

Serial No.	H-V038-E-8
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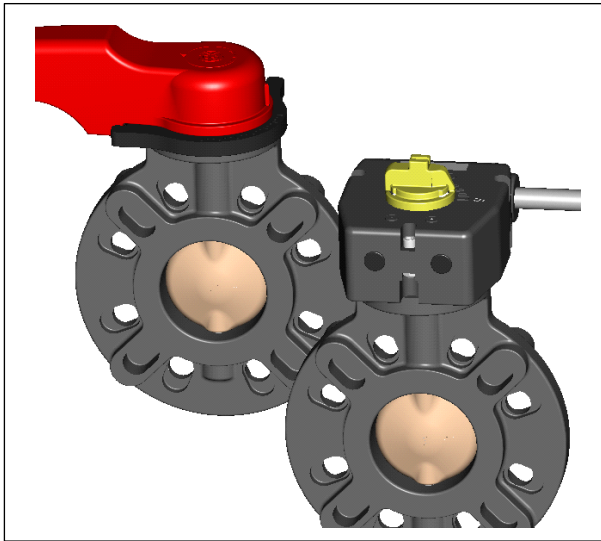
Rotary Damper

Type 57: 40~350mm (1 1/2''~14'')

Type 56: 400mm (16'')

Type 75: 450~600mm (18''~24'')

User's Manual





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ASAHI YUKIZAI CORPORATION

This user's guide contains very important information for the proper installation, maintenance and safe use of an ASAHI AV Product. Please store this manual in an easily accessible location.

<Warning & Caution Signs>

 Warning	This symbol reminds the user to take caution due to the potential for serious injury or death.
 Caution	This symbol reminds the user to take caution due to the potential for damage to the valve if used in such a manner.

<Prohibited & Mandatory Action Signs>

	Prohibited: When operating the valve, this symbol indicates an action that should not be taken.
	Mandatory action: When operating the valve, this symbol indicates mandatory actions that must be adhered to.

(1) Be sure to read the following warranty clauses of our product

- Always observe the specifications of and the precautions and instructions on using our product.
- We always strive to improve product quality and reliability, but cannot guarantee perfection. Therefore, should you intend to use this product with any equipment or machinery that may pose the risk of serious or even fatal injury, or property damage, ensure an appropriate safety design or take other measures with sufficient consideration given to possible problems. We shall assume no responsibility for any inconvenience stemming from any action on your part without our written consent in the form of specifications or other documented approval.
- The related technical documents, operation manuals, and other documentation prescribe precautions on selecting, constructing, installing, operating, maintaining, and servicing our products. For details, consult with our nearest distributor or agent.
- Our product warranty extends for one and a half years after the product is shipped from our factory or one year after the product is installed, whichever comes first. Any product abnormality that occurs during the warranty period or which is reported to us will be investigated immediately to identify its cause. Should our product be deemed defective, we shall assume the responsibility to repair or replace it free of charge.
- Any repair or replacement needed after the warranty period ends shall be charged to the customer.
- The warranty does not cover the following cases:
 - (1) Using our product under any condition not covered by our defined scope of warranty.
 - (2) Failure to observe our defined precautions or instructions regarding the construction, installation, handling, maintenance, or servicing of our product.
 - (3) Any inconvenience caused by any product other than ours.
 - (4) Remodeling or otherwise modifying our product by anyone other than us.
 - (5) Using any part of our product for anything other than the intended use of the product.
 - (6) Any abnormality that occurs due to a natural disaster, accident, or other incident not stemming from something inside our product.

(2) General operate instructions



Warning

- Using a positive-pressure gas with our plastic piping may pose a dangerous condition due to the repellent force particular to compressible fluids even when the gas is under similar pressures used for liquids. Therefore, be sure to take the necessary safety precautions such as covering the piping with protective material. For inquiries, please contact us. For conducting a leak test on newly installed piping, be sure to check for leaks under water pressure. If absolutely necessary to use a gas in testing, please consult your nearest service station beforehand.



Caution

- Do not step on or apply excessive weight on valve. (It can be damaged.)

- Do not use the valve in conditions where the fluid may have crystallized.
(The valve will not operate properly.)



- Keep the valve away from excessive heat or fire. (It can be damaged, or destroyed.)

- Always operate the valve within the pressure vs. temperature range.

(The valve can be damaged or deformed by operating beyond the allowable range.)

- Allow sufficient space for maintenance and inspection.

- Select a valve material that is compatible with the media. For chemical resistance information, refer to “CHEMICAL RESISTANCE ON ASAHI AV VALVE”.

(Some chemicals may damage incompatible valve materials.)

- Keep the valve out of direct sunlight, water and dust. Use cover to shield the valve.

(The valve will not operate properly.)

- Perform periodic maintenance. (Leakage may develop due to temperature changes or periods of prolonged storage, rest, or operation.)

(3) General instructions for transportation, unpacking and storage

Warning

- When suspending and supporting a valve, take care and do not stand under a suspended valve.



Caution

- This valve is not designed to handle impacts of any kind. Avoid throwing or dropping the valve.

- Avoid scratching the valve with any sharp object.

- Do not over-stack cardboard shipping boxes. Excessively stacked packages may collapse.

- Avoid contact with any coal tar creosote, insecticides, vermicides or paint.

(These chemicals may cause damage to the valve.)

- When transporting a valve, do not carry it by the handle.

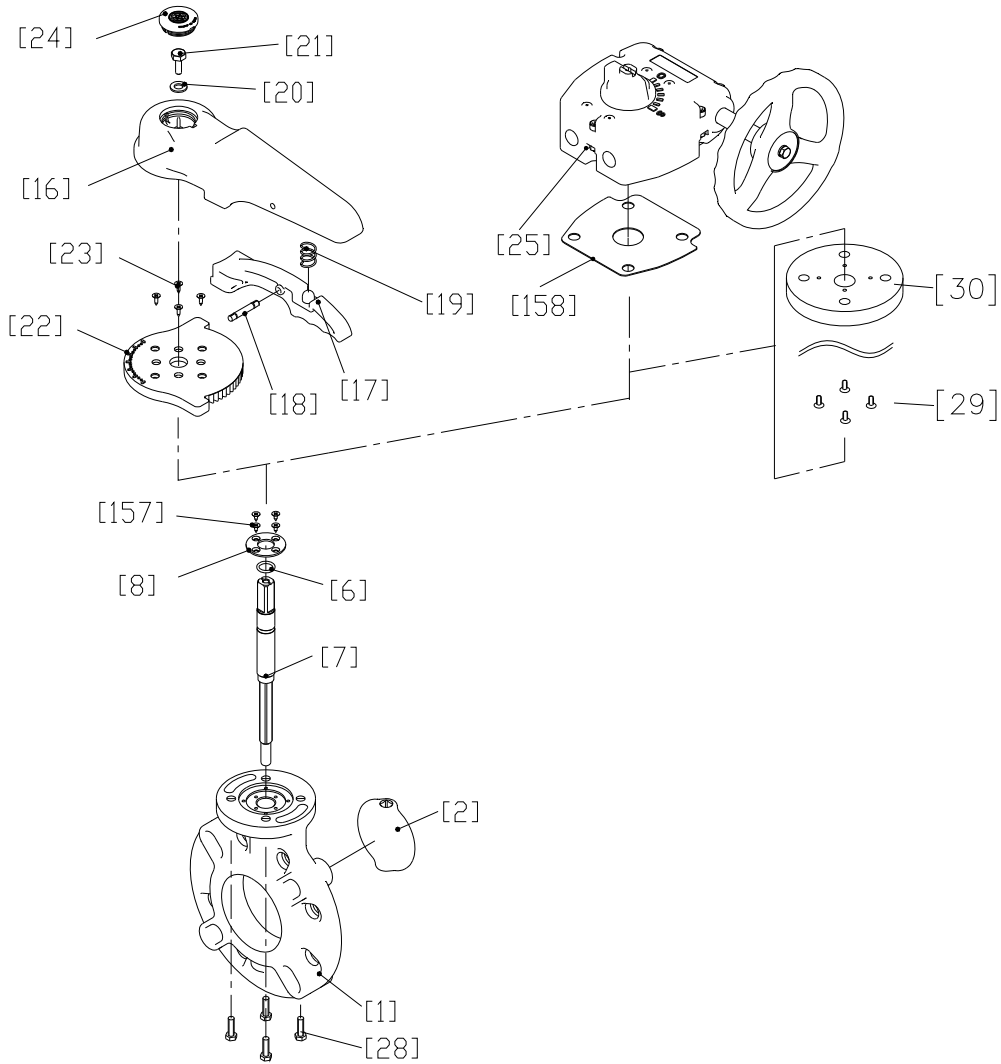


- Store products in their corrugated cardboard boxes. Avoid exposing products to direct sunlight, and store them indoors (at room temperature). Also avoid storing products in areas with excessive temperatures. (Corrugated cardboard packages become weaker as they become wet with water or other liquid. Take care in storage and handling.)

- After unpacking the products, check that they are defect-free and meet the specifications.

