TOMOE®

EXCELLENCE THROUGH HYDRODYNAMICS

GENERAL CATALOG

Valves & Actuator Selection Guide

TOMOE VALVE CO., LTD.

TOMOE®

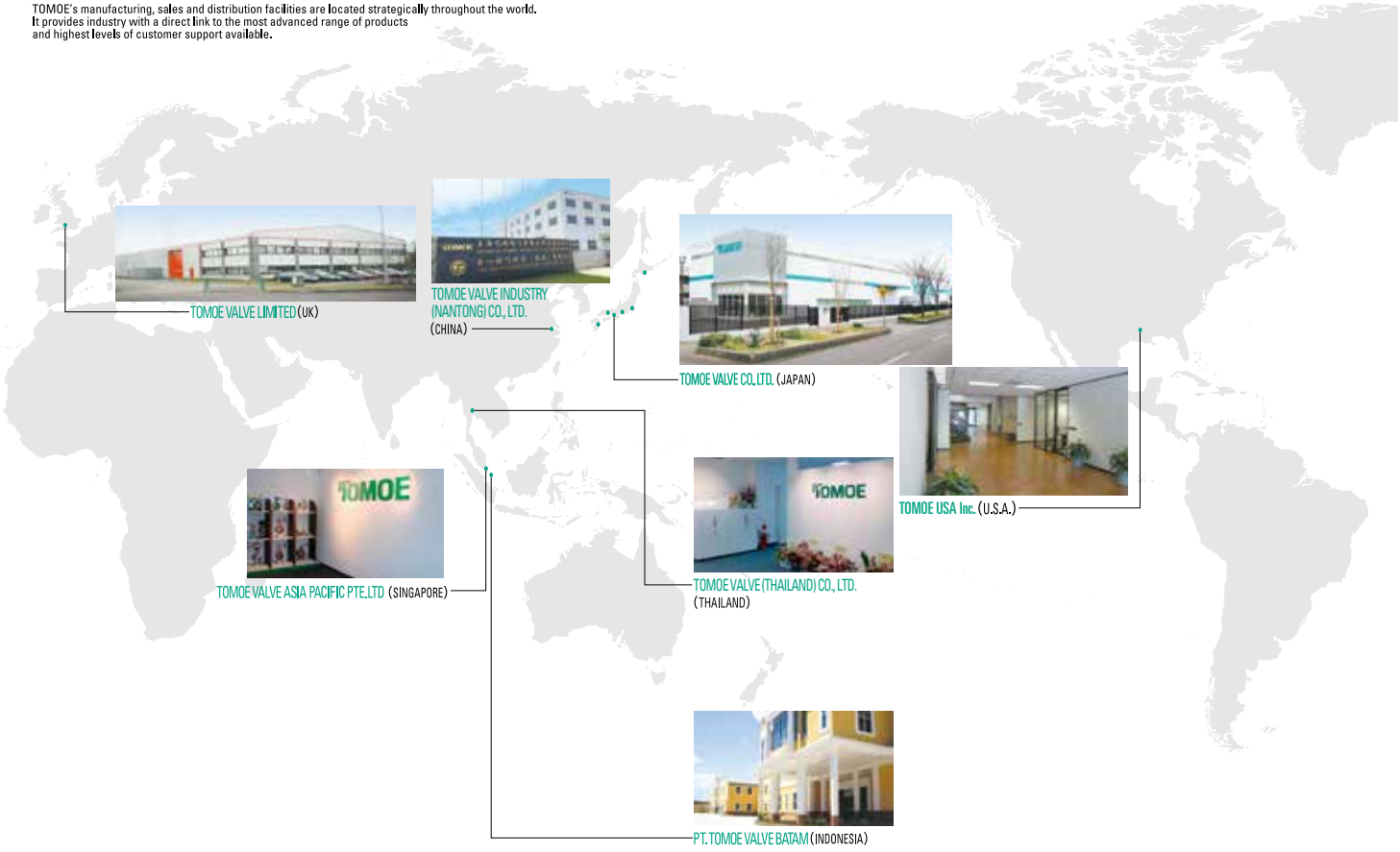
EXCELLENCE THROUGH HYDRODYNAMICS

TOMOE VALVE WebSite

www.tomoevalve.com

STRATEGIC, GLOBAL AND LOCAL RESOURCES

TOMOE's manufacturing, sales and distribution facilities are located strategically throughout the world.
It provides industry with a direct link to the most advanced range of products
and highest levels of customer support available.



INDEX

Standard Specifications

Standard Specifications

		Pressure (MPa)	Temperature (℃)	Valve Nominal size (mm)	Standard Materials Body	Standard Materials Disc	Standard Materials Seat	Approvals / Compliances
The Ultimate Process Valves	Tritec	25.5	-196 (※1 -46) ~ 700	80 to 1200	C.S. S.S.	C.S. S.S.	S.S.+GRAPHITE	FS CE
	TT2	5.1	-29 ~ 600	80 to 600	C.S. S.S.	C.S. S.S.	S.S.+GRAPHITE	FS CE
High Performance Butterfly Valves	334A	5.1	-29 ~ 232	50, 80 to 600	C.S. S.S.	S.S.	RPTFE	FS CE
	344Q	2.0	-29 ~ 232	80 to 600	Ni-Al-Br.	Ni-Al-Br.	RPTFE	FS
	302A / 303Q	2.0	-29 ~ 600	80 to 600	C.S. S.S.	S.S.	S.S.	FS CE
	304A	2.0	-29 ~ 232	80 to 600	C.S. S.S.	S.S.	RPTFE	CE
	304Q	2.0	-29 ~ 232	80 to 600	C.S. S.S.	S.S.	RPTFE	CE
	304YA	1.0	-29 ~ 200	40 to 300	D.I. S.S.	S.S.	RPTFE	
	302Y	2.0	-20 ~ 250	40 to 300	D.I. S.S.	S.S.	S.S.	CE
	304Y (HLV)	2.0	-20 ~ 200	40 to 300	D.I. S.S.	S.S.	RPTFE	CE
	304M	0.7	-30 ~ 230	650 to 1000	C.S. S.S.	C.S. S.S.	RPTFE	
Rotary Control Valves	507V	1.6	-50 ~ 400	50 to 400	C.S. S.S.	S.S.	——	CE
	508V	1.6	-20 ~ 120	50 to 200	D.I.	S.S.	EPDM※2 (OPTION: NBR CORE-Reinforced)	
		1.0	-20 ~ 120	250 to 600	D.I.	S.S.	EPDM※2 (OPTION: NBR CORE-Reinforced)	
	DTM	5.1	-29 ~ 400	80 to 300	C.S. S.S.	S.S.	RPTFE※3 S.S.	
Chemically Resistant Butterfly Valves	846T	1.0	-20 ~ 200	65 to 300	D.I.	S.S. PPS	PFA PTFE	CE
	847T / 847Q	1.0	-20 ~ 200	50 to 300	D.I.	PFA PTFE	PFA PTFE	CE
	841T	0.7	-10 ~ 100	350 to 600	D.I.	S.S.	PTFE	
	842T	0.7	-10 ~ 100	350 to 600	D.I.	PTFE	PTFE	CE
Rubber Seated Valves	700Z	1.0	-20 ~ 120	40 to 300	ALLOY DIE-CAST	S.S. PPS (40~200mm)	EPDM※2	JIS
	700G	1.0	-20 ~ 120	40 to 600	D.I. C.I. (350~600)	S.S. D.I. (80~600mm) S.S. (50~600mm)	NBR EPDM※2	JIS CE NK
	704G	1.0 Full Lugged	-20 ~ 120	50 to 600	D.I.	S.S. PPS (50~200mm)	NBR EPDM※2	JIS CE NK LR ABS
	705G	1.0	-20 ~ 120	50 to 600	D.I. C.I. (350~600)	S.S. PPS (50~200mm)	NBR EPDM※2	JIS CE NK LR ABS
	72WG / 72SG / 72LG	1.6	-20 ~ 120	40 to 600	D.I.	S.S.	NBR EPDM※2	
	731P	1.6	-20 ~ 120	50 to 600	D.I.	S.S.	NBR EPDM※2	JIS CE
	732P	2.0	-20 ~ 120	50 to 600	D.I.	S.S.	NBR EPDM※2	CE
	731R	1.6	-20 ~ 120	350 to 600	D.I.	S.S.	EPDM※2	
	700E	1.0	-20 ~ 120	650 to 1350	C.I.	D.I. (HARD CHROME PLATING) S.S.	NBR EPDM※2	NK
	700K	1.0	-20 ~ 120	650 to 1350	C.I.	D.I. (HARD CHROME PLATING) S.S.	NBR EPDM※2	NK
	700S	1.0	-20 ~ 120	650 to 900	C.I.	D.I. (HARD CHROME PLATING) S.S.	NBR EPDM※2	NK
	722F	1.0	-20 ~ 120	125 to 800	C.S. (OPTION : D.I.)	S.S. D.I.	NBR EPDM※2	NK LR ABS
	720F	1.0	-20 ~ 120	850 to 1350	C.S. (OPTION : D.I.)	S.S. D.I.	NBR EPDM※2	NK LR ABS
	227P	1.6	-10 ~ 80	650 to 2400	D.I. C.S.	S.S. AlBr	NBR EPDM※2	
Check Valves	MKT 907T / 908H	2.0	0 ~ 100	50 to 300	D.I. S.S.	S.S.	NBR EPDM※2	
	903L	1.0	-10 ~ 80	50 to 300	C.I.	S.S.	NBR※2 (OPTION: EPDM FKM)	NK
	901C	1.0	-10 ~ 80	350 to 450	C.I.	AlBr	NBR※2 (OPTION: EPDM FKM)	NK
	905C	3.0	-5 ~ 100	50 to 400	C.S.	S.S.	EPDM	

■Remarks: JIS JIS B 2032 FS Fire Safe Approvals(API607 4th Edition) CE CE Marking NK Nippon Kaiji Kyokai (NK) LR Lloyd's Register of Shipping ABS American Bureau of Shipping

※Please contact us if needed any detailed information.

※1 -46℃ service for Tritec is available with suitable material.
Please consult our sales for the service condition lower than -46℃.
※2 EPDM/NBR: If the fluid contains chlorine, the seat ring could be corroded early by combined factors such as concentration and temperature. For further information please contact our sales staff. In case of chlorine-containing fluid, 846T or 847T (containing fluorine resin) is recommended depending on combined factors such as concentration.
※3 In case of RPTFE, maximum operating temperature should not exceed 230℃.

Approvals

ISO 9001

Due to our highly-evaluated quality system throughout all processes across the entire company, from designing and development to order acceptance, procurement, manufacturing, inspection and shipment, registration of the ISO9001 international standard for quality management systems has been approved.

QUALITY ASSURANCE JIC REGISTERED ORGANIZATION No.0091-ISO 9001

JAB MS CM002

※The certification authority : Tomoe Valve Co., Ltd. (Japan)..... JIC
Shanghai Tomoe Valve Co., Ltd. (China)..... Lloyd's
Tomoe Valve Limited (UK)..... Lloyd's
PT. Tomoe Valve Batam (Indonesia)..... Lloyd's

Certifying authority	Certifying authority accredited by JICQA (JIC Quality Assurance Ltd.), and Japan Accreditation Board
Date of registration	September 11, 1995
Registration number	No.0091
Scope of registration	Designing, development and servicing of butterfly valves, actuators, and accessories

ISO9001 is a standard for a quality system for the entire company, whose scope ranges from quality policy of managers and clarification of responsibility to development, designing, order acceptance, procurement, manufacturing, inspection, shipment, servicing and even education and training. This standard requires systems that supply high-quality products trusted by users.

For fire safety

The symbol on the left indicates that the product is certified by the Fire Equipment and Safety Center of Japan; it is displayed on each product.
Note: When you contact us, please ask our sales staff for "fire-fighting" products.

700ZF
◇Certification Number VA-115

700G
◇Certification Number VA-065-1

702G
◇Certification Number VA-066-1

731P(50～300mm)
◇Certification Number VA-068-1

732P(50～300mm)
◇Certification Number VA-069-1

302Y
◇Certification Number VA-070

334A
◇Certification Number VA-103

907H
◇Certification Number VA-011

903LF
◇Certification Number VA-127

- Dry models other than 302Y cannot be used in places where products are exposed to flame or in environments where pipes are constantly filled with gas.
  However, these models can be used if covered with fire-resistant material such as Rockwool*1, of thickness more than 50 mm, to avoid direct flame.

*1 For selection of Rockwool, please inquire with fire authorities in your district.

- In environments such as above, please use 302Y (dry model).
- Rubber seated valves whose certification numbers have no suffixed numbers after hyphens are certified as wet models.

Waterworks approvals

779J
◇Registration number E-306
Certified by Japan Water Works Association

700ZJ
◇Registration number E-306
Certified by Japan Water Works Association

水道法基準適合 JWWA

Marine approvals

Nippon Kaiji Kyokai (NK)	NK 98FV601B	704G, 722F
	NK 93FV601B	700S, 700E, 720F
	NK 94FV601B	337Y, 331Y
	NK 92FV603B	700G, 901C, 903C
	NK 93FV606B	705G
	NK 09FV601B	302Y, 304Y, 304YA, 302A, 304A, TT2AFR
	NK 10FV604B	907T, 908H
	NK 19FV602B	903L
Lloyd's Register of Shipping	LR 00/10044	704G, 722F
	LR 96/10037	705G
American Bureau of Shipping	A.B.S 17-YO1613848-PDA	705G, 704G, 704R, 705R, 722F, 720F
	A.B.S 19-YO1893143-PDA	302Y, 304Y, 302A, 304A, TT2AFR
Bureau Veritas (France)	02572/IO BV	720F
	09498/D0 BV	704G
	09499/D1 BV	722F
	SMS.W.II/26357/D.0	-

Fire safe approvals

302A・334A
◇API Std 607 4th Edition

TOMOE TRITEC
◇BS 6755 Part 2/API 6FA and API Std 607 4th/5th Edition

TT2
◇API Std 607 4th/5th Edition

Handling Precautions

Butterfly Valves (common to all models)

For improvement of the product, dimensions or material may be changed without notice.
Please contact us for up-to-date information

Storage Conditions

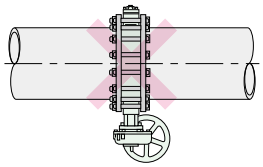
- To protect the seat rings, do not unpack valves until you are ready to install them. If a valve remains unpacked for a long period of time, dust or other particles may enter the valve and cause seat leakage.
- For temporary storage before installing or for long-term storage, keep valves in the vinyl bag in which they came and store them indoors in a cool, well-ventilated location (temperature of -10 to 60C and humidity of 70% or less). Keep the valve away from dusty locations and take care in protecting the valve and actuator from bearing excessive weights.

Installing Valves

- Valves can be installed in any orientation, to allow for the easiest possible operation of the valve. However, be careful of the orientation of the stem when your pipe layout is one of those covered on next page.

Piping Instructions

- Verify the materials of the seat ring and disc of the valve before installation.
- When installing a butterfly valve directly to a check valve or pump, install an extension or spacer to prevent the disc of the butterfly valve from contacting the check valve or pump.
- Install the valve only after completing all welding operations around the valve to prevent damage caused by the solder and other welding materials.
- After welding is performed on a flange, wait until it has sufficiently cooled before installing the valve. Never perform welding on a flange with the valve installed.
- In the surrounding piping, make sure that no welding residue, pipe waste, scaling, or dust remain in the pipe. Clean the inside of the pipes if necessary prior to installation.
- Before blowing air to remove any foreign matter in the piping, install an extension tube with face-to-face dimensions equal to that of the valve in place of the valve. Do not blow air with the valve installed in the pipe, for this may damage the seat ring.
- Clean the mating surface of the flange with compressed air before installation. Remove rust or foreign particles with cleaning alcohol or a neutral detergent.
- With a zinc plated flange, attention must be paid to avoid flange leakage due to an uneven surface of the flange.
- Make sure that there is no warpage in the flange, misalignment, or damage to the mating surface of the flange.
- Be sure to properly align the valve and mounting flanges.
- Install the jack bolts taking care not to damage the seat ring of the valve and adjust the face-to-face dimensions. The face-to-face dimensions should be such that the piping is spread open 3 to 5mm to allow the valve to be inserted.
- If possible, avoid mounting the actuator with it facing downward. Especially for valve sizes of 350mm or larger, where the lower portion of the valve stem bears thrust loads, never install the actuator facing downward.



- After centering the pipes, insert bolts at the proper locations so that the bottom of the valve can rest upon them to prevent the valve from falling through.
- Before tightening the installation bolts, make sure that the disc of the valve does not contact any portion of the flange when it is fully opened.
- Tighten the installation bolts to a torque of no more than 60Nm (6kgfm).
- The installation bolts should be tightened evenly and in the proper sequence. Tighten one bolt a small amount, and then proceed to another bolt that is located on the other side. Proceed tightening each bolt a little at a time by crisscrossing across the flange to insure well-balanced tightening.
- Upon completion of installation, fully open and close the valve once again to make sure that the disc does not touch the piping or gasket.

Operational Instructions

- Prior to operation, clean the outside of the piping with compressed air, and the inside of the piping with running water.
- If the valve is to be used at an opening angle of 30 or under for flow constriction, consult us beforehand.

Also...

- After installation, open and close the valve once every two weeks if the valve is not used for a long period of time, and open and close the valve a few times before starting actual operation.
- For pressure tests of the piping (where pressures exceed the rated pressure), always keep the valve fully open. Never fully close the valve or use it as a blind flange.
- If the actuator is a manual gear, pneumatic cylinder, electric motor, diaphragm or other similar type, and the ambient temperature is extremely high, it may be necessary to change the O-rings and other rubber components using special materials, or change the motor or solenoids to those with higher insulation levels, so be sure to consult us beforhand.
- Always operate lock lever, worm gear, or center handle type actuators by hand. Never use an extension bar on the lever or a wheel key on the gear handle, for they might damage the handle or lever. Unlike gate valves or globe valves, tightening with a high torque is unnecessary.
- Do not loosen the installation bolts or other bolted components before relieving the system pressure.
- To avoid any damage, which may be caused by vibration of piping to a valve, provide a 3D to 5D straight distance from any nozzle orifice or control valve which may be installed at the upper stream of the piping line. (See correct example of a combination of control valve and stop a valve on the right.)
- A valve 350mm or over may have a nut and bolt on the center of the bottom cover to support the weight of disc. Please do not touch it.
- Do not touch any open/close adjusting bolts and screws on any actuators (gear/pneumatic cylinder/electric motor) as these were pre-adjusted.

● We will indicate " level " of danger caused by neglecting these cautions as the following:

⚠ **CAUTION**	This mark indicates " possibility of serious injury to personnels or damage to components "

● We will indicate following marks for your attention.

⊘	This mark indicates that " you must not "

⚠ CAUTION

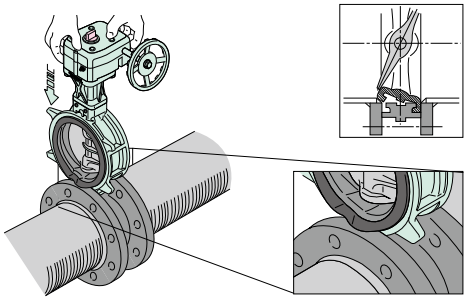
We will indicate " level " of danger caused by neglecting these cautions as the following:

⚠ CAUTION	this mark indicates " possibility of serious injury to personnels or damage to components "

We will indicate following marks for your attention.

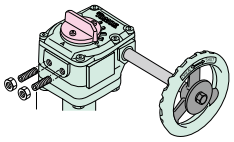
⊘	this mark indicates that " you must not "

⊘ **Forcing the valve between the pipe flanges may cause the seat ring to peel off and cause a leak.**



⊘ **Do not touch the stopper bolts of the gear box.**

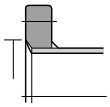
The closed position for the valve will change and result in leaking.



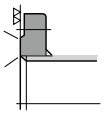
⊘ **Do not throw or mishandle the valve. Do not stand on or put objects on the actuator.**

⊘ **Below are causes of damage to the valve seat or leakage from the flanges.**

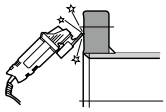
• Excessive Weld
The resulting oversized inner pipe diameter may cause a flange leak.



• Sharp Edges
May cause damage to the seat ring.

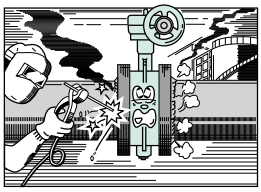


• Rough Surface from Grinding
May cause a flange leak.



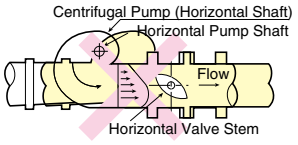
Do not install a valve to a flange that has just been welded.

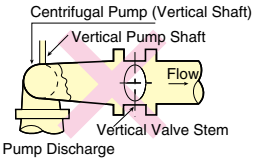
⊘ **Wait until it has sufficiently cooled before installing the valve. Never perform welding on a flange with the valve installed.**

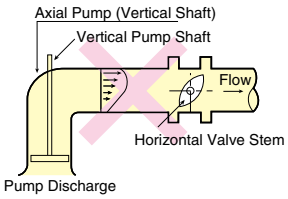


Installing a valve at a pump outlet

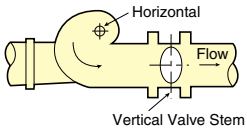
● **Incorrect Installation**

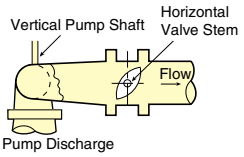


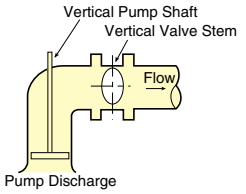




● **Correct Installation**

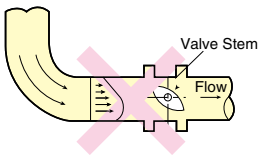


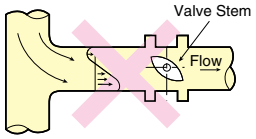


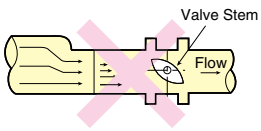


Installing at an elbow or a reducer

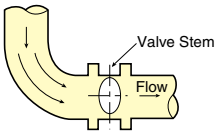
● **Incorrect Installation**

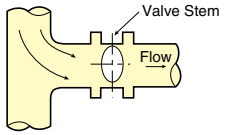


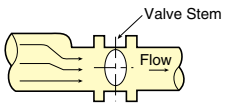




● **Correct Installation**

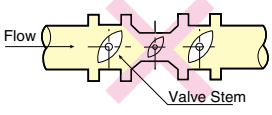






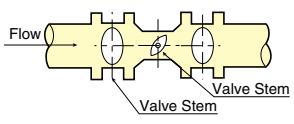
Combination of a control valve and stop valve

● **Incorrect Installation**



All the valve stems have the same orientation.

● **Correct Installation**



The orientation of the valve stems is alternating.

Handling Precautions

High Performance Butterfly Valves

TT2

334A

Tom Disco 302A/304A

Tom Disco 302Y/304Y/304YA

304M(HLV)

Storage Conditions

- Since the PTFE used in the seat rings is easily damaged, do not remove the protective covers on both sides of the valves until you are ready to install the valve (dust or other foreign particles may enter the valve and cause leakage).

Precautions Regarding Piping

- If valve models 337Y/336Y are used in temperatures exceeding 300C, use the specified spiral-wound gaskets.
- The gaskets must be properly aligned with the pipe flanges and the valve.
- Do not use PTFE-covered gaskets or soft gaskets such as rubber gaskets.
- If the actuator is installed so that its weight falls on the piping (e.g. when horizontally installed), install supports for the actuator and bonnet (especially in the case of extension bonnet and fin bonnet types).
- When fluids over 100C are being used, install insulating materials to the valve body where possible.

Installation Instructions

- Check the direction of flow prior to installation.
- Do not apply pressure to or lean on the lever or gear handle during installation.
- Do not use plastic flanges.
- When installing or removing the valve, keep the disc fully closed.
- Before installation, clean the inside of the pipe and flange surface. Make sure that no welding residue, rust, scaling, or dust remain in the pipe. If possible, install an extension tube with face-to-face dimensions equal to that of the valve in place of the valve and blow the inside of the piping clean with compressed air. Then clean the flanges and re-install the valve.
- Never weld on the up-or down-stream pipes while the valve is installed.
- To prevent stress concentration during the installation process, fix the up-and down-stream flanges after installing the valve in the flange.

Operation Instructions

- If leakage from the gland occurs during operation, immediately retighten the gland nuts. The nuts should be tightened alternately and evenly in a diagonal pattern, to avoid imbalance.
- For room temperature or cold to hot heat cycles, or batch flow such as form the base valve of a steam header, be sure to insulate the valve body. Also, warm up the valve before starting operation.

Rearrangement of Actuator

- When removing and remounting the actuator to change its orientation at the job site, align the marks (punch marking) on the top of the valve and the top of the valve stem to ensure proper positioning for the fully-closed position.

Replacement of Packing

- When replacing gland packing or seat ring, close the base valve and remove the valve from the piping.

Also...

- Before using a valve after it has not been used for a long period of time, open and close the handle once or twice.

Other

- When the valve is closed at lever actuator, fully close until the lever hits the stopper of the indicator.

Rotary Control Valves

Installation Instructions

- For rotary control valves (including butterfly valves), basically the rotation of the disc alters the area of the flow path and thereby controls the flow. Therefore, unlike globe valves, if an elbow or tee is placed upstream from the valve, the valve is directly affected by the disturbed flow and cavitation, noise, vibration, or other problems result. In the worst case, this may cause an imbalance of torque on the valve and result in rendering the actuator ineffective. To avoid these problems, install a straight pipe of a sufficient length (at least 6 to 8D) in the valve up-and down-stream side, and carefully consider the orientation of the valve to minimize the affect of drift. In addition, when installing stop valves in front of and behind the valve, leave a space of at least 6D in between.
- The concave side of the disc (the side with the stem exposed) must face upstream.
- Do not use plastic pipes and loose flanges.
- When installing or removing the valve, keep the disc fully closed.
- It is possible that seat leakage occur when fluid (e.g. powder and/or liquid) is solidified by working temperature and other cause. Consult us.
  Please note that use with vertical line such as bottom area of discharge spout of hopper, and tank.

Other

- When the valve is closed at lever actuator, fully close until the lever hits the stopper of the indicator.

507V

Installation Instructions

- Use a gasket when installing the valve.
- If using a diaphragm actuator, the actuator must be installed vertically.

Operation Instructions

- If leakage from the gland occurs during operation, immediately retighten the gland nuts. The nuts should be tightened alternately and evenly in a diagonal pattern, to avoid imbalance.

Other

- When the valve is closed at lever actuator, fully close until the lever hits the stopper of the indicator.

508V

Installation Instructions

- Since no gasket is required, do not install one.
- Valves can be installed in any orientation, to allow for the easiest possible operation of the valve. However, be careful of the orientation of the stem. Also, for valve sizes of 350mm or larger, never install the actuator facing downward. (Refer to “a Handling Precautions”.

Operation Instructions

- The pressure rating of the valve body is ANSI Class 300 (50 to 200mm) and ANSI Class 150 (250 to 400mm). However, since the pressure rating for the valve disc and stem is lower, be sure to have the valve in the open position when performing hydraulic pressure testing of the piping.

Other

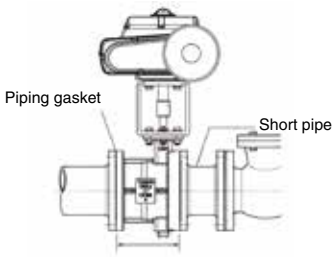
- When the valve is closed at lever actuator, fully close until the lever hits the stopper of the indicator.

Rotary Control Valves

DTM

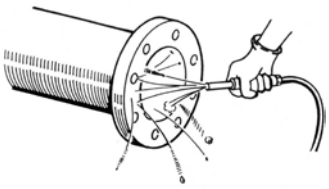
Installation Instructions

- Please use spiral wound gasket if spiral wound gasket is used for JIS10K pipe.
- In case of double flanged body, flange outside diameter and thickness may not be in accordance with the flange spec.
- Please insulate the valve body if used for heat cycle operation from ambient, low temperature to high temperature, and batch cycle operation by main valve of steam header.
- When installing a non-return valve, pump and DTM, always insert a short pipe in between. Not doing so will cause the disc to hit during operation and lead to faulty operation.



※Installation Direction in artwork is "B"direction.

- When the drive member is diaphragm, always keep the stem horizontal and the diaphragm facing up.
- Use air purging to clean the flange faces that will contact the valve. If there is rust or some other foreign material sticking to a flange face, clean it with a suitable cleaning fluid (alcohol or neutral detergent, etc.)



If possible, install in the piping a short pipe with a face-to-face dimension identical to the butterfly valve and blow into the pipe to completely remove foreign substances.

- When performing a pressure test, completely open the valve (if using a pressure higher than the rated pressure). Never use a fully closed valve in place of a blind flange. If inserting a blind flange or similar device, take care not to forcibly insert the flange as the flange face may be damaged on the DTM, causing leakage.

Other

- When the valve is closed at lever actuator, fully close until the lever hits the stopper of the indicator.

Chemically Resistant Butterfly Valves

Storage Conditions

- Since PFA･PTFE is easily damaged, do not unpack the valves until you are ready to install it in the piping.

Installation Instructions

- Except for Models 846T and 847T, a butterfly valve should be installed on a pipeline with gaskets in between piping flanges. For the gasket sizes, adhere to the recommended gasket sizes listed in this catalog and always use a gasket sealer to assure reliable sealing.
- Never use a soft gasket such as rubber gaskets. Doing so may cause malfunctions.
- When installing or removing the valve, keep the valve disc opened to an approximate10 angle.
- It is possible that seat leakage occur when fluid (e.g. powder and/or liquid) is solidified by working temperature and other cause. Consult us.
  Please note that use with vertical line such as bottom area of discharge spout of hopper, and tank.

Other

- When the valve is closed at lever actuator, fully close until the lever hits the stopper of the indicator.

846T/847T

Installation Instructions

- As a rule, these valves do not require a gasket for the pipe flanges. However, if a flange surface is not flat due to scratches, dents, or other such reasons, install a commercially-available gasket.
  However, do not use rubber or other soft gaskets. Doing so may cause malfunctions.

841T/842T

Installation Instructions

- Insert a gasket between the valve and flange. For the gasket size, adhere to the recommended gasket sizes listed in this catalog.
- Do not use rubber or other soft gaskets. Doing so may cause malfunctions.
- After centering the pipes, insert bolts at the proper locations so that the bottom of the valve can rest upon them to prevent the valve from falling through.

Handling Precautions

Rubber Seated Valves

If the fluid contains chlorine, EPDM and NBR seat ring may deteriorate early due to combined factors including density and temperature. In this case, 846T/847T(PTFE seated) is recommended. For details consult us.

Do not use an EPDM seat ring if the fluid contains even a slight amount of oil.

Using an impact wrench

Please be careful when using a high-output impact wrench for installation and tightening piping bolts of rubber seated butterfly valves. Doing so can deform or damage parts such as the valve body, seat ring, piping flange (especially the resin lining pipe) and bolts, depending on the type of impact wrench andhow it is used. If you wish to use an impact wrench, use one with a maximum output that is no more than the values (piping bolt strength) given in the table below.

Table1. Use of Metal Flange (Nm)

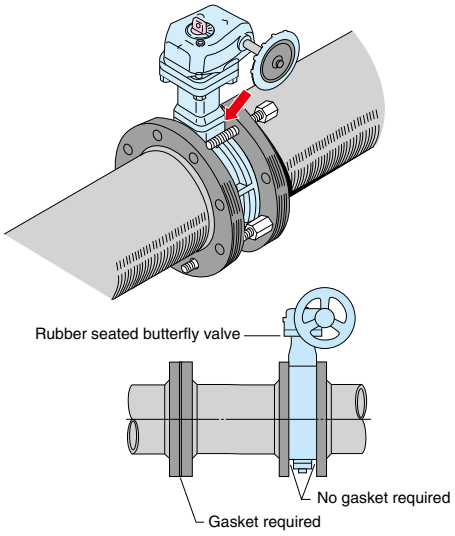
Bolt dia.	M12	M16	M20	M22	M24	M30	M36
Max. impact wrench output (Nm)	43 or less	106 or less	206 or less	280 or less	360 or less	700 or less	1,240 or less

Table2. Use of Resin Flange / Resin Lining Flange (Nm)

Valve port dia.	Bolt dia.	Recommended torque
40 to 100 mm	M16	40
125 to 200 mm	M20	80
250 to 350 mm	M22	100
400 to 500 mm	M24	130
550 to 600 mm	M30	250

Installation Instructions

- Align the pipes and insert the valve between them.
- Since no gasket is required, do not install one. Installing one may cause malfunctions.
- When installing or removing the valve, keep the valve disc opened to an approximate10 angle.
- Do not install a butterfly valve with a rubber seat directly to a rubber flexible joint. The direct connection will result in the improper functioning of the valve. In this case, place a spacer or a mating flange on both sides of the valve between the valve and the rubber flexible joints.



Other

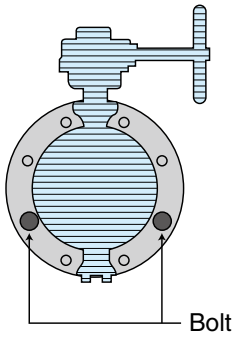
- When the valve is closed at lever actuator, fully close until the lever hits the stopper of the indicator.

700Z

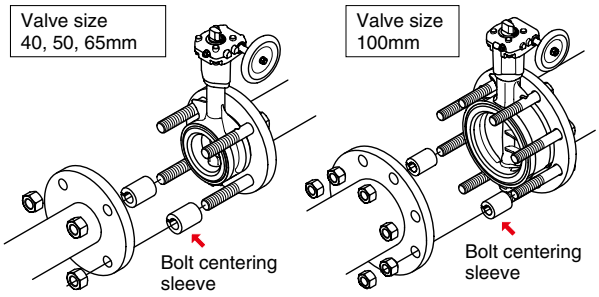
Installation Instructions

- After fixing center of both flanges, insert piping bolts and put the valve. (Fig.1)
- To center the piping for JIS 10K flange, insert centering sleeves on the bolts and install the bolts to support the valve at the bottom and prevent it from falling through (only for 40, 50, 65 and 100mm sizes). (Fig.2)

*Use the provided centering sleeves to facilitate the operation.



[Fig.1]



[Fig.2]

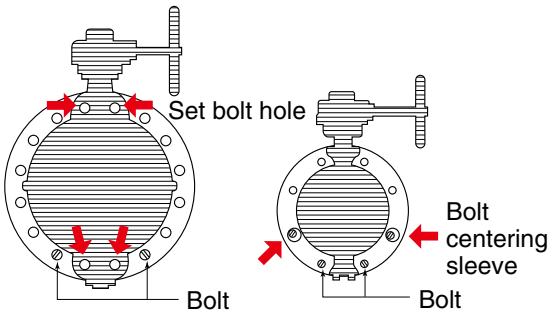
Rubber Seated Valves

700G/704G/705G

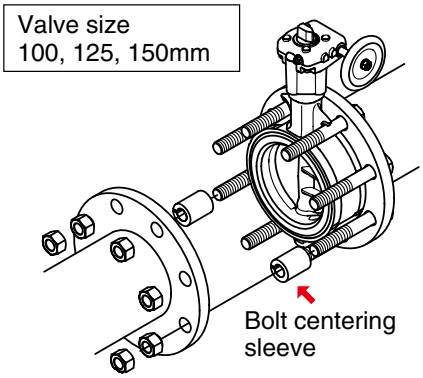
Installation Instructions

- After fixing center of both flanges, insert piping bolts and put the valve. (Fig.1)
- To center the piping for JIS 10K flange, insert centering sleeves on the bolts and install the bolts to support the valve at the bottom and prevent it from falling through (only for 100, 125 and 150mm sizes). (Fig.2)

*Use the provided centering sleeves to facilitate the operation.



[Fig.1]



[Fig.2]

72WG/72SG/72LG

731P/732P/732Q/752W

700E/700K/700S

704G/722F/720F

227P

Storage Conditions

- When stored for a long period of time, the FCD disc (ductile cast iron) and other plated parts (opening/closing board, bolts, nuts, worm shaft, etc.) should be coated with the specified "Ferro Guard" rust preventative once a year.

Installation Instructions

- Avoid solvents from touching the seat ring. Attention must be paid to prevent all materials other than NBR and Viton from being exposed to machine oil.

Handling Precautions

Anti-Vibration Check Valve

MKT

Installation Instructions

- Installation of the MKT immediately after welding the pipe flange will lead to adverse consequences, such as damage to the seatring. Make sure that the temperature has cooled sufficiently and that you have removed weld spatter before installing the MKT. Never weld when the MKT is in the piping. (Fig. A)

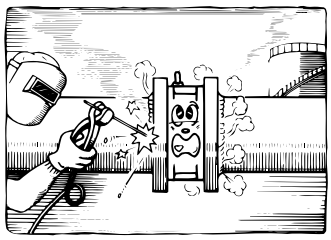


Fig.A

- The flange may leak if the flange face that contacts the MKT is as shown in Fig. B. Also, please confirm that there is no deformation to the flange or that there is no damage, such as scratches, on the flange surface.

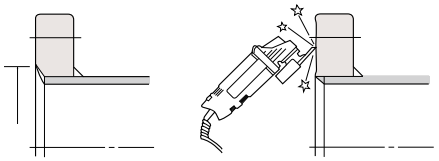


Fig.B

- **Excessive weld**
  The resulting oversized inner pipe diameter may cause a flange leak.
- **Rough surface from grinding**
  May cause a flange leak.

- Always be sure to use a piping gasket. The piping gasket will enter the piping inside and cause malfunction if a rubber or similar soft gasket is used. Therefore, make sure that the piping gasket does not enter the radius of MKT plate operation. (Fig. C)

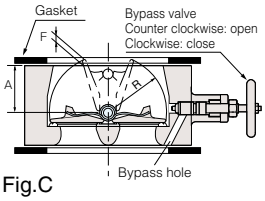


Fig.C

(Table 1) Plate operation radii

Nominal size		R	A	F※1
mm	inch			
50	2	29.0	30.0	0.0
65	2 1/2	36.3	36.0	0.0
80	3	43.2	40.5	0.0
100	4	53.3	38.0	10.5
125	5	66.0	47.5	13.5
150	6	78.9	53.5	20.0
200	8	104.2	72.0	24.5
250	10	129.8	83.5	30.3
300	12	154.5	110.0	23.0

※1. "0" when disk does not fly out.

- Align the MKT to the flanges accurately. Malfunction can occur if the pipe edge or piping gasket enters the radius of MKT plate operation.

- Do not apply strong shock such as by throwing the MKT.

- When installing butterfly valve and MKT, always insert a short pipe in between. Not doing so will cause the disc to hit during operation and lead to faulty operation. (Fig. D)

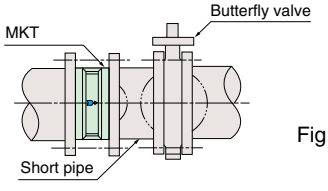


Fig.D

- Direct installation on the pump is possible, but please be sure to follow the cautions below.
  1 If the flow rate distribution is uneven immediately after the spiral pump, etc., make the flow rate distribution that is received by both plates of the check valve equal by installing so that the changing direction in the flow rate distribution is parallel to the hinge pin direction, as shown in (Fig. E)
  2 An average pump exit flow rate as a using conditwn must be no more than 10 m/sec (fresh water).
  3 If fluids exceed a flow rate of 5 m/s, cavitation may occur from the check valve. Therefore, separate the valve or other device on the downstream side by at least 2D when installing.
  4 Be careful of pressure loss in the check valve. (Refer to the Head loss vs. Flow table.)

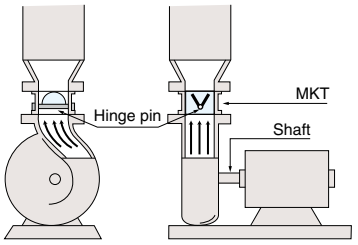


Fig.E

- Please consult us when the velocity flow by liquid exceeds 10 m/sec.

- Seat leakage may occur if the difference pressure is less than 0.04 MPa.

- Make sure no solvent gets onto the seat ring. If EPDM rubber is used, always keep the seat ring away from any machine oil. (The rubber material shows on the name plate).

- When installing the check valve, the installation direction should be in accordance with the following.
  1 For a horizontal installation make sure the check valve hinge pin is vertical. (Fig. F)

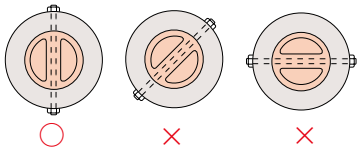


Fig.F

  2 For elbow or pump exit installations, make surely the influence of the flow rate on the plate to be well balanced. (Fig. G)
  3 For installations on the downstream side of butterfly valves, make surely the valve shaft of the butterfly valve and the hinge pin of the check valve crosses alternately.

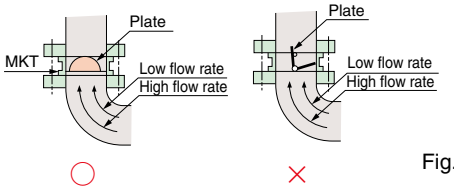


Fig.G

Although vibration caused by the pump and fluid will not affect MKT series valves, please install flexible piping or similar one in order to prevent any downstream piping and devices from vibretion affecting.

901C/903L/905L

Installation Instructions

- Install the valve so that the cast marking on the body of the Bata-Check corresponds with the flow direction. (Fig. 1)
- Vertical installation is also possible.

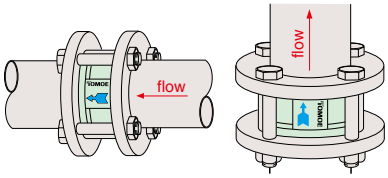


Fig.1

- For horizontal installation, have the rib of the Bata-Check aligned vertically. (Fig. 2)

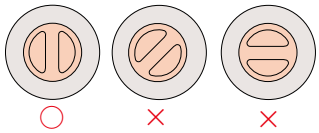


Fig.2

- Always place an extension pipe between a Bata-Check valve and butterfly valve. Never connect the two valves directly together. (Fig. 3)

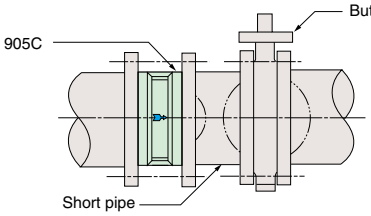


Fig.3

- Make sure that the end of a pipe or gasket does not come within the operating radius of the plate of the Bata-Check valve. (Fig. 4)

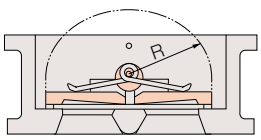


Fig.4

- When mounting a reducer in front of a Bata-Check valve, have a space of 5 times the valve diameter (5D) or more, or at least 2 to 3D between the valve and reducer. (Fig. 5)

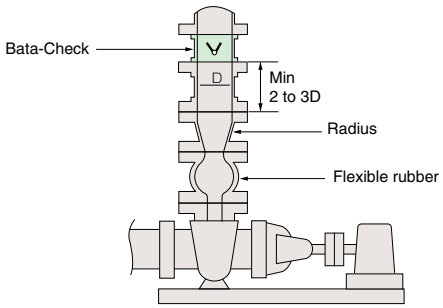


Fig.5

- When installing a Bata-Check valve near an elbow, have as large a space as possible between the elbow and the Bata-Check valve. Also, make sure that both plates are stressed evenly by the flow. (Fig. 6)

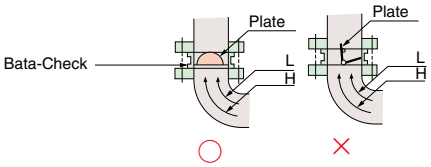


Fig.6

- When installing a Bata-Check valve at the outlet from a pump, leave a space of at least 6 times the valve diameter (6D) between the valve and pump. Also, make sure that both plates are stressed evenly by the flow. (Fig. 7)

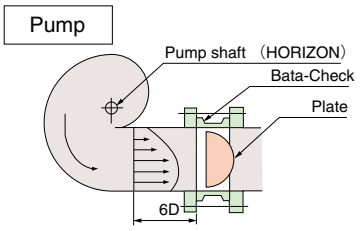


Fig.7

- Consult us when the liquid velocity flow exceeds 3m/sec.
- Seat leakage may occur if the pressure difference is less than 0.02Mpa.

Handling Precautions

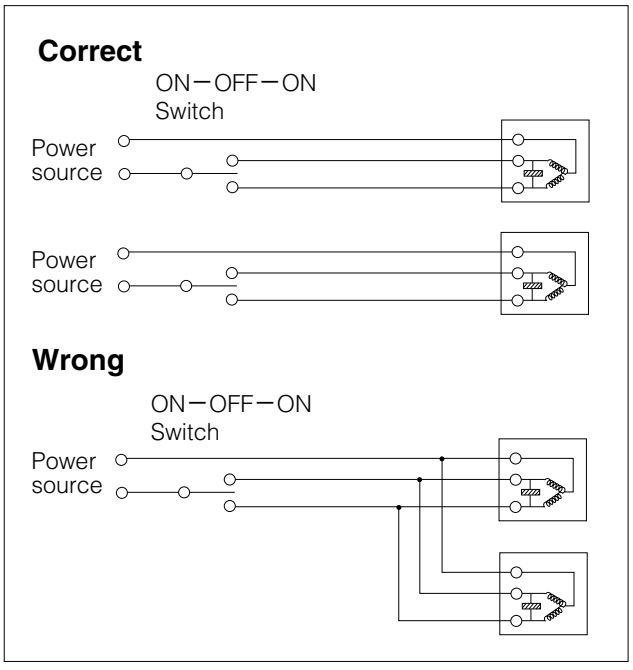
Actuators

Motorized Actuators

Handling Precautions

- The built-in spare limit switch for the fully opened and closed positions of the motorized actuator (non-voltage output switches for the fully opened and closed positions) is adjusted at the factory to output approximately 2% ahead of the position for actual sealing at the rated pressure. This is done to activate the limit switches with different cams. Since the positioning switch and opening angle detection switch must not activate simultaneously, the spare limit switch is set to always activate first. Therefore, if this output is used to stop the motor or signals, the valve will stop at that position and the sealing ability will be compromised. If your control requirements or other factors require that valve positioning be determined by the spare limit switches, be sure to inform us at the time of ordering. We will then adjust the output position for the spare limit switch to correspond to the fully closed position.

- Each electric motor actuator should be operated by an independent circuit breaker or relay. If more than two electric motor actuators are operated by one circuit, erroneous operation may result due to a loop circuit.



- Prepare a protection cover for the electric motor actuator to protect it from any corrosive fluid, such as cooling water with hypochorous acid that spreads out from a cooling tower directly. If no protection is provided, the sealing parts and actuator housing may become damaged.
- Prevent hunting of electric motor actuator with proper PID adjustment when employing it for proportional control purposes. Otherwise, the life of the valve and actuator will shorten due to wearing of the friction and connection parts.

New ELMY

Handling Precautions

- Perform the wiring in accordance with the diagram on the inside of the casing cover. After completing the wiring, verify the wiring connections carefully to make sure there are no mistakes.
- To prevent rainwater and the like from entering the unit at the two wiring outlets (G1/2), take the appropriate measures to assure a watertight seal.
- Every cover of the actuator is sealed with an O-ring sealing gasket. Take care not to damage the gaskets during disassembly or assembly of the actuator.
- Except for the top cover, all the screws for the covers have a sealing agent applied to them to prevent the screws from working loose. When removing a screw, take care not to strip the head of the screw with the screwdriver. Also, when installing a screw, apply a sealing agent to the screw and then install it.
- When adjusting the open/close limit switch, be sure to release the lock nut on the stopper bolt and then loosen the stopper bolt by 4 to 5 turns.
- Make a 0.5 second interval when reversing the electric motor actuator from intermediate position utilizing a potentiometer. Surge current generated from a motor may create some damage to the switching relay when reversing it. Modifications to the reduction gear or upgrading of the actuator may be required. Consult us.
- Each electric motor actuator should be operated by an independent circuit breaker or relay. Erroneous operation may be caused by a loop circuit if more than two motor actuators are operated by one circuit breaker or relay.
- Manual operation unit should be used after the power supply is cut. It may suddenly turn if the power is supplied.

New MICOM ELMY III

The "WARNING" mark indicates the possibility of death or serious injury.

- Before wiring the actuator, make sure that the power supply matches that listed on the specifications plate on the actuator. If the wrong voltage is supplied, it may cause the actuator to burn out.
- Be sure to connect the earth terminal to avoid electrical shocks.
- To prevent rainwater and the like from entering the unit at the two wiring outlets (G1/2), take the appropriate measures to assure a watertight seal. If moisture enters the unit, it may damage the actuator or cause it to burn out.
- If you need to touch a dip switch or reset a switch for adjustment or inspection, do not touch any other components or terminals on the circuit board. Careless touching of components or terminals may cause electrical shocks.

The "CAUTION" mark indicates the possibility of serious injury or damage to equipment.

- All necessary settings are completed prior to shipment from our factory. If any modifications or adjustments are required, follow the directions given in the instruction manual. Incorrect procedures may cause improper operation or damage to the components.
- When wiring the actuator, be sure to follow the circuit diagram. Be sure to then verify that there are no mistakes before supplying power to the actuator.
- The input and output signal wires in the unit built into the actuator are not insulated. If insulation is required, install a converter on the outside of the unit. Not doing so may cause improper operation.
- When setting the dip switches, do not apply excessive force as this could damage the switches.
- The input signal has preference over the contact input of a 4 to 20mA signal. If the 4 to 20mA signal is used for control, then be sure to eliminate the contact signal. Failure to do so may cause improper operation.
- When two actuators are controlled by one input signal, make sure that the signal is within the allowable load resistance of the output side. Failure to do so may cause improper operation.
- Do not apply loads over the capacity of output contacts for the opening angle, alarms, or stop signals.
- There are times when the surface of the actuator becomes hot during operation. This is caused by the heat from the internal motor and not due to a malfunction. However, if valve operation is more frequent than the allowable amount, the temperature alarm may sound and cause a compulsory stop.
- Every cover of the actuator is sealed with an O-ring sealing gasket. Take care not to damage the gaskets during wiring or inspecting of the actuator. The sealing properties will decrease, which may lead to malfunction.
- Except for the top cover, all the screws for the covers have a sealing agent applied to them to prevent the screws from working loose. When removing a screw, take care not to strip the head of the screw with the screwdriver.

Pneumatic Actuators

The "WARNING" mark indicates the possibility of death or serious injury.

This unit should be handled by well-versed and experienced technicians only.

- Compressed air is hazardous if wrongly handled. A machine or a unit utilizing compressed air should be handled by a well-trained professional technicians only.

Handling or dismantling of the unit should not be carried out before confirming the safety precautions.

- Inspection and maintenance should commence only after acknowledgment of safety precautions such as preventions against falling of parts or material or other accidental happenings.
- The unit should only be dismantled after confirmation of the above safety precautions and after removal of the air supply and power sources.
- Before restarting of the unit, ensure that the action of the movements are in a safe and normal position.

Handling Precautions

- During installation, make sure that no dust or any foreign matter enters through the air port.
- When attaching joints to taper screws on the air port, make sure that you screw them in properly and straightly. Do not overtighten as you may damage the threads. Also, be careful during the initial threading to ensure the proper catching of the threads.
- Use a speed controller to control rotating speed. Use a pressure reducing valve for speed adjustment.
- In the airline, install an air filter to remove any moisture or dust from the air. Moisture or dust will deteriorate the valve and shorten its operating life.
- Avoid use in ambient temperatures over 80C. Use in such high temperatures may cause malfunctions.
- Do not subject the cylinder or peripheral components to excessive forces such shocks or impacts with other objects.
- This cylinder is a non-lubricated type, however, you may provide lubrication for the protection of peripheral equipment. (Use JISK-2213 turbine additive oil No.1, No.2, or similar oil. Never use spindle oil or machine oil, as they deteriorate the O-rings and other rubber components.)
- Periodically check and retighten the bolts.
- Check and clean the actuator once a year even if it is not or has not been in use.
- If an external or internal air leak occurs during operation, inspect the actuator and check the condition of the O-rings and look for abrasion of the moving parts. If any component is damaged, replace it with a new one right away.

New T-DYNAMO

Handling Precautions

- The hexagonal bolts that retain the cover must not be slackened.
- On single acting types, removal of the cover will cause the spring to eject out, due to it s tensile strength impact and may cause injury or damage. In case of abnormal operation of the unit, customers are requested to contact our sales department.
- In the case of single acting actuators being installed outdoors, a rain-prevention precaution is required: the elbows on the air inlet/outlet ports should be oriented downwards, for example.
- When the case and the beas plate are separeted, appling screw slack inhibitor to bolt before re-assembly.

Handling Precautions

Condition Monitoring Unit

Tom Probe Series

The "WARNING" sign indicates possibility of death or serious injury.

•This product is not explosion-proof, and cannot be used in an explosion-prone area.

The "CAUTION" sign indicates the possibility of serious injury or damage to components.

Wiring Precautions

- Wiring should be performed by experienced technicians with electrical knowledge and only in accordance with local laws and regulations and each company's wiring and electrical work codes.
- Perform the wiring while the power is off. Otherwise electrical shocks may be caused.
- Before commencing the wiring, make sure that the power supply matches that listed on the specifications plate on the product. If the wrong voltage is supplied, the product may burn out.
- Do not use force to pull on the cables emerging from the cable gland. Otherwise, the interior of the main unit will be damaged, which may cause malfunctions.
- Before commencing the wiring, remove shavings, cutting oil, dust, etc. from the inside of the conduit.
- When performing the wiring, be sure to follow the circuit diagram. On completion, be sure to verify that there are no errors before supplying power to the product.
- Each cover is sealed with waterproof packing. Be careful not to damage the waterproof packing during wiring and inspection. Otherwise, sealing capability may be degraded, which may cause malfunctions.
- For electrical wiring from the power source, the voltage required for the device may be insufficient due to a drop in voltage caused by current fluctuation or power line resistance. Please design appropriate wiring at the planning phase to ensure correct supply voltage to the product.
- Ensure that each unused wire is insulated. If multiple wires are insulated together or an unused wire is not insulated properly, it may cause electrical shocks or a fire.
- If the switching contact output is at or below the minimum operating load, it may not overcome the oxide film, etc. which forms on the surface of the relay contact, and this may cause contact failure.
- As in the case of general relays, when an inductive load such as a DC motor and a DC solenoid is connected, the contact should be protected with a diode which absorbs surges, etc.

Precautions Regarding Initial Setting

- The valve opening/closing position depends on valve installation and piping design, and the full opening/closing position after installation may differ from the full opening/closing position before installation. To set the opening/closing position correctly, be sure to utilize the opening/closing position learning function after the valve is connected to the piping. This function opens/closes the valve automatically to detect the valve's full opening and closing positions. Before commencing this function, ensure that the valve opening/closing will not cause injury or impact on the system.
- For the communication network, communication is performed using our company's dedicated protocol via RS485.
- For the RS485 node network, configure the network in the daisy chain or bus topology. Design the wiring to keep the length of the branch lines from the trunk line as short as possible.
- For TPro1100 and TPro1700, a termination resistor is included in the interior of the device. For those devices which are located at the end of the daisy chain network, the terminator should be effective (ON side).
- If there are two or more nodes on the same communication network whose local network ID is the same, communication cannot be established correctly.
- If 0 is selected for the local network ID, communication is established with no devices.
- All of the data is recorded using information from the built-in calendar and clock in TPro1100. Thus the date and time must be set correctly.

Precautions After Starting Operation

- Improper attachment of the USB waterproof cap may allow entry of rainwater into the interior of the unit or allow corrosion inside the connector, which may lead to malfunction.

Maintenance Precautions

- Before commencing maintenance, ensure that the valve opening/closing will not cause injury or impact on the system. In particular, ASF performs a partial stroke test where the valve is automatically opened/closed slightly, based on the calendar in TPro1100. Perform maintenance after ensuring that ASF operation cannot cause injury or impact on the system.
- Before sending the product for repair, be sure to disable ASF. If this function is not disabled, a repair engineer may be injured when the valve is automatically opened/closed slightly, based on the calendar in the main unit.
- Before commencing disassembly, be sure to turn off the power to the unit, and take necessary precautions so that the valve cannot be operated. Otherwise, electrical shocks or malfunctions may be caused.

Guideline for Inspection of Our Products

Warranty period for our products is described in this catalog in "Warranty Period" under "Before Placing Your Order". For inspection of our products, please refer to the following as a guideline (only if the product is used with clean water at room temperature and at a pressure less than the rated pressure of the valve).
Initial performance retention life (inspection interval) is shown below. Please perform inspection and maintenance at every inspection interval.

■Concentric rubber seated butterfly valves (valve bodies)

Rubber seated valves are based on JISB2032 (wafer type rubber seated butterfly valves).
"After maximum operating hydraulic pressure is applied using clean water with the valve fully closed at room temperature and then repeating full opening/closing operation of the valve 10,000 times, no leakage shall be observed from the seat at 1.1 times the maximum operating pressure." (Excerpt from JISB2032-2009)
The life of the valve may be shortened if the ambient temperature is 50ºC or higher, if the fluid is corrosive, viscous and adherent, or if the fluid contains foreign or solid substances. [Table 1] [Table 2]

[Table 1]

Inspection interval if valve seat ring cannot be replaced	NAV series (Note 1)	High pressure valves with vulcanized seat	Check valves
	700Z series NAV series	731P, 732P, 733P	901C, 903C, 905C, 906C, 907H, 908H, 903L, 907L
Initial performance retention life (inspection interval) (Note 2)	Inspection interval is one year or 10,000 cycles of opening/closing, whichever comes first. Check for external leakage, loose bolts, valve seat leakage and abnormal operation. If any abnormality is found, detach the valve from the piping and check for corrosion of the valve body and wear of the seat ring. If any abnormality is found in these parts, replace the valve.		

[Table 2]

Rubber seated valves other than those above
Inspection interval is one year or 10,000 cycles of opening/closing, whichever comes first. Check for external leakage, loose bolts, valve seat leakage and abnormal operation. If any abnormality is found, detach the valve from the piping and check for corrosion of the valve body and wear of the seat ring. If any abnormality is found in these parts, replace consumables such as seat ring and packing. Performing the above maintenance can extend the valve's life to more than 10,000 cycles.

■Double eccentric valves (soft seated valves)

The level of performance and functionality at the time of shipment can be maintained until 3,000 cycles of opening/closing. However, this designed lifetime could become shortened depending on temperature conditions and type of fluid (corrosiveness, viscosity, solid matter and deposit).
Inspection interval is one year or 3,000 cycles of opening/closing, whichever comes first. Check for external leakage, loose bolts, valve seat leakage and abnormal operation. If any abnormality is found, detach the valve from the piping and check for corrosion of the valve body and wear of the seat ring. If necessary, replace consumables such as seat ring and packing.
Retighten gland packing, bottom cover bolts and piping bolts if needed.

■Double/triple eccentric butterfly valves (metal seated valves)

Regulations on seat leakage described in the valve specification are inspection standards at the time of shipment.
Leakage rate may increase depending on ambient temperature, pressure condition and type of fluid. Perform maintenance on sealing parts: their life is 3,000 cycles of opening/closing at most. (Replace them if needed.)
Inspection interval is one year or 3,000 cycles of opening/closing, whichever comes first. Check for external leakage, loose bolts, valve seat leakage and abnormal operation. If any abnormality is found, detach the valve from the piping and check for corrosion of the valve body and wear of the seat ring. If necessary, replace consumables such as seat ring and packing.
Retighten gland packing, bottom cover bolts and piping bolts if needed.

■Actuators (gears, levers) 1L, 1T, 1G, 1J, 2U, 2K, 2S, 2E

These parts are basically maintenance-free, but if the valve is frequently opened and closed (more than 10,000 cycles per year) or used in a bad environment (saline or moist environment), check for corrosion and loose bolts every 10,000 cycles or one year by visual inspection. If any abnormality is found, follow the instruction described in "All actuators" below.

■Actuators (cylinders) 7E, 7G, 7F, 3A, 3K, 3U

Inspection interval is 50,000 cycles of opening/closing or one year.
If any abnormality is found, follow the instruction described in "All actuators" below.

■Actuators (motorized actuators) 4I

For other motorized actuators, please contact us.
Inspection interval is 30,000 cycles of opening/closing or one year.
If any abnormality is found, follow the instruction described in "All actuators" below.

■All actuators

If any abnormality is found, open the lid of the actuator's reducer and check for ingress of water, discoloration of grease and damage to gears. If needed, perform maintenance such as greasing. If water ingress or gear damage is found, replace the actuator. For further information, refer to the instruction manual of each model. [Table 3]

■Status Monitoring Unit (Tom Probe) TPro1100, TPro1700

At least once a year, check for loosening of the mounting bolts for the main unit. If loose bolts are found, retighten them.
Check for loosening of the cable gland where the wires exit.
If the cable gland has loosened, retighten it.

Handling Precautions

Guideline for Inspection of Our Products

[Table 3]

Type of products	Inspection interval and initial performance retention life (cycles of opening/closing or usable years)	Type of maintenance
700Z series (Note 1)	10,000 cycles or 1 year	Appearance check Replacement of valve
Valves whose seats cannot be replaced (Note 2)	10,000 cycles or 1 year	Appearance check Replacement of valve
Concentric rubber seated butterfly valves (other than the above types)	10,000 cycles or 1 year	Appearance check Replacement of consumables
Double eccentric valves (soft seated)	3,000 cycles or 1 year	Appearance check Replacement of consumables
Double/triple eccentric valves (metal seated)	3,000 cycles or 1 year	Appearance check Replacement of consumables
Manual actuators (gears, levers)	10,000 cycles or 1 year	Appearance check Greasing, etc.
Automatic actuators (cylinders)	50,000 cycles or 1 year	Appearance check Replacement of consumables Greasing, etc
Automatic actuators (motorized)	30,000 cycles or 1 year Predetermined inspection needed	Regular inspection Check for abnormality Greasing, etc.

Life of valves is based on the extent of their use with clean water at room temperature and below rated pressure.
Usage condition of actuators, such as the ambient environment, should be within the range described in each specification and should not be in corrosive atmosphere (Note 3) (including installation near the shore).
If you need to use the product outside the above range, please check with us before placing your order.

Note 1) 700Z series: 700Z, 700ZK, 700ZS, 700ZJ, 700ZY, 700YJ
NAV series: 763Z, 773Z, 775Z, 775J, 776Z, 778Z, 778J, 779Z, 779J, 783Z, 785J, 788J
Note 2) Models whose rubber seats cannot be replaced are the following:
700Z series: 700Z, 700ZK, 700ZS, 700ZJ, 700ZY, 700YJ
NAV series: 763Z, 773Z, 775Z, 775J, 776Z, 778Z, 778J, 779Z, 779J, 783Z, 785J, 788J
731P series: 731P, 732P, 732X (vulcanized seat)
Check valves: 901C, 903C, 905C, 906C, 907H, 908H
Note 3) Corrosive atmosphere means an external environment that includes gases that corrode metal, rubber and resin (e.g. chlorine, saline air, etc.) or an environment in which the products are constantly exposed to water.
Note) For further information on inspection and disassembly, please refer to the instruction manual.
Note) The cycle described above means a repetition of opening/closing of a valve including full closing. The cycle does not include repetition of slight controlling movements with the valve half open. In such a case, each usage needs to be considered.

Information on discontinued models

**Information on discontinued models is provided below.
For further information on standard specifications,
please refer to the catalog before use.**

Information on discontinued models

Discontinued model	Nominal size	Date of sale discontinuation	Date of discontinuation of parts supply	Recommended alternative model
		＜High Performance Butterfly Valve＞		
336Y	350～600mm	2000.05.01	2005.04.30	**302A**
331Y	80～300mm	2000.05.01	2005.04.30	**304A**
		＜Chemically Resistant Butterfly Valves＞		
841T	250･300mm	2012.10.31	2017.10.31	**846T**
842T	250･300mm	2004.05.01	2009.04.30	**847T**
841T	50～200mm	2001.06.01	2006.05.31	**50mm:847T** **65～200mm:846T**
842T	50～200mm	1999.12.01	2004.11.30	**847T**
		＜Rubber Seated Valves＞		
700G/705G Only FCD450 disc	350～600mm	2019.12.31	2019.12.31	**700G/705G** SCS13 disc
700S ※	550mm	2019.12.31	2019.12.31	**700G/705G**
KRV	1400～2000mm	2018.12.31	2018.12.31	Consult us
773Z	40～300mm	2014.04.01	—	**NEW 700Z**
731X • 732X	350～600mm	2013.09.03	—	**731P • 732P** Model names integrated, but no change in product specification
SF490A Dacrotized Disc (700G･705G･704G)	65mm	2008.11	2009.10	**SCS14** (Ribbed) valve disc
702Z	40～300mm	2004.05.01	2009.04.30	**NEW 700Z**
700S ※	50～600mm (except for 550mm)	2004.05.01	2009.04.30	**700G** **705G**
732X	50～300mm	2000.10.01	2005.09.30	**731P･732P**
731X	50～300mm	1999.01.05	2003.12.31	**731P･732P**
641B	50～200mm	1999.06.01	2004.05.31	—
720F	50～800mm	1999.06.01	2004.06.01	**50～100mm:704G** **125～800mm:722F**
731X	350～400mm	1999.01.05	2003.12.31	**732X**
OLD 700Z	40～200mm	1998.09.01	2003.08.31	**NEW 700Z**
700E	50～600mm	1998.04.01	2003.03.31	**700G**
		＜Check Valves＞		
903C	50～300mm	2019.05.31	—	**903L**
907H	50～400mm	2018.12.31	—	**907T**
906C	50～300mm	2018.06.30	—	**907T**
904C		2010.07.31	2010.07.31	**908H**

Discontinued model	Date of sale discontinuation	Date of discontinuation of parts supply	Recommended alternative model
	＜Motorized Actuator＞		
PMK080SRM	2009.06.30	2010.06.30	**PMK-100CR**
SRE	2005.12.31	2010.12.30	**SRJ**
PMK030SRM	2003.07.31	2006.07.31	**PMK-030CR**
MICOM ELMY	1997.03.01	2002.02.28	**New MICOM ELMY**
	＜Pneumatic Actuator＞		
T-DYNAMO (3E/3F/3G)	2013.11.30	2018.11.30	**NEW T-DYNAMO** (7E/7F/7G)
T-matic	2006.10.31	2011.10.30	**NEW T-DYNAMO** (7E/7F/7G)
Z cylinder	2000.07.01	2005.06.30	**NEW T-DYNAMO** (7E/7F/7G)
6A, 6B	2017.12.31	2019.12.31	**3U, 3K, 7F, 7G**
	＜Manual Actuator＞		
2C gear	2017.12.31	2017.12.31	**2G gear**
1G lever	2004.06.01	2009.05.31	**1T lever**
2M gear	2000.09.01	2000.09.01	**2U gear**
1M lever	1997.10.01	2002.09.30	**1T lever**

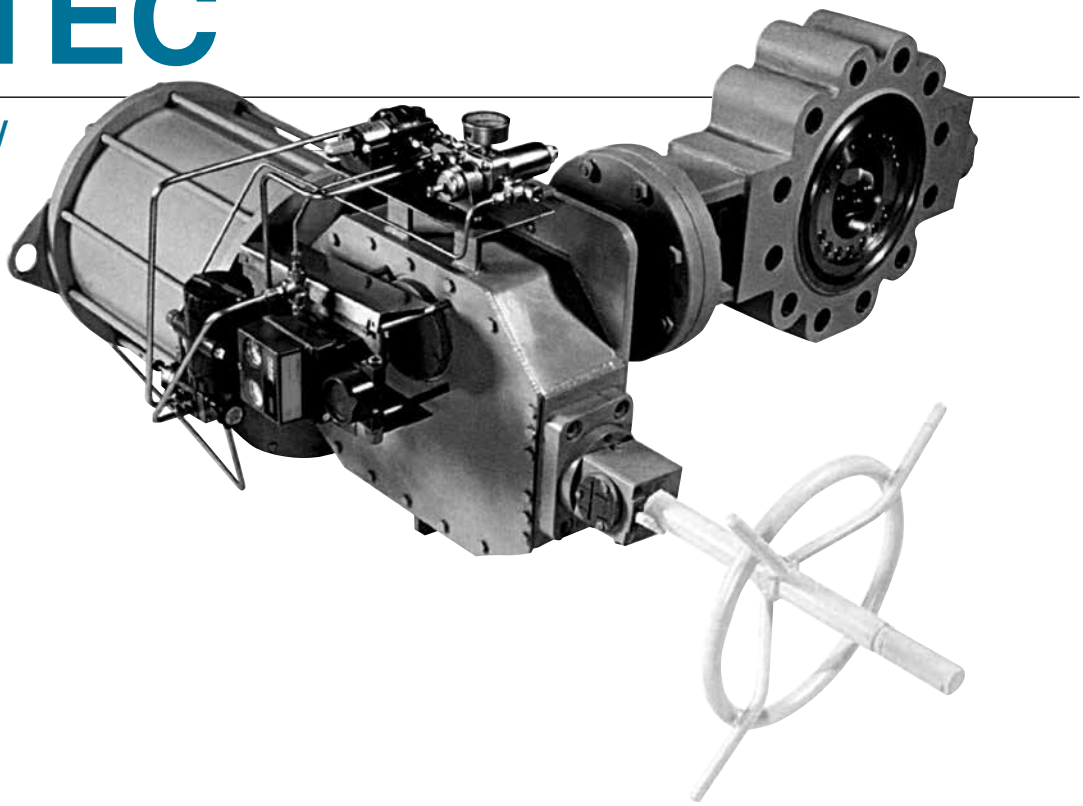
※ Following material combination is continued production; Body FC250 / Disc SCS13 / Stem SUS403 / Seatring NBR or EPDM
Spare parts seatring set (NBR or EPDM).
Please contact the sales office for further information.

BUTTERFLY VALVES SELECTION GUIDE

Butterfly Valves Selection Guide

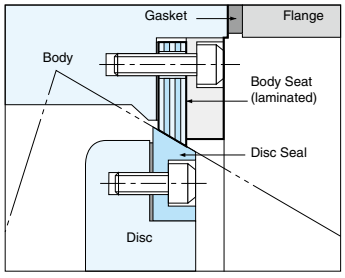
TRITEC

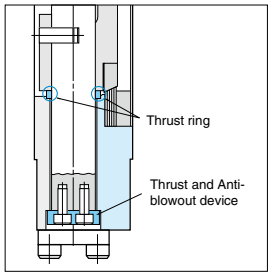
150 / 300 / 600 / 900 / 1500 / 2500lb Range



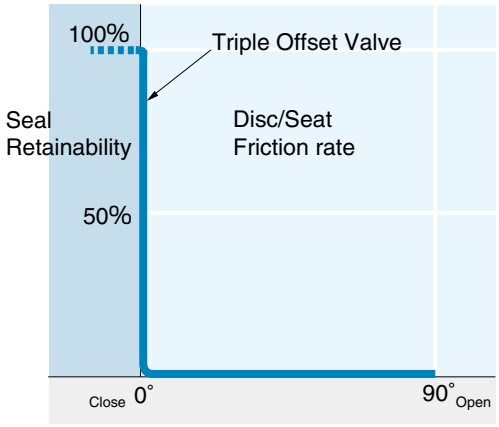
Features and Benefits

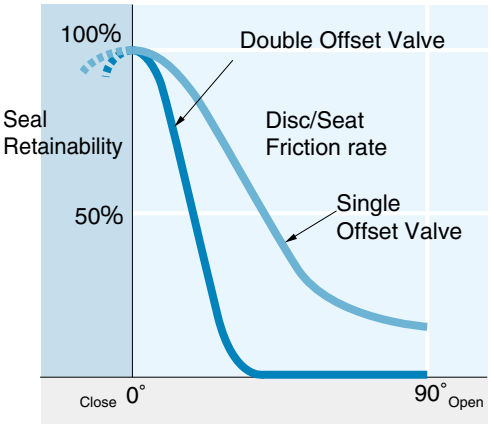
- Triple offset and ellipsoidal sealing Geometry
- Bi-directional bubble tight shut-off
- Inherently Firesafe
- Developed Geometry results in
  - Zero Seat/Seal Friction
  - Low Torques
  - Extended Service Life
  - Continued Seal through Thermal Cycling
  - Torque Seating
- Excellent flow and throttling characteristics covering services from Cryogenic to high temperature
- Excellent control of Fugitive Emission by virtue of Rotary stem movement and advanced packing materials
  - Less than 50ppm on Fugitive
  - Emission Test to cover EPA21
  - Other tests available on request
- Firesafe meet API Std 607 4th / 5th Edition and BS 6755 part 2 / API 6FA
- Available Fully Rated to Class 2500Lb
- Fully rated for end of line duty
- Standard materials conform to NACE,all exotic materials also available
- Laminated seat is mounted in the body, removing it from the erosive effects of the flowing media
- Seat is self centering “floating” design
- Both Seat and Seal are field replaceable without special tools
- Unique elliptical bolting pattern allows foolproof replacement of seat and seal
- Gasket Sealing Face is completely uninterrupted by fixings
- Suitable for use with Spiral Wound gaskets and all flange finishes including RTJ
- Antiblowout device on shaft with both internal and external retaining systems according to API Std 609
- ISO mounting flange allows easy fitting and changing of operators
- Operator is bolted and doweled to prevent radial movement and subsequent loss of seating torque
- Body counterbore and seat bolting arranged elliptically to ensure equal support, gasket land and gasket loading all around the elliptical edge of the laminated body seat
- Inboard and outboard thrust mechanisms prevent decentralising of disc, even under high temperature and line pressure
- By eliminating seat-seal friction on unseating, Tritec removes the “Blind Zone” and increases the rangeability or controllable range to the full 90˚ of movement. The rotation geometry and inboard bearing design reduce the effect of dynamic torque and mechanical noise-vibration, increasing midrange control accuracy. Cavitation and Noise reducers are available to complement the Tritec valve under high pressure drop process situations



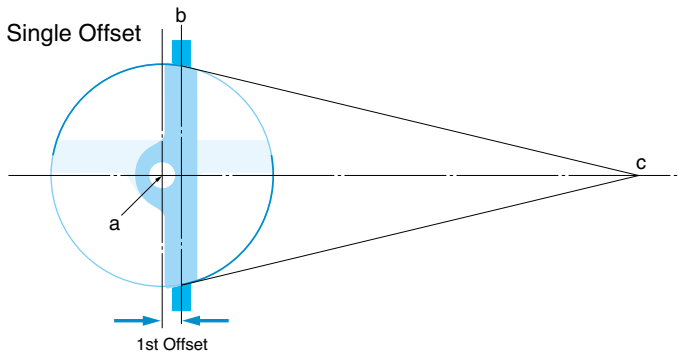


Offset Valve-Disc / Seat Friction

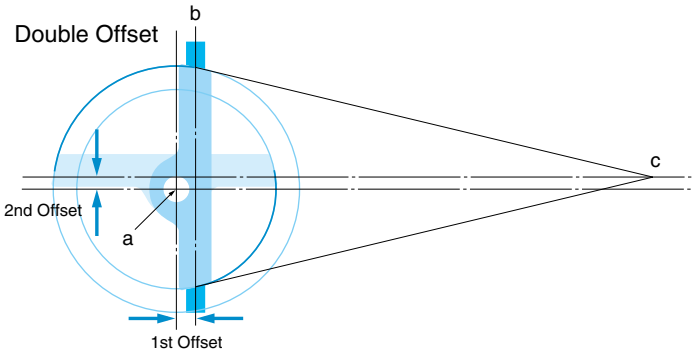




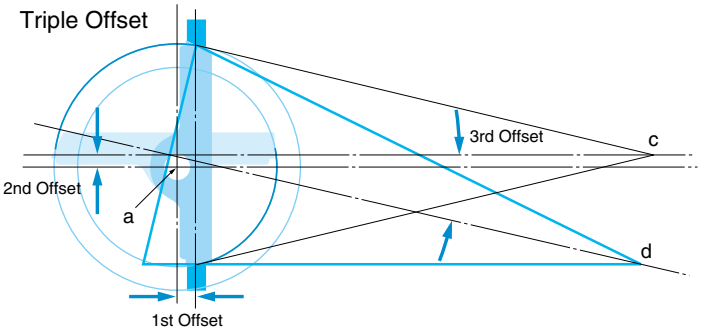
Tracing the evolution of Triple Offset design



The centre of rotation is moved back from the centreline of the valve disc. The seat and seal are designed conically and on centre. This design relies on a frictional interference seal and so is applicable only to soft seated valves.



The centre of rotation is moved from the centerline of the valve body. The seat and seal design remains conical and on centre. This design again relies on a frictional interference seal, but the length of rotation over which this friction occurs is reduced, allowing a larger range of process resistant seat materials to be used. However, these materials must be relatively soft or highly elastic to prevent “jamming”.



The centreline of the cone is rotated away from the valve centreline resulting in an ellipsoidal profile and providing the third offset. With this geometry, seat seal interference is completely eliminated ensuring long sealing life. The result is a torque seated, process-pressure-aided FRICTIONLESS seal. The geometry allows the body seat to be used as the closed limit stop, aiding operator adjustment. The Triple Offset design is ideally suited to metal seated valves providing bubble-tight performance in high temperature, high pressure and firesafe applications.

Standard Specifications

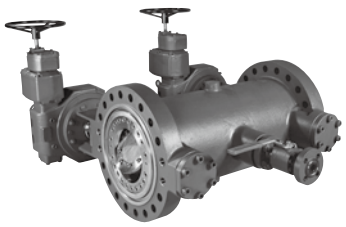
Design		API Std 609, BS 5155, ANSI B16.34, ASME SEC Ⅷ
Valve Sizes ※1		2"(50mm) ー 66"(1650mm)
Pressure Classes		Class 150, 300, 600, 900, 1500
Body Styles		Lugged, Wafer Flangeless, Double Flanged, Butt Weld End
Flange Accommodation ※2		ANSI B16.5:DN50 ー DN600 ANSI B16.47 Series A&B : DN700 ー DN1650
Face to Face ※3 Dimensions		LUG and WAFER Type API Std 609 Table 2 : DN 80 ー DN600 API Std 609 Table 1 : DN750, 900, 1050, 1200 ISO 5752 Wafer Short : DN700, 800, 1000 DOUBLE FLANGED Type ISO 5752／BS 5155 Double Flange Short
Pressure−Temperature Ratings		ASME/ANSI B16.34 : for Steel ASME/ANSI B16.24 : for Bronze Working Temperature Range as Standard −29℃ (−20°F) to +538℃ (1000°F) With selection of suitable materials −46℃(−51°F) to +700℃ (1292°F)
Pressure Tests		Shell Test, Seat Test : API Std 598 Seat Leakage Rate API Std 598, ISO 5208 Rate A, ANSI B16.104 (ANSI / FCI 70-2) Class Ⅵ
Firesafe		Certified Firesafe to API 6FA and API 607
Marking		API Std 609 MSS SP-25
Operators		Manual Gear, Electric, Pneumatic, Hydraulic
Standard materials	Body	A216 WCB, BS EN 10025(Carbon Steel), A351 CF8M
	Disc	A216 WCB, A351 CF8M
	Stem※4	A564 type 630 H1150+1150
	Body seat	316SS / Graphite
	Disc seal※5	316SS

※1. Please contact the sales office for larger sizes.
※2. JIS 10K, 20K, 30K MSS, API, BS, DIN, PN, ISO also available on request.
※3. ISO 5752 Gate Valve Short (Basic series 3) on request.
※4. Use Inconel 718 for over 315 degrees C.
※5. Titanium nitride hardened, Stellite #6 Coating is available as an option.
※6. Please consult our sales for the service condition lower than -46℃.

Design Options

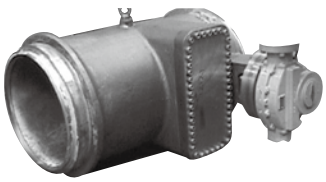
DOUBLE BLOCK & BLEED VALVES.(DBB2)

To allow verifiable, maintainable shut-off in critical isolation applications. Fire tested to AP16FA & AP1607.



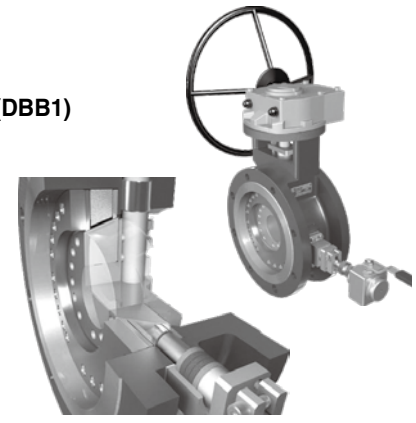
BUTT WELD WITH TOP ENTRY.

Allowing complete maintainability on valves which are welded into line.



