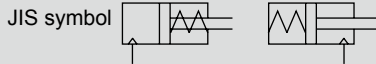




Flat compact cylinder single acting/push/single acting/pull

FCS Series/FCH Series

● Bore size: $\phi 25/\phi 32/\phi 40/\phi 50/\phi 63$



Specifications

Descriptions	FCS FCS-L						FCH FCH-L				
	Bore size mm	$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.	$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Actuation	Single acting push						Single acting pull				
Working fluid	Compressed air										
Max. working pressure MPa	0.7 (≈ 100 psi, 7 bar)										
Min. working pressure MPa	0.12 (≈ 17 psi, 1.2 bar)										
Proof pressure MPa	1.05 (≈ 150 psi, 10.5 bar)										
Ambient temperature $^{\circ}\text{C}$	-10 (14 $^{\circ}\text{F}$) to 60 (140 $^{\circ}\text{F}$) (no freezing)										
Port size	M5		Rc1/8		Rc1/4	M5		Rc1/8		Rc1/4	
Stroke tolerance mm	+0.5 0 (to 50)										
Working piston speed mm/s	50 to 500										
Cushion	None										
Lubrication	Not required (turbine oil type 1 ISO VG32 if necessary for lubrication)										
Allowable absorbed energy J	0.015	0.02	0.026	0.04	0.05	0.015	0.02	0.026	0.04	0.05	

Note: Do not leave the single acting cylinder pressurized for a long time. If it is left pressurized for long periods, the piston rod may not return due to spring load when the pressure is released.

Rotation-stop precision/Allowable torque

Descriptions	$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Non-rotating accuracy *2	$\pm 1^{\circ}$	$\pm 0.8^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$
Allowable torque N·m	1	1.6	2.5	3.9	5.9

*1: Avoid applying rotation torque with impact, or with violent changes in torque load direction.

*2: "Non-rotating accuracy" is the value when a torque load equivalent to 10% of "allowable torque" is applied to the end of the piston rod.

Stroke length

Model No.	Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
FCS	$\phi 25, \phi 32$ or equiv.	5, 10	10	1
FCH	$\phi 40, \phi 50, \phi 63$ or equiv.	10, 20	20	

*1: The custom stroke length is available in 1mm increments.

*2: The min. stroke length varies depending on switch mounting method. Refer to the following table.

Min. stroke length with switch

1		2
Rod side installation	Head side installation	Different surface mounting
10 mm		15 mm

FCS/FCH spring load

(Unit: N)

Bore size (mm)	Stroke length (mm)	When stroke length = 0	At full stroke length operation
$\phi 25$ or equiv.	5	27.4	35.3
	10	19.6	
$\phi 32$ or equiv.	5	36	47.5
	10	24.5	
$\phi 40$ or equiv.	10	38.5	47.6
	20	29.4	
$\phi 50$ or equiv.	10	56.5	74.9
	20	38.2	
$\phi 63$ or equiv.	10	92.2	119.8
	20	61.7	

Switch specifications

● Proximity switch

Descriptions	Proximity 2-wire		Proximity 3-wire		
	M2V	M2WV (2-color display)	M3V	M3PV (Custom order)	M3WV (2-color display)
Applications	Dedicated for programmable controller		For programmable controller, relay, IC circuit, compact solenoid valve		
Output method	-	NPN output	NPN output	PNP output	NPN output
Power supply voltage	-		4.5 to 28 VDC		10 to 28 VDC
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 30 mA		100 mA or less	100 mA or less	100 mA or less
Indicator lamp	LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)
Leakage current	1 mA or less		10 μA or less	0.05 mA or less	10 μA or less
Weight g	1 m:22 3 m:57 5 m:93				

● Reed switch

Descriptions	Reed 2-wire			
	M0V		M5V	
Applications	Programmable controller, relay		For programmable controller, relay, IC circuit (without indicator lamp), serial connection	
Power supply voltage	-		-	
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC or less
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator lamp	LED (Lit when ON)		Without indicator lamp	
Leakage current	0 mA			
Weight g	1 m:22 3 m:57 5 m:93			

*1 : Refer to Ending Page 1 for other switch specifications.

*2 : Dimensions depend on switch model No. Refer to Ending Page 13 for details.

Cylinder weight

(Unit: g)

Descriptions	Product weight when stroke length (S) = 0 mm				Switch weight	Mounting bracket weight	Additional weight per S = 10 mm
	FCS		FCH				
	Without switch	With switch	Without switch	With switch			
φ25 or equiv.	155	217	135	197	Refer to the weight in the switch specifications.	2	26
φ32 or equiv.	220	310	190	280			37
φ40 or equiv.	345	468	310	433			46
φ50 or equiv.	545	733	485	673			71
φ63 or equiv.	1090	1226	965	976			90
(Example) Product weight of FCS-32-10	<ul style="list-style-type: none"> ● Product weight when S = 0 mm.....220 g ● Additional weight when S = 10 mm37 g x $\frac{10}{10}$ = 37 g ● Product weight.....220 g + 37 g = 257 g 						

Theoretical thrust table

● FCS

(Unit: N)

Bore size (mm)	Working pressure MPa					
	0.2	0.3	0.4	0.5	0.6	0.7
φ25	-	1.12×10^2	1.62×10^2	2.11×10^2	2.60×10^2	3.09×10^2
φ32	-	1.85×10^2	2.63×10^2	3.41×10^2	4.18×10^2	4.96×10^2
φ40	2.11×10^2	3.40×10^2	4.69×10^2	5.98×10^2	7.27×10^2	8.56×10^2
φ50	3.11×10^2	5.05×10^2	6.98×10^2	8.91×10^2	1.08×10^3	1.28×10^3
φ63	5.16×10^2	8.34×10^2	1.15×10^3	1.47×10^3	1.79×10^3	2.10×10^3

● FCH

(Unit: N)

Bore size (mm)	Working pressure MPa					
	0.2	0.3	0.4	0.5	0.6	0.7
φ25	-	78.5	1.16×10^2	1.54×10^2	1.92×10^2	2.30×10^2
φ32	-	1.25×10^2	1.83×10^2	2.40×10^2	2.98×10^2	3.55×10^2
φ40	1.70×10^2	2.79×10^2	3.88×10^2	4.97×10^2	6.06×10^2	7.15×10^2
φ50	2.49×10^2	4.10×10^2	5.72×10^2	7.34×10^2	8.96×10^2	1.06×10^3
φ63	4.53×10^2	7.39×10^2	1.03×10^3	1.31×10^3	1.60×10^3	1.88×10^3

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/
COVP/N2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/
MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd
Contr
Ending

FCS/FCH Series

How to order

Without switch (without magnet for switch)

FCS - **25** - **10** - **N**

With switch (built-in magnet for switch)

FCS-L - **25** - **10** - **M2V** - **R** - **N**

A Model No.

B Bore size

C Port thread

D Stroke length

E Switch model No.
* indicates the lead wire length.

F Switch quantity

G Option
*2

⚠ Precautions for model No. selection

*1 : Refer to page 1462 for the min. stroke length with switch.

*2 : Dimensions of copper and PTFE free "P6" are the same as those of the standard.

[Example of model No.]

FCS-L-25-10-M2V-R-M

Model: Flat compact cylinder

A Model No. : Single acting/push

B Bore size : φ25 mm

C Port thread : Rc thread

D Stroke length : 10 mm

E Switch model No. : Proximity switch M2V

F Switch quantity : 1 on rod side

G Option : Piston rod material (stainless steel)

Code	Content
A Model No.	
FCS	Single acting/push
FCS-L	Single acting/push/with switch
FCH	Single acting/pull
FCH-L	Single acting/pull/with switch

B Bore size (mm)	
25	φ25
32	φ32
40	φ40
50	φ50
63	φ63

C Port thread	
Blank	Rc thread
NN	NPT thread (φ40 or more) (custom order product)
GN	G thread (φ40 or more) (custom order product)

D Stroke length (mm)		
Bore size	Stroke length *1	Custom stroke length
φ25, φ32	1 to 10	In 1 mm increments
φ40 to φ63	1 to 20	

E Switch model No.					
Radial lead wire	Contact	Voltage		Display	Lead wire
		AC	DC		
M2V*	Proximity		●	1-color display	2-wire
M2WV*			●	2-color display	
M3V*			●	1-color display	3-wire
M3WV*			●	2-color display	
M3PV*	Reed		●	1-color display (custom order)	3-wire
M0V*		●	●	1-color display	
M5V*		●	●	Without indicator lamp	2-wire

* Lead wire length	
Blank	1 m (standard)
3	3 m (option)
5	5 m (option)

F Switch quantity	
R	1 on rod side
H	1 on head side
D	2

G Option	
Blank	Rod end female thread
M	Piston rod material (stainless steel)
N	Rod end male thread
R	With spigot
P6	Copper and PTFE free (copper-based/Teflon-based material is not used)

How to order switch

- Switch body + mounting bracket set

FCS - M2V

Switch model No.
(Item ⑤ on the previous page)

- Switch body only

SW - M2V

Switch model No.
(Item ⑤ on the previous page)

- Mounting bracket set

FCS - M

Mounting bracket

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/
COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/
MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

FJ

FK

Spd
Contr

Ending

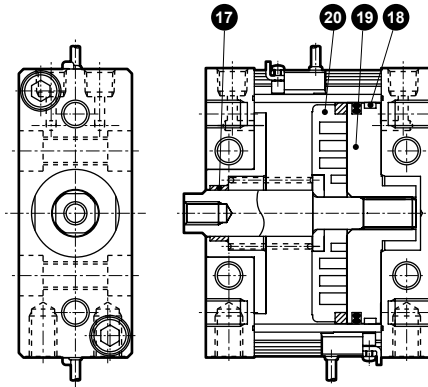
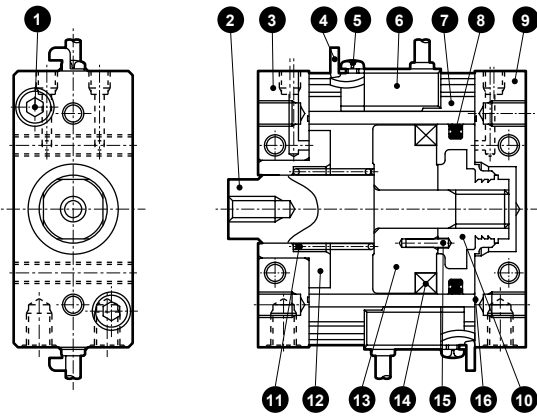
FCS/FCH Series

Internal structure and parts list

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/
COVPIN2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/
MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd
Contr
Ending

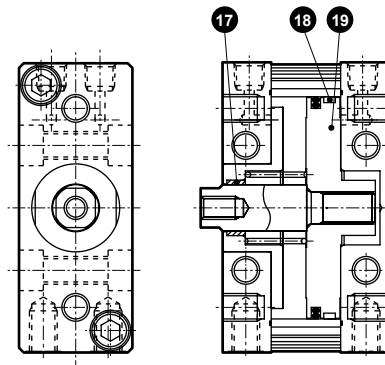
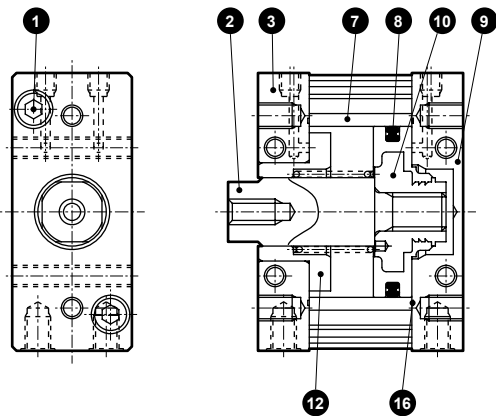
● FCS-L (single acting/push, with switch)
* φ25 to φ50 or equiv.