(4) Names of parts

1) Lever Type, Gear Type (40-350mm [1 1/2"-14"])/ Body Material: PVC, PP



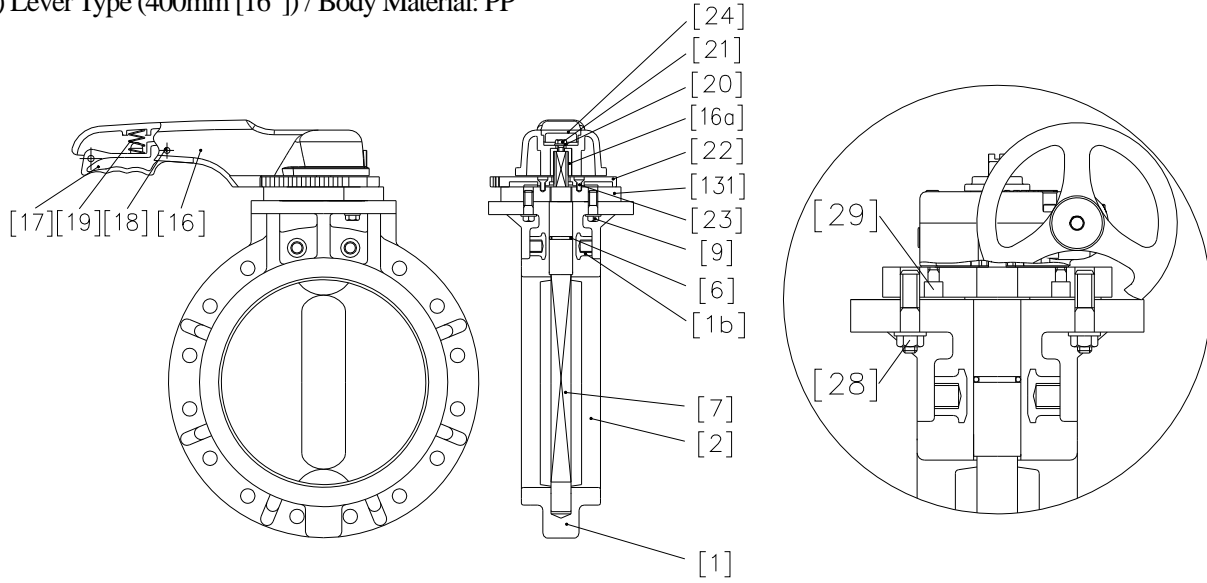
No.	DESCRIPTION	No.	DESCRIPTION	No.	DESCRIPTION
[1]	Body	[18]	Pin	[25]	Gear Box
[2]	Disk	[19]	Spring	[28]	Bolt (C) *1
[6]	O-Ring (C)	[20]	Washer (A)	[28]	Bolt (G) *3
[7]	Stem	[21]	Bolt (B)	[29]	Bolt (D) *2
[8]	Stem Holder (A) *1	[22]	Locking Plate	[30]	Stand *3
[16]	Handle (A)	[23]	Screw (F)	[157]	Screw (F) *1
[17]	Handle Lever	[24]	Cap (A)	[158]	Gasket (L)

*1: Used for size 40~200mm

*2: Used for size 300, 350mm

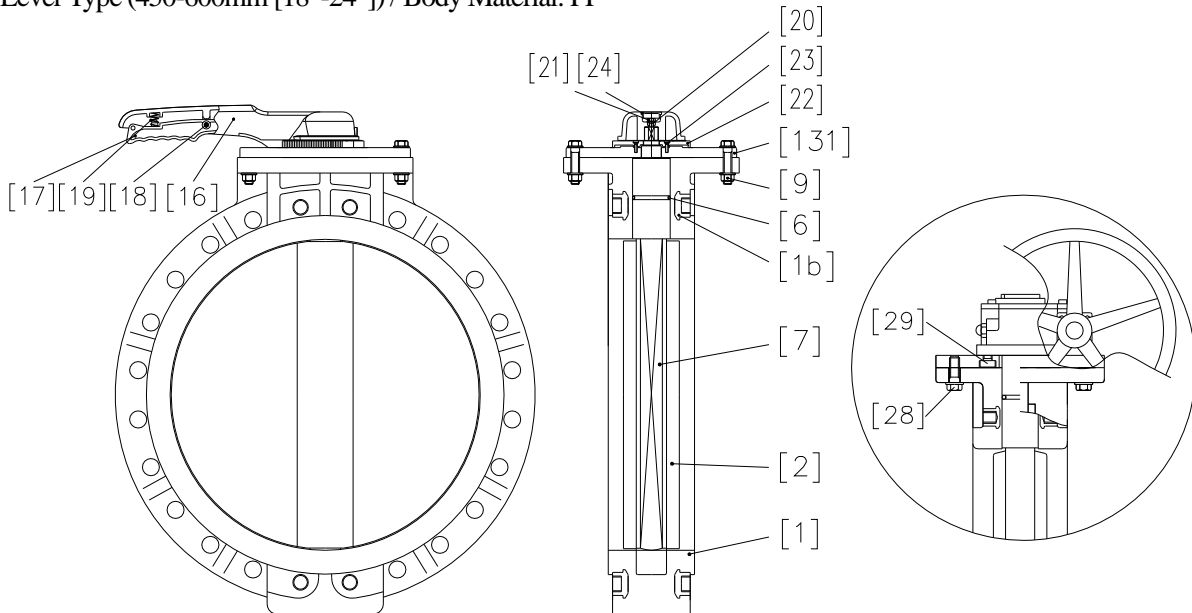
*3: Used for size 250~350mm

2) Lever Type (400mm [16'']) / Body Material: PP



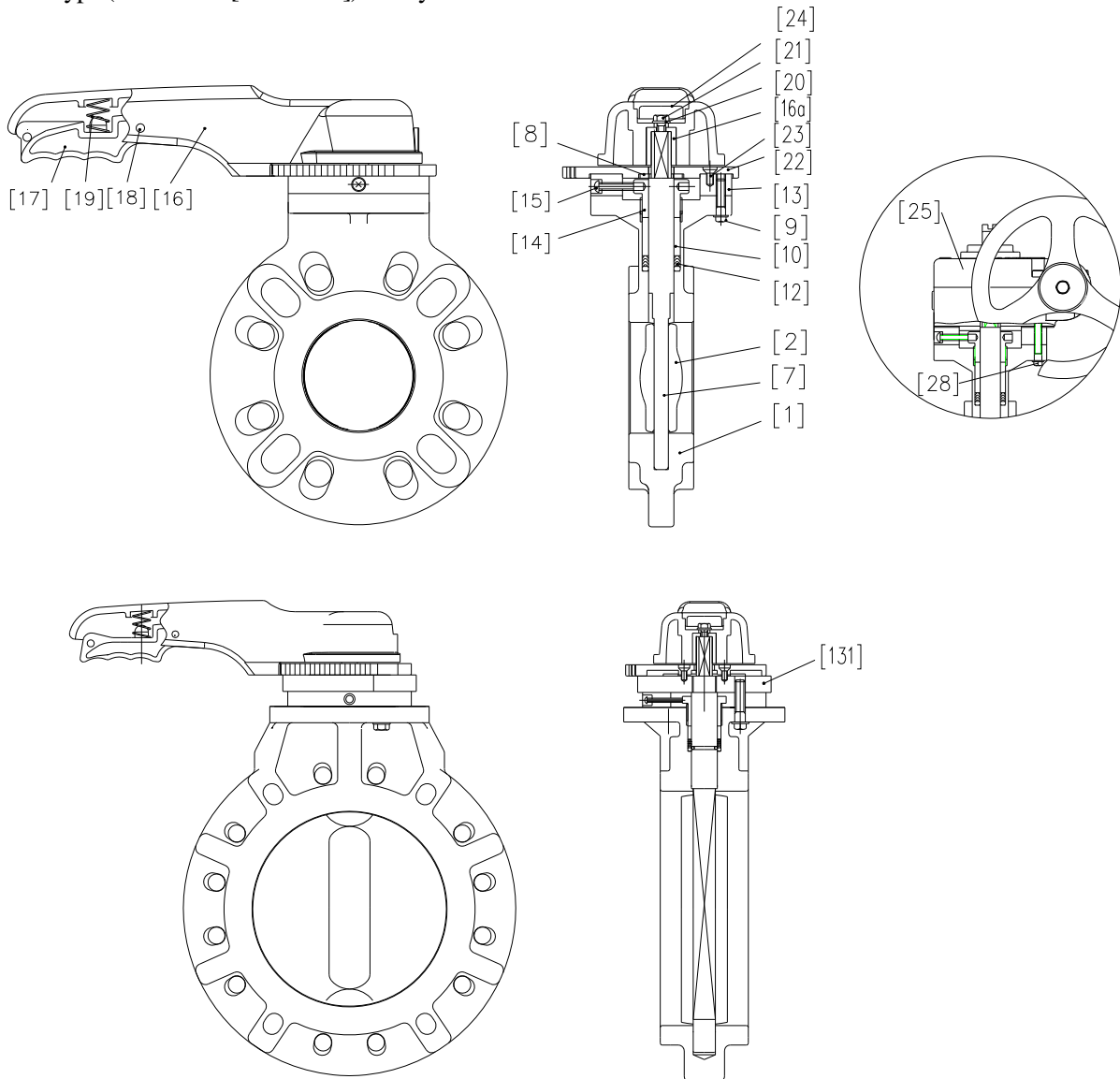
No.	DESCRIPTION	No.	DESCRIPTION	No.	DESCRIPTION
[1]	Body	[16a]	Insert Metal of Handle	[23]	Screw (B)
[1b]	Insert Metal of Body	[17]	Handle Lever	[24]	Cap (A)
[2]	Disk	[18]	Pin	[28]	Bolt (G)
[6]	O-Ring (C)	[19]	Spring	[29]	Bolt (D)
[7]	Stem	[20]	Washer (A)	[131]	Stem Holder (C)
[9]	Bolt (A)	[21]	Bolt (B)		
[16]	Handle (A)	[22]	Locking Plate		

3) Lever Type (450-600mm [18''-24'']) / Body Material: PP



No.	DESCRIPTION	No.	DESCRIPTION	No.	DESCRIPTION
[1]	Body	[16]	Handle (A)	[22]	Locking Plate
[1b]	Insert Metal of Body	[17]	Handle Lever	[23]	Screw (B)
[2]	Disk	[18]	Pin	[24]	Cap (A)
[6]	O-Ring (C)	[19]	Spring	[28]	Bolt (G)
[7]	Stem	[20]	Washer (A)	[29]	Bolt (D)
[9]	Bolt (A)	[21]	Bolt (B)	[131]	Stem Holder (C)

