

MONOSTAB Pressure Reducing Valve Series K1 05



Monostab Pressure Reducing Valve - General



Pressure reducing valve for controlling the pressure of a network downstream of the unit

Compliance with standards:

- Tested according to standard EN 12266.
- Face-to-face dimensions ISO 5752-1.
- French Sanitary Compliance Certificate (A.C.S.).

Compliance with EC directives:

- Drinking water 98/63/EC.
- Construction products 89/106/EC.
- Pressure equipment directive 97/23/EC (networks for the supply, distribution and discharge of water and associated equipment are not covered by this directive, as mentioned in Article 1 paragraph 3.2). This exclusion means that we are not required to apply the CE conformity marking on this product.

Compliance with the REACH Regulations (EC 1907/2006):

Environment:

- More than 98% recyclable.
- The wood and cardboard packaging can be re-used.
- Neutral packing materials can be taken to a waste treatment centre.

1 -General

1 - 1. Functions, applications:

This spring-actuated pressure reducing valve provides:

- An attractively priced replacement for a baffle block.
- **Reduction and stabilisation of the pressure of a downstream network** supplied by a **higher pressure** upstream network, irrespective of variations in upstream pressure and required flow rate; provided that the specifications of the supply network are compatible with the requirements of the downstream network.
- Protection of a sector or sensitive equipment.
- Stabilisation of the inlet pressure of a booster pump.
- Control of staged networks.

Applications:

- Public or private water distribution networks.
- Domestic, industrial or fire fighting water networks.
- Irrigation networks.
- Etc.

1 - 2. Specifications:

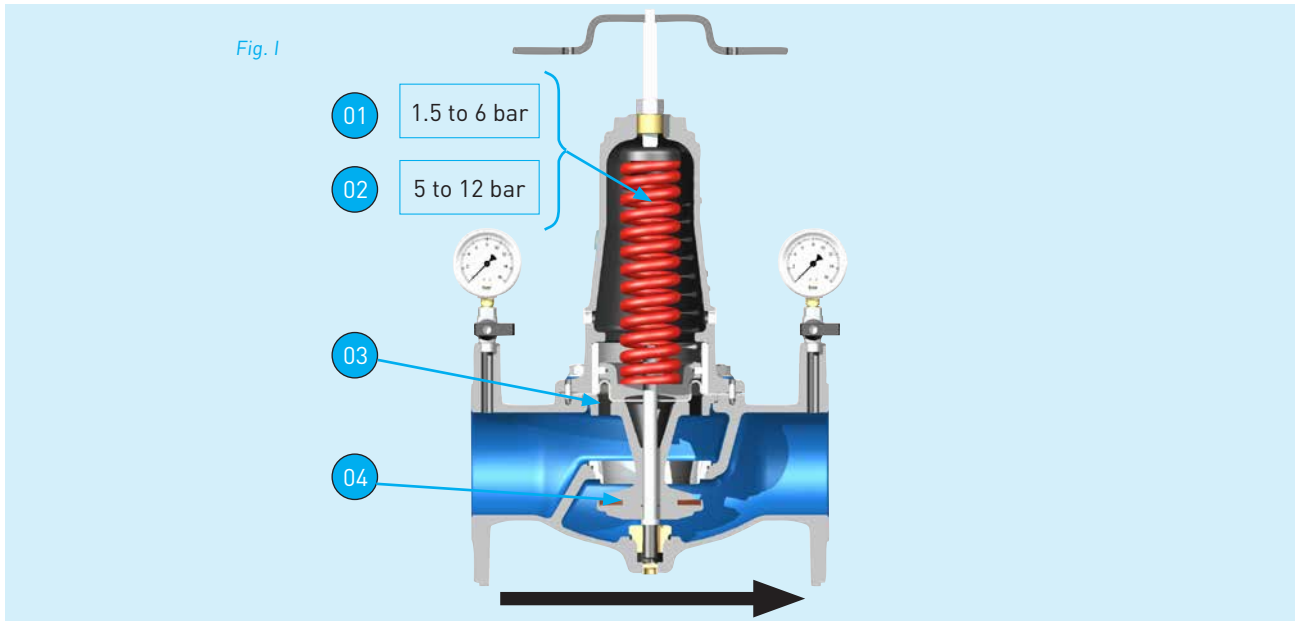
- Modern design.
- Simple construction.
- Robust construction.
- Safe operation.
- Unaffected by variations in upstream pressure and downstream flow requirements.
- Friction-free operation and no risk of blockage.
- Manufactured since 1982.
- Body and bonnet made of ductile iron.
- Powder epoxy coating approved for contact with drinking water.
- Stainless steel bolting.
- Removable stainless steel seat.
- Upper guide protected from contact with water.
- Lower guide coated with a scale inhibitor.
- PN 16 bar, 25 bar or 40 bar, depending on the model.
- Can be dismantled from above with no need for any special tools, and without having to disconnect the piping.
- Spare parts readily available.
- Pressure gauges not included (option).
- Monostab Kv values, for information only:

