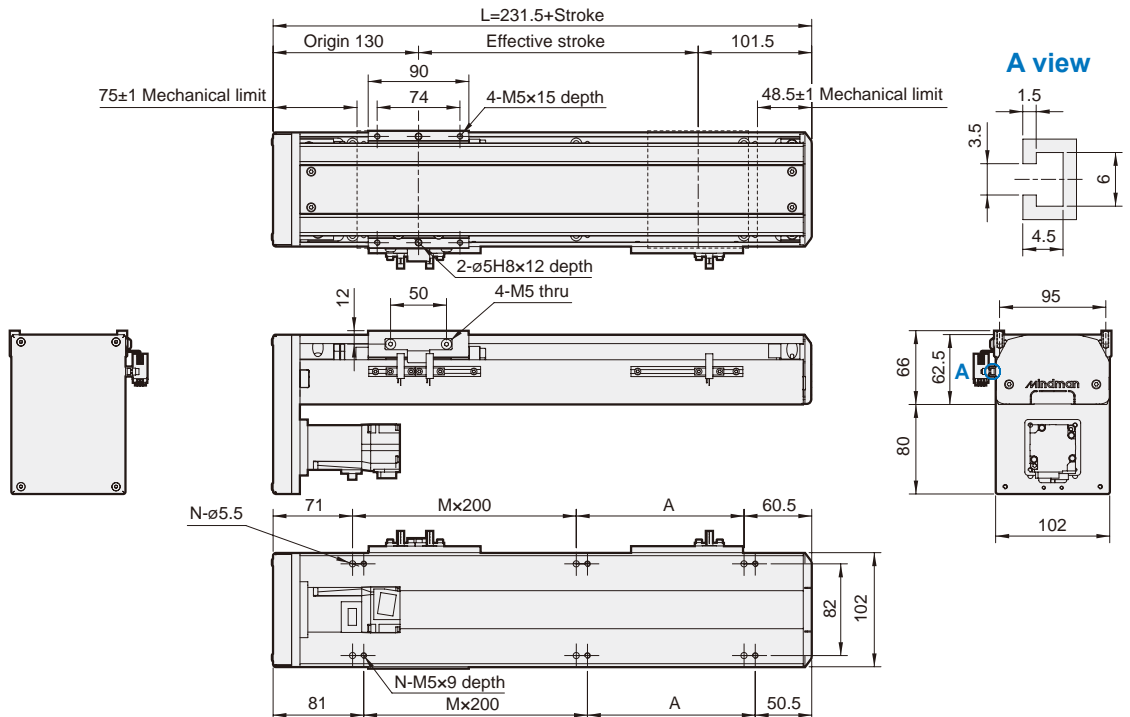


BC
Motor direct connection



| Stroke | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| L | 346.5 | 396.5 | 446.5 | 496.5 | 546.5 | 596.5 | 646.5 | 696.5 | 746.5 | 796.5 | 846.5 | 896.5 | 946.5 | 996.5 | 1046.5 | 1096.5 | 1146.5 | 1196.5 | 1246.5 |
| A | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 |
| M | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 |
| N | 4 | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 |

BM
Motor on lower side



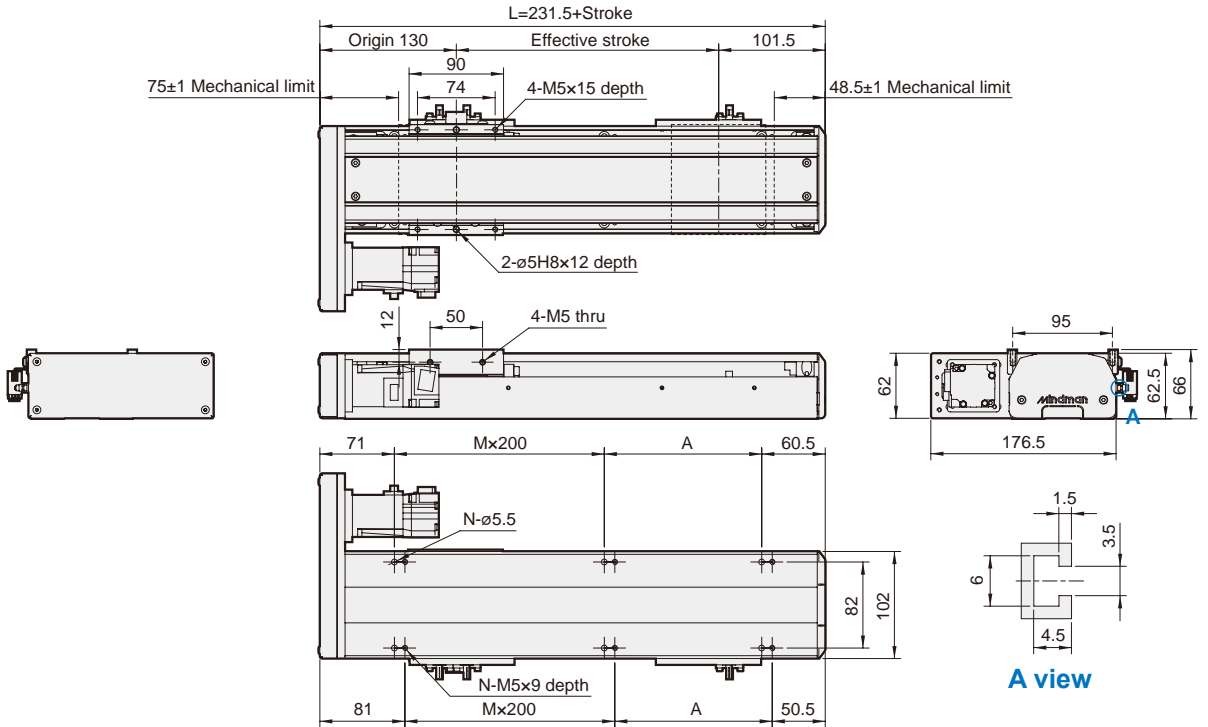
| Stroke | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| L | 331.5 | 381.5 | 431.5 | 481.5 | 531.5 | 581.5 | 631.5 | 681.5 | 731.5 | 781.5 | 831.5 | 881.5 | 931.5 | 981.5 | 1031.5 | 1081.5 | 1131.5 | 1181.5 | 1231.5 |
| A | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 |
| M | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 |
| N | 4 | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 |

METS2-10 Dimensions

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

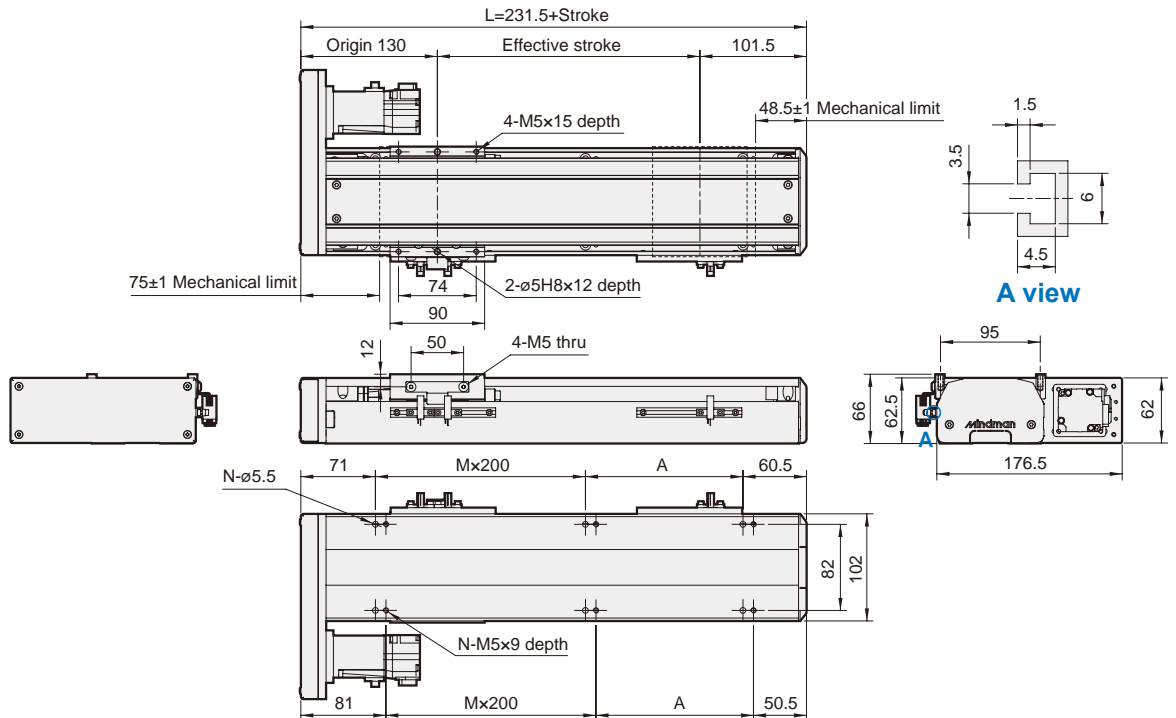


BL
Motor on left side



| Stroke | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| L | 331.5 | 381.5 | 431.5 | 481.5 | 531.5 | 581.5 | 631.5 | 681.5 | 731.5 | 781.5 | 831.5 | 881.5 | 931.5 | 981.5 | 1031.5 | 1081.5 | 1131.5 | 1181.5 | 1231.5 |
| A | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 |
| M | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 |
| N | 4 | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 |

BR
Motor on right side



| Stroke | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|
| L | 331.5 | 381.5 | 431.5 | 481.5 | 531.5 | 581.5 | 631.5 | 681.5 | 731.5 | 781.5 | 831.5 | 881.5 | 931.5 | 981.5 | 1031.5 | 1081.5 | 1131.5 | 1181.5 | 1231.5 |
| A | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 |
| M | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 |
| N | 4 | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 |

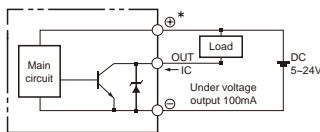
METS2-14 series

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



| | | | |
|-----------------|------------|-------------|--------------|
| Use environment | Standard | Servo motor | 200W / 400W |
| Actuation type | Ball screw | Guide type | Linear guide |

Sensor layout



Feature

- Modular product can save your time of designing and assembly, and greatly increase your development efficiency.
- High stiffness body made with integrated aluminum extrusion.
- It provides several position for motor installment.
- It is available for customized service.

Specification

| Model | METS2-14 | | |
|-----------------------------|---------------------|-----|------|
| Position repeatability (mm) | ±0.01 | | |
| Lead (mm) | 5 | 10 | 20 |
| Max. speed (mm/s) | 250 | 500 | 1000 |
| Stroke (mm) | 100~1000 / 50 pitch | | |
| Ball screw O.D. (mm) | C7 ø16 | | |
| Coupling (mm) | 10×14 / 10×11 (*1) | | |
| Home sensor | EE-SX672 (NPN) | | |

| AC servo motor | 200W | | | |
|------------------|-----------------|-----|-----|-----|
| Max. payload | Horizontal (kg) | 95 | 75 | 35 |
| | Vertical (kg) | 27 | 18 | 6 |
| Rated thrust (N) | | 683 | 341 | 174 |

| AC servo motor | 400W | | | |
|------------------|-----------------|------|-----|-----|
| Max. payload | Horizontal (kg) | 110 | 88 | 40 |
| | Vertical (kg) | 33 | 22 | 8 |
| Rated thrust (N) | | 1388 | 694 | 347 |

*1. Motor (200W) shaft diameter : Panasonic ø11, others ø14.

*2. When the stroke is over 750mm, the run-out of the ball screw will occur. We recommend to low down the working speed under this circumstance.

*3. Acceleration and deceleration value are set to 0.2 second.

Order example

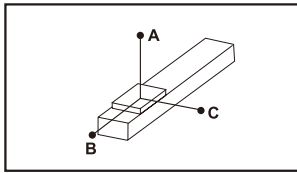
METS2-14 - L05 - 100 - BC - M20 B - A3 - XA00

| Model | | Size | | Motor position | | Motor brand | | Power output | | Brakes | | Limit sensor | |
|------------|-------|-----------------------------------|------------|-------------------|----------|-------------|------------------------|--------------|-----------|------------|-----------|--------------|--|
| L05 | 5 mm | 100~1000 mm 50 mm pitch | M | Built-in | M | Mitsubishi | 20 40 | 200W 400W | - | No brake | - | No sensor | |
| L10 | 10 mm | | BC | Direct connection | P | Panasonic | | | B | With brake | A1 | 1 pc | |
| L20 | 20 mm | | BM | Lower side | Y | Yaskawa | | | A2 | 2 pcs | | | |
| | | BR | Right side | D | Delta | A3 | | | 3 pcs | | | | |
| | | BL | Left side | E | Else | | | | | | | | |

* Sensor is packaged separately, and is freely operated for customer's adjustment.

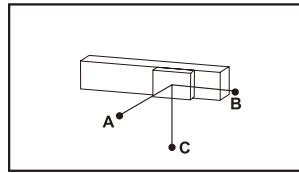
* If customized service is required, please kindly contact us.

Allowable overhang



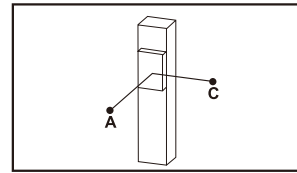
Unit: mm

| Horizontal installation | A | B | C |
|-------------------------|------|------|------|
| AC servo motor 200W | | | |
| Lead 5 | 60kg | 2300 | 250 |
| | 80kg | 1600 | 180 |
| | 95kg | 1150 | 145 |
| Lead 10 | 30kg | 2000 | 500 |
| | 50kg | 1400 | 280 |
| | 75kg | 1000 | 170 |
| Lead 20 | 10kg | 2300 | 1200 |
| | 20kg | 1400 | 600 |
| | 35kg | 1000 | 330 |



Unit: mm

| Wall installation | A | B | C |
|---------------------|------|-----|------|
| AC servo motor 200W | | | |
| Lead 5 | 60kg | 200 | 110 |
| | 80kg | 130 | 55 |
| | 95kg | 85 | 25 |
| Lead 10 | 30kg | 415 | 330 |
| | 50kg | 235 | 155 |
| | 75kg | 130 | 55 |
| Lead 20 | 10kg | 995 | 1200 |
| | 20kg | 500 | 555 |
| | 35kg | 270 | 230 |



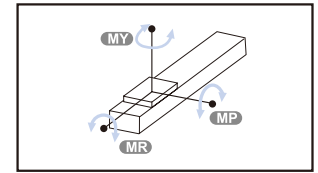
Unit: mm

| Vertical installation | A | C |
|-----------------------|------|------|
| AC servo motor 200W | | |
| Lead 5 | 20kg | 755 |
| | 25kg | 605 |
| | 27kg | 500 |
| Lead 10 | 10kg | 1350 |
| | 15kg | 900 |
| | 18kg | 675 |
| Lead 20 | 6kg | 1695 |
| | — | — |
| | — | — |
| AC servo motor 400W | | |
| Lead 20 | 4kg | 2400 |
| | 6kg | 1700 |
| | 8kg | 1300 |

* When the motor power is 400W, the max. payload is 110 kg (lead 5), 88 kg (lead 10), 40 kg (lead 20), and the load torque distance remains unchanged.

* When the motor power is 400W, the max. payload is 33 kg (lead 5), 22kg (lead 10), and the load torque distance remains unchanged.

Static loading moment



Unit: N.m

| Horizontal | |
|---------------------|-----|
| AC servo motor 200W | |
| MY | 262 |
| MP | 262 |
| MR | 261 |

Standard servo motors

| Brand | Mark | Power output | Motor model (Without brake) | Motor model (With brake) | Motor rod dim. (mm) | Motor mount P.C.D (mm) | Mounting port (mm) |
|------------|------|--------------|-----------------------------|--------------------------|---------------------|------------------------|--------------------|
| Mitsubishi | M | 200W | HG-KN23J | HG-KN23B J | ø14 | ø70 | 4-ø5.8 |
| | | 400W | HG-KN43J | HG-KN43B J | ø14 | ø70 | 4-ø5.8 |
| Panasonic | P | 200W | MHMF022L1U2M | MHMF022L1V2M | ø11 | ø70 | 4-ø4.5 |
| | | 400W | MHMF042L1U2M | MHMF042L1V2M | ø14 | ø70 | 4-ø4.5 |
| Yaskawa | Y | 200W | SGM7J-02A7A21 | SGM7J-02A7A2C | ø14 | ø70 | 4-ø5.5 |
| | | 400W | SGM7J-04A7A21 | SGM7J-04A7A2C | ø14 | ø70 | 4-ø5.5 |
| Delta | D | 200W | ECMA-C20602PS | ECMA-C20602FS | ø14 | ø70 | 4-ø5.5 |
| | | 400W | ECMA-C20604PS | ECMA-C20604QS | ø14 | ø70 | 4-ø5.5 |

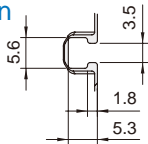
* If your inquiry is not included in above table, please kindly contact us.

METS2-14 Dimensions

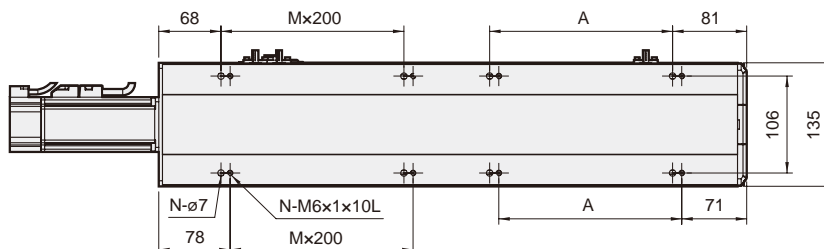
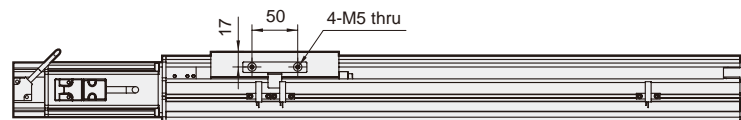
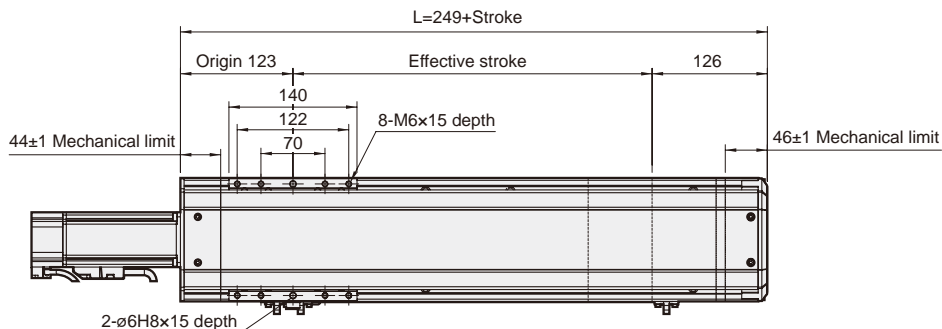
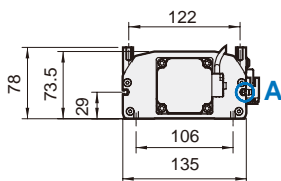
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



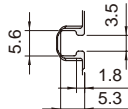
BC
Motor direct connection



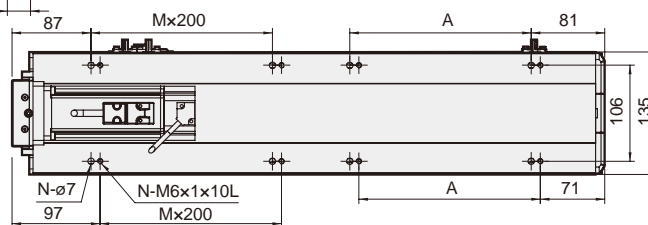
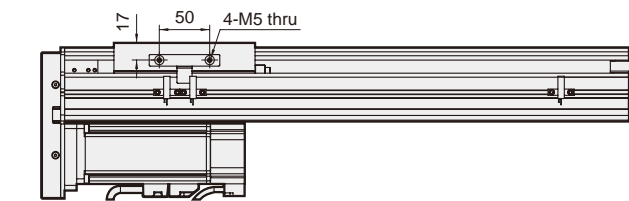
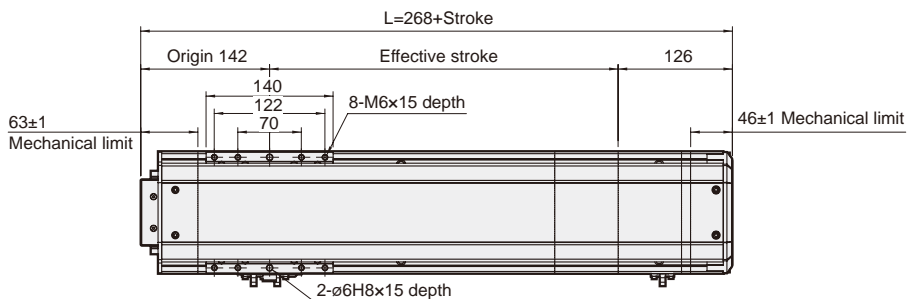
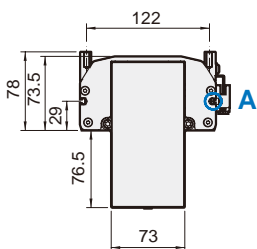
A view



BM
Motor on lower side



A view



Unit: mm

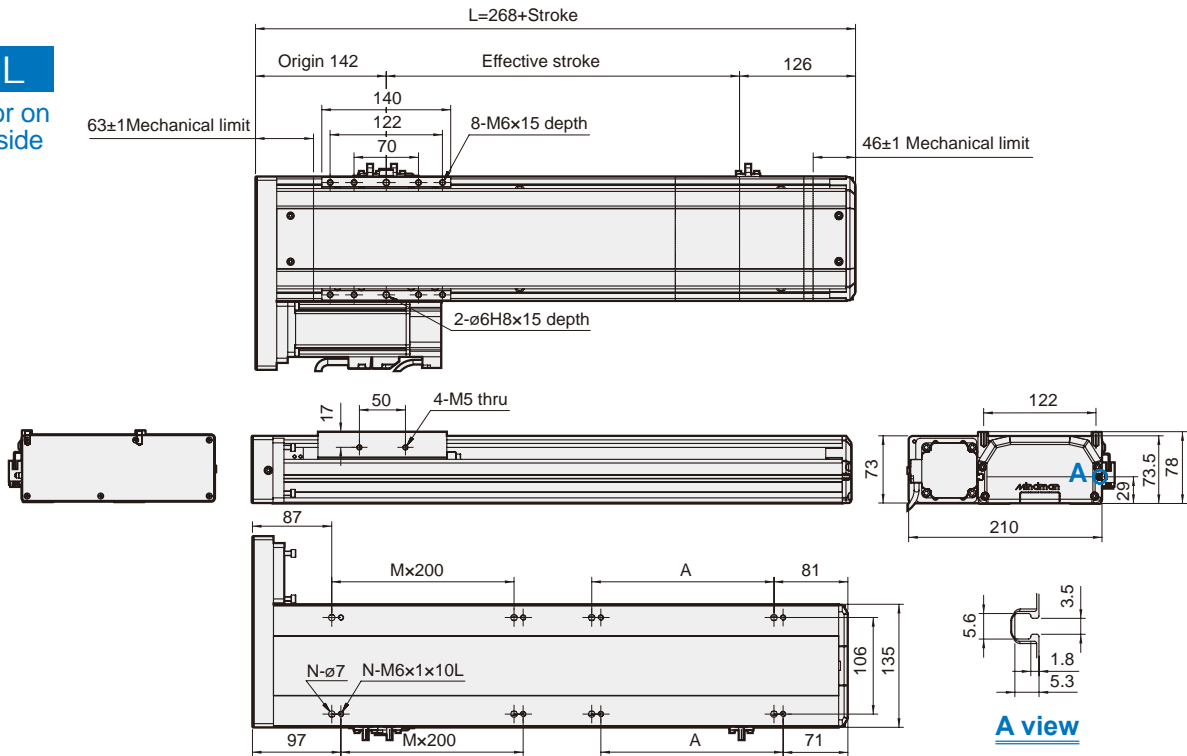
| Stroke | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| L | BC | 349 | 399 | 449 | 499 | 549 | 599 | 649 | 699 | 749 | 799 | 849 | 899 | 949 | 999 | 1049 | 1099 | 1149 | 1199 | 1249 |
| | BM | 368 | 418 | 468 | 518 | 568 | 618 | 668 | 718 | 768 | 818 | 868 | 918 | 968 | 1018 | 1068 | 1118 | 1168 | 1218 | 1268 |
| A | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | |
| M | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | |
| N | 4 | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 | |

METS2-14 Dimensions

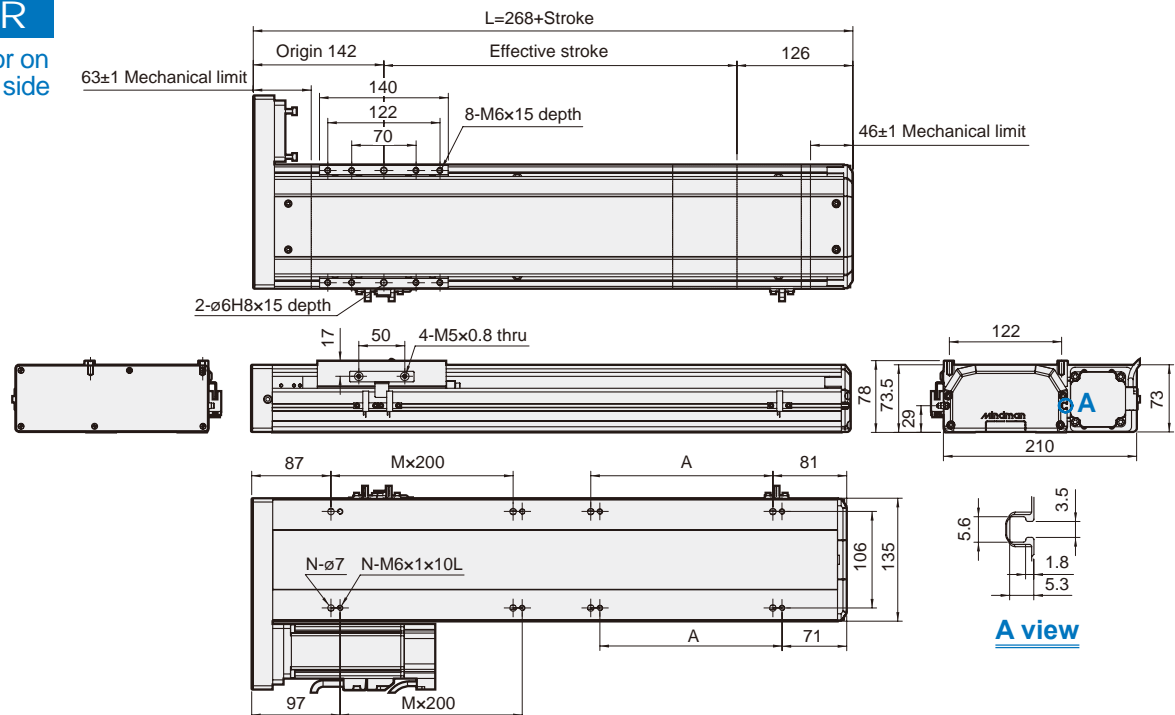
SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



BL
Motor on left side



BR
Motor on right side



Unit: mm

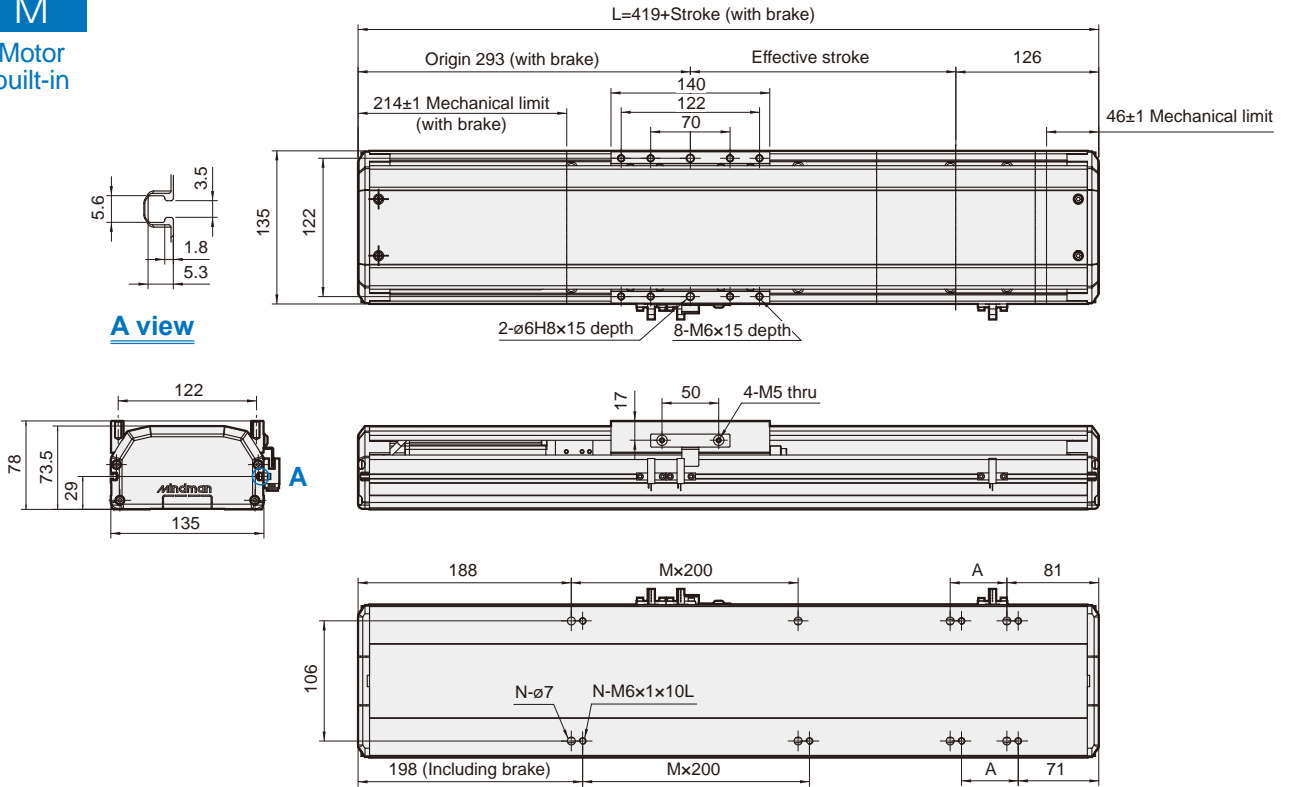
| Stroke | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| L | BL | 368 | 418 | 468 | 518 | 568 | 618 | 668 | 718 | 768 | 818 | 868 | 918 | 968 | 1018 | 1068 | 1118 | 1168 | 1218 | 1268 |
| | BR | 368 | 418 | 468 | 518 | 568 | 618 | 668 | 718 | 768 | 818 | 868 | 918 | 968 | 1018 | 1068 | 1118 | 1168 | 1218 | 1268 |
| A | | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 |
| M | | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 |
| N | | 4 | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 |

METS2-14 Dimensions

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



M
Motor
built-in



Unit: mm

| Stroke | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|
| L | 519 | 569 | 619 | 669 | 719 | 769 | 819 | 869 | 919 | 969 | 1019 | 1069 | 1119 | 1169 | 1219 | 1269 | 1319 | 1369 | 1419 |
| A | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 |
| M | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 |
| N | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 | 14 |

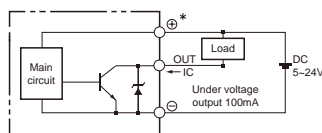
METS2-17 series

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



| | | | |
|----------------|------------|-------------|--------------|
| Environment | Standard | Servo motor | 400W / 750W |
| Actuation type | Ball screw | Guide type | Linear guide |

Sensor layout



Specification

| Model | METS2-17 | | |
|-----------------------------|---------------------|-----|------|
| Position repeatability (mm) | ±0.01 | | |
| Lead (mm) | 5 | 10 | 20 |
| Max. speed (mm/s) | 250 | 500 | 1000 |
| Stroke (mm) | 100~1200 / 50 pitch | | |
| Ball screw O.D. (mm) | C7 ø20 | | |
| Home sensor | EE-SX672 (NPN) | | |

| AC servo motor | 400W | | |
|------------------|-----------------|-----|-----|
| Coupling (mm) | 10×14 | | |
| Max. payload | Horizontal (kg) | 120 | 110 |
| | Vertical (kg) | 40 | 30 |
| Rated thrust (N) | 1388 | 694 | 347 |

| AC servo motor | 750W | | |
|------------------|-----------------|------|-----|
| Coupling (mm) | 10×19 | | |
| Max. payload | Horizontal (kg) | 120 | 120 |
| | Vertical (kg) | 50 | 40 |
| Rated thrust (N) | 2563 | 1281 | 640 |

- *1. When the stroke is over 750mm, the run-out of the ballscrew will occur. We recommend to low down the working speed under this circumstance.
- *2. Acceleration and deacceleration value are set to 0.2 second.

Order example

METS2-17 - L05 - 100 - BC - M40 B - A3 - XA00

| Model | Size | Stroke | Motor position | Motor brand | Power output | Brakes | Limit sensor |
|-------|-------|----------------------------|----------------------|--------------|-----------------------------------|--------------|--------------|
| L05 | 5 mm | 100~1200 mm 50 mm pitch | M Built-in (*) | M Mitsubishi | 40 75 400W 750W servo | - No brake | - No sensor |
| L10 | 10 mm | | BC Direct connection | P Panasonic | | B With brake | A1 1 pc |
| L20 | 20 mm | | BM Lower side | Y Yaskawa | | A2 2 pcs | |
| | | BR Right side | D Delta | A3 3 pcs | | | |
| | | BL Left side | E Else | | | | |

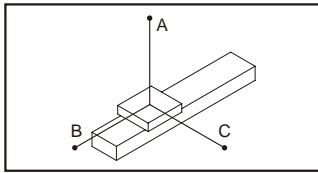
* Not applicable for 750W servo.

Standard servo motors

| Brand | Mark | Power output | Motor model (Without brake) | Motor model (With brake) | Motor rod dim. (mm) | Motor mount P.C.D (mm) | Mounting port (mm) |
|------------|------|--------------|-----------------------------|--------------------------|---------------------|------------------------|--------------------|
| Mitsubishi | M | 400W | HG-KN43J | HG-KN43B J | ø14 | ø70 | 4-ø5.8 |
| | | 750W | HG-KN73J | HG-KN73B J | ø19 | ø90 | 4-ø6.6 |
| Panasonic | P | 400W | MHMF042L1U2M | MHMF042L1V2M | ø14 | ø70 | 4-ø4.5 |
| | | 750W | MHMF082L1U2M | MHMF082L1V2M | ø19 | ø90 | 4-ø6.0 |
| Yaskawa | Y | 400W | SGM7J-04A7A21 | SGM7J-04A7A2C | ø14 | ø70 | 4-ø5.5 |
| | | 750W | SGM7J-08A7A21 | SGM7J-08A7A2C | ø19 | ø90 | 4-ø7.0 |
| Delta | D | 400W | ECMA-C20604PS | ECMA-C20604QS | ø14 | ø70 | 4-ø5.5 |
| | | 750W | ECMA-C20807PS | ECMA-C20807FS | ø19 | ø90 | 4-ø6.6 |

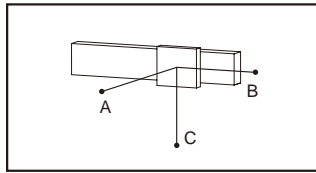
* If your inquiry is not included in above table, please kindly contact us.

Allowable overhang



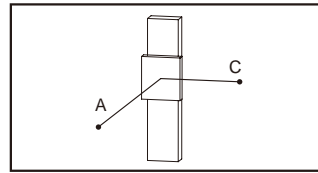
Unit: mm

| Horizontal installation | A | B | C | |
|----------------------------|--------|------|-----|-----|
| AC servo motor 400W / 750W | | | | |
| Lead 5 | 70kg | 3235 | 349 | 408 |
| | 90kg | 2482 | 263 | 306 |
| | 120kg | 1850 | 187 | 217 |
| Lead 10 | 65kg | 1911 | 338 | 373 |
| | 85kg | 1445 | 248 | 276 |
| | 110kg | 1102 | 182 | 202 |
| | 120kg* | 1000 | 164 | 182 |
| Lead 20 | 35kg | 1666 | 547 | 538 |
| | 55kg | 1030 | 331 | 328 |
| | 75kg | 733 | 231 | 230 |
| | 83kg* | 654 | 206 | 204 |



Unit: mm

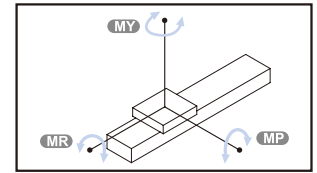
| Wall installation | A | B | C | |
|----------------------------|--------|-----|-----|------|
| AC servo motor 400W / 750W | | | | |
| Lead 5 | 75kg | 377 | 322 | 2988 |
| | 95kg | 288 | 246 | 2333 |
| | 120kg | 218 | 187 | 1850 |
| Lead 10 | 60kg | 408 | 368 | 2092 |
| | 80kg | 296 | 266 | 1554 |
| | 110kg | 202 | 182 | 1102 |
| | 120kg* | 182 | 164 | 1002 |
| Lead 20 | 30kg | 633 | 644 | 1961 |
| | 50kg | 365 | 369 | 1143 |
| | 75kg | 230 | 231 | 733 |
| | 83kg* | 204 | 206 | 656 |



Unit: mm

| Vertical installation | A | C | |
|----------------------------|-------|------|------|
| AC servo motor 400W / 750W | | | |
| Lead 5 | 20kg | 1368 | 1368 |
| | 30kg | 911 | 911 |
| | 40kg | 683 | 683 |
| | 50kg* | 546 | 546 |
| Lead 10 | 15kg | 1618 | 1618 |
| | 25kg | 970 | 970 |
| | 30kg | 808 | 808 |
| Lead 20 | 40kg* | 607 | 607 |
| | 10kg | 1922 | 1922 |
| | 14kg | 1377 | 1377 |
| | 25kg* | 769 | 769 |

Static loading moment



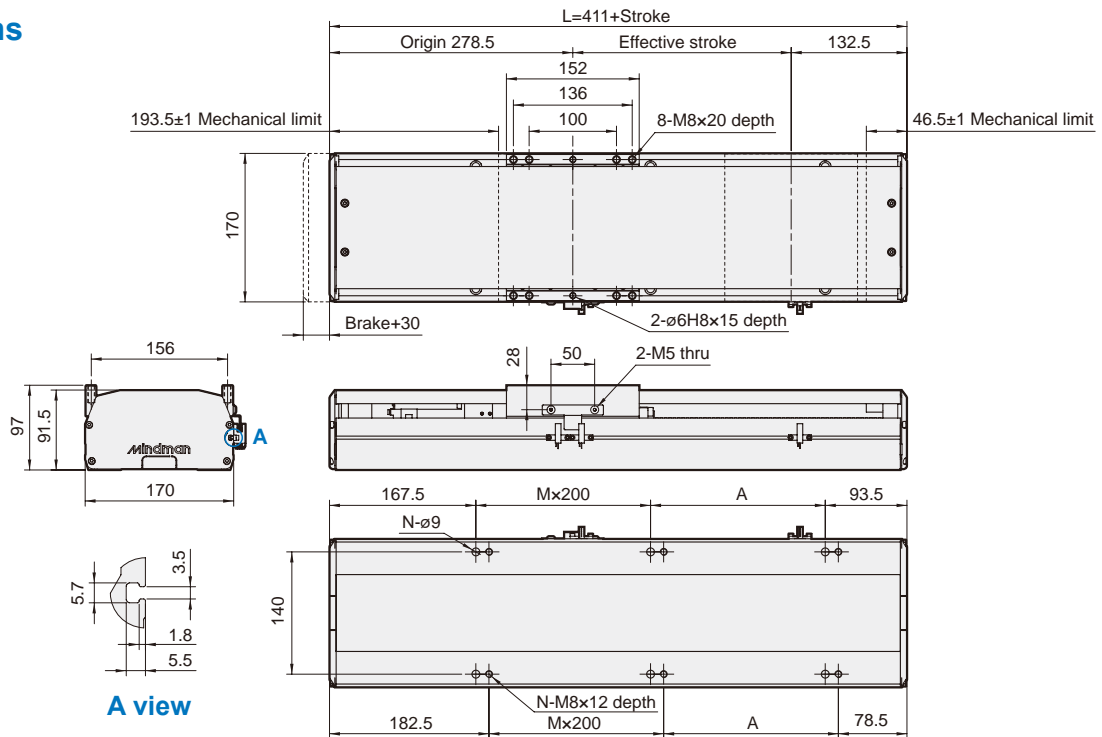
Unit: N.m

| Horizontal | |
|----------------------------|------|
| AC servo motor 400W / 750W | |
| MY | 1032 |
| MP | 1034 |
| MR | 908 |

* Only for 750W motor.

Dimensions

M
Motor built-in



A view

| Stroke | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 | 1150 | 1200 |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| L | 511 | 561 | 611 | 661 | 711 | 761 | 811 | 861 | 911 | 961 | 1011 | 1061 | 1111 | 1161 | 1211 | 1261 | 1311 | 1361 | 1411 | 1461 | 1511 | 1561 | 1611 |
| A | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 |
| M | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 6 |
| N | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 | 14 | 14 | 16 | 16 | 16 |

METS2-17 Dimensions

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

Gripper

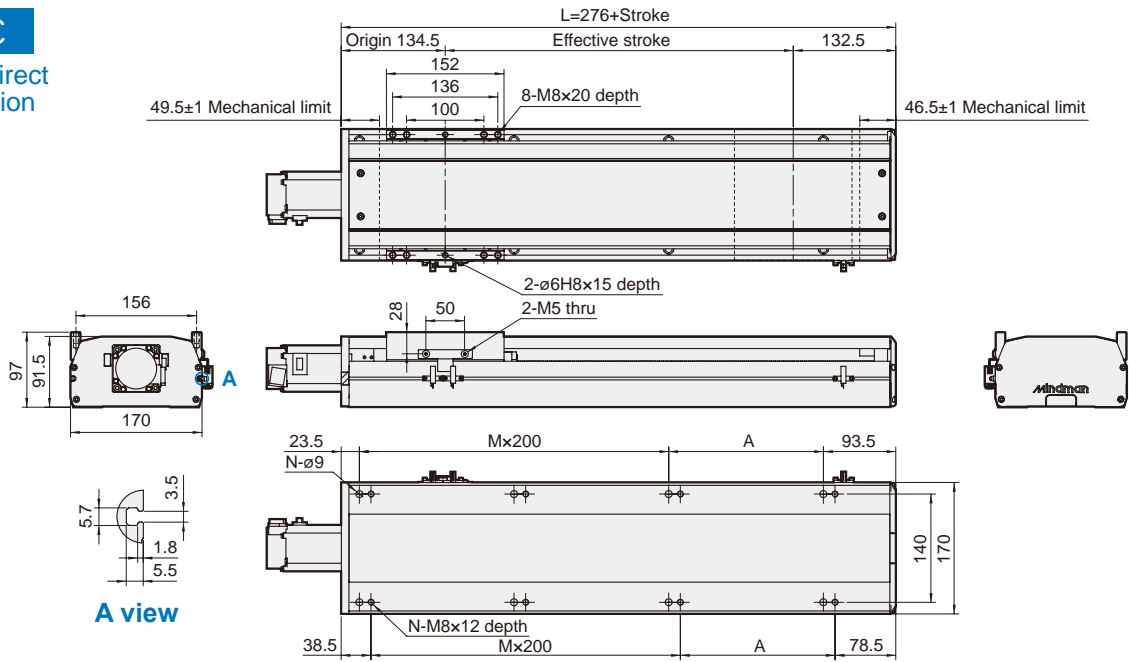
Electric Actuator

Auxiliary Equipment

Hydraulic Cylinder

BC

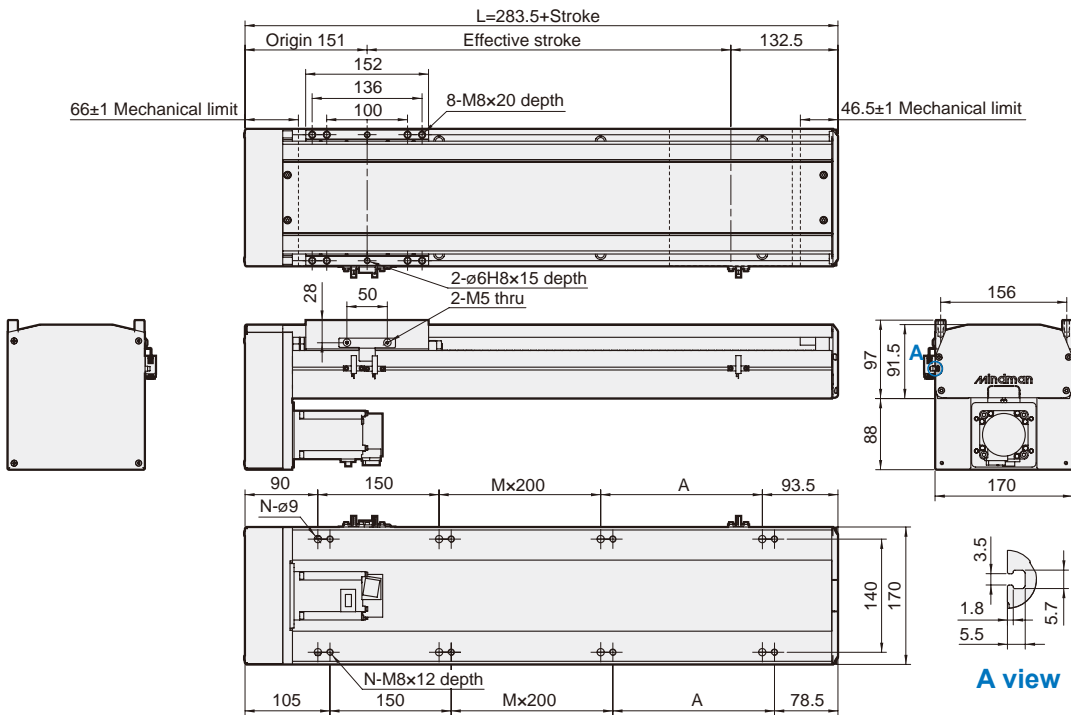
Motor direct
connction



| Stroke | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 | 1150 | 1200 |
|----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|
| L | 367 | 417 | 467 | 517 | 567 | 617 | 667 | 717 | 767 | 817 | 867 | 917 | 967 | 1017 | 1067 | 1117 | 1167 | 1217 | 1267 | 1317 | 1367 | 1417 | 1467 |
| A | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 |
| M | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 6 |
| N | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 | 14 | 14 | 16 | 16 | 16 |

BM

Motor on
lower side



| Stroke | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 | 1150 | 1200 |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| L | 383.5 | 433.5 | 483.5 | 533.5 | 583.5 | 633.5 | 683.5 | 733.5 | 783.5 | 833.5 | 883.5 | 933.5 | 983.5 | 1033.5 | 1083.5 | 1133.5 | 1183.5 | 1233.5 | 1283.5 | 1333.5 | 1383.5 | 1433.5 | 1483.5 |
| A | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 |
| M | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 |
| N | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 | 14 | 14 | 16 | 16 | 16 |

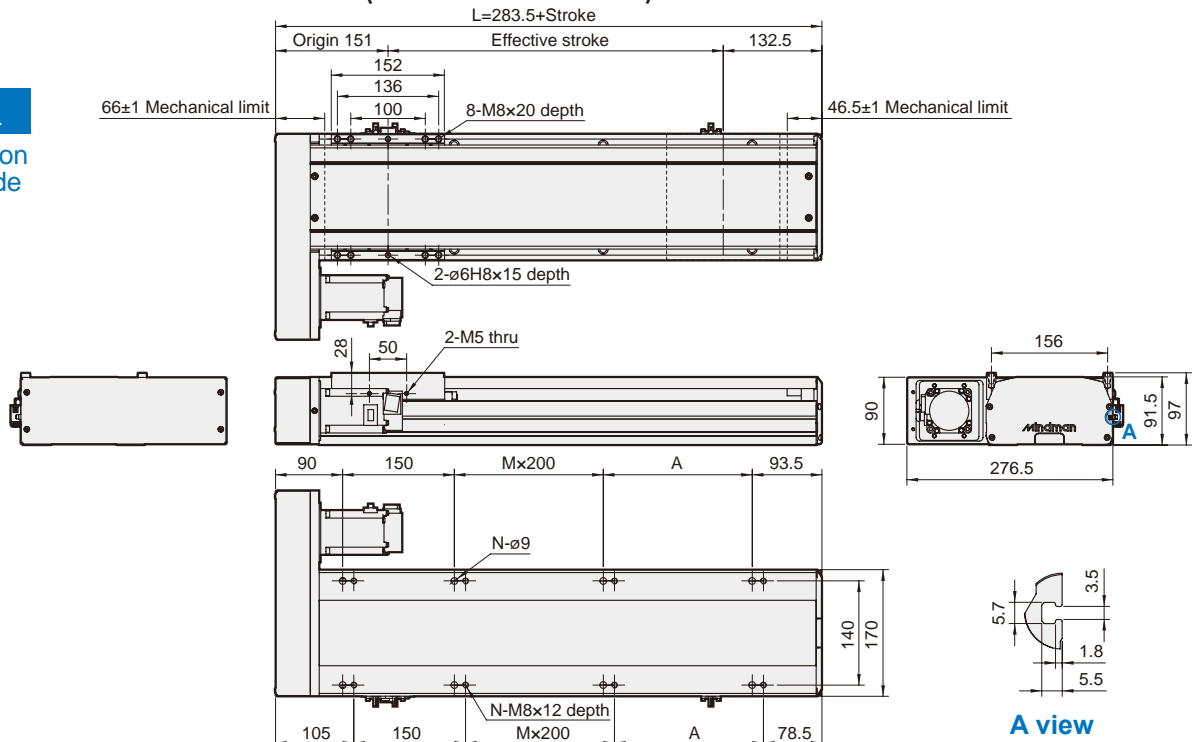
METS2-17 Dimensions



SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

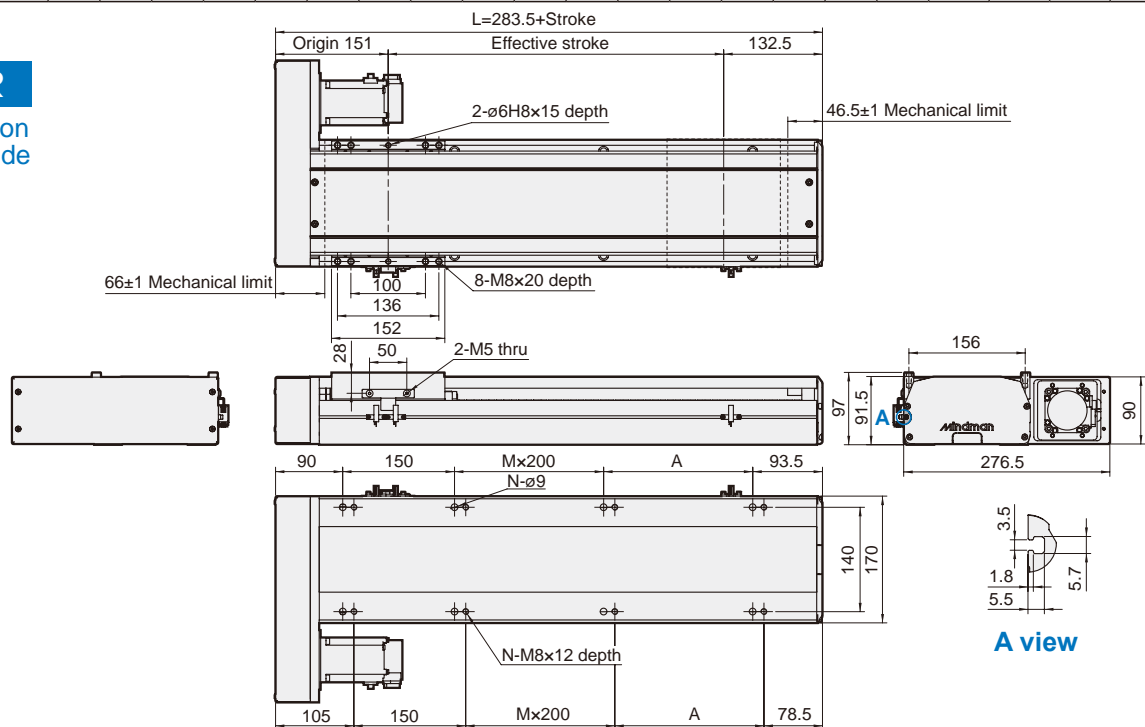
mindman

BL
Motor on left side



| Stroke | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 | 1150 | 1200 |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| L | 383.5 | 433.5 | 483.5 | 533.5 | 583.5 | 633.5 | 683.5 | 733.5 | 783.5 | 833.5 | 883.5 | 933.5 | 983.5 | 1033.5 | 1083.5 | 1133.5 | 1183.5 | 1233.5 | 1283.5 | 1333.5 | 1383.5 | 1433.5 | 1483.5 |
| A | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 |
| M | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 |
| N | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 | 14 | 14 | 16 | 16 | 16 |

BR
Motor on right side



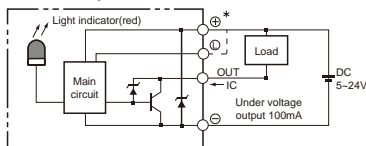
| Stroke | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 | 1150 | 1200 |
|----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| L | 383.5 | 433.5 | 483.5 | 533.5 | 583.5 | 633.5 | 683.5 | 733.5 | 783.5 | 833.5 | 883.5 | 933.5 | 983.5 | 1033.5 | 1083.5 | 1133.5 | 1183.5 | 1233.5 | 1283.5 | 1333.5 | 1383.5 | 1433.5 | 1483.5 |
| A | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 |
| M | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 |
| N | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 | 14 | 14 | 16 | 16 | 16 |



Specification

| Model | | METS-22 | | | |
|----------------------------|-----------------|---------------------|-------|-------|-------|
| Repeatability | (mm) | ±0.01 | | | |
| Ball screw lead | (mm) | 5 | 10 | 25 | 40 |
| Max. speed | (mm/s) | 250 | 500 | 1250 | 2000 |
| AC servo motor | (W) | 750W | | | |
| Max. payload | Horizontal (kg) | 150 | 150 | 120 | 60 |
| | Vertical (kg) | 55 | 45 | 20 | 10 |
| Rated thrust | (N) | 2563 | 1281 | 640 | 320 |
| Stroke | (mm) | 100~1500 / 50 pitch | | | |
| Ball screw | (mm) | C7ø25 | C7ø25 | C7ø25 | C7ø20 |
| High rigidity linear guide | (mm) | W23xH18 | | | |
| Coupling | (mm) | 17x19 | | | 12x19 |
| Home sensor | Outside | EE-SX672 (NPN) | | | |
| | Built in | EE-SX674 (NPN) | | | |

Sensor layout



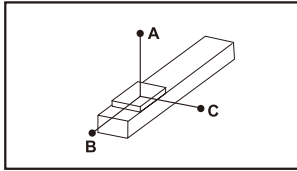
Order example

METS-22 - L10 - 100 - M - M75 B - C4 - 0001

| | | | | | | | | |
|--------------|-------------|----------------------------|---|--------------------------|----------|---|------------|--|
| Model | Size | Stroke | Brakes | Special order no. | | | | |
| METS-22 | L10 | 100 | B | 0001 | | | | |
| | | 100~1500 mm 50 mm pitch | <table border="1"> <tr> <td>-</td> <td>No brake</td> </tr> <tr> <td>B</td> <td>With brake</td> </tr> </table> | - | No brake | B | With brake | |
| - | No brake | | | | | | | |
| B | With brake | | | | | | | |

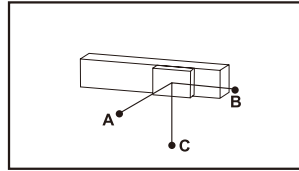
| Ball screw lead | Motor position | Motor brand | Power output | Home sensor | Limit sensor | |
|-----------------|----------------|-------------|--------------|-------------|--------------|----------|
| L05 | M | M | 75 750W | In side | In side | |
| L10 | BC | P | | A | 1 | 1 Pc |
| L25 | BM | Y | | B | 2 | 2 Pcs |
| L40 | BR | T | | Out side | | Out side |
| | BL | E | | C | 3 | 1 Pc |
| | | | D | 4 | 2 Pcs | |
| | | | No sensor | | No sensor | |
| | | | E | 5 | None | |

Allowable overhang



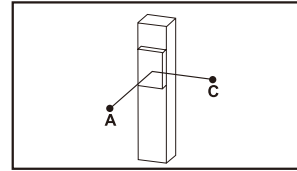
Unit: mm

| Horizontal installation | | A | B | C |
|-------------------------|-------|------|------|------|
| Lead 5 | 60kg | 3672 | 653 | 866 |
| | 100kg | 3000 | 370 | 497 |
| | 150kg | 2493 | 273 | 363 |
| Lead 10 | 60kg | 2652 | 899 | 994 |
| | 100kg | 1775 | 526 | 593 |
| | 150kg | 1396 | 317 | 267 |
| Lead 25 | 50kg | 2862 | 956 | 1191 |
| | 80kg | 2412 | 581 | 773 |
| | 120kg | 2025 | 373 | 556 |
| Lead 40 | 10kg | 4010 | 4010 | 3460 |
| | 30kg | 3011 | 2003 | 1911 |
| | 60kg | 2453 | 730 | 980 |



Unit: mm

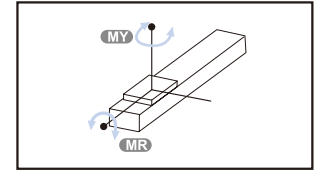
| Wall installation | | A | B | C |
|-------------------|-------|------|------|------|
| Lead 5 | 60kg | 795 | 525 | 3657 |
| | 100kg | 416 | 248 | 2993 |
| | 150kg | 290 | 159 | 2479 |
| Lead 10 | 60kg | 982 | 815 | 2573 |
| | 100kg | 569 | 442 | 1680 |
| | 150kg | 337 | 232 | 1258 |
| Lead 25 | 50kg | 1207 | 879 | 2862 |
| | 80kg | 779 | 504 | 2412 |
| | 120kg | 515 | 295 | 2025 |
| Lead 40 | 10kg | 3057 | 4113 | 4113 |
| | 30kg | 2112 | 2108 | 3387 |
| | 60kg | 1020 | 668 | 2461 |



Unit: mm

| Vertical installation | | A | C |
|-----------------------|------|------|------|
| Lead 5 | 30kg | 2688 | 2688 |
| | 50kg | 1893 | 1893 |
| | 70kg | 1640 | 1640 |
| Lead 10 | 20kg | 2297 | 2297 |
| | 30kg | 1518 | 1518 |
| | 45kg | 999 | 999 |
| Lead 25 | 15kg | 2767 | 2767 |
| | 20kg | 2100 | 2100 |
| | 25kg | 1702 | 1702 |
| Lead 40 | - | - | - |
| | - | - | - |
| | - | - | - |

Static loading moment



Unit: N.m

| | |
|----|------|
| MY | 2052 |
| MP | 2052 |
| MR | 1810 |

Standard servo motors

| Brand | Mark | Brake | Watt | AC-Voltage | Motor model | Compatible driver model |
|------------|------|---------------------------|------|------------|---------------|-------------------------|
| Mitsubishi | M | No brake(Horizontal type) | 750 | 220 | HF-KP73 | MR-J3-70A |
| | | With brake(Vertical type) | 750 | 220 | HF-KP73B | MR-J3-70A |
| Panasonic | P | No brake(Horizontal type) | 750 | 220 | MHMD082P1S | MADDT3520 |
| | | With brake(Vertical type) | 750 | 220 | MHMD082P1T | MADDT3520 |
| Delta | T | No brake(Horizontal type) | 750 | 220 | ECMA-C20807ES | ASD-B20721-B |
| | | With brake(Vertical type) | 750 | 220 | ECMA-C20807FS | ASD-B20721-B |

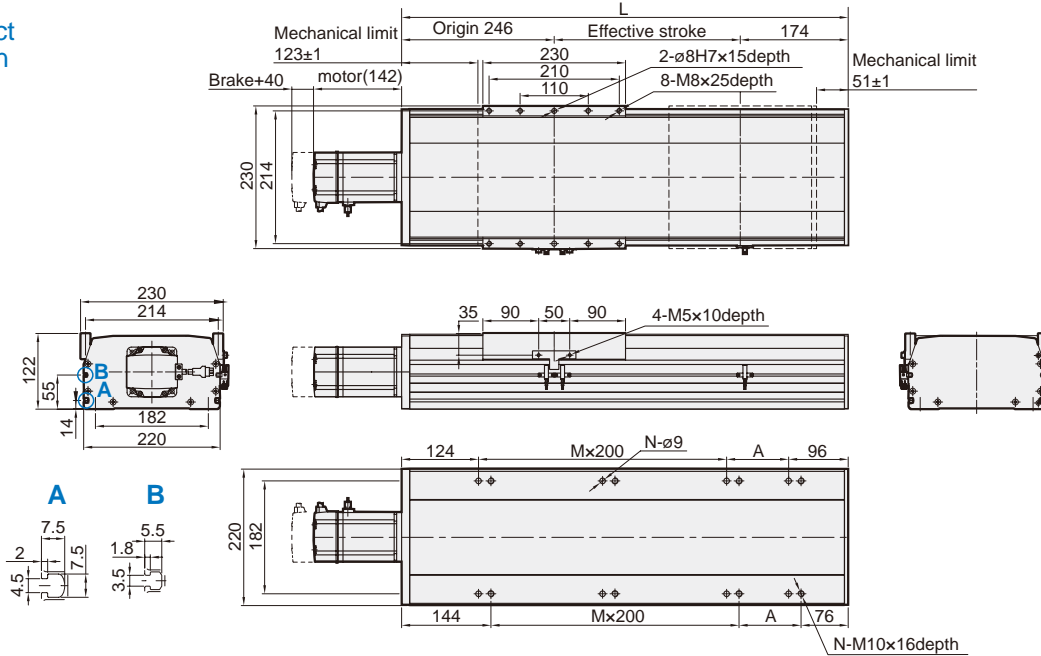
METS-22 Dimensions – Servo motor 750W



SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

BC

Motor direct connection

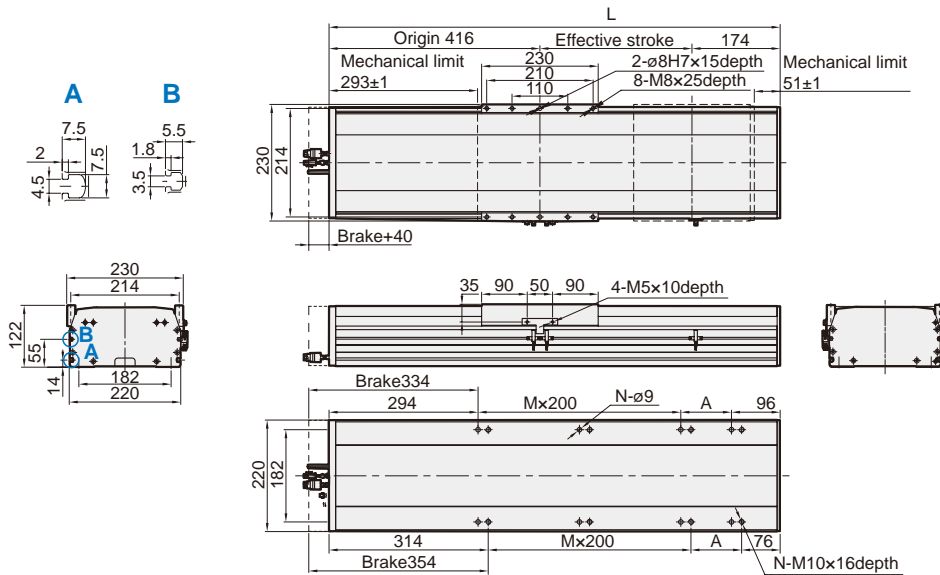


Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 | 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 | 1500 |
|-----------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|-----|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| L | 470 | 520 | 570 | 620 | 670 | 720 | 770 | 820 | 870 | 920 | 970 | 1020 | 1070 | 1120 | 1170 | 1220 | 1270 | 1320 | 1370 | 1420 | 1470 | 1520 | 1570 | 1620 | 1670 | 1720 | 1770 | 1820 | 1870 | 1920 |
| A | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 |
| M | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 | |
| N | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 14 | 14 | 14 | 14 | 16 | 16 | 16 | 16 | 18 | 18 | 18 | 18 | 20 | 20 | |
| KG | 25.4 | 26.86 | 28.32 | 29.78 | 31.24 | 32.7 | 34.16 | 35.62 | 37.08 | 38.54 | 40 | 41.46 | 42.92 | 44.38 | 45.84 | 47.3 | 48.76 | 50.22 | 51.68 | 53.14 | 54.6 | 56.06 | 57.52 | 58.98 | 60.44 | 61.9 | 63.36 | 64.82 | 66.28 | 67.74 |

M

Motor built-in



Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 | 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 | 1500 |
|-----------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| L | 640 | 690 | 740 | 790 | 840 | 890 | 940 | 990 | 1040 | 1090 | 1140 | 1190 | 1240 | 1290 | 1340 | 1390 | 1440 | 1490 | 1540 | 1590 | 1640 | 1690 | 1740 | 1790 | 1840 | 1890 | 1940 | 1990 | 2040 | 2090 |
| A | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 |
| M | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 |
| N | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 14 | 14 | 14 | 14 | 16 | 16 | 16 | 16 | 18 | 18 | 18 | 18 | 20 | 20 | |
| KG | 27.85 | 29.32 | 30.79 | 32.26 | 33.73 | 35.2 | 36.67 | 38.14 | 39.61 | 41.08 | 42.55 | 44.02 | 45.49 | 46.96 | 48.43 | 49.9 | 51.37 | 52.84 | 54.31 | 55.78 | 57.25 | 58.72 | 60.19 | 61.66 | 63.13 | 64.6 | 66.07 | 67.54 | 69.01 | 70.48 |

METS-22 Dimensions – Servo motor 750W

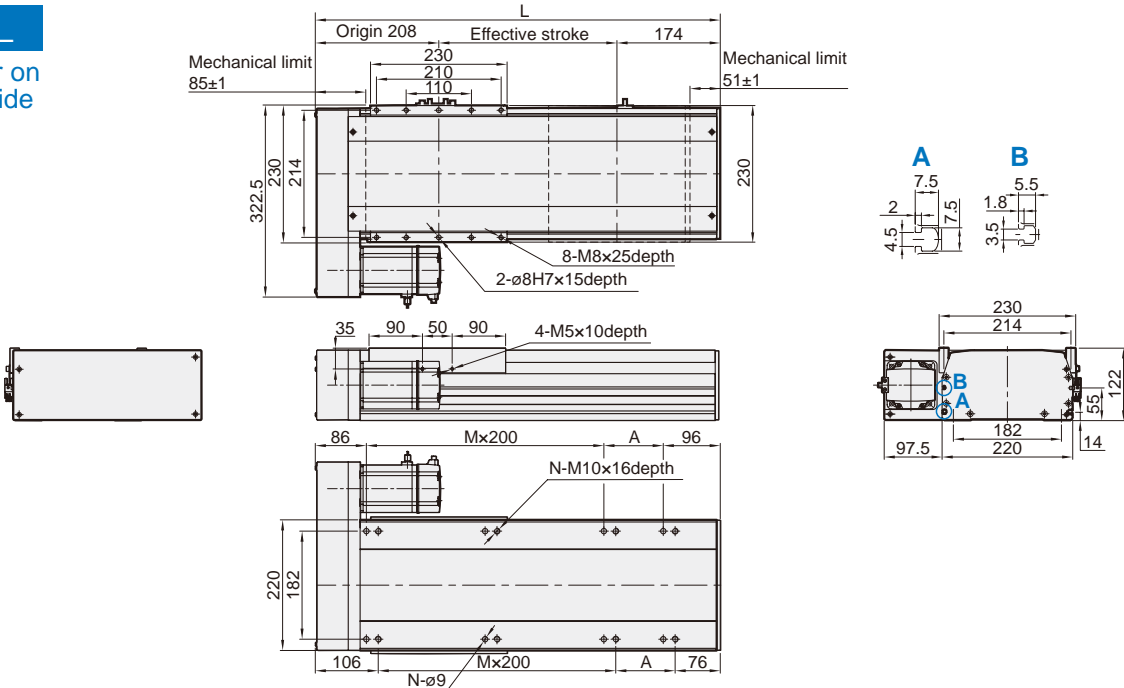


SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)

mindman

BL

Motor on left side

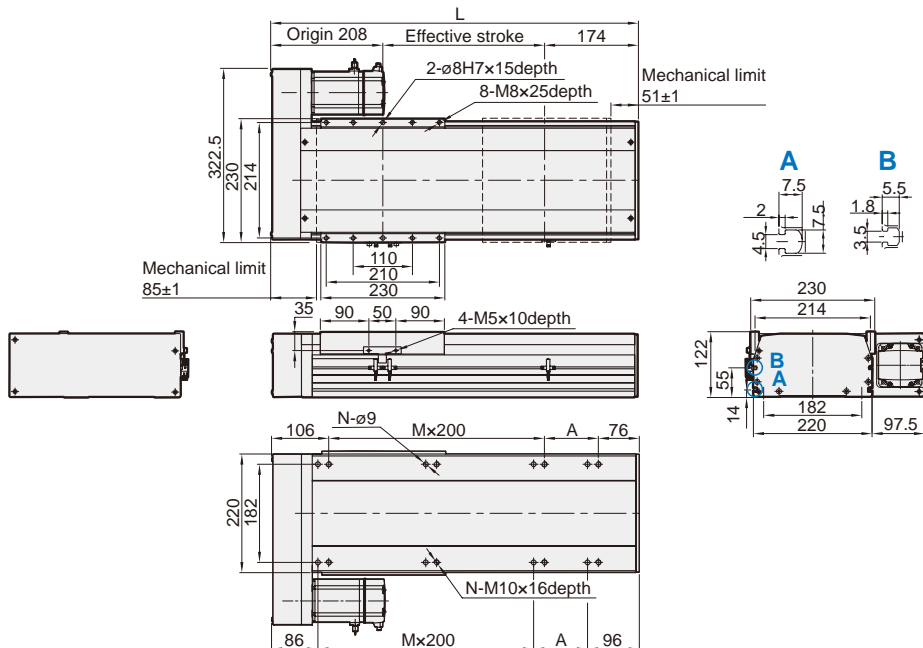


Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 | 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 | 1500 |
|-----------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| L | 432 | 482 | 532 | 582 | 632 | 682 | 732 | 782 | 832 | 882 | 932 | 982 | 1032 | 1082 | 1132 | 1182 | 1232 | 1282 | 1332 | 1382 | 1432 | 1482 | 1532 | 1582 | 1632 | 1682 | 1732 | 1782 | 1832 | 1882 |
| A | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 |
| M | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 |
| N | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 | 14 | 14 | 16 | 16 | 16 | 16 | 18 | 18 | 18 | 18 | 20 | 20 |
| KG | 24.2 | 25.66 | 27.12 | 28.58 | 30.04 | 31.5 | 32.96 | 34.42 | 35.88 | 37.34 | 38.8 | 40.26 | 41.72 | 43.18 | 44.64 | 46.1 | 47.56 | 49.02 | 50.48 | 51.94 | 53.4 | 54.86 | 56.32 | 57.78 | 59.24 | 60.7 | 62.16 | 63.62 | 65.08 | 66.54 |

BR

Motor on right side



Unit: mm

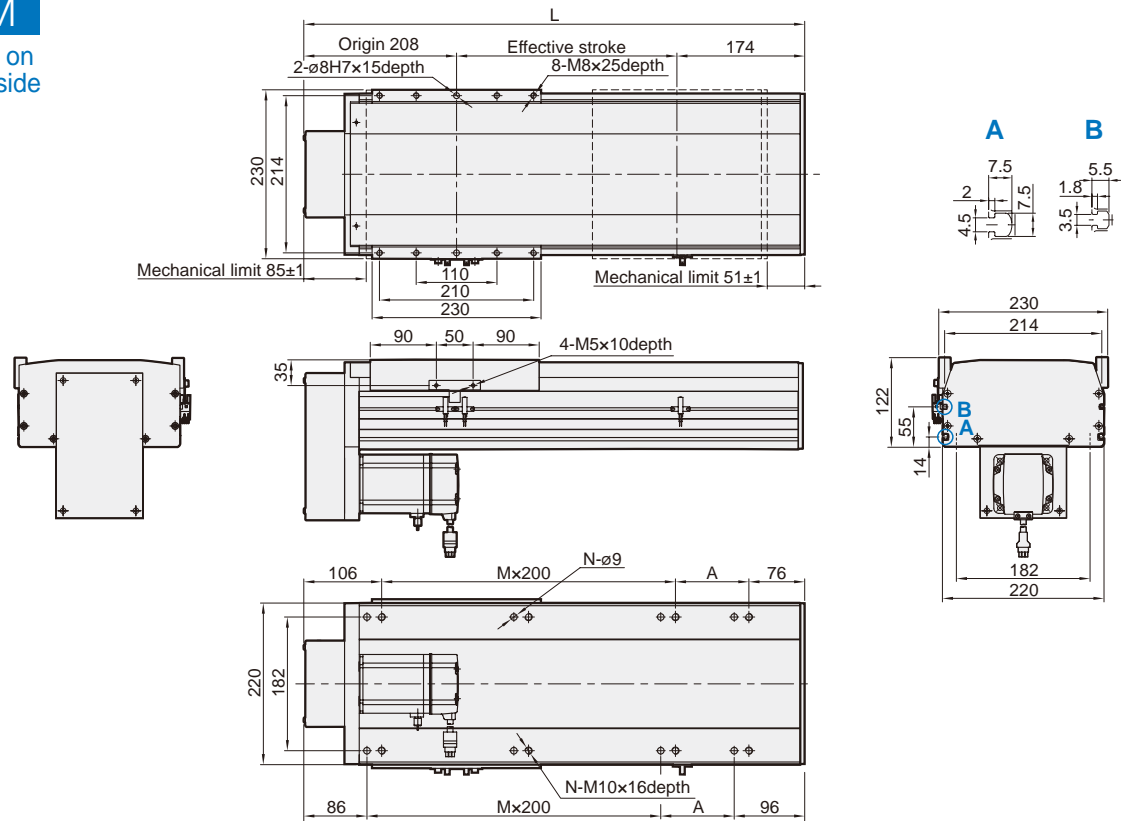
| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 | 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 | 1500 |
|-----------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| L | 432 | 482 | 532 | 582 | 632 | 682 | 732 | 782 | 832 | 882 | 932 | 982 | 1032 | 1082 | 1132 | 1182 | 1232 | 1282 | 1332 | 1382 | 1432 | 1482 | 1532 | 1582 | 1632 | 1682 | 1732 | 1782 | 1832 | 1882 |
| A | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 |
| M | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 |
| N | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 | 14 | 14 | 16 | 16 | 16 | 16 | 18 | 18 | 18 | 18 | 20 | 20 |
| KG | 24.2 | 25.66 | 27.12 | 28.58 | 30.04 | 31.5 | 32.96 | 34.42 | 35.88 | 37.34 | 38.8 | 40.26 | 41.72 | 43.18 | 44.64 | 46.1 | 47.56 | 49.02 | 50.48 | 51.94 | 53.4 | 54.86 | 56.32 | 57.78 | 59.24 | 60.7 | 62.16 | 63.62 | 65.08 | 66.54 |

METS-22 Dimensions – Servo motor 750W

SLIDER ELECTRIC CYLINDER (WITHOUT MOTOR)



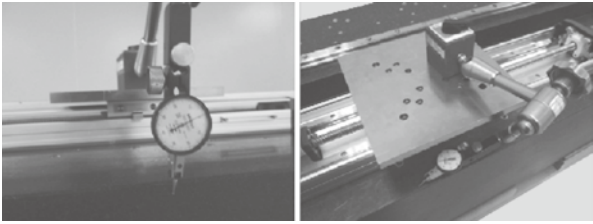
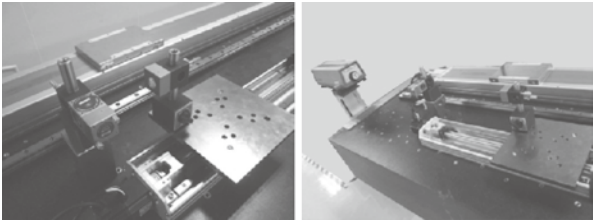
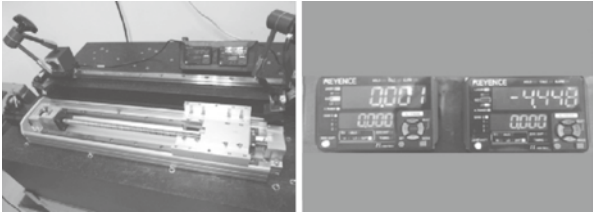
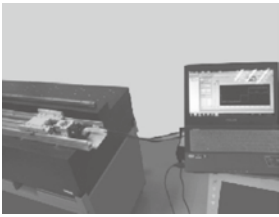


BM
Motor on lower side




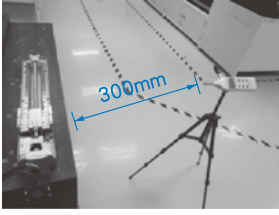
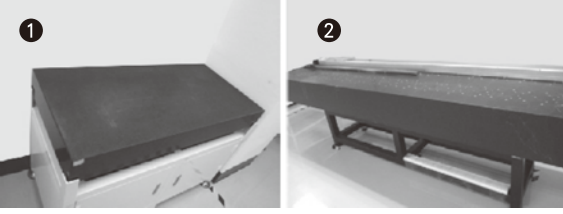
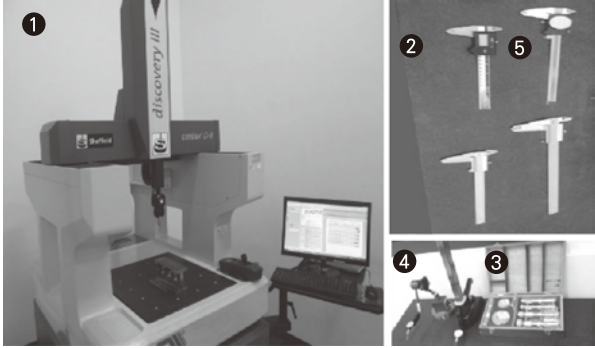
Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 | 900 | 950 | 1000 | 1050 | 1100 | 1150 | 1200 | 1250 | 1300 | 1350 | 1400 | 1450 | 1500 |
|-----------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|------|-------|-------|-------|-------|
| L | 432 | 482 | 532 | 582 | 632 | 682 | 732 | 782 | 832 | 882 | 932 | 982 | 1032 | 1082 | 1132 | 1182 | 1232 | 1282 | 1332 | 1382 | 1432 | 1482 | 1532 | 1582 | 1632 | 1682 | 1732 | 1782 | 1832 | 1882 |
| A | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 | 150 | 200 | 50 | 100 |
| M | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 5 | 5 | 5 | 5 | 6 | 6 | 6 | 6 | 7 | 7 | 7 | 7 | 8 | 8 |
| N | 6 | 6 | 6 | 6 | 8 | 8 | 8 | 8 | 10 | 10 | 10 | 10 | 12 | 12 | 12 | 12 | 14 | 14 | 14 | 14 | 16 | 16 | 16 | 16 | 18 | 18 | 18 | 18 | 20 | 20 |
| KG | 24.2 | 25.66 | 27.12 | 28.58 | 30.04 | 31.5 | 32.96 | 34.42 | 35.88 | 37.34 | 38.8 | 40.26 | 41.72 | 43.18 | 44.64 | 46.1 | 47.56 | 49.02 | 50.48 | 51.94 | 53.4 | 54.86 | 56.32 | 57.78 | 59.24 | 60.7 | 62.16 | 63.62 | 65.08 | 66.54 |

Measuring tools

| | | | |
|---|--|---|--|
|  | | 1. Parallelism testing / Height testing | |
| | | Measuring tools | Dial gauge and Dial indicator |
|  | | 2. Absolute straightness accuracy testing | |
| | | Measuring tools | Laser interferometer detection |
|  | | 3. Absolute straightness accuracy testing | |
| | | Measuring tools | Laser position detection |
|  | | 4. Power drive situation testing by motor electric current | |
| | | Measuring tools | Mitsubishi servo driver 100W, 200W, 400W |
|  | | 5. Smoothness testing | |
| | | Measuring tools | Pull tension gauge |
|  | | Measuring methods | |
| | | <ol style="list-style-type: none"> 1. Fix the actuator on granite. 2. Push the slider using pull tension gauge. 3. As photo display. 4. Record it as a reference. | |

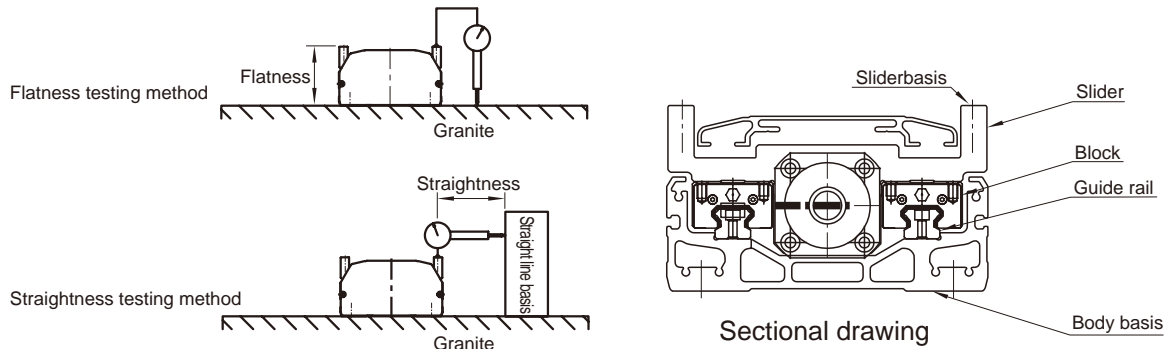
Measuring tools

| | | |
|---|---|--|
|  | 6. Belt tension testing | |
| Measuring tools | Pull tension gauge | |
| Measuring methods | <ol style="list-style-type: none"> 1. Fix the actuator on granite. 2. Use belt tension gauge to test the vibration of the belt. 3. As photo display. 4. Record it on shipping testing. | |
|  | 7. Decibel testing | |
| Measuring tools | Decibel meter | |
| Measuring methods | <ol style="list-style-type: none"> 1. Fix the actuator on granite. 2. Decibel meter put at the distance of 300mm. 3. Use motor to drive actuator in high speed. 4. As photo display. 5. Record it on shipping testing report. | |
|  | 8. Measuring tool- Granite platform | |
| Granite specifications | <ol style="list-style-type: none"> 1. Size 1295mm*600mm*140mm 2. Size 4020mm*800mm*300mm | |
|  | 9. Material tools | |
| Measuring tools | <ol style="list-style-type: none"> 1. 3D Inspection testing machine. 2. Electronic vernier caliper, vernier caliper. 3. Inside micrometer, outside micrometer. 4. Altimeter, vertical meter. 5. Electronic level meter. 6. Dial gauge, Dial indicator. 7. Steel tape, Steel ruler. | |
| Measuring tools calibration standards | Block gauge, ring gauge (regularly qualified) QC Room <ol style="list-style-type: none"> 1. Control temperature and humidity to keep the stability of the measurement. 2. Measuring tools calibrate regularly. | |

Flatness and straightness standard

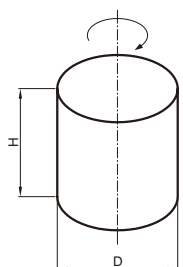
Flatness standard=The parallelism of body basis and slider basis is less then 0.05mm/M

Straightness standard=The parallelism of slider basis and straight line basis is less then 0.05mm/M



Equation of moment of inertia calculation

Usually the load is not simple form, and the calculation of the moment of inertia is not easy. As a method, load is replaced with several factors that resemble a simple form for which the moment of inertia can be calculated. The total of the moment of inertia for these factors is the obtained. The objects and equations often used for the calculation of the moment of inertia are shown below.

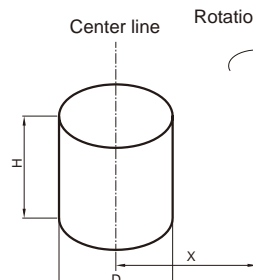


1.Moment of inertia for cylinder
The moment of inertia(J) for a cylinder having a rotation center such as shown below is given by

$$J = \frac{P\pi D^4 h}{32 \times 980} = \frac{WD^2}{8g} \text{ (kgf} \cdot \text{cm} \cdot \text{sec}^2\text{)}$$

$$= \frac{mD^2}{8} \text{ (Kgm}^2\text{)}$$

P = Density (kg/cm³)
g = Gravitational acceleration (cm/sec²)
W =Weight of cylinder (kgf)
m = Mass of cylinder (kg)

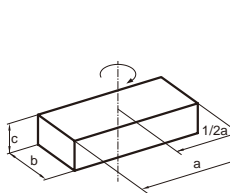


3.When the object's center line is offset from the rotation center
The moment of inertia(J) for a cylinder having a rotation center such as shown below is given by

$$J = \frac{P\pi D^4 h}{32} + \frac{P\pi D^4 h}{4} = \frac{WD^2}{8g} + \frac{WX^2}{G} \text{ (kgf} \cdot \text{cm} \cdot \text{sec}^2\text{)}$$

$$= \frac{mD^2}{8} + mX^2 \text{ (Kgm}^2\text{)}$$

P = Density (kg/cm³)
g = Gravitational acceleration (cm/sec²)
W =Weight of cylinder (kgf)
m = Mass of cylinder (kg)

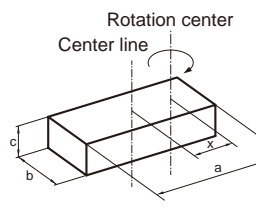


2.Moment of inertia for rectangular parallelepiped
The moment of inertia(J) for a cylinder having a rotation center such as shown below is given by

$$J = \frac{Pabc(a^2+b^2)}{12} = \frac{W(a^2+b^2)}{12g} \text{ (kgf} \cdot \text{cm} \cdot \text{sec}^2\text{)}$$

$$= \frac{M(a^2+b^2)}{12} \text{ (Kgm}^2\text{)}$$

P = Density (kg/cm³)
g = Gravitational acceleration (cm/sec²)
W =Weight of cylinder (kgf)
m = Mass of cylinder (kg)



Rotation center
Center line

$$J = \frac{Pabc(a^2+b^2)}{12} + \frac{PabcX^2}{G}$$

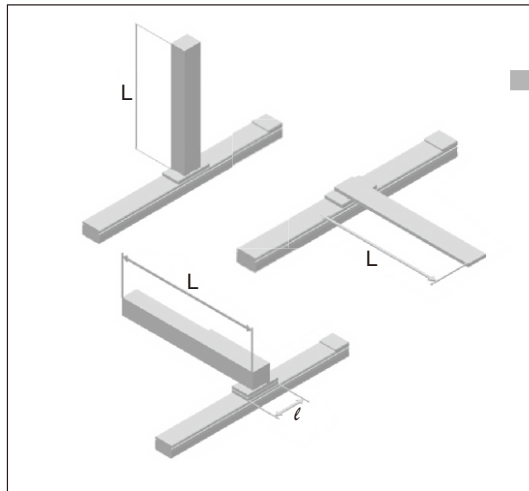
$$= \frac{W(a^2+b^2)}{12g} + \frac{WX^2}{G} \text{ (kgf} \cdot \text{cm} \cdot \text{sec}^2\text{)}$$

$$= \frac{M(a^2+b^2)}{12} + mX^2 \text{ (Kgm}^2\text{)}$$

W =Weight of prism (kgf)
m = Mass of prism (kg)

Overhang load length

An overhang load length is specified for a slider-type actuator to indicate the length of overhang (offset) from the actuator. When the length of an object mounted to the slider actuator exceeds this length, it will generate vibration and increase the setting time. So, pay attention to the allowable overhang length as well as the allowable dynamic moment.