4) Lever Type (40-350mm [1 1/2"-14"])/ Body Material: PVDF

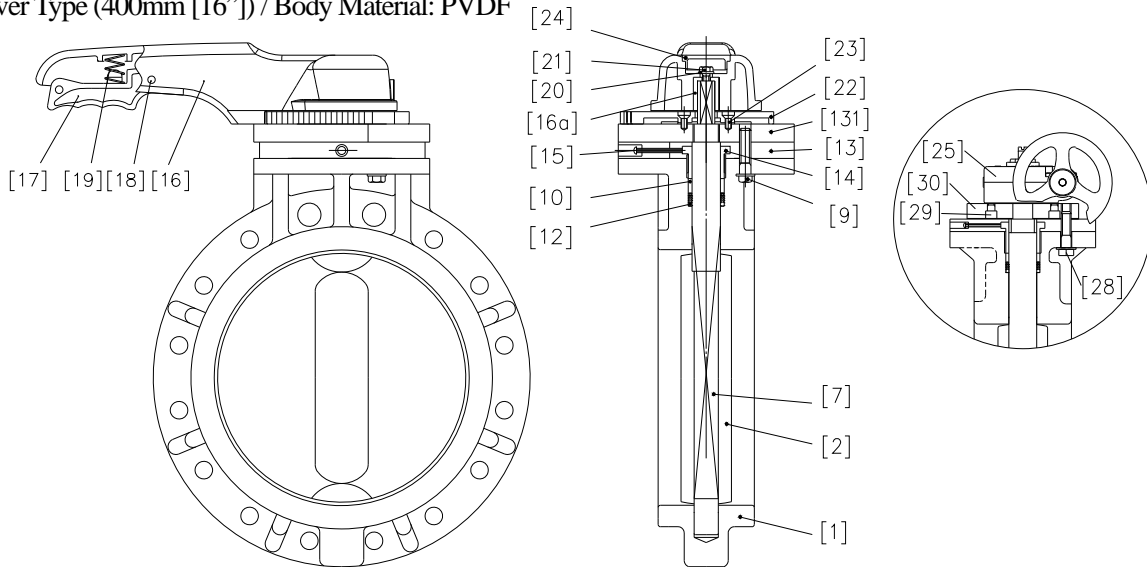


No.	DESCRIPTION	No.	DESCRIPTION	No.	DESCRIPTION
[1]	Body	[14]	Gland	[21]	Bolt (B)
[2]	Disk	[15]	Screw (A)	[22]	Locking Plate
[7]	Stem	[16]	Handle (A)	[23]	Screw (B)
[8]	Stem Holder (A) ^{*1}	[16a]	Insert Metal of Handle	[24]	Cap (A)
[9]	Bolt·Nut(A)	[17]	Handle Lever	[25]	Gear Box
[10]	Bush (A)	[18]	Pin	[28]	Bolt (C)
[12]	V-Packing	[19]	Spring	[131]	Stem Holder (C) ^{*2}
[13]	Spacer (A)	[20]	Washer (A)		

*1: Used for size 40~250mm

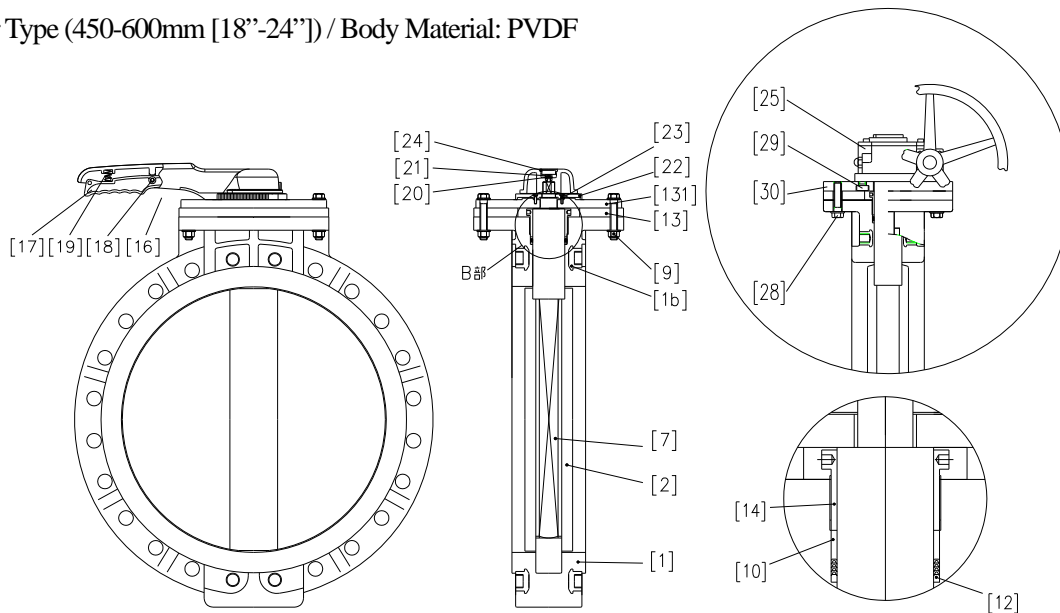
*2: Used for size 300, 350mm

5) Lever Type (400mm [16"]) / Body Material: PVDF



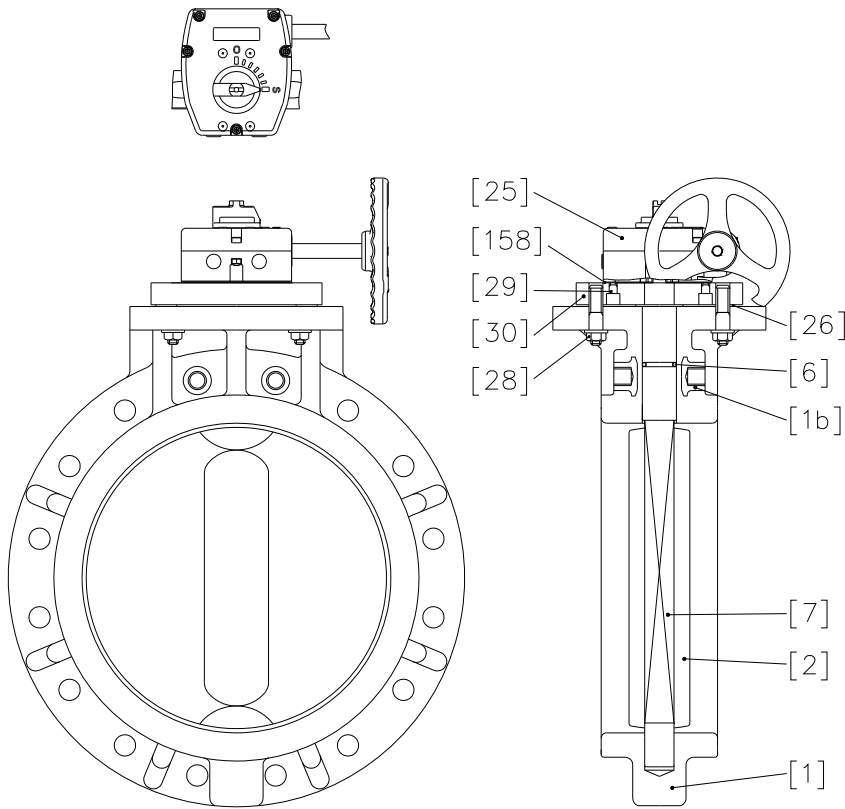
No.	DESCRIPTION	No.	DESCRIPTION	No.	DESCRIPTION
[1]	Body	[15]	Screw (A)	[22]	Locking Plate
[2]	Disk	[16]	Handle (A)	[23]	Screw (B)
[7]	Stem	[16a]	Insert Metal of Handle	[24]	Cap (A)
[9]	Bolt·Nut (A)	[17]	Handle Lever	[25]	Gear Box
[10]	Bush (A)	[18]	Pin	[28]	Bolt (C)
[12]	V-Packing	[19]	Spring	[29]	Bolt (D)
[13]	Spacer (A)	[20]	Washer (A)	[30]	Stand
[14]	Gland	[21]	Bolt (B)	[131]	Stem Holder (C)

6) Lever Type (450-600mm [18"-24"]) / Body Material: PVDF



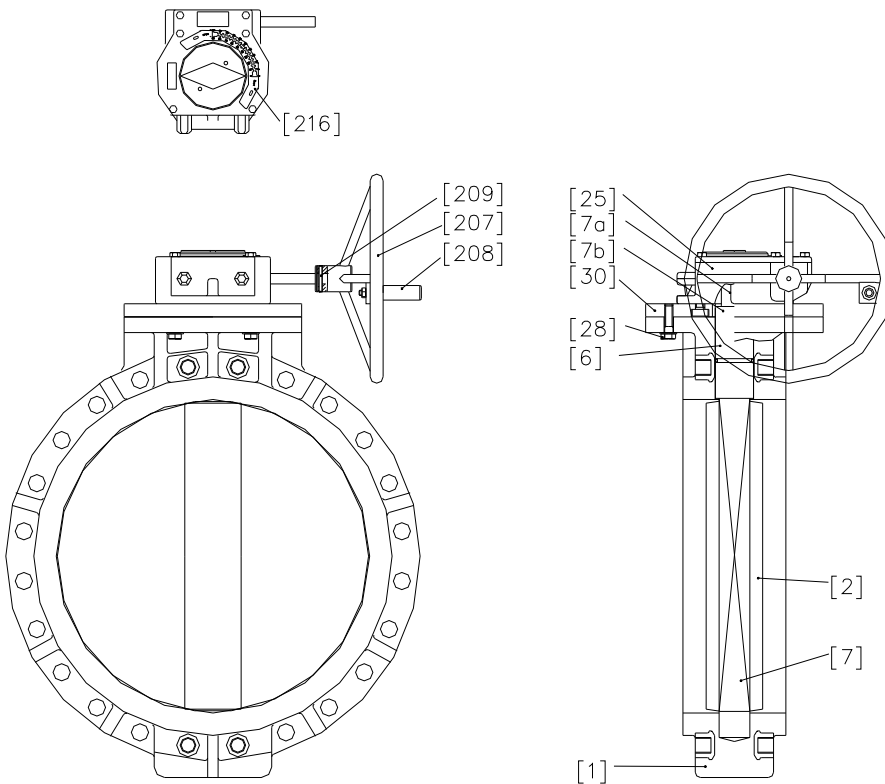
No.	DESCRIPTION	No.	DESCRIPTION	No.	DESCRIPTION
[1]	Body	[14]	Gland	[23]	Screw (B)
[1b]	Insert Metal of Body	[16]	Handle (A)	[24]	Cap (A)
[2]	Disk	[17]	Handle Lever	[25]	Gear Box
[7]	Stem	[18]	Pin	[28]	Bolt (C)
[9]	Bolt·Nut (A)	[19]	Spring	[29]	Bolt (D)
[10]	Bush (A)	[20]	Washer (A)	[30]	Stand
[12]	V-Packing	[21]	Bolt (B)	[131]	Stem Holder (C)
[13]	Spacer (A)	[22]	Locking Plate		

