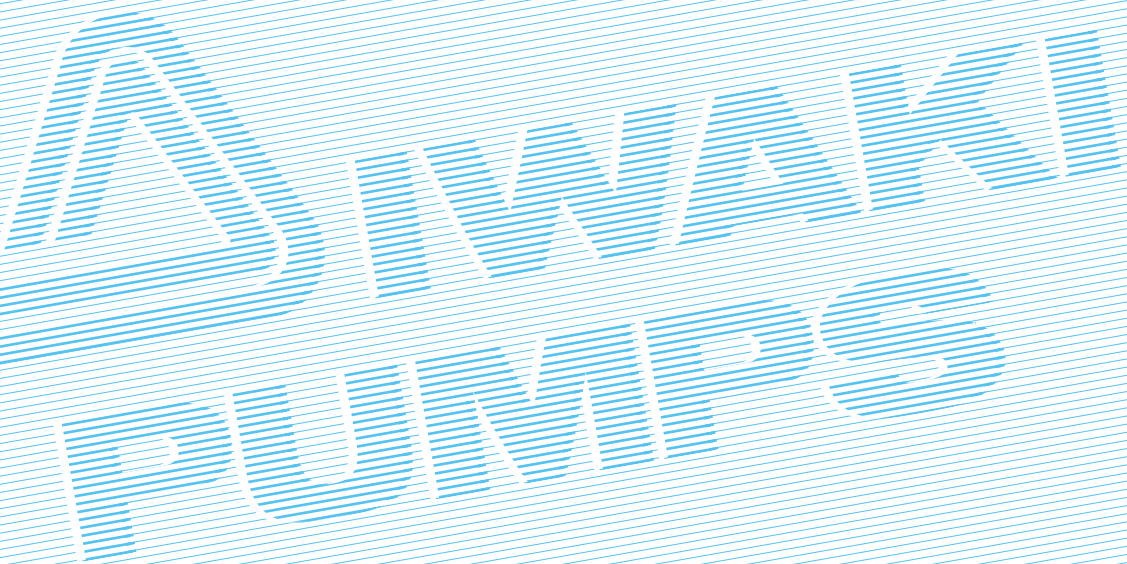
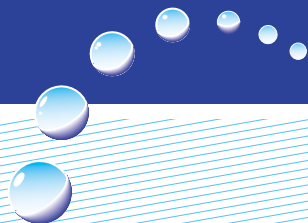




IWAKI Back Pressure Valve

BV & N-BV

Instruction Manual

 Read this manual before use of product

Thank you for selecting an Iwaki BV/N-BV Back pressure valve. This instruction manual deals with "Safety instructions", "Overview", "Installation" and "Maintenance" sections. Please read through this manual carefully to ensure the optimum performance, safety and service of your product.

Contents

Important instructions	1
Safety instructions	2
<i>Overview</i>	
1. Unpacking & Inspection	5
2. Operating principle	5
3. Model codes	6
4. Part names	7
<i>Installation</i>	
1. Before installation	14
<i>Maintenance</i>	
1. Maintenance & Inspection	21
2. Wear parts	21
3. Troubleshooting	22
4. Assembly & Disassembly	23
5. Specification	28

This instruction manual should be kept on hand by the end user for quick reference.

Contact us or your nearest dealer if you have any questions.

Important instructions

For the Safe and Correct Handling of this product

- "Safety Instruction" section deals with important details about handling of the product. Before use, read this section carefully for the prevention of personnel 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 a personal injury or property damage.



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 this 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 instructions

WARNING

• **Turn off power before service**

Be sure to turn off power to stop the pump and related devices and de-pressurize the piping system before service is performed. Make sure the power will NOT accidentally turn ON during service.



Turning off power

• **Wear protective clothing**

Always wear protective clothing such as an eye protection, chemical resistant gloves, a mask and a face shield during disassembly, assembly or maintenance work.



Wear protective gear

• **Spill precautions**

Ensure protection and containment of solution in the event of plumbing or pump damage (secondary containment).



Requirement

• **Do not install/store this product:**

- In a flammable/explosive atmosphere or in a dusty/humid environment.
- Where ambient temperature can exceed 0-40°C (32-104°F).
- Under mechanical vibration.
- In direct sunlight or wind & rain.



Prohibited

• **Stop operation**

If you notice any abnormal or dangerous conditions, suspend operation immediately and inspect/solve problems.



Caution

• **Use care handling**

Do not drop the product. An impact may affect performance.



Prohibited

• **Use a suitable device for lifting/moving some models in suspension**

Two or more operators may be needed for ensuring safe transport depending on product weight.



Caution

• **Qualified personnel only**

Set pressure of this product should be determined by qualified personnel with a full understanding of this product. Any person not familiar with the product should not take part in the operation or maintenance.



Caution

• **Do not modify the product**

Alterations to the product carry a high degree of risk. It is not the manufacturer's responsibility for any failure or injury resulting from alterations.



No Remodeling

• **Do not use the product in any condition other than its intended purpose**

The use of the product in any conditions other than those clearly specified may result in failure or injury. Use this product in specified conditions only.



Prohibited

• **Preventative maintenance**

Follow the instructions in the manual for replacing wear parts. Do not disassemble this product beyond the instructions provided.



Prohibited

Safety instructions

CAUTION

- **Do not add any valves on the secondary side of this product**

The pump or the back pressure valve would break when an additional valve in that wrong location is closed.



Risk of explosion

- **Check a mounting direction**

If this product is installed the other way around, the pump or back pressure valve may break.



Caution

- **Use a proper size tubing/piping that can handle the maximum possible liquid pressure**

Otherwise, failure including a chemical leak may result.



Requirement

- **PVC materials may deteriorate if exposed to direct sunlight or chemical liquid**

Protect the product with a cover. Keep good ventilation to the covered product so temperature won't rise too high and PVC materials won't deform.



Requirement

- **Do not touch this product with bare hands**

Risk of burns. The surface temperature of this product and piping becomes very high during and immediately after operation, depending on the liquid temperature.



Caution

- **Before cleaning**

Do not clean this product or nameplate with a solvent such as benzine or thinner. This may discolor the back pressure valve or erase printing. Use a dry or damp cloth or a neutral detergent.



Prohibited

- **Disposal of a used product**

Dispose of any used or damaged product in accordance with local rules and regulations. If necessary, consult a licensed industrial waste disposal company.



Caution

- **Before return of the product**

Drain chemical liquid out of this product and flush it out. Properly pack it with the chemical name on package.



Caution

Overview

<i>1. Unpacking & Inspection.....</i>	<i>5</i>
<i>2. Operating principle</i>	<i>5</i>
<i>3. Model codes.....</i>	<i>6</i>
<i>4. Part names.....</i>	<i>7</i>

Overview

1. Unpacking & Inspection



φ4×φ6 hose stopper



φ9×φ12 hose stopper

Open the package and check that the product conforms to your order. If any problem or inconsistency is found, immediately contact your distributor.

