

IWAKI Back Pressure Valve

BV & N-BV

Instruction Manual

⚠ Read this manual before use of product

Thank you for choosing an IWAKI's back pressure valve model BV and N-BV. This instruction manual deals with safety instructions, correct installation, operation, maintenance and troubleshooting procedures for back pressure valve. Please read through it carefully to ensure the optimum performance, safety and service of your valve.



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Important Instruction

For the Safe and Correct Handling of the Pump

- "Safety Instruction" section deals with important details about handling of the product. Before use, read this section carefully for the prevention of personal injury or property damage.
- Observe the instructions accompanied with "WARNING" or "CAUTION" in this manual. These instructions are very important for protecting users from dangerous situations.
- The symbols on this instruction manual have the following meanings:

 WARNING	Nonobservance or misapplication of “Warning” sections could lead to a serious accident which may result in death.
 CAUTION	Nonobservance or misapplication of “Caution” sections could lead to personal injury or property damage.

Types of Symbols



Indicates that “Warning” or “Caution” must be exercised. Inside this triangle, a concrete and practical image provided as a warning or caution message is depicted.



Indicates a prohibited action or procedure. Inside or near this circle, a concrete and practical image of the activity to be avoided is depicted.



Indicates an important action or procedure which must be performed or carried out without fail. Failure to follow the instructions herein can lead to malfunction or damage to the product.

Export Restrictions

Technical information contained in this instruction manual might be treated as controlled technology in your countries, due to agreements in international regime for export control. Please be reminded that export license/permission could be required when this manual is provided, due to export control regulations of your country.

Safety Section

WARNING

- **Turn off the power supply**

Working without disconnecting the power supply cause an electrical shock. Before engaging upon any working procedures involving the pump and valve, make sure to turn the power supply switch off and to stop the pump and other related devices.



Electrical Shock

- **Terminate operation**

When you detect or become aware of a dangerous sign or abnormal condition during operation, terminate the operation immediately and start from the beginning again.



- **For specified application only**

The use of a back pressure valve in any application other than those clearly specified may result in injury of person or damage to the valve. Use the valve strictly in accordance with valve specifications and application range.



Prohibited

- **No remodeling**

Never remodel a valve. Otherwise, a serious accident may result. Iwaki will not be responsible for any accident or damage of any kind which is caused by the user remodeling the valve without first obtaining permission or instructions from Iwaki.



No remodeling

- **Wear protectors**

If you touch or come in contact with any type of hazardous chemical liquid, including but not limited to chemicals, you may experience a serious injury. Wear protective gear (protective mask, gloves, etc.) during the pump operation.



Wear protective gear

- **Limited operating site and storage**

Do not install or store the valve in the following places:

Places where a flammable gas or material is used stored.

Places where the ambient temperature is extremely high (40°C or higher) or extremely low (0°C or lower).



Prohibited

- **Spill-out accident**

Protective measures should be taken against any accidental spill-out or leakage of the operating liquid as a result of unexpected damage of the pump, valve or the related piping.



Caution

CAUTION

- **Valve in pump discharge side piping**

Never install the shutoff valve in pump discharge side piping.

If the valve is closed while the pump is running, the valve may be broken.



Prohibited

- **Direction to be installed**

Correctly orient "IN" side and "OUT" side. Otherwise the back pressure valve may be broken.



- **Pipe**

Use suitable size and pressure resistant pipe. Otherwise liquid may leak or pipe may be broken.



- **Plastic material (PVC)**

PVC made pressure valve will be deteriorated by ultraviolet when it is installed being exposed to sunlight. Also it may be attacked by chemical liquid. Protect the valve by cover or by installing it at the place where the liquid can not be splashed.



- **Attention to hot pressure valve**

When high temperature liquid is transferred, pump, pressure valve or pipe are very hot. Do not touch them with bare hand.



Prohibited

- **When cleaning**

The body and label may be discolored if they are cleaned by benzene, solvent thinner or kerosene.



Prohibited

- **Disposal**

The pressure valve must be disposed according to the local law.

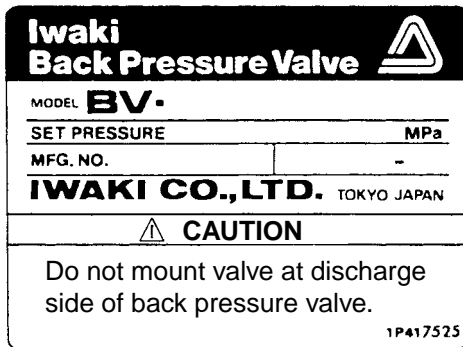


- **When returned**

When the pressure valve is returned to IWAKI, extract the liquid inside and clean the valve. Mention the liquid name used and "the valve is washed and cleaned" on the package.