7) Gear Type (400mm [16"]) / Body Material: PP



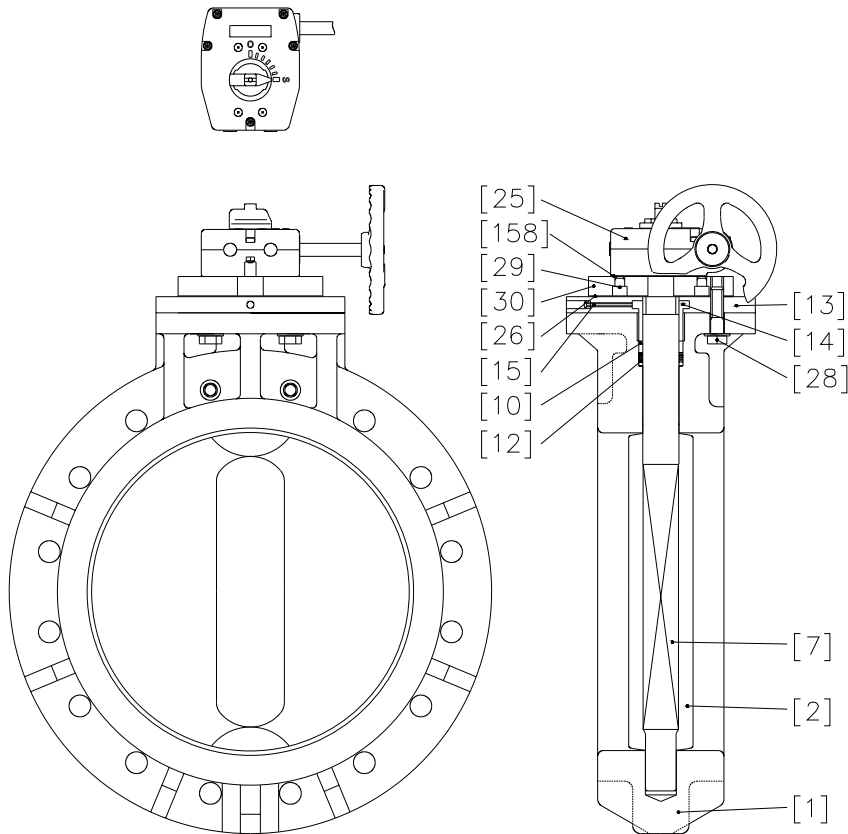
No.	DESCRIPTION
[1]	Body
[1b]	Inserted Metal of Body
[2]	Disc
[6]	O-Ring (C)
[7]	Stem
[25]	Gear Box
[26]	Gasket (A)
[28]	Bolt·Nut (G)
[29]	Bolt (D)
[30]	Stand
[158]	Gasket (L)

8) Gear Type (450-600mm [18"-24"]) / Body Material: PP



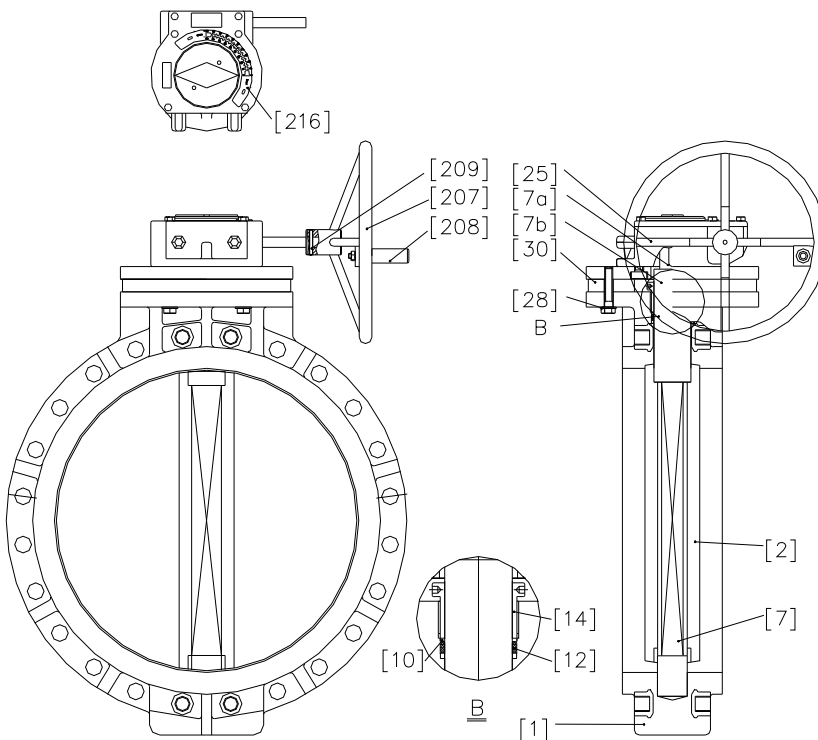
No.	DESCRIPTION
[1]	Body
[1b]	Inserted Metal of Body
[2]	Disc
[6]	O-Ring (C)
[7]	Stem
[7a]	Key (A)
[25]	Gear Box
[28]	Bolt·Nut (G)
[30]	Stand
[207]	Handle(C)
[208]	Handle Grip
[209]	Spring Pin
[216]	Scale Plate

9) Gear Type (400mm [16"]) / Body Material: PVDF



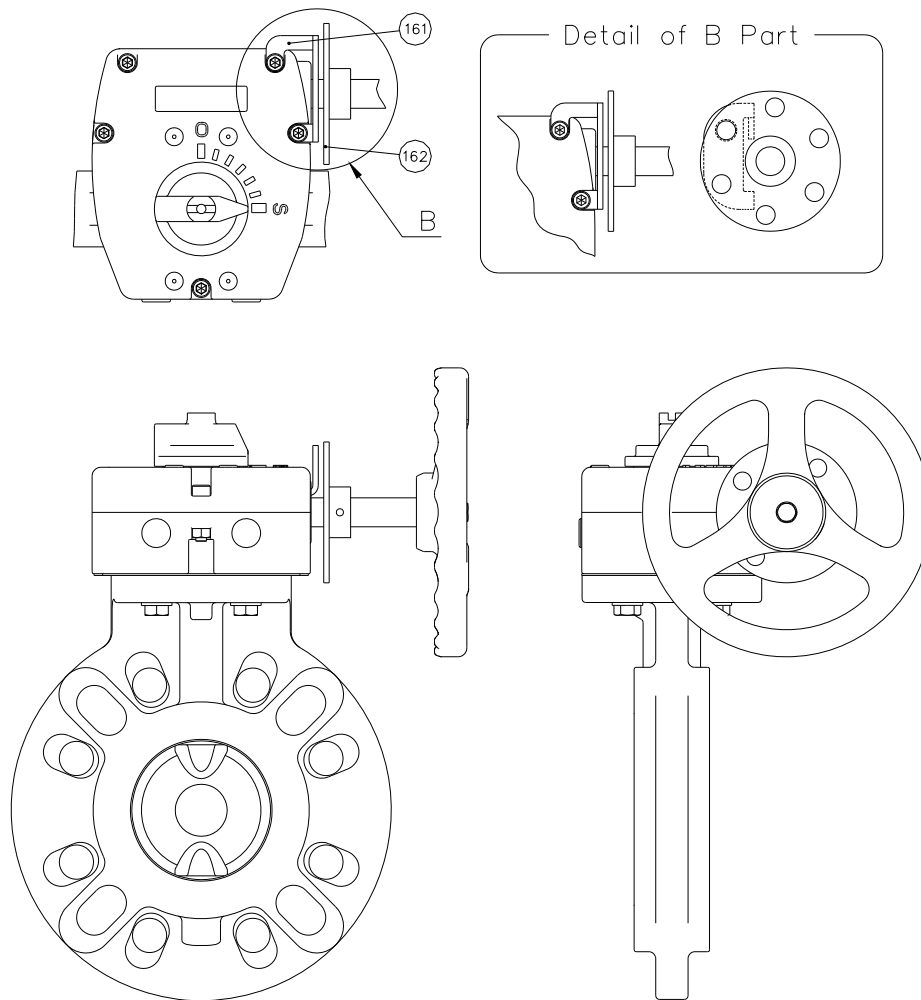
No.	DESCRIPTION
[1]	Body
[2]	Disc
[7]	Stem
[10]	Bush (A)
[12]	V-Packing
[13]	Spacer (A)
[14]	Gland
[15]	Screw (A)
[25]	Gear Box
[26]	Gasket (A)
[28]	Bolt·Nut (G)
[29]	Bolt (D)
[30]	Stand
[158]	Gasket (L)

10) Gear Type (450-600mm [18"-24"]) / Body Material: PVDF



No.	DESCRIPTION
[1]	Body
[1b]	Inserted Metal of Body
[2]	Disc
[7]	Stem
[7a]	Key (A)
[10]	Bush (A)
[12]	V-Packing
[13]	Spacer (A)
[14]	Gland
[25]	Gear Box
[28]	Bolt·Nut (G)
[30]	Stand
[207]	Handle(C)
[208]	Handle Grip
[209]	Spring Pin
[216]	Scale Plate