DOUBLE BLOCK & BLEED VALVES COMPACT VERSION (DBB1)

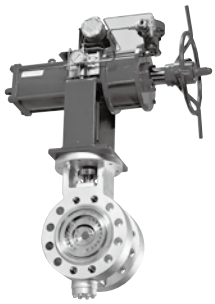
One valve with a unique double seat assembly and integral bleed port.



Design Options

CONTROL VALVES.

Frictionless seating means increased rangeability, allowing the Tritec valve to perform in both control and isolation application.

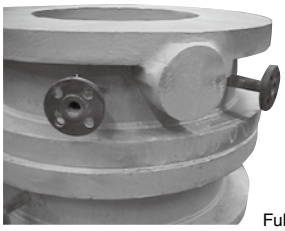


FIRE SAFE DESIGN.

Fire safe approval to API 6FA and API 607.

STEAM JACKETED VALVES.

To maintain process temperature ensuring media remains liquid. Disc and shaft steam tracing as an option.



Full-Jacket type

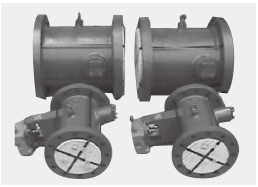
Semi-Jacket type

VALVES TO REDUCE FUGITIVE EMISSION.

Designed to reduce fugitive emission, testing is available to all international standards plus customer specific requirements.

GATE VALVE FACE TO FACE.

For the direct replacement of gate valves, all dimensions are exactly as per the standard Double Flanged valve with the exception of the face to face dimension which is shown below. (in accordance with ISO 5752 gate valve short).

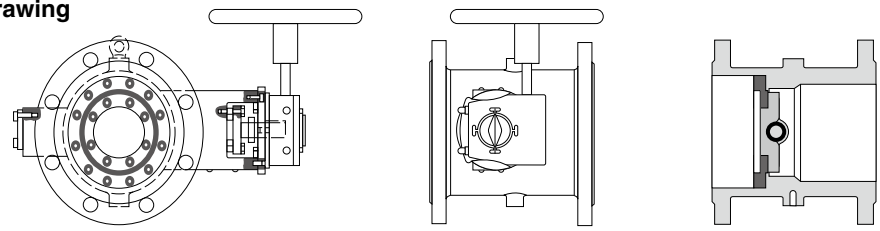


(Unit: mm)

Valve Size		150Lb Flanged	300Lb Flanged	600Lb Flanged	900Lb Flanged	1500Lb Flanged
mm	inch	Gate F-F	Gate F-F	Gate F-F	Gate F-F	Gate F-F
50	2	178	216	—	—	—
80	3	203	282	356	—	—
100	4	229	305	432	457	—
150	6	267	403	559	610	705
200	8	292	419	660	838	832
250	10	330	457	787	838	991
300	12	356	502	838	965	1130
350	14	381	762	889	1029	1257
400	16	406	838	991	1130	1384
450	18	432	914	1092	1219	1537
500	20	457	991	1194	1321	1664
600	24	508	1143	1397	1549	1943

Allows direct replacement of existing gate valves without modification of pipework.
Disc remains within the body face to face in the fully open position to allow removal of the valve from pipework even when the valve is open.
Reduction of fugitive emission due to quarter turn rather than linear shaft movement.
Reduced operator costs due to quarter turn rather than multi turn / linear.

Referential Drawing



Pressure-Temperature Ratings

Body	A216	Gr. WCB
Disc	A216	Gr. WCB
Shaft	A564	Type 630

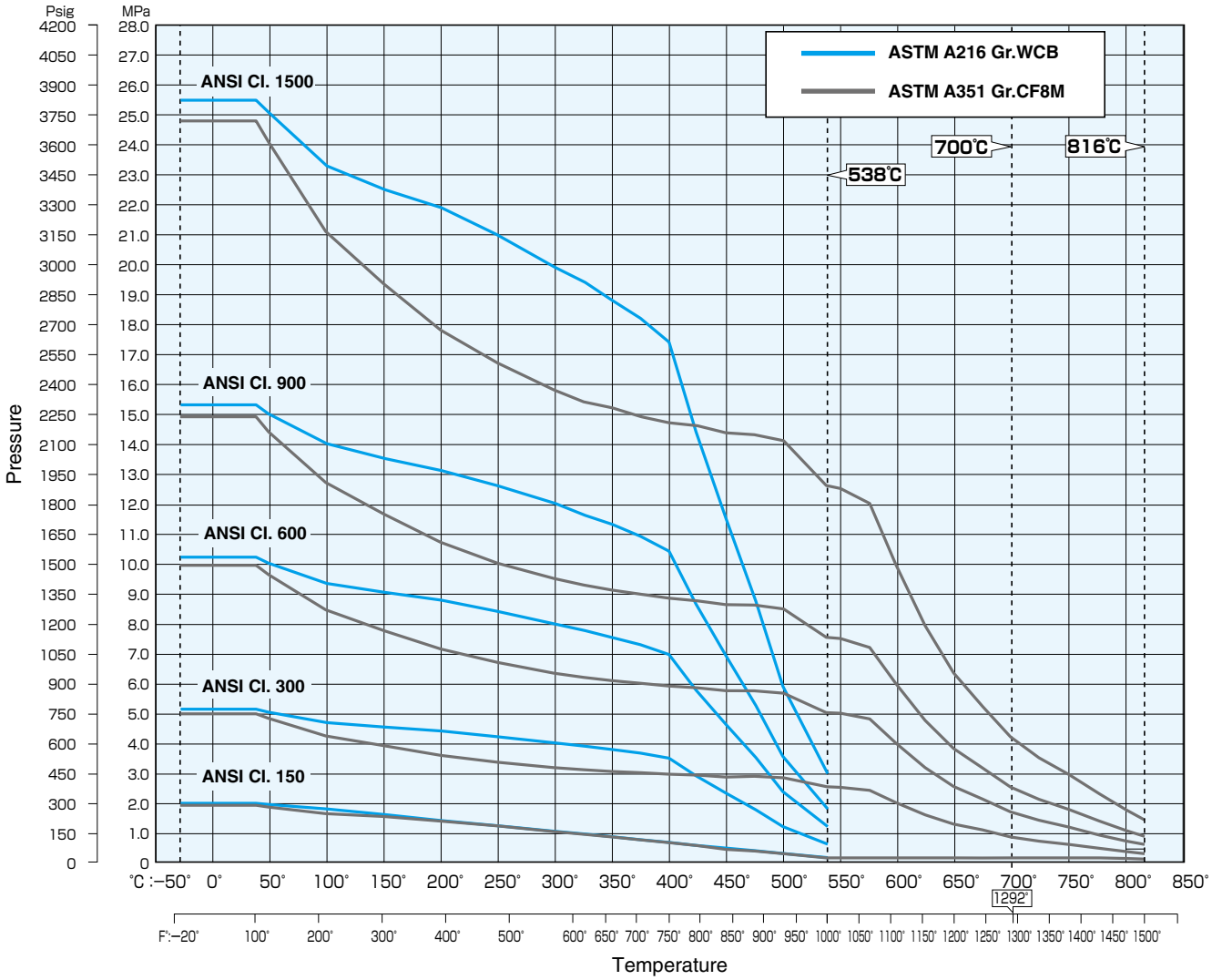
Temperature		Working Pressure (MPa)				
(°F)	(℃)	150	300	600	900	1500
−20	−29	1.96	5.11	10.2	15.3	25.5
100	38	1.96	5.11	10.2	15.3	25.5
122	50	1.92	5.01	10.0	15.0	25.1
212	100	1.77	4.66	9.32	14.0	23.3
302	150	1.58	4.51	9.02	13.5	22.5
392	200	1.38	4.38	8.76	13.1	21.9
482	250	1.21	4.19	8.39	12.6	21.0
572	300	1.02	3.98	7.96	12.0	19.9
617	325	0.930	3.87	7.74	11.6	19.4
662	350	0.840	3.76	7.51	11.3	18.8
707	375	0.740	3.64	7.27	10.9	18.2
752	400	0.650	3.47	6.94	10.4	17.4
797	425	0.550	2.88	5.75	8.63	14.4
842	450	0.460 ※1	2.30 ※1	4.60	6.90	11.5
887	475	0.370 ※1	1.74 ※1	3.49	5.23	8.72
932	500	0.280 ※1	1.18 ※1	2.35	3.53	5.88
1000	538	0.140 ※1	0.590 ※1	1.18	1.77	2.95

Body	A351	Gr. CF8M
Disc	A351	Gr. CF8M
Shaft	A564	Type 630

Temperature		Working Pressure (MPa)				
(°F)	(℃)	150	300	600	900	1500
−20	−29	1.90	4.96	9.93	14.9	24.8
100	38	1.90	4.96	9.93	14.9	24.8
122	50	1.84	4.81	9.62	14.4	24.1
212	100	1.62	4.22	8.44	12.7	21.1
302	150	1.48	3.85	7.70	11.6	19.3
392	200	1.37	3.57	7.13	10.7	17.8
482	250	1.21	3.34	6.68	10.0	16.7
572	300	1.02	3.16	6.32	9.49	15.8
617	325	0.930	3.09	6.18	9.27	15.4
662	350	0.840	3.03	6.07	9.10	15.2
707	375	0.740	2.99	5.98	8.96	14.9
752	400	0.650	2.94	5.89	8.83	14.7
797	425	0.550	2.91	5.83	8.74	14.6
842	450	0.460	2.88	5.77	8.65	14.4
887	475	0.370	2.87	5.73	8.60	14.3
932	500	0.280	2.82	5.65	8.47	14.1
1000	538	0.140	2.52	5.00	7.52	12.6

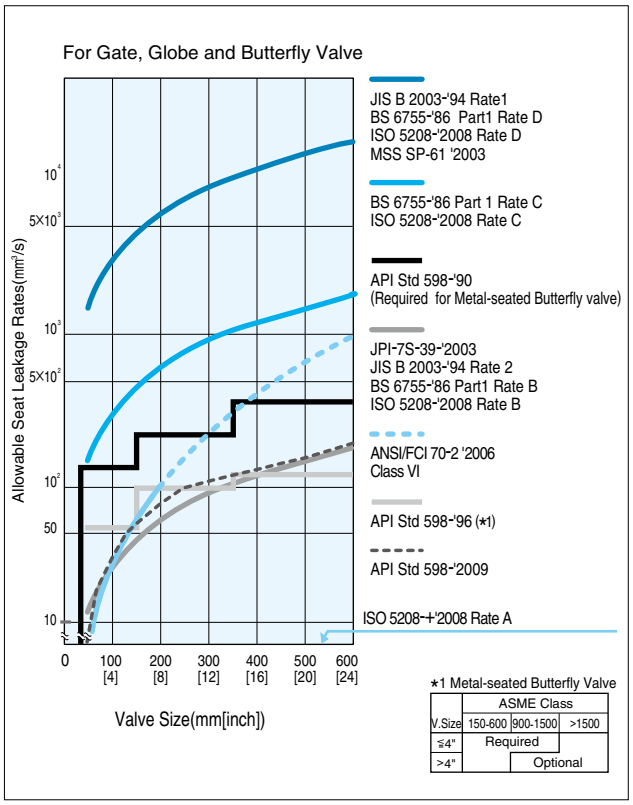
〈Notes〉※1. Permissible, but not recommended for prolonged use above 800°F(427 degree C).
Please contact a sales office for temperatures outside of standard temperature range as detailed in the above table.

Pressure-Temperature Ratings (ANSI B 16.34-2004)



Allowable Seat Leakage Rates by Standard

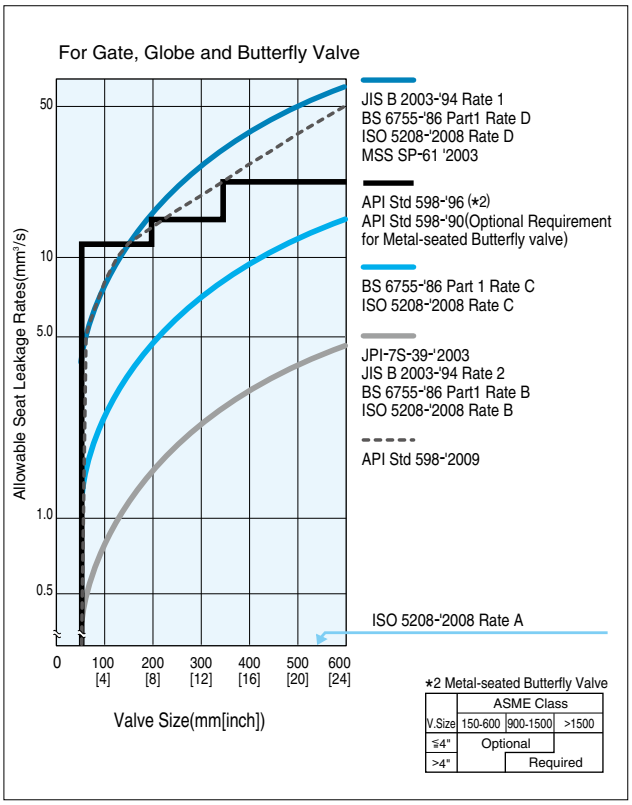
Gas Test



*1 Metal-seated Butterfly Valve

V.Size	ASME Class 150-600	900-1500	>1500
≤4"	Required		
>4"			Optional

Hydrostatic Test



*2 Metal-seated Butterfly Valve

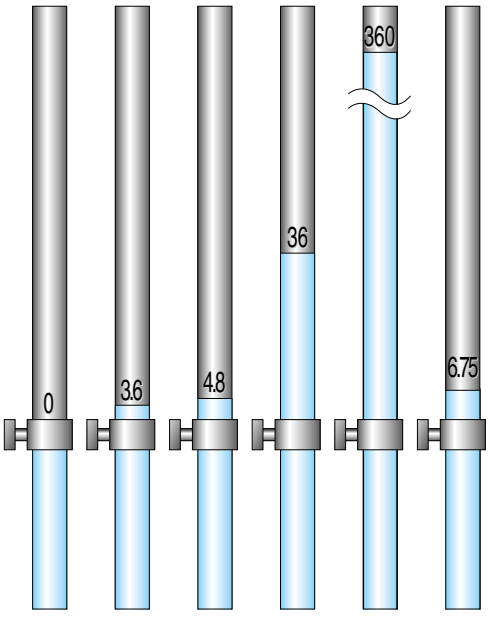
V.Size	ASME Class 150-600	900-1500	>1500
≤4"	Optional		
>4"			Required

Allowable Seat Leakage Rates by Standard

Gas Test

REFERENCE

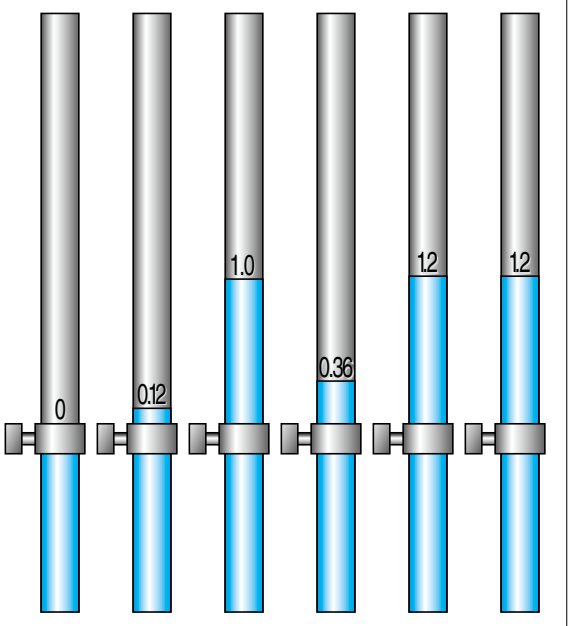
Valve size: 200mm (cc/min converted)



Standard	ISO 5208-'2008 Rate A	ISO 5208-'2008 Rate B	API Std 598-'2009	ISO 5208-'2008 Rate C	ISO 5208-'2008 Rate D	ANSI / FCI 70-2 Class VI
Test Pressure	6±1bar	6±1bar	4~7bar	6±1bar	6±1bar	3.5 bar or Max. Differential Pressure whichever is the least

Hydrostatic Test

REFERENCE



Standard	ISO 5208-'2008 Rate A	ISO 5208-'2008 Rate B	API Std 598-'2009	ISO 5208-'2008 Rate C	ISO 5208-'2008 Rate D	ANSI / FCI 70-2 Class V
Test Pressure	Max.Working Pressure× 1.1	Max.Working Pressure× 1.1	Design Differential Pressure× 1.1	Max.Working Pressure× 1.1	Max.Working Pressure× 1.1	Max.Working Pressure(20 bar)

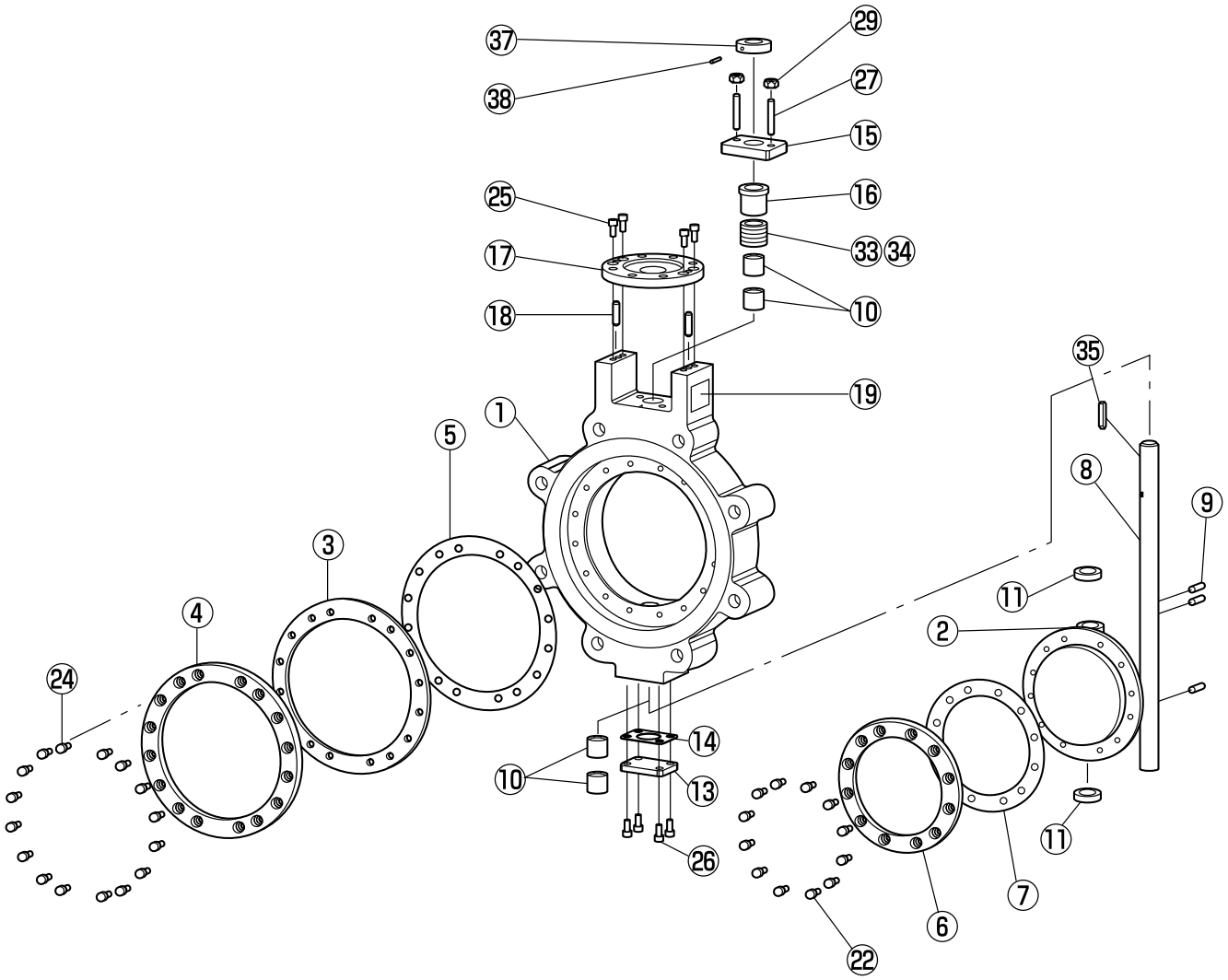
Operating and Maintenance Instructions

	No	Description	Q'ty
	1	Body	1
	2	Disc	1
★	3	Body Seat	1
	4	Body Seat Retaining Ring	1
★	5	Body Seat Gasket	1
	6	Disc Seal	1
	7	Disc Seal Gasket	1
	8	Shaft	1
	9	Shaft pin	2−4
	10	Bearing	4
	11	Thrust Ring	2
	13	End Cover	1
	14	End Cover Gasket	1
	15	Gland Plate	1
	16	Gland Plate Spigot	1

	No	Description	Q'ty
	17	Mounting Plate	1
	18	Dowel Pin	2−4
	19	Nameplate	1−2
	22	Disc Seal Screw	1set
	24	Body Seat Screw	1set
	25	Mounting Plate Screw	4−6
	26	End Cover Screw	4~
	27	Gland Stud	2
	29	Gland Nut	2
	33	Gland Packing	3
★	34	Gland Packing	2
★	35	Key	1
	37	Anti-blowout Collar	1
	38	Anti-blowout Device	1−2

★ : Recommended Spare Parts

◎ : Please refer to specific drawings



Operating and Maintenance Instructions

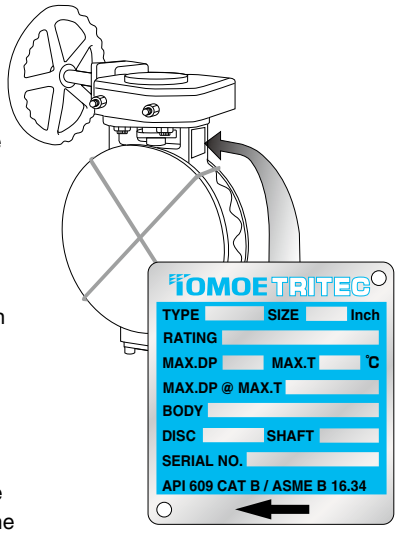
INTRODUCTION

This instruction provides general information on the operation, installation and maintenance of the Tritec triple offset valve. The Tritec valves have been designed and manufactured to operate in an aggressive environment under extremes of temperature and pressure for long periods and with minimal maintenance.

INSTRUCTIONS

PACKING

1. All valves will be despatched with protective covers attached to the flange faces to protect the gasket sealing surfaces and internal trim.
2. The valve disc is cracked off the seat in the almost closed position.
3. The Tritec nameplate shown in the picture contains information such as size,pressure class,materials and the unique serial number.



SPARE PARTS

1. When ordering spare parts or discussing matters concerning this valve with the sales office, it is essential to quote the unique Serial Number of the valve which is to be found on the stainless steel nameplate attached to the valve body adjacent to the operator.

TRANSPORTATION

1. Use crates or packing cases for ocean transportation.
2. For overland transportation, a covered vehicle is recommended with protective sheets covering the valves.

STORAGE

1. Store the valves indoors in a cool temperature between –10˚ and+60˚C, humidity at 70% or less.
2. Do not remove the protective covers until ready to install valves.
3. Machined ferrous surfaces are protected with an approved rust preventative. For long periods of storage, apply the rust preventative once a year to the unpainted surfaces.
4. When storing valves unpacked, take care in protecting valves and actuators from excessive loads. Do not stack unpacked valves.
5. If the valve is for clean gas duty and is being supplied "DEGREASED",a label is attached stating this and the valve sealed in a polythene covering. It is suggested that the valve is kept packed until it is to be installed in the pipeline.

UNPACKING

1. Unpack valves just before installation.

INSTALLATION

ⓐ The valve is designed to seal against bidirectional flow and can therefore be installed with flow in either direction. However enhanced sealing life will be obtained with upstream flow against the shaft side of the disc. This preferred flow direction is shown on the nameplate attached to the valve body adjacent to the operator and also on the GA drawing. The valve may be installed in the pipeline with the valve shaft in a horizontal,vertical or intermediate position.

ⓑ Prior to installation,the pipeline must be cleaned from dirt and welding residues to avoid damage to the valve during operation.

ⓒ Ensure that the valve is closed prior to installation to avoid the risk of damage to the sealing surfaces.

ⓓ The valve must be lifted by the eyebolt or lifting eyes provided with the valve.

ⓔ The valve must not be lifted by the operator or handwheel.

ⓕ The valve must not be used for pipework alignment.

ⓖ The Lugged or Double flanged type valve is suitable for dead end service ie.end of line duty,in either direction (in case of the valve specified both directions) to the full rating pressure of the piping system.

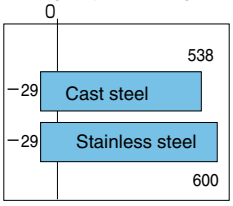
TT2

Valve nominal size

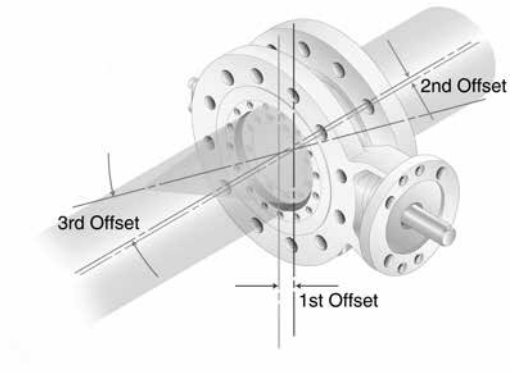
80 to 600mm

Max.working pressure MPa

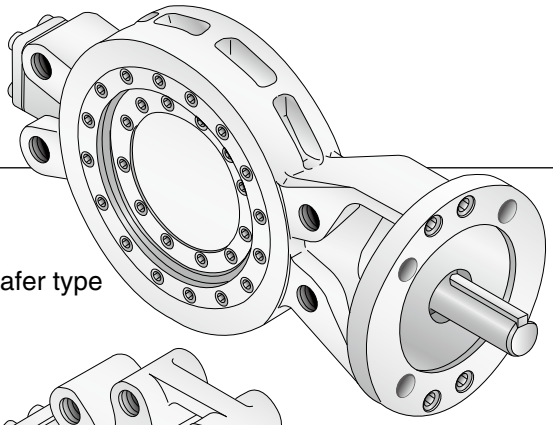
Working temperature range ˚C



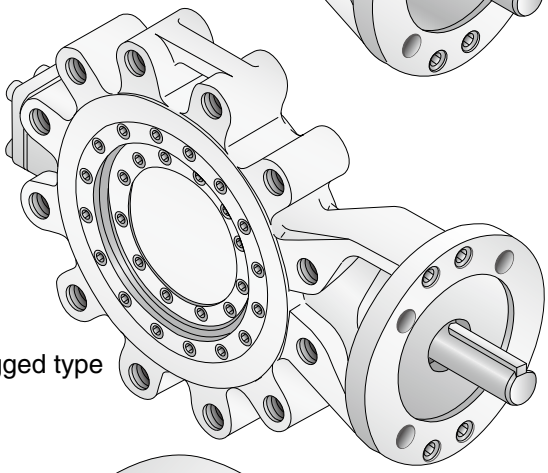
FS Fire safe certification to API607 5th Edition



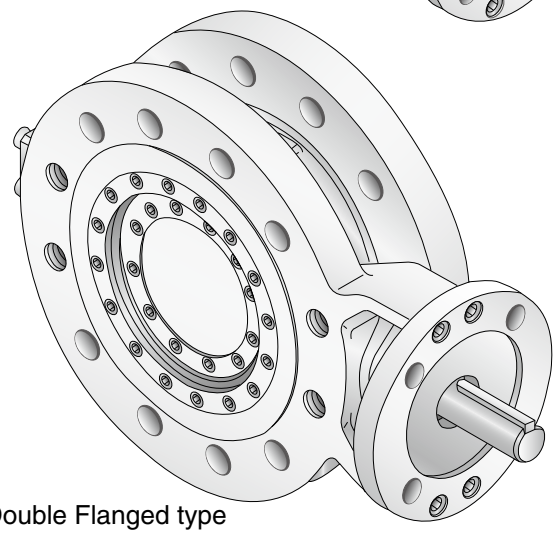
Worm Gear | Pneumatic Cylinder | Motorized



Wafer type



Lugged type



Double Flanged type

Always at the leading edge

Through an extensive commitment to Research & Development, TOMOE has remained at the leading edge of valve design for more than 50 years. The TT2 Triple Offset process valve is the result of advanced technology design and stringent testing to develop a valve that meets the high performance demands of applications where long life and positive shut-off under arduous conditions is essential.

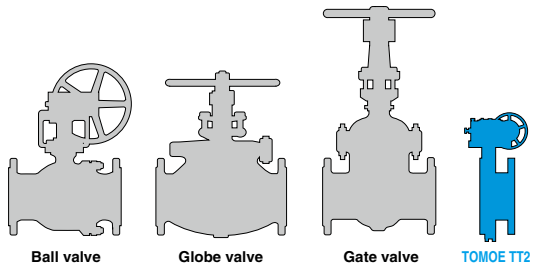
The TT2 inherits the torque sealing, friction-free sealing design of other valves in the TT series and the unique triple offset and ellipsoidal sealing geometry guarantees zero leakage and bubble-tight shut-off.

In addition, the compact, lightweight design of the TT2 triple offset valve has revolutionised design and maintenance of piping systems in the OPC industry.
Smaller and lighter than traditional ball, globe and gate valves, the TT2 features a fully field-replaceable seat and seal design for increased plant efficiency and reduced cost of ownership.

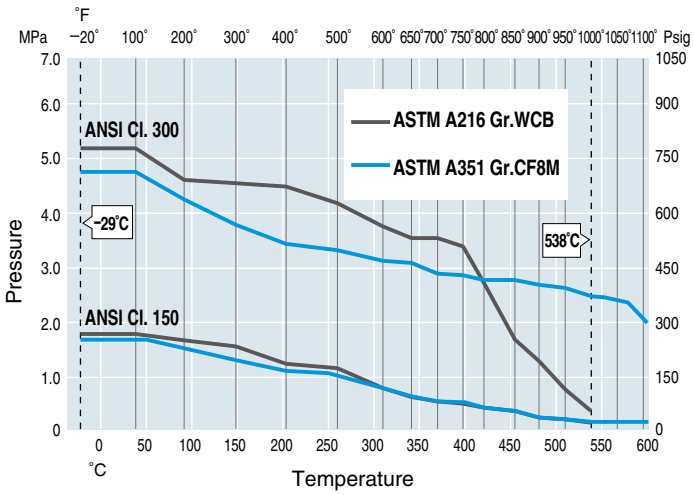
Available in Wafer, Lugged and Double Flanged type body styles to 150 lb and 300 lb pressure ratings, the TT2 triple offset valve has fire safe certification to API607 5th Edition, making it inherently safe in high risk industry applications.

Features and Benefits

- Zero leakage with metal seat
- Compact, lightweight design
- Fully field replaceable seat and seal design
- Longer life cycle
- Fire Safe Certification to API607 5th Edition



Pressure-Temperature Ratings

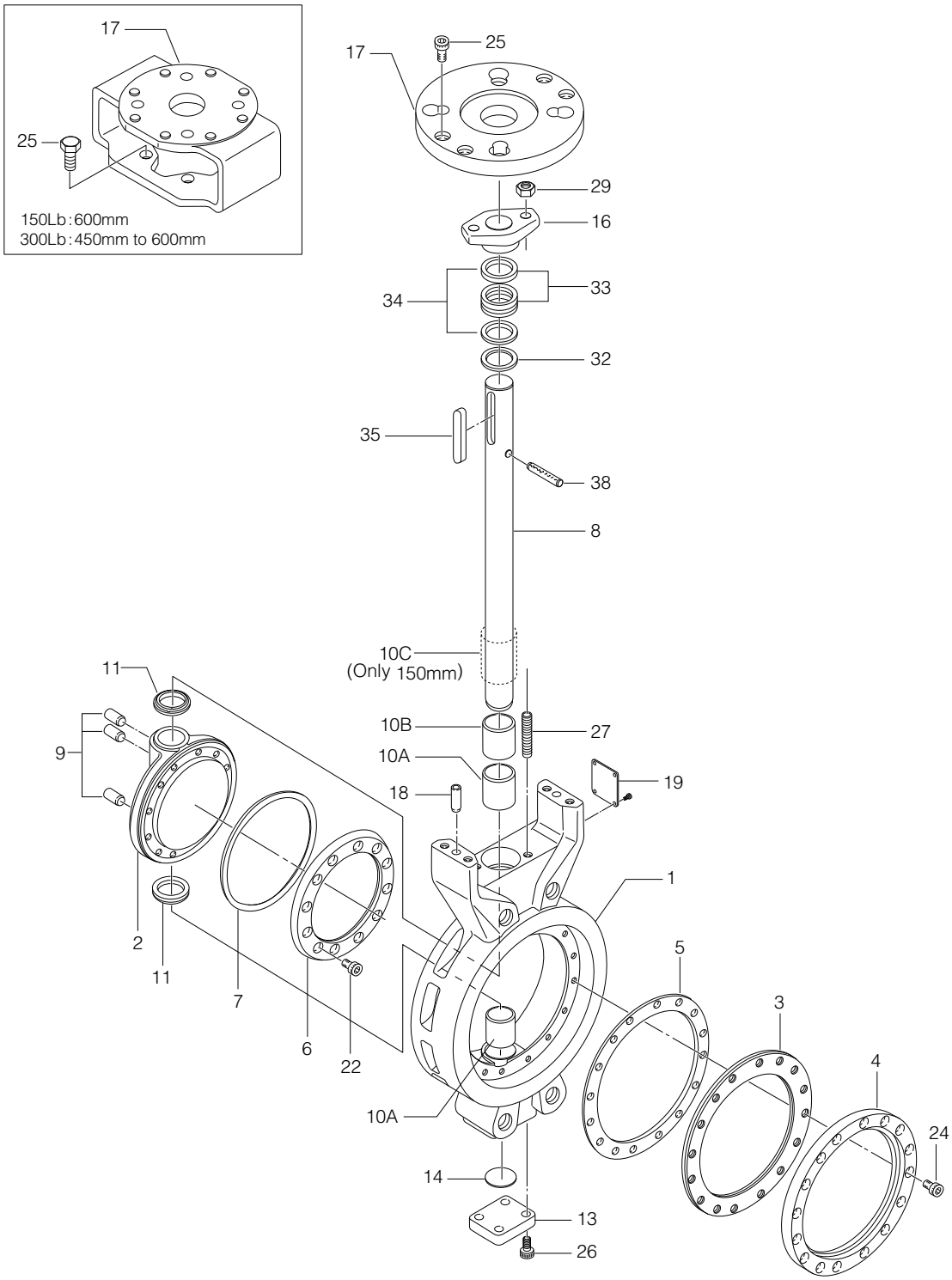


Standard Specifications

Design		API 609 Cat. B, ASME B16.34
Nominal diameter※1		3"(80mm) to 24"(600mm)
Pressure rating		Class 150, Class 300
Body style		Wafer, Lugged and double flanged, short and long
Applicable flange standard※2		ASME B16.5/JPI Class 150/300 JIS 10/16/20/30K BS4504 (DIN) PN10/16/25/40
Face-to-face dimensions※3		Wafer, Lugged : API609 Category B Class 150/300. Double flanged : ISO 5752/API 609 Category B, double flanged short pattern Class 150/300
Pressure-temperature rating※4		ASME B16.34 Class 150, 300lb, API609 Class 150, 300lb. Operating temperature (standard specifications): -29 to 538 degrees C (A216-WCB), -29 to 600 degrees C (A351 CF8M)
Pressure test		Main body pressure and seat leakage test: API598. Allowable seat leakage: Preffered; API 598, ISO 5208 rate A, ANSI/FCI 70-2 Class VI.
Fire safe		Fire Safe Certification based on API 607 4th / 5th Edition
Actuator		Manual Gear, Electric, Pneumatic, Hydraulic
Flow direction		Bi-directional (However, the standard pressure direction is for high pressure at the stem side. Selection of the drive section will differ depending on the pressure direction.)
Applicable gaskets		Use a spiral gasket. ASME B16.5/JPI Class 150/300 commercial products may be used. Please consult us regarding JIN, BS and DIN.
Standard materials	Body	A216 WCB or A351 CF8M
	Disc	A216 WCB or A351 CF8M
	Stem※5	A564 type 630 H1150+H1150
	Body seat	316SS / Graphite
	Disc seal※6	316SS
Coating		Silicon resin coating (Grey N7) for 200 degrees C and lower. Heat resistant silver coating for over 200 degrees C. No painting for stainless steel.

※1 Except for 5" (125mm), 22" (550mm)
※2 Please consult us regarding JIN, BS and DIN lugs and double flange types
※3 Long-pattern types can be manufactured to your desired specifications
※4 400 degrees C or less in an oxidized atmosphere
※5 Use Inconel 718 for over 400 degrees C.
※6 Titanium nitride hardened, Stellite #6 welding is available as an option
※ Valve stem position : horizontal position.

TT2 Expanded view of components



■TT2 Parts list (150Lb : 80mm to 500mm) (300Lb : 80mm to 400mm)

No.	Description		Q'ty	Remarks
1	Body		1	
2	Disc		1	
3	Body seat		1	
4	Retainer		1	
5	Body seat gasket		1	
6	Disc seal		1	
7	Disc seal gasket		1	
8	Stem		1	
9	Shaft pin		3	
10A	Bearing A		2	
10B	Bearing B		0 or 1	150Lb : 80,100mm : 1 150mm over : 0
				300Lb : 1
10C	Bearing spacer		0 or 1	150Lb : 150mm over : 1
				300Lb : 150mm : 1
11	Thrust ring		2	
13	Bottom cover		1	
14	Bottom gasket		1	
16	Glandplate spigot		1	
17	Mounting plate		1	
18	Dowel pin		2	
19	Nameplate		1	
22	Hexagon hole bolt	80mm to 200mm	4	80mm
			6	100mm
			8	150mm
			12	200mm
		250mm to 400mm	8	250mm
			12	300mm, 350mm
			16	400mm
24	Hexagon hole bolt	80mm to 200mm	8	80mm
			12	100mm, 150mm
			16	200mm
		250mm to 400mm	20	250mm
			24	300mm
			28	350mm
			32	400mm
25	Hexagon hole bolt		4	
26	Hexagon hole bolt		4	
27	Gland bolt		2	
29	Hexagon nut		2	
32	Packing retainer		1	
33	Gland packing		3	
34	Gland packing		2	
35	Key		1	
38	Spring pin		1	

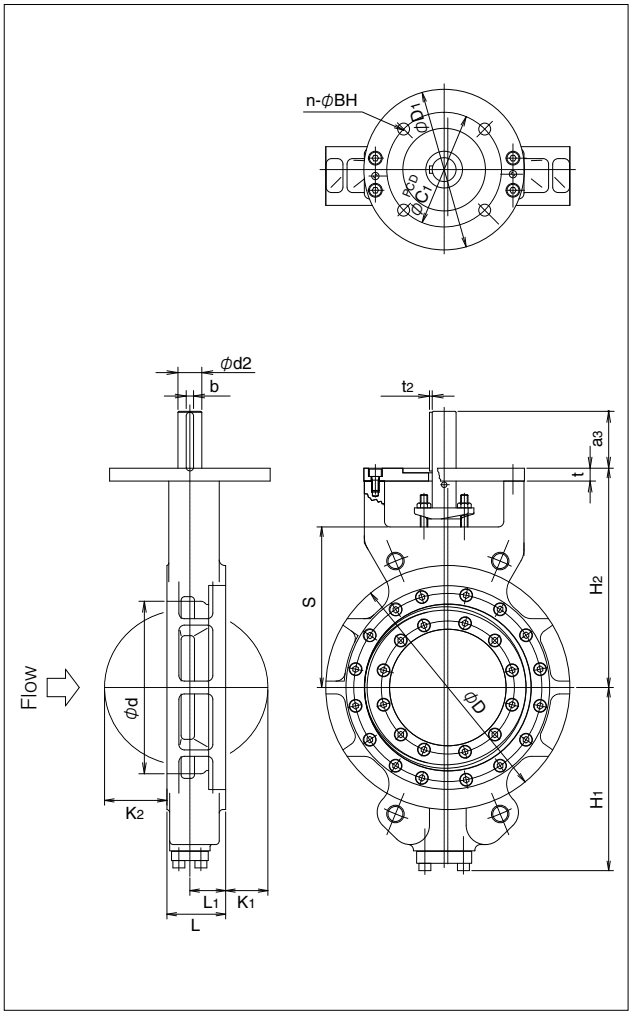
■TT2 Parts list (150Lb : 600mm) (300Lb : 450mm to 600mm)

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Body seat	1	
4	Retainer	1	
5	Body seat gasket	1	
6	Disc seal	1	
7	Disc seal gasket	1	
8	Stem	1	
9	Shaft pin	3	
10A	BearingA	2	
10B	BearingB	1	300Lb
10C	Bearing spacer	1	150Lb
11	Thrust ring	2	
13	Bottom cover	1	
14	Bottom gasket	1	
16	Glandplate spigot	1	
17	Bracket	1	
19	Nameplate	1	
22	Hexagon hole bolt	16	450mm, 600mm
		12	500mm
24	Hexagon hole bolt	20	450mm, 500mm
		28	600mm
25	Hexagon hole bolt	4	
26	Hexagon hole bolt	4	
27	Gland bolt	2	
29	Hexagon nut	2	
32	Packing retainer	1	
33	Gland packing	3	
34	Gland packing	2	
35	Key	1	
38	Spring pin	1	

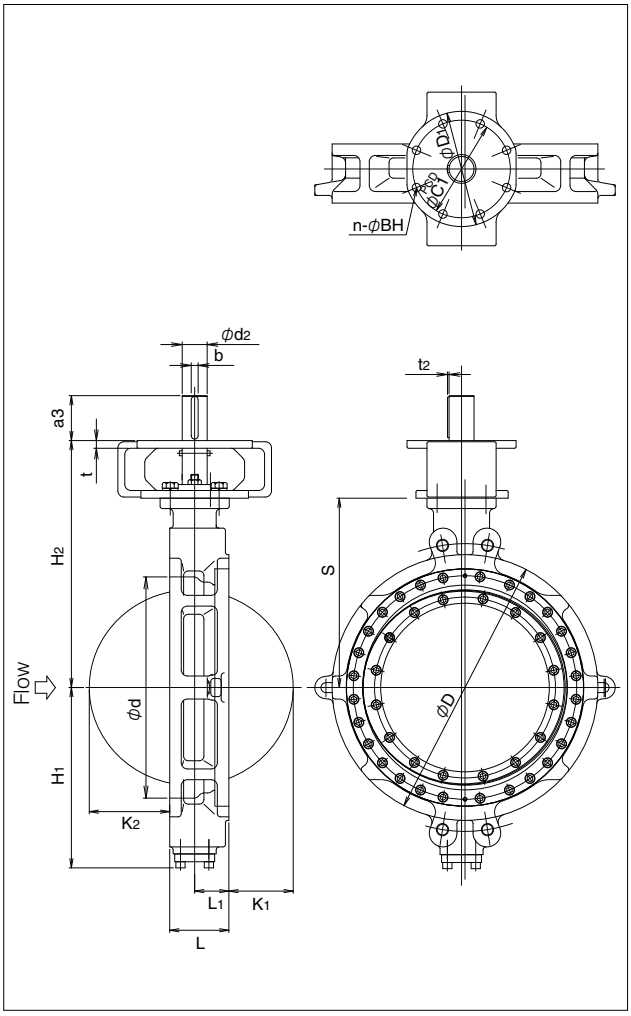
TT2-150Lb Bare shaft（Wafer type）

Nominal size		Dimension (mm)																		Approx. Mass (kg)
mm	inch	φd	φD	L	L_1	K_1	K_2	H_1	H_2	S	a_3	t	$φD_1$	n	BH	$φC_1$	$φd_2$	b	t_2	
80	3	82	127	48	29	3	23.1	120.6	159	110	34	12	125	4	11	102	18	6	2.5	7
100	4	108	154	54	31.5	9	27.0	144.6	194	132	34	12	125	4	11	102	20	6	2.5	11
150	6	159	215	57	35	25.5	45.5	189.6	242	180	34	12	125	4	11	102	22	6	2.5	18
200	8	202	266	64	39	46.7	67.4	199.6	248	180	64	14	175	4	11	102	26	8	3	27
250	10	235	324	71	43	63.5	86.5	245.6	326	252	64	14	175	4	13	125	30	8	3	45
300	12	290	373	81	48.5	84	109	281.6	376	281	79	20	210	4	22	165	37	10	3	66
350	14	329	413	92	52	95.5	117.5	307.6	400	305	79	20	210	4	22	165	37	10	3	82
400	16	370	470	102	63	108.3	144.3	345.6	470	355	79	25	226	4	22	165	45	14	3.5	107
450	18	432	534	114	68	120.6	158.4	383.6	510	395	79	25	226	4	22	165	52	16	4	160
500	20	488	585	127	79	131.3	178.3	410.6	531	416	79	25	226	4	22	165	52	16	4	188
600	24	576	692	154	89	167.5	209.5	469.6	643	493	117	20	300	8	19	254	65	18	4	306

■150Lb Wafer type 80mm to 500mm



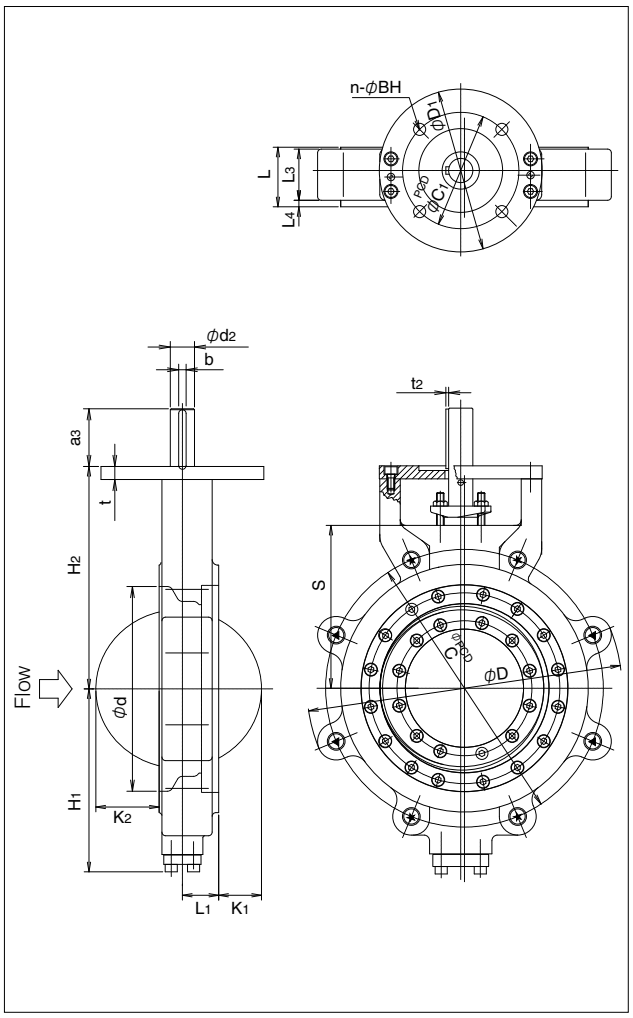
■150Lb Wafer type 600mm



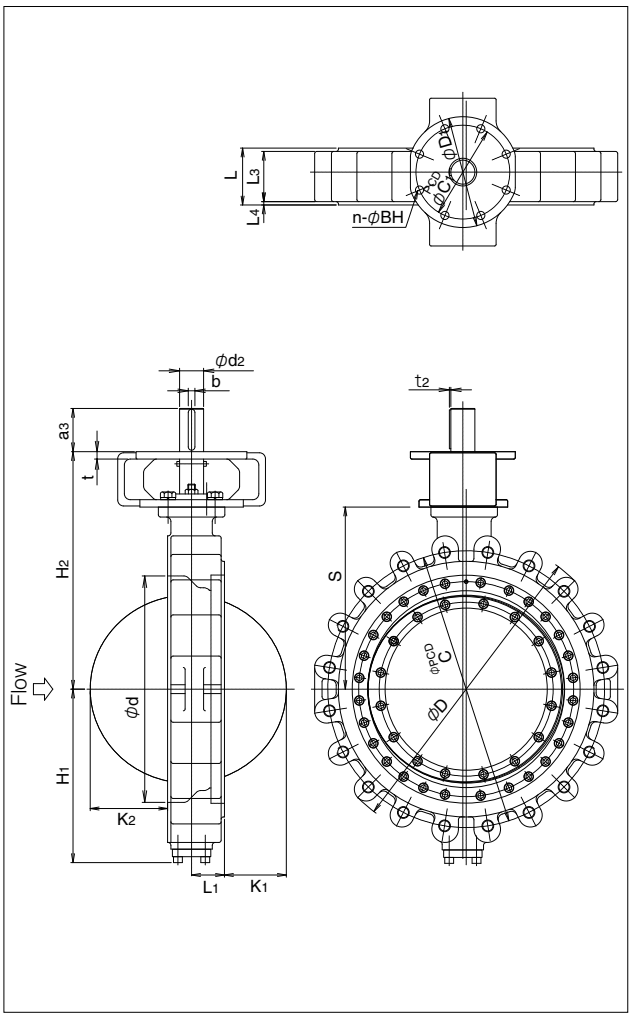
TT2-150Lb Bare shaft（Full Lugged type）

Nominal size		Dimension (mm)																				Approx. Mass (kg)
mm	inch	φd	φD	L	L_1	L_3	L_4	K_1	K_2	H_1	H_2	S	a_3	t	ϕD_1	n	BH	ϕC_1	ϕd_2	b	t_2	
80	3	100	185	48	29	42	4	3	23.1	120.6	159	110	34	12	125	4	11	102	18	6	2.5	7
100	4	117	238	54	31.5	46.5	5	9	27	144.6	194	132	34	12	125	4	11	102	20	6	2.5	13
150	6	167	281	57	35	51.5	3.5	25.5	45.5	189.6	242	180	34	12	125	4	11	102	22	6	2.5	21
200	8	218	338	64	39	55	7	46.7	67.4	199.6	248	180	64	14	175	4	11	102	26	8	3	29
250	10	270	424	71	43	63	4	63.5	86.5	245.6	326	252	64	14	175	4	13	125	30	8	3	52
300	12	320	478	81	48.5	71	5	84	109	281.6	376	281	79	20	210	4	22	165	37	10	3	76
350	14	350	526	92	52	79	6.5	95.5	117.5	307.6	400	305	79	20	210	4	22	165	37	10	3	91
400	16	410	592	102	63	92	5	108.3	144.3	345.6	470	355	79	25	226	4	22	165	45	14	3.5	134
450	18	460	634	114	68	98	10	120.6	158.4	383.6	510	395	79	25	226	4	22	165	52	16	4	185
500	20	510	714	127	79	107	10	131.3	178.3	410.6	531	416	79	25	226	4	22	165	52	16	4	225
600	24	614	830	154	89	136	9	167.5	209.5	469.6	643	493	117	20	300	8	19	254	65	18	4	393

■150Lb Full Lugged 80mm to 500mm



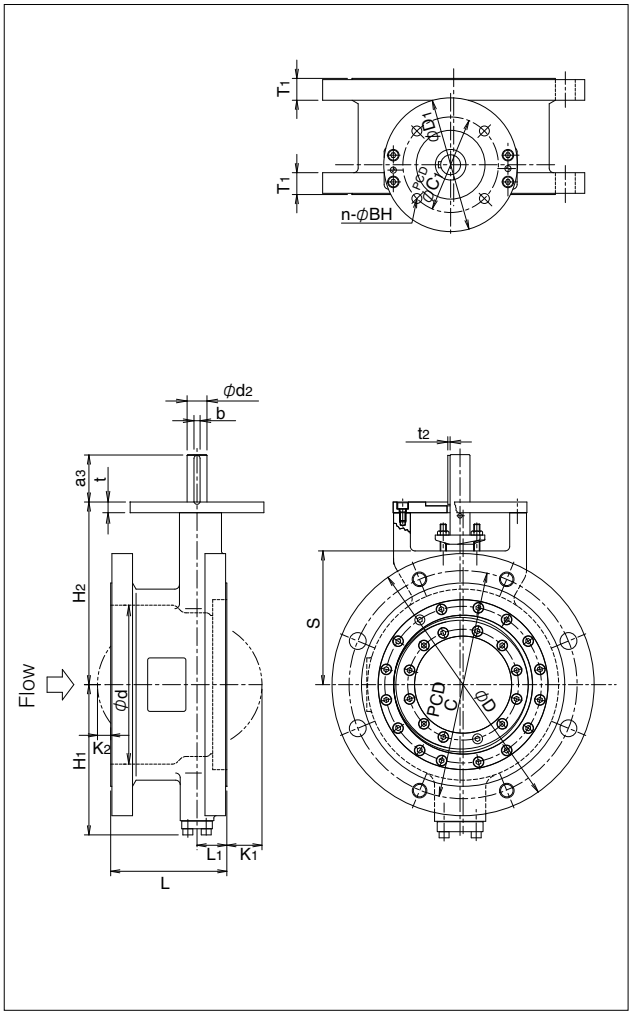
■150Lb Full Lugged 600mm



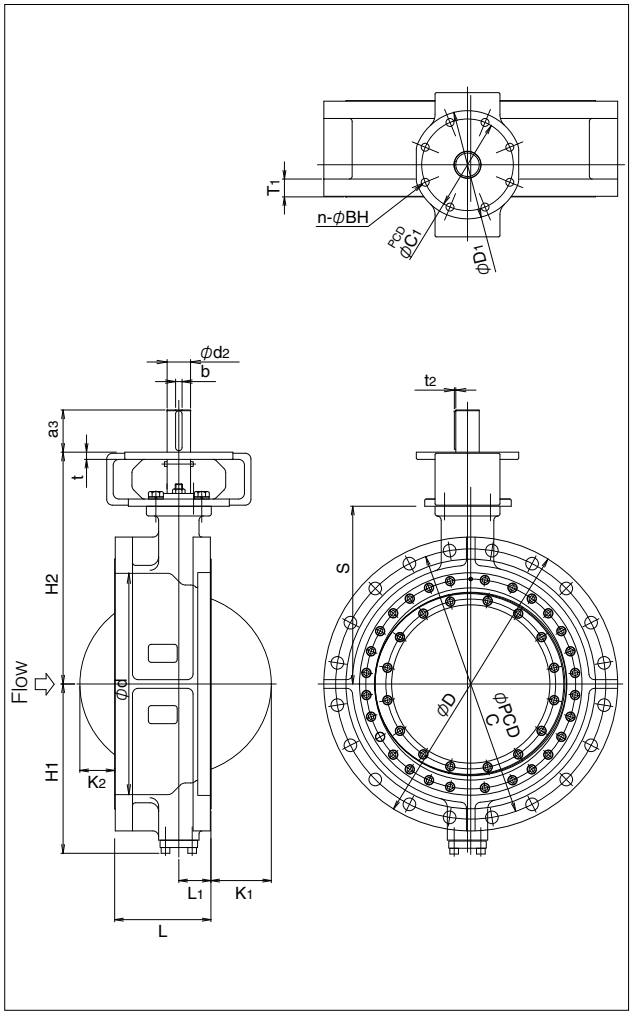
TT2-150Lb Bare shaft（Flanged type）

Nominal size		Dimension (mm)																			Approx. Mass (kg)
mm	inch	ϕd	ϕD	L	L_1	K_1	K_2	T_1	H_1	H_2	S	a_3	t	ϕD_1	n	BH	ϕC_1	ϕd_2	b	t_2	
80	3	90	190	114	29	3	0	25.5	120.6	159	110	34	12	125	4	11	102	18	6	2.5	15
100	4	117	229	127	31.5	9	0	25	144.6	194	132	34	12	125	4	11	102	20	6	2.5	21
150	6	167	279	140	35	25.5	0	27	189.6	242	180	34	12	125	4	11	102	22	6	2.5	35
200	8	218	343	152	39	46.7	0	29	199.6	248	180	64	14	175	4	11	102	26	8	3	49
250	10	270	406	165	43	63.5	0	32	245.6	326	252	64	14	175	4	13	125	30	8	3	77
300	12	320	483	178	48.5	84	12	33	281.6	376	281	79	20	210	4	22	165	37	10	3	117
350	14	350	535	190	52	95.5	19.5	36	307.6	400	305	79	20	210	4	22	165	37	10	3	155
400	16	410	595	216	63	108.3	30.3	37	345.6	470	355	79	25	226	4	22	165	45	14	3.5	194
450	18	458	635	222	68	120.6	50.4	40	383.6	510	395	79	25	226	4	22	165	52	16	4	237
500	20	510	700	229	79	131.3	76.3	43	410.6	531	416	79	25	226	4	22	165	52	16	4	312
600	24	614	815	267	89	167.5	96.5	48	469.6	643	493	117	20	300	8	19	254	65	18	4	432

■150Lb Flanged 80mm to 500mm



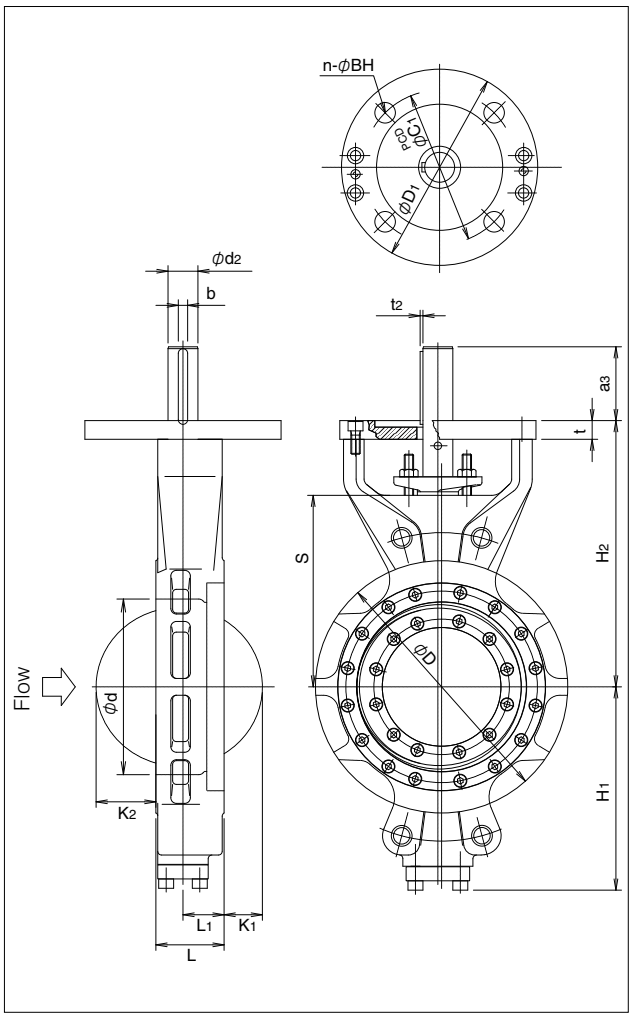
■150Lb Flanged 600mm



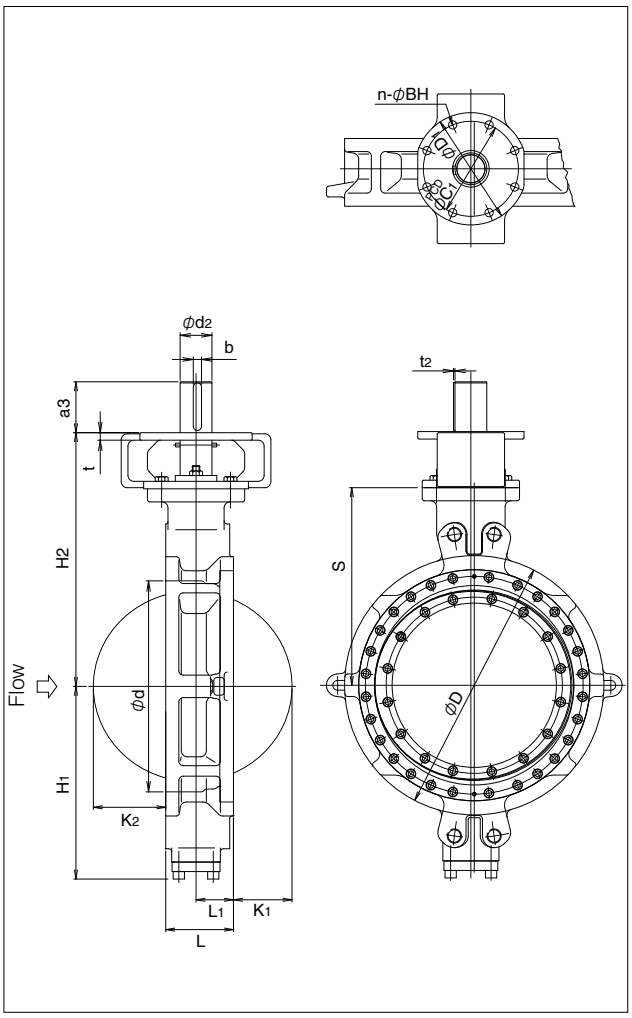
TT2-300Lb Bare shaft（Wafer type）

Nominal size		Dimension (mm)																		Approx. Mass (kg)
mm	inch	φd	φD	L	L_1	K_1	K_2	H_1	H_2	S	a_3	t	ϕD_1	n	BH	ϕC_1	ϕd_2	b	t_2	
80	3	82	127	48	29	3	23.1	120.6	159	110	34	12	125	4	11	102	18	6	2.5	7
100	4	108	154	54	31.5	9	27	144.6	194	132	34	12	125	4	11	102	20	6	2.5	11
150	6	153	215	59	36.5	24	45	188.6	276	212	64	14	175	4	11	102	26	8	3	23
200	8	188	270	73	44	41.7	63.4	217.6	285	205	79	20	210	4	18	140	32	10	3	37
250	10	235	324	83	47.5	59	79	259.6	355	260	79	20	210	4	22	165	37	10	3	59
300	12	290	381	92	53	79.5	102.5	305.6	428	313	79	25	226	4	22	165	45	14	3.5	89
350	14	329	413	117	60.5	87	101	340.6	460	345	79	25	226	4	22	165	52	16	4	113
400	16	370	470	133	71	100.3	121.3	373.6	518	388	109	32	300	8	18	254	60	18	4	166
450	18	426	534	149	79	109.6	134.4	400.6	574	424	117	20	300	8	22	254	70	20	4.5	231
500	20	476	592	159	85	125.3	152.3	441.6	602	452	136	20	300	8	22	254	75	20	4.5	292
600	24	564	693	181	100	156.5	193.5	514.6	678	528	136	20	300	8	22	254	85	22	5	416

■300Lb Wafer 80mm to 400mm



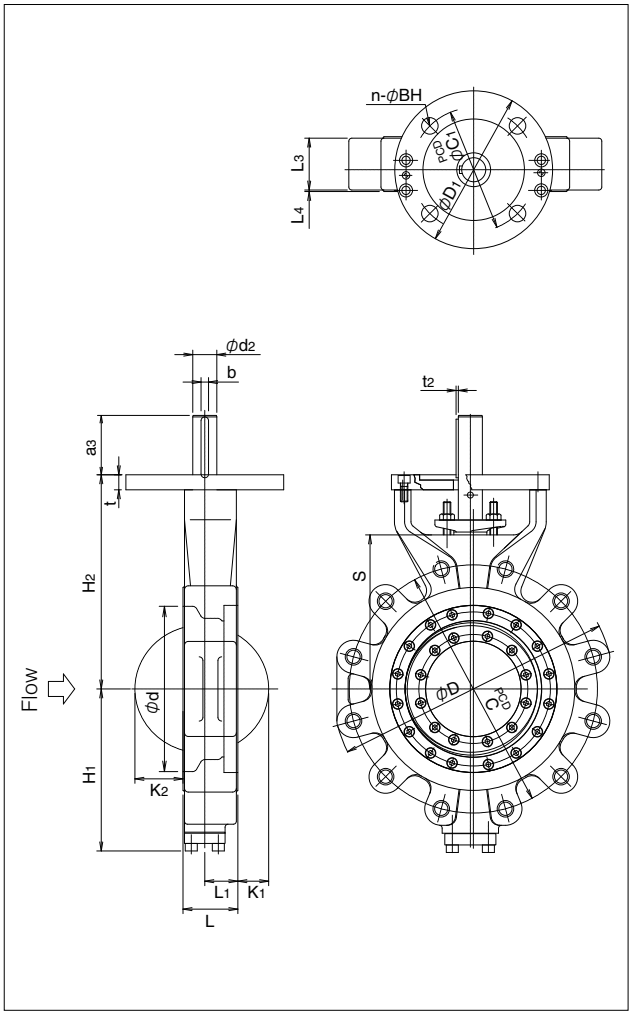
■300Lb Wafer 450mm to 600mm



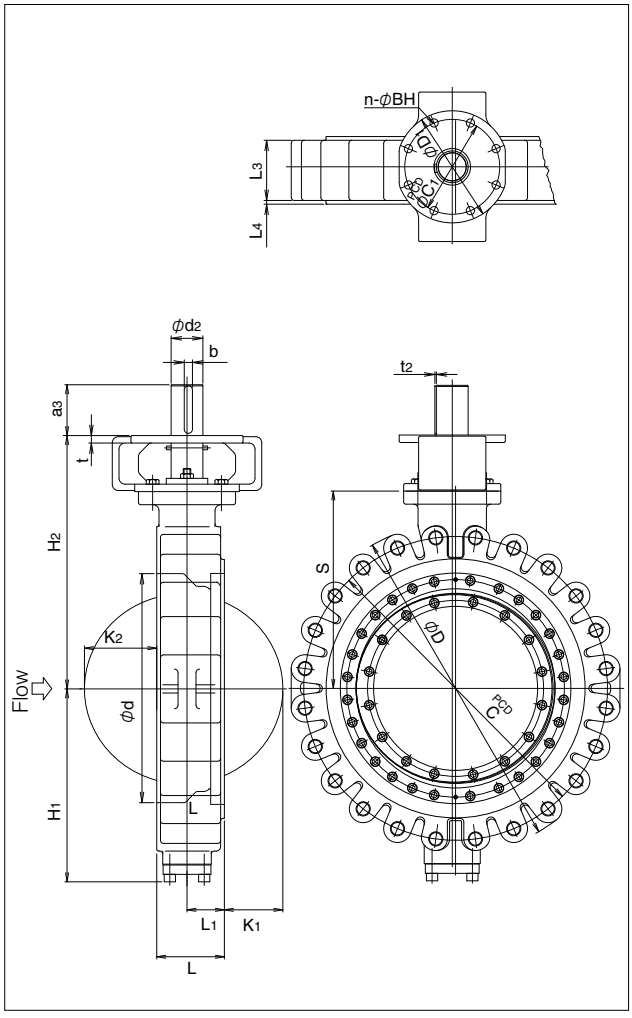
TT2-300Lb Bare shaft（Full Lugged type）

Nominal size		Dimension (mm)																				Approx. Mass (kg)
mm	inch	φd	φD	L	L_1	L_3	L_4	K_1	K_2	H_1	H_2	S	a_3	t	$φD_1$	n	BH	$φC_1$	$φd_2$	b	t_2	
80	3	82	204	48	29	42	4	3	23.1	120.6	159	110	34	12	125	4	11	102	18	6	2.5	8.4
100	4	117	238	54	31.5	47	5	9	27	144.6	194	132	34	12	125	4	11	102	20	6	2.5	13
150	6	166	312	59	36.5	52	5	24	45	188.6	276	212	64	14	175	4	11	102	26	8	3	24
200	8	220	374	73	44	69	2	41.7	63.4	217.6	285	205	79	20	210	4	18	140	32	10	3	44
250	10	275	435	83	47.5	75	4	59	79	259.6	355	260	79	20	210	4	22	165	37	10	3	71
300	12	320	503	92	53	82	5	79.5	102.5	305.6	428	313	79	25	226	4	22	165	45	14	3.5	105
350	14	360	570	117	60.5	109	4	87	101	340.6	460	345	79	25	226	4	22	165	52	16	4	163
400	16	400	630	133	71	125	4	100.3	121.3	373.6	518	388	109	32	300	8	18	254	60	18	4	225
450	18	460	690	149	79	137	6	109.6	134.4	400.6	574	424	117	20	300	8	22	254	70	20	4.5	327
500	20	513	748	159	85	141	8	125.3	152.3	441.6	602	452	136	20	300	8	22	254	75	20	4.5	375
600	24	613	887	181	100	161	10	156.5	193.5	514.6	678	528	136	20	300	8	22	254	85	22	5	560

■300Lb Full Lugged 80mm to 400mm



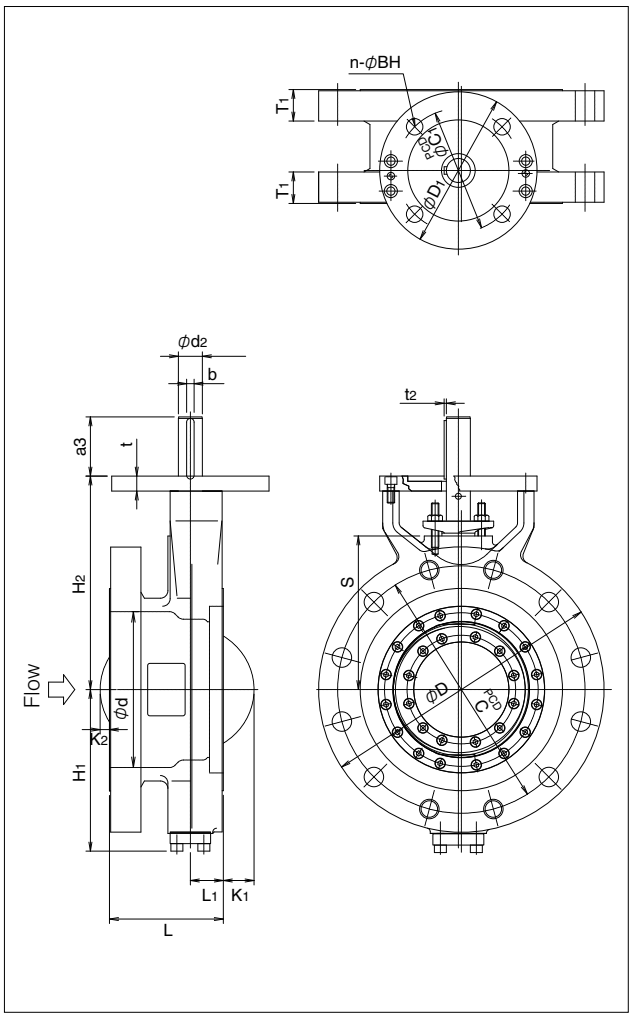
■300Lb Full Lugged 450mm to 600mm



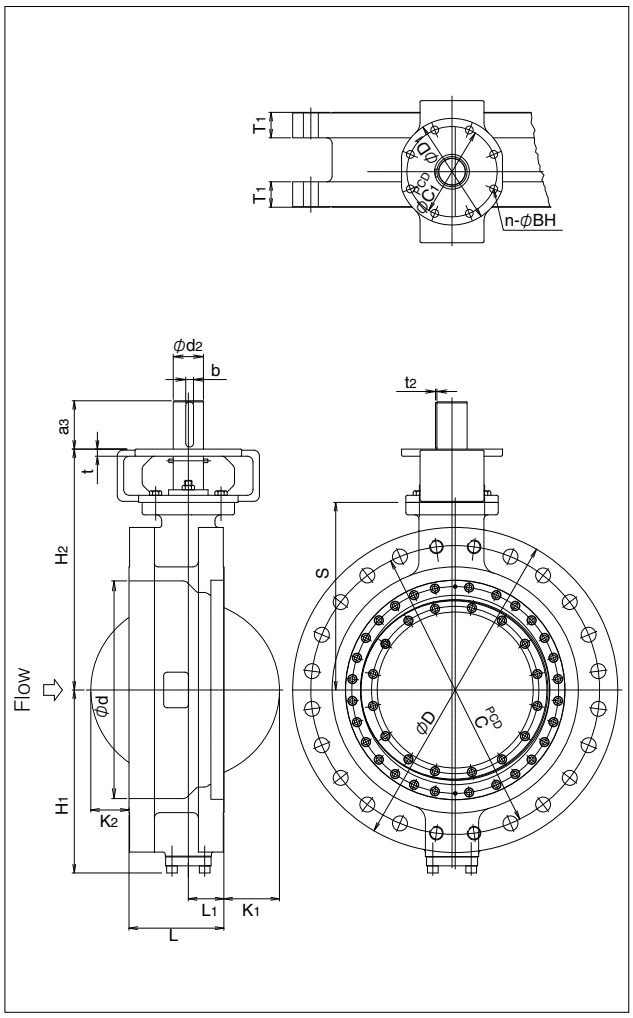
TT2-300Lb Bare shaft（Flanged type）

Nominal size		Dimension (mm)																			Approx. Mass (kg)
mm	inch	φd	φD	L	L_1	K_1	K_2	T_1	H_1	H_2	S	a_3	t	φD_1	n	BH	φC_1	φd_2	b	t_2	
80	3	90	210	114	29	3	0	29	120.6	159	110	34	12	125	4	11	102	18	6	2.5	17
100	4	117	254	127	31.5	9	0	32	144.6	194	132	34	12	125	4	11	102	20	6	2.5	28
150	6	166	318	140	36.5	24	0	37	188.6	276	212	64	14	175	4	11	102	26	8	3	48
200	8	208	381	152	44	41.7	0	42	217.6	285	205	79	20	210	4	18	140	32	10	3	78
250	10	275	444	165	47.5	59	0	48	259.6	355	260	79	20	210	4	22	165	37	10	3	114
300	12	310	520	178	53	79.5	16.5	51	305.6	428	313	79	25	226	4	22	165	45	14	3.5	175
350	14	360	585	190	60.5	87	28	55	340.6	460	345	79	25	226	4	22	165	52	16	4	235
400	16	410	648	216	71	100.3	38.3	58	373.6	518	388	109	32	300	8	18	254	60	18	4	302
450	18	460	710	222	79	109.6	61.4	61	400.6	574	424	117	20	300	8	22	254	70	20	4.5	407
500	20	513	775	229	85	125.3	82.3	64	441.6	602	452	136	20	300	8	22	254	75	20	4.5	491
600	24	613	915	267	100	156.5	107.5	70	514.6	678	528	136	20	300	8	22	254	85	22	5	724

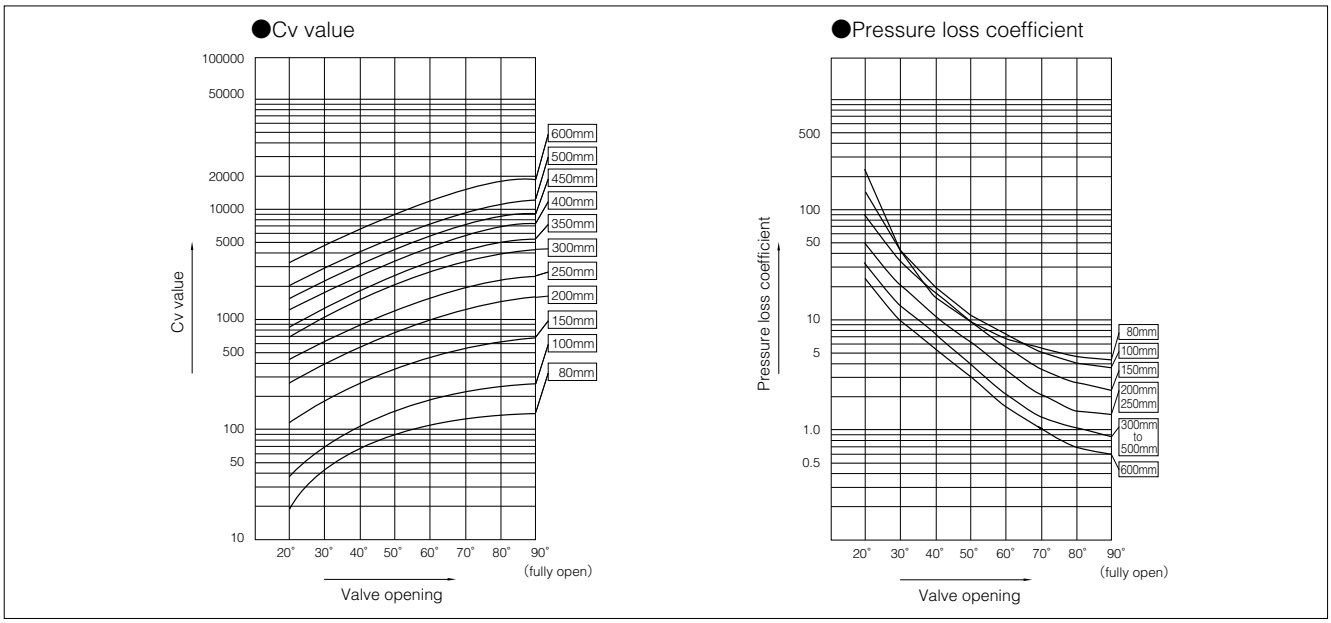
■300Lb Flanged 80mm to 400mm



■300Lb Flanged 450mm to 600mm



TT2 150Lb Cv value/pressure loss coefficient



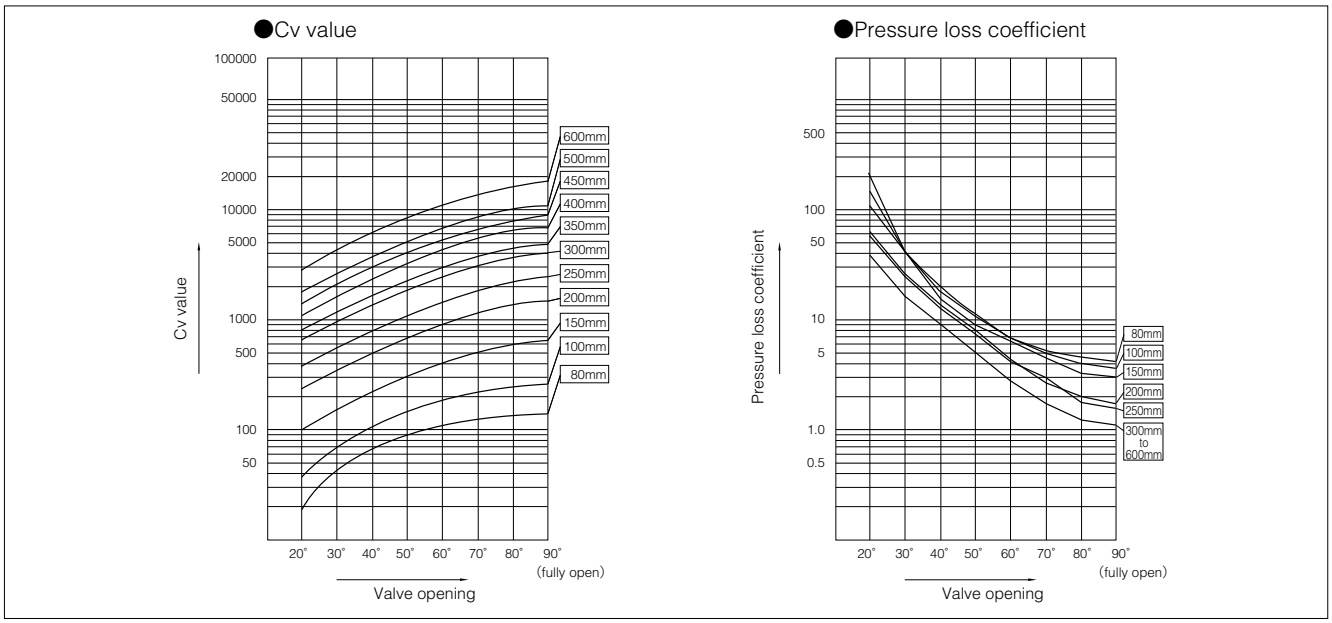
TT2 150Lb Cv value

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
80	3	18.5	42.9	69.8	92.5	109	121	130	134
100	4	38.9	73.1	109	146	182	217	244	255
150	6	111	181	253	340	446	559	650	686
200	8	259	400	542	730	980	1260	1480	1570
250	10	411	635	859	1160	1550	1990	2340	2480
300	12	697	1080	1460	1960	2630	3370	3970	4210
350	14	861	1330	1800	2420	3250	4170	4910	5200
400	16	1200	1850	2510	3370	4530	5810	6840	7250
450	18	1500	2310	3130	4220	5670	7270	8550	9060
500	20	1930	2980	4040	5440	7310	9360	11000	11700
600	24	3110	4800	6500	8750	11800	15100	17700	18800

TT2 150Lb Pressure loss coefficent

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
80	3	233	43.2	16.3	9.29	6.71	5.47	4.69	4.45
100	4	155	43.9	19.5	11.0	7.04	4.99	3.92	3.6
150	6	90.4	33.9	17.3	9.6	5.58	3.56	2.63	2.36
200	8	50.8	21.3	11.6	6.41	3.55	2.16	1.56	1.39
250	10	48.5	20.3	11.1	6.12	3.39	2.07	1.49	1.33
300	12	34.7	14.6	7.95	4.38	2.43	1.48	1.07	0.95
350	14	35.7	15	8.17	4.5	2.50	1.52	1.1	0.976
400	16	31.3	13.2	7.18	3.96	2.19	1.34	0.964	0.858
450	18	32.1	13.5	7.35	4.05	2.24	1.37	0.987	0.878
500	20	29.8	12.5	6.83	3.76	2.09	1.27	0.917	0.817
600	24	24.1	10.1	5.52	3.04	1.69	1.03	0.741	0.66

TT2 300Lb Cv value/pressure loss coefficient



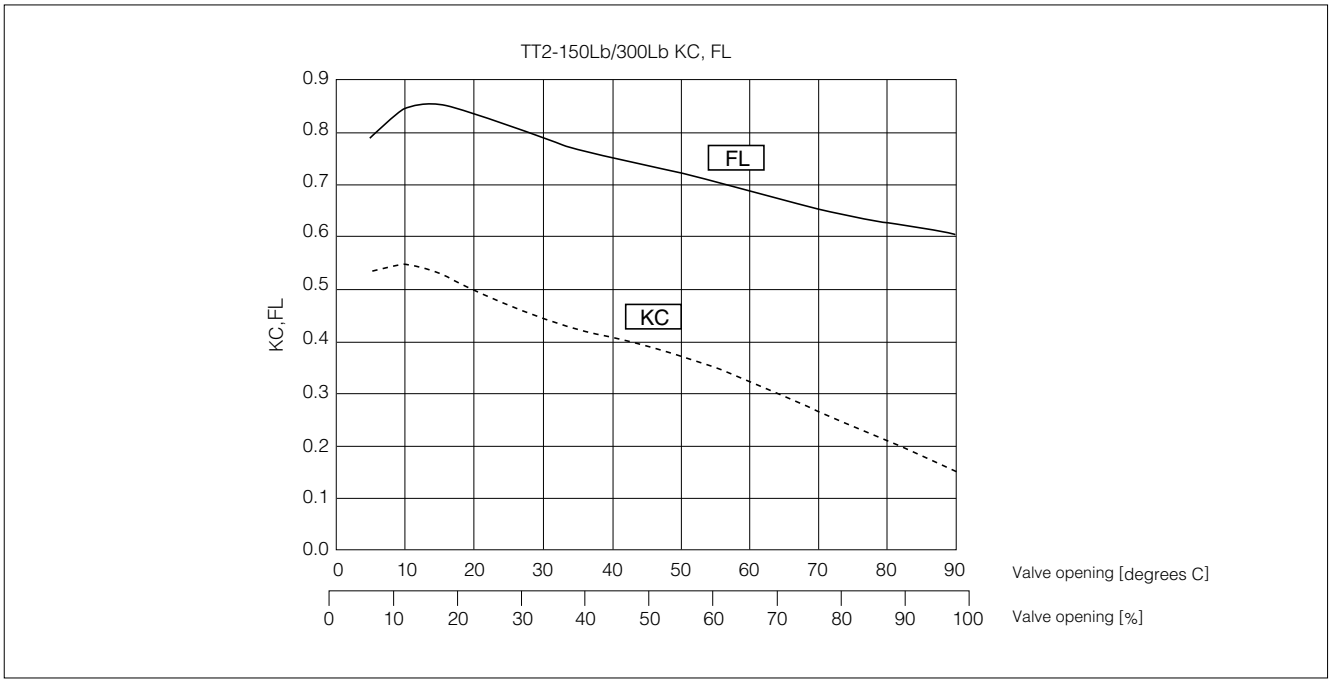
TT2 300Lb Cv value

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
80	3	18.5	42.9	69.8	92.5	109	121	130	134
100	4	38.9	73.1	109	146	182	217	244	255
150	6	99	162	226	304	399	499	580	612
200	8	232	357	484	652	875	1120	1320	1400
250	10	367	567	767	1030	1390	1780	2090	2220
300	12	622	960	1300	1750	2350	3010	3550	3760
350	14	768	1190	1610	2160	2910	3270	4380	4640
400	16	1070	1650	2240	3010	4050	5190	6100	6470
450	18	1340	2070	2800	3770	5060	6490	7630	8090
500	20	1730	2660	3610	4860	6520	8360	9840	10400
600	24	2780	4290	5800	7820	10500	13500	15800	16800

TT2 300Lb Pressure loss coefficent

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
80	3	233	43.2	16.3	9.29	6.71	5.47	4.69	4.45
100	4	155	43.9	19.5	11.0	7.04	4.99	3.92	3.6
150	6	113	42.5	21.7	12.0	7.00	4.46	3.3	2.97
200	8	63.7	26.7	14.6	8.04	4.46	2.71	1.96	1.74
250	10	60.8	25.5	13.9	7.67	4.25	2.59	1.87	1.66
300	12	43.5	18.3	9.97	5.49	3.05	1.85	1.34	1.19
350	14	44.7	18.8	10.2	5.65	3.13	1.91	1.38	1.22
400	16	39.3	16.5	9	4.96	2.75	1.67	1.21	1.08
450	18	40.3	16.9	9.22	5.08	2.82	1.71	1.24	1.1
500	20	37.4	15.7	8.57	4.72	2.62	1.59	1.15	1.02
600	24	30.2	12.7	6.92	3.81	2.11	1.29	0.929	0.827

TT2 KC, FL

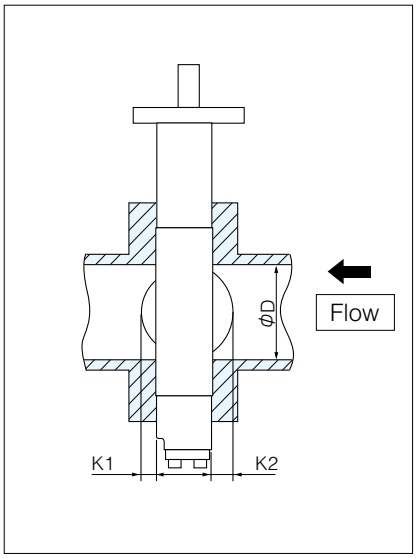


■150Lb, 300Lb

	Valve opening							
mm	20˚	30˚	40˚	50˚	60˚	70˚	80˚	90˚
KC	0.498	0.443	0.407	0.372	0.324	0.265	0.209	0.151
FL	0.838	0.788	0.752	0.724	0.691	0.654	0.626	0.604

TT2 Miniumum internal diameters of piping

Nominal size		Miniumum internal diameters of piping	
mm	inch	150Lb	300Lb
80	3	73	73
100	4	87	87
150	6	129	128
200	8	185	181
250	10	227	221
300	12	281	275
350	14	313	301
400	16	363	349
450	18	395	385
500	20	446	430
600	24	538	534



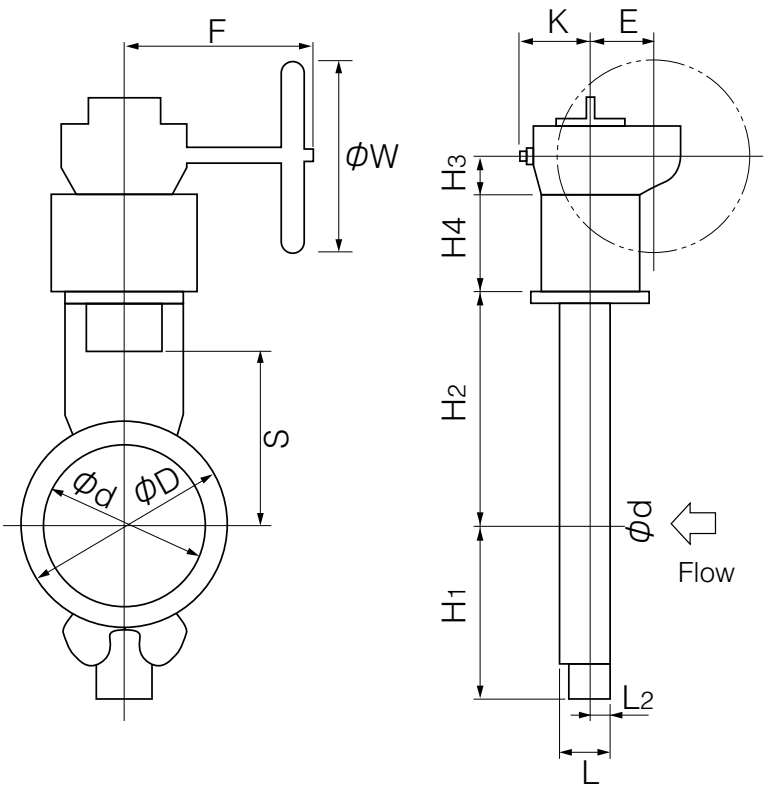
■150Lb Wafer type High temperature specification

Nominal size		Dimension (mm)													Gear type		Approx. Weight (kg)
mm	inch	φd	φD	L	L2	H1	H2	S	H3	H4	E	K	F	φW			
80	3	82	127	48	19	120.6	159	110	42	100	67	75	198	200	2U	2U-3	19 (15)
100	4	108	154	54	22.5	144.6	194	132	42	100	67	75	198	200		2U-3	23 (19)
150	6	159	215	57	22	189.6	242	180	42	100	67	75	198	200		2U-3	30 (26)
200	8	202	266	64	25	199.6	248	180	42	100	67	88	198	200		2U-3	39 (35)
250	10	235	324	71	28	245.6	326	252	48	150	88	90	223	280		2U-4	67 (61)
300	12	290	373	81	32.5	281.6	376	281	63	150	91.5	127	310	400	2K	SBWG-02	103 (87)
350	14	329	413	92	40	307.6	400	305	63	150	91.5	127	310	400		SBWG-02	119 (103)
400	16	370	470	102	39	345.6	470	355	63	180	113	156	343	560		SBWG-03	155 (135)
450	18	432	534	114	46	383.6	510	395	63	180	31.5	156	363	560		SBWG-03-1S	214 (194)
500	20	488	585	127	48	410.6	531	416	63	180	31.5	156	363	500		SBWG-03-1S	241 (221)
600	24	576	692	154	65	469.6	643	493	85	200	32.7	200	422	630		SBWG-04-1S	411 (381)

Standard is H4=0. Approx, Mass is shown in ( ).