* φ63 or equiv.



● FCS (Single acting/push)
* φ25 to φ50 or equiv.

* φ63 or equiv.



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon socket head cap screw	Steel	Zinc chromate	11	Spring	Steel	Electrodeposition
2	Piston rod	Steel	Industrial chrome plating	12	Bush spacer	Aluminum alloy	Alumite
3	Rod cover	Aluminum alloy	Black alumite	13	Spacer	Aluminum alloy	
4	Switch mounting bracket	Stainless steel		14	Magnet	Plastic	
5	Cross-recessed pan head machine screw	Steel	Zinc chromate	15	Spring pin	Steel	
6	Switch			16	Cover gasket	Nitrile rubber	
7	Tube	Aluminum alloy	Hard alumite	17	Bush	Aluminum alloy	Alumite
8	Piston packing	Nitrile rubber		18	Wear ring	Acetal resin	
9	Head cover	Aluminum alloy	Black alumite	19	Piston	Aluminum alloy	Chromate
10	Piston	Aluminum alloy die-casting + polyacetal		20	Spacer	Polyamide resin	

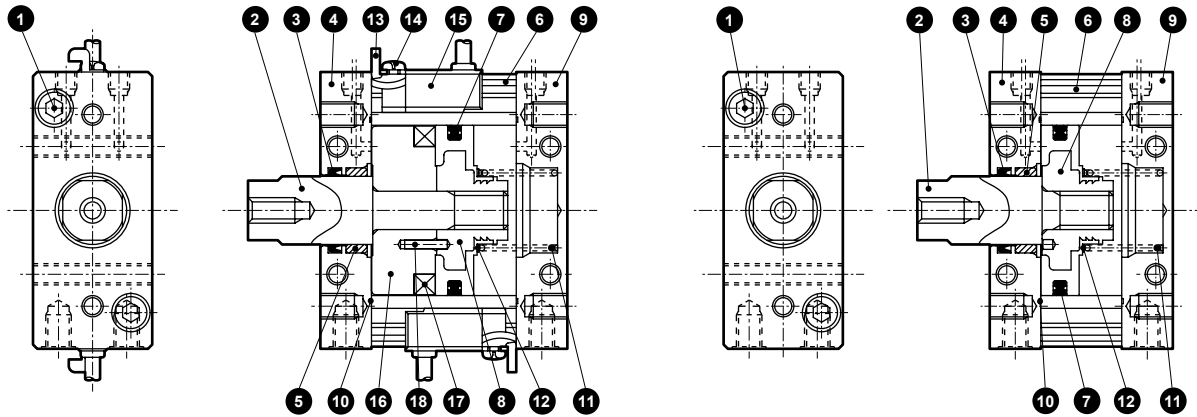
Repair parts list (common to types with/without switch)

Bore size (mm)	Kit No.	Repair parts No.
φ25 or equiv.	FCS-25K	● 8 ● 16
φ32 or equiv.	FCS-32K	
φ40 or equiv.	FCS-40K	
φ50 or equiv.	FCS-50K	
φ63 or equiv.	FCS-63K	

Internal structure and parts list

● FCH-L (single acting/pull, with switch)

● FCH



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon socket head cap screw	Steel	Zinc chromate	10	Cover gasket	Nitrile rubber	
2	Piston rod	Steel	Industrial chrome plating	11	Spring	Steel	Electrodeposition
3	Rod packing	Nitrile rubber		12	Spring holder	Stainless steel	
4	Rod cover	Aluminum alloy	Black alumite	13	Switch mounting bracket	Stainless steel	
5	Bush	Special bearing material *1		14	Cross-recessed pan head machine screw	Steel	Zinc chromate
6	Tube	Aluminum alloy	Hard alumite	15	Switch		
7	Piston packing	Nitrile rubber		16	Spacer	φ25 to φ50: Aluminum alloy φ63: Polyamide resin	
8	Piston	φ25 to φ50: Aluminum alloy die-casting + polyacetal φ63: Aluminum alloy	φ63: Chromate	17	Magnet	Plastic	
9	Head cover	Aluminum alloy	Black alumite	18	Spring pin	Steel	

*1: Special aluminum for copper and PTFE free.

Repair parts list (common to types with/without switch)

Bore size (mm)	Kit No.	Repair parts No.
φ25 or equiv.	FCH-25K	● 3 ● 7 ● 10
φ32 or equiv.	FCH-32K	
φ40 or equiv.	FCH-40K	
φ50 or equiv.	FCH-50K	
φ63 or equiv.	FCH-63K	

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/
COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/
MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

ShkAbs

FJ

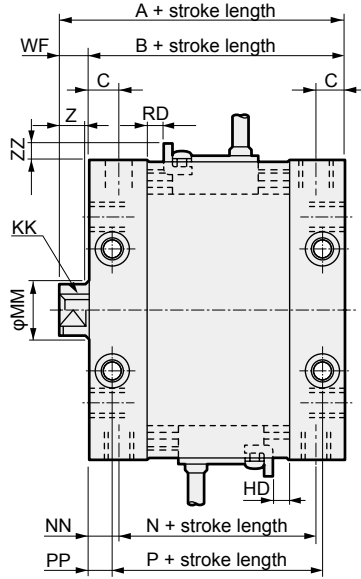
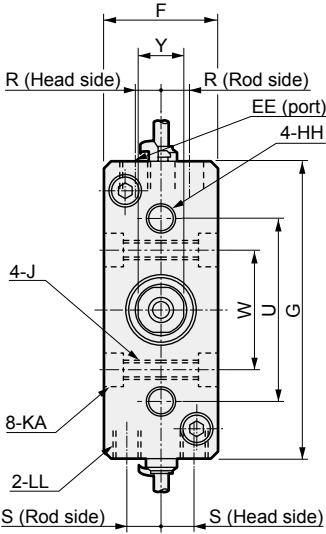
FK

Spd
Contr

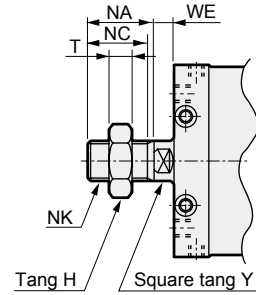
Ending

Dimensions

● FCS-L (single acting/push, with switch)



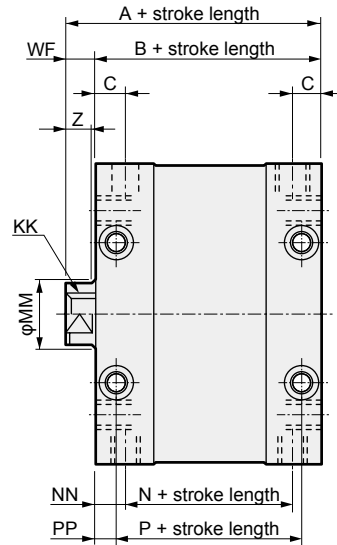
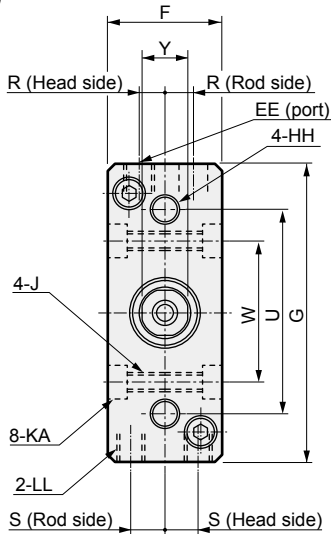
● Dimensions of rod end male thread (Option code N)



*1: This figure shows FCS-L-40.

*2: Position for Y section square tang is unspecified.

● FCS (without switch)



*1: This figure shows FCS-40.

*2: Position for Y section square tang is unspecified.

