

Serial No.	H - V - 028 E - 2
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Diaphragm Valves Type 14

True Union Diaphragm Valves Type14

User's Manual

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(1) General operating instruction

- Operating valve within the range of working temperature and pressure.
 - ☐The valve can be damaged by operation beyond allowable range of temperature or pressure.☐
- To select a valve in appropriate materials, refer to “CHEMICAL RESISTANCE ON ASAHI AV VALVE”.
 - ☐Some chemicals give heavy damage to valve materials.☐
- Bonnet bolt torque should be checked before installation, as they may become loose after long-term storage. A periodic check of the valve condition as well as bonnet & flange bolt torque should be made part of preventative maintenance program properly re-tightening the bolts as necessary. It is especially important to re-tighten all bolts during the first shutdown. refer to installation on page 5.
- The travel stop may have to be adjusted if media leakage is detected between the upstream & downstream sides of the valve.
- The valve is not designed to carry any external load of any kind. Never stand on or place anything heavy on the valve at anytime.
- Do not exert excessive force in closing the valve.
- The valve should be installed such that there is sufficient space for periodic inspection & maintenance.
- Do not store or install the valve near any heat source or hot surface.
- The valve should be operated by hand.

(2) General instructions for transportation, unpacking and storage

- Leave the valve in its original packaging until needed for installation.
- Avoid contact with any coal tar creosote, insecticides, vermicides or paint.
 - ☐Damage to the valve, in the force of swelling, may occur.☐
- The valve is not designed to handle any kind of impact. Avoid throwing or dropping the valve.
- Avoid scratching the valve with any sharp object.



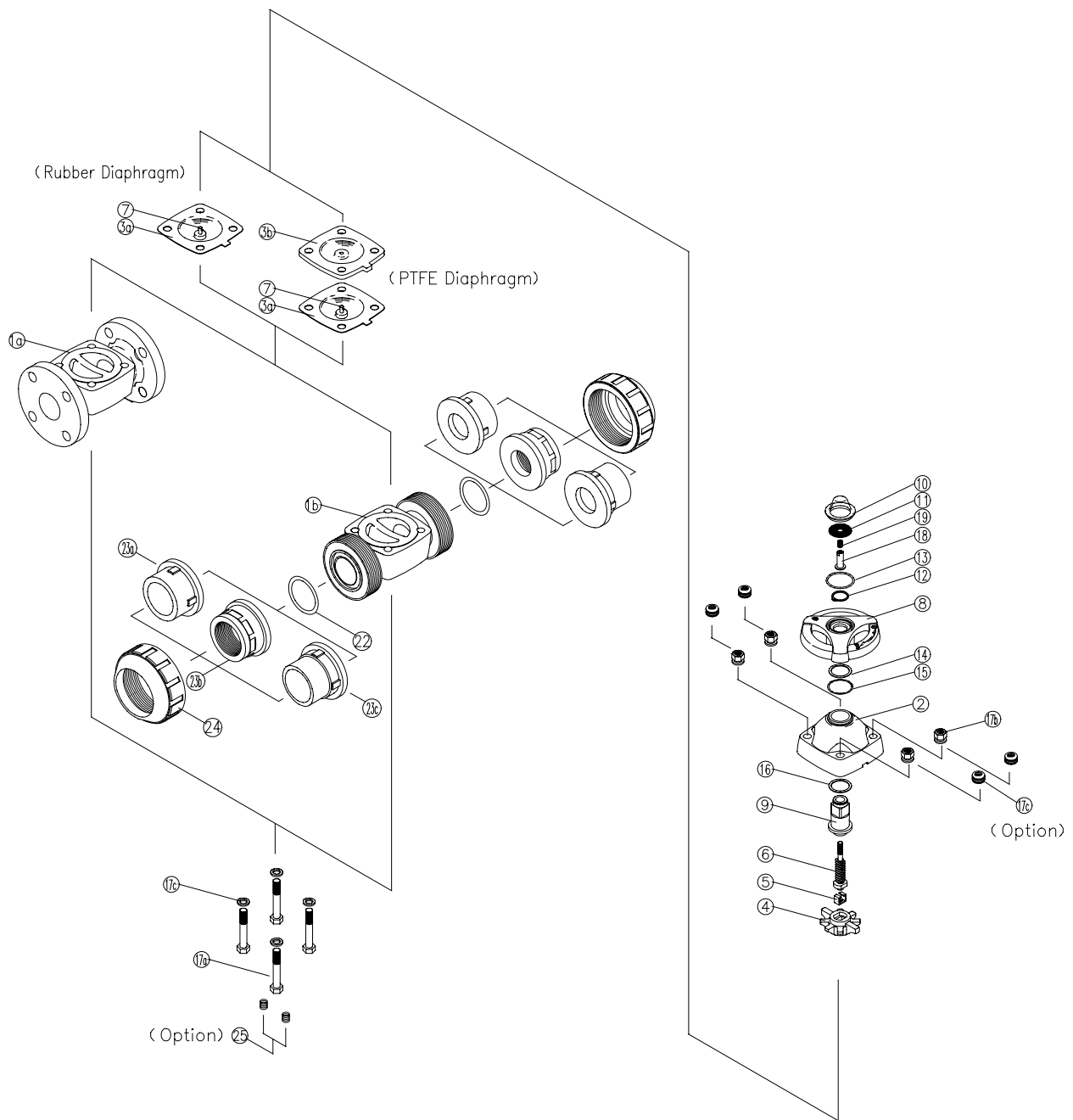
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(3) Name of parts