■TT2-2U/2K

80 to 250mm



■2U/2K Installation direction

Stem side / Flow / Retainer side	Stem side / Flow / Retainer side	Stem side / Flow / Retainer side	Stem side / Flow / Retainer side
2UA / 2KA	2UB / 2KB	2UC / 2KC	2UD / 2KD

Worm Gear Type TT2-2U(80mm to 250m) / TT2-2K(300mm to 600mm)

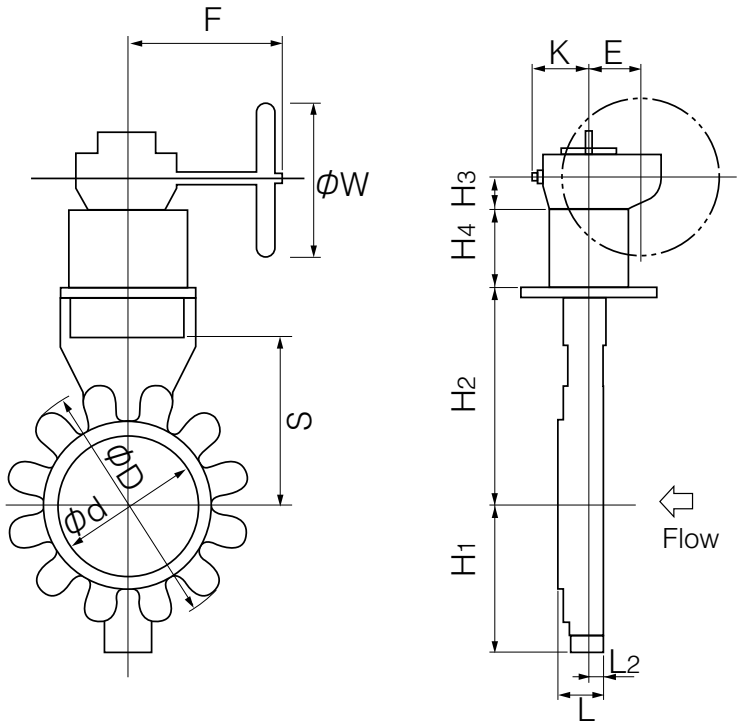
■150Lb Full Lugged Type in High Temperature Specification

Nominal size		Dimension (mm)													Gear type		Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	S	H_3	H_4	E	K	F	φW			
80	3	100	185	48	19	120.6	159	110	42	100	67	75	198	200	2U	2U-3	19 (15)
100	4	117	238	54	22.5	144.6	194	132	42	100	67	75	198	200		2U-3	25 (21)
150	6	167	281	57	22	189.6	242	180	42	100	67	75	198	200		2U-3	32 (28)
200	8	218	338	64	25	199.6	248	180	42	100	67	88	198	200		2U-3	40 (36)
250	10	270	424	71	28	245.6	326	252	48	150	88	90	222.5	280		2U-4	74 (68)
300	12	320	478	81	32.5	281.6	376	281	63	150	91.5	127	310	400	2K	SBWG-02	113 (97)
350	14	350	526	92	40	307.6	400	305	63	150	91.5	127	310	400		SBWG-02	128 (112)
400	16	410	592	102	39	345.6	470	355	63	180	113	156	343	560		SBWG-03	182 (162)
450	18	460	634	114	46	383.6	510	395	63	180	31.5	156	363	560		SBWG-03-1S	238 (218)
500	20	510	714	127	48	410.6	531	416	63	180	31.5	156	363	500		SBWG-03-1S	278 (258)
600	24	614	830	154	65	469.6	643	493	85	200	32.7	200	422	630		SBWG-04-1S	498 (468)

Standard is H_4=0. Approx, Mass is shown in ( ).

■TT2-2U/2K

80 to 250mm



■2U/2K Installation Direction

Stem Side / Flow / Retainer Side	Stem Side / Flow / Retainer Side	Stem Side / Flow / Retainer Side	Stem Side / Flow / Retainer Side
2UA / 2KA	2UB / 2KB	2UC / 2KC	2UD / 2KD

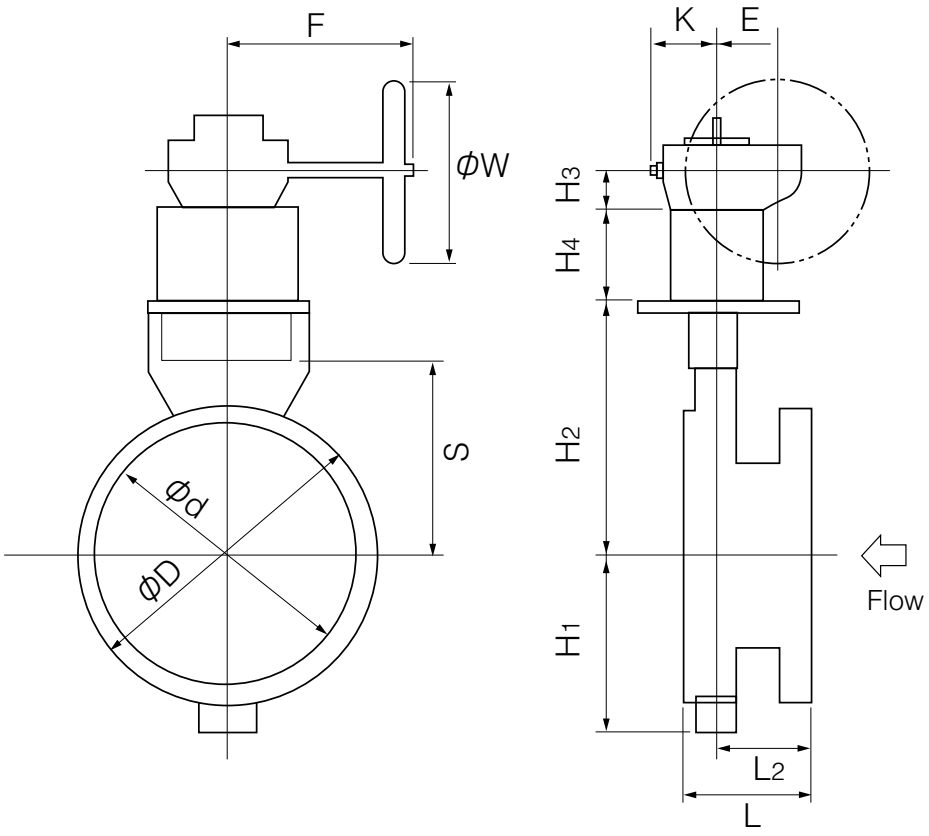
■150Lb Flanged Type in High Temperature Specification

Nominal size		Dimension (mm)													Gear type		Approx. Weight (kg)
mm	inch	φd	φD	L	L2	H1	H2	S	H3	H4	E	K	F	φW			
80	3	90	190	114	85	120.6	159	110	42	100	67	75	198	200	2U	2U-3	26 (22)
100	4	117	229	127	95.5	144.6	194	132	42	100	67	75	198	200		2U-3	33 (29)
150	6	167	279	140	105	189.6	242	180	42	100	67	75	198	200		2U-3	46 (42)
200	8	218	343	152	113	199.6	248	180	42	100	67	88	198	200		2U-3	60 (56)
250	10	270	406	165	122	245.6	326	252	48	150	88	90	222.5	280		2U-4	99 (93)
300	12	320	483	178	129.5	281.6	376	281	63	150	91.5	127	310	400	2K	SBWG-02	154 (138)
350	14	350	535	190	138	307.6	400	305	63	150	91.5	127	310	400		SBWG-02	192 (176)
400	16	410	595	216	153	345.6	470	355	63	180	113	156	343	560		SBWG-03	242 (222)
450	18	458	635	222	154	383.6	510	395	63	180	31.5	156	363	560		SBWG-03-1S	290 (270)
500	20	510	700	229	150	410.6	531	416	63	180	31.5	156	363	500		SBWG-03-1S	365 (345)
600	24	614	815	267	178	469.6	643	493	85	200	32.7	200	422	630		SBWG-04-1S	537 (507)

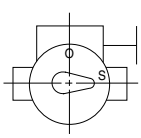
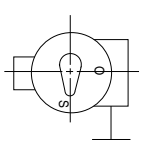
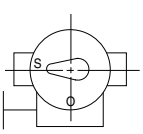
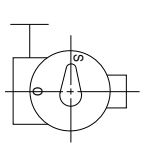
Standard is H4=0. Approx, Mass is shown in ( ).

■TT2-2U/2K

80 to 250mm



■2U/2K Installation Direction

Stem Side Flow  Retainer Side	Stem Side Flow  Retainer Side	Stem Side Flow  Retainer Side	Stem Side Flow  Retainer Side
2UA / 2KA	2UB / 2KB	2UC / 2KC	2UD / 2KD

Worm Gear Type TT2-2U(80mm to 150mm) / TT2-2K(200mm to 600mm)

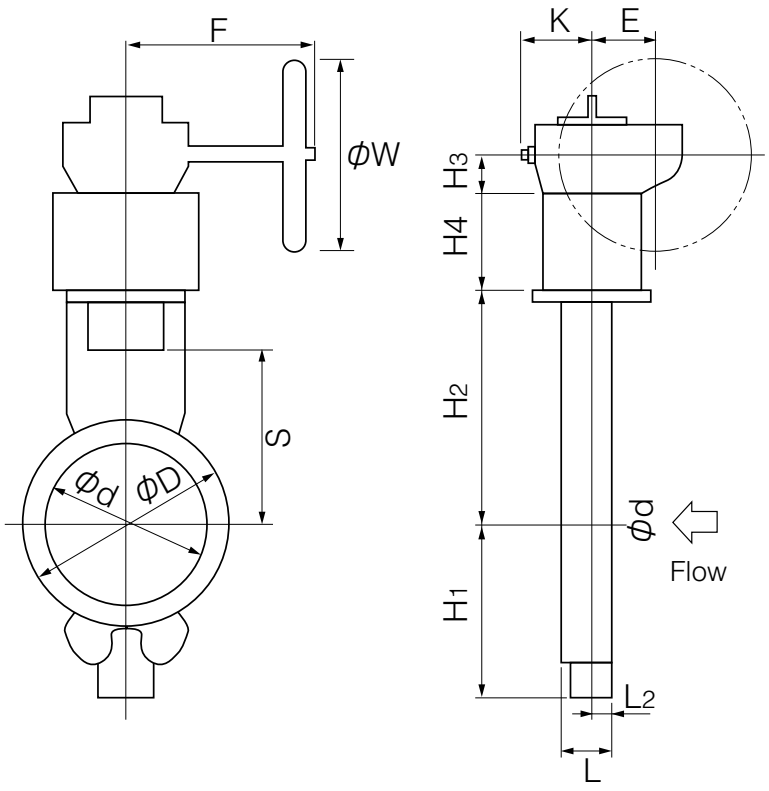
■300Lb Waefr Type in High Temperature Specification

Nominal size		Dimension (mm)													Gear type		Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	S	H_3	H_4	E	K	F	φW			
80	3	82	127	48	19	120.6	159	110	42	100	67	75	198	200	2U	2U-3	19 (15)
100	4	108	154	54	22.5	144.6	194	132	42	100	67	75	198	200		2U-3	23 (19)
150	6	153	215	59	22.5	188.6	276	212	42	100	67	88	198	200		2U-3	35 (31)
200	8	188	270	73	29	217.6	285	205	52	150	75	110	252	300	2K	SBWG-01	61 (49)
250	10	235	324	83	35.5	259.6	355	260	63	150	91.5	127	310	400		SBWG-02	96 (80)
300	12	290	381	92	39	305.6	428	313	63	180	113	156	343	560		SBWG-03	137 (117)
350	14	329	413	117	56.5	340.6	460	345	63	180	31.5	156	363	560		SBWG-03-1S	166 (146)
400	16	370	470	133	62	373.6	518	388	85	200	32.7	180	422	630		SBWG-04-1S	268 (238)
450	18	426	534	149	70	400.6	574	424	87	200	72.7	216	476	710		SBWG-05-1S	366 (329)
500	20	476	592	159	74	441.6	602	452	87	200	184.5	218	508	710		SBWG-05-1SD	436 (399)
600	24	564	693	181	81	514.6	678	528	110	200	230	290	648	800		SBWG-06-1SD	673 (636)

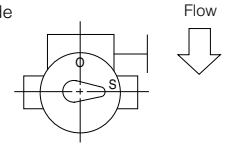
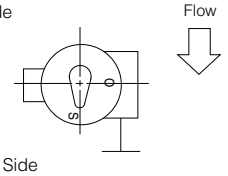
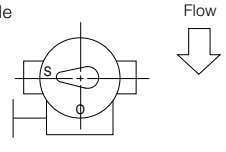
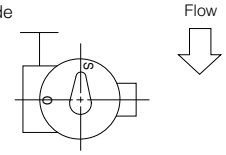
Standard is H_4=0. Approx, Mass is shown in ( ).

■TT2-2U/2K

80 to 150mm



■2U/2K Installation Direction

Stem Side Flow  Retainer Side	Stem Side Flow  Retainer Side	Stem Side Flow  Retainer Side	Stem Side Flow  Retainer Side
2UA / 2KA	2UB / 2KB	2UC / 2KC	2UD / 2KD

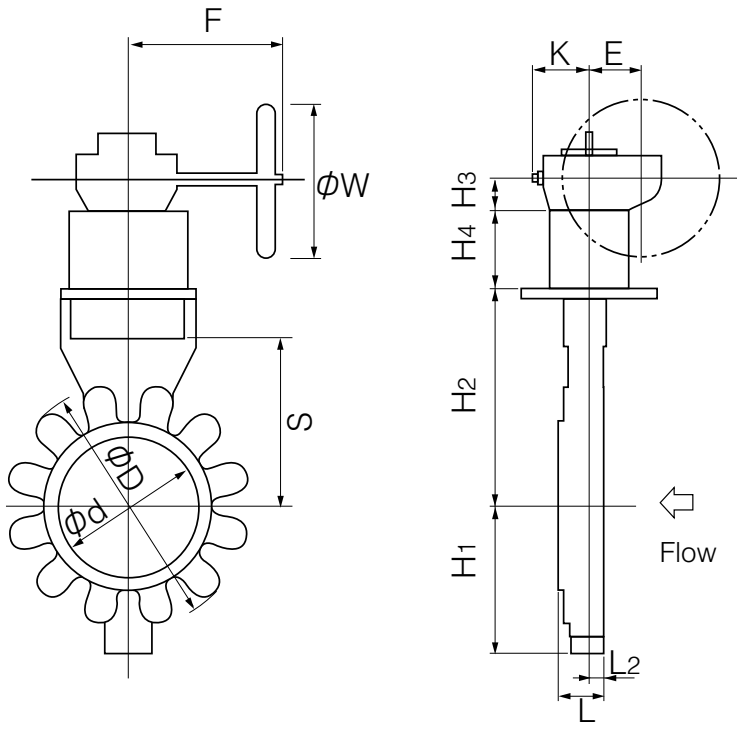
■300Lb Full Lugged Type in High Temperature Specification

Nominal size		Dimension (mm)													Gear type		Approx. Weight (kg)
mm	inch	φd	φD	L	L2	H1	H2	S	H3	H4	E	K	F	φW			
80	3	82	204	48	19	120.6	159	110	42	100	67	75	198	200	2U	2U-3	20 (16)
100	4	177	238	54	22.5	144.6	194	132	42	100	67	75	198	200		2U-3	25 (21)
150	6	166	312	59	22.5	188.6	276	212	42	100	67	88	198	200		2U-3	36 (32)
200	8	208	374	73	29	217.6	285	205	52	150	75	110	252	300	2K	SBWG-01	72 (56)
250	10	275	435	83	35.5	259.6	355	260	63	150	91.5	127	310	400		SBWG-02	108 (92)
300	12	320	503	92	39	305.6	428	313	63	180	113	156	343	560		SBWG-03	153 (133)
350	14	360	570	117	56.5	340.6	460	345	63	180	31.5	156	363	560		SBWG-03-1S	216 (196)
400	16	400	630	133	62	373.6	518	388	85	200	32.7	180	422	630		SBWG-04-1S	327 (297)
450	18	460	690	149	70	400.6	574	424	87	200	72.7	216	476	710		SBWG-05-1S	462 (425)
500	20	513	748	159	74	441.6	602	452	87	200	184.5	218	508	710		SBWG-05-1SD	519 (482)
600	24	613	887	181	81	514.6	678	528	110	200	230	290	648	800		SBWG-06-1SD	817 (780)

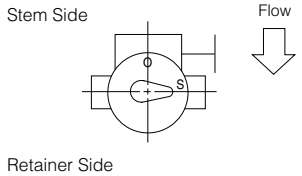
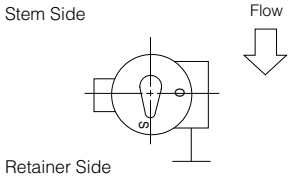
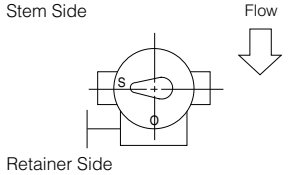
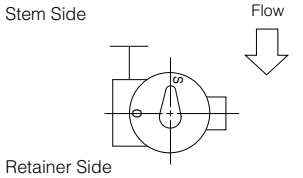
Standard is H4=0. Approx, Mass is shown in ( ).

■TT2-2U/2K

80 to 150mm



■2U/2K Installation Direction

			
Stem Side / Flow / Retainer Side	Stem Side / Flow / Retainer Side	Stem Side / Flow / Retainer Side	Stem Side / Flow / Retainer Side
2UA / 2KA	2UB / 2KB	2UC / 2KC	2UD / 2KD

Worm Gear Type TT2-2U(80mm to 150mm) / TT2-2K(200mm to 600mm)

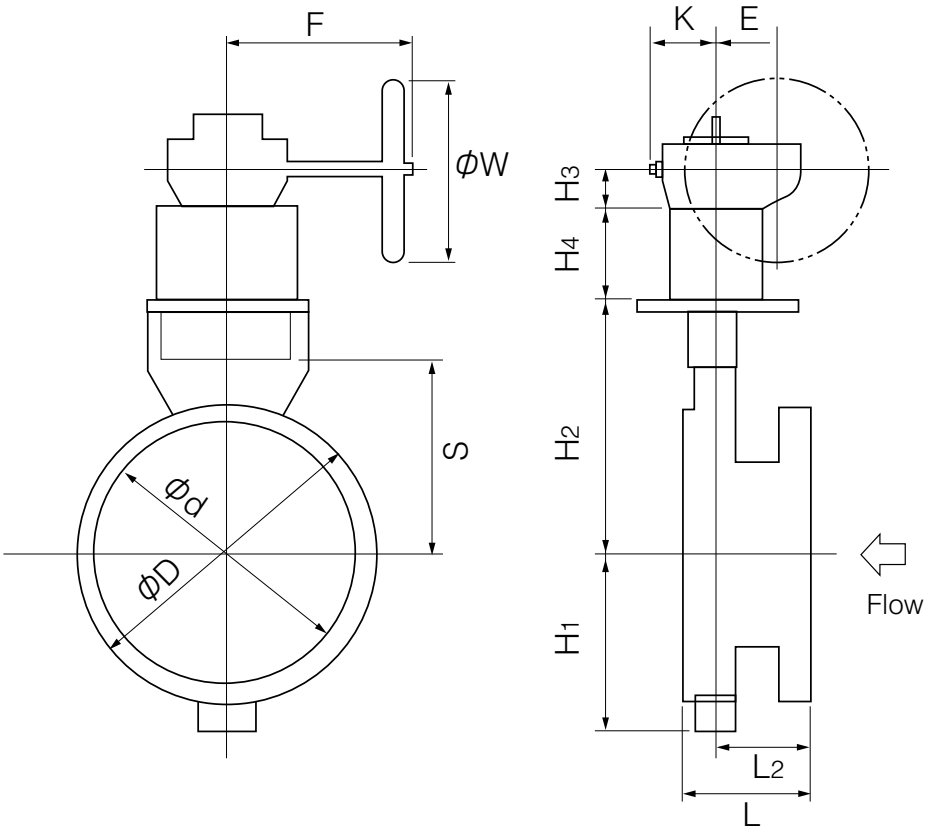
■300Lb Flanged Type in High Temperature Specification

Nominal size		Dimension (mm)													Gear type		Approx. Weight (kg)
mm	inch	φd	φD	L	L2	H1	H2	S	H3	H4	E	K	F	φW			
80	3	90	210	114	85	120.6	159	110	42	100	67	75	198	200	2U	2U-3	29 (25)
100	4	117	254	127	95.5	144.6	194	132	42	100	67	75	198	200		2U-3	40 (36)
150	6	166	318	140	103.5	188.6	276	212	42	100	67	88	198	200		2U-3	60 (56)
200	8	208	381	152	108	217.6	285	205	52	150	75	110	252	300	2K	SBWG-01	102 (90)
250	10	275	444	165	117.5	259.6	355	260	63	150	91.5	127	310	400		SBWG-02	151 (135)
300	12	310	520	178	125	305.6	428	313	63	180	113	156	343	560		SBWG-03	223 (203)
350	14	360	585	190	129.5	340.6	460	345	63	180	31.5	156	363	560		SBWG-03-1S	288 (268)
400	16	410	648	216	145	373.6	518	388	85	200	32.7	180	422	630		SBWG-04-1S	404 (374)
450	18	460	710	222	143	400.6	574	424	87	200	72.7	216	476	710		SBWG-05-1S	542 (505)
500	20	513	775	229	144	441.6	602	452	87	200	184.5	218	508	710		SBWG-05-1SD	635 (598)
600	24	613	915	267	167	514.6	678	528	110	200	230	290	648	800		SBWG-06-1SD	981 (944)

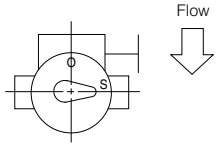
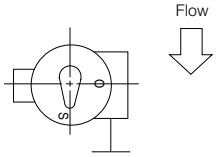
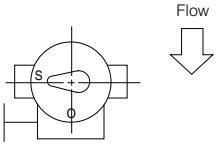
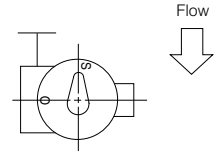
Standard is H4=0. Approx, Mass is shown in ( ).

■TT2-2U/2K

80 to 150mm



■2U/2K Installation Direction

Stem Side Flow  Retainer Side	Stem Side Flow  Retainer Side	Stem Side Flow  Retainer Side	Stem Side Flow  Retainer Side
2UA / 2KA	2UB / 2KB	2UC / 2KC	2UD / 2KD

TT2 Applicable flange standard

■150Lb Wafer

Nominal size		ANSI, API/JPI		JIS			BS4504, DIN, ISO			
mm	inch	300Lb	150Lb	10K	16K, 20K	30K	PN10(NP10)	PN16(NP16)	PN25(NP25)	PN40(NP40)
80	3	T (D)	—	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)
100	4	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)
150	6	×	T (D)	T (D)	T (D)	×	T (D)	T (D)	×	×
200	8	×	T (D)	T (D)	T (D)	×	T (D)	T (D)	×	×
250	10	×	T (D)	T (D)	T (D)	×	T (D)	T (D)	×	×
300	12	×	T (D)	T	T	×	T (D)	T (D)	×	×
350	14	×	T (D)	T (D)	T (D)	×	T (D)	T (D)	×	×
400	16	×	T (D)	T (D)	T (D)	×	T (D)	T (D)	×	×
450	18	×	T	T	T	×	T	T	×	×
500	20	×	T	T	T	×	T	T	×	×
600	24	×	T	T	T	×	T	T	×	×

■300Lb Wafer

Nominal size		ANSI, API/JPI		JIS			BS4504, DIN, ISO			
mm	inch	300Lb	150Lb	10K	16K, 20K	30K	PN10(NP10)	PN16(NP16)	PN25(NP25)	PN40(NP40)
80	3	T (D)	—	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)
100	4	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)
150	6	T (D)	×	×	T (D)	T (D)	×	T (D)	T (D)	T (D)
200	8	T (D)	×	×	T (D)	T (D)	×	T (D)	T (D)	T (D)
250	10	T	×	×	T (D)	T (D)	×	T (D)	T (D)	T (D)
300	12	T	×	×	T	T	×	T (D)	T	T
350	14	T	×	×	T	T	×	T	T	T
400	16	T	×	×	T	T	×	T	T	T
450	18	T	×	×	T	×	×	T	T	T
500	20	T	×	×	T	×	×	T	T	T
600	24	T	×	×	T	×	×	T	T	T

T(D) : With drill hole or tapping.
T : With flange tapping
— : No nominal diameter.
× : Not applicable

TT2 Applicable flange standard

■150Lb Lugged

Nominal size		ANSI, API/JPI		JIS			BS4504, DIN, ISO			
mm	inch	300Lb	150Lb	10K	16K, 20K	30K	PN10(NP10)	PN16(NP16)	PN25(NP25)	PN40(NP40)
80	3	×	T (D)	×	×	×	×	×	×	×
100	4	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)
150	6	×	T (D)	T (D)	×	×	T (D)	T (D)	×	×
200	8	×	T (D)	×	×	×	T (D)	×	×	×
250	10	×	T (D)	T (D)	T (D)	×	T (D)	T (D)	×	×
300	12	×	T (D)	×	×	×	T (D)	T (D)	×	×
350	14	×	T (D)	×	×	×	×	×	×	×
400	16	×	T (D)	T (D)	T (D)	×	T (D)	T (D)	×	×
450	18	×	T	×	×	×	×	×	×	×
500	20	×	T	T	T	×	T	T	×	×
600	24	×	T	×	×	×	T	T	×	×

■300Lb Lugged

Nominal size		ANSI, API/JPI		JIS			BS4504, DIN, ISO			
mm	inch	300Lb	150Lb	10K	16K, 20K	30K	PN10(NP10)	PN16(NP16)	PN25(NP25)	PN40(NP40)
80	3	T (D)	×	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)
100	4	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)	T (D)
150	6	T (D)	×	×	T (D)	T (D)	×	×	×	×
200	8	T (D)	×	×	T (D)	T (D)	×	T (D)	T (D)	T (D)
250	10	T	×	×	×	×	×	×	×	×
300	12	T	×	×	T	T	×	×	T	T
350	14	T	×	×	×	×	×	×	×	×
400	16	T	×	×	×	×	×	×	×	×
450	18	T	×	×	×	×	×	×	×	×
500	20	T	×	×	×	×	×	×	×	×
600	24	T	×	×	×	×	×	×	×	×

T(D) : With drill hole or tapping.
T : With flange tapping
× : Not applicable

TT2 Applicable flange standard

■150Lb DFSP

Nominal size		ANSI, API/JPI		JIS			BS4504, DIN, ISO			
mm	inch	300Lb	150Lb	10K	16K, 20K	30K	PN10(NP10)	PN16(NP16)	PN25(NP25)	PN40(NP40)
80	3	×	D	×	×	×	×	×	×	×
100	4	×	T	×	×	×	×	×	×	×
150	6	×	T	×	×	×	×	×	×	×
200	8	×	T	×	×	×	×	×	×	×
250	10	×	T	×	×	×	×	×	×	×
300	12	×	T	×	×	×	×	×	×	×
350	14	×	T	×	×	×	×	×	×	×
400	16	×	T	×	×	×	×	×	×	×
450	18	×	T	×	×	×	×	×	×	×
500	20	×	T	×	×	×	×	×	×	×
600	24	×	T	×	×	×	×	×	×	×

■300Lb DFSP

Nominal size		ANSI, API/JPI		JIS			BS4504, DIN, ISO			
mm	inch	300Lb	150Lb	10K	16K, 20K	30K	PN10(NP10)	PN16(NP16)	PN25(NP25)	PN40(NP40)
80	3	T	×	×	×	×	×	×	×	×
100	4	T	×	×	×	×	×	×	×	×
150	6	T	×	×	×	×	×	×	×	×
200	8	T	×	×	×	×	×	×	×	×
250	10	T	×	×	×	×	×	×	×	×
300	12	T	×	×	×	×	×	×	×	×
350	14	T	×	×	×	×	×	×	×	×
400	16	T	×	×	×	×	×	×	×	×
450	18	T	×	×	×	×	×	×	×	×
500	20	T	×	×	×	×	×	×	×	×
600	24	T	×	×	×	×	×	×	×	×

D : With flange drilling
T : With flange tapping
× : Not applicable

* JIS, BS, DIN double-flange type main body not available.
Please consult with us regarding the appropriateness of JIS, BS and DIN piping in an ANSI or API/JPI main body.

TT2 Wafer Type Piping Bolts and Nuts Sizes

■Wafer Type 150Lb

Nominal size		ASME B16.5 150Lb, JPI-7S-15 150Lb			10K		
mm	inch	Setting Bolts	Long Bolts	No.of Nuts	Setting Bolts	Long Bolts	No.of Nuts
80	3	—	4-5/8-11UNC×160	8	8-M16× 75(13× 8)	4-M16×145	16
100	4	8-5/8-11UNC× 85(13× 8)	4-5/8-11UNC×160	16	8-M16× 75(13× 8)	4-M16×145	16
150	6	8-3/4-10UNC× 95(17×11)	4-3/4-10UNC×175	16	8-M20× 85(17×11)	4-M20×170	16
200	8	8-3/4-10UNC× 95(17×11)	4-3/4-10UNC×185	16	8-M20× 85(17×11)	8-M20×180	24
250	10	8-7/8- 9UNC×100(19×12)	8-7/8- 9UNC×205	24	8-M22× 95(19×12)	8-M22×190	24
300	12	8-7/8- 9UNC×100(19×12)	8-7/8- 9UNC×220	24	8-M22× 95(19×12)	12-M22×200	32
350	14	8- 1-8UNC×115(21×14)	8- 1-8UNC×245	24	8-M22× 95(19×12)	12-M22×215	32
400	16	8- 1-8UNC×125(21×14)	12- 1-8UNC×260	32	8-M24×120(21×14)	12-M24×240	32
450	18	8- 1 1/8-8UN×135(24×16)	12-1 1/8-8UN×285	32	8-M24×110(21×14)	16-M24×250	40
500	20	8- 1 1/8-8UN×135(24×16)	16-1 1/8-8UN×300	40	8-M24×110(21×14)	16-M24×260	40
600	24	8- 1 1/4-8UN×145(24×16)	16-1 1/4-8UN×345	40	8-M30×125(24×16)	20-M30×320	48

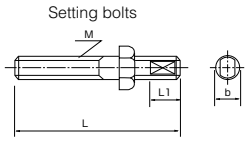
Nominal size		16K			20K		
mm	inch	Setting Bolts	Long Bolts	No.of Nuts	Setting Bolts	Long Bolts	No.of Nuts
80	3	8-M20× 85(17×11)	4-M20×160	16	8-M20× 85(17×11)	4-M20×160	16
100	4	8-M20× 85(17×11)	4-M20×170	16	8-M20× 85(17×11)	4-M20×170	16
150	6	8-M22× 95(19×12)	8-M22×175	24	8-M22× 95(19×12)	8-M22×190	24
200	8	8-M22× 95(19×12)	8-M22×190	24	8-M22×105(19×12)	8-M22×200	24
250	10	8-M24×100(21×14)	8-M24×210	24	8-M24×110(21×14)	8-M24×220	24
300	12	8-M24×100(21×14)	12-M24×220	32	8-M24×110(21×14)	12-M24×230	32
350	14	8-M30(P3)×125(24×16)	12-M30(P3)×250	32	8-M30(P3)×135(24×16)	12-M30(P3)×260	32
400	16	8-M30(P3)×135(24×16)	12-M30(P3)×275	32	8-M30(P3)×145(24×16)	12-M30(P3)×285	32
450	18	8-M30(P3)×135(24×16)	16-M30(P3)×285	40	8-M30(P3)×145(24×16)	16-M30(P3)×300	40
500	20	8-M30(P3)×135(24×16)	16-M30(P3)×300	40	8-M30(P3)×145(24×16)	16-M30(P3)×315	40
600	24	8-M36(P3)×155(30×20)	20-M36(P3)×355	48	8-M36(P3)×165(30×20)	20-M36(P3)×365	48

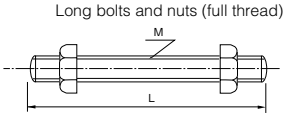
Note: Bolt/Nut material: SNB7/S45C
Please use a nut with a height that is 100% of the screw diameter.
The bold length calculation is based on use of a 4.5 mm thick spiral gasket.
The flange thickness calculation is based on the standard steel flange thickness.
Quantities shown are for one valve.

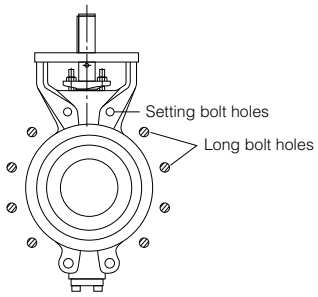
Examples

Setting bolts: 8 - M16 × 75 (13 × 8)
N M L b L1

Long bolts: 4 - M16 × 145
N M L







TT2 Wafer Type Piping Bolts and Nuts Sizes

■Wafer Type 150Lb

Nominal size		DIN NP10, BS4504 PN10, ISO7005-1 PN10			DIN NP16, BS4504 PN16, ISO7005-1 PN16		
mm	inch	Setting Bolts	Long Bolts	No.of Nuts	Setting Bolts	Long Bolts	No.of Nuts
80	3	8-M16× 75(13× 8)	4-M16×145	16	8-M16× 75(13× 8)	4-M16×145	16
100	4	8-M16× 75(13× 8)	4-M16×155	16	8-M16× 75(13× 8)	4-M16×155	16
150	6	8-M20× 85(17×11)	4-M20×170	16	8-M20× 85(17×11)	4-M20×170	16
200	8	8-M20× 85(17×11)	4-M20×180	16	8-M20× 85(17×11)	8-M20×180	24
250	10	8-M20× 95(17×11)	8-M20×190	24	8-M24×100(21×14)	8-M24×200	24
300	12	8-M20× 95(17×11)	8-M20×210	24	8-M24×100(21×14)	8-M24×220	24
350	14	8-M20× 95(17×11)	12-M20×210	32	8-M24×110(21×14)	12-M24×230	32
400	16	8-M24×110(21×14)	12-M24×230	32	8-M27×125(22×14)	12-M27×250	32
450	18	8-M24×110(21×14)	16-M24×250	40	8-M27×125(22×14)	16-M27×265	40
500	20	8-M24×110(21×14)	16-M24×260	40	8-M30×125(24×16)	16-M30×285	40
600	24	8-M27×125(22×14)	16-M27×310	40	8-M33×145(27×18)	16-M33×350	40

■Wafer Type 300Lb

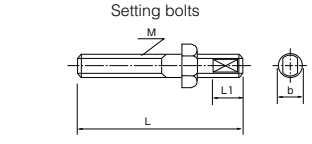
Nominal size		ASME B16.5 300Lb, JPI-7S-15 300Lb			JIS20K		
mm	inch	Setting Bolts	Long Bolts	No.of Nuts	Setting Bolts	Long Bolts	No.of Nuts
80	3	8-3/4-10UNC×95(17×11)	4-3/4-10UNC×175	16	8-M20× 85(17×11)	4-M20×160	16
100	4	8-3/4-10UNC×95(17×11)	4-3/4-10UNC×185	16	8-M20× 85(17×11)	4-M20×170	16
150	6	8-3/4-10UNC×95(17×11)	8-3/4-10UNC×200	24	8-M22× 95(19×12)	8-M22×190	24
200	8	8-7/8-9UNC×115(19×12)	8- 7/8-9UNC×235	24	8-M22×105(19×12)	8-M22×200	24
250	10	8- 1-8UNC×125(21×14)	12- 1-8UNC×260	32	8-M24×110(21×14)	8-M24×230	24
300	12	8-1 1/8-8UN×135(24×16)	12-1 1/8-8UN×285	32	8-M24×120(21×14)	12-M24×240	32
350	14	8-1 1/8-8UN×135(24×16)	16-1 1/8-8UN×315	40	8-M30(P3)×125(24×16)	12-M30(P3)×285	32
400	16	8-1 1/4-8UN×145(24×16)	16-1 1/4-8UN×345	40	8-M30(P3)×135(24×16)	12-M30(P3)×315	32
450	18	8-1 1/4-8UN×145(24×16)	20-1 1/4-8UN×365	48	8-M30(P3)×135(24×16)	16-M30(P3)×335	40
500	20	8-1 1/4-8UN×155(24×16)	20-1 1/4-8UN×380	48	8-M30(P3)×135(24×16)	16-M30(P3)×350	40
600	24	8-1 1/2-8UN×185(30×20)	20-1 1/2-8UN×430	48	8-M36(P3)×165(30×20)	20-M36(P3)×385	48

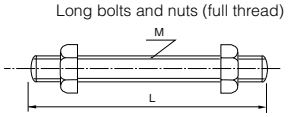
Note: Bolt/Nut material: SNB7/S45C
Please use a nut with a height that is 100% of the screw diameter.
The bold length calculation is based on use of a 4.5 mm thick spiral gasket.
The flange thickness calculation is based on the standard steel flange thickness.
Quantities shown are for one valve.

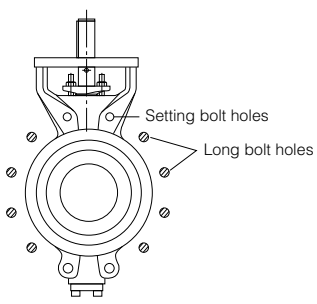
Examples

Setting bolts: 8 - M16 × 75 (13 × 8)
N M L b L1

Long bolts: 4 - M16 × 145
N M L







TT2 Wafer Type Piping Bolts and Nuts Sizes

■Wafer Type 300Lb

Nominal size		JIS30K			DIN NP25, BS4504 PN25, ISO7005-1 PN25		
mm	inch	Setting Bolts	Long Bolts	No.of Nuts	Setting Bolts	Long Bolts	No.of Nuts
80	3	8-M20× 85(17×11)	4-M20×170	16	8-M16× 75(13× 8)	4-M16×155	16
100	4	8-M22×105(19×12)	4-M22×190	16	8-M20× 85(17×11)	4-M20×170	16
150	6	8-M24×100(21×14)	8-M24×210	24	8-M24×100(21×14)	4-M24×190	16
200	8	8-M24×120(21×14)	8-M24×240	24	8-M24×110(21×14)	8-M24×210	24
250	10	8-M30(P3)×135(24×16)	8-M30(P3)×275	24	8-M27×115(22×14)	8-M27×230	24
300	12	8-M30(P3)×145(24×16)	12-M30(P3)×285	32	8-M27×115(22×14)	12-M27×250	32
350	14	8-M30(P3)×145(24×16)	12-M30(P3)×315	32	8-M30×125(24×16)	12-M30×285	32
400	16	8-M36(P3)×155(30×20)	12-M36(P3)×355	32	8-M33×135(27×18)	12-M33×310	32
450	18	—	—	—	8-M33×135(27×18)	16-M33×330	40
500	20	—	—	—	8-M33×135(27×18)	16-M33×350	40
600	24	—	—	—	8-M36×150(30×20)	16-M36×380	40

■Wafer Type 300Lb

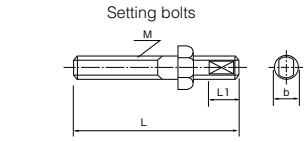
Nominal size		DIN NP40, BS4504 PN40, ISO7005-1 PN40		
mm	inch	Setting Bolts	Long Bolts	No.of Nuts
80	3	8-M16× 75(13× 8)	4-M16×155	16
100	4	8-M20× 85(17×11)	4-M20×170	16
150	6	8-M24×100(21×14)	4-M24×190	16
200	8	8-M27×115(22×14)	8-M27×230	24
250	10	8-M30×125(24×16)	8-M30×250	24
300	12	8-M30×125(24×16)	12-M30×270	32
350	14	8-M33×145(27×18)	12-M33×310	32
400	16	8-M36×150(30×20)	12-M36×340	32
450	18	8-M36×150(30×20)	16-M36×355	40
500	20	8-M39×160(32×21)	16-M39×375	40
600	24	8-M45×185(36×24)	16-M45×430	40

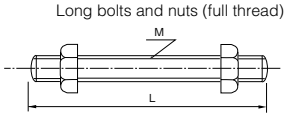
Note: Bolt/Nut material: SNB7/S45C
Please use a nut with a height that is 100% of the screw diameter.
The bold length calculation is based on use of a 4.5 mm thick spiral gasket.
The flange thickness calculation is based on the standard steel flange thickness.
Quantities shown are for one valve.

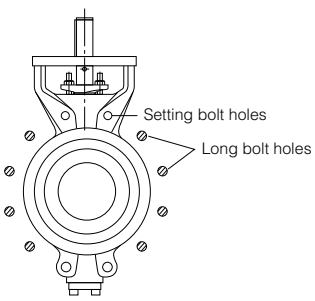
Examples

Setting bolts: 8 - M16 × 75 (13 × 8)
N M L b L1

Long bolts: 4 - M16 × 145
N M L







TT2 Full-lugged (fully-tapped) Piping Bolts and Nuts Sizes

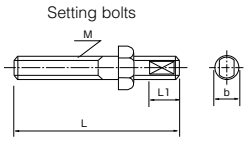
■Lugged Type 150Lb

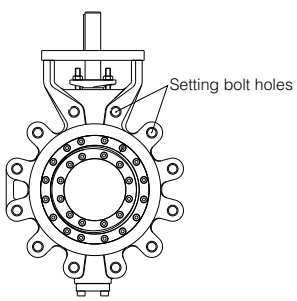
Nominal size		ASME B16.5 150Lb, JPI-7S-15 150Lb		JIS10K		JIS16K	
mm	inch	Setting Bolts	No.of Nuts	Setting Bolts	No.of Nuts	Setting Bolts	No.of Nuts
80	3	8- 5/8-11UNC×85(13× 8)	8	—	—	—	—
100	4	16-5/8-11UNC×85(13× 8)	16	16-M16× 75(13× 8)	16	16 -M20×85(17×11)	16
150	6	16-3/4-10UNC×95(17×11)	16	16-M20× 85(17×11)	16	—	—
200	8	16-3/4-10UNC×95(17×11)	16	—	—	—	—
250	10	24-7/8-9UNC×100(19×12)	24	24-M22× 95(19×12)	24	24-M24×100(21×14)	24
300	12	24-7/8-9UNC×100(19×12)	24	—	—	—	—
350	14	24- 1-8UNC×115(21×14)	24	—	—	—	—
400	16	32- 1-8UNC×115(21×14)	32	32-M24×110(21×14)	32	32-M30(P3)×125(24×16)	32
450	18	32-1 1/8-8UN×135(24×16)	32	—	—	—	—
500	20	40-1 1/8-8UN×135(24×16)	40	40-M24×110(21×14)	40	40-M30(P3)×135(24×16)	40
600	24	40-1 1/4-8UN×145(24×16)	40	—	—	—	—

Nominal size		JIS20K		DIN NP10 BS4504 PN10, ISO7005-1 PN10		DIN NP16, BS4504 PN16, ISO7005-1 PN16	
mm	inch	Setting Bolts	No.of Nuts	Setting Bolts	No.of Nuts	Setting Bolts	No.of Nuts
80	3	—	—	—	—	—	—
100	4	16-M20× 85(17×11)	16	16-M16× 75(13× 8)	16	16-M16× 75(13× 8)	16
150	6	—	—	16-M20× 85(17×11)	16	16-M20× 85(17×11)	16
200	8	—	—	16-M20× 85(17×11)	16	—	—
250	10	24-M24×110(21×14)	24	24-M20× 95(17×11)	24	24-M24×100(21×14)	24
300	12	—	—	24-M20× 95(17×11)	24	24-M24×100(21×14)	24
350	14	—	—	—	—	—	—
400	16	32-M30(P3)×135(24×16)	32	32-M24×110(21×14)	32	32-M27×115(22×14)	32
450	18	—	—	—	—	—	—
500	20	40-M30(P3)×145(24×16)	40	40-M24×110(21×14)	40	40-M30×125(24×16)	40
600	24	—	—	40-M27×115(22×14)	40	40-M33×145(27×18)	40

Note: Bolt/Nut material: SNB7/S45C
Please use a nut with a height that is 100% of the screw diameter.
The bold length calculation is based on use of a 4.5 mm thick spiral gasket.
The flange thickness calculation is based on the standard steel flange thickness.
Quantities shown are for one valve.

Examples
Setting bolts: 8 - M16 × 75 (13 × 8)
N M L b L1





TT2 Full-lugged(fully-tapped)Piping Bolts and Nuts Sizes

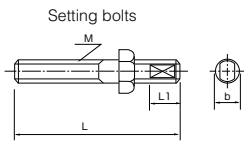
■Lugged Type 300Lb

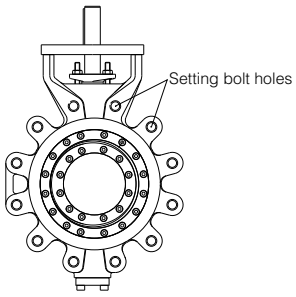
Nominal size		ASME B16.5 300Lb, JPI-7S-15 300Lb		JIS20K		JIS30K	
mm	inch	Setting Bolts	No.of Nuts	Hexagon Bolts	No.of Nuts	Hexagon Bolts	No.of Nuts
80	3	16-3/4-10UNC× 95(17×11)	16	16-M20× 75(17×11)	16	16-M20× 85(17×11)	16
100	4	16-3/4-10UNC× 95(17×11)	16	16-M20× 85(17×11)	16	16-M22× 95(19×12)	16
150	6	24-3/4-10UNC× 95(17×11)	24	24-M22× 95(19×12)	24	24-M24×110(21×14)	24
200	8	24- 7/8-9UNC×115(19×12)	24	24-M22×105(19×12)	24	24-M24×120(21×14)	24
250	10	32- 1-8UNC×125(21×14)	32	—	—	—	—
300	12	32- 1 1/8-8UN×135(24×16)	32	32-M24×120(21×14)	32	32-M30(P3)×135(24×16)	32
350	14	40- 1 1/8-8UN×135(24×16)	40	—	—	—	—
400	16	40- 1 1/4-8UN×145(24×16)	40	—	—	—	—
450	18	48- 1 1/4-8UN×145(24×16)	48	—	—	—	—
500	20	48- 1 1/4-8UN×155(24×16)	48	—	—	—	—
600	24	48- 1 1/2-8UN×185(30×20)	48	—	—	—	—

Nominal size		DIN NP25, BS4504 PN25, ISO7005-5 PN25		DIN NP40, BS4504 PN40, ISO7005-5 PN40	
mm	inch	Setting Bolts	No.of Nuts	Hexagon Bolts	No.of Nuts
80	3	16-M16× 75(13× 8)	16	16-M16× 75(13× 8)	16
100	4	16-M20× 85(17×11)	16	16-M20× 85(17×11)	16
150	6	—	—	—	—
200	8	24-M24×110(21×14)	24	24-M27×115(22×14)	24
250	10	—	—	—	—
300	12	32-M27×115(22×14)	32	32-M30×125(24×16)	32
350	14	—	—	—	—
400	16	—	—	—	—
450	18	—	—	—	—
500	20	—	—	—	—
600	24	—	—	—	—

Note: Bolt/Nut material: SNB7/S45C
Please use a nut with a height that is 100% of the screw diameter.
The bold length calculation is based on use of a 4.5 mm thick spiral gasket.
The flange thickness calculation is based on the standard steel flange thickness.
Quantities shown are for one valve.

Examples
Setting bolts: 8 - M16 × 75 (13 × 8)
N M L b L1





TT2 Double-flanged(short-pattern)Piping Bolts and Nuts Sizes

■150 Lb, Double-flanged, Short-pattern Type

Nominal size		ASME B16.5 150Lb, JPI-7S-15 150Lb		
mm	inch	Setting Bolts	Hexagon Bolts	No.of Nuts
80	3	—	8-5/8-11UNC× 80	8
100	4	4-5/8-11UNC×70(13× 8)	12-5/8-11UNC× 80	16
150	6	4-3/4-10UNC×85(17×11)	12-3/4-10UNC× 95	16
200	8	4-3/4-10UNC×85(17×11)	12-3/4-10UNC× 95	16
250	10	4-7/8-9UNC×100(19×12)	20-7/8-9UNC×100	24
300	12	4-7/8-9UNC×100(19×12)	20-7/8-9UNC×100	24
350	14	4- 1-8UNC×115(21×14)	20- 1-8UNC×115	24
400	16	4- 1-8UNC×115(21×14)	28- 1-8UNC×115	32
450	18	4-1 1/8-8UN×125(24×16)	28-1 1/8-8UN×130	32
500	20	4-1 1/8-8UN×125(24×16)	36-1 1/8-8UN×130	40
600	24	4-1 1/4-8UN×135(24×16)	36-1 1/4-8UN×145	40

■300Lb, Double-flanged, Short-pattern Type

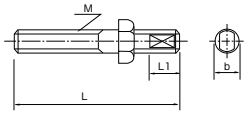
Nominal size		ASME B16.5 300Lb, JPI-7S-15 300Lb		
mm	inch	Setting Bolts	Hexagon Bolts	No.of Nuts
80	3	4-3/4-10UNC×85(17×11)	12-3/4-10UNC× 95	16
100	4	4-3/4-10UNC×85(17×11)	12-3/4-10UNC× 95	16
150	6	4-3/4-10UNC×95(17×11)	20-3/4-10UNC×105	24
200	8	4-7/8-9UNC×100(19×12)	20-7/8-9UNC×120	24
250	10	4- 1-8UNC×125(21×14)	28- 1-8UNC×140	32
300	12	4-1 1/8-8UN×135(24×16)	28-1 1/8-8UN×150	32
350	14	8-1 1/8-8UN×135(24×16)	32-1 1/8-8UN×150	40
400	16	8-1 1/4-8UN×145(24×16)	32-1 1/4-8UN×165	40
450	18	8-1 1/4-8UN×145(24×16)	40-1 1/4-8UN×165	48
500	20	8-1 1/4-8UN×145(24×16)	40-1 1/4-8UN×175	48
600	24	8-1 1/2-8UN×175(30×20)	40-1 1/2-8UN×195	48

Note: Bolt/Nut material: SNB7/S45C
Please use a nut with a height that is 100% of the screw diameter.
The bold length calculation is based on use of a 4.5 mm thick spiral gasket.
The flange thickness calculation is based on the standard steel flange thickness.
Quantities shown are for one valve.

Examples

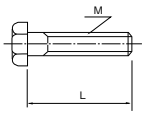
Setting bolts: 8 - M16 × 75 (13 × 8)
N M L b L1

Setting bolts



Hexagon bolts : 4 - M30 × 95
N M L

Hexagon bolts



TT2 Piping gasket

* In case of spiral gasket
  For API, JPI, ANSI flange ..... Any standard gaskets with inner/outer ring can be used.
  For JIS, BS, DIN flange ..... Use special spiral gasket shown below.

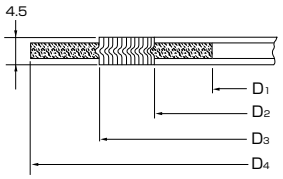
●TT2 Commercially available spiral gasket conformity chart (with inner and outer ring)

Nominal size		ASME/JPI		JIS			BS4504			
mm	inch	150Lb	300Lb	10K	16/20K	30K	PN10	PN16	PN25	PN40
80	3	○	○	×	×	×	×	×	×	×
100	4	○	○	×	×	×	×	×	×	×
150	6	○	○	○	○	×	○	○	○	○
200	8	○	○	○	○	×	○	○	○	○
250	10	○	○	○	×	×	○	○	○	○
300	12	○	○	○	×	×	○	○	○	○
350	14	○	○	○	×	×	○	○	○	○
400	16	○	○	○	×	×	○	○	○	○
450	18	○	○	○	○	–	○	○	○	○
500	20	○	○	○	○	–	○	○	○	○
600	24	○	○	○	○	–	○	○	○	○

* Please use the following special spiral gaskets for the portions marked in "X" in the conformity chart above.

●TT2 Special spiral gasket flange size

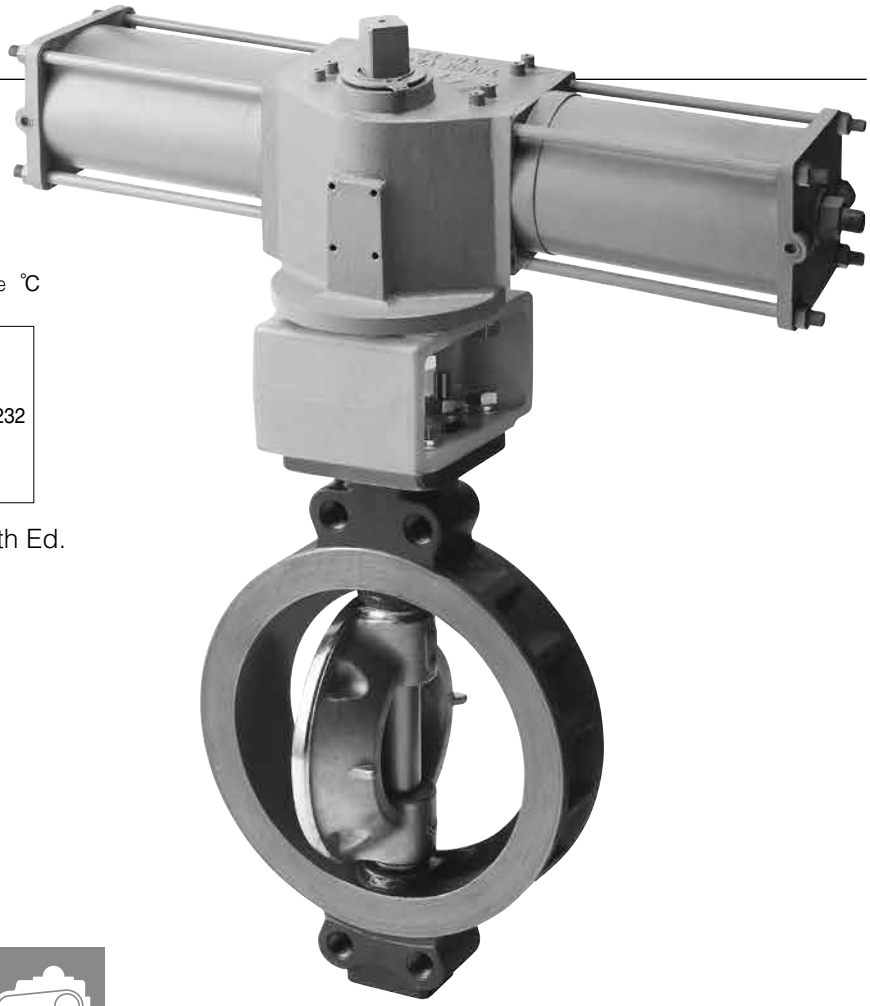
Nominal size		JIS10K				JIS16/20K				JIS30K				BS4504						
																	D4			
mm	inch	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	D4	D1	D2	D3	BS4504			
																	PN10	PN16	PN25	PN40
80	3	91	111	125	134	89	111	126	140	80	111	125	150	84	111	126	144	144	144	144
100	4	115	130	146	159	115	130	153	165	104	130	153	172	108	130	153	164	164	170	170
150	6	–	–	–	–	–	–	–	–	153	176	202	249	–	–	–	–	–	–	–
200	8	–	–	–	–	–	–	–	–	202	227	259	294	–	–	–	–	–	–	–
250	10	–	–	–	–	268	281	321	354	251	282	322	360	–	–	–	–	–	–	–
300	12	–	–	–	–	319	333	372	404	300	334	374	418	–	–	–	–	–	–	–
350	14	–	–	–	–	356	370	410	450	336	367	407	463	–	–	–	–	–	–	–
400	16	–	–	–	–	407	417	467	508	383	418	468	524	–	–	–	–	–	–	–



MEMO

High Performance Butterfly Valves to suit API standard 150lb/300lb Rating

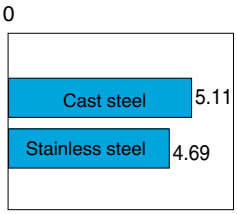
334A



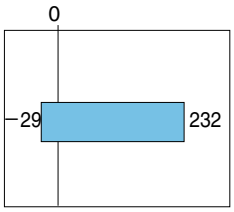
Valve nominal size

50 to 600mm

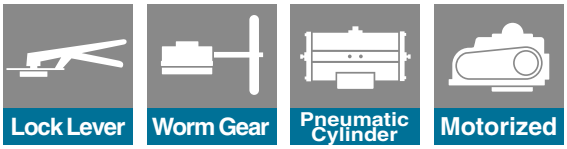
Max.working pressure MPa



Working temperature range ℃



FS Fire safe certification to API607 4th Ed.



Features and Benefits

Double Offset PTFE Seated
High Performance Butterfly Valve to Suit API
Standard Fire Safe Certication As Optional

Valve nominal size: 50, 80mm to 600mm
Max. working pressure: 150Lb: 2.0MPa, 300Lb: 5.1MPa
Working temperature range: 29 degrees C to 232 degrees C

General description

Designed to suit those severe conditions such as high temperature, high pressure or high velocity which disallow the use of soft resilient seated butterfly valves. Ideal for use including chemical processes, and applications with low pressure steam and high temperature gas. The valve is available for 150 and 300 LBS.

Double offset geometry

The design exhibits tight shut off, reduced torques, chemical resistance, excellent throttling capabilities, and the ability to operate with relatively high pressure drops.

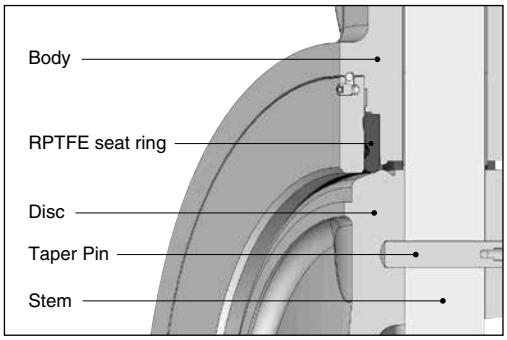
Characteristics

Fire safe certification to API607 4th Ed.

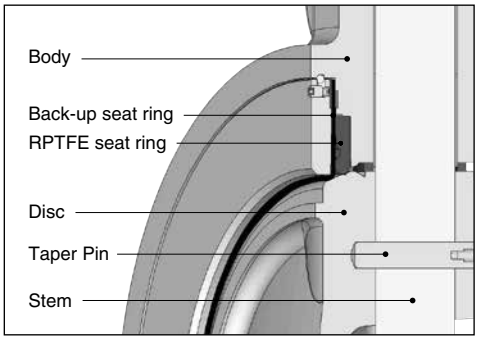
50mm : API607-5th edition Fire safe
80~600mm : API607-4th edition Fire safe ※

※ 300Lb-150mm/water body which standard is JIS16K/20K not be Applicable Fire safe. (it can not have necessary thickness.)

RPTFE as standard



334A Fire Safe Seat (API607 4th Ed.)



Standard Specifications

Product characteristics		Double offset soft seated butterfly valve	
Conection		Wafer type / Lugged type	
Nominal valve size ※1		50, 80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600mm	
Appricable standards	Face-to-face dimensions	80~600mm: API609 Class150/300 Category B 50mm: API609 Category A, ISO5752 Wafer butterfly valve	
	Flange standards (Wafer)※2	150Lb: ASME/JPI Class150, JIS 10K/16K/20K, BS 4504 PN10/16, DIN PN10/16 300Lb: ASME/JPI Class300, JIS 20K/30K, BS 4504 PN25/40, DIN PN25/40	
	Actuator attachment	ISO5211/1 (other than 300Lb-600mm)	
	P-T rating	ASME B16.34 / API609	
Applicable fluid		General hydrocarbon, Chemical prosess, steam, gas etc.	
Max.working pressure		150Lb: 2.0MPa (Body material : Both WCB and CF8M) 300Lb: 5.1MPa (Body material : WCB), 4.96MPa (Body material : CF8M)	
Working temperature range		-29 degree C to 232 degree C	
Pressure direction		Standard pressure direction : Pressure on retainer side	
Test Pressure	Shell test	Working pressure x 1.5 times (Hydrostatic pressure)	
	Seat leakage	0.7MPa(Air pressure) Based on API598-8thEdition Option : Working pressure x 1.1 times (Hydrostatic pressure)	
Standard Materials ※3	Body	ASTM A216 WCB	ASTM A351 CF8M
	Disc	ASTM A351 CF8M with hard chrome plating	
	Shaft	SUS420J2 ※4	630SS H1150 ※4
	Seat ring	RPTFE(Carbon graphite contained)	
	Retainer	S35C ※4	316SS ※4
	Gland Packing	Graphite	
Shaft shape for actuator conection		150Lb: 50mm to 250mm : Square / 300mm to 600mm : Key 300Lb: 50mm to 150mm : Square / 200mm to 600mm : Key	
Actuator		Lock lever, Worm gear, Pneumatic cylinder, Electric motor	
Coating		Silicon resin coating (Grey N7) for 200 degrees C and lower Heat resistant silver coating for over 200 degrees C. No coating for stainless steel.	
Usable Gasket		Sheet gasket : Marketed products available Spiral wound gasket : Marketed products (with inner & outer ring) available only for ASME/JPI Class 150 and 300 For other flange standards, special gasket for TOMOE is required.	
Option		50mm : API607-5th edition Fire safe 80~600mm : API607-4th edition Fire safe ※5	

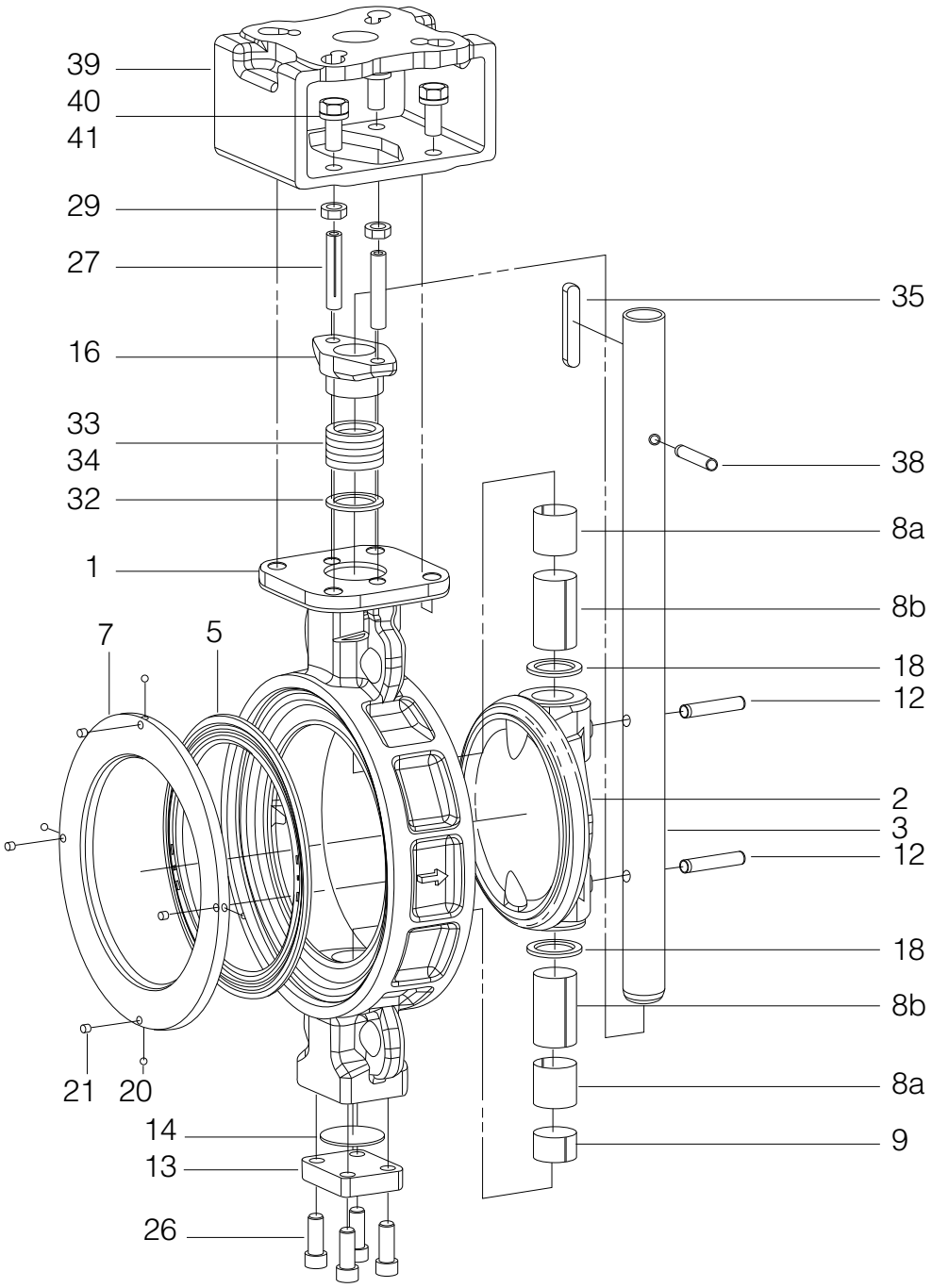
※1 Please contact us for the requirement of 125mm.
※2 Please contact us for the detail of applicable flange connection including lugged type.
※3 Special specification with aluminium bronze is also available. When materials other than standard are selected, the working pressure might be limited. Please consult us for the details.
※4 In case of Body material is WCB : Shaft /SUS420J2, Retainer/S35C In case of Body materials is CF8M : Shaft/630SS+H1150, Retainer/316SS
※5 300Lb-150mm/wafer body with flange standard JIS16K/20K is not applicable to fire-safe duties.

※There is possibility of seat leakage when fluid (powder/liquid) is solidified by working temperature and other cause, especially the valve is in a vertical position(e.g. at the bottom area of discharge spout of hopper and tank). Please consult us.