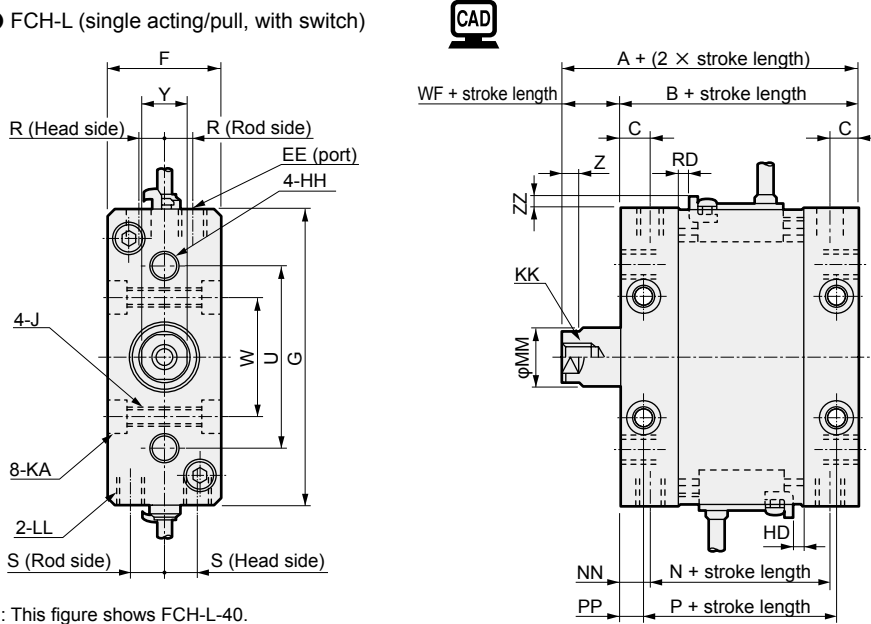
Code	Dimensions without switch				Dimensions with switch				Common dimensions							
	A	B	N	P	A	B	N	P	C	EE	F	G	HH	J	KA	
φ25 or equiv.	42	37	25	29	57	52	40	44	7.5	M5 depth 4	25	55	M5 depth 7	M5 (through)	-	
φ32 or equiv.	45	38	26	30	60	53	41	45	7.5	M5 depth 4	28	65	M6 depth 8	M5 (through)	-	
φ40 or equiv.	54	46	30	34	69	61	45	49	8.5	Rc1/8	32	83	M8 depth 10	M6 (through)	9.5 spot face depth 5.4	
φ50 or equiv.	60.5	51	34	32	75.5	66	49	47	10.5	Rc1/8	39	101	M10 depth 12	M10 (through)	11 spot face depth 6.5	
φ63 or equiv.	71.5	62	42	42	86.5	77	57	57	11.5	Rc1/4	49	125	M12 depth 15	M12 (through)	17.5 spot face depth 10.5	
Code	Common dimensions with switch															
Bore size (mm)	KK	LL	MM	NN	PP	R	S	U	W	WF	ZZ	RD	HD	Y	Z	
φ25 or equiv.	M5 depth 9	M5 depth 7	12	6	4	4.7	7	38	24	5	5.5 or less	3.5	0	10	5	
φ32 or equiv.	M6 depth 11	M6 depth 8	16	6	4	6.2	8	45	30	7	5.5 or less	4.5	0	14	7	
φ40 or equiv.	M8 depth 13	M8 depth 10	16	8	6	7.5	9	52	34	8	5.5 or less	4.5	0	14	7	
φ50 or equiv.	M8 depth 13	M10 depth 12	20	8.5	9.5	9	10	62	40	9.5	5.5 or less	4.5	0.5	17	8	
φ63 or equiv.	M10 depth 15	M12 depth 18	20	10	10	10.5	14	86	54	9.5	5.5 or less	4.5	4.5	17	8	

● Rod end male thread dimensions

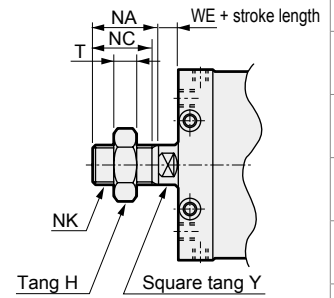
Code	H	NA	NC	NK	T	WE
φ25 or equiv.	17	22	20	M10×1.25	6	5
φ32 or equiv.	22	22	20	M14×1.5	8	7
φ40 or equiv.	22	22	20	M14×1.5	8	7
φ50 or equiv.	27	28	26	M18×1.5	11	8
φ63 or equiv.	27	28	26	M18×1.5	11	8

Dimensions

● FCH-L (single acting/pull, with switch)



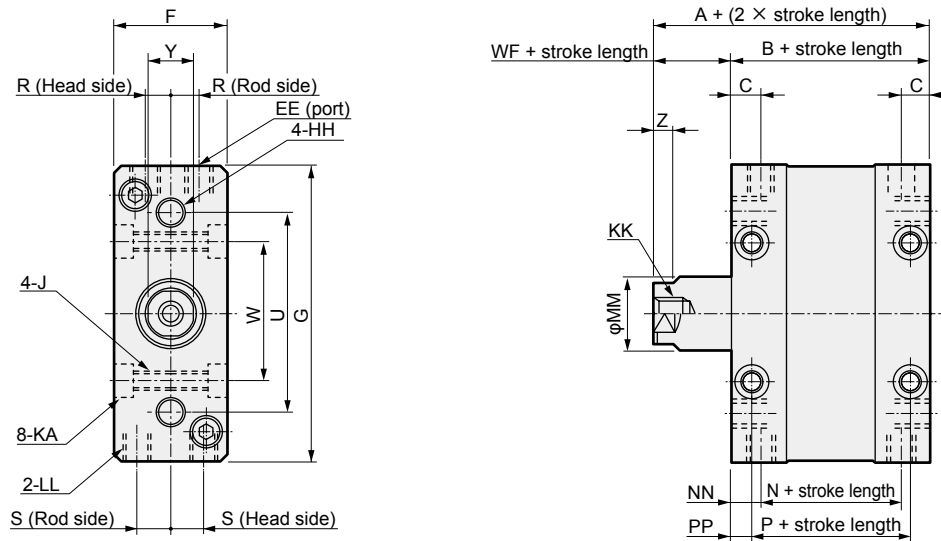
● Dimensions of rod end male thread (Option code: N)



*1: This figure shows FCH-L-40.

*2: Position for Y section square tang is unspecified.

● FCH (without switch)



*1: This figure shows FCH-40.

*2: Position for Y section square tang is unspecified.

Code	Dimensions without switch				Dimensions with switch				Common dimensions							
Bore size (mm)	A	B	N	P	A	B	N	P	C	EE	F	G	HH	J	KA	
φ25 or equiv.	37	32	20	24	52	47	35	39	7.5	M5 depth 4	25	55	M5 depth 7	M5 (through)	-	
φ32 or equiv.	40	33	21	25	55	48	36	40	7.5	M5 depth 4	28	65	M6 depth 8	M5 (through)	-	
φ40 or equiv.	49	41	25	29	64	56	40	44	8.5	Rc1/8	32	83	M8 depth 10	M6 (through)	9.5 spot face depth 5.4	
φ50 or equiv.	55.5	46	29	27	70.5	61	44	42	10.5	Rc1/8	39	101	M10 depth 12	M8 (through)	11 spot face depth 6.5	
φ63 or equiv.	66.5	57	37	37	81.5	72	52	52	11.5	Rc1/4	49	125	M12 depth 15	M12 (through)	17.5 spot face depth 10.5	

Code	Common dimensions with switch															
Bore size (mm)	KK	LL	MM	NN	PP	R	S	U	W	WF	ZZ	RD	HD	Y	Z	
φ25 or equiv.	M5 depth 9	M5 depth 7	12	6	4	4.7	7	38	24	5	5.5 or less	0	0	10	5	
φ32 or equiv.	M6 depth 11	M6 depth 8	16	6	4	6.2	8	45	30	7	5.5 or less	0	0	14	7	
φ40 or equiv.	M8 depth 13	M8 depth 10	16	8	6	7.5	9	52	34	8	5.5 or less	0	0	14	7	
φ50 or equiv.	M8 depth 13	M10 depth 12	20	8.5	9.5	9	10	62	40	9.5	5.5 or less	0	0.5	17	8	
φ63 or equiv.	M10 depth 15	M12 depth 18	20	10	10	10.5	14	86	54	9.5	5.5 or less	0	4.5	17	8	

● Rod end male thread dimensions

Code	H	NA	NC	NK	T	WE
Bore size (mm)						
φ25 or equiv.	17	22	20	M10×1.25	6	5
φ32 or equiv.	22	22	20	M14×1.5	8	7
φ40 or equiv.	22	22	20	M14×1.5	8	7
φ50 or equiv.	27	28	26	M18×1.5	11	8
φ63 or equiv.	27	28	26	M18×1.5	11	8

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

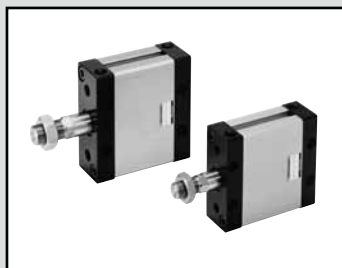
ShkAbs

FJ

FK

Spd Contr

Ending



Flat compact cylinder double acting/single rod

FCD Series

● Bore size: $\phi 25/\phi 32/\phi 40/\phi 50/\phi 63$



Specifications

Descriptions	FCD FCD-L				
	$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Bore size mm	$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Actuation	Double acting				
Working fluid	Compressed air				
Max. working pressure MPa	0.7 (≈ 100 psi, 7 bar)				
Min. working pressure MPa	0.07 (≈ 10 psi, 0.7 bar)				
Proof pressure MPa	1.05 (≈ 150 psi, 10.5 bar)				
Ambient temperature $^{\circ}\text{C}$	-10 (14 $^{\circ}\text{F}$) to 60 (140 $^{\circ}\text{F}$) (no freezing)				
Port size	M5		Rc1/8		Rc1/4
Stroke tolerance mm	+0.5 0 (to 50)				
Working piston speed mm/s	50 to 500				
Cushion	None				
Lubrication	Not required (turbine oil type 1 ISO VG32 if necessary for lubrication)				
Allowable absorbed energy J	0.015	0.02	0.026	0.04	0.05

Rotation-stop precision/Allowable torque

Descriptions	$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Non-rotating accuracy *2	$\pm 1^{\circ}$	$\pm 0.8^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$
Allowable torque N·m	1	1.6	2.5	3.9	5.9

*1: Avoid applying rotation torque with impact, or with violent changes in torque load direction.

*2: "Non-rotating accuracy" is the value when a torque load equivalent to 10% of "allowable torque" is applied to the end of the piston rod.

Stroke length

Model No.	Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
FCD	$\phi 25, \phi 32$ $\phi 40, \phi 50$ $\phi 63$ or equiv.	5/10/15/20/25 30/40/50	50	1

*1: The custom stroke length is available in 1mm increments.

*2: The min. stroke length varies depending on switch mounting method. Refer to the following table.