1. Check the nameplate to see if the information such as model codes and set pressure is as ordered.

2. Check accessories are complete.

- BV-3 TV/TE -MS: φ4×φ6 hose stopper

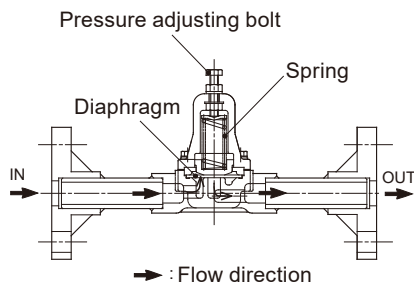
- BV-3 TV/TE -ML: φ9×φ12 hose stopper

*Note the two (2) 4×9 hose stoppers are equipped to the BV-3 TV/TE -"MS" when shipped from our factory as well as the 8×13 hose stoppers to the BV-3 TV/TE -"ML". Use the attached hose stoppers along with actual tube size to be used.

3. Check for transit damage, deformation and loose bolts.

2. Operating principle

<BV-3P-15 flange connection type>



An Iwaki BV back pressure valve and N-BV back pressure valve have an adjustable set pressure mechanism and are designed for use with our metering pumps.

When the liquid pressure exceeds the set pressure of this product, the diaphragm automatically opens to keep the flow pressure constant.

Overview

3. Model codes

■ BV series

BV - 2 S6 B - 15
a b c d e

a	Series code		BV
b	Maximum capacity		1 : 1L/min 2 : 2L/min 3 : 3L/min 7 : 7.5L/min 25 : 25L/min
c	Lower case/ Diaphragm/ O ring	BV-1	PV : PVC/FKM/FKM PE : PVC/EPDM/EPDM TV : PVDF/FKM/FKM
		BV-2	S6 : SCS14 (or SUS316)/PTFE/No O ring
		BV-3	P : PVC/PTFE/No O ring NV : PVC/FKM/No O ring PV : PVC/PTFE/FKM NE : PVC/EPDM/No O ring PE : PVC/PTFE/EPDM TV : PVDF/FKM/FKM TE : PVDF/EPDM/EPDM
		BV-7/-25	S6 : SCS14 (or SUS316)/PTFE/No O ring V : PVC/PTFE/No O ring TV : PVDF/PTFE/FKM TE : PVDF/PTFE/EPDM F : PVDF/PTFE/No O ring
d	Max set pressure*1		No code : 0.3MPa, 0.8MPa, or 1.0MPa B : Above 0.8MPa L : 0.2MPa
e	Connection type	Tube	4H : ø4×ø9 tube (PVC) 8H : ø8×ø13.5 tube (PVC) 12H : ø12×ø18 tube (PVC) 4P : ø4×ø6 tube (PE) 9P : ø9×ø12 tube (PE) 12P : ø12×ø16 tube (PE) MS : ø4×ø9 tube or ø4×ø6 tube ML : ø8×ø13 tube or ø9×ø12 tube
		Flange	15 : 15A flange 20 : 20A flange 25 : 25A flange 40 : 40A flange 50 : 50A flange
		Thread	R : R ½ N : ½ NPT G : G ¾ C17 : Rc ½ C18 : Rc ¾

*1 See page 28 for all available back pressure models and the set pressure at each model.

■ N-BV series

N 50 BV - 5 S4 - F
a b a c d e

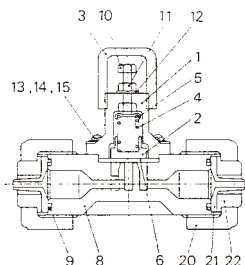
a	Series code		N_BV
b	Connection size		50 : 50A 65 (SUS) : 65A 65-50 (PVC) : 65A
c	Max set pressure		5 : 0.5MPa
d	Lower case/ Diaphragm/ O ring		S4 : SUS304/PTFE/No O ring S6 : SUS316/PTFE/No O ring V : PVC/CR/CR V2 : PVC/FKM/FKM
e	Connection type		F : Flange

Overview

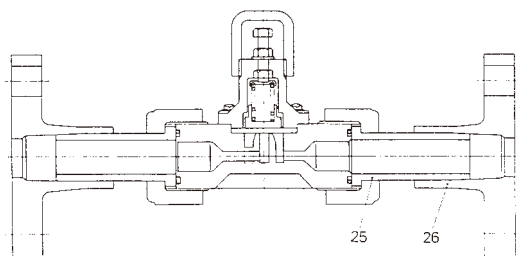
4. Part names

■ BV series

BV-1 PV/PE -4H/-8H/-12H/-4P/-9P/-12P/-13E



BV-1 PV/PE -15/-20



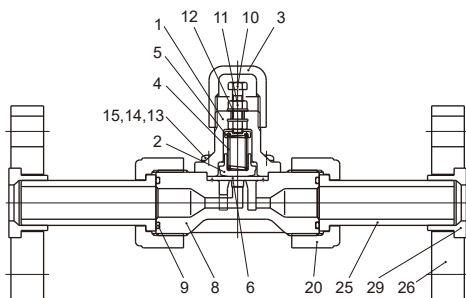
No.	Name	Q'ty	Material
1	Upper case	1	PVC
2	Retainer plate	1	PVC
3	Cap	1	PVC
4	Spring	1	SWP-A
5	Spring seat	1	SPCC
6	Diaphragm	1	FKM/EPDM*1
8	Lower case	1	PVC
9	O ring	2	FKM/EPDM*1
10	Hex head bolt	1	STNLS STL
11	Hex nut	1	STNLS STL
12	Plain washer	1	STNLS STL
13	Machine screw	4	STNLS STL
14	Plain washer	4	STNLS STL
15	Hex nut	4	STNLS STL
20	Nut	2	PVC
21	Tube insert*2	2	PVC
22	Ferrule*2	2	SS400
25	Union*3	2	PVC
26	Flange*3	2	PVC

*1 FKM for PV type or EPDM for PE type

*2 Parts for tube connection

*3 Parts for flange connection

BV-1 TV/TVL -15

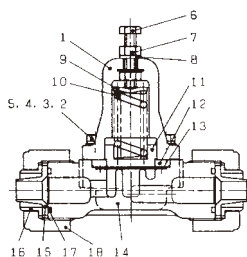


No.	Name	Q'ty	Material
1	Upper case	1	PVC
2	Retainer plate	1	PVC
3	Cap	1	PVC
4	Spring	1	SWP-A
5	Spring seat	1	SPCC
6	Diaphragm	1	FKM
8	Lower case	1	CFRPVDF
9	O ring	2	FKM
10	Hex head bolt	1	STNLS STL
11	Hex nut	1	STNLS STL
12	Plain washer	1	STNLS STL
13	Machine screw	4	STNLS STL
14	Plain washer	4	STNLS STL
15	Hex nut	4	STNLS STL
20	Nut	2	CFRPVDF
25	Union	2	PVDF
26	Flange	2	PPG
29	Flange adapter	2	PVDF