DN	50	65	80	100	125	150	200
Kv	25	31	72	101	175	216	437

Hydraulic engineer's note:

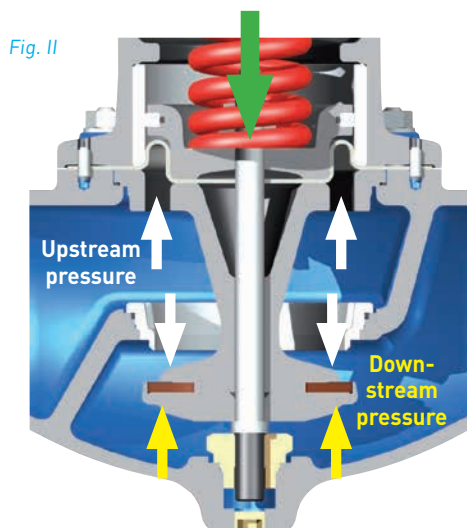
- The **Kv** is the flow rate in the fully open device in m³/h with a head loss of 1 bar.

Monostab Pressure Reducing Valve - General



1 – 3. Operation:

- This pressure reducing valve is a valve disc type (04) downstream pressure stabiliser, compensated by a spring (01) or (02) and balanced against upstream pressure by a rolling diaphragm (03) (PN 16 and 25 bar) or a piston (PN 40 bar).
- The effect of the upstream pressure (white arrows) on the top of the valve disc is counteracted by the effect of the same pressure below the rolling diaphragm or the piston. The effects cancel each other out and the assembly is thus unaffected by variations in the upstream pressure.
- The effect of the downstream pressure below the valve disc assembly (yellow arrows) is compensated by the adjustable compression of the spring (green arrow).
- When the downstream pressure drops below the set pressure, the force exerted by the spring becomes predominant. The mobile unit moves downwards thus allowing through a higher flow rate, which returns the pressure to the set value.
- Conversely, if the downstream pressure increases, the force below the assembly exceeds that of the spring. The mobile unit rises and limits the flow, and the downstream pressure decreases and thus remains stable.



Hydraulic engineer's notes:

A) As with **all devices directly actuated by a spring**, the accuracy of adjustment between zero flow and maximum flow is directly related to the travel of this spring. In order to be watertight, the valve disc must rise. To do this:

1. The spring must compress.
2. Its resistance increases.

3. The downstream pressure applied under the valve disc must increase.

- Conversely, to reach the maximum flow rate, the valve disc must move down as far as it will go:

1. The spring must relax.
2. Its resistance decreases.

3. The downstream pressure under the valve disc must decrease.

- To reduce the Δp associated with this mechanical law, the gradient of the springs must be reduced. This would lead to a reduction in the adjustment range of each spring and thus multiply the number of springs by 2 or 3, or result in a significant elongation of the springs.