Min. stroke length with switch

1		2	
Rod side installation	Head side installation	Different surface mounting	Same surface mounting
10 mm		15 mm	35 mm ($\phi 25/32/40/50$) 30 mm ($\phi 63$)

Switch specifications

● Proximity switch

Descriptions	Proximity 2-wire		Proximity 3-wire		
	M2V	M2WV (2-color display)	M3V	M3PV (Custom order)	M3WV (2-color display)
Applications	Dedicated for programmable controller		Programmable controller, relay, IC circuit, small solenoid valve		
Output method	-	NPN output	NPN output	PNP output	NPN output
Power supply voltage	-		4.5 to 28 VDC		10 to 28 VDC
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 30 mA		100 mA or less	100 mA or less	100 mA or less
Indicator lamp	LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)
Leakage current	1 mA or less		10 μA or less	0.05 mA or less	10 μA or less
Weight	g 1 m:22 3 m:57 5 m:93				

● Reed switch

Descriptions	Reed 2-wire			
	M0V		M5V	
Applications	Programmable controller, relay		For programmable controller, relay, IC circuit (without indicator lamp), serial connection	
Power supply voltage	-		-	
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC or less
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator lamp	LED (Lit when ON)		Without indicator lamp	
Leakage current	0 mA			
Weight	g 1 m:22 3 m:57 5 m:93			

*1: Refer to Ending Page 1 for other switch specifications.

*2: Dimensions depend on switch model No. Refer to Ending Page 13 for details.

Cylinder weight

(Unit: g)

Descriptions	Product weight when stroke length (S) = 0 mm		Switch weight	Mounting bracket weight	Additional weight per S = 10 mm	
	FCD					
Bore size (mm)	Without switch	With switch	Refer to the weight in the switch specifications.	2		
φ25 or equiv.	130	192				26
φ32 or equiv.	185	275				37
φ40 or equiv.	300	423				46
φ50 or equiv.	470	658				71
φ63 or equiv.	950	1086				90

(Example) Product weight of FCD-32-20

- Product weight when S = 0 mm.....185 g
- Additional weight when S = 20 mm37 g × $\frac{20}{10}$ = 74 g
- Product weight.....185 g + 74 g = 259 g

Theoretical thrust table

(Unit: N)

Bore size (mm)	Operating direction	Working pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
φ25	Push	49.3	73.9	98.5	1.48×10^2	1.97×10^2	2.46×10^2	2.96×10^2	3.45×10^2
	Pull	37.9	56.9	75.9	1.14×10^2	1.52×10^2	1.90×10^2	2.28×10^2	2.66×10^2
φ32	Push	77.6	1.16×10^2	1.55×10^2	2.33×10^2	3.10×10^2	3.88×10^2	4.66×10^2	5.43×10^2
	Pull	57.5	86.3	1.15×10^2	1.73×10^2	2.30×10^2	2.88×10^2	3.45×10^2	4.03×10^2
φ40	Push	1.29×10^2	1.94×10^2	2.58×10^2	3.87×10^2	5.16×10^2	6.45×10^2	7.75×10^2	9.04×10^2
	Pull	1.09×10^2	1.63×10^2	2.18×10^2	3.27×10^2	4.36×10^2	5.45×10^2	6.54×10^2	7.63×10^2
φ50	Push	1.93×10^2	2.90×10^2	3.86×10^2	5.80×10^2	7.73×10^2	9.66×10^2	1.16×10^3	1.35×10^3
	Pull	1.62×10^2	2.43×10^2	3.24×10^2	4.85×10^2	6.47×10^2	8.09×10^2	9.71×10^2	1.13×10^3
φ63	Push	3.18×10^2	4.77×10^2	6.36×10^2	9.53×10^2	1.27×10^3	1.59×10^3	1.91×10^3	2.22×10^3
	Pull	2.86×10^2	4.30×10^2	5.73×10^2	8.59×10^2	1.15×10^3	1.43×10^3	1.72×10^3	2.00×10^3

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/
COVP/N2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/
MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd
Contr
Ending

How to order

Without switch (without magnet for switch)

FCD - **25** - **10** - **N**

With switch (built-in magnet for switch)

FCD-L - **25** - **10** - **M2V** - **R** - **N**

A Model No.

B Bore size

C Port thread

D Stroke length

E Switch model No.

* indicates the lead wire length.

F Switch quantity

G Option
*2

⚠ Precautions for model No. selection

*1: Refer to page 1470 for the min. stroke length with switch.

*2: Dimensions of copper and PTFE free "P6" are the same as those of the standard.

[Example of model No.]

FCD-L-25-10-M2V-R-M

Model: Flat compact cylinder

- A** Model No. : Double acting/with switch
- B** Bore size : φ25 mm
- C** Port thread : Rc thread
- D** Stroke length : 10 mm
- E** Switch model No. : Proximity switch M2V
- F** Switch quantity : 1 on rod side
- G** Option : Piston rod material (stainless steel)

Code	Content				
A Model No.					
FCD	Double acting				
FCD-L	Double acting/with switch				
B Bore size (mm)					
25	φ25				
32	φ32				
40	φ40				
50	φ50				
63	φ63				
C Port thread					
Blank	Rc thread				
NN	NPT thread (φ40 or more) (custom order product)				
GN	G thread (φ40 or more) (custom order product)				
D Stroke length (mm)					
Bore size	Stroke length *1	Custom stroke length			
φ25 to φ63	1 to 50	In 1 mm increments			
E Switch model No.					
Radial lead wire	Contact	Voltage		Display	Lead wire
		AC	DC		
M2V*	Proximity		●	1-color display	2-wire
M2WV*			●	2-color display	
M3V*			●	1-color display	3-wire
M3WV*			●	2-color display	
M3PV*			●	1-color display (custom order)	
M0V*	Reed	●	●	1-color display	2-wire
M5V*		●	●	Without indicator lamp	
* Lead wire length					
Blank	1 m (standard)				
3	3 m (option)				
5	5 m (option)				
F Switch quantity					
R	1 on rod side				
H	1 on head side				
D	2				
T	3				
G Option					
Blank	Rod end female thread				
M	Piston rod material (stainless steel)				
N	Rod end male thread				
R	With spigot				
P6	Copper and PTFE free (copper-based/Teflon-based material is not used)				

How to order switch

- Switch body + mounting bracket set

FCS - M2V

Switch model No.
(Item ⑥ on the previous page)

- Switch body only

SW - M2V

Switch model No.
(Item ⑥ on the previous page)

- Mounting bracket set

FCS - M

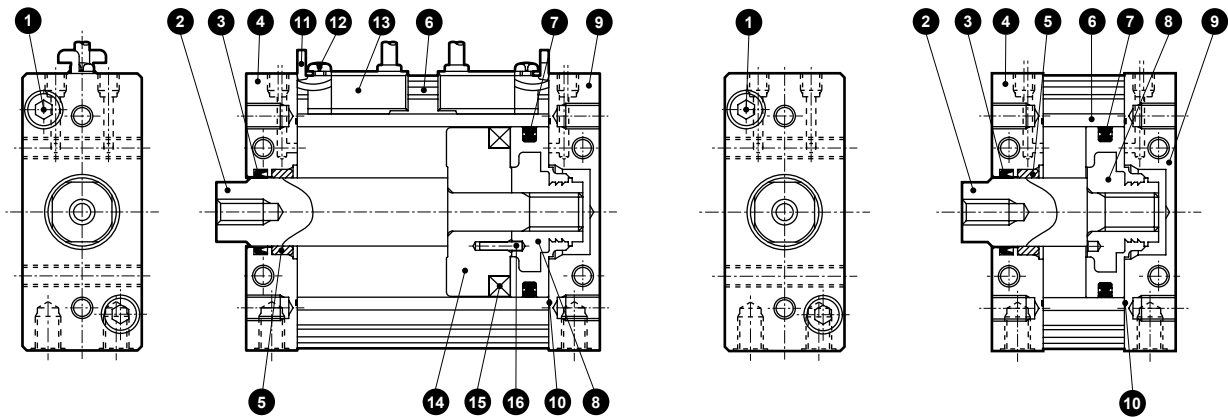
Mounting bracket

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/ COVP/N2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/ MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd Contr
Ending

Internal structure and parts list

● FCD-L (with switch)

● FCD



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon socket head cap screw	Steel	Zinc chromate	9	Head cover	Aluminum alloy	Black alumite
2	Piston rod	Steel	Industrial chrome plating	10	Cover gasket	Nitrile rubber	
3	Rod packing	Nitrile rubber		11	Switch mounting bracket	Stainless steel	
4	Rod cover	Aluminum alloy	Black alumite	12	Cross-recessed pan head machine screw	Steel	Zinc chromate
5	Bush	Special bearing material *1		13	Switch		
6	Tube	Aluminum alloy	Hard alumite	14	Spacer	φ25 to φ50: Aluminum alloy φ63: Polyamide resin	
7	Piston packing	Nitrile rubber		15	Magnet	Plastic	
8	Piston	φ25 to φ50: Aluminum alloy die-casting + polyacetal φ63: Aluminum alloy	φ63: Chromate	16	Spring pin	Steel	

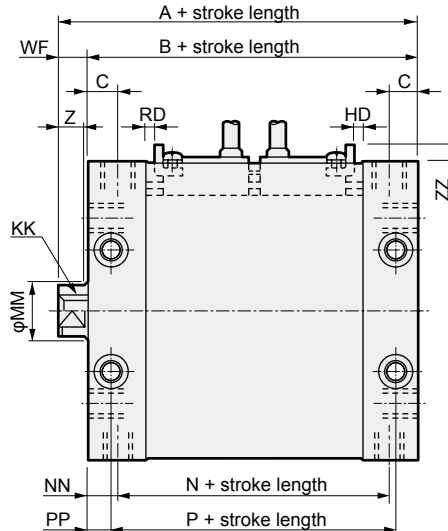
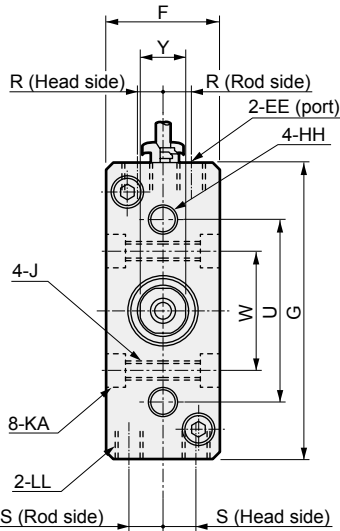
*1: Special aluminum for copper and PTFE free.