1. Unpacking and inspection

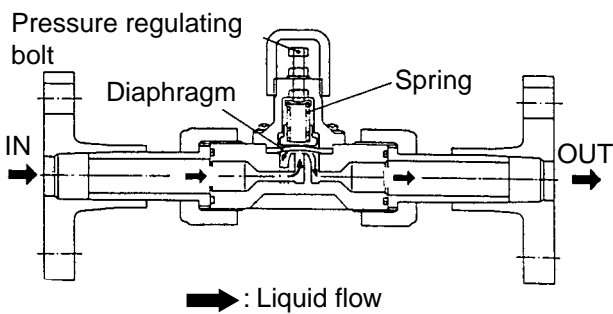


After unpacking of pressure valve, check the following points.

- (1) If the model name and set pressure mentioned on the nameplate are your ordering ones.
- (2) If the pressure valve is not broken or bolts and nuts are not loosened during the transportation.

2. Outline of product

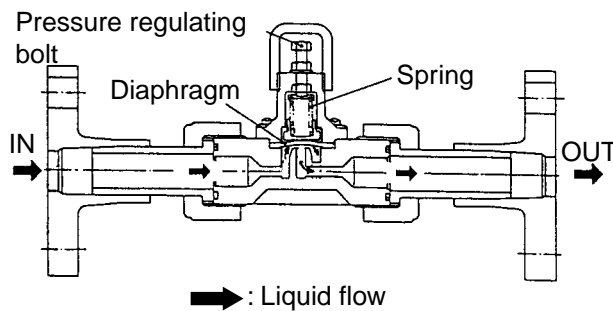
• BV model flange type



IWAKI back pressure valve model BV and model N-BV are set pressure adjustable pressure regulating valve which is designed as an accessory of metering pump.

When the liquid pressure exceeds the set pressure of the back pressure valve, the valve automatically opens to keep the same pressure and to make the liquid flow stable.

• BV-1P()L-15 model flange type



3. Model identification

• BV model

<div style="text-align: center;"> BV - 2 S6 B - 15 (1) (2) (3) (4) (5) </div>		
(1)	Series	BV
(2)	Max. volume	1 : 1L/min 2 : L/min 3 : 3L/min 7 : 7L/min 25 : 25L/min
(3)	Wet-end material Main parts/O-ring	BV-1 PV : PVC/FKM PE : PVC/EPDM
		BV-3 P : PVC•PTFE/None NE : PVC•PTFE PV : PVC•PTFE/FKM NV : PVC•FKM PE : PVC•PTFE/EPDM
		BV-2•7•25 S6 : SCS14 (or SUS316)•PTFE/None V : PVC•PTFE/None TV : PVDF•PTFE/FKM TE : PVDF•PTFE/EPDM
(4)	Set pressure	No symbol : 0.8MPa or below BV-3P...1.0MPa or below BV-3N...0.3MPa or below B : 0.8MPa or more L : 0.05~0.3MPa (only for BV-1P)
(5)	Connection bore symbol	Hose connection 4H : 4 X 9 dia. hose 12H : 12 X 18 dia. hose
		Flange connection 15 : 15A Flange 20 : 20A Flange 25 : 25A Flange 40 : 40A Flange

Refer to page 6 for available model.

• N-BV model

<div style="text-align: center;"> N 50 BV - 5 S4 - F <div style="display: flex; justify-content: center; align-items: center;"> <div style="border: 1px solid black; padding: 2px 10px; margin-right: 10px;"> (2) (1) </div> <div style="text-align: center;"> (3) (4) (5) </div> </div> </div>		
(1)	Series	BV () BV
(2)	Connection bore	50 : 50A 65 : 65A
(3)	Max. set pressure	5 : 0.5MPa
(4)	Wet-end material	S4 : SUS304, PTFE S6 : SUS316, PTFE V : PVC, CR V2 : PVC, FKM
(5)	Connection	F : Flange type