Model type

Type	Wafer type		Lugged type	
	150Lb	300Lb	150Lb	300Lb
Standard	324A	334A	324Q	334Q
Fire safe	344A	354A	344Q	354Q

334A Expanded view of bare shaft



■334A Bare shaft parts list-150Lb

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
5	Seat ring	1	
7	Seat ring retainer	1	
8a	Bearing a	0	600mm
		1	300mm
		2	80mm to 150mm, 500mm
		3	200mm
		4	250mm, 350mm
		6	400mm, 450mm
8b	Bearing b	0	400mm, 450mm
		1	80mm, 100mm, 200mm, 250mm, 350mm
		2	150mm, 500mm
		3	300mm
		4	600mm
9	Bearing spacer	1	
12	Taper pin	2	80mm to 300mm
		3	350mm to 600mm
13	Bottom cover	1	
14	Bottom gasket	1	
16	Gland plate spigot	1	
18	Space ring	2	
20	Ball	2	80mm, 100mm
		4	150mm to 600mm
21	Set screw	2	80mm, 100mm
		4	150mm to 600mm
26	Hexagon hole bolt	4	
27	Gland bolt	2	
29	Hexagon nut	2	
32	Packing retainer	1	
33	Gland packing a	3	
34	Gland packing b	2	
35	Key	0	80mm to 150mm
		1	200mm to 600mm
38	Spring pin	1	
39	Column	1	
40	Hexagon bolt	4	
41	Spring washer	4	

■334A Bare shaft parts list-300Lb

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
5	Seat ring	1	
7	Seat ring retainer	1	
8a	Bearing a	2	
8b	Bearing b	1	80mm to 150mm
		2	200mm to 600mm
9	Bearing spacer	1	
12	Taper pin	2	80mm to 200mm
		3	250mm to 600mm
13	Bottom cover	1	
14	Bottom gasket	1	
16	Gland plate spigot	1	
18	Space ring	2	
20	Ball	2	80mm, 100mm
		4	150mm to 600mm
21	Set screw	2	80mm, 100mm
		4	150mm to 600mm
26	Hexagon hole bolt	4	
27	Gland bolt	2	
29	Hexagon nut	2	
32	Packing retainer	1	
33	Gland packing a	3	
34	Gland packing b	2	
35	Key	0	80mm to 150mm
		1	200mm to 600mm
38	Spring pin	1	
39	Column	1	
40	Hexagon bolt	4	
41	Spring washer	4	

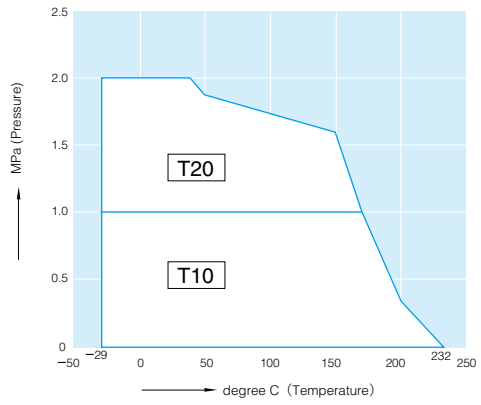
334A Actuator Selection Chart

■334A-150Lb

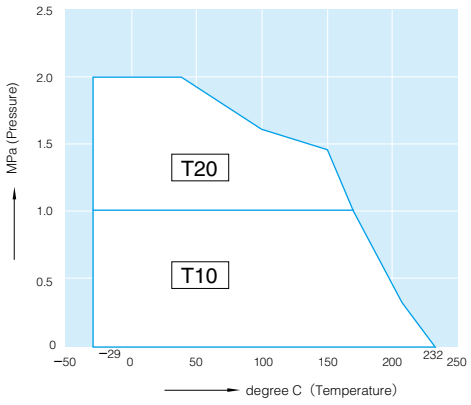
Type	Model	Category	Size (mm / inch)											
			50	80	100	150	200	250	300	350	400	450	500	600
			2	3	4	6	8	10	12	14	16	18	20	24
Lock lever	1T	T10	1T-1	1T-2										
		T20												
Worm gear	2U,2K	T10	2U-1	2U-2	2U-3		2U-4			2K (SBWG-01)	2K (SBWG-02)	2K (SBWG-03)		2K (SBWG-04-1S)
		T20												
Double-action pneumatic	7E,3A	T10	T85	T200	T380		T750			TGA-125		TGA-140	TGA-160	TGA-180
		T20									TGA-140	TGA-160	TGA-180	TGA-200
Single-action pneumatic	7G,7F 3U,3K	T10	T200S	T380S	T750S		TG-12S			TG-14S		TG-20S		
		T20												
Single phase motor	4I	T10	4I-0	4I-1	4I-2	4I-2.5		4I-3			4I-4			
		T20												

334A Pressure -Tempreture

334A-150Lb Actuator Division
(Body Material : WCB)



334A-150Lb Actuator Division
(Body Material : CF8M)



T10 : 1MPa or less
T20 : Over 1MPa to 2MPa

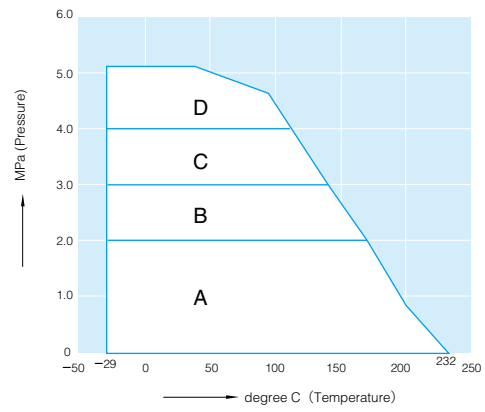
334A Actuator Selection Chart

■334A-300Lb

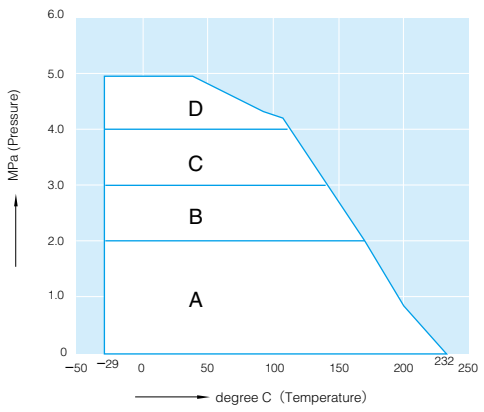
Type	Model	Category	Size (mm / inch) 50 / 2	80 / 3	100 / 4	150 / 6	200 / 8	250 / 10	300 / 12	350 / 14	400 / 16	450 / 18	500 / 20	600 / 24
Lock lever	1T	A, B, C, D	1T-1	1T-2										
Worm gear	2U,2K	A, B, C, D	2U-1	2U-2		2U-3	2U-4	2K (SBWG01)	2K (SBWG02)	2K (SBWG03)	2K (SBWG03-1S)	2K (SBWG04-1S)		2K (SBWG05-1S)
Double-action pneumatic	7E,3A	A	T85	T200		T380	T750	TGA-125	TGA-125	TGA-140	TGA-160	TGA-160	TGA-180	TGA-200
		B									TGA-160	TGA-180	TGA-200	TGA-220
		C								TGA-160	TGA-180	TGA-200	TGA-220	
		D			T380	T750	TGA-125	TGA-140	TGA-160	TGA-180	TGA-200	TGA-220		TGA-250
Single-action pneumatic	7G,7F 3U,3K	A, B, C, D	T200S	T380S	T750S	TG-12S		TG-14S	TG-20S					
Single phase motor	4I	A, B, C, D	4I-0	4I-1	4I-2	4I-2.5	4I-3		4I-4					

334A Pressure Rating

334A-300Lb Actuator Division
(Body Material : WCB)



334A-300Lb Actuator Division
(Body Material : CF8M)



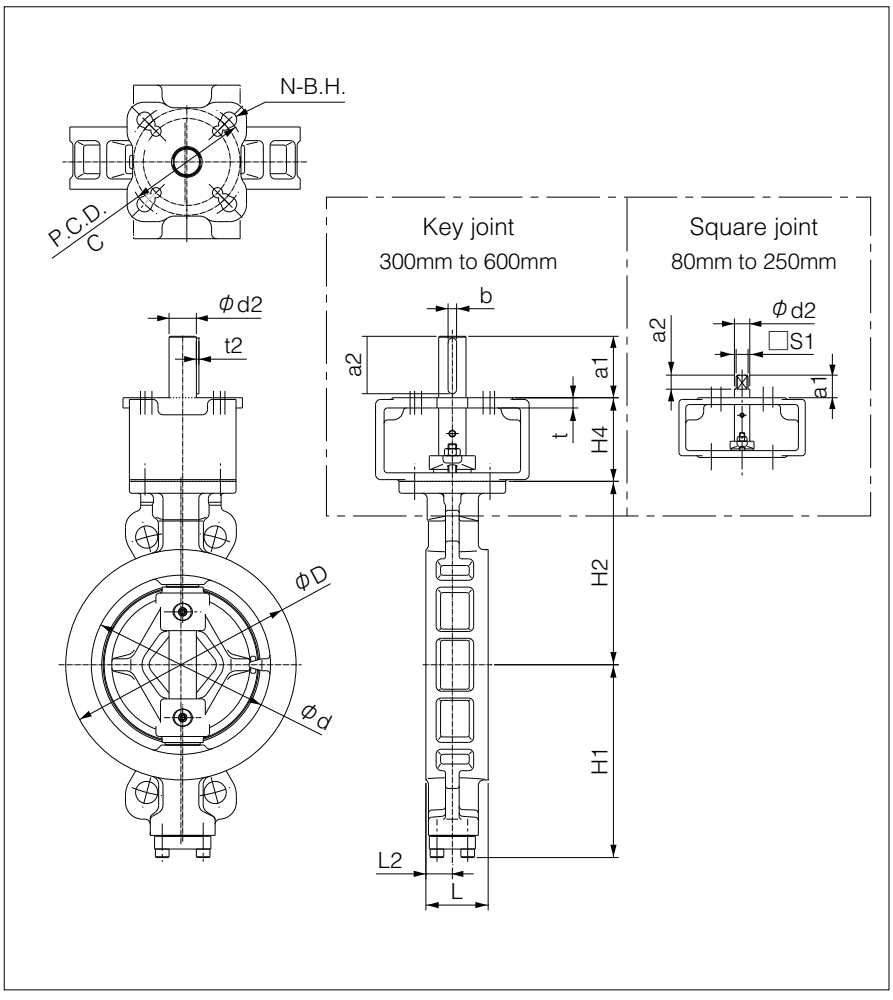
A: 2 MPa or less
B: Over 2 MPa to 3 MPa
C: Over 3 MPa to 4 MPa
D: Over 4 MPa to maximum allowable pressure

334A Bare Shaft Dimension

■150Lb

Nominal size		Dimension (mm)															Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	a_1	a_2	□S_1	φd_2	b	t_2	H_4	t	Top Flange type	
50	2	60	97	43	17.5	102.5	102.5	22.5	11.5	12	14	—	—	70	8	F07, F10	5.7
80	3	86.5	128	48	20	118	127	26.5	16.5	14	18	—	—	70	8	F07, F10	8
100	4	112	158	54	22	147	149	26.5	20	16	20	—	—	70	8	F07, F10	10.7
150	6	160	216	57	23	186	190	26.5	20	18	22	—	—	98	12	F10, F12, F14	18.9
200	8	210	270	64	26.5	201	209.2	37	30	22	26	—	—	98	12	F10, F12, F14	25.6
250	10	260	324	71	29	254	253	37	34	24	30	—	—	98	12	F10, F12, F14	39
300	12	310	382	81	36	283	280.5	72	67	—	32	10	3	98	12	F10, F12, F14	49
350	14	347	415	92	37	313	301	72	67	—	37	10	3	125	16	F14, F16	73
400	16	402	473	102	40	348	350	86	81	—	42	12	3	125	16	F14, F16	101
450	18	446	534	114	46	394	383.6	86	81	—	45	14	3.5	125	16	F14, F16	145
500	20	497	586	127	55	421	409.2	86	81	—	52	16	4	125	16	F14, F16	179
600	24	600	694	154	70	481	473	116	111	—	60	18	4	150	20	Special A, Special B	304

■150Lb 80mm to 600mm



■Top Flange Type Dimension List

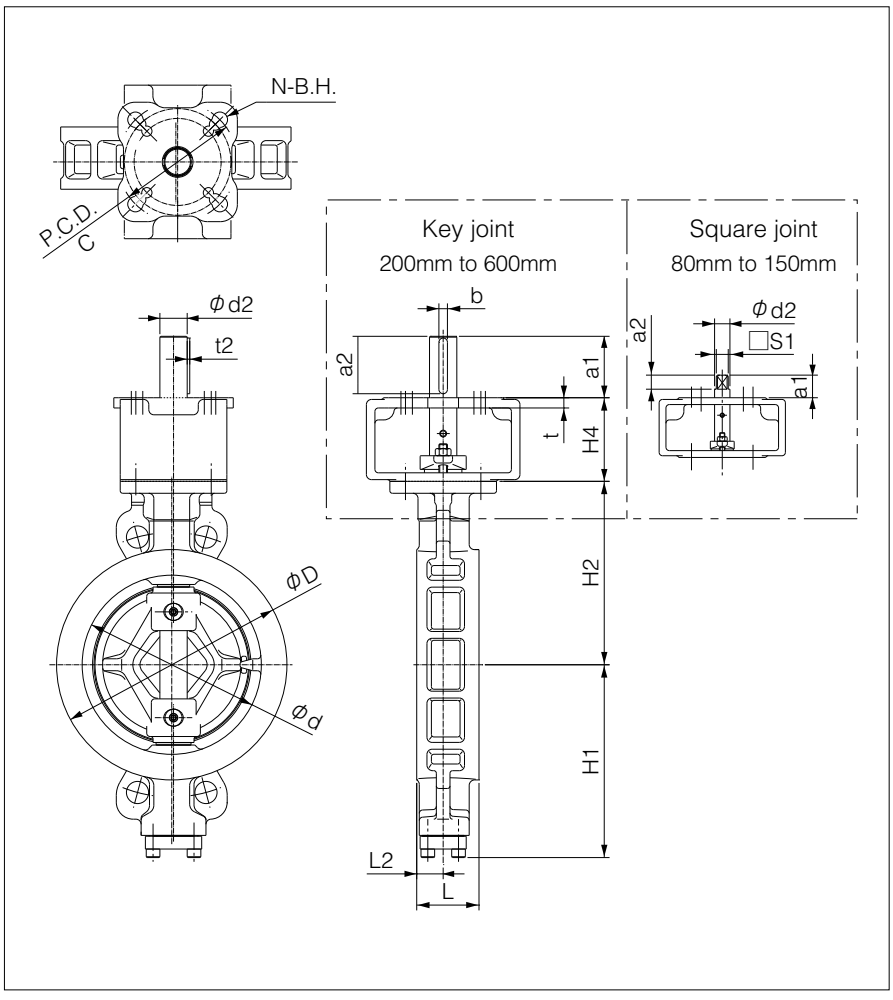
Flange type	P.C.D. C	N	B.H.
F07	70	4	10
F10	102	4	12
F12	125	4	14
F14	140	4	18
F16	165	4	22
F25	254	8	18
Special A	220	4	22
Special B	254	8	22

334A Bare Shaft Dimension

■300Lb

Nominal size		Dimension (mm)															Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	a_1	a_2	□S_1	φd_2	b	t_2	H_4	t	Top Flange type	
50	2	60	97	43	17.5	102.5	102.5	22.5	11.5	12	14	—	—	70	8	F07, F10	5.7
80	3	86.5	128	48	20	118	127	26.5	16.5	14	18	—	—	70	8	F07, F10	8
100	4	112	158	54	22	147	149	26.5	20	16	20	—	—	70	8	F07, F10	10.7
150	6	160	216	59	24	192	187	37	30	22	26	—	—	98	12	F10, F12, F14	21.4
200	8	210	270	73	31	226	215	72	67	—	32	10	3	98	12	F10, F12, F14	32
250	10	260	326	83	36	260	253	72	67	—	37	10	3	125	16	F14, F16	60
300	12	310	385	92	42	292	294.5	86	81	—	42	12	3	125	16	F14, F16	83
350	14	347	420	117	52	338	326	86	81	—	45	14	3.5	125	16	F14, F16	113
400	16	402	476	133	61.5	376	364	86	81	—	52	16	4	125	16	F14, F16	157
450	18	446	536	149	70	402	394.5	116	111	—	60	18	4	150	20	F25, Special A	231
500	20	497	590	159	75	431	426.5	116	111	—	65	18	4	150	20	F25, Special A	283
600	24	600	701	181	84	504	496	136	131	—	70	20	4.5	150	20	Special A, Special B	433

■300Lb 80mm to 600mm



■Top Flange Type Dimension List

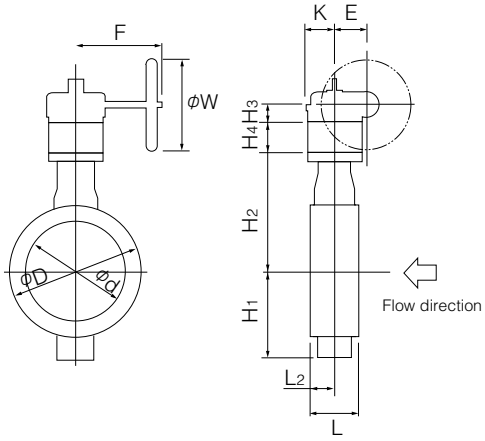
Flange type	P.C.D. C	N	B.H.
F07	70	4	10
F10	102	4	12
F12	125	4	14
F14	140	4	18
F16	165	4	22
F25	254	8	18
Special A	220	4	22
Special B	254	8	22

Worm Gear Type-150Lb 334A-2U(50 to 300mm) / 334A-2K(350 to 600mm)

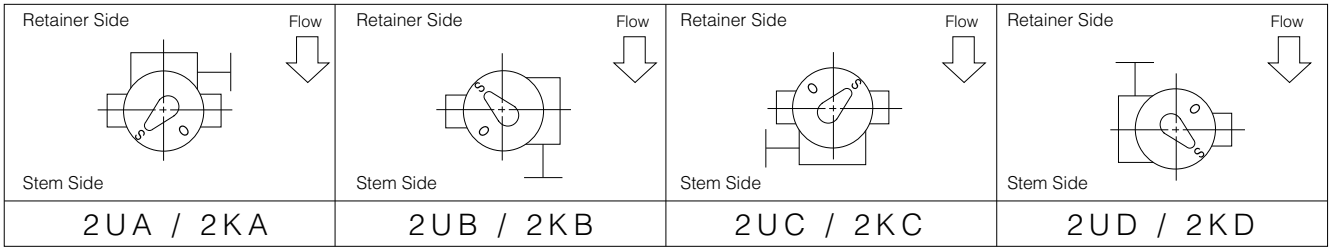
■150Lb

Nominal size		Dimension (mm)												Gear type	Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	H_3	H_4	E	K	F	φW		
50	2	60	97	43	17.5	102.5	102.5	29.5	70	36	74	160	100	2U-1	8
80	3	86.5	128	48	20	118	127	34.5	70	44	74	173.5	160	2U-2	12.5
100	4	112	158	54	22	147	149	34.5	70	44	74	173.5	160	2U-2	15
150	6	160	216	57	23	186	190	41.5	98	67	90	198	200	2U-3	27
200	8	210	270	64	26.5	201	209.2	41.5	98	67	90	198	200	2U-3	34
250	10	260	324	71	29	254	253	48	98	87.5	90	222.5	280	2U-4	55
300	12	310	382	81	36	283	280.5	48	98	87.5	90	222.5	280	2U-4	65
350	14	347	415	92	37	313	301	52	125	75	113	252	370	SBWG-01	79
400	16	402	473	102	40	348	350	63	125	91.5	113	310	450	SBWG-02	123
450	18	446	534	114	46	394	384	63	125	113	113	343	550	SBWG-03	173
500	20	497	586	127	55	421	409	63	125	113	113	343	550	SBWG-03	207
600	24	600	694	154	70	481	473	85	150	32.7	200	422	710	SBWG-04-1S	363

■334A-2U/2K



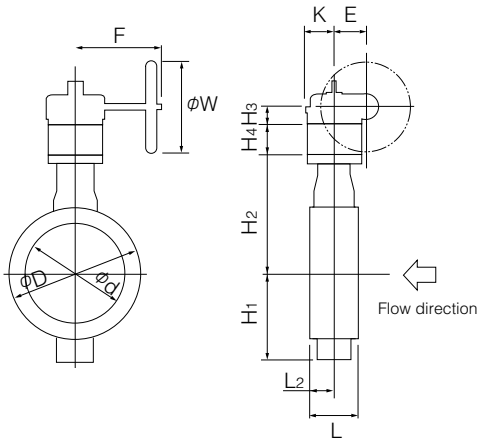
■2U/2K Installation Direction



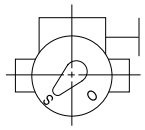
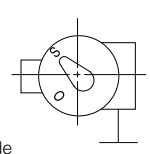
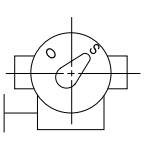
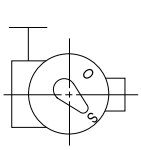
■300Lb

Nominal size		Dimension (mm)												Gear type	Approx. Weight (kg)
mm	inch	ϕd	ϕD	L	L_2	H_1	H_2	H_3	H_4	E	K	F	ϕW		
50	2	60	97	43	17.5	102.5	102.5	29.5	70	36	74	160	100	2U-1	8.0
80	3	86.5	128	48	20	118	127	34.5	70	44	74	173.5	160	2U-2	12.5
100	4	112	158	54	22	147	149	34.5	70	44	74	173.5	160	2U-2	15
150	6	160	216	59	24	192	187	41.5	98	67	90	198	200	2U-3	29
200	8	210	270	73	31	226	215	48	98	87.5	90	222.5	280	2U-4	48
250	10	260	326	83	36	260	253	52	125	75	113	360	400	SBWG-01	72
300	12	310	385	92	42	292	294.5	63	125	91.5	113	418.5	500	SBWG-02	104
350	14	347	420	117	52	338	326	63	125	113	113	452	560	SBWG-03	141
400	16	402	476	133	61.5	376	364	63	125	31.5	113	481	560	SBWG-03-1S	190
450	18	446	536	149	70	402	394.5	85	150	32.7	200	550	630	SBWG-04-1S	306
500	20	497	590	159	75	431	426.5	85	150	32.7	200	550	630	SBWG-04-1S	358
600	24	600	701	181	84	504	496	87	150	72.7	200	599.5	710	SBWG-05-1S	531

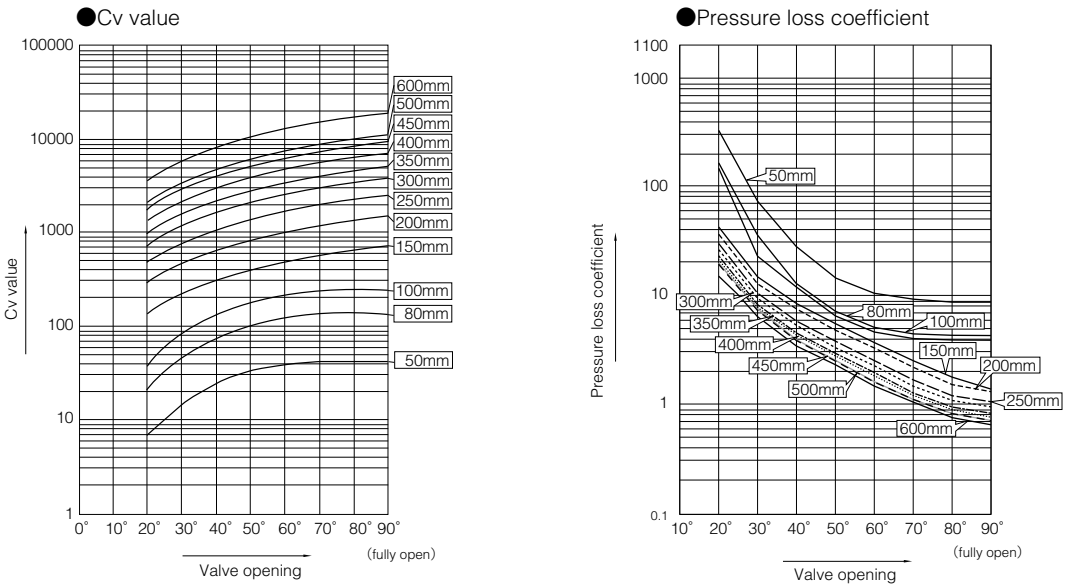
■334A-2U/2K



■2U/2K Installation Direction

Retainer Side / Flow / Stem Side	Retainer Side / Flow / Stem Side	Retainer Side / Flow / Stem Side	Retainer Side / Flow / Stem Side
			
2UA/2KA	2UB/2KB	2UC/2KC	2UD/2KD

334A-150Lb Cv value and pressure loss coefficient



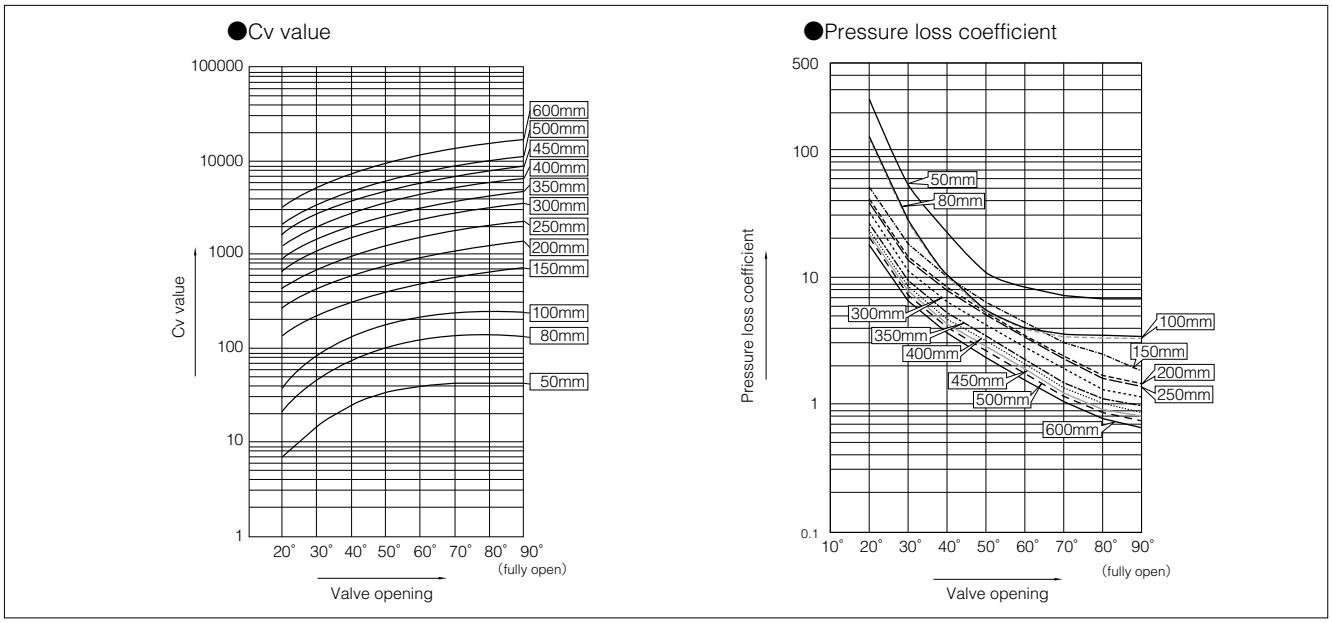
334A -150Lb Cv value

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
50	2	7	15	24	33	39	42	43	43
80	3	22	47	77	104	124	134	135	136
100	4	38	83	135	184	219	236	238	240
150	6	140	231	310	385	471	573	677	729
200	8	295	488	655	814	995	1211	1430	1540
250	10	479	792	1063	1321	1615	1966	2321	2500
300	12	747	1236	1659	2061	2519	3066	3621	3900
350	14	1002	1657	2225	2765	3378	4112	4856	5230
400	16	1379	2281	3063	3806	4651	5661	6685	7200
450	18	1835	3035	4075	5064	6188	7533	8895	9580
500	20	2146	3549	4764	5920	7235	8806	10399	11200
600	24	3583	5925	7955	9885	12080	14703	17362	18700

334A -150Lb Pressure loss coefficent

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
50	2	33.6	73.3	28.6	15.1	10.8	9.4	8.9	8.9
80	3	171.9	36.3	13.5	7.3	5.2	4.4	4.4	4.3
100	4	156.9	33.2	12.3	6.7	4.7	4.1	4.0	3.9
150	6	42.5	15.6	8.6	5.6	3.7	2.5	1.8	1.6
200	8	37.5	13.7	7.6	4.9	3.3	2.2	1.6	1.4
250	10	29.3	10.7	5.9	3.8	2.6	1.7	1.3	1.1
300	12	25.8	9.4	5.2	3.4	2.3	1.5	1.1	1.0
350	14	22.2	8.1	4.5	2.9	2.0	1.3	1.0	0.8
400	16	21.2	7.8	4.3	2.8	1.9	1.3	0.9	0.8
450	18	19.3	7.1	3.9	2.5	1.7	1.1	0.8	0.7
500	20	19.2	7.0	3.9	2.5	2.1	1.1	0.8	0.7
600	24	18.0	6.6	3.6	2.4	1.6	1.1	0.8	0.7

334A-300Lb Cv value and pressure loss coefficient



334A -300Lb Cv value

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
50	2	7	15	24	33	39	42	43	43
80	3	22	47	77	104	124	134	135	136
100	4	38	83	135	184	219	236	238	240
150	6	139	230	309	384	470	572	675	727
200	8	270	446	599	744	909	1106	1306	1407
250	10	436	720	967	1202	1469	1787	2111	2273
300	12	677	1120	1503	1868	2283	2778	3281	3533
350	14	909	1503	2018	2508	3065	3730	4405	4744
400	16	1249	2065	2773	3445	4210	5125	6052	6518
450	18	1664	2751	3694	4590	5609	6828	8062	8683
500	20	2122	3510	4712	5855	7155	8710	10285	11077
600	24	3245	5366	7205	8953	10941	13317	15725	16937

334A -300Lb Pressure loss coefficent

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
50	2	262.0	57.1	22.3	11.8	8.4	7.3	6.9	6.9
80	3	136.3	28.8	10.7	5.8	4.1	3.5	3.5	3.4
100	4	132.5	28.0	10.4	5.6	4.0	3.4	3.4	3.3
150	6	50.6	18.5	10.3	6.7	4.5	3.0	2.2	1.9
200	8	41.4	15.1	8.4	5.4	3.6	2.5	1.8	1.5
250	10	39.2	14.3	8.0	5.2	3.5	2.3	1.7	1.4
300	12	32.5	11.9	6.6	4.3	2.9	1.9	1.4	1.2
350	14	26.3	9.6	5.3	3.5	2.3	1.6	1.1	1.0
400	16	23.9	8.8	4.9	3.1	2.1	1.4	1.0	0.9
450	18	21.7	7.9	4.4	2.9	1.9	1.3	0.9	0.8
500	20	20.5	7.5	4.2	2.7	1.8	1.2	0.9	0.8
600	24	18.3	6.7	3.7	2.4	1.6	1.1	0.8	0.7

334A Applicable Flange Standard Table

■150Lb Wafer Type

Nominal size		ASME/JPI 50Lb	JIS 10K	JIS 16/20K	BS4504(DIN) PN 10	BS4504(DIN) PN 16
mm	inch					
50	2	○※1	○※1	D※2	D※2	○※1
80	3	○※1	D※2	D※2	D※2	D※2
100	4	D※2	D※2	D※2	D※2	D※2
150	6	D※2	D※2	D※2	D※2	D※2
200	8	D※2	D※2	D※2	D※2	D※2
250	10	D※2	D※2	D※2	D※2	D※2
300	12	D※2	D※2	D※2	D※2	D※2
350	14	D※2	D※2	D※2	D※2	D※2
400	16	D※2	D※2	D※2	D※2	D※2
450	18	T	T	T	T	T
500	20	T	T	T	T	T
600	24	T	T	T	T	T

※1 : Can be used without flange drilling.
※2 : There are 2 upper drilling holes for 50mm and 80mm to 250mm types, and a total of 4 drilling holes, 2 upper and 2 lower, for 300mm to 400mm types.

D: With flange drilling
T: With flange tapping
○: Can be used without flange drilling.

■150Lb Lugged Type

Nominal size		ASME/JPI 50Lb	JIS 10K	JIS 16/20K	BS4504(DIN) PN 10	BS4504(DIN) PN 16
mm	inch					
50	2	T	T	T※1	T	T
80	3	T	T※1	T※1	T※1	T※1
100	4	T※1	T※1	T※1	T※1	T※1
150	6	T	T	T※1	T	T
200	8	T	×	T※1	T	T※1
250	10	T	T	T	T	T
300	12	T	×	T※1	T	T
350	14	T	×	×	×	×
400	16	T	T	T	T	T
450	18	T	×	×	×	×
500	20	T	T	T	T	T
600	24	T	×	T※1	T	T

※1 : Use 300Lb body. In this case, 300Lb body of 150mm or more in the nominal size must note that the face-to-face dimensions are different.
※ : Please consult with us regarding drilling holes for the lugged type.

T: With flange tapping
×: A special wooden form is required.

334A Applicable flange standard

■300Lb Wafer type

Nominal size		ASME/JPI 300Lb	JIS20K	JIS30K	BS4504(DIN) PN25	BS4504(DIN) PN40
mm	inch					
50	2	D※2	D※2	D※2	○※1	○※1
80	3	D※2	D※2	D※2	D※2	D※2
100	4	D※2	D※2	D※2	D※2	D※2
150	6	D※2	D※2	D※2	D※2	D※2
200	8	D※2	D※2	D※2	D※2	D※2
250	10	T	D※2/ T	D※2/ T	D※2/ T	D※2 (T)
300	12	T	T	T	T	T
350	14	T	T	T	T	T
400	16	T	T	T	T	T
450	18	T	T		T	T
500	20	T	T		T	T
600	24	T	T		T	T

※1 : Can be used without flange drilling.
※2 : There are 2 upper drilling holes for 50mm and 80mm to 250mm types, and a total of 4 drilling holes, 2 upper and 2 lower, for 300mm to 400mm types.

D/T: With drill hole or tapping.
D : With flange drilling
T : With flange tapping

■300Lb Lugged type

Nominal size		ASME/JPI 300Lb	JIS20K	JIS30K	BS4504(DIN) PN25	BS4504(DIN) PN40
mm	inch					
50	2	T	T	T	T※	T※
80	3	T	T	T	T	T
100	4	T	T	T	T	T
150	6	T	T	T	×	×
200	8	T	T	T	T	T
250	10	T	×	×	×	×
300	12	T	T	T	T	T
350	14	T	×	×	×	×
400	16	T	×	×	×	×
450	18	T	×		×	×
500	20	T	×		×	×
600	24	T	T		×	×

※ Please consult with us regarding drilling holes for the lugged type.

T : With flange tapping
× : A special wooden form is required.

334A

334A-300Lb/150Lb Applicable Pipe List in Case

Nominal size		JIS (STPG)			ANSI B36.1		
mm	inch	Sch#40	Sch#60	Sch#80	Sch#40	Sch#60	Sch#80
50	2	○	○	○	○		○
80	3	○	○	○	○		○
100	4	○	○	○	○		○
150	6	○	○	○	○		○
200	8	○	○	○	○	○	○
250	10	○	○	○	○	○	○
300	12	○	○	○	○	○	○
350	14	○	○	○	○	○	○
400	16	○	○	○	○	○	○
450	18	○	○	○	○	○	○
500	20	○	○	○	○	○	○
600	24	○	○	○	○	○	○

※ Determine the appropriateness of using other pipes according to the minimum internal pipe diameter indicated in the following table.

334A Miniumum Internal Diameters of Piping

Nominal size		Miniumum internal diameters of piping	
mm	inch	150Lb	300Lb
50	2	45	45
80	3	73	73
100	4	93	93
150	6	138	138
200	8	186	185
250	10	226	225
300	12	268	267
350	14	310	306
400	16	354	347
450	18	402	394
500	20	444	438
600	24	535	533

※ The gap between the disc edge and the pipe is smallest at the stem side flange face when all nominal sizes are fully open.

※ Because the above gap is calculated with the pipe considered as extending up to the flange end, the value will differ depending on the way the pipe and flange are welded.

334A Piping Gasket

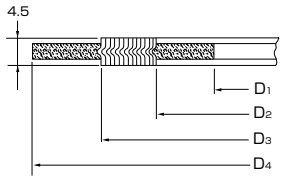
* In case of sheet gasket ..... Any standard can be used.
* In case of spiral gasket
  For API, JPI, ANSI flange ..... Any standard gaskets with inner/outer ring can be used.
  For JIS flange ..... Use special spiral gasket shown below.

●334A Special Spiral Gasket Flange Size

Nominal size		D_1	D_2	D_3	D_4								
					ASME JPI		JIS			BS4504			
mm	inch				Class 150	Class 300	10K	16/20K	30K	PN10	PN16	PN25	PN40
50	2	61	69	88	104	111	104	104	114	109	109	109	109
80	3	89	97	120	136	148	134	140	150	144	144	144	144
100	4	115	124	145	174	180	159	165	172	164	164	170	170
150	6	166	178	205	222	250	220	237	249	220	220	226	226
200	8	217	227	256	279	307	270	282	294	275	275	286	293
250	10	268	278	315	339	362	332	354	360	330	331	343	355
300	12	319	339	370	409	422	377	404	418	380	386	403	420
350	14	256	369	403	450	485	422	450	463	440	446	460	477
400	16	406	420	457	514	539	484	508	524	491	498	517	549
450	18	458	472	517	549	596	539	573	—	541	558	567	574
500	20	508	523	567	606	654	594	628	—	596	620	627	631
600	24	610	626	672	717	774	700	734	—	698	737	734	750

※ Using 334A gasket for size 300, 350mm.
Using TOMOE 300 series for other.

Remark : In case a minute leakage of gas (less than 100PPm) becomes a problem, please inquire of our business charge.



●Commercially Available Spiral Gaskets (with inner and outer ring)

Nominal size		ASME/JPI	JIS			BS4504
mm	inch	150/300Lb	10K	16K/20K	30K	PN10, 16, 25, 40
50	2	○	○	○	○	○
80	3	○	○	○	×	○
100	4	○	×	○	×	○
150	6	○	×	×	×	×
200	8	○	×	×	×	×
250	10	○	×	×	×	×
300	12	○	×	○	×	×
350	14	○	×	×	×	○
400	16	○	×	×	○	○
450	18	○	×	×	–	○
500	20	○	×	×	–	○
600	24	○	×	×	–	○

○:Can be use., ×:Can not be used, –:No Standard

334A Applicable Gasket Standard Table for Piping

Nominal size		Joint sheet and RPTFE solid gasket (t≦2mm)				*PTFE mold type gasket VALQUA or NICHIASU	
		ASME/JPI	JIS		BS4504	ASME/JPI	JIS
mm	inch	150/300Lb	10K, 16K, 20K	30K	PN10,16,25,40	150/300Lb	10K, 16K, 20K
50	2	○	○	○	○	○	○
80	3	○	○	○	○	○	○
100	4	○	○	○	○	○	○
150	6	○	○	○	○	○	○
200	8	○	○	○	○	○	○
250	10	○	○	○	○	○	○
300	12	○	○	○	○	○	○
350	14	○	○	○	○	○	○
400	16	○	○	○	○	○	○
450	18	○	○	–	○	○	○
500	20	○	○	–	○	○	○
600	24	○	○	–	○	○	○

*All standard joint seats and PTFE cut gaskets can be used.
*Only VALQUA flawless gaskets (Part No.: 7030/7031/7035) and NICHIAS PTFE cushion gaskets (Part No.: 9010/9011) can be used.
(Products from other manufacturers cannot be used due to their dimensions.)

334A Piping Bolts and Nuts Sizes

■150Lb Wafer Type

Nominal size		ASME/JPI class150			JIS10K		
mm	inch	Setting Bolts	Long Bolts	No.of Nuts	Setting Bolts	Long Bolts	No.of Nuts
50	2	—	4- 5/8-11UNC×140	8	—	4-M16×135	8
80	3	—	4- 5/8-11UNC×160	8	—	8-M16×145	16
100	4	—	8- 5/8-11UNC×160	16	—	8-M16×145	16
150	6	—	8- 3/4-10UNC×175	16	—	8-M20×170	16
200	8	—	8- 3/4-10UNC×185	16	—	12-M20×180	24
250	10	—	12- 7/8-9UNC×205	24	—	12-M22×190	24
300	12	—	12- 7/8-9UNC×220	24	—	16-M22×200	32
350	14	—	12- 1-8UNC ×245	24	—	16-M22×215	32
400	16	—	16- 1-8UNC ×260	32	—	16-M24×240	32
450	18	8-1 1/8-8UN×140(24×16)	12-1 1/8-8UN ×285	32	8-M24×120(21×14)	16-M24×250	40
500	20	8-1 1-8-8UN×145(24×16)	16-1 1-8-8UN ×300	40	8-M24×120(21×14)	16-M24×260	40
600	24	8-1 1/4-8UN×150(24×16)	16-1 1/4-8UN ×345	40	8-M30×135(24×16)	20-M30×310	48

Nominal size		JIS16K			JIS20K		
mm	inch	Setting Bolts	Long Bolts	No.of Nuts	Setting Bolts	Long Bolts	No.of Nuts
50	2	—	8-M20 ×135	16	—	8-M20 ×135	16
80	3	—	8-M20 ×160	16	—	8-M20 ×160	16
100	4	—	8-M20 ×170	16	—	8-M20 ×170	16
150	6	—	12-M22 ×175	24	—	12-M22 ×190	24
200	8	—	12-M22 ×190	24	—	12-M22 ×200	24
250	10	—	12-M24 ×210	24	—	12-M24 ×220	24
300	12	—	16-M24 ×220	32	—	16-M24 ×230	32
350	14	—	16-M30(P3)×250	32	—	16-M30(P3)×260	32
400	16	—	16-M30(P3)×275	32	—	16-M30(P3)×285	32
450	18	8-M30(P3)×140(24×16)	16-M30(P3)×285	40	8-M30(P3)×150(24×16)	16-M30(P3)×300	40
500	20	8-M30(P3)×145(24×16)	16-M30(P3)×300	40	8-M30(P3)×155(24×16)	16-M30(P3)×315	40
600	24	8-M36(P3)×160(30×20)	20-M36(P3)×355	48	8-M36(P3)×170(30×20)	20-M36(P3)×365	48

Nominal size		BS4504 PN10※			BS4504 PN16※		
mm	inch	Setting Bolts	Long Bolts	No.of Nuts	Setting Bolts	Long Bolts	No.of Nuts
50	2	—	4-M16×135	8	—	4-M16×135	8
80	3	—	8-M16×145	16	—	8-M16×145	16
100	4	—	8-M16×155	16	—	8-M16×155	16
150	6	—	8-M20×170	16	—	8-M20×170	16
200	8	—	8-M20×180	16	—	12-M20×180	24
250	10	—	12-M20×190	24	—	12-M24×200	24
300	12	—	12-M20×200	24	—	12-M24×220	24
350	14	—	16-M20×210	32	—	16-M24×230	32
400	16	—	16-M24×230	32	—	16-M27×250	32
450	18	8-M24×115(21×14)	16-M24×250	40	8-M27×125(22×14)	16-M27×265	40
500	20	8-M24×115(21×14)	16-M24×260	40	8-M30×140(24×16)	16-M30×285	40
600	24	8-M27×120(22×14)	16-M27×310	40	8-M33×150(27×18)	16-M33×330	40

334A Piping Bolts and Nuts Sizes

■150Lb Lugged Type（All taps）

Nominal size		ASME/JPI class 150		JIS10K		JIS16K	
mm	inch	Setting Bolts	No.of Nuts	Setting Bolts	No.of Nuts	Setting Bolts	No.of Nuts
50	2	8- 5/8-11UNC× 75(13× 8)	8	8-M16×75(13× 8)	8	8-M16× 75(13× 8)	8
80	3	8- 5/8-11UNC× 85(13× 8)	8	16-M16×75(13× 8)	16	16-M20× 85(17×11)	16
100	4	16- 5/8-11UNC× 85(13× 8)	16	16-M16×75(13× 8)	16	16-M20× 90(17×11)	16
150	6	16- 3/4-10UNC× 95(17×11)	16	16-M20×90(17×11)	16	—	—
200	8	16- 3/4-10UNC×100(17×11)	16	—	—	—	—
250	10	24- 7/8- 9UNC×115(19×12)	24	24-M22×105(19×12)	24	24-M24×115(21×14)	24
300	12	24- 7/8- 9UNC×115(19×12)	24	—	—	—	—
350	14	24- 1-8UNC×125(21×14)	24	—	—	—	—
400	16	32- 1-8UNC×125(21×14)	32	32-M24×115(21×14)	32	32-M30(P3)×140(24×16)	32
450	18	32-1 1/8-8UN ×140(24×16)	32	—	—	—	—
500	20	40-1 1/8-8UN ×145(24×16)	40	40-M24×125(21×14)	40	40-M30(P3)×150(24×16)	40
600	24	40-1 1/4-8UN ×160(24×16)	40	—	—	—	—

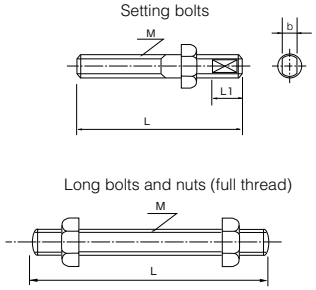
Nominal size		JIS20K		BS4504 PN10※		BS4504 PN16※	
mm	inch	Setting Bolts	No.of Nuts	Setting Bolts	No.of Nuts	Setting Bolts	No.of Nuts
50	2	8-M16× 75(13× 8)	8	8-M16× 75(13× 8)	8	8-M16× 75(13× 8)	8
80	3	16-M20× 85(17×11)	16	16-M16× 75(17×11)	16	16-M16× 75(13× 8)	16
100	4	16-M20× 90(17×11)	16	16-M16× 75(17×11)	16	16-M16× 75(13× 8)	16
150	6	—	—	16-M20× 90(17×11)	16	16-M20× 90(17×11)	16
200	8	—	—	16-M20× 95(17×11)	16	—	—
250	10	24-M24×125(21×14)	24	24-M20×105(17×11)	24	24-M24×115(21×14)	24
300	12	—	—	24-M20×105(17×11)	24	24-M24×115(21×14)	24
350	14	—	—	—	—	—	—
400	16	32-M30(P3)×145(24×16)	32	32-M24×115(21×14)	32	32-M27×125(22×14)	32
450	18	—	—	—	—	—	—
500	20	40-M30(P3)×155(24×16)	40	40-M24×120(21×14)	40	40-M30×140(24×16)	40
600	24	—	—	40-M27×125(22×14)	40	40-M33×150(27×18)	40

Note: Bolt/Nut material: SNB7/S45C
Please use a nut with a height that is 100% of the screw diameter.
The bolt length calculation is based on use of a 4.5 mm thick spiral gasket.
The flange thickness calculation is based on the standard steel flange thickness.
※ Mark: The flange thickness calculation is based on the welding neck flange thickness.
Quantities shown are for one valve.

Examples

Setting bolts: 8 - M16 × 75 (13 × 8)
N M L b L1

Long bolts: 4 - M16 × 145
N M L



334A Piping Bolts and Nuts Sizes

■300Lb Wafer

Nominal size		ASME/JPI class300			JIS20K		
mm	inch	Setting Bolts	Long Bolts	No.of Nuts	Setting Bolts	Long Bolts	No.of Nuts
50	2	—	8- 5/8-11UNC×140	16	—	8-M16 ×135	16
80	3	—	8- 3/4-10UNC×175	16	—	8-M20 ×160	16
100	4	—	8- 3/4-10UNC×185	16	—	8-M20 ×170	16
150	6	—	12- 3/4-10UNC×200	24	—	12-M22 ×190	24
200	8	—	12- 7/8-9UNC×235	24	—	12-M22 ×200	24
250	10	8-1-8UNC×125(21×14)	12- 1-8UNC×260	32	8(0)-M24 ×110(21×14)	8(12)-M24 ×230	24
300	12	8-1 1/8-8UN×135(24×16)	12-1 1/8-8UN ×285	32	8-M24 ×120(21×14)	12-M24 ×240	32
350	14	8-1 1/8-8UN×145(24×16)	16-1 1/8-8UN ×315	40	8-M30(P3)×140(24×16)	12-M30(P3)×285	32
400	16	8-1 1/4-8UN×155(24×16)	16-1 1/4-8UN ×345	40	8-M30(P3)×140(24×16)	12-M30(P3)×315	32
450	18	8-1 1/4-8UN×155(24×16)	20-1 1/4-8UN ×365	48	8-M30(P3)×145(24×16)	16-M30(P3)×335	40
500	20	8-1 1/4-8UN×160(24×16)	20-1 1/4-8UN ×380	48	8-M30(P3)×150(24×16)	16-M30(P3)×350	40
600	24	8-1 1/2-8UN×190(30×20)	20-1 1/2-8UN ×430	48	8-M36(P3)×175(30×20)	20-M36(P3)×385	48

Nominal size		JIS30K		
mm	inch	Setting Bolts	Long Bolts	No.of Nuts
50	2	—	8-M16 ×145	16
80	3	—	8-M20 ×170	16
100	4	—	8-M22 ×190	16
150	6	—	12-M24 ×210	24
200	8	—	12-M24 ×240	24
250	10	8(0)-M30(P3)×135(24×16)	8(12)-M30(P3)×275	24
300	12	8-M30(P3)×145(24×16)	12-M30(P3)×285	32
350	14	8-M30(P3)×155(24×16)	12-M30(P3)×315	32
400	16	8-M36(P3)×170(30×20)	12-M36(P3)×355	32

Nominal size		BS4504(DIN)NP25			BS4504(DIN)NP40		
mm	inch	Setting Bolts	Long Bolts	No.of Nuts	Setting Bolts	Long Bolts	No.of Nuts
50	2	—	4-M16×145	8	—	4-M16 ×145	8
80	3	—	8-M16×155	16	—	8-M16 ×155	16
100	4	—	8-M20×170	16	—	8-M20 ×170	16
150	6	—	8-M24×190	16	—	8- M24×190	16
200	8	—	12-M24×210	24	—	12-M27×230	24
250	10	8(0)-M27×115(22×14)	8(12)-M27×230	24	8(0)-M30×125(24×16)	8(12)-M30×250	24
300	12	8-M27×115(22×14)	12-M27×250	32	8-M30×125(24×16)	12-M30×270	32
350	14	8-M30×135(24×16)	12-M30×285	32	8-M33×150(27×18)	12-M33×310	32
400	16	8-M33×145(27×18)	12-M33×310	32	8-M36×160(30×20)	12-M36×340	32
450	18	8-M33×145(27×18)	16-M33×330	40	8-M36×160(30×20)	16-M36×355	40
500	20	8-M33×150(27×18)	16-M33×350	40	8-M39×170(32×21)	16-M39×375	40
600	24	8-M36×170(30×20)	16-M36×380	40	8-M45×200(36×24)	16-M45×430	40

334A Piping Bolts and Nuts Sizes

■300 Lb Lugged (fully-tapped)

Nominal size		ASME/JPI class300		JIS20K		JIS30K	
mm	inch	Setting Bolts	No.of Nuts	Setting Bolts	No.of Nuts	Setting Bolts	No.of Nuts
50	2	16-5/8-11UNC×75(13× 8)	16	16-M16× 75(13× 8)	16	—	—
80	3	16-3/4-10UNC×90(17×11)	16	16-M20× 85(17×11)	16	16-M20× 85(17×11)	16
100	4	16-3/4-10UNC×90(17×11)	16	16-M20× 85(17×11)	16	16-M22×100(19×12)	16
150	6	24-3/4-10UNC×95(17×11)	24	24-M22×100(19×12)	24	24-M24×110(21×14)	24
200	8	24-7/8-9UNC×110(19×12)	24	24-M22×100(19×12)	24	24-M24×115(21×14)	24
250	10	32- 1-8UNC×125(21×14)	32	—	—	—	—
300	12	32-1 1/8-8UN×135(24×16)	32	32-M24×110(21×14)	32	32-M30(P3)×140(24×16)	32
350	14	40-1 1/8-8UN×145(24×16)	40	—	—	—	—
400	16	40-1 1/4-8UN×160(24×16)	40	—	—	—	—
450	18	48-1 1/4-8UN×160(24×16)	48	—	—	—	—
500	20	48-1 1/4-8UN×160(24×16)	48	—	—	—	—
600	24	48-1 1/2-8UN×190(30×20)	48	48-M36(P3)×170(30×20)	48	—	—

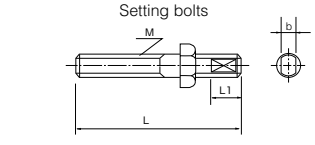
Nominal size		BS4504(DIN)NP25		BS4504(DIN)NP40	
mm	inch	Setting Bolts	No.of Nuts	Setting Bolts	No.of Nuts
50	2	8-M16× 75(13× 8)	8	8-M16× 75(13× 8)	8
80	3	16-M16× 75(13× 8)	16	16-M16× 75(13× 8)	16
100	4	16-M20× 85(17×11)	16	16-M20× 85(17×11)	16
150	6	—	—	—	—
200	8	24-M24×110(21×14)	24	24-M27×115(22×14)	24
250	10	—	—	—	—
300	12	32-M27×115(24×14)	32	32-M30×115(24×16)	32
350	14	—	—	—	—
400	16	—	—	—	—
450	18	—	—	—	—
500	20	—	—	—	—
600	24	—	—	—	—

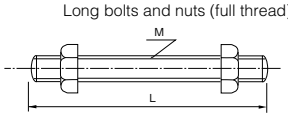
Note: Bolt/Nut material: SNB7/S45C
Please use a nut with a height that is 100% of the screw diameter.
The bolt length calculation is based on use of a 4.5 mm thick spiral gasket.
The flange thickness calculation is based on the standard steel flange thickness.
Quantities shown are for one valve.
250 mm bolt quantities are indicated as follows: The quantity outside the brackets applies when the setting bolt holes are tapped and the values inside the brackets apply when the setting bolt holes are drilled.

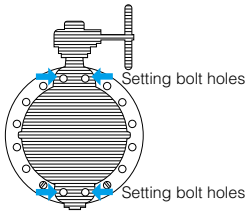
Examples

Setting bolts: 8 - M16 × 75 (13 × 8)
N M L b L1

Long bolts: 4 - M16 × 145
N M L





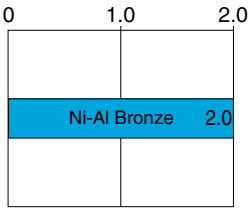


344Q

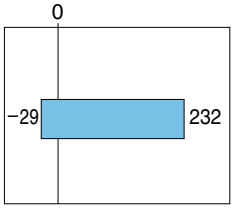
Valve nominal size

80 to 600mm

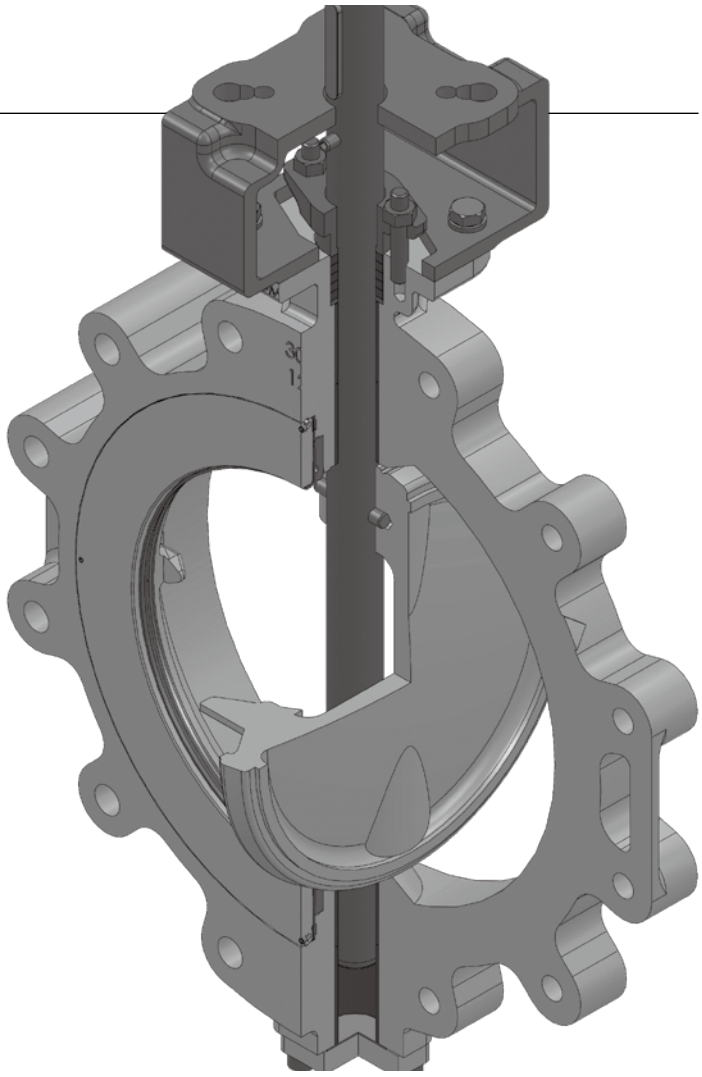
Max.working pressure MPa

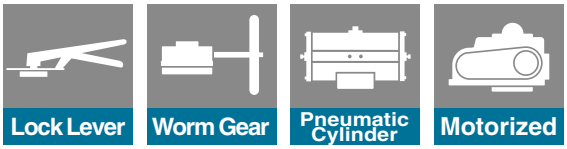


Working temperature range ℃



FS Fire safe certification to API607 7th Ed. / ISO10497 3rd Ed.





Features and Benefits

Double Offset PTFE Seated High Performance Butterfly Valve to Suit API Standard Fire Safe Certification

General description

Designed to suit those severe conditions such as high temperature, high pressure or high velocity which disallow the use of soft resilient seated butterfly valves. Ideal for use for seawater fire fighting.

Seawater service application

Designed to suit seawater service application such as fire fighting line for FPSO.

Double offset geometry

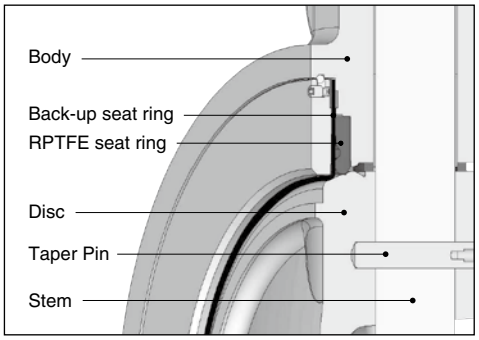
The design exhibits tight shut off, reduced torques, chemical resistance, excellent throttling capabilities, and the ability to operate with relatively high pressure drops.

Characteristics

Fire safe certification to API607 7th Ed.

API607-7th edition Fire safe / ISO10497 3rd Ed.

344Q Fire Safe Seat

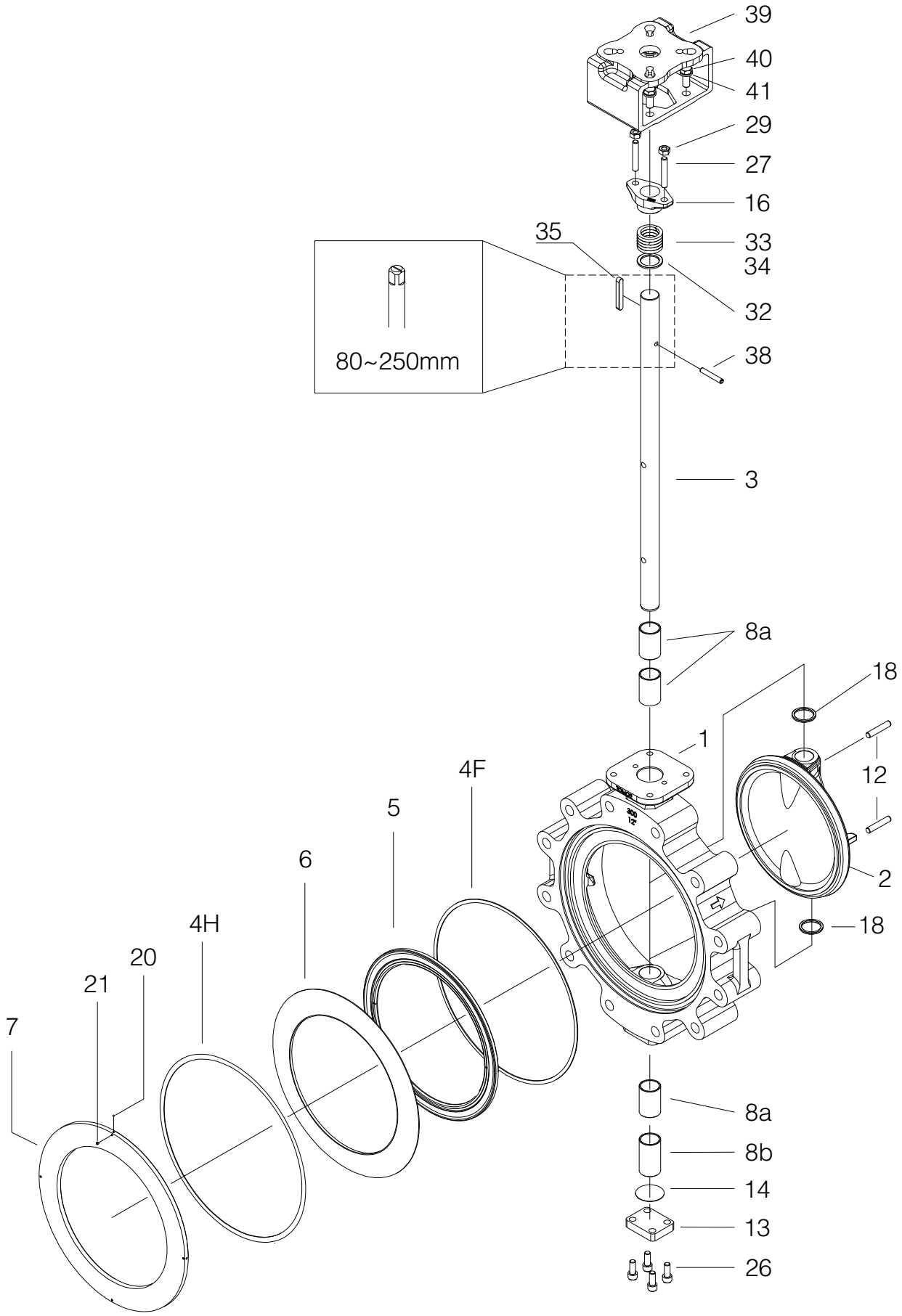


Standard Specifications

Product characteristics		Double offset soft seated butterfly valve
Conection		Lugged type
Nominal valve size		80, 100, 150, 200, 250, 300, 350, 400, 450, 500, 600mm
Appricable standards	Face-to-face dimensions	API609 Class150 Category B
	Flange standards	ASME/JPI Class150, Flat Face
	Actuator attachment	ISO5211/1
	P-T rating	ASME B16.34 / API 609
Applicable fluid		Seawater
Max.working pressure		2.0MPa
Working temperature range		-29 degree C to 232 degree C
Pressure direction		Standard pressure direction : Pressure on retainer side
Test Pressure	Shell test	Working pressure x 1.5 times (Hydrostatic pressure)
	Seat leakage	0.7MPa(Air pressure) Based on API598-9th Ed. Option : Working pressure x 1.1 times (Hydrostatic pressure)
Standard Materials	Body	ASTM B148 C95800
	Disc	ASTM B148 C95800
	Shaft	MONEL K-500
	Seat ring	RPTFE(Carbon graphite contained) / Inconel 625
	Retainer	ASTM B148 C95800
	Gland Packing	Graphite
Shaft shape for actuator conection		150Lb: 80mm to 250mm : Square / 300mm to 600mm : Key
Actuator		Lock lever, Worm gear, Pneumatic cylinder, Electric motor
Coating		No coating.
Usable Gasket		Sheet gasket : Marketed products available Spiral wound gasket : Marketed products (with inner & outer ring) available
Fire safe		API607-7th edition, ISO10497 3rd edition

※It is possible that seat leakage occur when fluid (e.g. powder and/or liquid) is solidified by working temperature and other cause. Consult us.

344Q Expanded view of bare shaft



344Q Parts List

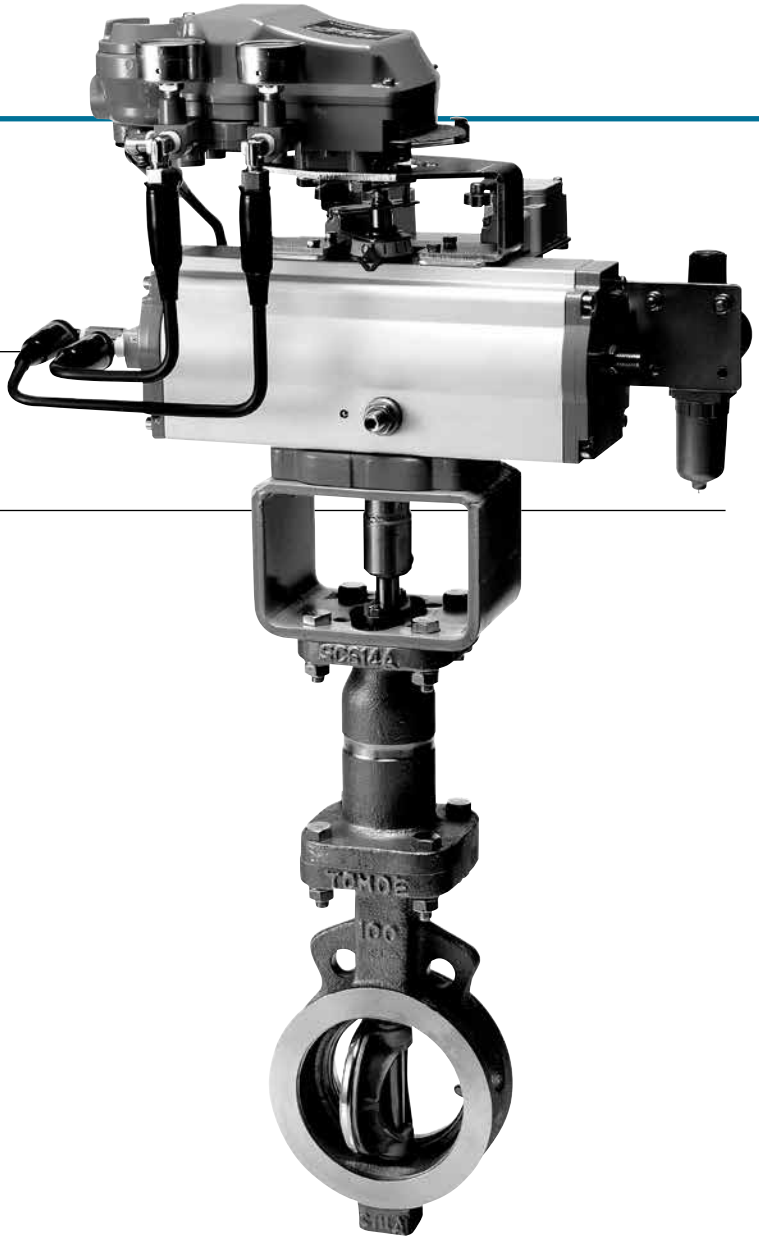
No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
4F	Body gasket	1	
4H	Retainer gasket	1	
5	Seat ring	1	
6	Backup Seatring	1	
7	Seat ring retainer	1	
8a	Bearing a	0	600mm
		1	300mm
		2	80mm to 150mm, 500mm
		3	200mm
		4	250mm, 350mm
		6	400mm, 450mm
8b	Bearing b	0	400mm, 450mm
		1	80mm, 100mm, 200mm, 250mm, 350mm
		2	150mm, 500mm
		3	300mm
		4	600mm
9	Bearing spacer	1	
12	Taper pin	2	80mm to 300mm
		3	350mm to 600mm
13	Bottom cover	1	
14	Bottom gasket	1	
16	Gland plate spigot	1	
18	Space ring	2	
20	Ball	2	80mm, 100mm
		4	150mm to 600mm
21	Set screw	2	80mm, 100mm
		4	150mm to 600mm
26	Hexagon hole bolt	4	
27	Gland bolt	2	
29	Hexagon nut	2	
32	Packing retainer	1	
33	Gland packing a	3	
34	Gland packing b	2	
35	Key	0	80mm to 250mm
		1	300mm to 600mm
38	Spring pin	1	
39	Column	1	
40	Hexagon bolt	4	
41	Spring washer	4	

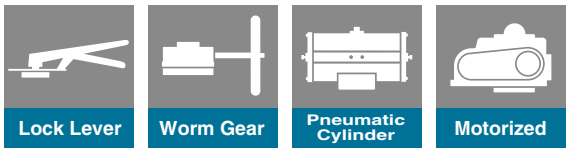
Double offset metal seat high performance butterfly valves to suit API standards 150 Lb Rating

Tom Disco

302A Wafer

303Q Lugged





Features and Benefits

Fire safe design

Designed as an inherently fire safe metal seated butterfly valve. Certified to Fire Safe Test as per API 607 4th Edition.

Bi-directional flow

Seals flow in both directions. The valves can be used even if the flow changes direction. (There are pressure limitations for each direction of flow. See chart for recommended specifications).

Disc with reinforced rib

Discs up to 300mm have a thin cross section but feature a reinforcing rib. As for 350mm to 600mm, the disc rib has a convex figuration. These designs successfully reduce thermal expansion and provide a constant sealing performance against any change in temperature or pressure of the fluid.

Double offset geometry

The axis of disc rotation is double offset to the seat ring. When the disc rotates, it unseats at a small turning angle by its cam effect. This prevents seat wear and provides reliable sealing performance over long periods.

Metal Seat

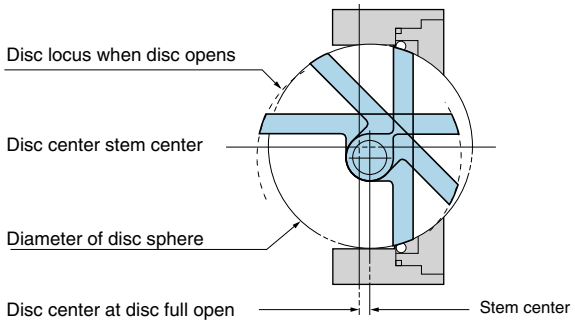
The resilient metal seat ring with coil spring compensates for thermal expansion or contraction of the body or disc. The ball lock method is adopted to facilitate replacement of the seat ring.

Improved reliability

By minimising the effect of friction and the special hard facing of the seating, the reliability of this metal seat butterfly valve is dramatically improved. The key connection of the disc and stem will prevent the direct effect of heat transaction from the stem to the disc as well as provide an anti-blow-out facility on the stem.

General description

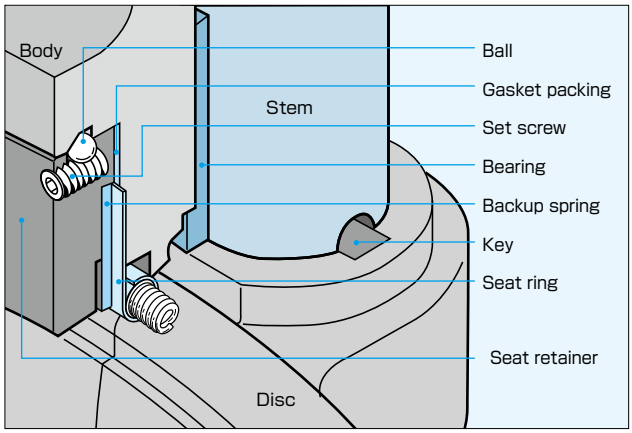
Inherent fire safe design with carbon steel or stainless steel body with ASME/ANSI B16.34 Class 150 rating and API 609 pressure temperature rating. Ideal for use in general hydrocarbon, chemical process, low pressure steam and gas applications.



Double-Eccentric Disc

The axis of disc rotation is double eccentric to the seat rings. When the disc rotates, it unseats at a small turning angle by its cam effect. This prevents seat wear and provides a perfect seal for long periods.

Fire Safe Seat Design



Standard Specifications

Valve nominal size※1		80, 100, 125, 150, 200, 250, 300mm		350, 400, 450, 500, 600mm
Applicable flange standard		JIS 10K/16K/20K ANSI 125/150Lb API/JPI 150Lb BS10 Table F BS 4504 PN 10/16 DIN PN10/16		JIS 5K/10K/16K/20K ANSI 125/150Lb API/JPI 150Lb BS10 Table E BS 4504 PN 10/16 DIN PN10/16
Face-to-face dimensions		API 609(class 150Lb, category B), JPI-7S-83(class 150Lb) ※125mmis as per JIS B 2002 (series 46)/ISO 5752 (series 20)		
Seat leakage		API 598-7th Edition (1996)※		
Connection		Double Offset Wafer Type (Option:Flanged,Lugged)		
Pressure-temperatue-rating※2		API 609 class 150Lb category B, ASME/ANSI B16.34 class 150Lb		
Fire safe		API 607 4th Edition		
Max. working pressure ※2		2.0MPa		
Working temperature range※3		–29 to 600 degrees C (Ext. bonnet is required at 400 degrees C and or over)		
Flow direction		Bi-directional flow (Flow to disc side is recommended.) ┌ Flow to disc side (2.0 MPa) └ Flow to stem side (1.0 MPa)※4		
Pressure test	Body shell	3.1 MPa (API 598 7th Edition) by hydraulic		
	Seat leak	7 bar (API 598 7th Edition) by air		
Standard materials	Body	SCPH2/WCB, SCS 14A/CF8M		SCPH2/WCB, SCS 13A/CF8, SCS 14A/CF8M
	Disc	80mm to 150mm	200mm to 300mm	350mm to 600mm
		SCS 16A(hard chrome plating)	SCS 14A(hard chrome plating)	SCS 13A(hard chrome plating), SCS 14A(hard chrome plating)
	Stem	SUS 420J2, SUS 329J1, SUS 316, SUS 329J4L		SUS 420J2, SUS 304, SUS 630
	Seat ring	SUS316L		
Coating		Silicon resin coating (Grey N7) for under 200 degrees C Heat resistant silver coating for 200 degrees C and over. No coating for stainless steel.		

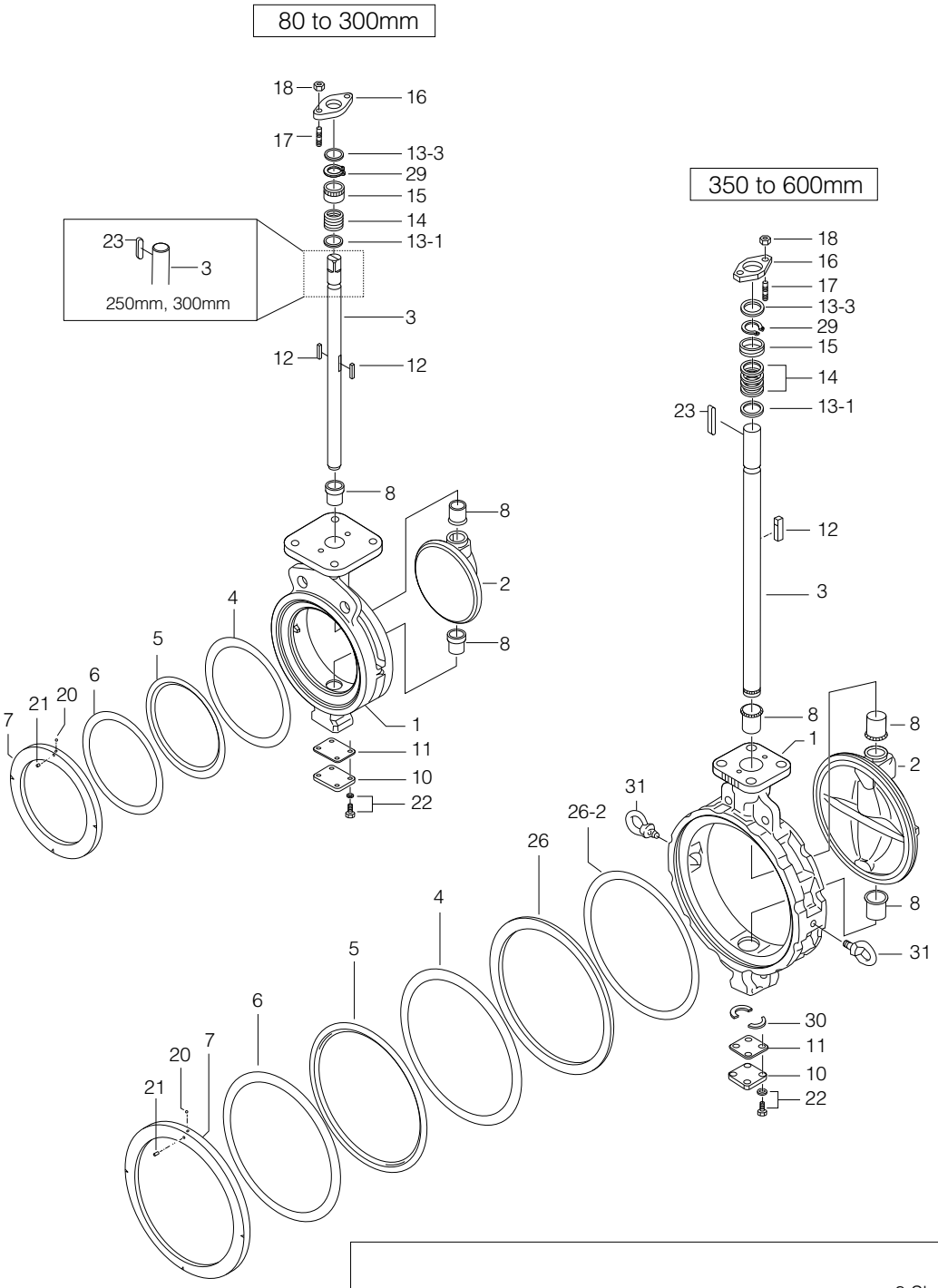
※1. Please use 302Y or 337Y if using a nominal valve diameter of 50mm and 65mm.
※2. Refer to pressure – temperature rating chart on page 302A/303Q-05.
※3. Contact us at 400 degrees C and or over for oxidizing atmosphere.
※4. Contact us regarding 350～600mm flowing to stem side.

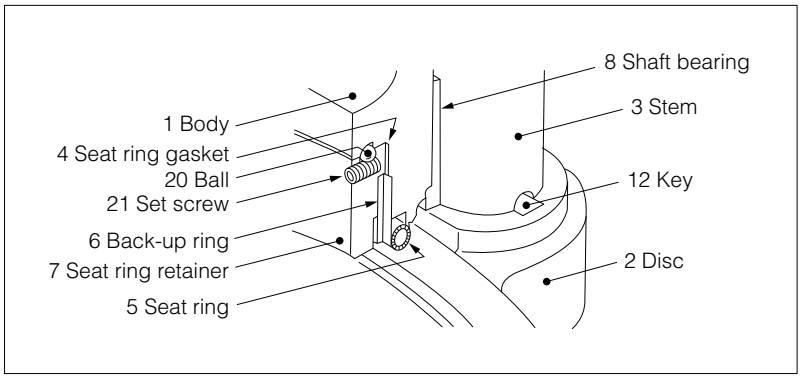
※It is possible that seat leakage occur when fluid (e.g. powder and/or liquid) is solidified by working temperature and other cause. Consult us.
Please note that use with vertical line such as bottom area of discharge spout of hopper, and tank.

Allowable leakage rate for closure test (API 598-7th Edition 1996)

Nominal size	Duration	Fluid	Allowable rate
80mm～150mm	1min	air	24bubbles / min or less(approx.1.5cc / min)
200mm～300mm	2min		40bubbles / min or less(approx.2.5cc / min)
350mm～600mm	2min		56bubbles / min or less(approx.3.5cc / min)

302A Expanded view of components





■302A Parts List (80mm to 300mm: −29 to 400 degrees C)

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
★ 4	Seat ring gasket	1	
★ 5	Seat ring	1	
★ 6	Back-up ring	1	
7	Seat ring retainer	1	
8	Shaft bearing	3	
10	Bottom cover	1	
★ 11	Bottom gasket	1	
12	Key	2	
13-1	Packing retainer	1	
13-3	Ring	1	
★ 14	Gland packing	1 set	
15	Gland bush	1	
16	Gland flange	1	
17	Gland bolt	2	80mm to 125mm
18	Gland nut	2	150mm to 300mm
★ 20	Ball	2	80mm to 125mm
		4	150mm to 300mm
★ 21	Set screw	2	
		4	Only 250mm, 300mm
22	Hexagon bolt, Spring washer	4 sets	
23	Stem key	1	
29	C-ring	1	

■302A Parts List (350mm to 600mm: −29 to 400 degrees C)

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
★ 4	Seat ring gasket	1	
★ 5	Seat ring	1	
★ 6	Back-up ring	1	
7	Seat ring retainer	1	
8	Shaft bearing	3	
10	Bottom cover	1	
★ 11	Bottom gasket	1	
12	Key	1	
13-1	Packing retainer	1	
13-3	Ring	1	
★ 14	Gland packing	1 set	
15	Gland bush	1	
16	Gland flange	1	
17	Gland bolt	2	
18	Gland nut	2	
★ 20	Ball	4	
★ 21	Set screw	4	
22	Hexagon bolt, Spring washer	4 sets	
23	Stem key	1	
26	Sub-retainer	1	
26-2	Seat spacer	1	Only 350mm
29	C-ring	1	
30	Thrust ring	2	
31	Eye bolt	2	Only 450mm to 600mm

Remark: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove set screws (Part #21 set screw).

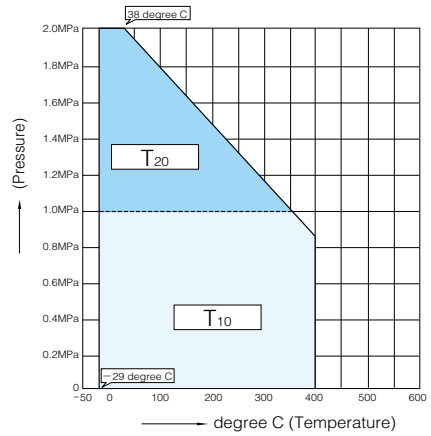
302A Actuator Selection Chart

■80mm to 300mm

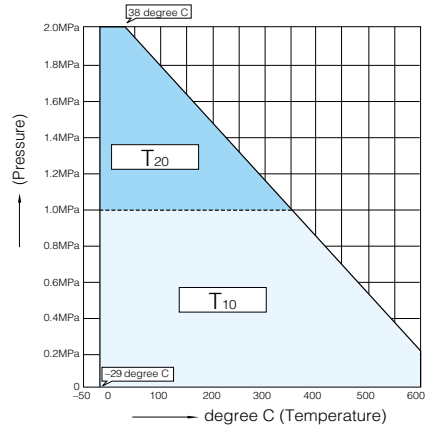
Model	Category	Size (mm/inch) 80 / 3	100 / 4	125 / 5	150 / 6	200 / 8	250 / 10	300 / 12
1T	T10	1T-2			1T-3			
	T20							
2U,2S	T10	2U-2			2U-4	DGH-2	DGH-3	
	T20							
7E,3A	T10	T85	T200		T380	T750		
	T20						TGA-125	
7G,7F 3U,3K	T10	T200S	T380S	T750S		TG-12S		
	T20	T380S			TG-10S		TG-14S	
4I	T10	4I-0	4I-1	4I-2		4I-2.5	4I-3	
	T20	4I-1			4I-2.5			
4J,4L	T10	SRJ-010	SRJ-020			SRJ-060		
	T20				SRJ-060	SRJ-1	LTKD-01 0.2kW/DGH-3	

■302A Pressure Rating

SCPH2



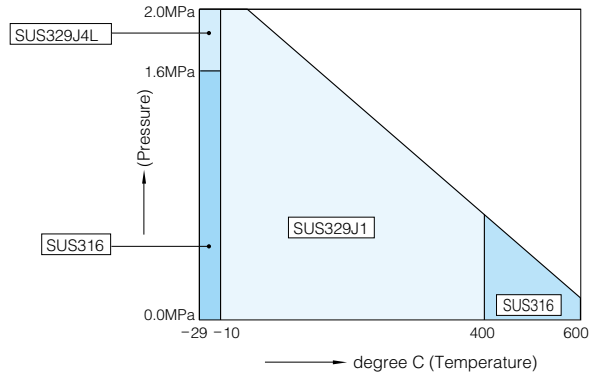
SCS14A



302A Standard Stem Material

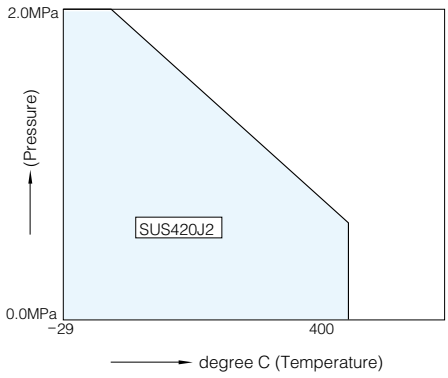
■80mm to 300mm

SCS 14A/CF8M Body



Pressure \ Temp.	−29 to less than −10 degrees C	−10 to less than 400 degrees C	400 to 600 degrees C
0 to less than 1.6MPa	SUS 316	SUS 329J1	SUS 316
1.6 to 2.0MPa	SUS 329J4L		

SCPH2/WCB Body



Pressure \ Temp.	−29 to less than 400 degrees C
0 to 2.0MPa	SUS 420J2

※1 Framed description shows stem material.
※2 Refer to Pressure - Temperature chart.
※3 Consult us regarding other materials.