Repair parts list (common to types with/without switch)

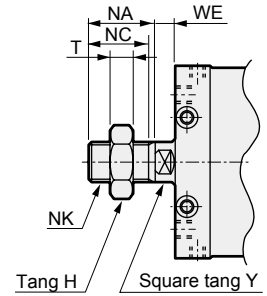
Bore size (mm)	Kit No.	Repair parts No.
φ25 or equiv.	FCD-25K	● 3 ● 7 ● 10
φ32 or equiv.	FCD-32K	
φ40 or equiv.	FCD-40K	
φ50 or equiv.	FCD-50K	
φ63 or equiv.	FCD-63K	

Dimensions

● FCD-L (double acting with switch)



● Dimensions of rod end male thread (Option code N)

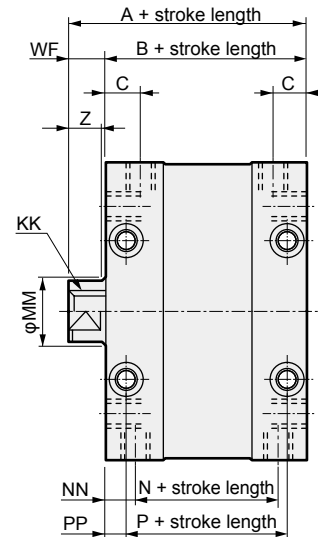
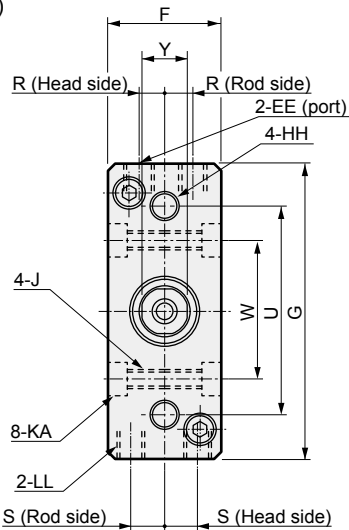


*1: This figure shows FCD-L-40.

*2: For same-surface installation with 2 switches, the stroke length of 35 mm and over for φ25 to φ50 equivalent or 30 mm and over for φ63 equivalent is required. For the stroke length of that value or less, set on both sides.

*3: Position for Y section square tang is unspecified.

● FCD (Without switch)



*1: This figure shows FCD-40.

*2: Position for Y section square tang is unspecified.

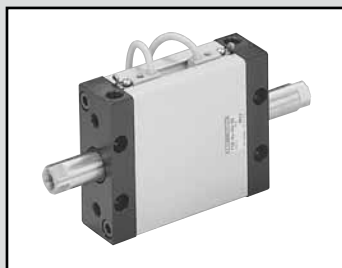
Code	Dimensions without switch				Dimensions with switch				Common dimensions							
	A	B	N	P	A	B	N	P	C	EE	F	G	HH	J	KA	
φ25 or equiv.	37	32	20	24	52	47	35	39	7.5	M5 depth 4	25	55	M5 depth 7	M5 (through)	-	
φ32 or equiv.	40	33	21	25	55	48	36	40	7.5	M5 depth 4	28	65	M6 depth 8	M5 (through)	-	
φ40 or equiv.	49	41	25	29	64	56	40	44	8.5	Rc1/8	32	83	M8 depth 10	M6 (through)	9.5 spot face depth 5.4	
φ50 or equiv.	55.5	46	29	27	70.5	61	44	42	10.5	Rc1/8	39	101	M10 depth 12	M8 (through)	11 spot face depth 6.5	
φ63 or equiv.	66.5	57	37	37	81.5	72	52	52	11.5	Rc1/4	49	125	M12 depth 15	M12 (through)	17.5 spot face depth 10.5	

Code	Common dimensions with switch															
	KK	LL	MM	NN	PP	R	S	U	W	WF	ZZ	RD	HD	Y	Z	
φ25 or equiv.	M5 depth 9	M5 depth 7	12	6	4	4.7	7	38	24	5	5.5 or less	0	0	10	5	
φ32 or equiv.	M6 depth 11	M6 depth 8	16	6	4	6.2	8	45	30	7	5.5 or less	0	0	14	7	
φ40 or equiv.	M8 depth 13	M8 depth 10	16	8	6	7.5	9	52	34	8	5.5 or less	0	0	14	7	
φ50 or equiv.	M8 depth 13	M10 depth 12	20	8.5	9.5	9	10	62	40	9.5	5.5 or less	0	0.5	17	8	
φ63 or equiv.	M10 depth 15	M12 depth 18	20	10	10	10.5	14	86	54	9.5	5.5 or less	0	4.5	17	8	

● Rod end male thread dimensions

Code	H	NA	NC	NK	T	WE
φ25 or equiv.	17	22	20	M10×1.25	6	5
φ32 or equiv.	22	22	20	M14×1.5	8	7
φ40 or equiv.	22	22	20	M14×1.5	8	7
φ50 or equiv.	27	28	26	M18×1.5	11	8
φ63 or equiv.	27	28	26	M18×1.5	11	8

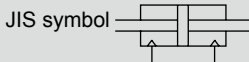
SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/
COVP/N2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/
MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd
Contr
Ending



Flat compact cylinder double acting/double rod

FCD-D Series

● Bore size: $\phi 25/\phi 32/\phi 40/\phi 50/\phi 63$



Specifications

Descriptions	FCD-D FCD-DL						
	mm		$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Bore size							
Actuation	Double acting/double rod						
Working fluid	Compressed air						
Max. working pressure MPa	0.7 (≈ 100 psi, 7 bar)						
Min. working pressure MPa	0.10 (≈ 15 psi, 1 bar)						
Proof pressure MPa	1.05 (≈ 150 psi, 10.5 bar)						
Ambient temperature $^{\circ}\text{C}$	-10 (14 $^{\circ}\text{F}$) to 60 (140 $^{\circ}\text{F}$) (no freezing)						
Port size	M5			Rc1/8		Rc1/4	
Stroke tolerance mm	+0.5 0 (to 50)						
Working piston speed mm/s	50 to 500						
Cushion	None						
Lubrication	Not required (turbine oil type 1 ISO VG32 if necessary for lubrication)						
Allowable absorbed energy J	0.015	0.02	0.026	0.04	0.05		

Rotation-stop precision/Allowable torque

Descriptions	$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Non-rotating accuracy *2	$\pm 1^{\circ}$	$\pm 0.8^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$
Allowable torque N·m	1	1.6	2.5	3.9	5.9

*1: Avoid applying rotation torque with impact, or with violent changes in torque load direction.

*2: "Non-rotating accuracy" is the value when a torque load equivalent to 10% of "allowable torque" is applied to the end of the piston rod.

Stroke length

Model No.	Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
FCD-D	$\phi 25, \phi 32$ $\phi 40, \phi 50$ $\phi 63$ or equiv.	5/10/15/20/25 30/40/50	50	1

*1: The custom stroke length is available in 1mm increments.

*2: The min. stroke length varies depending on switch mounting method. Refer to the following table.

Min. stroke length with switch

1		2	
Rod side installation	Head side installation	Different surface mounting	Same surface mounting
10 mm		15 mm	35 mm ($\phi 25/32/40/50$) 30 mm ($\phi 63$)

Switch specifications

● Proximity switch

Descriptions	Proximity 2-wire		Proximity 3-wire		
	M2V	M2WV (2-color display)	M3V	M3PV (Custom order)	M3WV (2-color display)
Applications	Dedicated for programmable controller		Programmable controller, relay, IC circuit, small solenoid valve		
Output method	-	NPN output	NPN output	PNP output	NPN output
Power supply voltage	-		4.5 to 28 VDC		10 to 28 VDC
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 30 mA		100 mA or less	100 mA or less	100 mA or less
Indicator lamp	LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)
Leakage current	1 mA or less		10 μA or less	0.05 mA or less	10 μA or less
Weight	g 1 m:22 3 m:57 5 m:93				

● Reed switch

Descriptions	Reed 2-wire			
	M0V		M5V	
Applications	Programmable controller, relay		For programmable controller, relay, IC circuit (without indicator lamp), serial connection	
Power supply voltage	-		-	
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC or less
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator lamp	LED (Lit when ON)		Without indicator lamp	
Leakage current	0 mA			
Weight	g 1 m:22 3 m:57 5 m:93			

*1: Refer to Ending Page 1 for other switch specifications.

*2: Dimensions depend on switch model No. Refer to Ending Page 13 for details.

Cylinder weight

(Unit: g)

Descriptions	Product weight when stroke length (S) = 0 mm		Switch weight	Mounting bracket weight	Additional weight per S = 10 mm
	FCD-D				
Bore size (mm)	Without switch	With switch			
φ25 or equiv.	145	220	Refer to the weight in the switch specifications.	2	35
φ32 or equiv.	215	330			53
φ40 or equiv.	330	478			62
φ50 or equiv.	545	773			96
φ63 or equiv.	1050	1226			115

(Example) Product weight of FCD-D-32-20

- Product weight when S = 0 mm.....215 g
- Additional weight when S = 20 mm53g x $\frac{20}{10}$ = 106 g
- Product weight.....215 g + 106 g = 321 g

Theoretical thrust table

(Unit: N)

Bore size (mm)	Operating direction	Working pressure MPa							
		0.1	0.15	0.2	0.3	0.4	0.5	0.6	0.7
φ25	Pull	37.9	56.9	75.9	1.14×10^2	1.52×10^2	1.90×10^2	2.28×10^2	2.66×10^2
φ32	Pull	57.5	86.3	1.15×10^2	1.73×10^2	2.30×10^2	2.88×10^2	3.45×10^2	4.03×10^2
φ40	Pull	1.09×10^2	1.63×10^2	2.18×10^2	3.27×10^2	4.36×10^2	5.45×10^2	6.54×10^2	7.63×10^2
φ50	Pull	1.62×10^2	2.43×10^2	3.24×10^2	4.85×10^2	6.47×10^2	8.09×10^2	9.71×10^2	1.13×10^3
φ63	Pull	2.86×10^2	4.30×10^2	5.73×10^2	8.59×10^2	1.15×10^3	1.43×10^3	1.72×10^3	2.00×10^3

FCD-D Series

How to order

Without switch (without magnet for switch)

FCD-D - **25** - **10** - **N**

With switch (built-in magnet for switch)

FCD-DL - **25** - **10** - **M2V** - **R** - **N**

A Model No.

B Bore size

C Port thread

D Stroke length

E Switch model No.
* indicates the lead wire length.

F Switch quantity

G Option
*2

⚠ Precautions for model No. selection

*1 : Refer to page 1476 for the min. stroke length with switch.

*2 : Dimensions of copper and PTFE free "P6" are the same as those of the standard.

[Example of model No.]