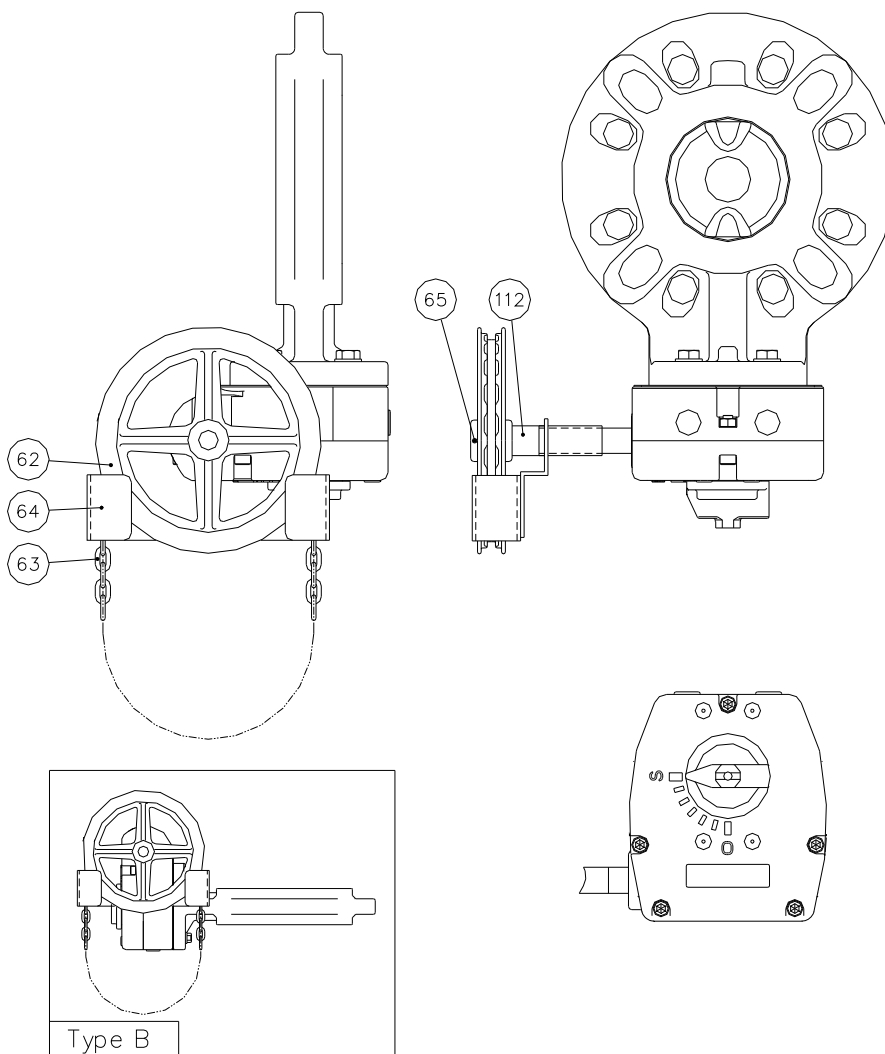
11) Gear Type (40-400mm [1 1/2"-16"]) with Handle Lock (Option)



※The shape and appearance of assembly differ a little with nominal size or body material compared to this drawing.

No.	DESCRIPTION
[161]	Locking Plate (A)
[162]	Locking Plate (B)

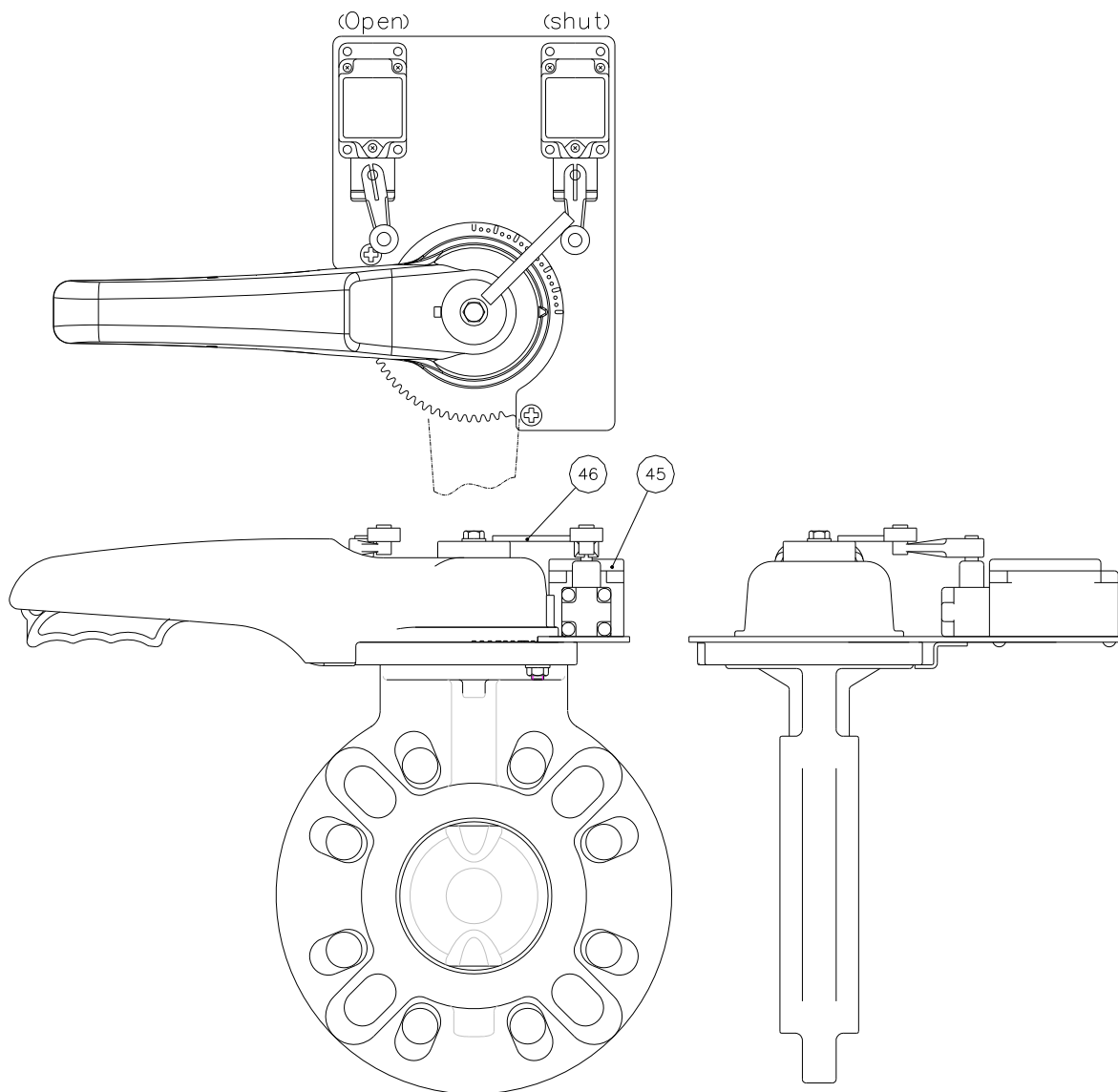
12) Chain Type (40-600mm [1 1/2"-24"]) (Option)



※The shape and appearance of assembly differ a little with nominal size or body material compared to this drawing.

No.	DESCRIPTION	No.	DESCRIPTION
[62]	Sprocket Wheel	[65]	Set Pin
[63]	Chain (A)	[112]	Joint (B)
[64]	Chain Cover		

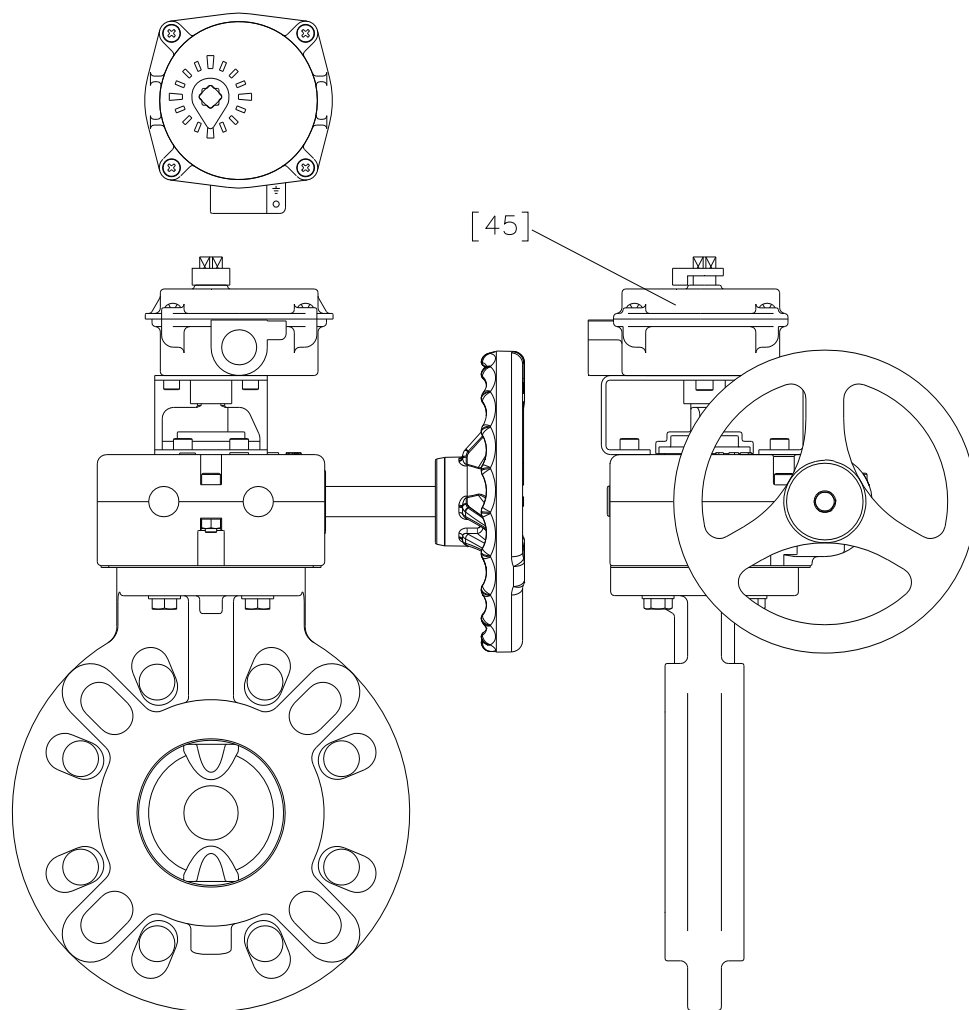
13) Lever Type (40-200mm [1 1/2"-8"]) with Limit Switch (1LS1-J) (Option)



※The shape and appearance of assembly differ a little with nominal size or body material compared to this drawing.