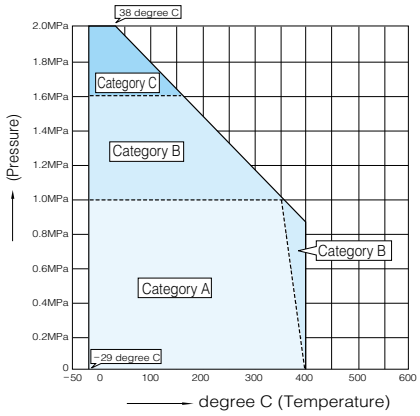
302A Actuator Selection Chart

■350mm to 600mm

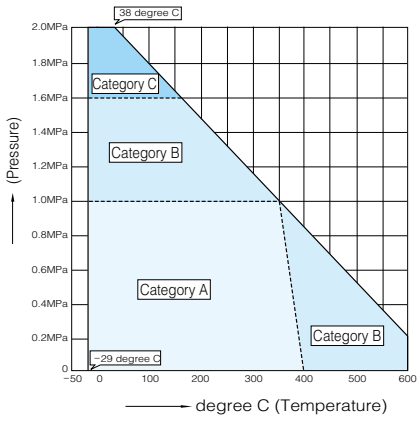
Model	Category	Size (mm/inch) 350 / 14	400 / 16	450 / 18	500 / 20	600 / 24
2S	A	DGH-3	DGH-4	DGH-4	DGH-4	DGH-4+R/G5
	B	DGH-3	DGH-4	DGH-4	DGH-4+R/G5	DGH-4.5 +R/G5
	C	DGH-3	DGH-4	DGH-4+R/G5	DGH-4+R/G5	DGH-4.5 +R/G5
3A	A	TGA-125	TGA-140	TGA-140	TGA-160	TGA-180
	B	TGA-125	TGA-140	TGA-140	TGA-180	TGA-200
	C	TGA-125	TGA-160	TGA-160	TGA-180	TGA-220
3U,3K	A	TG-14S	TG-20S	TG-20S	TG-20S	TG-20S
	B	TG-14S	TG-20S	TG-20S	TG-20S	TG-20S
	C	TG-14S	TG-20S	TG-20S	TG-20S	TG-20S
4 I	A	4 I -4	4 I -4	4 I -4	4 I -4	4 I -4
	B	4 I -4	4 I -4	4 I -4	4 I -4	4 I -4
	C	4 I -4	4 I -4	4 I -4	4 I -4	4 I -4
4L	A	LTKD-01 0.2kW/DGH-3	LTKD-02 0.4kW/DGH-4	LTKD-02 0.75kW/DGH-4	LTKD-02 0.75kW/DGH-4	LTKD-02 1.5kW/DGH-4
	B	LTKD-01 0.2kW/DGH-3	LTKD-02 0.4kW/DGH-4	LTKD-02 0.75kW/DGH-4	LTKD-02 0.75kW/DGH-4	LTKD-02 1.5kW/DGH-5
	C	LTKD-02 0.4kW/DGH-4	LTKD-02 0.4kW/DGH-4	LTKD-02 0.75kW/DGH-4	LTKD-02 1.5kW/DGH-4	LTKD-05 1.5kW/DGH-5

■302A Pressure Rating

SCPH2



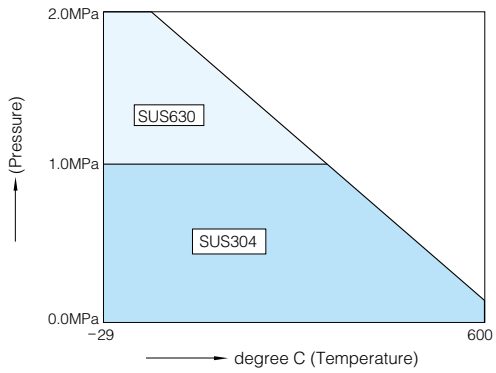
SCS13A



302A Standard Stem Material

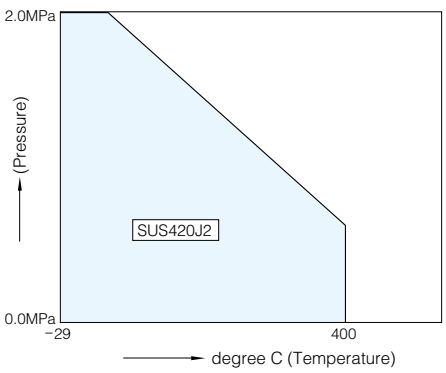
■350mm to 600mm

SCS 13A/CF8, SCS 14A/CF8M Body



Pressure \ Temp.	−29 to 600 degrees C
0 to less than 1.0MPa	SCS 13A body: SUS 304 SCS 14A body: SUS 316
1.0 to 2.0MPa	SUS 630

SCPH2/WCB Body

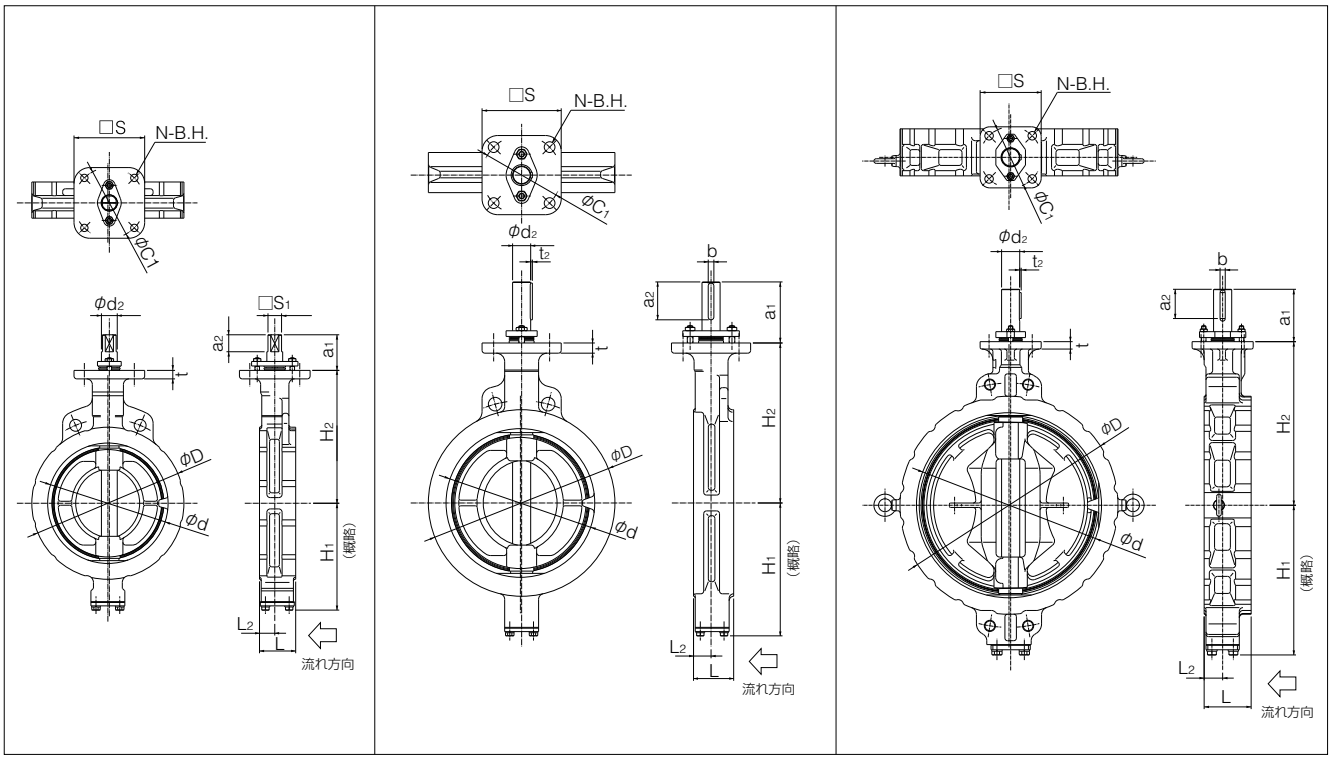


Pressure \ Temp.	−29 to less than 400 degrees C
0 to 2.0MPa	SUS 420J2

※1 Framed description shows stem material.
※2 Refer to Pressure - Temperature chart.
※3 Consult us regarding other materials.

Dimension List

■302A 80mm～200mm ■302A 250mm～400mm ■302A 450mm～600mm



■−29 to less than 400 degrees C

Stem shape	Nominal size		Dimension (mm)														Approx. Weight (kg)
	mm	inch	φd	φ1	L	L2	H1	H2	a1	a2	□S1	φd2	b	t2	t	ISO 5211 Top Flange	
01	80	3	89	127	48	22	95	147	52.5	16.5	14	16	–	–	15	F10	5
	100	4	112	156	54	24	110	170	52.5	16.5	14	16	–	–	15	F10	6.2
	125	5	137	185	56	23	139	185	52.5	16.5	16	20	–	–	15	F10	9.3
	150	6	163	216	57	23.5	164	205	55.5	20	18	22	–	–	15	F12	12.5
	200	8	213	269	64	27	190	235	63	30	24	28	–	–	15	F12	19
02	250	10	263	330	71	31	236	283	108	67.3	–	32	10	3	18	F14	33
	300	12	315	381	81	35	246	310	113	72.3	–	35	10	3	18	F14	42
	350	14	350	416	92	39.5	308	340	113	72	–	38	10	3	18	F14	61
	400	16	400	475	102	39	348	372	113	72	–	42	12	3.5	18	F14	88
	450	18	450	534	114	43	366	406	141.5	68	–	45	12	3.5	20	F16	135
	500	20	500	589	127	50	405	442	141.5	79	–	49	14	4	20	F16	173
	600	24	600	693	154	64	461	493	141.5	80	–	59	16	5	20	F16	272

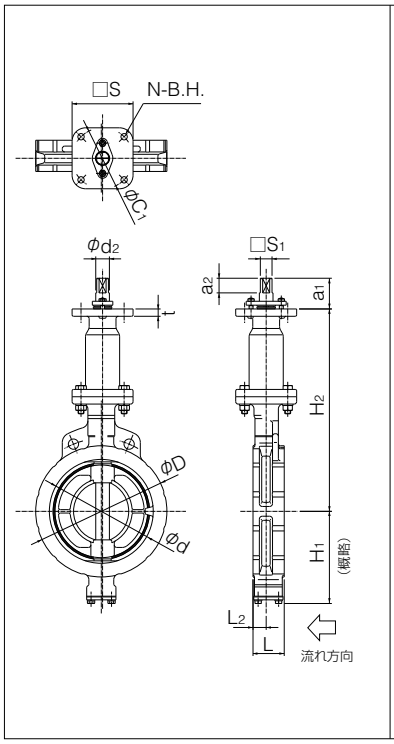
Stem shape	01 : square 02 : round with key

■Top Flange Dimension

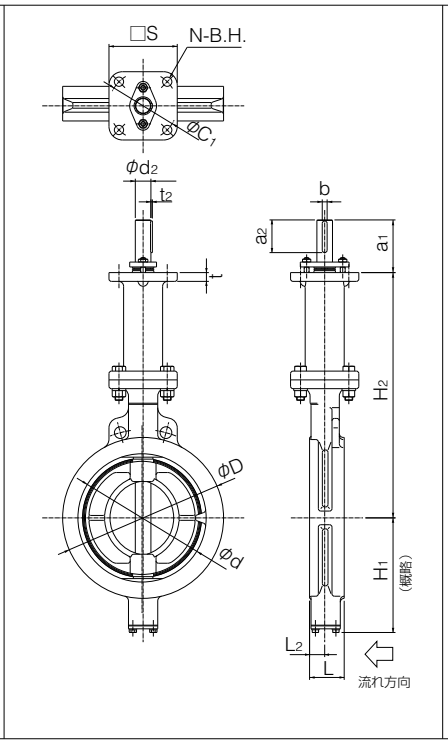
ISO 5211 Top Flange	□S	φC1	N	B.H.
F10	102	102	4	11
F12	125	125	4	13
F14	140	140	4	19
F16	165	165	4	23

302A Bare Shaft (01: 80mm to 200mm, 02: 250mm to 600mm)

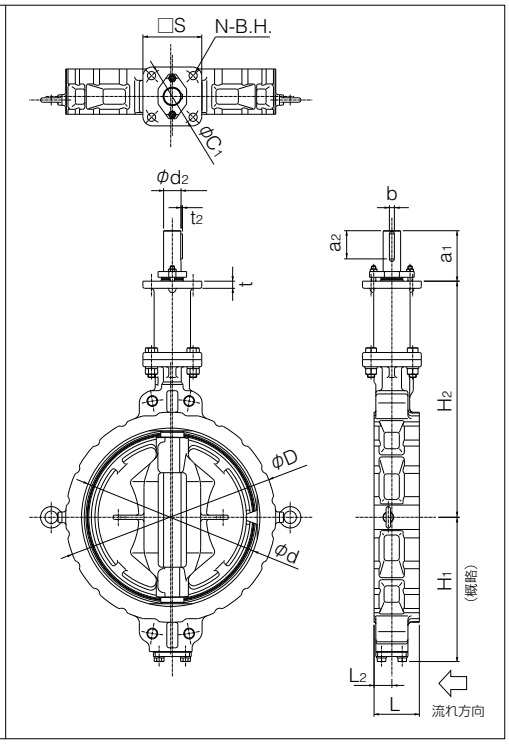
■302A 80mm～200mm
(High-Temperature Extension Bonnets)



■302A 250mm～400mm
(High-Temperature Extension Bonnets)



■302A 450mm～600mm
(High-Temperature Extension Bonnets)



■400 to less than 600 degrees C (High-Temperature Extension Bonnets)

Stem shape	Nominal size		Dimension (mm)														Approx. Weight (kg)
	mm	inch	φd	φD	L	L2	H1	H2	a1	a2	□S1	φd2	b	t2	t	ISO 5211 Top Flange	
01	80	3	89	127	48	22	95	297	52.5	16.5	14	16	—	—	15	F10	10.3
	100	4	112	156	54	24	110	320	52.5	16.5	14	16	—	—	15	F10	11.5
	125	5	137	185	56	23	139	335	52.5	16.5	16	20	—	—	15	F10	14.7
	150	6	163	216	57	23.5	164	385	55.5	20	18	22	—	—	15	F12	20
	200	8	213	269	64	27	190	415	63	30	24	28	—	—	15	F12	27
02	250	10	263	330	71	31	236	503	108	67.3	—	32	10	3	18	F14	46
	300	12	315	381	81	35	246	530	113	72.3	—	35	10	3	18	F14	55
	350	14	350	416	92	39.5	308	560	113	72	—	38	10	3	18	F14	76
	400	16	400	475	102	39	348	592	113	72	—	42	12	3.5	18	F14	104
	450	18	450	534	114	43	366	626	141.5	68	—	45	12	3.5	20	F16	152
	500	20	500	589	127	50	405	662	141.5	79	—	49	14	4	20	F16	191
	600	24	600	693	154	64	461	713	141.5	80	—	59	16	5	20	F16	291

Stem shape	01 : square 02 : round with key

■Top Flange Dimension

ISO 5211 Top Flange	□S	φC1	N	B.H.
F10	102	102	4	11
F12	125	125	4	13
F14	140	140	4	19
F16	165	165	4	23

Lock Lever Type 302A-1T (80mm to 150mm)

■−29 to less than 250 degrees C

Nominal size		Dimension (mm)									Lever type	Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	W		
80	3	89	127	48	22	95	147	T_{10}, T_{20}	117	300	1T-2	7.1
100	4	112	156	54	24	110	170	T_{10}, T_{20}	117	300	1T-2	8.3
125	5	137	185	56	23	139	185	T_{10}, T_{20}	117	300	1T-2	11.4
150	6	163	216	57	23.5	164	205	T_{10}, T_{20}	125	350	1T-3	14.6

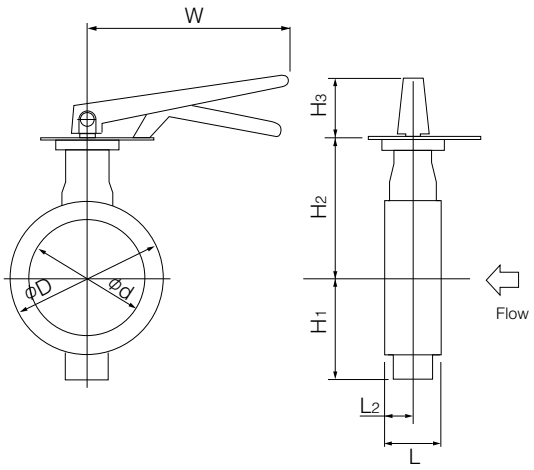
■250 to less than 400 degrees C

Nominal size		Dimension (mm)									Lever type	Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	W		
80	3	89	127	48	22	95	147	T_{10}, T_{20}	217	300	1T-2	9.7
100	4	112	156	54	24	110	170	T_{10}, T_{20}	217	300	1T-2	10.9
125	5	137	185	56	23	139	185	T_{10}, T_{20}	217	300	1T-2	14.2
150	6	163	216	57	23.5	164	205	T_{10}, T_{20}	297	350	1T-3	21.3

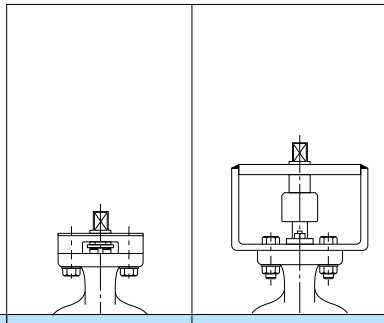
■400 to 600 degrees C

Nominal size		Dimension (mm)									Lever type	Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	W		
80	3	89	127	48	22	95	297	T_{10}	217	300	1T-2	15
100	4	112	156	54	24	110	320	T_{10}	217	300	1T-2	16.2
125	5	137	185	56	23	139	335	T_{10}	217	300	1T-2	19.6
150	6	163	216	57	23.5	164	385	T_{10}	297	350	1T-3	28.8

■302A-1T



■302A-1T Actuator Mounting Finish by Temperature



Temp.range		−29 to less than 250 degrees C	250 to less than 400 degrees C	400 to 600 degrees C
Body	80mm to 150mm	SCS14A SCPH2		SCS14A

■1T Installation Direction

1TA	1TB	1TC	1TD
Retainer Side / Flow / O / S / Stem Side	Retainer Side / Flow / O / S / Stem Side	Retainer Side / Flow / S / O / Stem Side	Retainer Side / Flow / S / O / Stem Side

Worm Gear Type 302A-2U (80mm to 150m) / 302A-2S(200mm to 600mm)

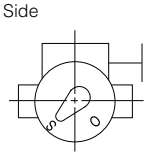
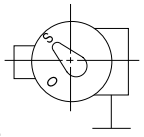
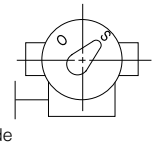
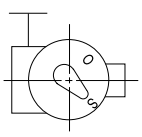
■−29 to less than 250 degrees C

Nominal size		Dimension (mm)												Gear type	Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	E	K	F	φW		
80	3	89	127	48	22	95	147	T_{10},T_{20}	61	44	53	173.5	160	2U-2	7.9
100	4	112	156	54	24	110	170	T_{10},T_{20}	61	44	53	173.5	160	2U-2	9.1
125	5	137	185	56	23	139	185	T_{10},T_{20}	61	44	53	173.5	160	2U-2	12.4
150	6	163	216	57	23.5	164	205	T_{10},T_{20}	77.5	87.5	90	222.5	200	2U-4	29
200	8	213	269	64	27	190	235	T_{10},T_{20}	72	85	126	246	280	DGH-2	33
250	10	263	330	71	31	236	283	T_{10},T_{20}	97	117	164	335	355	DGH-3	62
300	12	315	381	81	35	246	310	T_{10},T_{20}	97	117	164	335	355	DGH-3	72
350	14	350	416	92	39.5	308	340	A,B,C	97	117	164	335	355	DGH-3	99
400	16	400	475	102	39	348	372	A	97	117	164	335	355	DGH-3	124
								B,C	215	140	198	402	450	DGH-4	162
450	18	450	534	114	43	366	406	A,B	127	140	198	402	450	DGH-4	198
								C	127	140	198	432	355	DGH-4+R/G5	200
500	20	500	589	127	50	405	442	A	127	140	198	402	450	DGH-4	236
								B,C	127	140	198	432	355	DGH-4+R/G5	238
600	24	600	693	154	64	461	493	A	127	140	198	432	355	DGH-4+R/G5	338
								B,C	245	185	264	497	355	DGH-4.5+R/G5	413

■250 to less than 400 degrees C

Nominal size		Dimension (mm)												Gear type	Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	E	K	F	φW		
80	3	89	127	48	22	95	147	T_{10},T_{20}	134.5	44	53	173.5	160	2U-2	10.5
100	4	112	156	54	24	110	170	T_{10},T_{20}	134.5	44	53	173.5	160	2U-2	11.7
125	5	137	185	56	23	139	185	T_{10},T_{20}	134.5	44	53	173.5	160	2U-2	17.2
150	6	163	216	57	23.5	164	205	T_{10},T_{20}	223	87.5	90	222.5	200	2U-4	35
200	8	213	269	64	27	190	235	T_{10},T_{20}	217	85	126	246	280	DGH-2	39
250	10	263	330	71	31	236	283	T_{10},T_{20}	205	117	164	335	355	DGH-3	75
300	12	315	381	81	35	246	310	T_{10},T_{20}	205	117	164	335	355	DGH-3	85
350	14	350	416	92	39.5	308	340	A , B	205	117	164	335	355	DGH-3	108
400	16	400	475	102	39	348	372	A	205	117	164	335	355	DGH-3	134
								B	215	140	198	402	450	DGH-4	162
450	18	450	534	114	43	366	406	A , B	245	140	198	402	450	DGH-4	212
500	20	500	589	127	50	405	442	A	245	140	198	402	450	DGH-4	250
								B	245	140	198	432	355	DGH-4+R/G5	252
600	24	600	693	154	64	461	493	A	245	140	198	432	355	DGH-4+R/G5	351
								B	245	185	264	497	355	DGH-4.5+R/G5	413

■2U/2S Installation Direction

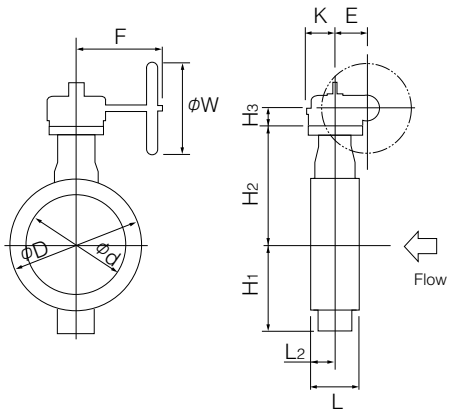
Retainer Side / Flow  Stem Side	Retainer Side / Flow  Stem Side	Retainer Side / Flow  Stem Side	Retainer Side / Flow  Stem Side
2UA/2SA	2UB/2SB	2UC/2SC	2UD/2SD

Worm Gear Type 302A-2U(80mm to 150m) / 302A-2S(200mm to 600mm)

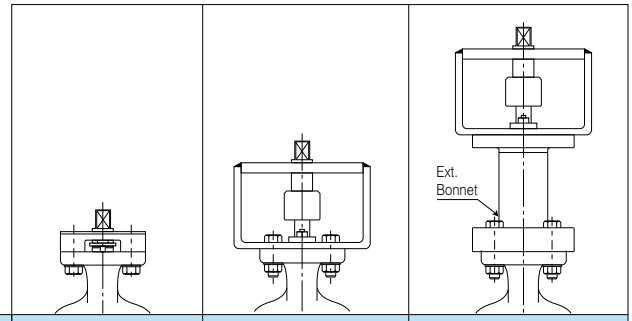
■400 to 600 degrees C

Nominal size		Dimension (mm)												Gear type	Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	E	K	F	φW		
80	3	89	127	48	22	95	297	T_{10}	134.5	44	53	173.5	160	2U-2	16
100	4	112	156	54	24	110	320	T_{10}	134.5	44	53	173.5	160	2U-2	17.2
125	5	137	185	56	23	139	335	T_{10}	134.5	44	53	173.5	160	2U-2	22.7
150	6	163	216	57	23.5	164	385	T_{10}	223	87.5	90	222.5	200	2U-4	42.5
200	8	213	269	64	27	190	415	T_{10}	217	85	126	246	280	DGH-2	47
250	10	263	330	71	31	236	503	T_{10}	205	117	164	335	355	DGH-3	88
300	12	315	381	81	35	246	530	T_{10}	205	117	164	335	355	DGH-3	98
350	14	350	416	92	39.5	308	560	B	205	117	164	335	355	DGH-3	124
400	16	400	475	102	39	348	592	B	215	140	198	402	450	DGH-4	178
450	18	450	534	114	43	366	626	B	245	140	198	402	450	DGH-4	228
500	20	500	589	127	50	405	662	B	245	140	198	432	355	DGH-4+R/G5	270
600	24	600	693	154	64	461	713	B	245	185	264	497	355	DGH-4.5+R/G5	432

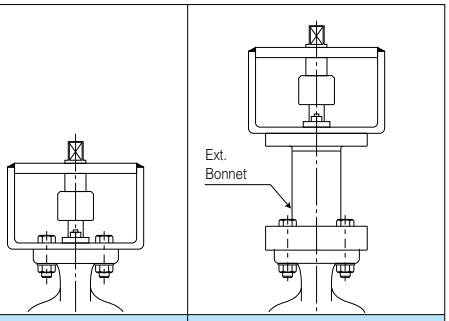
■302A-2U/2S



■302A-2U/2S Actuator Mounting Finish by Temperature



		−29 to less than 250 degrees C	250 to less than 400 degrees C	400 to 600 degrees C
Temp.range				
Body	80mm to 300mm	SCS14A SCPH2		SCS14A
	350mm to 600mm	SCS13A SCPH2		SCS13A



		−29 to less than 400 degrees C	400 to 600 degrees C
Temp.range			
Body	400mm (DGH-4) 600mm (DGH-4.5 +R/G5)	SCS13A SCPH2	SCS13A

Double-acting Pneumatic Cylinder Type 302A-7E (80mm to 300mm)

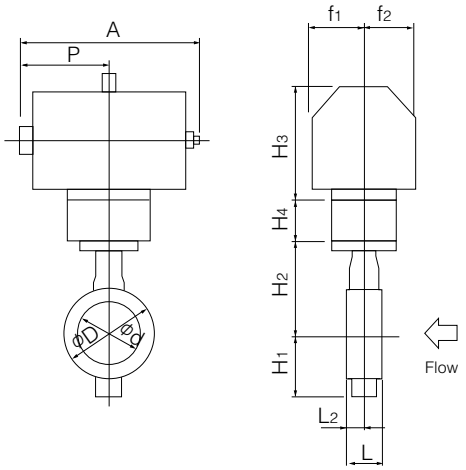
Less than 1.0 MPa

Nominal size		Dimension (mm)												Cylinder type	Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	H_3	H_4	A	P	f_1	f_2		
80	3	89	127	48	22	95	147	168	26.5	276	142	75	47	T85	11
100	4	112	156	54	24	110	170	203	26.5	346	176	79	57	T200	16
125	5	137	185	56	23	139	185	203	26.5	346	176	79	57	T200	19
150	6	163	216	57	23.5	164	205	231	29.5	423	214	91	69	T380	29
200	8	213	269	64	27	190	235	269	29.5	546	270	118	85	T750	45
250	10	263	330	71	31	236	283	269	190	546	270	118	87.5	T750	73
300	12	315	381	81	35	246	310	269	190	546	270	118	87.5	T750	82

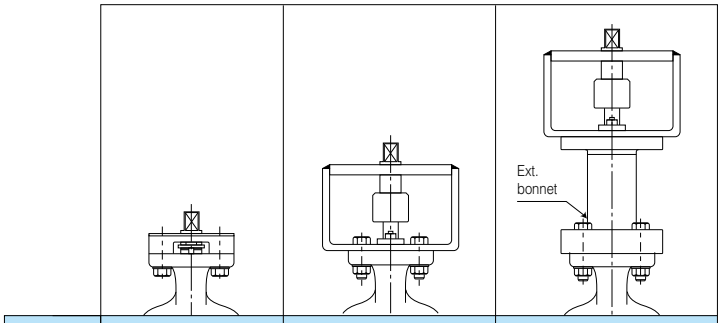
1.0 MPa to 2.0 MPa

Nominal size		Dimension (mm)												Cylinder type	Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	H_3	H_4	A	P	f_1	f_2		
80	3	89	127	48	22	95	147	203	26.5	346	176	79	57	T200	12
100	4	112	156	54	24	110	170	203	26.5	346	176	79	57	T200	16
125	5	137	185	56	23	139	185	231	26.5	423	214	91	69	T380	20
150	6	163	216	57	23.5	164	205	231	29.5	423	214	91	69	T380	29
200	8	213	269	64	27	190	235	269	29.5	546	270	118	85	T750	45

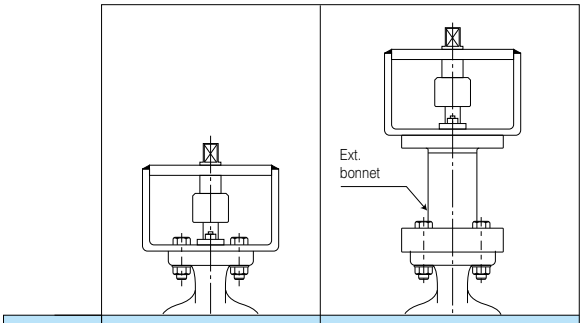
■302A-7E



■302A-7E Actuator Mounting Finish by Temperature

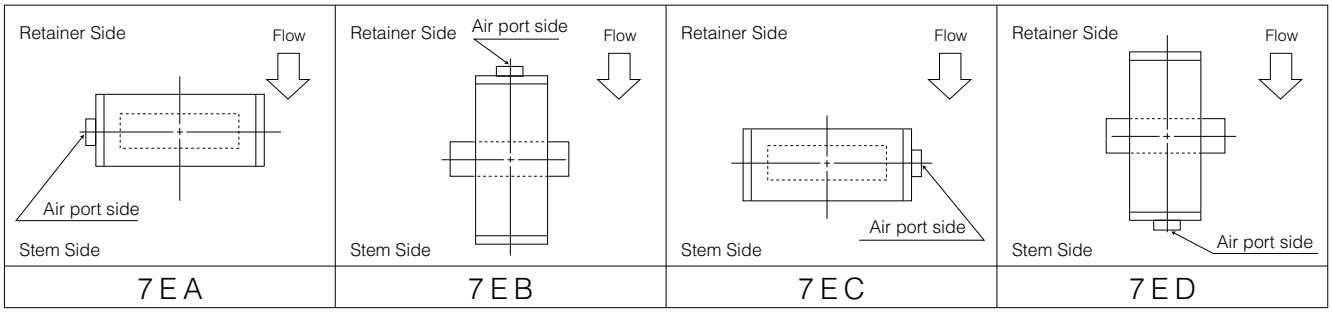


		−29 to less than 250 degrees C	250 to less than 400 degrees C	400 to 600 degrees C
Temp.range				
Body	80mm to 200mm	SCS14A SCPH2		SCS14A



		−29 to less than 400 degrees C	400 to 600 degrees C
Temp.range			
Body	250mm 300mm	SCS14A SCPH2	SCS14A
	350mm	SCS13A SCPH2	

■7E Installation Direction



Double-acting Pneumatic Cylinder Type 302A-3A (250mm to 600mm)

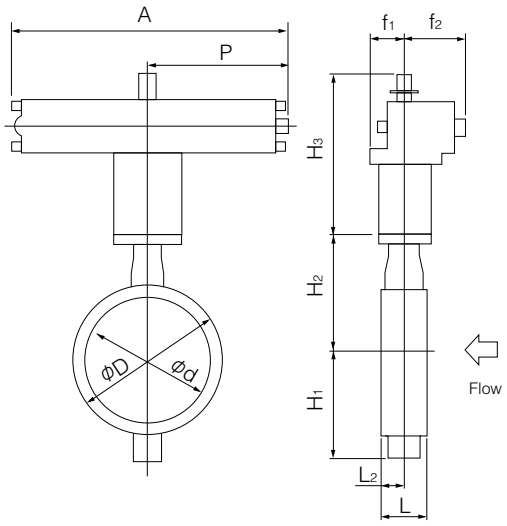
■−29 to less than 400 degrees C

Nominal size		Dimension (mm)												Cylinder type	Approx. Weight (kg)
mm	inch	Φd	ΦD	L	L_2	H_1	H_2	Category	H_3	A	P	f_1	f_2		
250	10	263	330	71	31	236	283	T_{20}	424	743	381	100	164	TGA-125	79
300	12	315	381	81	35	246	310	T_{20}	424	743	381	100	164	TGA-125	88
350	14	350	416	92	39.5	308	340	A	424	743	381	100	164	TGA-125	110
								B , C	472	810	417	100	180	TGA-140	121
400	16	400	475	102	39	348	372	A , B	472	810	417	100	180	TGA-140	147
								C	510	939	483	130	202	TGA-160	214
450	18	450	534	114	43	366	406	A	502	810	417	100	180	TGA-140	207
								B , C	530	939	483	130	202	TGA-160	263
500	20	500	589	127	50	405	442	A	530	939	483	130	202	TGA-160	302
								B , C	543	1053	543	130	218	TGA-180	330
600	24	600	693	154	64	461	493	A	543	1053	543	130	218	TGA-180	431
								B	610	1163	599	160	253	TGA-200	475
								C	640	1248	642	160	270	TGA-220	535

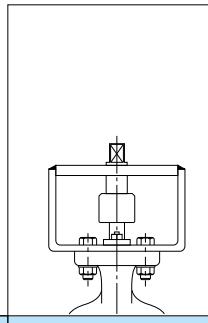
■400 to 600 degrees C

Nominal size		Dimension (mm)												Cylinder type	Approx. Weight (kg)
mm	inch	Φd	ΦD	L	L_2	H_1	H_2	Category	H_3	A	P	f_1	f_2		
350	14	350	416	92	39.5	308	560	B	472	810	417	100	180	TGA-140	136
400	16	400	475	102	39	348	592	B	472	810	417	100	180	TGA-140	163
450	18	450	534	114	43	366	626	B	530	939	483	130	202	TGA-160	280
500	20	500	589	127	50	405	662	B	543	1053	543	130	218	TGA-180	348
600	24	600	693	154	64	461	713	B	610	1163	599	160	253	TGA-200	494

■302A-3A



■302A-3A
Actuator Mounting Finish by Temperature



		−29 to less than 400 degrees C	400 to 600 degrees C
Temp.range			
Body	350mm to 600mm	SCS13A SCPH2	SCS13A

■3A Installation Direction

3AA	3AB	3AC	3AD
Retainer Side / Flow / Stem Side	Retainer Side / Flow / Stem Side	Retainer Side / Flow / Stem Side	Retainer Side / Flow / Stem Side

Single-acting Pneumatic Cylinder Type 302A-7G(Air to open: 80mm to 150mm) / 302A-7F(Air to close: 80mm to 150mm)

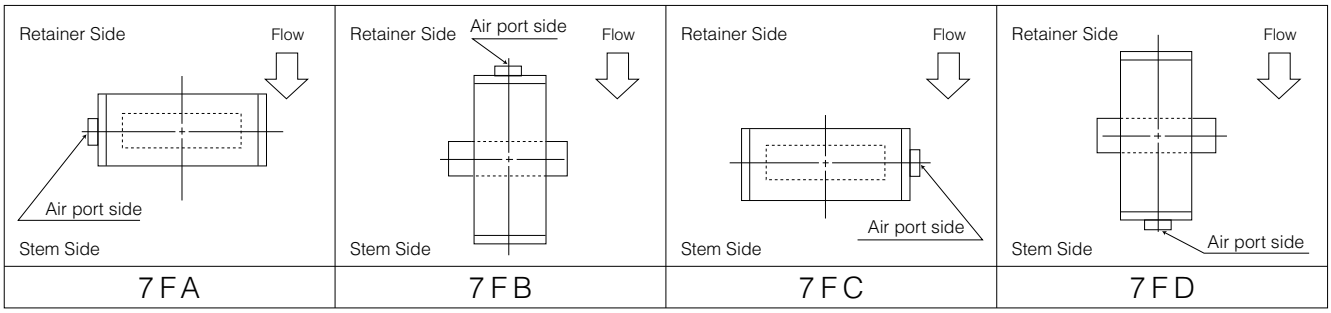
Less than 1.0 MPa

Nominal size		Dimension (mm)												Cylinder type	Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	H_3	H_4	A	P	f_1	f_2		
80	3	89	127	48	22	95	147	203	26.5	449	226	79	57	T200S	17
100	4	112	156	54	24	110	170	231	26.5	550	276	91	69	T380S	27
125	5	137	185	56	23	139	185	269	26.5	723	360	118	85	T750S	43
150	6	163	216	57	23.5	164	205	269	29.5	723	360	118	85	T750S	47

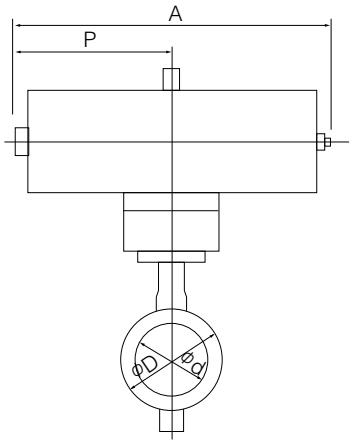
1.0 MPa to 2.0 MPa

Nominal size		Dimension (mm)												Cylinder type	Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	H_3	H_4	A	P	f_1	f_2		
80	3	89	127	48	22	95	147	231	26.5	550	276	91	69	T380S	26
100	4	112	156	54	24	110	170	269	26.5	723	360	118	85	T750S	40
125	5	137	185	56	23	139	185	269	26.5	723	360	118	85	T750S	43

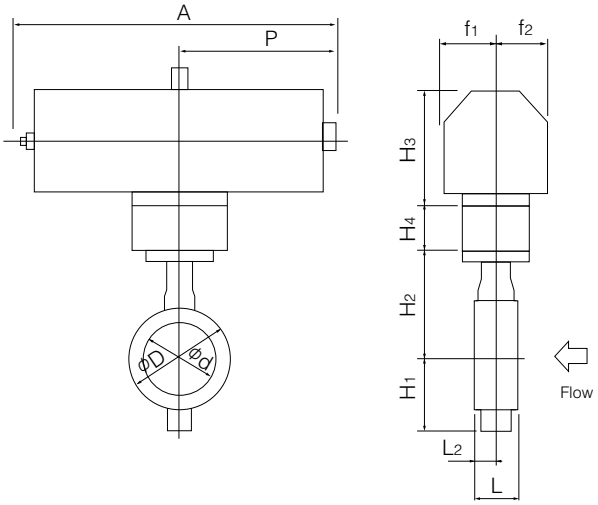
■7F Installation Direction



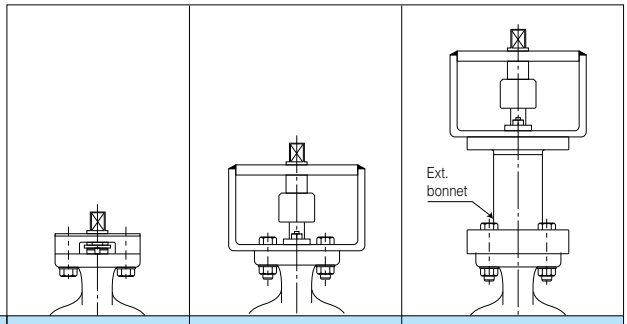
■302A-7F



■302A-7G

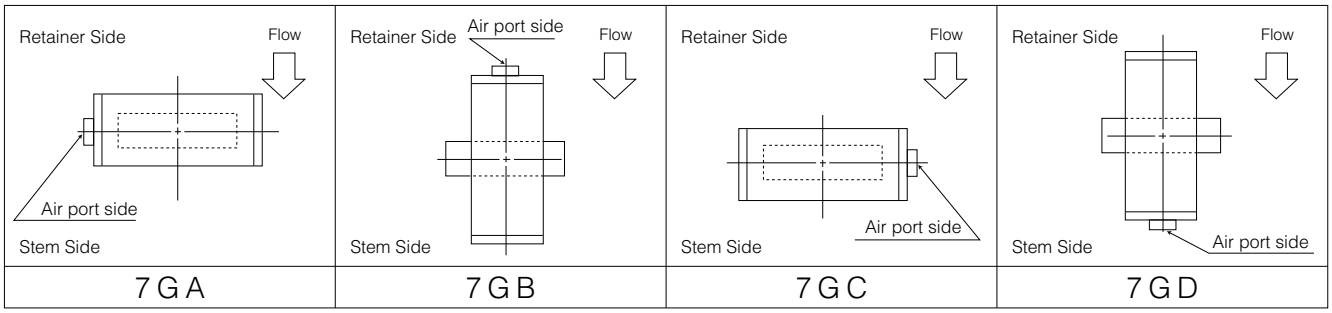


■302A-7F/7G Actuator Mounting Finish by Temperature



		−29 to less than 250 degrees C	250 to less than 400 degrees C	400 to 600 degrees C
Temp.range				
Body	80mm to 150mm	SCS14A SCPH2		SCS14A

■7G Installation Direction



7GA	7GB	7GC	7GD

Single-acting Pneumatic Cylinder Type 302A-3U(Air to open: 150mm to 600mm) / 302A-3K(Air to close: 150mm to 600mm)

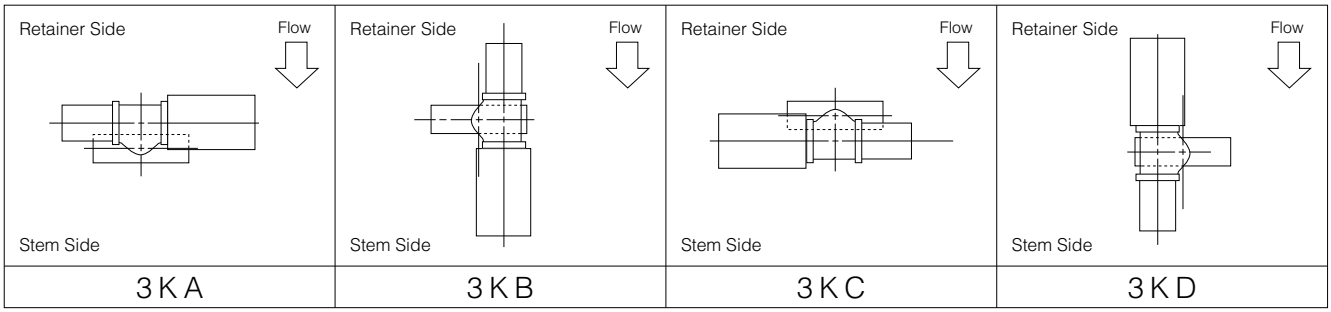
■−29 to 400 less than degrees C

Nominal size		Dimension (mm)												Cylinder type	Approx. Weight (kg)
mm	inch	Φd	ΦD	L	L_2	H_1	H_2	Category	H_3	A	P	f_1	f_2		
150	6	163	216	57	23.5	164	205	T_{20}	377	945	585	70	165	TG-10S	69
200	8	213	269	64	27	190	235	T_{10},T_{20}	377	1080	720	94	206	TG-12S	122
250	10	263	330	71	31	236	283	T_{10}	417	1080	720	94	206	TG-12S	141
								T_{20}	450	1255	865	131	257	TG-14S	237
300	12	315	381	81	35	246	310	T_{10}	417	1080	720	94	206	TG-12S	150
								T_{20}	450	1255	865	131	257	TG-14S	246
350	14	350	416	92	39.5	308	340	A	450	1255	865	131	257	TG-14S	264
								B,C	602	1655	1095	164	348	TG-20S	485
400	16	400	475	102	39	348	372	A	450	1255	865	131	257	TG-14S	292
								B,C	602	1655	1095	164	348	TG-20S	512
450	18	450	534	114	43	366	406	A,B,C	624	1655	1095	164	348	TG-20S	564
500	20	500	589	127	50	405	442	A,B	624	1655	1095	164	348	TG-20S	602
600	24	600	693	154	64	461	493	A	624	1655	1095	164	348	TG-20S	701

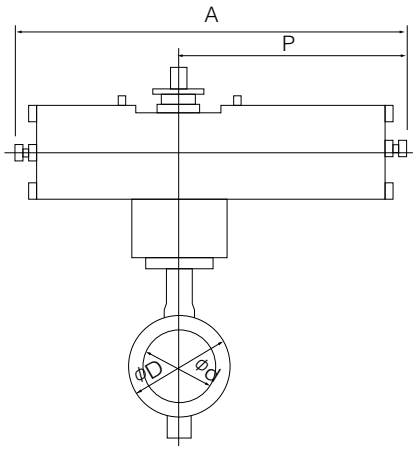
■400 to 600 degrees C

Nominal size		Dimension (mm)												Cylinder type	Approx. Weight (kg)
mm	inch	Φd	ΦD	L	L_2	H_1	H_2	Category	H_3	A	P	f_1	f_2		
200	8	213	269	64	27	190	415	T_{10}	377	1080	720	94	206	TG-12S	130
250	10	263	330	71	31	236	503	T_{10}	417	1080	720	94	206	TG-12S	154
300	12	315	381	81	35	246	530	T_{10}	417	1080	720	94	206	TG-12S	164
350	14	350	416	92	39.5	308	560	B	602	1655	1095	164	348	TG-20S	500
400	16	400	475	102	39	348	592	B	602	1655	1095	164	348	TG-20S	528
450	18	450	534	114	43	366	626	B	624	1655	1095	164	348	TG-20S	582
500	20	500	589	127	50	405	662	B	624	1655	1095	164	348	TG-20S	620

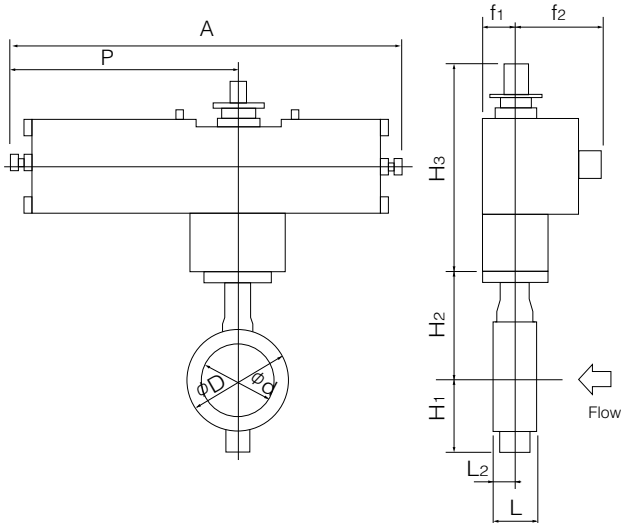
■3K Installation Direction



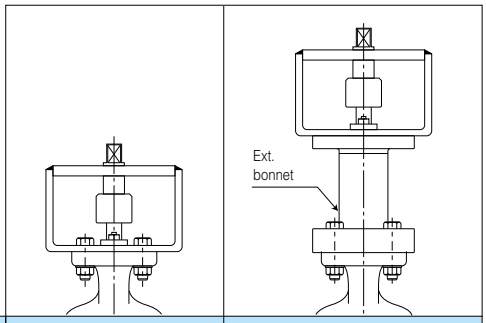
■302A-3K



■302A-3U

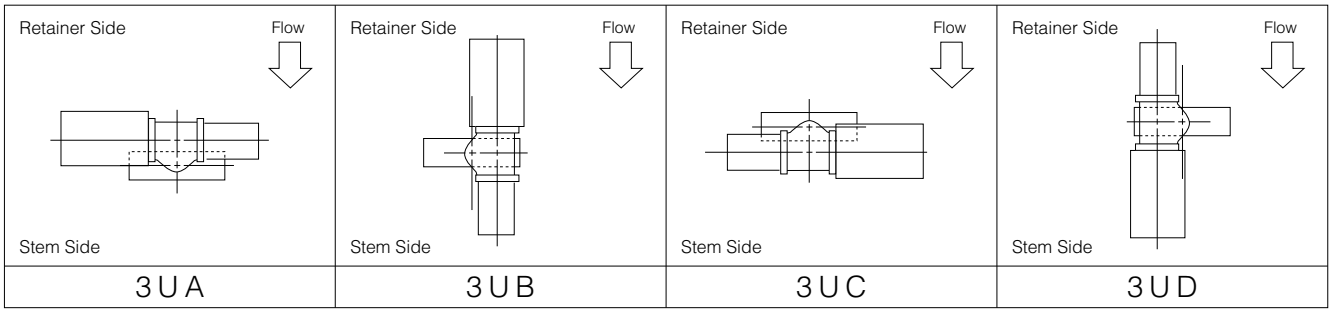


■302A 3U/3K Actuator Mounting Finish by Temperature



		−29 to less than 400 degrees C	400 to 600 degrees C
Temp.range			
Body	150mm to 300mm	SCS14A SCPH2	SCS14A
	350mm to 600mm	SCS13A SCPH2	SCS13A

■3U Installation Direction



Single Phase Electric Motor Type 302A-4 I (80mm to 400mm)

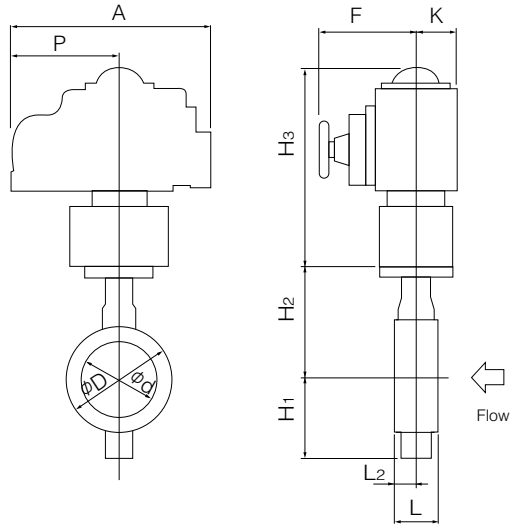
■−29 to less than 400 degrees C

Nominal size		Dimension (mm)												Motor type	Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	A	P	F	K		
80	3	89	127	48	22	95	147	T_{10}	250	202	100	85	54	4 I-0	12.1
								T_{20}	265	252	138	126	65	4 I-1	14.3
100	4	112	156	54	24	110	170	T_{10}	265	252	138	126	65	4 I-1	15.5
								T_{20}	298	310	167	154	85	4 I-2	21.5
125	5	137	185	56	23	139	185	T_{10},T_{20}	298	310	167	154	85	4 I-2	24.5
150	6	163	216	57	23.5	164	205	T_{10}	373	310	167	154	85	4 I-2	29.5
								T_{20}	373	310	167	154	85	4 I-2.5	31
200	8	213	269	64	27	190	235	T_{10}	373	310	167	154	85	4 I-2.5	39
								T_{20}	405	388	223	246	136	4 I-3	49
250	10	263	330	71	31	236	283	T_{10},T_{20}	420	388	223	246	136	4 I-3	66
300	12	315	381	81	35	246	310	T_{10},T_{20}	420	388	223	246	136	4 I-3	75
350	14	350	416	92	39.5	308	340	A,B	423	388	223	246	136	4 I-4	96
400	16	400	475	102	39	348	372	A	423	388	223	246	136	4 I-4	123

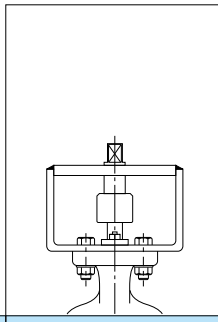
■400 to 600 degrees C

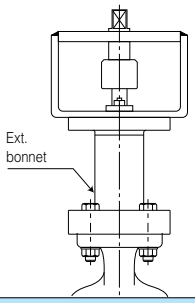
Nominal size		Dimension (mm)												Motor type	Approx. Weight (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	A	P	F	K		
80	3	89	127	48	22	95	297	T_{10}	250	202	100	85	54	4 I-0	17.6
100	4	112	156	54	24	110	320	T_{10}	265	252	138	126	65	4 I-1	21
125	5	137	185	56	23	139	335	T_{10}	298	310	167	154	85	4 I-2	30
150	6	163	216	57	23.5	164	385	T_{10}	373	310	167	154	85	4 I-2	37.5
200	8	213	269	64	27	190	415	T_{10}	373	310	167	154	85	4 I-2.5	47
250	10	263	330	71	31	236	503	T_{10}	420	388	223	246	136	4 I-3	79
300	12	315	381	81	35	246	530	T_{10}	420	388	223	246	136	4 I-3	88
350	14	350	416	92	39.5	308	560	B	423	388	223	246	136	4 I-4	138

■302A-4 I



■302A-4 I
Actuator Mounting Finish by Temperature





		−29 to less than 400 degrees C	400 to 600 degrees C
Temp.range			
Body	80mm to 300mm	SCS14A SCPH2	SCS14A
	350mm 400mm	SCS13A SCPH2	SCS13A

■4I Installation Direction

4 I A	4 I B	4 I C	4 I D
Retainer Side, Flow, Stem Side	Retainer Side, Flow, Stem Side	Retainer Side, Flow, Stem Side	Retainer Side, Flow, Stem Side

Three Phase Motor Actuator Type 302A-4L (250mm to 600mm)

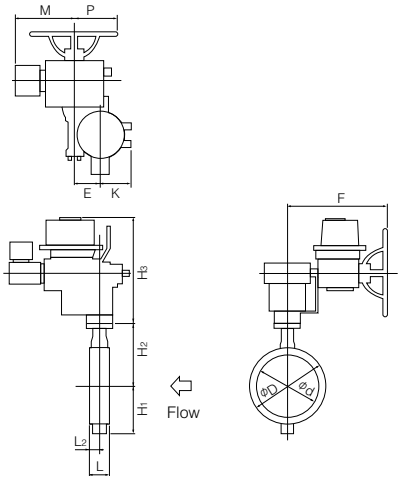
■−29 to less than 400 degrees C

Nominal size		Dimension (mm)													Motor type	Approx. Weight (kg)
mm	inch	Φd	ΦD	L	L_2	H_1	H_2	Category	H_3	E	K	F	M	P		
250	10	263	330	71	31	236	283	T_{10}	547	117	164	533	357	230	LTKD-01 0.2kW/ DGH-3	125
300	12	315	381	81	35	246	310	T_{10},T_{20}	547	117	164	533	357	230	LTKD-01 0.2kW/ DGH-3	133
350	14	350	416	92	39.5	308	340	A,B	547	117	164	533	357	230	LTKD-01 0.2kW/ DGH-3	171
								C	592	140	198	593	373	230	LTKD-02 0.4kW/ DGH-4	221
400	16	400	475	102	39	348	372	A	547	117	164	533	357	230	LTKD-01 0.2kW/ DGH-3	197
								B	592	140	198	593	373	230	LTKD-02 0.4kW/ DGH-4	247
								C	592	140	198	593	400	230	LTKD-02 0.75kW/ DGH-4	258
450	18	450	534	114	43	366	406	A	642	140	198	593	373	230	LTKD-02 0.4kW/ DGH-4	308
								B,C	642	140	198	593	400	230	LTKD-02 0.75kW/ DGH-4	319
500	20	500	589	127	50	405	442	A,B,C	642	140	198	593	400	230	LTKD-02 0.75kW/ DGH-4	357
600	24	600	693	154	64	461	493	A	642	140	198	593	400	230	LTKD-02 0.75kW/ DGH-4	460
								B,C	749	210	300	748	477	360	LTKD-05 1.5kW/ DGH-5	605

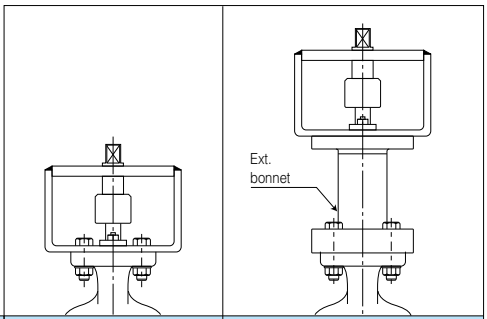
■400 to 600 degrees C

Nominal size		Dimension (mm)													Motor type	Approx. Weight (kg)
mm	inch	Φd	ΦD	L	L_2	H_1	H_2	Category	H_3	E	K	F	M	P		
300	12	315	381	81	35	246	530	T_{10}	547	117	164	533	357	230	LTKD-01 0.2kW/ DGH-3	146
350	14	350	416	92	39.5	308	560	B	547	117	164	533	357	230	LTKD-01 0.2kW/ DGH-3	186
400	16	400	475	102	39	348	592	B	592	140	198	593	373	230	LTKD-02 0.4kW/ DGH-4	263
450	18	450	534	114	43	366	626	B	642	140	198	593	400	230	LTKD-02 0.75kW/ DGH-4	336
500	20	500	589	127	50	405	662	B	642	140	198	593	400	230	LTKD-02 0.75kW/ DGH-4	375
600	24	600	693	154	64	461	713	B	749	210	300	748	477	360	LTKD-05 1.5kW/ DGH-5	625

■302A-4L

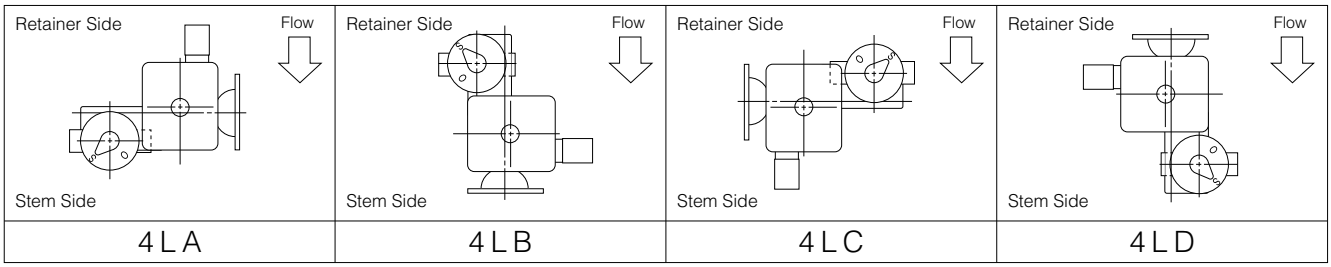


■302A-4L Actuator Mounting Finish by Temperature

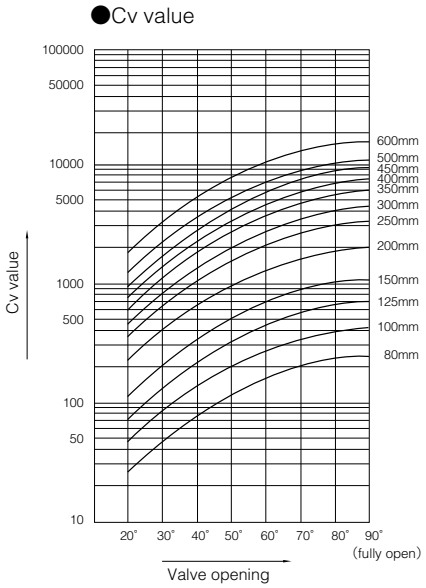


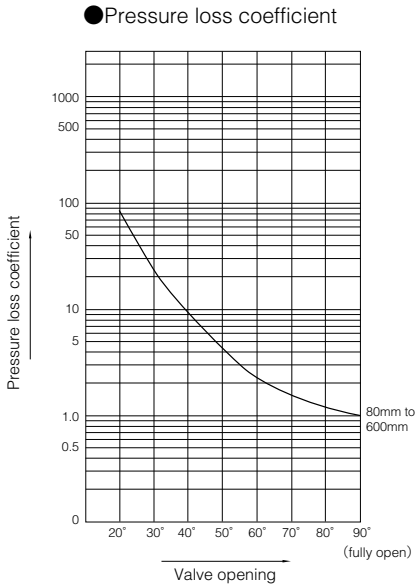
Temp.range		−29 to less than 400 degrees C	400 to 600 degrees C
Body	250mm 300mm	SCS14A SCPH2	SCS14A
	350mm to 600mm	SCS13A SCPH2	SCS13A

■4L Installation Direction



302A Cv value/pressure loss coefficient





302A Cv value

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
80	3	29	52	85	122	162	207	243	252
100	4	49	88	144	207	279	351	414	432
125	5	77	140	230	333	441	549	648	684
150	6	126	225	369	531	720	900	1080	1116
200	8	234	423	693	990	1350	1710	1980	2070
250	10	390	703	1148	1648	2240	2857	3300	3443
300	12	492	888	1454	2081	2838	3612	4172	4354
350	14	648	1170	1915	2741	3739	4758	5496	5736
400	16	829	1496	2449	3505	4780	6084	7027	7334
450	18	1041	1879	3076	4403	6004	7642	8827	9212
500	20	1323	2387	3909	5595	7630	9710	11216	11705
600	24	1929	3481	5700	8159	11126	14161	16356	17070

302A Pressure loss coefficent

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
80	3	95	29	11	5	3	2	1	1
100	4	98	30	11	5	3	2	1	1
125	5	93	28	10	5	3	2	1	1
150	6	70	22	8	4	2	1	1	1
200	8	62	19	7	3	2	1	1	1
250	10	54	17	6	3	2	1	1	1
300	12	70	21	8	4	2	1	1	1
350	14	68	21	8	4	2	1	1	1
400	16	73	22	8	4	2	1	1	1
450	18	75	23	9	4	2	1	1	1
500	20	72	22	8	4	2	1	1	1
600	24	70	22	8	4	2	1	1	1

302A Applicable flange standard

Nominal size		JIS				ANSI/API/JPI	BS4504		DIN		BS10
mm	inch	5K	10K	16K	20K	150Lb	PN10	PN16	NP10	NP16	Table E
80	3	×	D	D	D	○	D	D	D	D	×
100	4	×	D	D	D	D	D	D	D	D	×
125	5	×	D	D	D	D	D	D	D	D	×
150	6	×	D	D	D	D	D	D	D	D	×
200	8	×	D	D	D	D	D	D	D	D	×
250	10	×	D	D	D	D	D	D	D	D	×
300	12	×	D	D	D	D	D	D	D	D	×
350	14	D	D	D	D	D	D	D	D	D	D
400	16	D	D	D	D	D	D	D	D	D	D
450	18	D	T	T	T	D	T	T	T	T	D
500	20	T	T	T	T	T	T	T	T	T	T
600	24	T	T	T	T	T	T	T	T	T	T

○ : Can be used without flange drilling.
D : With flange drilling
T : With flange tapping
× : Not applicable

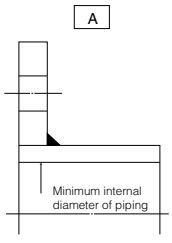
302A Applicable Pipe List in Case of A

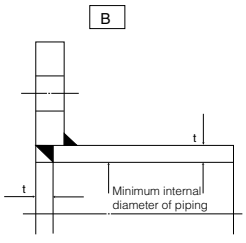
Nominal size		SGP		Sch20		Sch40		Sch60		Sch80		Sch10S		Sch20S		Minimum internal diameters of piping (mm)
mm	inch	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	
80	3	○	○	○	○	○	○	○	○	○	○	○	○	○	○	72.5
100	4	○	○	○	○	○	○	○	○	○	○	○	○	○	○	93.8
125	5	○	○	○	○	○	○	○	○	○	○	○	○	○	○	119.4
150	6	○	○	○	○	○	○	○	×	○	×	○	○	○	○	147.5
200	8	○	○	○	○	○	○	○	×	○	×	○	○	○	○	197.5
250	10	○	○	○	○	○	○	○	×	○	×	○	○	○	○	248.1
300	12	○	○	○	○	○	○	○	×	×	×	○	○	○	○	297.6
350	14	○	○	○	○	○	○	○	×	×	×	–	–	–	–	330.0
400	16	○	○	○	○	○	○	○	×	○	×	–	–	–	–	377.0
450	18	○	○	○	○	○	○	○	×	○	×	–	–	–	–	424.0
500	20	○	○	○	○	○	○	○	×	○	×	–	–	–	–	470.0
600	24	–	–	○	○	○	○	○	×	×	×	–	–	–	–	564.0

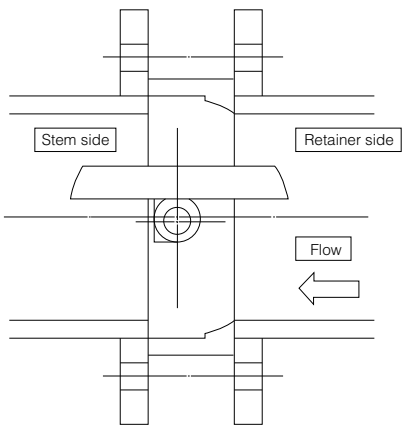
302A Applicable Pipe List in Case of B

Nominal size		SGP		Sch20		Sch40		Sch60		Sch80		Sch10S		Sch20S	
mm	inch	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)
80	3	○	○	○	○	○	○	○	○	○	○	○	○	○	○
100	4	○	○	○	○	○	○	○	○	○	○	○	○	○	○
125	5	○	○	○	○	○	○	○	○	○	○	○	○	○	○
150	6	○	○	○	○	○	○	○	○	○	○	○	○	○	○
200	8	○	○	○	○	○	○	○	×	○	×	○	○	○	○
250	10	○	○	○	○	○	○	○	×	○	×	○	○	○	○
300	12	○	○	○	○	○	○	○	×	○	×	○	○	○	○
350	14	○	○	○	○	○	○	○	×	○	×	–	–	–	–
400	16	○	○	○	○	○	○	○	×	○	×	–	–	–	–
450	18	○	○	○	○	○	○	○	×	○	×	–	–	–	–
500	20	○	○	○	○	○	○	○	×	○	×	–	–	–	–
600	24	–	–	○	○	○	○	○	×	○	×	–	–	–	–

Remark 1: ○=Applicable ×=Not applicable
Remark 2: The clearance between the disc and the pipe is based on API 609 and MSS SP-67.
80mm to 150mm: 1.5mm; 200mm to 500mm: 3.0mm, and 600mm: 6.4mm
Remark 3: Butterfly valves are inserted into a pipe that was fitted with the disc when fully open.
In cases where there is an "X" in the chart above or you are using a pipe or flange that is less than the minimum inner pipe diameter, use is still possible if means are taken such as inserting a spacer between the valve and flange. For details, please consult us.







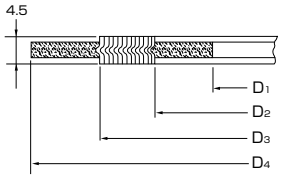
302A Piping gasket

●In case of sheet gasket ..... Any standard can be used.
●In case of spiral gasket
For API, JPI, ANSI flange ..... Any standard gaskets with inner/outer ring can be used.
For JIS flange ..... Use special spiral gasket shown below.

■Special spiral gasket for JIS flange size

Nominal size		JIS flange					
		5K, 10K, 16K, 20K			5K	10K	16K, 20K
mm	inch	D_1	D_2	D_3	D_4	D_4	D_4
80	3	89	97	120	×	134	140
100	4	115	124	145	×	159	165
125	5	140	151	177	×	190	202
150	6	166	178	205	×	220	237
200	8	217	227	256	×	270	282
250	10	268	278	315	×	332	354
300	12	319	331	362	×	377	404
350	14	356	369	399	412	422	450
400	16	406	420	457	472	484	508
450	18	458	472	517	532	539	573
500	20	508	532	567	582	594	628
600	24	610	626	672	689	700	734

Remark; ×: Not applicable



■Applicable standard for spiral gasket

Nominal size		Tomoe special			Standard gasket		
mm	inch	JIS 10K	JIS 16K JIS 20K	ANSI 125/150Lb	JIS 10K	JIS 16K JIS 20K	ANSI 125/150Lb
80	3	○	○	○	×	×	○
100	4	○	○	○	×	×	○
125	5	○	○	○	×	×	○
150	6	○	○	○	×	×	○
200	8	○	○	○	×	×	○
250	10	○	○	○	×	×	○
300	12	○	○	○	×	×	○
350	14	○	○	○	×	×	○
400	16	○	○	○	×	×	○
450	18	○	○	○	×	×	○
500	20	○	○	○	×	×	○
600	24	○	○	○	×	×	○

Remark 1: ○: Applicable, ×: Not applicable
Remark 2: In case a minute leakage of gas (less than 100PPm) becomes a problem, please inquire of our business charge.

302A Applicable standard for standard piping gasket

Nominal size		Max.allowable inside diameter (D)	Joint sheet or RPTFE solid gasket (t≦2mm)					PTFE mold type gasket VALQUA or NICHIAS				
mm	inch		JIS 5K	JIS 10K	JIS 16K JIS 20K	ANSI 125/150Lb	JPI 150Lb	JIS 5K	JIS 10K	JIS 16K JIS 20K	ANSI 125/150Lb	JPI 150Lb
80	3	97	×	○	○	○	○	×	○	○	○	○
100	4	124	×	○	○	○	○	×	○	○	○	○
125	5	151	×	○	○	○	○	×	○	○	○	○
150	6	178	×	○	○	○	○	×	○	○	○	○
200	8	227	×	○	○	○	○	×	○	○	○	○
250	10	282	×	○	○	○	○	×	○	○	○	○
300	12	331	×	○	○	○	○	×	○	○	○	○
350	14	362	○	○	○	○	○	○	○	○	○	○
400	16	414	○	○	○	○	○	○	○	○	○	○
450	18	468	○	○	○	○	○	○	○	○	○	○
500	20	518	○	○	○	○	○	○	○	○	○	○
600	24	619	○	○	○	○	○	○	○	○	○	○

Remark; ○: Applicable, ×: Not applicable

302A Piping Bolts and Nuts Sizes

Nominal size		JIS5K		JIS10K		JIS16K	
mm	inch	Long Bolts and Nuts	Setting Bolts	Long Bolts and Nuts	Setting Bolts	Long Bolts and Nuts	Setting Bolts
80	3	—	—	8-M16×145	—	8-M20×170	—
100	4	—	—	8-M16×145	—	8-M20×170	—
125	5	—	—	8-M20×170	—	8-M22×190	—
150	6	—	—	8-M20×170	—	12-M22×190	—
200	8	—	—	12-M20×170	—	12-M22×190	—
250	10	—	—	12-M22×190	—	12-M24×210	—
300	12	—	—	16-M22×190	—	16-M24×225	—
350	14	12-M22×210	—	16-M22×210	—	16-M30(P3)×245	—
400	16	16-M22×220	—	16-M24×235	—	16-M30(P3)×265	—
450	18	16-M22×230	※1	16-M24×250	4-M24×84×60	16-M30(P3)×280	4-M30(P3)× 95×65
					4-M24×58×50		4-M30(P3)× 73×50
500	20	16-M22×245	4-M22×80×50	16-M24×260	4-M24×90×60	16-M30(P3)×300	4-M30(P3)×105×65
			4-M22×60×50		4-M24×70×60		4-M30(P3)× 81×50
600	24	16-M24×280	4-M24×84×60	20-M30(P3)×300	4-M30(P3)×81×50	20-M36(P3)×345	4-M36(P3)×100×60
			4-M24×65×50		4-M30(P3)×65×50		4-M36(P3)× 82×50

Nominal size		JIS20K		ANSI150Lb, API/JPI150Lb	
mm	inch	Long Bolts and Nuts	Setting Bolts	Long Bolts and Nuts	Setting Bolts
80	3	8-M20×170	—	4-U5/8-11UNC×155	—
100	4	8-M20×170	—	8-U5/8-11UNC×155	—
125	5	8-M22×190	—	8-U3/4-10UNC×175	—
150	6	12-M22×190	—	8-U3/4-10UNC×175	—
200	8	12-M22×190	—	8-U3/4-10UNC×205	—
250	10	12-M24×210	—	12-U7/8- 9UNC×215	—
300	12	16-M24×225	—	12-U7/8- 9UNC×215	—
350	14	16-M30(P3)×260	—	12-U1 - 8UNC×240	—
400	16	16-M30(P3)×280	—	16-U1 - 8UNC×255	—
450	18	16-M30(P3)×300	4-M30(P3)×105×65	16-U1 1/8- 8UN×280	—
			4-M30(P3)× 81×50		
500	20	16-M30(P3)×315	4-M30(P3)×110×60	16-U1 1/8- 8UN×295	4-U1 1/8- 8UN×105×50
			4-M30(P3)× 90×65		4-U1 1/8- 8UN× 80×50
600	24	20-M36(P3)×360	4-M36(P3)×108×60	16-U1 1/4- 8UN×340	4-U1 1/4- 8UN×100×50
			4-M36(P3)× 90×50		4-U1 1/4- 8UN× 90×50

※1 Flange tapping is applicable, Please consult us for the further information.

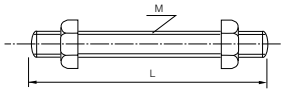
Remark: Use SNB 7/S45C (A193 B7/A, 194 2H) SUS304/SUS304
For long bolt, use full thread bolt.
For hexagon nut, use heavy nut.
A metric screw should have 3 pitches if its nominal diameter exceeds M30.
A unified screw should have 8 threads per inch if its nominal diameter exceeds 1 inch.
Hexagon bolts (set bolts) are indicated with the retainer side on the up side and the stem side on down side.

Examples

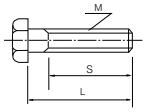
Long bolts: 12 - M22 × 185
(N, M, L)

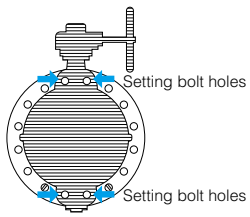
Setting bolts: 4 - M30 × 95 × 65
(Hexagon bolts)
(N, M, L, S)

Long bolts and nuts (full thread)



Setting bolts (Hexagon bolts)



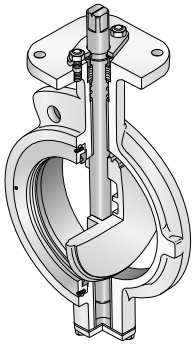


High Performance Butterfly Valves to Suit API Standard 150 lb Rating

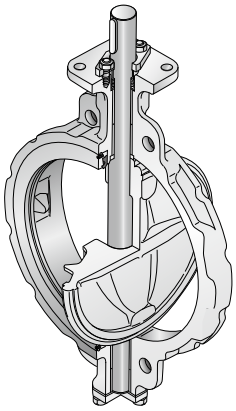
Tom Disco

304A Wafer

304Q Lugged



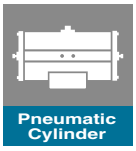
80mm to 300mm



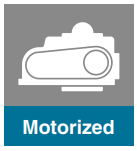
350mm to 600mm

Lock Lever

Worm Gear



Pneumatic Cylinder



Motorized

Features and Benefits

Unique stopper structure

For the 80 to 300mm models, automatic aligning and disc overrun prevention are ensured by the special spherical design of the inner surface of the body disc hub edge. As for the 350 to 600mm models, a spacer ring is provided between the mating surfaces of the disc hub edge and inner surface of the body for disc alignment.
Disc overrun is prevented by a protrusion on the inner surface of the body.

Double eccentric geometry

The axis of disc rotation is double offset to the seat ring. When the disc rotates, it unseats at a small turning angle by its cam effect. The design exhibits tight shut-off, reduced torques, chemical resistance, excellent throttling capabilities and the ability to operate with relatively high pressure drops. It also prevents seat abrasion and provides reliable sealing performance over long periods.

Bi-directional flow

Seals flow in both directions. The valves can be used even if the flow changes direction. (There are pressure limitations for each direction of flow. See chart for recommended specifications).

Easy replacement of the seat ring

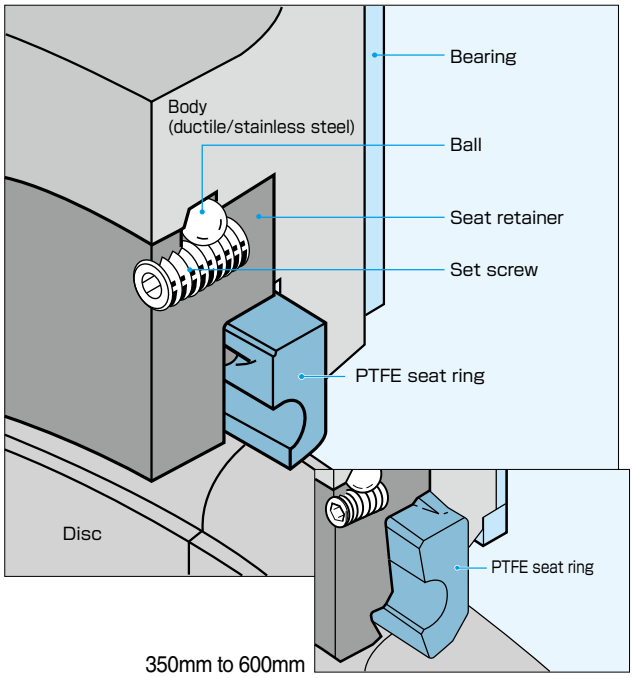
The ball lock method is used to simplify replacement of the seat ring.

General Description

Designed to suit those severe conditions such as high temperature, high pressure or high velocity, which disallow the use of soft resilient seated butterfly valves.
Ideal for use in chemical processes and applications with low pressure steam and high temperature gas.

Seat Structure

80mm to 300mm



350mm to 600mm

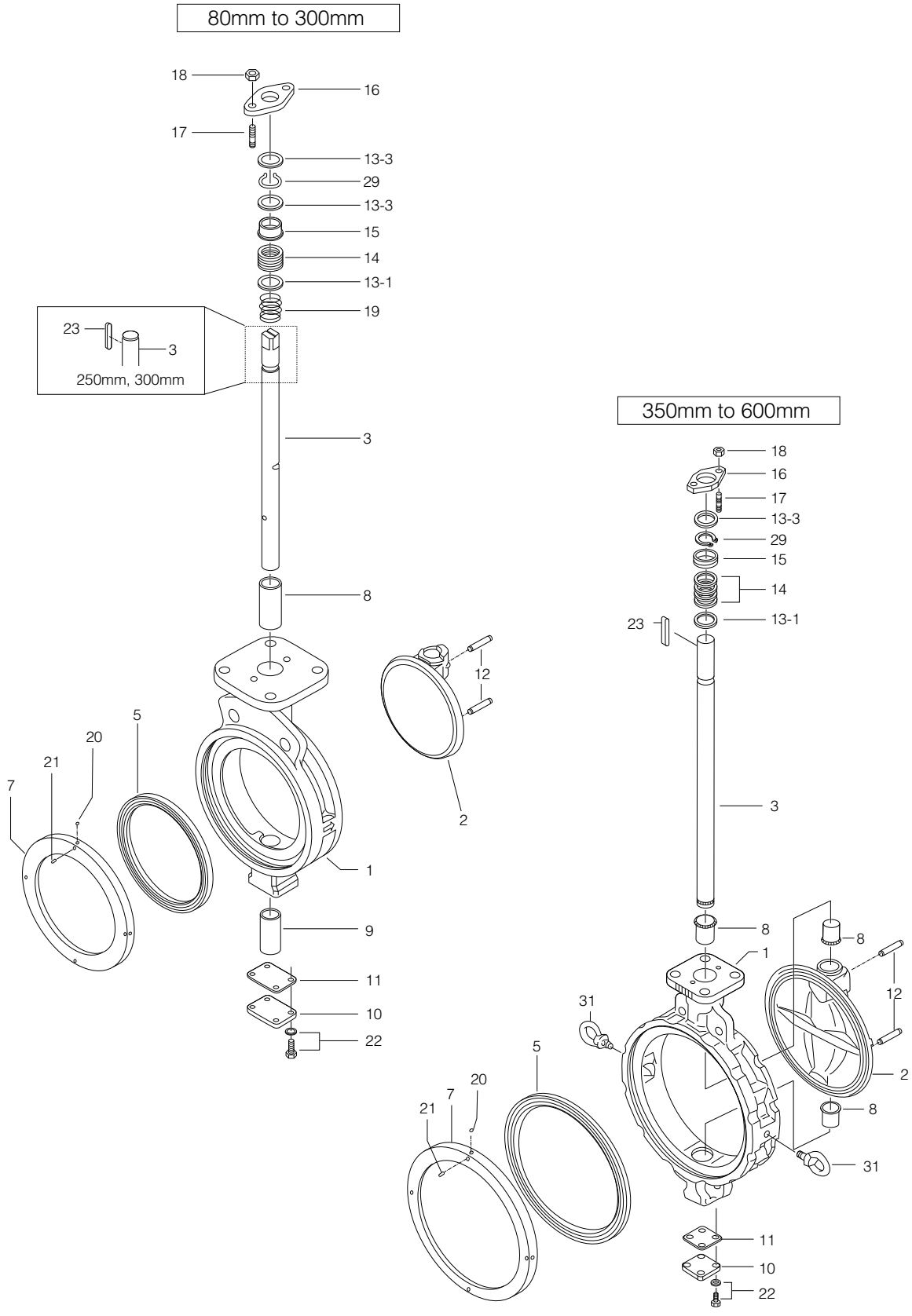
Standard Specifications

Valve nominal size		80mm to 300mm		350mm to 600mm (5 sizes)	
Face-to-face dimensions		API 609 (class 150)		API 609 (class 150) ISO 5752 (25 series), JIS B 2002 (47 series)	
Connection		Wafer type / Lugged type			
Pressure rating		ANSI B16.34 Class 150lb (Seat rating is designed to suit APII 609 150lb above zero degree C			
Applicable flange standard		JIS 10K/16K/20K, ANSI 125/150lb, BS 10 Table F, BS 4504 PN 10/16, DIN PN 10/16		JIS 10K/16K/20K, ANSI 125/150lb, BS 10 Table F, BS 4504 PN 10/16, DIN PN 10/16	
Body shell test		Max. 3.2MPa as per API 598			
Seat leak test		0.7MPa as per API 598 by Air. High pressure closure test is available upon request.			
Max. working pressure※1		2.0MPa			
		Bi-directional flow (Flow to disc side is recommended.)			
		Max. working pressure at reverse flow for 250mm and 300mm is 1.6MPa.		Max.working pressure at reverse flow is 1.0MPa.	
Working temperature range		–29 to 232 degrees C (RPTFE)		–20 to 232 degrees C (RPTFE)	
Seat leakage		–20 to 200 degrees C (White PTFE as option)			
		ISO 5208 rate A, API 598-1996			
Standard materials※2	Body	SCPH2/WCB	SCS 14A/CF8M	SCPH 2/WCB	SCS 13A/CF8
	Disc	SCS 13A/CF8 (Hard chrome plating)	SCS 16A/CF3M (Hard chrome plating)	SCS13A/CF8 (Hard chrome plating)	
	Stem	SUS 420 J2	SUS 329 J1 SUS 316 L SUS 329 J4 L	SUS 420 J2 SUS 630	SUS 304 (Under 1.0MPa) SUS 630 (Over 1.0MPa)
	Seat ring	RPTFE as standard, White PTFE as an option			
	Gland packing	RPTFE		Graphite	
Top flange		ISO 5211			
Bonnet type		Open bonnet			
Actuators	Lock lever	80 to 150mm			
	Worm gear	80 to 600mm			
	Pneumatic cylinder				
	Motorized				
Coating		Silicon resin coating (grey N7) for less than 200 degrees C. Heat resistant silver coating for 200 degrees C and over. No painting for stainless steel.			