4. Specification

Material	Model	Flow range L/min	Set pressure range MPa	Connection (JIS 10K flange)	Mass kg	
PVC	BV-1P()L-15	0.005 - 1.0	0.05 - 0.4	15A	0.5	
	BV-1P()-15		0.4 - 0.8			
	BV-3P()-12H	0.03 - 3.0	0.1 - 0.8	ø12 X ø18 Hose	0.4	
	BV-3P-15			15A	0.6	
	BV-3P-20			20A		
	BV-3P-25			25A	0.9	
	BV-3N()-12H		0.1 - 0.3	ø12 X ø18 Hose	0.4	
	BV-3N()-15			15A	0.6	
	BV-3N()-20			20A		
	BV-3N()-25			25A	0.9	
	BV-7V-20		0.2 - 7.5	0.05 - 0.8	20A	3.5
	BV-7V-25				25A	
	BV-25V-25	0.1 - 0.8		40A	4.0	
	BV-25V-40					
	N50BV-5V-F	2.5 - 50	0.15 - 0.5	50A	20	
	N50BV-5V2-F					
	N65I72BV-5V-F	5 - 70		65A		
	N65I72BV-5V2-F					
SUS316	BV-2S6-15	0.02 - 2.0	0.05 - 0.8	15A	3.5	
	BV-7S6-25	0.2 - 7.5		25A	6	
	BV-25S6-25	2 - 25	0.1 - 0.8		40A	7
	BV-25S6-40			7.5		
	N50BV-5S4-F	2.5 - 80	0.15 - 0.5	50A	29	
	N65BV-5S4-F	5 - 120		65A	42	
PVDF	BV-1T()-15	1.0	0.2 - 0.8	15A	0.5	
	BV-7T()-25	7.7	0.05 - 0.8	25A	5	
	BV-25T()-25	2 - 25	0.1 - 0.8			
	BV-25T()-40			40A	5.5	

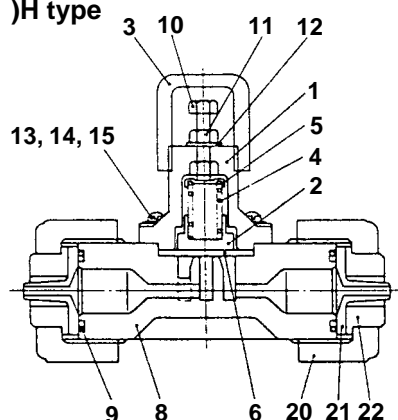
Note 1 : () is O ring material. ex. (E) : EPDM (V) : FKM

O ring material of N-BV model 5V : CR 5V2 : FKM

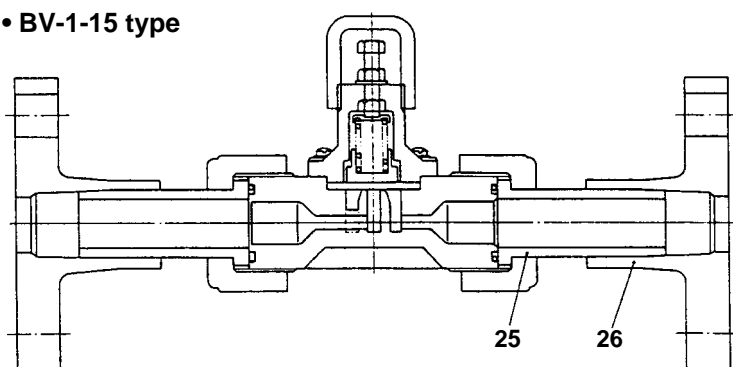
Note 2 : Diaphragm material is PTFE except BV-1P and BV-3N which have synthetic rubber diaphragm. (Same material as O ring)

5. Construction and parts name

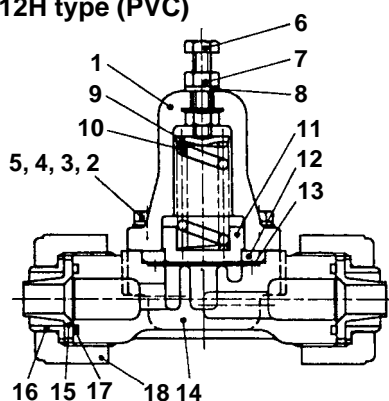
- BV type
- BV-1-()H type



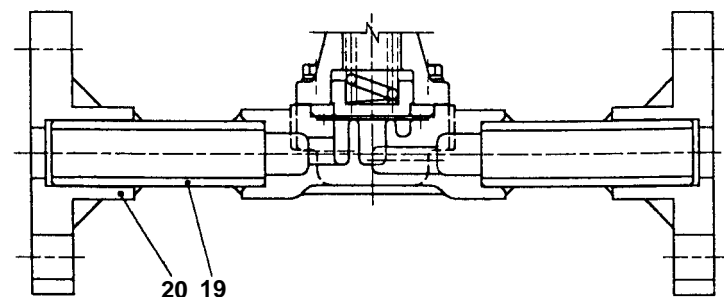
- BV-1-15 type



- BV-3P()-12H type (PVC)
- BV-3N()-12H type (PVC)



- BV-3P type (PVC)
- BV-3N() type (PVC)