No.	DESCRIPTION
[45]	Limit Switch
[46]	Limit Switch Pushing Plate

14) Gear Type (40-400mm [1 1/2"-16"]) with Limit Switch Box (TA2-SB2) (Option)

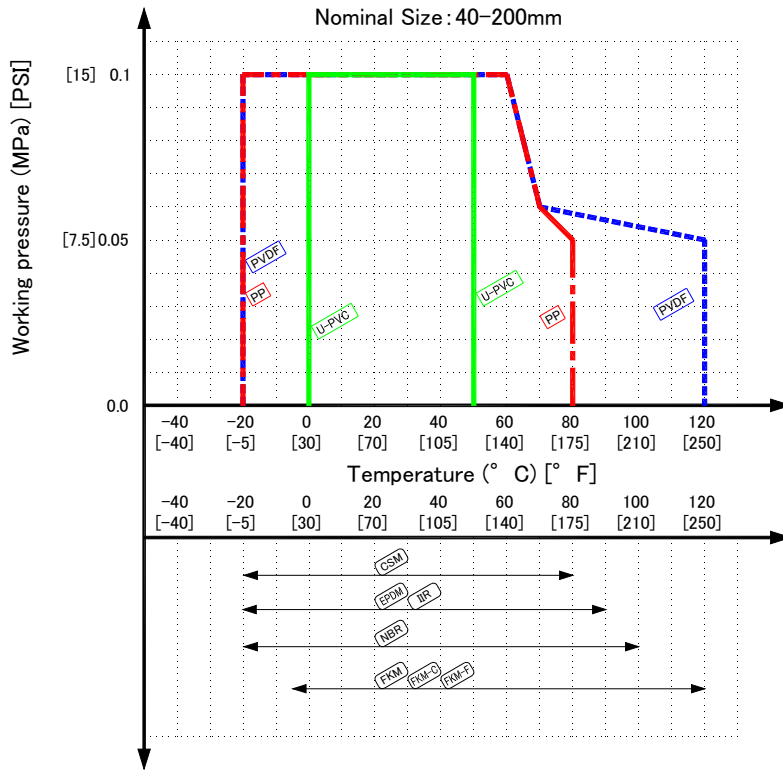


※The shape and appearance of assembly differ a little with nominal size or body material compared to this drawing.

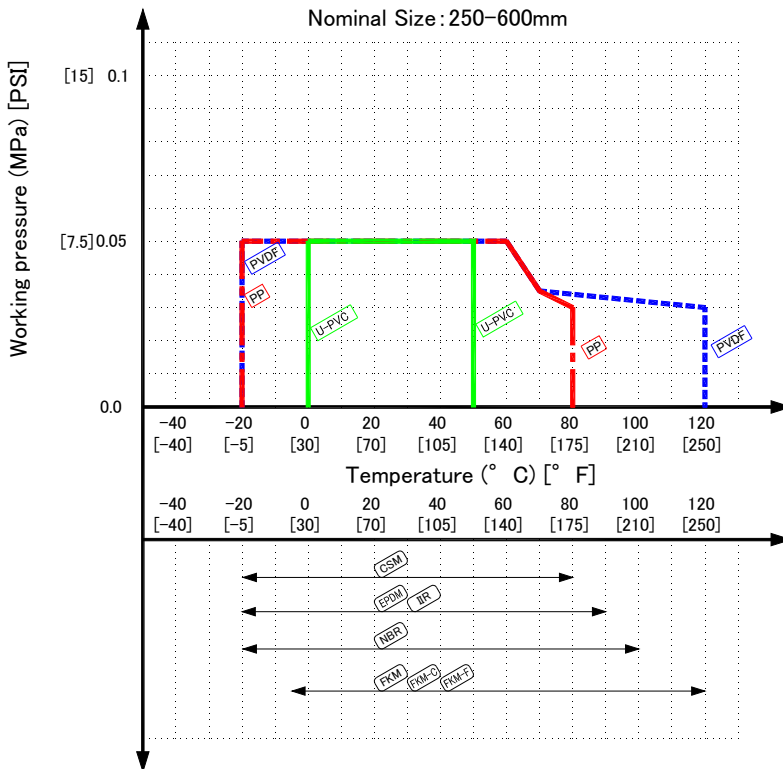
No.	DESCRIPTION
[45]	Limit Switch Box

(5) Working pressure vs. temperature

Rotary damper



Rotary damper



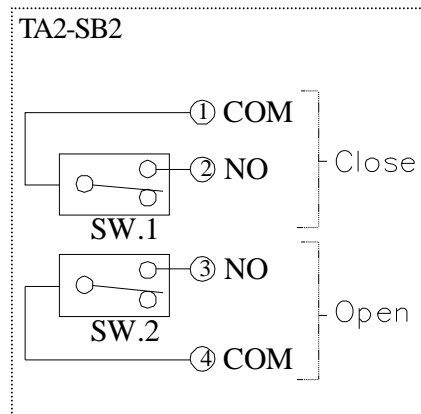
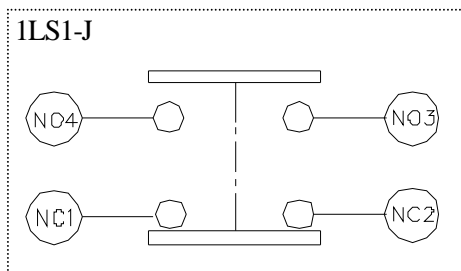
(6) Specification of limit switch (option)

Nominal Size	Type	Type Code	Protection Grade
40-200mm (1 1/2"-8")	Lever Type	1LS1-J	IP67
40-400mm (1 1/2"-16")	Gear Type	TA2-SB2	IP65




Limit Switch Rating

Type Code	Rate Voltage (V)	Resistive Load (A)	Inductive Load (A)
1LS1-J	AC 125	10	6
	AC 250	10	6
	DC 115	0.8	0.2
	DC 230	0.4	0.1
TA2-SB2	AC 125	11	7
	AC 250	11	7
	DC 125	0.5	-
	DC 250	0.25	-

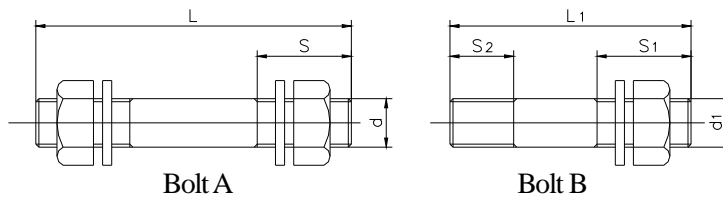
Connecting Diagram



(7) Installation procedure

- Warning**
-  - When suspending and supporting a valve, take care and do not stand under a suspended valve.
 -  - Be sure to conduct a safety check on all hand and power tools to be used before beginning work.
 - Wear protective gloves and safety goggles as fluid remain in the valve even if the pipeline is empty. (You may be injured.)
- Caution**
-  - When installing a pipe support by means of a U-band or something similar, take care not to over-tighten. (Excessive force may damage the pipe.)
 - When installing pipes and valves, ensure that they are not subjected to tension, compression, bending, impact, or other excessive stress.
 - Use flat faced flanges for connection to AV Valves.
 - Ensure that the mating flanges are of the same standards.

- Necessary items**
- Torque wrench ● Spanner wrench ● AV gasket
 - Bolt, Nut, Washer (For many flanges specification)





<JIS Standard>

Nominal Size		Bolt A (Minimum)			Bolt B				Quantity															
		d	L	S	d1	L	S1	S2	Bolt A	Bolt B	Nut & Washer													
40mm	1½"	M16	115mm (4.53")	40mm (1.57")	-	-	-	-	4	-	8													
50mm	2"		125mm (4.92")	45mm (1.77")																				
65mm	2½"		135mm (5.31")																					
80mm	3"		145mm (5.71")																					
100mm	4"	M20	165mm (6.50")	55mm (2.17")					-	-	-	-	8	-	16									
125mm	5"		175mm (6.89")																					
150mm	6"		195mm (7.68")																					
200mm	8"	M22	225mm (8.86")	60mm (2.36")									-	-	-	-	12	-	24					
250mm	10"		245mm (9.65")																					
300mm	12"		255mm (10.04")																					
350mm	14"	M24	290mm (11.42")	60mm (2.36")													M24	115mm (4.53")	60mm (2.36")	30mm (1.18")	16	-	32	
400mm	16"		305mm (12.01")	65mm (2.56")																				
450mm	18"		315mm (12.40")																					
500mm	20"	M30	350mm (13.78")															75mm (2.95")	M30	135mm (5.31")	70mm (2.76")	40mm (1.57")	14	4
600mm	24"		20	8																			48	

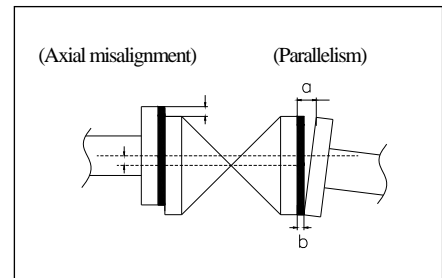
Procedure

- 1) Close the valve fully.
- 2) Set the AV gasket between the flanges.
- 3) Insert washers and bolts from the pipe side, insert washers and nuts from the valve side, then temporarily tighten them by hand.
(Threaded bolts are needed for JIS 10K [the connection standard], 450mm~600mm [18''~24''])



  - The parallelism and axial misalignment of the flange surface should be under the values shown in the following table to prevent damage the valve.
(A failure to observe them can cause destruction due to stress application to the pipe)

Unit: mm (inch)

Nom. Size	Axial misalignment	Parallelism (a-b)
40~80mm (1½''~3'')	1.0mm (0.04'')	0.8mm (0.03'')
100~150mm (4''~6'')	1.0mm (0.04'')	1.0mm (0.04'')
200~600mm (8''~24'')	1.5mm (0.06'')	1.0mm (0.04'')

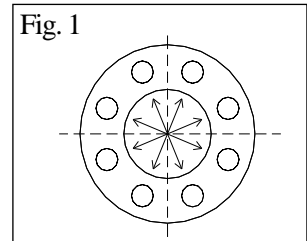


- 4) Tighten the bolts and nuts gradually with a torque wrench to the specified torque level in a diagonal manner.
(Refer to Fig.1.)

  - Tighten the bolts and nuts gradually with a torque wrench to the specified torque level in a diagonal manner.

Recommended torque value Unit : N·m{kgf·cm}[lb·inch]





Nom. Size	40mm (1½'')	50, 65mm (2'', 2½'')	80, 100mm (3'', 4'')	125, 150mm (5'', 6'')
Torque value	20.0 {204} [177]	22.5 {230} [200]	30.0 {306} [266]	40.0 {408} [355]



Nom. Size	200,250mm (8'',10'')	300, 350mm (12'', 14'')	400, 450mm (16'',18'')	500, 600mm (20'', 24'')
Torque value	55.0 {561} [488]	60.0 {612} [532]	80.0 {816} [710]	100.0 {1020} [887]

* These figures above show the specified torque value when the AV gasket used for 40mm (1½'') to 350mm(14'').
As for 400mm (16'') or more, refer to the figures above just as the recommended torque value as they do not use AV gaskets.