Diaphragm 3b is available only when diaphragm 3a is PTFE .

No.	DESCRIPTION	No.	DESCRIPTION	No.	DESCRIPTION
1a	Body (flange type)	9	Sleeve	17c	Conical spring washer
1b	Body (true union type)	10	Gauge cover	18	Stopper
2	Bonnet	11	Name Plate	19	Screw
3a	Diaphragm	12	Retaining ring c-type	22	O-ring (C)
3b	Cushion	13	O-ring (A)	23a	End connector (Socket end)
4	Compressor	14	Thrust ring (A)	23b	End connector (Threaded end)
5	Joint	15	O-ring (B)	23c	End connector (Spigot end)
6	Stem	16	Thrust ring (B)	24	Union nut
7	Inserted metal of DIA	17a	Bolt	25	Ensat
8	Handwheel	17b	Nut		

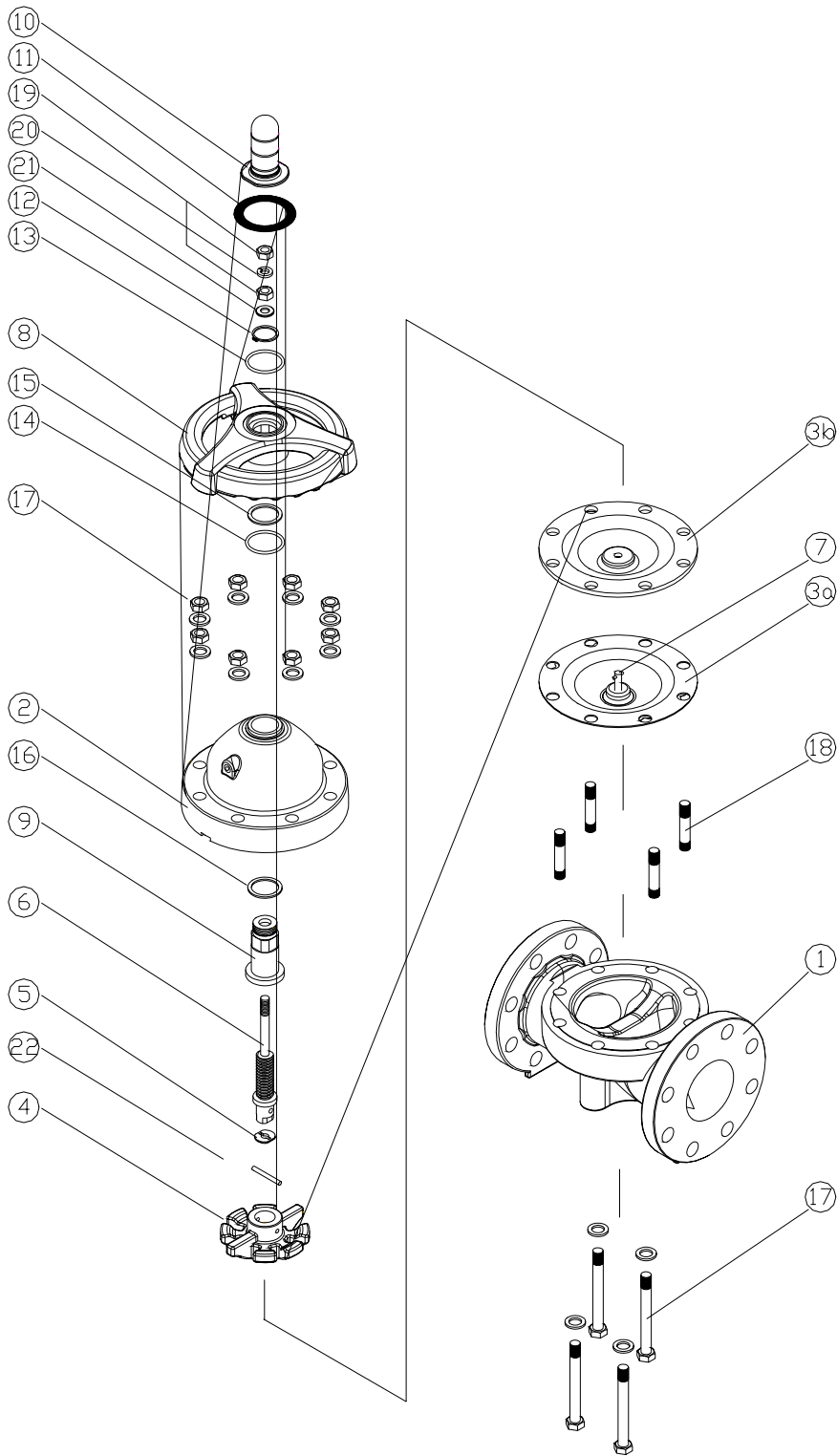