The allowable overhang load length is determined by the slider length.

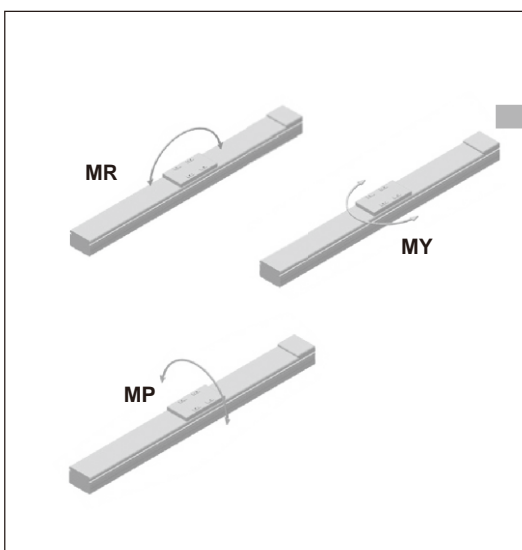
An overhang that exceeds the allowable overhang length will generate vibration and increase settling time.

$L/l = 5$ Within
* Between 3 to 4 for a camera equipped measuring machine.

- For example
 $L/l = 1.2$ Mechanical machine
 $L/l = 3$ Mechanical machine
 $L/l = 5$ Robot

Allowable dynamic moment

The allowable dynamic moment is the maximum offset load exerted on the slider, calculated from the guide life. The direction in which force is exerted on the guide is categorized into 3 directions-MP(pitch), MY(yaw), MR(roll)-the tolerance for each of which are set for each actuator. Applying a moment exceeding the allowable value will reduce the service life of the actuator. Use an auxiliary guide when working within or in excess of these tolerances.



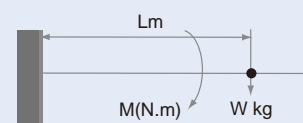
The allowable dynamic moment is calculated from the service life of the guide.

Over the moment would reduce the life of actuator.

*Moment is based on the following basis

$$M(\text{N.m}) = W(\text{kg}) \times L(\text{m}) \times 9.8$$

$W(\text{kg}) = \text{Load}$
 $L(\text{m}) = \text{Distance from work point to the center of gravity of payload.}$



Lead accuracy

PMI's precision ground ball screws are controlled in accordance with JIS B 1192. The permissible values and each part of definitions are shown below.

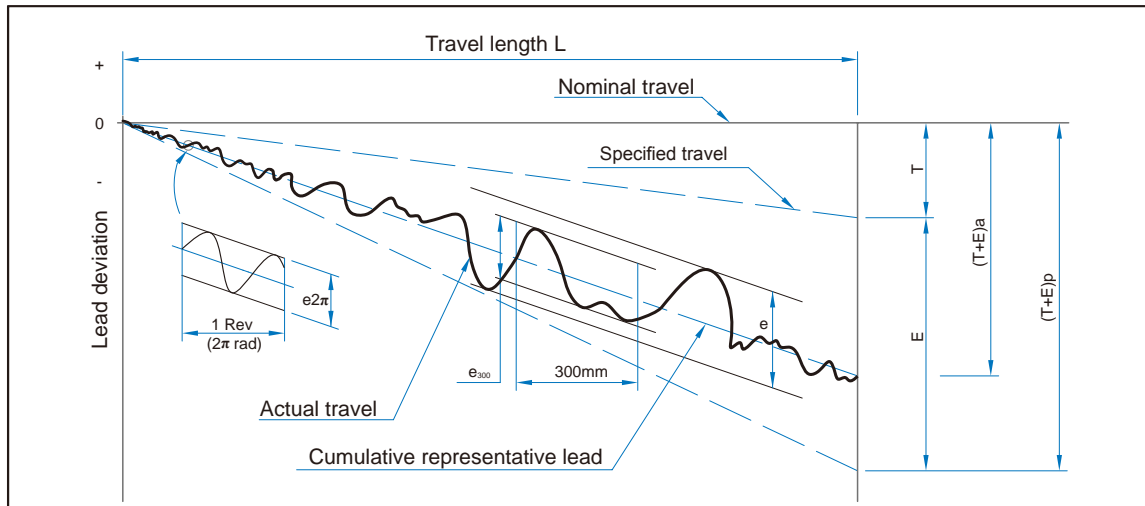


Fig.1 Technical terms concerning the lead

■ Table 1 Terms

| | | |
|------------------------|---|--|
| T+E | Cumulative representative lead | Cumulative representative lead. A straight line representing the tendency of the cumulative actual lead. This is obtained by least square method and measured by laser system. |
| P | | Permissible value. |
| a | | Actual value. |
| T | Specified travel specify the target value | Specified travel. This value is determined by customer and maker as it depends on different application requirements. |
| E | Cumulative representative lead error | Accumulated reference lead deviation. This is allowable deviation of specified travel. It is decided by both of the accuracy grade and effective thread length. |
| e | Change | Total relative lead variation maximum width of variation over the travel length. |
| e₃₀₀ | | Lead deviation in random 300 mm. |
| e_{2π} | | Lead deviation in random 1 revolution 2π rad. |

■ Table 2 Accumulated reference lead deviation ($\pm E$) and total relative variation (e)

| Effective thread length (mm) | Grade | | C0 | | C1 | | C2 | | C3 | | C4 | | C5 | | C6 | C7 | C8 |
|------------------------------|-------|-----|----|----|----|----|-----|----|-----|----|-----|-----|----|---|-------------|-------------|-------------|
| | E | e | E | e | E | e | E | e | E | e | E | e | E | e | | | |
| Over up to | | | | | | | | | | | | | | | ± 0.025 | ± 0.050 | ± 0.120 |
| 315 | 4 | 3.5 | 6 | 5 | 5 | 7 | 12 | 8 | 12 | 12 | 23 | 18 | | | 300mm | 300mm | 300mm |
| 315 400 | 5 | 3.5 | 7 | 5 | 7 | 7 | 13 | 10 | 14 | 12 | 25 | 20 | | | | | |
| 400 500 | 6 | 4 | 8 | 5 | 8 | 7 | 15 | 10 | 16 | 12 | 27 | 20 | | | | | |
| 500 630 | 6 | 4 | 9 | 6 | 9 | 7 | 16 | 12 | 18 | 14 | 30 | 23 | | | | | |
| 630 800 | 7 | 5 | 10 | 7 | 10 | 7 | 18 | 13 | 20 | 14 | 35 | 25 | | | | | |
| 800 1000 | 8 | 6 | 11 | 8 | 11 | 8 | 21 | 15 | 22 | 16 | 40 | 27 | | | | | |
| 1000 1250 | 9 | 6 | 13 | 9 | 13 | 9 | 24 | 16 | 25 | 18 | 46 | 30 | | | | | |
| 1250 1600 | 11 | 7 | 15 | 10 | 15 | 10 | 29 | 18 | 29 | 20 | 54 | 35 | | | | | |
| 1600 2000 | | | 18 | 11 | 18 | 11 | 35 | 21 | 35 | 22 | 65 | 40 | | | | | |
| 2000 2500 | | | 22 | 12 | 21 | 13 | 41 | 24 | 41 | 25 | 77 | 46 | | | | | |
| 2500 3150 | | | 26 | 15 | 25 | 15 | 50 | 29 | 50 | 29 | 93 | 54 | | | | | |
| 3150 4000 | | | 32 | 18 | 30 | 18 | 62 | 35 | 62 | 35 | 115 | 65 | | | | | |
| 4000 5000 | | | | | 36 | 21 | 76 | 41 | 76 | 41 | 140 | 77 | | | | | |
| 5000 6300 | | | | | | | 85 | 50 | 85 | 50 | 170 | 96 | | | | | |
| 6300 8000 | | | | | | | 106 | 62 | 106 | 62 | 213 | 115 | | | | | |
| 8000 | | | | | | | | | 132 | 75 | 265 | 140 | | | | | |

■ Table 3 Accuracy grade

Variation in random 300mm (e_{300}) and wobble ($e_{2\pi}$)

α_{522}

| Grade | C0 | C1 | C2 | C3 | C4 | C5 | C6 | C7 | C10 |
|-------|-----|----|----|----|----|----|----|----|-----|
| JIS | 3.5 | 5 | | 8 | | 18 | | 50 | 210 |
| PMI | 3.5 | 5 | 7 | 8 | 12 | 18 | 25 | 50 | 210 |

$\alpha_{4\pi}$

| Grade | C0 | C1 | C2 | C3 | C4 | C5 |
|-------|----|----|----|----|----|----|
| JIS | 3 | 4 | | 6 | | 8 |
| PMI | 3 | 4 | 4 | 6 | 8 | 8 |



Specification

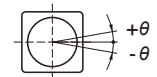
| Model | | MEQG-5 | | | | |
|---------------------------------|------------|-------------------|-----|-----|------|-----|
| Repeatability | (mm) | ±0.01 | | | | |
| Ball screw lead | (mm) | 2 | 5 | 10 | 20 | |
| Maximum speed (*1) | (mm/s) | 100 | 250 | 500 | 1000 | |
| Maximum payload (*2) | Horizontal | (kg) | 30 | 30 | 15 | 10 |
| | Vertical | (kg) | 10 | 10 | 5 | 2.5 |
| Rated thrust | (N) | 854 | 341 | 170 | 85 | |
| Stroke / pitch | (mm) | 50~600 / 50 Pitch | | | | |
| Motor output | (W) | 100 | | | | |
| Ball screw spec | (mm) | C7ø12 | | | | |
| Coupling | (mm) | 7x8 | | | | |
| Home sensor (Outside) | | CS-6T (NPN) | | | | |
| Anti-rotating accuracy (*3) (θ) | | ±0° | | | | |

*1. Acceleration and deceleration value is set 0.2 second.

*2. If payload is near maximum, it requires to collocate externally with auxiliary radial load.

*3. Avoid using the electric actuator in such a way that rotational torque would be applied to the piston rod. This may cause deformation of the anti-rotating guide, abnormal responses of the auto switch, play in the internal guide or an increase in the sliding resistance.

Anti-rotating accuracy of rod



Order example

MEQG-5 - L05 - 100 - BC - M10 B - C4 - 0001

| | | | | | | | | |
|--------------|-------------|--------------------------|---|--------------------------|----------|---|------------|--|
| Model | Size | Stroke | Brakes | Special order no. | | | | |
| | | 50~600 mm 50 mm pitch | <table border="1"> <tr> <td>-</td> <td>No brake</td> </tr> <tr> <td>B</td> <td>With brake</td> </tr> </table> | - | No brake | B | With brake | |
| - | No brake | | | | | | | |
| B | With brake | | | | | | | |

| | | | | |
|------------------------|-----------------------|----------------------------------|-----------------------|---------------------|
| Ball screw lead | Motor position | Motor brand, power output | Home sensor | Limit sensor |
| L02 2 mm | BC Direct connection | SERVO motor | | Out side |
| L05 5 mm | BM Lower side | M Mitsubishi | C Motor side | 3 1 Pc |
| L10 10 mm | BR Right side | P Panasonic | D Opposite motor side | 4 2 Pcs |
| L20 20 mm | BL Left side | Y Yaskawa | No sensor | No sensor |
| | | T Delta | E None | 5 None |
| | | 10 100W | | |

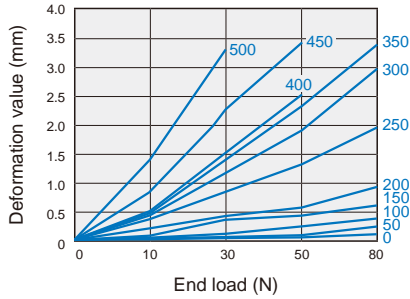
MEQG-5 Performance charts

ROD TYPE ELECTRIC CYLINDER (WITHOUT MOTOR)

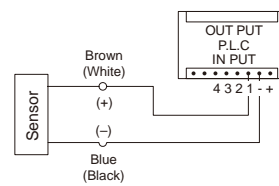
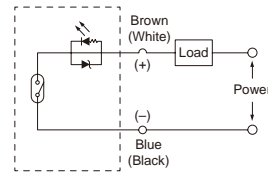


Shaft output deformation value

This form is only reference values.

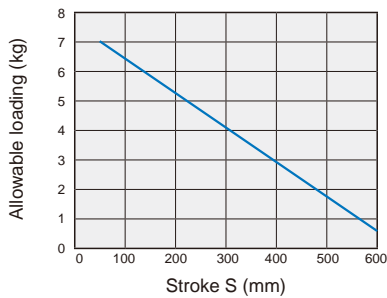
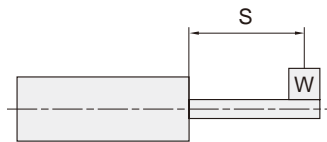


Sensor layout



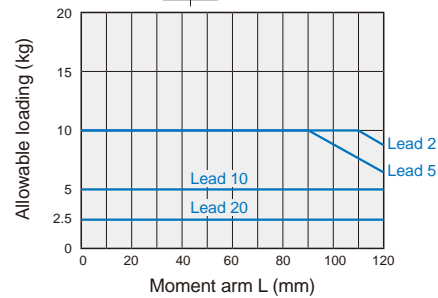
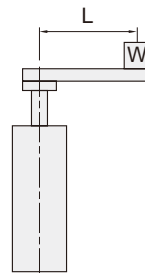
Allowable installation load

No external auxiliary mechanism, extension distance of load = 0



Load in vertical installation

Calculation conditions: 3000 rpm/min, acceleration and deceleration: 0.2s



Standard servo motors

| Brand | Mark | Brake | Watt | AC-Voltage | Motor model | Compatible driver model |
|------------|------|---------------------------|------|------------|---------------|-------------------------|
| Mitsubishi | M | No brake(Horizontal type) | 100 | 220 | HG-KR13 | MR-J4-10A |
| | | With brake(Vertical type) | 100 | 220 | HG-KR13B | MR-J4-10A |
| Panasonic | P | No brake(Horizontal type) | 100 | 220 | MSMD012G1U | MADHT1505 |
| | | With brake(Vertical type) | 100 | 220 | MSMD012G1V | MADHT1505 |
| Delta | T | No brake(Horizontal type) | 100 | 220 | ECMA-C20401ES | ASD-B20221-B |
| | | With brake(Vertical type) | 100 | 220 | ECMA-C20401FS | ASD-B20221-B |

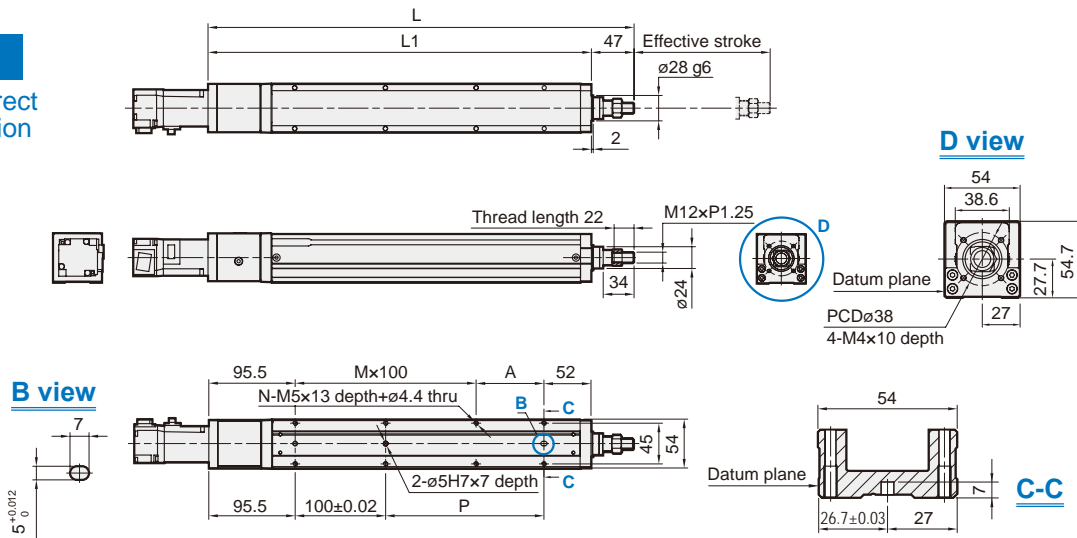
MEQG-5 Dimensions

ROD TYPE ELECTRIC CYLINDER (WITHOUT MOTOR)



BC

Motor direct connection

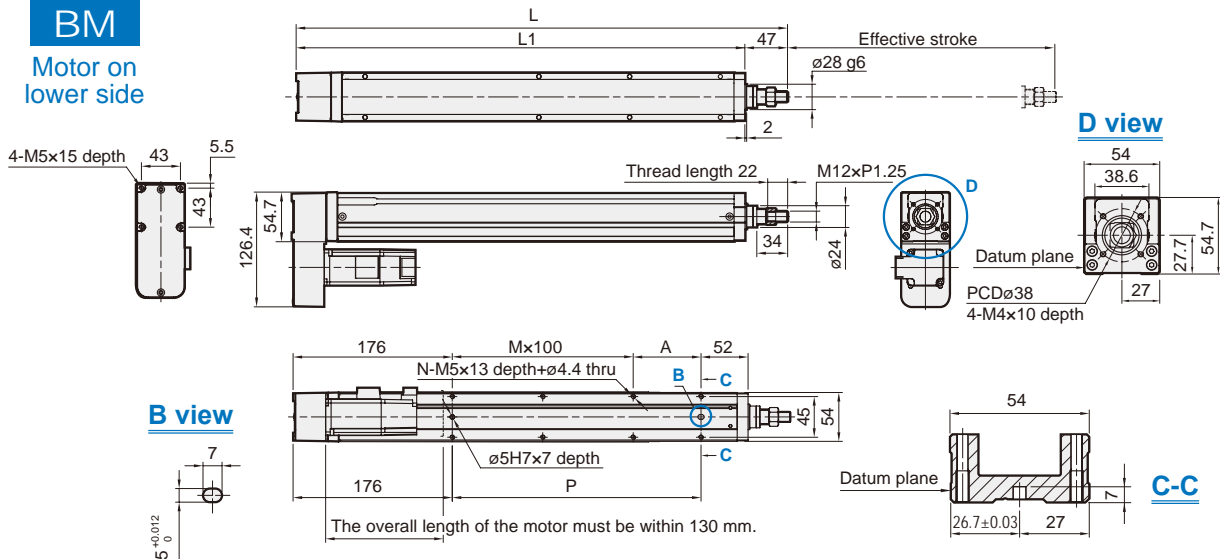


Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 |
|-----------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| L | 319.5 | 369.5 | 419.5 | 469.5 | 519.5 | 569.5 | 619.5 | 669.5 | 719.5 | 769.5 | 819.5 | 869.5 |
| L1 | 272.5 | 322.5 | 372.5 | 422.5 | 472.5 | 522.5 | 572.5 | 622.5 | 672.5 | 722.5 | 772.5 | 822.5 |
| A | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 |
| M | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 |
| P | 25 | 75 | 125 | 175 | 225 | 275 | 325 | 375 | 425 | 475 | 525 | 575 |
| KG | 2.17 | 2.36 | 2.56 | 2.76 | 2.95 | 3.15 | 3.35 | 3.54 | 3.74 | 3.94 | 4.13 | 4.33 |

BM

Motor on lower side



Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 |
|-----------|------|------|------|------|------|------|------|------|------|------|-----|-----|
| L | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 | 850 |
| L1 | 253 | 303 | 353 | 403 | 453 | 503 | 553 | 603 | 653 | 703 | 753 | 803 |
| A | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 | 25 | 75 |
| M | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 |
| N | 4 | 4 | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 |
| P | 25 | 75 | 125 | 175 | 225 | 275 | 325 | 375 | 425 | 475 | 525 | 575 |
| KG | 2.34 | 2.53 | 2.73 | 2.93 | 3.12 | 3.32 | 3.52 | 3.71 | 3.91 | 4.11 | 4.3 | 4.5 |

* When motor with brake assembled on lower side, or the total length over than spec limit, it may not use standard pinhole. Please contact us if you need more information and requirement.



Specification

| Model | | MEQG-8 | | | |
|-----------------------------|------------|-------------------|-----------|-----------|----|
| Repeatability | (mm) | ±0.01 | | | |
| Ball screw lead | (mm) | 5 | 10 | 20 | |
| Maximum speed (*1) | (mm/s) | 250 | 500 | 1000 | |
| Maximum payload (*2) | Horizontal | (kg) | 50 | 30 | 18 |
| | Vertical | (kg) | 15 | 8 | 3 |
| Rated thrust (*3) | (N) | 683 (1388) | 341 (694) | 174 (347) | |
| Stroke / pitch (*4) | (mm) | 50~800 / 50 Pitch | | | |
| Motor output | (W) | 200, 400 | | | |
| Ball screw spec. | (mm) | C7ø16 | | | |
| Coupling | (mm) | 10x14/11(*6) | | | |
| Home sensor (Outside) | | CS-6T (NPN) | | | |
| Anti-rotating accuracy (*5) | (θ) | ±0° | | | |

*1. Acceleration and deceleration value is set 0.2 second.

*2. If payload is near maximum, it requires to collocate externally with auxiliary radial load.

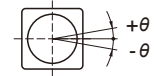
*3. () The value for power output 400W.

*4. When the stroke is over 750mm, the run-out of the ballscrew will occur. We recommend to low down the working speed under this circumstances.

*5. Avoid using the electric actuator in such a way that rotational torque would be applied to the piston rod. This may cause deformation of the anti-rotating guide, abnormal responses of the auto switch, play in the internal guide or an increase in the sliding resistance.

*6. Motor 200W shaft diameter: Panasonic: 11mm, Other: 14 mm.

Anti-rotating accuracy of rod



Order example

MEQG-8 - L10 - 100 - BC - M20 B - C4 - 0001

Model

Size

Stroke

50~800 mm
50 mm pitch

Brakes

| | |
|---|------------|
| - | No brake |
| B | With brake |

Special order no.

Ball screw lead

| | |
|-----|-------|
| L05 | 5 mm |
| L10 | 10 mm |
| L20 | 20 mm |

Motor position

| | |
|----|-------------------|
| BC | Direct connection |
| BM | Lower side |
| BR | Right side |
| BL | Left side |

Motor brand, power output

| SERVO motor | | | |
|-------------|------------|----|--------------|
| M | Mitsubishi | 20 | 200W 400W |
| P | Panasonic | | |
| Y | Yaskawa | 40 | 200W 400W |
| T | Delta | | |

Home sensor

| | |
|-----------|---------------------|
| Out side | |
| C | Motor side |
| D | Opposite motor side |
| No sensor | |
| E | None |

Limit sensor

| | |
|-----------|-------|
| Out side | |
| 3 | 1 Pc |
| 4 | 2 Pcs |
| No sensor | |
| 5 | None |

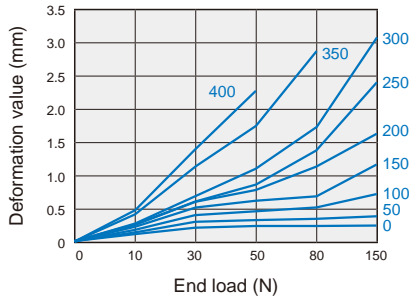
MEQG-8 Performance charts

ROD TYPE ELECTRIC CYLINDER (WITHOUT MOTOR)

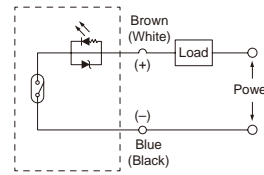


Shaft output deformation value

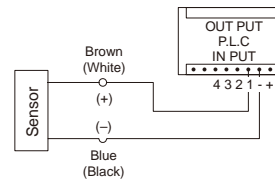
This form is only reference values.



Sensor layout



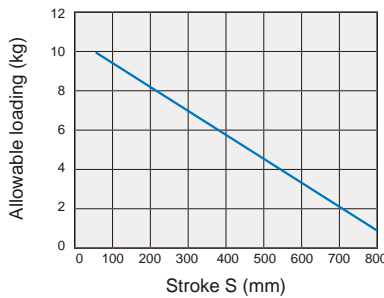
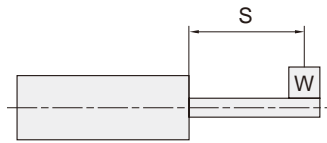
General load:
Such as relay or other resistive load.



Programmable controller connection diagram.

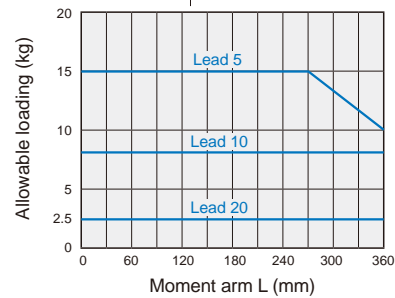
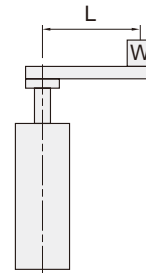
Allowable installation load

No external auxiliary mechanism, extension distance of load = 0



Load in vertical installation

Calculation conditions: 3000 rpm/min, acceleration and deceleration: 0.2s



Standard servo motors

| Brand | Mark | Brake | Watt | AC-Voltage | Motor model | Compatible driver model |
|------------|------|---------------------------|------|------------|---------------|-------------------------|
| Mitsubishi | M | No brake(Horizontal type) | 200 | 220 | HG-KR23 | MR-J4-20A |
| | | | 400 | 220 | HG-KR43 | MR-J4-40A |
| | | With brake(Vertical type) | 200 | 220 | HG-KR23B | MR-J4-20A |
| | | | 400 | 220 | HG-KR43B | MR-J4-40A |
| Panasonic | P | No brake(Horizontal type) | 200 | 220 | MHMD022G1U | MADHT1507 |
| | | | 400 | 220 | MHMD042G1U | MBDHT2510 |
| | | With brake(Vertical type) | 200 | 220 | MHMD022G1V | MADHT1507 |
| | | | 400 | 220 | MHMD042G1V | MBDHT2510 |
| Delta | T | No brake(Horizontal type) | 200 | 220 | ECMA-C20602ES | ASD-B20221-B |
| | | | 400 | 220 | ECMA-C20604ES | ASD-B20421-B |
| | | With brake(Vertical type) | 200 | 220 | ECMA-C20602FS | ASD-B20221-B |
| | | | 400 | 220 | ECMA-C20604FS | ASD-B20421-B |

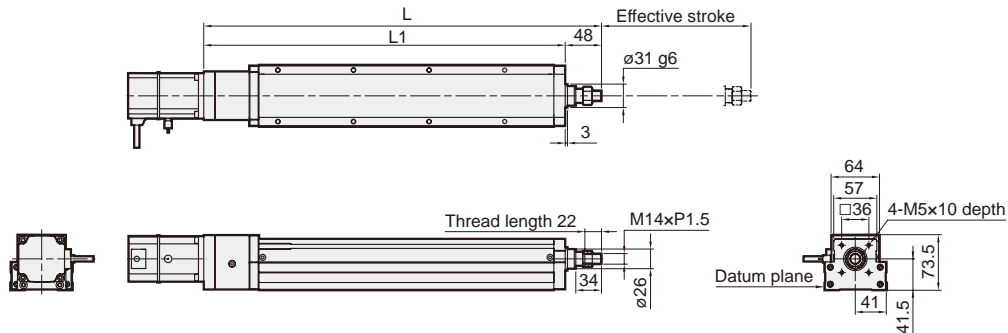
MEQG-8 Dimensions

ROD TYPE ELECTRIC CYLINDER (WITHOUT MOTOR)

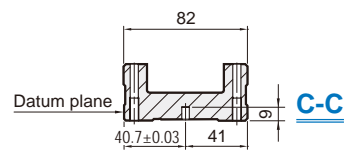
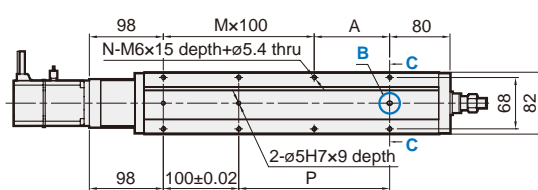
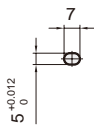


BC

Motor direct connection



B view

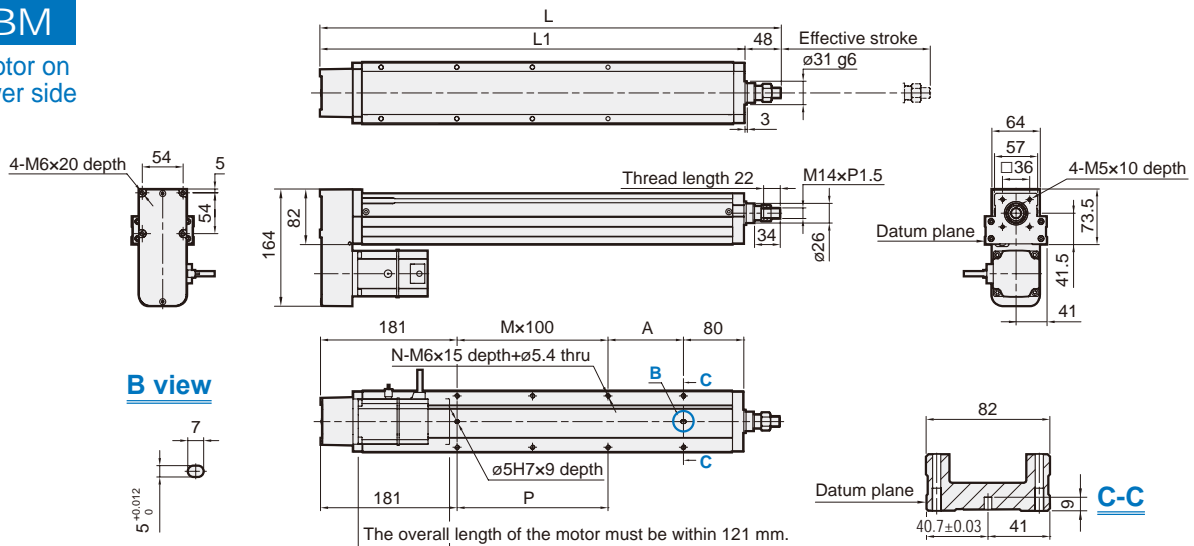


Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|-----------|------|------|------|------|------|-----|------|------|-----|------|------|------|------|------|-------|-------|
| L | 376 | 426 | 476 | 526 | 576 | 626 | 676 | 726 | 775 | 826 | 876 | 926 | 976 | 1026 | 1076 | 1126 |
| L1 | 328 | 378 | 428 | 478 | 528 | 578 | 628 | 678 | 728 | 778 | 828 | 878 | 928 | 978 | 1028 | 1078 |
| A | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 |
| M | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 |
| P | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
| KG | 5.08 | 5.44 | 5.81 | 6.17 | 6.54 | 6.9 | 7.27 | 7.63 | 8 | 8.36 | 8.73 | 9.09 | 9.46 | 9.82 | 10.19 | 10.55 |

BM

Motor on lower side



Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|-----------|------|------|------|------|------|------|------|-----|------|------|------|------|-------|-------|-------|-------|
| L | 359 | 409 | 459 | 509 | 559 | 609 | 659 | 709 | 775 | 809 | 859 | 909 | 959 | 1009 | 1059 | 1109 |
| L1 | 311 | 361 | 411 | 461 | 511 | 561 | 611 | 661 | 711 | 761 | 811 | 861 | 911 | 961 | 1011 | 1061 |
| A | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 |
| M | 0 | 0 | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 |
| N | 4 | 4 | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 |
| P | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
| KG | 5.82 | 6.17 | 6.53 | 6.88 | 7.24 | 7.59 | 7.95 | 8.3 | 8.66 | 9.01 | 9.37 | 9.72 | 10.08 | 10.43 | 10.79 | 11.14 |

* When motor with brake assembled on lower side, or the total length over than spec limit, it may not use standard pinhole. Please contact us if you need more information and requirement.

MEQG-8 Dimensions

ROD TYPE ELECTRIC CYLINDER (WITHOUT MOTOR)



Rotary Actuator

Clamp Cylinder

Gripper

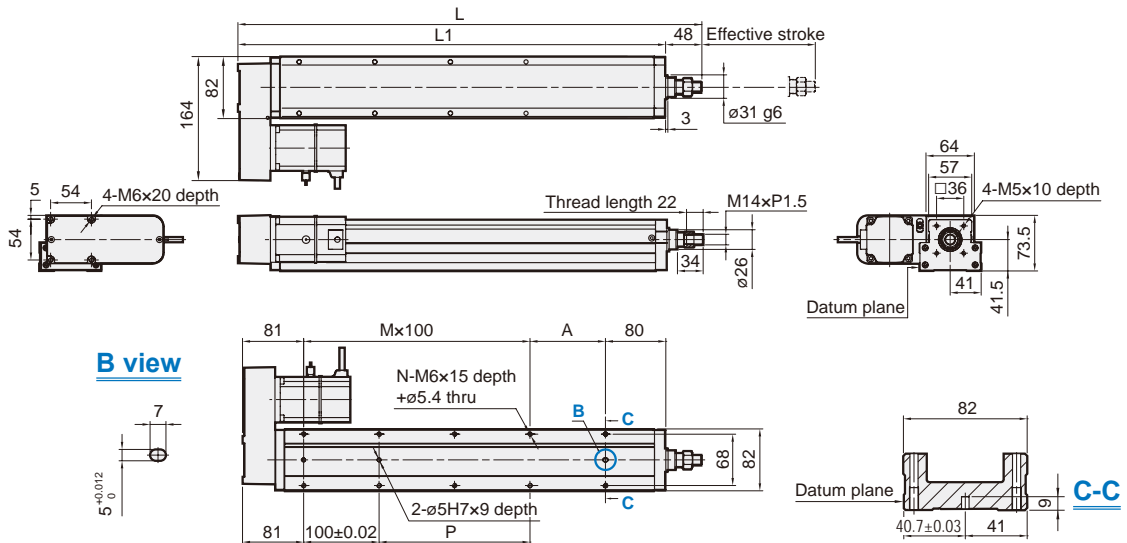
Electric Actuator

Auxiliary Equipment

Hydraulic Cylinder

BL

Motor on left side

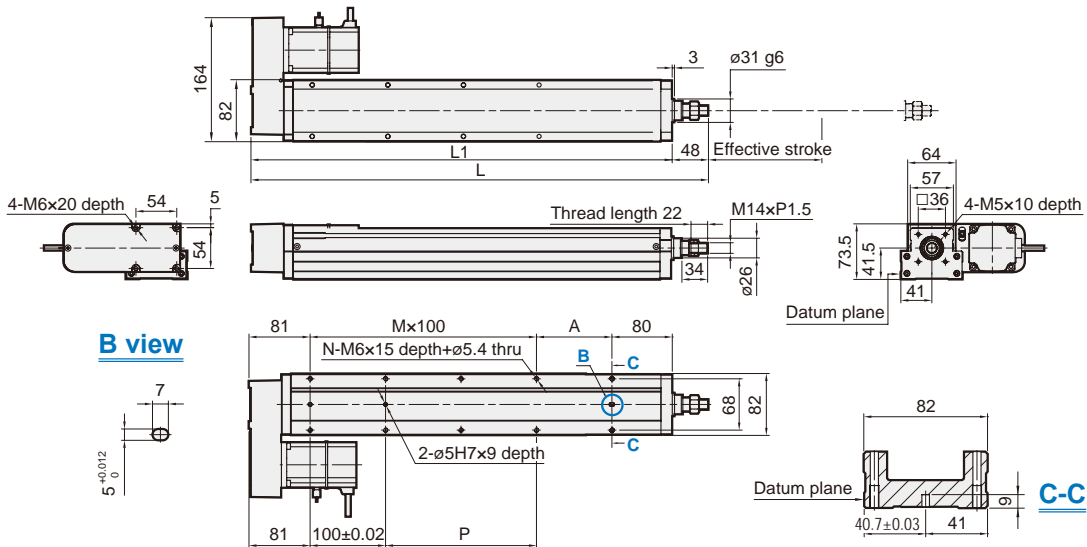


Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|-----------|------|------|------|------|------|------|------|-----|------|------|------|------|-------|-------|-------|-------|
| L | 359 | 409 | 459 | 509 | 559 | 609 | 659 | 709 | 775 | 809 | 859 | 909 | 959 | 1009 | 1059 | 1109 |
| L1 | 311 | 361 | 411 | 461 | 511 | 561 | 611 | 661 | 711 | 761 | 811 | 861 | 911 | 961 | 1011 | 1061 |
| A | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 |
| M | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 |
| P | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
| KG | 5.82 | 6.17 | 6.53 | 6.88 | 7.24 | 7.59 | 7.95 | 8.3 | 8.66 | 9.01 | 9.37 | 9.72 | 10.08 | 10.43 | 10.79 | 11.14 |

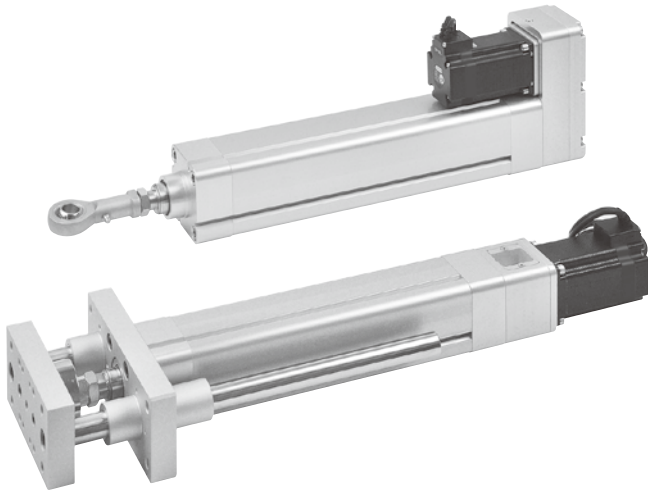
BR

Motor on right side



Unit: mm

| Stroke | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
|-----------|------|------|------|------|------|------|------|-----|------|------|------|------|-------|-------|-------|-------|
| L | 359 | 409 | 459 | 509 | 559 | 609 | 659 | 709 | 775 | 809 | 859 | 909 | 959 | 1009 | 1059 | 1109 |
| L1 | 311 | 361 | 411 | 461 | 511 | 561 | 611 | 661 | 711 | 761 | 811 | 861 | 911 | 961 | 1011 | 1061 |
| A | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 | 50 | 100 |
| M | 1 | 1 | 2 | 2 | 3 | 3 | 4 | 4 | 5 | 5 | 6 | 6 | 7 | 7 | 8 | 8 |
| N | 6 | 6 | 8 | 8 | 10 | 10 | 12 | 12 | 14 | 14 | 16 | 16 | 18 | 18 | 20 | 20 |
| P | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 | 550 | 600 | 650 | 700 | 750 | 800 |
| KG | 5.82 | 6.17 | 6.53 | 6.88 | 7.24 | 7.59 | 7.95 | 8.3 | 8.66 | 9.01 | 9.37 | 9.72 | 10.08 | 10.43 | 10.79 | 11.14 |



| | | | |
|-------------|--------------|--------------|-------------|
| Motor type | Servo / Step | Transmission | Ball screw |
| Environment | Standard | Guide type | Slide guide |

Specification

| Model | MEQI | | | | | | |
|-----------------------------|---------------------------|-------|------|------------------|-------|------|----|
| Size | 50 | | | 63 | | | |
| Position repeatability (mm) | ±0.02 | | | | | | |
| Lead *1 (mm) | 5 | 10 | 20 | 5 | 10 | 20 | |
| Ball screw (ø) | C7ø16 | | | C7ø20 | | | |
| Stroke (mm) | 100~600/50 pitch | | | 100~800/50 pitch | | | |
| Anti-rotation tolerance (°) | ±0.4 | | | | | | |
| No-load torque (N.m) | <0.2 | <0.25 | <0.3 | <0.3 | <0.35 | <0.4 | |
| Sensor switch | RDFE (Refer to page 5-11) | | | | | | |
| With AC servo motor (W) | 400 | | | | | | |
| Max. speed *2 (mm/s) | 250 | 500 | 1000 | 250 | 500 | 1000 | |
| Rated thrust (N) | 1560 | 780 | 390 | 1560 | 780 | 390 | |
| Work load *3 | Horizontal (kg) | 110 | 88 | 40 | 110 | 88 | 40 |
| | Vertical (kg) | 33 | 22 | 10 | 33 | 22 | 10 |
| With step motor | □56 | | | | | | |
| Max. speed *2 (mm/s) | 125 | 250 | 500 | 125 | 250 | 500 | |
| Rated thrust (N) | 1120 | 560 | 280 | 1120 | 560 | 280 | |

*1. Other ball screw accuracy or lead is optional.

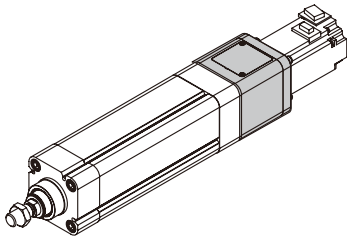
*2. Acceleration and deceleration value is set 0.2 second.

*3. An external guide is necessary to support the load.
The operating speed under work load is less than maximum speed.

Order example

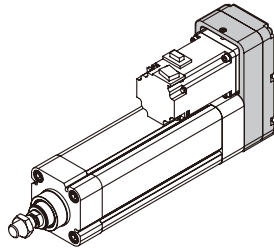
| | | | | | | | | | | |
|---|------------|-----------------|------------|---------|------------|----------------|-------------------|--------------|-------------|-------------------|
| MEQI — 50 L05 — 200 — BC — M 40 B — A3 D — XA00 | | | | | | | | | | |
| Model | Size | Ball screw lead | | Stroke | | Motor position | | Limit sensor | Sensor type | Special order No. |
| | 50 | L05 | 5 mm | 100~600 | 50 | BC | Direct connection | — | D | 2-wire |
| | 63 | L10 | 10 mm | 100~800 | 63 | BA | Turned | A1 | N | NPN |
| | | L20 | 20 mm | | | | | A2 | P | PNP |
| | | | | | | | | A3 | | |
| Motor brand | | Power output | | Brakes | | | | | | |
| M | Mitsubishi | 40 | 400W servo | — | No brake | | | | | |
| P | Panasonic | | | B | With brake | | | | | |
| Y | Yaskawa | | | | | | | | | |
| D | Delta | | | | | | | | | |
| S | Mindman | 56 | □56 Step | | | | | | | |

Motor position



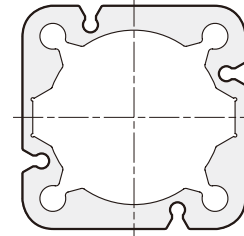
BC

Direct connection



BA

Turned



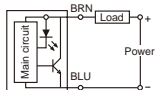
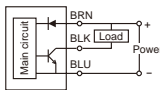
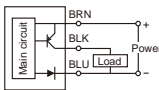
Unlimited installation on all sides due to symmetrical design.

Standard motors

| Brand | Mark | Power output | Motor model (Without brake) | Motor model (With brake) | Motor rod (mm) | Motor mount P.C.D (mm) | Mounting port (mm) |
|------------|----------|--------------|-----------------------------|--------------------------|----------------|------------------------|--------------------|
| Mitsubishi | M | 400W | HG-KN43J | HG-KN43B J | ø14 | ø70 | 4-ø5.8 |
| Panasonic | P | 400W | MHMF042L1U2M | MHMF042L1V2M | | | 4-ø4.5 |
| Yaskawa | Y | 400W | SGM7J-04A7A21 | SGM7J-04A7A2C | | | 4-ø5.5 |
| Delta | D | 400W | ECMA-C20604PS | ECMA-C20604QS | | | 4-ø5.5 |
| Mindman | S | □56 | - | - | ø6.35 | □47.14 | 4-ø5.0 |

* If your inquiry is not included in above table, please kindly contact us.

Sensor specification

| Model | RDFE | RNFE | RPFE |
|---------------------|---|---|---|
| Wiring method | 2 wire | 3 wire | |
| Switching logic | Solid state output, Normally open | | |
| Switch Type | Non-contact | NPN current sinking | PNP current sourcing |
| Operating voltage | 5~30V DC | 5~30V DC | 5~30V DC |
| Switching current | 50mA max. | | |
| Contact rating *1 | 1.5W max. | | |
| Current consumption | — | 10mA @24V DC max. | |
| Voltage drop | 3.5V max. | 0.5V @ 50mA max. | |
| Leakage current | 0.1mA(40uA) max. | 0.01mA max. | |
| Indicator | Red LED | | |
| Connect diagram |  |  |  |

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.

*2. Caution for safety please refer to page 10-3-4.

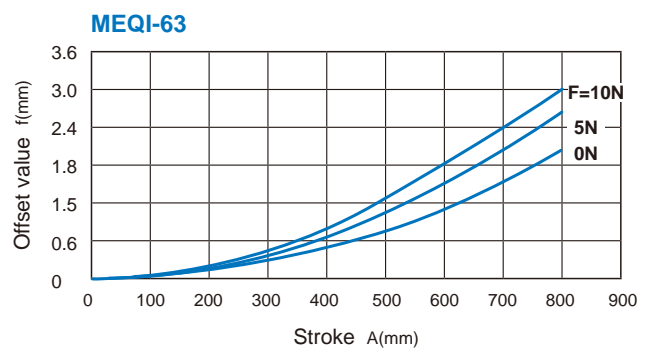
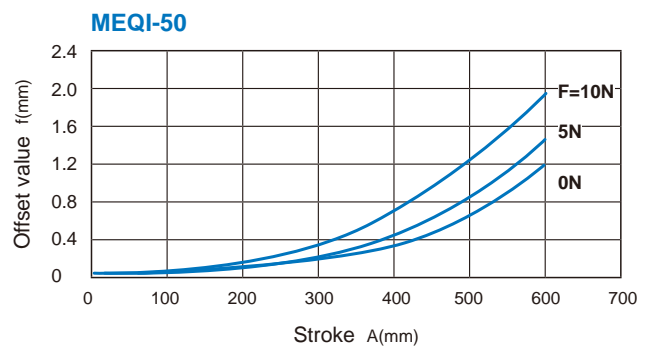
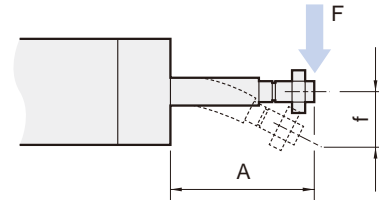
Mounting accessories

* Use the same accessories with MCQV.

FAC — MCQV — 50

| Mounting type | Model | Size |
|---------------|-----------------------------------|----------|
| | LB | 50 63 |
| | CA | |
| | CB | |
| | CDB (Extra purchase CB+Pin) | |
| | FAC | |
| | FBC | |
| | Y | |
| | I | |
| | YS (Y+Floating pin) | |
| | LC | |
| | TFA | MEQI |
| | TFB | |
| | TC | |

Rod bending offset



Weight

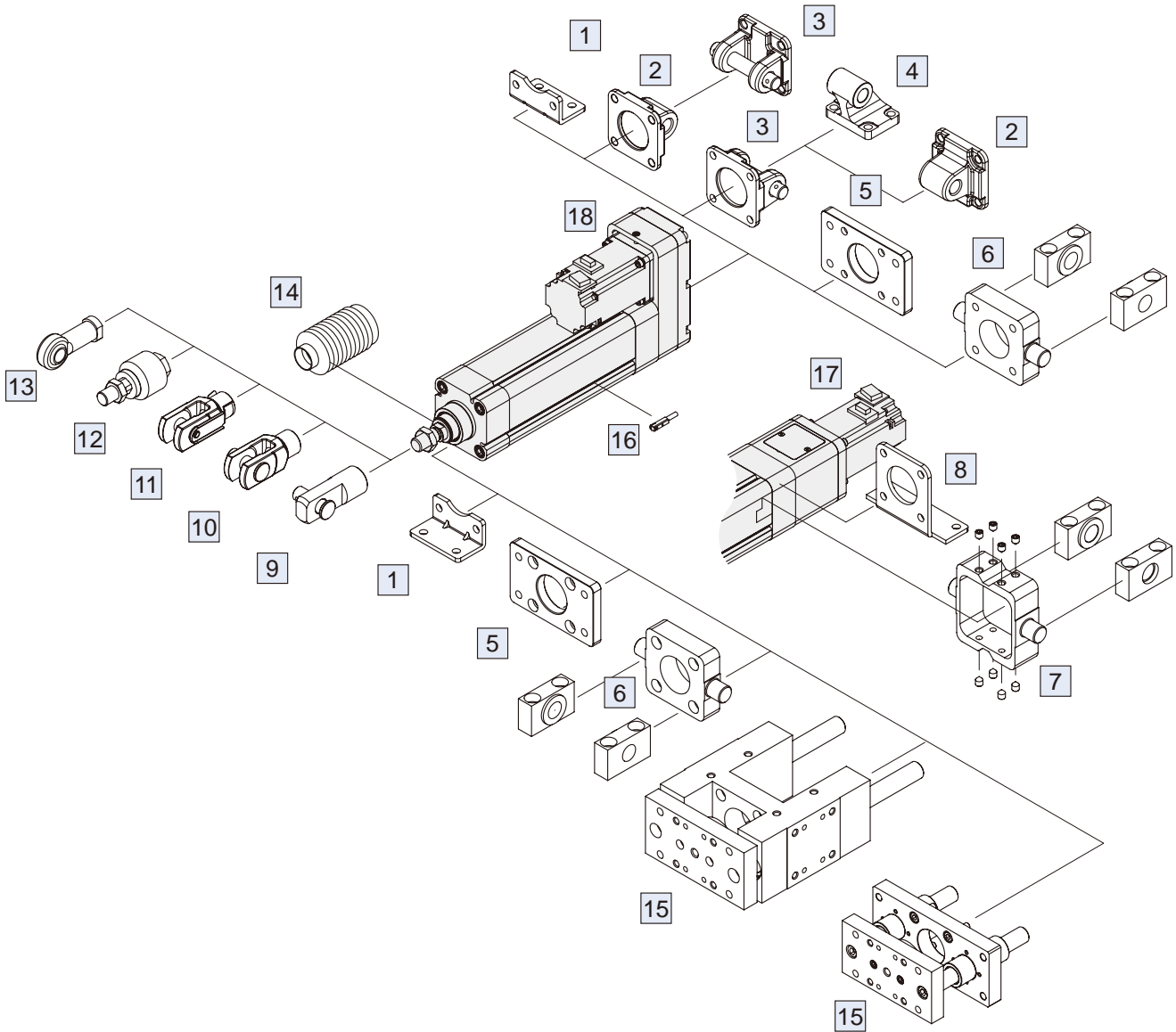
Unit: kg

| Model | Basic weight MEQI | Stroke 100 mm MEQI |
|-------|----------------------|-----------------------|
| Size | | |
| 50 | 1.99 | 0.73 |
| 63 | 2.85 | 0.99 |

* This table is the basic weight of the motor Exposed version.

| Model | LB | LC | CA | CB | CDB | FAC / FBC | TC | TFA / TFB |
|-------|------|------|------|------|------|-----------|------|-----------|
| Size | | | | | | | | |
| 50 | 0.32 | 0.29 | 0.39 | 0.35 | 0.46 | 0.46 | 0.51 | 0.61 |
| 63 | 0.40 | 0.36 | 0.67 | 0.54 | 0.55 | 0.68 | 0.80 | 1.20 |

| Model | Y | I | PIN | | YS |
|-------|------|------|-------|---------|------|
| | | | Y / I | CA / CB | |
| Size | | | | | |
| 50 | 0.27 | 0.34 | 0.08 | 0.07 | 0.07 |
| 63 | 0.27 | 0.33 | 0.08 | 0.15 | 0.07 |

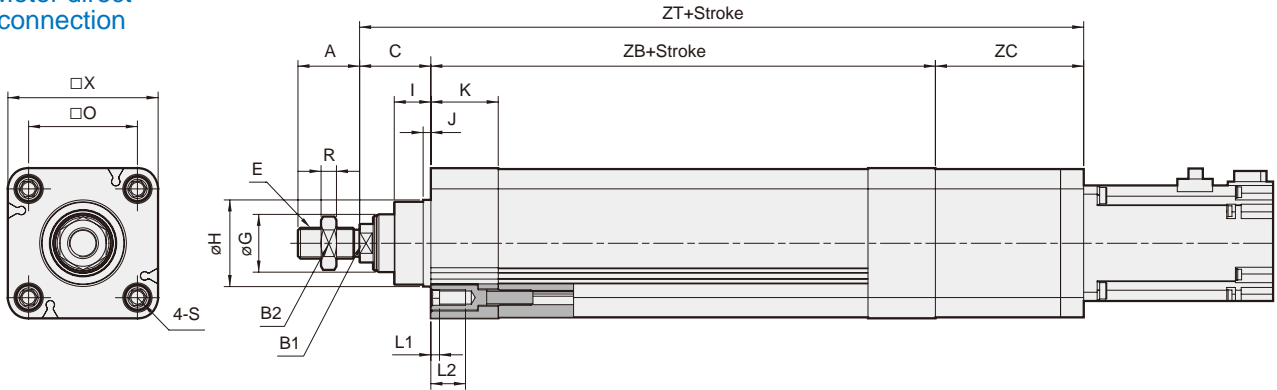


| No. | Accessories | Page |
|-----|------------------------------|--------------|
| 1 | Mounting accessories LB | 4-87 |
| 2 | Mounting accessories CA | 4-89 |
| 3 | Mounting accessories CB | 4-89 |
| 4 | Mounting accessories CDB | 4-90 |
| 5 | Mounting accessories FAC/FBC | 4-88 |
| 6 | Mounting accessories TFA/TFB | 4-91 |
| 7 | Mounting accessories TC | 4-90 |
| 8 | Mounting accessories LC | 4-87 |
| 9 | Accessories I+PIN | 1-46 (Vol.2) |
| 10 | Accessories Y+PIN | 1-46 (Vol.2) |

| No. | Accessories | Page |
|-----|----------------------------------|--------------|
| 11 | Accessories YS | 1-46 (Vol.2) |
| 12 | Floating joint MFC | 8-2 (Vol.2) |
| 13 | Female rod ends PHS | 8-6 (Vol.2) |
| 14 | Protective bellows kit | — |
| 15 | MGTB/TU/TX Guide holder assembly | 4-39 (Vol.2) |
| 16 | Sensor switch RDFE | 5-11 |
| 17 | Motor direct connection kit BC | 4-86 |
| 18 | Motor Turned kit BA | 4-86 |

BC

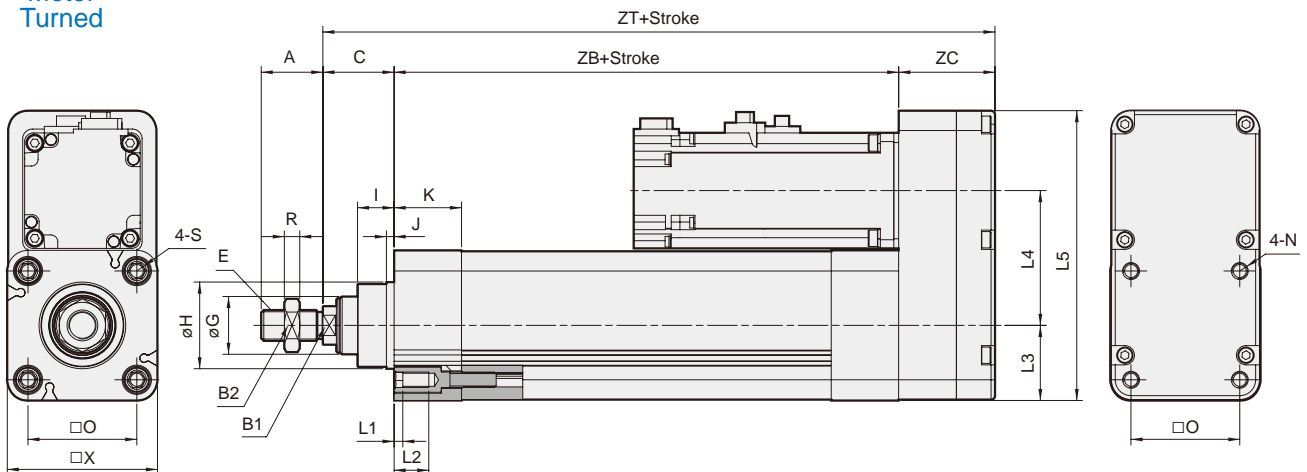
Motor direct connection



| Code Size | A | B1 | B2 | C | E | G | H | I | J | K | L1 | L2 | O | R | S | X | ZB | ZC | | ZT | |
|--------------|----|----|----|----|---------|----|----|----|---|----|-----|----|------|---|---------|----|-----|-------|------|-------|------|
| | | | | | | | | | | | | | | | | | | servo | step | servo | step |
| 50 | 32 | 17 | 24 | 37 | M16x1.5 | 25 | 40 | 19 | 4 | 31 | 4.5 | 18 | 46.5 | 8 | M8x1.25 | 65 | 152 | 67 | 48 | 256 | 237 |
| 63 | 32 | 17 | 24 | 37 | M16x1.5 | 30 | 45 | 19 | 4 | 35 | 4.5 | 18 | 56.5 | 8 | M8x1.25 | 78 | 162 | 77 | 55 | 276 | 254 |

BA

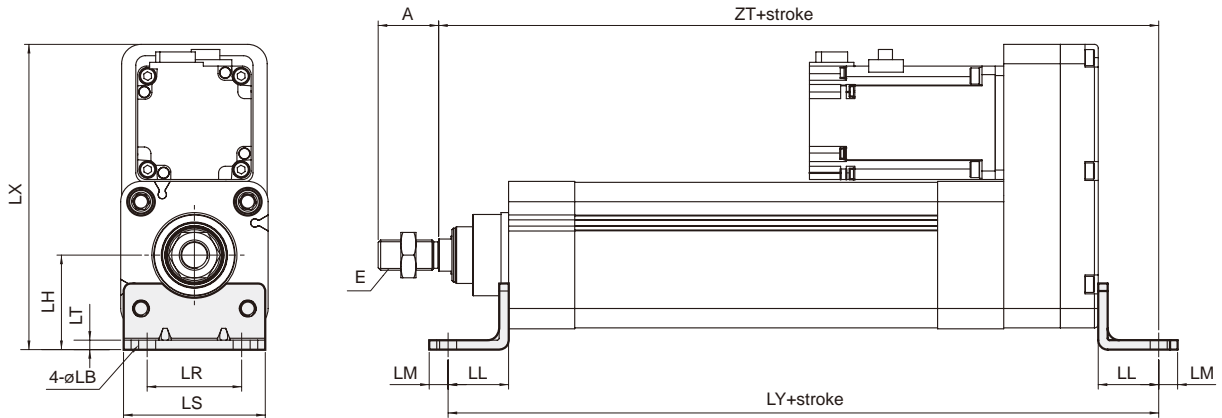
Motor Turned



| Code Size | A | B1 | B2 | C | E | G | H | I | J | K | L1 | L2 | L3 | L4 | L5 | N | O | R | S | X | ZB | ZC | ZT |
|--------------|----|----|----|----|---------|----|----|----|---|----|-----|----|------|----|-------|-------------|------|---|---------|----|-----|----|-----|
| | | | | | | | | | | | | | | | | | | | | | | | |
| 63 | 32 | 17 | 24 | 37 | M16x1.5 | 30 | 45 | 19 | 4 | 35 | 4.5 | 18 | 39.0 | 70 | 150.5 | M8x1.25x12L | 56.5 | 8 | M8x1.25 | 78 | 162 | 50 | 249 |

LB

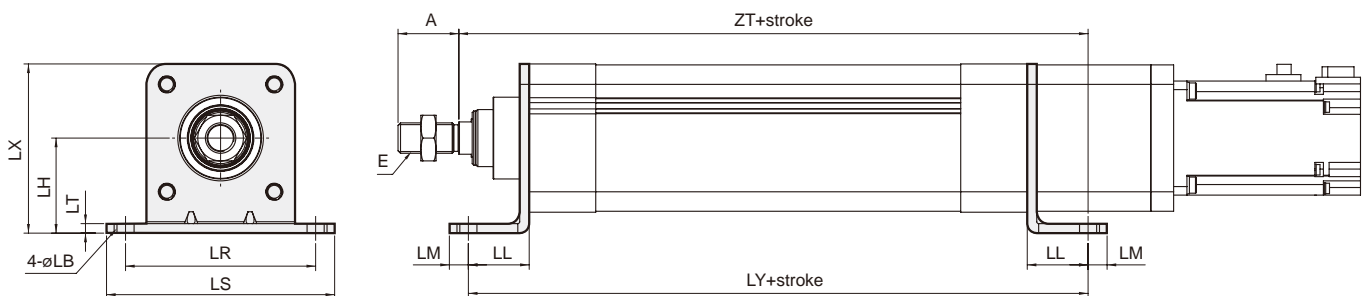
* Only for (BA) motor turned type.



| Code Size | A | E | LB | LH | LL | LM | LR | LS | LT | LX | LY | ZT |
|-----------|----|---------|----|----|----|----|----|----|----|-------|-----|-----|
| 50 | 32 | M16x1.5 | 9 | 45 | 32 | 10 | 45 | 65 | 5 | 163.0 | 266 | 271 |
| 63 | 32 | M16x1.5 | 9 | 50 | 32 | 10 | 50 | 75 | 5 | 161.5 | 276 | 281 |

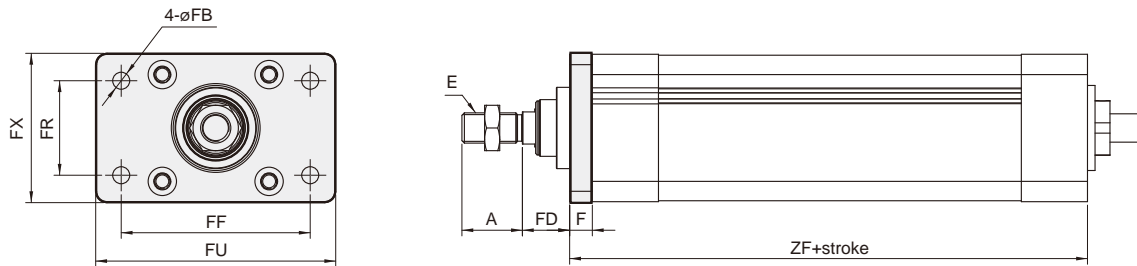
LC

* Only for (BC) motor direct connection type.



| Code Size | A | E | LB | LH | LL | LM | LR | LS | LT | LX | LY | ZT |
|-----------|----|---------|----|----|----|----|-----|-----|----|------|-----|-----|
| 50 | 32 | M16x1.5 | 9 | 45 | 32 | 10 | 90 | 110 | 5 | 77.5 | 216 | 221 |
| 63 | 32 | M16x1.5 | 9 | 50 | 32 | 10 | 100 | 120 | 5 | 89.0 | 226 | 231 |

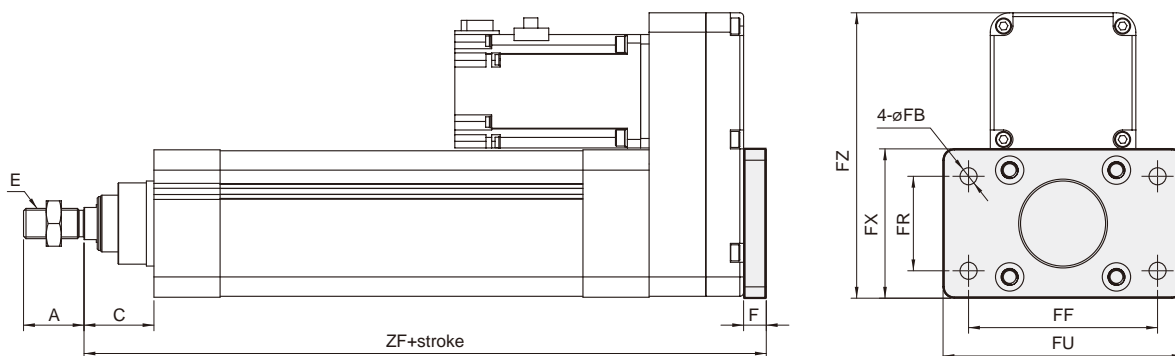
FAC



| Code Size | A | E | F | FB | FD | FF | FR | FU | FX | ZF |
|-----------|----|---------|----|----|----|-----|----|-----|----|-----|
| 50 | 32 | M16x1.5 | 12 | 9 | 25 | 90 | 45 | 112 | 67 | 164 |
| 63 | 32 | M16x1.5 | 12 | 9 | 25 | 100 | 50 | 127 | 79 | 174 |

FBC

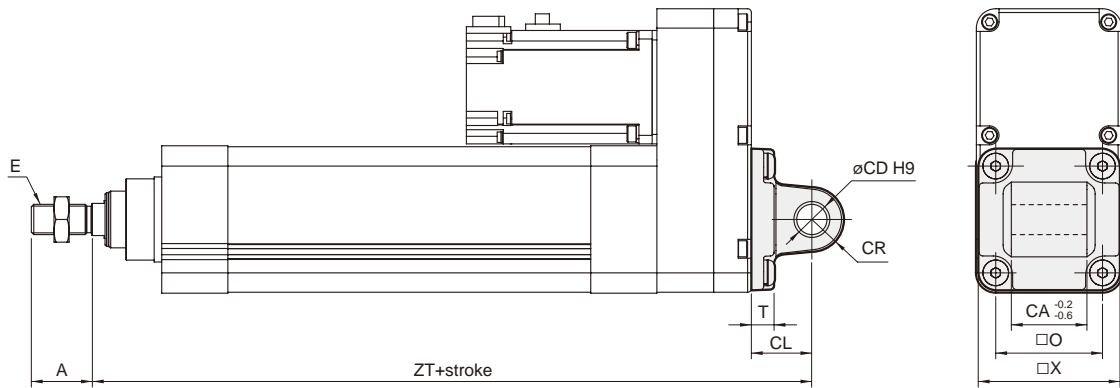
* Only for (BA) motor turned type.



| Code Size | A | C | E | F | FB | FF | FR | FU | FX | FZ | ZF |
|-----------|----|----|---------|----|----|-----|----|-----|----|-------|-----|
| 50 | 32 | 37 | M16x1.5 | 12 | 9 | 90 | 45 | 112 | 67 | 151.5 | 251 |
| 63 | 32 | 37 | M16x1.5 | 12 | 9 | 100 | 50 | 127 | 79 | 151.0 | 261 |

CA

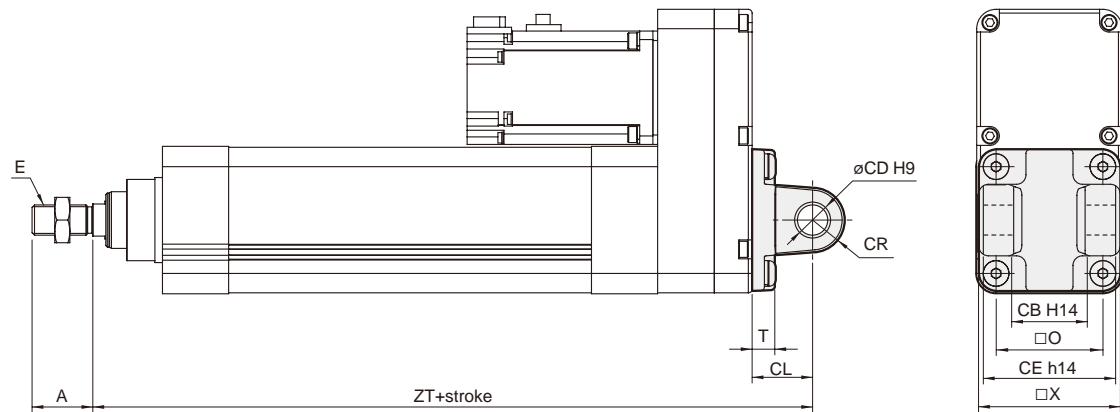
* Only for (BA) motor turned type.



| Code Size | A | CA | CD | CL | CR | E | O | T | X | ZT |
|-----------|----|----|----|----|-----|---------|------|----|----|-----|
| 50 | 32 | 32 | 12 | 27 | R13 | M16×1.5 | 46.5 | 12 | 64 | 266 |
| 63 | 32 | 40 | 16 | 32 | R17 | M16×1.5 | 56.5 | 12 | 75 | 281 |

CB

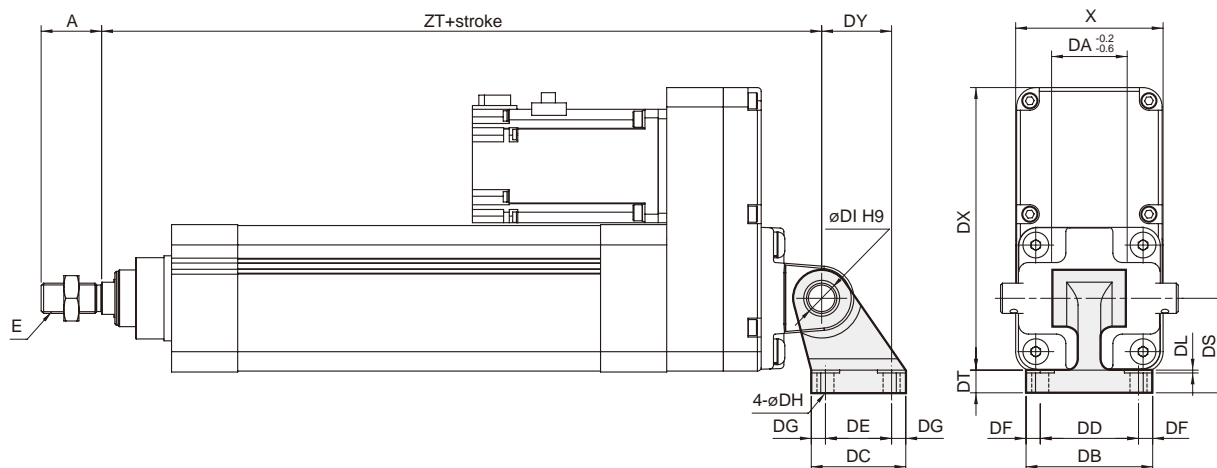
* Only for (BA) motor turned type.



| Code Size | A | CB | CD | CE | CL | CR | E | O | T | X | ZT |
|-----------|----|----|----|----|----|-----|---------|------|----|----|-----|
| 50 | 32 | 32 | 12 | 60 | 27 | R13 | M16×1.5 | 46.5 | 12 | 64 | 266 |
| 63 | 32 | 40 | 16 | 70 | 32 | R17 | M16×1.5 | 56.5 | 12 | 75 | 281 |

CDB

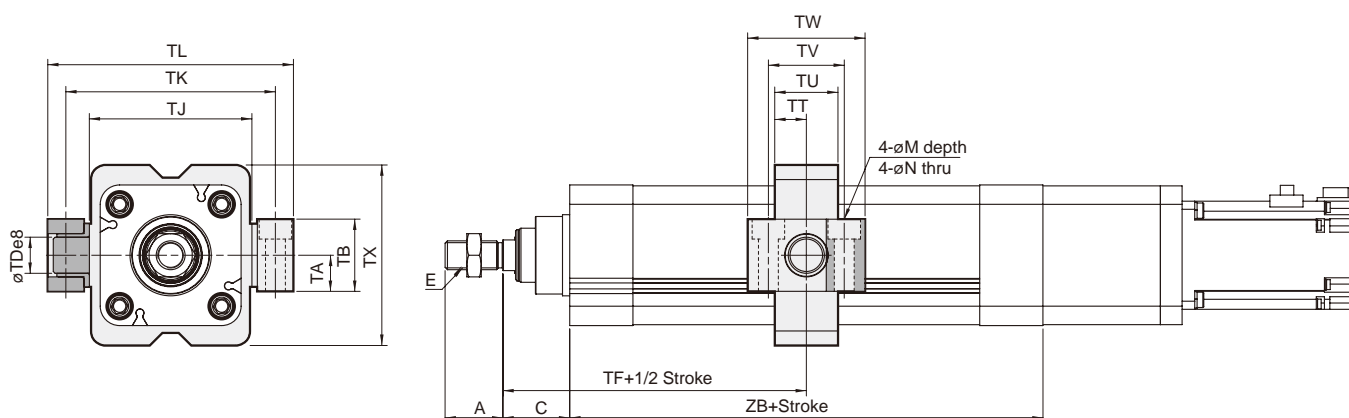
* Only for (BA) motor turned type.



| Code Size | A | DA | DB | DC | DD | DE | DF | DG | DH | DI | DL | DS | DT | DX | DY | E | X | ZT |
|-----------|----|----|----|----|----|----|-----|-----|----|----|-----|----|----|-------|----|---------|----|-----|
| 50 | 32 | 32 | 65 | 45 | 50 | 30 | 7.5 | 7.5 | 9 | 12 | 1.5 | 45 | 12 | 151.0 | 33 | M16x1.5 | 65 | 266 |
| 63 | 32 | 40 | 67 | 50 | 52 | 35 | 7.5 | 7.5 | 9 | 16 | 1.5 | 50 | 12 | 149.5 | 37 | M16x1.5 | 78 | 281 |

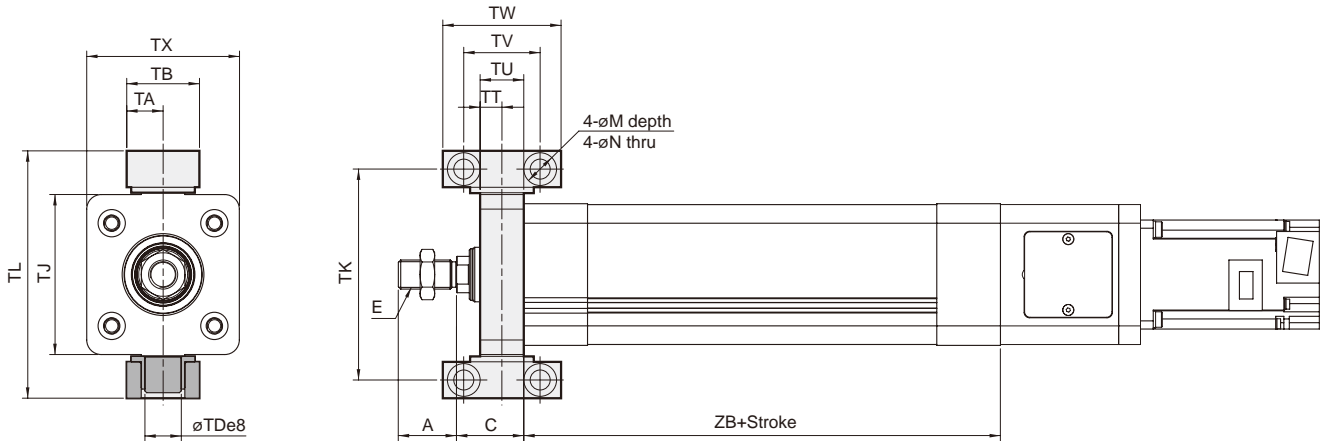
TC

* When used for (BA) motor turned type the stroke must over 250mm.



| Code Size | A | C | E | M | N | TA | TB | TD | TF | TJ | TK | TL | TT | TU | TV | TW | TX | ZB |
|-----------|----|----|---------|-------|----|----|----|----|-----|----|-----|-----|------|----|----|----|-----|-----|
| 50 | 32 | 37 | M16x1.5 | 15x9 | 9 | 18 | 36 | 16 | 113 | 75 | 99 | 117 | 16 | 32 | 36 | 55 | 85 | 152 |
| 63 | 32 | 37 | M16x1.5 | 18x11 | 11 | 20 | 40 | 20 | 118 | 90 | 116 | 136 | 17.5 | 35 | 42 | 65 | 100 | 162 |

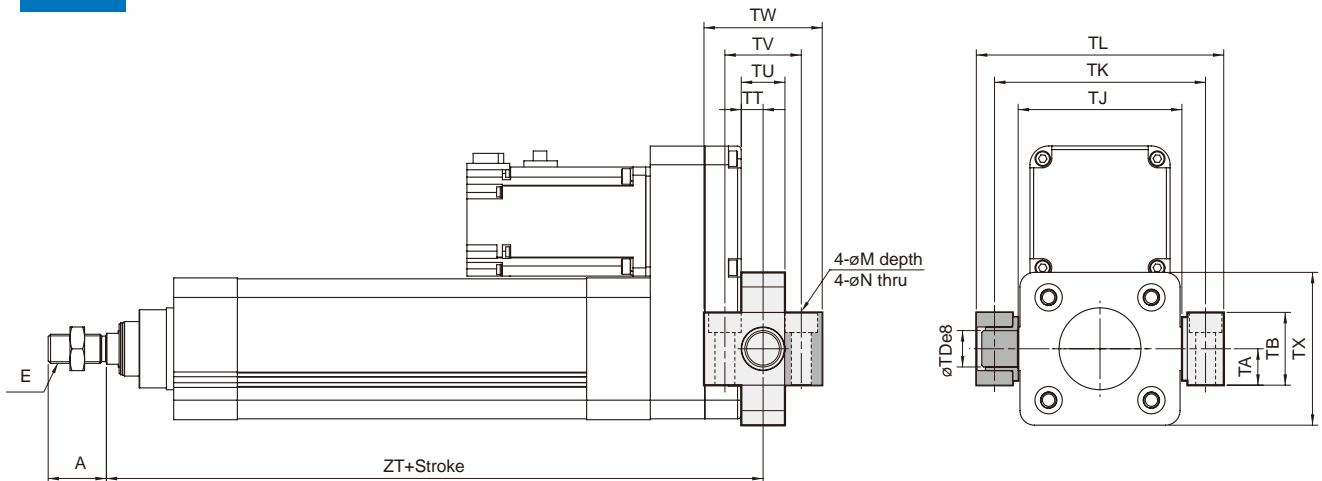
TFA



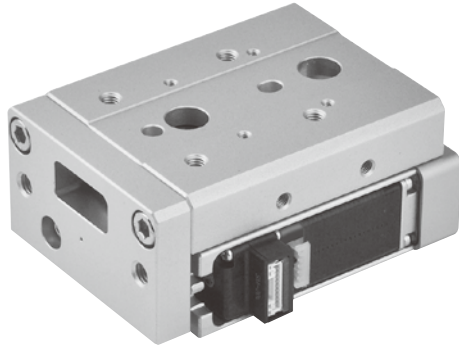
| Code Size | A | C | E | M | N | TA | TB | TD | TJ | TK | TL | TT | TU | TV | TW | TX | ZB |
|-----------|----|----|---------|-------|----|----|----|----|----|-----|-----|-----|----|----|----|----|-----|
| 50 | 32 | 37 | M16×1.5 | 15×9 | 9 | 18 | 36 | 16 | 75 | 99 | 117 | 9.5 | 19 | 36 | 55 | 69 | 152 |
| 63 | 32 | 37 | M16×1.5 | 18×11 | 11 | 20 | 40 | 20 | 90 | 116 | 136 | 12 | 24 | 42 | 65 | 84 | 162 |

TFB

* Only for (BA) motor turned type.



| Code Size | A | E | M | N | TA | TB | TD | TJ | TK | TL | TT | TU | TV | TW | TX | ZT |
|-----------|----|---------|-------|----|----|----|----|----|-----|-----|-----|----|----|----|----|-------|
| 50 | 32 | M16×1.5 | 15×9 | 9 | 18 | 36 | 16 | 75 | 99 | 117 | 9.5 | 19 | 36 | 55 | 69 | 248.5 |
| 63 | 32 | M16×1.5 | 18×11 | 11 | 20 | 40 | 20 | 90 | 116 | 136 | 12 | 24 | 42 | 65 | 84 | 261.0 |



Specification

| Model | MESS2 | | |
|-----------------------------|-----------------------------|--------------------|---------|
| Size | 16 | 25 | |
| Position repeatability (mm) | ±0.02 | | |
| Lead (mm) | 2 | 2 | 8 |
| Maximum speed *1 (mm/s) | ≤50 | ≤100 | ≤400 |
| Work load *2 | Horizontal (kg) | 3 | 1.5 |
| | Vertical (kg) | 0.8 | 0.8 |
| Pushing force *1,3,4 (N) | 18 ~ 60 | 64 ~ 195 | 18 ~ 48 |
| Stroke (mm) | 30 / 50 | 30 / 50 / 75 / 100 | |
| Motor size (mm) | □20 | □28 | |
| Encoder | Incremental A/B/Z (4000PPR) | | |
| Rated voltage | DC 24V±10% | | |

*1. The speed and force may change depending on the cable length, load, stroke and mounting conditions.

*2. The maximum load capacity decreases as the speed increases.

*3. The accuracy of pushing force is ± 20%.

*4. Pushing force for MESS2 is from 30% to 90%.

Motor type Step motor

Transmission Ball screw + Belt

Environment Standard

Guide type Cross roller guide

Order example

MESS2 - 16 L02 - 30 - CQ1 03 N 01 - XA00

Model

Special order no.

| Size | Ball screw lead | Stroke | Controller | I/O type | I/O cable length |
|------|-----------------|--------|------------|----------|------------------|
| 16 | L02 | 2 mm | CQ1 | N | 01 |
| | L08 | 8 mm | CP | | |
| 25 | L02 | 2 mm | MECQ1 | NPN | 03 |
| | L02 | 2 mm | | | |
| | L08 | 8 mm | | | |

* Please refer to page 4-106, 108.

* Standard: 1.5 m

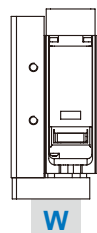
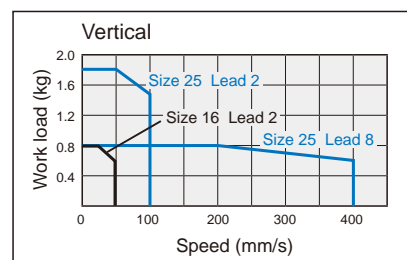
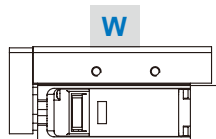
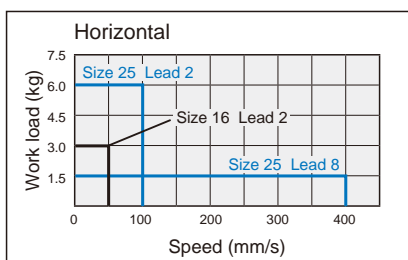
* Only for Spec. 25.