FCD-DL-25-10-M2V-R-M

Model: Flat compact cylinder

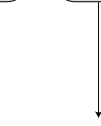
- A** Model No. : Double acting/double rod/with switch
- B** Bore size : φ25 mm
- C** Port thread : Rc thread
- D** Stroke length : 10 mm
- E** Switch model No. : Proximity switch M2V
- F** Switch quantity : 1 on rod side
- G** Option : Piston rod material (stainless steel)

Code	Content				
A Model No.					
FCD-D	Double acting/double rod				
FCD-DL	Double acting/double rod/with switch				
B Bore size (mm)					
25	φ25				
32	φ32				
40	φ40				
50	φ50				
63	φ63				
C Port thread					
Blank	Rc thread				
NN	NPT thread (φ40 or more) (custom order product)				
GN	G thread (φ40 or more) (custom order product)				
D Stroke length (mm)					
Bore size	Stroke length *1	Custom stroke length			
φ25 to φ63	1 to 50	In 1 mm increments			
E Switch model No.					
Radial lead wire	Contact	Voltage		Display	Lead wire
		AC	DC		
M2V*	Proximity		●	1-color display	2-wire
M2WV*			●	2-color display	
M3V*			●	1-color display	3-wire
M3WV*			●	2-color display	
M3PV*			●	1-color display (custom order)	
M0V*	Reed	●	●	1-color display	2-wire
M5V*		●	●	Without indicator lamp	
* Lead wire length					
Blank	1 m (standard)				
3	3 m (option)				
5	5 m (option)				
F Switch quantity					
R	1 on rod side				
H	1 on head side				
D	2				
T	3				
G Option					
Blank	Rod end female thread				
M	Piston rod material (stainless steel)				
N	Rod end male thread				
R	With spigot				
P6	Copper and PTFE free (copper-based/Teflon-based material is not used)				

How to order switch

● Switch body + mounting bracket set

FCS - M2V



Switch model No.
(Item ⑥ on the previous page)

● Switch body only

SW - M2V



Switch model No.
(Item ⑥ on the previous page)

● Mounting bracket set

FCS - M



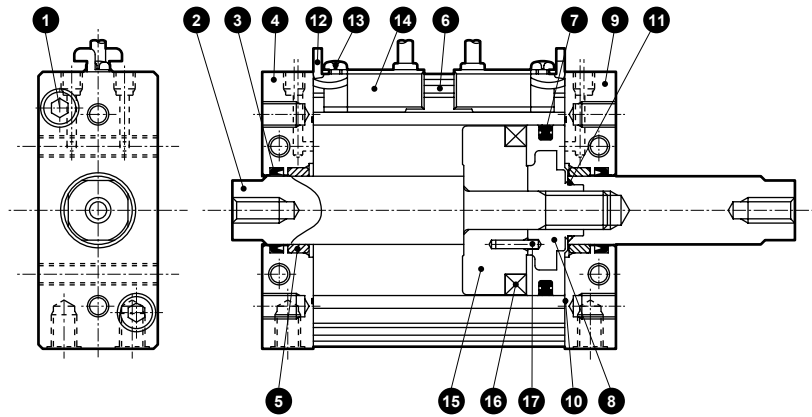
Mounting bracket

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/ COVP/N2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/ MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd Contr
Ending

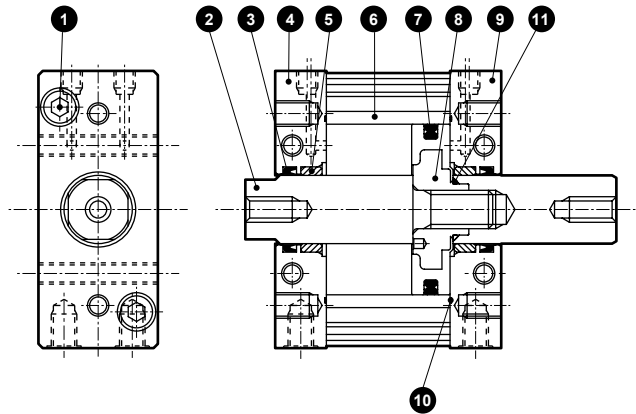
FCD-D Series

Internal structure and parts list

● FCD-DL (with switch)



● FCD-D



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon socket head cap screw	Steel	Zinc chromate	9	Head cover	Aluminum alloy	Black alumite
2	Piston rod	Steel	Industrial chrome plating	10	Cover gasket	Nitrile rubber	
3	Rod packing	Nitrile rubber		11	Piston gasket	Nitrile rubber	
4	Rod cover	Aluminum alloy	Black alumite	12	Switch mounting bracket	Stainless steel	
5	Bush	Special bearing material	*1	13	Cross-recessed pan head machine screw	Steel	Zinc chromate
6	Tube	Aluminum alloy	Hard alumite	14	Switch		
7	Piston packing	Nitrile rubber		15	Spacer	φ25 to φ50: Aluminum alloy φ63: Polyamide resin	
8	Piston	φ25 to φ50: Aluminum alloy die-casting + polyacetal φ63: Aluminum alloy	φ63: Chromate	16	Magnet	Plastic	
				17	Spring pin	Steel	

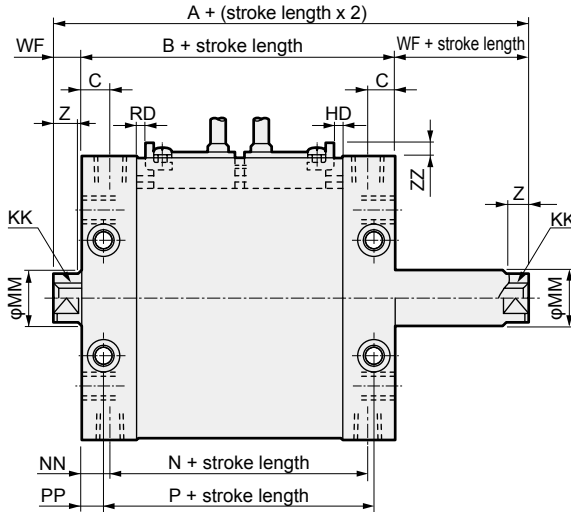
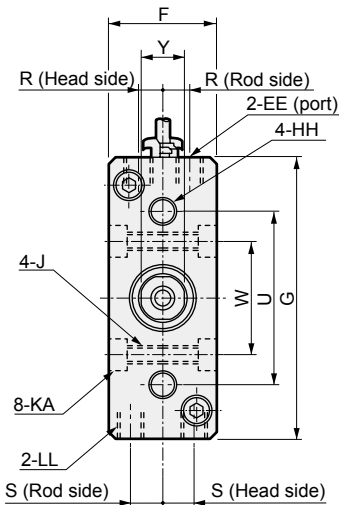
*1: Special aluminum for copper and PTFE free.

Repair parts list (common to types with/without switch)

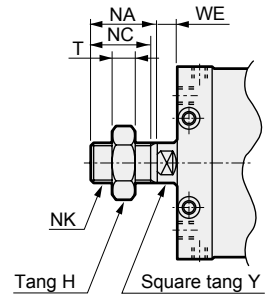
Bore size (mm)	Kit No.	Repair parts No.
φ25 or equiv.	FCD-D-25K	
φ32 or equiv.	FCD-D-32K	
φ40 or equiv.	FCD-D-40K	
φ50 or equiv.	FCD-D-50K	
φ63 or equiv.	FCD-D-63K	

Dimensions

● FCD-DL (double acting double rod with switch)



● Dimensions of rod end male thread (Option code: N)

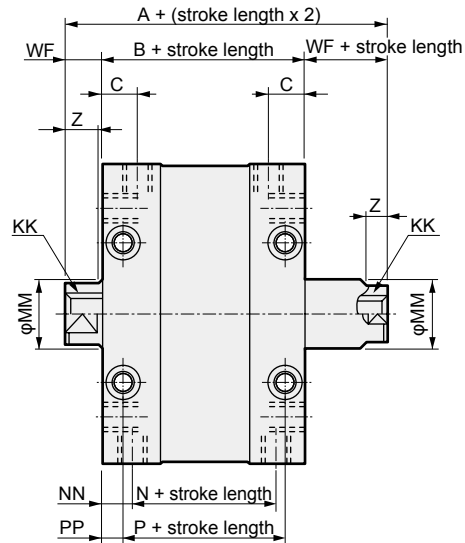
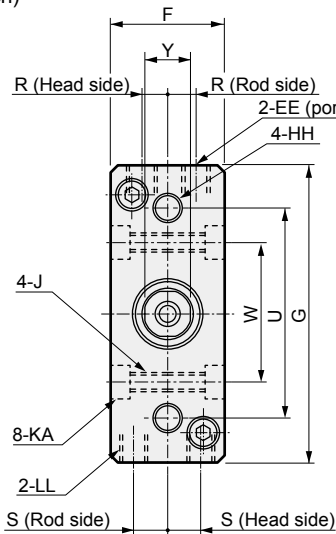


*1: This figure shows FCD-DL-40.

*2: For same-surface installation with 2 switches, the stroke length of 35 mm and over for φ25 to φ50 equivalent or 30 mm and over for φ63 equivalent is required. For the stroke length of that value or less, set on both sides.

*3: Position for Y section square tang is unspecified.

● FCD-D (without switch)



*1: This figure shows FCD-D-40.

*2: Position for Y section square tang is unspecified.