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Diaphragm 3b is available only when diaphragm 3a is PTFE .

No.	DESCRIPTION	No.	DESCRIPTION	No.	DESCRIPTION
1	Body	8	Handwheel	16	Thrust ring(B)
2	Bonnet	9	Sleeve	17	Bolt-Nut
3a	Diaphragm	10	Gauge cover	18	Inserted nut
3b	Cushion	11	Name plate	19	Stopper
4	Compressor	12	Retaining ring-c type	20	Conical spring washer
5	Joint	13	O-ring(A)	21	Sheet ring
6	Stem	14	O-ring(B)	22	Compressor pin
7	Inserted metal of DIA	15	Thrust ring(A)		



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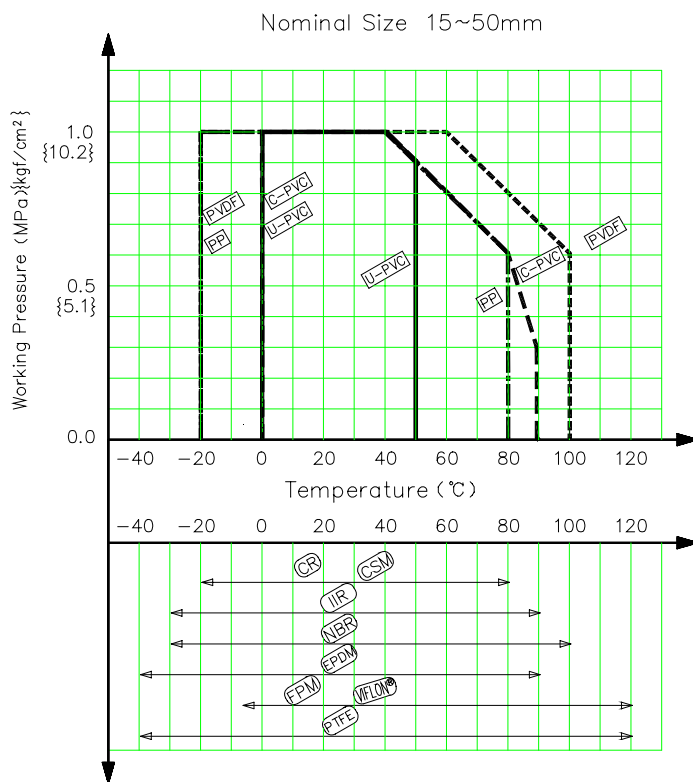
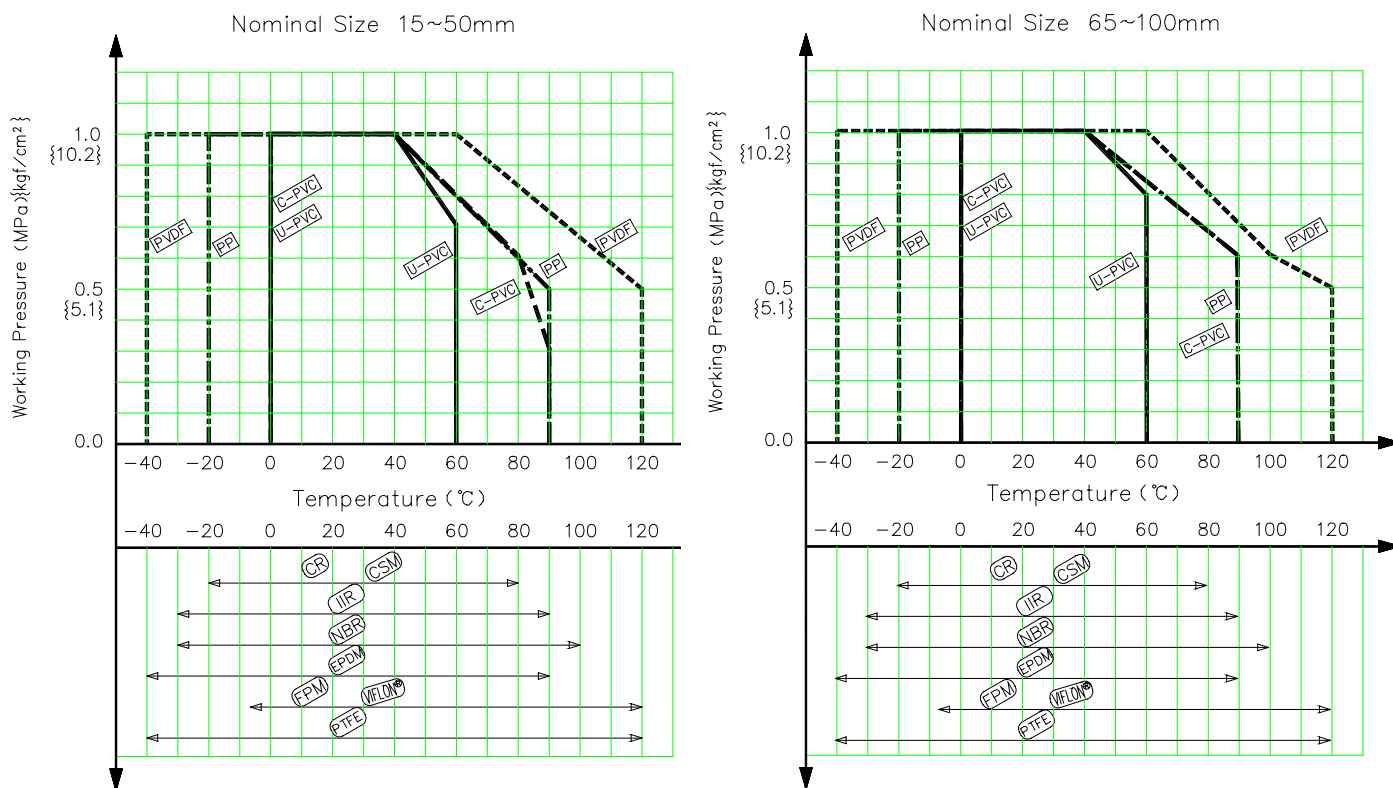
member
iapa