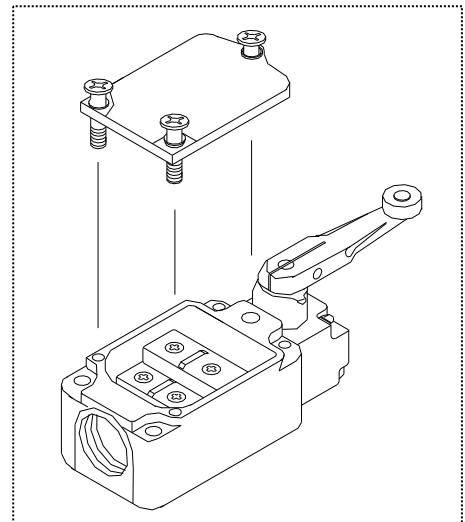
(8) Connection of limit switch procedure (option)

-   - Shut down the power on the equipment before connecting wires. There are risks of electrical shock depending on the level of operating voltage.
-   - Be sure that the terminal cover and body cover are put on during the operation.
- Connect the cables by using insulated sheathed crimping terminals in such a way as not to contact the cover or housing. (Contact of a crimping terminal with the cover may disable the cover from being closed or may cause a ground fault.)
- If you use the limit switch at 1-100mA or 5-30V, consult near Asahi dealer.
- Ensure all covers are tightly fastened prior to operation.
(Insufficient fastening may allow rainwater, dust or dirt to come in, resulting in breakdown.)

- Necessary items
- Screwdriver (+)
 - Screwdriver (-)
 - Crimp-style terminal
 - Wire stripper
 - Terminal crimping tool

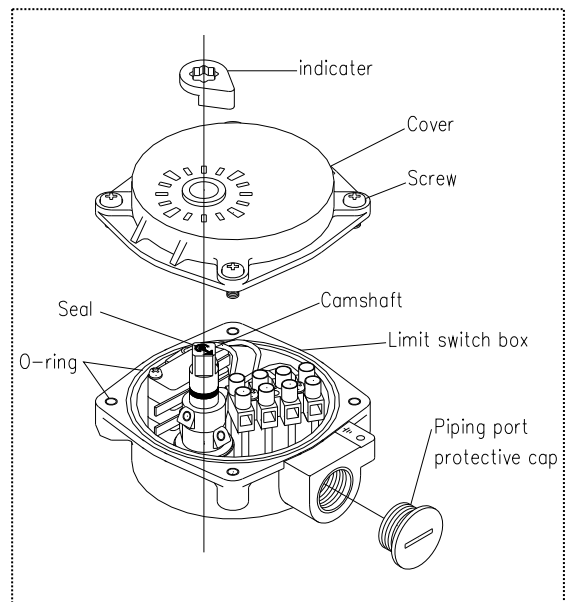
Procedure (ILS1-J)

- 1) Loosen the three screws used to attach the limit switch cover with a screwdriver (+) and remove the cover from the limit switch.
*These screws are captive.
- 2) Pull and remove the protective cap, made of resin, from the cover.
- 3) Draw the cable through the connector.
- 4) Strip the cable with a wire stripper.
- 5) Install a crimp-style terminal on the lead wire with a terminal crimping tool.
- 6) Connect the terminal screw with a screwdriver (+) according to the internal circuit diagram show in page 15.
* Tighten the screws. (If not, electric leaks or shocks may occur.)
- 7) Tighten the above three screws with a screw driver (+) to install the cover on the limit switch.
- 8) Tighten the cable by connector.




Procedure (TA2-SB2/ TA-200-SB2)

- 1) Remove the indicator.
- 2) Remove the fixed screws from casing using screw driver (+).
※Don't be missing the o-ring of case end.
- 3) Turn to counter clockwise and remove the piping port protective cap.
- 4) Draw the cable through the connector.
- 5) Strip the cable with wire stripper.
- 6) Connect the cable to terminal board with a screw driver (-) in accordance page 15.
※Tighten the screws. (Short circuit or shocks may occur.)



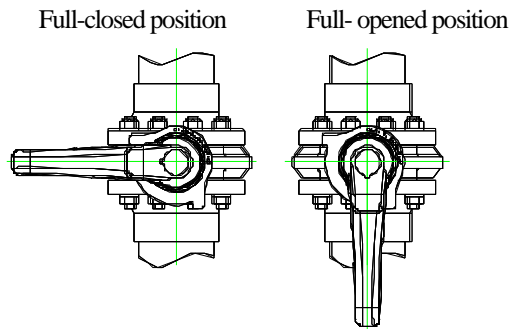
- 7) Tighten up the connector to fix the cable.
- 8) The screws must be tightened in turn after set the casing with screws driver (+)
 - ※Be sure to set the o-ring when the casing is re-set. (Short circuit or shocks may occur.)
- 9) Inset the indicator to the upper camshaft which must be set same direction of the seal's arrow.

(9) Operating procedure

 **Caution** - The installed valve must never be opened or closed when foreign matter such as sand is present in the pipeline.

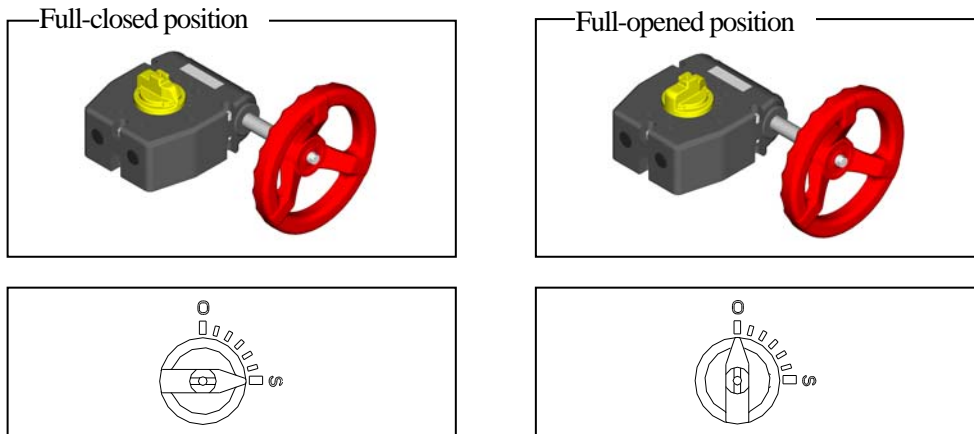
- Do not exert excessive force in closing the valve.
- When operating the handle, be sure to do so with your hand. (Using a tool may damage the handle.)

- 1) Open and close the valve by turning handle slowly. Turn clockwise to close and counterclockwise to open.
- 2) Lever type, the direction of handle is same as the disc.
 - For the full-closed position, the handle is perpendicular to the piping system.
 - For the full-opened position, the handle is parallel to the piping system.

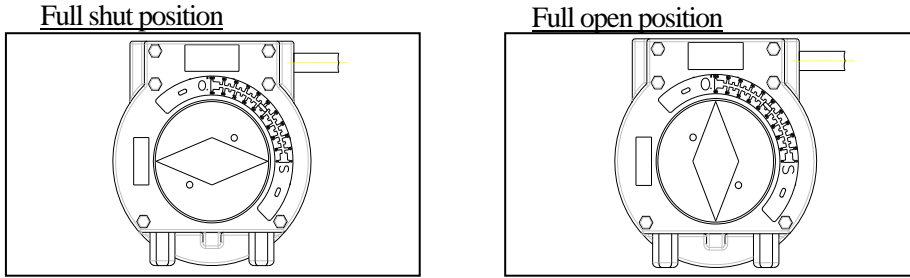


- 3) Gear type, the indicator shows the position of the disc on the top of gear box.
 - For the full-closed position, the indication shows Shut.
 - For the full-opened position, the indication shows Open.

-Nominal Size: 40-400mm (1 1/2"-16")



-Nominal Size: 450-600mm (18"-24")



(10) Disassembly and assembly procedure for parts replacement

- Warning** (Warning icon) - The handle part can be removed with line pressure present. The stem retainer can't be removed with line pressure present. If stem retainer needs to be removed, there can not be line pressure present.
- Caution** (Caution icon) - Wear protective gloves and safety goggles as fluid remain in the valve even if the pipeline is empty. (You may be injured.)
- When installing pipes and valves, ensure that they are not subjected to tension, compression, bending, impact, or other excessive stress.
- Do not change or replace valve parts under line pressure.

- Necessary items
- Protective gloves
 - Safety goggles
 - Spanner wrench
 - Socket wrench
 - Hexagonal Wrench
 - Jack
 - Plate
 - Thrust bearing
 - Pipe
 - Silicon grease
 - Screw driver (-)
 - Screw driver (+)

Body Material: U-PVC, PP

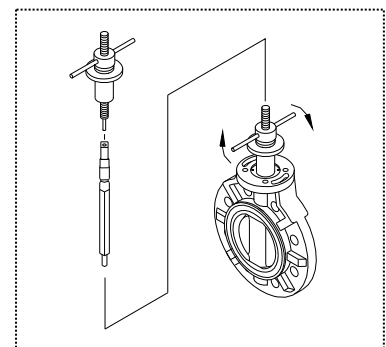
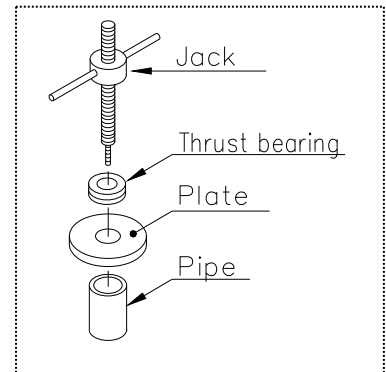
<< Disassembly >>

Procedure

- 1) Drain the fluid completely from the pipeline, and close the valve fully.
- 2) Loosen the connecting bolts and nuts with a spanner wrench.
- 3) Remove the valve from the pipeline.

As for the lever type

- 4) To take off handle (A) [16], firstly take off cap (A) [24] by using screw driver (-) and release bolt (B) [21] by using a socket wrench, then pull up the handle (A) [16] with holding handle lever [17].
- 5) To take off locking plate [22], release four tapping screws (B) [23] first by using a screw driver (+).
- 6) <40-350mm (1 1/2"-14")>
To take off stem holder (A) [8], release screw (F) [157] first by using a screw driver (+).
- <400-600mm (16"-24")>
To take off stem holder (C) [131], loosen bolt (A) [9] first by using a spanner wrench.