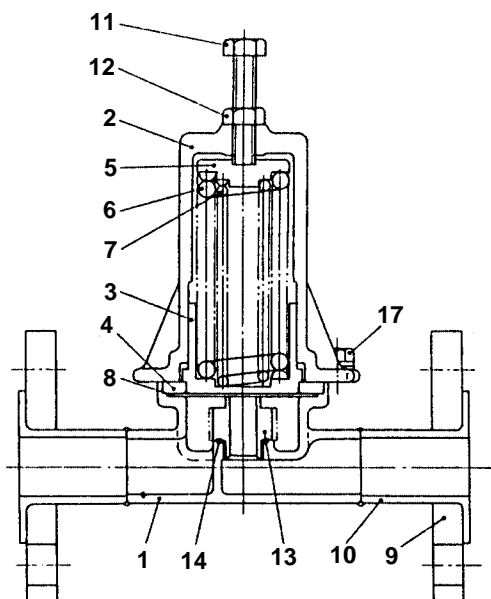
No.	Parts name	Q'ty	Material
1	Top case	1	PVC
2	Retainer	1	
3	Cap	1	
4	Spring	1	SWPA
5	Spring seat	1	SPCC
6	Diaphragm	1	(Note 1)
8	Body	1	SWPA
9	O ring	2	(Note 1)
10	Press. adjust. bolt	1	SWPA
11	Lock nut	1	SS400
12	Plate washer	1	SS400
13	Pan head screw	4	SWPM
14	Plate washer	4	SS400
15	Hex. nut	4	SS400
20	Nut	2	PVC
21	Hose port(Note2)	2	PVC
22	Hose holder(Note2)	2	SS400
25	Union(Note3)	2	PVC
26	Flange(Note3)	2	PVC

Note 1: FKM for PV type, EPDM for PE type
 2: Only for BV-1-()H type
 3: Only for BV-1-15

No.	Parts name	Q'ty	Material
1	Top case	1	PVC
2	Hex. bolt	4	SS
3	Spring washer	4	
4	Plate washer	4	
5	Hex. nut	4	
6	Press. Adjust. Bolt	1	
7	Hex. nut	1	
8	Plate washer	1	
9	Spring seat	1	SUS304
10	Spring	1	SUS304
11	Retainer plate	1	PVC
12	Stopper	1	S45C
13	Diaphragm	1	(Note 4)
14	Bottom case	1	PVC
15	Hose port (Note 2)	2	PVC
16	Hose holder(Note2)	2	SS400
17	O ring (Note 2)	2	(Note 1)
18	Nut (Note 2)	2	
19	Pipe (Note3)	2	PVC
20	TS flange (Note 3)	2	

Note 1: FKM for PV & NV types
 EPDM for PE & NE types
 2: Used for hose type
 3: Used for flange type
 4: PTFE+EPDM for P () type
 FKM for NV type
 EPDM for NE type

• BV-2, 7, 25S6 types (SUS)



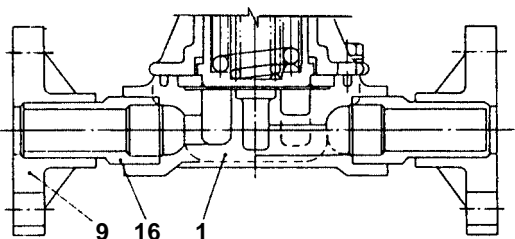
No.	Parts name	Q'ty	S6 type	V type
1	Bottom case	1	SCS14	PVC
2	Top case	1	FC250	
3	Retainer plate	1	S45C	
4	Stopper	1	S45C	
5	Spring seat	1	SS400	
6	Spring A	1	SUS304	
8	Diaphragm	1	PTFE	
9	Flange	2	SUS304	PVC
10	Lap end(Note1)	2	SCS14	
11	Press. adjust. bolt	1	SUS304	
12	Lock nut	1	SUS304	
13	Valve seat(Note1)	1	SUS316	
14	Gasket (Note1)	1	PTFE	
16	Pipe (Note 2)	2		PVC
17	Hex. bolt	4	SUS305	

Note 1 : Only for BV-2,7,25 - S6

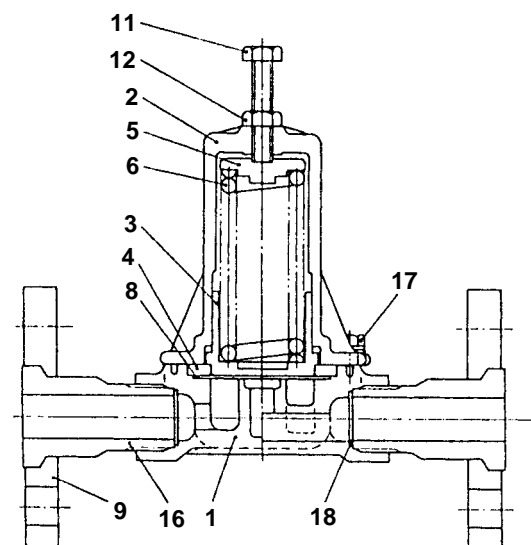
2 : Only for BV-7,25 - V

3 : Not available for 0.8MPa or more pressure

• BV-7, 25V types (PVC)