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(4) Comparison between operating temperature and pressure

Flange



Caution

Do not operate valve beyond the range of working temperature and pressure.



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(5) Installation procedure

Flanged type (Material : U-PVC,C-PVC,PP,PVDF)

Necessary

- Torque wrench
- AV gasket
- When a non-AV gasket is used ,a different tightening torque instruction should be followed.)

Procedure

- 1) Set the AV gasket between the flanges.
- 2) Insert washers and bolts from the coupled flange side, insert washers and nuts from the valve side, and temporarily tighten them by hand.

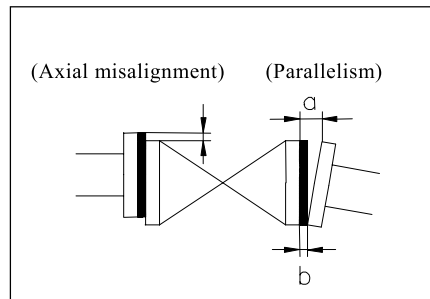
Remark

The parallelism and axial misalignment of the flange surface should be bellow the values in the following

□A failure to observe them can cause destruction due to stress application to the pipe□

Unit : mm

Nom. Size	Axial misalignment	Parallelism (a-b)
15 □32	1.0	0.5
40, 50	1.0	0.8
100	1.0	1.0



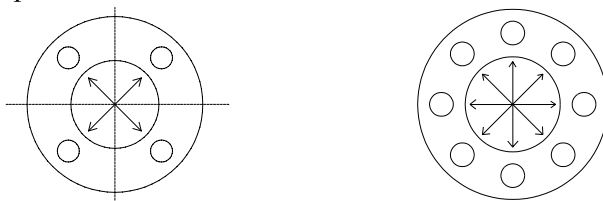
- 3) Using a torque wrench, tighten the bolts and nuts gradually to the specified torque level in a diagonal manner (Refer to fig.1.)

Specified torque valve

Unit □ N-m □ kgf-cm □

Nom. Size	15 □20mm	25 □40mm	50 □65mm	80 □100mm
Torque valve	17.5 {179}	20.0 {204}	22.5 {230}	30.0 {306}

Fig. 1



Remark

Avoid excessive tightening. (The valve can be destroyed.)

Threaded type (Material : U-PVC,C-PVC,PP,PVDF)

Necessary items

- Sealing tape □A non-sealing tape can cause leakage. □
- Belt wrench □Do not use Pipe wrench. □
- Spanner

Remark

Make sure that the joint part has resin thread.

□ Metallic thread can destroy the body cap □

Procedure

- Wind a sealing tape around the external thread of joint, leaving the end (about 3mm) free.
- Loosen the union nut [26] with a belt wrench..
- Remove the union nut [26] and the end connector[25].
- Lead the union nut [26] through the pipe.
- Tighten the external thread of the joint and the end connector [25] lightly by hand.
- Using a spanner, screw in the end connector [25] by turning 180° 360° carefully without damaging it.