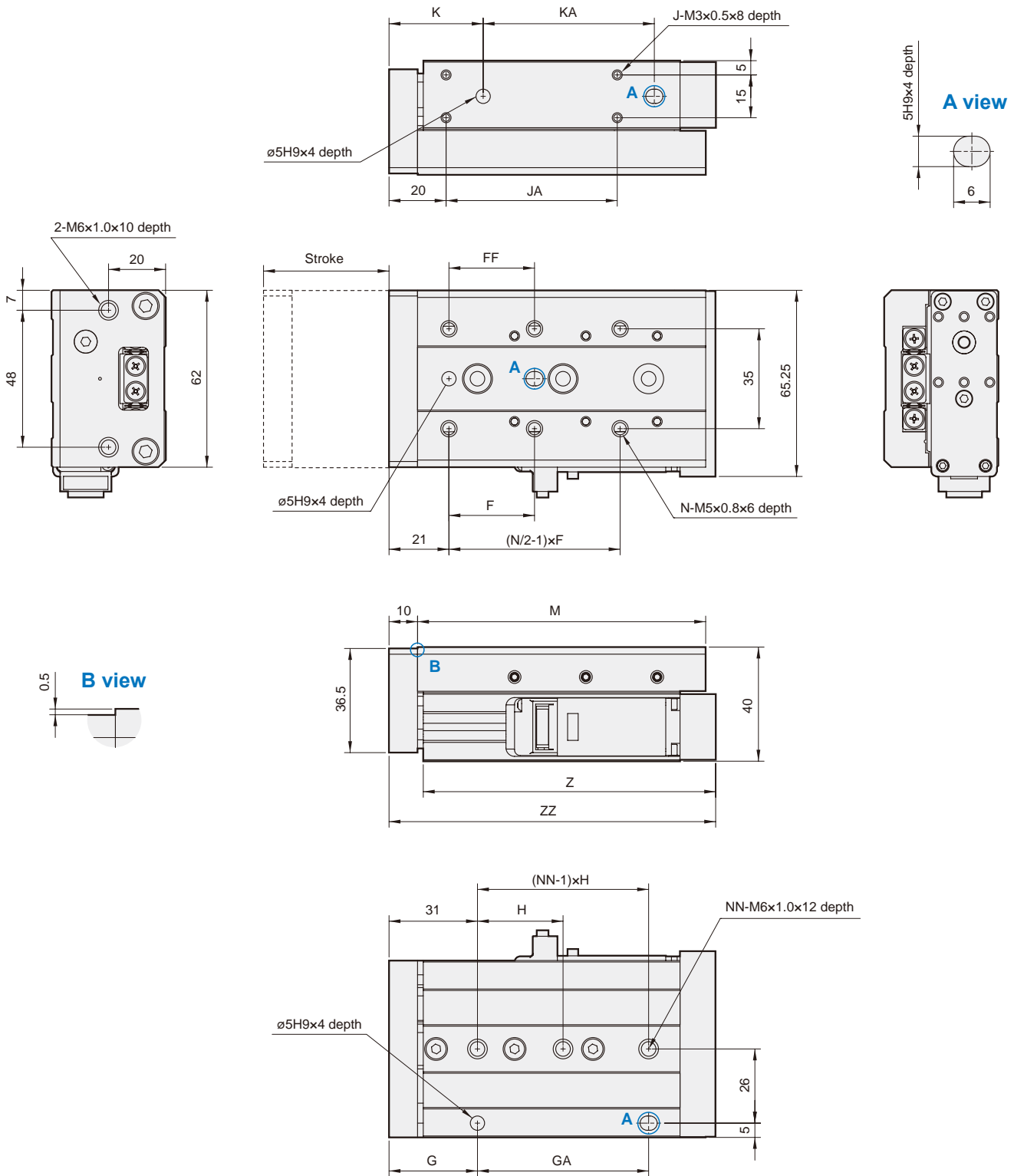
Actuator cable length

| | |
|----|-------|
| 01 | 1.5 m |
| 03 | 3 m |
| 05 | 5 m |

* Standard: 3 m

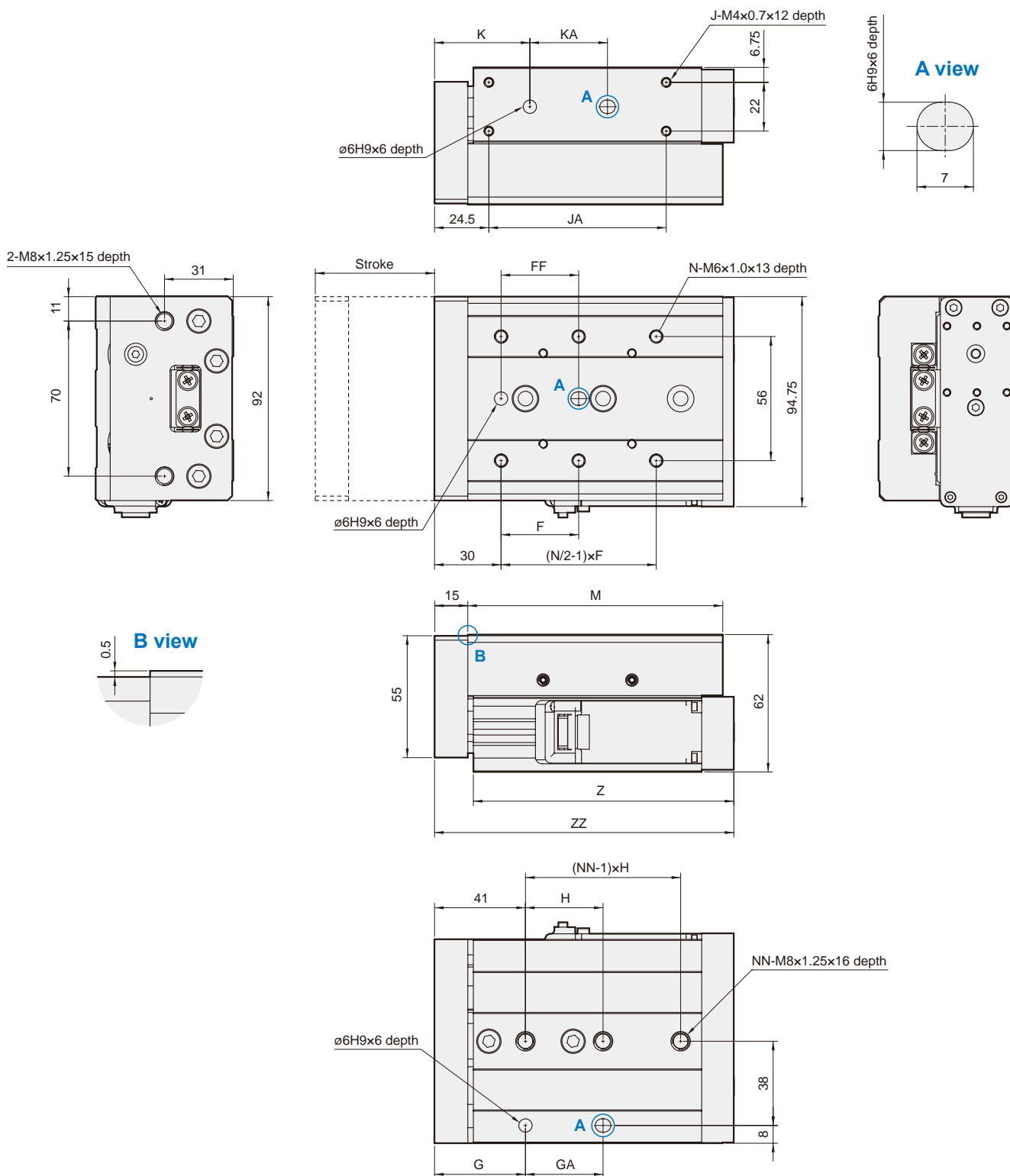
Speed-work load curve diagram





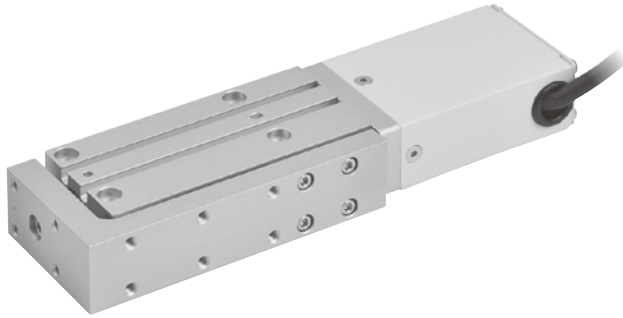
Unit: mm

| Stroke | F | FF | G | GA | H | J | JA | K | KA | M | N | NN | Z | ZZ | Weight (g) |
|--------|----|----|----|----|----|---|----|----|----|-----|---|----|-------|-------|------------|
| 30 | 35 | 35 | 27 | 40 | 40 | 4 | 40 | 29 | 40 | 76 | 4 | 2 | 77.5 | 89.5 | 634 |
| 50 | 30 | 30 | 31 | 60 | 30 | 4 | 60 | 33 | 60 | 101 | 6 | 3 | 102.5 | 114.5 | 812 |



Unit: mm

| Stroke | F | FF | G | GA | H | J | JA | K | KA | M | N | NN | Z | ZZ | Weight (g) |
|--------|----|----|------|----|----|---|-----|------|----|-----|---|----|-------|-----|------------|
| 30 | 50 | 40 | 30.5 | 45 | 45 | 4 | 40 | 32.5 | 45 | 92 | 4 | 2 | 94.5 | 112 | 1743 |
| 50 | 35 | 35 | 41 | 35 | 35 | 4 | 80 | 43 | 35 | 115 | 6 | 3 | 117.5 | 135 | 2030 |
| 75 | 60 | 60 | 41 | 70 | 35 | 6 | 120 | 43 | 70 | 156 | 6 | 4 | 158.5 | 176 | 2680 |
| 100 | 70 | 70 | 41 | 70 | 35 | 6 | 160 | 43 | 70 | 197 | 6 | 5 | 199.5 | 217 | 3380 |



Specification

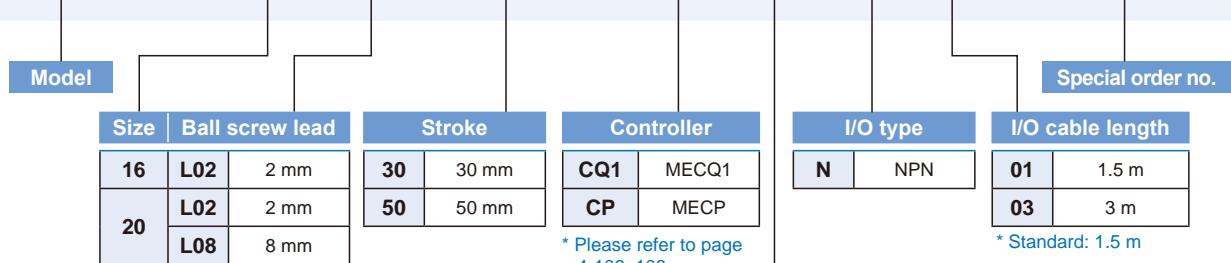
| Model | MESH2 | | |
|-----------------------------|-----------------------------|----------|---------|
| Size | 16 | 20 | |
| Position repeatability (mm) | ±0.02 | | |
| Lead (mm) | 2 | 2 | 8 |
| Maximum speed *1 (mm/s) | ≤50 | ≤100 | ≤400 |
| Work load *2 (kg) | Horizontal | 3 | 1.5 |
| | Vertical | 0.8 | 0.8 |
| Pushing force *1,3,4 (N) | 24 ~ 68 | 64 ~ 195 | 18 ~ 48 |
| Stroke (mm) | 30 / 50 | | |
| Motor size (mm) | □20 | □28 | |
| Encoder | Incremental A/B/Z (4000PPR) | | |
| Rated voltage | DC 24V±10% | | |

- *1. The speed and force may change depending on the cable length, load, stroke and mounting conditions.
- *2. The maximum load capacity decreases as the speed increases.
- *3. The accuracy of pushing force is ± 20%.
- *4. Pushing force for MESH2 is from 30% to 90%.

| | | | |
|-------------|------------|--------------|-----------------|
| Motor type | Step motor | Transmission | Ball screw |
| Environment | Standard | Guide type | Linear guideway |

Order example

MESH2 - 16 L02 - 30 - CQ1 03 N 01 - XA00



* Please refer to page 4-106, 108.

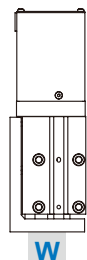
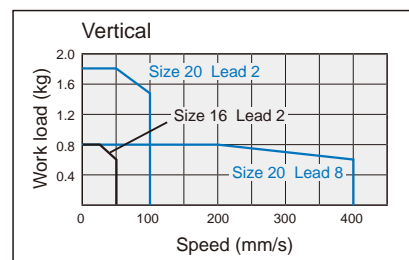
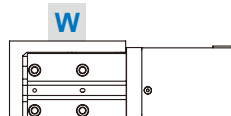
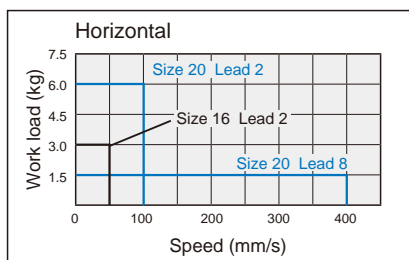
* Standard: 1.5 m

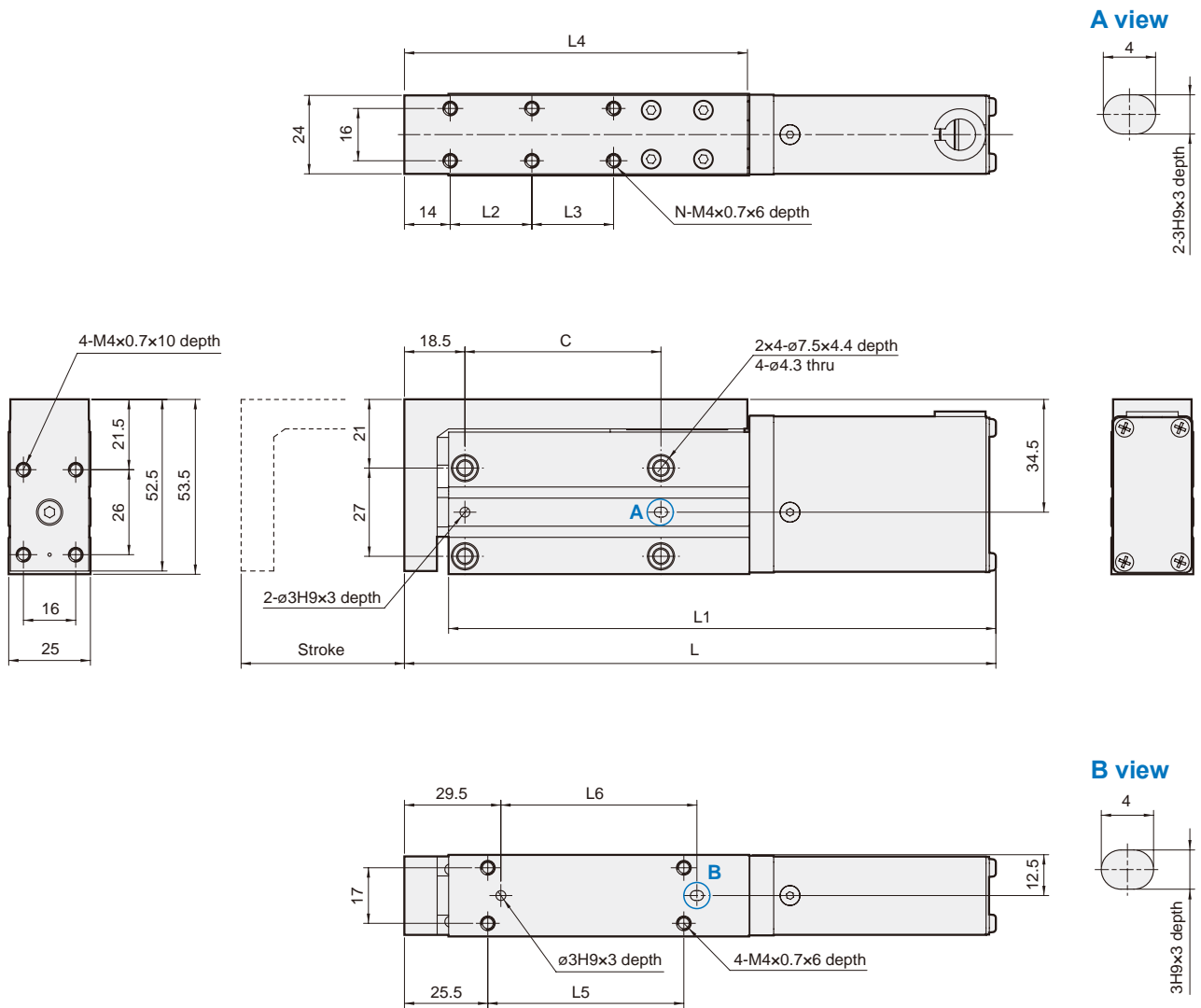
Actuator cable length

| | |
|----|-------|
| 01 | 1.5 m |
| 03 | 3 m |
| 05 | 5 m |

* Standard: 3 m

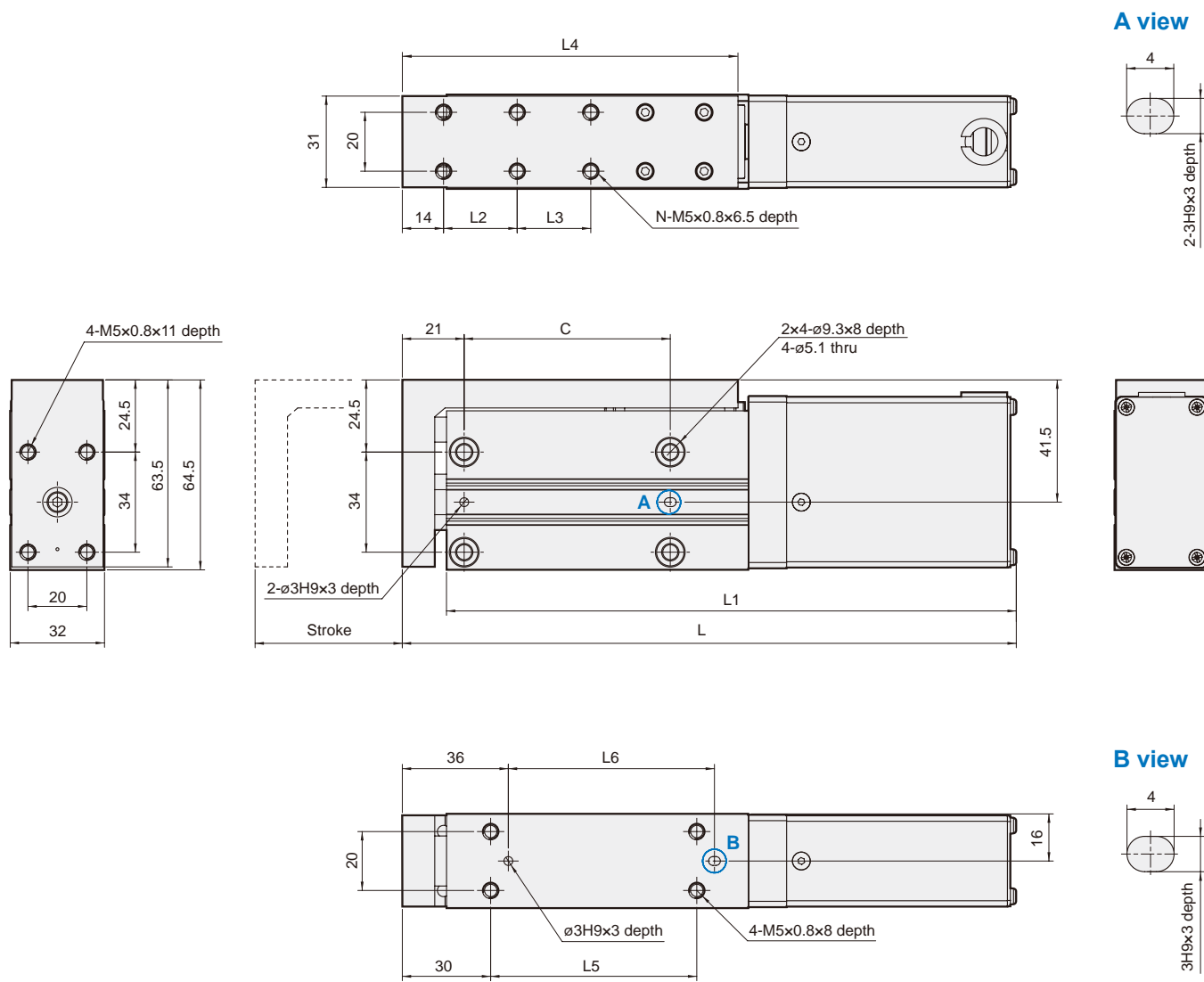
Speed-work load curve diagram





Unit: mm

| Stroke | C | L | L1 | L2 | L3 | L4 | L5 | L6 | N | Weight (g) |
|--------|----|-----|-------|----|----|-----|----|----|---|------------|
| 30 | 40 | 161 | 147.5 | 30 | - | 85 | 40 | 40 | 4 | 500 |
| 50 | 60 | 181 | 167.5 | 25 | 25 | 105 | 60 | 60 | 6 | 562 |

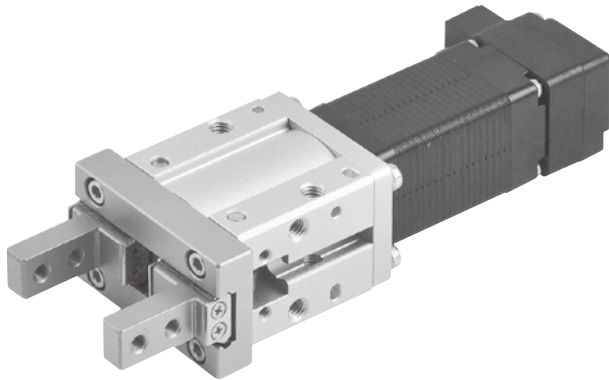


Unit: mm

| Stroke | C | L | L1 | L2 | L3 | L4 | L5 | L6 | N | Weight (g) |
|--------|----|-------|-------|----|----|-----|----|----|---|------------|
| 30 | 40 | 188.5 | 173.5 | 30 | - | 97 | 40 | 40 | 4 | 950 |
| 50 | 70 | 208.5 | 193.5 | 25 | 25 | 114 | 70 | 70 | 6 | 1049 |

MEHC2 series

ELECTRIC GRIPPER (WITH MOTOR)



Specification

| Model | MEHC2 | |
|--------------------------------|-----------------------------|-----|
| Size | 16 | 25 |
| Gripping force *1 (N) | 19.5 | 26 |
| Opening / Closing stroke (mm) | 6 | 14 |
| Position repeatability *2 (mm) | ±0.02 | |
| Motor size (mm) | □20 | □28 |
| Encoder | Incremental A/B/Z (4000PPR) | |
| Rated voltage | DC24 V ±10% | |
| Gripping mass *3 (kg) | 0.4 | 0.8 |
| Weight (g) | 222 | 662 |

*1. Gripping force tolerance ± 20%.

*2. When under same procedure, the position repeatability of workpiece.

*3. The gripping mass may change depending on the gripper attachments or friction coefficient.

Motor type Step motor Transmission Lead screw

Environment Standard Guide type Linear guideway

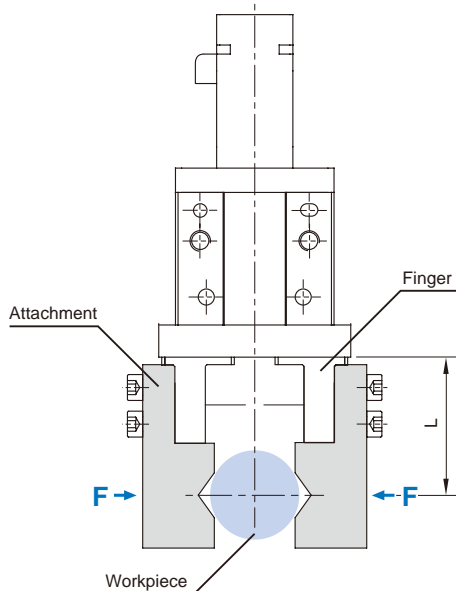
Order example

MEHC2 - 16 - N F - CQ1 03 N 01 - XA00

Model **Size** **Special order no.**

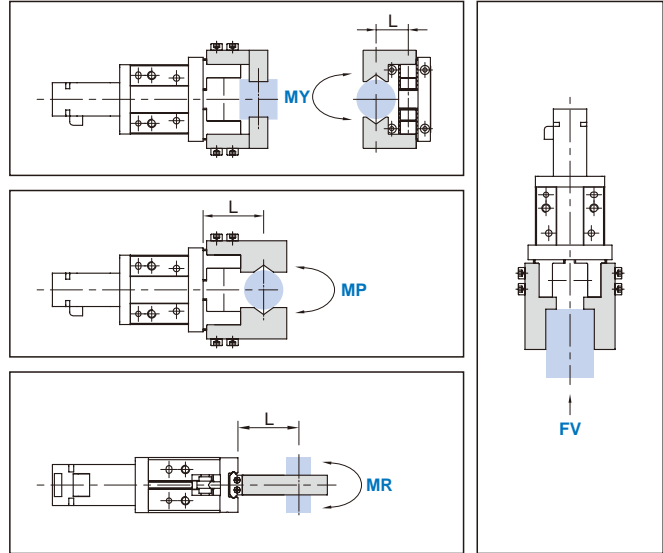
| | | | | | |
|-----------------------|-----------------------------------|--------------------------|-------------------------------|------------------------------|-------------------------|
| Spec. and type | | Motor cable entry | Controller | I/O type | I/O cable length |
| Blank: Standard | 1: Standard type with side tapped | Blank: Parallel | CQ1 MECQ1 | N NPN | 01 1.5 m |
| | | | * Please refer to page 4-106. | | 03 3 m |
| N: Narrow | N1: Narrow type with side tapped | F: Perpendicular | | Actuator cable length | * Standard: 1.5 m |
| | | | | 01 1.5 m | |
| | | | | 03 3 m | |
| | | | | 05 5 m | |
| | | | | * Standard: 3 m | |

Evaluation of gripping force



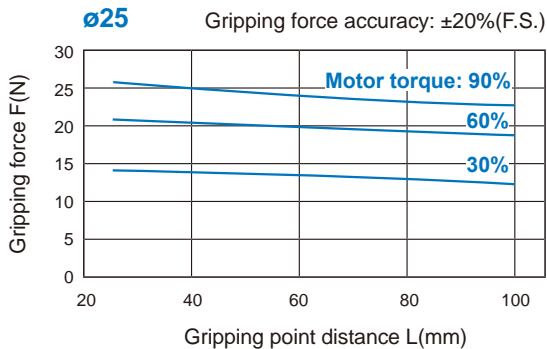
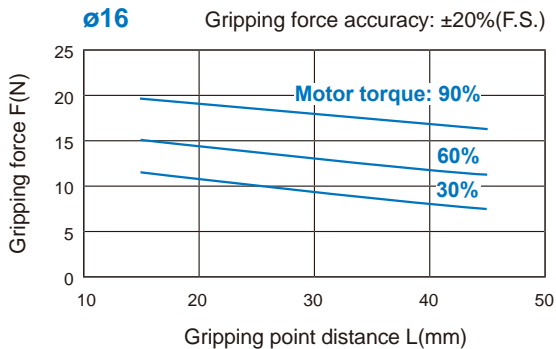
L = Gripping point distance
F = Gripping force

Allowable moment and force (N.m / N)



| Model | MY | MP | MR | FV |
|----------|-------------------|------|------|----------------|
| | Max. moment (N.m) | | | Max. force (N) |
| MEHC2-16 | 0.68 | 0.68 | 1.36 | 98 |
| MEHC2-25 | 1.94 | 1.94 | 3.88 | 255 |

Diagram



Calculation of allowable external force

$$\text{Allowable load } F(N) = \frac{M(\text{maximum allowable moment})(N \cdot m)}{L(m)}$$

*MY: Allowable yaw moment *FV: Vertical maximum force
*MP: Allowable pitch moment *L: Distance to the loading location (mm).
*MR: Allowable roll moment

Example

When a static load of 20N is operating, which applies roll Moment to point L=25mm from the MEHC2-16 guide.

$$\text{Allowable load } F(N) = \frac{MR}{L(m)} = \frac{1.36}{0.025} = 54.4 \text{ N}$$

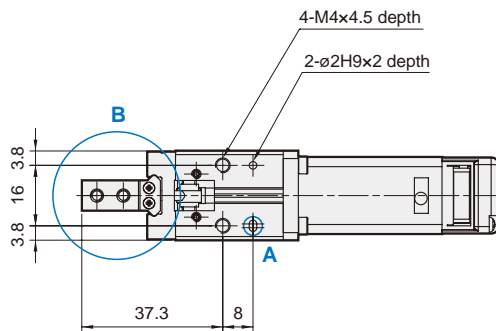
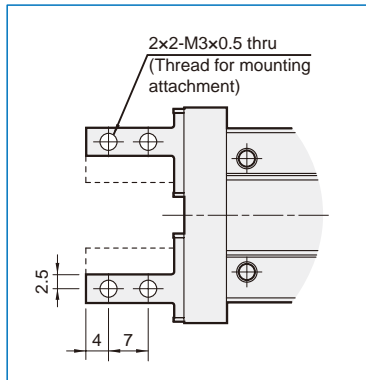
Since actual load 20N is less than allowable load 54.4 N, the gripper can be used.

MEHC2 Dimensions $\varnothing 16$

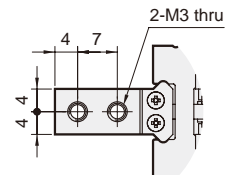
ELECTRIC GRIPPER (WITH MOTOR)



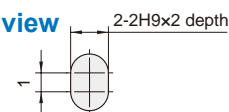
1: Standard type with side tapping



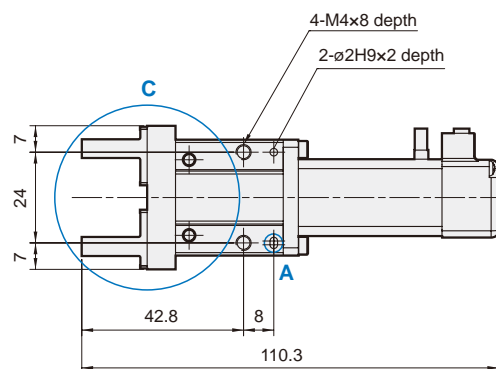
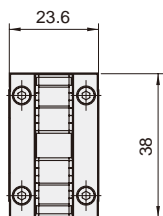
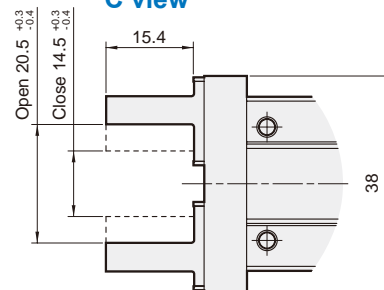
B view



A view

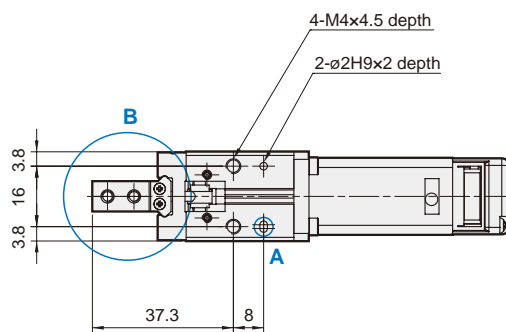
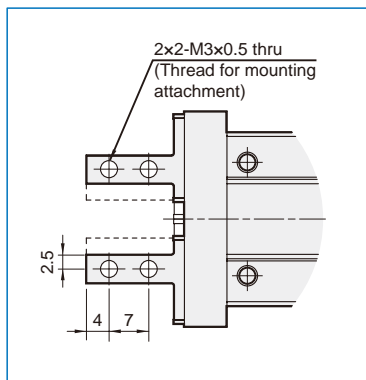


C view

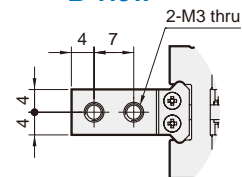


N Narrow type

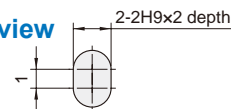
N1: Narrow type with side tapping



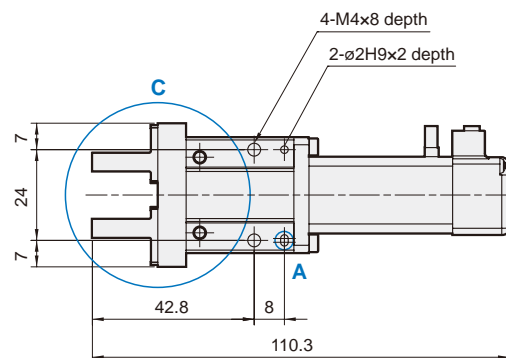
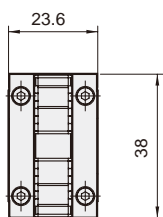
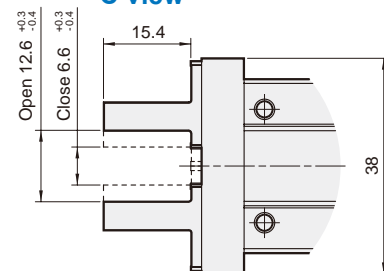
B view



A view



C view

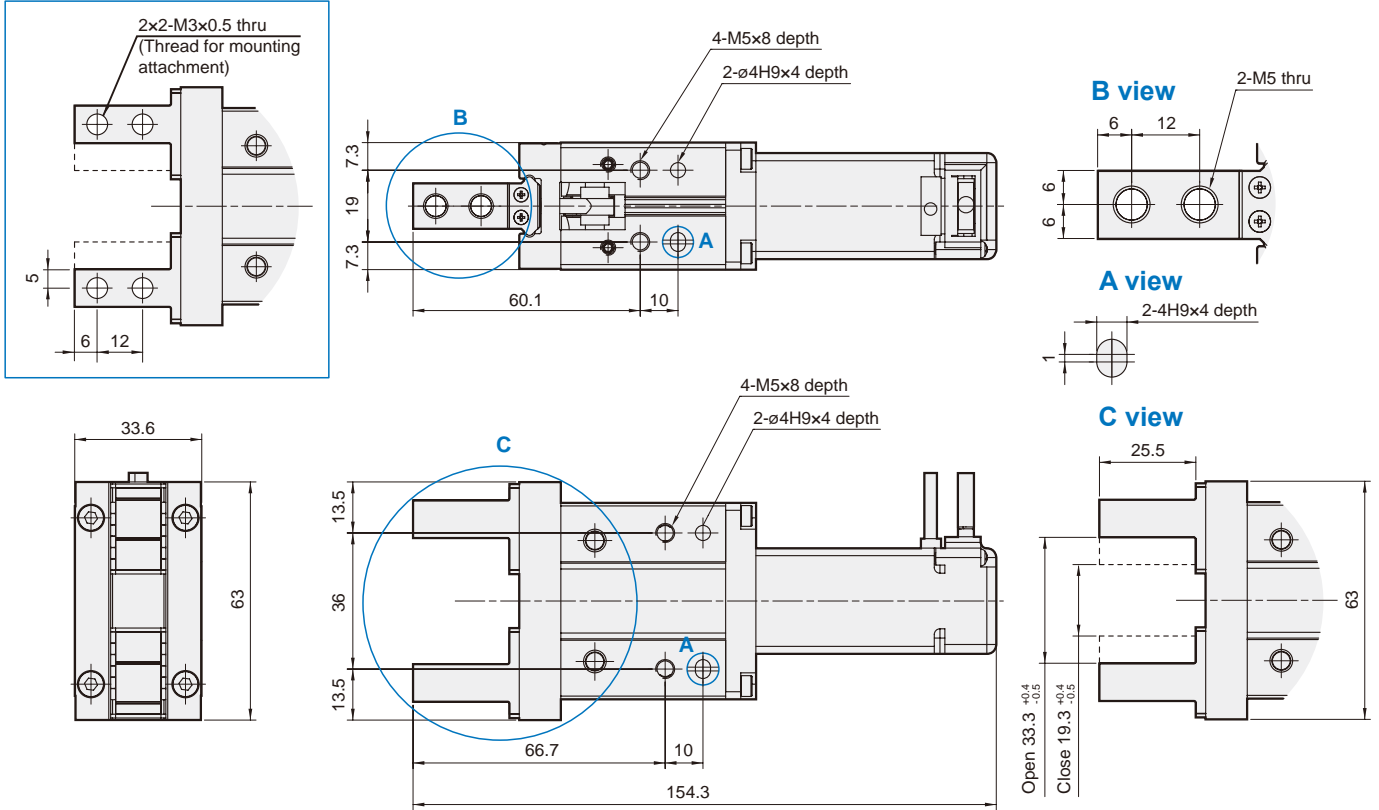


MEHC2 Dimensions $\varnothing 25$

ELECTRIC GRIPPER (WITH MOTOR)

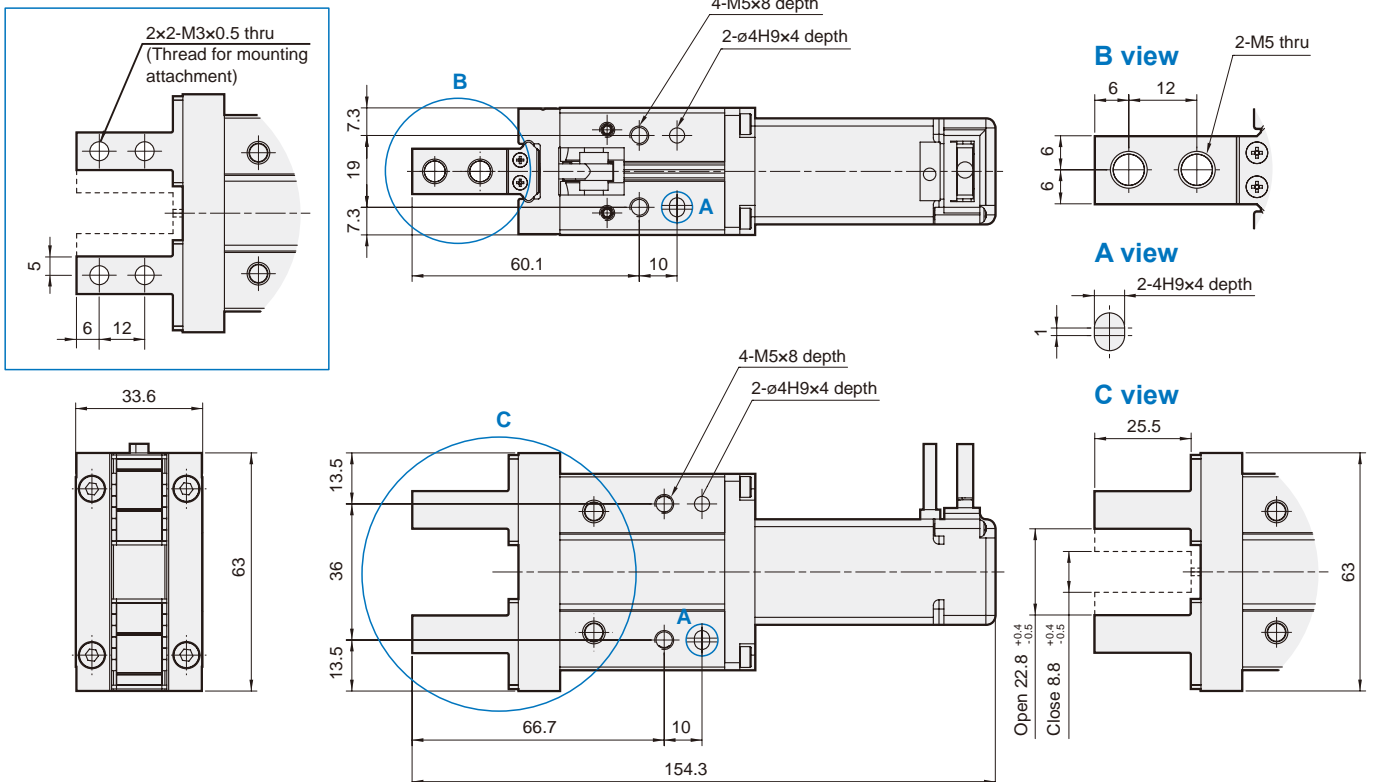


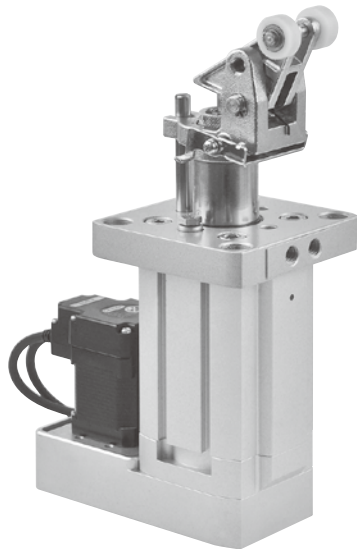
1: Standard type with side tapping



N Narrow type

N1: Narrow type with side tapping





Motor type Step motor

Transmission Trapezoidal screw + belt

Feature

- Patented lever-lock mechanism.
- Proximity sensors are available.
- Magnetic as standard.
- Adjustable shock absorbers provide good capacity for different applications.

Specification

| Model | MESBE |
|----------------------------------|-------------------------------------|
| Size | 50 |
| Stroke (mm) | 30 |
| Repeatability (mm) | ±0.1 |
| Ball screw lead (mm) | 1.5 |
| Ascend / descend time (s) | 1 |
| Max. operating frequency (c.p.m) | 5.5 |
| Ambient temperature | 0~+55°C (No freezing) |
| Ambient humidity (RH) | 35~85% (No condensation) |
| Motor size | □42 |
| Encoder | Incremental encoder (4000PPR) |
| Rated voltage | DC 24V±10% |
| Cushion | Adjustable shock absorber |
| Sensor switch | RDVE(V) (Please refer to page 5-11) |
| Weight (g) | 2000 |

Order example

MESBE - 50 - 30 - L - S - CQ1 03 N 01

| Model | Size | Stroke | Lever Lock | Roller Material | Controller | I/O type | I/O cable length |
|-------|------|-------------|-------------------------------|------------------|------------|----------|--------------------|
| MESBE | 50 | 30 30 mm | - Without L Lock mechanism | - POM S Steel | CQ1 MECQ1 | N NPN | 01 1.5 m 03 3 m |

* Please refer to page 4-106.

| Actuator cable length | |
|-----------------------|-------|
| 01 | 1.5 m |
| 03 | 3 m |
| 05 | 5 m |

* Standard: 1.5 m

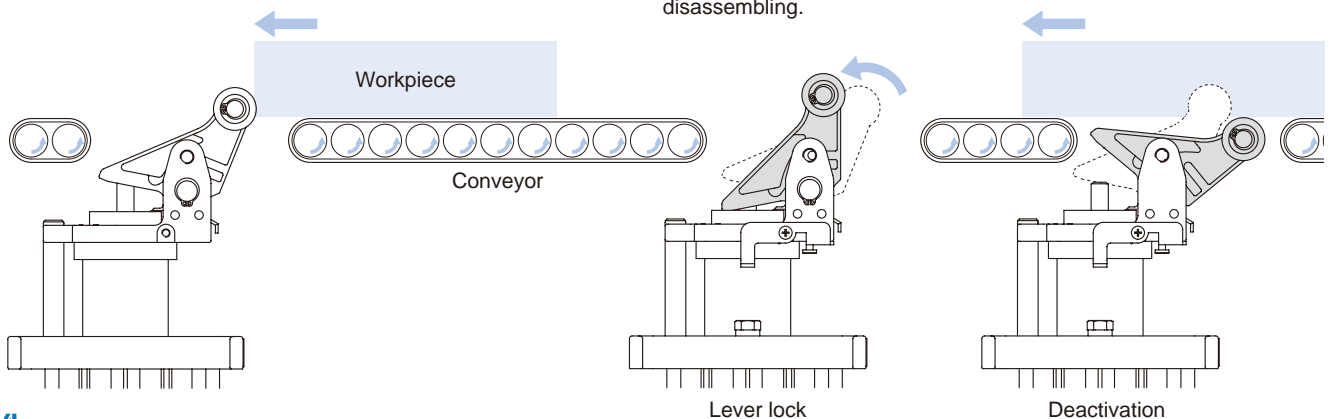
Intended use

Stopping transferred workpiece.

Lock & Deactivation mechanism

Lock mechanism prevents the light-weight workpiece from moving back by the force of shock absorber after damping.

Deactivation mechanism can deactivate the cylinder without any disassembling.



Stop roller (x2)

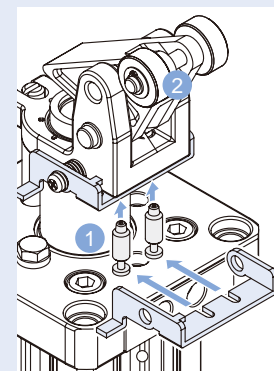
Roller toggle lever

(Optional)
Lock mechanism

For activating / deactivating lever position locking mechanism.

For $\varnothing 50$, two pins for lever lock and deactivation mechanism are delivered for every L type MESBE.

The pin for lever lock function is installed before delivery. The other pin is attached in the package. Please see the assembling guide below for installing.



- 1 Lever-lock function
- 2 Free-pass function

Thread (x2)

For inductive proximity sensor.

Guide rod

For protection against rotation.

Knurled cap

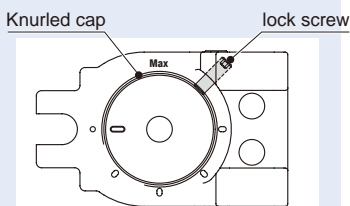
Step 1

Turn knurled cap until the desired cushioning is reached.

- Max mark: Cushion becomes harder.
- 0 mark: Cushion becomes softer.

Step 2

Tighten lock screw.
Tightening torque: 2 N.m



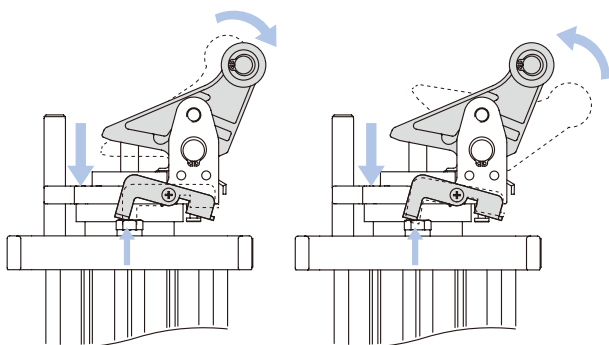
Through hole (x4)

For mounting.

Sensor switch groove (x4)

1 Unlock bolt (Accessories)

The locking / deactivation mechanism of MESBE*-L* can be unlocked/reactivated by return the piston rod.



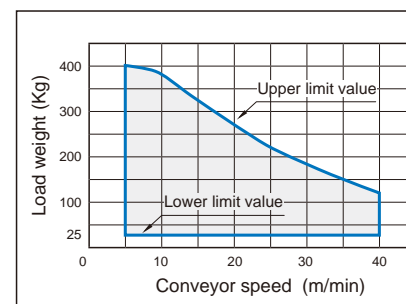
Unlocking locked lever

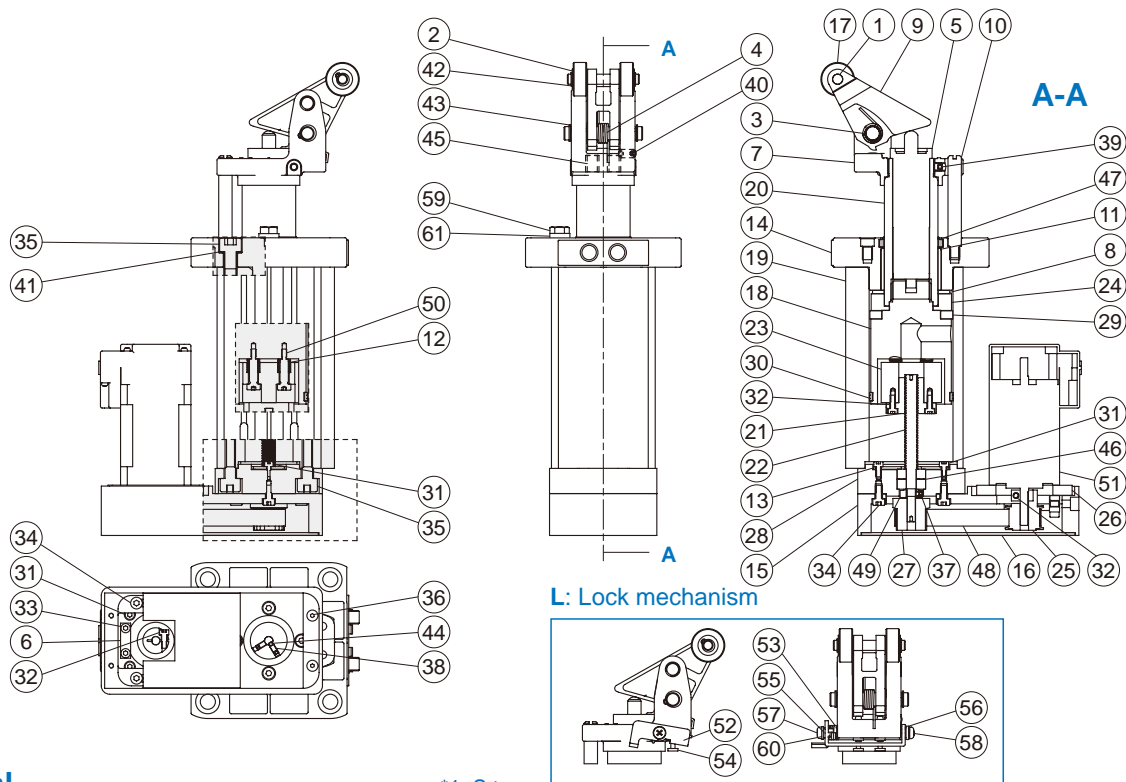
Unlocking free-pass

Load-speed chart for conveyor transmission

The chart is applied with the situation of friction coefficient $\mu = 0.1$

$\varnothing 50-30$



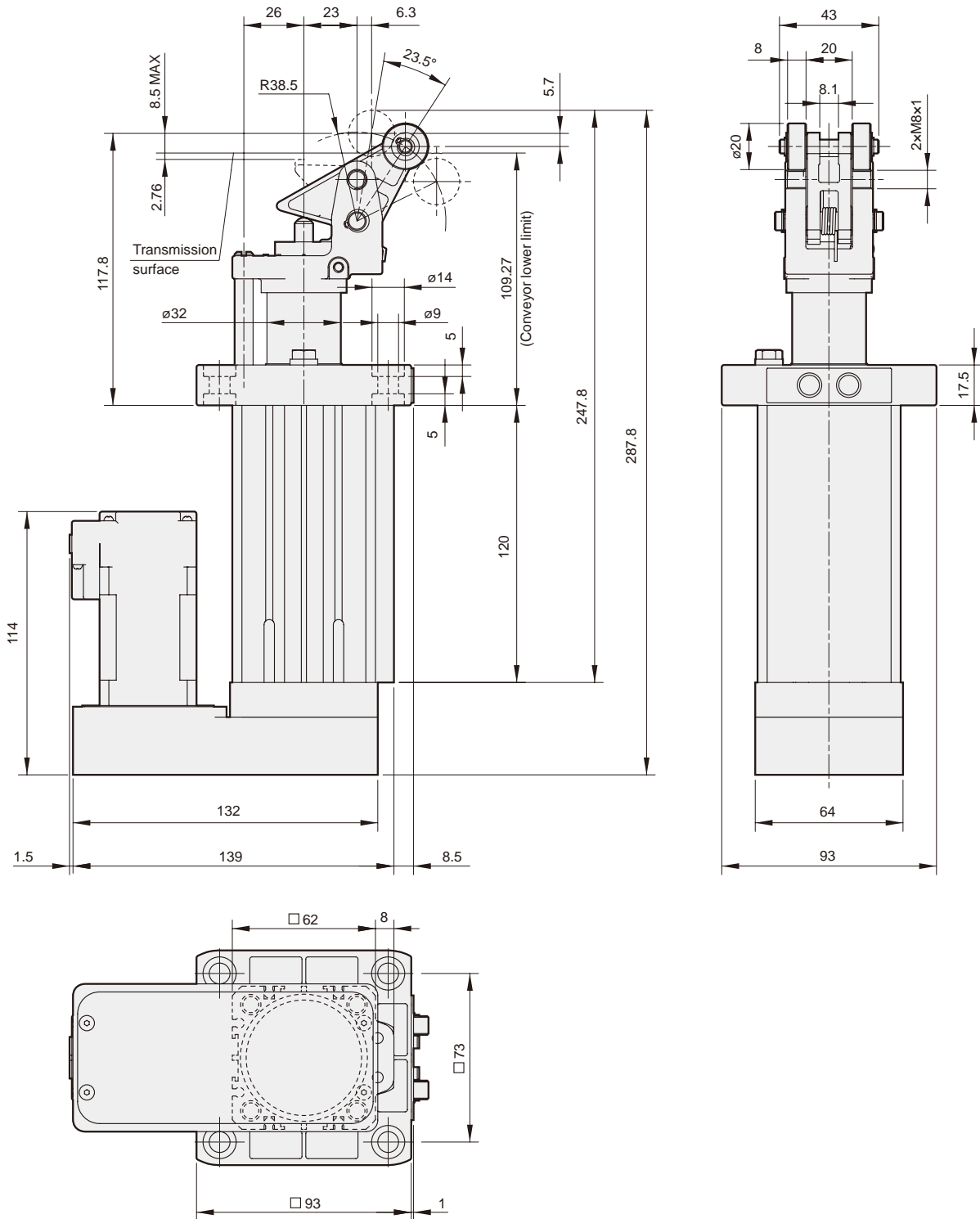


Material

*1. S type.

| No. | Part name | Material | Q'y |
|-----|-----------------------|----------------|-----|
| 1 | Roller pin | Steel | 1 |
| 2 | Roller Washer | Steel | 2 |
| 3 | Lever Pin | Steel | 1 |
| 4 | Lever spring | Steel | 1 |
| 5 | Adjustable absorber | - | 1 |
| 6 | Adjustment Block | Aluminum alloy | 1 |
| 7 | Lever holder | Steel | 1 |
| 8 | Cushion pad | NBR | 1 |
| 9 | Lever | Steel | 1 |
| 10 | Guide rod | Steel | 1 |
| 11 | Bush | Resin | 1 |
| 12 | Spring | Steel | 4 |
| 13 | Bearing cap | Steel | 1 |
| 14 | Cover | Aluminum alloy | 1 |
| 15 | Motor connector | Aluminum alloy | 1 |
| 16 | Cover | Aluminum alloy | 1 |
| 17 | Roller | Alloy steel *1 | 2 |
| | | Resin | 2 |
| 18 | Piston | Aluminum alloy | 1 |
| 19 | Housing | Aluminum alloy | 1 |
| 20 | Piston rod | Steel | 1 |
| 21 | ACME Screw (with nut) | Copper alloy | 1 |
| 22 | | Steel | 1 |
| 23 | Piston connector | Aluminum alloy | 1 |
| 24 | Magnet holder | Aluminum alloy | 1 |
| 25 | Driving wheel | Aluminum alloy | 1 |
| 26 | Motor holder | Aluminum alloy | 1 |
| 27 | Driven wheel | Aluminum alloy | 1 |
| 28 | Housing holder | Aluminum alloy | 1 |
| 29 | Magnet ring | Magnet | 1 |
| 30 | Wear ring | Resin | 1 |

| No. | Part name | Material | Q'y |
|-----|---------------------|-----------------|-----|
| 31 | | Stainless steel | 8 |
| 32 | | Steel | 5 |
| 33 | Hexagon bolt | Stainless steel | 2 |
| 34 | | Stainless steel | 8 |
| 35 | | Stainless steel | 8 |
| 36 | Screw | Stainless steel | 4 |
| 37 | Screw | Stainless steel | 2 |
| 38 | | Stainless steel | 2 |
| 39 | Screw | Steel | 1 |
| 40 | | Steel | 1 |
| 41 | Spring washer | Steel | 4 |
| 42 | Stop ring | Steel | 2 |
| 43 | | Steel | 2 |
| 44 | Feather key | Steel | 1 |
| 45 | Rod bush | Resin | 2 |
| 46 | Ball bearing | Steel | 2 |
| 47 | Dust-proof seal | NBR | 1 |
| 48 | Timing belt | Resin | 1 |
| 49 | Screw | Steel | 1 |
| 50 | Screw | Steel | 4 |
| 51 | Step motor | - | 1 |
| 52 | Lever lock | Steel | 1 |
| 53 | Spring | Steel | 1 |
| 54 | Locating pin | Steel | 2 |
| 55 | Collar | Steel | 1 |
| 56 | Collar #2 | Steel | 1 |
| 57 | Screw | Steel | 1 |
| 58 | Screw (with washer) | Steel | 1 |
| 59 | Screw | Steel | 1 |
| 60 | Spring washer | Steel | 1 |
| 61 | Flat washer | Steel | 1 |





Specification

| Model | MECQ1 | |
|---------------------|---|---------------|
| Input voltage | DC 24V ±10% | |
| Number of axis | Control 16 axes by daisy-chaining through RS-485 port | |
| Dimension (mm) | W134 × H83 × D26.5 | |
| Motor size | □20 / □28 / □35 / □42 / □56 | |
| Encoder | Incremental A/B/Z (4000PPR) | |
| Operation mode | I/O trigger, Communication control | |
| Motion control mode | ABS mode | |
| | INC mode | |
| | Continuous mode | |
| | Push mode | |
| Position | Number of rows | 256 |
| | Rows setting | I/O, Software |

*1. When the driver is under default resolution 4000:
 The pulse of MEHC2-16 is ± 9600 max.
 The pulse of MEHC2-25 is ± 18900 max.
 *2. Please use "Push motion" to grip.

Order example

MECQ1 – 20L

Controller

Motor size

| | |
|-----|-----|
| 20L | □20 |
| 28L | □28 |
| 35L | □35 |
| 42L | □42 |
| 56L | □56 |

Accessories

MECQ1 – S015

Controller

Cable length

I/O signal cable

| | |
|------|-------|
| S015 | 1.5 m |
| S03 | 3 m |

Actuator cable*

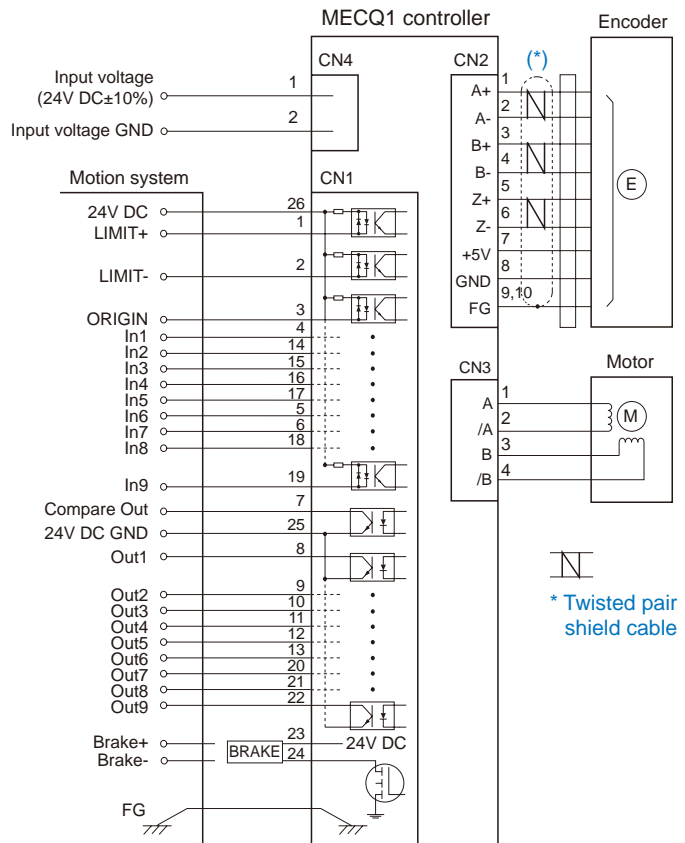
| | |
|------|-------|
| M015 | 1.5 m |
| M03 | 3 m |
| M05 | 5 m |

Power connection

P

* Actuator cable = Encoder cable + motor cable

External wiring diagram

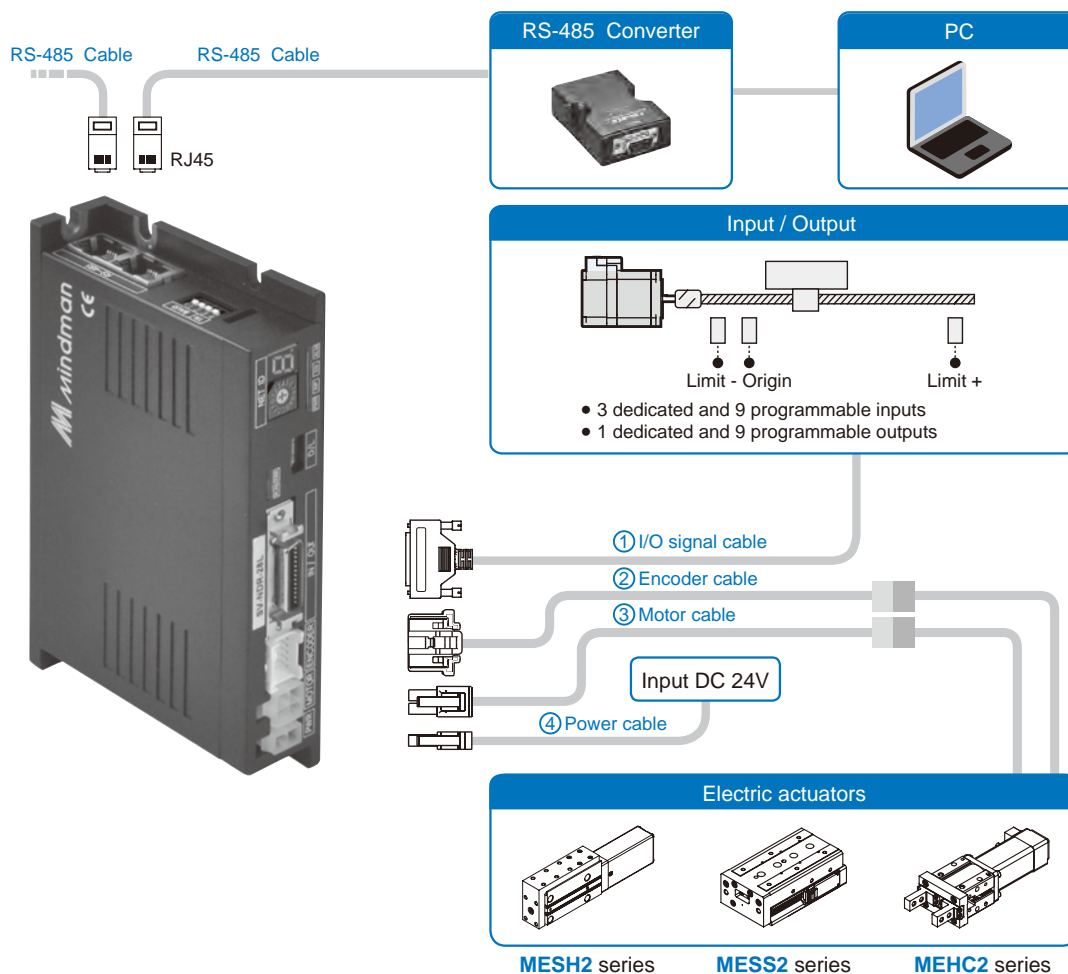


Caution

- Please refer to the manual when connects motor extension cable.
- Careful connection will be required to protect any damages.

MECQ1 Motor controller – System configuration

ELECTRIC CYLINDER CONTROLLER



Accessories

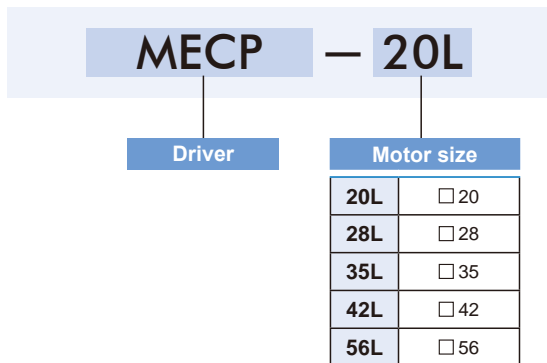
| No. | Purpose | Item | Note | Exterior | | |
|-----|------------------|----------------|----------------|---------------------------|----------------------|--|
| ① | I/O signal cable | Shell | 10326-52FO-008 | Isolation | | |
| | | Connector | 10126-3000PE | | | |
| ② | Encoder cable | Drive side | Housing | 51353-1000 | Isolation + Flexible | |
| | | Terminal | 56134-9000 | | | |
| | Encoder side | Housing | SMP-09V-NC | | | |
| | Terminal | SHF-001T-0.8BS | | | | |
| ③ | Motor cable | Drive side | Housing | 5557-04R | Flexible | |
| | | Terminal | 5556T | | | |
| | Motor side | Housing | 5557-04R | | | |
| | Terminal | 5556T | | | | |
| ④ | Power connection | Housing | 5557-02R | Housing and terminal only | | |
| | | Terminal | 5556T | | | |



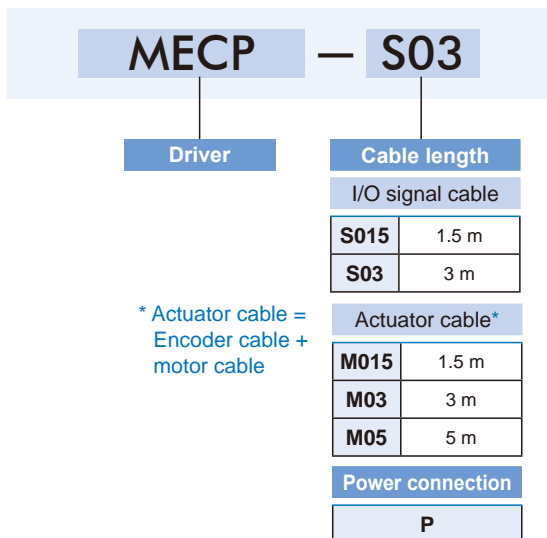
Specification

| Model | MECP | |
|----------------|-----------------------------|---|
| Input voltage | DC 24V ±10% | |
| Dimension (mm) | W115.5 × H66 × D25.3 | |
| Motor size | □20 / □28 / □35 / □42 / □56 | |
| Encoder | Incremental A/B/Z (4000PPR) | |
| Operation mode | Pulse control | |
| Functions | Resolution (P/R) | 500~50000(Selectable by DIP switch) * Default: 4000 |
| | LED display | Power status, In-position status, Enable status, Alarm status |
| | Max frequency | 500KHz (Duty 50%) |
| I/O Singal | Input singal | Position command pulse, Enable, Alarm reset (Photocoupler input) |
| | Output singal | In-position, Alarm (Photocoupler output), Brake |

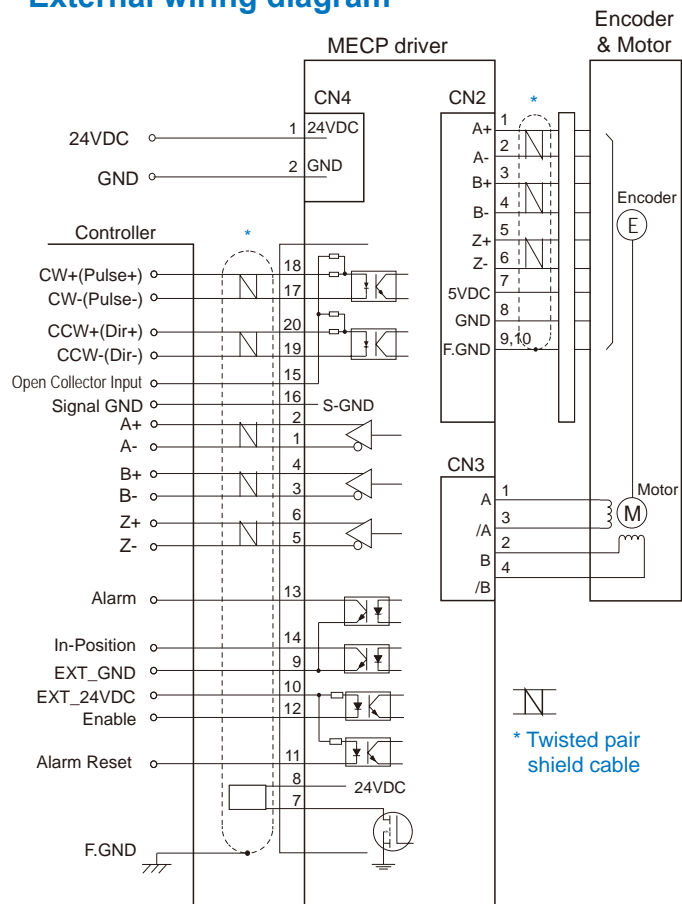
Order example



Accessories

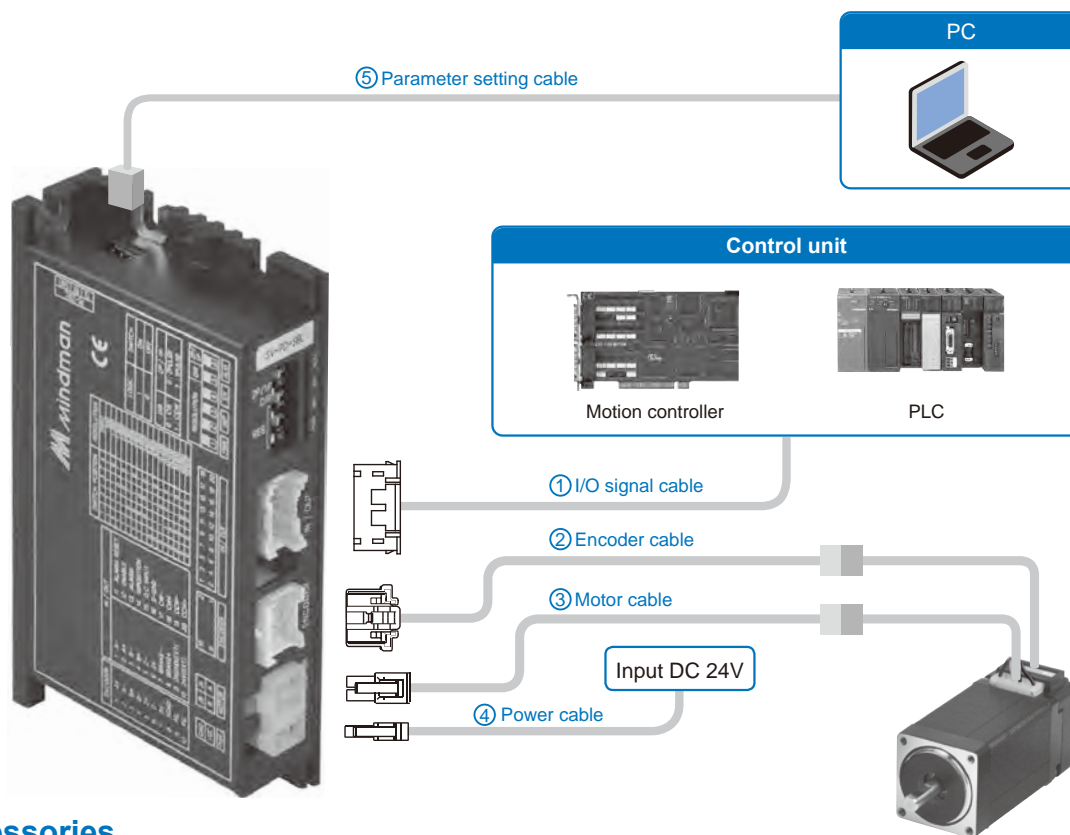


External wiring diagram

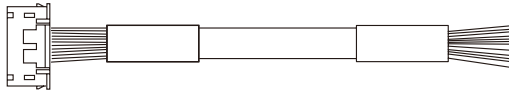
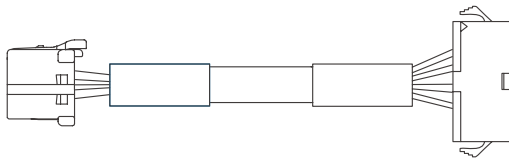
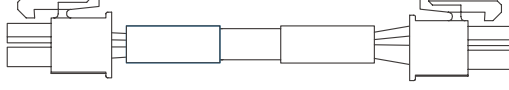
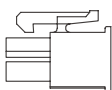



Caution

- Please refer to the manual when connects motor extension cable.
- Careful connection will be required to protect any damages.
- * When connects I/O cable between controller and drive, please turn off the power of both controller and drive, in order to protect the drive from any damage.

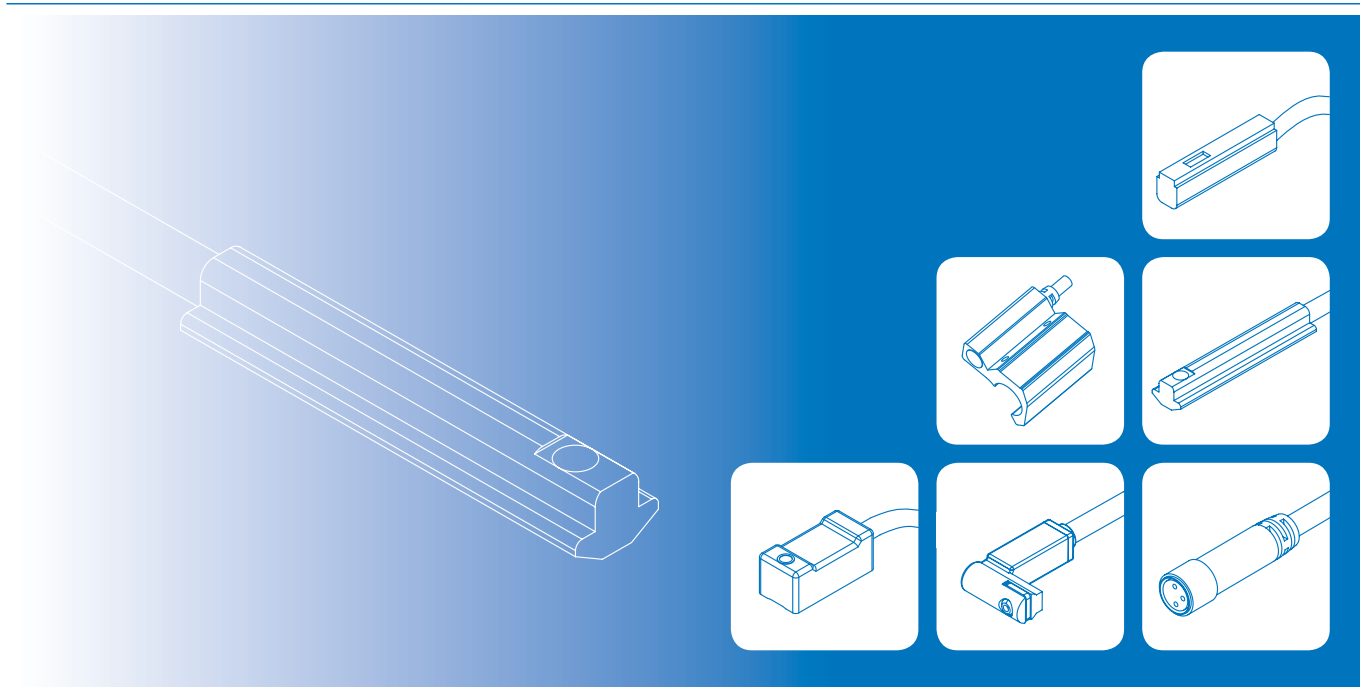


Accessories

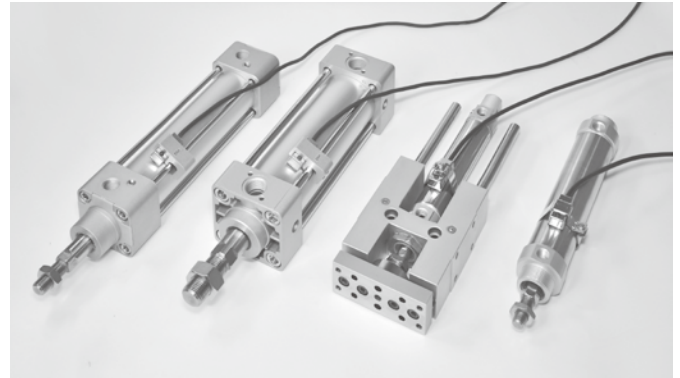
| No. | Purpose | Item | | Note | Exterior | |
|-----|-------------------------|--------------|----------------|---------------------------|---|--|
| ① | I/O signal cable | Housing | PADP-20V-1-S | Isolation |  | |
| | | Terminal | SPH-002T-P0.5L | | | |
| ② | Encoder cable | Drive side | Housing | 51353-1000 | Isolation + Flexible |  |
| | | | Terminal | 56134-9000 | | |
| | | Encoder side | Housing | SMP-09V-NC | | |
| | | | Terminal | SHF-001T-0.8BS | | |
| ③ | Motor cable | Drive side | Housing | 5557-04R | Flexible |  |
| | | | Terminal | 5556T | | |
| | | Motor side | Housing | 5557-04R | | |
| | | | Terminal | 5556T | | |
| ④ | Power connection | Housing | 5557-02R | Housing and terminal only |  | |
| | | Terminal | 5556T | | | |
| ⑤ | Parameter setting cable | Housing | 5264-03 | Housing and terminal only |  | |
| | | Terminal | 5263 | | | |



AUXILIARY EQUIPMENT



| | | SENSOR SWITCH | | |
|------------------------------|-------------------------|----------------------|------|------|
| RC* | RCA..... | | 5-2 | |
| | RCB..... | | 5-4 | |
| | RCD..... | | 5-5 | |
| | RCE..... | | 5-6 | |
| | RCE1..... | | 5-7 | |
| | RCI..... | | 5-8 | |
| | RD* | RDEP..... | | 5-10 |
| | | RDFE..... | | 5-11 |
| RDGV..... | | | 5-12 | |
| RDKP..... | | | 5-13 | |
| RDP8 New | | | 5-14 | |
| RNKD / RPKD New | | | 5-15 | |
| LN* | LN01G..... | | 5-16 | |
| | LN01P..... | | 5-17 | |
| | LN32H..... | | 5-18 | |
| | LN40R..... | | 5-19 | |
| | LN65 New | | 5-20 | |
| | | CABLE WITH CONNECTOR | | |
| M8* | M83* / M84*..... | | 5-21 | |
| | M83R-F New | | 5-22 | |



Order example

* Special order is available.

RCA — □

MODEL

RCA: Reed switch
RDA: Without contact
RNA: NPN
RNAE: NPN
RPA: PNP
RPAE: PNP

WIRE LENGTH

Blank: L=2000mm
1M: L=1000mm
QD: M8, 3 Pin connector
EQD: M8, 3 Pin connector

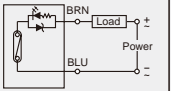
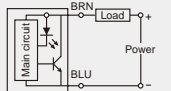
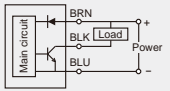

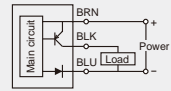

Switch holder / band

HV1

SWITCH HOLDER

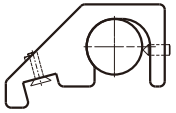
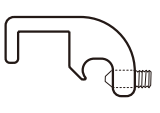
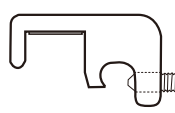
HA*: for MCQA, MCQV
HV*: for MCQA, MCQV, MCQV2, MCQV3, MCQV2L, MCBQV, MCBQV2, MCBQV3, MCQN
HS*: for MSB*-ø50
BGA*: for MCKG*
PN-A*: for MCKA
PM*: for MCQA, MCQV

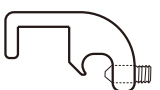
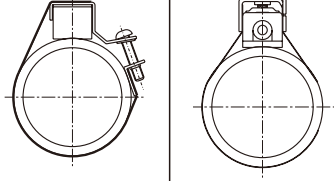
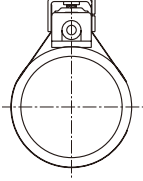
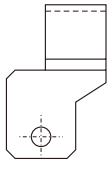
Specification

| Model | RCA | RDA | RNA | RNAE | RPA | RPAE |
|--------------------------|---|---|--|---|---|---|
| Wiring method | 2 wire | | 3 wire | | | |
| Switching logic | SPST N.O. | Solid state output, normally open | | | | |
| Switch type | Reed switch | Non-contact | NPN current sinking | | PNP current sourcing | |
| Operating voltage | 5~240V DC/AC | | 5~30V DC | | | |
| Switching current | 100mA max. | 50mA max. | 200mA max. | | | |
| Switching rating (*1) | 10W max. | 1.5W max. | 6W max. | | | |
| Current consumption | — | | 15 mA@24V DC max. | 6 mA@24V DC max. | 15 mA@24V DC max. | 6 mA@24V DC max. |
| Voltage drop | 3.5V max. | 3.7V max. | 1.5V max. | 0.5max. | 1.5V max. | 0.5max. |
| Leakage current | — | 0.1mA(40uA) max. | 0.01mA max. | | | |
| Indicator | Green LED | Red LED | | | Green LED | |
| Cable | ø4, 2C, PVC | | ø4, 3C, PVC | | | |
| Temperature range | -10~+70°C (No freezing) | | | | | |
| Shock (*2) | 30G | | 50G | | | |
| Vibration (*3) | 9G | | | | | |
| Enclosure classification | IEC 60529 IP67 | | | | | |
| Protection circuit (*4) | 1 | 3,4 | 2,3,4 | 3,4 | 2,3,4 | 3,4 |
| Weight | 46 g (2m cable) | | | | | |
| Connect diagram |  |  |  |  |  |  |

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.
 *2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.
 *3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.
 *4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression
 *5. Caution for safety please refer to page 7-8~9.

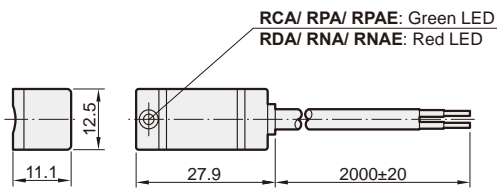
Assembling style

| Cylinder type | MCQA | | | | | MCQV2 / MCBQV2 | | | MCQV | | | MCQV3/ MCBQV3 |
|--------------------|---|--------|------|------|-----|---|-------|--------|---|------|------|------------------|
| | Hold | | | | | Hold | | | | | Hold | |
| Order | HV2 | HV4 | PM14 | PM16 | HA5 | HV1 | HV2 | HV3 | HV4 | PM16 | HA5V | HV2 |
| Cylinder tube I.D. | 40,50,63 | 80,100 | 125 | 150 | 200 | 32,40 | 50,63 | 80,100 | 125 | 160 | 200 | 63 |
| Pictures |  | | | | |  | | |  | | | |

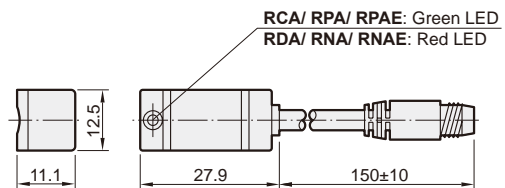
| Cylinder type | MCBQV | MCQV2L | | MCQN | | | MCKG* | | MCKA | MSB* ϕ 50 | |
|--------------------|---|--------|-----|------|-------|--------|--|-------|---|----------------|---|
| | Hold | Hold | | Hold | | | Band | | Band | Hold | |
| Order | HV4 | HV2 | HV3 | HV1 | HV2 | HV3 | BGA50 | BGA63 | PN-A40 | HS | |
| Cylinder tube I.D. | 125 | 63 | 80 | 40 | 50,63 | 80,100 | 50 | 63 | 40 | 50 | |
| Pictures |  | | | | | |  | |  | |  |

Dimension

RCA/ RDA/ RNA/ RNAE/ RPA/ RPAE

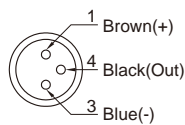
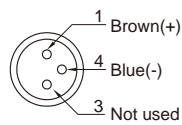
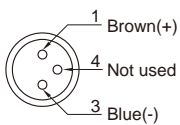


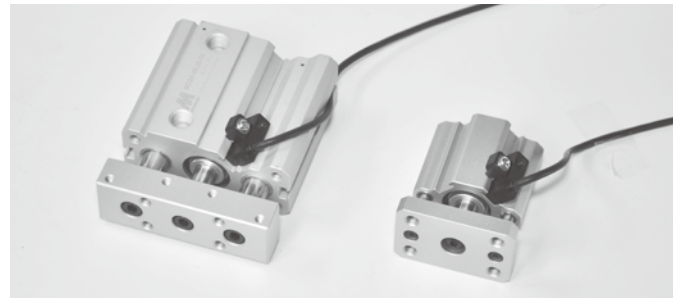
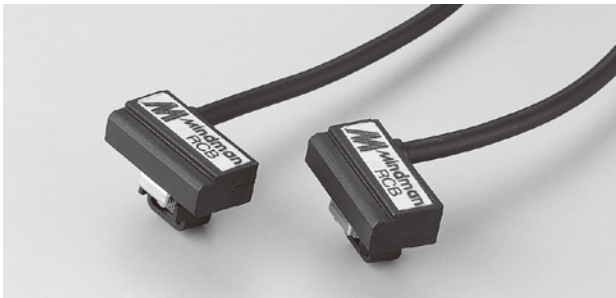
RCA-QD/ RDA-QD/ RNA-QD/ RNAE-QD/ RPA-QD/ RPAE-QD



Wiring of the QD

- 2 wire QD wiring
- 2 wire EQD wiring
- 3 wire QD wiring





Order example

RCB — □

MODEL

RCB: Reed switch
 RDB: Without contact
 RNB: NPN
 RNBE: NPN
 RPB: PNP
 RPBE: PNP

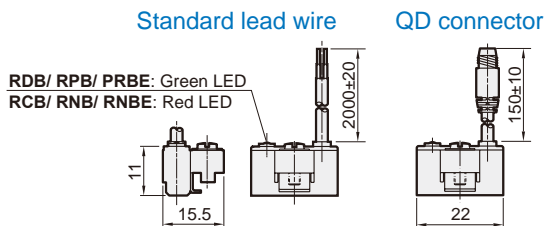
WIRE LENGTH

Blank: L=2000mm
 1M: L=1000mm
 QD: M8, 3 Pin connector
 EQD: M8, 3 Pin connector
 * Special order is available.

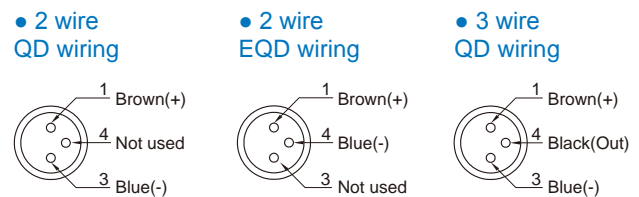
Assembling style

| Cylinder type | Mounting clamp |
|---|----------------|
| MCJA, MCJQ, MCJQ2, MCGA, MCGJ, MCG3, MCDA, MCRA, MCKB, MSB*, MSLD | |

Dimension



Wiring of the QD



Specification

| Model | RCB | RDB | RNB | RNBE | RPB | RPBE |
|--------------------------|-------------------------|------------------|-----------------------------------|------------------|----------------------|------------------|
| Wiring method | 2 wire | | 3 wire | | | |
| Switching logic | SPST normally open | | Solid state output, normally open | | | |
| Switch Type | Reed switch | Non-contact | NPN current sinking | | PNP current sourcing | |
| Operating voltage | 5~240V DC/AC | | 5~30V DC | | | |
| Switching current | 100mA max. | 50mA max. | 200mA max. | | | |
| Switching rating(*1) | 10W max. | 1.5W max. | 6W max. | | | |
| Current consumption | - | | 22 mA@24V DC max. | 6 mA@24V DC max. | 20 mA@24V DC max. | 6 mA@24V DC max. |
| Voltage drop | 3.5V max. | 3.7V max. | 0.5V max. | | | |
| Leakage current | - | 0.1mA(40uA) max. | 0.01mA max. | | | |
| Indicator | Red LED | Green LED | Red LED | | Green LED | |
| Cable | ø3.3, 2C, PVC | | ø3.3, 3C, PVC | | | |
| Temperature range | -10~+70°C (No freezing) | | | | | |
| Shock (*2) | 30G | | 50G | | | |
| Vibration (*3) | 9G | | | | | |
| Enclosure classification | IEC 60529 IP67 | | | | | |
| Protection circuit (*4) | 1 | | 3,4 | | | |
| Weight | 33 g (2m cable) | | | | | |
| Connect diagram | | | | | | |

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.
 *2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.
 *3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.
 *4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression
 *5. Caution for safety please refer to page 7-8~9.