※1 Please consult us if the pressure exceeds 1.6MPa.
※2 Please refer to the pressure rating chart and stem material chart in the following pages.

※It is possible that seat leakage occur when fluid (e.g. powder and/or liquid) is solidified by working temperature and other cause. Consult us.
Please note that use with vertical line such as bottom area of discharge spout of hopper, and tank.

304A Expanded view of components



■304A Parts List（80mm to 300mm）

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
★ 5	Seat ring	1	
7	Seat ring retainer	1	
8	Top shaft bearing	1	
9	Bottom shaft bearing	1	
10	Bottom cover	1	
★ 11	Bottom gasket	1	
12	Taper pin	2	
13-1	Packing retainer	1	
13-3	Ring	2	
★ 14	Gland packing	1 set	
15	Gland bush	1	
16	Gland flange	1	
17	Gland bolt	2	
18	Gland nut	2	
19	Gland coil	1	Only 80mm to 150mm
★ 20	Ball	2	80mm to 125mm
		4	150mm to 300mm
★ 21	Set screw	2	80mm to 125mm
		4	150mm to 300mm
22	Hexagon bolt, Spring washer	4 sets	
23	Stem key	1	Only 250mm, 300mm
29	C-ring	1	

■304A Parts List（350mm to 600mm）

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
★ 5	Seat ring	1	
7	Seat ring retainer	1	
8	Shaft bearing	3	
10	Bottom cover	1	
★ 11	Bottom gasket	1	
12	Taper pin	1	
13-1	Packing retainer	1	
13-3	Ring	1	
★ 14	Gland packing	1 set	
15	Gland bush	1	
16	Gland flange	1	
17	Gland bolt	2	
18	Gland nut	2	
★ 20	Ball	4	
★ 21	Set screw	4	
22	Hexagon bolt, Spring washer	4 sets	
23	Stem key	1	
29	C-ring	1	
31	Eye bolt	2	Only 450mm to 600mm

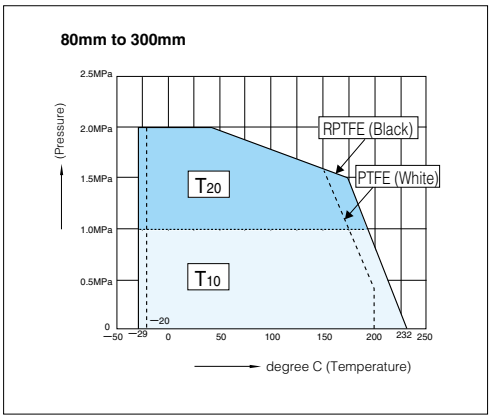
Remark: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove set screws (Part #21 Set screw).

304A Actuator selection chart

■80mm to 300mm

Model	Category	Size (mm / inch)						
		80	100	125	150	200	250	300
		3	4	5	6	8	10	12
1T	T10 / T20	1T-2			1T-3			
2U	T10 / T20	2U-2			2U-4		2U-5	
7E	T10 / T20	T85		T200		T380		T750
7G,7F 3U,3K	T10 / T20	T200S	T380S	T380S	T750S		TG-12S	
4 I	T10 / T20	4 I-0	4 I-1	4 I-2		4 I-2.5	4 I-3	
4J	T10 / T20	SRJ-010			SRJ-020		SRJ-060	

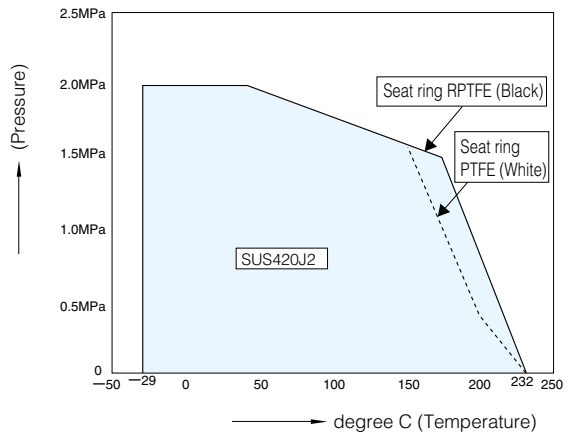
■304A Pressure rating



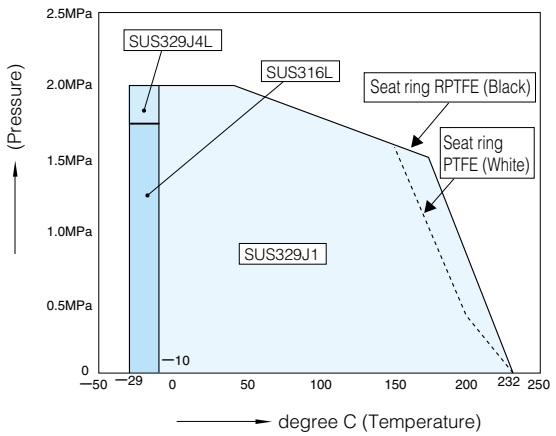
304A Standard stem material

■80mm to 300mm

SCPH2 / WCB body



SCS14A / CF8M body



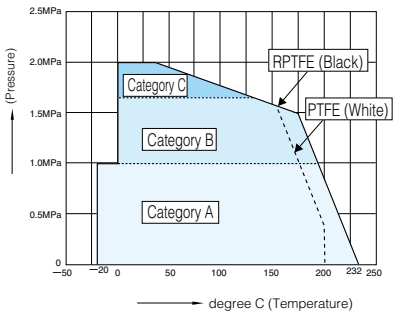
304A Actuator selection chart

■350mm to 600mm

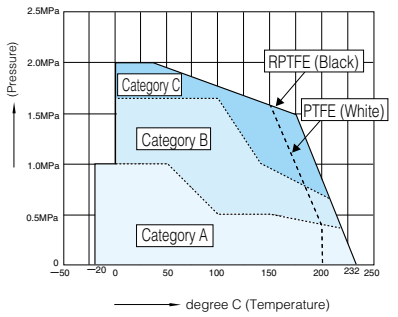
Model	Category	Size (mm/inch) 350 / 14	400 / 16	450 / 18	500 / 20	600 / 24
2S	A	DGH-3	DGH-4			DGH-4+R/G5
	B					DGH-4.5 +R/G5
	C			DGH-4+R/G5		
3A	A	TGA-125	TGA-140			TGA-180
	B	TGA-140		TGA-160		TGA-200
	C				TGA-180	TGA-220
3U,3K	A	TG-14S	TG-20S			
	B					
	C					
4 I	A	4 I-4				
	B					
	C					
4L	A	LTKD-01 0.2kW/DGH-3		LTKD-02 0.4kW/DGH-4		LTKD-02 0.75kW/DGH-4
	B		LTKD-02 0.4kW/DGH-4		LTKD-02 1.5kW/ DGH-4	LTKD-05 1.5kW/ DGH-5
	C	LTKD-02 0.4kW/DGH-4	LTKD-02 0.75kW/DGH-4			

■304A Pressure rating

350mm to 450mm



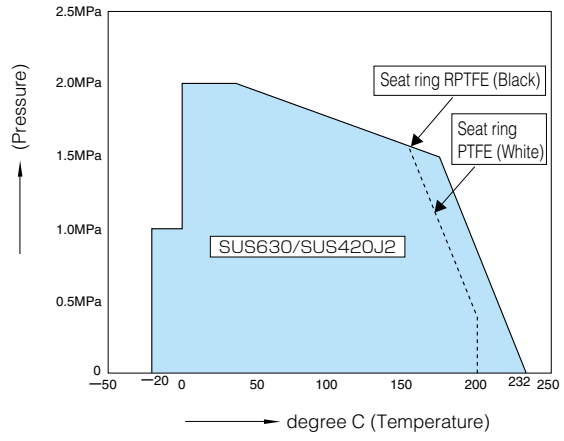
500mm·600mm



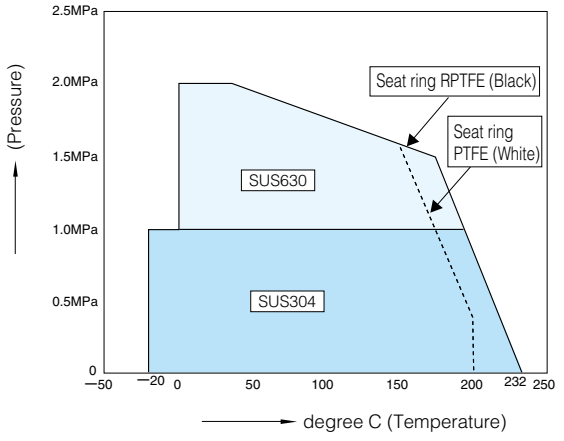
304A Standard stem material

■350mm to 600mm

SCPH2 / WCB body

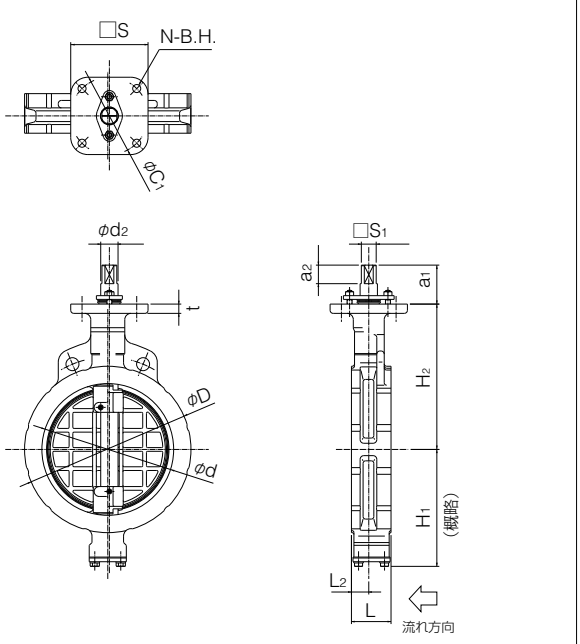


SCS13A / CF8 body

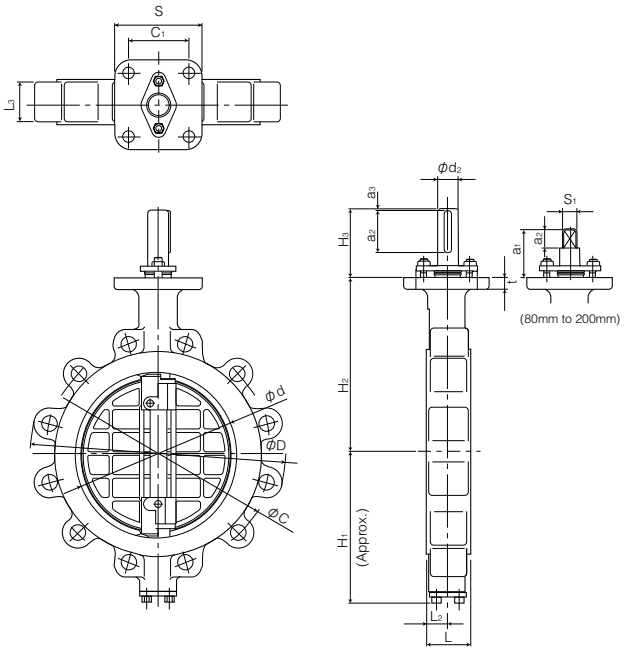


Dimension List

Wafer type 304A



Lugged type 304Q



■304A Dimension List

Stem shape	Nominal size		Dimension (mm)														Approx. Weight (kg)
	mm	inch	φd	φD	L	L2	H1	H2	a1	a2	□S1	φd2	b	t2	t	ISO 5211 Top Flange	
01	80	3	89	127	48	23	95	147	52.5	16.5	14	16	—	—	15	F10	5
	100	4	112	156	54	24	110	170	52.5	16.5	14	16	—	—	15	F10	6.2
	125	5	137	185	56	24	139	185	52.5	16.5	16	20	—	—	15	F10	9.3
	150	6	163	216	57	23	164	205	55.5	20	18	22	—	—	15	F12	12.5
	200	8	213	269	64	28	190	235	63	30	24	28	—	—	15	F12	19
02	250	10	263	330	71	31	236	283	108	67.3	—	32	10	3	18	F14	33
	300	12	315	381	81	35	246	310	111	72.3	—	35	10	3	18	F14	42
	350	14	350	416	92	39.5	308	340	113	72	—	38	10	3	18	F14	61
	400	16	400	475	102	39	348	372	113	72	—	42	12	3.5	18	F14	88
	450	18	450	534	114	43	366	406	141.5	68	—	45	12	3.5	20	F16	135
	500	20	500	589	127	50	405	442	141.5	79	—	49	14	4	20	F16	173
	600	24	600	693	154	64	461	493	141.5	80	—	59	16	5	20	F16	272

■Top Flange Dimension

ISO 5211 Top Flange	□S	φC1	N	B.H.
F10	102	102	4	11
F12	125	125	4	13
F14	140	140	4	19
F16	165	165	4	23

Stem shape	01 : square 02 : round with key

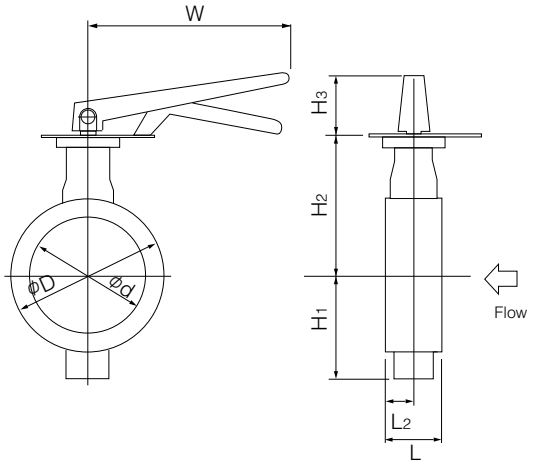
■304Q Dimension List

Nominal size		Dimension (mm)																Approx. Weight (kg)
mm	inch	φd	φD	L	L2	L3	H1	H2	H3	φd2	a2	a3	S1	S	t	C1	φC	
80	3	89	198	48	23	38	95	147	52.5	16	16.5	—	14	102	15	72	152.5	6
100	4	112	227	54	24	46	110	170	52.5	16	16.5	—	14	102	15	72	190.5	9.5
125	5	137	256	56	24	48	139	185	52.5	20	16.5	—	16	102	15	72	216	14
150	6	163	282	57	23	49	164	205	55.5	22	20	—	18	125	15	88.4	241.5	16
200	8	213	343	64	28	54	190	235	63	28	30	—	24	125	15	88.4	298.5	24
250	10	263	412	71	31	61	236	283	108	32	65	2	—	140	18	99	362	41
300	12	315	482	81	35	71	246	310	111	35	70	2	—	140	18	99	432	56
350	14	350	536	92	39.5	70	308	340	113	38	70	2	—	140	18	99	476.2	85
400	16	400	600	102	39	75	348	372	113	42	70	2	—	140	18	99	539.7	125
450	18	450	636	114	43	83	366	406	141.5	45	60	8	—	165	20	116.7	577.8	170
500	20	500	720	127	50	90	405	442	141.5	49	70	9	—	165	20	116.7	635	225
600	24	600	814	154	64	131	461	493	141.5	59	70	10	—	165	20	116.7	749.3	350

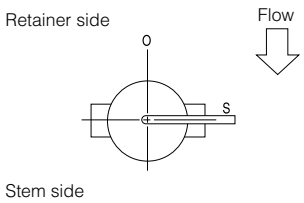
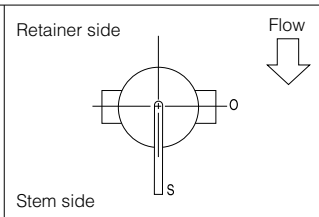
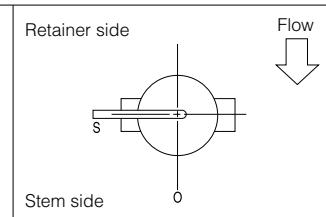
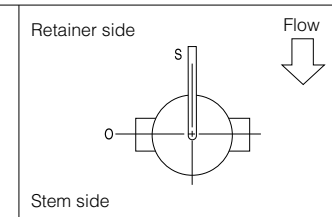
Lock lever type 304A-1T(80mm to 150mm)

Nominal size		Dimension (mm)									Lever type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	W		
80	3	89	127	48	23	95	147	T_{10}, T_{20}	117	300	1T-2	7.1
100	4	112	156	54	24	110	170	T_{10}, T_{20}	117	300	1T-2	8.3
125	5	137	185	56	24	139	185	T_{10}, T_{20}	117	300	1T-2	11.4
150	6	163	216	57	23	164	205	T_{10}, T_{20}	125	350	1T-3	14.6

■304A-1T



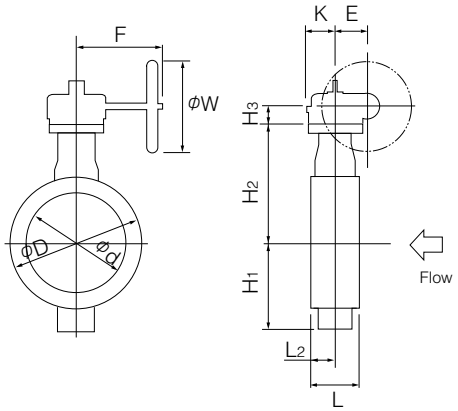
■1T Installation direction

1TA	1TB	1TC	1TD
			

Worm gear type 304A-2U (80mm to 300mm) / 304A-2S (350mm to 600mm)

Nominal size		Dimension (mm)												Gear type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	E	K	F	φW		
80	3	89	127	48	23	95	147	T_{10},T_{20}	61	44	53	173.5	160	2U-2	7.9
100	4	112	156	54	24	110	170	T_{10},T_{20}	61	44	53	173.5	160	2U-2	9.1
125	5	137	185	56	24	139	185	T_{10},T_{20}	61	44	53	173.5	160	2U-2	12.4
150	6	163	216	57	23	164	205	T_{10},T_{20}	77.5	87.5	90	222.5	200	2U-4	29
200	8	213	269	64	28	190	235	T_{10},T_{20}	77.5	87.5	90	222.5	200	2U-4	35.5
250	10	263	330	71	31	236	283	T_{10},T_{20}	90	87.5	90	222.5	280	2U-4	49.5
300	12	315	381	81	35	246	310	T_{10},T_{20}	92	90	105	266	280	2U-5	64
350	14	350	416	92	39.5	308	340	A,B,C	97	117	164	335	355	DGH-3	99
400	16	400	475	102	39	348	372	A	97	117	164	335	355	DGH-3	124
								B,C	215	140	198	402	450	DGH-4	162
450	18	450	534	114	43	366	406	A,B	127	140	198	402	450	DGH-4	198
								C	127	140	198	432	355	DGH-4+R/G5	200
500	20	500	589	127	50	405	442	A,B	127	140	198	402	450	DGH-4	236
								C	127	140	198	432	355	DGH-4+R/G5	238
600	24	600	693	154	64	461	493	A	127	140	198	432	355	DGH-4+R/G5	338
								B,C	245	185	264	497	355	DGH-4.5+R/G5	413

■304A-2U/2S



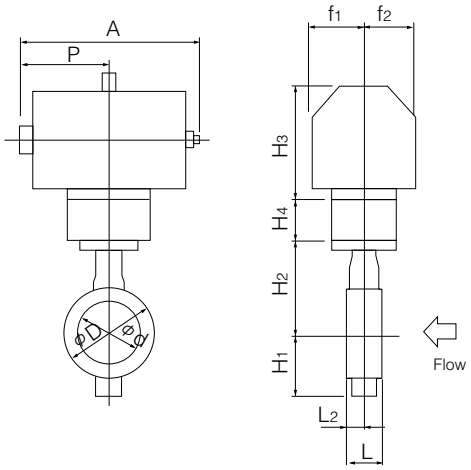
■2U/2S Installation direction

Retainer side / Flow / Stem side	Retainer side / Flow / Stem side	Retainer side / Flow / Stem side	Retainer side / Flow / Stem side
2UA/2SA	2UB/2SB	2UC/2SC	2UD/2SD

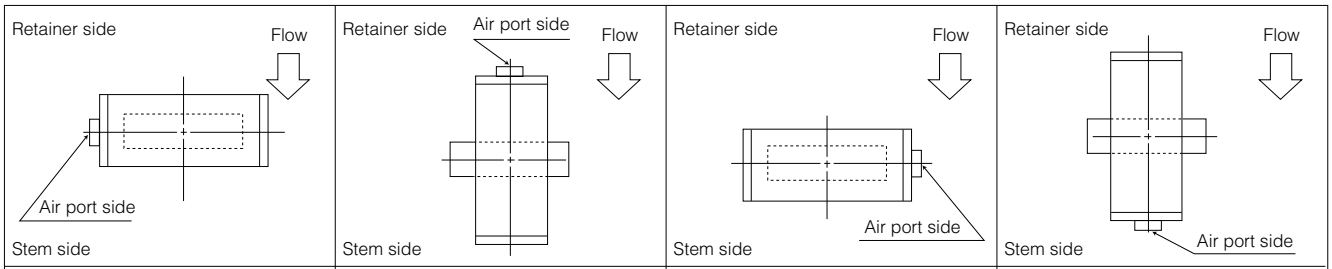
Double-acting pneumatic cylinder type 304A-7E（80mm to 300mm）

Nominal size		Dimension (mm)													Cylinder type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	H_4	A	P	f_1	f_2		
80	3	89	127	48	23	95	147	T_{10},T_{20}	168	26.5	276	142	75	47	T85	11
100	4	112	156	54	24	110	170	T_{10}	168	26.5	276	142	75	47	T85	12
								T_{20}	203	26.5	346	176	79	57	T200	16
125	5	137	185	56	24	139	185	T_{10},T_{20}	203	26.5	346	176	79	57	T200	19
150	6	163	216	57	23	164	205	T_{10},T_{20}	203	29.5	346	176	79	57	T200	23
200	8	213	269	64	28	190	235	T_{10},T_{20}	231	29.5	423	214	91	69	T380	35
250	10	263	330	71	31	236	283	T_{10}	231	190	423	214	91	87.5	T380	63
								T_{20}	269	190	546	270	118	87.5	T750	73
300	12	315	381	81	35	246	310	T_{10},T_{20}	269	190	546	270	118	87.5	T750	82

■304A-7E



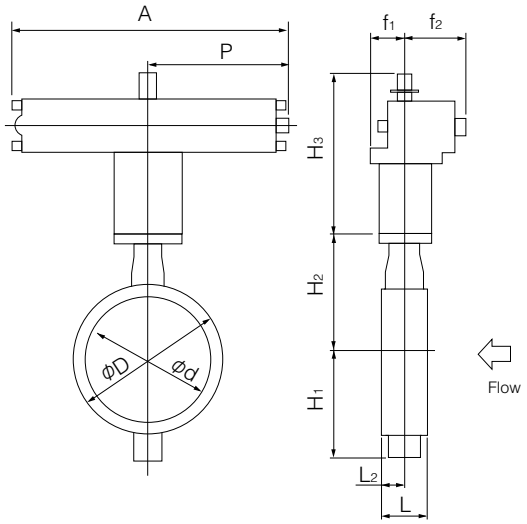
■7E Installation direction



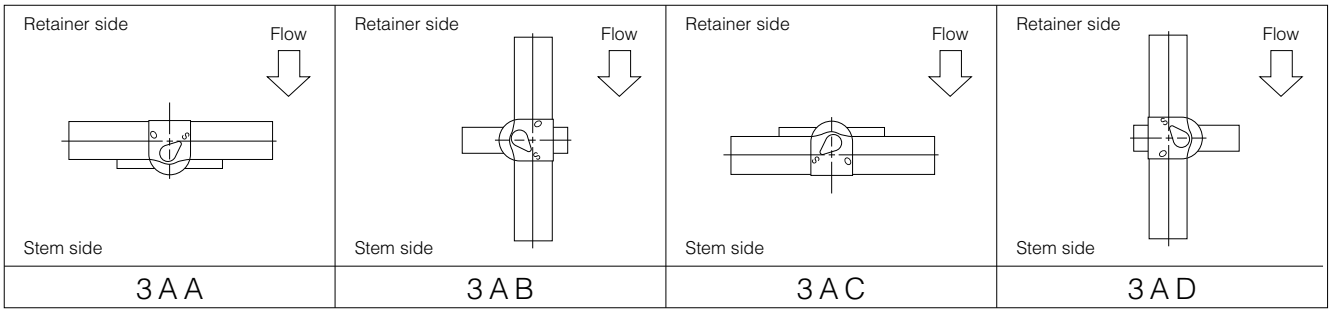
Double-acting pneumatic cylinder type 304A-3A (350mm to 600mm)

Nominal size		Dimension (mm)												Cylinder type	Approx. Mass (kg)
mm	inch	Φd	ΦD	L	L_2	H_1	H_2	Category	H_3	A	P	f_1	f_2		
350	14	350	416	92	39.5	308	340	A	424	743	381	100	164	TGA-125	110
								B,C	472	810	417	100	180	TGA-140	121
400	16	400	475	102	39	348	372	A	424	743	381	100	164	TGA-125	136
								B	472	810	417	100	180	TGA-140	147
								C	510	939	483	130	202	TGA-160	214
450	18	450	534	114	43	366	406	A	502	810	417	100	180	TGA-140	207
								B,C	530	939	483	130	202	TGA-160	263
500	20	500	589	127	50	405	442	A	502	810	417	100	180	TGA-140	246
								B	530	939	483	130	202	TGA-160	302
								C	543	1053	543	130	218	TGA-180	330
600	24	600	693	154	64	461	493	A	543	1053	543	130	218	TGA-180	431
								B	610	1163	599	160	253	TGA-200	475
								C	640	1248	642	160	270	TGA-220	535

■304A-3A



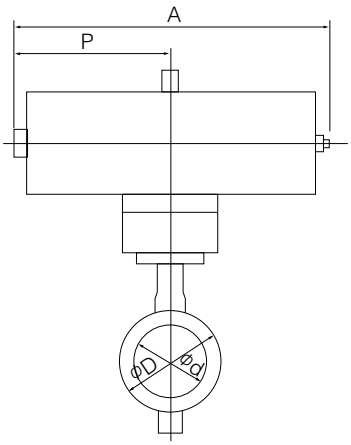
■3A Installation direction



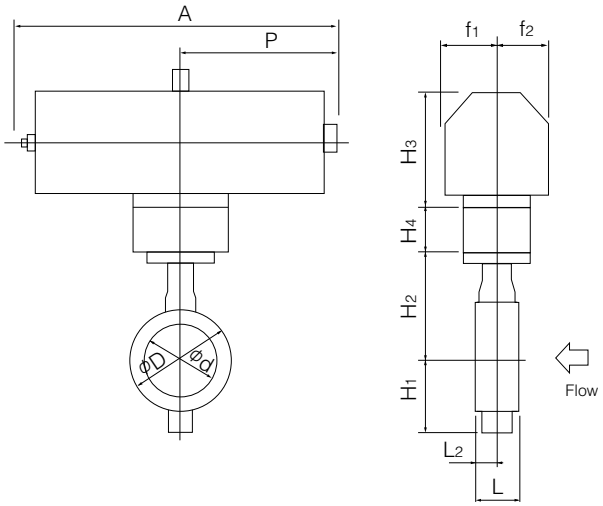
Single-acting pneumatic cylinder type 304A-7G (Air to open: 80mm to 200mm) / 304A-7F (Air to close: 80mm to 200mm)

Nominal size		Dimension (mm)													Cylinder type	Approx. Mass (kg)
mm	inch	Φd	ΦD	L	L_2	H_1	H_2	Category	H_3	H_4	A	P	f_1	f_2		
80	3	89	127	48	23	95	147	T_{10},T_{20}	203	26.5	449	226	79	57	T200S	17
100	4	112	156	54	24	110	170	T_{10}	203	26.5	449	226	79	57	T200S	18
								T_{20}	231	26.5	550	276	91	69	T380S	27
125	5	137	185	56	24	139	185	T_{10}	231	26.5	550	276	91	69	T380S	30
								T_{20}	269	26.5	723	360	118	85	T750S	43
150	6	163	216	57	23	164	205	T_{10},T_{20}	269	29.5	723	360	118	85	T750S	47
200	8	213	269	64	28	190	235	T_{10}	269	29.5	723	360	118	85	T750S	54

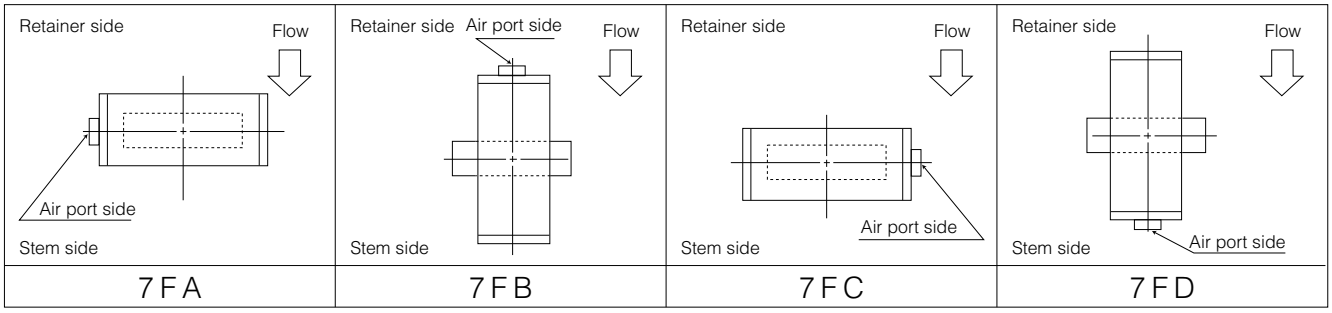
■304A-7F



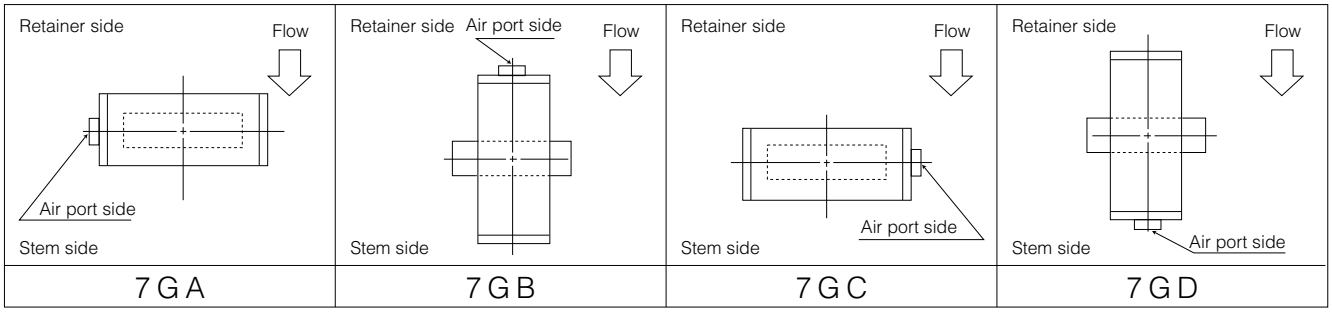
■304A-7G



■7F Installation direction



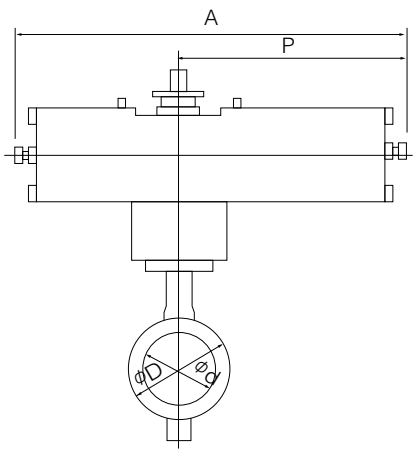
■7G Installation direction



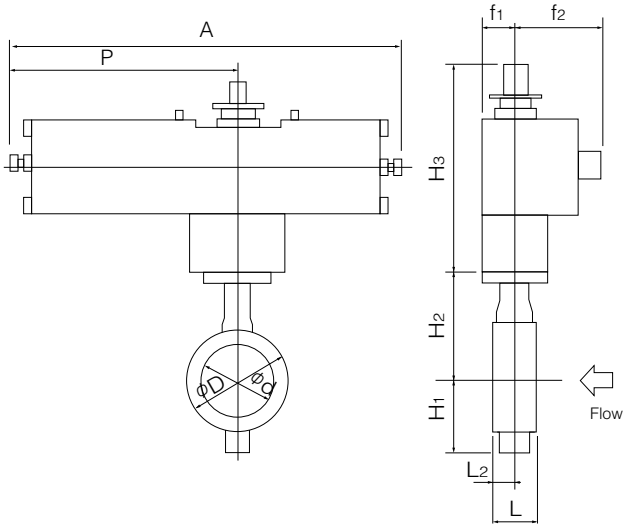
Single-acting pneumatic cylinder type 304A-3U (Air to open: 200mm to 600mm) / 304A-3K (Air to close: 200mm to 600mm)

Nominal size		Dimension (mm)												Cylinder type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H3	A	P	f1	f2		
200	8	213	269	64	28	190	235	T_{10}	377	945	585	75	165	TG-10S	78
								T_{20}	377	1080	720	94	206	TG-12S	122
250	10	263	330	71	31	236	283	T_{10},T_{20}	417	1080	720	94	206	TG-12S	141
300	12	315	381	81	35	246	310	T_{10},T_{20}	417	1080	720	94	206	TG-12S	150
350	14	350	416	92	39.5	308	340	A	450	1255	865	131	257	TG-14S	264
								B, C	602	1655	1095	164	348	TG-20S	485
400	16	400	475	102	39	348	372	A	450	1255	865	131	257	TG-14S	292
								B, C	602	1655	1095	164	348	TG-20S	512
450	18	450	534	114	43	366	406	A, B, C	624	1655	1095	164	348	TG-20S	564
500	20	500	589	127	50	405	442	A, B, C	624	1655	1095	164	348	TG-20S	602
600	24	600	693	154	64	461	493	A	624	1655	1095	164	348	TG-20S	701

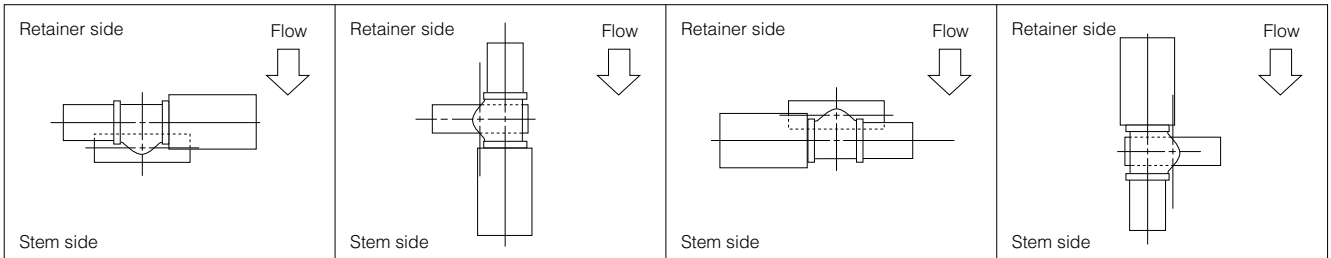
■304A-3K



■304A-3U

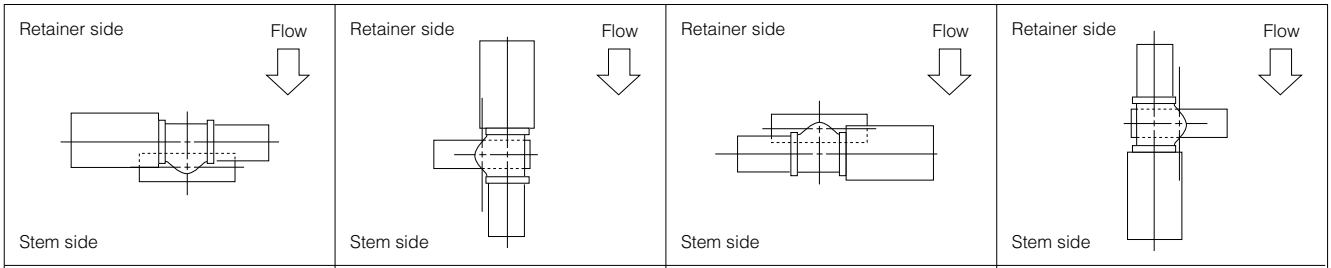


■3K Installation direction



3KA	3KB	3KC	3KD

■3U Installation direction

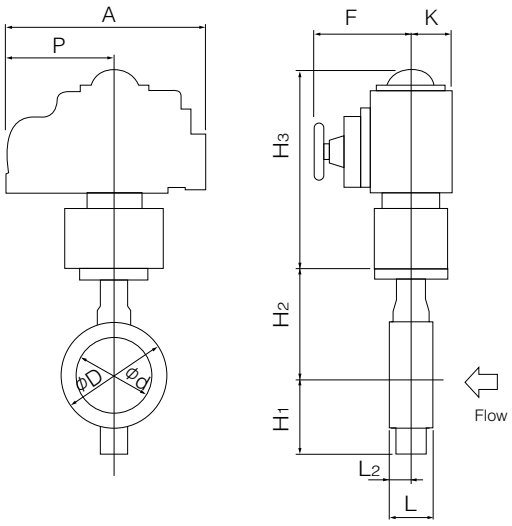


3UA	3UB	3UC	3UD

Single phase electric motor type 304A-4 I (80mm to 400mm)

Nominal size		Dimension (mm)												Motor type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	A	P	F	K		
80	3	89	127	48	23	95	147	T_{10},T_{20}	250	202	100	85	54	4 I-0	12.1
100	4	112	156	54	24	110	170	T_{10}	265	252	138	126	65	4 I-1	15.5
								T_{20}	298	310	167	154	85	4 I-2	21.5
125	5	137	185	56	24	139	185	T_{10},T_{20}	298	310	167	154	85	4 I-2	24.5
150	6	163	216	57	23	164	205	T_{10},T_{20}	373	310	167	154	85	4 I-2	29.5
200	8	213	269	64	28	190	235	T_{10},T_{20}	373	310	167	154	85	4 I-2.5	39
250	10	263	330	71	31	236	283	T_{10}	411	310	167	154	85	4 I-2.5	56.5
								T_{20}	420	388	223	246	136	4 I-3	66
300	12	315	381	81	35	246	310	T_{10},T_{20}	420	388	223	246	136	4 I-3	75
350	14	350	416	92	39.5	308	340	A , B	423	388	223	246	136	4 I-4	96
400	16	400	475	102	39	348	372	A	423	388	223	246	136	4 I-4	123

■304A-4 I



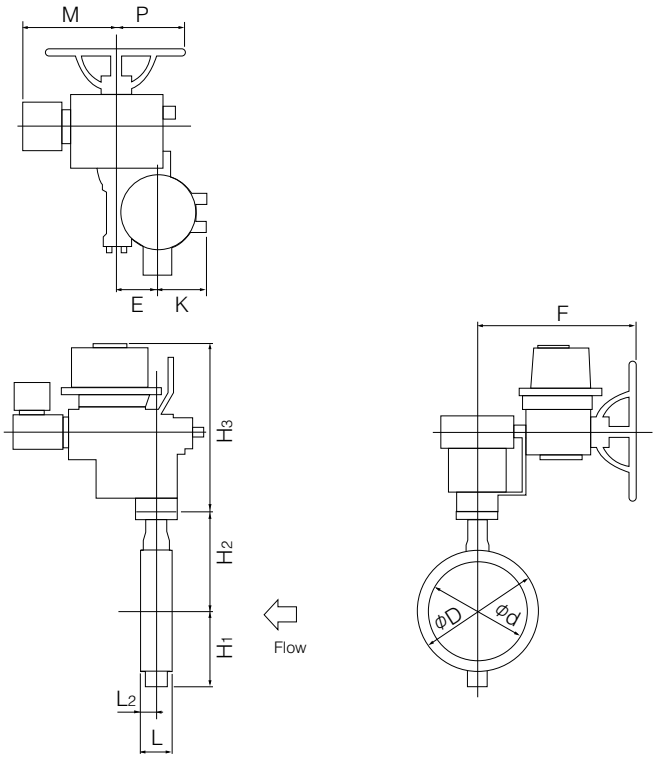
■4I Installation direction

4 I A	4 I B	4 I C	4 I D
Retainer side / Flow / Stem side	Retainer side / Flow / Stem side	Retainer side / Flow / Stem side	Retainer side / Flow / Stem side

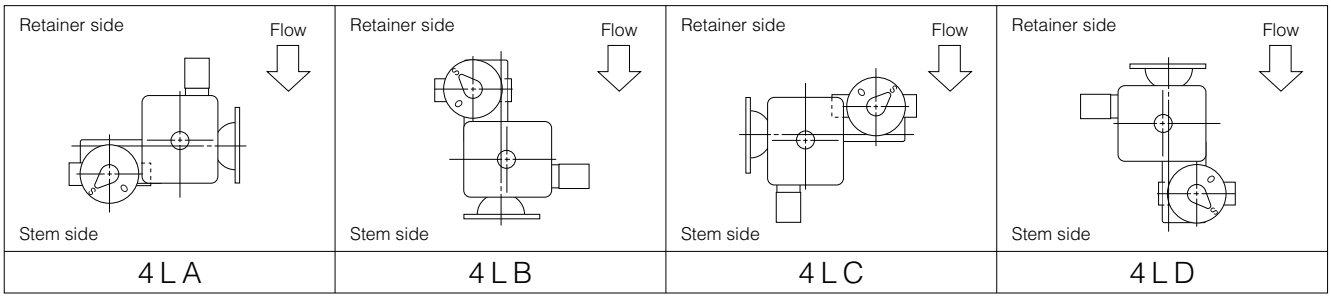
Three phase motor actuator type 304A-4L (350mm to 600mm)

Nominal size		Dimension (mm)												Motor type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	E	K	F	M	P	
350	14	350	416	92	39.5	308	340	A, B	547	117	164	533	357	230	LTKD-01 0.2kW /DGH-3	171
								C	592	140	198	593	373	230	LTKD-02 0.4kW /DGH-4	221
400	16	400	475	102	39	348	372	A	547	117	164	533	357	230	LTKD-01 0.2kW /DGH-3	197
								B	592	140	198	593	373	230	LTKD-02 0.4kW /DGH-4	247
								C	592	140	198	593	400	230	LTKD-02 0.75kW /DGH-4	258
450	18	450	534	114	43	366	406	A	642	140	198	593	373	230	LTKD-02 0.4kW /DGH-4	308
								B, C	642	140	198	593	400	230	LTKD-02 0.75kW /DGH-4	319
500	20	500	589	127	50	405	442	A	642	140	198	593	373	230	LTKD-02 0.4kW /DGH-4	346
								B, C	642	140	198	593	400	230	LTKD-02 0.75kW /DGH-4	357
600	24	600	693	154	64	461	493	A	642	140	198	593	400	230	LTKD-02 0.75kW /DGH-4	460
								B, C	749	210	300	748	477	360	LTKD-05 1.5kW /DGH-5	605

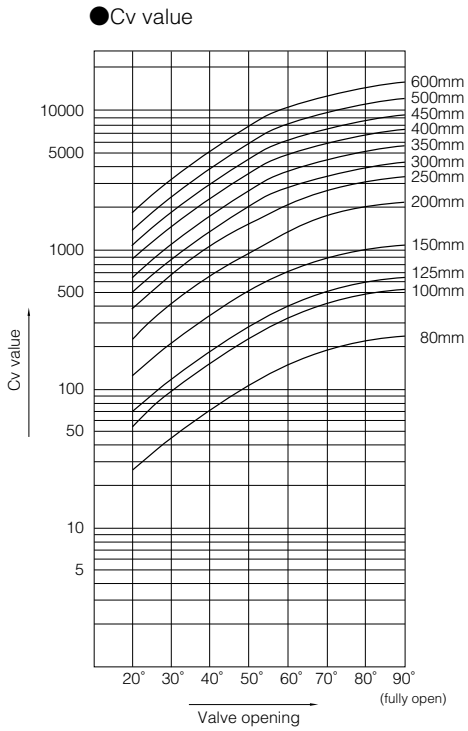
■304A-4L



■4L Installation direction



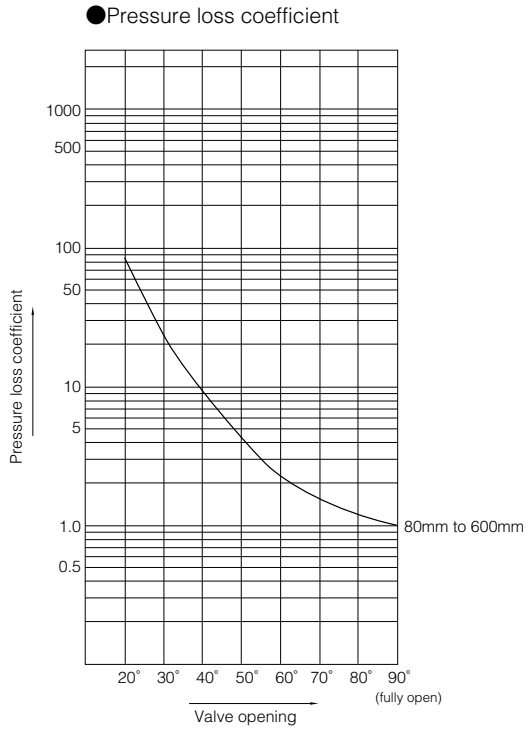
304A Cv value



304A Cv value

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
80	3	29	52	85	122	162	207	243	252
100	4	49	88	144	207	279	351	414	432
125	5	77	140	230	333	441	549	648	684
150	6	126	225	369	531	720	900	1080	1116
200	8	234	423	693	990	1350	1710	1980	2070
250	10	390	703	1148	1648	2240	2857	3300	3443
300	12	492	888	1454	2081	2838	3612	4172	4354
350	14	648	1170	1915	2741	3739	4758	5496	5736
400	16	829	1496	2449	3505	4780	6084	7027	7334
450	18	1041	1879	3076	4403	6004	7642	8827	9212
500	20	1323	2387	3909	5595	7630	9710	11216	11705
600	24	1929	3481	5700	8159	11126	14161	16356	17070

304A pressure loss coefficient



304A Pressure loss coefficient

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
80	3	95	29	11	5	3	2	1	1
100	4	98	30	11	5	3	2	1	1
125	5	93	28	10	5	3	2	1	1
150	6	70	22	8	4	2	1	1	1
200	8	62	19	7	3	2	1	1	1
250	10	54	17	6	3	2	1	1	1
300	12	70	21	8	4	2	1	1	1
350	14	68	21	8	4	2	1	1	1
400	16	73	22	8	4	2	1	1	1
450	18	75	23	9	4	2	1	1	1
500	20	72	22	8	4	2	1	1	1
600	24	70	22	8	4	2	1	1	1

304A Applicable flange standard

Nominal size		JIS				ANSI/API/JPI	BS4504		DIN		BS10
mm	inch	5K	10K	16K	20K	150Lb	PN10	PN16	NP10	NP16	Table E
80	3	×	D	D	D	○	D	D	D	D	×
100	4	×	D	D	D	D	D	D	D	D	×
125	5	×	D	D	D	D	D	D	D	D	×
150	6	×	D	D	D	D	D	D	D	D	×
200	8	×	D	D	D	D	D	D	D	D	×
250	10	×	D	D	D	D	D	D	D	D	×
300	12	×	D	D	D	D	D	D	D	D	×
350	14	D	D	D	D	D	D	D	D	D	D
400	16	D	D	D	D	D	D	D	D	D	D
450	18	D	T	T	T	D	T	T	T	T	D
500	20	T	T	T	T	T	T	T	T	T	T
600	24	T	T	T	T	T	T	T	T	T	T

○ : Can be used without flange drilling.
D : With flange drilling
T : With flange tapping
× : Not applicable

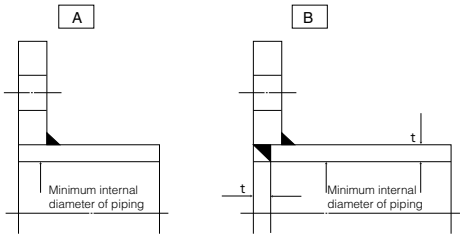
304A Applicable pipe list in case of A

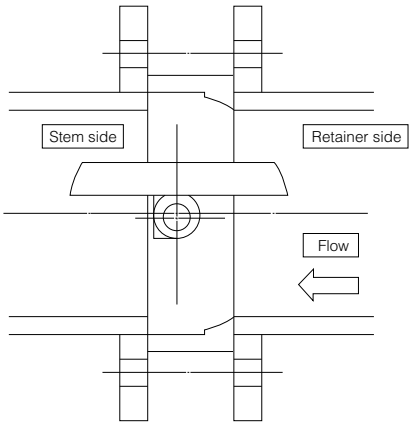
Nominal size		SGP		Sch20		Sch40		Sch60		Sch80		Sch10S		Sch20S		Minimum internal diameters of piping (mm)
mm	inch	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	
80	3	○	○	○	○	○	○	○	○	○	○	○	○	○	○	72.5
100	4	○	○	○	○	○	○	○	○	○	○	○	○	○	○	93.8
125	5	○	○	○	○	○	○	○	○	○	○	○	○	○	○	119.4
150	6	○	○	○	○	○	○	○	×	○	×	○	○	○	○	147.5
200	8	○	○	○	○	○	○	○	×	○	×	○	○	○	○	197.5
250	10	○	○	○	○	○	○	○	×	○	×	○	○	○	○	248.1
300	12	○	○	○	○	○	○	○	×	×	×	○	○	○	○	297.6
350	14	○	○	○	○	○	○	○	×	×	×	–	–	–	–	330
400	16	○	○	○	○	○	○	○	×	○	×	–	–	–	–	377
450	18	○	○	○	○	○	○	○	×	○	×	–	–	–	–	424
500	20	○	○	○	○	○	○	○	×	○	×	–	–	–	–	470
600	24	–	–	○	○	○	○	○	×	×	×	–	–	–	–	564

304A Applicable pipe list in case of B

Nominal size		SGP		Sch20		Sch40		Sch60		Sch80		Sch10S		Sch20S		Minimum internal diameters of piping (mm)
mm	inch	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	
80	3	○	○	○	○	○	○	○	○	○	○	○	○	○	○	63.6
100	4	○	○	○	○	○	○	○	○	○	○	○	○	○	○	87.0
125	5	○	○	○	○	○	○	○	○	○	○	○	○	○	○	112.8
150	6	○	○	○	○	○	○	○	○	○	○	○	○	○	○	142.5
200	8	○	○	○	○	○	○	○	×	○	×	○	○	○	○	193.3
250	10	○	○	○	○	○	○	○	×	○	×	○	○	○	○	248.1
300	12	○	○	○	○	○	○	○	×	○	×	○	○	○	○	297.6
350	14	○	○	○	○	○	○	○	×	○	×	–	–	–	–	323.0
400	16	○	○	○	○	○	○	○	×	○	×	–	–	–	–	371.0
450	18	○	○	○	○	○	○	○	×	○	×	–	–	–	–	418.0
500	20	○	○	○	○	○	○	○	×	○	×	–	–	–	–	464.0
600	24	–	–	○	○	○	○	○	×	○	×	–	–	–	–	557.0

Remark 1: ○=Applicable ×=Not applicable
Remark 2: The clearance of disc and pipe is based on API 609 and
MSS SP67 80mm to 150mm: 1.5mm, 200mm to 500mm: 3.0mm, 600mm: 6.4mm
Remark 3: In case of "×"shown above, internal pipe diameter or flange is smaller tham mimium internal diameter.
Consider to put a spacer between a valve and a flange. Consult us.





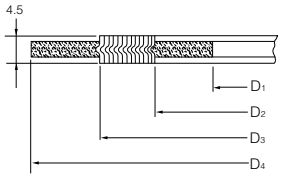
304A Piping gasket

●In case of sheet gasket ..... Any standard can be used.
●In case of spiral gasket
For API, JPI, ANSI flange ..... Any standard gaskets with inner/outer ring can be used.
For JIS flange ..... Use special spiral gasket shown below.

■Special spiral gasket for JIS flange size

Nominal size		JIS flange					
		5K, 10K, 16K, 20K			5K	10K	16K, 20K
mm	inch	D1	D2	D3	D4	D4	D4
80	3	89	97	120	×	134	140
100	4	115	124	145	×	159	165
125	5	140	151	177	×	190	202
150	6	166	178	205	×	220	237
200	8	217	227	256	×	270	282
250	10	268	278	315	×	332	354
300	12	319	331	362	×	377	404
350	14	356	369	399	412	422	450
400	16	406	420	457	472	484	508
450	18	458	472	517	532	539	573
500	20	508	532	567	582	594	628
600	24	610	626	672	689	700	734

Remark1; ×: Not applicable



■Applicable standard for spiral gasket

Nominal size		Tomoe special			Standard gasket		
mm	inch	JIS 10K	JIS 16K JIS 20K	ANSI 125/150Lb	JIS 10K	JIS 16K JIS 20K	ANSI 125/150Lb
80	3	○	○	○	×	×	○
100	4	○	○	○	×	×	○
125	5	○	○	○	×	×	○
150	6	○	○	○	×	×	○
200	8	○	○	○	×	×	○
250	10	○	○	○	×	×	○
300	12	○	○	○	×	×	○
350	14	○	○	○	×	×	○
400	16	○	○	○	×	×	○
450	18	○	○	○	×	×	○
500	20	○	○	○	×	×	○
600	24	○	○	○	×	×	○

Remark 1: ○: Applicable, ×: Not applicable
Remark 2: In case a minute leakage of gas (less than 100PPm) becomes a problem, please inquire of our business charge.

304A Applicable standard for standard piping gasket

Nominal size		Max.allowable inside diameter (D)	Joint sheet or RPTFE solid gasket (t≦2mm)					PTFE mold type gasket VALQUA or NICHIAS				
mm	inch		JIS 5K	JIS 10K	JIS 16K JIS 20K	ANSI 125/150Lb	JPI 150Lb	JIS 5K	JIS 10K	JIS 16K JIS 20K	ANSI 125/150Lb	JPI 150Lb
80	3	97	×	○	○	○	○	×	○	○	○	○
100	4	124	×	○	○	○	○	×	○	○	○	○
125	5	151	×	○	○	○	○	×	○	○	○	○
150	6	178	×	○	○	○	○	×	○	○	○	○
200	8	227	×	○	○	○	○	×	○	○	○	○
250	10	282	×	○	○	○	○	×	○	○	○	○
300	12	331	×	○	○	○	○	×	○	○	○	○
350	14	362	○	○	○	○	○	○	○	○	○	○
400	16	414	○	○	○	○	○	○	○	○	○	○
450	18	468	○	○	○	○	○	○	○	○	○	○
500	20	518	○	○	○	○	○	○	○	○	○	○
600	24	619	○	○	○	○	○	○	○	○	○	○

Remark; ○: Applicable, ×: Not applicable

304A Piping Bolts and Nuts Sizes

Nominal size		JIS5K		JIS10K		JIS16K	
mm	inch	Long Bolts and Nuts	Setting Bolts	Long Bolts and Nuts	Setting Bolts	Long Bolts and Nuts	Setting Bolts
80	3	—	—	8-M16×145	—	8-M20×170	—
100	4	—	—	8-M16×145	—	8-M20×170	—
125	5	—	—	8-M20×170	—	8-M22×190	—
150	6	—	—	8-M20×170	—	12-M22×190	—
200	8	—	—	12-M20×170	—	12-M22×190	—
250	10	—	—	12-M22×190	—	12-M24×210	—
300	12	—	—	16-M22×190	—	16-M24×225	—
350	14	12-M22×210	—	16-M22×210	—	16-M30(P3)×245	—
400	16	16-M22×220	—	16-M24×235	—	16-M30(P3)×265	—
450	18	16-M22×230	※1	16-M24×250	4-M24×84×60	16-M30(P3)×280	4-M30(P3)× 95×65
					4-M24×58×50		4-M30(P3)× 73×50
500	20	16-M22×245	4-M22×80×50	16-M24×260	4-M24×90×60	16-M30(P3)×300	4-M30(P3)×105×65
			4-M22×60×50		4-M24×70×60		4-M30(P3)× 81×50
600	24	16-M24×280	4-M24×84×60	20-M30(P3)×300	4-M30(P3)×81×50	20-M36(P3)×345	4-M36(P3)×100×60
			4-M24×65×50		4-M30(P3)×65×50		4-M36(P3)× 82×50

Nominal size		JIS20K		ANSI150Lb, API/JPI150Lb	
mm	inch	Long Bolts and Nuts	Setting Bolts	Long Bolts and Nuts	Setting Bolts
80	3	8-M20×170	—	4-U5/8-11UNC×155	—
100	4	8-M20×170	—	8-U5/8-11UNC×155	—
125	5	8-M22×190	—	8-U3/4-10UNC×175	—
150	6	12-M22×190	—	8-U3/4-10UNC×175	—
200	8	12-M22×190	—	8-U3/4-10UNC×205	—
250	10	12-M24×210	—	12-U7/8- 9UNC×215	—
300	12	16-M24×225	—	12-U7/8- 9UNC×215	—
350	14	16-M30(P3)×260	—	12-U1 - 8UNC×240	—
400	16	16-M30(P3)×280	—	16-U1 - 8UNC×255	—
450	18	16-M30(P3)×300	4-M30(P3)×105×65	16-U1 1/8- 8UN×280	—
			4-M30(P3)× 81×50		
500	20	16-M30(P3)×315	4-M30(P3)×110×60	16-U1 1/8- 8UN×295	4-U1 1/8- 8UN×105×50
			4-M30(P3)× 90×65		4-U1 1/8- 8UN× 80×50
600	24	20-M36(P3)×360	4-M36(P3)×108×60	16-U1 1/4- 8UN×340	4-U1 1/4- 8UN×100×50
			4-M36(P3)× 90×50		4-U1 1/4- 8UN× 90×50

※1 Tapped drilling is also applicable.

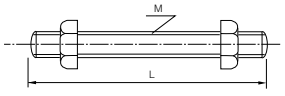
Remark: Use SNB 7/S45C (A193 B7/A, 194 2H) SUS304/SUS304
For long bolt, use full thread bolt.
For hexagon nut, use heavy nut.
A metric screw should have 3 pitches if its nominal diameter exceeds M30.
A unified screw should have 8 threads per inch if its nominal diameter exceeds 1 inch.
Hexagon bolts (set bolts) are indicated with the retainer side on the up side and the stem side on down side.

Examples

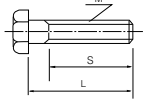
Long bolts: 12 - M22 × 185
(N - M × L)

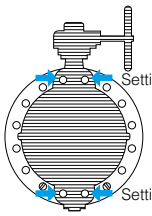
Setting bolts: 4 - M30 × 95 × 65
(Hexagon bolts) (N - M × L × S)

Long bolts and nuts (full thread)



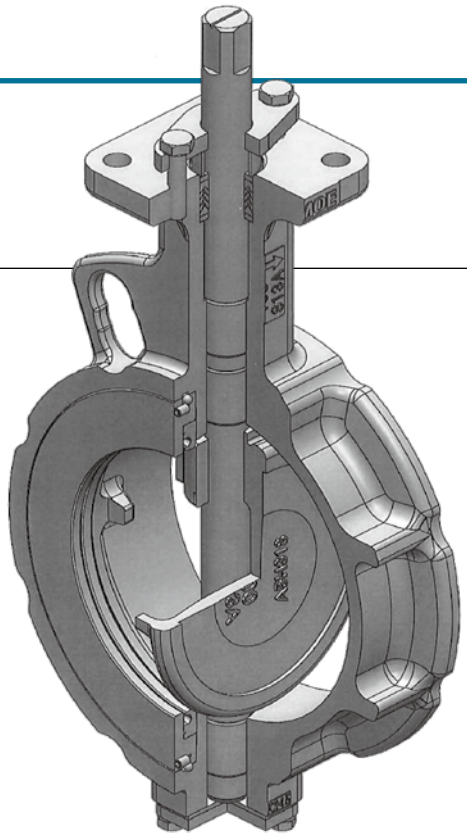
Setting bolts (Hexagon bolts)





MEMO

304YA Wafer



Lock Lever | Worm Gear | Pneumatic Cylinder | Motorized

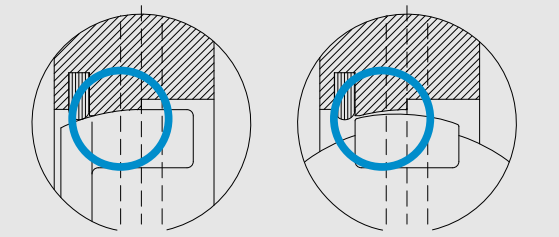
Features and Benefits

Weight saving

30% weight saving with suitable design of 1.0MPa
(compared with existing 304Y 300mm)

Self aligning disc design

Contact area of the body and the disc is spherical.
These spherical centers are displaced. When valve position is fully close, these surfaces are attached. When valve position is fully open, there is a clearance between the body and the disc. It can get both of smooth rotation and seal performance.



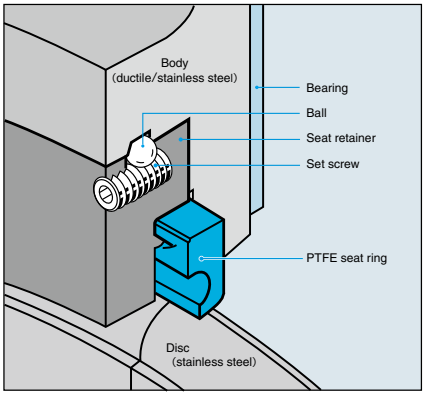
Applicable for hot/cold water supply

Low temperature range expansion

Change from -20 degrees C to -29 degrees C

Easy replacement of the seat ring

The ball lock method is used to simplify replacement of the seat ring.



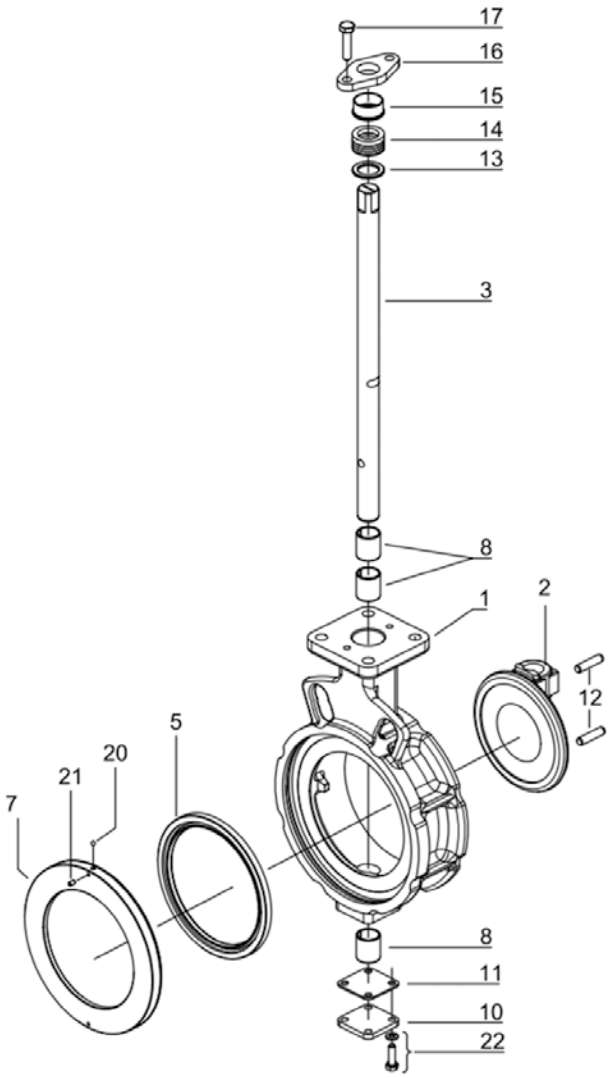
Standard Specifications

Valve Model		304YA		
Valve type		Double eccentric (Water)		
Valve nominal size		40, 50, 65, 80, 100, 125, 150, 200, 250, 300mm 1 1/2, 2, 2 1/2, 3, 4, 5, 6, 8, 10, 12inch		
Max. allowable working pressure		1.0MPa		
Allowable seat leakage		ISO 5208 leakage A (Tight shut off)		
Flow direction		Bi -directional Standard direction of pressurization : Retainer side Maximum pressure on shaft side (200mm to 300mm) : 0.6MPa		
Applicable standards	Face to face dimensions	JIS B 2002 (Series46) / ISO 5752 (Series20)		
	Applicable flange connection	JIS 5K / 10K / ANSI 150Lb		
	Top flange	In compliance with ISO 5211		
Standard Materials※1	Body	FCD450	SCS13A	
	Disc	SCS13A		
	Shaft	SUS420J2	SUS630 (H1150)	
	Seatring	RPTFE (Carbon and graphite contained)		
	Seatring retainer	SF490A※2 or S25C or S45C	SCS13A※2 or SUS304	
	Shaft bearing	PTFE+ SS400	PTFE+ SUS316L	
	Bottom gasket	#8121 or T#1215-A Expanded graphite (Low temperature: -29℃～200℃ V#7020)		
	Gland packing	RPTFE (Graphite contained)		
Maximum Temperature Range		FCD450 body: -20℃ or over ～ less than 200℃	SCS13A body: -29℃ or over ～ less than 200℃	
Test pressure	Body Shell	working pressure×1.5 (Hydraulic pressure)		
	Seat leak	working pressure×1.1 (Pneumatic pressure)		
Actuators		Lock lever	1T	40 to 150mm (1 1/2 to 6inch)
		Worm gear	2U	40 to 300mm (1 1/2 to 12inch)
		Pneumatic cylinder	7E	40 to 300mm (1 1/2 to 12inch)
			7F, 7G	40 to 200mm (1 1/2 to 8inch)
			3U, 3K	250, 300mm (10, 12inch)
		Motorized	4I	40 to 300mm (1 1/2 to 12inch)
			4J	40 to 300mm (1 1/2 to 12inch)
Fluid types		Air Gas, Hot air, Water, Chemical solution, Steam		
Surface traetment	Disc	Hard chrome plating		

※1. The parts that use properly by body material and specification, please refer to the Following table.
※2. In case of 40mm
Case of SCS body : Material is SCS13A only. (Common parts is 304Y)
Case of FCD body : Material is SF490A only. (Common parts is 304Y)
※ There is possibility of seat leakage when fluid (powder/liquid) is solidified by working temperature and other cause, especially the valve is in a vertical position(e.g. at the bottom area of discharge spout of hopper and tank). Please consult us.

Specification	Body's Material	Temperature range	Parts material			
			Shaft	Seatring	Bottom gasket	Grand packing
for Standard	SCS13A	0℃ to 200℃	SUS630	RPTFE: (Carbon and graphite contained)	#8121 or T#1215-A	RPTFE: (Graphite contained)
	FCD450		SUS420J2			
for Low Temperature	SCS13A	−29℃ to 200℃	SUS630		V#7020	
	FCD450	−20℃ to 200℃	SUS420J2			

304YA Expanded view of components



304YA Parts list

■304YA Parts list

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Shaft	1	
★ 5	Seatring	1	
7	Seatring retainer	1	
8	Shaft bearing	3	
10	Bottom cover	1	
★ 11	Bottom gasket	1	
12	Taper pin	2	
13	Packing retainer	1	
★ 14	Gland packing	1 set	
15	Rough gland	1 set	
16	Gland flange	1	
17	Hxagon bolt	2	
★ 20	Ball	2	40mm to 100mm
		3	125mm to 300mm
★ 21	Hexagon socket set screw	2	40mm to 100mm
		3	125mm to 300mm
22	Hexagon bolt, Spring washer	4	

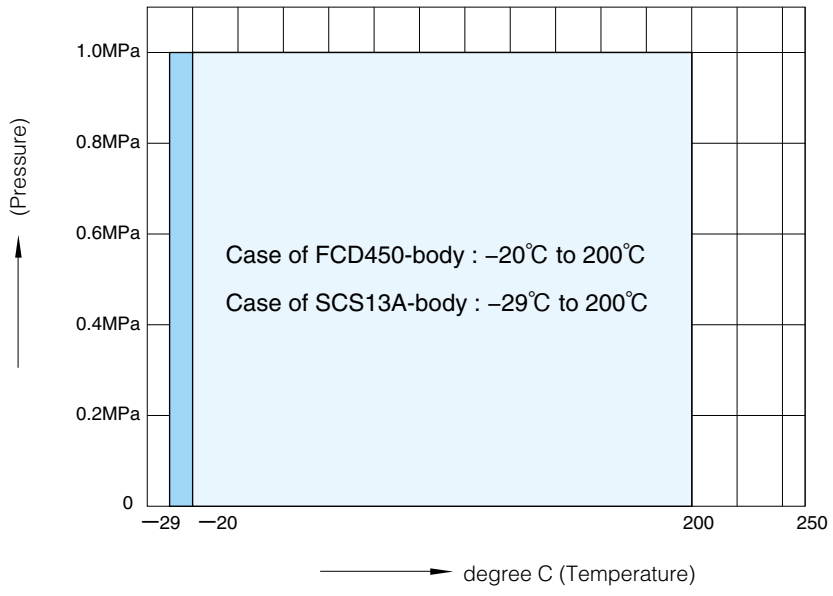
Remark: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove set screws (Part #21 Set screw).