Remark
 Avoid excessive tightening. (The valve can be destroyed.)

- Make sure that the O-ring(A) [14] is mounted.
- Set the end connector [25] and union nut [26] directly on the body without allowing the O-ring(A) [14] to come off.
- Tighten the union nut [26] lightly by hand.

10) Using a belt wrench, screw it in by turning 90° 180° carefully without damaging it.

Remark
 Avoid excessive tightening. The valve can be destroyed.

Sockettype (Material : U-PVC,C-PVC)

Necessary items

- Adhesive for hard vinyl chloride pipes
- Belt wrench

Remark

Do not install a socket type valve where the atmospheric temperature is 5° or lower. The valve can be destroyed.

Procedure

- Loosen the union nut [26] with a belt wrench.
- Remove the union nut [26] and end connector [25] .
- Lead the union nut through the pipe.
- Clean the hub part of the end connector [25] by wiping the waste cloth.
- Apply adhesive evenly to the hub part of the end connector [25] and the pipe spigot.

Remark
 Do not apply more adhesives than necessary.



- The valve can be destroyed due to solvent cracking.

Adhesive quality guideline

Nom. Size	15	20	25	32	40	50	65	80	100
Quality	1.0	1.3	2.0	2.4	3.5	4.8	6.9	9.0	13.0

- After applying adhesive, insert the pipe quickly to the end connector [25] and leave it alone for at least 60 seconds.
- Wipe away overflowing adhesive.
- Make sure that O-ring(A) [14] is mounted
- Set the end connector [25] and union nut [25] directly on the body without allowing the O-ring(A) [14] to come off.

10) Tighten the union nut [25] lightly by hand.

11) Using a belt wrench, screw it in by turning 90° 180° carefully without damaging it.

Remark
Avoid excessive tightening. (The valve can be destroyed.)

Sockettype (Material : PP,PVDF)

Spigottype (Material : PP,PVDF)

Necessary items

- Belt wrench Do not use the pipe wrench.
- Sleeve welder or automatic welding machine
- User's manual for sleeve welder or automatic welding machine

Procedure

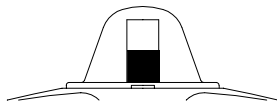
- Loosen the union nut with a belt wrench.
- Remove the union nut [26] and the end connector.
- Lead the union nut [26] through the pipe.
- For the next step, refer to the user's manual for the sleeve welder or the automatic welding machine.
- After welding, make sure that the O-ring(A) [14] is mounted.
- Set the end connector [25] and the union nut [26] directly without allowing the O-ring(A) [14] to come off.
- Tighten the union nut [14] lightly by hand.
- Use a belt wrench, screw it in by turning 90° 180° carefully without damaging it.

Remark
Avoid excessive tightening. (The valve can be destroyed.)

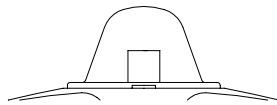
(6) Operating Procedure

- Open and close the valve by rotating handwheel.
- The top of the travel stop will be flush with the top of the handwheel when the valve is fully closed.