Overview

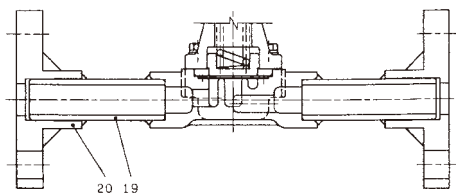
BV-3 PE/PV -12H/-12P/-13E

BV-3 NE/NV -12H/-12P/-13E



BV-3 P-15/-20/-25

BV-3 NE/NV -15/-20/-25



No.	Name	Q'ty	Material
1	Upper case	1	PVC
2	Hex head bolt	4	STNLS STL
3	Spring washer	4	STNLS STL
4	Plain washer	4	STNLS STL
5	Hex nut	4	STNLS STL
6	Adjusting bolt	1	STNLS STL
7	Hex nut	1	STNLS STL
8	Plain washer	1	STNLS STL
9	Spring seat	1	SUS304
10	Spring	1	SUS304
11	Retainer plate	1	PVC
12	Stopper	1	S45C
13	Diaphragm ^{*4}	1	PTFE+EPDM
14	Lower case	1	PVC
15	Tube insert ^{*2}	2	PVC
16	Ferrule ^{*2}	2	SS400
17	O ring ^{*2}	2	FKM/EPDM ^{*1}
18	Nut ^{*2}	2	PVC
19	Pipe ^{*3}	2	PVC
20	T.S. flange ^{*3}	2	PVC

^{*1} FKM for PV type or EPDM for PE type

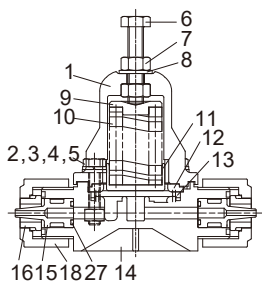
^{*2} Parts for tube connection

^{*3} Parts for flange connection

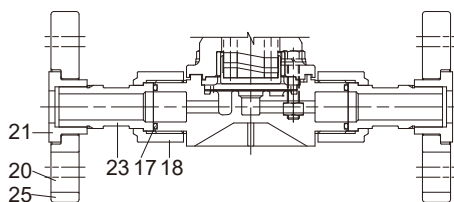
^{*4} FKM for NV type or EPDM for NE type

Overview

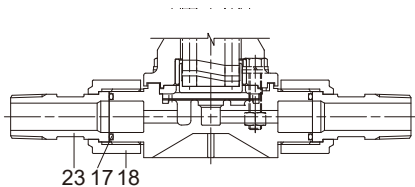
BV-3 TV/TE -MS-/ML



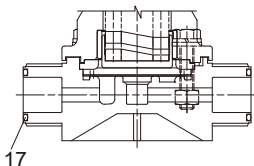
BV-3 TV/TE -15/-20



BV-3 TV/TE -R/-N



BV-3 TV/TE -G



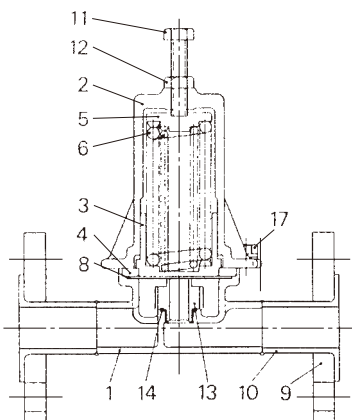
No.	Name	Q'ty	Material
1	Upper case	1	GFRPP
2	Hex head bolt	4	STNLS STL
3	Spring washer	4	STNLS STL
4	Plain washer	4	STNLS STL
5	Hex nut	4	STNLS STL
6	Adjusting bolt	1	STNLS STL
7	Hex nut	1	STNLS STL
8	Plain washer	1	STNLS STL
9	Spring seat	1	SUS316
10	Spring	1	SUP12
11	Retainer plate	1	SUS316
12	Stopper	1	SUS316
13	Diaphragm	1	FKM/EPDM ^{*1}
14	Lower case	1	PVDF
15	Hose adapter	2	PVDF
16	Hose stopper	2	PPS
17	O ring (P-18)	2	FKM/EPDM ^{*1}
18	Nut	2	GFRPP
20	Flange	2	GFRPP
21	Flange adapter	2	PVDF
23	Fitting	2	PVDF
25	Flange unit ^{*2}	2	-
27	O ring (P-9)	2	FKM/EPDM ^{*1}

^{*1} FKM for TV type or EPDM for TE type

^{*2} Parts for flange connection (Part # 18, 20, 21, and 23)

Overview

BV-2/-7/-25 S6

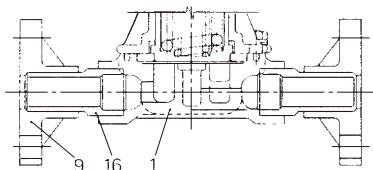


No.	Name	Q'ty	S6	V
1	Lower case	1	SCS14	PVC
2	Upper case	1	FC250	
3	Retainer plate	1	S45C	
4	Stopper	1	S45C	
5	Spring seat	1	SS400	
6	Spring A	1	SUS304	
8	Diaphragm	1	PTFE	
9	Flange	2	SUS304	PVC
10	Lap end* ¹	2	SUS316	
11	Adjusting bolt	1	STNLS STL	
12	Nut	1	STNLS STL	
13	Valve seat* ¹	1	SUS316	
14	Gasket* ¹	1	PTFE	
16	Pipe* ²	2		PVC
17	Hex bolt	4	STNLS STL	

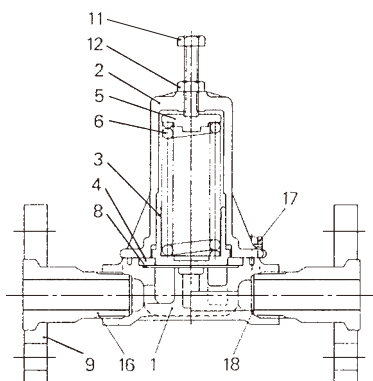
*¹ Equipped to BV-2/-7/-25 S6 type

*² Equipped to BV-7/-25 V type

BV-7/-25 V



BV-7/-25 TV/TE



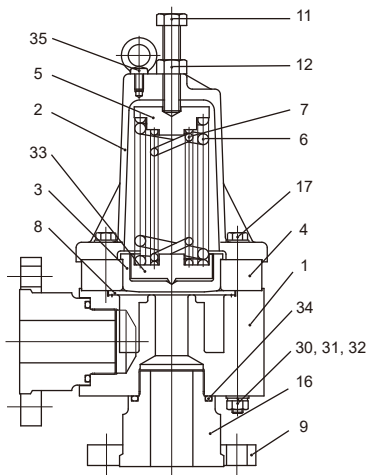
No.	Name	Q'ty	Material
1	Lower case	1	CFRPVDF
2	Upper case	1	FC250
3	Retainer plate	1	S45C
4	Stopper	1	S45C
5	Spring seat	1	SS400
6	Spring A	1	SUS304
8	Diaphragm	1	PTFE
9	Flange	2	SUS304
11	Adjusting bolt	1	STNLS STL
12	Nut	1	STNLS STL
16	Inlet and Outlet	2	PVDF
17	Hex bolt/nut	4	STNLS STL
18	O ring	2	FKM/EPDM* ¹