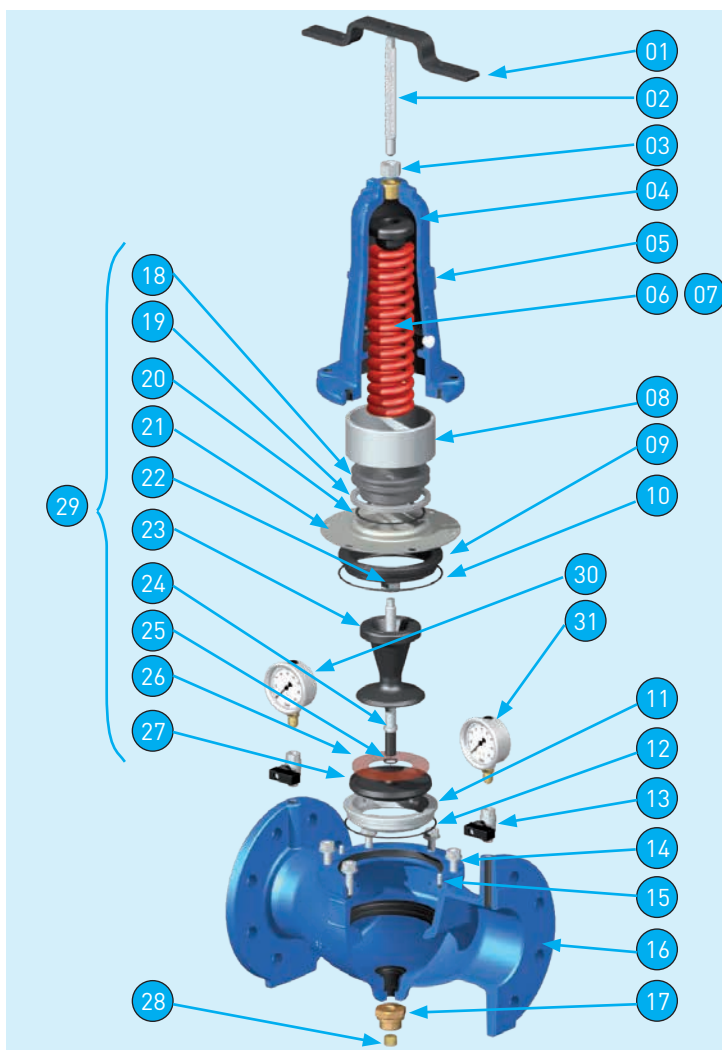
- A spring-actuated pressure reducing valve is a device designed to manage excess pressure and generate a head loss; in fact it is its sole function!

- To provide more precise management of networks with highly variable specifications, spring-actuated devices are not transparent. We have designed the Hydrobloc system which is particularly suited to this type of difficult-to-manage network. Your Bayard representative is at your disposal to discuss the system with you.

B) The Monostab's diaphragm eliminates upstream pressure fluctuations and ensures perfect guidance, unaffected by scaling that could lead to blockage.

- Should the diaphragm leak, the water would flow through openings in the bonnet. This leakage would then alert the operator but have no effect on the unit's operation.

Monostab Pressure Reducing Valve PN 16 and PN 25 bar - General



1 - 4. Conditions of use PN 16 or PN 25 bar:

• Downstream control pressures:

1. Spring A, blue = 1.5 to 6 bar.

2. Spring B, red = 5 to 12 bar.

For other adjustment ranges, contact your Bayard representative.

• Minimum supply pressure 2 bar, to obtain a downstream pressure setting of 1.5 bar.

• Accuracy of adjustment = 0.5 to 1 bar according to the downstream pressure setting.

• Operating temperature: + 1°C to + 65°C.

• Drinking water or screened raw water (2 mm).

• Range:

- DN 40 to 150, PN 16, ISO PN 10 and 16

- DN 200, PN 16, ISO PN 10

- DN 200, PN 16, ISO PN 16

- DN 50 to 150, PN 25, ISO PN 25

• PN 40 bar (see next page).

• Dimensions and weights, see page 6.

Item	Part name	No.	Materials	Standards
01	Calibrating key	1	Steel/S235JR	EN 10025
02	Calibrating screw	-	Stainless steel/X20Cr13	EN 10088
03	Nut	1	A2 stainless steel	EN ISO 3506
04	Base plate	-	Ductile iron GL/EN-GJL-250	EN 1561
05	Bonnet subassembly	1	Ductile iron GS/EN-GJS-450-10	EN 1563
06	Calibrating spring 1.5 to 6 bar (blue)	1	Coated steel	DIN 17223
07	Calibrating spring 5 to 12 bar (red)	1	Coated steel	DIN 17223
08	Upper cylinder	1	Stainless steel/X2CrNi 18-9	EN 10088
09	Lower cylinder	1	Ductile iron GL/EN-GJL-250	EN 1561
10	Lower cylinder O-ring	1	EPDM	-
11	Seat + gasket	1	Stainless steel/X5CrNiMo 17-12-2	EN 10088
12	Seat gasket	1	EPDM	-
13	Pressure gauge isolating valve	2	Nickel-plated brass	-
14	Bonnet retaining nut [4 to 8 acc. to DN]	1 set	A2 stainless steel	EN ISO 3506
15	Alignment pin	2	A2 stainless steel	EN ISO 3506
16	Body	1	Ductile iron GS/EN-GJS-450-10	EN 1583
17	Stem guide	1	Bronze/CuSn12-C	EN ISO 1982
18	Upper diaphragm holder	1	Ductile iron GL/EN-GJL-250	EN 1561
19	Segment	1	HDPE	-
20	Upper diaphragm holder O-ring	2	EPDM	-
21	Diaphragm	1	Textile reinforced elastomer/CR	-
22	Locking nut	1	A2 stainless steel	EN ISO 3506
23	Valve disc holder	1	Ductile iron GL/EN-GJL-250	EN 1561
24	Stem coated with scale inhibitor	1	Stainless steel/X8CrNiS 18-9	EN 10088
25	Centre stem O-ring	1	EPDM	-
26	Resilient valve disc	1	PUR	-
27	Valve disc plate	1	Ductile iron GL/EN-GJL-250	EN 1561
28	Plug	1	Brass/CuZn39Pb3	EN 1982
29	Mobile subassembly, items 18 to 27	1	-	-
30	Upstream pressure gauge (option)	1	Stainless steel/X5CrNi 18-10	EN 10088
31	Downstream pressure gauge (option)	1	Stainless steel/X5CrNi 18-10	EN 10088
32	Maintenance kit, items 09-10-12-19-20-21-22-25-26	1	-	-