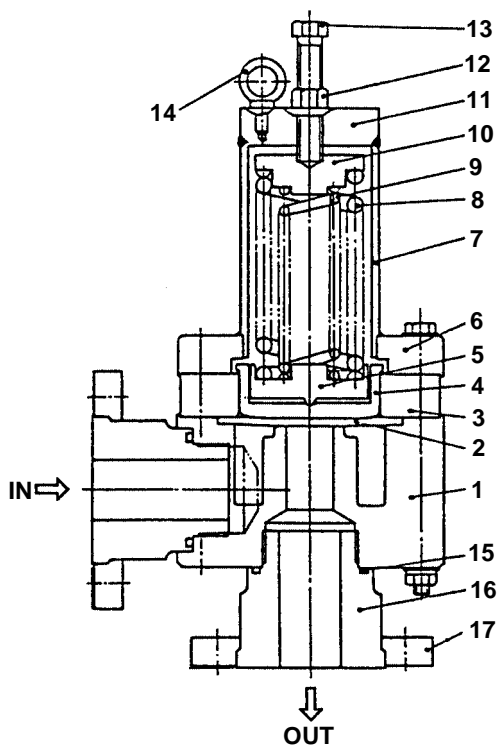
• BV-7, 25TV-TE types (PVDF)



No.	Parts name	Q'ty	Material
1	Bottom case	1	PVDF
2	Top case	1	FC250
3	Retainer plate	1	S45C
4	Stopper	1	S45C
5	Spring seat	1	SS400
6	Spring A	1	SUS304
8	Diaphragm	1	PTFE
9	Flange	2	PVC
11	Press. adjust. bolt	1	SUS305
12	Lock nut	1	SUS305
16	Connection port	2	PVDF
17	Hex. bolt	4	SUS305
18	O ring	2	(Note 1)

Note 1: FKM for TV type, EPDM for TE type

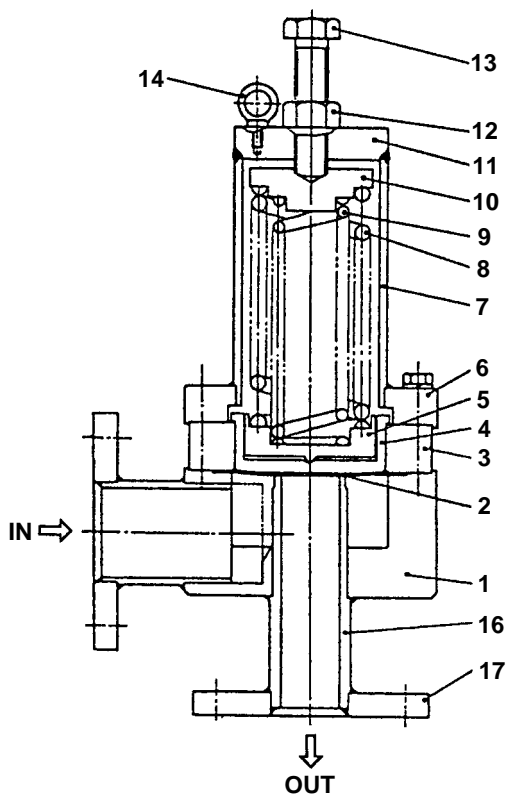
- N-BV type
- N-BV-()V-V2 types (PVC)



No.	Parts name	Q'ty	S4 type	V, V2 type
1	Bottom case	1	SUS304,316	
2	Diaphragm	1	PTFE	
3	Stopper	1	SUS304	
4	Retainer	1	SS400	
5	Spring seat C	1	SS400	
6	Case C	1	SS400	
7	Case B	1	STPG	
8	Spring A	1	SUS304	
9	Spring B(Note 2)	1	SUS304	
10	Spring seat B	1	SS400	
11	Case A	1	SS400	
12	Lock nut	1	SUS305	
13	Press. adjust. bolt	1	SUS305	
14	Eye bolt	1	S15C	
15	O ring (Note 3)	2		(Note 1)
16	Nipple (Note 4)	2	SUS304,316	PVC
17	Flange	2	SUS304,316	PVC

Note 1 : CR for V type
FKM for V2 type
2 : No spring B for 0.2mpa or lower set pressure.
3 : Only for PVC
4 : Pipe for SUS typ

- N-BV-()S4 type (SUS)



6. How to use

CAUTION

- Clean pipe inside before back pressure valve is installed. Foreign matters in back pressure valve cause clogged valve resulting in failed transferring and damaged valve.

- (1) Do not feed slurry by a system with this back pressure installed. This valve cannot substitute for a check valve.
- (2) A strainer should be installed to prevent dust and other foreign matter from scratching or scraping the surface of the diaphragm.
- (3) This valve is not recommended as a means to prevent the siphon phenomenon.