Code	Dimensions without switch				Dimensions with switch				Common dimensions							
	A	B	N	P	A	B	N	P	C	EE	F	G	HH	J	KA	
φ25 or equiv.	42	32	20	24	57	47	35	39	7.5	M5 depth 4	25	55	M5 depth 7	M5 (through)	-	
φ32 or equiv.	47	33	21	25	62	48	36	40	7.5	M5 depth 4	28	65	M6 depth 8	M5 (through)	-	
φ40 or equiv.	57	41	25	29	72	56	40	44	8.5	Rc1/8	32	83	M8 depth 10	M6 (through)	9.5 spot face depth 5.4	
φ50 or equiv.	65	46	29	27	80	61	44	42	10.5	Rc1/8	39	101	M10 depth 12	M8 (through)	11 spot face depth 6.5	
φ63 or equiv.	76	57	37	37	91	72	52	52	11.5	Rc1/4	49	125	M12 depth 15	M12 (through)	17.5 spot face depth 10.5	

Code	Common dimensions with switch															
	KK	LL	MM	NN	PP	R	S	U	W	WF	ZZ	RD	HD	Y	Z	
φ25 or equiv.	M5 depth 9	M5 depth 7	12	6	4	4.7	7	38	24	5	5.5 or less	0	0	10	5	
φ32 or equiv.	M6 depth 11	M6 depth 8	16	6	4	6.2	8	45	30	7	5.5 or less	0	0	14	7	
φ40 or equiv.	M8 depth 13	M8 depth 10	16	8	6	7.5	9	52	34	8	5.5 or less	0	0	14	7	
φ50 or equiv.	M8 depth 13	M10 depth 12	20	8.5	9.5	9	10	62	40	9.5	5.5 or less	0	0.5	17	8	
φ63 or equiv.	M10 depth 15	M12 depth 18	20	10	10	10.5	14	86	54	9.5	5.5 or less	0	4.5	17	8	

● Rod end male thread dimensions

Code	H	NA	NC	NK	T	WE
φ25 or equiv.	17	22	20	M10×1.25	6	5
φ32 or equiv.	22	22	20	M14×1.5	8	7
φ40 or equiv.	22	22	20	M14×1.5	8	7
φ50 or equiv.	27	28	26	M18×1.5	11	8
φ63 or equiv.	27	28	26	M18×1.5	11	8

SCP*3

CMK2

CMA2

SCM

SCG

SCA2

SCS2

CKV2

CAV2/
COVP/N2

SSD2

SSG

SSD

CAT

MDC2

MVC

SMG

MSD/
MSDG

FC*

STK

SRL3

SRG3

SRM3

SRT3

MRL2

MRG2

SM-25

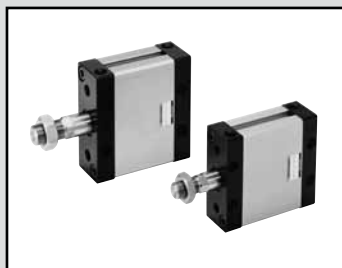
ShkAbs

FJ

FK

Spd
Contr

Ending



Flat compact cylinder double acting/cushioned

FCD-K Series

● Bore size: $\phi 25/\phi 32/\phi 40/\phi 50/\phi 63$



Specifications

Descriptions	FCD-K FCD-KL					
	mm	$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Bore size	mm	$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Actuation	Double acting/cushioned					
Working fluid	Compressed air					
Max. working pressure	MPa	0.7 (≈ 100 psi, 7 bar)				
Min. working pressure	MPa	0.07 (≈ 10 psi, 0.7 bar)				
Proof pressure	MPa	1.05 (≈ 150 psi, 10.5 bar)				
Ambient temperature	$^{\circ}\text{C}$	-10 (14 $^{\circ}\text{F}$) to 60 (140 $^{\circ}\text{F}$) (no freezing)				
Port size		M5		Rc1/8		Rc1/4
Stroke tolerance	mm	+1.5 (to 50), +2.0 (to 150) 0 0				
Working piston speed	mm/s	50 to 500				
Cushion	Rubber cushion					
Lubrication	Not required (turbine oil class 1 ISO VG32 if necessary for lubrication)					
Allowable absorbed energy	J	0.34	0.54	0.67	1.02	1.56

Rotation-stop precision/Allowable torque

Descriptions		$\phi 25$ or equiv.	$\phi 32$ or equiv.	$\phi 40$ or equiv.	$\phi 50$ or equiv.	$\phi 63$ or equiv.
Non-rotating accuracy	*2	$\pm 1^{\circ}$	$\pm 0.8^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$	$\pm 0.5^{\circ}$
Allowable torque	N·m	1	1.6	2.5	3.9	5.9

*1: Avoid applying rotation torque with impact, or with violent changes in torque load direction.

*2: "Non-rotating accuracy" is the value when a torque load equivalent to 10% of "allowable torque" is applied to the end of the piston rod.

Stroke length

Model No.	Bore size (mm)	Standard stroke length (mm)	Max. stroke length (mm)	Min. stroke length (mm)
FCD-K	$\phi 25, \phi 32$	5/10/15/20/25	150	1
	$\phi 40, \phi 50$	30/40/50		
	$\phi 63$ or equiv.			

*1: The custom stroke length is available in 1mm increments.

*2: The min. stroke length varies depending on switch mounting method. Refer to the following table.

Min. stroke length with switch

1		2	
Rod side installation	Head side installation	Different surface mounting	Same surface mounting
10 mm		15 mm	35 mm ($\phi 25/32/40/50$) 30 mm ($\phi 63$)

Switch specifications

● Proximity switch

Descriptions	Proximity 2-wire		Proximity 3-wire		
	M2V	M2WV (2-color display)	M3V	M3PV (Custom order)	M3WV (2-color display)
Applications	Dedicated for programmable controller		Programmable controller, relay, IC circuit, small solenoid valve		
Output method	-	NPN output	NPN output	PNP output	NPN output
Power supply voltage	-		4.5 to 28 VDC		10 to 28 VDC
Load voltage	10 to 30 VDC		30 VDC or less		
Load current	5 to 30 mA		100 mA or less	100 mA or less	100 mA or less
Indicator lamp	LED (Lit when ON)	Red/green LED (Lit when ON)	LED (Lit when ON)	Yellow LED (Lit when ON)	Red/green LED (Lit when ON)
Leakage current	1 mA or less		10 μA or less	0.05 mA or less	10 μA or less
Weight	g 1 m:22 3 m:57 5 m:93				

● Reed switch

Descriptions	Reed 2-wire			
	M0V		M5V	
Applications	Programmable controller, relay		For programmable controller, relay, IC circuit (without indicator lamp), serial connection	
Power supply voltage	-		-	
Load voltage	12/24 VDC	110 VAC	5/12/24 VDC	110 VAC or less
Load current	5 to 50 mA	7 to 20 mA	50 mA or less	20 mA or less
Indicator lamp	LED (Lit when ON)		Without indicator lamp	
Leakage current	0 mA			
Weight	g 1 m:22 3 m:57 5 m:93			

*1: Refer to Ending Page 1 for other switch specifications.

*2: Dimensions depend on switch model No. Refer to Ending Page 13 for details.

Cylinder weight

(Unit: g)

Descriptions	Product weight when stroke length (S) = 0 mm		Switch weight	Mounting bracket weight	Additional weight per S = 10 mm
	FCD-K				
Bore size (mm)	Without switch	With switch			
φ25 or equiv.	155	221	Refer to the weight in the switch specifications.	2	26
φ32 or equiv.	225	316			37
φ40 or equiv.	355	481			46
φ50 or equiv.	550	741			71
φ63 or equiv.	1135	1196			90

(Example) Product weight of FCD-K-32-20

- Product weight when S = 0 mm.....225 g
- Additional weight when S = 20 mm $37 \text{ g} \times \frac{20}{10} = 74 \text{ g}$
- Product weight..... $225 \text{ g} + 74 \text{ g} = 299 \text{ g}$

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/ COVP/N2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/ MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd Contr
Ending

FCD-K Series

How to order

Without switch (without magnet for switch)

FCD-K - **25** - **10** - **N**

With switch (built-in magnet for switch)

FCD-KL - **25** - **10** - **M2V** - **R** - **N**

A Model No.

B Bore size

C Port thread

D Stroke length

E Switch model No.
* indicates the lead wire length.

F Switch quantity

G Option
*2

⚠ Precautions for model No. selection

*1 : Refer to page 1482 for the min. stroke length with switch.

*2 : Dimensions of copper and PTFE free "P6" are the same as those of the standard.

[Example of model No.]

FCD-KL-25-10-M2V-R-M

Model: Flat compact cylinder

- A** Model No. : Double acting/cushioned/with switch
- B** Bore size : φ25 mm
- C** Port thread : Rc thread
- D** Stroke length : 10 mm
- E** Switch model No. : Proximity switch M2V
- F** Switch quantity : 1 on rod side
- G** Option : Piston rod material (stainless steel)

Code	Content				
A Model No.					
FCD-K	Double acting/cushioned				
FCD-KL	Double acting/cushioned/with switch				
B Bore size (mm)					
25	φ25				
32	φ32				
40	φ40				
50	φ50				
63	φ63				
C Port thread					
Blank	Rc thread				
NN	NPT thread (φ40 or more) (custom order product)				
GN	G thread (φ40 or more) (custom order product)				
D Stroke length (mm)					
Bore size	Stroke length *1	Custom stroke length			
φ25 to φ63	1 to 150	In 1 mm increments			
E Switch model No.					
Radial lead wire	Contact	Voltage		Display	Lead wire
		AC	DC		
M2V*	Proximity		●	1-color display	2-wire
M2WV*			●	2-color display	
M3V*			●	1-color display	3-wire
M3WV*			●	2-color display	
M3PV*			●	1-color display (custom order)	
M0V*	Reed	●	●	1-color display	2-wire
M5V*		●	●	Without indicator lamp	
* Lead wire length					
Blank	1 m (standard)				
3	3 m (option)				
5	5 m (option)				
F Switch quantity					
R	1 on rod side				
H	1 on head side				
D	2				
T	3				
G Option					
Blank	Rod end female thread				
M	Piston rod material (stainless steel)				
N	Rod end male thread				
R	With spigot				
P6	Copper and PTFE free (copper-based/Teflon-based material is not used)				

How to order switch

- Switch body + mounting bracket set

FCS - M2V

↓
Switch model No.
(Item ⑤ on the previous page)

- Switch body only

SW - M2V

↓
Switch model No.
(Item ⑤ on the previous page)