RCD series

SENSOR SWITCH



Rotary Actuator

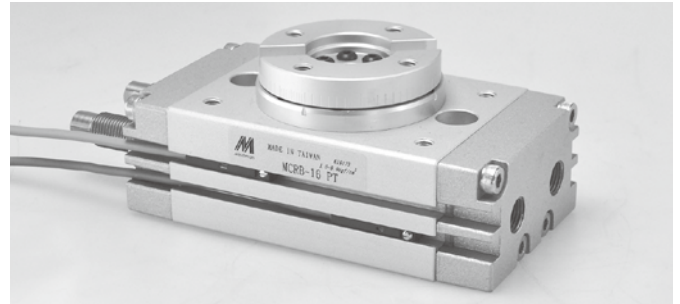
Clamp Cylinder

Gripper

Electric Actuator

Auxiliary Equipment

Hydraulic Cylinder



Order example

RCD — □

MODEL

- RCD: Reed switch
- RDD: Without contact
- RND: NPN
- RNDE: NPN
- RPD: PNP
- RPDE: PNP

WIRE LENGTH

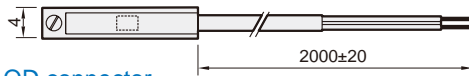
- Blank: L=2000mm
- 1M: L=1000mm
- QD: M8, 3 Pin connector
- EQD: M8, 3 Pin connector
- * Special order is available.

Assembling style

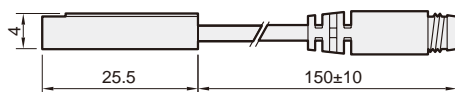
| Cylinder type | Mounting clamp |
|---------------|----------------|
| MCRPMS, MCRB | |

Dimension

Standard lead wire

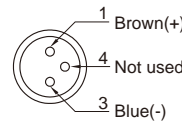


QD connector

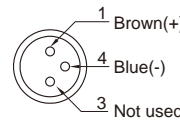


Wiring of the QD

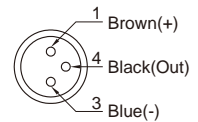
• 2 wire QD wiring



• 2 wire EQD wiring



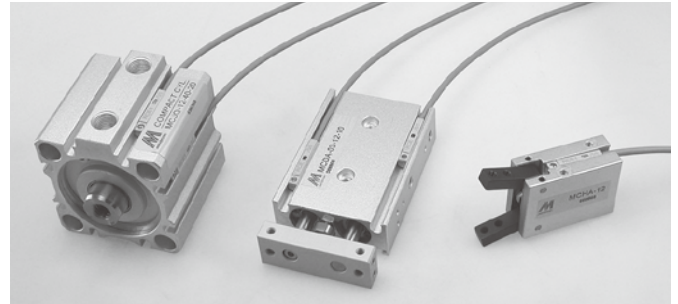
• 3 wire QD wiring



Specification

| Model | RCD | RDD | RND | RNDE | RPD | RPDE |
|--------------------------|-------------------------|-----------------|-----------------------------------|-----------------|----------------------|-----------------|
| Wiring method | 2 wire | | 3 wire | | | |
| Switching logic | SPST normally open | | Solid state output, normally open | | | |
| Switch Type | Reed switch | Non-contact | NPN current sinking | | PNP current sourcing | |
| Operating voltage | 5~120V DC/AC | | 5~30V DC | | | |
| Switching current | 100mA max. | 50mA max. | 200mA max. | | | |
| Contact rating (*1) | 10W max. | 1.5W max. | 6W max. | | | |
| Current consumption | - | | 8 mA@24V DC Max | 6 mA@24V DC Max | 8 mA@24V DC Max | 6 mA@24V DC Max |
| Voltage drop | 3.5V max. | 3.7V max. | 1V@200mA Max | 0.5V@200mA Max | 1V@200mA Max | 0.5V@200mA Max |
| Leakage current | - | 0.1mA(40uA) Max | 0.01mA Max | | | |
| Indicator | Red LED | | | Green LED | | |
| Cable | ø2.8, 2C, PUR | | ø2.8, 3C, PUR | | | |
| Temperature range | -10~+70°C (No freezing) | | | | | |
| Shock (*2) | 30G | | 50G | | | |
| Vibration (*3) | 9 G | | | | | |
| Enclosure classification | IEC 60529 IP67 | | | | | |
| Protection circuit (*4) | 1 | 3, 4 | 2, 3, 4 | 3, 4 | 2, 3, 4 | 3, 4 |
| Weight | 20 g (2m cable) | | | | | |
| Connect diagram | | | | | | |

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.
 *2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.
 *3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.
 *4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression
 *5. Caution for safety please refer to page 7-8-9.



Order example * Special order is available.

RCE — □

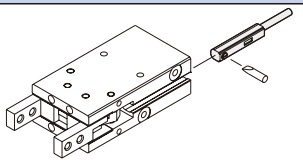
MODEL

RCE: Reed Switch
 RDE: Non-contact
 RDE-D: Non-contact, two indicators
 RNE: NPN
 RNEE: NPN
 RPE: PNP
 RPEE: PNP

WIRE LENGTH

Blank: L=2000mm
 1M: L=1000mm
 QD: M8, 3 Pin connector
 EQD: M8, 3 Pin connector

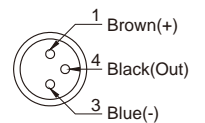
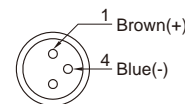
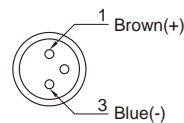
Assembling style

| Cylinder type | Mounting clamp |
|---|---|
| MCJA, MCJQ, MCKJQ, MCFA, MCGB, MCGS, MCGD, MCGJ, MCG3, MCDA, MCSH, MCSS, MCSQ, MCSF, MCRPMD, MCRA, MCKB, MCKC, MCHA, MCHB, MCHC, MSB*, MSL* |  |

* RDE not applicable to MCDA-12, MCSS-6/8, MCSQ.

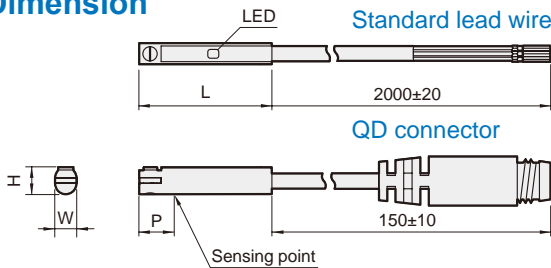
Wiring of the QD

- 2 wire QD wiring
- 2 wire EQD wiring
- 3 wire QD wiring

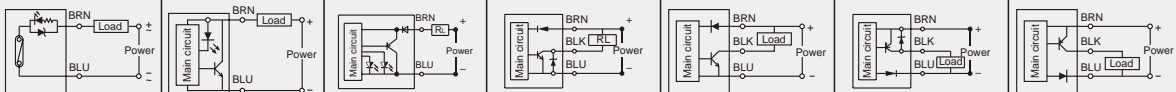


| Code Model | H | L | P | W |
|------------|------|----|----|-----|
| RCE | 5 | 24 | 12 | 4 |
| RDE, RDE-D | 5 | 24 | 6 | 4 |
| RNE, RPE | 4.65 | 22 | 6 | 4.1 |
| RNEE, RPEE | 5 | 22 | 6 | 4 |

Dimension



Specification

| Model | RCE | RDE | RDE-D | RNE | RNEE | RPE | RPEE |
|--------------------------|--|-------------|-----------|-----------------------------------|------------------|----------------------|------------------|
| Wiring method | 2 wire | | | 3 wire | | | |
| Switching logic | SPST normally open | | | Solid state output, normally open | | | |
| Switch Type | Reed switch | Non-contact | | NPN current sinking | | PNP current sourcing | |
| Operating voltage | 5~220V DC/AC | | 10~28V DC | 5~30V DC | | | |
| Switching current | 50mA max. | 50mA max. | 80mA max. | 50mA max. | 200mA max. | 50mA max. | 200mA max. |
| Switching rating(*1) | 10W max. | 1.5W max. | 2W max. | 1.5W max. | 6W max. | 1.5W max. | 6W max. |
| Current consumption | — | | | 10 mA@24V DC max. | 6 mA@24V DC max. | 12 mA@24V DC max. | 6 mA@24V DC max. |
| Voltage drop | 3.5V max. | | 4V max. | 0.5V max. | 0.5V @200mA max. | 1.5V max. | 0.5V @200mA max. |
| Leakage current | — | 0.1mA max. | 1mA max. | 0.01mA max. | | | |
| Indicator (LED) | Red | | Red/Green | Red | | Green | |
| Cable | ø2.8,2C,PUR | ø2.8,2C,PUR | | ø3, 3C, PU | | | |
| Temperature range | -10~+70°C (No freezing) | | | | | | |
| Shock (*2) | 30G | | | | | | 50G |
| Vibration (*3) | 9G | | | | | | |
| Enclosure classification | IEC 60529 IP67 | | | | | | |
| Protection circuit (*4) | 1 | 3,4 | 2,3,4 | 3,4 | | | |
| Weight | 20 g (2m cable) | | | | | | |
| Connect diagram |  | | | | | | |

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.
 *2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.
 *3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.
 *4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression
 *5. Caution for safety please refer to page 7-8~9.

RCE1 series

SENSOR SWITCH



Order example * Special order is available.

RCE1 — □

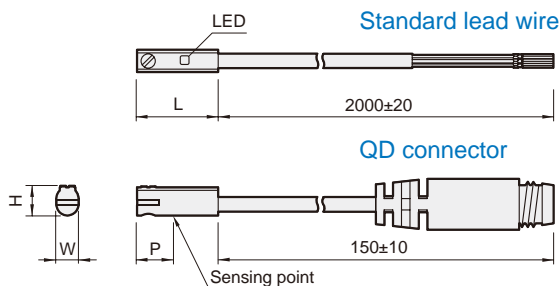
MODEL

RCE1: Reed Switch
RDE1E: Non-contact
RNE1E: NPN
RPE1E: PNP

WIRE LENGTH

Blank: L=2000mm
1M: L=1000mm
QD: M8, 3 Pin connector
EQD: M8, 3 Pin connector

Dimension



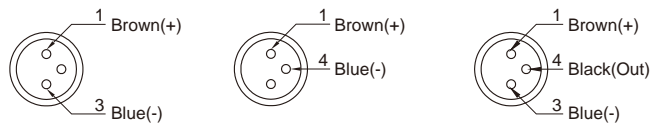
Assembling style

| Cylinder type | Mounting clamp |
|---|----------------|
| MCJA, MCJQ, MCKJQ, MCFA, MCGB, MCGS, MCGD, MCGJ, MCG3, MCDA, MCSH, MCSS, MCSQ, MCSF, MCRPMD, MCRA, MCKB, MCKC, MCHA, MCHB, MCHC, MSB*, MSL* | |

* RNE1E not applicable to MCDA-12.

Wiring of the QD

- 2 wire QD wiring
- 2 wire EQD wiring
- 3 wire QD wiring



| Code Model | H | L | P | W |
|------------|------|------|----|-----|
| RCE1 | 4.65 | 22.0 | 12 | 4.1 |
| RDE1E | 5 | 14.2 | 6 | 4 |
| RNE1E | 5 | 14.2 | 6 | 4 |
| RPE1E | 5 | 14.2 | 6 | 4 |

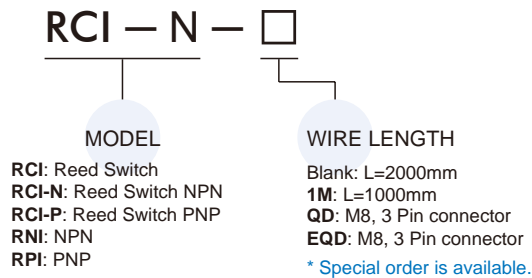
Specification

| Model | RCE1 | RDE1E | RNE1E | RPE1E |
|--------------------------|-----------------------------------|------------------|---------------------|----------------------|
| Wiring method | 2 wire | | 3 wire | |
| Switching logic | Solid state output, normally open | | | |
| Switch Type | Reed switch | Non-contact | NPN current sinking | PNP current sourcing |
| Operating voltage | 5~120V DC/AC | | 5~30V DC | |
| Switching current | 100mA max. | 50mA max. | 80mA max. | |
| Switching rating(*1) | 10W max. | 1.5W max. | 2.2W max. | |
| Current consumption | — | | 10 mA@24V DC max. | |
| Voltage drop | 3.5V max. | | 0.5V @50mA max. | |
| Leakage current | — | 0.1mA(40uA) max. | 0.01mA max. | |
| Indicator (LED) | Red | | | |
| Cable | ø2.8,2C,PU | ø2.6,2C,PVC | ø2.6,3C,PVC | |
| Temperature range | -10~+70°C (No freezing) | | | |
| Shock (*2) | 30G | 50G | | |
| Vibration (*3) | 9G | | | |
| Enclosure classification | IEC 60529 IP67 | | | |
| Protection circuit (*4) | 1 | 3,4 | | |
| Weight | 20 g (2m cable) | | | |
| Connect diagram | | | | |

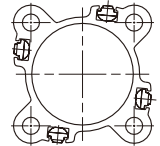
*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.
*2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.
*3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.
*4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression
*5. Caution for safety please refer to page 7-8-9.



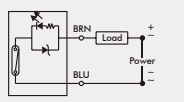
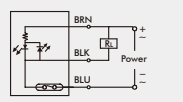
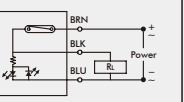
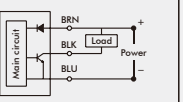
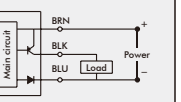
Order example



Assembling style

| Cylinder type | Mounting clamp |
|---|--|
| MCQI2, MCQI3, MCKQI2, MCBQI2, MCBQI3, MCJI, MCGI, MGTB, MGTU, MGTX, METB |  |

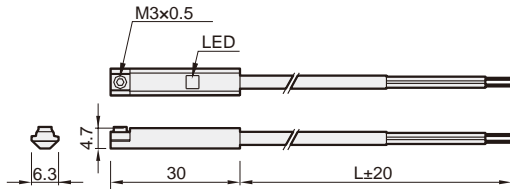
Specification

| Model | RCI | RCI-N | RCI-P | RNI | RPI |
|---------------------------|---|---|--|---|---|
| Wiring | 2 wire | 3 wire | | 3 wire | |
| Switching logic | Normal open | | | | |
| Switch Type | Reed switch | Reed switch NPN | Reed switch PNP | NPN current sinking | PNP current sourcing |
| Voltage range | 5~240V DC/AC | 10~30V DC | | 10~30V DC | |
| Current range | 100mA max. | 500mA max. | | 200mA max. | |
| Contact rating(*1) | 10W max. | | | 6W max. | |
| Current consumption | — | 5 mA@24V DC max. | | 20 mA@24V DC max. | |
| Voltage drop | 3.5V max. | 0.1V@100mA max. | | 1.5V max. | |
| Leakage current | — | — | — | 0.05mA max. | |
| Indicator | Red LED | Yellow LED | | Red LED | Yellow LED |
| Cable | ø3,2C,PUR | ø3,3C,PUR | | ø3,3C,PUR | |
| Temperature | -10~+70°C (No freezing) | | | | |
| Shock (*2) | 30G | | | 50G | |
| Vibration (*3) | 9G | | | | |
| Protection classification | IEC 60529 IP67 | | | | |
| Protection circuit (*4) | 1 | | | 2,3,4 | |
| Weight | 23 g (2m cable) | | | | |
| Connect diagram |  |  |  |  |  |

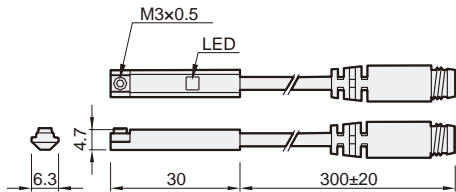
*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.
 *2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.
 *3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.
 *4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression
 *5. Caution for safety please refer to page 7-8~9.

Dimension

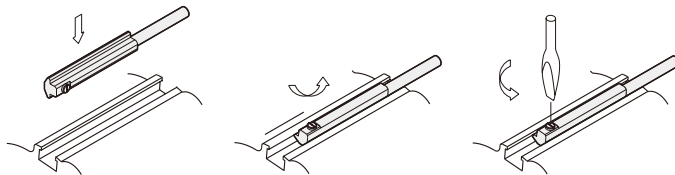
RCI-*/RNI/RPI



RCI-*-QD/RNI-QD/RPI-QD

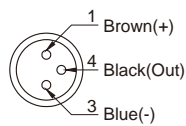
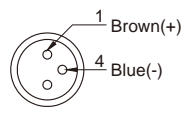
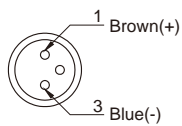


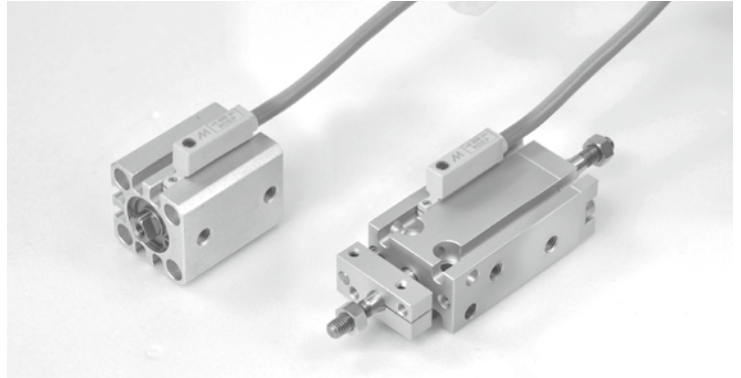
Mounting



Wiring of the QD

- 2 wire QD wiring
- 2 wire EQD wiring
- 3 wire QD wiring





Application environment

- RDEP can be applied in the strong magnetic field environment such as automotive manufacturing or areas near welding machine.
- When RDEP detects the magnetic AC field (50 or 60Hz) it will keep the status of output and will not be effected.

Order example

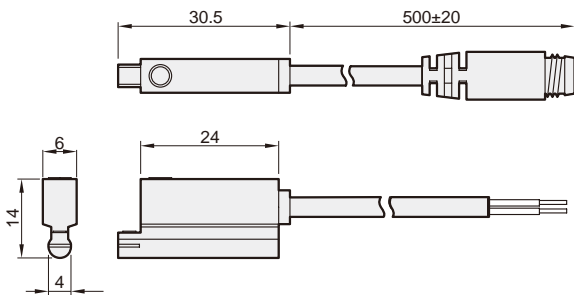
RDEP — □

MODEL

WIRE LENGTH

Blank: 3000mm
QD: M12, 4Pin connector

Dimension



Specification

| Model | RDEP |
|--------------------------|---------------------------------------|
| Wiring method | 2 wire |
| Switching logic | Solid state output, normally open |
| Switch type | Current sourcing |
| Operating voltage | 10~28V DC |
| Switching current | 5~50mA max. |
| Switching rating (*1) | 1.5W max. |
| Current consumption | — |
| Voltage drop | 5V max. |
| Leakage current | 1mA max. |
| Indicator | Unstable: Red LED ; Stable: Green LED |
| Cable | ø4.8, 2C, PVC |
| Temperature range | -10°C~+60°C (No freezing) |
| Shock (*2) | 50G |
| Vibration (*3) | 9G |
| Enclosure classification | IEC 60529 IP67 |
| Protection circuit (*4) | 3, 4 |
| Weight | 100 g (3m cable) |
| Connect diagram | |

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.

*2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.

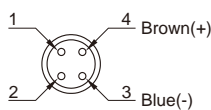
*3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.

*4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression

*5. Caution for safety please refer to page 7-8-9.

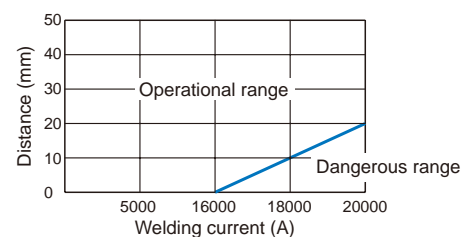
Wiring of the QD

- 2 wire



Weld-field immune

The operational distance can be 0mm between sensor and welding gun (welding conductor or cable) when the welding current less than 16000A.

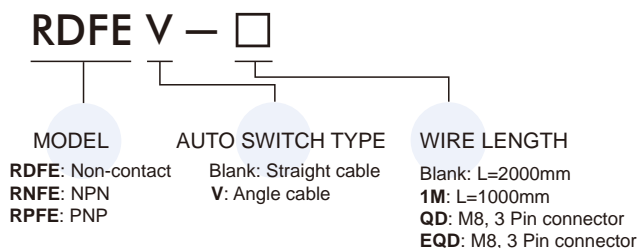


Assembling style

| Cylinder type | Mounting clamp |
|---|----------------|
| MCJA, MCJQ, MCKJQ, MCFA, MCGB, MCGS, MCGD, MCGJ, MCG3, MCDA, MCSS, MCSH, MCSQ, MCRA, MCKB, MCKC, MSB*, MSL* | |



Order example * Special order is available.



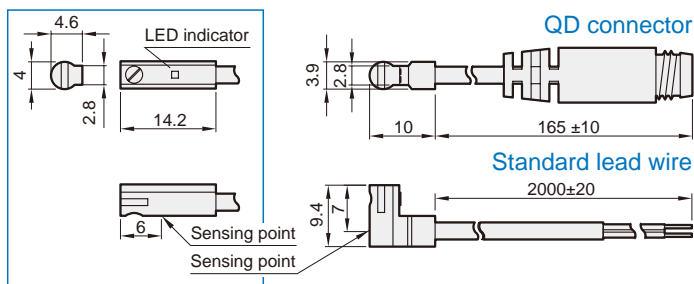
Assembling style

| Applicable model | Mounting clamp |
|--|----------------|
| MAM*, MCJU, MCFB, MCMJP, MCDJ, MSBE, MCRJ-S, MCRQ, MCRQ-S, MCHC-6, MCHD, MCHH, MCHU, MCHS, MCHX, MCHG2, MCHJ, MCHY, MEQI | |

Dimension

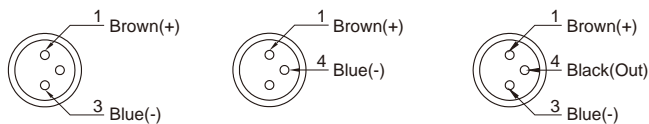
Straight cable

Angle cable



Wiring of the QD

- 2 wire QD wiring
- 2 wire EQD wiring
- 3 wire QD wiring



Specification

| Model | RDFE / RDFEV | RNFE | RNFEV | RPFE | RPFEV |
|--------------------------|---------------------------------------|---------------------|------------------|----------------------|------------------|
| Wiring method | 2 wire | 3 wire | | | |
| Switching logic | Solid state output, Normally open | | | | |
| Switch Type | Non-contact | NPN current sinking | | PNP current sourcing | |
| Operating voltage | 5~30V DC | 5~30V DC | | 5~30V DC | |
| Switching current | 50mA max. | 50mA max. | 80mA max. | 50mA max. | 80mA max. |
| Contact rating(*1) | 1.5W max. | 1.5W max. | 2.2W max. | 1.5W max. | 2.2W max. |
| Current consumption | — | 10mA @24V DC max. | 6mA @24V DC max. | 10mA @24V DC max. | 6mA @24V DC max. |
| Voltage drop | 3.5V max. | 0.5V @ 50mA max. | | | |
| Leakage current | 0.1mA(40uA) max. | 0.01mA max. | | | |
| Indicator | Red LED | | | | |
| Cable | ø2.6, 2C, PVC | ø2.6, 3C, PVC | | | |
| Operating Frequency | 1000 Hz | | | | |
| Temperature range | -10~+70°C (No freezing) | | | | |
| Shock (*2) | 50G | | | | |
| Vibration (*3) | 9G | | | | |
| Enclosure classification | IEC 60529 IP67 | | | | |
| Protection circuit (*4) | 3, 4 | | | | |
| Weight | 12.8 g (1m cable) / 23.8 g (2m cable) | | | | |
| Connect diagram | | | | | |

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.

*2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.

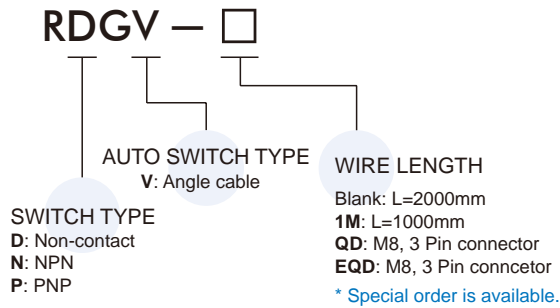
*3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.

*4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression

*5. Caution for safety please refer to page 7-8~9.



Order example

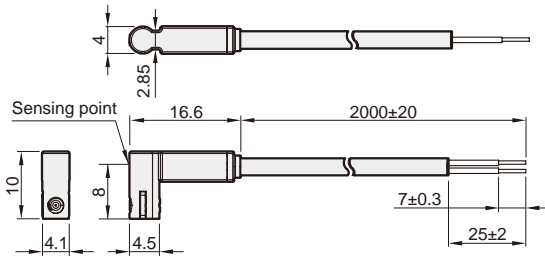


Specification

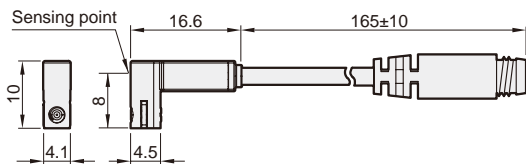
| Model | RDGV | RNGV | RPGV |
|--------------------------|-----------------------------------|---------------------|----------------------|
| Wiring method | 2 wire | 3 wire | |
| Switching logic | Solid state output, Normally open | | |
| Switch type | Non-contact | NPN current sinking | PNP current sourcing |
| Operating voltage | 10~28V DC | 5~28V DC | |
| Switching current | 4~20mA max. | 50mA max. | |
| Contact rating (*1) | 0.6W max. | 1.5W max. | |
| Current consumption | — | 10mA @24V DC max. | |
| Voltage drop | 3.5V max. | 0.5V @ 50mA max. | |
| Leakage current | 0.8mA max. | 0.01mA max. | |
| Indicator | Red LED | | |
| Cable | ∅2.6, 2C, PVC | ∅2.6, 3C, PVC | |
| Operating Frequency | 1000 Hz | | |
| Temperature range | -10°C~+70°C (No freezing) | | |
| Shock (*2) | 50G | | |
| Vibration (*3) | 9G | | |
| Enclosure classification | IEC 60529 IP67 | | |
| Protection circuit (*4) | 4 | 3, 4 | |
| Weight | 23 g (2m cable) | | |
| Connect diagram | | | |

Dimension

RDGV / RNGV / RPGV

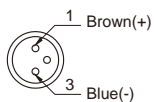


RDGV-QD / RNGV-QD / RPGV-QD

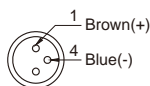


Wiring of the QD

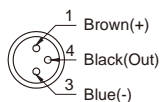
• 2 wire
QD wiring



• 2 wire
EQD wiring

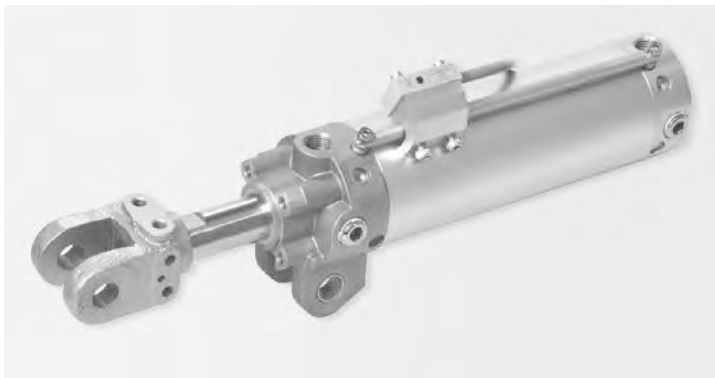


• 3 wire
QD wiring



Assembling style

| Cylinder type | Mounting clamp |
|---|----------------|
| MCJU, MCFB, MCMJP, MCGS, MCDJ, MCHJ-50 | |



Application environment

- RDKP can be applied in the strong magnetic field environment such as automotive manufacturing or areas near welding machine.
- When RDKP detects the magnetic AC field (50 or 60Hz) it will keep the status of output and will not be effected.

Order example

RDKP — □

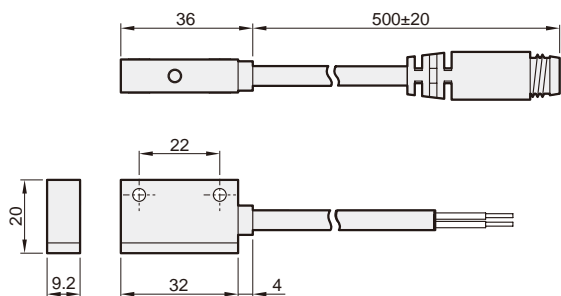
MODEL

WIRE LENGTH

Blank: 3000mm

QD: M12, 4 Pin connector

Dimension



Specification

| Model | RDKP |
|--------------------------|---------------------------------------|
| Wiring method | 2 wire |
| Switching logic | Solid state output, normally open |
| Switch type | Current sourcing |
| Operating voltage | 10~28V DC |
| Switching current | 5~50mA max. |
| Switching rating (*1) | 1.5W max. |
| Current consumption | — |
| Voltage drop | 5V max. |
| Leakage current | 1mA max. |
| Indicator | Unstable: Red LED ; Stable: Green LED |
| Cable | ø5.4, 2C, PVC |
| Temperature range | -10°C~+60°C (No freezing) |
| Shock (*2) | 30G |
| Vibration (*3) | 9G |
| Enclosure classification | IEC 60529 IP67 |
| Protection circuit (*4) | 3, 4 |
| Weight | 120 g (3m cable) |
| Connect diagram | |

*1. Warning: Never exceed rating (watt=voltage×amperage). Permanent damage to sensor will occur.

*2. Sin wave / X.Y.Z. 3 directions / 3 times each direction / 11ms each time.

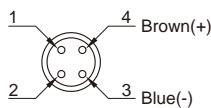
*3. Double amplitude 1.5mm / 10Hz~55Hz~10Hz(Sweep 1min) / X.Y.Z. 3 directions / 1 hour each time.

*4. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression

*5. Caution for safety please refer to page 7-8-9.

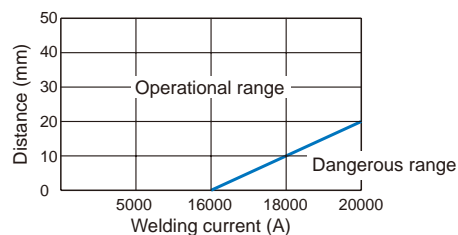
Wiring of the QD

- 2 wire



Weld-field immune

The operational distance can be 0mm between sensor and welding gun (welding conductor or cable) when the welding current less than 16000A.



Assembling style

| Cylinder type | Mounting clamp |
|---------------|----------------|
| MCKG* | |



Order example

RDP8 — N — 3M

MODEL

SWITCH TYPE

WIRE LENGTH

N: NPN
P: PNP

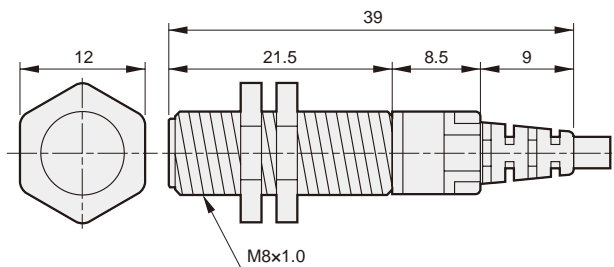
3M: 3000mm

Specification

| Model | RDP8 |
|----------------------------|--|
| Operating voltage | 10~30V DC |
| Power ripple | 20% peak to peak |
| Current consumption | 10mA max. |
| Detection distance | 1.8~2.0 mm for steel 0.4~0.6mm for aluminum |
| Hysteresis | 10% of sensing distance max. |
| Response frequency | 2.5KHz min. |
| Output type | NPN, PNP |
| Output logic | N.O. |
| Output current | 150mA max. |
| Residual voltage | 0.1V max. |
| Leakage current | 0.8mA max. |
| Protection type | Short circuit & polarity reversed protection |
| Indicator (LED) | White |
| Cable length | 3m±0.1 m |
| Cable | 3c/ø3, gray cover, oil and shaking resistance |
| Maximum voltage resistance | 2.5kv / 1 minute min. |
| Operating environment | -20°C ~ +80°C, 35% ~ 85% RH |
| Protection class | IP 67 |

* Caution for safety please refer to page 7-8-9.

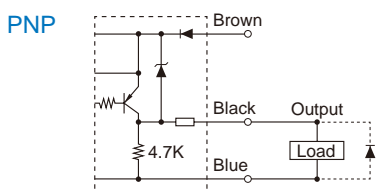
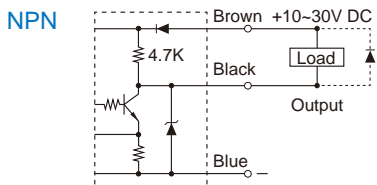
Dimension

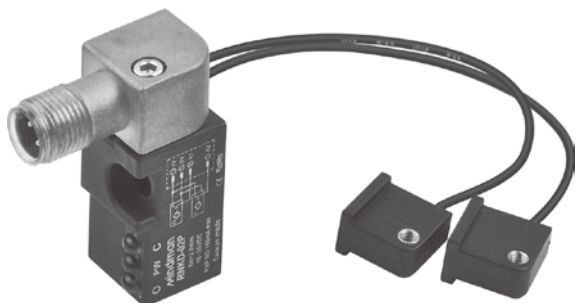


Assembling style

| Cylinder type | Mounting clamp |
|---------------|----------------|
| MCHJ, MCHS | |

Connect diagram





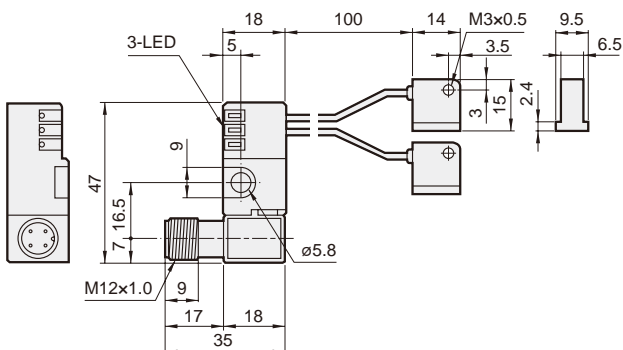
Order example

R N K D

SWITCH TYPE

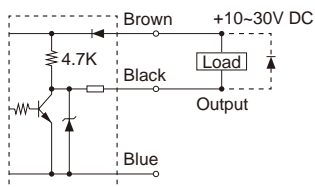
N: NPN
P: PNP

Dimension

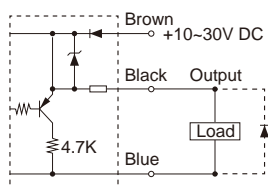


Connect diagram

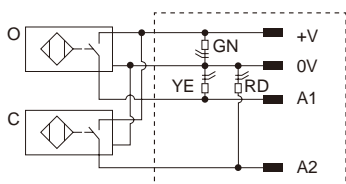
NPN



PNP



M12 Connection



Connection wires

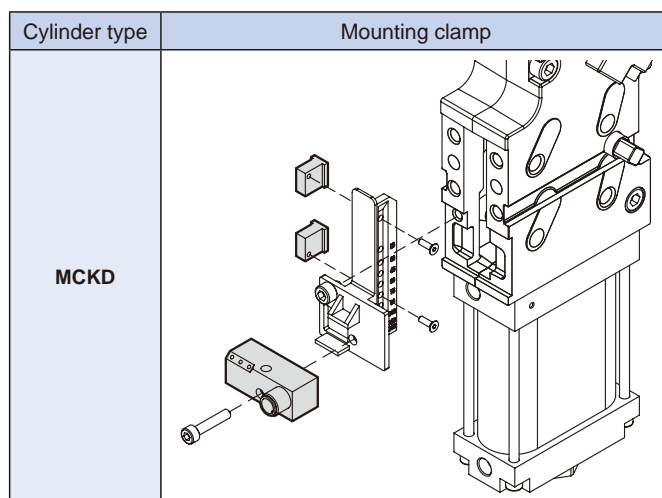
Brown: +V Blue: 0V
Black: Open White: Close

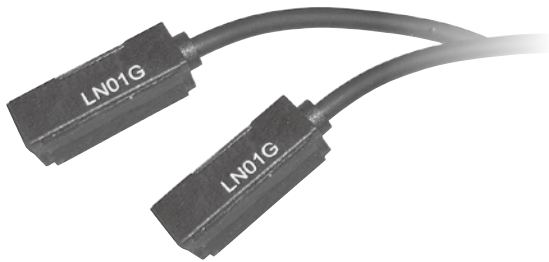
Specification

| Model | RNKD | RPKD |
|----------------------------|--|------|
| Output method | NPN | PNP |
| Voltage | 10~30V DC | |
| Current consumption | 15mA max. | |
| Output current | 150mA max. | |
| Voltage drop | 0.8V | |
| Leakage current | 0.1mA | |
| Sensing distance | 2.5mm±10% | |
| Effective sensing distance | 80% of sensing distance min. | |
| Hysteresis | 10% of sensing distance max. | |
| Thermal drift | 10µm/°C max. | |
| Accuracy | 2% of sensing distance max. | |
| Pilot LED | Power: Green, Open: Yellow, Close: Red | |
| Frequency | 100 Hz max. | |
| Protection circuit | Short circuit & polarity reversal protection | |
| Housing material | PBT | |
| Protection class | IEC 60529 IP67 | |
| Vibration resistance | 300m/s ² / (55~2000Hz)(IEC-60068-2-6) | |
| Shock resistance | 300m/s ² with 11ms (IEC-60068-2-27) | |
| EMC interference | IEC 61000-6-4 | |
| Dielectric strength | 2.5kv / 1 minute min. | |
| Insulation strength | 100 MΩ / 500V DC | |
| Operating environment | -20°C ~ +80°C, 100%RH max. (Condensation permitted) | |

* Caution for safety please refer to page 7-8-9.

Assembling style





Order example

LN01G — P — □

MODEL

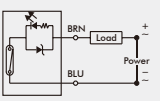
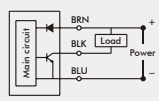
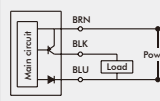


LN01G

Blank: Lead wire
QD: Connector

SWITCH TYPE
Blank: Reed switch
N: NPN
P: PNP

Specification

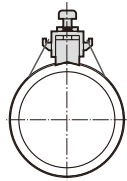
| Model | LN01G | LN01G-N | LN01G-P |
|--------------------------|---|--|--|
| Wiring method | 2 wire | 3 wire | |
| Switching logic | Normally open | Solid state output, normally open | |
| Switch Type | Reed switch | NPN current sinking | PNP current sourcing |
| Operating voltage | 5~240V DC/AC | 5~30V DC | |
| Switching current | 100mA max. | 200mA max. | |
| Switching rating(*1) | 10W max. | 6W max. | |
| Current consumption | — | OFF:7mA(24V) ON:20mA(24V) max. | |
| Voltage drop | 3V max. | 0.5V@200mA max. | |
| Indicator | Red LED | | Green LED |
| Cable | ø3.3, 2C, PVC | ø3.3, 3C, PVC | |
| Temperature range | -10~+70°C (No freezing) | | |
| Enclosure classification | IEC 60529 IP67 | | |
| Protection circuit (*2) | 1 | 3, 4 | |
| Symbol |  |  |  |

*1. Warning: Never exceed rating (watt=voltage×amperage).

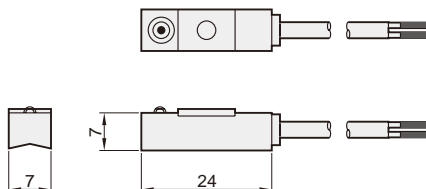
*2. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression.

*3. Caution for safety please refer to page 7-8-9.

Assembling style

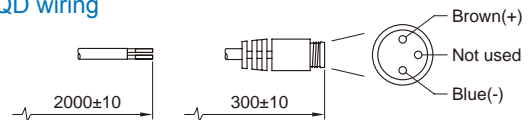
| Cylinder type | Mounting clamp |
|---------------|---|
| MDO* |  |

Dimension

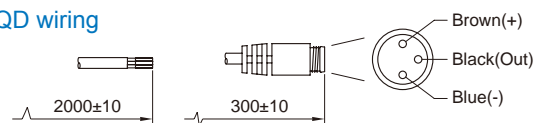


Wiring of the QD

• 2 wire QD wiring



• 3 wire QD wiring



LN01P series

SENSOR SWITCH



Order example

LN01P — AN — □

MODEL



LN01P



LN02P



LN03P

Blank: Lead wire
QD: Connector

SWITCH TYPE
Blank: Reed switch
AN: NPN
AP: PNP

Specification

| Model | LN0*P | LN0*P-AN | LN0*P-AP |
|--------------------------|-------------------------|-----------------------------------|----------------------|
| Wiring method | 2 wire | 3 wire | |
| Switching logic | Normally open | Solid state output, normally open | |
| Switch Type | Reed switch | NPN current sinking | PNP current sourcing |
| Operating voltage | 10~220V DC/AC | 5~30V DC | |
| Switching current | 100mA max. | 200mA max. | |
| Switching rating(*1) | 10W max. | 6W max. | |
| Current consumption | — | OFF:7mA(24V) ON:20mA(24V) max. | |
| Voltage drop | 3V max. | 0.5V@200mA max. | |
| Indicator | Red LED | | Green LED |
| Cable | ø3.3, 2C, PVC | ø3.3, 3C, PVC | |
| Temperature range | -10~+70°C (No freezing) | | |
| Enclosure classification | IEC 60529 IP67 | | |
| Protection circuit (*2) | 1 | 3, 4 | |
| Symbol | | | |

*1. Warning: Never exceed rating (watt=voltage×amperage).

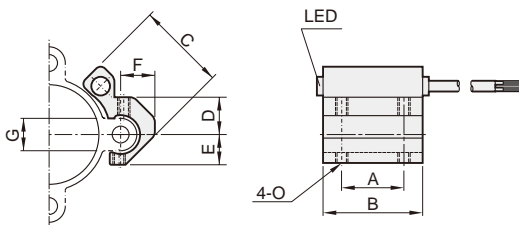
*2. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression.

*3. Caution for safety please refer to page 7-8-9.

Assembling style

| Cylinder type | MDM* | | | | | MRPH | |
|----------------|-------|-------|-------|----|-----|-------|----|
| Order | LN01P | LN02P | LN03P | 80 | 100 | LN01P | |
| Tube I.D. | 40 | 50 | 63 | 80 | 100 | 32 | 40 |
| Mounting clamp | | | | | | | |

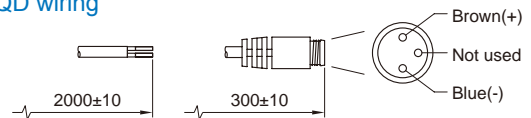
Dimension



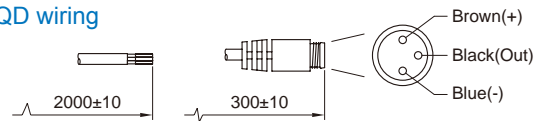
| Model | A | B | C | D | E | F | G | O |
|-------|----|----|------|----|------|----|------|----|
| LN01P | 20 | 32 | 28.5 | 12 | 9.8 | 11 | 10.5 | M4 |
| LN02P | 20 | 32 | 37.5 | 15 | 13.5 | 12 | 13.5 | M4 |
| LN03P | 20 | 32 | 56 | 18 | 15 | 14 | 17 | M4 |

Wiring of the QD

• 2 wire QD wiring



• 3 wire QD wiring





Order example

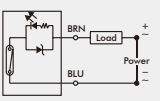
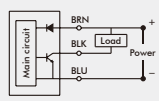
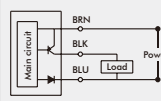
LN32H — P — □

MODEL

Blank: Lead wire
QD: Connector

SWITCH TYPE
Blank: Reed switch
N: NPN
P: PNP

Specification

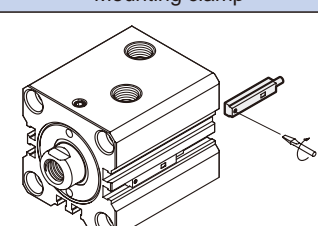
| Model | LN32H | LN32H-N | LN32H-P |
|--------------------------|---|--|--|
| Wiring method | 2 wire | 3 wire | |
| Switching logic | Normally open | Solid state output, normally open | |
| Switch Type | Reed switch | NPN current sinking | PNP current sinking |
| Operating voltage | 5~240V DC/AC | 10~30V DC | |
| Switching current | 100mA max. | 200mA max. | |
| Switching rating(*1) | 10W max. | 3W max. | |
| Current consumption | — | OFF:7mA(24V) ON:17mA(24V) max. | |
| Voltage drop | 3.5V max. | 2.0V max. | |
| Indicator | Red LED | | Yellow LED |
| Cable | ø3.3, 2C, PVC | ø3.3, 3C, PVC | |
| Temperature range | -10~+70°C (No freezing) | | |
| Enclosure classification | IEC 60529 IP67 | | |
| Protection circuit (*2) | 1 | 3, 4 | |
| Symbol |  |  |  |

*1. Warning: Never exceed rating (watt=voltage×amperage).

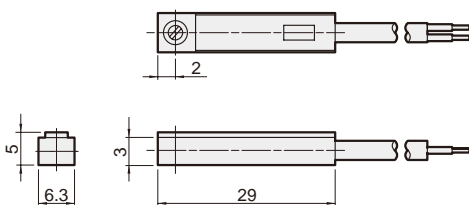
*2. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression.

*3. Caution for safety please refer to page 7-8-9.

Assembling style

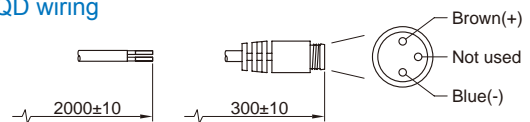
| Cylinder type | Mounting clamp |
|---------------|---|
| MHCB-M |  |

Dimension

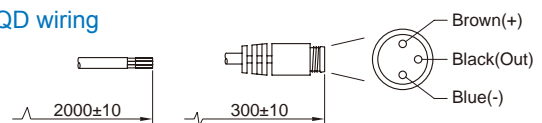


Wiring of the QD

• 2 wire QD wiring

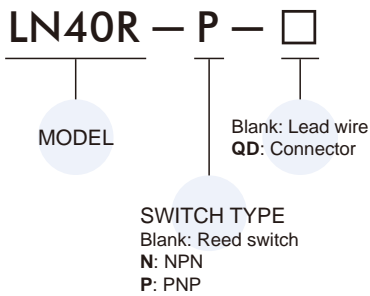


• 3 wire QD wiring

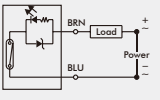
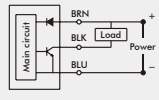
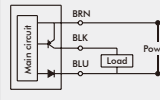




Order example



Specification

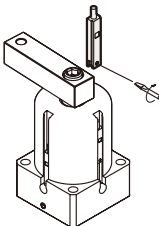
| Model | LN40R | LN40R-N | LN40R-P |
|--------------------------|---|--|--|
| Wiring method | 2 wire | 3 wire | |
| Switching logic | Normally open | Solid state output, normally open | |
| Switch Type | Reed switch | NPN current sinking | PNP current sinking |
| Operating voltage | 5~120V DC/AC | 50~30V DC | |
| Switching current | 100mA max. | 200mA max. | |
| Switching rating(*1) | 10W max. | 3W max. | |
| Current consumption | — | OFF:7mA(24V) ON:17mA(24V) max. | |
| Voltage drop | 2.5V max. | 1.5V@100mA max. | |
| Indicator | Red LED | | Yellow LED |
| Cable | ø3, 2C, PVC | ø3, 3C, PVC | |
| Temperature range | -10~+70°C (No freezing) | | |
| Enclosure classification | IEC 60529 IP67 | | |
| Protection circuit (*2) | 1 | 3, 4 | |
| Symbol |  |  |  |

*1. Warning: Never exceed rating (watt=voltage×amperage).

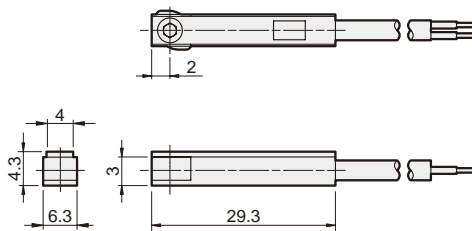
*2. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression.

*3. Caution for safety please refer to page 7-8-9.

Assembling style

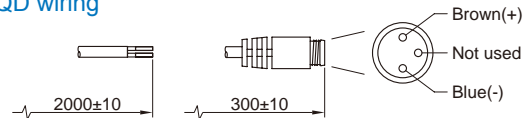
| Cylinder type | Mounting clamp |
|---------------|---|
| MTA* |  |

Dimension

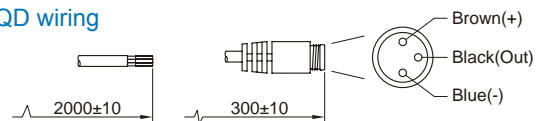


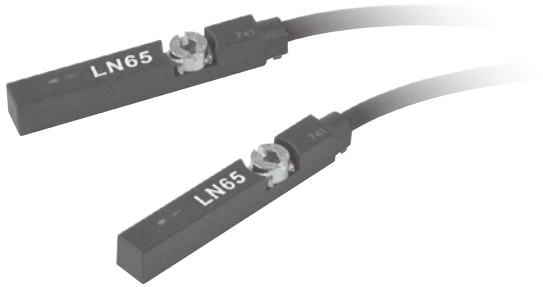
Wiring of the QD

• 2 wire QD wiring

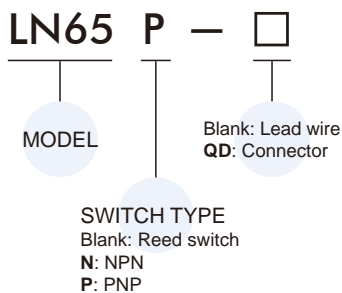


• 3 wire QD wiring





Order example



Specification

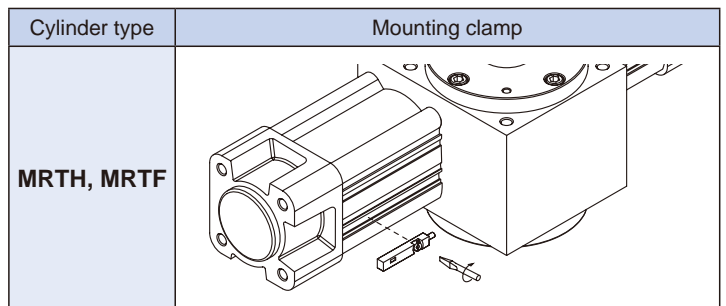
| Model | LN65 | LN65N | LN65P |
|--------------------------|-------------------------|-----------------------------------|---------------------|
| Wiring method | 2 wire | 3 wire | |
| Switching logic | Normally open | Solid state output, normally open | |
| Switch Type | Reed switch | NPN current sinking | PNP current sinking |
| Operating voltage | 5~240V DC/AC | 5~30V DC | |
| Switching current | 100mA max. | 200mA max. | |
| Switching rating(*1) | 10W max. | 6W max. | |
| Current consumption | — | OFF:7mA(24V) ON:20mA(24V) max. | |
| Voltage drop | 3.0V max. | 0.5V@200mA max. | |
| Operating frequency | < 2ms | < 1ms | |
| Indicator | Red LED | | Yellow LED |
| Cable | ø2.8, 2C, PUR | ø2.8, 3C, PUR | |
| Temperature range | -10~+70°C (No freezing) | | |
| Enclosure classification | IP67 | | |
| Protection circuit (*2) | 1 | 3, 4 | |
| Symbol | | | |

*1. Warning: Never exceed rating (watt=voltage×amperage).

*2. 1=None / 2=Short-circuit / 3=Power source reverse polarity / 4=Surge suppression.

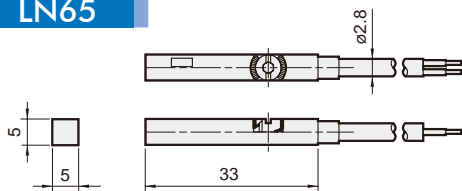
*3. Caution for safety please refer to page 7-8-9.

Assembling style



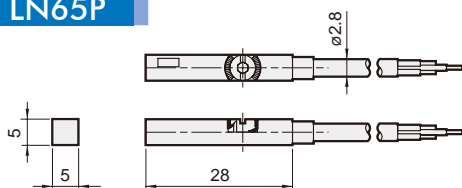
Dimension

LN65



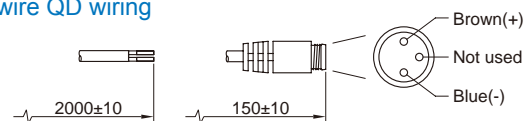
LN65N

LN65P

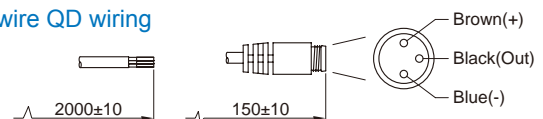


Wiring of the QD

• 2 wire QD wiring



• 3 wire QD wiring



M83*/ M84* series

CABLE WITH CONNECTOR / M8 (MALE)



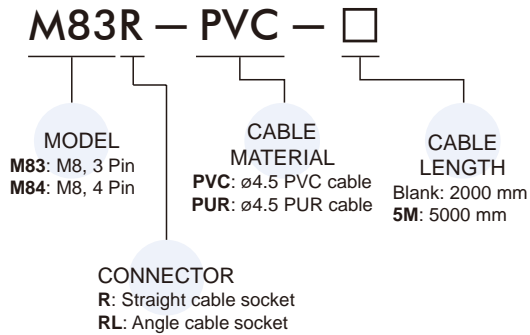
mindman



Specification

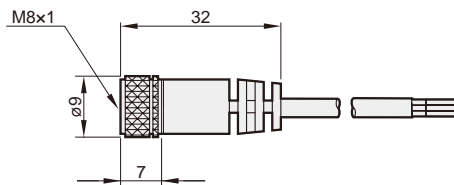
| Model | M83R / M83RL | | M84R / M84RL | |
|-------------------------|---------------------------|-----------|--------------|-----------|
| Female pin out | | | | |
| Number of contacts | 3 | | 4 | |
| Rated voltage | 60V DC/AC | | | |
| Rated current | 3A | | | |
| Contact material | Gold plated brass | | | |
| Contact bearer material | PA | | | |
| Housing material | PP | | | |
| Housing color | Black | | | |
| Cable material | ø4.5, PVC | ø4.5, PUR | ø4.5, PVC | ø4.5, PUR |
| Cable color | Gray | Black | Gray | Black |
| Temperature | -20°C~+80°C (No freezing) | | | |
| Cable conductor | 24AWG | | | |
| Protection class | IEC60529 IP 67 | | | |

Order example

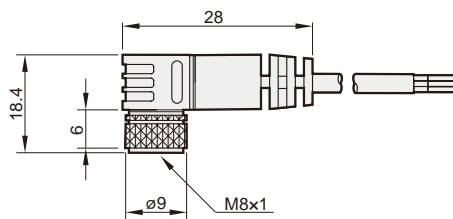


Dimension

• Straight cable socket (R)



• Angle cable socket (RL)



M83R-F series



CABLE WITH CONNECTOR / M8 (MALE) – M8 (FEMALE)

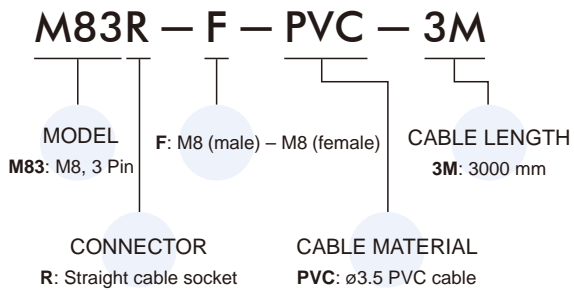
mindman



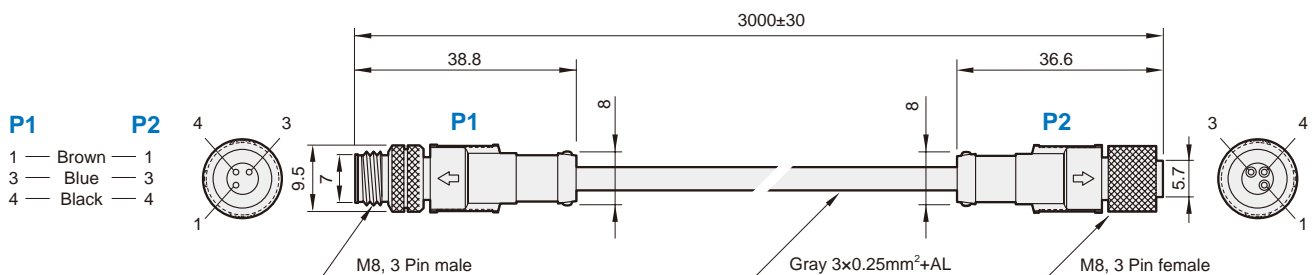
Specification

| Model | M83R-F | |
|-----------------------------|-----------------------------|---|
| Male / Female pin out | | |
| Number of contacts | 3 | 3 |
| Rated voltage | 125V DC/AC | |
| Rated current | 3A | |
| Contact material | Brass (Au plating) | |
| Contact bearer material | PVC | |
| Housing color | Gray | |
| Cable material | ø3.5, PVC | |
| Cable color | Gray | |
| Temperature | -20°C~+60°C (No freezing) | |
| Cable conductor | 0.25mm ² / 24AWG | |
| Protection class of contact | IP 67 | |

Order example



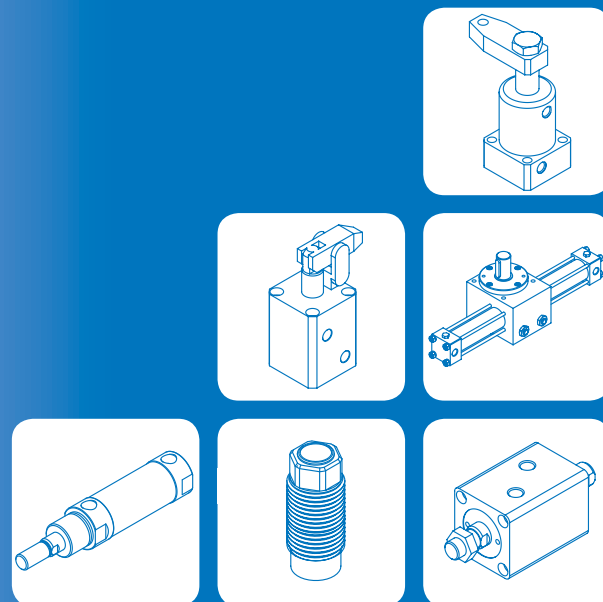
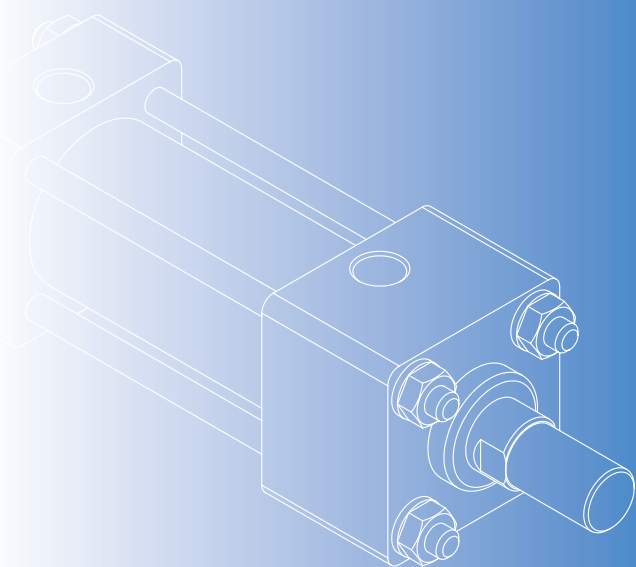
Dimension





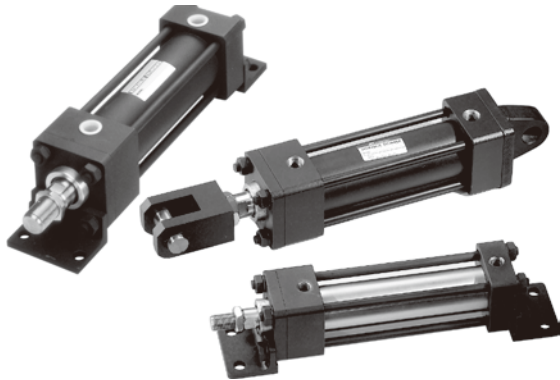


HYDRAULIC CYLINDER



| | | |
|--------------|---|------|
| | Double Acting Cylinder | |
| MDH* | MDHB / MDHD / MDHN..... | 6-2 |
| | Double Acting Cylinder-with Magnet | |
| MDM* | MDMB / MDMD / MDMN..... | 6-2 |
| | Compact Hydraulic Cylinder | |
| MHC* | MHCB / MHCQ | 6-15 |
| | Compact Hydraulic with Piston Sensing Cylinder | |
| | MHCB-M / MHCB-MZ | 6-32 |
| | Manifold type Hydraulic Cylinder | |
| MHCB* | MHCBR / MHCBF / MHCBS | 6-35 |
| | Hydraulic with Piston Sensing Cylinder | |
| MDO* | MDOC / MDOA / MDOD / MDON | 6-44 |
| | Hydraulic Rotary Actuator | |
| MRPH | | 6-51 |
| | Hydraulic Lever-type Cylinder | |
| MHCK | MHCK / MHCK-F | 6-54 |
| | Hydraulic - Swing Clamp Cylinder | |
| MTH* | MTHS / MTHD | 6-56 |
| MHS* | MHS / MHSD | 6-63 |
| MHTS* | MHTS / MHTSD | 6-63 |
| | High oil pressure Swing clamping Cylinder | |
| MF* | MFS / MFT | 6-66 |
| MD* | MDS / MDT | 6-66 |

| | | |
|------------|-------------------------------|------|
| | Threaded-body Cylinder | |
| MTC | MTC-**A/B | 6-69 |
| | Hydraulic Work Support | |
| MSP | MSP-**A/B | 6-70 |






Specification




| Model | MDHB, MDHD, MDHN | |
|-----------------------------|---|-------------------|
| Tube I.D. (mm) | 40, 50, 63 | 80, 100, 125, 150 |
| Standard stroke (mm) | 50, 100, 150, 200, 250, 300, 350, 400, 450, 500 | |
| The range of stroke | Max.1500 mm | Max.1900 mm |
| Medium | Filtered oil | |
| Material of cylinder barrel | Carbon steel STKM 13C | |
| Max. operating pressure | 14 MPa | |
| Ambient temperature | -10~+60°C (No freezing) | |

| Model | MDMB, MDMD, MDMN | | |
|-----------------------------|---|-------|---------|
| Tube I.D. (mm) | 40, 50 | 63 | 80, 100 |
| Standard stroke (mm) | 50, 100, 150, 200, 250, 300, 350, 400, 450, 500 | | |
| Medium | Filtered oil | | |
| Material of cylinder barrel | SUS304 Stainless steel | | |
| Max. operating pressure | 7 MPa | | |
| Proof pressure | 10.5 MPa | | |
| Speed range (mm/sec) | 0.5~300 mm/sec | | |
| Ambient temperature | -10~+60°C (No freezing) | | |
| Sensor switch (*) | LN01P | LN02P | LN03P |

Double acting

| | | |
|-----------------|------------------------------------|---|
| MDHB | Standard type |  |
| MDHD | Double rod type |  |
| MDHN-A/B | Adjustable forward stroke cylinder |  |

Double acting (with magnet)


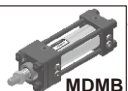

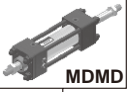


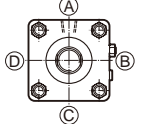
| | | |
|-----------------|------------------------------------|---|
| MDMB | Standard type |  |
| MDMD | Double rod type |  |
| MDMN-A/B | Adjustable forward stroke cylinder |  |

* The series of hydraulic cylinder can be with cushion.

* LN**P specification, please refer to page 5-17.

Order example

1 - MDHB - 50 - N - 100 - BC - A - LB - Y

| STANDARD | WITH MAGNET | TUBE I.D. | STROKE | CUSHION | PORT & CUSHION ADJ. LOCATION | MOUNTING TYPE |
|---|---|-----------|--------|---------|---|---------------|
|  |  | 50 | 100 | N | Blank: Standard type A: Adjustable 25mm B: Adjustable 50mm (Only for MD*N type) | FA |
|  |  | | | H | * Change port & cushion adj. location. Port location (B) (C) Cushion adjustment location | FB |
|  |  | | | B | Blank: Standard type A: Port location B: Cushion adjustment location | LA |
| | | | | |  | LB |
| | | | | | | CA |
| | | | | | | CB |
| | | | | | | TC |
| | | | | | | Y |
| | | | | | | I |

SEAL MATERIAL

| Symbol | Seal material | Kind of fluid | | | | |
|--------|------------------------|-------------------------|----------------------|-------------------------|--------------------|--------------------|
| | | Petroleum - based fluid | Water - glycol fluid | Phosphate - ester fluid | Water in oil fluid | Oil in water fluid |
| 1 | NBR Nitrile rubber | ○ | ○ | × | ○ | ○ |
| 2 | PU Polyurethane rubber | ○ | × | × | △ | △ |
| 3 | VITON Fluoro elastomer | ○ | × | ○ | ○ | ○ |

Note. ○ allowable × unallowable △ consult us

HYDRAULIC CYLINDER

MDHB, MDHD, MDHN Standard stroke

Unit: mm

| Tube I.D. | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|-------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| $\varnothing 40$ | ● | ● | ● | ● | ● | ● | — | — | — | — |
| $\varnothing 50$ | ● | ● | ● | ● | ● | ● | — | — | — | — |
| $\varnothing 63$ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| $\varnothing 80$ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| $\varnothing 100$ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| $\varnothing 125$ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| $\varnothing 150$ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

Note. May to order of unstandard stroke.

MDMB, MDMD, MDMN Standard stroke

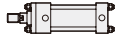
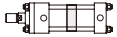
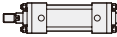

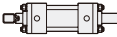
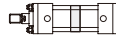
Unit: mm

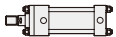

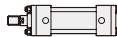



| Tube I.D. | 50 | 100 | 150 | 200 | 250 | 300 | 350 | 400 | 450 | 500 |
|-------------------|----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| $\varnothing 40$ | ● | ● | ● | ● | ● | ● | — | — | — | — |
| $\varnothing 50$ | ● | ● | ● | ● | ● | ● | — | — | — | — |
| $\varnothing 63$ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| $\varnothing 80$ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| $\varnothing 100$ | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |











Note. May to order of unstandard stroke.

Cylinder weight

Unit: kg

| Model | Basic weight MDHB | Stroke 25 mm MDHB | Basic weight MDHD | Basic weight MDHN-A | Basic weight MDHN-B | Stroke 25 mm MDHD/MDHN |
|-------------------|---|---|---|---|--|---|
| Tube I.D. |  |  |  |  |  |  |
| $\varnothing 40$ | 3.7 | 0.155 | 4.8 | 5.5 | 5.8 | 0.21 |
| $\varnothing 50$ | 6.2 | 0.244 | 8.0 | 9.1 | 9.6 | 0.34 |
| $\varnothing 63$ | 8.9 | 0.421 | 11.2 | 12.8 | 13.4 | 0.60 |
| $\varnothing 80$ | 14.6 | 0.546 | 17.3 | 19.5 | 20.3 | 0.80 |
| $\varnothing 100$ | 24.2 | 0.895 | 28.2 | 31.3 | 32.3 | 1.28 |
| $\varnothing 125$ | 40.9 | 1.462 | 49.4 | 53.2 | 54.4 | 2.01 |
| $\varnothing 150$ | 64.5 | 2.337 | 80.5 | 87.6 | 89.4 | 3.31 |

| Model | Basic weight MDMB | Stroke 25 mm MDMB | Basic weight MDMD | Basic weight MDMN-A | Basic weight MDMN-B | Stroke 25 mm MDMD/MDMN |
|-------------------|---|---|---|---|--|---|
| Tube I.D. |  |  |  |  |  |  |
| $\varnothing 40$ | 3.66 | 0.14 | 4.8 | 5.5 | 5.8 | 0.21 |
| $\varnothing 50$ | 6.15 | 0.22 | 8.0 | 9.1 | 9.5 | 0.32 |
| $\varnothing 63$ | 8.70 | 0.34 | 11.0 | 12.6 | 13.2 | 0.53 |
| $\varnothing 80$ | 14.60 | 0.54 | 17.3 | 19.5 | 20.3 | 0.80 |
| $\varnothing 100$ | 23.80 | 0.75 | 27.8 | 30.9 | 32.0 | 1.14 |

| Model | FA | FB | LA | LB | CA | CB+Pin | TC | Y+Pin | I | Nut (Rod) |
|-------------------|---|---|---|---|---|---|---|---|---|---|
| Tube I.D. |  |  |  |  |  |  |  |  |  |  |
| $\varnothing 40$ | 0.3 | 0.6 | 0.5 | 0.6 | 0.6 | 0.7 | 0.6 | 0.6 | 0.6 | 0.02 |
| $\varnothing 50$ | 0.8 | 1.2 | 0.9 | 0.8 | 1.0 | 1.1 | 1.0 | 0.9 | 0.9 | 0.04 |
| $\varnothing 63$ | 1.3 | 1.8 | 1.0 | 1.4 | 1.8 | 2.1 | 1.2 | 1.5 | 1.2 | 0.08 |
| $\varnothing 80$ | 1.4 | 2.7 | 1.6 | 1.8 | 3.0 | 3.6 | 2.1 | 1.8 | 1.8 | 0.08 |
| $\varnothing 100$ | 2.2 | 4.8 | 1.9 | 3.0 | 5.1 | 6.6 | 3.8 | 4.2 | 3.3 | 0.18 |
| $\varnothing 125$ | 3.6 | 8.1 | 3.6 | 6.0 | 10.2 | 12.9 | 6.2 | 6.9 | 6.0 | 0.22 |
| $\varnothing 150$ | 6.2 | 13.5 | 5.1 | 8.4 | 16.2 | 20.4 | 10.9 | 10.8 | 9.6 | 0.57 |

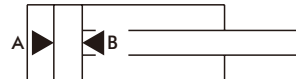
HYDRAULIC CYLINDER

Stroke tolerance

Unit: mm

| stroke | ~100 | 101~250 | 251~630 | 631~1000 | 1001~1600 | 1601~2000 |
|-----------|-----------|-----------|------------|-----------|-----------|-----------|
| Tolerance | +0.8 0 | +1.0 0 | +1.25 0 | +1.4 0 | +1.6 0 | +1.8 0 |

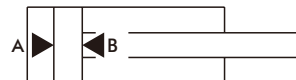
MDHB, MDHD, MDHN Theoretic force



Unit: KN

| Tube I.D. (mm) | Rod (mm) | Area (mm ²) | Operating pressure (MPa) | | | | | | | | | |
|----------------|----------|-------------------------|--------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| | | | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
| ø40 | ø20 | A | 1256 | 7.54 | 8.79 | 10.05 | 11.30 | 12.56 | 13.82 | 15.07 | 16.33 | 17.58 |
| | | B | 942 | 5.65 | 6.59 | 7.54 | 8.48 | 9.42 | 10.36 | 11.30 | 12.25 | 13.19 |
| ø50 | ø25 | A | 1963 | 11.78 | 13.74 | 15.70 | 17.67 | 19.63 | 21.59 | 23.56 | 25.52 | 27.48 |
| | | B | 1472 | 8.83 | 10.30 | 11.78 | 13.25 | 14.72 | 16.19 | 17.66 | 19.14 | 20.61 |
| ø63 | ø35 | A | 3116 | 18.70 | 21.81 | 24.93 | 28.06 | 31.18 | 34.28 | 37.39 | 40.51 | 43.62 |
| | | B | 2154 | 12.92 | 15.08 | 17.23 | 19.39 | 21.54 | 23.69 | 25.85 | 28.00 | 30.16 |
| ø80 | ø40 | A | 5024 | 30.14 | 35.17 | 40.19 | 45.22 | 50.24 | 55.26 | 60.29 | 65.31 | 70.34 |
| | | B | 3768 | 22.61 | 26.38 | 30.14 | 33.91 | 37.68 | 41.45 | 45.22 | 48.98 | 52.75 |
| ø100 | ø50 | A | 7850 | 47.10 | 54.95 | 62.80 | 70.65 | 78.50 | 86.35 | 94.20 | 102.05 | 109.90 |
| | | B | 5887 | 35.32 | 41.21 | 47.10 | 52.98 | 58.87 | 64.76 | 70.64 | 76.53 | 82.42 |
| ø125 | ø60 | A | 12266 | 73.60 | 85.86 | 98.13 | 110.39 | 122.66 | 134.93 | 147.19 | 159.46 | 171.72 |
| | | B | 9440 | 56.64 | 66.08 | 75.52 | 84.96 | 94.40 | 103.84 | 113.28 | 122.72 | 132.16 |
| ø150 | ø80 | A | 17662 | 105.97 | 123.63 | 141.30 | 158.96 | 176.62 | 194.28 | 211.94 | 229.61 | 247.27 |
| | | B | 12638 | 75.83 | 88.47 | 101.10 | 113.74 | 126.38 | 139.02 | 151.66 | 164.29 | 176.93 |

MDMB, MDMD, MDMN Theoretic force



Unit: N

| Tube I.D. (mm) | Rod (mm) | Area (mm ²) | Operating pressure (MPa) | | | | | | | | | |
|----------------|----------|-------------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| ø40 | ø20 | A | 1256 | 2512 | 3768 | 5024 | 6280 | 7536 | 8792 | 10048 | 11304 | 12560 |
| | | B | 942 | 1884 | 2826 | 3768 | 4710 | 5652 | 6594 | 7536 | 8478 | 9420 |
| ø50 | ø25 | A | 1963 | 3926 | 5889 | 7852 | 9815 | 11778 | 13741 | 15704 | 17667 | 19630 |
| | | B | 1472 | 2944 | 4416 | 5888 | 7360 | 8832 | 10304 | 11776 | 13248 | 14720 |
| ø63 | ø35 | A | 3116 | 6232 | 9348 | 12464 | 15580 | 18696 | 21812 | 24928 | 28062 | 31180 |
| | | B | 2154 | 4308 | 6462 | 8616 | 10770 | 12924 | 15078 | 17232 | 19386 | 21540 |
| ø80 | ø40 | A | 5024 | 10048 | 15072 | 20096 | 25120 | 30144 | 35168 | 40192 | 45216 | 50240 |
| | | B | 3768 | 7536 | 11304 | 15072 | 18840 | 22608 | 26376 | 30144 | 33912 | 37680 |
| ø100 | ø50 | A | 7850 | 15700 | 23550 | 31400 | 39250 | 47100 | 54950 | 62800 | 70650 | 78500 |
| | | B | 5887 | 11774 | 17661 | 23548 | 29435 | 35322 | 41209 | 47196 | 52983 | 58870 |

The method of calculation (Hydraulic cylinders' force)

$$F = P \times A - f$$

| | | |
|------------|--------------------|--------------------|
| F : | Cylinders' force | (N) |
| P : | Operating pressure | (MPa) |
| A : | Piston area | (mm ²) |
| f : | Friction drag | (N) |

HYDRAULIC CYLINDER

How to order the seal kit

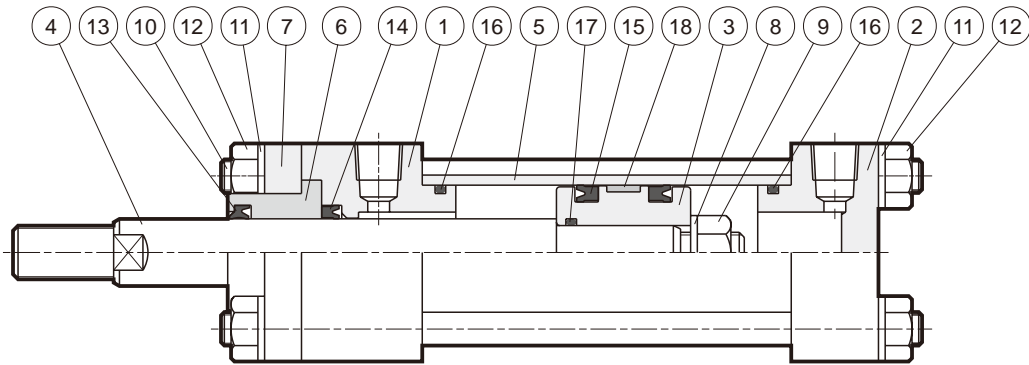
MDHBSK

| Tube I.D. | Seal kit |
|-----------|--|
| 40 | MDHBSK40 - Including No.13,14,15,16,17,18 |
| 50 | MDHBSK50 - Including No.13,14,15,16,17,18 |
| 63 | MDHBSK63 - Including No.13,14,15,16,17,18 |
| 80 | MDHBSK80 - Including No.13,14,15,16,17,18 |
| 100 | MDHBSK100 - Including No.13,14,15,16,17,18 |
| 125 | MDHBSK125 - Including No.13,14,15,16,17,18 |
| 150 | MDHBSK150 - Including No.13,14,15,16,17,18 |

MDHDSK

| Tube I.D. | Seal kit |
|-----------|--|
| 40 | MDHDSK40 - Including No.10,11,12,13,14,15 |
| 50 | MDHDSK50 - Including No.10,11,12,13,14,15 |
| 63 | MDHDSK63 - Including No.10,11,12,13,14,15 |
| 80 | MDHDSK80 - Including No.10,11,12,13,14,15 |
| 100 | MDHDSK100 - Including No.10,11,12,13,14,15 |
| 125 | MDHDSK125 - Including No.10,11,12,13,14,15 |
| 150 | MDHDSK150 - Including No.10,11,12,13,14,15 |

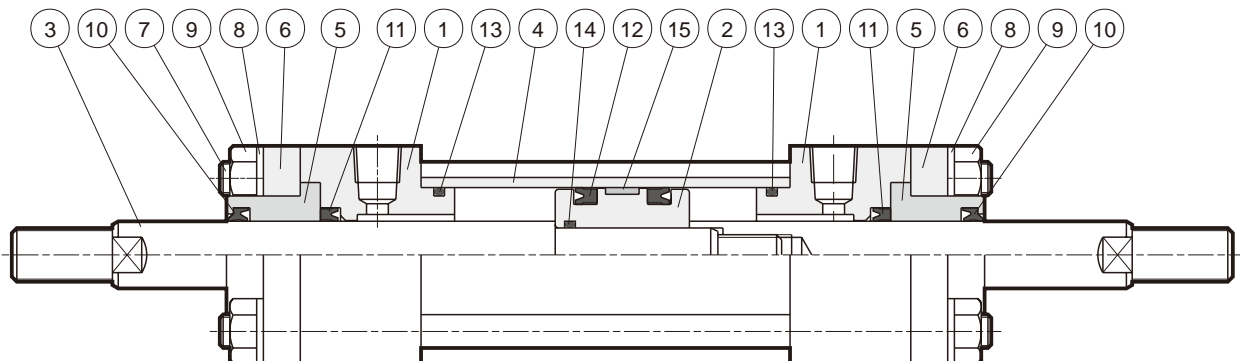
MDHB



Parts list

| No. | Part name | Q'y | No. | Part name | Q'y | No. | Part name | Q'y |
|-----|---------------|-----|-----|---------------|-----|-----|-----------------|-----|
| 1 | Rod cover | 1 | 7 | End plate | 1 | 13 | Dust wiper | 1 |
| 2 | Head cover | 1 | 8 | Spring washer | 1 | 14 | Rod packing | 1 |
| 3 | Piston | 1 | 9 | Piston nut | 1 | 15 | Piston packing | 2 |
| 4 | Piston rod | 1 | 10 | Tie bolt | 4 | 16 | Cylinder gasket | 2 |
| 5 | Cylinder tube | 1 | 11 | Spring washer | 8 | 17 | Piston gasket | 1 |
| 6 | Rod bush | 1 | 12 | Nut | 8 | 18 | Wearing ring | 1 |

MDHD



Parts list

| No. | Part name | Q'y | No. | Part name | Q'y | No. | Part name | Q'y |
|-----|---------------|-----|-----|---------------|-----|-----|-----------------|-----|
| 1 | Rod cover | 2 | 6 | End plate | 2 | 11 | Rod packing | 2 |
| 2 | Piston | 1 | 7 | Tie bolt | 4 | 12 | Piston packing | 2 |
| 3 | Piston rod | 1 | 8 | Spring washer | 8 | 13 | Cylinder gasket | 2 |
| 4 | Cylinder tube | 1 | 9 | Nut | 8 | 14 | Piston gasket | 1 |
| 5 | Rod bush | 2 | 10 | Dust wiper | 2 | 15 | Wearing ring | 1 |

HYDRAULIC CYLINDER

How to order the seal kit

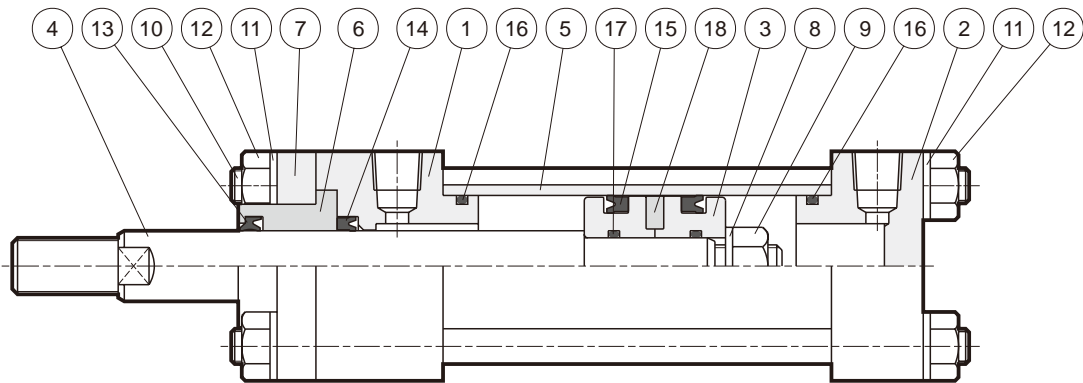
MDMBSK

| Tube I.D. | Seal kit |
|-----------|---|
| 40 | MDMBSK40 - Including No.13,14,15,16,17 |
| 50 | MDMBSK50 - Including No.13,14,15,16,17 |
| 63 | MDMBSK63 - Including No.13,14,15,16,17 |
| 80 | MDMBSK80 - Including No.13,14,15,16,17 |
| 100 | MDMBSK100 - Including No.13,14,15,16,17 |

MDMDSK

| Tube I.D. | Seal kit |
|-----------|---|
| 40 | MDMDSK40 - Including No.10,11,12,13,14 |
| 50 | MDMDSK50 - Including No.10,11,12,13,14 |
| 63 | MDMDSK63 - Including No.10,11,12,13,14 |
| 80 | MDMDSK80 - Including No.10,11,12,13,14 |
| 100 | MDMDSK100 - Including No.10,11,12,13,14 |

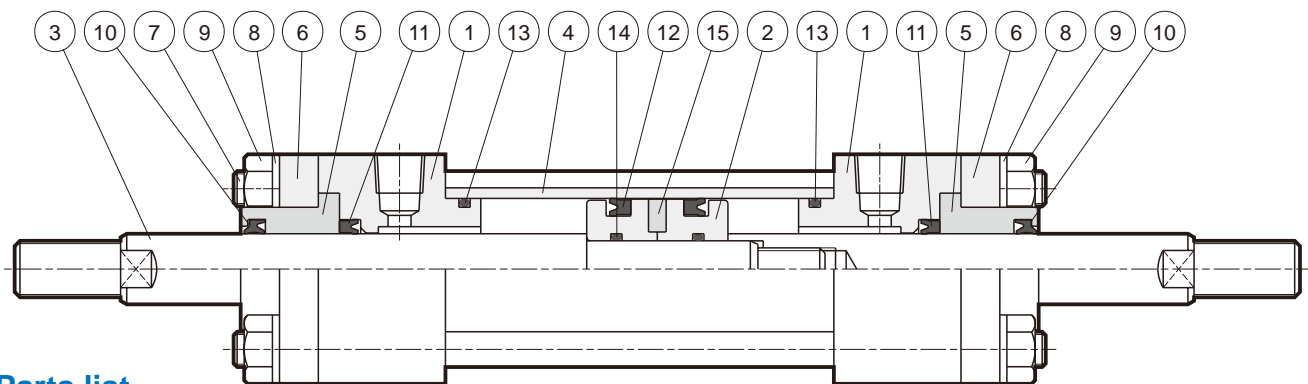
MDMB



Parts list

| No. | Part name | Q'y | No. | Part name | Q'y | No. | Part name | Q'y |
|-----|---------------|-----|-----|---------------|-----|-----|-----------------|-----|
| 1 | Rod cover | 1 | 7 | End plate | 1 | 13 | Dust wiper | 1 |
| 2 | Head cover | 1 | 8 | Spring washer | 1 | 14 | Rod packing | 1 |
| 3 | Piston | 1 | 9 | Nut | 1 | 15 | Piston packing | 2 |
| 4 | Piston rod | 1 | 10 | Tie bolt | 4 | 16 | Cylinder gasket | 2 |
| 5 | Cylinder tube | 1 | 11 | Spring washer | 8 | 17 | Piston gasket | 1 |
| 6 | Rod bush | 1 | 12 | Nut | 8 | 18 | Magnet | 1 |

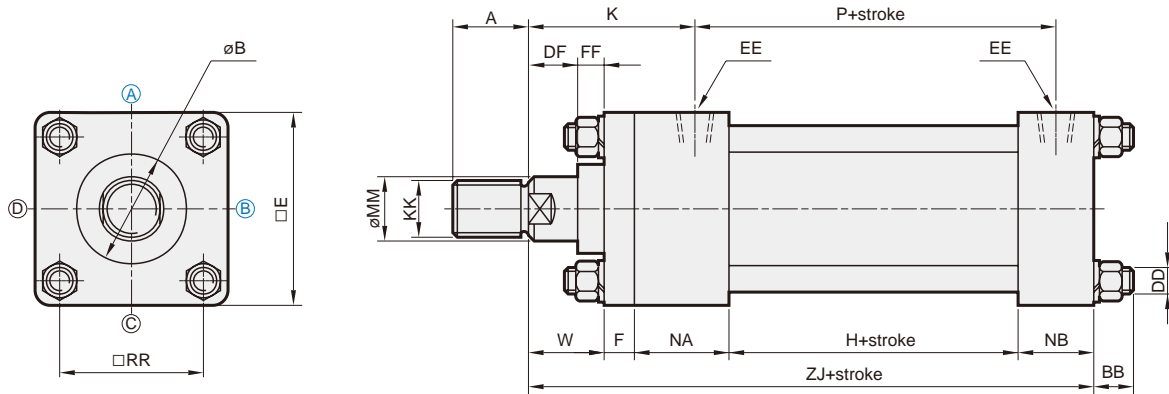
MDMD



Parts list

| No. | Part name | Q'y | No. | Part name | Q'y | No. | Part name | Q'y |
|-----|---------------|-----|-----|---------------|-----|-----|-----------------|-----|
| 1 | Rod cover | 2 | 6 | End plate | 2 | 11 | Rod packing | 2 |
| 2 | Piston | 1 | 7 | Tie bolt | 4 | 12 | Piston packing | 2 |
| 3 | Piston rod | 1 | 8 | Spring washer | 8 | 13 | Cylinder gasket | 2 |
| 4 | Cylinder tube | 1 | 9 | Nut | 8 | 14 | Piston gasket | 1 |
| 5 | Rod bush | 2 | 10 | Dust wiper | 2 | 15 | Magnet | 1 |