Monostab Pressure Reducing Valve PN 40 bar - General

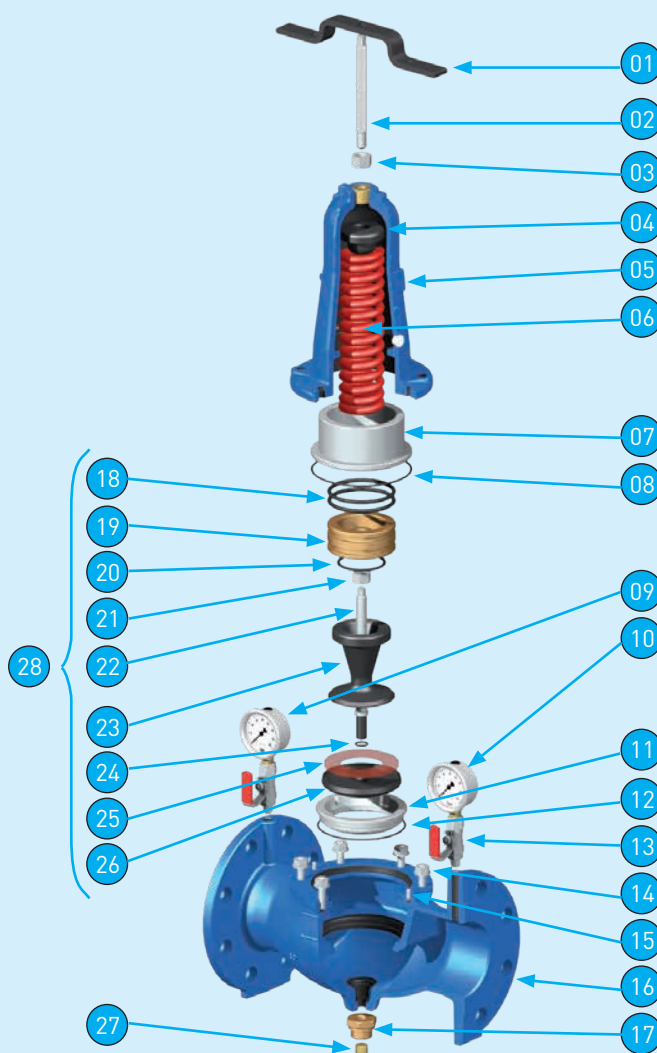
1 - 5. Conditions of use PN 40 bar:

- Downstream control pressures:

Spring B, red = 5 to 12 bar.

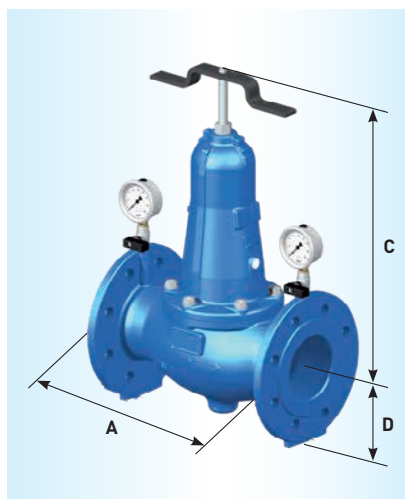
For other adjustment ranges, contact your Bayard representative.

- Minimum supply pressure 7 bar, to obtain a downstream pressure setting of 5 bar.
- Accuracy of adjustment = 0.5 to 1 bar according to the downstream pressure setting.
- Operating temperature: + 1°C to + 65°C.
- Drinking water or screened raw water (2 mm).
- Range:
 - DN 50 to 150, PN 40, ISO PN 40.
- Dimensions and weights, see page 6.