6-1. Precautions on operation

- (1) Position to be installed

Install the back pressure valve horizontally in the pump discharge side piping.

If installed vertically, air trap is apt to be generated .

- (2) Never install a valve in the OUT side piping of back pressure valve.

Caution

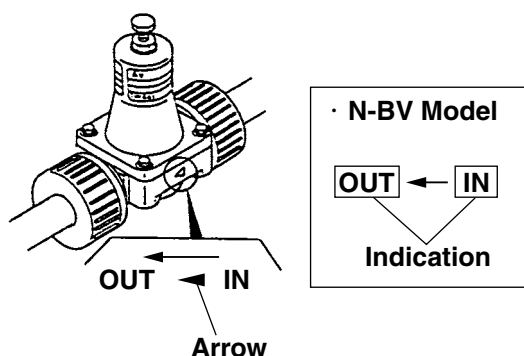
- If the valve is closed by mistake, the back pressure valve and pump may be damaged.

- (3) Direction to be installed

Caution

- Correctly connect INLET and OUTLET of the pressure valve. Otherwise, the valve may be broken. Install the back pressure valve so that the liquid flows in the direction of arrow (in the direction of OUT indication in case of N-BV model).

If the pressure valve is installed in reverse, it may not operate even when the pressure exceeds the set value.



- (4) Secondary side pressure

The secondary side pressure of back pressure valve should be limited to the half or below the set pressure of back pressure valve. Pressure is added to the secondary side, the blowoff pressure of the back pressure valve changes and re-adjustment of the valve is needed.

- (5) Flow capacity range

Flow rate of back pressure valve should be within the specified range. (See Item 10 “Specification”)

- (6) Confirmation of set pressure (on trial operation)

The pressure is adjusted at your specifying value when shipped, but it may change according to the liquid viscosity or the secondary pressure. Confirm the pressure on trial running by pressure gauge, and if you find it changed, adjust it referring to the item “pressure adjusting method” on page .

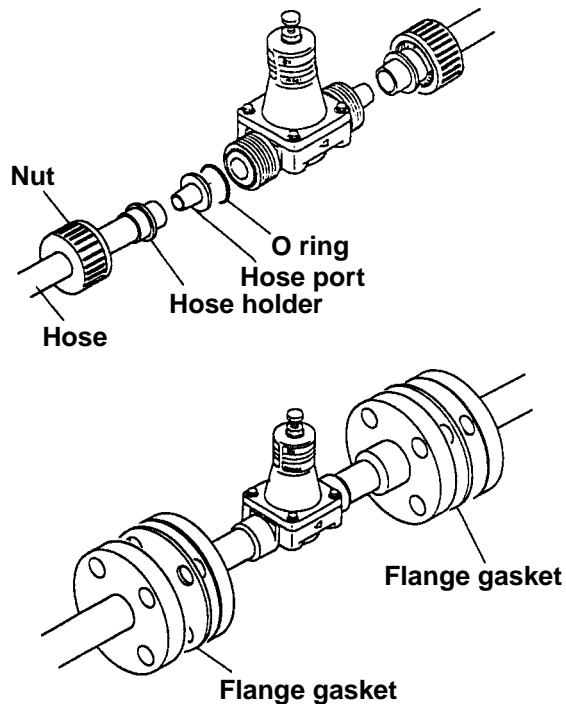
- (7) Liquid temperature range

Types NE, V, V2, PE, PV and S4 : 0 to 50 deg. C

Type S6 : 0 to 80 deg. C

Types TE and TV : 0 to 90 deg. C

6-2. Installation



Hose connection

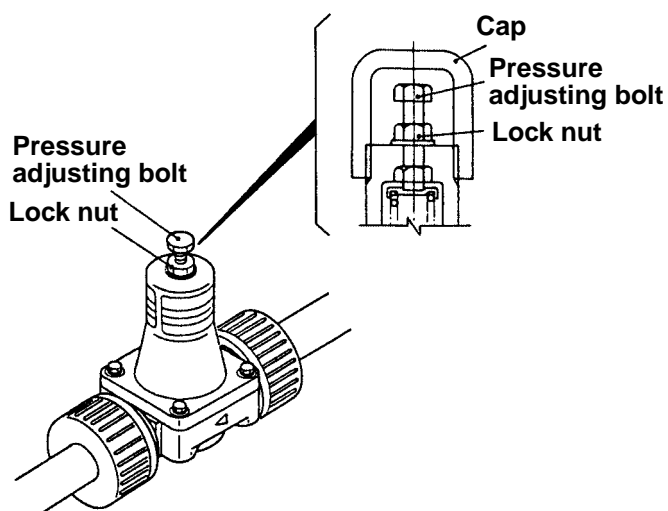
- (1) Remove a nut to take a hose holder and a hose port off.
- (2) Put the nut and hose holder on the hose and then mount the hose port at the hose end.
- (3) Apply the hose port with hose to the valve and tighten the nut. Do not forget to put an O ring.