As for the gear type

4) <40-200mm (1 1/2"-8")>

To take off gear box [25], loosen bolt (C) [28] and pull the gear box [25] up to remove.

<250-600mm (10"-24")>

To take off gear box [25], loosen bolt (G) [28] and pull the gear box [25] (with stand [30]) up to remove.

5) <250-600mm (10"-24")>

To take off gear box [25] from stand [30], loosen bolt first by using a hexagonal wrench.

7) <40-100mm (1 1/2"-4")>

Pull out the stem [7] by pliers or hand.

<125-600mm (5"-24")>

Attach jack, thrust bearing, plate, and pipe to the valve, and thread the jack into the stem [7].

As for the handle of gearbox[450-600mm (18"-24")]

1) Extrude the spring pin which is connecting the shaft and steering wheel by a tool.

Pull out the steering wheel of the shaft.

<< Assembly >>

Procedure

- 1) Before starting assembly, silicone grease (equivalent to Toray Silicone HVG) should be spread O-ring (C) [6].
- 2) The procedure of the assembly is the almost reverse of its disassembly.

Body Material: PVDF

<< Disassembly >>

Procedure

- 1) Drain the fluid completely from the pipeline, and close the valve fully.
- 2) Loosen the connecting bolts and nuts with a spanner wrench.
- 3) Remove the valve from the pipeline.

As for the lever type

4) To take off handle (A) [16], firstly take off cap (A) [24] by using screw driver (-) and release bolt (B) [21] by using a socket wrench, then pull up the handle (A) [16] with holding handle lever [17].

5) To take off locking plate [22], release four tapping screws (B) [23] first by using a screw driver (+).

6) <40-400mm (1 1/2"-16")>

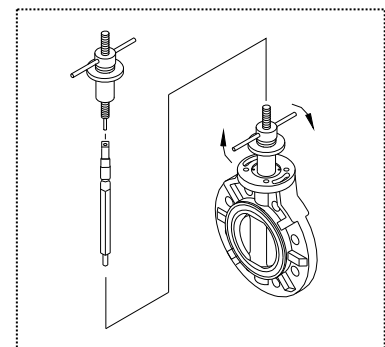
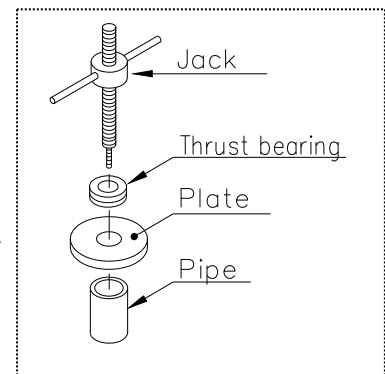
Release screw (A) [15] by using screw driver (+)

7) <40-250mm (1 1/2"-10")>

To take off spacer (A) [13], loosen bolt (A) [9] by using a screw driver (+).

<300-6000mm (10")>

To take off spacer (A) [13] and stem holder (C) [131], loosen bolt (A) [9] first by using a spanner wrench.



As for the gear box

4) <40-400mm (1 1/2"-16")>

Release screw (A) [15] by using screw driver (+)

5) <40-350mm (1 1/2"-14")>

To take off spacer (A) [13] and gear box [25], loosen bolt (C) [28] first by using a spanner wrench.

<400-600mm (16"-24")>

To take off gear box [25] (with stand [30]), loosen bolt (C) [28] first using a spanner wrench.

6) <400-600mm (16"-24")>

To take off gear box [25] from stand [30], loosen bolt first by using a hexagonal wrench.

8) Release gland [14] by hand.

9) <40-100mm (1 1/2"-4")>

Pull out the stem [7] by pliers or hand.

<125-600mm (5"-24")>

Attach jack, thrust bearing, plate, and pipe to the valve, and thread the jack into the stem [7].

As for the handle of gearbox[450-600mm (18"-24")]

1) Extrude the spring pin which is connecting the shaft and steering wheel by a tool.

Pull out the steering wheel of the shaft.

<< Assembly >>

Procedure

- 1) Before starting assembly, silicone grease (equivalent to Toray Silicone HVG) should be spread sliding surfaces.
- 2) The procedure of the assembly is the almost reverse of its disassembly.

(11) Installation procedure for handle

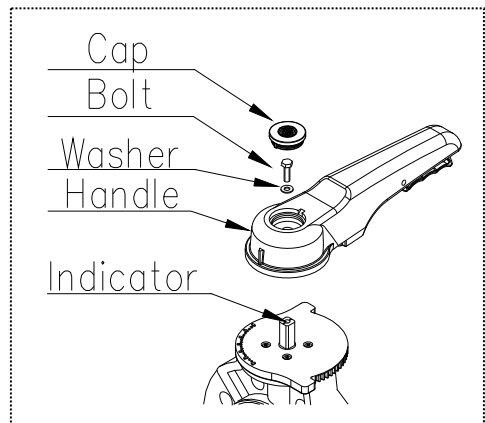
Necessary items

- Plastic Hammer ● Socket Wrench ● Screw Driver(-)
- Goggles ● Protective Glove

《Installation》

Procedure

- 1) Install the handle on the stem. Set the direction of handle in the indication line at the top of stem.
- 2) Fix the handle at the top of stem with the attached bolts and washer by using socket wrench.
- 3) Set the convex part at the side of the cap and the concave of the handle, and set in the cap by striking lightly by using a plastic hammer.

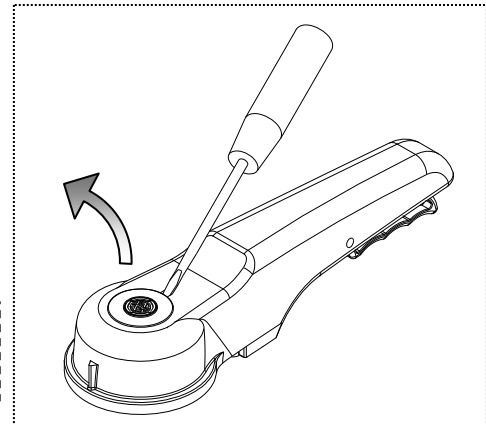




Nominal Size	40-100mm (1 1/2"-4")	125-400mm (5"-16")	450-600mm (18"-24")
Bolt Size	M6×15L	M8×15L	M8×20L
Socket Size	10	13	13

《Remove》

Procedure

- 1) To remove the cap, push up the side of the cap by using screw driver (-).
- 2) Loose the bolts and washer by using socket wrench, then remove the handle.



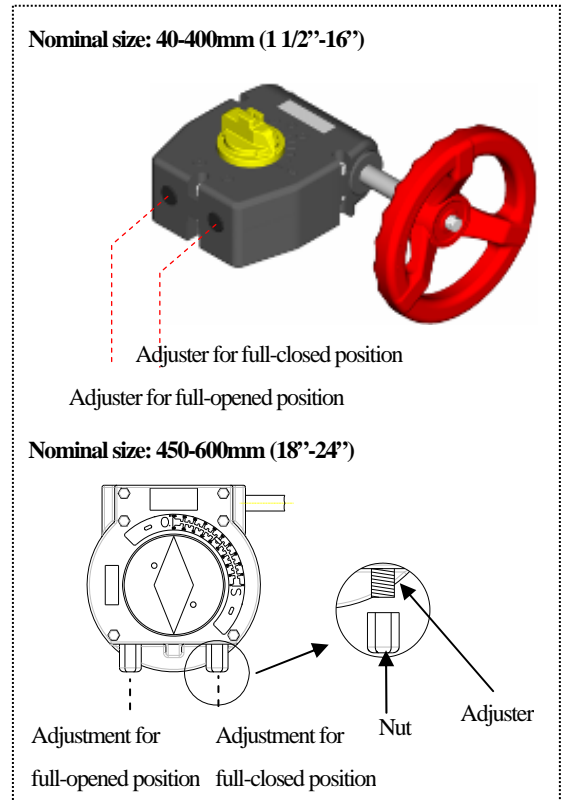
Caution   - Do not give any unjust force to cap, in installing or removing the cap. (It can be damaged)

(12) Adjustment procedure for stopper



Necessary items
 ● Allen wrench

- * As for the lever type, adjust the valve travel with the locking plate [22]. The far edge of the rock part is the full-closed or full-opened position.
- * As for the gear type, the adjustments for full-opened and full-closed position are step-less, and it can be done with the stopper adjuster.

- 1) <40-400mm (1 1/2"-16")>
 Remove the rubber cap of Full-closing (Full-opening) adjuster.
 <450-600mm (18"-24")>
 Remove the nut by spanner wrench.
- 2) Loosen the adjuster hex-bolt by an Allen wrench.
- 3) Adjust the disc of valve to required position.
- 4) Tighten the adjuster with an Allen wrench.
- 5) <40-400mm (1 1/2"-16")>
 Put the rubber cap of Full-closing (Full-opening) adjuster back on gearbox by hand.
 <450-600mm (18"-24")>
 Attach the nut to the stopper.



(13) Inspection items

  - Perform periodic maintenance. (Leakage may develop due to temperature changes or over periods of prolonged storage, rest or operation.)



Inspect the following items.

(1)	Check for the flaws, crack, or deformation on the valve.
(2)	Check for leaks to the outside.
(3)	Check for deformation of seat or disc due to improper installation of valve.
(4)	Check for the smoothness of handle operation.

(14) Troubleshooting

Problem	Cause	Treatment
Fluid leaks to the outside.	1) The connecting bolts are not tightened properly or torques unevenly.	Adjust and retighten the bolts.
The handle does not operate smoothly.	1) Foreign materials have collected on the disc. 2) The gearbox is damaged. 3) The connecting bolt is too much tightened.	Remove the material. Repair or replace. Adjust and retighten the flange bolts.
Valve does not operate.	1) The gear box is damaged. 2) The stem is damaged. 3) The spring pin is damaged	Repair or replace. Replace the stem. Replace the spring pin

(15) Handling of residual and waste materials

  - Make sure to consult a waste treatment dealer for recommendations on the proper disposal of plastic valves. (Poisonous gas is generated when the valve is burned improperly.)

Rotary Damper
40-600mm (1 1/2"-24")

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