*¹ FKM for TV type or EPDM for TE type

Overview

■ N-BV series

N 50/65-50 BV-5 V/V2

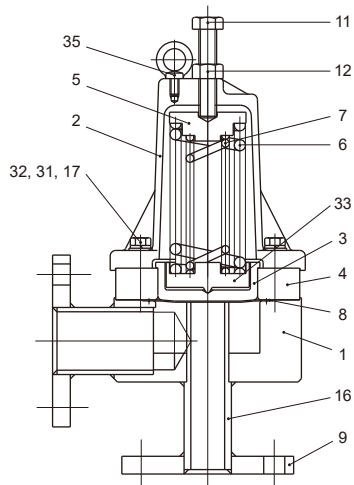


No.	Name	Q'ty	Material
1	Lower case	1	PVC
2	Upper case	1	FC250
3	Retainer	1	SS400
4	Stopper	1	SUS304
5	Spring seat B	1	SS400
6	Spring A	1	SUS304
7	Spring B*2	1	SUS304
8	Diaphragm	1	CR/FKM*1
9	Flange	2	PVC
11	Adjusting bolt	1	STNLS STL
12	Nut	1	STNLS STL
16	Nipple	2	PVC
17	Hex bolt	6	STNLS STL
30	Hex nut	6	STNLS STL
31	Spring washer	6	STNLS STL
32	Plain washer	12	STNLS STL
33	Spring seat C	1	SS400
34	O ring	2	CR/FKM*1
35	Eye bolt	1	Steel

*1 CR for V type and FKM for V2 type

*2 Spring B is not installed for the models of 0.2MPa or lower set pressure.

N 50 BV-5 S6

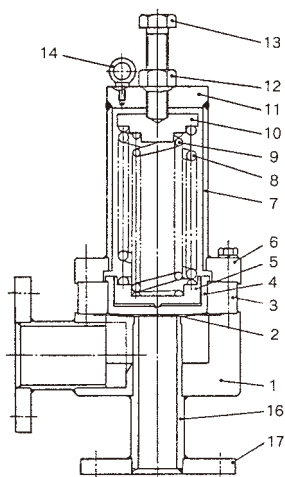


No.	Name	Q'ty	Material
1	Lower case	1	SUS304/316
2	Upper case	1	FC250
3	Retainer	1	SS400
4	Stopper	1	SUS304
5	Spring seat B	1	SS400
6	Spring A	1	SUS304
7	Spring B*1	1	SUS304
8	Diaphragm	1	PTFE
9	Flange	2	SUS304/316
11	Adjusting bolt	1	STNLS STL
12	Nut	1	STNLS STL
16	Pipe	2	SUS304/316
17	Hex bolt	6	STNLS STL
31	Spring washer	6	STNLS STL
32	Plain washer	6	STNLS STL
33	Spring seat C	1	SS400
35	Eye bolt	1	Steel

*1 Spring B is not installed for the models of 0.2MPa or lower set pressure.

Overview

N 65 BV-5 S6



No.	Name	Q'ty	Material
1	Lower 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* ¹	1	SUS304
10	Spring seat B	1	SS400
11	Case A	1	SS400
12	Nut	1	STNLS STL
13	Adjusting bolt	1	STNLS STL
14	Eye bolt	1	STNLS STL
16	Pipe	2	SUS304/316
17	Flange	2	SUS304/316

*1 Spring B is not installed for the models of 0.2MPa or lower set pressure.

Installation

<i>1. Before installation</i>	<i>14</i>
-------------------------------------	-----------

Installation

CAUTION

Clean the inside of plumbing before mounting the BV/N-BV back pressure valve. If foreign matters or debris clogs the back pressure valve, the targeted flow rate of the pump may not be obtained or the valve may even fail.

1. Before installation

■ Precautions for use

1. Mounting location

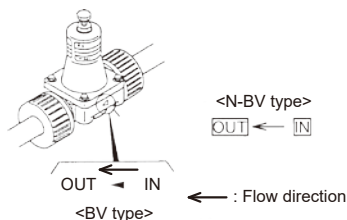
Install the BV/N-BV back pressure valve in a horizontal discharge line. If it is installed vertically, air will be trapped.

CAUTION

Do not add any valves on the secondary side of the BV/N-BV back pressure valve. The pump or the back pressure valve would break when an additional valve in that wrong location is closed.

2. Mounting direction

The "OUT" and "IN" marks indicate the correct mounting direction of the back pressure valve.



CAUTION

Make sure the mounting direction is correct. If it is installed the other way around, the back pressure valve may fail.

*If it does not open or close properly even at a set pressure, it may be a sign of an incorrectly-mounted valve.

3. Secondary line pressure of the back pressure valve

For the BV-1 PV/PE back pressure valve, always keep the secondary side of the back pressure valve "open-ended".

For the other models than the BV-1 PV/PE valve, keep it less than half the set pressure of those valves. If not, unfavourable pressure could adversely affect the opening pressure (set pressure) and readjustment would be needed accordingly.

4. Maximum allowable flow rate and set pressure range

Observe the specifications of each back pressure valve. See page 28 for detail.

Installation

5. Commissioning

The set pressure of the back pressure valve is adjusted as per your designation (with clean water) when shipped from our factory; however, further adjustment will be needed as an actual opening pressure of the valve varies with ambient temperature, liquid viscosity, and the secondary line pressure of the back pressure valve. Also, perform commissioning before full operation and ensure the valve works properly. See the "Pressure adjustment" section as well.

6. Liquid temperature range

Wet end material code	Temperature
NE/NV/V/V2/PE/PV/3TE/3TV/S4	0 to 50°C (32 to 122°F)
S6	0 to 80°C (32 to 176°F)
1TE/1TV/7TE/7TV/25TE/25TV	0 to 90°C (32 to 194°F)

7. Additional solenoid valve

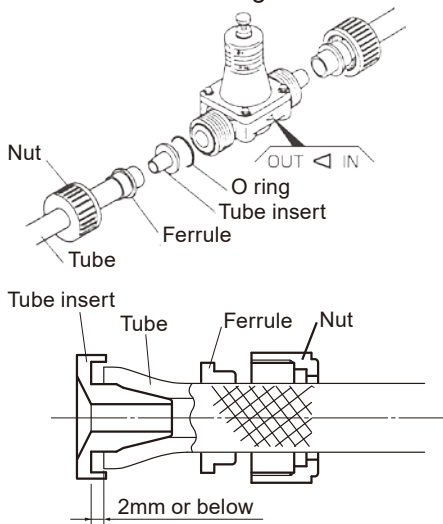
The back pressure valve gives the appropriate back pressure to the pump for the prevention of siphoning/overfeeding whilst the pump is running; however, it won't assure you that the valve shuts off the liquid flow completely after the pump and the system are stopped, especially when the primary side of the back pressure valve is pressurized. If necessary, use an additional solenoid valve to make sure the liquid dose not flow.

■ Valve mounting

Clean the inside of plumbing before mounting the BV/N-BV back pressure valve.