Flange connection

Fix the flanges of back pressure valve to pipe flanges through the gaskets.
Tighten the bolts diagonally and evenly.

6-3. Pressure adjusting method

When the back pressure valve is shipped, the pressure is adjusted at your required value. If you wish to adjust the pressure, do it according to the following procedures.



Pressure adjustment is done by a pressure adjusting bolt. The pressure gradually increases if the bolt is turned clockwise and gradually decreases if turned counter-clockwise.

- (1) Loosen a lock nut which fix the pressure adjusting bolt. (Remove a cap if you find it.)
- (2) Looking at a pressure gauge, turn the adjusting bolt to set at your desiring pressure.
(First turn the bolt two or three turns then loosen it to start the setting.)
- (3) After the setting is finished, tighten the lock nut.

7. Disassembling & assembling

Refer to item 5 “Construction and parts name” for the parts names and numbers written in following disassembling and assembling procedures.

7-1. Model BV-1

Disassembling

- (1) Remove cap (3) and loosen lock nut (11) by rotating counter-clockwise. Then remove pressure adjusting bolt (10) by rotating it counter-clockwise.
- (2) Remove pan head screw (13) and take off top case (1).
- (3) Remove spring seat (5), spring (4) and retainer (2).
- (4) Remove diaphragm (6).
If the place where diaphragm contacts body is dirty, wash and clean them. If you find any scratch, replace body (8) and diaphragm (6) by new ones.
- (5) Remove nut (20). Check O ring (9) and replace it by new one if you find scratch or scrape.

Assembling

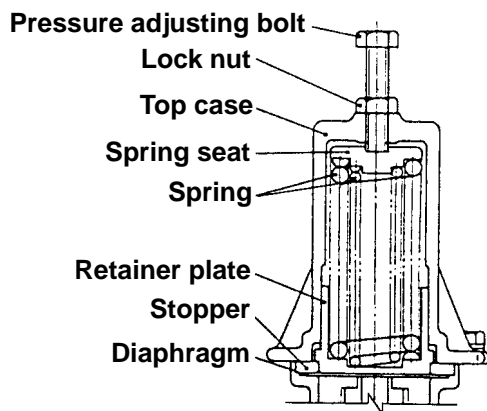
- (1) Mount diaphragm (6) to body (8) adjusting to its groove and mount retainer (2).
Apply grease to the contacting parts of retainer and diaphragm. Use grease which is chemically resistible such as silicone grease.
- (2) Apply grease to both ends of spring (4) and mount spring (4) and spring seat (5).
- (3) Mount top case (1). Securely fix it by pan head screw (13).
- (4) Put lock nut (11) and plate washer (12) to pressure adjusting bolt (10) and drive them into top case (1).
- (5) Mount the back pressure valve to piping. (Refer to item 6-2. “Installation”)
- (6) After the back pressure valve is installed in piping, operate the pump as trial to adjust the pressure according to the item 6-3 “Pressure adjusting method”.
- (7) Mount cap.

7-2. Models BV-2, 3, 7, 25

Remarks: Parts No. for BV-2,7,&25 is shown in () and BV-3 in < >.

Disassembling

- (1) Turn counter-clockwise lock nut (12) or hex. bolt <7> to loosen it and turn pressure adjusting bolt (11) <6> counter-clockwise and remove it.
- (2) Remove hex. bolt (17) <2> and remove top case (2) <1>.
- (3) Remove spring seat (5) <9>, spring (6), (7) <19>, retainer plate (3) <11> and stopper (4) <12>.
- (4) Remove diaphragm (8) <13>.
If you find diaphragm swelled, scratched or worn, replace it by new one. It is recommended you replace the diaphragm once a year because it is consumable parts.
If you find the dust or so at the part where the diaphragm contacts valve seat (bottom case in case of PVC type, TV, TE types), wash and clean it. Also if you find scratch or scrape on the contacting part, replace the valve seat or bottom case by new one.
- (5) When you check O ring (TV, TE types (18)) <17>
TV, TE types : Remove connection port (16) to check O ring.
NV, NE, PV, PE types : Remove nut <18> to check O ring.
Replace O ring if you find scratch or scrape on it.