Item	Part name	No.	Materials	Standards
01	Calibrating key	1	Steel/S235JR	EN 10025
02	Calibrating screw	1	Stainless steel/X20Cr13	EN 10088
03	Nut	1	A2 stainless steel	EN ISO 3506
04	Base plate	1	Ductile iron GL/EN-GJL-250	EN 1561
05	Bonnet subassembly + threaded ring	1	Ductile iron GS/EN-GJS-450-10	EN 1563
06	Calibrating spring 5 to 12 bar	1	Coated steel	DIN 17223
07	Cylinder	1	Stainless steel/X2CrNi 18-9	EN 10088
08	Cylinder O-ring	1	EPDM	EN 10088
09	Pressure gauge 0-40 bar (option)	1	Stainless steel/X5CrNi 18-10	EN 10088
10	Pressure gauge 0-16 bar (option)	1	Stainless steel/X5CrNi 18-10	EN 10088
11	Seat + gasket (item 12)	1	Stainless steel/X5CrNiMo 17-12-2	EN 10088
12	Seat gasket	1	EPDM	-
13	Pressure gauge isolating valve	2	Nickel-plated brass	-
14	Bonnet retaining nut (4 to 8 acc. to DN)	1 set	A2 stainless steel	EN ISO 3506
15	Alignment pin	2	A2 stainless steel	EN ISO 3506
16	Body	1	Ductile iron GS/EN-GJS-450-10	EN 1563
17	Stem guide	1	Bronze/CuSn12-C	EN 1982
18	O-ring under piston	1	EPDM	-
19	Piston	1	Bronze/CuSn12-C	EN 1982
20	Piston O-ring	1	EPDM	-
21	Locking nut	1	A2 stainless steel	EN ISO 3506
22	Stem coated with scale inhibitor	1	Stainless steel/X8CrNi 18-9	EN 10088
23	Valve disc holder	1	Ductile iron GL/EN-GJL-250	EN 1561
24	Centre stem O-ring	1	EPDM	-
25	Resilient valve disc	1	PUR	-
26	Valve disc plate	1	Ductile iron GL/EN-GJL-250	EN 1561
27	Plug	1	Brass/CuZn39Pb3	EN 1982
28	Mobile subassembly, items 18 to 26	1	-	-
29	Maintenance kit, items 08-12-18-20-21-24-25	1	-	-

Monostab Pressure Reducing Valve - Establishing a project



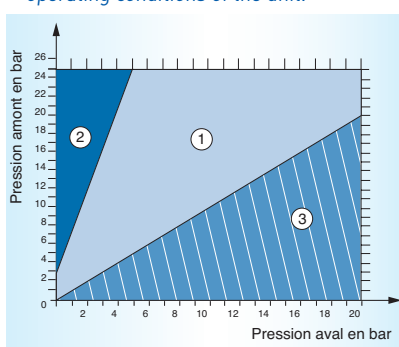
1 - 6. Dimensions and weights:

DN	PN	Drilling or ISO PN	A mm	C mm	D mm	C+D mm	Weight kg
40/50	16	40/50 drilling	230	430	86	516	18
50	16 and 25	ISO PN 10/16 and 25	230	430	86	516	18
50	40	ISO PN 40	230	430	86	516	25
60/65	16	ISO PN 16	290	420	100	520	22
65	16 and 25	ISO PN 16 and 25	290	420	100	520	22
65	40	ISO PN 40	290	420	100	520	27
80	16	4 and 8 holes	310	450	112	562	25
80	16 and 25	ISO PN 16 and 25	310	450	112	562	25
80	40	ISO PN 40	310	450	112	562	34
100	16	ISO PN 16	350	450	112	562	31.3
100	25	ISO PN 25	350	450	121	671	33
100	40	ISO PN 40	350	450	112	562	38
125	16	ISO PN 16	400	550	145	695	60
125	25	ISO PN 25	400	550	145	695	65
125	40	ISO PN 40	400	550	145	695	68
150	16	ISO PN 16	480	550	145	695	66
150	25	ISO PN 25	480	550	153	703	68
150	40	ISO PN 40	480	550	145	695	76
200	16	ISO PN 10 or 16	600	940	185	1,125	120

Hydraulic engineer's notes:

- The diameter of a pressure reducing valve depends on the maximum flow rate, the specifications of the network and the operating conditions, irrespective of the diameter of the pipe.
- If the hydraulic grade line of the upstream supply network varies and approaches the required downstream setting, it may be prudent to carry out a comparative study with a device from the Hydrobloc family.
- The calculations should include the residual pressure needed at the delivery point, while taking any positive or negative difference in level into account.

Cavitation diagram used to check the operating conditions of the unit.