⚠ CAUTION

Check if the mounting direction is correct before installation of the valve.

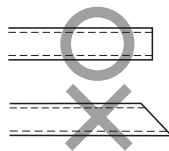


Tube connection (except BV-3 TV/TE)

1. Cut the tube ends flat.

⚠ CAUTION

A chemical leak could result if it's not cut flat.



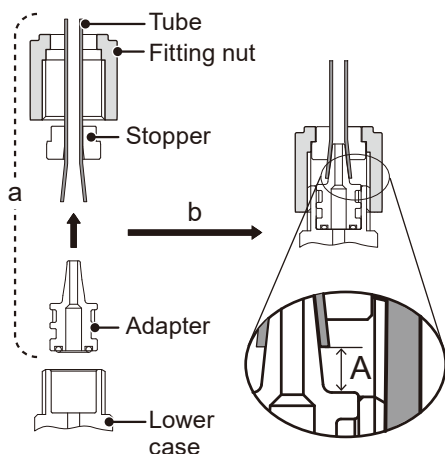
2. Pass a tube into the nut and ferrule, and then slide it down to the tube insert to maintain the 2mm gap or even deeper.

Installation

3. Fit O ring if provided. Hand-tighten the nut to the lower case.

⚠ CAUTION

- Do not use excessive force to the plastic nut.
- Some chemicals attack a PVC tube significantly. Do not use those aggressive chemicals.



Tube connection (BV-3 TE/TV)

1. Cut the tube ends flat.

⚠ CAUTION

A chemical leak could result if it's not cut flat.

2. Pass the tube through the fitting nut and stopper, and then slide it down onto the adapter to the following depth or farther.

Tube size (I.D.×O.D.)	Depth (A)
ø4×ø9	4mm
ø4×ø6	6mm
ø8×ø13	5mm
ø9×ø12	7mm

3. Put the tube end (adapter) onto the fitting. Then hand tighten the fitting nut.

4. Retighten the fitting nut by turning it further 180 degrees with an adjustable wrench or spanner so it crushes into the tube a little.

*Do not use excessive force when tightening the plastic fitting nut.

*When removing the connection, if the adapter has become stuck in the crushed tube and the stopper and those parts cannot be separated, contact us for a new adapter/stopper set.

*Do not reuse the same crushed tube end to reseal the tubing. Cut off the end and start with new tubing to ensure a new seal is established.

*Some tubing may be too firm to be pushed onto the adapter to the designated depth shown above. If so, wet the tapered area of the adapter to give it some lubricity, or immerse the tube end into warm water (40°C/104°F or below) to give it more flexibility.

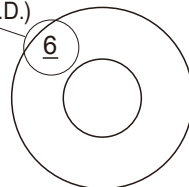
Installation

*The BV/N-BV back pressure valve is equipped with the $\varnothing 4 \times \varnothing 9$ or $\varnothing 8 \times \varnothing 13$ hose stoppers when shipped from our factory. If you are to use a different tube size ($\varnothing 4 \times \varnothing 6$ or $\varnothing 9 \times \varnothing 12$), change the hose stopper size accordingly.

*You can tell the stopper size (tube O.D.) by the numeric number on stopper back.

Stopper size	Applicable tube size
6	$\varnothing 4 \times \varnothing 6$
9	$\varnothing 4 \times \varnothing 9$
12	$\varnothing 9 \times \varnothing 12$
13	$\varnothing 8 \times \varnothing 13$

Stopper size
(Tube O.D.)



*There are four (4) different shape hose stoppers according to the size. Three of them have the pre-determined mounting direction (except 13 size hose stopper that has no mounting direction). See the diagram on the previous page for the correct mounting direction of the hose stoppers.



9 size hose stopper



6 size hose stopper



12 size hose stopper



13 size hose stopper

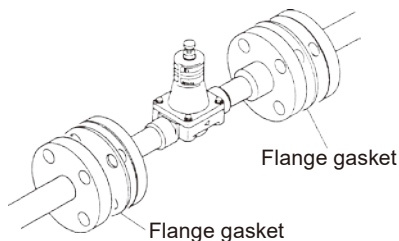
Installation

Flange connection

Always place a flange gasket between flanges.

Tighten the bolts diagonally and evenly. Use a suitable device for handling a large back pressure valve.

*Two or more operators may be needed for ensuring safe transport depending on weight.



Flange/Thread connection (BV-3 TE/TV)

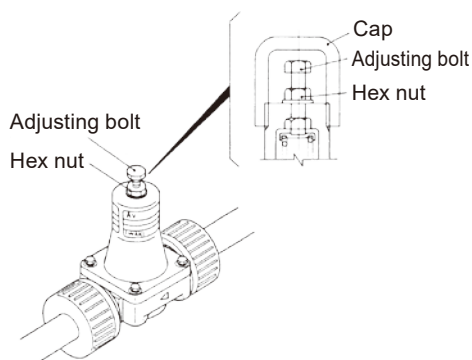
1. Mount the "Fitting" to the lower case and fasten the nut.
2. Use an adjustable wrench or a spanner to further tighten the nut for 45 degrees.

*Do not use excessive force to the plastic nut.

Installation

■ Pressure adjustment

The set pressure of the back pressure valve is adjusted to your designation (with clean water) when shipped from our factory; however, further adjustment will be needed along with an actual opening pressure in your operating conditions or when the valve is taken apart and then put together for maintenance.



1. Remove the cap if attached and loosen a hex nut.
2. Check the discharge pressure gauge to determine at which pressure the back pressure valve opens to flow liquid.
3. If the valve opens at lower pressure than the optimal level, gradually turn the adjusting bolt clockwise to raise the opening pressure (that is the set pressure).
If the valve opens at higher pressure, gradually turn the adjusting bolt counter-clockwise to reduce the opening pressure.
4. After the adjustment, tighten the hex nut and replace the cap.
5. See the pressure gauge. Repeat these steps until the best set pressure is obtained.

Maintenance

<i>1. Maintenance & Inspection</i>	<i>21</i>
<i>2. Wear parts.....</i>	<i>21</i>
<i>3. Troubleshooting.....</i>	<i>22</i>
<i>4. Assembly & Disassembly.....</i>	<i>23</i>
<i>5. Specification.....</i>	<i>28</i>

Maintenance

1. Maintenance & Inspection

■ Daily inspection

1. Check the back pressure valve every day for:

- Mechanical vibration
- Abnormal noise
- A leak
- Pressure change

■ Periodic inspection (every six months)

1. Remove foreign matters from the back pressure valve.

Clean the inside of the back pressure valve. If foreign matters clog the flow path of the valve, it adversely affects the opening pressure.

2. Check for scratched, worn or cracked parts.

Replace if any.

3. Check if the upper case is secured.

CAUTION

If the upper case becomes loose, it impairs the crush-mount sealing of the diaphragm and a liquid starts to leak.

*The upper case fixing screws may loosen as that plastic case creeps. Periodically check the upper case is held tight. If it's not, tighten screws.