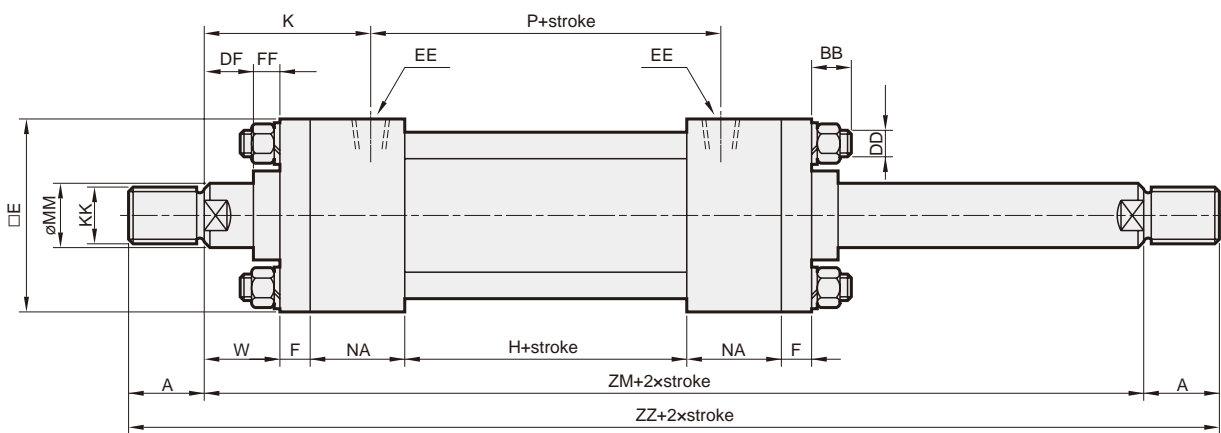
MDHB / MDMB Standard type



Note. (A) Port location
(B) Cushion adjustment location

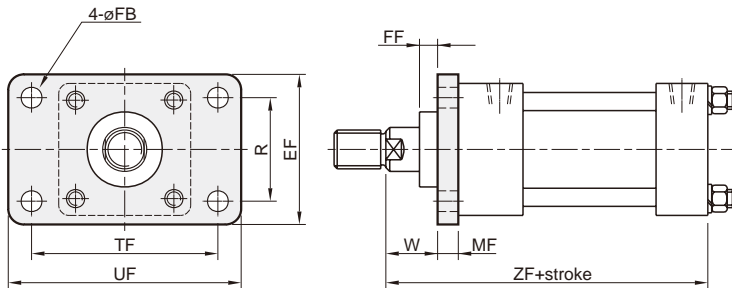
| Code Tube I.D. | A | B | BB | DD | DF | E | EE | F | FF | H | K | KK | MM | NA | NB | P | RR | W | ZJ |
|-------------------|----|----|----|----------|----|-----|-------|----|----|----|-----|---------|----|----|----|-----|-----|----|-----|
| $\varnothing 40$ | 30 | 35 | 16 | M10x1.25 | 14 | 65 | Rc1/4 | 11 | 11 | 60 | 60 | M16x1.5 | 20 | 36 | 26 | 84 | 45 | 25 | 158 |
| $\varnothing 50$ | 35 | 40 | 16 | M10x1.25 | 16 | 75 | Rc3/8 | 13 | 9 | 60 | 66 | M22x1.5 | 25 | 42 | 34 | 88 | 52 | 25 | 174 |
| $\varnothing 63$ | 40 | 50 | 18 | M12x1.5 | 21 | 90 | Rc3/8 | 15 | 9 | 65 | 73 | M30x1.5 | 35 | 42 | 34 | 93 | 63 | 30 | 186 |
| $\varnothing 80$ | 45 | 55 | 18 | M16x1.5 | 23 | 110 | Rc1/2 | 18 | 7 | 65 | 79 | M30x1.5 | 40 | 46 | 39 | 95 | 80 | 30 | 198 |
| $\varnothing 100$ | 50 | 65 | 25 | M18x1.5 | 33 | 135 | Rc1/2 | 20 | 7 | 74 | 95 | M40x2.0 | 50 | 50 | 40 | 104 | 102 | 40 | 224 |
| $\varnothing 125$ | 60 | 75 | 30 | M22x1.5 | 38 | 165 | Rc3/4 | 25 | 7 | 74 | 109 | M48x2.0 | 60 | 58 | 47 | 112 | 122 | 45 | 249 |
| $\varnothing 150$ | 70 | 95 | 30 | M26x1.5 | 43 | 195 | Rc3/4 | 30 | 7 | 90 | 119 | M72x2.0 | 80 | 58 | 48 | 128 | 148 | 50 | 276 |

MDHD / MDMD Double rod type



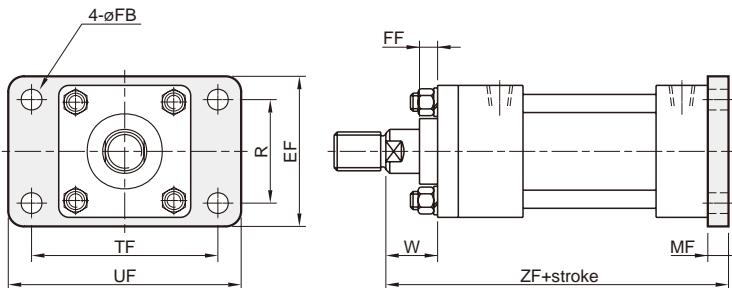
| Code Tube I.D. | A | B | BB | DD | DF | E | EE | F | FF | H | K | KK | MM | NA | P | RR | W | ZM | ZZ |
|-------------------|----|----|----|----------|----|-----|-------|----|----|----|-----|---------|----|----|-----|-----|----|-----|-----|
| $\varnothing 40$ | 30 | 35 | 16 | M10x1.25 | 14 | 65 | Rc1/4 | 11 | 11 | 60 | 60 | M16x1.5 | 20 | 36 | 84 | 45 | 25 | 204 | 264 |
| $\varnothing 50$ | 35 | 40 | 16 | M10x1.25 | 16 | 75 | Rc3/8 | 13 | 9 | 60 | 66 | M22x1.5 | 25 | 42 | 88 | 52 | 25 | 220 | 290 |
| $\varnothing 63$ | 40 | 50 | 18 | M12x1.5 | 21 | 90 | Rc3/8 | 15 | 9 | 65 | 73 | M30x1.5 | 35 | 42 | 93 | 63 | 30 | 239 | 319 |
| $\varnothing 80$ | 45 | 55 | 18 | M16x1.5 | 23 | 110 | Rc1/2 | 18 | 7 | 65 | 79 | M30x1.5 | 40 | 46 | 95 | 80 | 30 | 253 | 343 |
| $\varnothing 100$ | 50 | 65 | 25 | M18x1.5 | 33 | 135 | Rc1/2 | 20 | 7 | 74 | 95 | M40x2.0 | 50 | 50 | 104 | 102 | 40 | 294 | 394 |
| $\varnothing 125$ | 60 | 75 | 30 | M22x1.5 | 38 | 165 | Rc3/4 | 25 | 7 | 74 | 109 | M48x2.0 | 60 | 58 | 112 | 122 | 45 | 330 | 450 |
| $\varnothing 150$ | 70 | 95 | 30 | M26x1.5 | 43 | 195 | Rc3/4 | 30 | 7 | 90 | 119 | M72x2.0 | 80 | 58 | 128 | 148 | 50 | 366 | 506 |

FA Front flange



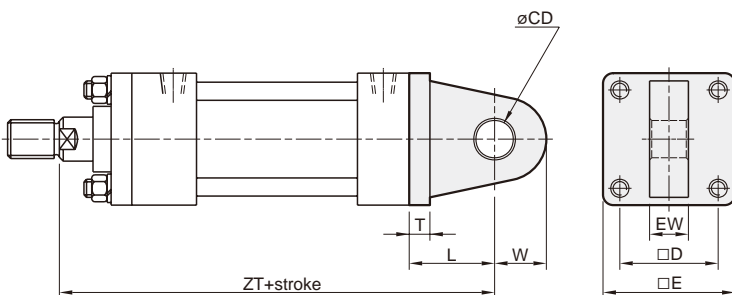
| Code Tube I.D. | EF | FB | FF | MF | R | TF | UF | W | ZF |
|-------------------|-----|----|----|----|-----|-----|-----|----|-----|
| $\varnothing 40$ | 69 | 11 | 11 | 11 | 46 | 95 | 118 | 25 | 158 |
| $\varnothing 50$ | 85 | 11 | 9 | 13 | 58 | 115 | 145 | 25 | 174 |
| $\varnothing 63$ | 98 | 14 | 9 | 15 | 65 | 132 | 165 | 30 | 186 |
| $\varnothing 80$ | 118 | 18 | 7 | 18 | 87 | 155 | 190 | 30 | 198 |
| $\varnothing 100$ | 150 | 22 | 7 | 20 | 109 | 190 | 230 | 40 | 224 |
| $\varnothing 125$ | 175 | 24 | 7 | 25 | 130 | 224 | 272 | 45 | 249 |
| $\varnothing 150$ | 210 | 28 | 7 | 30 | 155 | 270 | 320 | 50 | 276 |

FB Rear flange



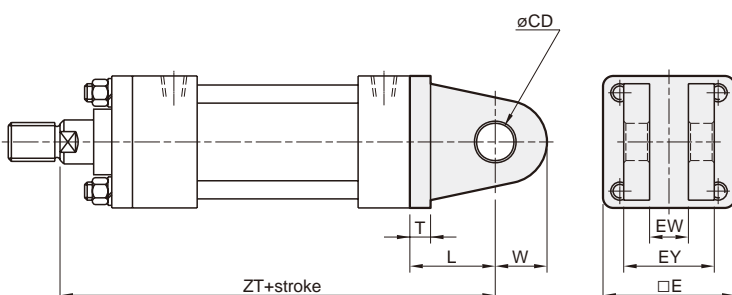
| Code Tube I.D. | EF | FB | FF | MF | R | TF | UF | W | ZF |
|-------------------|-----|----|----|----|-----|-----|-----|----|-----|
| $\varnothing 40$ | 69 | 11 | 11 | 11 | 46 | 95 | 118 | 25 | 169 |
| $\varnothing 50$ | 85 | 11 | 9 | 13 | 58 | 115 | 145 | 25 | 187 |
| $\varnothing 63$ | 98 | 14 | 9 | 15 | 65 | 132 | 165 | 30 | 201 |
| $\varnothing 80$ | 118 | 18 | 7 | 18 | 87 | 155 | 190 | 30 | 216 |
| $\varnothing 100$ | 150 | 22 | 7 | 20 | 109 | 190 | 230 | 40 | 244 |
| $\varnothing 125$ | 175 | 24 | 7 | 25 | 130 | 224 | 272 | 45 | 274 |
| $\varnothing 150$ | 210 | 28 | 7 | 30 | 155 | 270 | 320 | 50 | 306 |

CA Male pivot



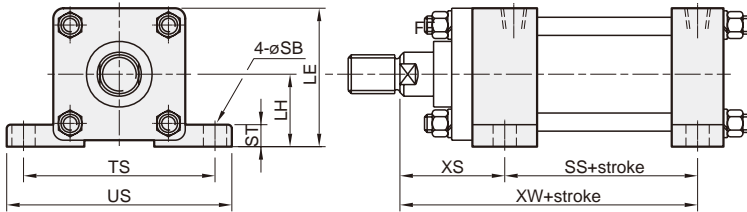
| Code Tube I.D. | CD | D | E | EW | L | T | W | ZT |
|-------------------|----|-----|-----|----|-----|----|----|-----|
| $\varnothing 40$ | 16 | 45 | 65 | 20 | 38 | 11 | 16 | 196 |
| $\varnothing 50$ | 20 | 52 | 75 | 25 | 45 | 13 | 20 | 219 |
| $\varnothing 63$ | 25 | 63 | 90 | 30 | 54 | 15 | 25 | 240 |
| $\varnothing 80$ | 30 | 80 | 110 | 35 | 71 | 18 | 30 | 269 |
| $\varnothing 100$ | 40 | 102 | 135 | 40 | 86 | 20 | 40 | 310 |
| $\varnothing 125$ | 50 | 122 | 165 | 50 | 110 | 25 | 50 | 359 |
| $\varnothing 150$ | 60 | 148 | 195 | 60 | 109 | 30 | 60 | 385 |

CB Female pivot



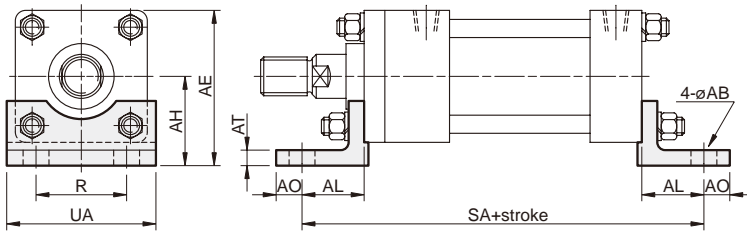
| Code Tube I.D. | CD | E | EW | EY | L | T | W | ZT |
|-------------------|----|-----|----|-----|-----|----|----|-----|
| $\varnothing 40$ | 16 | 65 | 20 | 50 | 38 | 11 | 16 | 196 |
| $\varnothing 50$ | 20 | 75 | 25 | 57 | 45 | 13 | 20 | 219 |
| $\varnothing 63$ | 25 | 90 | 30 | 70 | 54 | 15 | 25 | 240 |
| $\varnothing 80$ | 30 | 110 | 35 | 80 | 71 | 18 | 30 | 269 |
| $\varnothing 100$ | 40 | 135 | 40 | 100 | 86 | 20 | 40 | 310 |
| $\varnothing 125$ | 50 | 165 | 50 | 126 | 110 | 25 | 50 | 359 |
| $\varnothing 150$ | 60 | 195 | 60 | 160 | 109 | 30 | 60 | 385 |

LA Side lugs



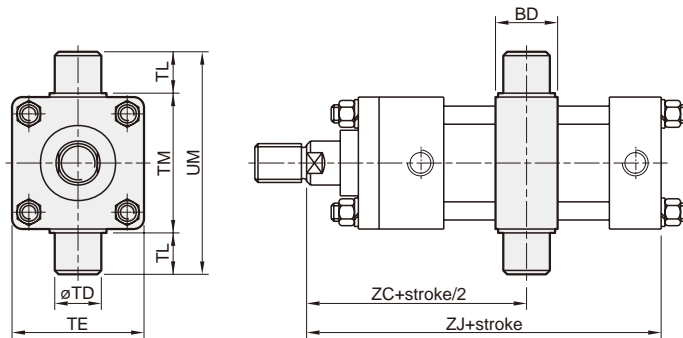
| Code Tube I.D. | LE | LH | SB | SS | ST | TS | XS | XW | US |
|-------------------|-------|------|----|-------|----|-----|-----|-------|-----|
| $\varnothing 40$ | 70 | 37.5 | 11 | 91 | 14 | 95 | 54 | 145 | 118 |
| $\varnothing 50$ | 82.5 | 45 | 11 | 98 | 17 | 115 | 59 | 157 | 145 |
| $\varnothing 63$ | 95 | 50 | 14 | 103 | 19 | 132 | 66 | 169 | 165 |
| $\varnothing 80$ | 115 | 60 | 18 | 107.5 | 25 | 155 | 71 | 178.5 | 190 |
| $\varnothing 100$ | 138.5 | 71 | 22 | 119 | 27 | 190 | 85 | 204 | 230 |
| $\varnothing 125$ | 167.5 | 85 | 24 | 126.5 | 32 | 224 | 99 | 225.5 | 272 |
| $\varnothing 150$ | 203.5 | 106 | 28 | 143 | 37 | 270 | 109 | 252 | 320 |

LB Foot mouting



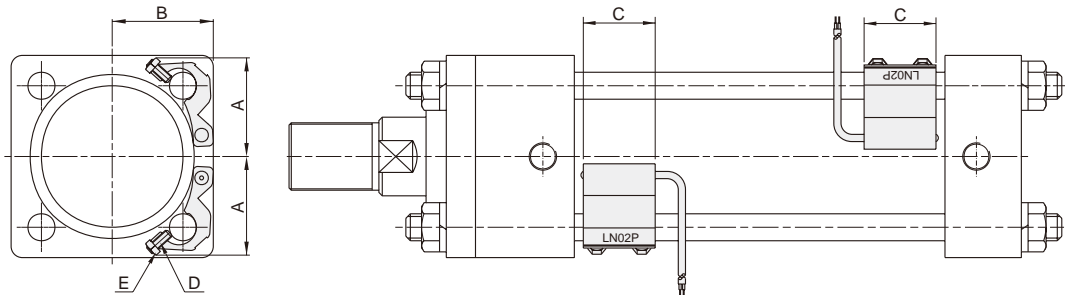
| Code Tube I.D. | AB | AE | AH | AL | AO | AT | R | SA | UA |
|-------------------|----|-------|-----|------|----|----|-----|-----|-----|
| $\varnothing 40$ | 11 | 75.5 | 43 | 32.5 | 13 | 8 | 46 | 198 | 69 |
| $\varnothing 50$ | 11 | 87.5 | 50 | 32.5 | 15 | 8 | 58 | 214 | 85 |
| $\varnothing 63$ | 14 | 105 | 60 | 37 | 18 | 10 | 65 | 230 | 98 |
| $\varnothing 80$ | 18 | 127 | 72 | 49 | 20 | 12 | 87 | 266 | 118 |
| $\varnothing 100$ | 22 | 152.5 | 85 | 58 | 23 | 12 | 109 | 300 | 150 |
| $\varnothing 125$ | 24 | 187.5 | 105 | 68.5 | 29 | 15 | 130 | 341 | 175 |
| $\varnothing 150$ | 28 | 220.5 | 123 | 74.5 | 30 | 18 | 155 | 375 | 210 |

TC Intermediate pivot



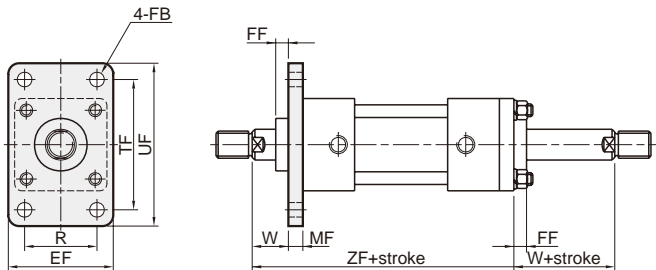
| Code Tube I.D. | BD | TE | TD | TL | TM | UM | ZC | ZJ |
|-------------------|----|-----|----|----|-----|-----|-------|-----|
| $\varnothing 40$ | 28 | 65 | 20 | 20 | 69 | 109 | 102 | 158 |
| $\varnothing 50$ | 33 | 75 | 25 | 25 | 85 | 135 | 110 | 174 |
| $\varnothing 63$ | 38 | 90 | 30 | 30 | 98 | 158 | 119.5 | 186 |
| $\varnothing 80$ | 38 | 110 | 30 | 30 | 118 | 178 | 126.5 | 198 |
| $\varnothing 100$ | 48 | 135 | 40 | 40 | 145 | 225 | 147 | 224 |
| $\varnothing 125$ | 58 | 165 | 50 | 50 | 175 | 275 | 165 | 249 |
| $\varnothing 150$ | 73 | 195 | 60 | 63 | 205 | 331 | 183 | 276 |

Installation of sensor switches



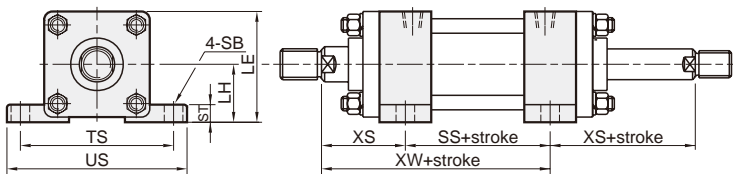
| Code Tube I.D. | Sensor switch | A | B | C | D | E |
|-------------------|---------------|------|----|----|--------|----|
| $\varnothing 40$ | LN01P | 33.7 | 33 | 32 | M4x12L | M4 |
| $\varnothing 50$ | LN01P | 36.6 | 37 | 32 | M4x12L | M4 |
| $\varnothing 63$ | LN02P | 44 | 45 | 32 | M4x12L | M4 |
| $\varnothing 80$ | LN03P | 54 | 56 | 32 | M4x12L | M4 |
| $\varnothing 100$ | LN03P | 65 | 67 | 32 | M4x12L | M4 |

FA Front flange



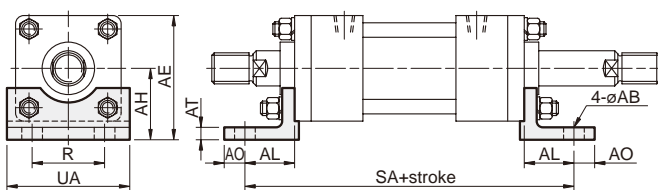
| Code Tube I.D. | EF | FB | FF | MF | R | TF | UF | W | ZF |
|-------------------|-----|----|----|----|-----|-----|-----|----|-----|
| $\varnothing 40$ | 69 | 11 | 11 | 11 | 46 | 95 | 118 | 25 | 179 |
| $\varnothing 50$ | 85 | 11 | 9 | 13 | 58 | 115 | 145 | 25 | 195 |
| $\varnothing 63$ | 98 | 14 | 9 | 15 | 65 | 132 | 165 | 30 | 209 |
| $\varnothing 80$ | 118 | 18 | 7 | 18 | 87 | 155 | 190 | 30 | 223 |
| $\varnothing 100$ | 150 | 22 | 7 | 20 | 109 | 190 | 230 | 40 | 254 |
| $\varnothing 125$ | 175 | 24 | 7 | 25 | 130 | 224 | 272 | 45 | 285 |
| $\varnothing 150$ | 210 | 28 | 7 | 30 | 155 | 270 | 320 | 50 | 316 |

LA Side lugs



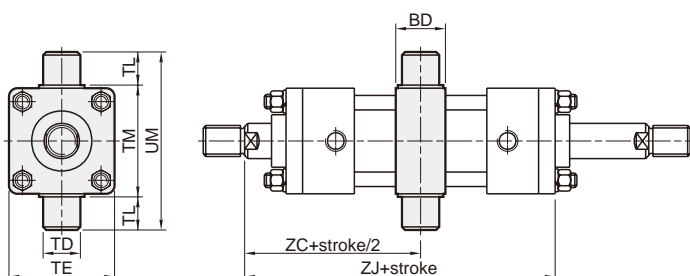
| Code Tube I.D. | LE | LH | SB | SS | ST | TS | XS | XW | US |
|-------------------|-------|------|----|-----|----|-----|-----|-----|-----|
| $\varnothing 40$ | 70 | 37.5 | 11 | 96 | 14 | 95 | 54 | 150 | 118 |
| $\varnothing 50$ | 82.5 | 45 | 11 | 102 | 17 | 115 | 59 | 161 | 145 |
| $\varnothing 63$ | 95 | 50 | 14 | 107 | 19 | 132 | 66 | 173 | 165 |
| $\varnothing 80$ | 115 | 60 | 18 | 111 | 25 | 155 | 71 | 182 | 190 |
| $\varnothing 100$ | 138.5 | 71 | 22 | 124 | 27 | 190 | 85 | 209 | 230 |
| $\varnothing 125$ | 167.5 | 85 | 24 | 132 | 32 | 224 | 99 | 231 | 272 |
| $\varnothing 150$ | 203.5 | 106 | 28 | 148 | 37 | 270 | 109 | 257 | 320 |

LB Foot mounting



| Code Tube I.D. | AB | AE | AH | AL | AO | AT | R | SA | UA |
|-------------------|----|-------|-----|------|----|----|-----|-----|-----|
| $\varnothing 40$ | 11 | 75.5 | 43 | 32.5 | 13 | 8 | 46 | 219 | 69 |
| $\varnothing 50$ | 11 | 87.5 | 50 | 32.5 | 15 | 8 | 58 | 235 | 85 |
| $\varnothing 63$ | 14 | 105 | 60 | 37 | 18 | 10 | 65 | 253 | 98 |
| $\varnothing 80$ | 18 | 127 | 72 | 49 | 20 | 12 | 87 | 291 | 118 |
| $\varnothing 100$ | 22 | 152.5 | 85 | 58 | 23 | 12 | 109 | 330 | 150 |
| $\varnothing 125$ | 24 | 187.5 | 105 | 68.5 | 29 | 15 | 130 | 377 | 175 |
| $\varnothing 150$ | 28 | 220.5 | 123 | 74.5 | 30 | 18 | 155 | 415 | 210 |

TC Intermediate pivot



| Code Tube I.D. | BD | TE | TD | TL | TM | UM | ZC | ZJ |
|-------------------|----|-----|----|----|-----|-----|-------|-----|
| $\varnothing 40$ | 28 | 65 | 20 | 20 | 69 | 109 | 102 | 179 |
| $\varnothing 50$ | 33 | 75 | 25 | 25 | 85 | 135 | 110 | 195 |
| $\varnothing 63$ | 38 | 90 | 30 | 30 | 98 | 158 | 119.5 | 209 |
| $\varnothing 80$ | 38 | 110 | 30 | 30 | 118 | 178 | 126.5 | 223 |
| $\varnothing 100$ | 48 | 135 | 40 | 40 | 145 | 225 | 147 | 254 |
| $\varnothing 125$ | 58 | 165 | 50 | 50 | 175 | 275 | 165 | 285 |
| $\varnothing 150$ | 73 | 195 | 60 | 63 | 205 | 331 | 183 | 316 |

MDHN/MDMN Adjustable stroke $\varnothing 40\sim\varnothing 150$

HYDRAULIC CYLINDER



Rotary Actuator

Clamp Cylinder

Gripper

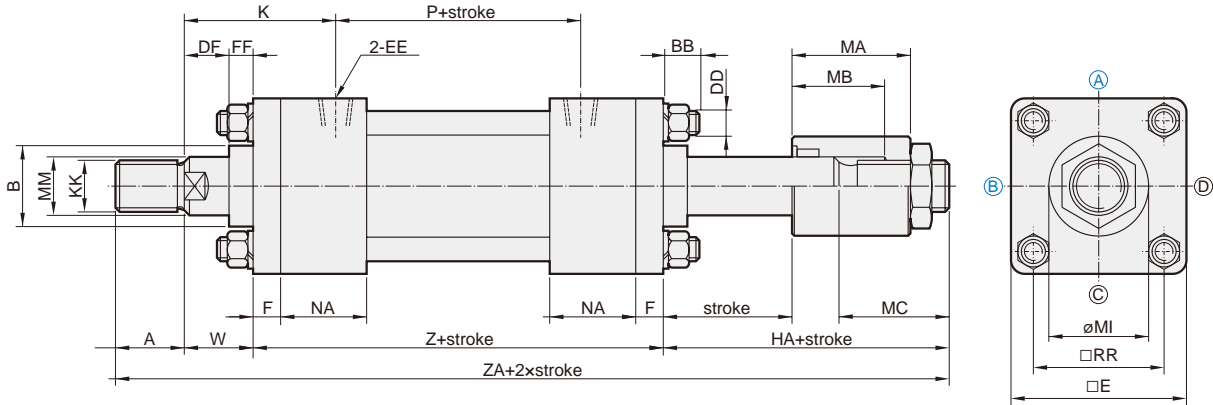
Electric Actuator

Auxiliary Equipment

Hydraulic Cylinder

MDHN / MDMN (A : adjustable stroke 25 mm)

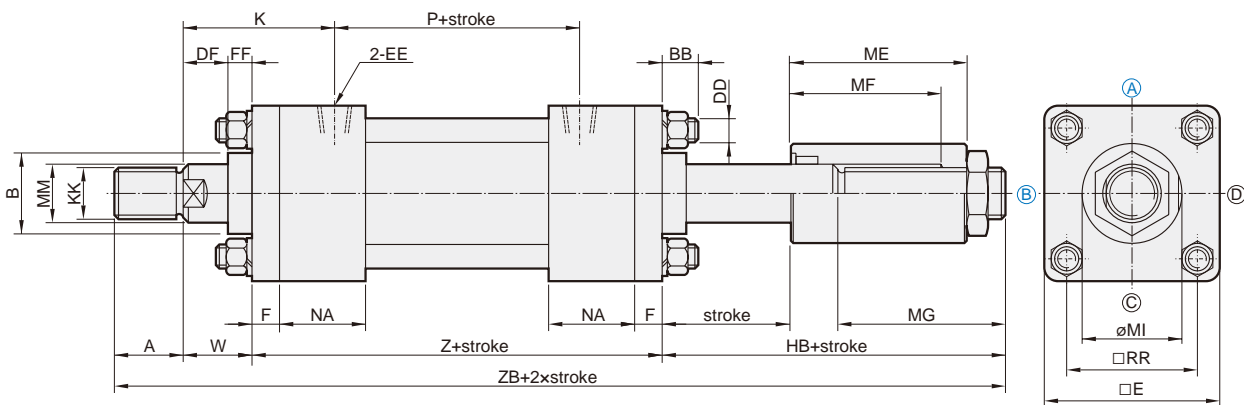
Note. (A) Port location
(B) Cushion adjustment location



| Code Tube I.D. | A | B | BB | DD | DF | E | EE | F | FF | HA | K | KK | MA | MB | MC | MI | MM | NA | P | RR | W | Z | ZA |
|-------------------|----|----|----|----------|----|-----|-------|----|----|-----|-----|---------|----|----|----|-----|----|----|-----|-----|----|-----|-----|
| $\varnothing 40$ | 30 | 35 | 14 | M10x1.25 | 14 | 65 | Rc1/4 | 11 | 11 | 71 | 59 | M16x1.5 | 60 | 45 | 51 | 42 | 20 | 36 | 86 | 45 | 25 | 154 | 280 |
| $\varnothing 50$ | 35 | 40 | 14 | M10x1.25 | 16 | 75 | Rc3/8 | 13 | 9 | 77 | 65 | M22x1.5 | 63 | 45 | 57 | 50 | 25 | 42 | 90 | 52 | 25 | 170 | 307 |
| $\varnothing 63$ | 40 | 50 | 16 | M12x1.5 | 21 | 90 | Rc3/8 | 15 | 9 | 81 | 72 | M30x1.5 | 65 | 45 | 61 | 60 | 35 | 42 | 95 | 63 | 30 | 179 | 330 |
| $\varnothing 80$ | 45 | 55 | 19 | M16x1.5 | 23 | 110 | Rc1/2 | 18 | 7 | 81 | 76 | M30x1.5 | 65 | 45 | 61 | 70 | 40 | 46 | 101 | 80 | 30 | 193 | 349 |
| $\varnothing 100$ | 50 | 65 | 25 | M18x1.5 | 33 | 135 | Rc1/2 | 20 | 7 | 88 | 92 | M40x2.0 | 70 | 45 | 68 | 80 | 50 | 50 | 110 | 102 | 40 | 214 | 392 |
| $\varnothing 125$ | 60 | 75 | 30 | M22x1.5 | 38 | 165 | Rc3/4 | 25 | 7 | 97 | 108 | M48x2.0 | 76 | 46 | 73 | 85 | 60 | 58 | 114 | 122 | 45 | 240 | 442 |
| $\varnothing 150$ | 70 | 95 | 30 | M26x1.5 | 43 | 195 | Rc3/4 | 30 | 7 | 112 | 118 | M72x2.0 | 86 | 46 | 92 | 110 | 80 | 58 | 130 | 148 | 50 | 266 | 498 |

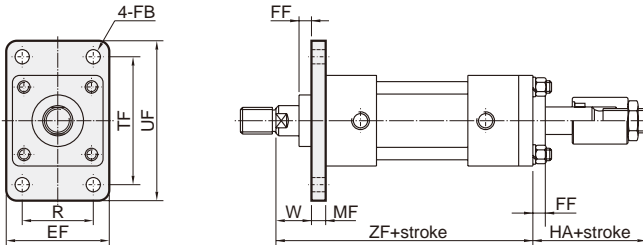
MDHN / MDMN (B : adjustable stroke 50 mm)

Note. (A) Port location
(B) Cushion adjustment location



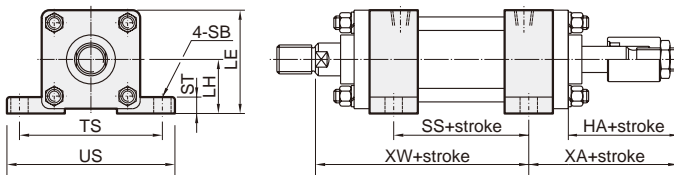
| Code Tube I.D. | A | B | BB | DD | DF | E | EE | F | FF | HB | K | KK | ME | MF | MG | MI | MM | NA | P | RR | W | Z | ZB |
|-------------------|----|----|----|----------|----|-----|-------|----|----|-----|-----|---------|-----|----|-----|-----|----|----|-----|-----|----|-----|-----|
| $\varnothing 40$ | 30 | 35 | 14 | M10x1.25 | 14 | 65 | Rc1/4 | 11 | 11 | 96 | 59 | M16x1.5 | 85 | 70 | 76 | 42 | 20 | 36 | 86 | 45 | 25 | 154 | 305 |
| $\varnothing 50$ | 35 | 40 | 14 | M10x1.25 | 16 | 75 | Rc3/8 | 13 | 9 | 102 | 65 | M22x1.5 | 88 | 70 | 82 | 50 | 25 | 42 | 90 | 52 | 25 | 170 | 332 |
| $\varnothing 63$ | 40 | 50 | 16 | M12x1.5 | 21 | 90 | Rc3/8 | 15 | 9 | 106 | 72 | M30x1.5 | 90 | 70 | 86 | 60 | 35 | 42 | 95 | 63 | 30 | 179 | 355 |
| $\varnothing 80$ | 45 | 55 | 19 | M16x1.5 | 23 | 110 | Rc1/2 | 18 | 7 | 106 | 76 | M30x1.5 | 90 | 70 | 86 | 70 | 40 | 46 | 101 | 80 | 30 | 193 | 374 |
| $\varnothing 100$ | 50 | 65 | 25 | M18x1.5 | 33 | 135 | Rc1/2 | 20 | 7 | 113 | 92 | M40x2.0 | 95 | 70 | 93 | 80 | 50 | 50 | 110 | 102 | 40 | 214 | 417 |
| $\varnothing 125$ | 60 | 75 | 30 | M22x1.5 | 38 | 165 | Rc3/4 | 25 | 7 | 122 | 108 | M48x2.0 | 101 | 71 | 98 | 85 | 60 | 58 | 114 | 122 | 45 | 240 | 467 |
| $\varnothing 150$ | 70 | 95 | 30 | M26x1.5 | 43 | 195 | Rc3/4 | 30 | 7 | 137 | 118 | M72x2.0 | 111 | 71 | 117 | 110 | 80 | 58 | 130 | 148 | 50 | 266 | 523 |

FA (A : adjustable stroke 25 mm)



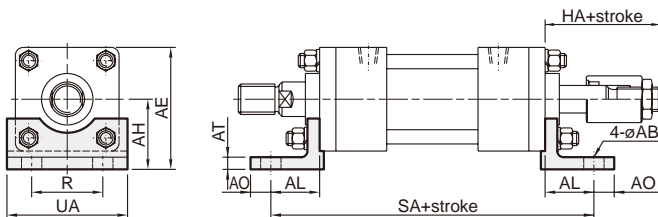
| Code Tube I.D. | EF | FB | FF | HA | MF | R | TF | UF | W | ZF |
|-------------------|-----|----|----|-----|----|-----|-----|-----|----|-----|
| $\varnothing 40$ | 69 | 11 | 11 | 71 | 11 | 46 | 95 | 118 | 25 | 179 |
| $\varnothing 50$ | 85 | 11 | 9 | 77 | 13 | 58 | 115 | 145 | 25 | 195 |
| $\varnothing 63$ | 98 | 14 | 9 | 81 | 15 | 65 | 132 | 165 | 30 | 209 |
| $\varnothing 80$ | 118 | 18 | 7 | 81 | 18 | 87 | 155 | 190 | 30 | 223 |
| $\varnothing 100$ | 150 | 22 | 7 | 88 | 20 | 109 | 190 | 230 | 40 | 254 |
| $\varnothing 125$ | 175 | 24 | 7 | 97 | 25 | 130 | 224 | 272 | 45 | 285 |
| $\varnothing 150$ | 210 | 28 | 7 | 112 | 30 | 155 | 270 | 320 | 50 | 316 |

LA (A : adjustable stroke 25 mm)



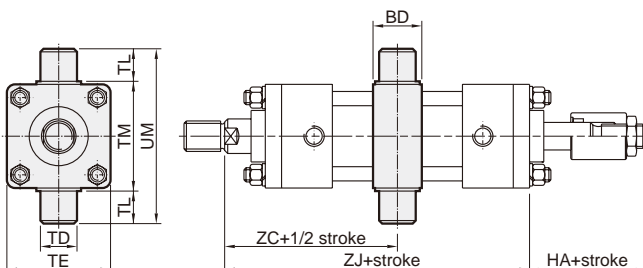
| Code Tube I.D. | LE | LH | HA | SB | SS | ST | TS | XA | XW | US |
|-------------------|-------|------|-----|----|-----|----|-----|-----|-----|-----|
| $\varnothing 40$ | 70 | 37.5 | 71 | 11 | 96 | 14 | 95 | 100 | 150 | 118 |
| $\varnothing 50$ | 82.5 | 45 | 77 | 11 | 102 | 17 | 115 | 111 | 161 | 145 |
| $\varnothing 63$ | 95 | 50 | 81 | 14 | 107 | 19 | 132 | 117 | 173 | 165 |
| $\varnothing 80$ | 115 | 60 | 81 | 18 | 111 | 25 | 155 | 122 | 182 | 190 |
| $\varnothing 100$ | 138.5 | 71 | 88 | 22 | 124 | 27 | 190 | 133 | 209 | 230 |
| $\varnothing 125$ | 167.5 | 85 | 97 | 24 | 132 | 32 | 224 | 151 | 231 | 272 |
| $\varnothing 150$ | 203.5 | 106 | 112 | 28 | 148 | 37 | 270 | 171 | 257 | 320 |

LB (A : adjustable stroke 25 mm)



| Code Tube I.D. | AB | AE | AH | AL | AO | AT | HA | R | SA | UA |
|-------------------|----|-------|-----|------|----|----|-----|-----|-----|-----|
| $\varnothing 40$ | 11 | 75.5 | 43 | 32.5 | 13 | 8 | 71 | 46 | 219 | 69 |
| $\varnothing 50$ | 11 | 87.5 | 50 | 32.5 | 15 | 8 | 77 | 58 | 235 | 85 |
| $\varnothing 63$ | 14 | 105 | 60 | 37 | 18 | 10 | 81 | 65 | 253 | 98 |
| $\varnothing 80$ | 18 | 127 | 72 | 49 | 20 | 12 | 81 | 87 | 291 | 118 |
| $\varnothing 100$ | 22 | 152.5 | 85 | 58 | 23 | 12 | 88 | 109 | 330 | 150 |
| $\varnothing 125$ | 24 | 187.5 | 105 | 68.5 | 29 | 15 | 97 | 130 | 377 | 175 |
| $\varnothing 150$ | 28 | 220.5 | 123 | 74.5 | 30 | 18 | 112 | 155 | 415 | 210 |

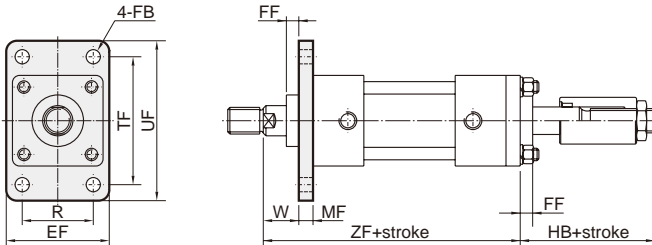
TC (A : adjustable stroke 25 mm)



| Code Tube I.D. | BD | HA | TE | TD | TL | TM | UM | ZC | ZJ |
|-------------------|----|-----|-----|----|----|-----|-----|-------|-----|
| $\varnothing 40$ | 28 | 71 | 65 | 20 | 20 | 69 | 109 | 102 | 179 |
| $\varnothing 50$ | 33 | 77 | 75 | 25 | 25 | 85 | 135 | 110 | 195 |
| $\varnothing 63$ | 38 | 81 | 90 | 30 | 30 | 98 | 158 | 119.5 | 209 |
| $\varnothing 80$ | 38 | 81 | 110 | 30 | 30 | 118 | 178 | 126.5 | 223 |
| $\varnothing 100$ | 48 | 88 | 135 | 40 | 40 | 145 | 225 | 147 | 254 |
| $\varnothing 125$ | 58 | 97 | 165 | 50 | 50 | 175 | 275 | 165 | 285 |
| $\varnothing 150$ | 73 | 112 | 195 | 60 | 63 | 205 | 331 | 183 | 316 |

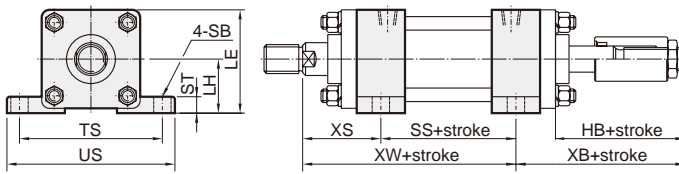
HYDRAULIC CYLINDER

FA (B : adjustable stroke 50 mm)



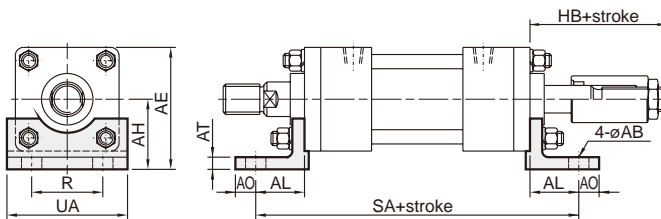
| Code Tube I.D. | EF | FB | FF | HB | MF | R | TF | UF | W | ZF |
|-------------------|-----|----|----|-----|----|-----|-----|-----|----|-----|
| ø40 | 69 | 11 | 11 | 96 | 11 | 46 | 95 | 118 | 25 | 179 |
| ø50 | 85 | 11 | 9 | 102 | 13 | 58 | 115 | 145 | 25 | 195 |
| ø63 | 98 | 14 | 9 | 106 | 15 | 65 | 132 | 165 | 30 | 209 |
| ø80 | 118 | 18 | 7 | 106 | 18 | 87 | 155 | 190 | 30 | 223 |
| ø100 | 150 | 22 | 7 | 113 | 20 | 109 | 190 | 230 | 40 | 254 |
| ø125 | 175 | 24 | 7 | 122 | 25 | 130 | 224 | 272 | 45 | 285 |
| ø150 | 210 | 28 | 7 | 137 | 30 | 155 | 270 | 320 | 50 | 316 |

LA (B : adjustable stroke 50 mm)



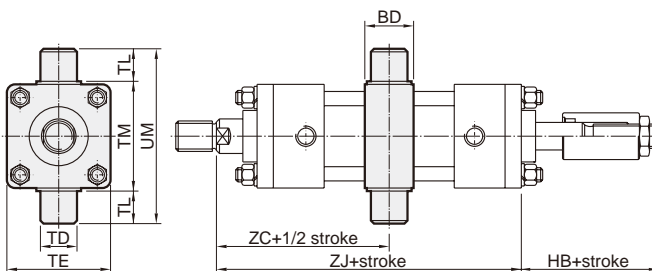
| Code Tube I.D. | LE | LH | HB | SB | SS | ST | TS | XB | XW | US |
|-------------------|-------|------|-----|----|-----|----|-----|-----|-----|-----|
| ø40 | 70 | 37.5 | 96 | 11 | 96 | 14 | 95 | 125 | 150 | 118 |
| ø50 | 82.5 | 45 | 102 | 11 | 102 | 17 | 115 | 136 | 161 | 145 |
| ø63 | 95 | 50 | 106 | 14 | 107 | 19 | 132 | 142 | 173 | 165 |
| ø80 | 115 | 60 | 106 | 18 | 111 | 25 | 155 | 147 | 182 | 190 |
| ø100 | 138.5 | 71 | 113 | 22 | 124 | 27 | 190 | 158 | 209 | 230 |
| ø125 | 167.5 | 85 | 122 | 24 | 132 | 32 | 224 | 176 | 231 | 272 |
| ø150 | 203.5 | 106 | 137 | 28 | 148 | 37 | 270 | 196 | 257 | 320 |

LB (B : adjustable stroke 50 mm)



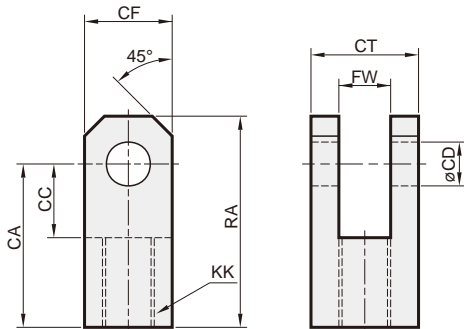
| Code Tube I.D. | AB | AE | AH | AL | AO | AT | HB | R | SA | UA |
|-------------------|----|-------|-----|------|----|----|-----|-----|-----|-----|
| ø40 | 11 | 75.5 | 43 | 32.5 | 13 | 8 | 96 | 46 | 219 | 69 |
| ø50 | 11 | 87.5 | 50 | 32.5 | 15 | 8 | 102 | 58 | 235 | 85 |
| ø63 | 14 | 105 | 60 | 37 | 18 | 10 | 106 | 65 | 253 | 98 |
| ø80 | 18 | 127 | 72 | 49 | 20 | 12 | 106 | 87 | 291 | 118 |
| ø100 | 22 | 152.5 | 85 | 58 | 23 | 12 | 113 | 109 | 330 | 150 |
| ø125 | 24 | 187.5 | 105 | 68.5 | 29 | 15 | 122 | 130 | 377 | 175 |
| ø150 | 28 | 220.5 | 123 | 74.5 | 30 | 18 | 137 | 155 | 415 | 210 |

TC (B : adjustable stroke 50 mm)



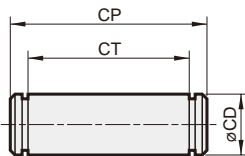
| Code Tube I.D. | BD | HB | TE | TD | TL | TM | UM | ZC | ZJ |
|-------------------|----|-----|-----|----|----|-----|-----|-------|-----|
| ø40 | 28 | 96 | 65 | 20 | 20 | 69 | 109 | 102 | 179 |
| ø50 | 33 | 102 | 75 | 25 | 25 | 85 | 135 | 110 | 195 |
| ø63 | 38 | 106 | 90 | 30 | 30 | 98 | 158 | 119.5 | 209 |
| ø80 | 38 | 106 | 110 | 30 | 30 | 118 | 178 | 126.5 | 223 |
| ø100 | 48 | 113 | 135 | 40 | 40 | 145 | 225 | 147 | 254 |
| ø125 | 58 | 122 | 165 | 50 | 50 | 175 | 275 | 165 | 285 |
| ø150 | 73 | 137 | 195 | 60 | 63 | 205 | 331 | 183 | 316 |

Y connector



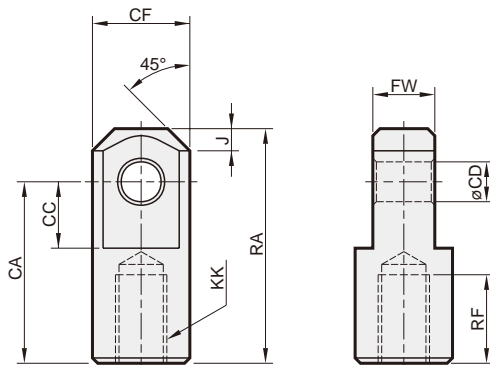
| Model | Tube I.D. | CA | CC | CD | CF | CT | FW | KK | RF |
|-----------|-------------------|-----|----|----|-----|-----|----|---------|----|
| Y-M16x1.5 | $\varnothing 40$ | 50 | 26 | 16 | 35 | 45 | 20 | M16x1.5 | 24 |
| Y-M22x1.5 | $\varnothing 50$ | 60 | 30 | 20 | 40 | 50 | 25 | M22x1.5 | 30 |
| Y-M30x1.5 | $\varnothing 63$ | 80 | 40 | 25 | 50 | 60 | 30 | M30x1.5 | 40 |
| Y-M30x1.5 | $\varnothing 80$ | 80 | 40 | 30 | 60 | 65 | 35 | M30x1.5 | 40 |
| Y-M40x2.0 | $\varnothing 100$ | 90 | 50 | 40 | 80 | 90 | 40 | M40x2.0 | 40 |
| Y-M48x2.0 | $\varnothing 125$ | 110 | 60 | 50 | 100 | 100 | 50 | M48x2.0 | 50 |
| Y-M72x2.0 | $\varnothing 150$ | 130 | 70 | 60 | 120 | 120 | 60 | M72x2.0 | 60 |

Pin



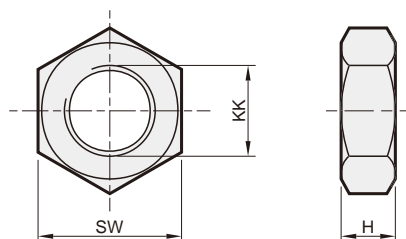
| Model | Tube I.D. | CD | CP | | CT | |
|--------|-------------------|------------|-------|--------|-------|--------|
| | | Y / CB-PIN | Y-PIN | CB-PIN | Y-PIN | CB-PIN |
| P1659 | $\varnothing 40$ | 16 | 59 | 64 | 46 | 51 |
| P2066 | $\varnothing 50$ | 20 | 66 | 73 | 51 | 58 |
| P2576 | $\varnothing 63$ | 25 | 76 | 86 | 61 | 71 |
| P3081 | $\varnothing 80$ | 30 | 81 | 96 | 66 | 81 |
| P40114 | $\varnothing 100$ | 40 | 114 | 124 | 91 | 101 |
| P50124 | $\varnothing 125$ | 50 | 124 | 150 | 101 | 127 |
| P60156 | $\varnothing 150$ | 60 | 156 | 196 | 121 | 161 |

I connector

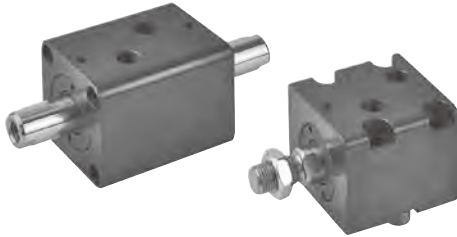


| Model | Tube I.D. | CA | CC | CD | CF | FW | J | KK | RA | RF |
|-----------|-------------------|-----|----|----|-----|----|------|---------|-----|----|
| I-M16x1.5 | $\varnothing 40$ | 55 | 30 | 16 | 40 | 20 | 8 | M16x1.5 | 75 | 20 |
| I-M22x1.5 | $\varnothing 50$ | 65 | 35 | 20 | 50 | 25 | 10 | M22x1.5 | 90 | 25 |
| I-M30x1.5 | $\varnothing 63$ | 80 | 40 | 25 | 55 | 30 | 12.5 | M30x1.5 | 110 | 35 |
| I-M30x1.5 | $\varnothing 80$ | 90 | 45 | 30 | 60 | 35 | 15 | M30x1.5 | 125 | 35 |
| I-M40x2.0 | $\varnothing 100$ | 105 | 55 | 40 | 80 | 40 | 20 | M40x2.0 | 145 | 40 |
| I-M48x2.0 | $\varnothing 125$ | 120 | 65 | 50 | 100 | 50 | 30 | M48x2.0 | 170 | 50 |
| I-M72x2.0 | $\varnothing 150$ | 140 | 75 | 60 | 120 | 60 | 30 | M72x2.0 | 200 | 55 |

Mounting nut



| Model | Tube I.D. | H | KK | SW |
|-----------|-------------------|----|---------|-----|
| N-M16x1.5 | $\varnothing 40$ | 8 | M16x1.5 | 24 |
| N-M22x1.5 | $\varnothing 50$ | 11 | M22x1.5 | 32 |
| N-M30x1.5 | $\varnothing 63$ | 13 | M30x1.5 | 41 |
| N-M30x1.5 | $\varnothing 80$ | 13 | M30x1.5 | 41 |
| N-M40x2.0 | $\varnothing 100$ | 15 | M40x2.0 | 57 |
| N-M48x2.0 | $\varnothing 125$ | 15 | M48x2.0 | 65 |
| N-M72x2.0 | $\varnothing 150$ | 20 | M72x2.0 | 100 |

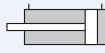
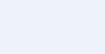
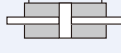
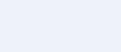
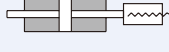


Features

- Compact body design keeps overall length to a minimum.
- Cylinder barrel internally honed to ensure smooth and consistent piston movement.
- High quality materials are used throughout construction.



Specification











| Model | MHC* | | | | | | |
|--------------------------|-------------------------|----|----|----|----|-----|----|
| Tube I.D. (mm) | 20 | 25 | 32 | 40 | 50 | 63 | 80 |
| The range of stroke (mm) | 30 | 30 | 60 | 80 | 90 | 100 | |
| Medium | Filtered oil | | | | | | |
| Material | Carbon steel | | | | | | |
| Max. operating pressure | 14 MPa | | | | | | |
| Ambient temperature | -10~+60°C (No freezing) | | | | | | |

| | | |
|----------------|---|---|
| MHCB | Front mounting (Single rod type) |  |
| MHCQ | Side mounting (Single rod type) |  |
| MHCB-D | Front mounting (Double rod type) |  |
| MHCQ-D | Side mounting (Double rod type) |  |
| MHC*-DA | Adjustable forward 25/50mm stroke cylinder |  |
| MHC*-DB | (Double rod type) | |

Order example

MHCB — 50 — 30 — ZDA

| | | | | |
|--|-----------|--------|-----------------------------------|---------------|
| MODEL | TUBE I.D. | STROKE | ROD END TYPE D: Double rod | |
|  MHCB | 50 | 30 | Blank | ZD |
|  MHCQ | | | Z | ZDA |
| | | | D | ZDB |
| | | | DA | LD |
| | | | DB | RD (*) |

| | | | | | |
|-----------|---|---|---------------|---|---|
| Blank |  | Single rod / Female thread | ZD |  | Double rod / Male thread |
| Z |  | Single rod / Male thread | ZDA |  | Double rod / Male thread / Adjustable stroke 25mm |
| D |  | Double rod / Female thread | ZDB |  | Double rod / Male thread / Adjustable stroke 50mm |
| DA |  | Double rod / Female thread / Adjustable stroke 25mm | LD |  | Double rod / One female thread, One male thread |
| DB |  | Double rod / Female thread / Adjustable stroke 50mm | RD (*) |  | Double rod / One male thread, One female thread |

* Only for MHCQ model.

Standard stroke

● Standard products ○ Made to order

| Model | Stroke Tube I.D. | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 80 | 90 | 100 |
|--|------------------|---|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| MHCB MHCB-Z | ø20 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — | — | — |
| | ø25 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø32 | ● | ● | ● | ● | ● | ● | ○ | ● | ○ | ● | ● | — | — | — | — |
| | ø40 | ● | ● | ● | ● | ● | ● | ○ | ● | ○ | ● | ● | ● | ● | — | — |
| | ø50 | ● | ● | ● | ● | ● | ● | ○ | ● | ○ | ● | ● | ● | ● | ● | — |
| | ø63 | ● | ● | ● | ● | ● | ● | ○ | ● | ○ | ● | ● | ● | ● | ● | ● |
| MHCB-D MHCB-ZD MHCB-LD | ø32 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø40 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø50 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø63 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| MHCB-DA MHCB-ZDA MHCB-DB MHCB-ZDB | ø32 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø40 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø50 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø63 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø80 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |

| Model | Stroke Tube I.D. | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 80 | 90 | 100 |
|--|------------------|---|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|
| MHCQ MHCQ-Z | ø32 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø40 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø50 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø63 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| MHCQ-D MHCQ-ZD MHCQ-RD MHCQ-LD | ø32 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø40 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø50 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø63 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| MHCQ-DA MHCQ-ZDA MHCQ-DB MHCQ-ZDB | ø32 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø40 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø50 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |
| | ø63 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● | — | — | — | — | — |

Theoretic force

Unit: KN

| Tube I.D. (mm) | Rod (mm) | Area (mm ²) | Operating pressure (MPa) | | | | | | | | | |
|----------------|----------|-------------------------|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| | | | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | |
| ø20 | ø12 | A | 314 | 1.88 | 2.20 | 2.51 | 2.83 | 3.14 | 3.46 | 3.77 | 4.08 | 4.40 |
| | | B | 201 | 1.21 | 1.41 | 1.61 | 1.81 | 2.01 | 2.21 | 2.41 | 2.61 | 2.81 |
| ø25 | ø14 | A | 491 | 2.95 | 3.44 | 3.93 | 4.42 | 4.91 | 5.40 | 5.89 | 6.38 | 6.87 |
| | | B | 337 | 2.02 | 2.36 | 2.70 | 3.03 | 3.37 | 3.71 | 4.04 | 4.38 | 4.72 |
| ø32 | ø20 | A | 804 | 4.83 | 5.63 | 6.43 | 7.24 | 8.04 | 8.85 | 9.65 | 10.46 | 11.26 |
| | | B | 490 | 2.94 | 3.43 | 3.92 | 4.41 | 4.90 | 5.39 | 5.88 | 6.37 | 6.86 |
| ø40 | ø25 | A | 1257 | 7.54 | 8.80 | 10.05 | 11.31 | 12.57 | 13.82 | 15.08 | 16.34 | 17.59 |
| | | B | 766 | 4.59 | 5.36 | 6.13 | 6.89 | 7.66 | 8.42 | 9.19 | 9.95 | 10.72 |
| ø50 | ø30 | A | 1963 | 11.78 | 13.74 | 15.71 | 17.67 | 19.63 | 21.60 | 23.56 | 25.53 | 27.49 |
| | | B | 1257 | 7.54 | 8.80 | 10.05 | 11.31 | 12.57 | 13.82 | 15.08 | 16.34 | 17.59 |
| ø63 | ø35 | A | 3117 | 18.70 | 21.82 | 24.94 | 28.06 | 31.17 | 34.29 | 37.41 | 40.52 | 43.64 |
| | | B | 2155 | 12.93 | 15.09 | 17.24 | 19.40 | 21.55 | 23.71 | 25.86 | 28.02 | 30.17 |
| ø80 | ø45 | A | 5027 | 30.16 | 35.19 | 40.21 | 45.24 | 50.27 | 55.29 | 60.32 | 65.35 | 70.37 |
| | | B | 3436 | 20.62 | 24.05 | 27.49 | 30.93 | 34.36 | 37.80 | 41.23 | 44.67 | 48.11 |

The method of calculation
(Hydraulic cylinders' force)

$$F = P \times A - f$$

| | | |
|-----|--------------------|--------------------|
| F: | Cylinders' force | (N) |
| P: | Operating pressure | (MPa) |
| A: | Piston area | (mm ²) |
| f : | Friction drag | (N) |

How to order the seal kit

MHC□SK □

B
Q

| Tube I.D. | Seal kit |
|-----------|---|
| 20 | MHCB20 - Including No.6,7,8,9,10 |
| 25 | MHCB25 - Including No.6,7,8,9,10 |
| 32 | MHCB32,MHCQ32 - Including No.6,7,8,9,10 |
| 40 | MHCB40,MHCQ40 - Including No.6,7,8,9,10 |
| 50 | MHCB50,MHCQ50 - Including No.6,7,8,9,10 |
| 63 | MHCB63,MHCQ63 - Including No.6,7,8,9,10 |
| 80 | MHCB80 - Including No.6,7,8,9,10 |

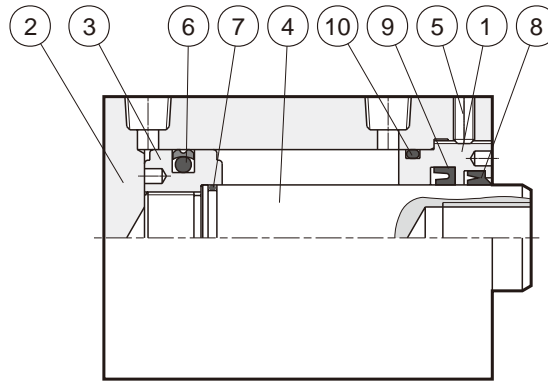
MHC□SK □ D

B
Q

| Tube I.D. | Seal kit |
|-----------|---|
| 32 | MHCB32D,MHCQ32D - Including No.6,7,8,9,10 |
| 40 | MHCB40D,MHCQ40D - Including No.6,7,8,9,10 |
| 50 | MHCB50D,MHCQ50D - Including No.6,7,8,9,10 |
| 63 | MHCB63D,MHCQ63D - Including No.6,7,8,9,10 |
| 80 | MHCB80D - Including No.6,7,8,9,10 |

MHCB

MHCQ

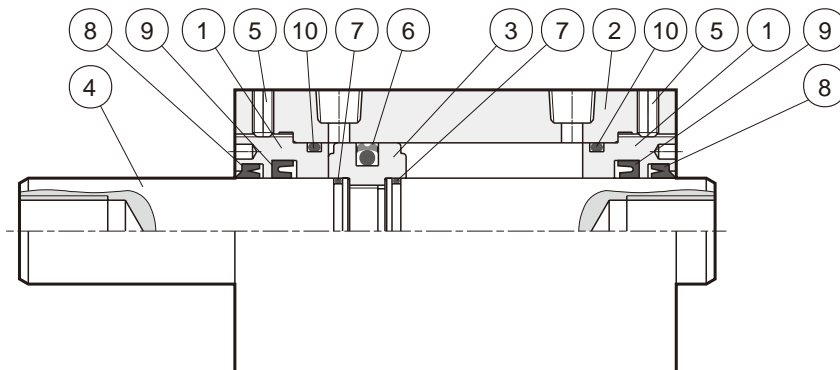


Parts list

| No. | Part name | Q'y | No. | Part name | Q'y | No. | Part name | Q'y |
|-----|---------------|-----|-----|----------------|-----|-----|-----------------|-----|
| 1 | Rod cover | 1 | 5 | Set screw | 1 | 9 | Rod packing | 1 |
| 2 | Cylinder tube | 1 | 6 | Piston packing | 1 | 10 | Cylinder gasket | 1 |
| 3 | Piston | 1 | 7 | Piston gasket | 1 | 11 | | |
| 4 | Piston rod | 1 | 8 | Dust wiper | 1 | 12 | | |

MHCB-D

MHCQ-D



Parts list

| No. | Part name | Q'y | No. | Part name | Q'y | No. | Part name | Q'y |
|-----|---------------|-----|-----|----------------|-----|-----|-----------------|-----|
| 1 | Rod cover | 2 | 5 | Set screw | 2 | 9 | Rod packing | 2 |
| 2 | Cylinder tube | 1 | 6 | Piston packing | 1 | 10 | Cylinder gasket | 2 |
| 3 | Piston | 1 | 7 | Piston gasket | 2 | 11 | | |
| 4 | Piston rod | 1 | 8 | Dust wiper | 2 | 12 | | |

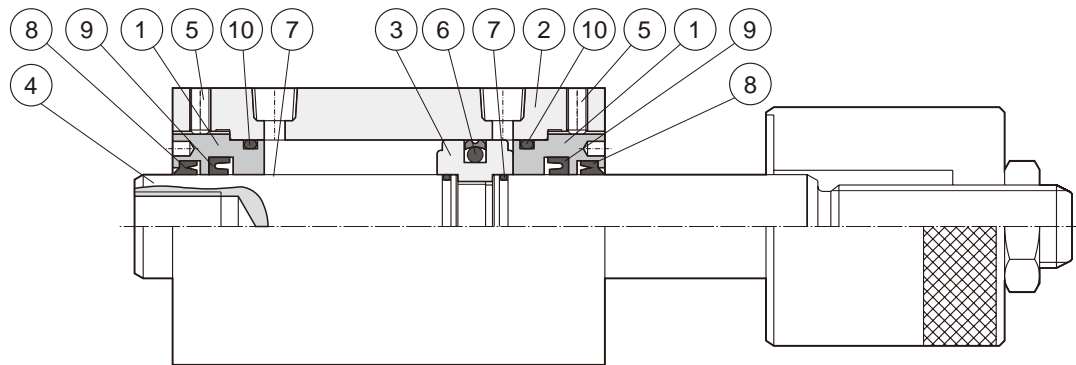
How to order the seal kit

MHC SK D

B
 Q

| Tube I.D. | Seal kit |
|-----------|--|
| 32 | MHCBSK32D, MHCQSK32D - Including No.6,7,8,9,10 |
| 40 | MHCBSK40D, MHCQSK40D - Including No.6,7,8,9,10 |
| 50 | MHCBSK50D, MHCQSK50D - Including No.6,7,8,9,10 |
| 63 | MHCBSK63D, MHCQSK63D - Including No.6,7,8,9,10 |
| 80 | MHCBSK80D - Including No.6,7,8,9,10 |

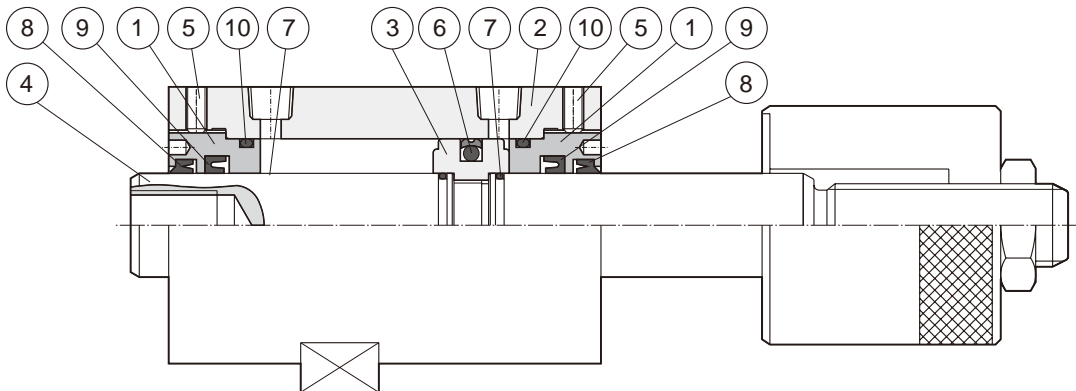
MHCB-DA MHCB-DB



Parts list

| No. | Part name | Q'y | No. | Part name | Q'y | No. | Part name | Q'y |
|-----|---------------|-----|-----|----------------|-----|-----|-----------------|-----|
| 1 | Rod cover | 1 | 5 | Set screw | 1 | 9 | Rod packing | 1 |
| 2 | Cylinder tube | 1 | 6 | Piston packing | 1 | 10 | Cylinder gasket | 1 |
| 3 | Piston | 1 | 7 | Piston gasket | 1 | 11 | | |
| 4 | Piston rod | 1 | 8 | Dust wiper | 1 | 12 | | |

MHCQ-DA MHCQ-DB



Parts list

| No. | Part name | Q'y | No. | Part name | Q'y | No. | Part name | Q'y |
|-----|---------------|-----|-----|----------------|-----|-----|-----------------|-----|
| 1 | Rod cover | 2 | 5 | Set screw | 2 | 9 | Rod packing | 2 |
| 2 | Cylinder tube | 1 | 6 | Piston packing | 1 | 10 | Cylinder gasket | 2 |
| 3 | Piston | 1 | 7 | Piston gasket | 2 | 11 | | |
| 4 | Piston rod | 1 | 8 | Dust wiper | 2 | 12 | | |

Cylinder weight (Including the mounting nut)

| Tube I.D. | $\varnothing 20$ | | $\varnothing 25$ | | $\varnothing 32$ | | | | $\varnothing 40$ | | | | $\varnothing 50$ | | | | $\varnothing 63$ | | | | $\varnothing 80$ | |
|-----------|------------------|------|------------------|------|------------------|------|------|------|------------------|------|------|------|------------------|------|------|------|------------------|------|-------|-------|------------------|-------|
| | MHCB | | MHCB | | MHCB | | MHCQ | | MHCB | | MHCQ | | MHCB | | MHCQ | | MHCB | | MHCQ | | MHCB | |
| | N | Z | N | Z | N | Z | N | Z | N | Z | N | Z | N | Z | N | Z | N | Z | N | Z | N | Z |
| 5 | 0.64 | 0.69 | 0.88 | 0.93 | 1.61 | 1.71 | 1.72 | 1.82 | 2.00 | 2.20 | 2.21 | 2.41 | 2.78 | 3.03 | 3.27 | 3.52 | 4.24 | 4.69 | 5.28 | 5.73 | 7.46 | 8.31 |
| 10 | 0.63 | 0.68 | 0.87 | 0.92 | 1.73 | 1.83 | 1.71 | 1.81 | 2.15 | 2.35 | 2.19 | 2.39 | 2.96 | 3.21 | 3.24 | 3.49 | 4.48 | 4.93 | 5.22 | 5.67 | 7.80 | 8.65 |
| 15 | 0.75 | 0.80 | 1.02 | 1.07 | 1.85 | 1.95 | 1.98 | 2.08 | 2.30 | 2.50 | 2.55 | 2.75 | 3.14 | 3.39 | 3.71 | 3.96 | 4.72 | 5.17 | 5.90 | 6.35 | 8.14 | 8.99 |
| 20 | 0.74 | 0.79 | 1.01 | 1.06 | 1.97 | 2.07 | 1.97 | 2.07 | 2.45 | 2.65 | 2.53 | 2.73 | 3.32 | 3.57 | 3.68 | 3.93 | 4.96 | 5.41 | 5.84 | 6.29 | 8.48 | 9.33 |
| 25 | 0.86 | 0.91 | 1.16 | 1.21 | 2.09 | 2.19 | 2.24 | 2.34 | 2.60 | 2.80 | 2.89 | 3.09 | 3.50 | 3.75 | 4.15 | 4.40 | 5.20 | 5.65 | 6.52 | 6.97 | 8.82 | 9.67 |
| 30 | 0.85 | 0.90 | 1.15 | 1.20 | 2.21 | 2.31 | 2.23 | 2.33 | 2.75 | 2.95 | 2.87 | 3.07 | 3.68 | 3.93 | 4.12 | 4.37 | 5.44 | 5.89 | 6.46 | 6.91 | 9.16 | 10.01 |
| 35 | 0.97 | 1.02 | 1.30 | 1.35 | 2.46 | 2.56 | 2.50 | 2.60 | 3.07 | 3.27 | 3.23 | 3.43 | 4.07 | 4.32 | 4.59 | 4.84 | 5.98 | 6.43 | 7.14 | 7.59 | 9.93 | 10.78 |
| 40 | 0.96 | 1.01 | 1.29 | 1.34 | 2.45 | 2.55 | 2.49 | 2.59 | 3.05 | 3.25 | 3.21 | 3.41 | 4.04 | 4.29 | 4.56 | 4.81 | 5.92 | 6.37 | 7.08 | 7.53 | 9.84 | 10.69 |
| 45 | — | — | 1.44 | 1.49 | 2.70 | 2.80 | 2.76 | 2.86 | 3.37 | 3.57 | 3.57 | 3.77 | 4.43 | 4.68 | 5.03 | 5.28 | 6.46 | 6.91 | 7.76 | 8.21 | 10.61 | 11.46 |
| 50 | — | — | 1.43 | 1.48 | 2.69 | 2.79 | 2.75 | 2.85 | 3.35 | 3.55 | 3.55 | 3.75 | 4.40 | 4.65 | 5.00 | 5.25 | 6.40 | 6.85 | 7.70 | 8.15 | 10.52 | 11.37 |
| 60 | — | — | — | — | 2.93 | 3.03 | 3.01 | 3.11 | 3.65 | 3.85 | 3.89 | 4.09 | 4.76 | 5.01 | 5.44 | 5.69 | 6.88 | 7.33 | 8.32 | 8.77 | 11.20 | 12.05 |
| 70 | — | — | — | — | 3.17 | 3.27 | 3.27 | 3.37 | 3.95 | 4.15 | 4.23 | 4.43 | 5.12 | 5.37 | 5.88 | 6.13 | 7.36 | 7.81 | 8.94 | 9.39 | 11.88 | 12.73 |
| 80 | — | — | — | — | 3.41 | 3.51 | 3.53 | 3.63 | 4.25 | 4.45 | 4.57 | 4.77 | 5.48 | 5.73 | 6.32 | 6.57 | 7.84 | 8.29 | 9.56 | 10.01 | 12.56 | 13.41 |
| 90 | — | — | — | — | 3.65 | 3.75 | 3.79 | 3.89 | 4.55 | 4.75 | 4.91 | 5.11 | 5.84 | 6.09 | 6.76 | 7.01 | 8.32 | 8.77 | 10.18 | 10.63 | 13.24 | 14.09 |
| 100 | — | — | — | — | 3.89 | 3.99 | 4.05 | 4.15 | 4.85 | 5.05 | 5.25 | 5.45 | 6.20 | 6.45 | 7.20 | 7.45 | 8.80 | 9.25 | 10.80 | 11.25 | 13.92 | 14.77 |


* N (Female thread); Z (Male thread)

| Tube I.D. | $\varnothing 32$ | | | | | | $\varnothing 40$ | | | | | | $\varnothing 50$ | | | | | | $\varnothing 63$ | | | | | | $\varnothing 80$ | | |
|-----------|------------------|------|------|--------|------|------|------------------|------|------|--------|------|------|------------------|------|------|--------|------|------|------------------|------|------|--------|------|------|------------------|-------|-------|
| | MHCB_D | | | MHCQ_D | | | MHCB_D | | | MHCQ_D | | | MHCB_D | | | MHCQ_D | | | MHCB_D | | | MHCQ_D | | | MHCB_D | | |
| | N | Z | L | N | Z | L,R | N | Z | L | N | Z | L,R | N | Z | L | N | Z | L,R | N | Z | L | N | Z | L,R | N | Z | L |
| 5 | 1.89 | 2.06 | 1.97 | 1.90 | 2.07 | 1.99 | 2.37 | 2.71 | 2.54 | 2.45 | 2.79 | 2.62 | 3.22 | 3.65 | 3.44 | 3.63 | 4.05 | 3.84 | 4.85 | 5.61 | 5.23 | 5.59 | 6.35 | 5.98 | 10.18 | 11.63 | 10.90 |
| 10 | 1.89 | 2.06 | 1.97 | 1.90 | 2.07 | 1.99 | 2.37 | 2.71 | 2.54 | 2.45 | 2.79 | 2.62 | 3.22 | 3.65 | 3.43 | 3.62 | 4.05 | 3.84 | 4.83 | 5.59 | 5.21 | 5.58 | 6.34 | 5.96 | 10.15 | 11.60 | 10.88 |
| 15 | 2.11 | 2.28 | 2.20 | 2.14 | 2.31 | 2.23 | 2.66 | 3.00 | 2.83 | 2.77 | 3.11 | 2.94 | 3.58 | 4.00 | 3.79 | 4.05 | 4.47 | 4.26 | 5.32 | 6.08 | 5.70 | 6.18 | 6.95 | 6.57 | 10.87 | 12.31 | 11.59 |
| 20 | 2.11 | 2.28 | 2.20 | 2.14 | 2.31 | 2.23 | 2.66 | 3.00 | 2.83 | 2.77 | 3.11 | 2.94 | 3.57 | 4.00 | 3.79 | 4.04 | 4.47 | 4.26 | 5.30 | 6.07 | 5.68 | 6.17 | 6.93 | 6.55 | 10.84 | 12.28 | 11.58 |
| 25 | 2.34 | 2.51 | 2.42 | 2.38 | 2.55 | 2.47 | 2.94 | 3.28 | 3.11 | 3.09 | 3.43 | 3.26 | 3.93 | 4.36 | 4.14 | 4.47 | 4.90 | 4.68 | 5.79 | 6.56 | 6.17 | 6.78 | 7.54 | 7.16 | 11.55 | 12.99 | 12.27 |
| 30 | 2.34 | 2.51 | 2.42 | 2.39 | 2.56 | 2.47 | 2.95 | 3.29 | 3.12 | 3.10 | 3.44 | 3.27 | 3.93 | 4.35 | 4.14 | 4.47 | 4.89 | 4.68 | 5.77 | 6.54 | 6.15 | 6.76 | 7.52 | 7.14 | 11.52 | 12.97 | 12.25 |
| 35 | 2.56 | 2.73 | 2.65 | 2.63 | 2.80 | 2.71 | 3.23 | 3.57 | 3.40 | 3.42 | 3.76 | 3.59 | 4.28 | 4.71 | 4.50 | 4.89 | 5.32 | 5.10 | 6.26 | 7.03 | 6.64 | 7.37 | 8.13 | 7.75 | 12.23 | 13.68 | 12.96 |
| 40 | 2.56 | 2.73 | 2.65 | 2.63 | 2.80 | 2.71 | 3.23 | 3.57 | 3.40 | 3.42 | 3.76 | 3.59 | 4.28 | 4.71 | 4.49 | 4.89 | 5.31 | 5.10 | 6.24 | 7.01 | 6.63 | 7.35 | 8.11 | 7.73 | 12.21 | 13.65 | 12.93 |
| 45 | 2.79 | 2.96 | 2.87 | 2.87 | 3.04 | 2.95 | 3.52 | 3.86 | 3.69 | 3.74 | 4.08 | 3.91 | 4.64 | 5.06 | 4.85 | 5.31 | 5.74 | 5.52 | 6.73 | 7.50 | 7.12 | 7.96 | 8.72 | 8.34 | 12.92 | 14.35 | 13.64 |
| 50 | 2.79 | 2.96 | 2.87 | 2.87 | 3.04 | 2.96 | 3.52 | 3.86 | 3.69 | 3.74 | 4.08 | 3.91 | 4.63 | 5.06 | 4.85 | 5.31 | 5.73 | 5.52 | 6.72 | 7.48 | 7.10 | 7.94 | 8.71 | 8.32 | 12.89 | 14.34 | 13.61 |

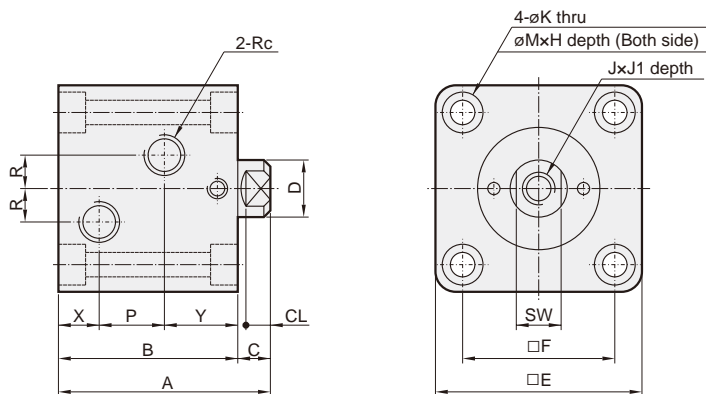
* N (Bilateral Female thread); Z (Bilateral Male thread); L, R (Unilateral Female thread)

Mounting weight

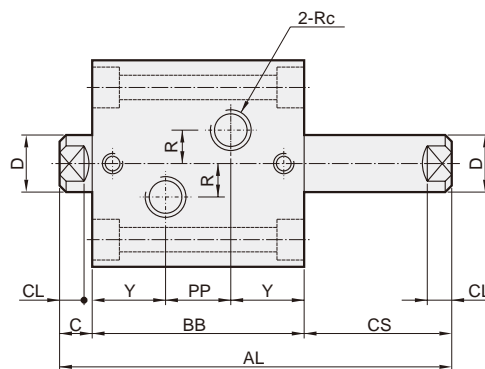
Unit: kg

| Tube I.D. (mm) | Adjustable Nut | | Nut (Rod) |
|------------------|--------------------------|--------------------------|---|
| | A Adjustable Stroke 25mm | B Adjustable Stroke 50mm |  |
| $\varnothing 32$ | 0.6 | 0.9 | 0.02 |
| $\varnothing 40$ | 1.0 | 1.45 | 0.04 |
| $\varnothing 50$ | 1.15 | 1.7 | 0.08 |
| $\varnothing 63$ | 2.15 | 3 | 0.08 |
| $\varnothing 80$ | 3.4 | 4.2 | 0.18 |

MHCB

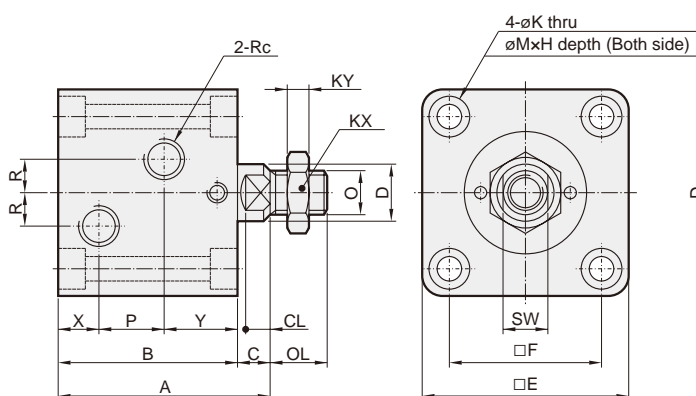


MHCB-D

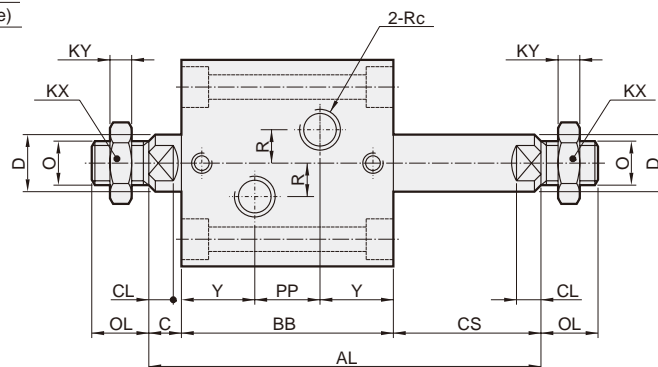


CS=C+stroke

MHCB-Z

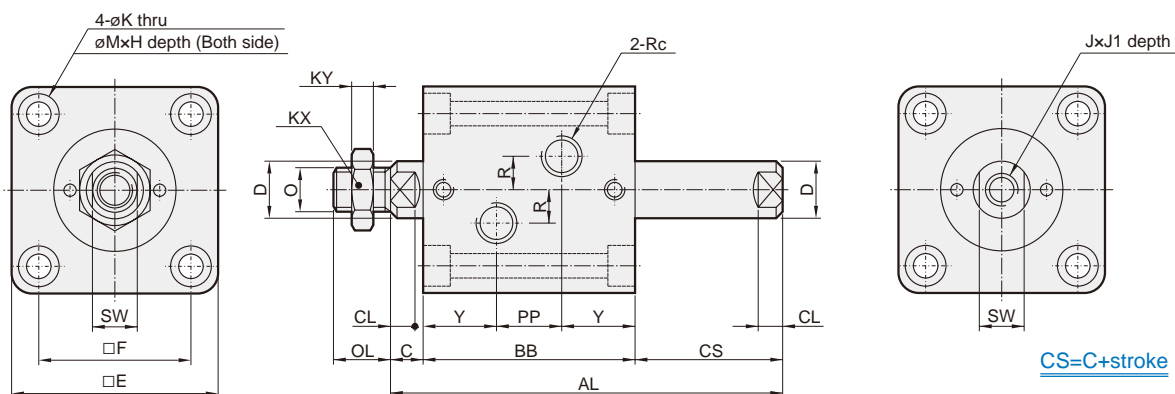


MHCB-ZD



CS=C+stroke

MHCB-LD



CS=C+stroke



COMPACT HYDRAULIC CYLINDER

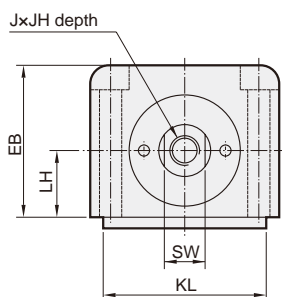
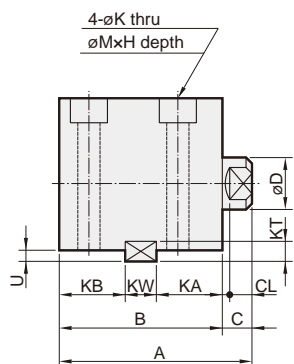
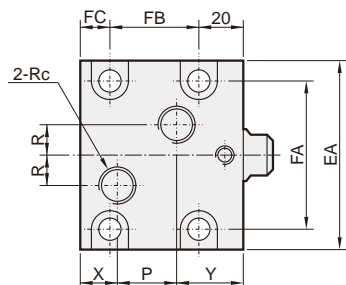
mindman

| Tube I.D. | Model | MHCB / MHCB-Z | | | | | | | | | | | | | | |
|------------------|--------|---------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | Stroke | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 80 | 90 | 100 |
| $\varnothing 20$ | A | 61 | 61 | 71 | 71 | 81 | 81 | 91 | 91 | - | - | - | - | - | - | - |
| | B | 53 | 53 | 63 | 63 | 73 | 73 | 83 | 83 | - | - | - | - | - | - | - |
| | P | 20 | 20 | 30 | 30 | 40 | 40 | 50 | 50 | - | - | - | - | - | - | - |
| $\varnothing 25$ | A | 63 | 63 | 73 | 73 | 83 | 83 | 93 | 93 | 103 | 103 | - | - | - | - | - |
| | B | 55 | 55 | 65 | 65 | 75 | 75 | 85 | 85 | 95 | 95 | - | - | - | - | - |
| | P | 22 | 22 | 32 | 32 | 42 | 42 | 52 | 52 | 62 | 62 | - | - | - | - | - |
| $\varnothing 32$ | A | 69 | 74 | 79 | 84 | 89 | 94 | 104 | 104 | 114 | 114 | 124 | - | - | - | - |
| | B | 59 | 64 | 69 | 74 | 79 | 84 | 94 | 94 | 104 | 104 | 114 | - | - | - | - |
| | P | 19 | 24 | 29 | 34 | 39 | 44 | 54 | 54 | 64 | 64 | 74 | - | - | - | - |
| $\varnothing 40$ | A | 70 | 75 | 80 | 85 | 90 | 95 | 105 | 105 | 115 | 115 | 125 | 135 | 145 | - | - |
| | B | 60 | 65 | 70 | 75 | 80 | 85 | 95 | 95 | 105 | 105 | 115 | 125 | 135 | - | - |
| | P | 20 | 25 | 30 | 35 | 40 | 45 | 55 | 55 | 65 | 65 | 75 | 85 | 95 | - | - |
| $\varnothing 50$ | A | 76 | 81 | 86 | 91 | 96 | 101 | 111 | 111 | 121 | 121 | 131 | 141 | 151 | 161 | - |
| | B | 65 | 70 | 75 | 80 | 85 | 90 | 100 | 100 | 110 | 110 | 120 | 130 | 140 | 150 | - |
| | P | 23 | 28 | 33 | 38 | 43 | 48 | 58 | 58 | 68 | 68 | 78 | 88 | 98 | 108 | - |
| $\varnothing 63$ | A | 85 | 90 | 95 | 100 | 105 | 110 | 120 | 120 | 130 | 130 | 140 | 150 | 160 | 170 | 180 |
| | B | 72 | 77 | 82 | 87 | 92 | 97 | 107 | 107 | 117 | 117 | 127 | 137 | 147 | 157 | 167 |
| | P | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 60 | 70 | 70 | 80 | 90 | 100 | 110 | 120 |
| $\varnothing 80$ | A | 100 | 105 | 110 | 115 | 120 | 125 | 135 | 135 | 145 | 145 | 155 | 165 | 175 | 185 | 195 |
| | B | 83 | 88 | 93 | 98 | 103 | 108 | 118 | 118 | 128 | 128 | 138 | 148 | 158 | 168 | 178 |
| | P | 32 | 37 | 42 | 47 | 52 | 57 | 67 | 67 | 77 | 77 | 87 | 97 | 107 | 117 | 127 |