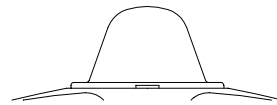
< Nominal size : 15□50mm >



Full open

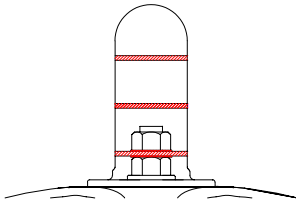


Half open

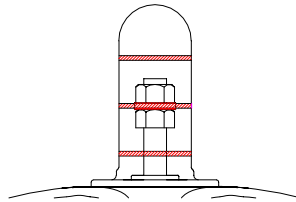


Full closed

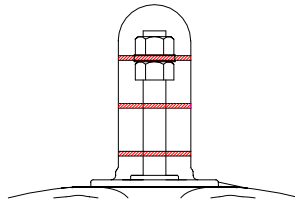
< Nominal size : 65□100mm >



Full open



Half open



Full closed

Caution

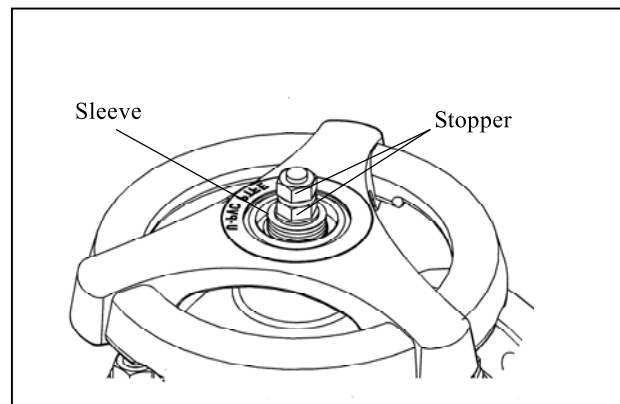
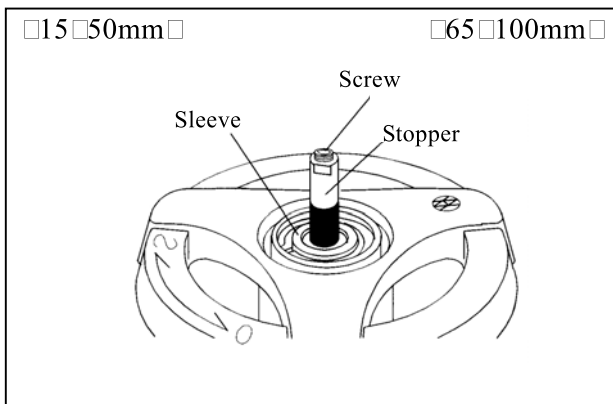
The valve is designed for manual operation only.

- The use of assist device may damage the valve. □

(7) Adjustment procedure for stopper

Necessary items

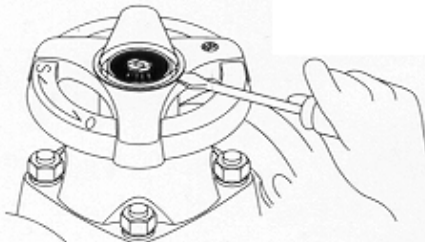
- Spanner
- Hexagonal wrench
- Driver(-)
- Protective Gloves
- Goggles



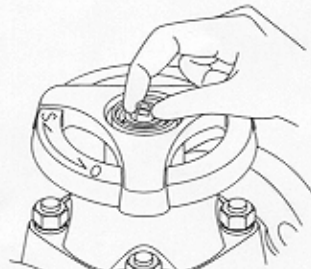
Travel stop adjustment

□ Nominal size : 15□50mm □

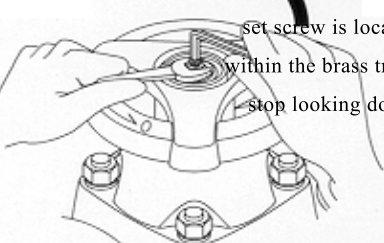
□ Turn valve handle clockwise to the full closed position.
Remove the gauge cover, being careful not to damage the gauge cover O-ring.




□ Tighten the travel stop clockwise until it stop and the turn it back (counter-clockwise)180°.



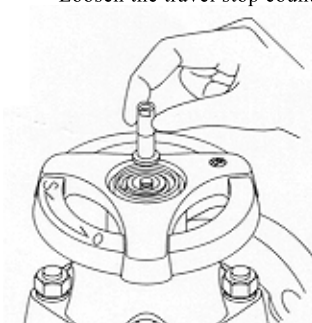
□ Remove the travel stop / position indicator with a wrench and loosen the axial set screw counter-clockwise with an Allen wrench. The axial set screw is located within the brass travel stop looking down.



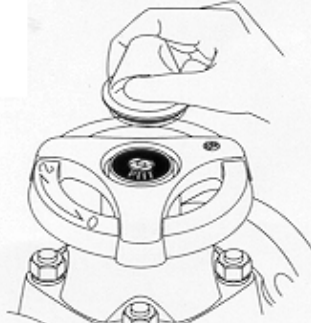
□ Secure the travel stop/position indicator with wrench and tighten the axial set screw clockwise with an Allen wrench.



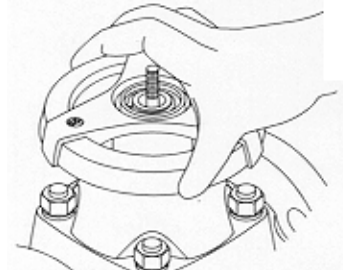
□ Loosen the travel stop counter-clockwise.



□ Re-attach the gauge cover.



□ Slowly tighten the handwheel clock wise until the leak-by stop.



Tightening torque of the screw

Unit : N□m (kgf□cm)

Nom. Size	15-32	40,50
Torque valve	7.8 (80)	11.8 (120)