4. Check for damaged tubing

The service life of tubing may be shortened by liquid characteristics, the ultraviolet ray intensity and the liquid pressure level. If tubing starts hardening, discolouring or deforming from these factors, replace with new tubing for the prevention of a chemical leak or any other problems.

2. Wear parts

For a long operation wear parts need to be replaced periodically. It is recommended that the following parts are always stocked for immediate replacement. Contact us or your nearest dealer with the following information.

1. Part names and numbers. See the "**4. Part names**" pages for detail.
2. Model code and manufacturing number. See the nameplate.
3. A drawing number if you have.

Part names	Q'ty	Life time
Diaphragm	1	One year
O ring	2	

Maintenance

3. Troubleshooting

If you notice any abnormal or dangerous conditions, stop operation immediately and check the following points. If you are not able to remove problems, contact us or your nearest distributor.

Troubles	Causes	Countermeasures
Liquid leaks.	The upper case is not held tight.	Tighten the fixing screws.
	An O rings is out of place or damaged.	Correct/Replace O ring.
	Tubing/piping is not connected to the back pressure valve correctly.	Correct tubing/piping connection.
	Foreign matters impairs crush-mount diaphragm sealing. The diaphragm is damaged	Take apart and clean the back pressure valve.
	Loose nut	Tighten nuts.
	The PVDF/PVC lower case has crept and deformed.	Tighten fixing screws on the upper case. Replace the lower case as necessary.
Actual opening pressure of the back pressure valve is different from the set pressure.	The internal flow path is blocked by foreign matters.	Take apart and clean the back pressure valve.
	The set pressure (adjusting bolt) is set too high.	Reset the set pressure.
	The set pressure (adjusting bolt) is set too low.	Reset the set pressure.
	Liquid viscosity is too high.	Reset the set pressure.
	Air pocket in the back pressure valve	Mount the BV horizontally.
Opening pressure is too low.	The set pressure (adjusting bolt) is set too low.	Reset the set pressure.
Opening pressure is too high.	The internal flow path is blocked with foreign matters.	Take apart and clean the back pressure valve.
	The set pressure (adjusting bolt) is set too high.	Reset the set pressure.
	Liquid viscosity is too high.	Reset the set pressure.

Maintenance

4. Assembly & Disassembly

See the "Part names" pages as well. If sufficient space is kept around the back pressure valve for easy access and maintenance, the back pressure valve can be taken apart without demounted from plumbing (if O rings are to be removed, the back pressure valve must be demounted.).

⚠ CAUTION

- Risk of electrical shock. Be sure to turn off power to stop the pump and related devices before service is performed.
- Solution in the discharge line may be under pressure. Release the pressure from the discharge line before disconnecting plumbing or disassembly of the pump to avoid solution spray.
- Always wear protective clothing such as safety goggles and protective gloves. Remove a harmful chemical immediately if you or parts have got wet accidentally.

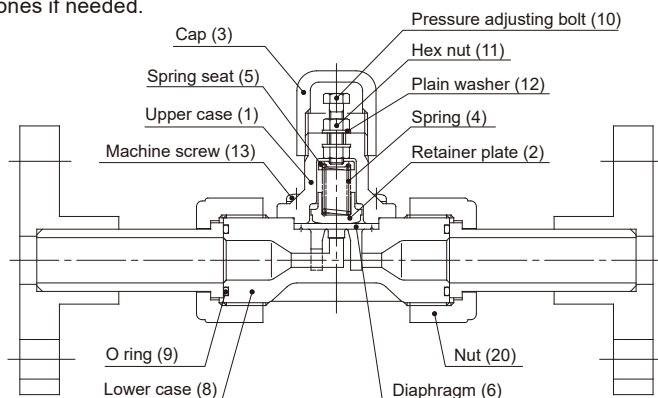
■ BV-1

Follow the instructions below. See the "4. Part names" section as well.

Disassembly

1. Remove the Cap (3) and loosen the Hex nut (11) by turning it CCW. Then turn the Pressure adjusting bolt (10) CCW until it is removed.
2. Remove the Machine screws (13) and the Upper case (1).
3. Remove the Spring seat (5), Spring (4) and Retainer plate (2).
4. Remove the Diaphragm (6).
*Clean the crush-mount sealing area of the Diaphragm as necessary. Replace the Diaphragm and the Lower case (8) with new ones if the sealing surface is damaged.
5. Remove the Nut (20) and check the O rings (9) for wear or damage. Replace the O rings with new ones if needed.

<BV-1-15>



Maintenance

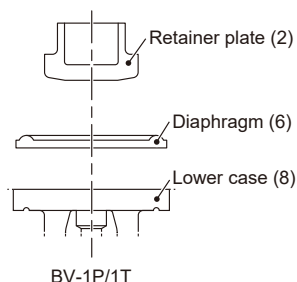
Assembly

In general, assembly should be done in reverse order of the disassembly process.

1. Mount the Diaphragm (6) to the Lower case (8). Be sure the Diaphragm is fitted in place (into a groove on the Lower case).

2. Place the Retainer plate (2) onto the Diaphragm.

*Apply a chemically-resistant silicone grease to the contact face between the Diaphragm and the Retainer plate.



3. Apply the silicone grease (or any grease) to both the ends of the Spring (4). And then place the Spring and the Spring seat (5) onto the Retainer plate (2).
4. Mount the Upper case (1) with the Machine screws (13).
5. Fit the Hex nut (11) and Plain washer (12) to the Pressure adjusting bolt (10) and screw the bolt into the Upper case (1).
6. Install the completed relive valve into plumbing. See the valve mounting section as well.
7. Run the pump for commissioning and find an optimal set pressure with the actual operating conditions (liquid characteristics, temperature, etc.). See the "Pressure adjustment" section as well.
8. Fit the cap.

■ BV-2/-3/-7/-25

Parts numbers in "()" are for the BV-2/-7/-25 and "<>" are for the BV-3.

Disassembly

1. Loosen the Nuts (12) or the Hex nut <7> and turn the Adjusting bolt (11) <6> CCW until it is removed.
2. Remove the hex bolts (17) <2> and the Upper case (2) <1>.
3. Remove the Spring seat (5) <9>, Springs (6) <10>, Retainer plate (3) <11> and Stopper (4) <12>.
4. Remove the Diaphragm (8) <13>. Replace the Diaphragm if it has been swollen, worn, or damaged, or after 1 year of operation, whichever comes first.
*Clean the crush-mount sealing area of the Diaphragm (8) <13> as necessary. Replace the Diaphragm and the Valve seat (13) (or the Lower case (1) <14> for the P/PV/PE/V/TV/TE types) with new ones if its sealing surface is damaged.
5. Remove the Inlet and Outlet (16) or Nut <18> to take out the O rings (18) <17> if provided. Replace O rings as necessary.

Maintenance

Parts numbers in "< >" are for the BV-2/-7/-25 and "< >" are for the BV-3.

Assembly

In general, assembly should be done in reverse order of the disassembly process.

1. Mount the Diaphragm (8) <13> to the Lower case (1) <14>. Be sure the Diaphragm is properly fitted in place (into a groove on the Lower case) and place the Stopper (4) <12>.