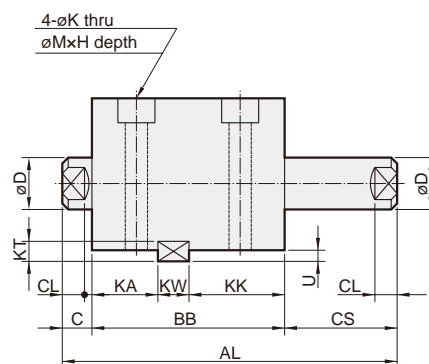
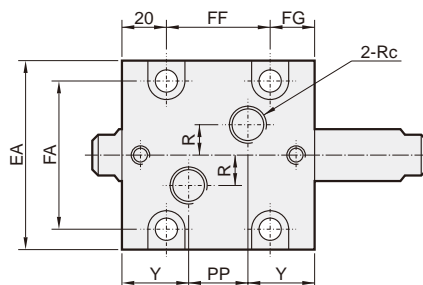
| Tube I.D. | Model | MHCB-D / MHCB-ZD / MHCB-LD | | | | | | | | | | | | | | |
|------------------|--------|----------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|-----|
| | Stroke | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 80 | 90 | 100 |
| $\varnothing 32$ | AL | 104 | 109 | 124 | 129 | 144 | 149 | 164 | 169 | 184 | 189 | - | - | - | - | - |
| | BB | 79 | 79 | 89 | 89 | 99 | 99 | 109 | 109 | 119 | 119 | - | - | - | - | - |
| | CS | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | - | - | - | - | - |
| | PP | 23 | 23 | 33 | 33 | 43 | 43 | 53 | 53 | 63 | 63 | - | - | - | - | - |
| $\varnothing 40$ | AL | 105 | 110 | 125 | 130 | 145 | 150 | 165 | 170 | 185 | 190 | - | - | - | - | - |
| | BB | 80 | 80 | 90 | 90 | 100 | 100 | 110 | 110 | 120 | 120 | - | - | - | - | - |
| | CS | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | - | - | - | - | - |
| | PP | 24 | 24 | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 | - | - | - | - | - |
| $\varnothing 50$ | AL | 112 | 117 | 132 | 137 | 152 | 157 | 172 | 177 | 192 | 197 | - | - | - | - | - |
| | BB | 85 | 85 | 95 | 95 | 105 | 105 | 115 | 115 | 125 | 125 | - | - | - | - | - |
| | CS | 16 | 21 | 26 | 31 | 36 | 41 | 46 | 51 | 56 | 61 | - | - | - | - | - |
| | PP | 26 | 26 | 36 | 36 | 46 | 46 | 56 | 56 | 66 | 66 | - | - | - | - | - |
| $\varnothing 63$ | AL | 123 | 128 | 143 | 148 | 163 | 168 | 183 | 188 | 203 | 208 | - | - | - | - | - |
| | BB | 92 | 92 | 102 | 102 | 112 | 112 | 122 | 122 | 132 | 132 | - | - | - | - | - |
| | CS | 18 | 23 | 28 | 33 | 38 | 43 | 48 | 53 | 58 | 63 | - | - | - | - | - |
| | PP | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 | - | - | - | - | - |
| $\varnothing 80$ | AL | 142 | 147 | 162 | 167 | 182 | 187 | 202 | 207 | 222 | 227 | - | - | - | - | - |
| | BB | 103 | 103 | 113 | 113 | 123 | 123 | 133 | 133 | 143 | 143 | - | - | - | - | - |
| | CS | 22 | 27 | 32 | 37 | 42 | 47 | 52 | 57 | 62 | 67 | - | - | - | - | - |
| | PP | 37 | 37 | 47 | 47 | 57 | 57 | 67 | 67 | 77 | 77 | - | - | - | - | - |

| Code Tube I.D. | C | CL | D | E | F | H | J | J1 | K | KX | KY | M | O | OL | PT | R | SW | X | Y |
|-------------------|----|----|----|-----|----|-----|----------|----|-----|----|----|----|----------|----|-------|----|----|------|------|
| $\varnothing 20$ | 8 | 6 | 12 | 42 | 30 | 5.5 | M8x1.25 | 12 | 5.6 | 17 | 6 | 9 | M10x1.25 | 20 | Rc1/8 | 5 | 10 | 10 | 23 |
| $\varnothing 25$ | 8 | 6 | 14 | 48 | 36 | 5.5 | M10x1.5 | 15 | 5.6 | 19 | 7 | 9 | M12x1.25 | 22 | Rc1/8 | 5 | 12 | 10 | 23 |
| $\varnothing 32$ | 10 | 7 | 20 | 62 | 47 | 6.5 | M12x1.75 | 15 | 6.6 | 24 | 8 | 11 | M16x1.5 | 25 | Rc1/4 | 10 | 17 | 12 | 28 |
| $\varnothing 40$ | 10 | 7 | 25 | 70 | 52 | 9 | M16x2.0 | 20 | 9 | 32 | 11 | 14 | M22x1.5 | 30 | Rc1/4 | 10 | 22 | 12 | 28 |
| $\varnothing 50$ | 11 | 8 | 30 | 80 | 58 | 11 | M20x2.5 | 25 | 11 | 35 | 14 | 18 | M26x1.5 | 35 | Rc1/4 | 10 | 27 | 12.5 | 29.5 |
| $\varnothing 63$ | 13 | 10 | 35 | 94 | 69 | 13 | M27x3.0 | 35 | 13 | 41 | 13 | 20 | M30x1.5 | 40 | Rc3/8 | 10 | 32 | 16 | 31 |
| $\varnothing 80$ | 17 | 14 | 45 | 114 | 86 | 15 | M30x3.5 | 35 | 15 | 50 | 10 | 22 | M39x1.5 | 45 | Rc3/8 | 15 | 41 | 18 | 33 |

MHCQ

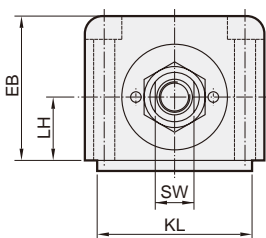
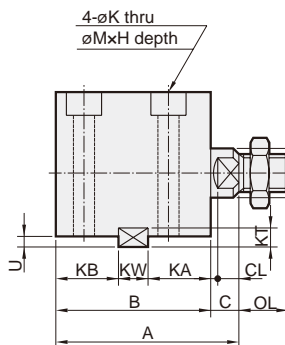
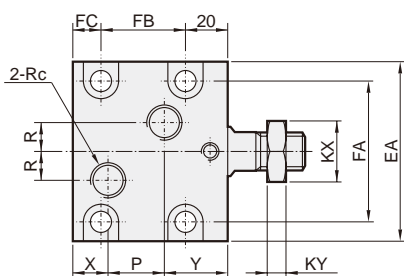


MHCQ-D

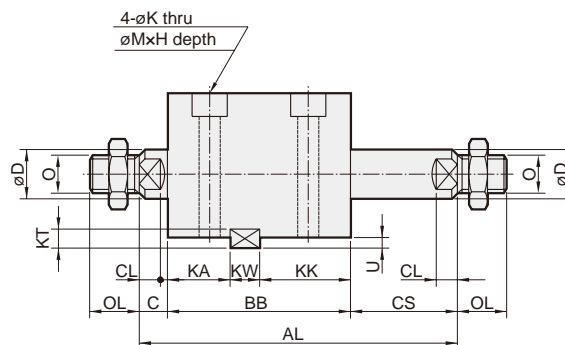
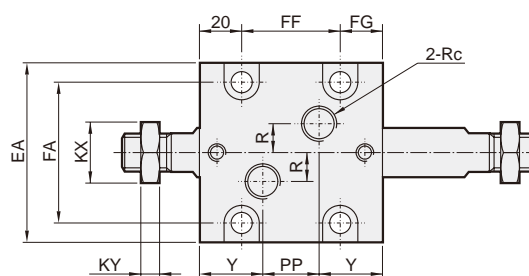


CS=C+stroke

MHCQ-Z



MHCQ-ZD



CS=C+stroke

| Tube I.D. | Model Stroke | MHCQ / MHCQ-Z | | | | | | | | | |
|-----------|-----------------|---------------|----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| ø32 | A | 74 | 74 | 84 | 84 | 94 | 94 | 104 | 104 | 114 | 114 |
| | B | 64 | 64 | 74 | 74 | 84 | 84 | 94 | 94 | 104 | 104 |
| | FB | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 | 74 | 74 |
| | KB | 24 | 24 | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 |
| | P | 24 | 24 | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 |
| ø40 | A | 75 | 75 | 85 | 85 | 95 | 95 | 105 | 105 | 115 | 115 |
| | B | 65 | 65 | 75 | 75 | 85 | 85 | 95 | 95 | 105 | 105 |
| | FB | 33 | 33 | 43 | 43 | 53 | 53 | 63 | 63 | 73 | 73 |
| | KB | 25 | 25 | 35 | 35 | 45 | 45 | 55 | 55 | 65 | 65 |
| | P | 25 | 25 | 35 | 35 | 45 | 45 | 55 | 55 | 65 | 65 |
| ø50 | A | 81 | 81 | 91 | 91 | 101 | 101 | 111 | 111 | 121 | 121 |
| | B | 70 | 70 | 80 | 80 | 90 | 90 | 100 | 100 | 110 | 110 |
| | FB | 37 | 37 | 47 | 47 | 57 | 57 | 67 | 67 | 77 | 77 |
| | KB | 27 | 27 | 37 | 37 | 47 | 47 | 57 | 57 | 67 | 67 |
| | P | 28 | 28 | 38 | 38 | 48 | 48 | 58 | 58 | 68 | 68 |
| ø63 | A | 90 | 90 | 100 | 100 | 110 | 110 | 120 | 120 | 130 | 130 |
| | B | 77 | 77 | 87 | 87 | 97 | 97 | 107 | 107 | 117 | 117 |
| | FB | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KB | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |
| | P | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |

| Tube I.D. | Model Stroke | MHCQ-D / MHCQ-ZD | | | | | | | | | |
|-----------|-----------------|------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| ø32 | AL | 104 | 109 | 124 | 129 | 144 | 149 | 164 | 169 | 184 | 189 |
| | BB | 79 | 79 | 89 | 89 | 99 | 99 | 109 | 109 | 119 | 119 |
| | CS | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| | FF | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KK | 39 | 39 | 49 | 49 | 59 | 59 | 69 | 69 | 79 | 79 |
| | PP | 23 | 23 | 33 | 33 | 43 | 43 | 53 | 53 | 63 | 63 |
| ø40 | AL | 105 | 110 | 125 | 130 | 145 | 150 | 165 | 170 | 185 | 190 |
| | BB | 80 | 80 | 90 | 90 | 100 | 100 | 110 | 110 | 120 | 120 |
| | CS | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| | FF | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KK | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 | 80 | 80 |
| | PP | 24 | 24 | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 |
| ø50 | AL | 112 | 117 | 132 | 137 | 152 | 157 | 172 | 177 | 192 | 197 |
| | BB | 85 | 85 | 95 | 95 | 105 | 105 | 115 | 115 | 125 | 125 |
| | CS | 16 | 21 | 26 | 31 | 36 | 41 | 46 | 51 | 56 | 61 |
| | FF | 45 | 45 | 55 | 55 | 65 | 65 | 75 | 75 | 85 | 85 |
| | KK | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | PP | 26 | 26 | 36 | 36 | 46 | 46 | 56 | 56 | 66 | 66 |
| ø63 | AL | 123 | 128 | 143 | 148 | 163 | 168 | 183 | 188 | 203 | 208 |
| | BB | 92 | 92 | 102 | 102 | 112 | 112 | 122 | 122 | 132 | 132 |
| | CS | 18 | 23 | 28 | 33 | 38 | 43 | 48 | 53 | 58 | 63 |
| | FF | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 | 92 | 92 |
| | KK | 45 | 45 | 55 | 55 | 65 | 65 | 75 | 75 | 85 | 85 |
| | PP | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |

| Code Tube I.D. | C | CL | D | EA | EB | FA | FC | FG | H | J | JH | K | KA | KL |
|-------------------|----|----|----|-----|----|----|----|----|----|----------|----|----|----|-----|
| ø32 | 10 | 7 | 20 | 70 | 56 | 56 | 10 | 17 | 9 | M12x1.75 | 15 | 9 | 28 | 63 |
| ø40 | 10 | 7 | 25 | 80 | 64 | 62 | 12 | 18 | 11 | M16x2.0 | 20 | 11 | 28 | 70 |
| ø50 | 11 | 8 | 30 | 94 | 74 | 74 | 13 | 20 | 13 | M20x2.5 | 25 | 13 | 29 | 80 |
| ø63 | 13 | 10 | 35 | 114 | 89 | 90 | 15 | 20 | 15 | M27x3.0 | 35 | 15 | 31 | 100 |

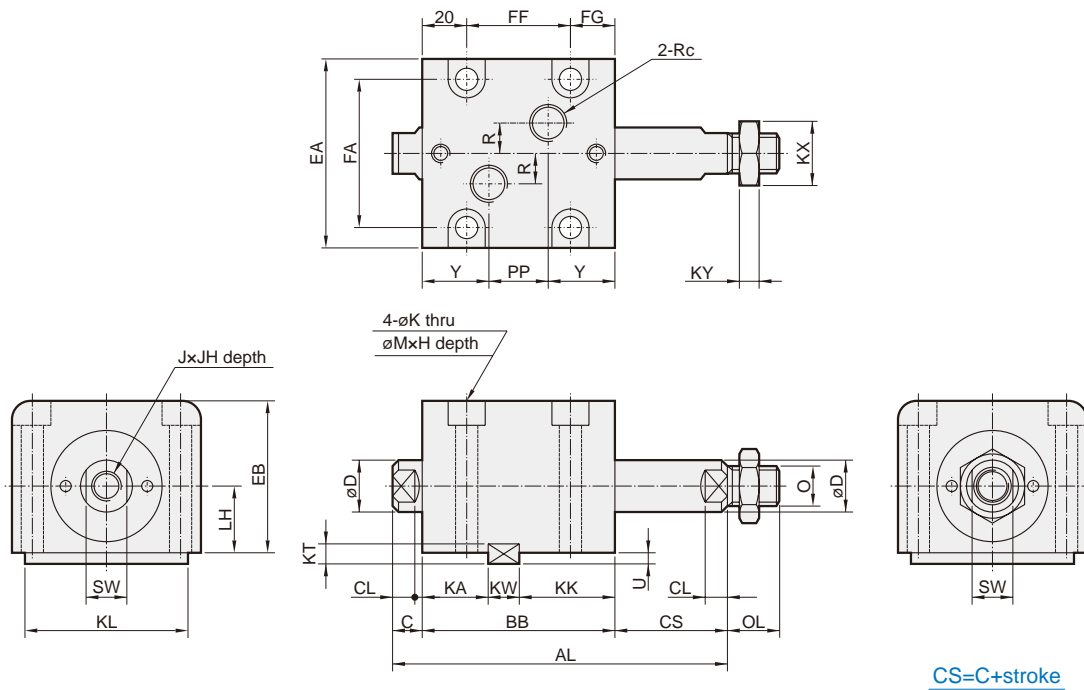
| Code Tube I.D. | KT | KW | KX | KY | LH | M | O | OL | PT | R | SW | U | X | Y |
|-------------------|----|----|----|----|----|----|---------|----|-------|----|----|-----|------|------|
| ø32 | 8 | 12 | 24 | 8 | 25 | 14 | M16x1.5 | 25 | Rc1/4 | 10 | 17 | 4.5 | 12 | 28 |
| ø40 | 8 | 12 | 32 | 11 | 29 | 18 | M22x1.5 | 30 | Rc1/4 | 10 | 22 | 4.5 | 12 | 28 |
| ø50 | 9 | 14 | 35 | 14 | 34 | 20 | M26x1.5 | 35 | Rc1/4 | 10 | 27 | 5 | 12.5 | 29.5 |
| ø63 | 10 | 16 | 41 | 13 | 42 | 22 | M30x1.5 | 40 | Rc3/8 | 10 | 32 | 5.5 | 16 | 31 |

MHCQ-*D Dimensions – Double rod $\phi 32\sim\phi 63$

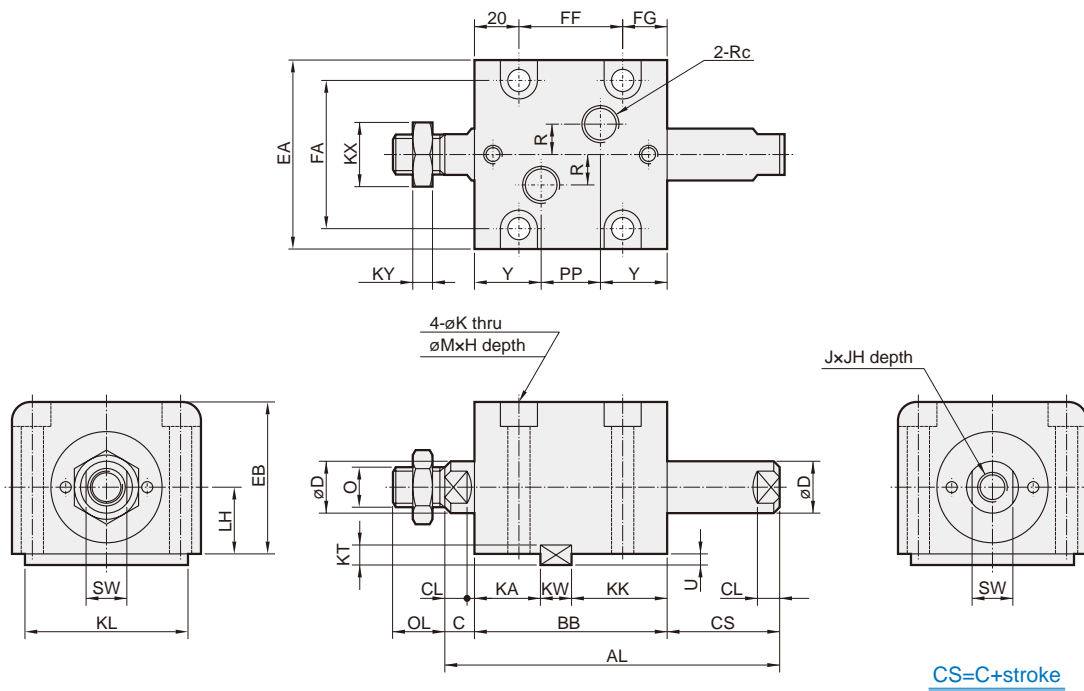
COMPACT HYDRAULIC CYLINDER



MHCQ-RD



MHCQ-LD



MHCQ-*D Dimensions – Double rod ø32~ø63



COMPACT HYDRAULIC CYLINDER

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| Tube I.D. | Model | MHCQ-RD / MHCQ-LD | | | | | | | | | |
|-----------|--------|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | Stroke | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| ø32 | AL | 104 | 109 | 124 | 129 | 144 | 149 | 164 | 169 | 184 | 189 |
| | BB | 79 | 79 | 89 | 89 | 99 | 99 | 109 | 109 | 119 | 119 |
| | CS | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| | FF | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KK | 39 | 39 | 49 | 49 | 59 | 59 | 69 | 69 | 79 | 79 |
| | PP | 23 | 23 | 33 | 33 | 43 | 43 | 53 | 53 | 63 | 63 |
| ø40 | AL | 105 | 110 | 125 | 130 | 145 | 150 | 165 | 170 | 185 | 190 |
| | BB | 80 | 80 | 90 | 90 | 100 | 100 | 110 | 110 | 120 | 120 |
| | CS | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 |
| | FF | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KK | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 | 80 | 80 |
| | PP | 24 | 24 | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 |
| ø50 | AL | 112 | 117 | 132 | 137 | 152 | 157 | 172 | 177 | 192 | 197 |
| | BB | 85 | 85 | 95 | 95 | 105 | 105 | 115 | 115 | 125 | 125 |
| | CS | 16 | 21 | 26 | 31 | 36 | 41 | 46 | 51 | 56 | 61 |
| | FF | 45 | 45 | 55 | 55 | 65 | 65 | 75 | 75 | 85 | 85 |
| | KK | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | PP | 26 | 26 | 36 | 36 | 46 | 46 | 56 | 56 | 66 | 66 |
| ø63 | AL | 123 | 128 | 143 | 148 | 163 | 168 | 183 | 188 | 203 | 208 |
| | BB | 92 | 92 | 102 | 102 | 112 | 112 | 122 | 122 | 132 | 132 |
| | CS | 18 | 23 | 28 | 33 | 38 | 43 | 48 | 53 | 58 | 63 |
| | FF | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 | 92 | 92 |
| | KK | 45 | 45 | 55 | 55 | 65 | 65 | 75 | 75 | 85 | 85 |
| | PP | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |

| Code Tube I.D. | C | CL | D | EA | EB | FA | FG | H | J | JH | K | KA | KL | KT |
|-------------------|----|----|----|-----|----|----|----|----|----------|----|----|----|-----|----|
| ø32 | 10 | 7 | 20 | 70 | 56 | 56 | 17 | 9 | M12x1.75 | 15 | 9 | 28 | 63 | 8 |
| ø40 | 10 | 7 | 25 | 80 | 64 | 62 | 18 | 11 | M16x2.0 | 20 | 11 | 28 | 70 | 8 |
| ø50 | 11 | 8 | 30 | 94 | 74 | 74 | 20 | 13 | M20x2.5 | 25 | 13 | 29 | 80 | 9 |
| ø63 | 13 | 10 | 35 | 114 | 89 | 90 | 20 | 15 | M27x3.0 | 35 | 15 | 31 | 100 | 10 |

| Code Tube I.D. | KW | KX | KY | LH | M | O | OL | PT | R | SW | U | Y |
|-------------------|----|----|----|----|----|---------|----|-------|----|----|-----|------|
| ø32 | 12 | 24 | 8 | 25 | 14 | M16x1.5 | 25 | Rc1/4 | 10 | 17 | 4.5 | 28 |
| ø40 | 12 | 32 | 11 | 29 | 18 | M22x1.5 | 30 | Rc1/4 | 10 | 22 | 4.5 | 28 |
| ø50 | 14 | 35 | 14 | 34 | 20 | M26x1.5 | 35 | Rc1/4 | 10 | 27 | 5 | 29.5 |
| ø63 | 16 | 41 | 13 | 42 | 22 | M30x1.5 | 40 | Rc3/8 | 10 | 32 | 5.5 | 31 |

MHCB Dimensions – Adjustable stroke $\varnothing 32\sim\varnothing 80$

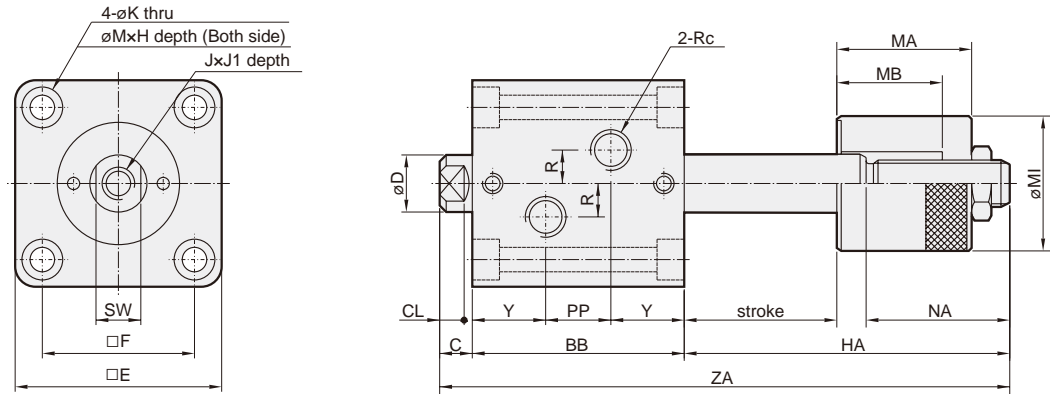


COMPACT HYDRAULIC CYLINDER

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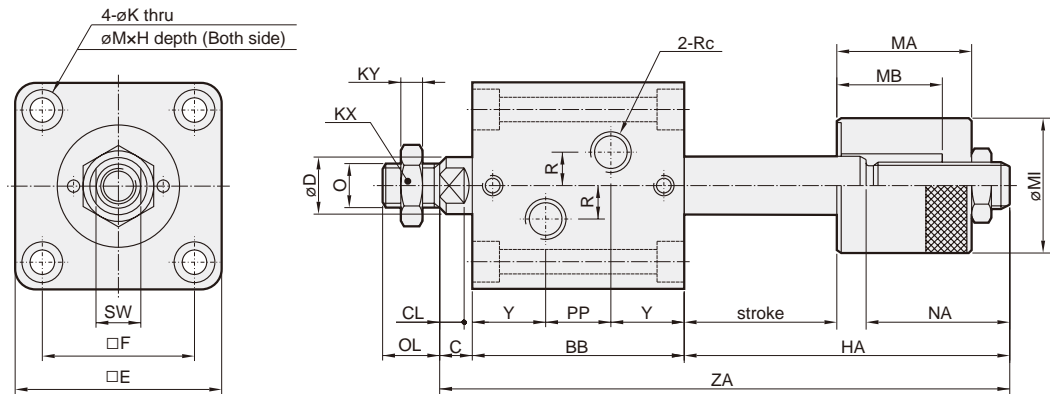
MHCB-DA

Adjustable stroke
25 mm



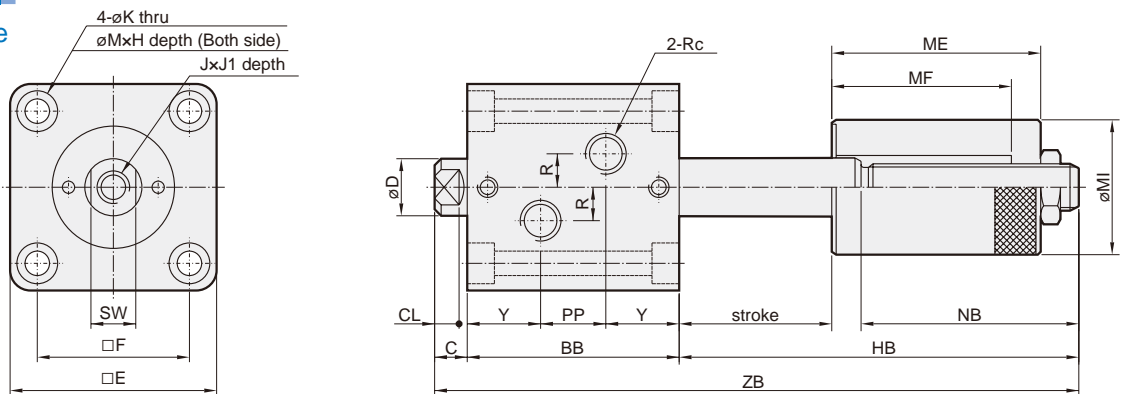
MHCB-ZDA

Adjustable stroke
25 mm



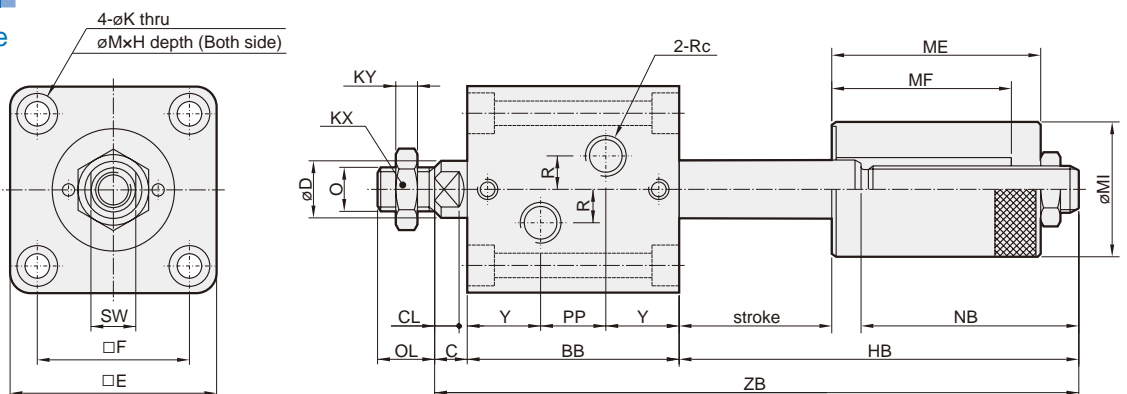
MHCB-DB

Adjustable stroke
50 mm



MHCB-ZDB

Adjustable stroke
50 mm





COMPACT HYDRAULIC CYLINDER

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Rotary Actuator

Clamp Cylinder

Gripper

Electric Actuator

Auxiliary Equipment

Hydraulic Cylinder

| Tube I.D. | Model | MHCB-DA / MHCB-ZDA | | | | | | | | | | | | | | |
|------------------|--------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|-----|
| | Stroke | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 80 | 90 | 100 |
| $\varnothing 32$ | ZA | 153 | 158 | 173 | 178 | 193 | 198 | 213 | 218 | 233 | 238 | - | - | - | - | - |
| | BB | 79 | 79 | 89 | 89 | 99 | 99 | 109 | 109 | 119 | 119 | - | - | - | - | - |
| | PP | 23 | 23 | 33 | 33 | 43 | 43 | 53 | 53 | 63 | 63 | - | - | - | - | - |
| | HA | 64 | 69 | 74 | 79 | 84 | 89 | 94 | 99 | 104 | 109 | - | - | - | - | - |
| $\varnothing 40$ | ZA | 163 | 168 | 183 | 188 | 203 | 208 | 223 | 228 | 243 | 248 | - | - | - | - | - |
| | BB | 80 | 80 | 90 | 90 | 100 | 100 | 110 | 110 | 120 | 120 | - | - | - | - | - |
| | PP | 24 | 24 | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 | - | - | - | - | - |
| | HA | 73 | 78 | 83 | 88 | 93 | 98 | 103 | 108 | 113 | 118 | - | - | - | - | - |
| $\varnothing 50$ | ZA | 171 | 176 | 191 | 196 | 211 | 216 | 231 | 236 | 251 | 256 | - | - | - | - | - |
| | BB | 85 | 85 | 95 | 95 | 105 | 105 | 115 | 115 | 125 | 125 | - | - | - | - | - |
| | PP | 26 | 26 | 36 | 36 | 46 | 46 | 56 | 56 | 66 | 66 | - | - | - | - | - |
| | HA | 75 | 80 | 85 | 90 | 95 | 100 | 105 | 110 | 115 | 120 | - | - | - | - | - |
| $\varnothing 63$ | ZA | 188 | 193 | 208 | 213 | 228 | 233 | 248 | 253 | 268 | 273 | - | - | - | - | - |
| | BB | 92 | 92 | 102 | 102 | 112 | 112 | 122 | 122 | 132 | 132 | - | - | - | - | - |
| | PP | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 | - | - | - | - | - |
| | HA | 83 | 88 | 93 | 98 | 103 | 108 | 113 | 118 | 123 | 128 | - | - | - | - | - |
| $\varnothing 80$ | ZA | 207 | 212 | 227 | 232 | 247 | 252 | 267 | 272 | 287 | 292 | - | - | - | - | - |
| | BB | 103 | 103 | 113 | 113 | 123 | 123 | 133 | 133 | 143 | 143 | - | - | - | - | - |
| | PP | 37 | 37 | 47 | 47 | 57 | 57 | 67 | 67 | 77 | 77 | - | - | - | - | - |
| | HA | 87 | 92 | 97 | 102 | 107 | 112 | 117 | 122 | 127 | 132 | - | - | - | - | - |

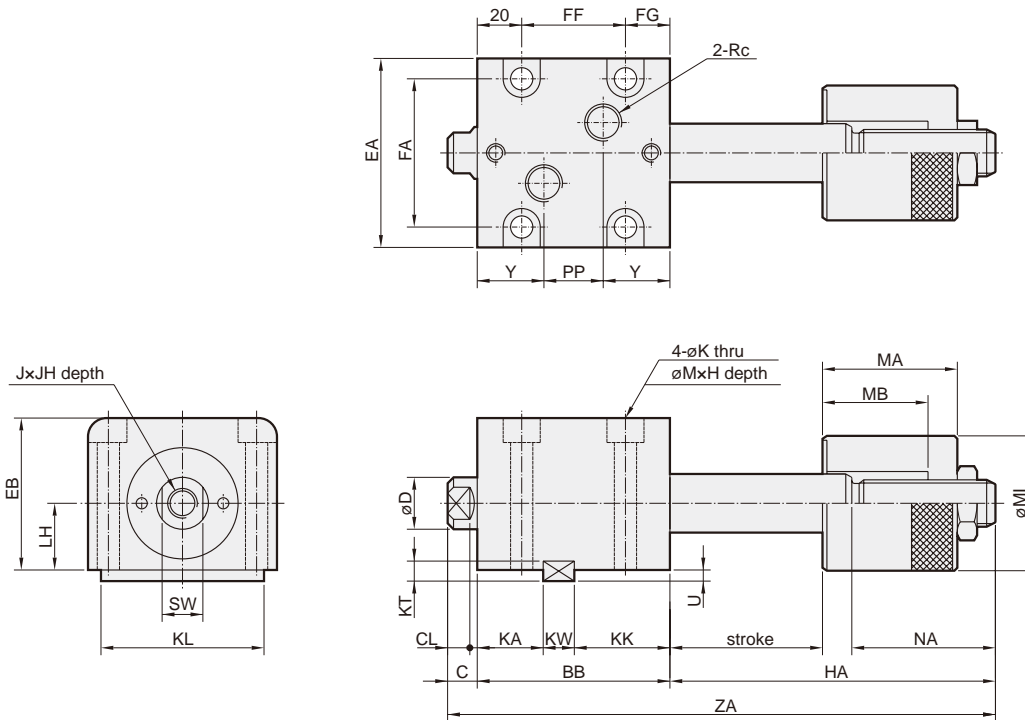
| Tube I.D. | Model | MHCB-DB / MHCB-ZDB | | | | | | | | | | | | | | |
|------------------|--------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|----|----|----|-----|
| | Stroke | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 | 60 | 70 | 80 | 90 | 100 |
| $\varnothing 32$ | ZB | 178 | 183 | 198 | 203 | 218 | 223 | 238 | 243 | 258 | 263 | - | - | - | - | - |
| | BB | 79 | 79 | 89 | 89 | 99 | 99 | 109 | 109 | 119 | 119 | - | - | - | - | - |
| | PP | 23 | 23 | 33 | 33 | 43 | 43 | 53 | 53 | 63 | 63 | - | - | - | - | - |
| | HB | 89 | 94 | 99 | 104 | 109 | 114 | 119 | 124 | 129 | 134 | - | - | - | - | - |
| $\varnothing 40$ | ZB | 188 | 193 | 208 | 213 | 228 | 233 | 248 | 253 | 268 | 273 | - | - | - | - | - |
| | BB | 80 | 80 | 90 | 90 | 100 | 100 | 110 | 110 | 120 | 120 | - | - | - | - | - |
| | PP | 24 | 24 | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 | - | - | - | - | - |
| | HB | 98 | 103 | 108 | 113 | 118 | 123 | 128 | 133 | 138 | 143 | - | - | - | - | - |
| $\varnothing 50$ | ZB | 196 | 201 | 216 | 221 | 236 | 241 | 256 | 261 | 276 | 281 | - | - | - | - | - |
| | BB | 85 | 85 | 95 | 95 | 105 | 105 | 115 | 115 | 125 | 125 | - | - | - | - | - |
| | PP | 26 | 26 | 36 | 36 | 46 | 46 | 56 | 56 | 66 | 66 | - | - | - | - | - |
| | HB | 100 | 105 | 110 | 115 | 120 | 125 | 130 | 135 | 140 | 145 | - | - | - | - | - |
| $\varnothing 63$ | ZB | 213 | 218 | 233 | 238 | 253 | 258 | 273 | 278 | 293 | 298 | - | - | - | - | - |
| | BB | 92 | 92 | 102 | 102 | 112 | 112 | 122 | 122 | 132 | 132 | - | - | - | - | - |
| | PP | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 | - | - | - | - | - |
| | HB | 108 | 113 | 118 | 123 | 128 | 133 | 138 | 143 | 148 | 153 | - | - | - | - | - |
| $\varnothing 80$ | ZB | 232 | 237 | 252 | 257 | 272 | 277 | 292 | 297 | 312 | 317 | - | - | - | - | - |
| | BB | 103 | 103 | 113 | 113 | 123 | 123 | 133 | 133 | 143 | 143 | - | - | - | - | - |
| | PP | 37 | 37 | 47 | 47 | 57 | 57 | 67 | 67 | 77 | 77 | - | - | - | - | - |
| | HB | 112 | 117 | 122 | 127 | 132 | 137 | 142 | 147 | 152 | 157 | - | - | - | - | - |

| Code Tube I.D. | C | CL | D | E | F | H | J | J1 | K | KX | KY | M | MI | MA |
|-------------------|----|----|----|-----|----|-----|----------|----|-----|----|----|----|----|----|
| $\varnothing 32$ | 10 | 7 | 20 | 62 | 47 | 6.5 | M12x1.75 | 15 | 6.6 | 24 | 8 | 11 | 45 | 46 |
| $\varnothing 40$ | 10 | 7 | 25 | 70 | 52 | 9 | M16x2.0 | 20 | 9 | 32 | 11 | 14 | 55 | 54 |
| $\varnothing 50$ | 11 | 8 | 30 | 80 | 58 | 11 | M20x2.5 | 25 | 11 | 35 | 14 | 18 | 60 | 53 |
| $\varnothing 63$ | 13 | 10 | 35 | 94 | 69 | 13 | M27x3.0 | 35 | 13 | 41 | 13 | 20 | 75 | 63 |
| $\varnothing 80$ | 17 | 14 | 45 | 114 | 86 | 15 | M30x3.5 | 35 | 15 | 50 | 10 | 22 | 90 | 70 |

| Code Tube I.D. | MB | ME | MF | NA | NB | O | OL | PT | R | SW | Y |
|-------------------|----|----|----|----|----|---------|----|-------|----|----|------|
| $\varnothing 32$ | 36 | 71 | 61 | 49 | 74 | M16x1.5 | 25 | Rc1/4 | 10 | 17 | 28 |
| $\varnothing 40$ | 36 | 79 | 61 | 58 | 83 | M22x1.5 | 30 | Rc1/4 | 10 | 22 | 28 |
| $\varnothing 50$ | 37 | 78 | 62 | 59 | 84 | M26x1.5 | 35 | Rc1/4 | 10 | 27 | 29.5 |
| $\varnothing 63$ | 39 | 88 | 64 | 65 | 90 | M30x1.5 | 40 | Rc3/8 | 10 | 32 | 31 |
| $\varnothing 80$ | 43 | 95 | 68 | 65 | 90 | M39x1.5 | 45 | Rc3/8 | 15 | 41 | 33 |

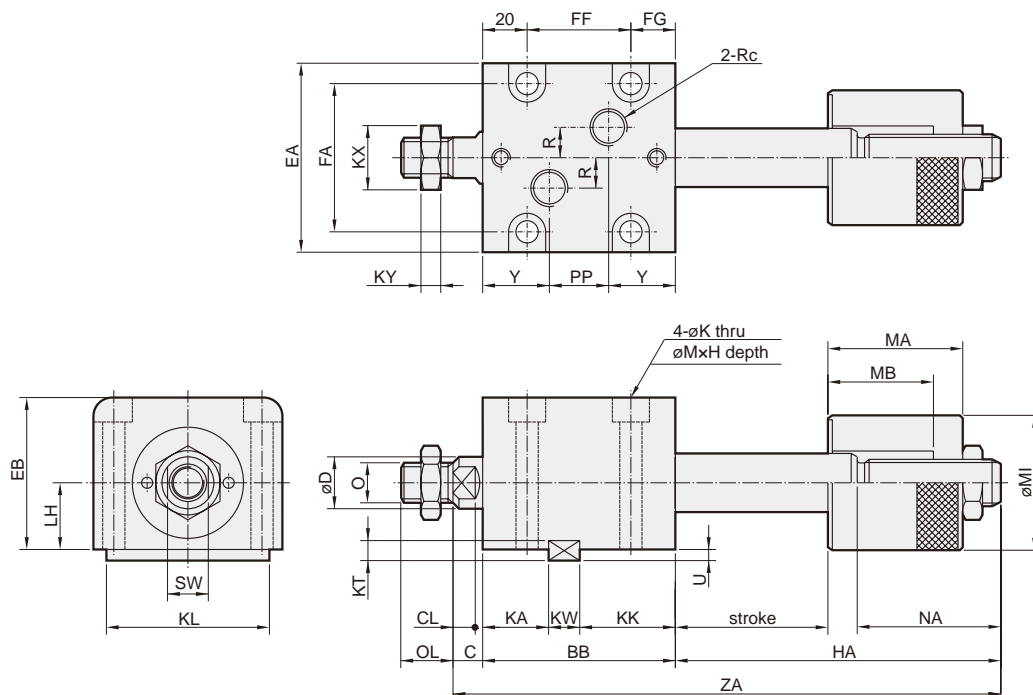
MHCQ-DA

Adjustable stroke 25 mm



MHCQ-ZDA

Adjustable stroke 25 mm



MHCQ-DA Dimensions – Adjustable stroke ø32~ø63



COMPACT HYDRAULIC CYLINDER

Mindman

| Tube I.D. | Model | MHCQ-DA / MHCQ-ZDA | | | | | | | | | |
|-----------|-------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | Stroke | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 |
| ø32 | ZA | 153 | 158 | 173 | 178 | 193 | 198 | 213 | 218 | 233 | 238 |
| | BB | 79 | 79 | 89 | 89 | 99 | 99 | 109 | 109 | 119 | 119 |
| | FF | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KK | 39 | 39 | 49 | 49 | 59 | 59 | 69 | 69 | 79 | 79 |
| | PP | 23 | 23 | 33 | 33 | 43 | 43 | 53 | 53 | 63 | 63 |
| | HA | 64 | 69 | 74 | 79 | 84 | 89 | 94 | 99 | 104 | 109 |
| ø40 | ZA | 163 | 168 | 183 | 188 | 203 | 208 | 223 | 228 | 243 | 248 |
| | BB | 80 | 80 | 90 | 90 | 100 | 100 | 110 | 110 | 120 | 120 |
| | FF | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KK | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 | 80 | 80 |
| | PP | 24 | 24 | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 |
| | HA | 73 | 78 | 83 | 88 | 93 | 98 | 103 | 108 | 113 | 118 |
| ø50 | ZA | 171 | 176 | 191 | 196 | 211 | 216 | 231 | 236 | 251 | 256 |
| | BB | 85 | 85 | 95 | 95 | 105 | 105 | 115 | 115 | 125 | 125 |
| | FF | 45 | 45 | 55 | 55 | 65 | 65 | 75 | 75 | 85 | 85 |
| | KK | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | PP | 26 | 26 | 36 | 36 | 46 | 46 | 56 | 56 | 66 | 66 |
| | HA | 75 | 80 | 85 | 90 | 95 | 100 | 105 | 110 | 115 | 120 |
| ø63 | ZA | 188 | 193 | 208 | 213 | 228 | 233 | 248 | 253 | 268 | 273 |
| | BB | 92 | 92 | 102 | 102 | 112 | 112 | 122 | 122 | 132 | 132 |
| | FF | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 | 92 | 92 |
| | KK | 45 | 45 | 55 | 55 | 65 | 65 | 75 | 75 | 85 | 85 |
| | PP | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |
| | HA | 83 | 88 | 93 | 98 | 103 | 108 | 113 | 118 | 123 | 128 |

| Code Tube I.D. | C | CL | D | EA | EB | FA | FG | H | J | JH | K | KA | KL | KT | KW |
|-------------------|----|----|----|-----|----|----|----|----|----------|----|----|----|-----|----|----|
| ø32 | 10 | 7 | 20 | 70 | 56 | 56 | 17 | 9 | M12×1.75 | 15 | 9 | 28 | 63 | 8 | 12 |
| ø40 | 10 | 7 | 25 | 80 | 64 | 62 | 18 | 11 | M16×2.0 | 20 | 11 | 28 | 70 | 8 | 12 |
| ø50 | 11 | 8 | 30 | 94 | 74 | 74 | 20 | 13 | M20×2.5 | 25 | 13 | 29 | 80 | 9 | 14 |
| ø63 | 13 | 10 | 35 | 114 | 89 | 90 | 20 | 15 | M27×3.0 | 35 | 15 | 31 | 100 | 10 | 16 |

| Code Tube I.D. | KX | KY | LH | M | MI | MA | MB | NA | O | OL | PT | R | SW | U | Y |
|-------------------|----|----|----|----|----|----|----|----|---------|----|-------|----|----|-----|------|
| ø32 | 24 | 8 | 25 | 14 | 45 | 46 | 36 | 49 | M16×1.5 | 25 | Rc1/4 | 10 | 17 | 4.5 | 28 |
| ø40 | 32 | 11 | 29 | 18 | 55 | 54 | 36 | 58 | M22×1.5 | 30 | Rc1/4 | 10 | 22 | 4.5 | 28 |
| ø50 | 35 | 14 | 34 | 20 | 60 | 53 | 37 | 59 | M26×1.5 | 35 | Rc1/4 | 10 | 27 | 5 | 29.5 |
| ø63 | 41 | 13 | 42 | 22 | 75 | 63 | 39 | 65 | M30×1.5 | 40 | Rc3/8 | 10 | 32 | 5.5 | 31 |

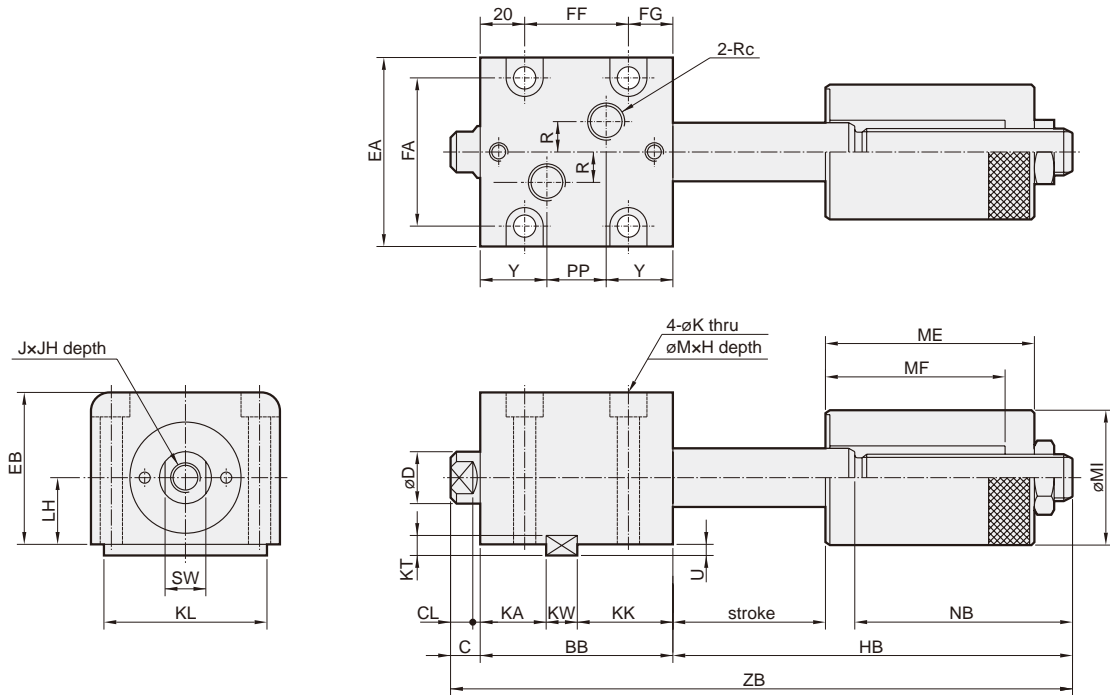
MHCQ-DB Dimensions – Adjustable stroke $\varnothing 32\sim\varnothing 63$



COMPACT HYDRAULIC CYLINDER

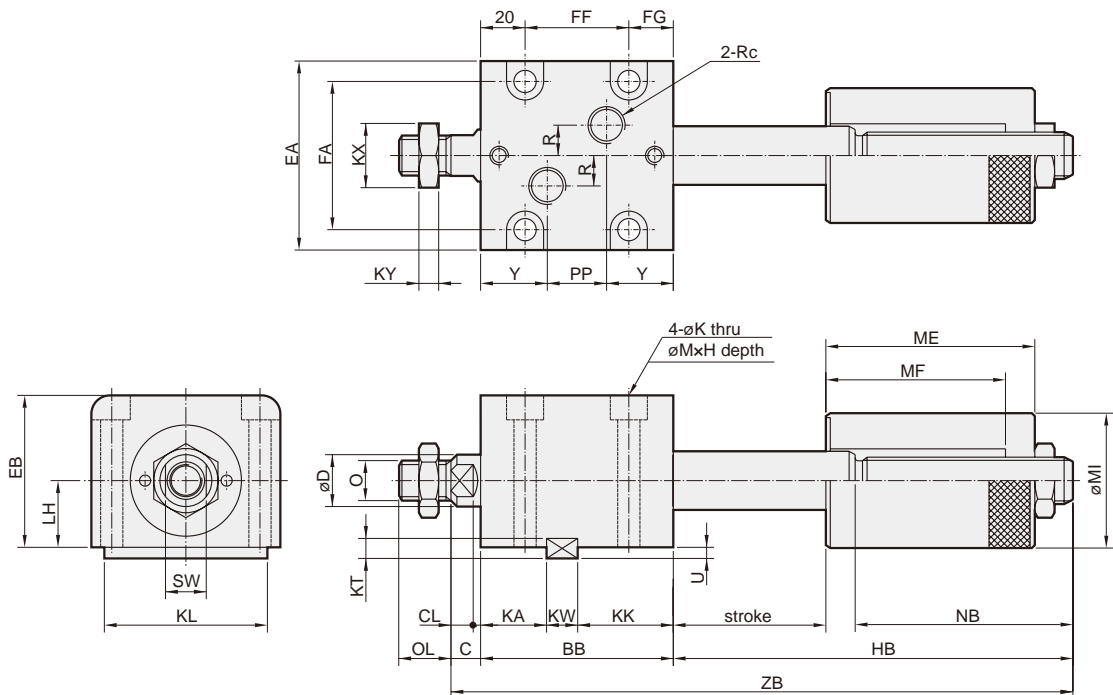
MHCQ-DB

Adjustable stroke 50 mm



MHCQ-ZDB

Adjustable stroke 50 mm



MHCQ-DB Dimensions – Adjustable stroke ø32~ø63



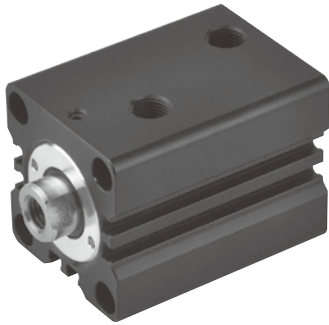
COMPACT HYDRAULIC CYLINDER

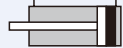
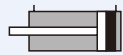
mindman

| Tube I.D. | Model | MHCQ-DB / MHCQ-ZDB | | | | | | | | | |
|-----------|-------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | Stroke | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 |
| ø32 | ZB | 178 | 183 | 198 | 203 | 218 | 223 | 238 | 243 | 258 | 263 |
| | BB | 79 | 79 | 89 | 89 | 99 | 99 | 109 | 109 | 119 | 119 |
| | FF | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KK | 39 | 39 | 49 | 49 | 59 | 59 | 69 | 69 | 79 | 79 |
| | PP | 23 | 23 | 33 | 33 | 43 | 43 | 53 | 53 | 63 | 63 |
| | HB | 89 | 94 | 99 | 104 | 109 | 114 | 119 | 124 | 129 | 134 |
| ø40 | ZB | 188 | 193 | 208 | 213 | 228 | 233 | 248 | 253 | 268 | 273 |
| | BB | 80 | 80 | 90 | 90 | 100 | 100 | 110 | 110 | 120 | 120 |
| | FF | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KK | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 | 80 | 80 |
| | PP | 24 | 24 | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 |
| | HB | 98 | 103 | 108 | 113 | 118 | 123 | 128 | 133 | 138 | 143 |
| ø50 | ZB | 196 | 201 | 216 | 221 | 236 | 241 | 256 | 261 | 276 | 281 |
| | BB | 85 | 85 | 95 | 95 | 105 | 105 | 115 | 115 | 125 | 125 |
| | FF | 45 | 45 | 55 | 55 | 65 | 65 | 75 | 75 | 85 | 85 |
| | KK | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | PP | 26 | 26 | 36 | 36 | 46 | 46 | 56 | 56 | 66 | 66 |
| | HB | 100 | 105 | 110 | 115 | 120 | 125 | 130 | 135 | 140 | 145 |
| ø63 | ZB | 213 | 218 | 233 | 238 | 253 | 258 | 273 | 278 | 293 | 298 |
| | BB | 92 | 92 | 102 | 102 | 112 | 112 | 122 | 122 | 132 | 132 |
| | FF | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 | 92 | 92 |
| | KK | 45 | 45 | 55 | 55 | 65 | 65 | 75 | 75 | 85 | 85 |
| | PP | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |
| | HB | 108 | 113 | 118 | 123 | 128 | 133 | 138 | 143 | 148 | 153 |

| Code Tube I.D. | C | CL | D | EA | EB | FA | FG | H | J | JH | K | KA | KL | KT | KW |
|-------------------|----|----|----|-----|----|----|----|----|----------|----|----|----|-----|----|----|
| ø32 | 10 | 7 | 20 | 70 | 56 | 56 | 17 | 9 | M12x1.75 | 15 | 9 | 28 | 63 | 8 | 12 |
| ø40 | 10 | 7 | 25 | 80 | 64 | 62 | 18 | 11 | M16x2.0 | 20 | 11 | 28 | 70 | 8 | 12 |
| ø50 | 11 | 8 | 30 | 94 | 74 | 74 | 20 | 13 | M20x2.5 | 25 | 13 | 29 | 80 | 9 | 14 |
| ø63 | 13 | 10 | 35 | 114 | 89 | 90 | 20 | 15 | M27x3.0 | 35 | 15 | 31 | 100 | 10 | 16 |

| Code Tube I.D. | KX | KY | LH | M | MI | ME | MF | NB | O | OL | PT | R | SW | U | Y |
|-------------------|----|----|----|----|----|----|----|----|---------|----|-------|----|----|-----|------|
| ø32 | 24 | 8 | 25 | 14 | 45 | 71 | 61 | 74 | M16x1.5 | 25 | Rc1/4 | 10 | 17 | 4.5 | 28 |
| ø40 | 32 | 11 | 29 | 18 | 55 | 79 | 61 | 83 | M22x1.5 | 30 | Rc1/4 | 10 | 22 | 4.5 | 28 |
| ø50 | 35 | 14 | 34 | 20 | 60 | 78 | 62 | 84 | M26x1.5 | 35 | Rc1/4 | 10 | 27 | 5 | 29.5 |
| ø63 | 41 | 13 | 42 | 22 | 75 | 88 | 64 | 90 | M30x1.5 | 40 | Rc3/8 | 10 | 32 | 5.5 | 31 |



| | | |
|-----------------|--------------------------------------|---|
| MHCB..M | Front mounting |  |
| MHCB..MZ | Front mounting (Male thread type) |  |

Features

- Compact body design keeps overall length to a minimum.
- Cylinder barrel internally honed to ensure smooth and consistent piston movement.
- High quality materials are used throughout construction.
- Magnetic as standard.

Specification

| Model | MHCB-M |
|--------------------------|-----------------------------------|
| Tube I.D. (mm) | 32, 40, 50, 63, 80 |
| The range of stroke (mm) | 10 ~ 50 |
| Medium | Filtered oil |
| Material | Anodised aluminum alloy |
| Max. operating pressure | 7 MPa |
| Ambient temperature | -10~+60°C (No freezing) |
| Sensor switch | LN32H (Please refer to page 5-18) |

Standard stroke

| Model | Stroke Tube I.D. | 10 | 20 | 30 | 40 | 50 | | | | | | | | | | | | | | | | | | | | | | | | | |
|-------|---------------------|--------|---|-----|----|----|---|---|---|-----|---|---|---|---|---|-----|---|---|---|---|---|-----|---|---|---|---|---|-----|---|---|---|
| | | MHCB-M | <table border="1"> <tr><td>ø32</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>ø40</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>ø50</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>ø63</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> <tr><td>ø80</td><td>●</td><td>●</td><td>●</td><td>●</td><td>●</td></tr> </table> | ø32 | ● | ● | ● | ● | ● | ø40 | ● | ● | ● | ● | ● | ø50 | ● | ● | ● | ● | ● | ø63 | ● | ● | ● | ● | ● | ø80 | ● | ● | ● |
| ø32 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ø40 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ø50 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ø63 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ø80 | ● | ● | ● | ● | ● | | | | | | | | | | | | | | | | | | | | | | | | | | |

Order example

MHCB — 50 M — 30 — Z

MODEL

TUBE I.D.

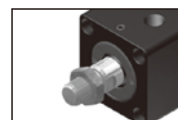
STROKE

ROD END TYPE

M: Magnet

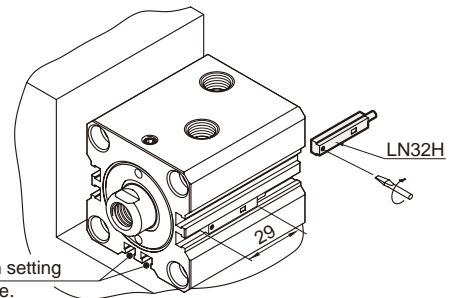


Blank: Female thread



Z: Male thread

Installation of sensor switch



The sensor switch setting here is not suitable.

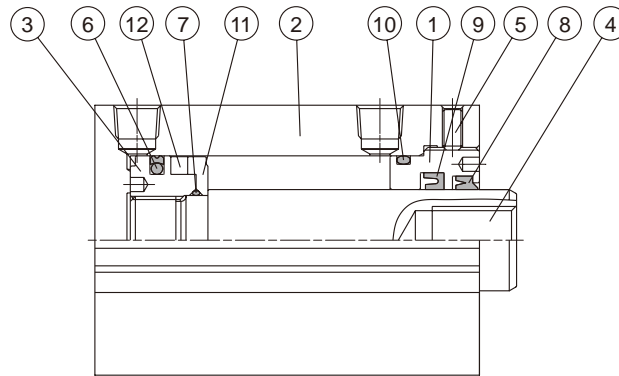
- © When setting the sensor switch, it can't be near with magnet materials (carbon steel, cast iron). The distance must be over 10mm. If it is quite near, the sensor switch will be inactive easily.

How to order the seal kit

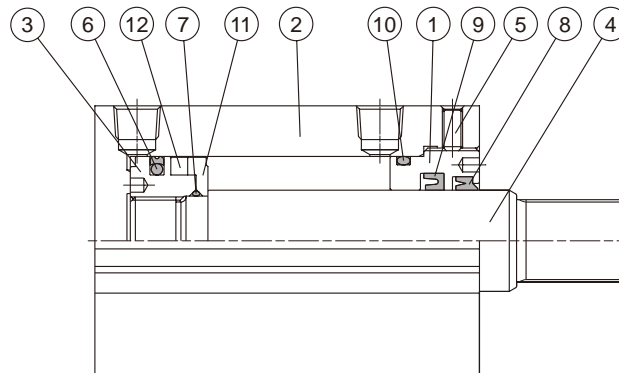
MHCB-MSK

| Tube I.D. | Seal kit |
|-----------|--------------------------------------|
| 32 | MHCB-MSK32 - Including No.6,7,8,9,10 |
| 40 | MHCB-MSK40 - Including No.6,7,8,9,10 |
| 50 | MHCB-MSK50 - Including No.6,7,8,9,10 |
| 63 | MHCB-MSK63 - Including No.6,7,8,9,10 |
| 80 | MHCB-MSK80 - Including No.6,7,8,9,10 |

MHCB-M



MHCB-MZ



Parts list

| No. | Part name | Q'y | No. | Part name | Q'y | No. | Part name | Q'y |
|-----|---------------|-----|-----|----------------|-----|-----|-----------------|-----|
| 1 | Rod cover | 1 | 5 | Set screw | 1 | 9 | Rod packing | 1 |
| 2 | Cylinder tube | 1 | 6 | Piston packing | 1 | 10 | Cylinder gasket | 1 |
| 3 | Piston | 1 | 7 | Piston gasket | 1 | 11 | Washer | 1 |
| 4 | Piston rod | 1 | 8 | Dust wiper | 1 | 12 | Magnet | 1 |

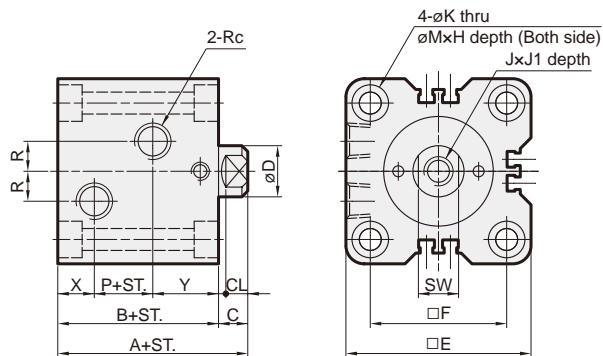
MHCB-M Dimensions $\varnothing 32\sim\varnothing 80$



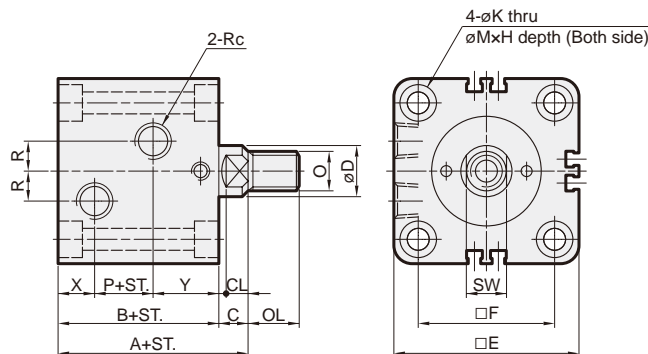
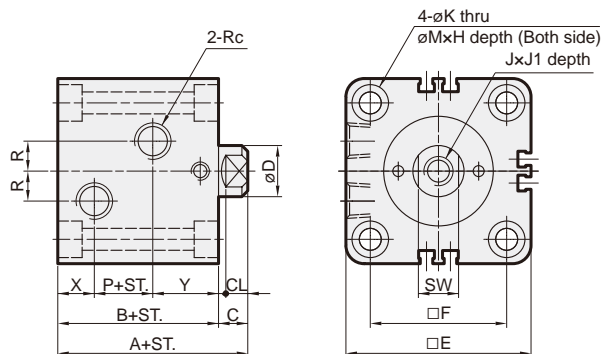
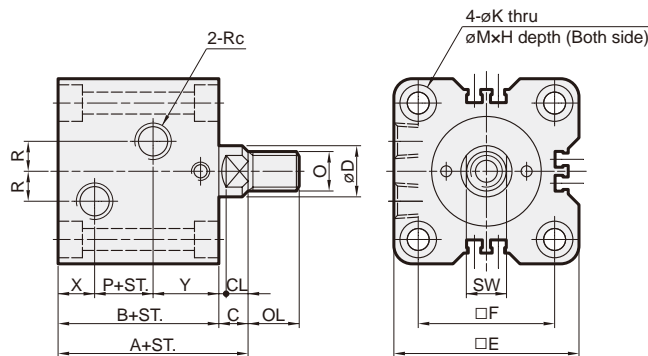
COMPACT HYDRAULIC WITH PISTON SENSING CYLINDER

mindman

MHCB-M



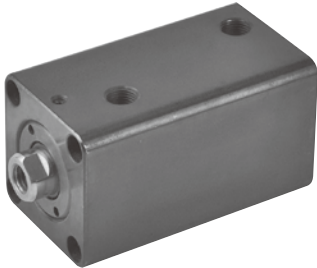
MHCB-MZ



ST.=stroke

| Code Tube I.D. | C | CL | D | E | F | H | J | J1 | K | M | O | OL | PT | R | SW | X | Y |
|-------------------|----|----|----|-----|----|-----|----------|----|-----|----|---------|----|-------|----|----|------|------|
| $\varnothing 32$ | 10 | 7 | 20 | 62 | 47 | 6.5 | M12x1.75 | 15 | 6.6 | 11 | M16x1.5 | 25 | Rc1/4 | 10 | 17 | 12 | 28 |
| $\varnothing 40$ | 10 | 7 | 25 | 70 | 52 | 9 | M16x2.0 | 20 | 9 | 14 | M22x1.5 | 30 | Rc1/4 | 10 | 22 | 12 | 28 |
| $\varnothing 50$ | 11 | 8 | 30 | 80 | 58 | 11 | M20x2.5 | 25 | 11 | 18 | M26x1.5 | 35 | Rc1/4 | 10 | 27 | 12.5 | 29.5 |
| $\varnothing 63$ | 13 | 10 | 35 | 94 | 69 | 13 | M27x3.0 | 35 | 13 | 20 | M30x1.5 | 40 | Rc3/8 | 10 | 32 | 16 | 31 |
| $\varnothing 80$ | 17 | 14 | 45 | 114 | 86 | 15 | M30x3.5 | 35 | 15 | 22 | M39x1.5 | 45 | Rc3/8 | 15 | 41 | 18 | 33 |

| Tube I.D. (mm) | | Stroke | | | | | | | | | |
|-------------------|---|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| $\varnothing 32$ | A | 74 | 74 | 84 | 84 | 94 | 94 | 104 | 104 | 114 | 114 |
| | B | 64 | 64 | 74 | 74 | 84 | 84 | 94 | 94 | 104 | 104 |
| | P | 24 | 24 | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 |
| $\varnothing 40$ | A | 75 | 75 | 85 | 85 | 95 | 95 | 105 | 105 | 115 | 115 |
| | B | 65 | 65 | 75 | 75 | 85 | 85 | 95 | 95 | 105 | 105 |
| | P | 25 | 25 | 35 | 35 | 45 | 45 | 55 | 55 | 65 | 65 |
| $\varnothing 50$ | A | 81 | 81 | 91 | 91 | 101 | 101 | 111 | 111 | 121 | 121 |
| | B | 70 | 70 | 80 | 80 | 90 | 90 | 100 | 100 | 110 | 110 |
| | P | 28 | 28 | 38 | 38 | 48 | 48 | 58 | 58 | 68 | 68 |
| $\varnothing 63$ | A | 90 | 90 | 100 | 100 | 110 | 110 | 120 | 120 | 130 | 130 |
| | B | 77 | 77 | 87 | 87 | 97 | 97 | 107 | 107 | 117 | 117 |
| | P | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |
| $\varnothing 80$ | A | 105 | 105 | 115 | 115 | 125 | 125 | 135 | 135 | 145 | 145 |
| | B | 88 | 88 | 98 | 98 | 108 | 108 | 118 | 118 | 128 | 128 |
| | P | 37 | 37 | 47 | 47 | 57 | 57 | 67 | 67 | 77 | 77 |



Features

- Compact body design keeps overall length to a minimum.
- Cylinder barrel internally honed to ensure smooth and consistent piston movement.
- High quality materials are used throughout construction.

Specification

| Model | MHCB* | | | | | | |
|--------------------------|-------------------------|----|----|----|----|----|----|
| Tube I.D. (mm) | 20 | 25 | 32 | 40 | 50 | 63 | 80 |
| The range of stroke (mm) | 30 | | 50 | | | | |
| Medium | Filtered oil | | | | | | |
| Material | Carbon steel | | | | | | |
| Max. operating pressure | 14 MPa | | | | | | |
| Ambient temperature | -10~+60°C (No freezing) | | | | | | |

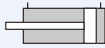
Standard stroke

● Standard products ○ Made to order

| Type | Stroke Tube I.D. | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
|----------------|---------------------|---|----|----|----|----|----|----|----|----|----|
| MHCBR MHCBF | ø20 | ○ | ● | ○ | ● | ○ | ● | - | - | - | - |
| | ø25 | ○ | ● | ○ | ● | ○ | ● | - | - | - | - |
| | ø32 | ● | ● | ● | ● | ● | ○ | ● | ○ | ● | ● |
| | ø40 | ● | ● | ● | ● | ● | ● | ○ | ● | ○ | ● |
| | ø50 | ● | ● | ● | ● | ● | ● | ○ | ● | ○ | ● |
| | ø63 | ● | ● | ● | ● | ● | ● | ○ | ● | ○ | ● |
| MHCBS | ø32 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● |
| | ø40 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● |
| | ø50 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● |
| | ø63 | ○ | ● | ○ | ● | ○ | ● | ○ | ● | ○ | ● |

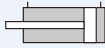
MHCBR

Front mounting
(Axial front manifold type)



MHCBF

Front mounting
(Axial back manifold type)



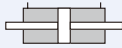
MHCBS

Side mounting
(Manifold type)



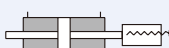
MHCBS-D

Side mounting
(Double rod type)
(Manifold type)



MHCBS-DA MHCBS-DB

Adjustable forward
stroke cylinder



Order example

MHCBS — 50 — 30 — ZDA

MODEL



TUBE I.D.

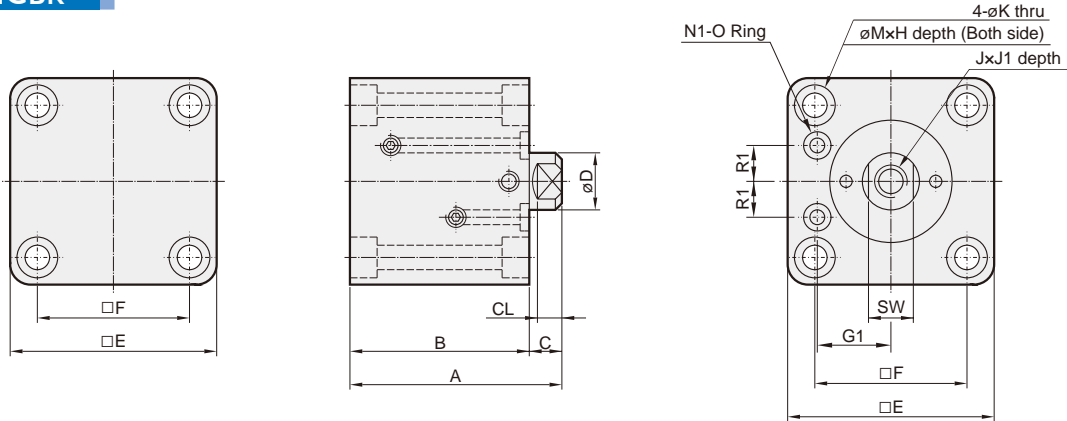
STROKE

ROD END TYPE **D**: Double rod

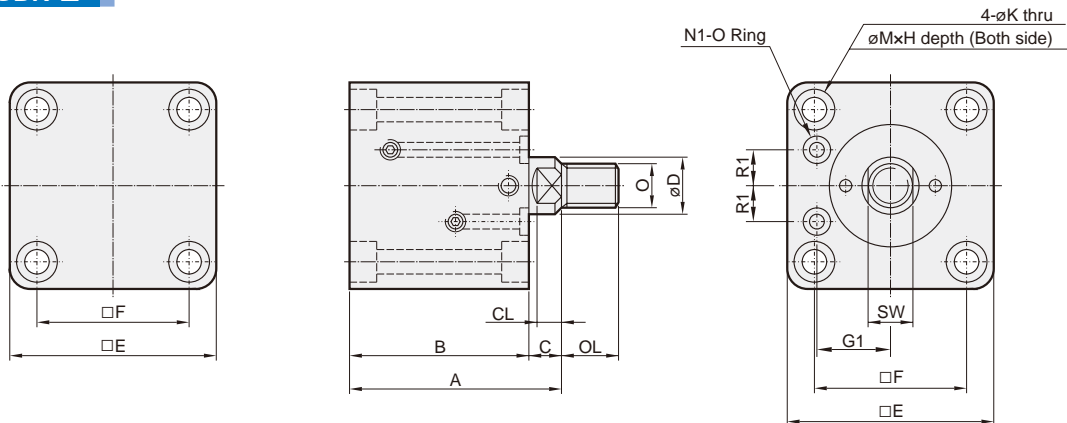
| | | | | | |
|------------------|--|-------------------------------|-------------------|--|--|
| Blank | | Single rod / Female thread | DA (*) | | Double rod / Female thread / Adjustable stroke 25 mm |
| Z | | Single rod / Male thread | DB (*) | | Double rod / Female thread / Adjustable stroke 50 mm |
| D (*) | | Double rod / Female thread | ZDA (*) | | Double rod / Male thread / Adjustable stroke 25 mm |
| ZD (*) | | Double rod / Male thread | ZDB (*) | | Double rod / Male thread / Adjustable stroke 50 mm |

* Only for MHCBS model.