Area 1 = normal working conditions.

Area 2 = cavitation, reduce the pressure in stages with two units in series, or consult your Bayard representative.

Area 3 = not possible.

Bayard Customer Technical Support has engineers and technicians who have vast experience of networks. Discuss your project with your Bayard representative.

2 - Establishing a project

2 - 1. General, practical advice:

- This device is ideal for disrupting a substantial, stable head pressure.
- Its simple, robust design simplifies maintenance.

2 - 2. Choosing the diameter:

A prudent choice is based on the following:

- The maximum flow rate at peak times = **Q max.**
- The difference between the upstream and downstream pressure **at this max. flow rate = Available Δp.**
- The exceptional flow rate =
 - Seasonal variations.
 - Fire protection requirements of 30, 60, or 120 m³/h, i.e. 8.4, 16.7 or 33.4 l/s.
 - Other.

The table below shows a **DN** based on **Q max. (l/s)** and the **available Δp.**

DN	50	65	80	100	125	150	200	Average velocity in the section
Available Δp. = 1 bar	2.9	5.0	7.8	11.8	18.4	26.5	47.2	1.5 m/s
Available Δp. from 1 to 3 bar	4.0	6.6	10.1	15.7	24.5	35.3	62.8	2 m/s
Available Δp. > 3 bar	5.9	10.0	15.0	23.6	36.8	53	94.1	3 m/s
Exceptional flow rate	7.9	13.3	20.0	31.4	49.1	70.7	125.7	4 m/s*

* Accuracy of adjustment is not guaranteed at this velocity

Bayard can provide you with sizing software:



Monostab Pressure Reducing Valve - Establishing a project

2 - 3. Examples of dimensions (mm) of manholes for installing a Monostab:

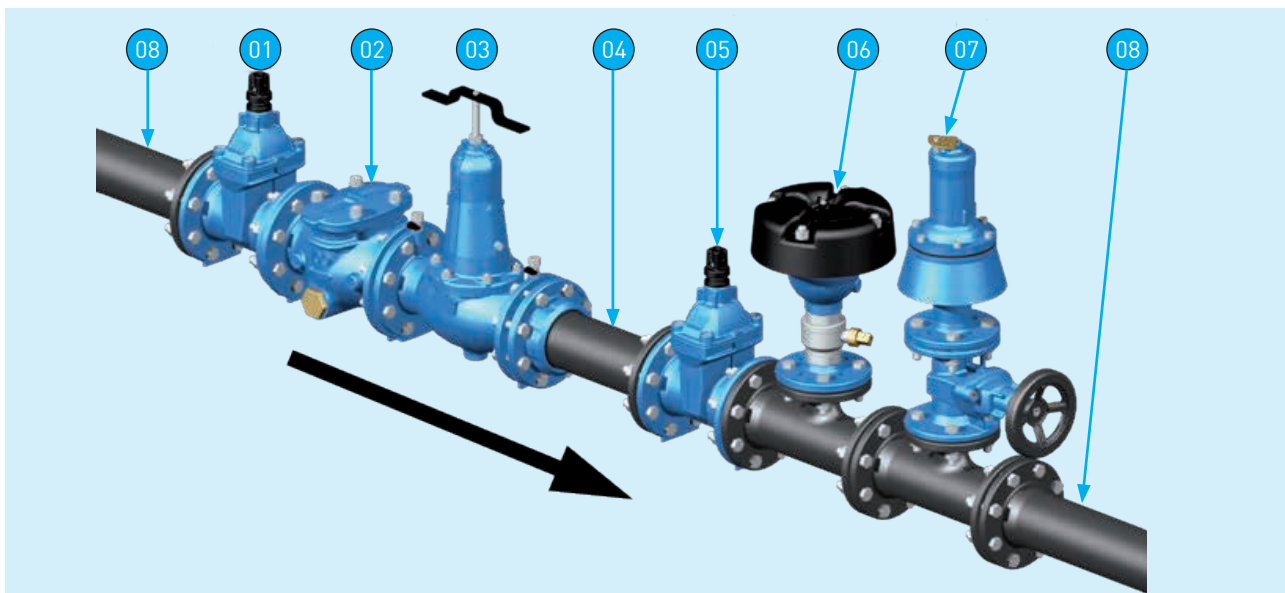
DN	Upstream valve 01	Filter - Str. box 02	Monostab regulator 03	Dismantling joint 04	Downstream valve 05	Tee for air valve 06	Length L	Connecting flange clearance 08	Minimum length of manhole	Additional lengths if required	Minimum width for maintenance
40	240	230	230	200	240	280	1,420	2x250	1,920		1,300
50	250	230	230	200	250	320	1,480	2x250	1,980		1,300
60/65	270	230	290	200	270	320	1,580	2x250	2,080	Meter	1,300
80	280	300	310	210	280	330	1,710	2x300	2,310	Flanges or converging tubes	1,300
100	300	300	350	220	300	360	1,830	2x300	2,430	Tee for Djet relief valve	1,500
125	325	400	400	220	325	400	2,070	2x350	2,770		1,500
150	350	400	480	230	350	440	2,250	2x350	2,950		1,500
200	400	500	600	230	400	520	2,650	2x400	3,450		1,800