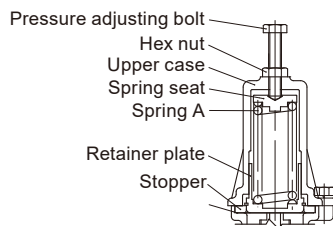
*For the BV-3 P/PV/PE, place the Diaphragm <13> with its white face downwards (facing the Lower case).

*For the BV-3 TV/TE, place the Diaphragm <13> with its painted face upwards (facing the Retainer plate <11>).

2. Grease (about 0.5mm thickness) the contact face between the Retainer plate (3) <11>, the Stopper (4) <12>, and the Diaphragm (8) <13>.

*For the BV-3 P/PV/PE, use chemically-resistant "silicone" grease.

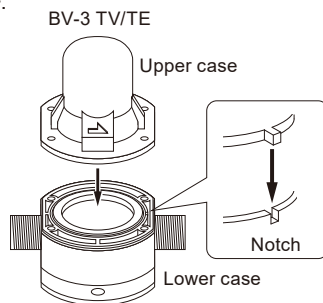
*For the BV-3 TV/TE, use chemically-resistant "fluorine" grease.



3. Place the Springs (6) <10> onto the Retainer plate (3) <11>. Apply grease (about 0.5mm thickness) to both ends of the Spring seat (5) <9> and cap the Spring(s).

4. Mount the Upper case (2) <1> with the Hex bolts (17) <2>.

*For the BV-3 TV/TE, the Lower case <14> has the notch to receive the Upper case <1> in the correct direction.



5. Install the completed back pressure valve into plumbing. See the valve mounting section for detail.

*For the BV-2/-7/-25 TV/TE, fit the O rings (18) properly into a groove on the Lower case (1) and use a spanner to fasten the Inlet and Outlet (16).

*For the BV-3P with tube connections, fit the O rings <17> properly into the groove on the Lower case <14> and fasten the Nuts <18>.

6. Run the pump for commissioning and find an optimal set pressure along with the actual operating conditions (liquid characteristics, temperature, etc.). See the "Pressure adjustment" section as well.

Maintenance

■ N 50/65•50 BV

Follow the instructions below. See the "4. Part names" section as well.

Disassembly

1. Remove the back pressure valve from the piping. Note the N-BV is a heavy product. Always use the Eye bolt (35) to ensure it will not accidentally drop.

*The valve needs not be demounted from the piping as long as there is no need for the O rings (34) to be replaced.

2. Loosen the Nut (12) and turn the Adjusting bolt (11) CCW until it is removed.
3. Remove the Hex bolt (17) and the Upper case (2).
4. Remove the Spring seat B (5), Spring A (6), Spring B (7), Spring seat C (33), Retainer (3) and Stopper (4).
5. Remove the Diaphragm (8). Replace the Diaphragm if it has been swollen, worn, or damaged, or after 1 year of operation, whichever comes first.

*Clean the sealing surface between the Diaphragm (8) and the Lower case (1) as necessary. Replace these parts if the sealing surface is damaged.

*For the N-BV-V/-V2 types, remove the Nipples (16) to take out the O rings (34). Replace the O rings with new ones if worn or damaged.

Assembly

In general, assembly should be done in reverse order of the disassembly process.

1. Mount the Diaphragm (8) to the Lower case (1). Be sure the Diaphragm is properly fitted into a groove on the Lower case and then place the Stopper (4).
2. Grease the contact face between the Retainer (3) and the Stopper (4), and combine them.
3. Place the Spring seat C (33), Spring A (6), Spring B (7) and Spring seat B (5) onto the Retainer (3).
4. Mount the Upper case (2) and then tighten with the Hex bolt (17). Make sure the Adjusting bolt (11) is properly held by the Spring seat B (5).

*For the N-BV-V/-V2 types, provide the Nipple (16) with the Flange (9) and the O ring (34), and fit it into the Lower case (1).

5. Install the complete back pressure valve into plumbing.
6. Run the pump for commissioning and find an optimal set pressure along with the actual operating conditions (liquid characteristics, temperature, etc.). See the "Pressure adjustment" section as well.

Maintenance

■ N 65 BV-5 S6

Follow the instructions below. See the "4. Part names" section as well.

Disassembly

1. Remove the back pressure valve from the piping. Note the N-BV is a heavy product. Always use the Eye bolt (14) to ensure it will not accidentally drop.
2. Loosen the Nut (12) and turn the Adjusting bolt (13) CCW until it is removed.
3. Remove the upper case fixing bolts and the Case A (11), Case B (7), and Case C (6).
4. Remove the Spring seat B (10), Spring A (8), Spring B (9), Retainer (4) and Stopper (3).
5. Remove the Diaphragm (2). Replace the Diaphragm if it has been swollen, worn, or damaged, or after 1 year of operation, whichever comes first.

*Clean the sealing surface between the Diaphragm (2) and the Lower case (1) as necessary.
Replace these parts if the sealing surface is damaged.

Assembly

In general, assembly should be done in reverse order of the disassembly process.

1. Mount the Diaphragm (2) to the Lower case (1). Be sure the Diaphragm is properly fitted into a groove on the Lower case and then place the Stopper (3).
2. Grease the contact face between the Retainer (4) and the Stopper (3) and combine them.
3. Place the Spring seat C (5), Spring A (8), Spring B (9) and Spring seat B (10) onto the Retainer (4).
4. Mount the Case C (6), Case B (7), and the Case A (11) to the Lower case (1) and then tighten with the hexagon bolts. Make sure the Adjusting bolt (13) is properly held by the Spring seat B (10).
5. Install the complete back pressure valve into plumbing.
6. Run the pump for commissioning and find an optimal set pressure along with the actual operating conditions (liquid characteristics, temperature, etc.). See the "Pressure adjustment" section as well.