Travel stop adjustment

□ Nominal size 65□100mm □

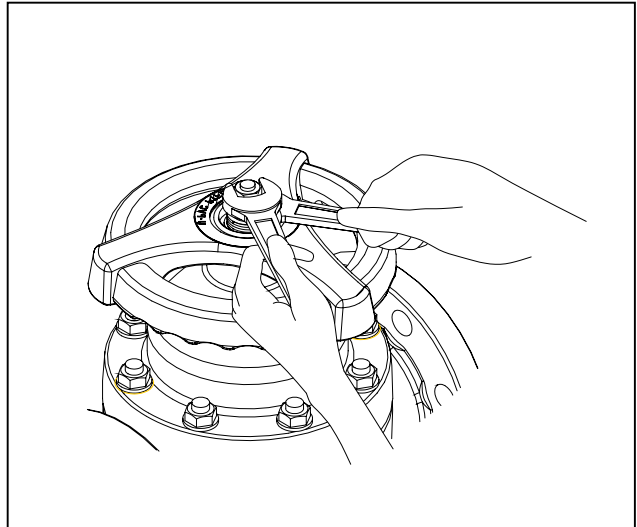
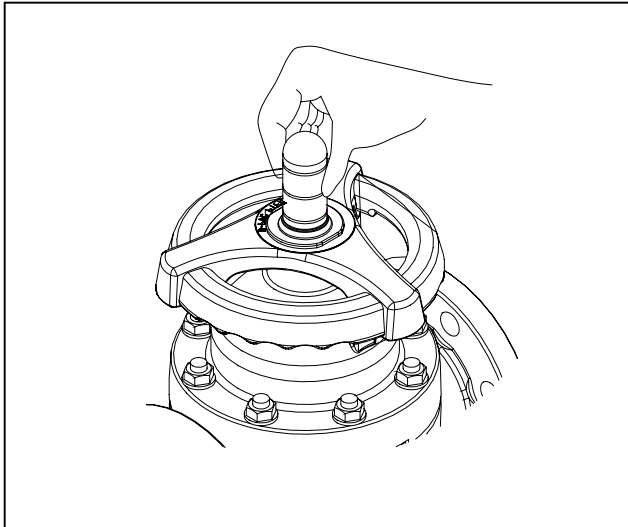
□ Loosen the gauge cover [11] with hand.

□ Loosen the upper nut [20] when fixes the lower nut [20] with wrench.

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- Loosen the lower nut [20].
- Operate the handwheel to tighten gradually until the leakage of fluid stops.
- Tighten the lower nut [20] until it stop, and then turn it back (counter-clockwise) 180°.
- Tighten the upper nut [20] when fix the lower nut [20] with wrench.
- Tighten the gauge cover [11].



Tightening torque of the screw

Unit : N·m (kgf·cm)	
Nom. Size	65-100
Torque valve	15.0 (153)

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(8) Diaphragm replacement procedure

Necessary items

- Torque wrench
- Spanner □□□
- Protective gloves
- Goggles

Remark

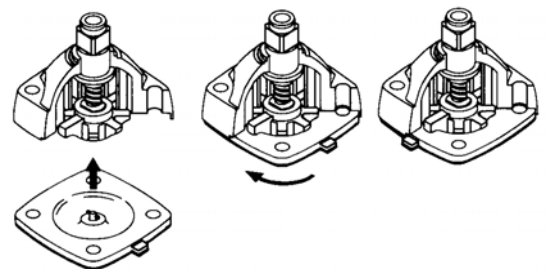
Wear protective gloves and goggles because some fluid is left in the body.

You can be injured by working without them.

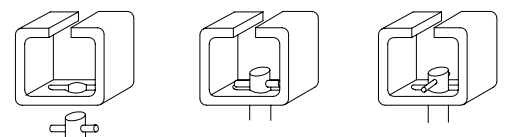
- 1) Drain fluid completely from the pipe line.
- 2) Remove valve bonnet from the body.
- 3) Turn handle of valve clockwise until it stops. Do not for it . The compressor should be fully extended out of the bonnet.

4) Bayonet connection type (standard)

Remove the diaphragm from the compressor by turning it 90° and mount the new diaphragm by reversing step. Make sure that the pin of inserted metal of diaphragm connects joint completely.

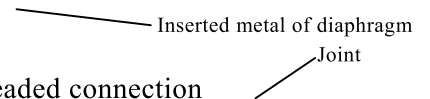


Bayonet connection



Threaded connection type

Turn the diaphragm clockwise to remove the diaphragm and mount the new diaphragm by reversing step.



Threaded connection

- 5 Mount the bonnet to the valve by reversing step 2. Tighten bonnet bolts by hand only.
- 6 Rotate the handle 360° counter-clockwise.
- 7 Using a torque wrench, tighten the bonnet bolts in a diagonal, criss-cross pattern.

Bonnet torque wrench

Unit : N-m{kgf-cm}

Nom. Size Diaphragm	15□20 □	25□32 □	40 □	50 □	65mm	80mm	100mm
Rubber	3 {31}	5 {51}	12 {122}	15 {153}	13 {133}	18 {184}	35 {357}
PTFE	5 {51}	8 {82}	15 {153}	20 {204}	15 {153}	20 {204}	40 {408}

- 8 Re-adjust the stopper if necessary.