304YA Actuator selection chart

■304YA

Model	Size (mm / inch)									
	40	50	65	80	100	125	150	200	250	300
	1 1/2	2	2 1/2	3	4	5	6	8	10	12
1T	1T-1					1T-2				
2U	2U-0		2U-1		2U-2			2U-3		2U-4
7E	T35			T85		T200		T380		T750
7G,7F	T85S			T200S		T380S	T750S			
3U,3K									TG-12S	
4 I	4I-0				4I-1	4I-2		4I-2.5		4I-3
4J	SRJ-010						SRJ-020	SRJ-060		

304YA Pressure and temperature rating

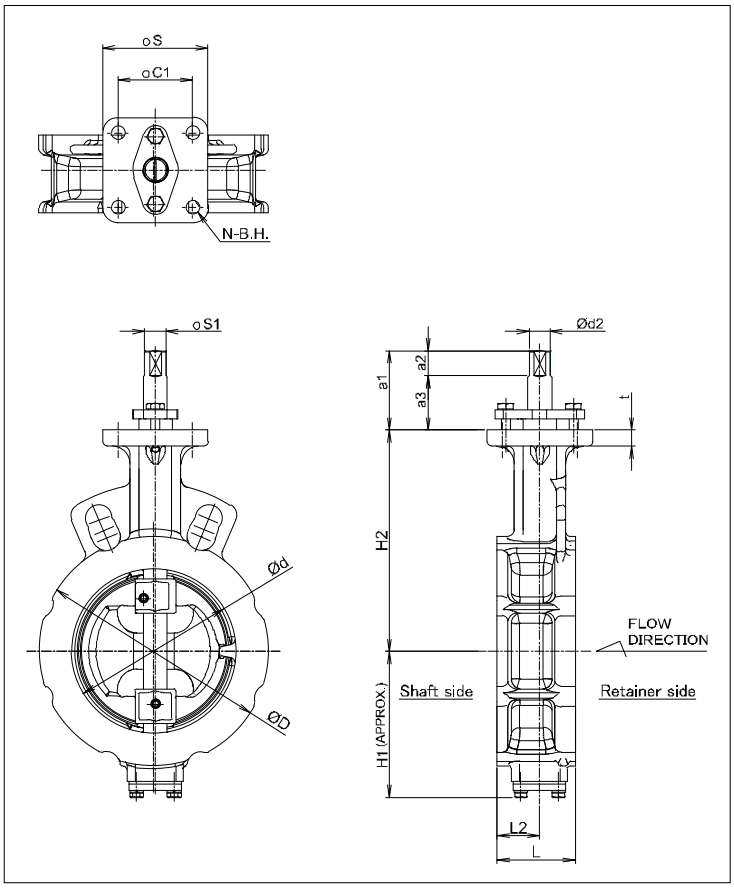


304YA Bare shaft

■304YA-01

Nominal size		Dimension (mm)													Approx. Mass (kg)	
mm	inch	φd	φD	L	L_2	H_1	H_2	a_1	a_2	a_3	$φd_2$	□S_1	t	Flange type	SCS-body	FCD-body
40	1 1/2	48	81	33	15	57	106	46.5	10.5	36	10	8	11	F07	1.7	1.6
50	2	59	96	43	25.4	67	114	46.5	10.5	36	10	8	11	F07	2.3	2.1
65	2 1/2	73	115	46	27.4	75	125	46.5	10.5	36	12	10	11	F07	3.0	2.8
80	3	87	127	46	24.5	83	132	47.5	11.5	36	14	12	11	F07	3.5	3.2
100	4	109	152	52	28.3	97	147	52.5	16.5	36	16	14	11	F07	4.6	4.3
125	5	137	183	56	30.1	111	166	52.5	16.5	36	18	14	13	F10	7.1	6.7
150	6	163	211	57	28.9	129	181	52.5	16.5	36	20	16	13	F10	8.9	8.4
200	8	213	257	62	30.8	156	212	55	20	35	22	18	13	F10	12.3	11.6
250	10	263	322	70	33.3	184	243	60	30	30	28	24	13	F10	21.0	19.9
300	12	315	367	80	40.8	213	290	63	30	33	30	24	16	F12	28.2	26.8

■304YA-01



■Top flange

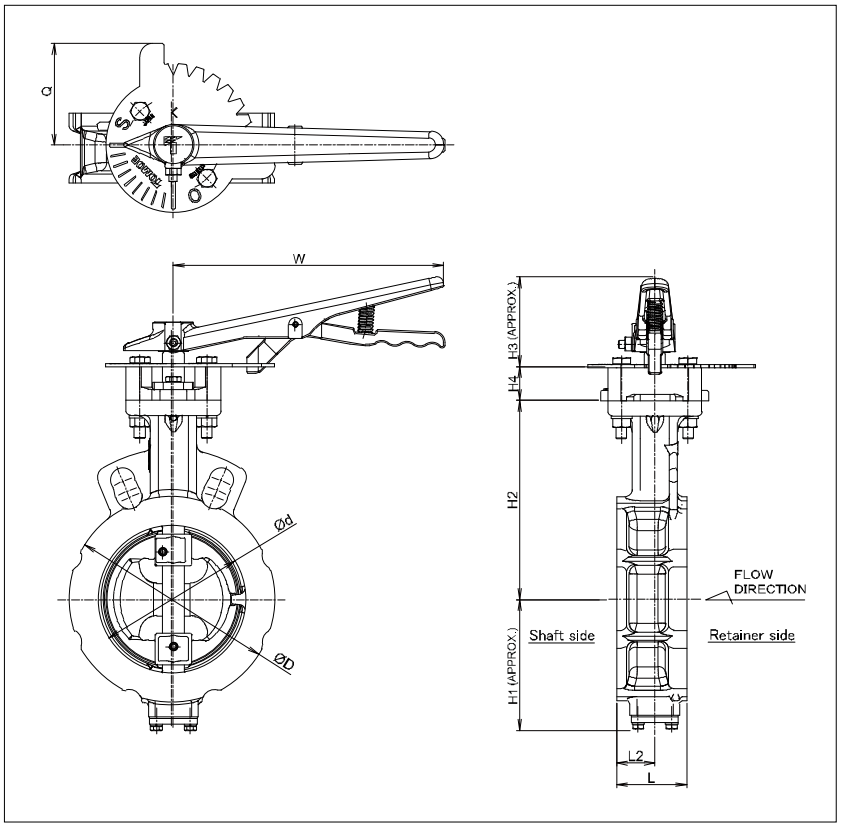
Flange type	□S	φC_1	N	B.H.
F07	70	49.5	4	9
F10	102	72.1	4	11
F12	125	88.4	4	13

Lock lever type 304YA-1T(40mm to 150mm)

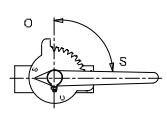
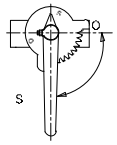
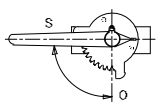
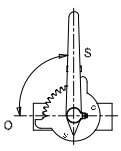
■304YA-1T

Nominal size		Dimension (mm)										Lever type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	H_3	H_4	Q	W		
40	1 1/2	48	81	33	15	57	106	66	25	75	200	1T-1	2.8
50	2	59	96	43	25.4	67	114	66	25	75	200	1T-1	3.3
65	2 1/2	73	115	46	27.4	75	125	66	25	75	200	1T-1	4.1
80	3	87	127	46	24.5	83	132	66	25	75	200	1T-1	4.5
100	4	109	152	52	28.3	97	147	66	25	75	200	1T-1	5.7
125	5	137	183	56	30.1	111	166	92	25	87.5	300	1T-2	9.3
150	6	163	211	57	28.9	129	181	92	25	87.5	300	1T-2	11.1

■304YA-1T



■1T Installation direction

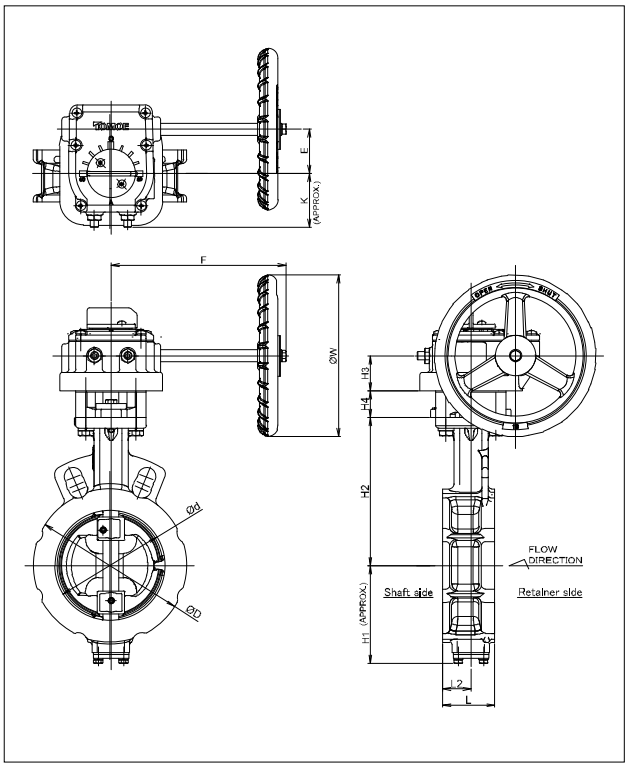
Retainer side / Flow / Shaft side	Retainer side / Flow / Shaft side	Retainer side / Flow / Shaft side	Retainer side / Flow / Shaft side
			
1TA	1TB	1TC	1TD

Worm gear type 304YA-2U（40mm to 300mm）

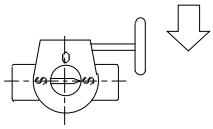
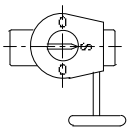
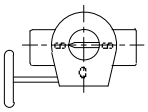
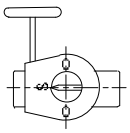
■304YA-2U（40mm to 300mm)

Nominal size		Dimension (mm)												Gear type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	H_3	H_4	E	K	F	φW		
40	1 1/2	48	81	33	15	57	106	29.5	26.5	36	46	160	100	2U-0	4.3
50	2	59	96	43	25.4	67	114	29.5	26.5	36	46	160	100	2U-0	4.9
65	2 1/2	73	115	46	27.4	75	125	29.5	26.5	36	46	160	100	2U-1	5.6
80	3	87	127	46	24.5	83	132	29.5	26.5	36	46	160	100	2U-1	6.1
100	4	109	152	52	28.3	97	147	34.5	26.5	44	53	173.5	160	2U-2	9.1
125	5	137	183	56	30.1	111	166	34.5	26.5	44	53	173.5	160	2U-2	12.0
150	6	163	211	57	28.9	129	181	34.5	26.5	44	53	173.5	160	2U-2	13.8
200	8	213	257	62	30.8	156	212	41.5	26.5	67	75	198	200	2U-3	20.8
250	10	263	322	70	33.3	184	243	41.5	26.5	67	75	198	200	2U-3	29.5
300	12	315	367	80	40.8	213	290	48.0	29.5	87.5	90	222.5	200	2U-4	45.6

■304YA-2U



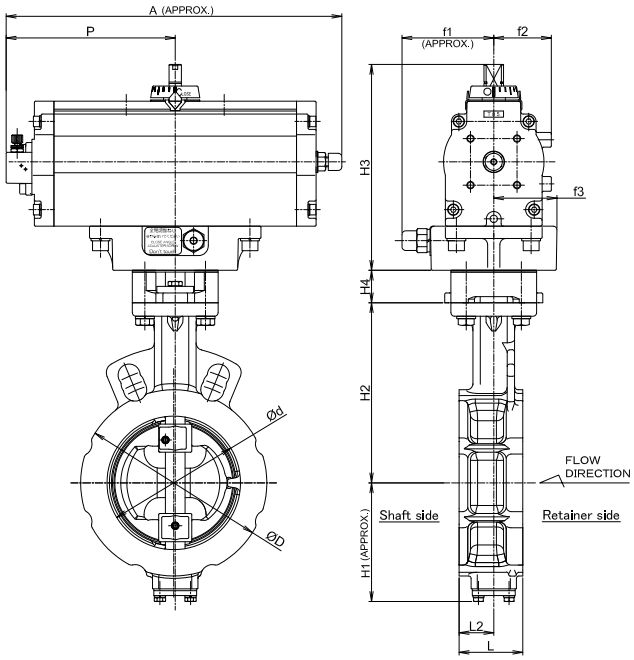
■2U Installation direction

Retainer side Flow  Shaft side	Retainer side Flow  Shaft side
2UA	2UB
Retainer side Flow  Shaft side	Retainer side Flow  Shaft side
2UC	2UD

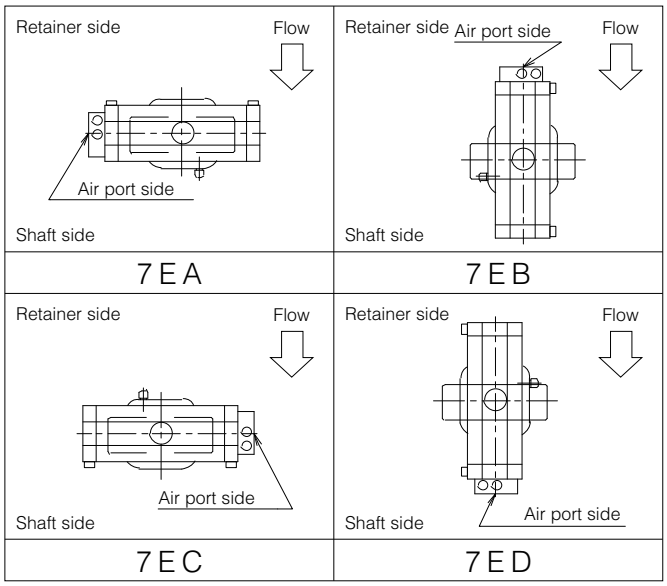
■304YA-7E

Nominal size		Dimension (mm)													Cylinder type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	H_3	H_4	A	P	f_1	f_2	f_3		
40	1 1/2	48	81	33	15	57	106	125	26.5	228	116	57	29	35	T35	3.8
50	2	59	96	43	25.4	67	114	125	26.5	228	116	57	29	35	T35	4.4
65	2 1/2	73	115	46	27.4	75	125	125	26.5	228	116	57	29	35	T35	5.1
80	3	87	127	46	24.5	83	132	168	26.5	276	142	75	47	51	T85	8.5
100	4	109	152	52	28.3	97	147	168	26.5	276	142	75	47	51	T85	9.6
125	5	137	183	56	30.1	111	166	203	26.5	346	176	79	57	51	T200	15.8
150	6	163	211	57	28.9	129	181	203	26.5	346	176	79	57	51	T200	17.6
200	8	213	257	62	30.8	156	212	231	26.5	426	214	91	69	62.5	T380	27.1
250	10	263	322	70	33.3	184	243	231	26.5	426	214	91	69	62.5	T380	35.8
300	12	315	367	80	40.8	213	290	269	29.5	546	270	118	85	70	T750	53.6

■304YA-7E



■7E Installation direction

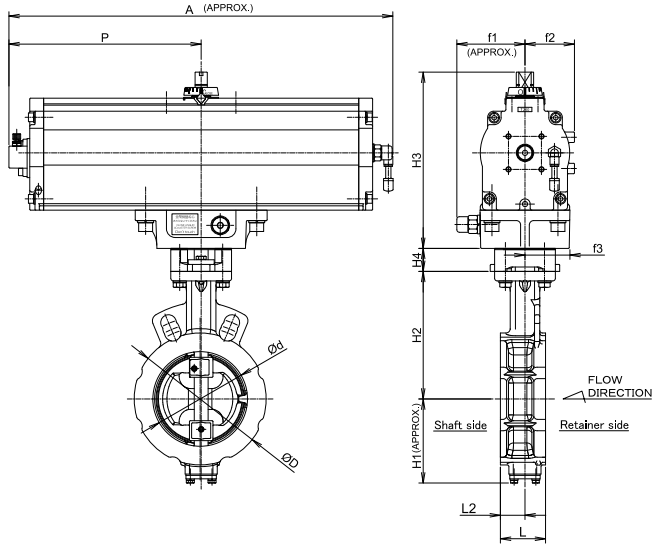


Single-acting pneumatic cylinder type 304YA-7G(Air to open: 40mm to 200mm) / 304YA-7F(Air to close: 40mm to 200mm)

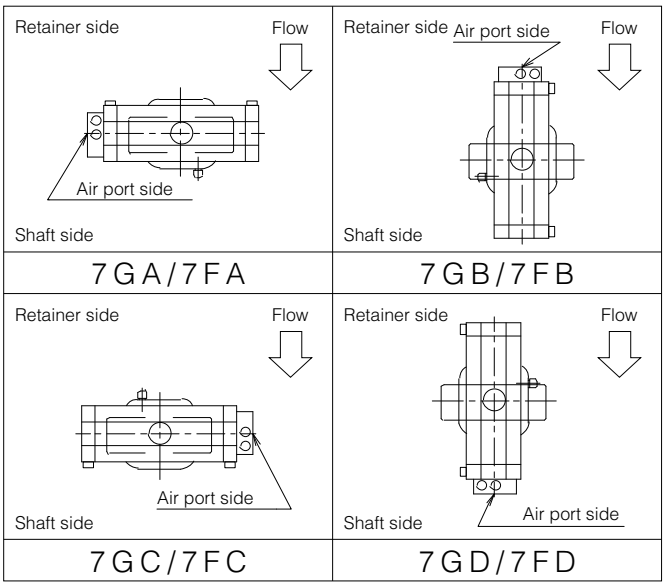
■304YA-7G/7F

Nominal size		Dimension (mm)													Cylinder type	Approx. Mass (kg)
mm	inch	φd	φD	L	L2	H1	H2	H3	H4	A	P	f1	f2	f3		
40	1 1/2	48	81	33	15	57	106	168	26.5	363.5	182.5	75	47	51	T85S	8.3
50	2	59	96	43	25.4	67	114	168	26.5	363.5	182.5	75	47	51	T85S	8.9
65	2 1/2	73	115	46	27.4	75	125	168	26.5	363.5	182.5	75	47	51	T85S	9.6
80	3	87	127	46	24.5	83	132	203	26.5	448.5	225.5	79	57	51	T200S	14.6
100	4	109	152	52	28.3	97	147	203	26.5	448.5	225.5	79	57	51	T200S	15.7
125	5	137	183	56	30.1	111	166	231	26.5	549.5	276	91	69	62.5	T380S	26.8
150	6	163	211	57	28.9	129	181	269	26.5	722.5	359.5	118	85	70	T750S	42.1
200	8	213	257	62	30.8	156	212	269	26.5	722.5	359.5	118	85	70	T750S	45.5

■304YA-7G/7F



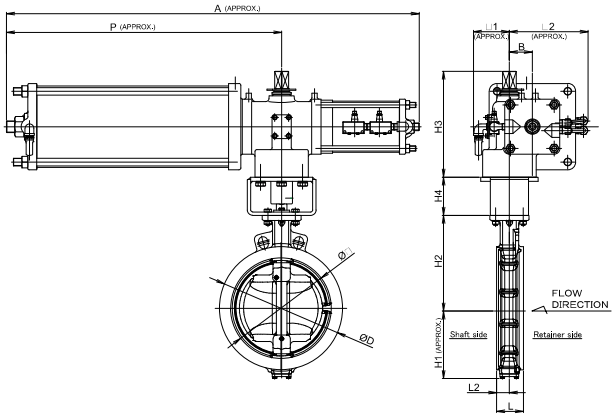
■7G/7F Installation direction



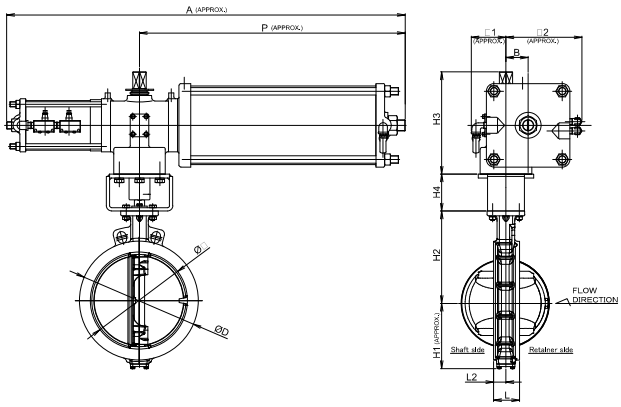
■304YA-3U/3K

Nominal size		Dimension (mm)													Cylinder type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	H_3	H_4	A	P	B	f_1	f_2		
250	10	263	322	70	33.3	184	243	277	100	1080	720	60	94	206	TG-12S	122
300	12	315	367	80	40.8	213	290	277	100	1080	720	60	94	206	TG-12S	130

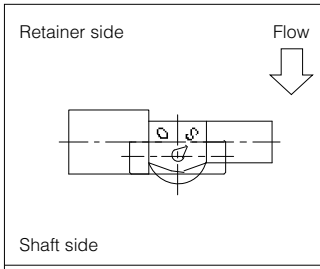
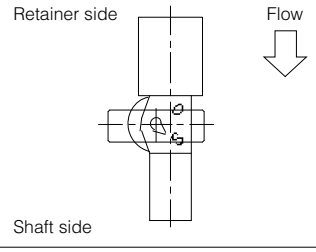
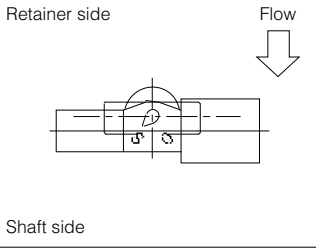
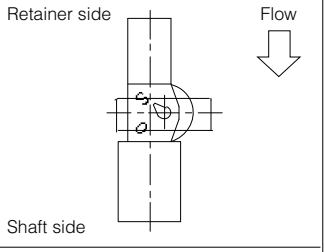
■304YA-3U



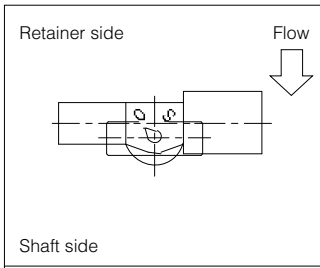
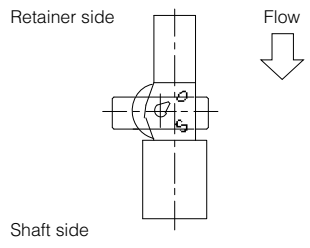
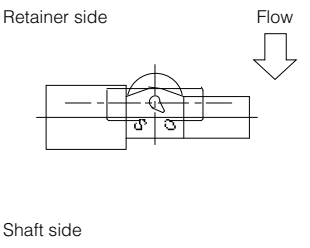
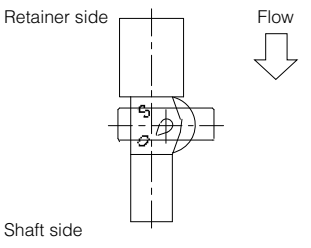
■304YA-3K



■3U Installation direction

			
3UA	3UB	3UC	3UD

■3K Installation direction

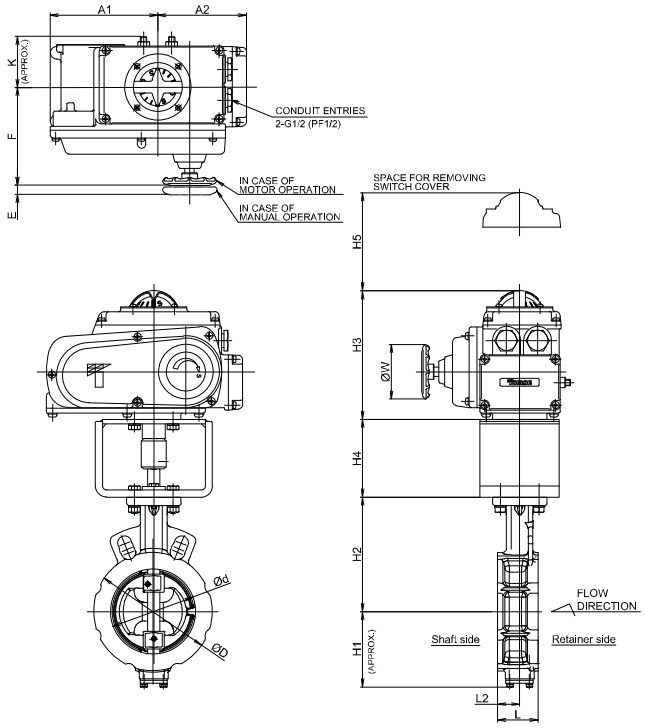
			
3KA	3KB	3KC	3KD

Single phase electric motor type 304YA-4 I (40mm to 300mm)

■304YA-4 I

Nominal size		Dimension (mm)															Motor type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	H_3	H_4	H_5	A_1	A_2	F	K	E	φW		
40	1 1/2	48	81	33	15	57	106	150	100	100	100	102	85	53.8	43	—	NEL-0	9.3
50	2	59	96	43	25.4	67	114	150	100	100	100	102	85	53.8	43	—	NEL-0	9.9
65	2 1/2	73	115	46	27.4	75	125	150	100	100	100	102	85	53.8	43	—	NEL-0	10.6
80	3	87	127	46	24.5	83	132	150	100	100	100	102	85	53.8	43	—	NEL-0	11.1
100	4	109	152	52	28.3	97	147	165	100	100	138	114	126	65	12	70	NEL-1	14.4
125	5	137	183	56	30.1	111	166	198	100	100	167	143	154	85	14	100	NEL-2	22.3
150	6	163	211	57	28.9	129	181	198	100	100	167	143	154	85	14	100	NEL-2	24.6
200	8	213	257	62	30.8	156	212	198	175	100	167	143	154	85	14	100	NEL-2.5	33.6
250	10	263	322	70	33.3	184	243	198	175	100	167	143	154	85	14	100	NEL-2.5	42.3
300	12	315	367	80	40.8	213	290	230	175	100	223	98.5	245.5	136	22.5	200	NEL-3	59.9

■304YA-4 I



■4 I Installation direction

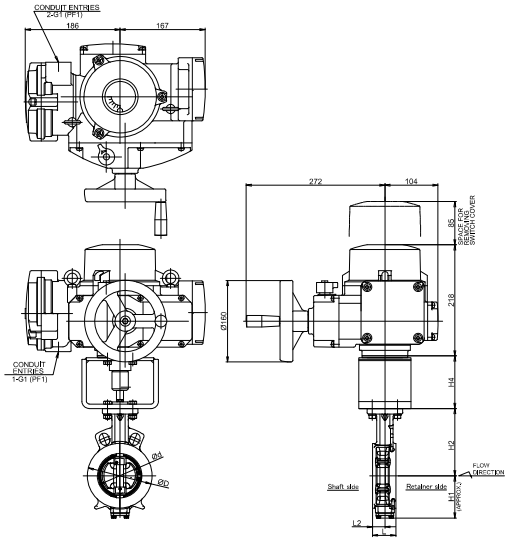
Retainer side / Flow / Shaft side	Retainer side / Flow / Shaft side
4 I A	4 I B
Retainer side / Flow / Shaft side	Retainer side / Flow / Shaft side
4 I C	4 I D

Three phase motor actuator type 304YA-4J(40mm to 300mm)

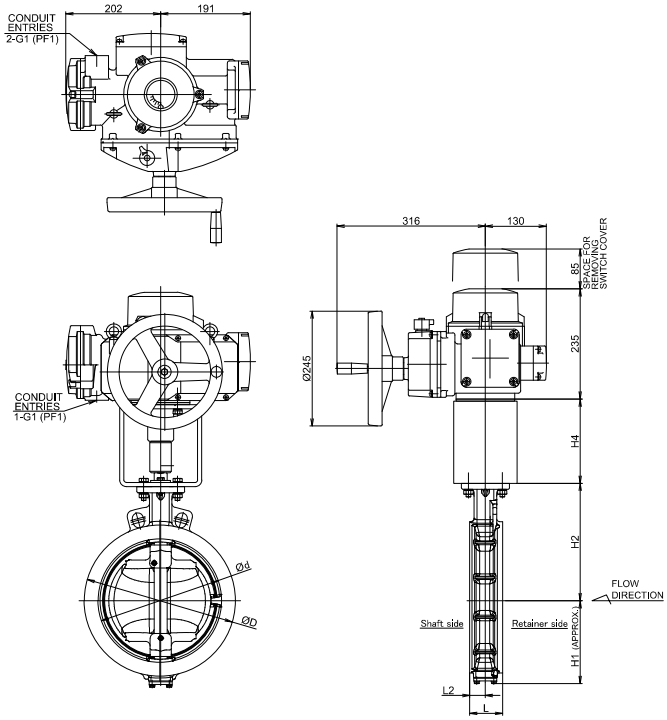
■304YA-4J

Nominal size		Dimension (mm)							Motor type			Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	H_4	Model	90° Control time(sec) (50/60Hz)		
40	1 1/2	48	81	33	15	57	106	103	SRJ-010_40W	9 / 7.5	18 / 15	18.2
50	2	59	96	43	25.4	67	114	103	SRJ-010_40W	9 / 7.5	18 / 15	18.8
65	2 1/2	73	115	46	27.4	75	125	103	SRJ-010_40W	9 / 7.5	18 / 15	19.5
80	3	87	127	46	24.5	83	132	103	SRJ-010_40W	9 / 7.5	18 / 15	20.0
100	4	109	152	52	28.3	97	147	103	SRJ-010_40W	9 / 7.5	18 / 15	21.1
125	5	137	183	56	30.1	111	166	103	SRJ-010_40W	9 / 7.5	18 / 15	23.6
150	6	163	211	57	28.9	129	181	180	SRJ-020_40W	18 / 15	36 / 30	28.9
200	8	213	257	62	30.8	156	212	180	SRJ-060_100W	18 / 15	36 / 30	39.3
250	10	263	322	70	33.3	184	243	180	SRJ-060_100W	18 / 15	36 / 30	48.0
300	12	315	367	80	40.8	213	290	180	SRJ-060_100W	18 / 15	36 / 30	55.2

■304YA-4J 40 to 150mm



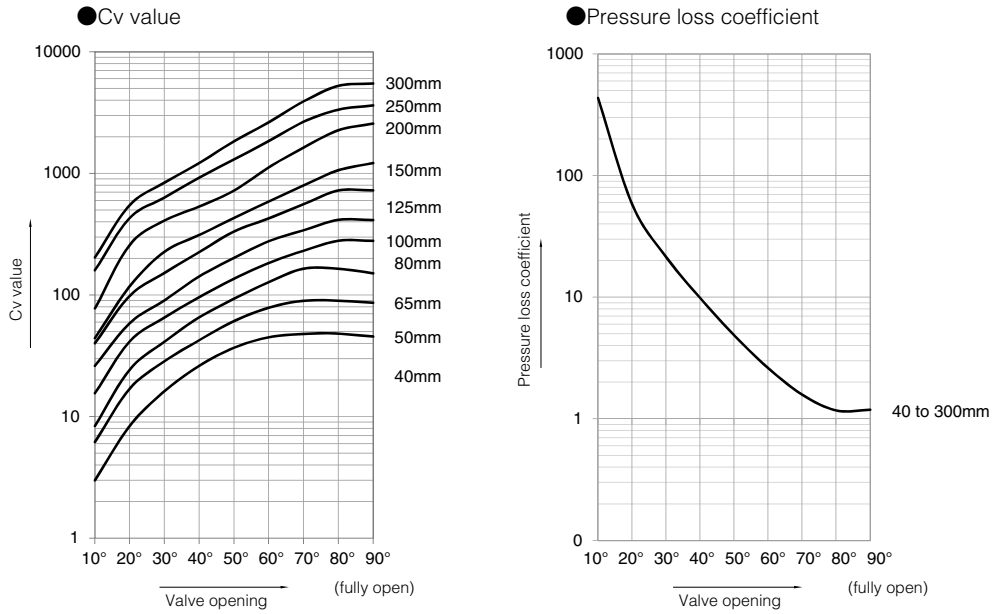
■304YA-4J 200 to 300mm



■4J Installation direction

4JA	4JB	4JC	4JD
Retainer side / Flow / Shaft side	Retainer side / Flow / Shaft side	Retainer side / Flow / Shaft side	Retainer side / Flow / Shaft side

304YA Cv value/pressure loss coefficient



304YA Cv value

Nominal size		Valve opening								
mm	inch	10°	20°	30°	40°	50°	60°	70°	80°	90°
40	1 1/2	3	8	16	26	37	45	48	48	46
50	2	6	17	29	43	61	79	90	90	87
65	2 1/2	8	24	41	66	93	128	165	165	151
80	3	16	42	65	96	137	184	232	280	280
100	4	26	59	91	142	202	277	342	416	414
125	5	40	99	152	226	334	428	559	725	725
150	6	44	118	227	312	431	589	799	1065	1219
200	8	78	259	410	535	725	1123	1632	2272	2570
250	10	160	431	634	926	1306	1848	2662	3352	3628
300	12	204	550	840	1220	1840	2636	3920	5260	5498

304YA Pressure loss coefficient

Nominal size		Valve opening								
mm	inch	10°	20°	30°	40°	50°	60°	70°	80°	90°
40	1 1/2	608	78	21	8	4	3	2	2	3
50	2	348	46	16	7	4	2	2	2	2
65	2 1/2	541	64	22	9	4	2	1	1	2
80	3	360	51	20	10	5	3	2	1	1
100	4	311	62	26	11	5	3	2	1	1
125	5	323	54	23	10	5	3	2	1	1
150	6	554	77	21	11	6	3	2	1	1
200	8	565	51	20	12	7	3	1	1	1
250	10	326	45	21	10	5	2	1	1	1
300	12	416	57	25	12	5	2	1	1	1

304YA Applicable pipe list in case of A, B

Figure A

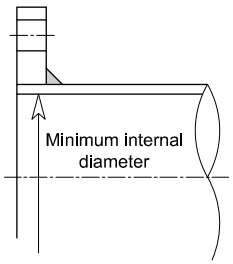
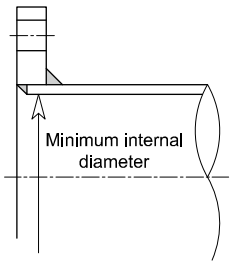


Figure B



Nominal size		JISG3452	JISG3454		JISG3459 (Stainless)	
mm	inch	SGP	Sch20	Sch40	Sch10S	Sch20S
40	1 1/2	○	—	○	○	○
50	2	○	○	○	○	○
65	2 1/2	○	○	○	○	○
80	3	○	○	○	○	○
100	4	○	○	○	○	○
125	5	○	○	○	○	○
150	6	○	○	○	○	○
200	8	○	○	○	○	○
250	10	○	○	○	○	○
300	12	○	○	○	○	○

304YA Piping gasket

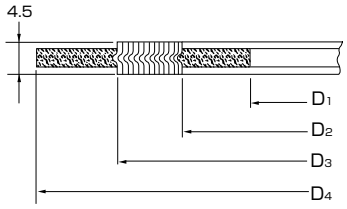
●In case of sheet gasket ..... Any standard can be used excluding 65mm-JIS flange. For 65mm-JIS flange, use the sheet gasket that followed old JIS Standard: JIS B 2404_1999 for inner diameter. For other size, JIS standard products can be used.

●In case of spiral gasket ..... Use special spiral gasket shown below.

■Special spiral gasket

Nominal size		JIS FLANGE JIS 10K				ANSI FLANGE ANSI 150Lb			
mm	inch	D_1	D_2	D_3	D_4	D_1	D_2	D_3	D_4
40	1 1/2	48	54	73	89	48	54	73	85
50	2	61	69	88	104	61	69	88	104
65	2 1/2	73	81	100	124	73	81	100	123
80	3	89	97	120	134	89	97	120	136
100	4	115	124	146	159	115	124	146	174
125	5	140	151	177	190	140	151	177	196
150	6	166	178	207	220	166	178	207	222
200	8	217	227	257	270	217	229	257	279
250	10	268	282	318	332	268	285	318	333
300	12	319	331	362	377	319	335	362	409

Remark : In case a minute leakage of gas (less than 100PPm) becomes a problem, please consult to engineers.



■Available punching gasket and PTFE envelope gasket

Nominal size		Inner diameter permissible max, dimension	Joint sheet and PTFE punching gasket (t≦2mm)			PTFE Envelope gasket (NIPPON VALQUA products: 7030, 7031, 7035 series)		
mm	inch	D	JIS 5K	JIS 10K	ANSI 150Lb	JIS 5K	JIS 10K	ANSI 150Lb
40	1 1/2	55	○	○	○	○	○	○
50	2	69	○	○	○	○	○	○
65	2 1/2	77	×	×	○	×	×	○
80	3	97	○	○	○	○	○	○
100	4	124	○	○	○	○	○	○
125	5	151	○	○	○	○	○	○
150	6	178	○	○	○	○	○	○
200	8	227	○	○	○	○	○	○
250	10	282	○	○	○	○	○	○
300	12	331	○	○	○	○	○	○

Remarks : These gasket cannot use for 65mm of JIS piping.
If use for 65mm, you must choose under 77mm for the inner diameter.
PTFE envelope gasket, NIPPON VALQUA product only available. (In other manufacturers, product size is unavailable.)

304YA Applicable flange standard

Nominal size		JIS		ASME B16.1 ASME B16.5		BS4504 DIN2632,DIN2633 GB/T9113.1	
mm	inch	5K	10K	Class125	Class150	PN10 PN1.0	PN16 PN1.6
40	1 1/2	○	○	○	○	○	△
50	2	○	○	○	○	○	△
65	2 1/2	○	○	○	○	○	△
80	3	○	○	○	○	○	○
100	4	○	○	○	○	○	○
125	5	○	○	○	○	○	○
150	6	○	○	○	○	○	○
200	8	○	○	○	○	○	○
250	10	○	○	○	○	○	△
300	12	○	○	○	○	○	○

○ : Possible to connect.
△ : Allows connection by additional machining.

304YA Piping bolts and nuts sizes

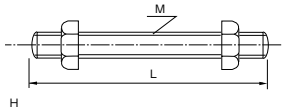
Nominal size		JIS 5K	JIS 10K	ANSI 150Lb
mm	inch			
40	1 1/2	4-M12×100×12	4-M16×120×16	4-U1/2×115×16
50	2	4-M12×120×12	4-M16×130×16	4-U5/8×140×16
65	2 1/2	4-M12×120×12	4-M16×145×16	4-U5/8×155×16
80	3	4-M16×130×16	8-M16×145×16	4-U5/8×155×20
100	4	8-M16×145×16	8-M16×145×16	8-U5/8×155×20
125	5	8-M16×145×16	8-M20×170×20	8-U3/4×175×22
150	6	8-M16×145×16	8-M20×170×20	8-U3/4×175×22
200	8	8-M20×170×20	12-M20×170×20	8-U3/4×205×22
250	10	12-M20×190×20	12-M22×190×22	12-U7/8×215×24
300	12	12-M20×190×20	16-M22×190×22	12-U7/8×215×24

Remark: Long bolt uses full threaded bolt.
Hexagon nut uses heavy nut.

Example

Long bolts: 8 - M16 × 145 × 16
N M L H

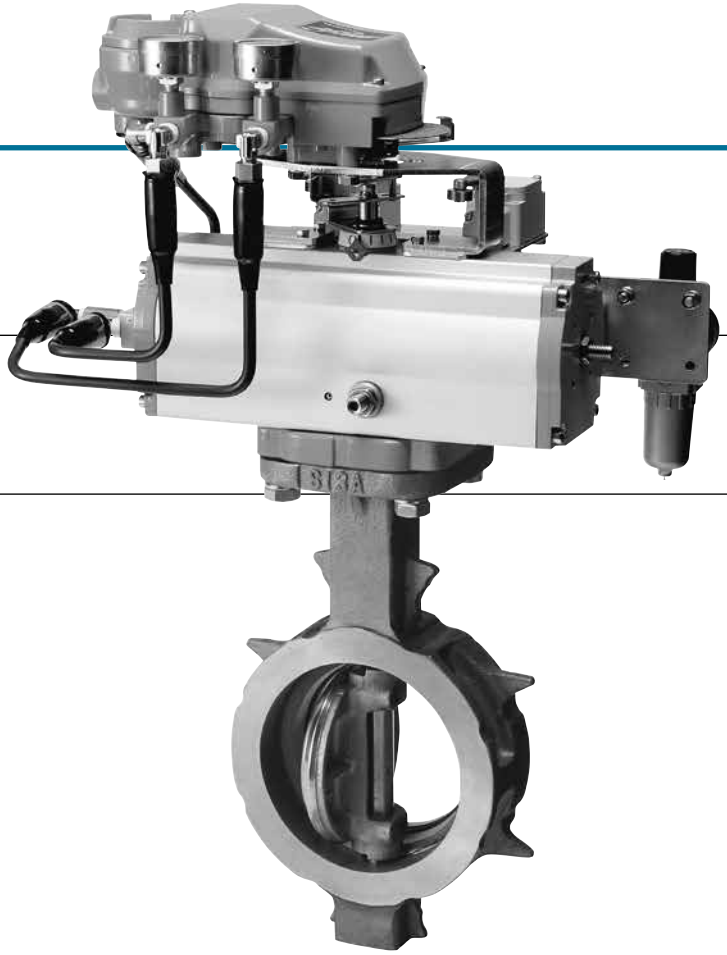
Long bolts and nuts (full thread)



General Purpose High Temperature and High Pressure Service Valves

302Y Wafer

304Y Wafer



Lock Lever | Worm Gear | Pneumatic Cylinder | Motorized

Features and Benefits

Ideal shut-off with new stopper mechanism. Two types of seat – metal and PTFE – for optimum performance in your application.

Unique stopper structure

For the 40 to 300mm models, automatic aligning and disc overrun prevention are ensured by the special spherical design of the inner surface of the body disc hub edge. Disc overrun is prevented by a protrusion on the inner surface of the body.

Double eccentric structure

The disc is rotated easily by minimal torque and unseats after turning only a small angle. Moreover, seat abrasion is prevented for a long life of reliable sealing.

Thin disc with a rigid construction

The disc is thin but ribbed for extra rigidity. The disc reduces thermal expansion and provides consistent sealing even in changing temperature or pressure situations.

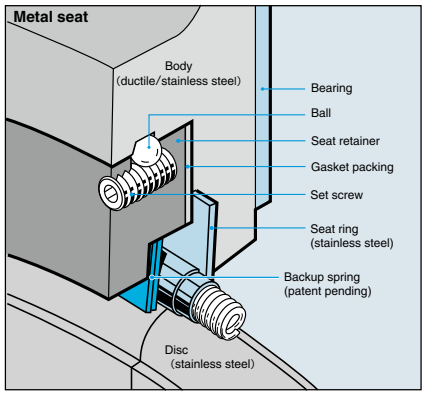
Seal the flow from both directions

Seals flow in both directions. Valve can be used as is, even if the flow changes direction. (There are pressure limitations for each direction of flow. See Pressure-temperature leakage chart for recommended specifications.)

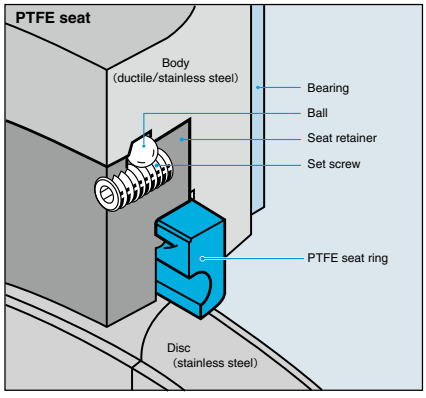
Easy replacement of the seat ring

The ball lock method is used to simplify replacement of the seat ring.

302Y
Resilient metal seat ring with original coil spring



304Y
PTFE seat ring is inert to most chemical products and solvents

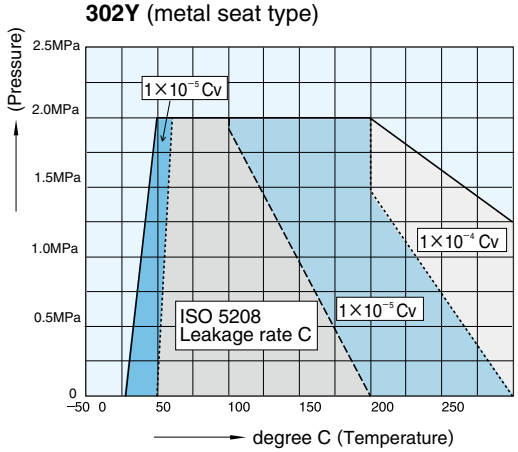


General Description

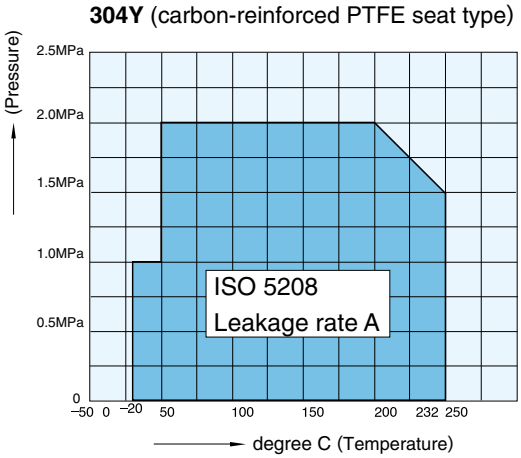
The 300 series is optimal for applications that cannot be handled by valves with rubber seats because of the temperature, pressure, fluid velocity or fluid itself. Two types are available: the 302Y with a metal seat for steam line applications and the 304Y with a PTFE seat for chemical line applications.

Pressure-Temperature Leakage Chart

302Y (metal seat type)



304Y (carbon-reinforced PTFE seat type)



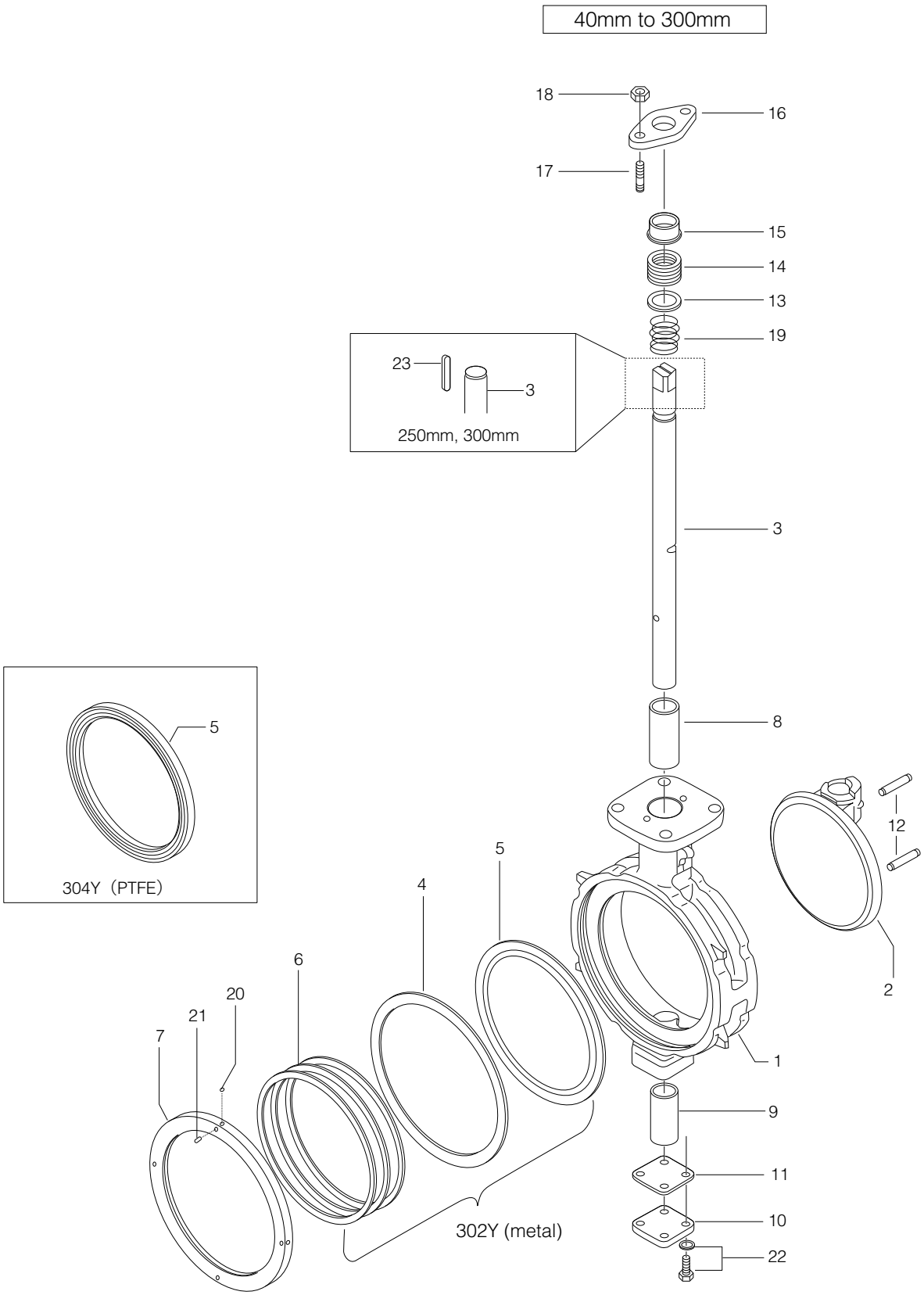
※ The operating range is the area within the thick lines

Standard Specifications

Valve type		302Y	304Y
Seat type		Metal seat type	PTFE seat type
Valve nominal size		40mm to 300mm	40mm to 300mm
Applicable flange standard ※1		JIS 5K/10K/16K/20K, ANSI 150lb, BS10 Table E/F, BS4504, PN 6/10/16, DIN PN 6/10/16 etc	
Face-to-face dimensions		JIS B 2002 (46 series) / ISO 5752 (20 series)	
Actuator mounting flange		ISO 5211	
Pressure rating		ANSI (B16.34, B16.42) Class 150 lb	
Max. working pressure		2.0MPa (250, 300mm: 1.6MPa)	2.0 MPa
Body shell test		Max. 3.0MPa	
Seat leak test		Max. 2.2MPa	
Flow direction		Bi -directional (Standard direction of pressurization: Retainer side) On the valve disc side: 2.0MPa On the valve stem side: 1.0MPa The max. pressure on the valve disc side for 250mm and 300mm valves is 1.6MPa	Bi -directional (Standard direction of pressurization: Retainer side) On the valve disc side: 2.0MPa
Seat leakage		ISO 5208 leakage rate C	ISO 5208 leakage rate A (tight shut-off)
Working temperature range		-20 to 250 degrees C	-20 to 200 degrees C
Standard materials	Body ※2	FCD450 (Tufftride treated) OR SCS13A	
	Disc	SCS13A (HdCr plating)	
	Stem	SUS420J2 or SUS3291J1	
	Seat ring	SUS316	RPTFE (with carbon graphite) or the optional specification PFA + PTFE (white)
	Gland packing	PTFE with carbon graphite	
Bonnet type		Open bonnet	
Actuators	Lock lever	40 to 150mm	
	Worm gear	40 to 300mm	
	Pneumatic cylinder	40 to 300mm	
	Motorised	40 to 300mm	
Coating		Under 200 degrees C: Modified silicon resin coating (Munsell N7). 200 degrees C and over: Heat resistant painting (silver). No painting for stainless steel.	

※1. 65mm is not applicable for BS 10 Table E.
※2. For size 40mm, only SCS13A is available for the body material.
※There is possibility of seat leakage when fluid (powder/liquid) is solidified by working temperature and other cause, especially the valve is in a vertical position(e.g. at the bottom area of discharge spout of hopper and tank). Please consult us.

302Y/304Y Expanded view of components



■302Y Parts list

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
★ 4	Seat ring gasket	1	
★ 5	Seat ring	1	
★ 6	Back-up spring	2	40mm to 100mm
		3	125mm to 200mm
		4	250mm, 300mm
7	Seat ring retainer	1	
8	Top shaft bearing	1	
9	Bottom shaft bearing	1	
10	Bottom cover	1	
★ 11	Bottom gasket	1	
12	Taper pin	2	
13	Packing retainer	1	
★ 14	Gland packing	1 sets	
15	Rough gland	1	
16	Gland flange	1	
17	Gland bolt	2	
18	Gland nut	2	
19	Gland coil	1	Only 40mm to 150mm
★ 20	Ball	2	40mm to 125mm
		4	150mm to 300mm
★ 21	Set screw	2	40mm to 125mm
		4	150mm to 300mm
22	Hexagon bolt, Spring washer	4 sets	
23	Key	1	Only 250mm, 300mm

■304Y Parts list

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
★ 5	Seat ring	1	
7	Seat ring retainer	1	
8	Top shaft bearing	1	
9	Bottom shaft bearing	1	
10	Bottom cover	1	
★ 11	Bottom gasket	1	
12	Taper pin	2	
13	Packing retainer	1	
★ 14	Gland packing	1 sets	
15	Gland bush	1	
16	Gland flange	1	
17	Gland bolt	2	
18	Gland nut	2	
19	Gland coil	1	Only 40mm to 150mm
★ 20	Ball	2	40mm to 125mm
		4	150mm to 300mm
★ 21	Set screw	2	40mm to 125mm
		4	150mm to 300mm
22	Hexagon bolt, Spring washer	4 sets	
23	Key	1	Only 250mm, 300mm

Remark: The ★ indicates recommended spare parts. They are supplied as "Seat ring set" with a small hexagonal spanner to remove set screws (Part #21 Set screw).

302Y Actuator selection chart

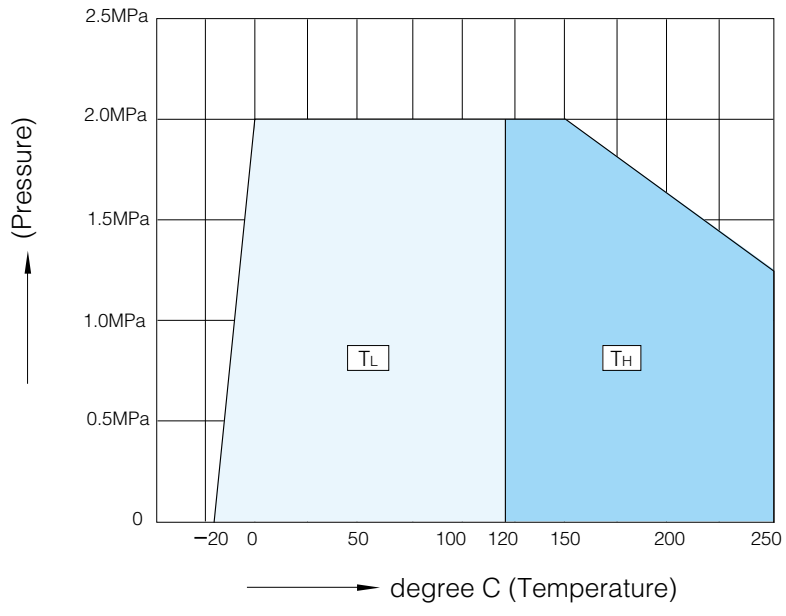
■302Y

Model	Category	Size (mm / inch)									
		40	50	65	80	100	125	150	200	250	300
		1 1/2	2	2 1/2	3	4	5	6	8	10	12
1T	T_L / T_H	1T-1			1T-2			1T-3			
2U,2S	T_L / T_H	2U-0	2U-1		2U-2		2U-3	2U-4	DGH-2	DGH-3	
7E,3A	T_L / T_H	T85		T200		T200	T380	T380	T750	TGA-125	
7G,7F 3U,3K	T_L / T_H	T200S			T380S		T750S	TG-12S		TG-14S	
4 I	T_L	4 I-0			4 I-2			4 I-2.5	4 I-3		4 I-4 (control)
	T_H			4 I-1							4 I-4
4J,4L	T_L / T_H	SRJ-010			SRJ-020			SRJ-060		LTKD-01 0.2kW/ DGH-3	

Remark: For the 300mm model with the accessories below (for control), type 4I-4 should be selected.

- Micom unit
- Servo unit
- Speed control unit
- Potentiometer

302Y Pressure rating

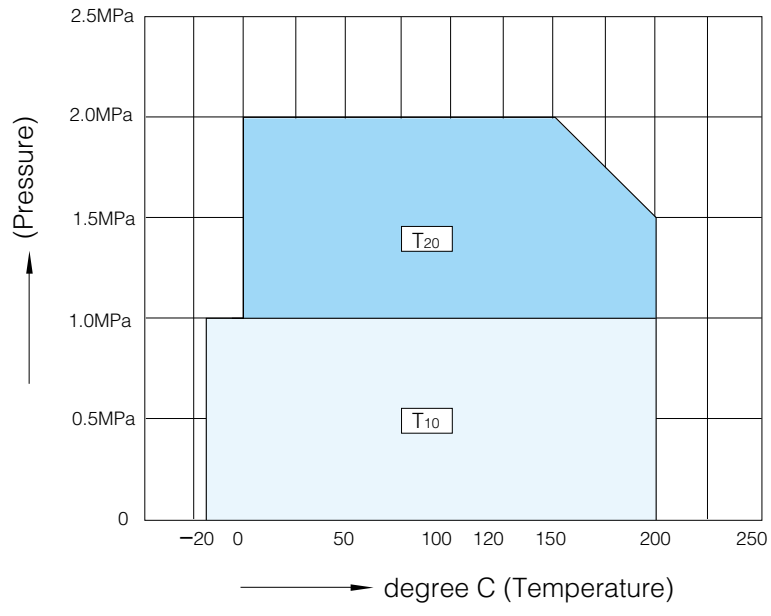


304Y Actuator selection chart

■304Y

Model	Category	Size (mm / inch)									
		40	50	65	80	100	125	150	200	250	300
		1 1/2	2	2 1/2	3	4	5	6	8	10	12
1T	T10 / T20	1T-1			1T-2			1T-3			
2U	T10 / T20	2U-0	2U-1		2U-2			2U-4		2U-5	
7E	T10 / T20	T35			T85		T200		T380	T750	
7G,7F 3U,3K	T10 / T20	T85S			T200S	T380S	T380S	T750S		TG-12S	
4 I	T10 / T20	4 I-0				4 I-1	4 I-2		4 I-2.5	4 I-3	
4J	T10 / T20	SRJ-010						SRJ-020		SRJ-060	

304Y Pressure rating



302Y/304Y Bare shaft (01: 40mm to 200mm, 02: 250mm, 300mm)

■302Y-01/02, 304Y-01/02

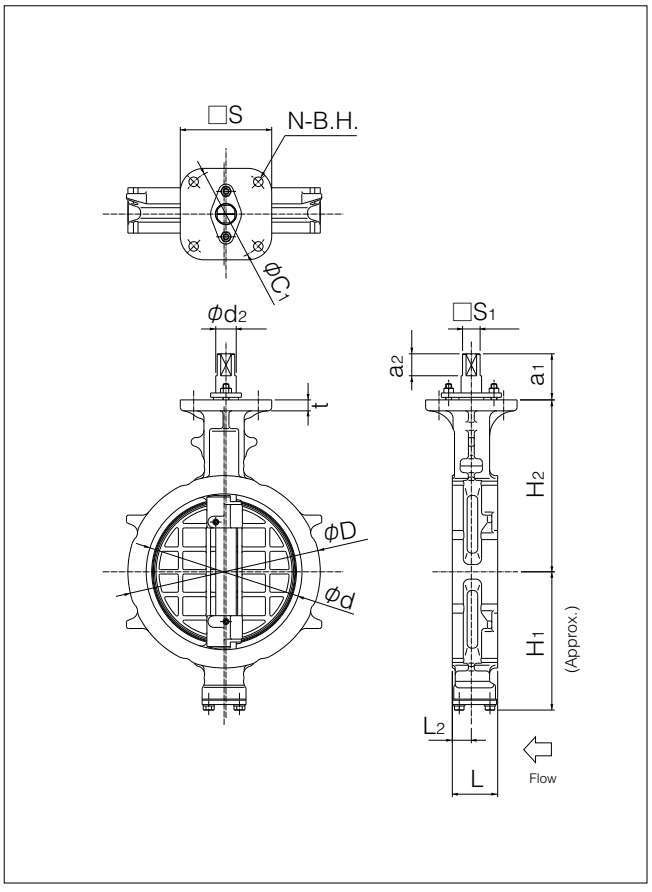
Stem design	Nominal size		Dimension (mm)														Approx. Mass (kg)
	mm	inch	φd	φD	L	L_2	H_1	H_2	a_1	a_2	□S_1	φd_2	b	t_2	t	Flange type	
01	40	1 1/2	48	81	33	15	64	118	47.5	11.5	8	10	–	–	12	F07	2.1
	50	2	60	97	43	21	74	125	47.5	11.5	10	12	–	–	12	F07	2.5
	65	2 1/2	74	117	46	22	85	138	47.5	11.5	12	14	–	–	12	F07	3.6
	80	3	89	127	46	21	95	147	52.5	16.5	14	16	–	–	15	F10	4.7
	100	4	112	152	52	22	110	170	52.5	16.5	14	16	–	–	15	F10	5.7
	125	5	137	183	56	24	139	185	52.5	16.5	16	20	–	–	15	F10	8.8
	150	6	163	213	57	23	164	205	55.5	20	18	22	–	–	15	F12	12
	200	8	213	263	62	26	190	235	63.0	30	24	28	–	–	15	F12	18
02	250	10	263	325	70	30	236	283	108.0	65	–	32	10	3	18	F14	32
	300	12	315	368	80	34	246	310	113.0	70	–	35	10	3	18	F14	39

Stem design	
	01 : Square
	02 : Round with key

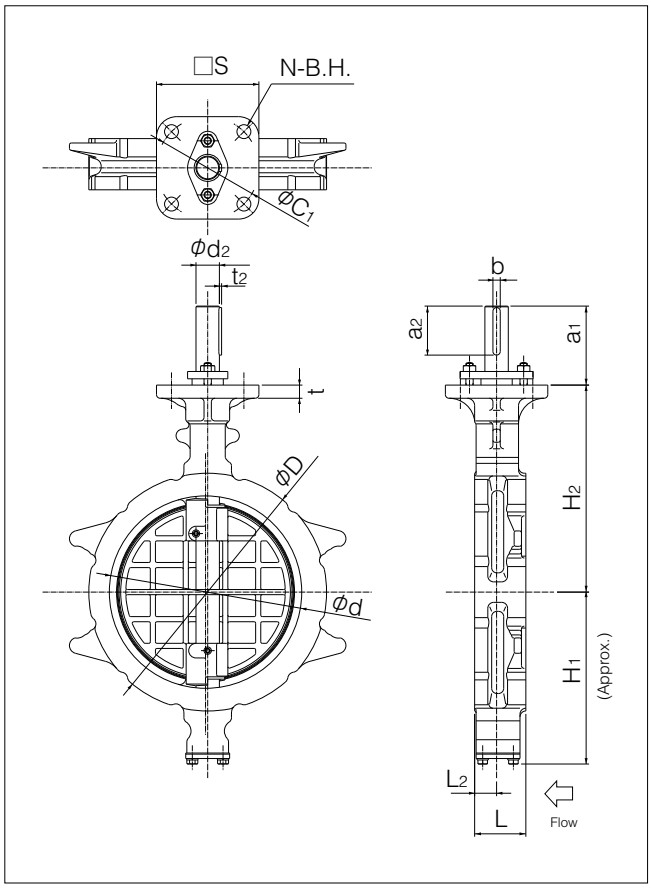
■Top flange

Flange type	□S	φC_1	N	B.H.
F07	70	70	4	9
F10	102	102	4	11
F12	125	125	4	13
F14	140	140	4	19

■302Y/304Y 40mm to 200mm



■302Y/304Y 250mm, 300mm

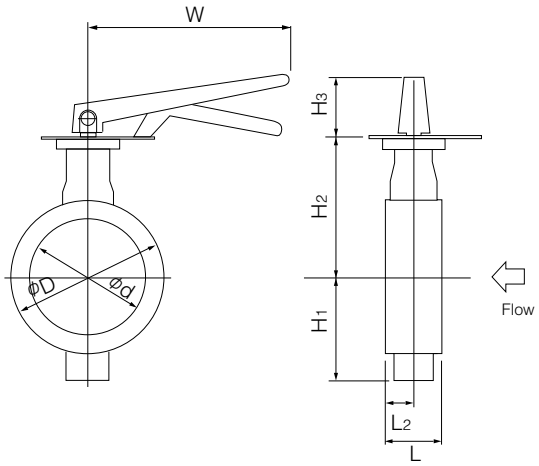


Lock lever type 302Y/304Y-1T（40mm to 150mm）

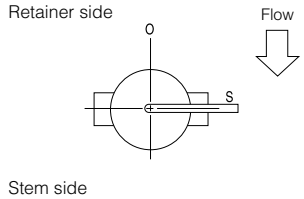
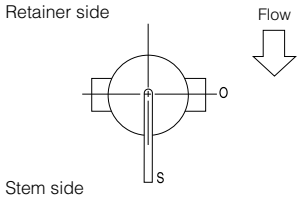
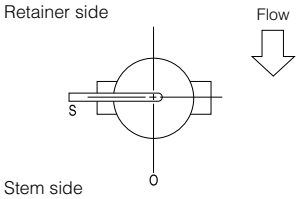
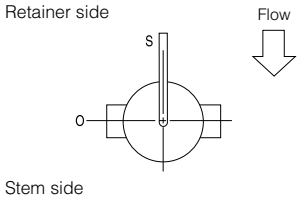
■302Y-1T, 304Y-1T

Nominal size		Dimension (mm)								Lever type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	H_3	W		
40	1 1/2	48	81	33	15	64	118	91	200	1T-1	3.1
50	2	60	97	43	21	74	125	91	200	1T-1	3.5
65	2 1/2	74	117	46	22	85	138	91	200	1T-1	4.6
80	3	89	127	46	21	95	147	117	300	1T-2	6.8
100	4	112	152	52	22	110	170	117	300	1T-2	7.8
125	5	137	183	56	24	139	185	117	300	1T-2	10.9
150	6	163	213	57	23	164	205	125	350	1T-3	14.1

■302Y-1T, 304Y-1T



■1T Installation direction

			
1TA	1TB	1TC	1TD

Tom Disco 302Y/304Y

Worm gear type 302Y-2U（40mm to 150mm）/ 302Y-2S (200mm to 300mm) / 304Y-2U（40mm to 300mm）

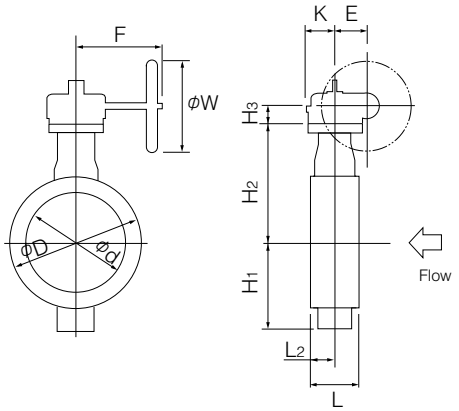
■302Y-2U（40mm to 150mm）/ 2S (200mm to 300mm)

Nominal size		Dimension (mm)											Gear type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	H_3	E	K	F	φW		
40	1 1/2	48	81	33	15	64	118	56	36	46	160	100	2U-0	5
50	2	60	97	43	21	74	125	56	36	46	160	100	2U-1	5.4
65	2 1/2	74	117	46	22	85	138	56	36	46	160	100	2U-1	6.5
80	3	89	127	46	21	95	147	61	44	53	173.5	160	2U-2	7.6
100	4	112	152	52	22	110	170	61	44	53	173.5	160	2U-2	8.6
125	5	137	183	56	24	139	185	68	67	75	198	200	2U-3	18
150	6	163	213	57	23	164	205	77.5	87.5	90	222.5	200	2U-4	28.5
200	8	213	263	62	26	190	235	72	85	126	246	280	DGH-2	38
250	10	263	325	70	30	236	283	97	117	164	335	355	DGH-3	69
300	12	315	368	80	34	246	310	97	117	164	335	355	DGH-3	76

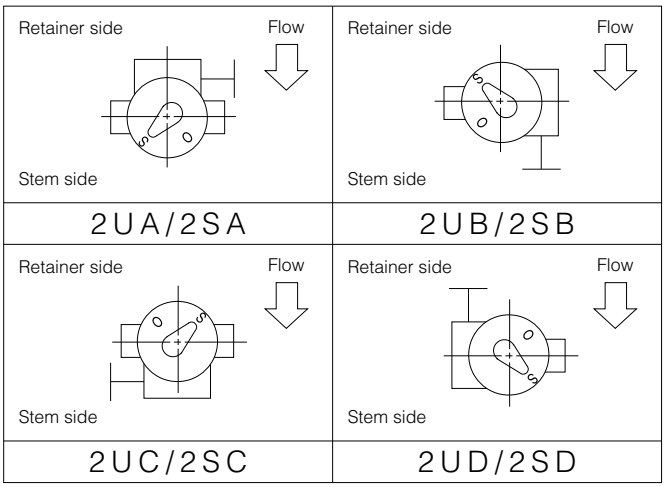
■304Y-2U

Nominal size		Dimension (mm)											Gear type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	H_3	E	K	F	φW		
40	1 1/2	48	81	33	15	64	118	56	36	46	160	100	2U-0	5
50	2	60	97	43	21	74	125	56	36	46	160	100	2U-1	5.4
65	2 1/2	74	117	46	22	85	138	56	36	46	160	100	2U-1	6.5
80	3	89	127	46	21	95	147	61	44	53	173.5	160	2U-2	7.6
100	4	112	152	52	22	110	170	61	44	53	173.5	160	2U-2	8.6
125	5	137	183	56	24	139	185	61	44	53	173.5	160	2U-2	11.9
150	6	163	213	57	23	164	205	77.5	87.5	90	222.5	200	2U-4	28.5
200	8	213	263	62	26	190	235	77.5	87.5	90	222.5	200	2U-4	34.5
250	10	263	325	70	30	236	283	90	87.5	90	222.5	280	2U-4	49.7
300	12	315	368	80	34	246	310	92	90	105	266	280	2U-5	61

■302Y-2U/2S
■304Y-2U



■2U/2S Installation direction



Double-acting pneumatic cylinder type 302Y-7E(40mm to 200mm) / 304Y-7E(40mm to 300mm)

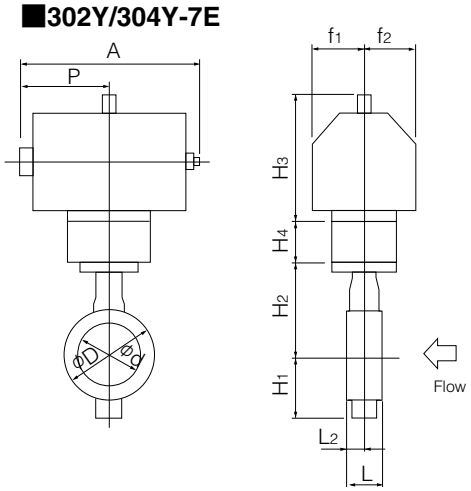
■302Y-7E

Nominal size		Dimension (mm)													Cylinder type	Approx. Mass (kg)
mm	inch	Φd	ΦD	L	L_2	H_1	H_2	Category	H_3	H_4	A	P	f_1	f_2		
40	1 1/2	48	81	33	15	64	118	T_L,T_H	168	26.5	276	142	75	47	T85	8
50	2	60	97	43	21	74	125	T_L,T_H	168	26.5	276	142	75	47	T85	8
65	2 1/2	74	117	46	22	85	138	T_L	168	26.5	276	142	75	47	T85	9
								T_H	203	26.5	346	176	79	57	T200	13
80	3	89	127	46	21	95	147	T_L	168	26.5	276	142	75	47	T85	11
								T_H	203	26.5	346	176	79	57	T200	14
100	4	112	152	52	22	110	170	T_L	203	26.5	346	176	79	57	T200	15
								T_H	231	26.5	423	214	91	69	T380	21
125	5	137	183	56	24	139	185	T_L	203	26.5	346	176	79	57	T200	18
								T_H	231	26.5	423	214	91	69	T380	24
150	6	163	213	57	23	164	205	T_L	231	29.5	423	214	91	69	T380	28
								T_H	269	29.5	546	270	118	85	T750	38
200	8	213	263	62	26	190	235	T_L,T_H	269	29.5	546	270	118	85	T750	44

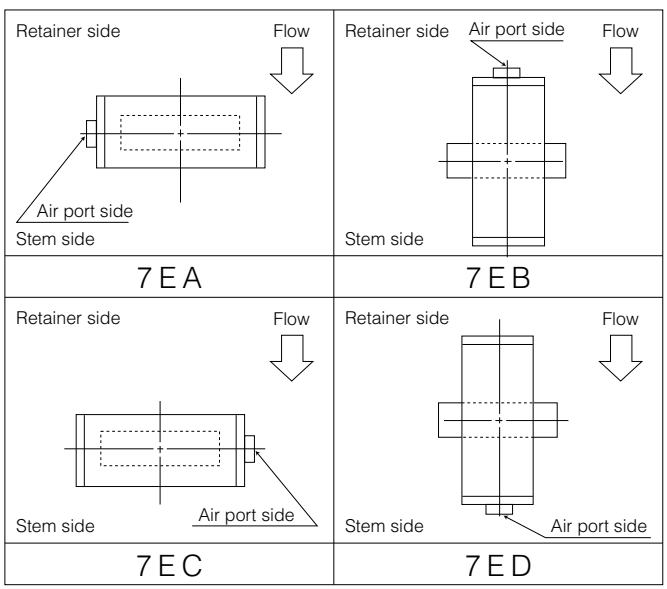
■304Y-7E

Nominal size		Dimension (mm)													Cylinder type	Approx. Mass (kg)
mm	inch	Φd	ΦD	L	L_2	H_1	H_2	Category	H_3	H_4	A	P	f_1	f_2		
40	1 1/2	48	81	33	15	64	118	T_{10},T_{20}	125	26.5	228	116	57	29	T35	5
50	2	60	97	43	21	74	125	T_{10},T_{20}	125	26.5	228	116	57	29	T35	5
65	2 1/2	74	117	46	22	85	138	T_{10}	125	26.5	228	116	57	29	T35	6
								T_{20}	168	26.5	276	142	75	47	T85	9
80	3	89	127	46	21	95	147	T_{10},T_{20}	168	26.5	276	142	75	47	T85	11
100	4	112	152	52	22	110	170	T_{10}	168	26.5	276	142	75	47	T85	12
								T_{20}	203	26.5	346	176	79	57	T200	15
125	5	137	183	56	24	139	185	T_{10},T_{20}	203	26.5	346	176	79	57	T200	18
150	6	163	213	57	23	164	205	T_{10},T_{20}	203	29.5	346	176	79	57	T200	22
200	8	213	263	62	26	190	235	T_{10},T_{20}	231	29.5	423	214	91	69	T380	34
250	10	263	325	70	30	236	283	T_{10}	231	190	423	214	91	87.5	T380	62
								T_{20}	269	190	546	270	118	87.5	T750	72
300	12	315	368	80	34	246	310	T_{10},T_{20}	269	190	546	270	118	87.5	T750	79

■302Y/304Y-7E



■7E Installation direction

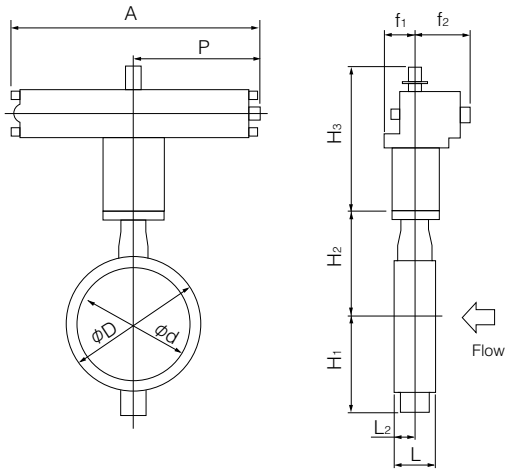


Double-acting pneumatic cylinder type 302Y-3A (250, 300mm)

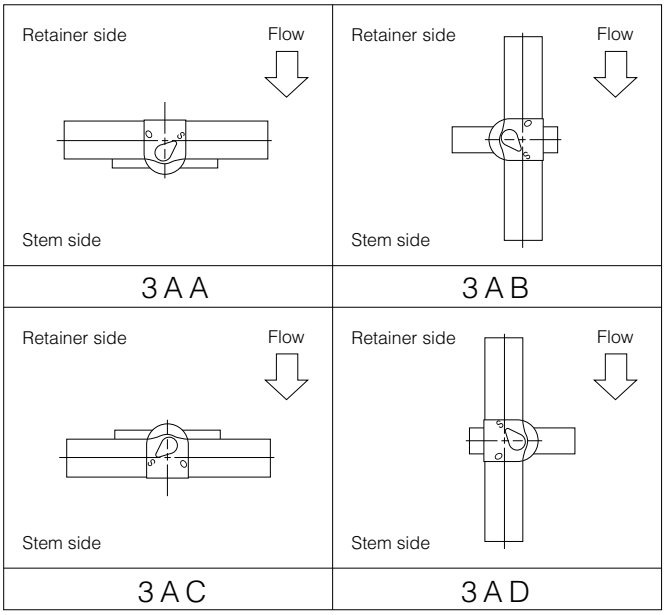
■302Y-3A

Nominal size		Dimension (mm)												Cylinder type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	A	P	f_1	f_2		
250	10	263	325	70	30	236	283	T_L,T_H	424	754	381	71	167	TGA-125	78
300	12	315	368	80	34	246	310	T_L,T_H	424	754	381	71	167	TGA-125	85

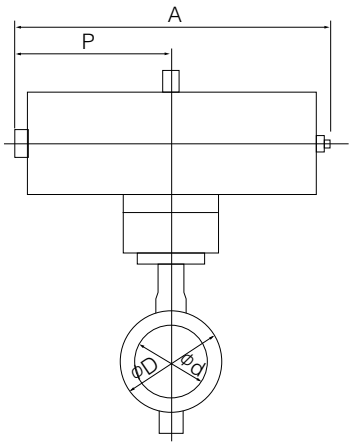
■302Y-3A



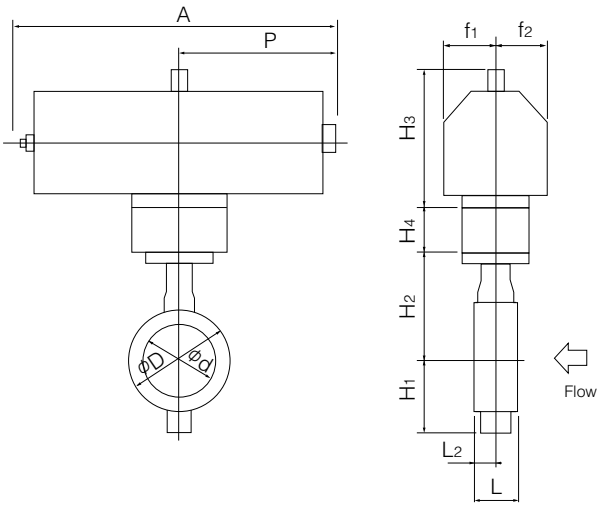
■3A Installation direction



■304A-7F



■304A-7G



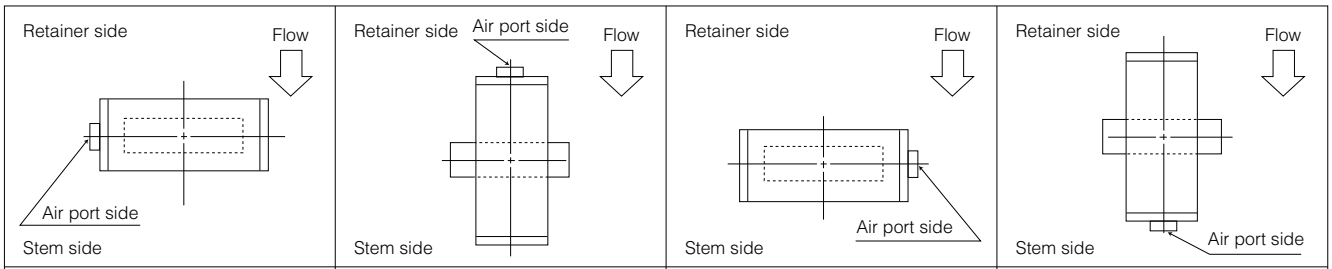
■302Y-7G/7F

Nominal size		Dimension (mm)													Cylinder type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	H_4	A	P	f_1	f_2		
40	1 1/2	48	81	33	15	64	118	T_L,T_H	203	26.5	449	226	79	57	T200S	14
50	2	60	97	43	21	74	125	T_L	203	26.5	449	226	79	57	T200S	14
								T_H	231	26.5	550	276	91	69	T380S	23
65	2 1/2	74	117	46	22	85	138	T_L	203	26.5	449	226	79	57	T200S	15
								T_H	231	26.5	550	276	91	69	T380S	24
80	3	89	127	46	21	95	147	T_L,T_H	231	26.5	550	276	91	69	T380S	25
100	4	112	152	52	22	110	170	T_L	231	26.5	550	276	91	69	T380S	26
								T_H	269	26.5	723	360	118	85	T750S	40
125	5	137	183	56	24	139	185	T_L,T_H	269	26.5	723	360	118	85	T750S	43
150	6	163	213	57	23	164	205	T_L	269	29.5	723	360	118	85	T750S	47

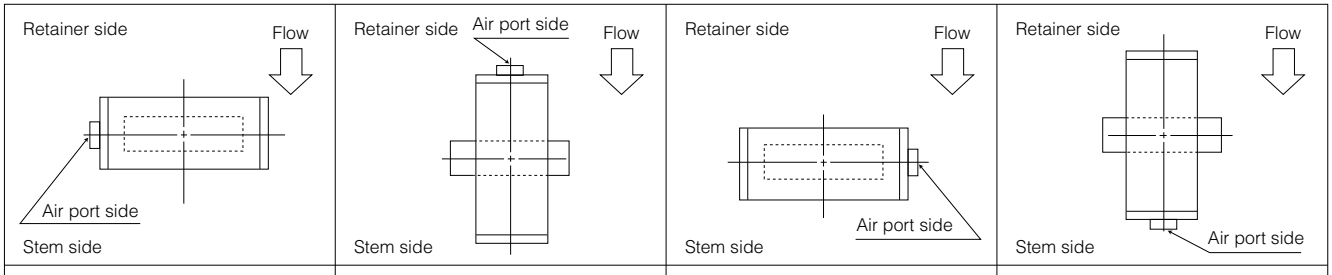
■304Y-7G/7F

Nominal size		Dimension (mm)													Cylinder type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	H_4	A	P	f_1	f_2		
40	1 1/2	48	81	33	15	64	118	T_{10},T_{20}	168	26.5	364	183	75	47	T85S	10
50	2	60	97	43	21	74	125	T_{10},T_{20}	168	26.5	364	183	75	47	T85S	10
65	2 1/2	74	117	46	22	85	138	T_{10}	168	26.5	364	183	75	47	T85S	11
								T_{20}	203	26.5	449	226	79	57	T200S	15
80	3	89	127	46	21	95	147	T_{10},T_{20}	203	26.5	449	226	79	57	T200S	17
100	4	112	152	52	22	110	170	T_{10}	203	26.5	449	226	79	57	T200S	18
								T_{20}	231	26.5	550	276	91	69	T380S	26
125	5	137	183	56	24	139	185	T_{10}	231	26.5	550	276	91	69	T380S	29
								T_{20}	269	26.5	723	360	118	85	T750S	43
150	6	163	213	57	23	164	205	T_{10},T_{20}	269	29.5	723	360	118	85	T750S	47
200	8	213	263	62	26	190	235	T_{10}	269	29.5	723	360	118	85	T750S	53

■7F Installation direction



■7G Installation direction



Tom Disco 302Y/304Y

Single-acting pneumatic cylinder type 302Y-3U(Air to open: 150mm to 300mm) / 302Y-3K(Air to close: 150mm to 300mm)
304Y-3U(Air to open: 200mm to 300mm) / 304Y-3K(Air to close: 200mm to 300mm)

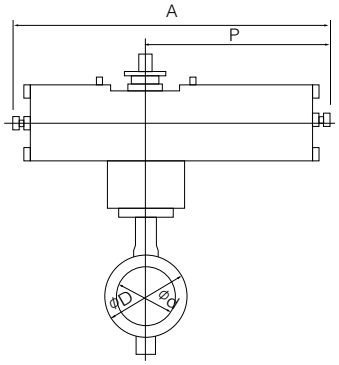
■302Y-3U/3K

Nominal size		Dimension (mm)												Cylinder type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	A	P	f_1	f_2		
150	6	163	213	57	23	164	205	T_L	377	945	585	75	165	TG-10S	70
								T_H	377	1080	720	94	206	TG-12S	116
200	8	213	263	62	26	190	235	T_L,T_H	377	1080	720	94	206	TG-12S	122
250	10	263	325	70	30	236	283	T_L,T_H	450	1255	865	131	257	TG-14S	238
300	12	315	368	80	34	246	310	T_L,T_H	450	1255	865	131	257	TG-14S	245

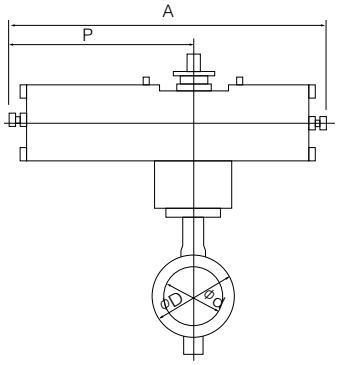
■304Y-3U/3K

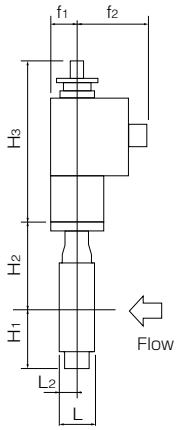
Nominal size		Dimension (mm)												Cylinder type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	A	P	f_1	f_2		
200	8	213	263	62	26	190	235	T_{10}	377	945	585	75	165	TG-10S	77
								T_{20}	377	1080	720	94	206	TG-12S	122
250	10	263	325	70	30	236	283	T_{10},T_{20}	417	1080	720	94	206	TG-12S	137
300	12	315	368	80	34	246	310	T_{10},T_{20}	417	1080	720	94	206	TG-12S	144

■302Y/304Y-3K

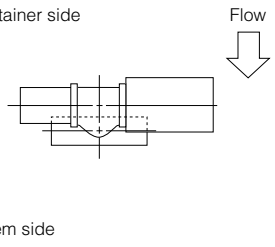
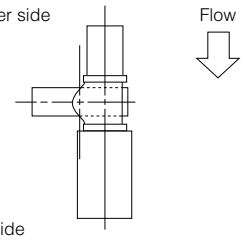
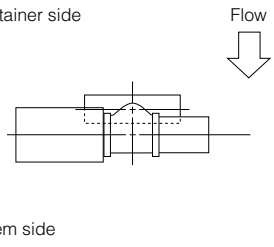
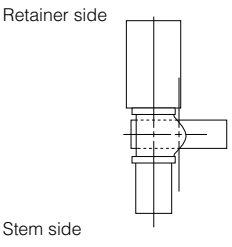


■302Y/304Y-3U

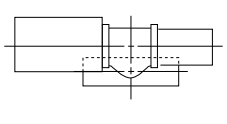
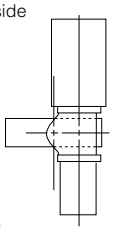
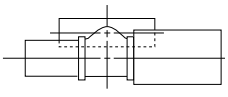
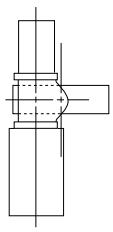




■3K Installation direction

			
Retainer side / Flow / Stem side	Retainer side / Flow / Stem side	Retainer side / Flow / Stem side	Retainer side / Flow / Stem side
3KA	3KB	3KC	3KD

■3U Installation direction

			
Retainer side / Flow / Stem side	Retainer side / Flow / Stem side	Retainer side / Flow / Stem side	Retainer side / Flow / Stem side
3UA	3UB	3UC	3UD

Single phase electric motor type 302Y/304Y-4 I(40mm to 300mm)

■302Y-4 I

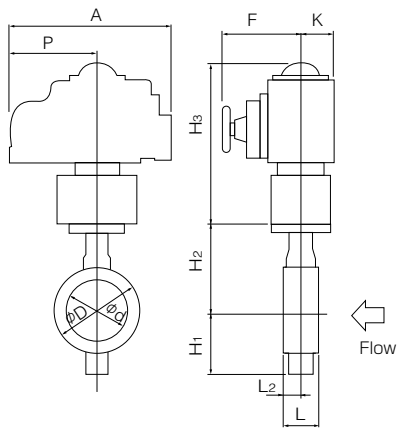
Nominal size		Dimension (mm)												Motor type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	A	P	F	K		
40	1 1/2	48	81	33	15	64	118	T_L,T_H	250	202	100	85	54	4 I-0	9.4
50	2	60	97	43	21	74	125	T_L,T_H	250	202	100	85	54	4 I-0	9.8
65	2 1/2	74	117	46	22	85	138	T_L	250	202	100	85	54	4 I-0	10.8
								T_H	265	252	138	126	65	4 I-1	13
80	3	89	127	46	21	95	147	T_L,T_H	298	310	167	154	85	4 I-2	20
100	4	112	152	52	22	110	170	T_L,T_H	298	310	167	154	85	4 I-2	21
125	5	137	183	56	24	139	185	T_L,T_H	298	310	167	154	85	4 I-2	24
150	6	163	213	57	23	164	205	T_L,T_H	373	310	167	154	85	4 I-2.5	31
200	8	213	263	62	26	190	235	T_L,T_H	405	388	223	246	136	4 I-3	48
250	10	263	325	70	30	236	283	T_L,T_H	420	388	223	246	136	4 I-3	65
300	12	315	368	80	34	246	310	$T_{L(Remark)}$	420	388	223	246	136	4 I-3	72
								T_H	423	388	223	246	136	4 I-4	77

Remark: For the 300mm model with the accessories on the right (for control) type 4I-4 should be selected. ●Micom unit ●Servo unit ●Speed control unit ●Potentiometer

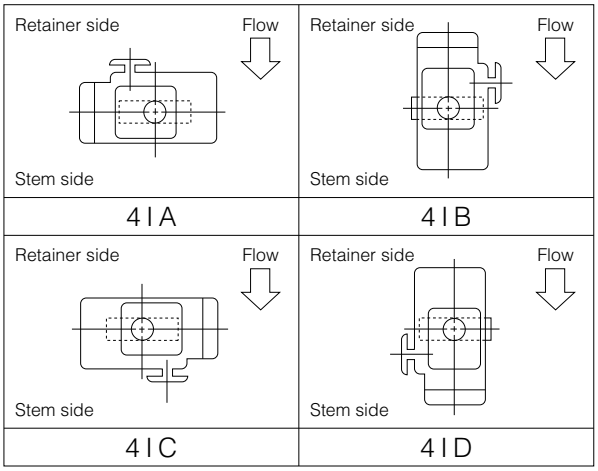
■304Y-4 I

Nominal size		Dimension (mm)												Motor type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	A	P	F	K		
40	1 1/2	48	81	33	15	64	118	T_{10},T_{20}	250	202	100	85	54	4 I-0	9.4
50	2	60	97	43	21	74	125	T_{10},T_{20}	250	202	100	85	54	4 I-0	9.8
65	2 1/2	74	117	46	22	85	138	T_{10},T_{20}	250	202	100	85	54	4 I-0	10.8
80	3	89	127	46	21	95	147	T_{10},T_{20}	250	202	100	85	54	4 I-0	11.8
100	4	112	152	52	22	110	170	T_{10}	265	252	138	126	65	4 I-1	15
								T_{20}	298	310	167	154	85	4 I-2	21
125	5	137	183	56	24	139	185	T_{10},T_{20}	298	310	167	154	85	4 I-2	24
150	6	163	213	57	23	164	205	T_{10},T_{20}	373	310	167	154	85	4 I-2	29
200	8	213	263	62	26	190	235	T_{10},T_{20}	373	310	167	154	85	4 I-2.5	38
250	10	263	325	70	30	236	283	T_{10}	411	310	167	154	85	4 I-2.5	55.5
								T_{20}	420	388	223	246	136	4 I-3	65
300	12	315	368	80	34	246	310	T_{10},T_{20}	420	388	223	246	136	4 I-3	72

■302Y/304Y-4 I



■4I Installation direction

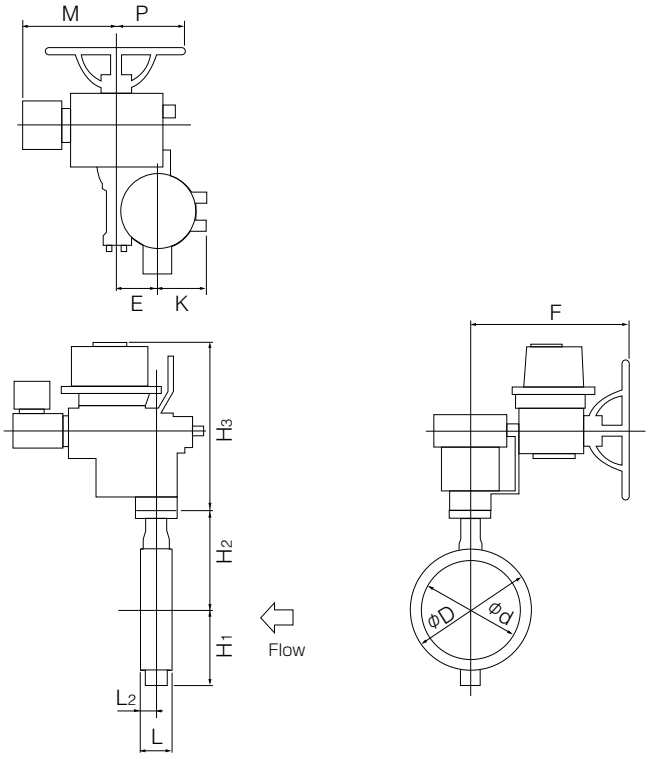


Three phase motor actuator type 302Y-4L(250mm, 300mm)

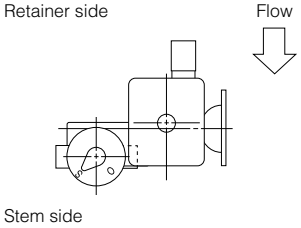
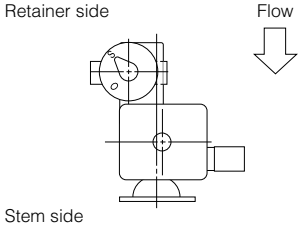
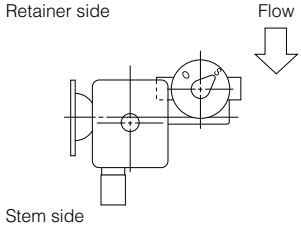
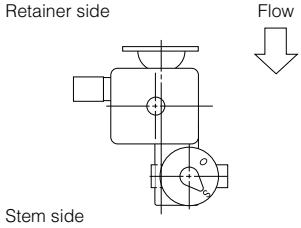
■302Y-4L

Nominal size		Dimension (mm)													Motor type	Approx. Mass (kg)
mm	inch	φd	φD	L	L_2	H_1	H_2	Category	H_3	E	K	F	M	P		
250	10	263	325	70	30	236	283	T_L,T_H	547	117	164	533	357	230	LTKD-01 0.2kW/ DGH-3	123
300	12	315	368	80	34	246	310	T_L,T_H	547	117	164	533	357	230	LTKD-01 0.2kW/ DGH-3	130

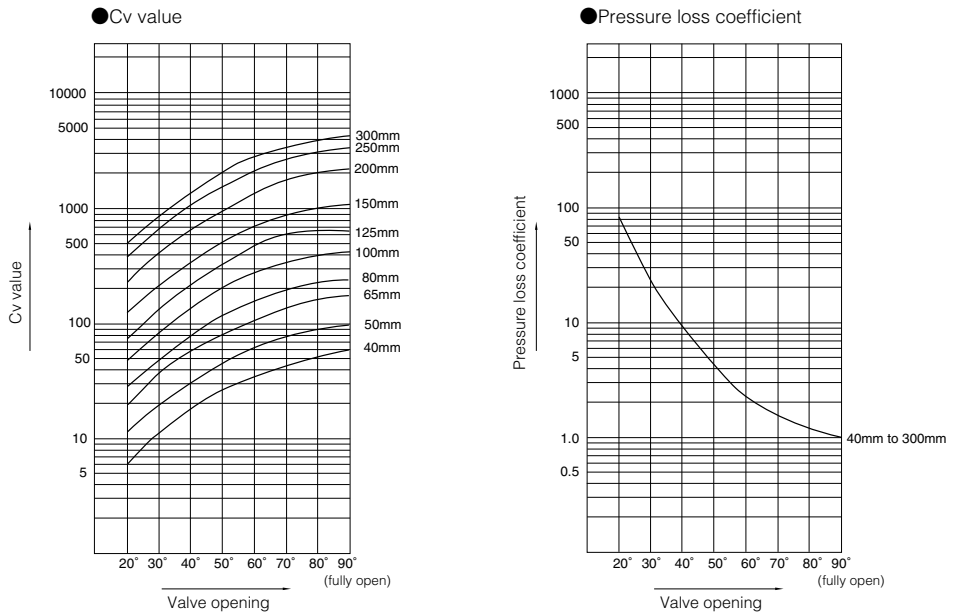
■302Y-4L



■4L Installation direction

			
4LA	4LB	4LC	4LD

302Y/304Y Cv value/pressure loss coefficient



302Y/304Y Cv value

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
40	1 1/2	6	12	20	30	39	49	57	60
50	2	11	21	33	49	64	80	95	99
65	2 1/2	20	37	59	86	112	140	168	176
80	3	29	54	84	123	161	207	244	252
100	4	48	90	143	209	277	351	415	432
125	5	76	143	229	336	438	551	653	684
150	6	129	225	372	531	722	898	1075	1116
200	8	240	422	700	990	1361	1690	1982	2070
250	10	400	704	1157	1650	2255	2826	3298	3443
300	12	505	890	1465	2084	2860	3568	4178	4354

302Y/304Y Pressure loss coefficient

Nominal size		Valve opening							
mm	inch	20°	30°	40°	50°	60°	70°	80°	90°
40	1 1/2	184	72	16	7	4	3	2	2
50	2	142	38	15	7	4	3	2	2
65	2 1/2	116	33	13	6	4	2	2	1
80	3	111	32	13	6	4	2	2	1
100	4	117	33	13	6	3	2	2	1
125	5	110	31	12	6	3	2	1	1
150	6	75	24	9	4	2	2	1	1
200	8	65	21	8	4	2	1	1	1
250	10	56	18	7	3	2	1	1	1
300	12	72	23	9	4	2	1	1	1

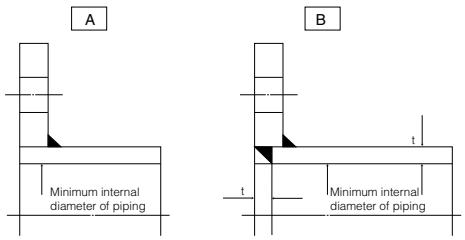
302Y/304Y Applicable pipe list in case of A

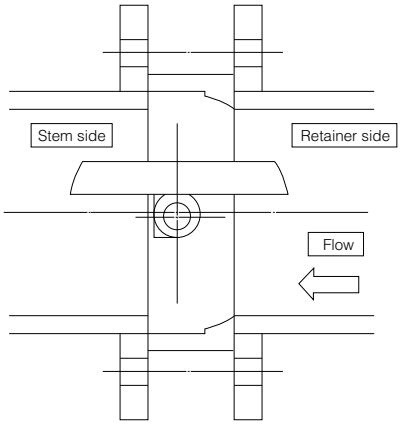
Nominal size		SGP		Sch20		Sch40		Sch60		Sch80		Sch10S		Sch20S		Minimum internal diameters of piping (mm)
mm	inch	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	
40	1 1/2	○	○	—	—	○	○	○	○	○	○	○	○	○	○	32.7
50	2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	34.6
65	2 1/2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	53.6
80	3	○	○	○	○	○	○	○	○	○	○	○	○	○	○	72.5
100	4	○	○	○	○	○	○	○	○	○	○	○	○	○	○	93.8
125	5	○	○	○	○	○	○	○	○	○	○	○	○	○	○	119.4
150	6	○	○	○	○	○	○	○	×	○	×	○	○	○	○	147.5
200	8	○	○	○	○	○	○	○	×	○	×	○	○	○	○	197.5
250	10	○	○	○	○	○	○	○	×	○	×	○	○	○	○	248.1
300	12	○	○	○	○	○	○	○	×	×	×	○	○	○	○	297.6

302Y/304Y Applicable pipe list in case of B

Nominal size		SGP		Sch20		Sch40		Sch60		Sch80		Sch10S		Sch20S		Minimum internal diameters of piping (mm)
mm	inch	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	Retainer (up stream)	Stem Side (down stream)	
40	1 1/2	○	○	—	—	○	○	○	○	○	○	○	○	○	○	20.0
50	2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	25.0
65	2 1/2	○	○	○	○	○	○	○	○	○	○	○	○	○	○	40.0
80	3	○	○	○	○	○	○	○	○	○	○	○	○	○	○	63.6
100	4	○	○	○	○	○	○	○	○	○	○	○	○	○	○	87.0
125	5	○	○	○	○	○	○	○	○	○	○	○	○	○	○	112.8
150	6	○	○	○	○	○	○	○	○	○	○	○	○	○	○	142.5
200	8	○	○	○	○	○	○	○	×	○	×	○	○	○	○	193.3
250	10	○	○	○	○	○	○	○	×	○	×	○	○	○	○	248.1
300	12	○	○	○	○	○	○	○	×	○	×	○	○	○	○	297.6

Remark 1: ○=Applicable ×=Not applicable
Remark 2: The clearance between the disc and the pipe is based on API 609 and MSS SP-67.
40mm to 150mm: 1.5mm; 200mm to 300mm: 3.0mm
Remark 3: Butterfly valves are inserted into a pipe that was fitted with the disc when fully open.
In cases where there is an "X" in the chart above or you are using a pipe or flange that is less than the minimum inner pipe diameter, use is still possible if means are taken such as inserting a spacer between the valve and flange.
For details, please consult us.