- Mounting bracket set

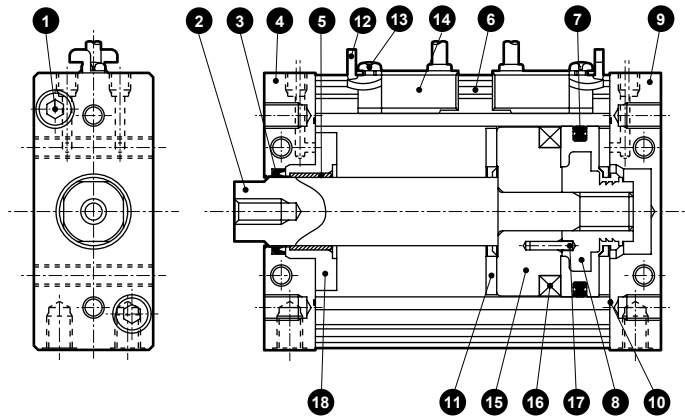
FCS - M

↓
Mounting bracket

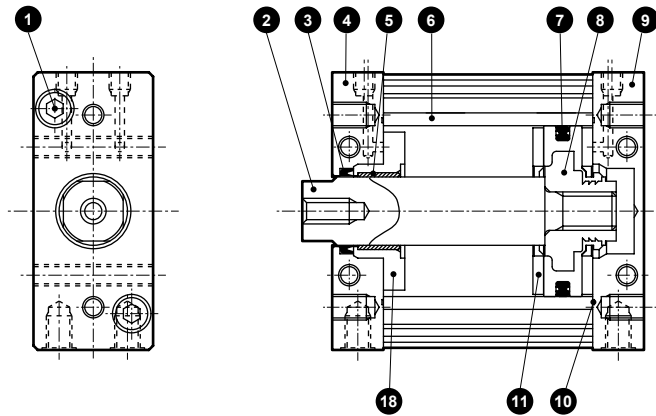
SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/ COVP/N2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/ MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd Contr
Ending

Internal structure and parts list

● FCD-KL (with switch)



● FCD-K



No.	Part name	Material	Remarks	No.	Part name	Material	Remarks
1	Hexagon socket head cap screw	Steel	Zinc chromate	10	Cover gasket	Nitrile rubber	
2	Piston rod	Steel	Industrial chrome plating	11	Cushion rubber	Urethane rubber	
3	Rod packing	Nitrile rubber		12	Switch mounting bracket	Stainless steel	
4	Rod cover	Aluminum alloy	Black alumite	13	Cross-recessed pan head machine screw	Steel	Zinc chromate
5	Bush	Special bearing material *1		14	Switch		
6	Tube	Aluminum alloy	Hard alumite	15	Spacer	φ25 to φ50: Aluminum alloy φ63: Polyamide resin	
7	Piston packing	Nitrile rubber		16	Magnet	Plastic	
8	Piston	φ25 to φ50: Aluminum alloy die-casting + polyacetal φ63: Aluminum alloy	φ63: Chromate	17	Spring pin	Steel	
9	Head cover	Aluminum alloy	Black alumite	18	Bush spacer	Aluminum alloy	φ63: Chromate

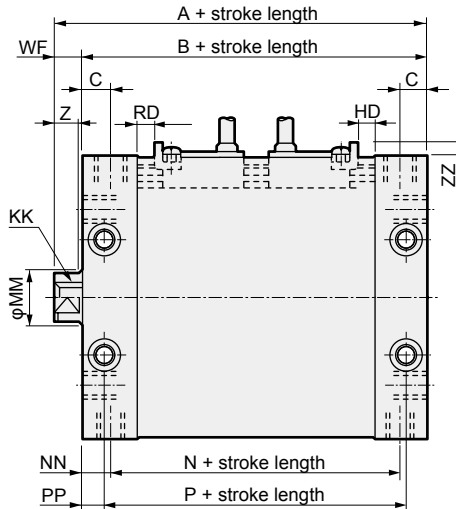
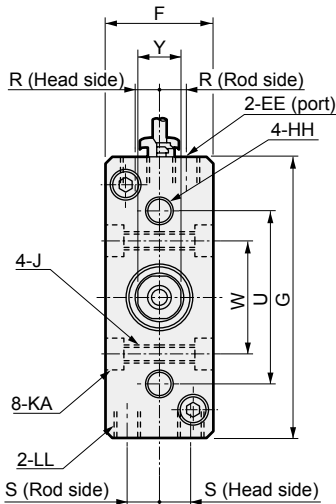
*1: Special aluminum for copper and PTFE free.

Repair parts list (common to types with/without switch)

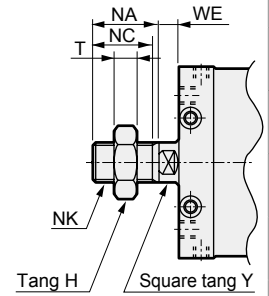
Bore size (mm)	Kit No.	Repair parts No.
φ25 or equiv.	FCD-K-25K	3 7 10 11
φ32 or equiv.	FCD-K-32K	
φ40 or equiv.	FCD-K-40K	
φ50 or equiv.	FCD-K-50K	
φ63 or equiv.	FCD-K-63K	

Dimensions

● FCD-KL (double acting cushioned, with switch)



● Dimensions of rod end male thread (Option code: N)

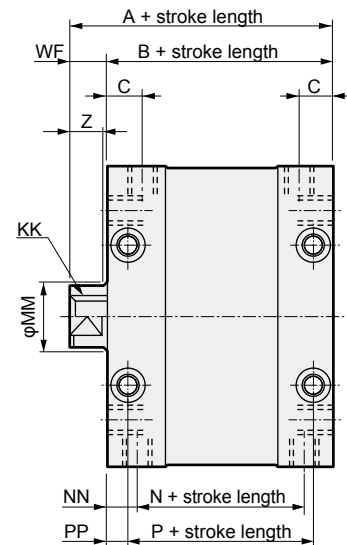
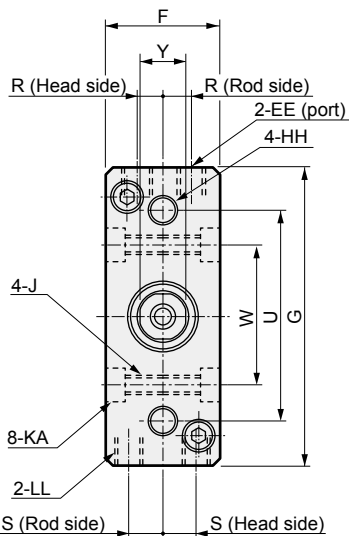


*1: This figure shows FCD-KL-40.

*2: For same-surface installation with 2 switches, the stroke length of 35 mm and over for φ25 to φ50 equivalent or 30 mm and over for φ63 equivalent is required. For the stroke length of that value or less, set on both sides.

*3: Position for Y section square tang is unspecified.

● FCD-K (without switch)



*1: This figure shows FCD-K-32.

*2: Position for Y section square tang is unspecified.

Code	Dimensions without switch				Dimensions with switch				Common dimensions							
	A	B	N	P	A	B	N	P	C	EE	F	G	HH	J	KA	
φ25 or equiv.	47	42	30	34	62	57	45	49	7.5	M5 depth 4	25	55	M5 depth 7	M5 (through)	-	
φ32 or equiv.	50	43	31	35	65	58	46	50	7.5	M5 depth 4	28	65	M6 depth 8	M5 (through)	-	
φ40 or equiv.	59	51	35	39	74	66	50	54	8.5	Rc1/8	32	83	M8 depth 10	M6 (through)	9.5 spot face depth 5.4	
φ50 or equiv.	65.5	56	39	37	80.5	71	54	52	10.5	Rc1/8	39	101	M10 depth 12	M8 (through)	11 spot face depth 6.5	
φ63 or equiv.	76.5	67	47	47	91.5	82	62	62	11.5	Rc1/4	49	125	M12 depth 15	M12 (through)	17.5 spot face depth 10.5	

Code	Common dimensions with switch															
	KK	LL	MM	NN	PP	R	S	U	W	WF	ZZ	RD	HD	Y	Z	
φ25 or equiv.	M5 depth 9	M5 depth 7	12	6	4	4.7	7	38	24	5	5.5 or less	6	1	10	5	
φ32 or equiv.	M6 depth 11	M6 depth 8	16	6	4	6.2	8	45	30	7	5.5 or less	7	1	14	7	
φ40 or equiv.	M8 depth 13	M8 depth 10	16	8	6	7.5	9	52	34	8	5.5 or less	7	2	14	7	
φ50 or equiv.	M8 depth 13	M10 depth 12	20	8.5	9.5	9	10	62	40	9.5	5.5 or less	7	3	17	8	
φ63 or equiv.	M10 depth 15	M12 depth 18	20	10	10	10.5	14	86	54	9.5	5.5 or less	7	7	17	8	

● Rod end male thread dimensions

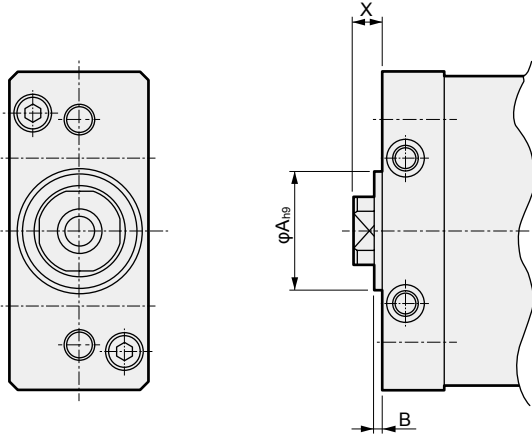
Code	H	NA	NC	NK	T	WE
φ25 or equiv.	17	22	20	M10×1.25	6	5
φ32 or equiv.	22	22	20	M14×1.5	8	7
φ40 or equiv.	22	22	20	M14×1.5	8	7
φ50 or equiv.	27	28	26	M18×1.5	11	8
φ63 or equiv.	27	28	26	M18×1.5	11	8

SCP*3
CMK2
CMA2
SCM
SCG
SCA2
SCS2
CKV2
CAV2/ COVP/N2
SSD2
SSG
SSD
CAT
MDC2
MVC
SMG
MSD/ MSDG
FC*
STK
SRL3
SRG3
SRM3
SRT3
MRL2
MRG2
SM-25
ShkAbs
FJ
FK
Spd Contr
Ending

FC Series common dimensions: Option (with spigot)



● Dimensions with spigot (option code R)



Code	A	B	X
φ25 or equiv.	20	2 ⁰ _{-0.4}	5
φ32 or equiv.	24	2 ⁰ _{-0.4}	7
φ40 or equiv.	28	2 ⁰ _{-0.4}	8
φ50 or equiv.	32	2 ⁰ _{-0.4}	9.5
φ63 or equiv.	32	2 ⁰ _{-0.4}	9.5

- SCP*3
- CMK2
- CMA2
- SCM
- SCG
- SCA2
- SCS2
- CKV2
- CAV2/
COVPIN2
- SSD2
- SSG
- SSD
- CAT
- MDC2
- MVC
- SMG
- MSD/
MSDG
- FC***
- STK
- SRL3
- SRG3
- SRM3
- SRT3
- MRL2
- MRG2
- SM-25
- ShkAbs
- FJ
- FK
- Spd
Contr
- Ending