Maintenance

5. Specification

Material	Model	Max. flow L/min	Set pressure MPa	Connection	Mass kg
PVC	BV-1 PV/PE L-15	0.005-1.0	0.05-0.2	15A	0.5
	BV-1 PV/PE -15		0.25-0.8		
	BV-1 PV/PE L-20		0.05-0.2	20A	0.7
	BV-1 PV/PE -20		0.25-0.8		
	BV-1 PV/PE L-4H		0.05-0.2	ø4×ø9 tube (PVC)	0.2
	BV-1 PV/PE -4H		0.25-0.8		
	BV-1 PV/PE L-8H		0.05-0.2	ø8×ø13.5 tube (PVC)	
	BV-1 PV/PE -8H		0.25-0.8		
	BV-1 PV/PE L-4P		0.05-0.2	ø4×ø6 tube (PE)	
	BV-1 PV/PE -4P		0.25-0.8		
	BV-1 PV/PE L-9P		0.05-0.2	ø9×ø12 tube (PE)	
	BV-1 PV/PE -9P		0.25-0.8		
	BV-1 PV/PE L-12H		0.05-0.2	ø12×ø18 tube (PVC)	
	BV-1 PV/PE -12H		0.25-0.8		
	BV-1 PV/PE L-12P		0.05-0.2	ø12×ø16 tube (PE)	
	BV-1 PV/PE -12P		0.25-0.8		
	BV-1 PV/PE L-13E		0.05-0.2	ø13×ø20 tube (PVC)	
	BV-1 PV/PE -13E		0.25-0.8		
	BV-3 P -15	0.03-3.0	0.1-0.8	15A	0.6
	BV-3 P -20			20A	
	BV-3 P -25			25A	0.9
	BV-3 PV/PE -12H			ø12×ø18 tube (PVC)	
	BV-3 PV/PE -12P			ø12×ø16 tube (PE)	0.4
	BV-3 PV/PE -13E			ø13×ø20 tube (PVC)	
	BV-3 NV/NE -15		0.1-0.3	15A	0.6
	BV-3 NV/NE -20			20A	
	BV-3 NV/NE -25			25A	0.9
	BV-3 NV/NE -12H			ø12×ø18 tube (PVC)	
	BV-3 NV/NE -12P			ø12×ø16 tube (PE)	0.4
	BV-3 NV/NE -13E			ø13×ø20 tube (PVC)	
	BV-7 V -20	0.2-7.5	0.05-0.8	20A	3.5
	BV-7 V -25			25A	
	BV-25 V -25	2.0-25	0.1-0.8	25A	4.0
	BV-25 V -40			40A	
	BV-25 V -50			50A	4.5
	N 50 BV -5V-F	2.5-50	0.15-0.5	50A	20
	N 50 BV -5V2-F				
	N 65-50 BV -5V-F	5-70		65A	
	N 65-50 BV -5V2-F				

Maintenance

Material	Model	Max. flow L/min	Set pressure MPa	Connection	Mass kg
SUS	BV-2 S6 -15	0.02-2.0	0.05-0.8	15A	3.5
	BV-2 S6 -C17			Rc½	
	BV-2 S6 -C18			Rc¾	
	BV-7 S6 -20	0.2-7.5		20A	6.0
	BV-7 S6 -25			25A	
	BV-25 S6 -25	2-25	0.1-0.8	25A	7.0
	BV-25 S6 -40			40A	7.5
	BV-25 S6 -50			50A	8.5
	N 50 BV -5 S6/S4-F	2.5-80	0.15-0.5	50A	29
N 65 BV -5 S6/S4-F	5-120	65A		42	
PVDF	BV-1 TVL -15	0.005-1.0	0.05-0.2	15A	0.5
	BV-1 TV -15		0.25-0.8	15A	
	BV-3 TV/TE -15	0.000125-3.0	0.1-0.8	15A	0.6
	BV-3 TV/TE -20			20A	0.7
	BV-3 TV/TE -MS			0.5	
	BV-3 TV/TE -ML				
	BV-3 TV/TE -R				
	BV-3 TV/TE -N			½NPT	
	BV-3 TV/TE -G			G¾	0.4
	BV-7 TV/TE -15	0.2-7.5	0.05-0.8	15A	5.0
	BV-7 TV/TE -25			25A	
	BV-7 F -C17			Rc½	3.5
	BV-7 F -C18			Rc¾	
	BV-25 TV/TE -25	2-25	0.1-0.8	25A	5.0
	BV-25 TV/TE -40			40A	5.5

NOTE1: The code "E" stands for a EPDM O ring, "V" for FKM O ring, "5V" for CR O ring, "5V2" for FKM O ring.

NOTE2: A PTFE diaphragm is used for all models except the BV-1 PE/PV and the BV-3 NV/NE/TV/TE. Those exceptional models have compounded FKM or EPDM diaphragm.

NOTE3: Observe the maximum discharge pressure of tubing.

NOTE4: The code "S6" stands for SUS316, "S4" stands for SUS304

IWAKI PUMPS



<https://www.iwakipumps.jp>

IWAKI CO., LTD. 6-6 Kanda-Sudacho 2-chome Chiyoda-ku Tokyo 101-8558 Japan
TEL: +81 3 3254 2935 FAX: +81 3 3252 8892

European Headquarter / IWAKI Europe GmbH
TEL: +49 2154 9254 0 FAX: +49 2154 9254 48

Germany / IWAKI Europe GmbH
TEL: +49 2154 9254 50 FAX: +49 2154 9254 55

The Netherlands / IWAKI Europe GmbH (Netherlands Branch)
TEL: +31 74 2420011 FAX: +49 2154 9254 48

Italy / IWAKI Europe GmbH (Italy Branch)
TEL: +39 0445 561219 FAX: +39 0445 569088

Spain / IWAKI Europe GmbH (Spain Branch)
TEL/FAX: +34 934 741 638

Poland / IWAKI Europe GmbH (East Europe Branch)
TEL: +48 12 347 0755 FAX: +48 12 347 0900

Denmark / IWAKI Nordic A/S
TEL: +45 48 242345

Finland / IWAKI Suomi Oy
TEL: +358 10 201 0490

Norway / IWAKI Norge AS
TEL: +47 23 38 49 00

Sweden / IWAKI Sverige AB
TEL: +46 8 511 72900

Belgium / IWAKI Belgium N.V.
TEL: +32 13 670200 FAX: +32 13 672030

France / IWAKI France S.A.
TEL: +33 1 69 63 33 70 FAX: +33 1 64 49 92 73

U.S.A. / IWAKI America Inc.
TEL: +1 508 429 1440 FAX: +1 508 429 1386

Brazil / IWAKI Do Brasil Comercio De Bombas Hidraulicas LTDA.
TEL/FAX: +55 19 3244 5900

China (Shanghai) / IWAKI Pumps (Shanghai) Co., Ltd.
TEL: +86 21 6272 7502 FAX: +86 21 6272 6929

China (Hong Kong) / IWAKI Pumps Co., Ltd.
TEL: +852 2607 1168 FAX: +852 2607 1000

China (Guangzhou) / GFTZ IWAKI Engineering & Trading Co., Ltd.
TEL: +86 20 84350603 FAX: +86 20 84359181

China (Shenzhen) / IWAKI Pumps (Shenzhen) Co., Ltd.
TEL: +86 0755 8656 3696

Singapore / IWAKI Singapore Pte Ltd.
TEL: +65 6316 2028 FAX: +65 6316 3221

Indonesia / IWAKI Singapore Pte Ltd. (Indonesia Office)
TEL: +62 21 6906606 FAX: +62 21 6906612

Malaysia / IWAKIm SDN. BHD.
TEL: +60 3 7803 8807 FAX: +60 3 7803 4800

Korea / IWAKI Korea Co., Ltd.
TEL: +82 2 6238 4800 FAX: +82 2 6238 4801

Taiwan / IWAKI Pumps Taiwan Co., Ltd.
TEL: +886 2 8227 6900 FAX: +886 2 8227 6818

Thailand / IWAKI (Thailand) Co., Ltd.
TEL: +66 2 322 2471 FAX: +66 2 322 2477

Australia / IWAKI Pumps Australia Pty Ltd.
TEL: +61 2 9899 2411 FAX: +61 2 9899 2421