MHCBR



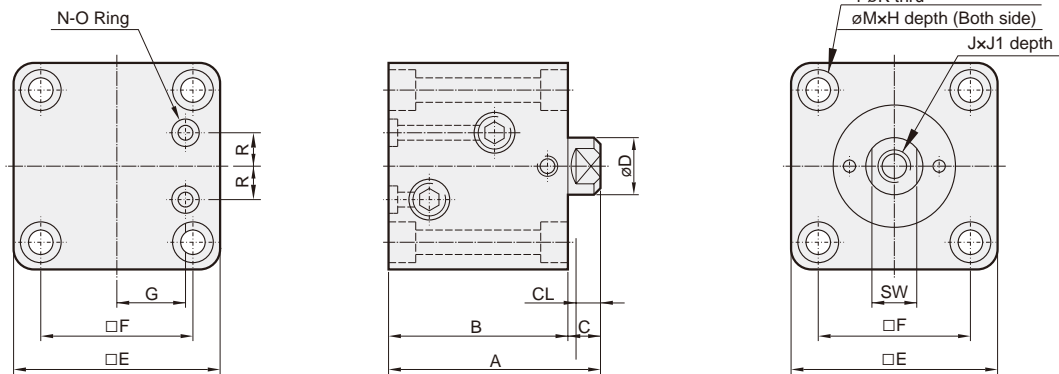
MHCBR-Z



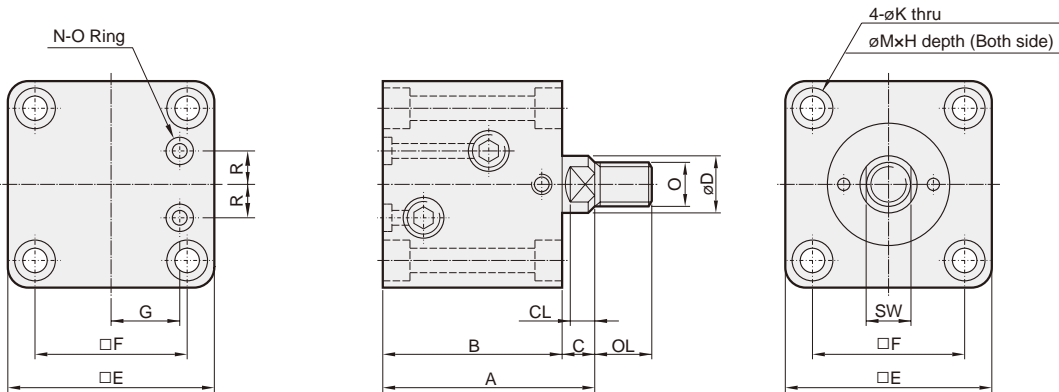
| Tube I.D. (mm) | Type Stroke | MHCBR / MHCBR-Z | | | | | | | | | |
|-------------------|----------------|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| ø20 | A | 61 | 61 | 71 | 71 | 81 | 81 | - | - | - | - |
| | B | 53 | 53 | 63 | 63 | 73 | 73 | - | - | - | - |
| ø25 | A | 63 | 63 | 73 | 73 | 83 | 83 | - | - | - | - |
| | B | 55 | 55 | 65 | 65 | 75 | 75 | - | - | - | - |
| ø32 | A | 69 | 74 | 79 | 84 | 89 | 94 | 104 | 104 | 114 | 114 |
| | B | 59 | 64 | 69 | 74 | 79 | 84 | 94 | 94 | 104 | 104 |
| ø40 | A | 70 | 75 | 80 | 85 | 90 | 95 | 105 | 105 | 115 | 115 |
| | B | 60 | 65 | 70 | 75 | 80 | 85 | 95 | 95 | 105 | 105 |
| ø50 | A | 76 | 81 | 86 | 91 | 96 | 101 | 111 | 111 | 121 | 121 |
| | B | 65 | 70 | 75 | 80 | 85 | 90 | 100 | 100 | 110 | 110 |
| ø63 | A | 85 | 90 | 95 | 100 | 105 | 110 | 120 | 120 | 130 | 130 |
| | B | 72 | 77 | 82 | 87 | 92 | 97 | 107 | 107 | 117 | 117 |
| ø80 | A | 100 | 105 | 110 | 115 | 120 | 125 | 135 | 135 | 145 | 145 |
| | B | 83 | 88 | 93 | 98 | 103 | 108 | 118 | 118 | 128 | 128 |

| Code Tube I.D. | C | CL | D | E | F | G1 | H | J | J1 | K | M | N1 | O | OL | R1 | SW |
|-------------------|----|----|----|-----|----|------|-----|----------|----|-----|----|-----|----------|----|------|----|
| ø20 | 8 | 6 | 12 | 42 | 30 | 16.5 | 5.5 | M8x1.25 | 12 | 5.6 | 9 | P4 | M10x1.25 | 20 | 6.5 | 10 |
| ø25 | 8 | 6 | 14 | 48 | 36 | 19.5 | 5.5 | M10x1.5 | 15 | 5.6 | 9 | P4 | M12x1.25 | 22 | 9 | 12 |
| ø32 | 10 | 7 | 20 | 62 | 47 | 24 | 6.5 | M12x1.75 | 15 | 6.6 | 11 | P6 | M16x1.5 | 25 | 12 | 17 |
| ø40 | 10 | 7 | 25 | 70 | 52 | 27 | 9 | M16x2.0 | 20 | 9 | 14 | P6 | M22x1.5 | 30 | 13 | 22 |
| ø50 | 11 | 8 | 30 | 80 | 58 | 32 | 11 | M20x2.5 | 25 | 11 | 18 | P8 | M26x1.5 | 35 | 13.5 | 27 |
| ø63 | 13 | 10 | 35 | 94 | 69 | 38 | 13 | M27x3.0 | 35 | 13 | 20 | P8 | M30x1.5 | 40 | 17.5 | 32 |
| ø80 | 17 | 14 | 45 | 114 | 86 | 47 | 15 | M30x3.5 | 35 | 15 | 22 | P11 | M39x1.5 | 45 | 22.5 | 41 |

MHCBF



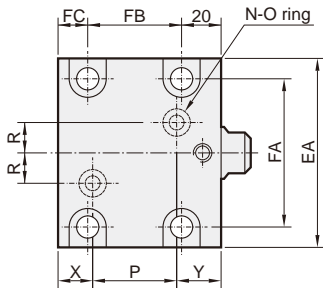
MHCBF-Z



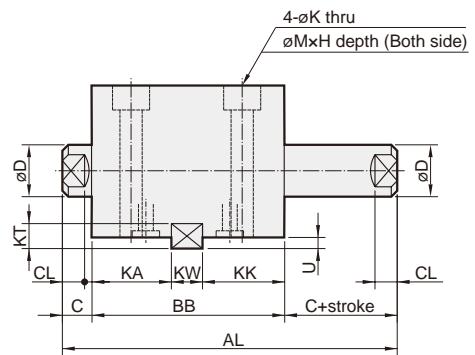
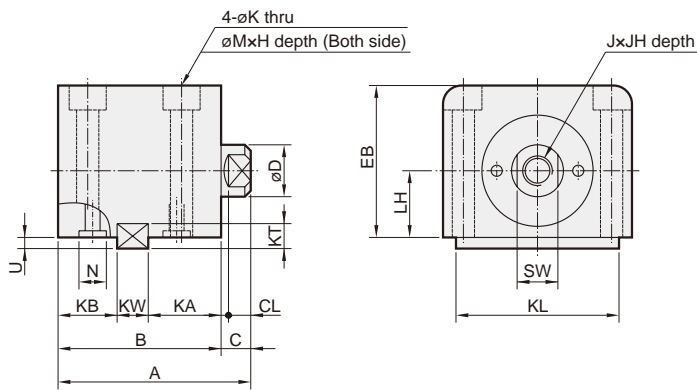
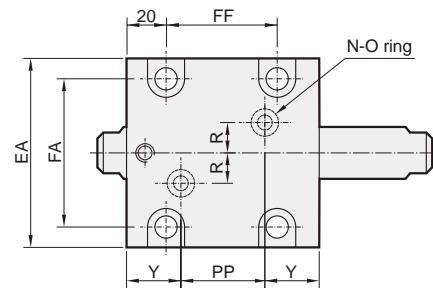
| Tube I.D. (mm) | Type Stroke | MHCBF / MHCBF-Z | | | | | | | | | |
|-------------------|----------------|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| ø20 | A | 61 | 61 | 71 | 71 | 81 | 81 | - | - | - | - |
| | B | 53 | 53 | 63 | 63 | 73 | 73 | - | - | - | - |
| ø25 | A | 63 | 63 | 73 | 73 | 83 | 83 | - | - | - | - |
| | B | 55 | 55 | 65 | 65 | 75 | 75 | - | - | - | - |
| ø32 | A | 69 | 74 | 79 | 84 | 89 | 94 | 104 | 104 | 114 | 114 |
| | B | 59 | 64 | 69 | 74 | 79 | 84 | 94 | 94 | 104 | 104 |
| ø40 | A | 70 | 75 | 80 | 85 | 90 | 95 | 105 | 105 | 115 | 115 |
| | B | 60 | 65 | 70 | 75 | 80 | 85 | 95 | 95 | 105 | 105 |
| ø50 | A | 76 | 81 | 86 | 91 | 96 | 101 | 111 | 111 | 121 | 121 |
| | B | 65 | 70 | 75 | 80 | 85 | 90 | 100 | 100 | 110 | 110 |
| ø63 | A | 85 | 90 | 95 | 100 | 105 | 110 | 120 | 120 | 130 | 130 |
| | B | 72 | 77 | 82 | 87 | 92 | 97 | 107 | 107 | 117 | 117 |
| ø80 | A | 100 | 105 | 110 | 115 | 120 | 125 | 135 | 135 | 145 | 145 |
| | B | 83 | 88 | 93 | 98 | 103 | 108 | 118 | 118 | 128 | 128 |

| Code Tube I.D. | C | CL | D | E | F | G | H | J | J1 | K | M | N | O | OL | R | SW |
|-------------------|----|----|----|-----|----|----|-----|----------|----|-----|----|-----|----------|----|-----|----|
| ø20 | 8 | 6 | 12 | 42 | 30 | 13 | 5.5 | M8x1.25 | 12 | 5.6 | 9 | P5 | M10x1.25 | 20 | 5.5 | 10 |
| ø25 | 8 | 6 | 14 | 48 | 36 | 15 | 5.5 | M10x1.5 | 15 | 5.6 | 9 | P7 | M12x1.25 | 22 | 6.5 | 12 |
| ø32 | 10 | 7 | 20 | 62 | 47 | 20 | 6.5 | M12x1.75 | 15 | 6.6 | 11 | P9 | M16x1.5 | 25 | 10 | 17 |
| ø40 | 10 | 7 | 25 | 70 | 52 | 24 | 9 | M16x2.0 | 20 | 9 | 14 | P9 | M22x1.5 | 30 | 10 | 22 |
| ø50 | 11 | 8 | 30 | 80 | 58 | 29 | 11 | M20x2.5 | 25 | 11 | 18 | P9 | M26x1.5 | 35 | 10 | 27 |
| ø63 | 13 | 10 | 35 | 94 | 69 | 35 | 13 | M27x3.0 | 35 | 13 | 20 | P11 | M30x1.5 | 40 | 13 | 32 |
| ø80 | 17 | 14 | 45 | 114 | 86 | 44 | 15 | M30x3.5 | 35 | 15 | 22 | P11 | M39x1.5 | 45 | 15 | 41 |

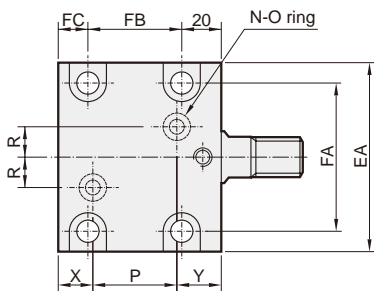
MHCBS



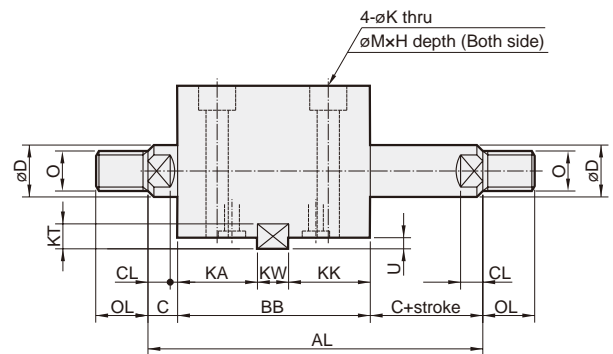
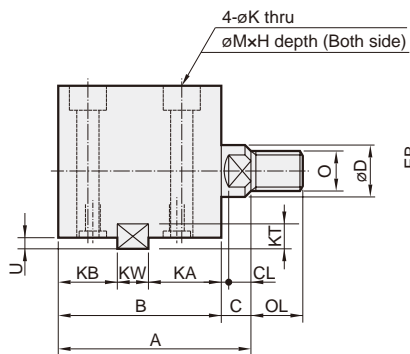
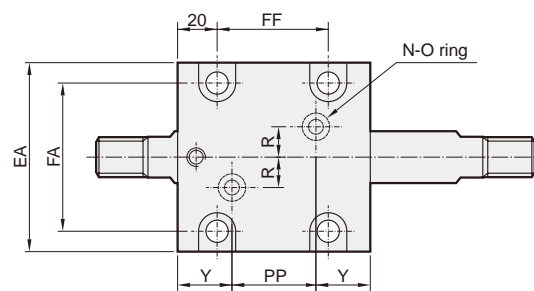
MHCBS-D



MHCBS-Z



MHCBS-ZD



| Tube I.D. (mm) | Type | MHCBS / MHCBS-Z | | | | | | | | | |
|-------------------|--------|-----------------|----|-----|-----|-----|-----|-----|-----|-----|-----|
| | Stroke | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| $\varnothing 32$ | A | 74 | 74 | 84 | 84 | 94 | 94 | 104 | 104 | 114 | 114 |
| | B | 64 | 64 | 74 | 74 | 84 | 84 | 94 | 94 | 104 | 104 |
| | FB | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 | 74 | 74 |
| | KB | — | — | 24 | 24 | 34 | 34 | 44 | 44 | 54 | 54 |
| | P | 24 | 24 | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 |
| $\varnothing 40$ | A | 75 | 75 | 85 | 85 | 95 | 95 | 105 | 105 | 115 | 115 |
| | B | 65 | 65 | 75 | 75 | 85 | 85 | 95 | 95 | 105 | 105 |
| | FB | 33 | 33 | 43 | 43 | 53 | 53 | 63 | 63 | 73 | 73 |
| | KB | — | — | 25 | 25 | 35 | 35 | 45 | 45 | 55 | 55 |
| $\varnothing 50$ | A | 81 | 81 | 91 | 91 | 101 | 101 | 111 | 111 | 121 | 121 |
| | B | 70 | 70 | 80 | 80 | 90 | 90 | 100 | 100 | 110 | 110 |
| | FB | 37 | 37 | 47 | 47 | 57 | 57 | 67 | 67 | 77 | 77 |
| | KB | — | — | 26 | 26 | 36 | 36 | 46 | 46 | 56 | 56 |
| $\varnothing 63$ | A | 90 | 90 | 100 | 100 | 110 | 110 | 120 | 120 | 130 | 130 |
| | B | 77 | 77 | 87 | 87 | 97 | 97 | 107 | 107 | 117 | 117 |
| | FB | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KB | — | — | 29 | 29 | 39 | 39 | 49 | 49 | 59 | 59 |
| | P | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |

| Tube I.D. (mm) | Type | MHCBS-D / MHCBS-ZD | | | | | | | | | |
|-------------------|--------|--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | Stroke | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| $\varnothing 32$ | AL | 104 | 109 | 124 | 129 | 144 | 149 | 164 | 169 | 184 | 189 |
| | BB | 79 | 79 | 89 | 89 | 99 | 99 | 109 | 109 | 119 | 119 |
| | FF | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KK | — | — | 39 | 39 | 49 | 49 | 59 | 59 | 69 | 69 |
| | PP | 23 | 23 | 33 | 33 | 43 | 43 | 53 | 53 | 63 | 63 |
| $\varnothing 40$ | AL | 105 | 110 | 125 | 130 | 145 | 150 | 165 | 170 | 185 | 190 |
| | BB | 80 | 80 | 90 | 90 | 100 | 100 | 110 | 110 | 120 | 120 |
| | FF | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KK | — | — | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |
| $\varnothing 50$ | AL | 112 | 117 | 132 | 137 | 152 | 157 | 172 | 177 | 192 | 197 |
| | BB | 85 | 85 | 95 | 95 | 105 | 105 | 115 | 115 | 125 | 125 |
| | FF | 45 | 45 | 55 | 55 | 65 | 65 | 75 | 75 | 85 | 85 |
| | KK | — | — | 41 | 41 | 51 | 51 | 61 | 61 | 71 | 71 |
| $\varnothing 63$ | AL | 123 | 128 | 143 | 148 | 163 | 168 | 183 | 188 | 203 | 208 |
| | BB | 92 | 92 | 102 | 102 | 112 | 112 | 122 | 122 | 132 | 132 |
| | FF | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 | 92 | 92 |
| | KK | — | — | 44 | 44 | 54 | 54 | 64 | 64 | 74 | 74 |
| | PP | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |

| Code Tube I.D. | C | CL | D | EA | EB | FA | FC | H | J | JH | K | KA | KL | KT |
|-------------------|----|----|----|-----|----|----|----|----|----------|----|----|----|-----|----|
| $\varnothing 32$ | 10 | 7 | 20 | 70 | 56 | 56 | 10 | 9 | M12x1.75 | 15 | 9 | 38 | 63 | 8 |
| $\varnothing 40$ | 10 | 7 | 25 | 80 | 64 | 62 | 12 | 11 | M16x2.0 | 20 | 11 | 38 | 70 | 8 |
| $\varnothing 50$ | 11 | 8 | 30 | 94 | 74 | 74 | 13 | 13 | M20x2.5 | 25 | 13 | 40 | 80 | 9 |
| $\varnothing 63$ | 13 | 10 | 35 | 114 | 89 | 90 | 15 | 15 | M27x3.0 | 35 | 15 | 42 | 100 | 10 |

| Code Tube I.D. | KW | LH | M | N | O | OL | R | SW | U | X | Y |
|-------------------|----|----|----|-----|---------|----|----|----|-----|------|------|
| $\varnothing 32$ | 12 | 25 | 14 | P9 | M16x1.5 | 25 | 10 | 17 | 4.5 | 12 | 28 |
| $\varnothing 40$ | 12 | 29 | 18 | P9 | M22x1.5 | 30 | 10 | 22 | 4.5 | 12 | 28 |
| $\varnothing 50$ | 14 | 34 | 20 | P11 | M26x1.5 | 35 | 10 | 27 | 5 | 12.5 | 29.5 |
| $\varnothing 63$ | 16 | 42 | 22 | P11 | M30x1.5 | 40 | 10 | 32 | 5.5 | 16 | 31 |

MHCBS Dimensions – Adjustable stroke A $\phi 32\sim\phi 63$

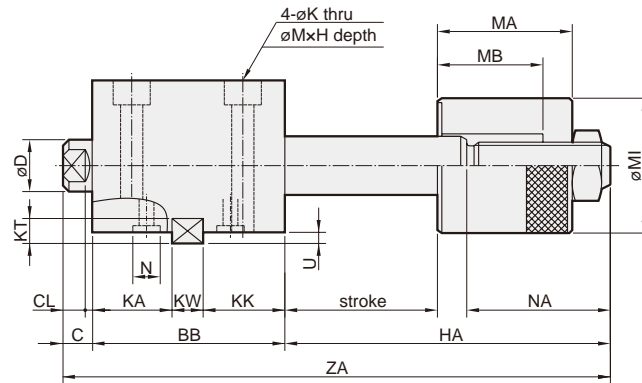
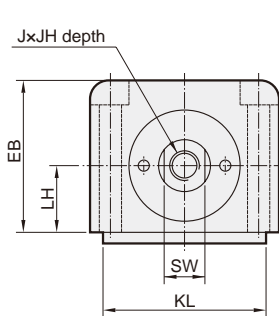
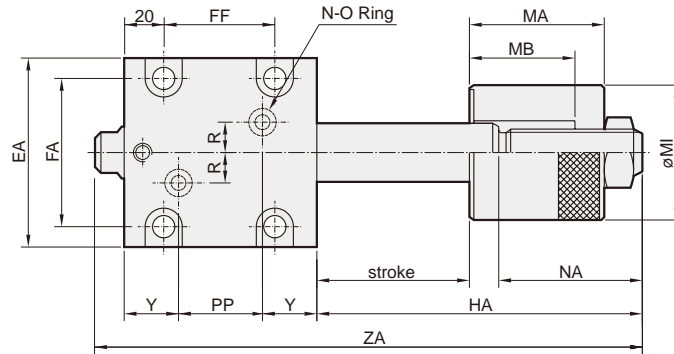


MANIFOLD TYPE HYDRAULIC CYLINDER

mindman

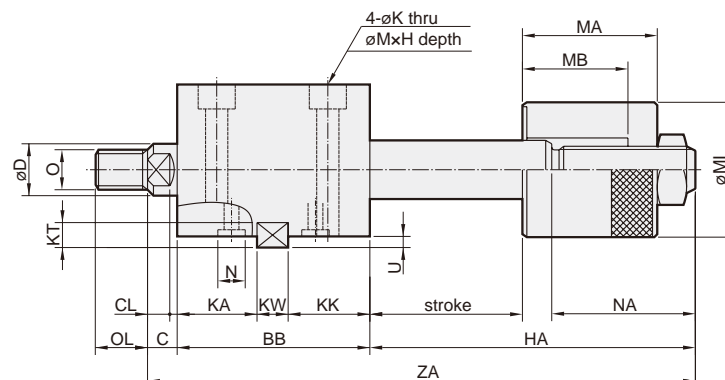
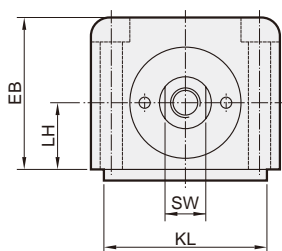
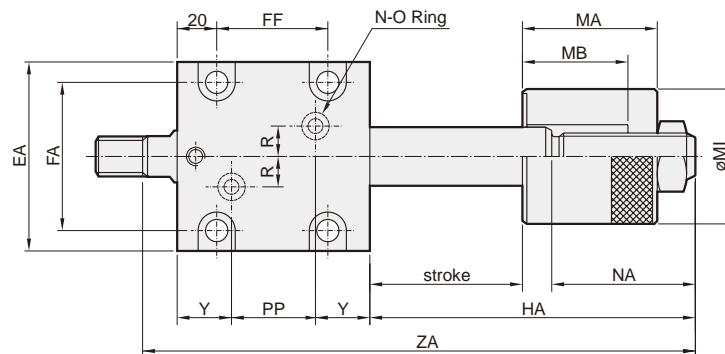
MHCBS-DA

Adjustable stroke 25 mm



MHCBS-ZDA

Adjustable stroke 25 mm





MANIFOLD TYPE HYDRAULIC CYLINDER

mindman

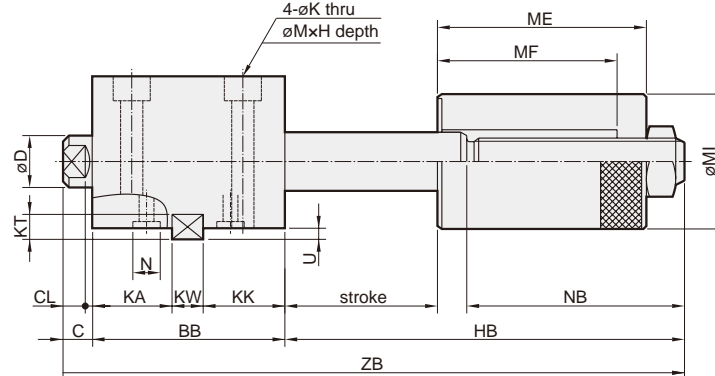
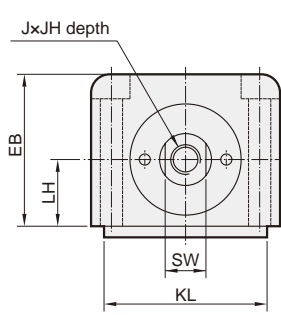
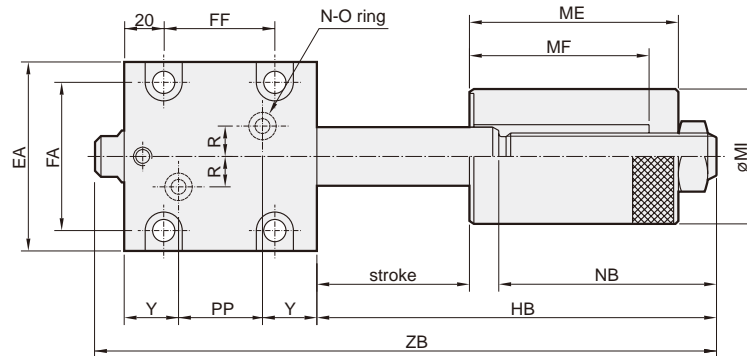
| Tube I.D. (mm) | Type | MHCBS-DA / MHCBS-ZDA | | | | | | | | | |
|-------------------|------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | Stroke | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 |
| ø32 | ZA | 153 | 158 | 173 | 178 | 193 | 198 | 213 | 218 | 233 | 238 |
| | BB | 79 | 79 | 89 | 89 | 99 | 99 | 109 | 109 | 119 | 119 |
| | FF | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KK | — | — | 39 | 39 | 49 | 49 | 59 | 59 | 69 | 69 |
| | PP | 23 | 23 | 33 | 33 | 43 | 43 | 53 | 53 | 63 | 63 |
| | HA | 64 | 69 | 74 | 79 | 84 | 89 | 94 | 99 | 104 | 109 |
| ø40 | ZA | 163 | 168 | 183 | 188 | 203 | 208 | 223 | 228 | 243 | 248 |
| | BB | 80 | 80 | 90 | 90 | 100 | 100 | 110 | 110 | 120 | 120 |
| | FF | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KK | — | — | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |
| | PP | 24 | 24 | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 |
| | HA | 73 | 78 | 83 | 88 | 93 | 98 | 103 | 108 | 113 | 118 |
| ø50 | ZA | 171 | 176 | 191 | 196 | 211 | 216 | 231 | 236 | 251 | 256 |
| | BB | 85 | 85 | 95 | 95 | 105 | 105 | 115 | 115 | 125 | 125 |
| | FF | 45 | 45 | 55 | 55 | 65 | 65 | 75 | 75 | 85 | 85 |
| | KK | — | — | 41 | 41 | 51 | 51 | 61 | 61 | 71 | 71 |
| | PP | 26 | 26 | 36 | 36 | 46 | 46 | 56 | 56 | 66 | 66 |
| | HA | 75 | 80 | 85 | 90 | 95 | 100 | 105 | 110 | 115 | 120 |
| ø63 | ZA | 188 | 193 | 208 | 213 | 228 | 233 | 248 | 253 | 268 | 273 |
| | BB | 92 | 92 | 102 | 102 | 112 | 112 | 122 | 122 | 132 | 132 |
| | FF | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 | 92 | 92 |
| | KK | — | — | 44 | 44 | 54 | 54 | 64 | 64 | 74 | 74 |
| | PP | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |
| | HA | 83 | 88 | 93 | 98 | 103 | 108 | 113 | 118 | 123 | 128 |

| Code Tube I.D. | C | CL | D | EA | EB | FA | H | J | JH | K | KA | KL | KT | KW | LH |
|-------------------|----|----|----|-----|----|----|----|----------|----|----|----|-----|----|----|----|
| ø32 | 10 | 7 | 20 | 70 | 56 | 56 | 9 | M12×1.75 | 15 | 9 | 38 | 63 | 8 | 12 | 25 |
| ø40 | 10 | 7 | 25 | 80 | 64 | 62 | 11 | M16×2.0 | 20 | 11 | 38 | 70 | 8 | 12 | 29 |
| ø50 | 11 | 8 | 30 | 94 | 74 | 74 | 13 | M20×2.5 | 25 | 13 | 40 | 80 | 9 | 14 | 34 |
| ø63 | 13 | 10 | 35 | 114 | 89 | 90 | 15 | M27×3.0 | 35 | 15 | 42 | 100 | 10 | 16 | 42 |

| Code Tube I.D. | M | MI | MA | MB | N | NA | O | OL | R | SW | U | Y |
|-------------------|----|----|----|----|-----|----|---------|----|----|----|-----|------|
| ø32 | 14 | 45 | 46 | 36 | P9 | 49 | M16×1.5 | 25 | 10 | 17 | 4.5 | 28 |
| ø40 | 18 | 55 | 54 | 36 | P9 | 58 | M22×1.5 | 30 | 10 | 22 | 4.5 | 28 |
| ø50 | 20 | 60 | 53 | 37 | P11 | 59 | M26×1.5 | 35 | 10 | 27 | 5 | 29.5 |
| ø63 | 22 | 75 | 63 | 39 | P11 | 65 | M30×1.5 | 40 | 10 | 32 | 5.5 | 31 |

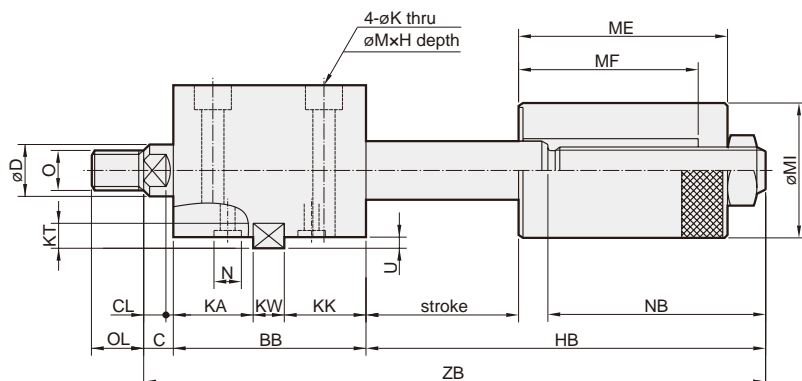
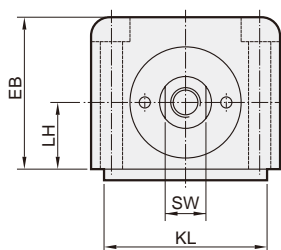
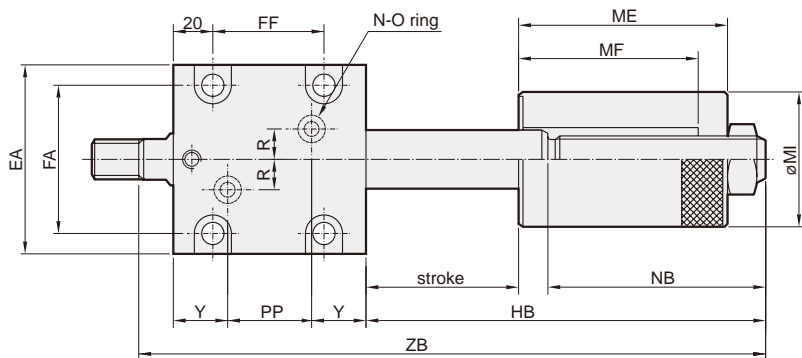
MHCBS-DB

Adjustable stroke 50 mm



MHCBS-ZDB

Adjustable stroke 50 mm





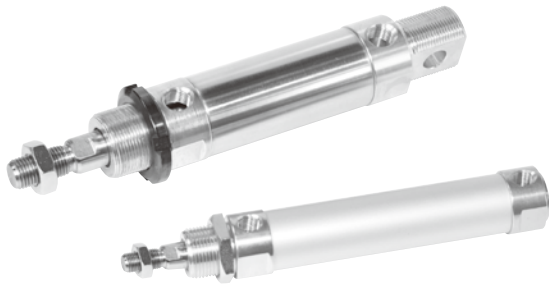
MANIFOLD TYPE HYDRAULIC CYLINDER

mindman

| Tube I.D. (mm) | Type | MHCBS-DB / MHCBS-ZDB | | | | | | | | | |
|-------------------|------|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | | Stroke | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 |
| ø32 | ZB | 178 | 183 | 198 | 203 | 218 | 223 | 238 | 243 | 258 | 263 |
| | BB | 79 | 79 | 89 | 89 | 99 | 99 | 109 | 109 | 119 | 119 |
| | FF | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KK | — | — | 39 | 39 | 49 | 49 | 59 | 59 | 69 | 69 |
| | PP | 23 | 23 | 33 | 33 | 43 | 43 | 53 | 53 | 63 | 63 |
| | HB | 89 | 94 | 99 | 104 | 109 | 114 | 119 | 124 | 129 | 134 |
| ø40 | ZB | 188 | 193 | 208 | 213 | 228 | 233 | 248 | 253 | 268 | 273 |
| | BB | 80 | 80 | 90 | 90 | 100 | 100 | 110 | 110 | 120 | 120 |
| | FF | 42 | 42 | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 |
| | KK | — | — | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |
| | PP | 24 | 24 | 34 | 34 | 44 | 44 | 54 | 54 | 64 | 64 |
| | HB | 98 | 103 | 108 | 113 | 118 | 123 | 128 | 133 | 138 | 143 |
| ø50 | ZB | 196 | 201 | 216 | 221 | 236 | 241 | 256 | 261 | 276 | 281 |
| | BB | 85 | 85 | 95 | 95 | 105 | 105 | 115 | 115 | 125 | 125 |
| | FF | 45 | 45 | 55 | 55 | 65 | 65 | 75 | 75 | 85 | 85 |
| | KK | — | — | 41 | 41 | 51 | 51 | 61 | 61 | 71 | 71 |
| | PP | 26 | 26 | 36 | 36 | 46 | 46 | 56 | 56 | 66 | 66 |
| | HB | 100 | 105 | 110 | 115 | 120 | 125 | 130 | 135 | 140 | 145 |
| ø63 | ZB | 213 | 218 | 233 | 238 | 253 | 258 | 273 | 278 | 293 | 298 |
| | BB | 92 | 92 | 102 | 102 | 112 | 112 | 122 | 122 | 132 | 132 |
| | FF | 52 | 52 | 62 | 62 | 72 | 72 | 82 | 82 | 92 | 92 |
| | KK | — | — | 44 | 44 | 54 | 54 | 64 | 64 | 74 | 74 |
| | PP | 30 | 30 | 40 | 40 | 50 | 50 | 60 | 60 | 70 | 70 |
| | HB | 108 | 113 | 118 | 123 | 128 | 133 | 138 | 143 | 148 | 153 |

| Code Tube I.D. | C | CL | D | EA | EB | FA | H | J | JH | K | KA | KL | KT | KW | LH |
|-------------------|----|----|----|-----|----|----|----|----------|----|----|----|-----|----|----|----|
| ø32 | 10 | 7 | 20 | 70 | 56 | 56 | 9 | M12×1.75 | 15 | 9 | 38 | 63 | 8 | 12 | 25 |
| ø40 | 10 | 7 | 25 | 80 | 64 | 62 | 11 | M16×2.0 | 20 | 11 | 38 | 70 | 8 | 12 | 29 |
| ø50 | 11 | 8 | 30 | 94 | 74 | 74 | 13 | M20×2.5 | 25 | 13 | 40 | 80 | 9 | 14 | 34 |
| ø63 | 13 | 10 | 35 | 114 | 89 | 90 | 15 | M27×3.0 | 35 | 15 | 42 | 100 | 10 | 16 | 42 |

| Code Tube I.D. | M | MI | ME | MF | N | NB | O | OL | R | SW | U | Y |
|-------------------|----|----|----|----|-----|----|---------|----|----|----|-----|------|
| ø32 | 14 | 45 | 71 | 61 | P9 | 74 | M16×1.5 | 25 | 10 | 17 | 4.5 | 28 |
| ø40 | 18 | 55 | 79 | 61 | P9 | 83 | M22×1.5 | 30 | 10 | 22 | 4.5 | 28 |
| ø50 | 20 | 60 | 78 | 62 | P11 | 84 | M26×1.5 | 35 | 10 | 27 | 5 | 29.5 |
| ø63 | 22 | 75 | 88 | 64 | P11 | 90 | M30×1.5 | 40 | 10 | 32 | 5.5 | 31 |



Features

- Hydraulic cylinder with magnetic piston allows sensors to be used.
- Large range of mounting accessories.
- Adjustable stroke available.
- Magnetic as standard.

Specification




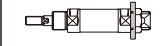



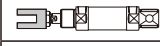
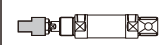
| Model | MDO* | |
|-----------------------------|-----------------------------------|-----------------|
| Tube I.D. (mm) | 20 | 32 |
| Medium | Filtered oil | |
| Material of cylinder barrel | Anodised aluminum | Stainless steel |
| Max. operating pressure | 3.5 MPa | |
| Proof pressure | 5 MPa | |
| Speed range | 0.5~300 mm/sec | |
| The range of temperature | -10~+60°C (No freezing) | |
| Sensor switch | LN01G (Please refer to page 5-16) | |

Double acting hydraulic cylinders

| | | |
|-------------|--------------------------------|--|
| MDOC | Pivot type | |
| MDOA | Front nose mounting type | |
| MDOD | Double rod type | |
| MDON | Adjustable forward stroke type | |

Order example

MDON — 32 — 100 — A — LB — Y

| MODEL | TUBE I.D. | STROKE | ADJUSTABLE STROKE | ACCESSORY |
|---|-----------|--------|--|---|
|  MDOC | 32 | 100 | Blank: Standard type A: Adjustable 25mm B: Adjustable 50mm * Only for MDON model. |  FA |
|  MDOA | | | |  FB |
|  MDOD | | | |  LB |
|  MDON | | | |  Y |
| | | | |  I |

Standard stroke

| Tube I.D. | 25 | 50 | 75 | 100 | 125 | 150 | 200 | 250 | 300 |
|-----------|----|----|----|-----|-----|-----|-----|-----|-----|
| ø20 | ● | ● | ● | ● | ● | ● | ● | - | - |
| ø32 | ● | ● | ● | ● | ● | ● | ● | ● | ● |

Unit: mm

Note. May to order of unstandard stroke.



Theoretic force

| Tube I.D. (mm) | Rod (mm) | Area (mm ²) | Operating pressure (MPa) | | | | | | | |
|----------------|----------|-------------------------|--------------------------|-----|-----|------|------|------|------|------|
| | | | 0.5 | 1.0 | 1.5 | 2.0 | 2.5 | 3.0 | 3.5 | |
| ø20 | ø12 | A | 314 | 157 | 314 | 471 | 628 | 785 | 942 | 1099 |
| | | B | 201 | 101 | 201 | 302 | 402 | 503 | 603 | 704 |
| ø32 | ø16 | A | 707 | 354 | 707 | 1061 | 1414 | 1768 | 2121 | 2475 |
| | | B | 506 | 253 | 506 | 759 | 1012 | 1265 | 1518 | 1771 |

Unit: N

The method of calculation (Hydraulic cylinders' force)

$$F = P \times A - f$$

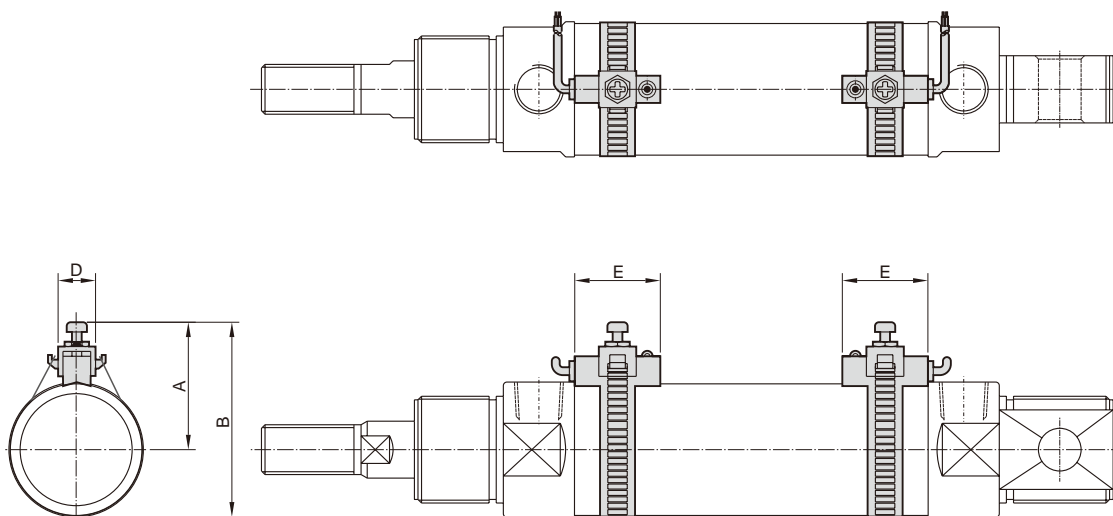
F: Cylinders' force (N)

P: Operating pressure (MPa)

A: Piston area (mm²)

f : Friction drag (N)

Installation of sensor switches



| Tube I.D. | Sensor switch | A | B | D | E |
|-----------|---------------|----|------|---|----|
| 20 | LN01G | 28 | 40.5 | 7 | 22 |
| 32 | LN01G | 33 | 49.5 | 7 | 22 |

How to order the seal kit

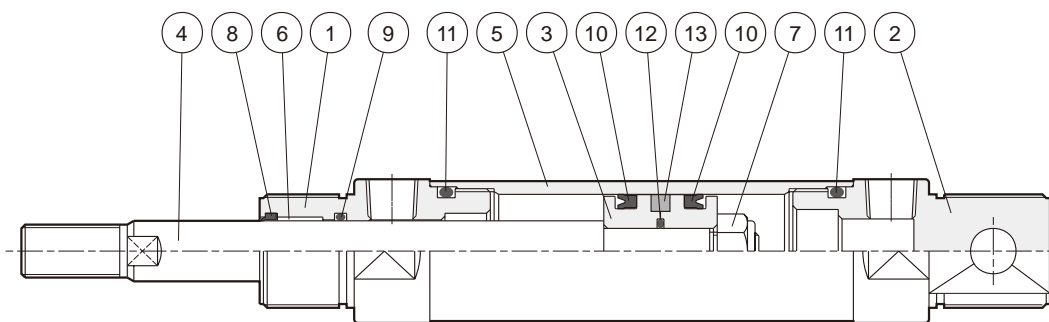
MDOSK

| Tube I.D. | Seal kit |
|-----------|-------------------------------------|
| 20 | MDOSK20 - Including No.8,9,10,11,12 |
| 32 | MDOSK32 - Including No.8,9,10,11,12 |

MDODSK

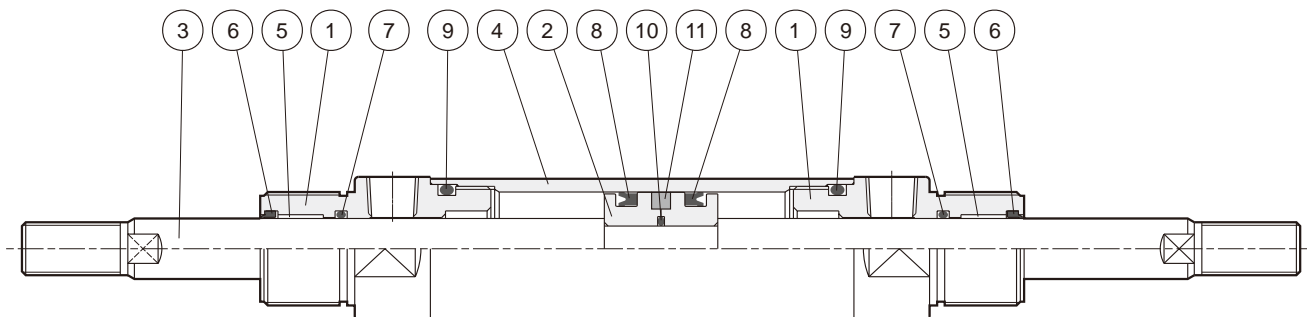
| Tube I.D. | Seal kit |
|-----------|------------------------------------|
| 20 | MDODSK20 - Including No.6,7,8,9,10 |
| 32 | MDODSK32 - Including No.6,7,8,9,10 |

MDOA / MDOC



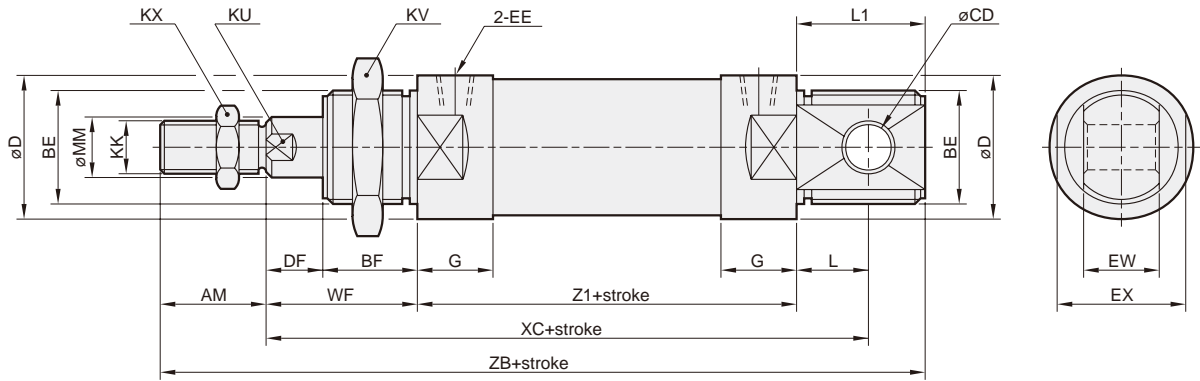
| No. | Part name | Q'y | No. | Part name | Q'y | No. | Part name | Q'y |
|-----|---------------|-----|-----|-----------------|-----|-----|-----------------|-----|
| 1 | Rod cover | 1 | 6 | Oilless bearing | 1 | 11 | Cylinder gasket | 2 |
| 2 | Head cover | 1 | 7 | Nut | 1 | 12 | Piston gasket | 1 |
| 3 | Piston | 1 | 8 | Dust wiper | 1 | 13 | Magnet | 1 |
| 4 | Piston rod | 1 | 9 | Rod packing | 1 | | | |
| 5 | Cylinder tube | 1 | 10 | Piston packing | 2 | | | |

MDOD

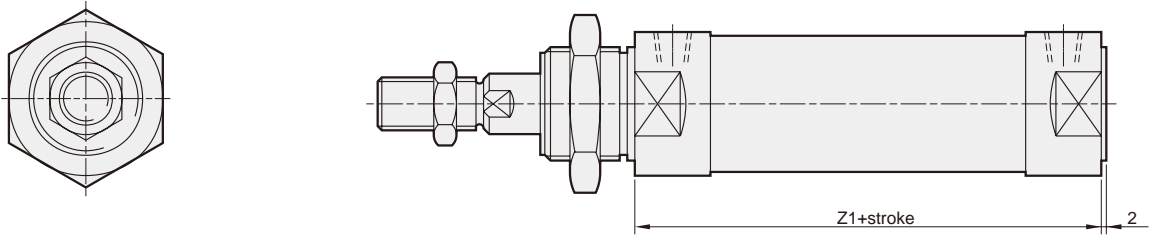


| No. | Part name | Q'y | No. | Part name | Q'y | No. | Part name | Q'y |
|-----|---------------|-----|-----|-----------------|-----|-----|-----------------|-----|
| 1 | Rod cover | 2 | 5 | Oilless bearing | 2 | 9 | Cylinder gasket | 2 |
| 2 | Piston | 1 | 6 | Dust wiper | 2 | 10 | Piston gasket | 1 |
| 3 | Piston rod | 1 | 7 | Rod packing | 2 | 11 | Magnet | 1 |
| 4 | Cylinder tube | 1 | 8 | Piston packing | 2 | | | |

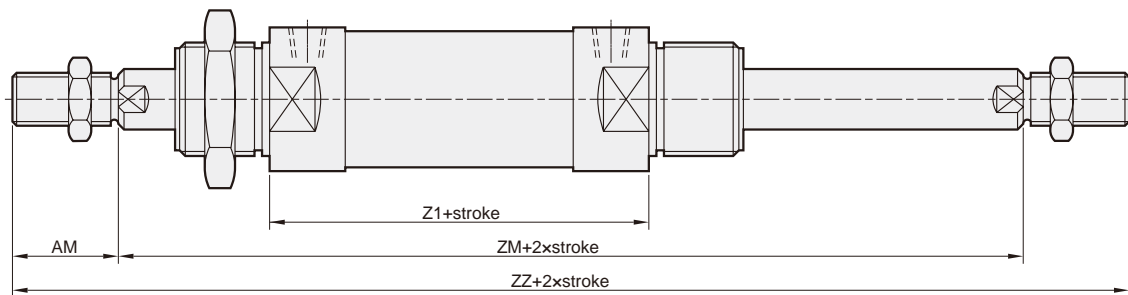
MDOC



MDOA

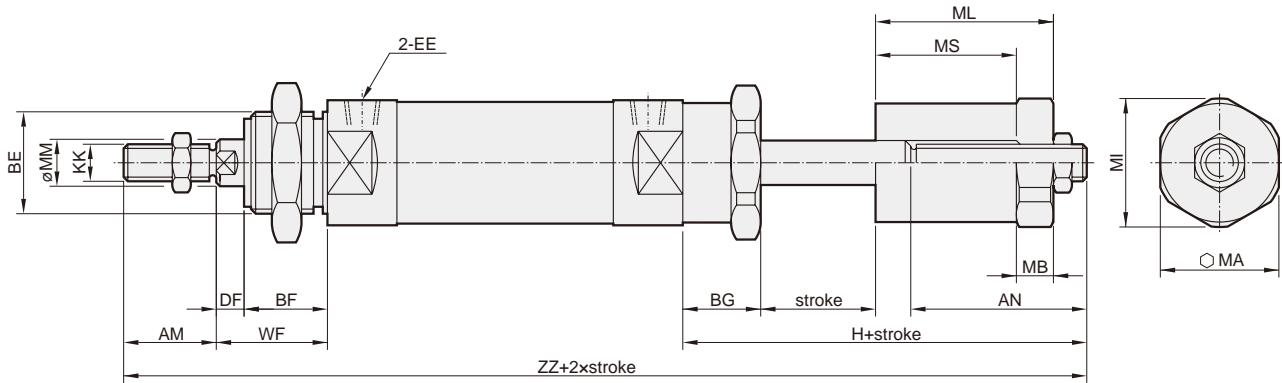


MDOD



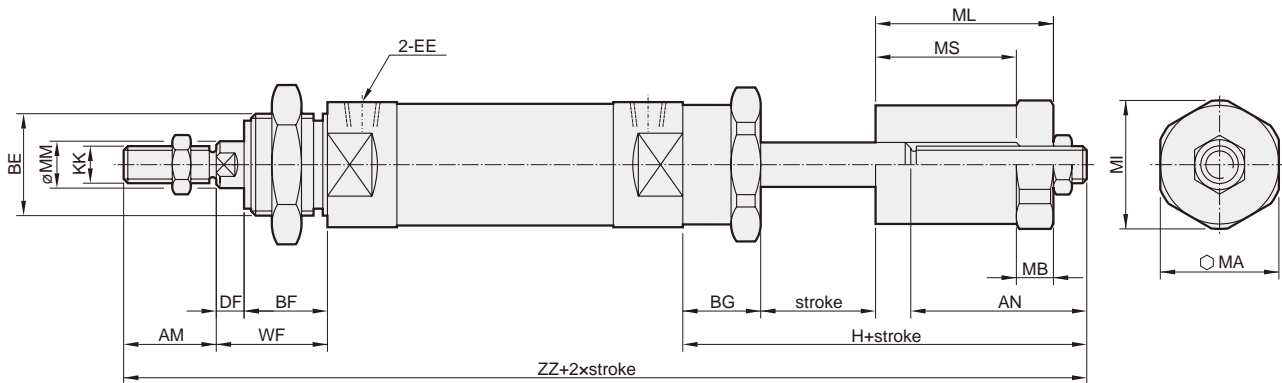
| Code Tube I.D. | AM | BE | BF | CD | D | DF | EE | EX | EW | G | KK | KU | KV | KX | L | L1 | MM | WF | XC | Z1 | ZB | ZM | ZZ |
|-------------------|----|---------|----|----|----|----|-------|----|----|----|----------|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|
| $\phi 20$ | 20 | M22x1.5 | 20 | 10 | 28 | 8 | Rc1/8 | 25 | 12 | 16 | M10x1.25 | 10 | 27 | 17 | 15 | 25 | 12 | 28 | 130 | 87 | 160 | 143 | 183 |
| $\phi 32$ | 28 | M30x1.5 | 25 | 12 | 38 | 15 | Rc1/4 | 35 | 20 | 20 | M14x1.5 | 14 | 41 | 22 | 17 | 32 | 16 | 40 | 159 | 102 | 202 | 182 | 238 |

MDON (A : Adjustable stroke 25mm)



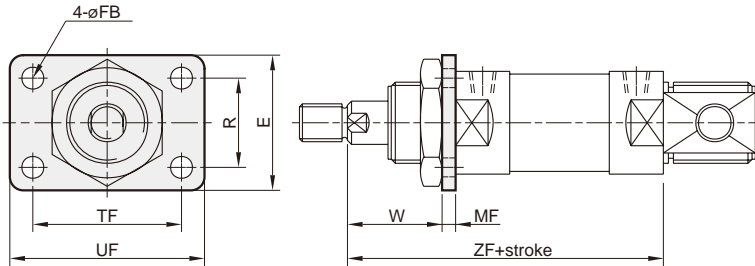
| Code Tube I.D. | AN | AM | BE | BF | BG | DF | EE | H | KK | MA | MB | MI | ML | MM | MS | WF | ZZ |
|-------------------|----|----|---------|----|----|----|------|----|----------|----|----|----|----|----|----|----|-----|
| $\varnothing 20$ | 48 | 20 | M22x1.5 | 20 | 25 | 8 | G1/8 | 81 | M10x1.25 | 27 | 10 | 29 | 47 | 12 | 37 | 28 | 216 |
| $\varnothing 32$ | 48 | 28 | M30x1.5 | 25 | 30 | 15 | G1/4 | 88 | M14x1.5 | 32 | 10 | 35 | 47 | 16 | 37 | 40 | 258 |

MDON (B : Adjustable stroke 50mm)



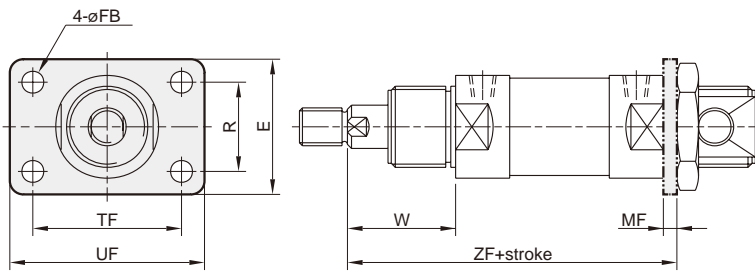
| Code Tube I.D. | AN | AM | BE | BF | BG | DF | EE | H | KK | MA | MB | MI | ML | MM | MS | WF | ZZ |
|-------------------|----|----|---------|----|----|----|------|-----|----------|----|----|----|----|----|----|----|-----|
| $\varnothing 20$ | 73 | 20 | M22x1.5 | 20 | 25 | 8 | G1/8 | 106 | M10x1.25 | 27 | 10 | 29 | 72 | 12 | 62 | 28 | 241 |
| $\varnothing 32$ | 73 | 28 | M30x1.5 | 25 | 30 | 15 | G1/4 | 113 | M14x1.5 | 32 | 10 | 35 | 72 | 16 | 62 | 40 | 283 |

FA



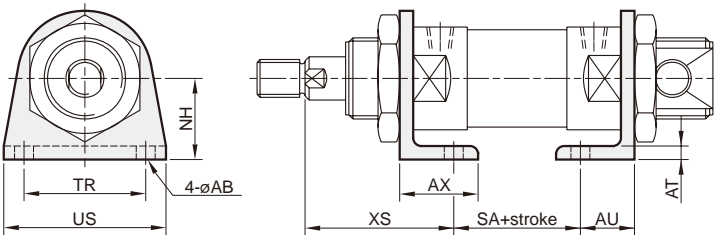
| Code Tube I.D. | E | FB | MF | R | TF | UF | W | ZF |
|-------------------|----|----|----|----|----|----|----|-----|
| $\varnothing 20$ | 38 | 7 | 6 | 21 | 51 | 68 | 22 | 115 |
| $\varnothing 32$ | 50 | 7 | 9 | 33 | 55 | 72 | 31 | 142 |

FB



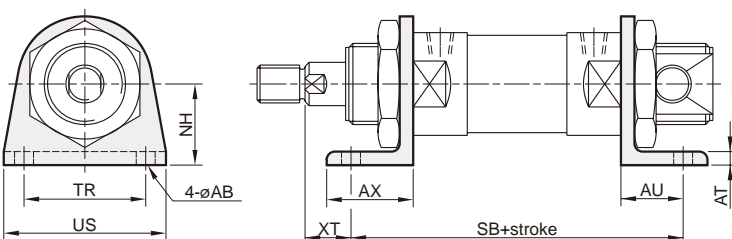
| Code Tube I.D. | E | FB | MF | R | TF | UF | W | ZF |
|-------------------|----|----|----|----|----|----|----|-----|
| $\varnothing 20$ | 38 | 7 | 6 | 21 | 51 | 68 | 28 | 121 |
| $\varnothing 32$ | 50 | 7 | 9 | 33 | 55 | 72 | 40 | 151 |

LB



| Code Tube I.D. | AB | AT | AU | AX | NH | SA | TR | US | XS |
|-------------------|----|----|----|----|----|----|----|----|----|
| $\varnothing 20$ | 7 | 5 | 17 | 25 | 25 | 63 | 40 | 54 | 40 |
| $\varnothing 32$ | 7 | 5 | 20 | 30 | 35 | 72 | 40 | 55 | 55 |

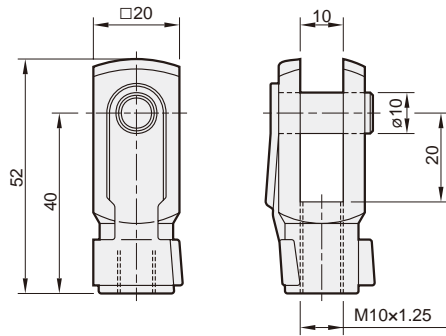
LB



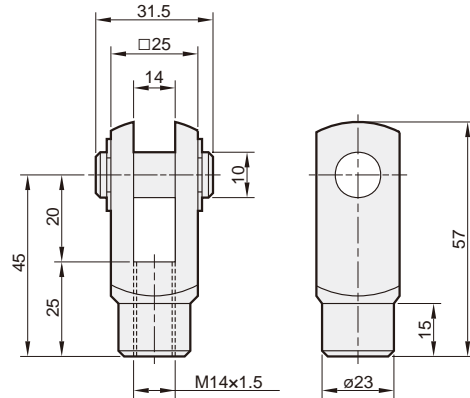
| Code Tube I.D. | AB | AT | AU | AX | NH | SB | TR | US | XT |
|-------------------|----|----|----|----|----|-----|----|----|----|
| $\varnothing 20$ | 7 | 5 | 17 | 25 | 25 | 121 | 40 | 54 | 11 |
| $\varnothing 32$ | 7 | 5 | 20 | 30 | 35 | 142 | 40 | 55 | 20 |

Y connector Pin (Extra purchase)

Type Y - M10x1.25

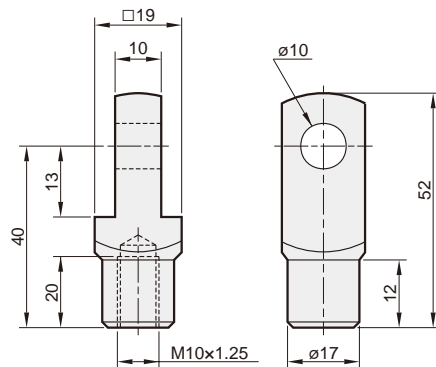


Type Y - M14x1.5

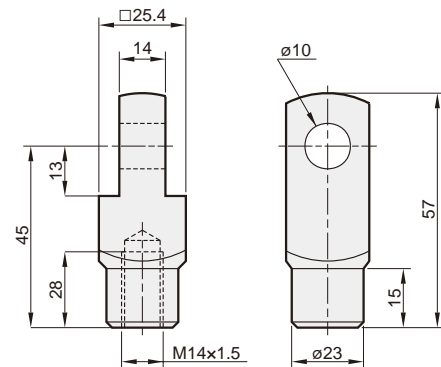


I connector

Type I - M10x1.25

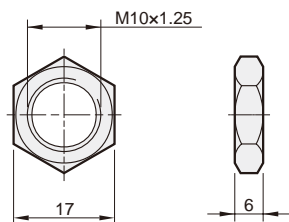


Type I - M14x1.5

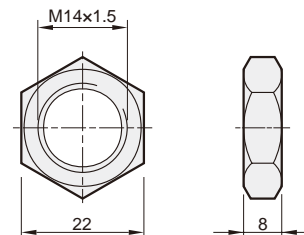


Mounting nut

Type N - M10x1.25

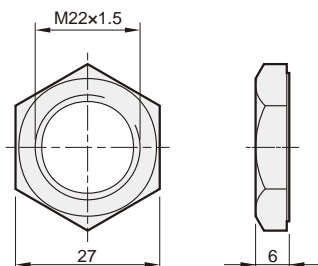


Type N - M14x1.5

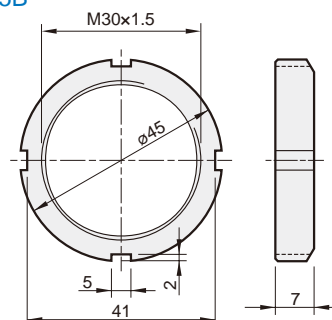


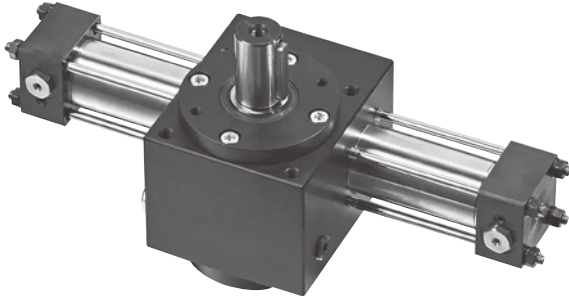
Mounting nut

Type N - M22x1.5



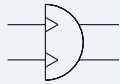
Type N - M30x1.5B





MRPH

Male pivot gear



Order example

MRPH — 40 — 90

MODEL

TUBE I.D.

ROTATION

32
40

90: 90°
180: 180°

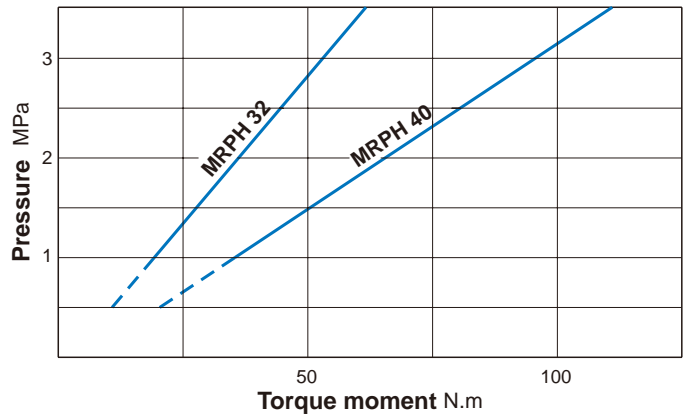
Features

- Compact body manufactured from anodised aluminum.
- Functional design with clean appearance.
- Rotation angle can be adjusted via screw

Specification

| Model | MRPH | |
|-------------------------------|--|-------|
| Tube I.D. (mm) | 32 | 40 |
| Standard rotation | 90±5°, 180±5° | |
| Rotating shaft dia. (mm) | 24 | 28 |
| Initial position of slot (mm) | See dimensional feature | |
| Medium | Filtered air with or without lubrication | |
| Max. operating pressure | 3.5 MPa | |
| Ambient temperature | -10~+60°C (No freezing) | |
| Max. allowable axial thrust | 12 kg | 20 kg |
| Sensor switch | LN01P (Please refer to page 5-17) | |

Output torque table



Kind of fluid

| Petroleum - based fluid | Water - glycol fluid | Phosphate - ester fluid | Water in oil fluid | Oil in water fluid |
|-------------------------|----------------------|-------------------------|--------------------|--------------------|
| ○ | × | × | △ | △ |

Note. ○ allowable × unallowable △ consult us

Oil volume per

Unit: ml

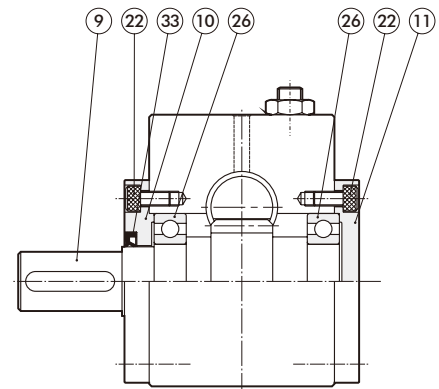
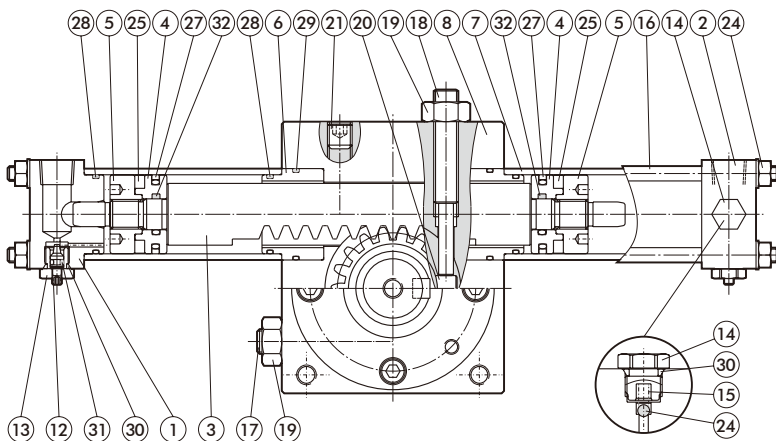
| Rotary angle Tube I.D. | 90° | 180° |
|---------------------------|-----|------|
| 32 | 29 | 54 |
| 40 | 52 | 100 |

HYDRAULIC ROTARY ACTUATOR

How to order the seal kit

MRPHSK

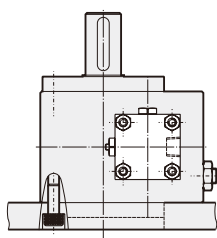
| Tube I.D. | Seal kit |
|-----------|--|
| 32 | MRPHSK32 - Including No.27,28,29,30,31,32,33 |
| 40 | MRPHSK40 - Including No.27,28,29,30,31,32,33 |



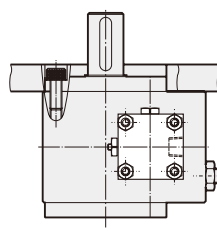
Parts list

| No. | Part name | Q'ty | No. | Part name | Q'ty | No. | Part name | Q'ty |
|-----|---------------|------|-----|---------------------------|------|-----|---------------------|------|
| 1 | End cap | 1 | 12 | Cushion needle | 2 | 23 | Nut & Spring washer | 8 |
| 2 | End cap | 1 | 13 | Cushion plug | 2 | 24 | Steel ball | 2 |
| 3 | Rack | 1 | 14 | Check valve | 2 | 25 | Magnet | 2 |
| 4 | Piston | 2 | 15 | Spring | 2 | 26 | Ball bearing | 2 |
| 5 | Magnet holder | 2 | 16 | Tie bolt | 8 | 27 | Piston packing | 2 |
| 6 | Rod bush | 2 | 17 | Adjusting screw | 1 | 28 | Cylinder gasket | 4 |
| 7 | Cylinder tube | 2 | 18 | Adjusting screw | 1 | 29 | O-ring | 2 |
| 8 | Housing | 1 | 19 | Lock nut | 2 | 30 | O-ring | 4 |
| 9 | Pinion shaft | 1 | 20 | Stopper pin | 1 | 31 | O-ring | 2 |
| 10 | End cover | 1 | 21 | Set screw | 1 | 32 | Piston gasket | 2 |
| 11 | End cover | 1 | 22 | Hexagon socket head screw | 8 | 33 | Rod packing | 1 |

Mounting type

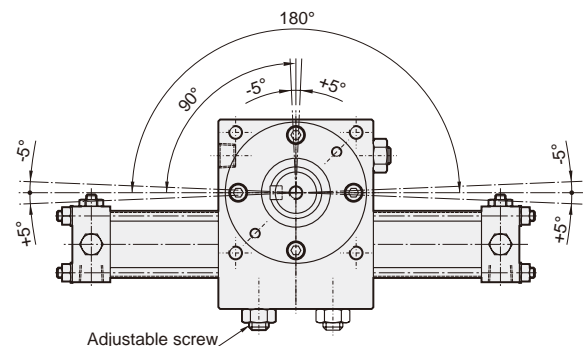


Bottom mounting

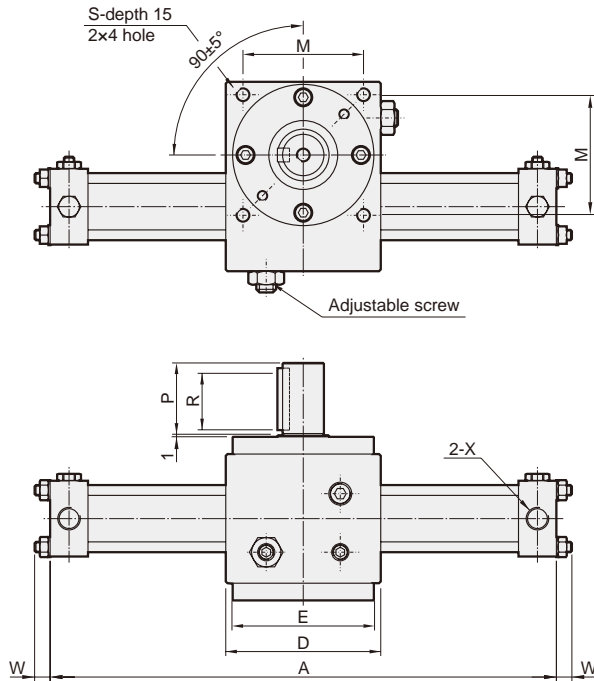


Top mounting

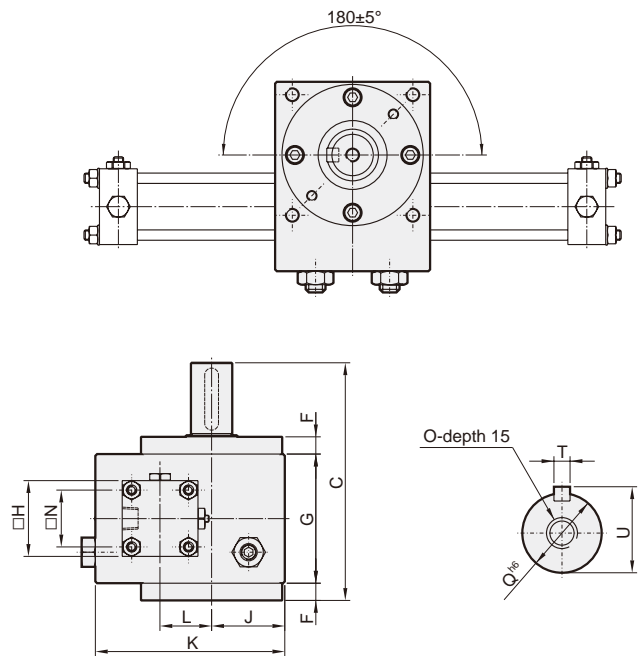
Rotating direction and adjustable angle



Angle of rotation 90°

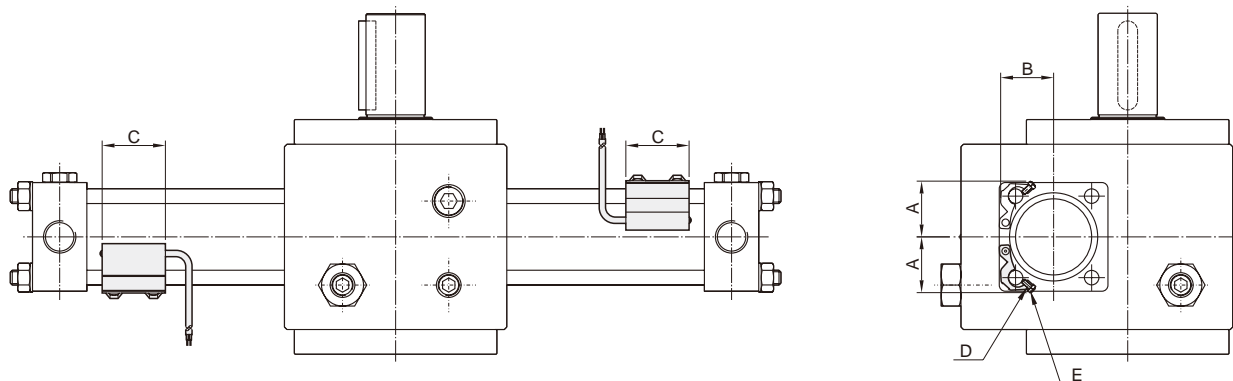


Angle of rotation 180°

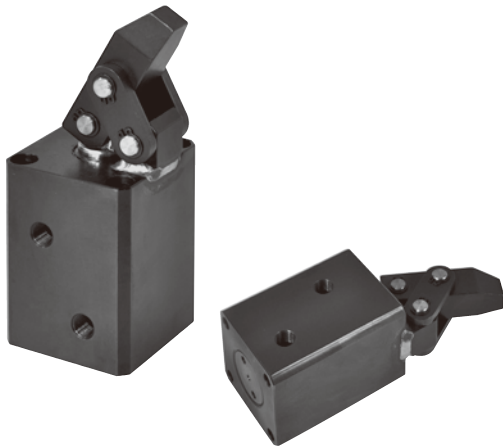


| Code | A | | C | D | E | F | G | H | J | K | L | M | N | O | P | Q | R | S | T | U | W | X |
|------|-----|------|-----|-----|----|----|----|----|------|-----|----|----|----|----|----|----|----|-----|---|----|---|-------|
| | 90° | 180° | | | | | | | | | | | | | | | | | | | | |
| 32 | 286 | 357 | 138 | 90 | 82 | 10 | 75 | 44 | 42.5 | 110 | 30 | 70 | 33 | M8 | 42 | 24 | 36 | M8 | 8 | 27 | 9 | Rc1/4 |
| 40 | 315 | 400 | 170 | 105 | 96 | 12 | 95 | 50 | 51.5 | 135 | 36 | 82 | 37 | M8 | 50 | 28 | 45 | M10 | 8 | 31 | 9 | Rc3/8 |

Installation of sensor switches



| Code | Sensor switch | A | B | C | D | E |
|------|---------------|----|----|----|--------|----|
| 32 | LN01P | 25 | 29 | 32 | M4x16L | M4 |
| 40 | LN01P | 27 | 30 | 32 | M4x16L | M4 |



Features

- Lever type clamp cylinder gives high clamping force.
- Manifold or freestanding model available.
- Carbon steel body ensures long life of unit.
- Ideal for use on CNC machine tools where repetitive clamping is required.

Specification

| Model | MHCK | | | | |
|--------------------------|-----------|-------|-------|-------|-------|
| Tube I.D. (mm) | 25 | 32 | 40 | 50 | 63 |
| Piston-rod (mm) | 18 | 20 | 22.4 | 28 | 35 |
| Standard stroke (mm) | 25 | 25 | 30 | 35 | 40 |
| Operating pressure range | 0.5~5 MPa | | | | |
| Proof pressure | 7 MPa | | | | |
| Clamping force (3 MPa) | 1296N | 2123N | 3063N | 4531N | 6471N |

MHCK

Standard type



MHCK-F

Manifold type



Order example

MHCK – 25 – F

MODEL

TUBE I.D.

MANIFOLD TYPE



Blank: Standard type

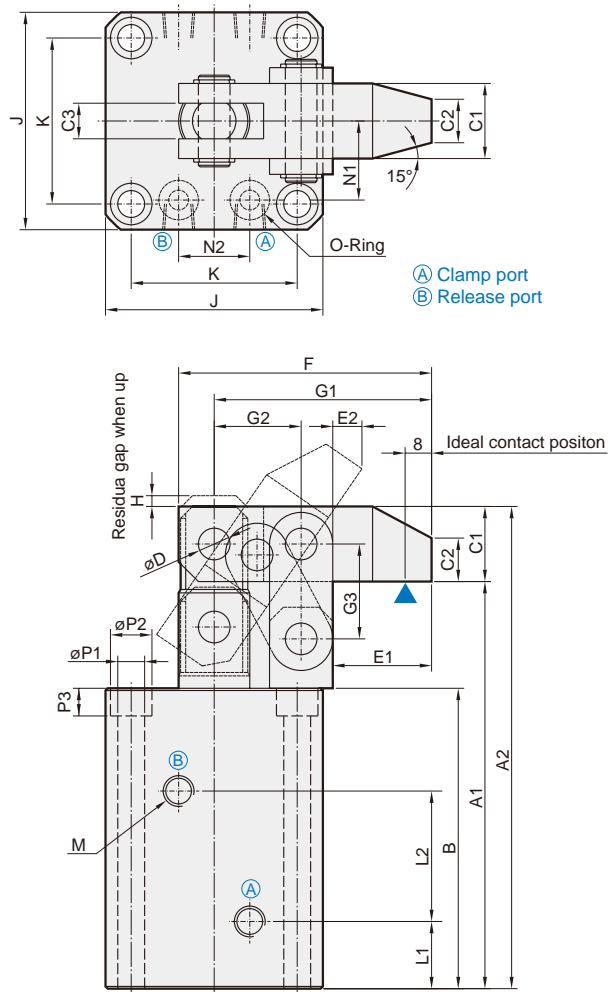


F: Manifold type

HYDRAULIC LEVER-TYPE CYLINDER

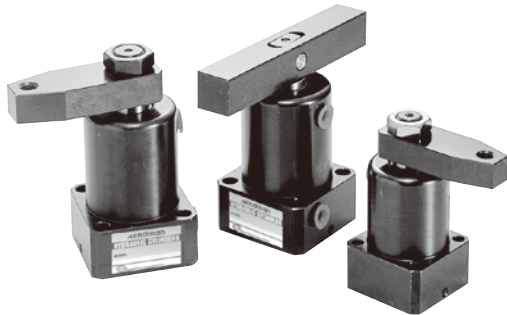
MHCK

MHCK-F



| Code Tube I.D. | A1 | A2 | B | C1 | C2 | C3 | D | E1 | E2 | F | G1 | G2 | G3 | H | J |
|-------------------|-----|-------|-----|------|----|----|----|------|------|-----|----|----|----|---|----|
| 25 | 103 | 122 | 76 | 19 | 11 | 9 | 8 | 25 | 5 | 64 | 55 | 22 | 24 | 3 | 55 |
| 32 | 112 | 131 | 85 | 19 | 11 | 9 | 8 | 25 | 5 | 64 | 55 | 22 | 24 | 3 | 57 |
| 40 | 122 | 144.2 | 90 | 22.2 | 13 | 10 | 10 | 30 | 5.5 | 77 | 66 | 26 | 29 | 4 | 69 |
| 50 | 137 | 162.4 | 100 | 25.4 | 15 | 11 | 12 | 35.5 | 6.5 | 90 | 77 | 30 | 33 | 5 | 75 |
| 63 | 155 | 186.8 | 111 | 31.8 | 19 | 15 | 15 | 43 | 12.8 | 110 | 94 | 36 | 39 | 4 | 96 |

| Code Tube I.D. | K | L1 | L2 | M | N1 | N2 | O | P1 | P2 | P3 |
|-------------------|----|------|----|-------|----|----|----|-----|------|----|
| 25 | 42 | 17 | 33 | Rc1/8 | 20 | 18 | P7 | 6.8 | 10.5 | 7 |
| 32 | 44 | 19 | 38 | Rc1/8 | 22 | 22 | P7 | 6.8 | 10.5 | 7 |
| 40 | 52 | 19 | 40 | Rc1/4 | 26 | 26 | P8 | 9 | 14 | 9 |
| 50 | 58 | 21.5 | 45 | Rc1/4 | 30 | 32 | P8 | 9 | 14 | 9 |
| 63 | 75 | 22 | 52 | Rc1/4 | 38 | 38 | P9 | 11 | 18 | 11 |



Features

- Compact design available with large range of bore sizes.
- Available with both clockwise and anti clockwise movement.
- Available with single or double arms.
- Available with inbuilt flow control.

Note

- Please don't exceed 1.5 times of the original length, if it is necessary to increase the length of the clamping arm.
- Suggested to install a flow control valve protect cylinder barrel and internal components against fretting wear

Specification

| Model | MTHS, MTHD |
|-----------------------------|---|
| Tube I.D. (mm) | 25, 32, 40, 50, 63 |
| Acting type | Double acting |
| Medium | Filtered oil |
| Operating pressure range | 0.5~7 MPa |
| Proof pressure | 10 MPa |
| Material of cylinder barrel | Carbon steel |
| Standard angle of rotation | 90°±2° (Angles of 0°, 45° and 60° are optional) |
| Rotating direction | Clockwise or counter clockwise |

Double acting

MTHS / MTHD

Single side clamping arm / Double sides clamping arm



Double acting (manifold type)

MTHS..FC / MTHD..FC

Single side clamping arm / Double sides clamping arm
(With flow control) (With flow control)



MTHS..F / MTHD..F

Single side clamping arm / Double sides clamping arm



MTHS..MF / MTHD..MF

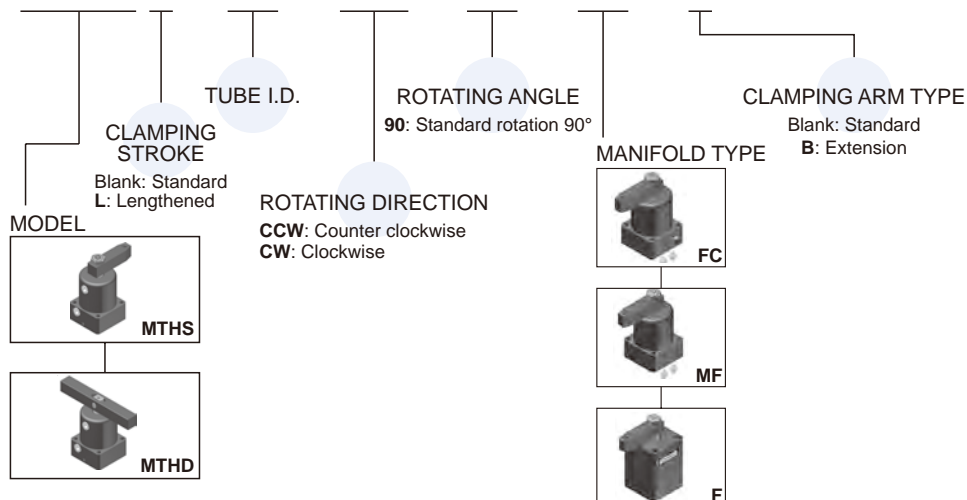
Single side clamping arm / Double sides clamping arm



| Tube I.D. | | 25 | 32 | 40 | 50 | 63 |
|-----------|---------|----|----|----|----|----|
| Model | | | | | | |
| MTHS | MTHD | ○ | ○ | ○ | ○ | ○ |
| MTHSL | MTHDL | × | ○ | ○ | ○ | ○ |
| MTHS-FC | MTHD-FC | ○ | ○ | ○ | ○ | ○ |
| MTHS-MF | MTHD-MF | ○ | ○ | ○ | ○ | ○ |
| MTHS-F | MTHD-F | ○ | ○ | ○ | ○ | × |

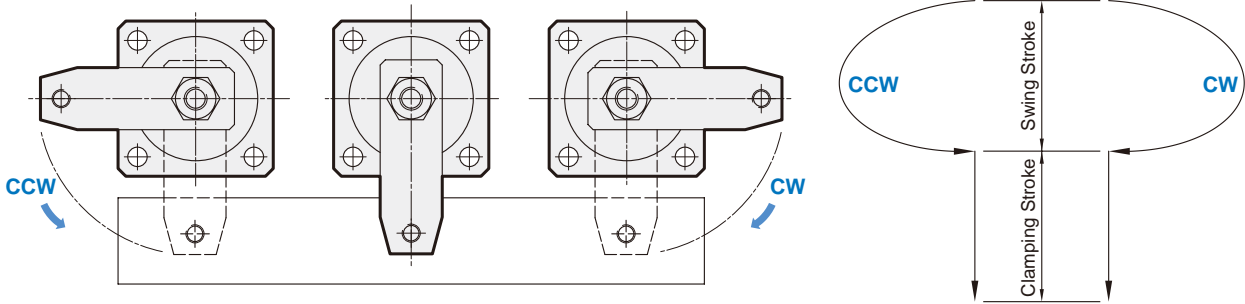
Order example

MTHS L – 25 – CW – 90 – FC – B

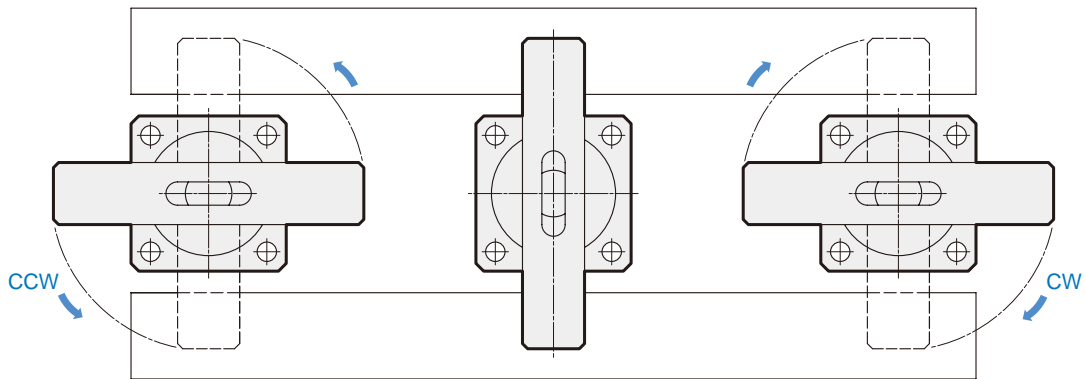


HYDRAULIC SWING CLAMP CYLINDER

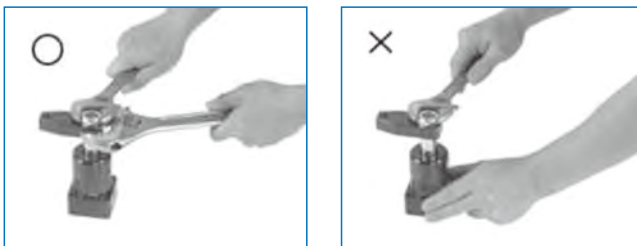
Single side swing clamp



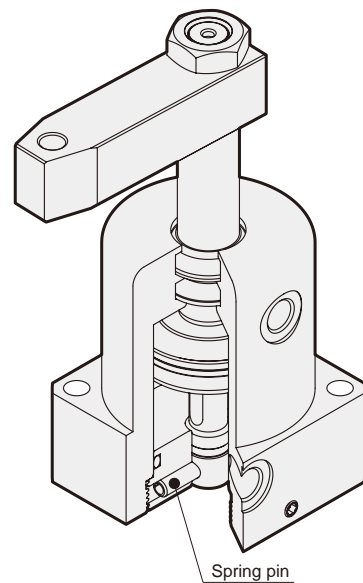
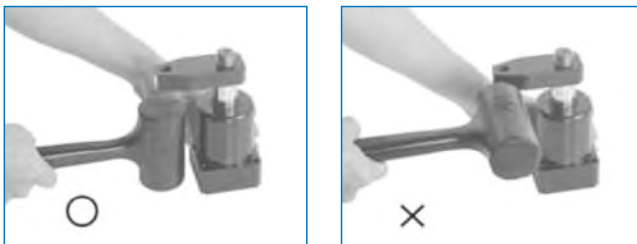
Double side swing clamp



Clamping arm mounting methods



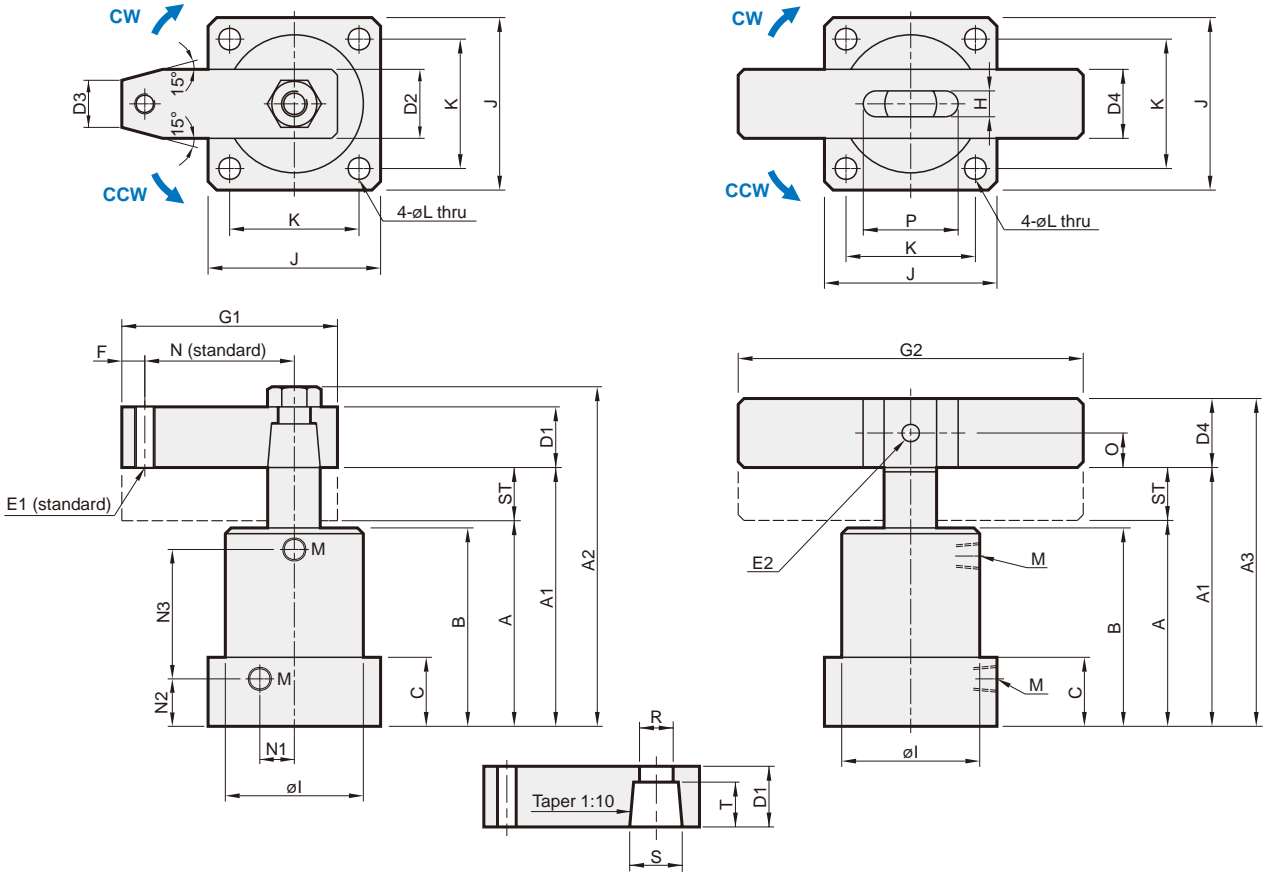
Clamping arm removing methods



Note. If the clamping arm is wrong mounting and removing, the spring pin is broken easily. Then the rotation angle is deviation or the action is not smooth when the cylinder works.