Assembling

- (1) Put the diaphragm (8) <13> on the groove of bottom case (1) <14> and mount stopper (4) <12>. In case of BV-3, put the plastic side (white side) to the body.
- (2) Mount retainer plate (3) <11>. Apply grease (0.5mm thick) on the retainer plate, stopper inside and also on the contacting part of diaphragm and retainer plate. For BV-3, apply chemically resistible grease such as silicone grease.
- (3) Apply grease (0.5mm thick) on the spring seat (5) <9> and mount spring and spring seat.
- (4) Mount top case (2) <1> and fix it with hex. bolt (17) <2>.
- (5) Install the back pressure valve on the piping.
TV, TE types : Put O ring on the groove of bottom case, screw in the pipe (16) and fix it with wrench.
In case of BV-3 hose connection type : Put O ring on the groove of bottom case and screw in nut.
- (6) When the works are finished, operate the pump to set the pressure. (See item 6-3. pressure adjusting method on page 10.)

7-3. N-BV

Disassembling

- (1) Remove the back pressure valve from the piping. N-BV model is heavy so do the works making use of eye bolt (14) for your safety.
If O ring (15) is not checked, the back pressure valve can be disassembled leaving it connected to the piping.
- (2) Loosen lock nut (12) turning it counterclock direction. Remove pressure adjusting bolt (13) turning it counterclock direction.
- (3) Remove hex. bolt and remove top case (Case A (11), case B (7), case C (6)).
- (4) Remove spring seat B (10), spring A(8), B (9), spring seat C (5), retainer (4) and stopper (3).
- (5) Remove diaphragm (2). If you find the diaphragm swelled, worn or scratched, replace it by new one. The diaphragm is consumable. It is recommended the diaphragm is replaced by new one once a year.
- (6) If you find dust or like at the contacting parts of diaphragm (2) and bottom case (1). Also, if you find the scratch at the bottom case where the diaphragm contacts, replace the bottom case by new one.
- (7) In case the bottom case is PVC
Remove nipple (16) to remove O ring (15). If you find scratch on O ring, replace it by new one.

Assembling

- (1) Put the diaphragm (2) adjusting it to the groove of bottom case (1) and mount the stopper (3) adjusting the bolt holes of bottom case to the bolt holes of stopper.
- (2) Apply grease to outside of retainer (4) and inside of stopper (3) and mount the retainer.
- (3) Mount spring seat C (5), spring A (8), B (9) and spring seat B (10).
- (4) Mount top case
When the top case (case A (11), case B (7), case C (6)) is mounted, adjust the end of pressure adjusting volt (13) to the facing of spring seat B (10). Firmly fix it with hex. bolt adjusting the bolt holes of bottom cas (1) and stopper (3). In case that the bottom case is PVC type, insert flange to nipple (16) , put O ring (15) and mount to bottom case (1).
- (5) After the back pressure valve is mounted to the piping, adjust the set pressure and securely fix the pressure adjusting bolt (13) with lock not (12).

8. Trouble cause and countermeasures

Trouble	Cause	Countermeasure
Liquid leaks.	Top case is not mounted securely.	Mount top case firmly.
	Scratch or damage on O ring or no O ring is put.	Replace.
	Insufficient or loosened connection of hose or pipe.	Mount hose or pipe again or tighten it.
	Dust on diaphragm or damaged diaphragm.	Disassemble and clean or replace diaphragm.
	Insufficient tightening of nut.	Tighten nut.
	Bottom case deformed (PVC, PVDF type)	Tighten top case, mounting bolt or replace bottom case.
Set pressure can not be obtained.	Clogged liquid path.	Disassemble and clean to remove dust.
	Too tightened pressure adjusting bolt.	Set again the pressure.
	Insufficiently tightened adjusting bolt.	Set again the pressure.
	Air trap in port.	Mount in horizontally.
Too low popping pressure	Insufficiently tightened adjusting bolt.	Set again the pressure.
Too high popping pressure	Clogged liquid path.	Disassemble and clean to remove dust.
	Too tightened pressure adjusting bolt.	Set again the pressure.
	Too viscous liquid.	Set again the pressure.

9. Inspection and maintenance

Daily inspection

Check to see:

Vibration or abnormal sound

No liquid leakage

No pressure change

Periodic inspection (Disassemble and check once a six months)

(1) Remove foreign matters

If the dust or like adheres the back pressure valve, it clogs liquid path which may cause change in set pressure or the precision of pump. To keep the performance, disassemble and clean the back pressure valve.

(2) Check to see if there is no scratch, wear or crack. If you find them, replace the parts by new one.

(3) In case of PVC, TV, TE types (BV-1, 7V-25, 25V-25, 40)

Caution

If top case is not tightened enough, the diaphragm may not make enough sealing and liquid may leak. (It is possible the dimension may change depending on material. Periodically check the tightening of top case and tighten the bolts if they are loosened.

10. Spare parts

If the valve is continuously used for a long period, it is recommended that appropriate consumable parts are stocked.

Parts name	Q'ty/unit	Estimated life (Reference)
Diaphragm	1	One year
O ring	2	

IWAKI PUMPS



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