The accessories are Bayard PN 25 references. Check the dimensions if other references are used.

The lengths "L" correspond to PN 25, ISO PN 25 equipment. Lengths can vary according to the PN and flange drilling. The upstream and downstream "connecting flange clearance" will absorb this variation. PN 40 bar, consult your Bayard representative.

The manhole must allow for 1.50 m above and 0.30 m below the piping. If, for technical reasons, it is not possible to comply with these dimensions, ensure there is 1.00 m above and at least 0.80 m below for the safety of personnel during inspection and maintenance operations.

The manhole must include suitable drainage or ventilation. In order for the air valve to operate correctly it must not be sealed.



2 - 4. Installation instructions:

Project:

- Ensure that the room is large enough to be able to work safely on the device. Unobstructed clearance of 1.00 m around, 1.50 m above and 0.30 m below the pipe is considered reasonable. Also remember that the room must have suitable drainage and if necessary, ventilation.
- Provide a restraining system if necessary, or a self-restrained assembly.
- Ensure that the pressure reducing valve is equipped with an upstream (01) and a downstream (05) valve. These elements are essential for safe commissioning, easy adjustment and controlled filling of the downstream network. Adjusting the downstream pressure on an empty network is dangerous and may cause water hammer.
- Install a strainer box (02) to stop foreign bodies before they enter the equipment. A "Y" filter may seem less costly, but it is only PN 16 and will be less easy to clean and require a large amount of space below the pipe in order to remove the filter strainer.
- A dismantling joint (04) will allow the assembly to be self-restrained and dismantled.
- On a downward pipe, install an air valve or Vannair (06) immediately downstream of any pressure reducing device.
- On a pipe that is horizontal or rising towards the device (less common), install an air valve or Vannair immediately upstream of the pressure reducing valve. In both cases, this will improve hydraulic performance, and prevent unwanted noise and pressure fluctuations due to air trapped upstream or downstream of the valve.
- The unit can be mounted in any position. Remember to provide air ventilation according to the position of the unit and direction of fluid flow.
- A relief valve (07) will protect the downstream network should the pressure reducing valve fail due to a lack of inspection or minimum maintenance. Its gradual leakage will alert the network supervisor of a problem before any possible financial consequences occur as a result of breakage due to overpressure.

Monostab Pressure Reducing Valve - Project implementation

Exchange - replacement:

- The distance between flanges on Monostab units has complied with the European standard since **1995**. When replacing units manufactured prior to 1995, compensating spacers must be inserted or the piping must be cut as indicated in the table below.