(9) Mounting an Ensats, and a base (panel)

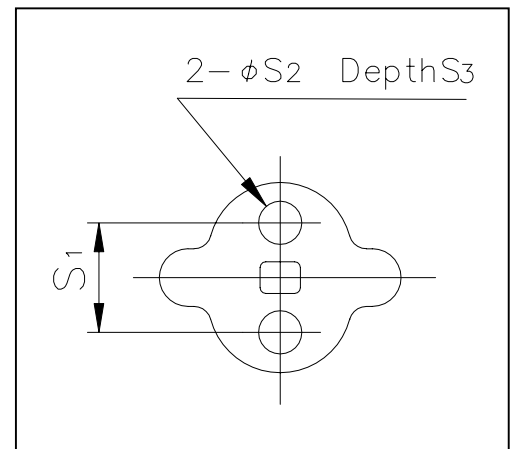
Procedure

Refer to the user's manual for the Ensats (Commercially available).

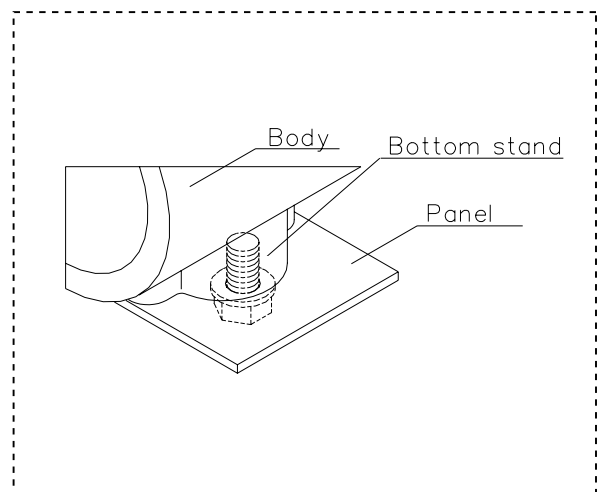
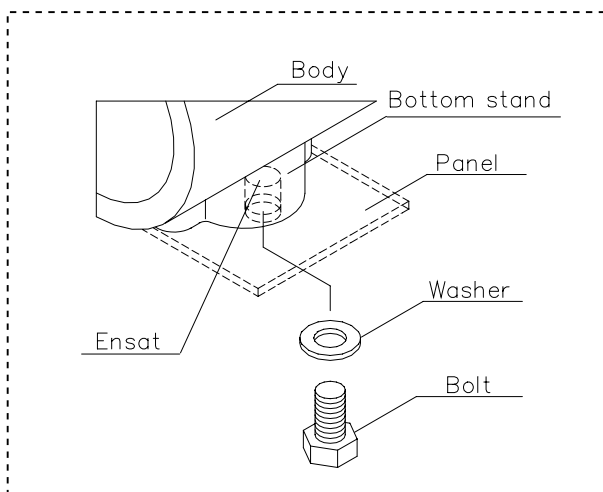
Bottom stand dimension

Unit □ □

Nom. Size	□ □	□ □	□ □
□ □ □ □ □	25	7	13
□ □ □ □ □	45	9	15
□ □	85	11	20
□ □	100	15	28
□ □ □	120	15	28



Fixation of bottom stand with panel



(10) Inspection items

◦ Inspect the follow items ;

<input type="checkbox"/>	Check for any flaw, crack, or deformation on the outside.
<input type="checkbox"/>	Check whether fluid leaks to the outside.
<input type="checkbox"/>	Check whether the cap nut has been loosened.
<input type="checkbox"/>	Check whether the handle can be operated smoothly.

(11) Troubleshooting and action

Problem	Cause	Action
Fluid is leaking past the fully closed position.	The travel stop is not set correctly.	Adjust the travel stop.
	Solid particles have lodged in the valve.	Clear the solid particles from the valve.
	Media has worn diaphragm and / or weir.	Replace.
Valve can not be fully open.	The diaphragm has pulled off the stem.	Replace diaphragm. If the valve is in vacuum service, special vacuum valves may be required. Consult factory.
	The metal joint (part#5) failed.	Remove diaphragm&compressor and replace joint.
The handle spins freely.	The stem is broken.	Disassemble bonnet and replace the stem.
	The metal joint (part#5) failed.	Remove diaphragm&compressor and replace joint.
Valve leaks between body and bonnet.	Bonnet bolts have loosened.	Re-tighten.
	Media has crystallized on the diaphragm.	Disassemble and clean on a regular basis. Replace defective diaphragm, if necessary.
	The diaphragm has failed due to fatigue.	Replace.
Valve leaks from stem.	The diaphragm has failed.	Replace.

(12) Handling of residual and waste materials

Remark

In discarding remaining or waste materials, be sure to ask a waste service company.

Poisonous gas is generated.



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Diaphragm Valve Type 14
True Union Diaphragm Valve Type 14

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