MTHS / MTHSL

MTHD / MTHDL



Single side clamping arm

ST: Stroke

* Clamping stroke lengthened type.

| Model | Tube I.D. (mm) | Piston rod (mm) | Swing stroke (mm) | Clamping stroke (mm) | | Pressure area push/pull (mm ²) | Clamping force (N) 3.5MPa | Clamping arm type | | | | |
|---------|----------------|-----------------|-------------------|----------------------|----|--|---------------------------|-------------------|-----------|----------|-----------|-----|
| | | | | Standard | * | | | G1 | | G2 | | |
| | | | | | | | | Standard | Extension | Standard | Extension | |
| MTHS-25 | MTHD-25 | ø25 | ø18 | 9 | 13 | — | 491 / 237 | 830 | 74 | 100 | 140 | 200 |
| MTHS-32 | MTHD-32 | ø32 | ø20 | 11 | 15 | 30 | 804 / 490 | 1720 | 81 | 110 | 160 | 230 |
| MTHS-40 | MTHD-40 | ø40 | ø22.4 | 11 | 15 | 30 | 1257 / 863 | 3020 | 86 | 120 | 160 | 230 |
| MTHS-50 | MTHD-50 | ø50 | ø28 | 13 | 17 | 34 | 1963 / 1347 | 4710 | 96 | 130 | 180 | 260 |
| MTHS-63 | MTHD-63 | ø63 | ø35 | 13 | 17 | 34 | 3117 / 2155 | 7540 | 114 | 150 | 200 | — |

| Code Model | Standard type | | | | | | Clamping stroke lengthened type * | | | | | | C | D1 | D2 | D3 | D4 | E1 | E2 | |
|------------|---------------|-----|-----|-----|-------|-----|-----------------------------------|-----|-----|-----|-------|-----|----|----|----|----|----|-------|----------|-----|
| | A | A1 | A2 | A3 | B | ST | A | A1 | A2 | A3 | B | ST | | | | | | | | |
| MTHS-25 | MTHD-25 | 79 | 101 | 124 | 120 | 76 | 22 | — | — | — | — | — | — | 27 | 15 | 27 | 15 | □19 | M10x1.5 | ø8 |
| MTHS-32 | MTHD-32 | 89 | 115 | 140 | 137.2 | 85 | 26 | 104 | 145 | 170 | 167.2 | 100 | 41 | 30 | 17 | 31 | 17 | □22.2 | M10x1.5 | ø8 |
| MTHS-40 | MTHD-40 | 94 | 120 | 148 | 142.2 | 90 | 26 | 109 | 150 | 178 | 172.2 | 105 | 41 | 30 | 18 | 31 | 17 | □22.2 | M10x1.5 | ø10 |
| MTHS-50 | MTHD-50 | 104 | 134 | 166 | 159.4 | 100 | 30 | 121 | 168 | 200 | 193.4 | 117 | 47 | 34 | 20 | 37 | 19 | □25.4 | M12x1.75 | ø12 |
| MTHS-63 | MTHD-63 | 109 | 139 | 175 | 170.8 | 105 | 30 | 126 | 173 | 209 | 204.8 | 122 | 47 | 34 | 23 | 48 | 24 | □31.8 | M16x2.0 | ø15 |

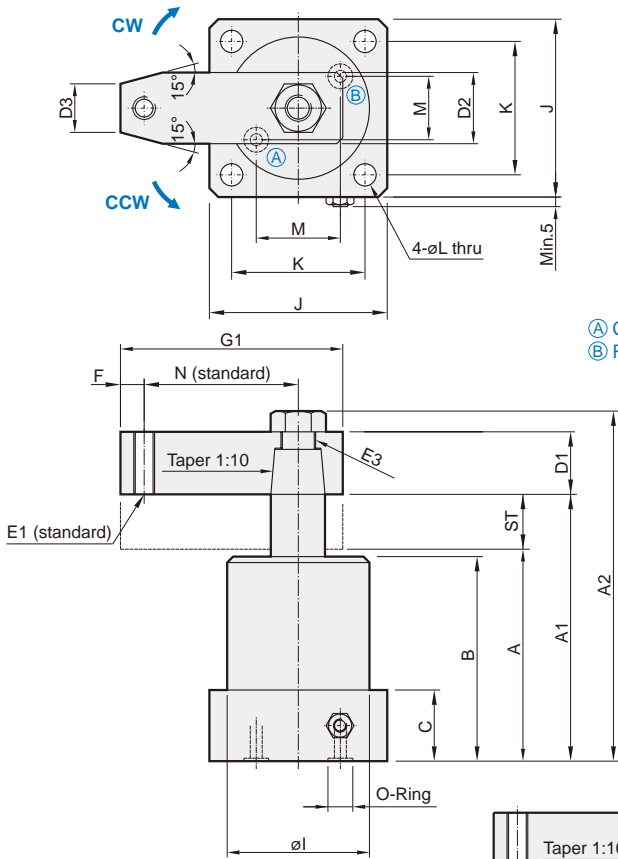
| Code Model | F | H | I | J | K | L | M | N | N1 | N2 | N3 | | O | P | R | S | T | |
|------------|---------|----|----|-----|----|----|------|-------|----|----|----------|------|------|------|----|-----|-------|----|
| | | | | | | | | | | | Standard | * | | | | | | |
| MTHS-25 | MTHD-25 | 10 | 9 | ø46 | 52 | 40 | ø6.8 | Rc1/8 | 50 | 8 | 17 | 46 | — | 9.5 | 25 | ø15 | ø18 | 13 |
| MTHS-32 | MTHD-32 | 10 | 10 | ø50 | 56 | 44 | ø6.8 | Rc1/8 | 55 | 10 | 19 | 52 | 67 | 11.1 | 29 | ø17 | ø20 | 14 |
| MTHS-40 | MTHD-40 | 10 | 10 | ø54 | 63 | 48 | ø9 | Rc1/8 | 60 | 12 | 19 | 57 | 72 | 11.1 | 31 | ø19 | ø22.4 | 15 |
| MTHS-50 | MTHD-50 | 12 | 12 | ø66 | 72 | 57 | ø9 | Rc1/4 | 65 | 15 | 21.5 | 63.5 | 80.5 | 12.7 | 38 | ø21 | ø28 | 16 |
| MTHS-63 | MTHD-63 | 15 | 15 | ø80 | 88 | 70 | ø11 | Rc1/4 | 75 | 17 | 22 | 68 | 85 | 15.9 | 48 | ø27 | ø35 | 18 |

MTH*-FC Manifold type (With flow control) $\varnothing 25\sim\varnothing 63$

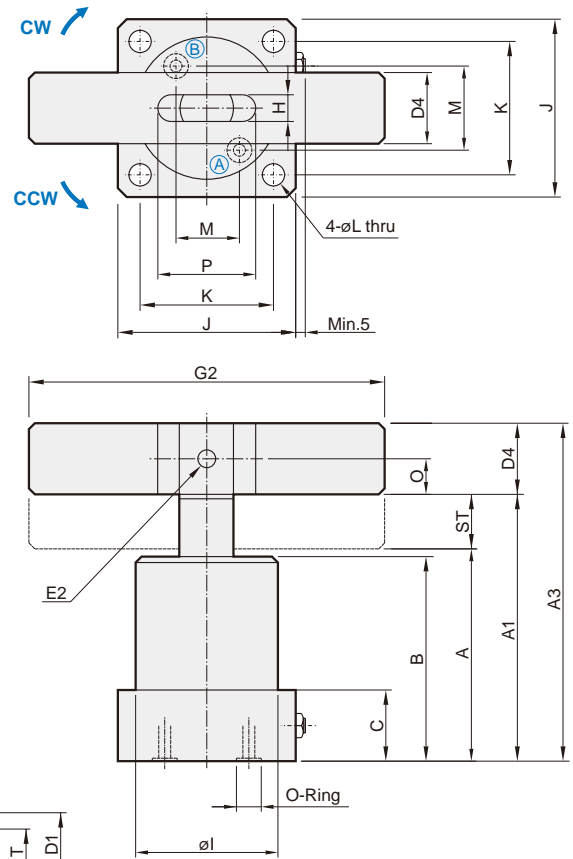


HYDRAULIC SWING CLAMP CYLINDER

MTHS-FC



MTHD-FC



Ⓐ Clamp port
Ⓑ Release port

Single side clamping arm

ST: Stroke

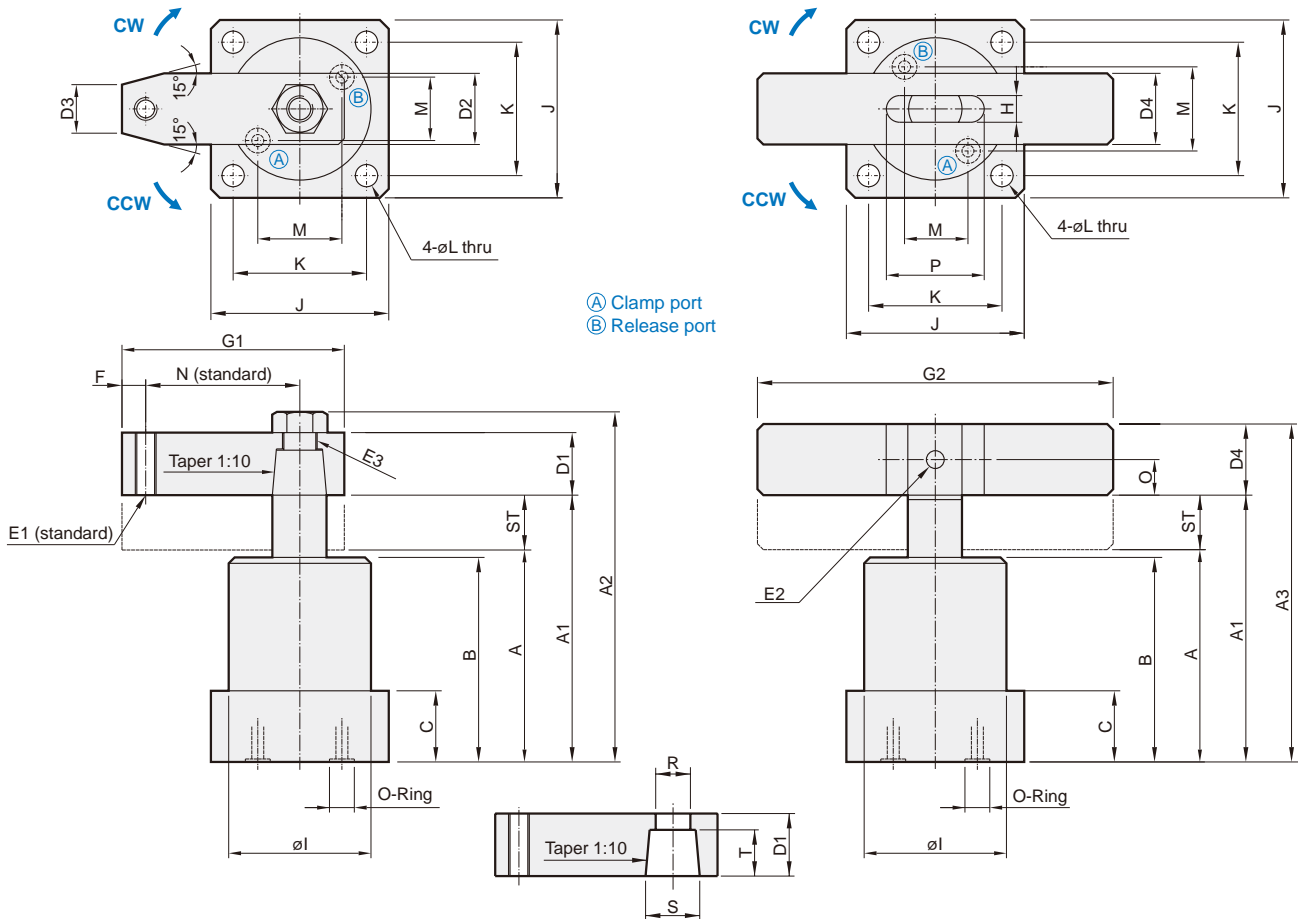
| Model | Tube I.D. (mm) | Piston rod (mm) | Swing stroke (mm) | Clamping stroke (mm) | Pressure area push/pull (mm ²) | Clamping force (N) 3.5MPa | Clamping arm type | | | | |
|-----------|----------------|------------------|--------------------|----------------------|--|---------------------------|-------------------|-----------|----------|-----------|-----|
| | | | | | | | G1 | | G2 | | |
| | | | | | | | Standard | Extension | Standard | Extension | |
| MTHS-25FC | MTHD-25FC | $\varnothing 25$ | $\varnothing 18$ | 9 | 13 | 491 / 237 | 830 | 74 | 100 | 140 | 200 |
| MTHS-32FC | MTHD-32FC | $\varnothing 32$ | $\varnothing 20$ | 11 | 15 | 804 / 490 | 1720 | 81 | 110 | 160 | 230 |
| MTHS-40FC | MTHD-40FC | $\varnothing 40$ | $\varnothing 22.4$ | 11 | 15 | 1257 / 863 | 3020 | 86 | 120 | 160 | 230 |
| MTHS-50FC | MTHD-50FC | $\varnothing 50$ | $\varnothing 28$ | 13 | 17 | 1963 / 1347 | 4710 | 96 | 130 | 180 | 260 |
| MTHS-63FC | MTHD-63FC | $\varnothing 63$ | $\varnothing 35$ | 13 | 17 | 3117 / 2155 | 7540 | 114 | 150 | 200 | — |

| Code Model | ST | A | A1 | A2 | A3 | B | C | D1 | D2 | D3 | D4 | E1 | E2 | E3 | |
|------------|-----------|----|-----|-----|-----|-------|-----|----|----|----|----|----------------|----------|------------------|---------|
| MTHS-25FC | MTHD-25FC | 22 | 79 | 101 | 124 | 120 | 76 | 22 | 15 | 27 | 15 | $\square 19$ | M10x1.5 | $\varnothing 8$ | M14x1.5 |
| MTHS-32FC | MTHD-32FC | 26 | 89 | 115 | 140 | 137.2 | 85 | 25 | 17 | 31 | 17 | $\square 22.2$ | M10x1.5 | $\varnothing 8$ | M16x1.5 |
| MTHS-40FC | MTHD-40FC | 26 | 94 | 120 | 148 | 142.2 | 90 | 25 | 18 | 31 | 17 | $\square 22.2$ | M10x1.5 | $\varnothing 10$ | M18x1.5 |
| MTHS-50FC | MTHD-50FC | 30 | 104 | 134 | 166 | 159.4 | 100 | 30 | 20 | 37 | 19 | $\square 25.4$ | M12x1.75 | $\varnothing 12$ | M20x1.5 |
| MTHS-63FC | MTHD-63FC | 30 | 109 | 139 | 175 | 170.8 | 105 | 30 | 23 | 48 | 24 | $\square 31.8$ | M16x2.0 | $\varnothing 15$ | M26x1.5 |

| Code Model | F | G1 | G2 | H | I | J | K | L | M | N | O | O-Ring | P | R | S | T | |
|------------|-----------|----|-----|-----|----|------------------|----|----|-------------------|----|----|--------|----|----|------------------|--------------------|----|
| MTHS-25FC | MTHD-25FC | 10 | 74 | 140 | 9 | $\varnothing 46$ | 55 | 42 | $\varnothing 6.8$ | 19 | 50 | 9.5 | P7 | 25 | $\varnothing 15$ | $\varnothing 18$ | 13 |
| MTHS-32FC | MTHD-32FC | 10 | 81 | 160 | 10 | $\varnothing 50$ | 57 | 44 | $\varnothing 6.8$ | 21 | 55 | 11.1 | P7 | 29 | $\varnothing 17$ | $\varnothing 20$ | 14 |
| MTHS-40FC | MTHD-40FC | 10 | 86 | 160 | 10 | $\varnothing 54$ | 63 | 48 | $\varnothing 9$ | 23 | 60 | 11.1 | P9 | 31 | $\varnothing 19$ | $\varnothing 22.4$ | 15 |
| MTHS-50FC | MTHD-50FC | 12 | 96 | 180 | 12 | $\varnothing 66$ | 72 | 57 | $\varnothing 9$ | 28 | 65 | 12.7 | P9 | 38 | $\varnothing 21$ | $\varnothing 28$ | 16 |
| MTHS-63FC | MTHD-63FC | 15 | 114 | 200 | 15 | $\varnothing 80$ | 88 | 70 | $\varnothing 11$ | 32 | 75 | 15.9 | P9 | 48 | $\varnothing 27$ | $\varnothing 35$ | 18 |

MTHS-MF

MTHD-MF



Single side clamping arm

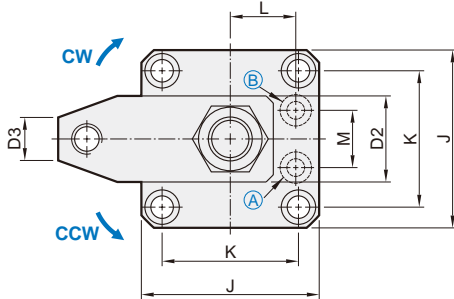
ST: Stroke

| Model | Tube I.D. (mm) | Piston rod (mm) | Swing stroke (mm) | Clamping stroke (mm) | Pressure area push/pull (mm ²) | Clamping force (N) 3.5MPa | Clamping arm type | | | | |
|-----------|----------------|-----------------|-------------------|----------------------|--|---------------------------|-------------------|-----------|----------|-----------|-----|
| | | | | | | | G1 | | G2 | | |
| | | | | | | | Standard | Extension | Standard | Extension | |
| MTHS-25MF | MTHD-25MF | $\phi 25$ | $\phi 18$ | 9 | 13 | 491 / 237 | 830 | 74 | 100 | 140 | 200 |
| MTHS-32MF | MTHD-32MF | $\phi 32$ | $\phi 20$ | 11 | 15 | 804 / 490 | 1720 | 81 | 110 | 160 | 230 |
| MTHS-40MF | MTHD-40MF | $\phi 40$ | $\phi 22.4$ | 11 | 15 | 1257 / 863 | 3020 | 86 | 120 | 160 | 230 |
| MTHS-50MF | MTHD-50MF | $\phi 50$ | $\phi 28$ | 13 | 17 | 1963 / 1347 | 4710 | 96 | 130 | 180 | 260 |
| MTHS-63MF | MTHD-63MF | $\phi 63$ | $\phi 35$ | 13 | 17 | 3117 / 2155 | 7540 | 114 | 150 | 200 | — |

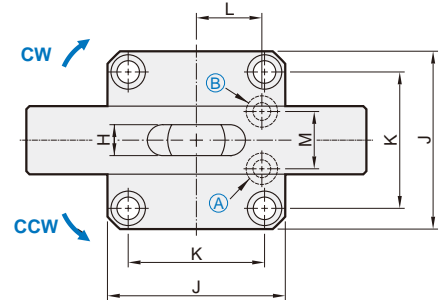
| Code Model | ST | A | A1 | A2 | A3 | B | C | D1 | D2 | D3 | D4 | E1 | E2 | E3 | |
|------------|-----------|----|-----|-----|-----|-------|-----|----|----|----|----|-------|----------|-----------|---------|
| MTHS-25MF | MTHD-25MF | 22 | 79 | 101 | 124 | 120 | 76 | 22 | 15 | 27 | 15 | □19 | M10x1.5 | $\phi 8$ | M14x1.5 |
| MTHS-32MF | MTHD-32MF | 26 | 89 | 115 | 140 | 137.2 | 85 | 25 | 17 | 31 | 17 | □22.2 | M10x1.5 | $\phi 8$ | M16x1.5 |
| MTHS-40MF | MTHD-40MF | 26 | 94 | 120 | 148 | 142.2 | 90 | 25 | 18 | 31 | 17 | □22.2 | M10x1.5 | $\phi 10$ | M18x1.5 |
| MTHS-50MF | MTHD-50MF | 30 | 104 | 134 | 166 | 159.4 | 100 | 30 | 20 | 37 | 19 | □25.4 | M12x1.75 | $\phi 12$ | M20x1.5 |
| MTHS-63MF | MTHD-63MF | 30 | 109 | 139 | 175 | 170.8 | 105 | 30 | 23 | 48 | 24 | □31.8 | M16x2.0 | $\phi 15$ | M26x1.5 |

| Code Model | F | G1 | G2 | H | I | J | K | L | M | N | O | O-Ring | P | R | S | T | |
|------------|-----------|----|-----|-----|----|-----------|----|----|------------|----|----|--------|----|----|-----------|-------------|----|
| MTHS-25MF | MTHD-25MF | 10 | 74 | 140 | 9 | $\phi 46$ | 55 | 42 | $\phi 6.8$ | 19 | 50 | 9.5 | P7 | 25 | $\phi 15$ | $\phi 18$ | 13 |
| MTHS-32MF | MTHD-32MF | 10 | 81 | 160 | 10 | $\phi 50$ | 57 | 44 | $\phi 6.8$ | 21 | 55 | 11.1 | P7 | 29 | $\phi 17$ | $\phi 20$ | 14 |
| MTHS-40MF | MTHD-40MF | 10 | 86 | 160 | 10 | $\phi 54$ | 63 | 48 | $\phi 9$ | 23 | 60 | 11.1 | P9 | 31 | $\phi 19$ | $\phi 22.4$ | 15 |
| MTHS-50MF | MTHD-50MF | 12 | 96 | 180 | 12 | $\phi 66$ | 72 | 57 | $\phi 9$ | 28 | 65 | 12.7 | P9 | 38 | $\phi 21$ | $\phi 28$ | 16 |
| MTHS-63MF | MTHD-63MF | 15 | 114 | 200 | 15 | $\phi 80$ | 88 | 70 | $\phi 11$ | 32 | 75 | 15.9 | P9 | 48 | $\phi 27$ | $\phi 35$ | 18 |

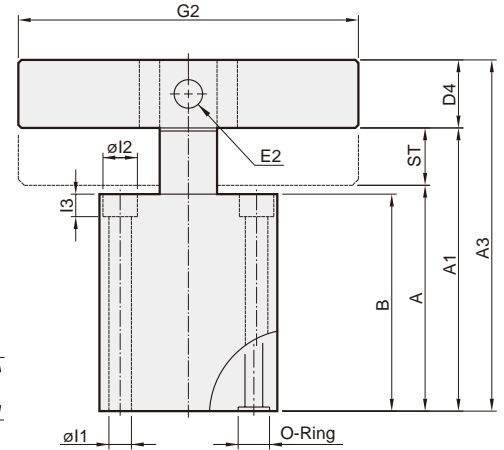
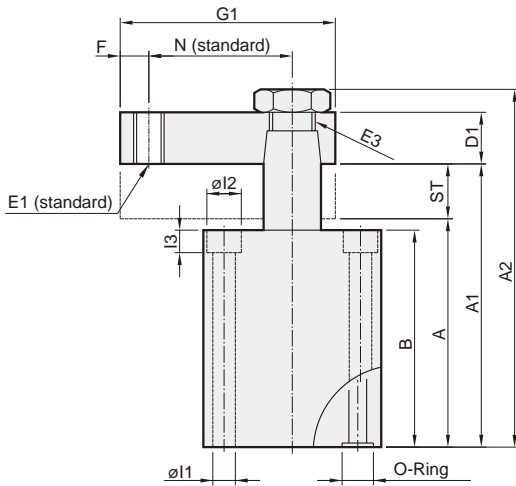
MTHS-F



MTHD-F



Ⓐ Clamp port
Ⓑ Release port



Single side clamping arm

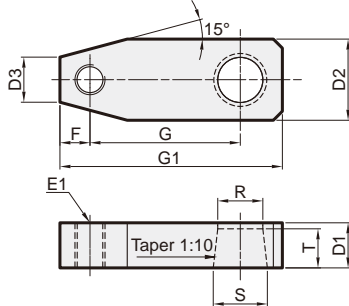
ST: Stroke

| Model | | Tube I.D. (mm) | Piston rod (mm) | Swing stroke (mm) | Clamping stroke (mm) | Pressure area push/pull (mm ²) | Clamping force (N) 3.5MPa | Clamping arm type | | | |
|----------|----------|----------------|-----------------|-------------------|----------------------|--|---------------------------|-------------------|-----------|----------|-----------|
| | | | | | | | | G1 | | G2 | |
| | | | | | | | | Standard | Extension | Standard | Extension |
| MTHS-25F | MTHD-25F | $\phi 25$ | $\phi 18$ | 9 | 13 | 491 / 237 | 830 | 74 | 100 | 140 | 200 |
| MTHS-32F | MTHD-32F | $\phi 32$ | $\phi 20$ | 11 | 15 | 804 / 490 | 1720 | 81 | 110 | 160 | 230 |
| MTHS-40F | MTHD-40F | $\phi 40$ | $\phi 22.4$ | 11 | 15 | 1257 / 863 | 3020 | 86 | 120 | 160 | 230 |
| MTHS-50F | MTHD-50F | $\phi 50$ | $\phi 28$ | 13 | 17 | 1963 / 1347 | 4710 | 96 | 130 | 180 | 260 |

| Code Model | | ST | A | A1 | A2 | A3 | B | C | D1 | D2 | D3 | D4 | E1 | E2 | E3 |
|------------|----------|----|-----|-----|-----|-------|-----|----|----|----|----|----------------|----------|-----------|---------|
| MTHS-25F | MTHD-25F | 22 | 79 | 101 | 124 | 120 | 76 | 22 | 15 | 27 | 15 | $\square 19$ | M10x1.5 | $\phi 8$ | M14x1.5 |
| MTHS-32F | MTHD-32F | 26 | 89 | 115 | 140 | 137.2 | 85 | 25 | 17 | 31 | 17 | $\square 22.2$ | M10x1.5 | $\phi 8$ | M16x1.5 |
| MTHS-40F | MTHD-40F | 26 | 94 | 120 | 148 | 142.2 | 90 | 25 | 18 | 31 | 17 | $\square 22.2$ | M10x1.5 | $\phi 10$ | M18x1.5 |
| MTHS-50F | MTHD-50F | 30 | 104 | 134 | 166 | 159.4 | 100 | 30 | 20 | 37 | 19 | $\square 25.4$ | M12x1.75 | $\phi 12$ | M20x1.5 |

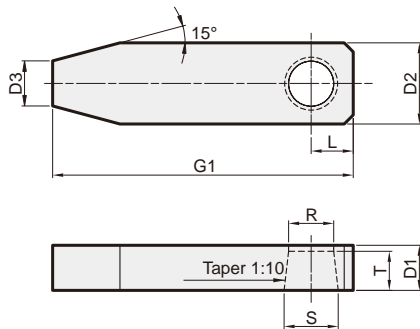
| Code Model | | F | G1 | G2 | H | I1 | I2 | I3 | J | K | L | M | N | O-Ring | R | S | T |
|------------|----------|----|----|-----|----|------------|-------------|----|----|----|----|----|----|--------|-----------|-------------|----|
| MTHS-25F | MTHD-25F | 10 | 74 | 140 | 9 | $\phi 6.8$ | $\phi 10.5$ | 7 | 55 | 42 | 20 | 18 | 50 | P7 | $\phi 15$ | $\phi 18$ | 13 |
| MTHS-32F | MTHD-32F | 10 | 81 | 160 | 10 | $\phi 6.8$ | $\phi 10.5$ | 7 | 57 | 44 | 22 | 22 | 55 | P7 | $\phi 17$ | $\phi 20$ | 14 |
| MTHS-40F | MTHD-40F | 10 | 86 | 160 | 10 | $\phi 9$ | $\phi 14$ | 9 | 69 | 52 | 26 | 26 | 60 | P8 | $\phi 19$ | $\phi 22.4$ | 15 |
| MTHS-50F | MTHD-50F | 12 | 96 | 180 | 12 | $\phi 9$ | $\phi 14$ | 9 | 75 | 58 | 30 | 32 | 65 | P8 | $\phi 21$ | $\phi 28$ | 16 |

Single side clamping arm (Standard type with thread)



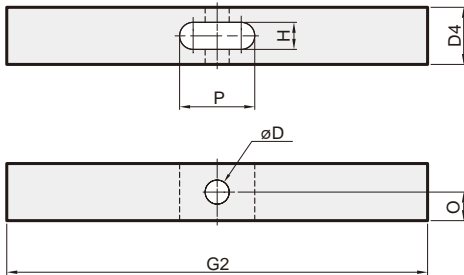
| Code Model | D1 | D2 | D3 | F | G | G1 | E1 | R | S | T |
|------------|----|----|----|----|----|-----|----------|----|------|----|
| MTHS-25 | 15 | 27 | 15 | 10 | 50 | 74 | M10x1.5 | 15 | 18 | 13 |
| MTHS-32 | 17 | 31 | 17 | 10 | 55 | 81 | M10x1.5 | 17 | 20 | 14 |
| MTHS-40 | 18 | 31 | 17 | 10 | 60 | 86 | M10x1.5 | 19 | 22.4 | 15 |
| MTHS-50 | 20 | 37 | 19 | 12 | 65 | 96 | M12x1.75 | 21 | 28 | 16 |
| MTHS-63 | 23 | 48 | 24 | 15 | 75 | 114 | M16x2.0 | 27 | 35 | 18 |

Single side clamping arm B type (Extension type without thread)



| Code Model | D1 | D2 | D3 | L | G1 | R | S | T |
|------------|----|----|----|----|-----|----|------|----|
| MTHS-25 B | 15 | 27 | 15 | 14 | 100 | 15 | 18 | 13 |
| MTHS-32 B | 17 | 31 | 17 | 16 | 110 | 17 | 20 | 14 |
| MTHS-40 B | 18 | 31 | 17 | 16 | 120 | 19 | 22.4 | 15 |
| MTHS-50 B | 20 | 37 | 19 | 19 | 130 | 21 | 28 | 16 |
| MTHS-63 B | 23 | 48 | 24 | 24 | 150 | 27 | 35 | 18 |

Double side clamping arm (Standard & Extension type)



Double side clamping arm (Standard type)

| Code Model | D | D4 | O | P | H | G2 |
|------------|------------------|----------------|------|----|----|-----|
| MTHD-25 | $\varnothing 8$ | $\square 19$ | 9.5 | 25 | 9 | 140 |
| MTHD-32 | $\varnothing 8$ | $\square 22.2$ | 11.1 | 29 | 10 | 160 |
| MTHD-40 | $\varnothing 10$ | $\square 22.2$ | 11.1 | 31 | 10 | 160 |
| MTHD-50 | $\varnothing 12$ | $\square 25.4$ | 12.7 | 38 | 12 | 180 |
| MTHD-63 | $\varnothing 15$ | $\square 31.8$ | 15.9 | 48 | 15 | 200 |

Double side clamping arm B type (Extension type)

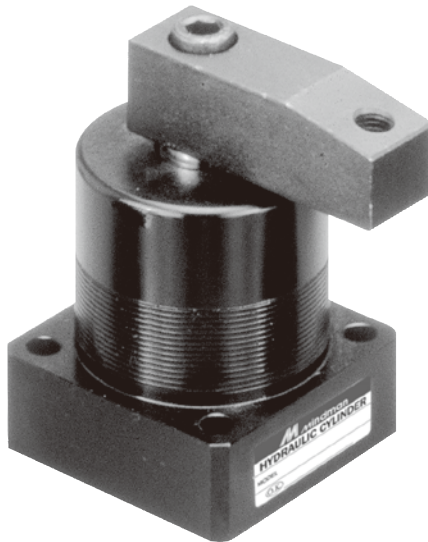
| Code Model | D | D4 | O | P | H | G2 |
|------------|------------------|----------------|------|----|----|-----|
| MTHD-25 B | $\varnothing 8$ | $\square 19$ | 9.5 | 25 | 9 | 200 |
| MTHD-32 B | $\varnothing 8$ | $\square 22.2$ | 11.1 | 29 | 10 | 230 |
| MTHD-40 B | $\varnothing 10$ | $\square 22.2$ | 11.1 | 31 | 10 | 230 |
| MTHD-50 B | $\varnothing 12$ | $\square 25.4$ | 12.7 | 38 | 12 | 260 |

Cylinder weight

| Model | Weight |
|---------|--------|
| MTHS-25 | 1.3 |
| MTHD-25 | 1.5 |
| MTHS-32 | 1.7 |
| MTHD-32 | 2.0 |
| MTHS-40 | 2.0 |
| MTHD-40 | 2.3 |
| MTHS-50 | 3.2 |
| MTHD-50 | 3.5 |
| MTHS-63 | 5.1 |
| MTHD-63 | 5.7 |

| Model | Weight | Model | Weight |
|----------|--------|----------|--------|
| MTHS-25F | 1.8 | MTHSL-32 | 2.4 |
| MTHD-25F | 2.0 | MTHDL-32 | 2.7 |
| MTHS-32F | 2.2 | MTHSL-40 | 2.8 |
| MTHD-32F | 2.5 | MTHDL-40 | 3.1 |
| MTHS-40F | 3.3 | MTHSL-50 | 4.5 |
| MTHD-40F | 3.5 | MTHDL-50 | 4.8 |
| MTHS-50F | 4.3 | MTHSL-63 | 7.1 |
| MTHD-50F | 4.65 | MTHDL-63 | 7.7 |

Unit: kg



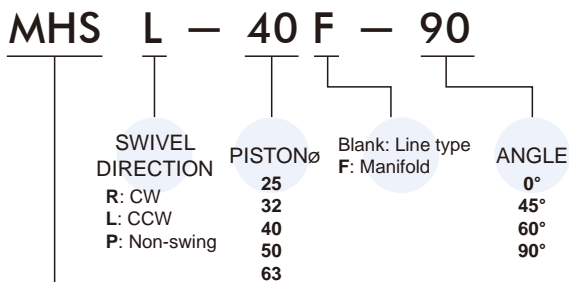
Features

- Double clamp retracting, the piston rod rotates, causing the clamping arm to swing in either a clockwise or counterclockwise direction. Clamping then takes place as the rod continues to retract in a straight line, pulling the arm against the workpieces.
- Pull cylinder type, Available models offer angles of rotation of 0°, 45°, 60° or 90°.
- The cylinder body is made of aluminum alloy and the surface is hard membrane treated.
- Mounting methods: Square base type, threaded type, flange type.

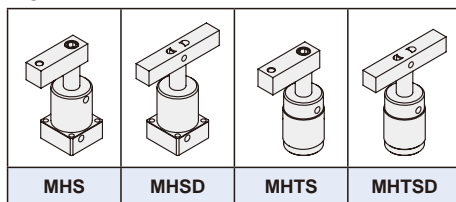
Note

- When it is necessary to change the length of the clamping arm, it should be noted that do not exceed 1.2 times of the original G value in order to avoid the serious slanting of the piston rod.
- Suggested to add a flow control valve to the hydraulic inlet to control the motion of the swing angle in order to prevent the inertial impact.
- A workpiece should not be clamped within a swing stroke, and it should be clamped within the vertical downward clamping stroke.
- Whenever placing and taking off a workpiece, it is necessary to use an air gun to clean the piston and the seal for removing the iron slag or foreigner objects attached thereon in order to prevent the foreigner objects from entering the seal to cause oil leakage.

Order example

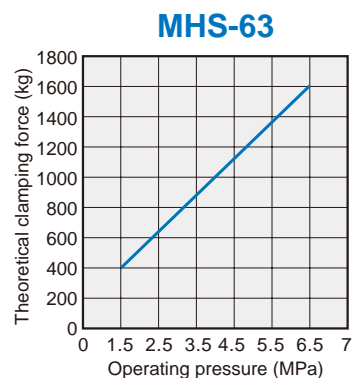
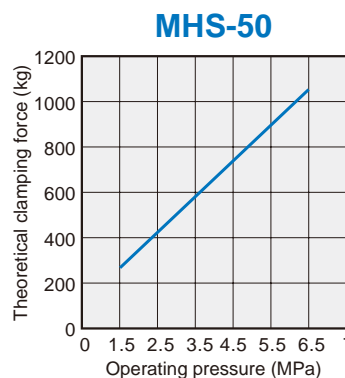
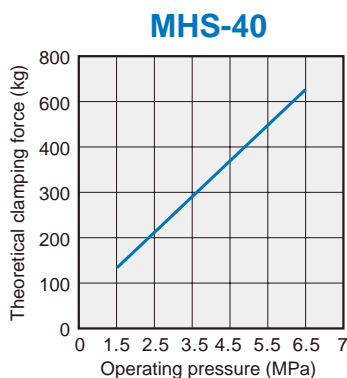
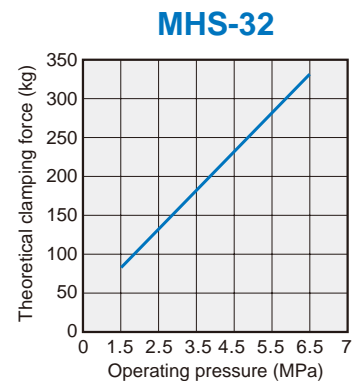
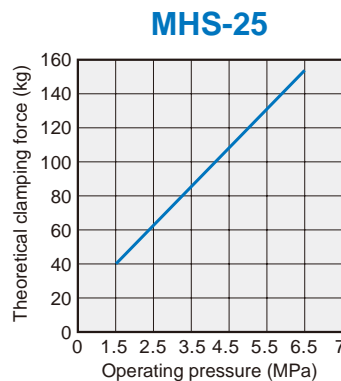


MODEL



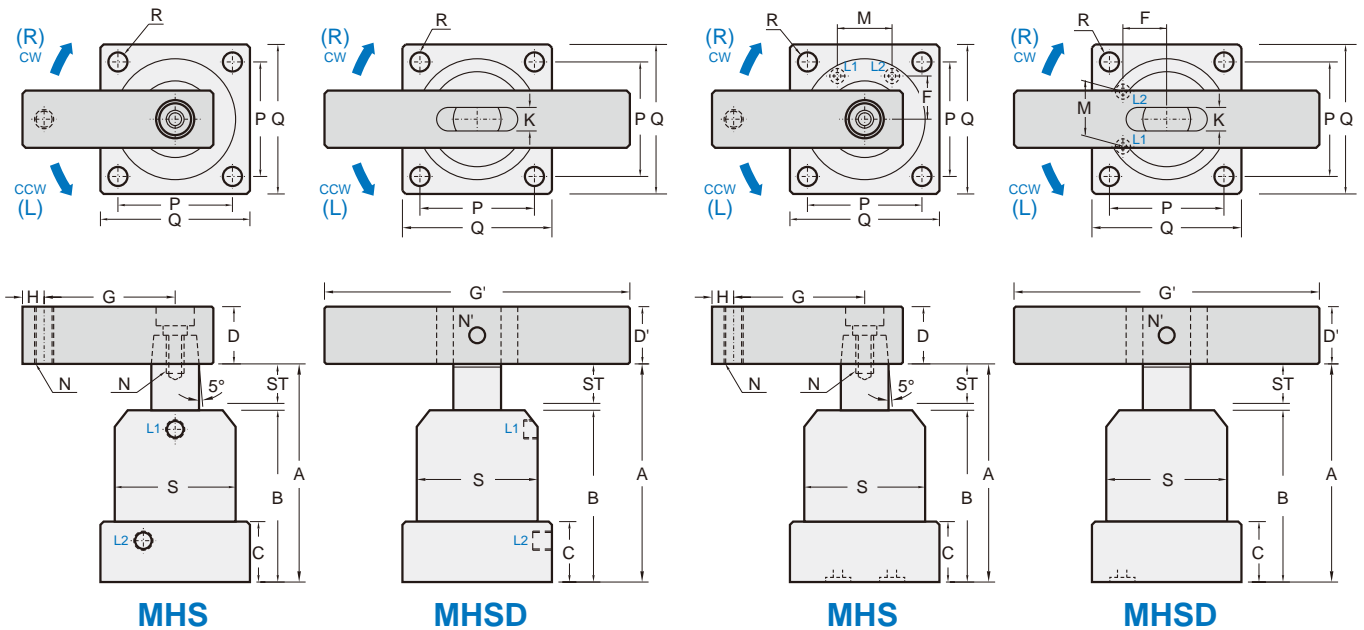
* MHTS and MHTSD produced by order.

Schematic view showing a theoretical clamping force under different hydraulic pressure.



MHS*

MHS*-F



MHS

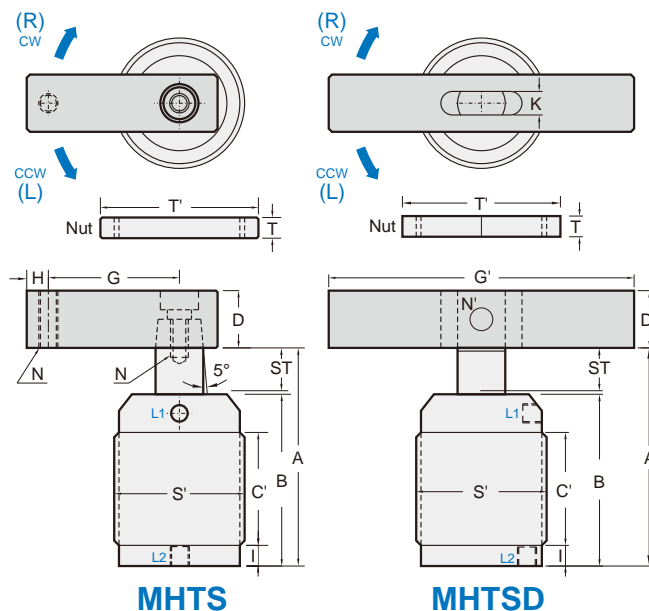
MHSD

MHS

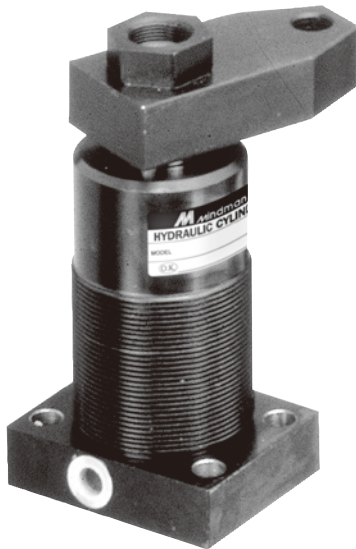
MHSD

| Flange type | MHS-25 MHSD-25 | MHS-32 MHSD-32 | MHS-40 MHSD-40 | MHS-50 MHSD-50 | MHS-63 MHSD-63 |
|-------------------------------|--------------------|-------------------|-------------------|-------------------|-------------------|
| Operating pressure range | 2~4.5 MPa | | | | |
| Proof pressure | 7 MPa | | | | |
| Cylinder operating | Double acting | | | | |
| Swivel angle | 90°(60°,45°,0°)±2° | | | | |
| Swivel stroke (mm) | 12 | 14 | 14 | 14 | 14 |
| Clamping stroke (mm) | 14 | 15 | 15 | 15 | 15 |
| Piston \varnothing (mm) | 25 | 32 | 40 | 50 | 63 |
| Piston rod \varnothing (mm) | 18 | 20 | 20 | 20 | 25 |
| Theoretical force (2.5 MPa) | 59kg | 125kg | 200kg | 400kg | 600kg |
| A (unclamp) (mm) | 100 | 111 | 113.6 | 114.5 | 118 |
| B (mm) | 70 | 76 | 80 | 80 | 85 |
| C (mm) | 23 | 25 | 27 | 27 | 32 |
| D (mm) | □25.4 | □25.4 | □25.4 | □25.4 | □32 |
| D' (mm) | □19 | □22 | □22 | □22 | □25.4 |
| G (mm) | 50 | 55 | 55 | 55 | 75 |
| G' (mm) | 100 | 120 | 120 | 120 | 140 |
| H (mm) | 10 | 10 | 10 | 10 | 11 |
| K (mm) | 9 | 10 | 10 | 10 | 12 |
| L1 (clamp) L2 (unclamp) | Rc1/8 | Rc1/8 | Rc1/8 | Rc1/8 | Rc1/8 |
| O-ring manifold | S4 | S4 | S4 | S4 | S4 |
| N (mm) | M10x1.5 | M10x1.5 | M10x1.5 | M10x1.5 | M12x1.75 |
| N' (mm) | ∅8 | ∅8 | ∅8 | ∅8 | ∅10 |
| P (mm) | 40 | 44 | 48 | 57 | 70 |
| Q (mm) | 50 | 55 | 62 | 74 | 88 |
| R (mm) | ∅6.5 | ∅6.5 | ∅8.5 | ∅8.5 | ∅10.5 |
| S (mm) | ∅45 | ∅50 | ∅54 | ∅65 | ∅80 |
| M (mm) | 18 | 24 | 26 | 30 | 40 |
| F (mm) | 15 | 17 | 20 | 25 | 30 |
| Weight (kg) | 0.8 | 1.0 | 1.1 | 1.4 | 2.3 |

MHTS*



| Threaded type (produced by order) | MHTS-25 MHTSD-25 | MHTS-32 MHTSD-32 | MHTS-40 MHTSD-40 | MHTS-50 MHTSD-50 |
|--------------------------------------|--|---------------------|---------------------|---------------------|
| Operating pressure range | 2~4.5 MPa | | | |
| Proof pressure | 7 MPa | | | |
| Cylinder operating | Double acting | | | |
| Swivel angle | $90^\circ(60^\circ, 45^\circ, 0^\circ)\pm 2^\circ$ | | | |
| Swivel stroke (mm) | 12 | 14 | 14 | 14 |
| Clamping stroke (mm) | 14 | 15 | 15 | 15 |
| Piston \varnothing (mm) | 25 | 32 | 40 | 50 |
| Piston rod \varnothing (mm) | 18 | 20 | 20 | 20 |
| Theoretical force (2.5 MPa) | 59kg | 125kg | 200kg | 400kg |
| A (unclamp) (mm) | 100 | 111 | 113.6 | 114.5 |
| B (mm) | 70 | 76 | 80 | 80 |
| C' (mm) | 35 | 45 | 45 | 45 |
| D (mm) | $\square 25.4$ | $\square 25.4$ | $\square 25.4$ | $\square 25.4$ |
| D' (mm) | $\square 19$ | $\square 22$ | $\square 22$ | $\square 22$ |
| G (mm) | 50 | 55 | 55 | 55 |
| G' (mm) | 100 | 120 | 120 | 120 |
| H (mm) | 10 | 10 | 10 | 10 |
| I (mm) | 9 | 9 | 9 | 9 |
| K (mm) | 9 | 10 | 10 | 10 |
| L1 (clamp) L2 (unclamp) | Rc1/8 | Rc1/8 | Rc1/8 | Rc1/8 |
| N (mm) | M10x1.5 | M10x1.5 | M10x1.5 | M10x1.5 |
| N' (mm) | $\varnothing 8$ | $\varnothing 8$ | $\varnothing 8$ | $\varnothing 8$ |
| S' (mm) | M45x1.5 | M50x1.5 | M55x1.5 | M65x1.5 |
| T ($\times 2$ pcs nut) (mm) | 10 | 11 | 11 | 12 |
| T' (mm) | $\varnothing 65$ | $\varnothing 70$ | $\varnothing 75$ | $\varnothing 85$ |
| Weight (kg) | 0.8 | 1.1 | 1.25 | 1.7 |



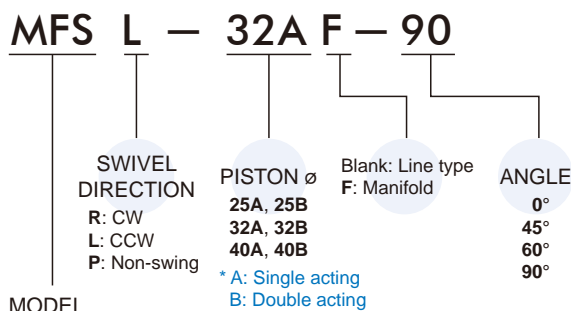
Features

- Double clamp retracting, the piston rod rotates, causing the clamping arm to swing in either a clockwise or counterclockwise direction. Clamping then takes place as the rod continues to retract in a straight line, pulling the arm against the workpieces.
- Pull cylinder type, Available models offer angles of rotation of 0°, 45°, 60° or 90°.
- The cylinder body is made of carbon steel and the surface is hard membrane treated.

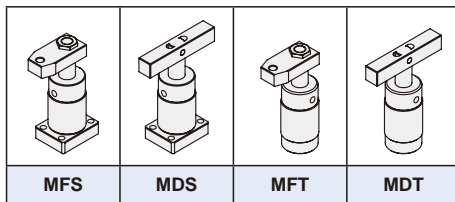
Note

- When it is necessary to change the length of the clamping arm, it should be noted that do not exceed 1.2 times of the original G value in order to avoid the serious slanting of the piston rod.
- Suggested to add a flow control valve to the hydraulic inlet to control the motion of the swing angle in order to prevent the inertial impaction.
- A workpiece should not be clamped within a swing stroke, and it should be calmped within the vertical downward clamping stroke.
- Whenever placing and taking off a workpiece, it is necessary to use an air gun to clean the piston and the seal for removing the iron slag or foreigner objects attached thereon in order to prevent the foreigner objects form entering the seal to cause oil leakage.

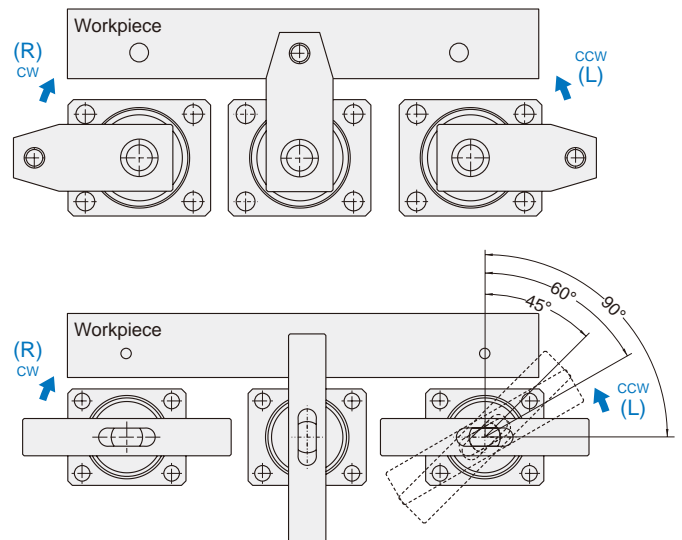
Order example



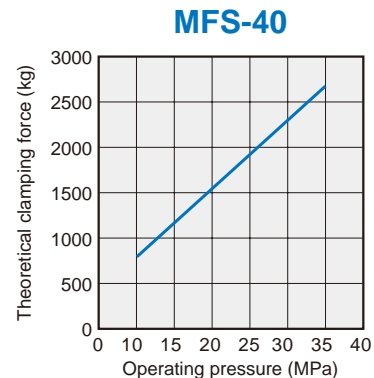
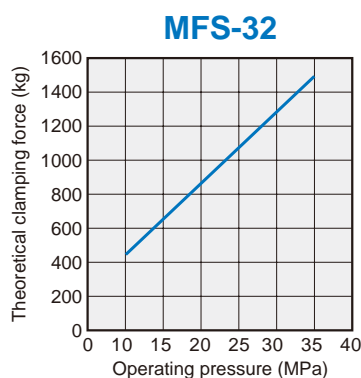
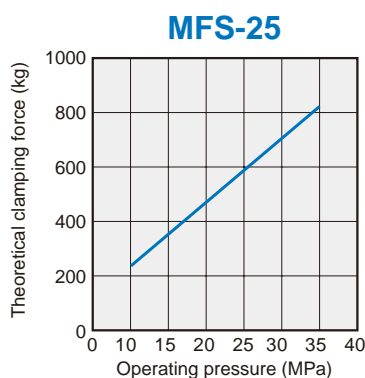
MODEL



Swivel dir. definition

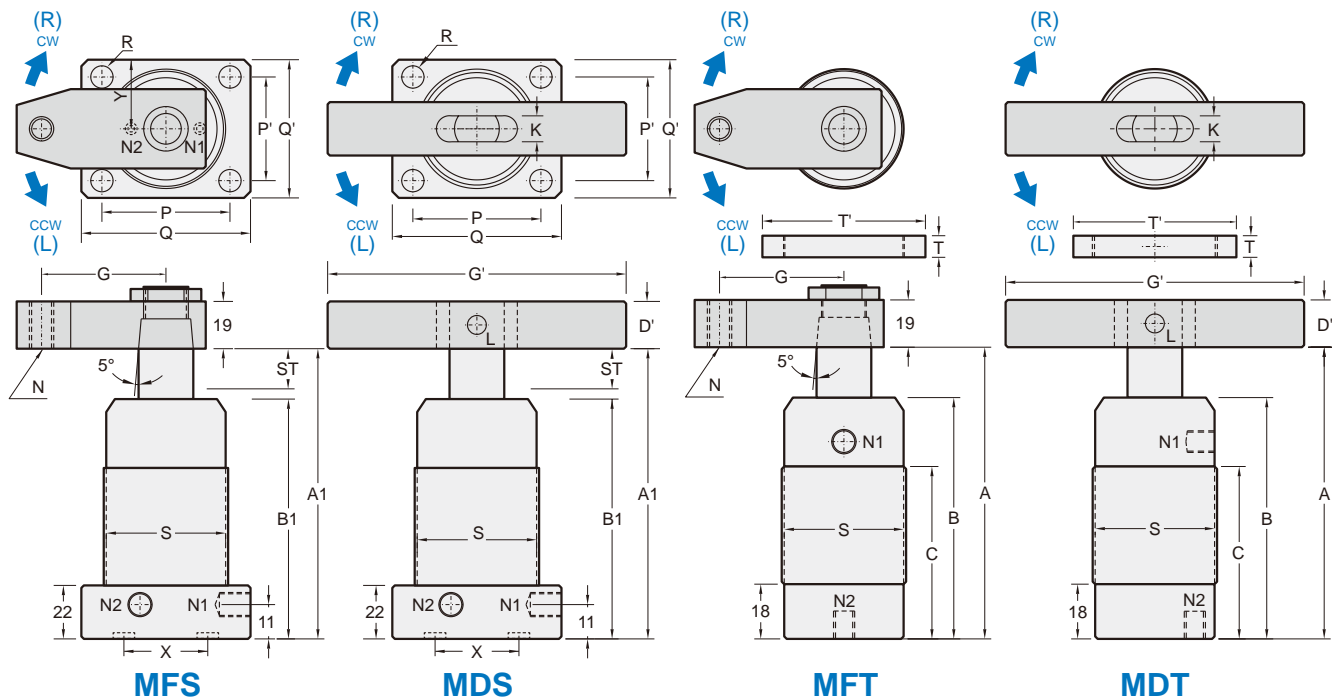


Schematic view showing a theoretical clamping force under different hydraulic pressure.



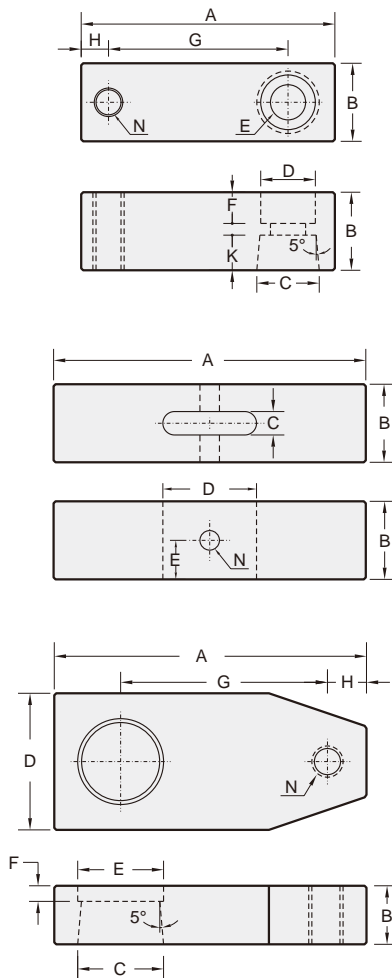
MF* / MD* Dimensions $\phi 25\sim\phi 40$

HIGH OIL PRESSURE SWING CLAMP CYLINDER



| MFS / MDS (Flange type) | 25A | 32A | 40A | 25B | 32B | 40B |
|-------------------------------|-------------------------------|--------------|----------------|---------------|--------------|----------------|
| MFT / MDT (Threaded type) | | | | | | |
| Operating pressure range | 5~21 MPa | | | | | |
| Proof pressure | 35 MPa | | | | | |
| Cylinder operating | Single acting | | | Double acting | | |
| Swivel stroke (mm) | 12 | | | 15 | | |
| Clamping stroke (mm) | 11 | | | 18 | | |
| Swivel angle | 90°(60°,45°,0°) $\pm 2^\circ$ | | | | | |
| Piston ϕ (mm) | 25 | 32 | 40 | 25 | 32 | 40 |
| Piston rod ϕ (mm) | 18 | 22 | 25 | 18 | 22 | 25 |
| Theoretical force (21 MPa) | 495kg | 890kg | 1600kg | 495kg | 890kg | 1600kg |
| A (unclamp) (mm) | 127 | 127 | 127 | 134 | 133 | 134 |
| A1 (unclamp) (mm) | 131 | 131 | 131 | 138 | 137 | 138 |
| B (mm) | 102 | 97 | 98 | 102 | 97 | 98 |
| B1 (mm) | 106 | 101 | 102 | 106 | 101 | 102 |
| C (mm) | 70 | 74 | 76 | 70 | 74 | 76 |
| D' (mm) | $\square 19$ | $\square 22$ | $\square 25.4$ | $\square 19$ | $\square 22$ | $\square 25.4$ |
| G (mm) | 45 | 50 | 50 | 45 | 50 | 50 |
| G' (mm) | 100 | 120 | 140 | 100 | 120 | 140 |
| K (mm) | 9 | 10 | 12 | 9 | 10 | 12 |
| L (mm) | $\phi 8$ | $\phi 8$ | $\phi 10$ | $\phi 8$ | $\phi 8$ | $\phi 10$ |
| N1 (clamp)/ N2 (unclamp) (mm) | Rc1/8 | Rc1/8 | Rc1/8 | Rc1/8 | Rc1/8 | Rc1/8 |
| O-ring manifold | P7 | P7 | P7 | P7 | P7 | P7 |
| N (mm) | M12x1.75 | M12x1.75 | M12x1.75 | M12x1.75 | M12x1.75 | M12x1.75 |
| P (mm) | 50 | 54 | 66 | 50 | 54 | 66 |
| P' (mm) | 30 | 34 | 40 | 30 | 34 | 40 |
| Q (mm) | 64 | 68 | 84 | 64 | 68 | 84 |
| Q' (mm) | 46 | 54 | 64 | 46 | 54 | 64 |
| R (mm) | $\phi 6.5$ | $\phi 8.5$ | $\phi 8.5$ | $\phi 6.5$ | $\phi 8.5$ | $\phi 8.5$ |
| S (mm) | M45x1.5 | M50x1.5 | M60x1.5 | M45x1.5 | M50x1.5 | M60x1.5 |
| T (x2 pcs) (mm) | 10 | 11 | 11 | 10 | 11 | 11 |
| T' (mm) | $\phi 65$ | $\phi 70$ | $\phi 80$ | $\phi 65$ | $\phi 70$ | $\phi 80$ |
| X (mm) | 35 | 40 | 50 | 35 | 40 | 50 |
| Y (mm) | 23 | 27 | 32 | 23 | 27 | 32 |
| Weight (kg) | 1.5 | 1.9 | 2.9 | 1.5 | 1.9 | 2.9 |

Clamping arm



Unit: mm

| Code Model | A | B | C | D | E | F | G | H | K | N |
|--|-----|-----|----|----|----|----|----|----|----|-----|
| MAS-25 | 50 | □16 | 14 | 11 | 7 | 6 | 30 | 8 | 6 | M6 |
| MAS-32 MATS-32 MAS-40 MATS-40 | 70 | □19 | 16 | 14 | 9 | 7 | 50 | 9 | 9 | M8 |
| MHS-32 MHTS-32 MHS-40 MHTS-40 MHS-50 MHTS-50 | 80 | □25 | 20 | 17 | 11 | 9 | 55 | 10 | 12 | M10 |
| MAS-50 MATS-50 MAS-63 | 95 | □25 | 20 | 17 | 11 | 9 | 70 | 10 | 12 | M10 |
| MHS-25 | 74 | □25 | 18 | 17 | 11 | 9 | 50 | 10 | 12 | M10 |
| MHS-63 | 103 | □32 | 25 | 19 | 13 | 12 | 75 | 11 | 14 | M12 |

Unit: mm

| Code Model | A | B | C | D | E | N |
|---|-----|-----|----|----|------|----|
| MASD-32 MATSD-32 MHSD-25 MDS-25 MASD-40 MATSD-40 MDT-25 | 100 | □19 | 9 | 30 | 9.5 | 8 |
| MASD-50 MATSD-50 MHSD-32 MHTSD-32 MDS-32 MASD-63 MHSD-40 MHTSD-40 MDT-32 MHSD-50 MHTSD-50 | 120 | □22 | 10 | 35 | 11 | 8 |
| MHSD-63 MDS-40 MDT-40 | 140 | □25 | 12 | 42 | 12.5 | 10 |

Unit: mm

| Code Model | A | B | C | D | E | F | G | H | N |
|----------------|----|----|----|----|----|---|----|----|-----|
| MFS-25, MFT-25 | 70 | 19 | 18 | 38 | 23 | 7 | 45 | 10 | M12 |
| MFS-32, MFT-32 | 78 | 19 | 22 | 38 | 25 | 7 | 50 | 10 | M12 |
| MFS-40, MFT-40 | 78 | 19 | 25 | 38 | 27 | 7 | 50 | 10 | M12 |

Flange type for manifold mounting with o-ring seal

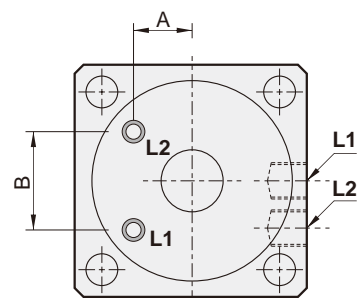
Flange type dil cavity paths are reserved on square base type of hydraulic & high pressure cylinder, contently for fixture design.

Unit: mm

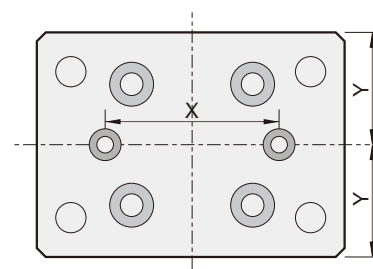
| Code Model | A | B | O-ring |
|------------|----|----|--------|
| MHS-25 | 15 | 18 | S4 |
| MHS-32 | 17 | 24 | S4 |
| MHS-40 | 20 | 26 | S4 |
| MHS-50 | 25 | 30 | S4 |
| MHS-63 | 30 | 40 | S4 |

Unit: mm

| Code Model | X | Y | O-ring |
|----------------|----|----|--------|
| MFS-25, MDS-25 | 35 | 23 | S4 |
| MFS-32, MDS-32 | 40 | 27 | S4 |
| MFS-40, MDS-40 | 50 | 32 | S4 |



Top view



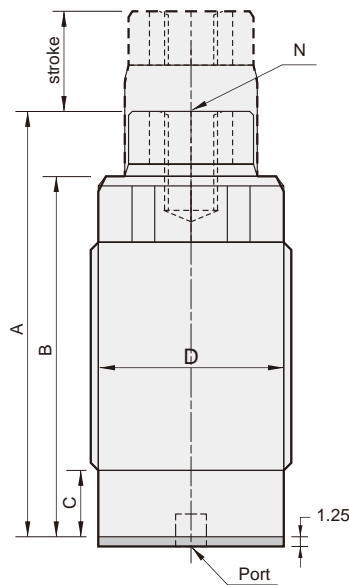
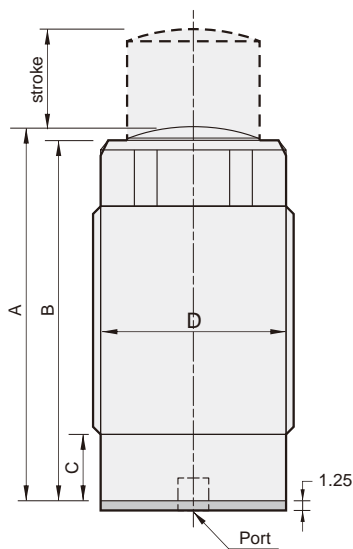
Features

- Simple construction, high strength unit ideal for pushing heavy loads.
- Threaded body design allows quick and easy installation.
- Additional mounting heads can be fitted to rod.
- Teflon packing ensures zero leakage.

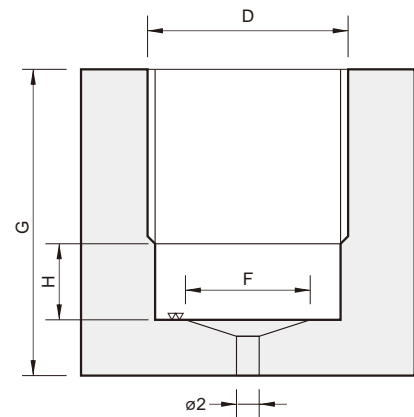


A series

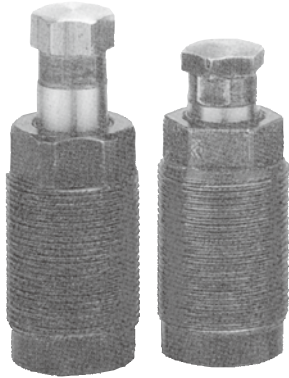
B series



Mounting diagram



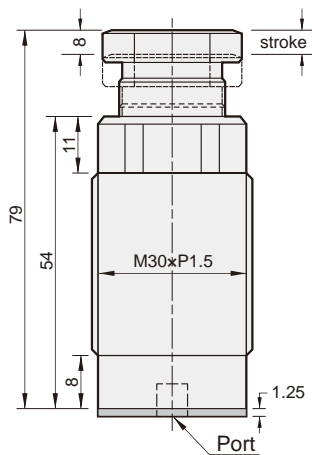
| Model Item | MTC-12A | MTC-16A | MTC-20A | MTC-25A | MTC-12B | MTC-16B | MTC-20B | MTC-25B |
|----------------------------|---------------|---------|---------|---------|---------|---------|---------|---------|
| Normal operating pressure | 2~35 MPa | | | | | | | |
| Cylinder operating | Single acting | | | | | | | |
| Stroke (mm) | 10 | 12 | 15 | 16 | 10 | 12 | 15 | 16 |
| Piston \varnothing (mm) | 12 | 16 | 20 | 25 | 12 | 16 | 20 | 25 |
| Theoretical force (20 MPa) | 200 kg | 400 kg | 620 kg | 980 kg | 200 kg | 400 kg | 620 kg | 980 kg |
| A (mm) | 38 | 46.5 | 56 | 57 | 45 | 52 | 64.5 | 67 |
| B (mm) | 36 | 44.5 | 54 | 55 | 36 | 44.5 | 54 | 55 |
| C (mm) | 7 | 8 | 8 | 11 | 7 | 8 | 8 | 11 |
| D (mm) | M22x1.5 | M26x1.5 | M30x1.5 | M38x1.5 | M22x1.5 | M26x1.5 | M30x1.5 | M38x1.5 |
| N (mm) | | | | | M6x1.0 | M6x1.0 | M8x1.25 | M8x1.25 |
| F (mm) | 12 | 16 | 20 | 25 | 12 | 16 | 20 | 25 |
| G (min) (mm) | 16 | 20 | 24 | 28 | 16 | 20 | 24 | 28 |
| H (max) (mm) | 8 | 9 | 9 | 11 | 8 | 9 | 9 | 11 |



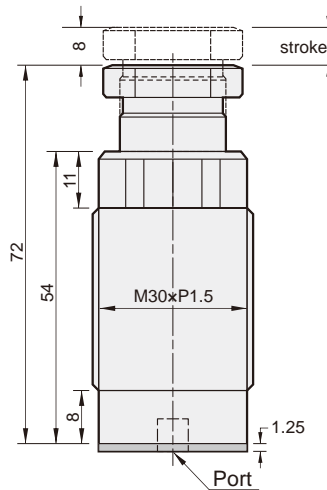
Features

- Hydraulic work support is used to both minimise vibration during machining and offer increased support.
- A type unit works on the outward stroke with a internal spring.
- B type unit works with oil pressure providing the motive force.

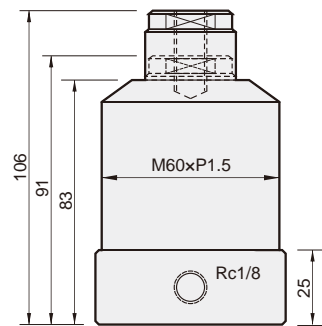
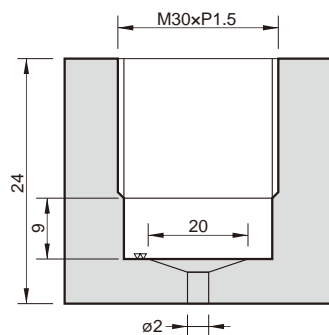
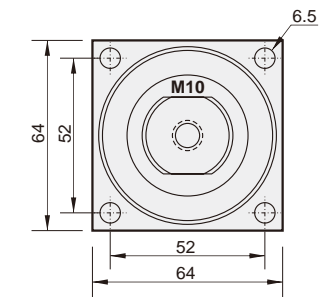
MSP-16A



MSP-16B



MSP-30A



Mounting diagram




| Model Item | MSP-16A | MSP-16B | MSP-30A |
|----------------------------|---------------|---------|------------|
| Normal operating pressure | 10~35 MPa | | 7.5~35 MPa |
| Cylinder operating | Single-acting | | |
| Piston ϕ (mm) | 16 | | 30 |
| Stroke (mm) | 8 | | 15 |
| Theoretical force (20 MPa) | 210 kg | | 750 kg |



PLEASE READ BEFORE USING

Before selecting model and servicing of the product, read throughly this CAUTIONS for SAFETY for the proper usage.

- The following cautions are for the purpose of preventing your personnel from suffering injury, by following the proper usage of the products.
- Items are classified in three categories, DANGER, WARNING, and CAUTION. All items are crucial for the safety and need to be followed without exception.

| | |
|---|---|
| DANGER  | Obviously dangerous, which may cause death or serious injury of personnel, and damage or destruction of property. |
| WARNING  | Not immediately subject to danger, however not avoiding the displayed danger when mishandling the product may cause death or serious injury of personnel and damage or destruction of property. |
| CAUTION  | Not immediately subject to danger, however not avoiding the displayed danger when mishandling the product may cause injury of personnel and damage or destruction of property. |

For the correct handling, please read the instruction manual before installing and servicing of the product.

DANGER

(Applies to all products on the catalogue)

- 1 Do not use any of our products for the purpose of maintenance and care of human life or body.
- 2 Do not use any product in the condition or the environment other than stipulated in the specification or where the hazardous stuff exists.
- 3 When installing a product, refer to the instruction manual for mounting style and fix securely (including the work carrier). Otherwise products may topple, fall, and operates out of control causing the injury of personnel.
- 4 Disassembling and reassembling of products should be made by the personnel who has enough knowledge and experience.
- 5 Depressurize products before disassembling or reassembling.
- 6 Do not remodel the products.

WARNING

(Applies to all products on the catalogue)

- 1 When servicing, keep within the working pressure range and voltage.
- 2 At a place where water or oil drops and where is much dust, cover the equipment. Otherwise damage and trouble will be caused.
- 3 Do not operate if the fluid or atmosphere contains the substance which may cause corrosion. Otherwise damage and trouble will be caused.
- 4 Do not touch the terminal part or switches, etc. when the product is energized. It may cause the inaccurate operation and the electric shock from the short circuit and the circuit trouble.
- 5 Do not stand on, use as a footing, or put things on the product. You may miss your step and fall, and the falling product may cause the injury of personnel. Also the product may get damaged causing the inaccurate operation and hazardous moves out of control.

(Pneumatic Actuator)

- 1 When starting operation, pay the full attention to the cylinder's moving direction.
- 2 Do not put hands where the cylinder moves.
- 3 Please use a speed control valve to adjust the piston speed within the limited value in our catalogue.
- 4 The value of dividing operation time into cylinder stroke is the average speed rather than max speed.

The max. speed of cushion pad type cylinders occur at the end of the stroke.

The max. speed of air cushion type cylinders occur at the start point of cushioning structure.
- 5 The max. speed of cylinders usually uses the value of average speed times 1.4~1.5.
- 6 When the load on cylinder is large, we suggest to use ourter shock absorber - even the max speed is within the limited value.
- 7 Cords such as the sensor switch's lead wire should not be damaged. Damaging, forcing, twisting tugging, winding, putting on a heavy object, and pinching will cause fire, electric shock abnormal operation by short circuit or circuit error.

(Pneumatic Valve. Pneumatic Accessories. Sensor Switch)

- 1 Cords such as the pressure switch's lead wire, solenoid valve's power supply cord should not be damaged. Damaging, forcing, twisting, tugging, winding, putting heavy object on, and pinching will cause fire, electric shock, abnormal operation by short circuit or circuit error.
- 2 Do not use filter or lubricator without a case guard.
- 3 For filter and lubricator, do not use a flawed or stained case.

Caution for safety

 PLEASE READ BEFORE USING

CAUTION

(Applies to all products on the catalogue)

- 1 If necessary, use protection glove, protection glasses, and safety shoes to secure the safety when operating products.
- 2 For the easy maintenance, enough space around the product should be provided.
- 3 When mounting, flush inside thoroughly to remove chips from piping, and seal tape, rust and dusts, in order to prevent troubles such as air leak.
- 4 When screwing in the fittings, fasten with the tie torque of proper size to the connection size.
- 5 Use clean air. Equip an air filter near the equipment to remove drain, dusts and etc. Periodically remove drain from the filter.
- 6 Spindle oil and machine oil must not be used for lubrication, or the swelled packings will cause operation troubles.
- 7 Operation below the temperature 5°C must be paid the full attention since it may cause the freezing of drain.
- 8 Magnetic products such as disk card, tape, and tester must be kept away from the magnet-equipped cylinder and solenoid valve's solenoid part.
- 9 When the product is no longer available for operation or needed, discard in a proper way as an industrial waste.
- 10 Do not throw the product into fire. The product may explode or the toxic gas may be generated.

(Pneumatic Actuator)

- 1 Products should be mounted on the plane face. Mounting on the warped face causes poor accuracy, air leak and troubles.
- 2 Flaw or dent on the mounting part of the cylinder may make the uneven face.
- 3 The chafing parts of piston rod and guide rod must be free from flaw or dent. Otherwise packings got damaged and air will leak.
- 4 When the cylinder draws, be careful not to put yourself between the cylinder and the link bar at the top (Twin guide cylinder).
- 5 Products do not need lubrication since they are initially lubricated. For lubrication, use turbine oil first class (ISO VG32) or the equivalent.
- 6 Sensor switch which senses the cylinder position must not be operated in the magnetically disturbed area. It will react to the magnetism and the sensing accuracy will be disturbed.
- 7 If the two switch-equipped cylinders are mounted close in parallel, a switch may react to the another cylinder's moving magnet, and effects on the sensing accuracy.
- 8 Avoid the load over the switch's allowable maximum load.

(Pneumatic Valve. Pneumatic Accessories. Sensor Switch)

- 1 Flaw or dent on the mounting part of the cylinder may make the uneven face.
- 2 Do not use solenoid valve, pressure switch, flow switch, on foot switch in the environment where the large electric current or the strong magnetism exist.
- 3 As for solenoid valve, check in the instruction manual whether the lubrication is needed. If needed, use turbine oil first class ISO VG32 on the equivalent.
- 4 In the case of double solenoid valve, do not energize both solenoids.
- 5 Avoid the load over the switch's allowable maximum load.

Warranty period

- This warranty is effective for a period of
- 18 months (one and a half years) after shipment from Taiwan factory, or
- One year after installation or
- 2,500 hours of actual operation whichever comes first.

Exceptions to the warranty

This warranty will not apply in the following cases

- Fatigue arising due to the passage of time, natural wear and tear occurring during operation (natural fading of painted or plated surfaces, deterioration of parts subject to wear).
- Minor natural phenomena which do not effect the capabilities of the robot (noise from computers, motors, etc.).
- Damage due to earthquakes, storms, floods thunderbolt, fire or any other natural or man-made calamities.
- Troubles caused by procedures prohibited in this manual.
- Modifications to the robot not approved by sales representatives.
- Use of any other than genuine parts and specified lubricant and grease.
- Insufficiency or errors in maintenance and inspection.
- Repairs by other than authorized dealers.

In addition, we response for the failure of our own goods repair, but are not responsible for other losses caused due to.

Services coveragte

We provide customers with the following services

- Guide to installation and trial operation.
- Guide to maintenance.
- Guide to wiring technical operation and training.
- Guide to technical programming.

Product safety information

To ensure correct and safe use of industrial robots, carefully read this manual and make yourself well acquainted with the contents. FOLLOW THE WARNINGS, CAUTIONS AND INSTRUCTIONS INCLUDED IN THIS MANUAL. Warning information in this manual is shown classified into the following items.

1. Safety records

Industrial robots are highly mechanical devices that provide a large degree of freedom when performing various manipulative tasks. Failure to take necessary safety measures or mishandling due to not following the instructions in this manual may result in trouble or damage to the robot and injury to personnel (robot operator or service personnel) including fatal accidents.

DANGER

Failure to follow DANGER instructions will result in severe injury or death to the robot operator, bystanders or persons inspecting or repairing the robot.

WARNING

Failure to follow WARNING instructions could result in severe injury or death to the robot operator, bystanders or persons inspecting or repairing the robot.

CAUTION

Failure to follow CAUTION instructions may result in injury to the robot operator, bystanders or persons inspecting or repairing the robot, or damage to the robot and or robot controller.

POINTS

Key points of the sequence of operations of the Electric Slide.

Note

It is not possible to list all safety items in detail within the limited space of this manual. So it is essential that the user have a full knowledge of basic safety rules and also that the operator makes correct judgments on safety procedures during operation. This manual and warning labels supplied with or affixed to the robot are written in English. If the robot operator or service personnel does not understand English, do not permit that person to handle the robot.

2. Essential caution items

Particularly important cautions for handling or operating the robot are described below. In addition, safety information about installation, operation, inspection and maintenance is provided in each chapter. Be sure to comply with these instructions to ensure safe use of the robot.

I. Observe the following cautions during automatic operation

- Install a safeguard (protective enclosure) to keep any person from entering within the movement range of the robot and suffering injury due to being struck by moving parts.
- Install a safety interlock that triggers emergency stop when the door or panel is opened.
- Install safeguards so that no one can enter inside except from doors or panels equipped with safety interlocks.

DANGER

Serious injury or death will result from impact with moving robot.

- Keep outside of guard during operation.
- Lock out power before approaching robot.

II. Attention to hand sandwiched

Use caution to prevent hands or fingers from being pinched or crushed.

WARNING

- Moving parts can pinch or crush.
- Keep hands away from robot arms.

III. Follow the instructions on listed on warning labels and in this manual

- Be sure to read the warning labels and this manual carefully and make sure you thoroughly understand their contents before attempting installation and operation of the robot.
- Before starting robot operation, be sure to reread the procedures and cautions relating to your work as well as descriptions in this chapter ("product Safety Information").
- Never install, adjust, inspect or service the robot in any manner that does not comply with the instructions in this manual.

WARNING

- Improper installation or operation can result in serious injury or death.
- Read the owner's manual and all warning labels before operation.

IV. Do not use the robot in environments containing inflammable gas, etc.

WARNING

- This robot was not designed for operation in environments where inflammable or explosive substances are present.
- Do not use the robot in environments containing inflammable gas, dust or liquids. Explosions or fire might otherwise result.

V. Do not use the robot in locations possibly subject to electromagnetic interference, etc.

WARNING

- Avoid using the robot in locations subject to electromagnetic interference, electrostatic discharge or radio frequency interference. Malfunctions might otherwise occur.

VI. Use caution when releasing the brake of a vertical use robot

WARNING

The vertical axis will slide down when the brake is released, causing a hazardous situation.

- Press the emergency stop button and prop up the vertical axis with a support stand before releasing the brake.
- Be careful not to let your body get caught between the vertical axis and installation base when releasing the brake to perform direct teach.

VII. Provide safety measures for end effector (gripper, etc)

WARNING

- End effectors must be designed and manufactured so that they create no hazards (for example, a workpiece that comes loose) even if power (electricity, air pressure, etc.) is shut off or power fluctuations occur.
- If there is a possible danger that the object gripped by the end effector may fly off or drop, then provide appropriate safety protection taking into account the object size, weight, temperature and chemical properties.

VIII. Use caution when removing the motor. (Vertical use robots)

 **WARNING**

The vertical axis will slide down when the motor is released, causing a hazardous situation.

- Turn off the robot controller and prop up the vertical axis with a support stand before removing the motor.
- Be careful not to let your body get caught between the vertical axis parts and installation base.

IX. Take the following safety precautions during inspection of controller.

 **WARNING**

- When you need to touch the terminals or connectors on the outside of the controller during inspection, always first turn off the controller power switch and also the power source in order to prevent possible electrical shock.
- Never touch any internal parts of the controller.

X. Consult us for corrective action when the robot is damaged or malfunctions occur.

 **WARNING**

If any part of the robot is damaged or any malfunction occurs, continuing the operation may be very dangerous. Please consult your sales office or dealer for corrective action.

XI. Be careful not to touch the motor or speed reduction gear casing when hot

 **WARNING**

The motor and speed reduction gear casing are extremely hot after automatic operation, so burns may occur if these are touched. Before handling these parts during inspection or servicing, turn off the controller, wait for a while and check that the part has cooled.

XII. Do not remove, alter or stain the warning labels.

 **WARNING**

- Do not remove, alter or stain the warning labels on the robot.
- Do not allow the warning labels to be hidden by devices installed onto the robot by the user.
- Provide proper lighting so that the symbols and instructions on the warning labels can be clearly seen even from outside the safeguard enclosure.

XIII. Protective bonding.

 **WARNING**

Be sure to ground the robot and controller to prevent electrical.

XIV. Be sure to make correct parameter settings.

 **WARNING**

The robot must be operated with correct tolerable moment of inertia and acceleration coefficients according to the manipulator tip mass and moment of inertia. If there are not correct, drive unit service life may end prematurely, and damage to robot parts or residual vibration during positioning may result.

3. Robot safety functions

I. Overload detection

This function detects an overload applied to the motor and shuts off the servo power.

II. Soft limits

Soft limits can be set on each axis to limit the working envelope in manual operation after return-to-origin and during automatic operation. Note: The working envelope is the area limited by soft limits.

III. Mechanical stoppers

If the servo power is suddenly shut off during high-speed operation by emergency stop or safety functions, these mechanical stoppers prevent the axis from exceeding the movement range. No mechanical stopper is provided on the rotating axis. Note: The movement range is the area limited by mechanical stoppers.

WARNING

Axis movement will not stop immediately after the servo power supply is shut off by emergency stop or other safety functions.

IV. Vertical axis brake

An electromagnetic brake is installed on the vertical use robot to prevent the vertical axis from sliding down when servo power is turned off. This brake is working when the controller is off or the vertical axis servo power is off even when the controller is on. The vertical axis brake can be released by means of the programming unit or by a command in the program when the controller is on.

WARNING

The vertical axis will slide down when the brake is released, creating a hazardous situation.

- Press the emergency stop button and prop the vertical axis with a support stand before releasing the brake.
- Use caution not to let your body get caught between the vertical axis and installation base when releasing the brake to perform direct teach.

4. Safety measures for the system

Since the robot is commonly used in conjunction with an automated system, dangerous situations are more likely to occur from the automated system than from the robot itself. Accordingly, appropriate safety measures must be taken on the part of the system manufacturer according to the individual system. The system manufacturer should provide a proper instruction manual for safe, correct operation and servicing of the system.

5. Trial operation

After making installations, adjustments, inspections, or maintenance or repairs to the robot, make a trial run using the following procedures.

I. If a safeguard enclosure has not yet been provided right after installation of the robot

Rope off or chain off around the movement area of the manipulator in place of the safeguard, and observe the following points.

- ① Use sturdy, stable posts which will not fall over easily.
- ② The rope or chain should be easily visible by everyone around the robot.
- ③ Place a sign to keep the operator or other personnel from entering the movement range of the manipulator.

II. Check the following points before turning on the controller

- ① Is the robot securely and correctly installed?
- ② Are the electrical connections to the robot correct?
- ③ Are items such as air pressure correctly supplied?
- ④ Is the robot correctly connected to peripheral equipment?
- ⑤ Have safety measures (safeguard enclosure, etc.) been taken?
- ⑥ Does the installation environment meet the specified standards.

III. After the controller is turned on, check the following points from outside the safeguard enclosure

- ❶ Does the robot start and stop as intended? Can the operation mode be selected correctly?
- ❷ Does each axis move as intended within the soft limits?
- ❸ Does the end effector move as intended?
- ❹ Are the signal transmissions to the end effector and peripheral equipment correct?
- ❺ Does emergency stop work?
- ❻ Are the teaching and playback functions normal?
- ❼ Are the safeguard enclosure and interlock working as intended?
- ❽ Does the robot move correctly during automatic operation?

6. Work within the safeguard enclosure

I. Work within the safeguard enclosure

When work is required inside the safeguard enclosure, always turn off the controller and place a sign indicating that the robot is being adjusted or serviced in order to keep any other person from touching the controller switch or operation panel, except for the following cases.

- ❶ Soft limit settings
- ❷ Teaching
For item 1, follow the precautions and procedure for each section.
To perform item 2, refer to the description in II. below.

II. Teaching

When performing teaching within the safeguard enclosure, comply with the instructions listed below.
Check or perform the following points from outside the safeguard enclosure.

- ❶ Make sure that no hazards are present within the safeguard enclosure by a visual check.
- ❷ Check that the programming unit MPB or DPB operates correctly.
- ❸ Check that no failures are found in the robot.
- ❹ Check that emergency stop works correctly.
- ❺ Select teaching mode and prohibit automatic operation.

Never enter the movement range of the manipulator while within the safeguard enclosure.

7. Automatic operation

I. Automatic operation described here includes all operations in AUTO mode

Check the following before starting automatic operation. No one is within the safeguard enclosure.
The programming unit and tools are in their specified locations.
The alarm or error lamps on the robot and peripheral equipment do not flash.
The safeguard enclosure is securely installed with safety interlocks actuated.

II. Observe the following during automatic operation or in cases where an error occurs

- ❶ After automatic operation has started, check the operation status and warning lamp to ensure that the robot is in automatic operation.
- ❷ Never enter the safeguard enclosure during automatic operation.
- ❸ If an error occurs in the robot or peripheral equipment, observe the following procedure before entering the safeguard enclosure.
 - a. Press the emergency stop button to set the robot to emergency stop.
 - b. Place a sign on the start switch, indicating that the robot is being inspected in order to keep any other person from touching the start switch and restarting the robot.

8. Adjustment and inspection

Do not attempt any installation, adjustment, inspection or maintenance unless it is described in this manual.

9. Repair and modification

Do not attempt any repair, parts replacement and modification unless described in this manual. These works require technical knowledge and skill, and may also involve work hazards.

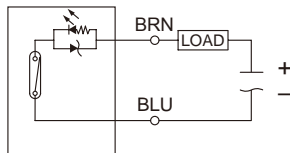
! SENSOR SWITCH

Technical information

! CAUTION

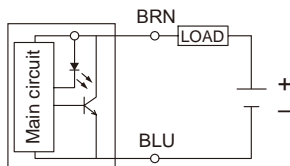
Do not exceed specification, permanent damage to the sensor may occur.

1. The 2-wire type magnetic sensor must be connected in series with load. Or the sensor may malfunction.
2. For reed switch type sensors, polarity must also be observed for the proper function of LED. Connect the brown wire in series with load to positive (+) and the blue wire to negative (-) of DC power source. If the polarity is reversed, reed sensor remain functional but LED will remain in "OFF" state.

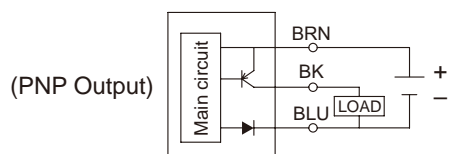
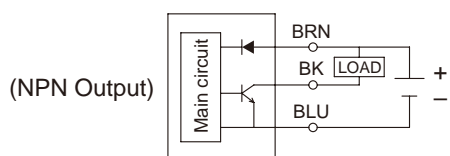


3. For solid-state type sensors, connect brown wire to the positive (+) and the blue to the negative (-) of DC power source. For 3-wire type, the black wire must be connected to the load only. If the black wire is accidentally connected to the power source, sensor may malfunction.

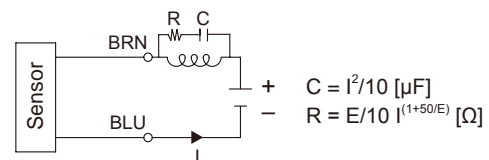
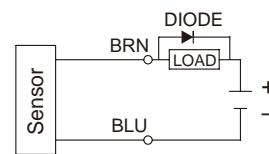
2-wire type



3-wire type



4. An external protection circuit may be required if the magnetic sensor is used with inductive load, such as relay or solenoid. For DC inductive load, attach an external diode parallel to the load and use R-C circuit parallel with AC inductive load as illustrated below.



C: Capacitor
R: Resistance
I: Load current
E: AC power

$$C = I^2/10 \text{ } [\mu\text{F}]$$

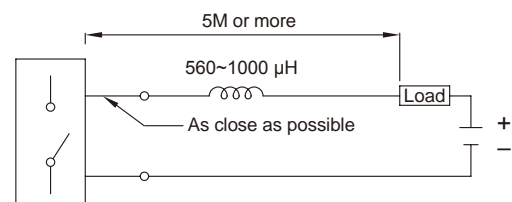
$$R = E/10 \text{ } |^{(1+50/E)} \text{ } [\Omega]$$

5. Keep sensors away from strong magnetic field to prevent malfunction.
6. Reed sensors are without protection circuit.

When a reed sensor is used with a capacitive load or with more than 5 meters lead wire, the life of the contact will be shortened. (especially when the switch is always ON)

Note

Please install a surge suppressor within 1 meter or an inductor (560~1000 μ H) in series of the sensor to prevent damage.



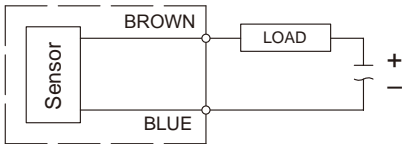
⚠️ SENSOR SWITCH

Connection method

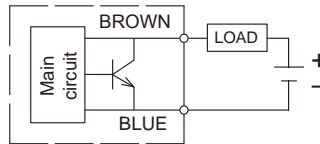
2 wire sensor connection

► General connection

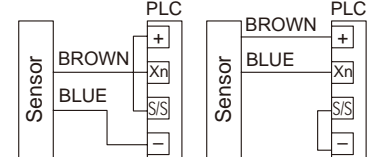
Reed switch



Solid-state type



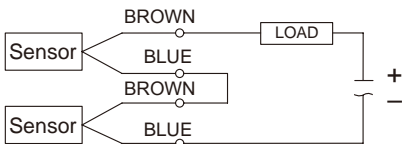
PLC



Connection to NPN input module

Connection to PNP input module

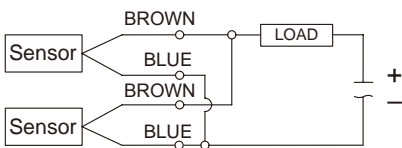
► Series connection (AND)



Note

1. When connecting 2-wire sensors in series (AND), don't exceed more than two sensors due to the internal voltage drop (Typical V drop=2.5~4V per switch). Excessive Voltage drop will cause the load fail to operate.

► Parallel connection (OR)

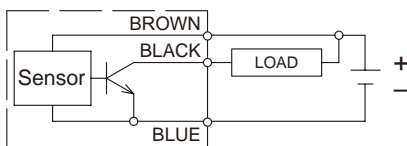


Note

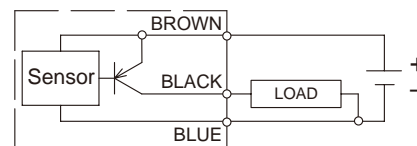
1. When connecting solid state 2-wire sensors in parallel (OR), current leakage will increase and cause improper load operation.
2. When connecting two magnetic sensors in parallel (OR), possible concurrent operation will cause dim LED illumination due to lower current distribution.

3 wire NPN connection

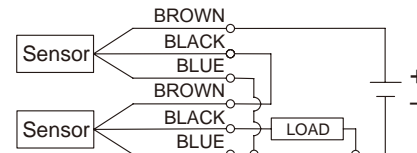
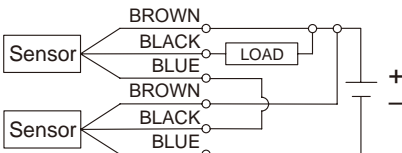
► General connection



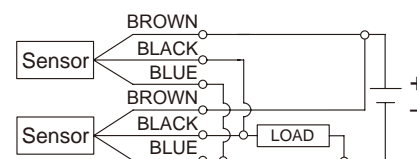
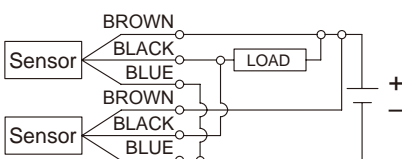
3 wire PNP connection



► Series connection (AND)



► Parallel connection (OR)





The
specifications
are subject to
change without
advance notice.

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