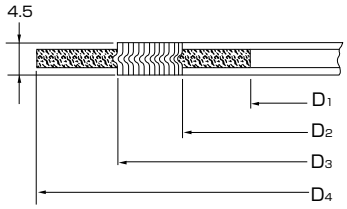
●In case of sheet gasket ..... Any standard can be used excluding 65mm-JIS flange. For 65mm-JIS flange, use the sheet gasket that followed old JIS Standard: JIS B 2404_1999 for inner diameter. For other size, JIS standard products can be used.

●In case of spiral gasket ..... Use special spiral gasket shown below.

■Special spiral gasket for JIS flange size

Nominal size		JIS flange					ANSI flange				
		10K, 16K, 20K		10K	16K, 20K		150-300Lb			150Lb	300Lb
mm	inch	D_1	D_2	D_3	D_4	D_4	D_1	D_2	D_3	D_4	D_4
40	1 1/2	48	54	73	89	89	48	54	73	85	95
50	2	61	69	88	104	104	61	69	88	104	111
65	2 1/2	73	81	100	124	124	73	81	100	123	129
80	3	89	97	120	134	140	89	97	120	136	148
100	4	115	124	146	159	165	115	124	146	174	180
125	5	140	151	177	190	203	140	151	177	196	215
150	6	166	178	207	220	238	166	178	207	222	250
200	8	217	227	257	270	283	217	229	257	279	307
250	10	268	282	318	333	356	268	285	318	339	362
300	12	319	331	362	378	406	319	335	362	409	422

Remark : In case a minute leakage of gas (less than 100PPm) becomes a problem, please consult our sales staff.



■Applicable standard for standard piping gasket

Nominal size		Max.allowable inside diameter (D)	Joint sheet or RPTFE solid gasket (t≦2mm)					PTFE mold type gasket Valqua: 7030, 7031or 7035				
mm	inch		JIS 5K	JIS 10K	JIS 16K JIS 20K	ANSI 150-300Lb	JPI 150-300Lb	JIS 5K	JIS 10K	JIS 16K JIS 20K	ANSI 150-300Lb	JPI 150-300Lb
40	1 1/2	55	○	○	○	○	○	○	○	○	○	○
50	2	69	○	○	○	○	○	○	○	○	○	○
65	2 1/2	81	○	○	○	○	○	×	×	×	○	○
80	3	97	○	○	○	○	○	○	○	○	○	○
100	4	124	○	○	○	○	○	○	○	○	○	○
125	5	151	○	○	○	○	○	○	○	○	○	○
150	6	178	○	○	○	○	○	○	○	○	○	○
200	8	227	○	○	○	○	○	○	○	○	○	○
250	10	282	○	○	○	○	○	○	○	○	○	○
300	12	331	○	○	○	○	○	○	○	○	○	○

Remark; ○: Applicable, ×: Not applicable

Tom Disco 302Y/304Y

302Y/304Y Applicable flange standard

Nominal size		JIS				ANSI 150Lb	BS4504		DIN		BS10
mm	inch	5K	10K	16K	20K		PN10	PN16	NP10	NP16	Table E
40	1 1/2	○	○	○	○	○	○	○	○	○	○
50	2	○	○	○	○	○	○	○	○	○	○
65	2 1/2	○	○	○	○	○	○	○	○	○	×
80	3	○	○	○	○	○	○	○	○	○	○
100	4	○	○	○	○	○	○	○	○	○	○
125	5	○	○	○	○	○	○	○	○	○	○
150	6	○	○	○	○	○	○	○	○	○	○
200	8	○	○	○	○	○	○	○	○	○	○
250	10	○	○	○	○	○	○	○	○	○	○
300	12	○	○	○	○	○	○	○	○	○	○

○ : Can be used without flange drilling.
× : Not applicable

302Y/304Y Piping bolts and nuts sizes

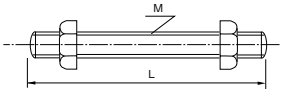
Nominal size		JIS5K	JIS10K	JIS16K/20K	ANSI150Lb
mm	inch	Long bolts and nuts	Long bolts and nuts	Long bolts and nuts	Long bolts and nuts
40	1 1/2	4-M12×100	4-M16×120	4-M16×120	4-U1/2-13UNC×115
50	2	4-M12×120	4-M16×130	8-M16×130	4-U5/8-11UNC×140
65	2 1/2	4-M12×120	4-M16×145	8-M16×145	4-U5/8-11UNC×155
80	3	4-M16×130	8-M16×145	8-M20×170	4-U5/8-11UNC×155
100	4	8-M16×145	8-M16×145	8-M20×170	8-U5/8-11UNC×155
125	5	8-M16×145	8-M20×170	8-M22×190	8-U3/4-10UNC×175
150	6	8-M16×145	8-M20×170	12-M22×190	8-U3/4-10UNC×175
200	8	8-M20×170	12-M20×170	12-M22×190	8-U3/4-10UNC×205
250	10	12-M20×190	12-M22×190	12-M24×210	12-U7/8- 9UNC×215
300	12	12-M20×190	16-M22×190	16-M24×225	12-U7/8- 9UNC×215

Remark: Use SNB7/S45C (A193 B7/A194 2H) SS400/SS400, SUS304/SUS304.
SS400 can be used with JIS5K/10K flanges 220 degrees C and below.
Long bolt uses full threaded bolt.
Hexagon nut uses heavy nut.

Example

Long bolts: 12 - M22 × 185
N M L

Long bolts and nuts (full thread)

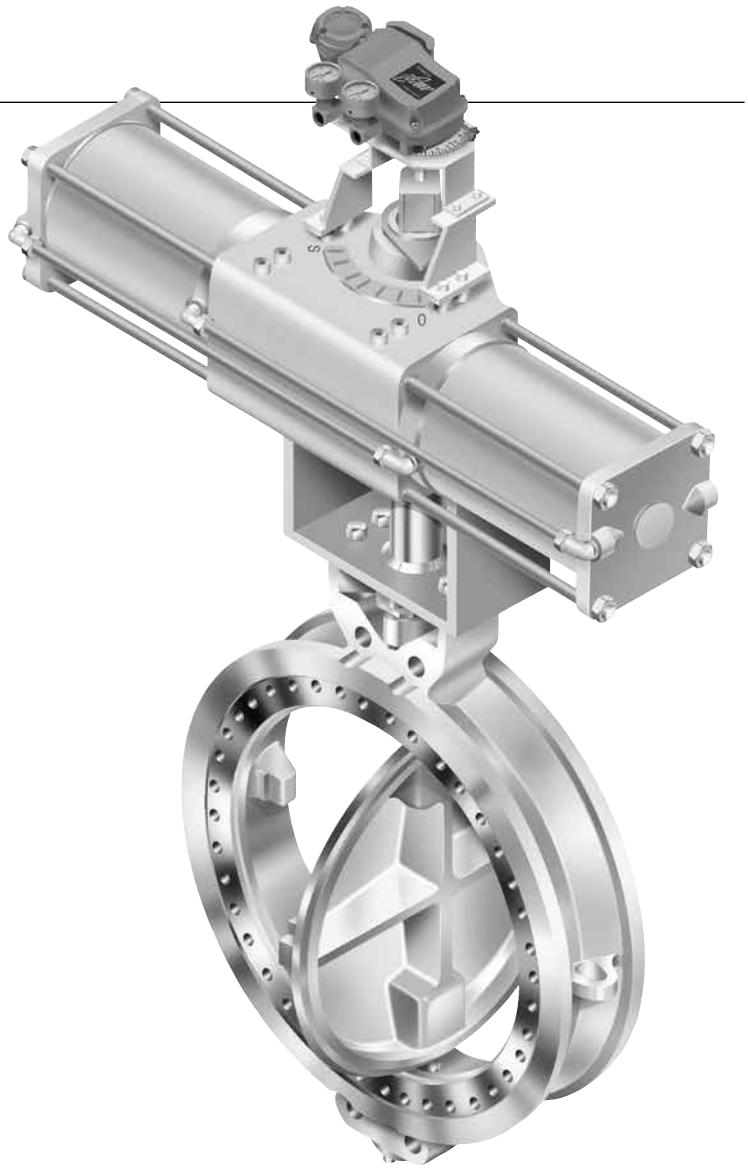


MEMO

Large Diameter Double Offset
High-Performance Butterfly Valves
for Medium/Light Duty Service

HLV304M

Custom-made design available!



Characteristics

Suitable for high-temperature, medium-to low- pressure service, such as in hot air, exhaust gas, steam, chemical fluids, and solvents.

Compact Design

Short pattern face to face dimensions. The body and disc design contributed to a valve that is lower in weight and more compact than other valves of this type.

Double Offset Geometry

The axis of disc rotation is double offset to the seat. When the disc rotates, it unseats at a small turning angle by its cam effect. This prevents seat wear and provides reliable sealing performance over a long period.

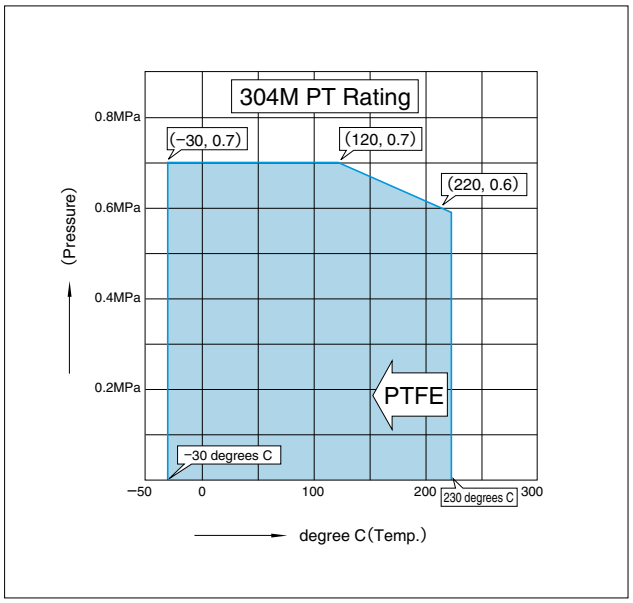
Simple Sealing Design/Reliable Performance

The simple sealing design with a minimal number of parts allows easy maintenance without special tools. Tight shut off with an RPTFE seat is available. See PT rating chart.

Custom-Made Design

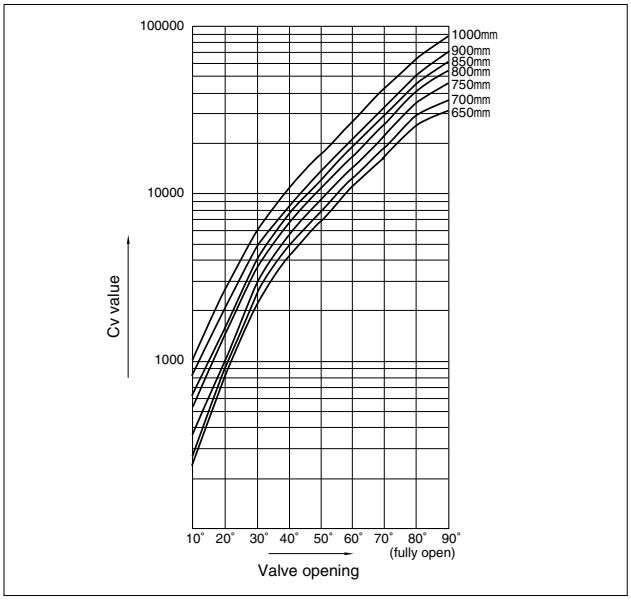
Custom made designs, including the use of special materials, a double flanged body or special face to face dimensions are available upon request. A metal seat type is also available.

304M PT Rating (RTFE SEAT)



※No actuator extension bonnet is required.

304M Cv Value



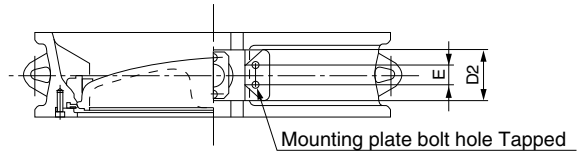
Standard Specifications

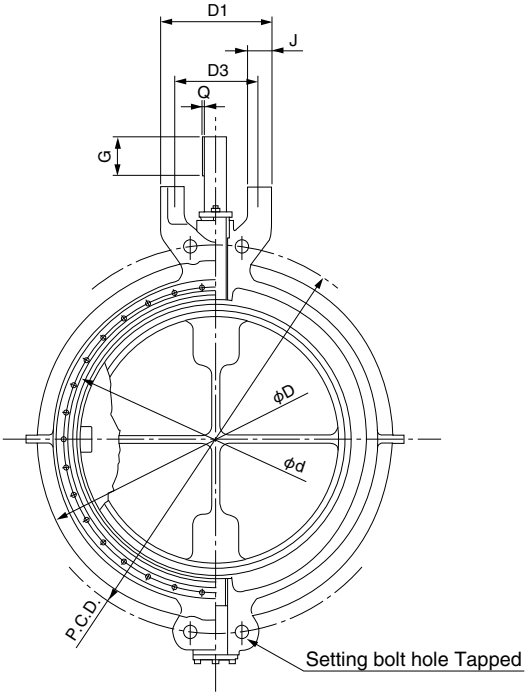
Valve model		304M
Valve size		650, 700, 750, 800, 850, 900, 1000mm
Face to face dimensions		Manufacturer's standard
Applicable flange standard		JIS 5K, 10K, ASME B16.47 Class 150 Series A or B, DIN/BS PN10
Standard materials	Body	Carbon steel casting (SCPH2/WCB) with Mn3 (PO4) 2 treatment, Stainless steel casting (SCS13A/CF8, SCS14A/CF8M)
	Disc	Stainless steel casting (SCS13A/CF8 with Cr.plating, SCS14A/CF8M with Cr. plating)
	Stem	Stainless steel type 431, 630, 316
	Seat	RPTFE
	Gland packing	Carbon graphite
Max.working pressure*		0.7MPa (0.2MPa on non-prefered direction)
Working temperature range*		−30 to 230 degrees C
Seat leakage		Working pressure x 1.1 times (Max 0.8Mpa)
Flow direction		Flow to shaft side.
Marking		API609/MSS-SP25/JIS B 2004
Piping flange gasket		Serrated spiral 45 to 55 groove/inch for gasket face finish, unless otherwise specified

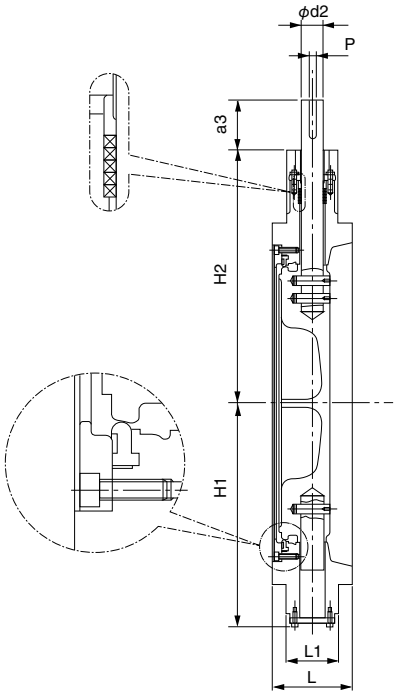
*Recommended piping position: shaft horizontal position
*Max. working pressure & temperature range are subject to change depending on customized specifications.

※It is possible that seat leakage occur when fluid (e.g. powder and/or liquid) is solidified by working temperature and other cause. Consult us.
Please note that use with vertical line such as bottom area of discharge spout of hopper, and tank.

HLV 304M Principal dimensions



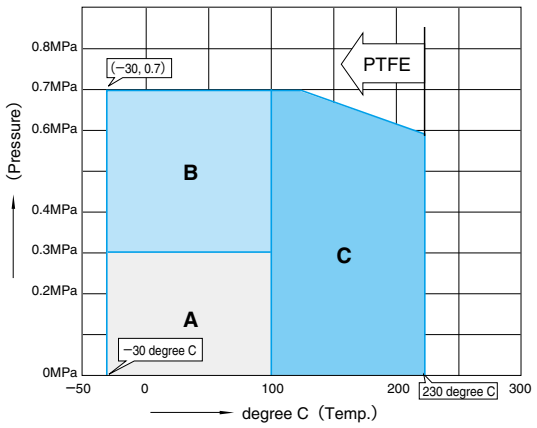




Nominal size		Dimension (mm)																Approx. Mass (kg)
mm	inch	d	D※1	L	L_1	H_1	H_2	a_3	d_2	D_1	D_2	D_3	E	J	G	P	Q	
650	26	653	739	165	105	459	520	117	45	230	105	175	40	50	79	14	3.5	218
700	28	702	789	165	132	510	560	145	55	430	132	380	90	55	121	16	4	285
750	30	754	843	180	132	546	690	145	60	430	132	380	90	55	121	18	4	365
800	32	801	893	190	132	579	705	145	60	430	132	380	90	55	121	18	4	407
850	34	853	943	203	143	591	720	175	65	430	143	380	90	55	151	20	4.5	460
900	36	903	993	203	137	621	750	175	65	430	137	380	90	55	151	20	4.5	505
1000	40	1000	1093	216	148	676	800	175	70	430	148	380	90	55	151	20	4.5	730

* Indicates JIS 5K value.

HLV 304M Typical Actuator Selection Chart



Category	Temp.	Pressure
A	−30 to 100 degree C	0.0MPa to 0.3MPa
B		0.3MPa to 0.7MPa
C	100 to 230 degree C	0.0MPa to 0.7MPa

	Size (mm) / Category	650	700	750	800	850	900	1000
Worm gear 2S	A	MGH-4						MGH-4.5
	B		MGH-4.5		MGH-5			MGH-7
	C	MGH-4.5	MGH-5		MGH-6	MGH-7		On application
DA cylinder 3A	A	TGA-160					TGA-180	
	B	TGA-180	TGA-200		TGA-220	TGA-250		
	C	TGA-200	TGA-220	TGA-250		TGA-280		
SA cylinder 3U, K	A	TG-20S						
	B	On application						
	C							

Electric motor actuator is also available upon request.
Safety factor for above actuator selection table: 1.5 times
Actuator selection is subject to the actual working condition.

HLV 304M Applicable Flange Standards

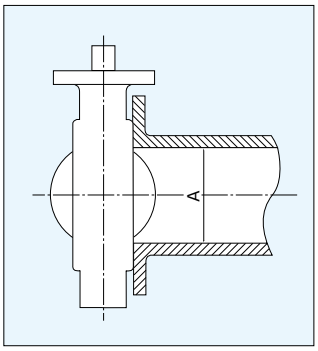
Nominal size		Flange Standard									
mm	inch	JIS5K	JIS10K	ASME A	ASME B	DIN 10	BS	TAYLOR	LADISH	G5524	BS 10
650	26	○	○	○	○	—	—	△	△	×	×
700	28	○	○	○	○	○	○	△	△	△	×
750	30	○	○	○	○	—	○	△	△	×	△
800	32	○	○	○	○	○	○	△	△	△	×
850	34	○	○	○	○	—	—	△	△	×	×
900	36	○	○	○	○	○	○	△	△	△	△
950	38	—	—	○	○	—	—	△	△	×	×
1000	40	○	○	○	○	○	○	△	△	△	×

JIS5: JIS B2238(1996)
JIS10: JIS B2238(1996)
ASME A: ASME B16.47-1990 table5 dimensions of class 150 series A flanges
ASME B: ASME B16.47-1990 table11 dimensions of class 150 series A flanges
DIN 10: DIN3532 PN10
BS: BS4504 NP10
TAYLOR: TAYLOR FORGE 125, 150Lb
LADISH: LADISH150
G5524: JIS G 5524
BS 10: BS10 TABLE E

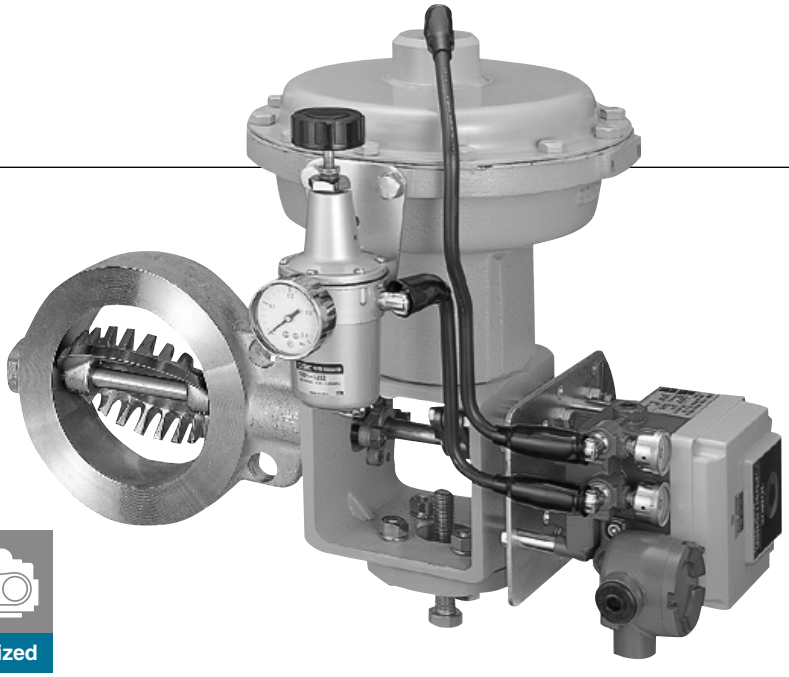
○ : Applicable
△ : Applicable subject to conditions
— : Not standard
× : Not applicable

HLV 304M Minimum Internal Diameters of Piping

Nominal size		Minimum internal diameters of piping A(mm)
mm	inch	
650	26	612
700	28	653
750	30	705
800	32	754
850	34	803
900	36	834
1000	40	950



507V



Diaphragm | Worm Gear | Pneumatic Cylinder | Motorized

Features and Benefits

For various applications such as air conditioning systems, pulp and paper mills, steel mills, chemical plants, food processing and many other process industries, the 507V rotary control valve will support your fluid control requirements.

Flexible control over a wide range

The 507V allows complete control over the full range from the open to the closed position. The valve can also handle high temperatures of up to 400 degrees C such as in steam lines and it will respond quickly and flexibly to any changes within the operating parameters of the process line. The 507V therefore is the optimum valve for any control system processing multiple products where the operating conditions change from time to time in accordance with process requirements.

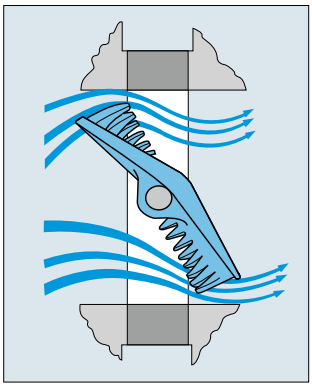
Cost-effective rotary control valve

In spite of its compact size and light weight, the 507V has a large valve capacity that minimises the energy loss of fluid at the fully open position.
This compact design reduces the required size of the actuator, installation space and piping supports. It also minimises vibration of control systems and increases the operating life.
These features provide the benefit of reducing the total operating cost of your plant.

Model 507V is the high temperature version of our rotary control valve designed for exclusive use in the regulation of fluids.

General Description

The high performance characteristics of this model originate from its unique design with a teeth and gull-wing shaped disc that touches the seat at a certain angle (Fig.1). The teeth are arranged on the circumference of the disc towards either direction of flow. The 'touch-at-an-angle' disc assists the reduction of seating and unseating torque and facilitates smooth control of the valve.
Other benefits include high rangeability, low noise level and anticavitation.
This model covers a wide temperature range in the fluid control of air conditioning systems, pulp and paper mills, chemical plants, steel mills and food processing applications.



General

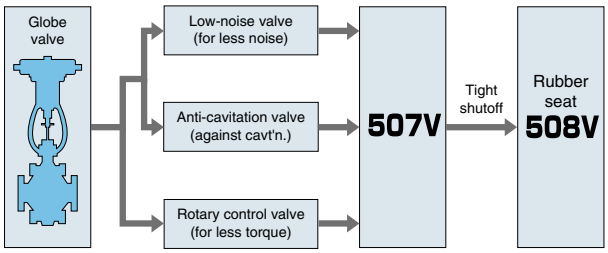
With guide-vane-like teeth around the disc edge, and the disc touching the seat at a certain angle, this product is a compact, lightweight and highly cost-effective, high-performance rotary control valve that exhibits outstanding control characteristics.
The valve provides steady control over a wide range with higher rangeability, better cavitation resistance, lower dynamic torque, lower noise level, and a better leakage rate than any other rotary control valve.
Two models, the 507V and 508V, are available for a range of severe applications. The 507V is the optimum type for fluid control of high pressure, high temperature systems. The 508V is characterized by its rubber seat ring. and eliminates the need for any additional stop valve because of its complete sealing capability.

Fundamental Structure

This product has two basic design features that are responsible for the outstanding performance. One is the teeth around the disc and the other is the gull-wing-like design of the disc.

The teeth on the circumference of the disc break up the fluid energy acting on it with a resultant reduction of pressure recovery.
Unlike conventional flat discs, the gull-wing-like disc of the product touches the seat at a certain angle for reduced seating/unseating torque. This results in steady control of the valve.

Recent trend toward rotary type control valves

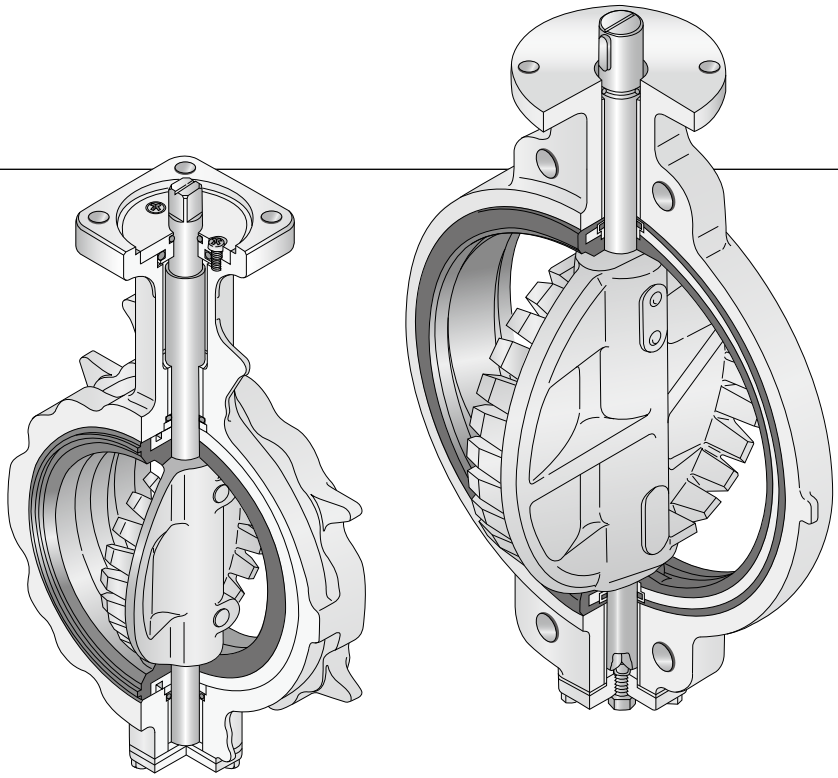


Standard Specifications

Valve nominal size		50 to 400mm	
Pressure rating		50 to 200mm: ANSI Class 300lb 250 to 400mm: ANSI Class 150lb	
Actuator mounting		Non-flange joint	
Flange accommodation		JIS: 10K/16K/20K, ANSI Class 150lb, ANSI Class 300lb, DIN PN 10/16/25 Please contact us when 250mm/16K and over.	
Service temperature ※1	Cast steel	-10 to 400 degrees C. Following materials are used for 200 degrees C or higher ー carbon for bearings, exfoliated graphite	
	Stainless steel	-50 to 400 degrees C. Following materials are used for 200 degrees C or higher ー carbon for bearings, exfoliated graphite	
Rangeability		100:1	
Valve opening		Max. 70˚	
Flow characteristics		Equal percent	
Leakage rate ※2		FCI 70-2 Class II	
Stuffing box		Studs and nuts tightening	
Standard materials	Body	Cast steel SCPH2(A216 WCB)	Stainless steel SCS14(A351 CF8M)
	Disc ※3	Stainless steel SCS14(A351 CF8M)	
	Stem	Stainless steel SUS630(SUS316)※4	
	Bearings	Reinforced PTFE, Carbon graphite(200 degrees C and over)	
	Packings	Exfoliated graphite	Exfoliated graphite

※1 Please consult us if the application is in the range of 400 to 600 degrees C.
※2 The disc is gull wing shaped and touches the metal seat at an angle. This design minimises leakage to a level less than 0.5% of the rated Cv which is equal to or lower than the leakage permitted on a double-seat globe control valve.
※3 The disc is electroless plated with nickel.
※4 Please consult us if an SUS316 stem is required.

508V



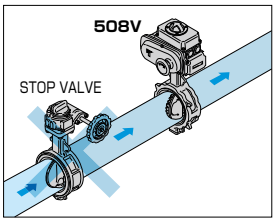
Features and Benefits

Except for the rubber seat ring, the 508V has the same design principle as the 507V. Excellent controllability is achieved by having the innovative teethed disc seating at a certain angle. The 508V has a reinforced core rubber seat ring allowing it to be used for high pressure service up to 1.6MPa with complete tight shut-off.

Rubber seat ring with a "control cosine curve" profile

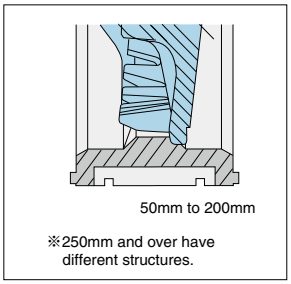
Taking into consideration the cosine curve profile rubber seat ring incorporated into our models 700G and 773Z, we developed a new type of seat ring for exclusive use in the 508V. The 508V has a reinforced core rubber seat ring incorporated with a "control cosine curve" profile for sizes between 50mm and 200mm. This seat ring design ensures a tight shut-off up to a working pressure of 1.6MPa.
The 508V available in sizes between 250mm and 350mm has a similar seat ring design and profile, but the seat ring is backed up by a precisely formed metal core which is encapsulated inside the rubber. This design enables the control valve to function under severe conditions of high velocity, a large differential pressure or a high vacuum. (The maximum allowable shut-off pressure is 1.0MPa).

No additional stop valve, less installation space and less cost



Because of its reliable sealing effect against a high differential pressure, the 508V does not require an additional stop valve. You save on installation space and benefit from the excellent cost effective features of our rotary control valve.

Satisfies both JIS and ISO standards for extended applications



The 508V is available in different flange specifications. Also, its face-to-face dimension meets both JIS and ISO requirements. Therefore this model is applicable for various industrial applications worldwide.

General

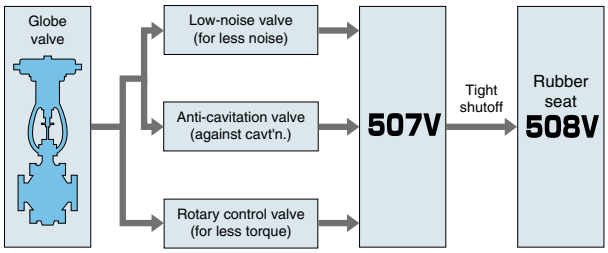
With guide-vane-like teeth around the disc edge, and the disc touching the seat at a certain angle, this product is a compact, lightweight and highly cost-effective, high-performance rotary control valve that exhibits outstanding control characteristics.
The valve provides steady control over a wide range with higher rangeability, better cavitation resistance, lower dynamic torque, lower noise level, and a better leakage rate than any other rotary control valve.
Two models, the 507V and 508V, are available for a range of severe applications. The 507V is the optimum type for fluid control of high pressure, high temperature systems. The 508V is characterized by its rubber seat ring. and eliminates the need for any additional stop valve because of its complete sealing capability.

Fundamental Structure

This product has two basic design features that are responsible for the outstanding performance. One is the teeth around the disc and the other is the gull-wing-like design of the disc.

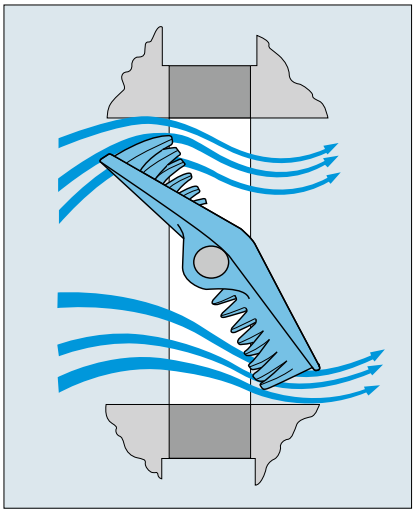
The teeth on the circumference of the disc break up the fluid energy acting on it with a resultant reduction of pressure recovery.
Unlike conventional flat discs, the gull-wing-like disc of the product touches the seat at a certain angle for reduced seating/unseating torque. This results in steady control of the valve.

Recent trend toward rotary type control valves



General Description

With a specially designed rubber seat ring, Model 508V ensures tight shut-off and eliminates the need for any additional stop valve required by conventional control valves. The high performance characteristics of this model originate from its unique design with a teeth and gull-wing shaped disc that touches the seat at a certain angle (Fig.1). The teeth are arranged on the circumference of the disc towards either direction of flow. The 'touchat-an-angle' disc assists the reduction of seating and unseating torque and facilitates smooth control of the valve. Other benefits include high rangeability, low noise level and anti-cavitation.
The face-to-face dimension meets both JIS and ISO standards so the 508V is applicable for various industrial fields including air conditioning systems.



Standard Specifications

Valve nominal size		50, 80, 100, 150, 200mm	250, 300, 350mm	400, 450, 500, 600mm
Face-to-face dimensions ※1		JIS B 2002 Series 46 / ISO 5752 Basic Series 20 Wafer butterfly valve (short)		
Flange accommodation		JIS: 5K/10K/16K/20K, ANSI 150lb, DIN PN 10/16, BS 4504 PN 10/16, BS10 'E', 'F', JIS G 5524, 5527	JIS: 10K/16K, ANSI 150lb, DIN PN 10/16, BS 4504 PN 10/16, BS10 'E', 'F', JIS G 5524, 5527	JIS: 10K, ANSI 150lb, DIN PN 10/16, BS 4504 PN 10/16, JIS G 7.5, 5527
Service temperature		-20 to 120 degrees C (NBR: -10 to 80 degrees C)		-10 to 80 degrees C (*EPDM: -20 to 120 degrees C)
Working temperature in continuous use ※2		0 to 70 degrees C (NBR : 0 to 60 degrees C)		0 to 60 degrees C (*EPDM : 0 to 70 degrees C)
Max. working pressure		1.6MPa (NBR: 1.0MPa)	1.0MPa	
Body test pressure		2.4MPa (NBR: 1.5MPa)	1.5MPa	
Seat leak pressure		1.8MPa (NBR: 1.1MPa)	1.1MPa	
Flow characteristics		Nearly equal percent		
Rangeability		100:1		
Standard materials	Body	FCD450 (No fluid exposure)		
	Disc	SCS14	SCS13	
	Stem	SUS420J2 (No fluid exposure)		
	Seat ring	*EPDM core-reinforced (Option – NBR core-reinforced)		NBR core-reinforced (Option - *EPDM core-reinforced)
Coating		Silicon resin coating (Grey N7)		Lacquer Primer (Munsell N7)

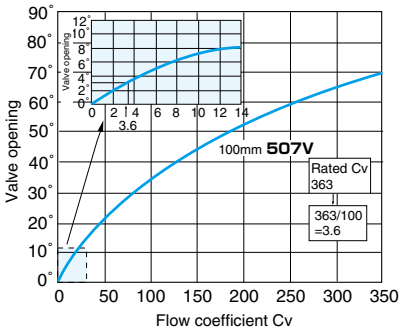
※1 350mm only : JIS B 2002 Series 47 / ISO Basic Series 25 (Medium)
※2 'Working temperature in continuous use' stands for the temperature continuously kept exceeding on hour.
* Never use an EPDM rubber seat ring if the valve is being used for oil or for a fluid containing even a slight amount of oil.

Multiple merits for multiple applications

Controllability

High rangeability

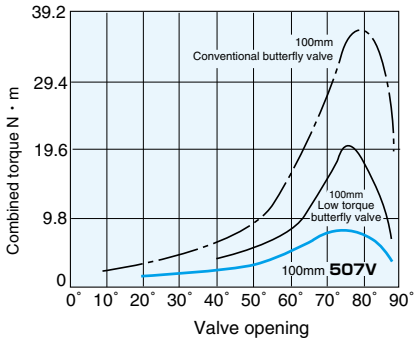
*The wide range of controllability permits flexible adjustment to any changes in the process conditions of production lines. This merit is especially beneficial to multifold productions.
*The conventional "split range control" with twin valves is no longer required. One product is enough to cover the whole range.



With its nearly "equal percent" flow characteristics and its very low leakage rate, the product offers an extremely high rangeability of 100:1.

Low dynamic torque

*The steady performance ensures more precise control.
*The compact actuator saves space and energy.

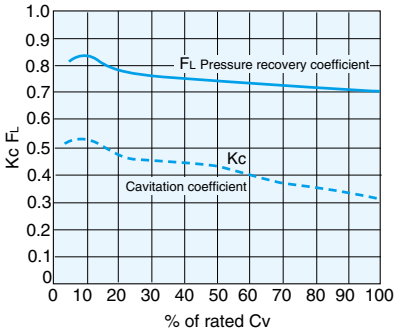


The above graph shows a comparison of the product with other typical valves.
The patented disc has remarkably reduces the dynamic torque.

Reliability

Excellent cavitation resistance

*The outstanding cavitation resistance increases the operational life of the valve and pipeline, and improves the reliability of the system.
*This model is works in more severe requirements than ever.

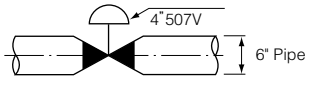


A high coefficient of initial cavitation (KC), and a high pressure recovery coefficient (FL), inhibit the occurence of cavitation.

Cv value

Size			Opening angle						
mm	inch		10°	20°	30°	40°	50°	60°	70°
50	2	Cv	3	11	22	38	53	69	85
		CvFp	3	11	22	37	50	63	74
80	3	Cv	14	33	58	88	120	140	176
		CvFp	14	33	58	86	115	133	158
100	4	Cv	17	43	80	127	179	250	363
		CvFp	17	43	80	126	175	238	323
150	6	Cv	55	120	210	320	450	590	825
		CvFp	55	120	208	315	441	560	730
200	8	Cv	70	175	350	620	1025	1265	1595
		CvFp	70	174	345	608	974	1151	1388
250	10	Cv	96	245	455	718	1135	1470	2515
		CvFp	96	244	450	710	1115	1396	2188
300	12	Cv	160	410	760	1200	1730	2460	3610
		CvFp	160	405	750	1175	1644	2238	3130
350	14	Cv	200	500	900	1500	2200	3200	4440
		CvFp	198	495	891	1470	2090	2910	3640
400	16	Cv	210	550	1020	1614	2327	3310	5650
		CvFp	210	548	1015	1598	2280	3145	5090

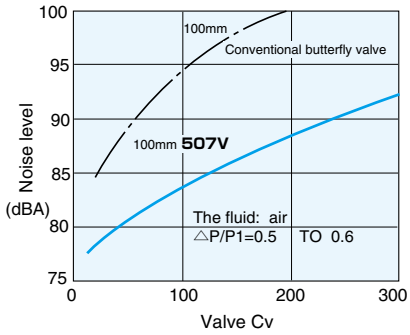
Remarks:
CvFp : Pipe size=1.5×Valve size
EX:



Environmental considerations

Low noise level

*Provides better work environment.
*Especially in air and gas applications, this product has a lower noise level by 5 to 10dBA and meets and exceeds noise regulations



The teeth on the disc cut the flow into fine jet streams.
This is the most effective device for lowering the noise level when the valve is half open.

Cost merit

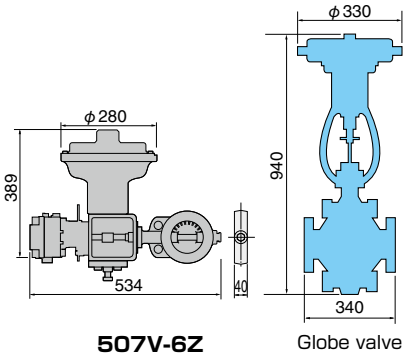
Larger valve capacity

*Reduces loss of energy at the fully open position.
*Allows one to two sizes of valve reduction in comparison with a conventional valve.

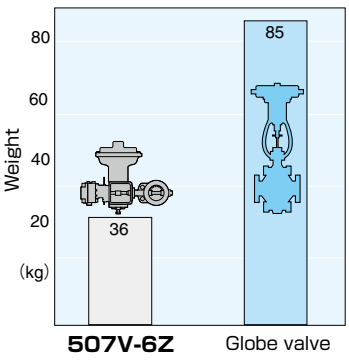
Compact and lightweight design

*Permits compact piping arrangement.
*Allows the use of a portable remote controller unit.
*Eliminates vibration problems of the piping system, and improves operational life.

Comparison of dimensions (Nominal size: 80mm)



Comparison of weight (Nominal size: 80mm)



Simple design

*Permits easy control of spare parts.
*Facilitates easy maintenance.
*Has a reduced number of parts and improved reliability.

Pressure recovery factor (FL), coefficient of incipient cavitation (Kc)

Opening angle	10°	20°	30°	40°	50°	60°	70°
Pressure recovery factor (FL)	0.85	0.80	0.78	0.76	0.73	0.71	0.70
Coefficient of incipient cavitation (Kc)	0.55	0.50	0.47	0.45	0.40	0.37	0.32

507V

507V Actuator selection chart

■507V

型 番	Size (mm/inch)								
	50	80	100	150	200	250	300	350	400
	2	3	4	6	8	10	12	14	16
2S	DGH-1					DGH-2			
7E,3A	T85			T200	T380	T750		TGA-100	
7G,7F	T200S		T380S			TG-12S			
4 I	4 I-1			4 I-2		4 I-2.5	4 I-3		
6Z	280H					400H			

507V Allowable differencial pressure for 7E

■Double-action Cylinder (Stem 630ss)

(MPa)

Nominal size			Cv %(Cv/Rated Cv)					
			0	20	40	60	80	100
			Valve opening %					
mm	inch	Cylinder	0	41	57	69	86	100
50	2	T85	4.9	1.54	3.33	2.94	2.94	2.94
80	3	T85	4.9	1.01	2.25	1.86	1.86	1.86
100	4	T85	3.43	1.37	0.97	0.78	0.78	0.78
150	6	T200	1.37	0.48	0.34	0.29	0.29	0.29
200	8	T380	1.17	0.30	0.20	0.14	0.14	0.14
250	10	T380	1.47	0.42	0.28	0.19	0.19	0.19
300	12	T750	0.98	0.25	0.16	0.12	0.12	0.12
350	14	T750	0.64	0.16	0.10	0.08	0.08	0.08
400	16	T750	0.59	0.11	0.07	0.06	0.06	0.06

507V Allowable differencial pressure for 7G, 7F

■Single-action Cylinder (Stem 630ss)

(MPa)

Nominal size			Cv %(Cv/Rated Cv)					
			0	20	40	60	80	100
			Valve opening %					
mm	inch	Cylinder	0	41	57	69	86	100
50	2	T200S	4.90	1.28	3.33	2.94	2.94	2.94
80	3	T200S	4.90	0.85	2.25	1.86	1.86	1.86
100	4	T380S	3.43	1.06	0.79	0.75	0.78	0.78
150	6	T380S	1.37	0.36	0.26	0.24	0.29	0.29
200	8	T380S	1.17	0.30	0.20	0.14	0.14	0.14

507V Allowable differencial pressure for 6Z

■Diaphram Actuator (Stem 630ss)

(MPa)

Nominal size		Model	Supply pressure (MPa)	Spring range (kPa)	Cv %(Cv/Rated Cv)					
					Close	20	40	60	80	100
					Valve opening %					
mm	inch				0	41	57	69	86	100
50	2	280H	0.27	60 to 220	4.90	4.90	3.33	2.94	2.94	2.94
80	3	280H	0.27	60 to 220	4.90	3.13	2.25	1.86	1.86	1.86
100	4	280H	0.27	60 to 220	3.43	1.37	0.97	0.78	0.78	0.78
150	6	280H	0.27	60 to 220	1.37	0.48	0.34	0.29	0.29	0.29
200	8	280H	0.27	60 to 220	1.21	0.30	0.20	0.14	0.14	0.14
250	10	400H	0.27	60 to 190	1.50	0.36	0.25	0.21	0.20	0.20
300	12	400H	0.27	60 to 190	1.03	0.22	0.14	0.12	0.12	0.12
350	14	400H	0.27	60 to 190	0.64	0.15	0.10	0.09	0.08	0.08
400	16	400H	0.27	60 to 190	0.59	0.10	0.07	0.06	0.05	0.05

507V Allowable differencial pressure on stem

■SUS630

(MPa)

Nominal size		Cv %(Cv/Rated Cv)					
		0	20	40	60	80	100
		Valve opening %					
mm	inch	0	41	57	69	86	100
50	2	4.90	4.90	3.33	2.94	2.94	2.94
80	3	4.90	3.13	2.25	1.86	1.86	1.86
100	4	3.43	1.37	0.97	0.78	0.78	0.78
150	6	1.37	0.48	0.34	0.29	0.29	0.29
200	8	1.17	0.30	0.19	0.14	0.14	0.14
250	10	1.47	0.42	0.28	0.20	0.20	0.20
300	12	0.98	0.25	0.16	0.12	0.12	0.12
350	14	0.64	0.16	0.10	0.08	0.08	0.08
400	16	0.59	0.11	0.07	0.06	0.06	0.06

■SUS316

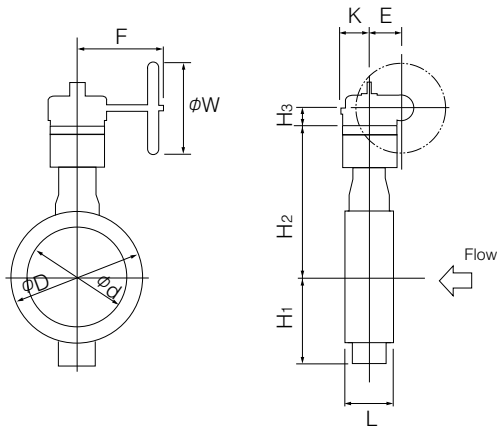
(MPa)

Nominal size		Cv %(Cv/Rated Cv)					
		0	20	40	60	80	100
		Valve opening %					
mm	inch	0	41	57	69	86	100
50	2	4.90	2.45	1.76	1.57	1.57	1.57
80	3	3.13	1.56	1.17	0.98	0.98	0.98
100	4	1.66	0.70	0.53	0.39	0.39	0.39
150	6	0.78	0.24	0.16	0.13	0.13	0.13
200	8	0.54	0.15	0.10	0.08	0.08	0.08
250	10	0.73	0.21	0.14	0.12	0.12	0.12
300	12	0.51	0.12	0.08	0.06	0.06	0.06
350	14	0.38	0.08	0.06	0.05	0.05	0.05
400	16	0.32	0.06	0.04	0.03	0.03	0.03

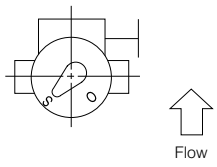
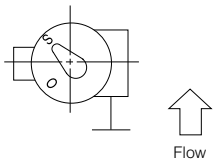
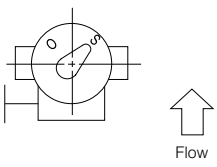
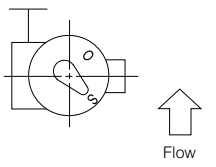
Worm gear type 507V-2S (50mm to 400mm)

Nominal size		Dimension (mm)										Gear type	Approx. Mass (kg)
mm	inch	φd	φD	L	H_1	H_2	H_3	E	K	F	φW		
50	2	49	92	40	63	183	32	58	93	156	160	DGH-1	13
80	3	73	127	40	86	201	32	58	93	156	160	DGH-1	15
100	4	97	155	40	98	224	32	58	93	156	160	DGH-1	16
150	6	146	216	52	129	262	32	58	93	156	160	DGH-1	23
200	8	194	265	62	184	283	32	58	93	161	200	DGH-1	32
250	10	241	324	89	196	393	42	85	126	246	280	DGH-2	60
300	12	289	370	89	230	446	42	85	126	246	280	DGH-2	70
350	14	318	415	89	256	431	42	85	126	246	280	DGH-2	86
400	16	364	470	108	296	453	42	85	126	246	280	DGH-2	100

■507V-2S



■2S Installation direction

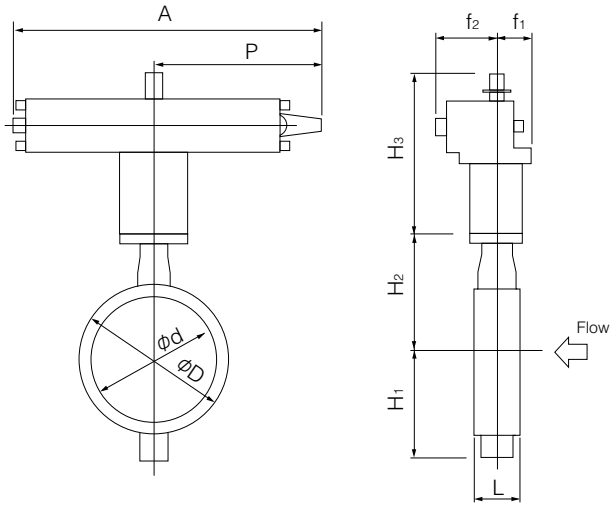
			
2SA	2SB	2SC	2SD

Double-acting Pneumatic Cylinder Type 507V-3A（350mm, 400mm）

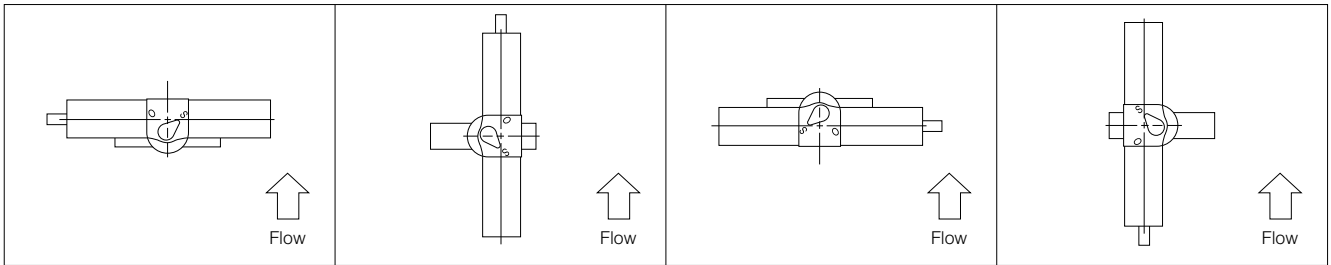
Nominal size		Dimension (mm)										Cylinder type	Approx. Weight (kg)
mm	inch	φd	φD	L	H_1	H_2	H_3	A	P	f_1	f_2		
350	14	318	415	89	256	316	404	773	433	83	133	TGA-100	95
400	16	364	470	108	296	338	404	773	433	83	133	TGA-100	110

•A free angle adjuster comes with the pneumatic cylinder.

■507V-3A



■3A Installation Direction

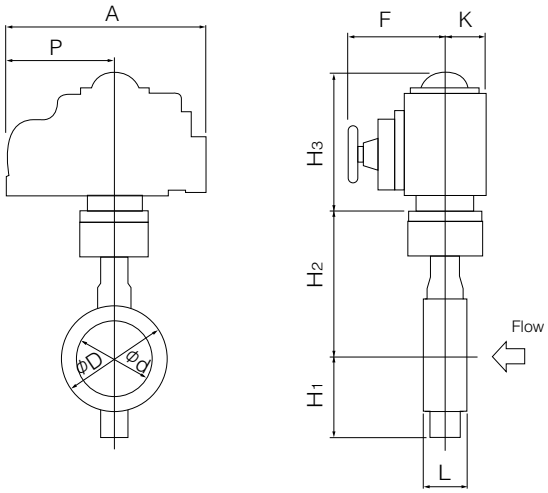


3AA	3AB	3AC	3AD

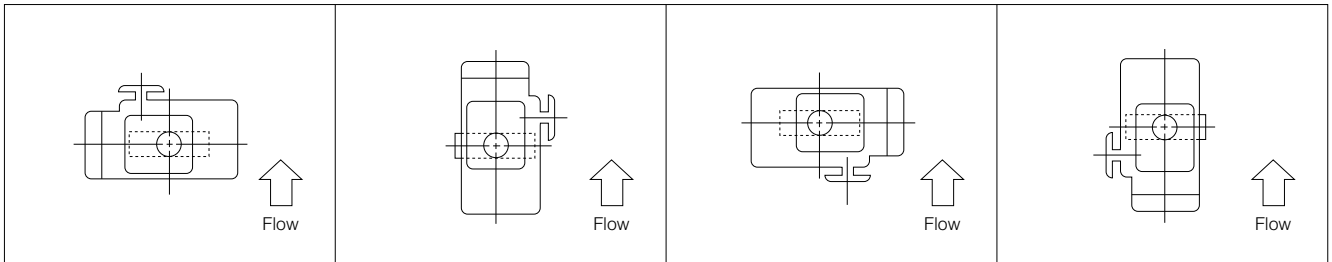
Single Phase Electric Motor Type 507V-4 I(50mm to 400mm)

Nominal size		Dimension (mm)										Motor type	Approx. Weight (kg)
mm	inch	φd	φD	L	H_1	H_2	H_3	A	P	F	K		
50	2	49	92	40	63	198	191	252	138	126	65	4 I-1	18.3
80	3	73	127	40	86	216	191	252	138	126	65	4 I-1	19.3
100	4	97	155	40	98	239	191	252	138	126	65	4 I-1	20.3
150	6	146	216	52	129	262	224	310	167	154	85	4 I-2	24
200	8	194	265	62	184	283	224	310	167	154	85	4 I-2	34
250	10	241	324	89	196	413	227	310	167	154	85	4 I-2.5	51
300	12	289	370	89	230	446	255	388	223	246	136	4 I-3	70
350	14	318	415	89	256	431	255	388	223	246	136	4 I-3	86
400	16	364	470	108	296	453	255	388	223	246	136	4 I-3	100

■507V-4 I



■4I Installation Direction



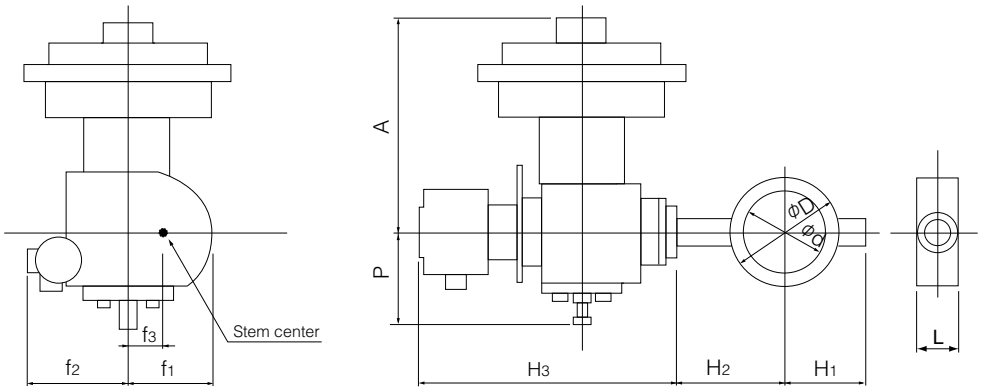
4 I A	4 I B	4 I C	4 I D

507V-6Z(50mm to 400mm)with diaphragm actuator

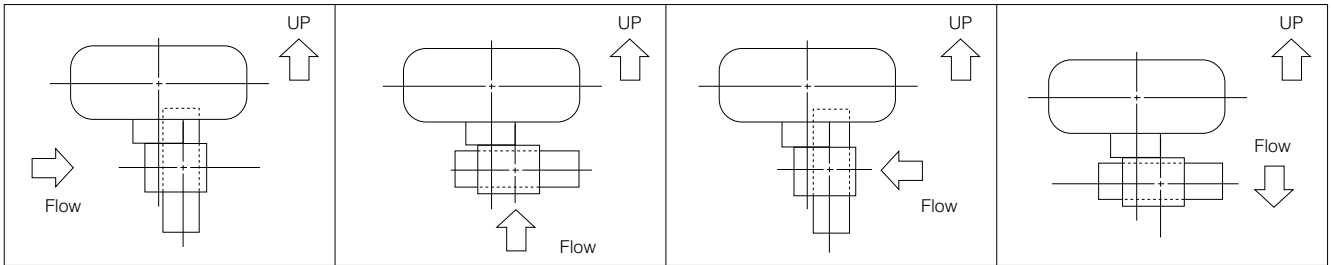
Nominal size		Dimension (mm)											Diaphragm type	Approx. Mass (kg)
mm	inch	φd	φD	L	H_1	H_2	H_3	A	P	f_1	f_2	f_3		
50	2	49	92	40	63	108	322	310	126	121	147	36	280H	35
80	3	73	127	40	86	126	322	310	126	121	147	36	280H	37
100	4	97	155	40	98	149	322	310	126	121	147	36	280H	38
150	6	146	216	52	129	187	322	310	126	121	147	36	280H	45
200	8	194	265	62	184	208	332	310	126	121	147	36	280H	54
250	10	241	324	89	196	278	402	416	185	135	133	50	400H	90
300	12	289	370	89	230	331	402	416	185	135	133	50	400H	100
350	14	318	415	89	256	316	402	416	185	135	133	50	400H	115
400	16	364	470	108	296	338	402	416	185	135	133	50	400H	130

Remarks: H3 shows the dimension when the positioner (TCE2000) is installed.
The H3 dimension will change depending on the positioner type.

■507V-6Z



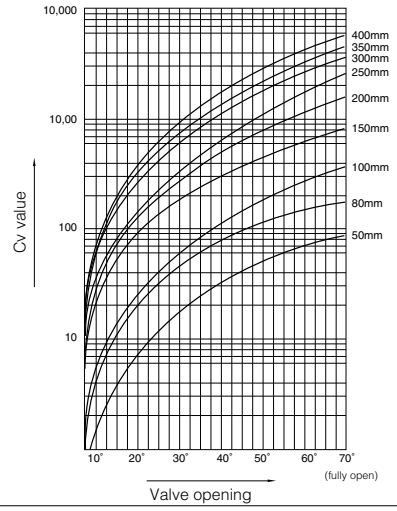
■6Z Installation direction



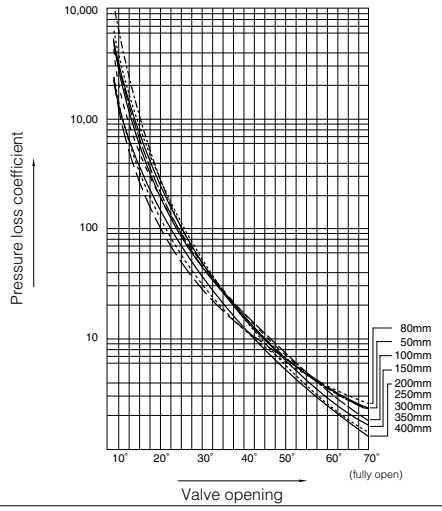
6ZA	6ZB	6ZC	6ZD

507V Cv value/pressure loss coefficient

●Cv value



●Pressure loss coefficient



507V Cv value

Nominal size		Valve opening						
mm	inch	10°	20°	30°	40°	50°	60°	70°
50	2	3	11	22	38	53	69	85
80	3	14	33	58	88	120	140	176
100	4	17	43	80	127	179	250	363
150	6	55	120	210	320	450	590	825
200	8	70	175	350	620	1020	1265	1595
250	10	96	245	455	718	1135	1470	2515
300	12	160	410	760	1200	1730	2460	3610
350	14	200	500	900	1500	2200	3200	4440
400	16	210	550	1020	1614	2329	3310	5650

507V Pressure loss coefficient

Nominal size		Valve opening						
mm	inch	10°	20°	30°	40°	50°	60°	70°
50	2	1832	136	34.1	11.4	5.9	3.5	2.3
80	3	406	73	23.6	10.3	5.5	4.1	2.6
100	4	810	127	36.6	14.5	6.5	3.1	1.8
150	6	367	77	25.2	10.9	5.5	2.8	1.7
200	8	697	111	31.3	11.3	4.6	2.1	1.4
250	10	889	136	39.6	14.2	5.4	2.5	1.3
300	12	748	100	30.7	11.0	4.7	2.3	1.3
350	14	815	115	32.6	11.7	5.0	2.4	1.4
400	16	1126	149	37.2	12.5	5.0	2.3	1.4

507V Pressure recovery coefficient(FL)and Cavitation coefficient(Kc)

Valve opening	10°	20°	30°	40°	50°	60°	70°
Pressure recovery coefficient(FL)	0.85	0.80	0.78	0.76	0.73	0.71	0.70
Cavitation coefficient(Kc)	0.55	0.50	0.47	0.45	0.40	0.37	0.32

507V Applicable pipe list in case of A

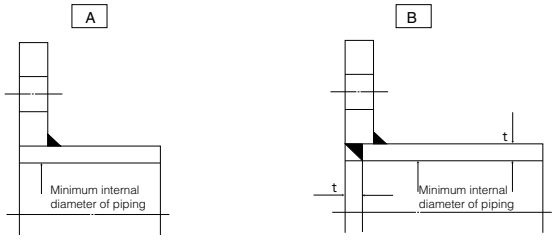
Nominal size		SGP	STPY	Sch20	Sch40	Sch10S	Sch20S	Minimum internal diameters of piping (mm)
mm	inch							
50	2	○	–	○	○	○	○	36
80	3	○	–	○	○	○	○	71
100	4	○	–	○	○	○	○	98
150	6	○	–	○	○	○	○	148
200	8	○	–	○	○	○	○	199
250	10	○	–	○	○	○	○	241
300	12	○	–	○	○	○	○	293
350	14	○	○	○	○	–	–	321
400	16	○	○	○	○	–	–	367

507V Applicable pipe list in case of B

Nominal size		SGP	STPY	Sch20	Sch40	Sch10S	Sch20S
mm	inch						
50	2	○	–	○	○	○	○
80	3	○	–	○	○	○	○
100	4	○	–	○	○	○	○
150	6	○	–	○	○	○	○
200	8	○	–	○	○	○	○
250	10	○	–	○	○	○	○
300	12	○	–	○	○	○	○
350	14	○	○	○	○	–	–
400	16	○	○	○	○	–	–

Remark1: ○=Applicable ×=Not applicable

Remark2: Butterfly valves are inserted into a pipe that was fitted with the disc when fully open.
In cases where you are using a pipe or flange that is less than the minimum inner pipe diameter, use is still possible if means are taken such as inserting a spacer between the valve and flange.
For details, please consult us.



507V Applicable flange standard

Nominal size		JIS			ANSI		BS4504	DIN
mm	inch	10K	16K	20K	150Lb	300Lb	PN10	NP10
50	2	○	D	D	○	D	○	○
80	3	D	D	D	○	D	D	D
100	4	D	D	D	D	D	D	D
150	6	D	D	D	D	D	D	D
200	8	D	D	D	D	D	D	D
250	10	D	×	×	D	×	D	D
300	12	D	×	×	D	×	D	D
350	14	D	×	×	D	×	D	D
400	16	D	×	×	D	×	D	D

○ : Can be used without flange drilling.
D : With flange drilling
× : Not applicable

507V Piping bolt and nut sizes

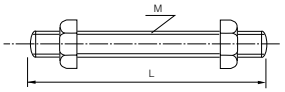
Nominal size		JIS 10K	JIS 20K	ANSI 150Lb	ANSI 300Lb
mm	inch	Long bolts and nuts		Long bolts and nuts	
50	2	4-M16×130	8-M16×130	4-U 5/8×140	8-U 5/8×140
80	3	8-M16×130	8-M20×170	4-U 5/8×150	8-U 3/4×175
100	4	8-M16×130	8-M20×170	8-U 5/8×150	8-U 3/4×175
150	6	8-M20×170	12-M22×190	8-U 3/4×175	12-U 3/4×190
200	8	12-M20×170	12-M22×210	8-U 3/4×190	12-U 7/8×230
250	10	12-M22×210	—	12-U 7/8×230	—
300	12	16-M22×210	—	12-U 7/8×230	—
350	14	16-M22×210	—	12-U 1 ×260	—
400	16	16-M24×240	—	16-U 1 ×260	—

Material Long bolt: SNB7
Nut: S45C

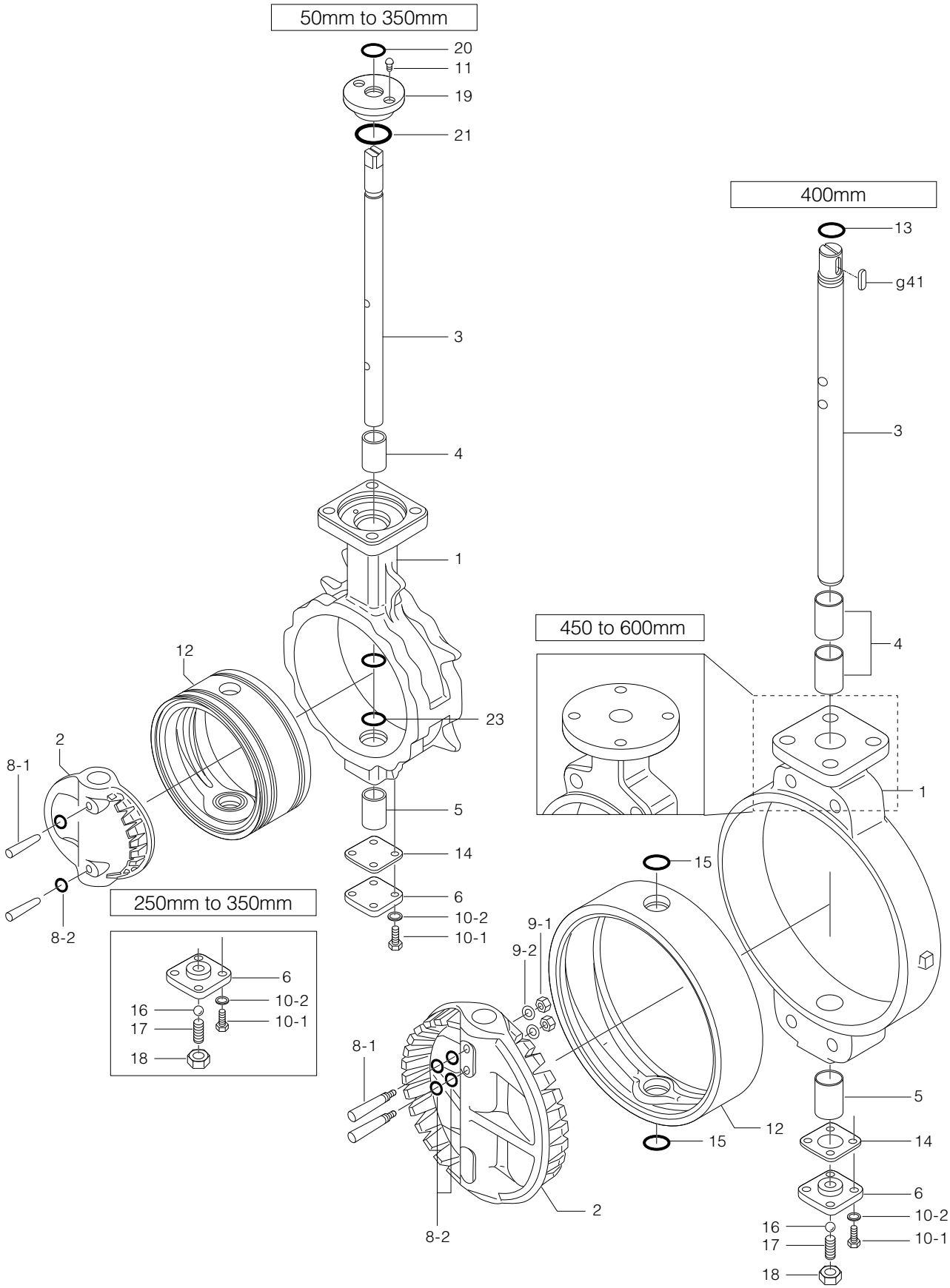
Example

Long bolts: 12 - M22 × 185
N M L

Long bolts and nuts (full thread)



508V Expanded view of components



■508V Parts list (50mm to 350mm)

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
4	Bearing	1	50mm to 250mm
		2	300mm, 350mm
5	Bearing	1	
6	Bottom cover	1	
★ 8-1	Taper pin	2	
★ 8-2	O-ring	4	Only 250mm, 350mm
10-1	Hexagon bolt	4	
10-2	Spring washer	4	
11	Machine screw	2	50mm to 200mm
		4	250mm to 350mm
★ 12	Seat ring	1	
★ 14	Gasket	1	
16	Ball	1	Only 250mm to 300mm
17	Hollow bolt	1	Only 250mm to 300mm
18	Lock nut	1	Only 250mm to 300mm
19	Dust seal	1	
★ 20	O-ring	1	
★ 21	O-ring	1	
★ 23	O-ring	2	

■508V Parts list (400mm to 600mm)

No.	Description	Q'ty	Remarks
1	Body	1	
2	Disc	1	
3	Stem	1	
4	Bearing	2	400mm, 500mm
		3	450mm, 600mm
5	Bearing	1	400mm
		2	450mm to 600mm
6	Bottom cover	1	
★ 8-1	Taper pin	2	
★ 8-2	O-ring	4	
★ 9-1	Hexagon bolt	2	
★ 9-2	Spring washer	2	
10-1	Hexagon bolt	4	
10-2	Spring washer	4	
★ 12	Seat ring	1	
★ 13	O-ring	1	
★ 14	Gasket	1	
★ 15	O-ring	2	
16	Ball	1	
17	Hollow bolt	1	
18	Lock nut	1	
g41	Key	1	

Remark: The ★ indicates recommended spare parts. They are supplied as "Seat ring set".