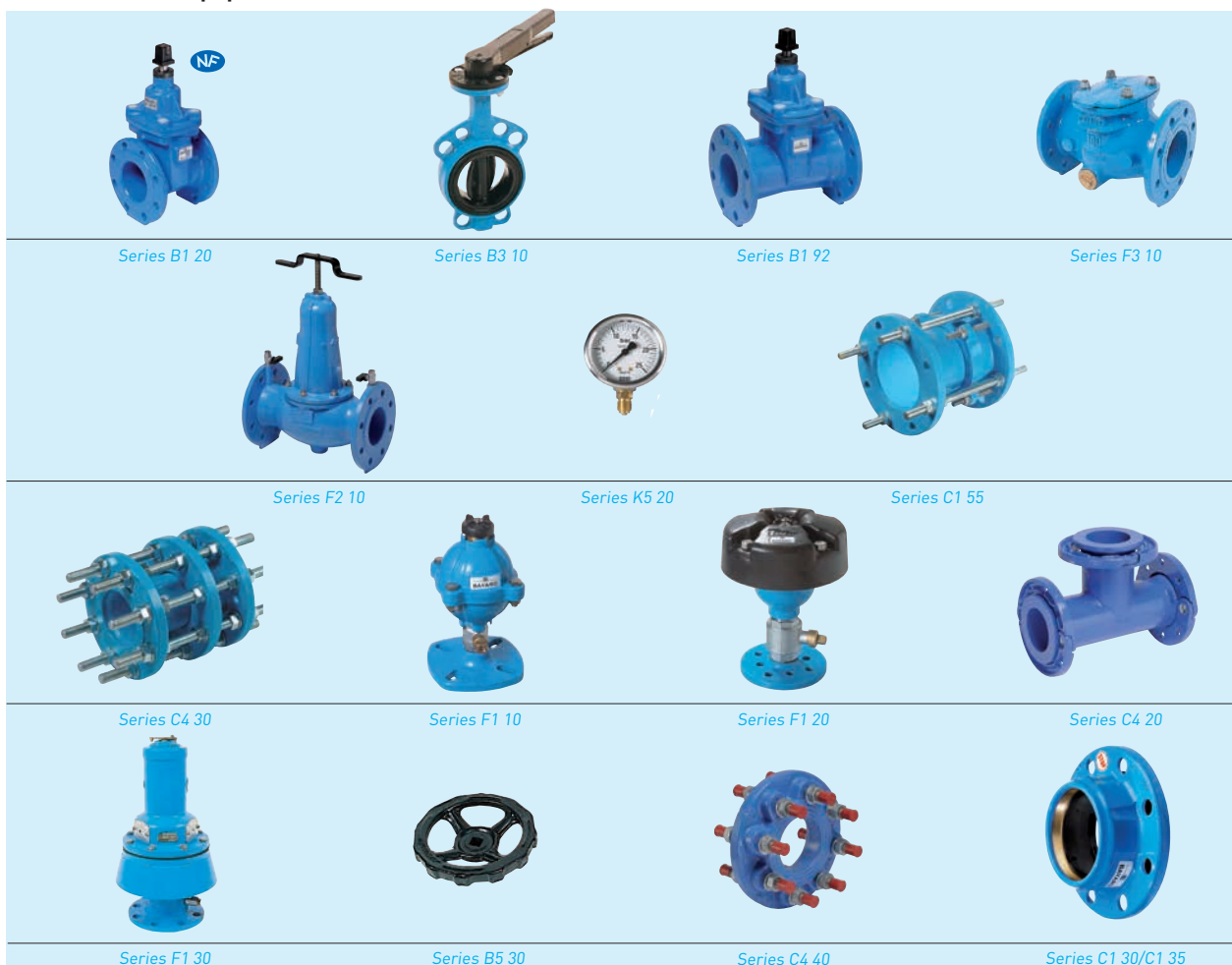


ISO PN 10/16 flanges from DN 40 to DN 150 and ISO PN 10 for DN 200

DN of new device	DN of device	Former listed dimension	Standard dimension	Spacer dimension	Spacer code
40/50	40	300 mm	230 mm	70 mm	319305
40/50	50	300 mm	230 mm	70 mm	319315
50	50	230 mm	230 mm	-	-
65	60	325 mm	290 mm	35 mm	319320
65	65	325 mm	290 mm	35 mm	319330
80	80	325 mm	310 mm	15 mm	319340
100	100	385 mm	350 mm	35 mm	319350
125	125	385 mm	400 mm	cut	-
150	150	450 mm	480 mm	cut	-
200	200	600 mm	600 mm	-	-

3 - Project implementation

3 - 1. Additional equipment



Safety and environment:

All installation, maintenance and repair operations must comply with current local regulations concerning occupational safety and the environment. Ensure that those carrying out such operations wear appropriate personal protective equipment. Ensure that all lifting equipment and electrical tools used comply with current regulations, and that they are used correctly. All installation, maintenance and repair work must be carried out by qualified, trained and authorised personnel, in accordance with current legislation.

From an environmental perspective, the device is recyclable. Recommend that the cardboard box or wooden crate is placed in a recycling container. The packing foam is a neutral waste product, and can be taken to a waste treatment centre for incineration.

Monostab Pressure Reducing Valve - Project implementation

3 - 2. Alternative equipment:

A pressure reducing valve from the HYDROBLOC family is a good replacement for the MONOSTAB spring-actuated pressure reducing valve. Following a detailed study, this type of control valve can be specified with one or two smaller diameters, and it can be upgraded in line with any changes in the network's specifications. Contact Bayard for more information.

Your Bayard representative is at your disposal for any information regarding equipment used in conjunction with the Monostab.

3 - 3. Installation - Operation:

Even the most well-thought out design can only be satisfactory if a minimum of good engineering practice is applied to its installation and operation. The following is an extract from the recommendations included in our **After-Sales Service Manual** for the Monostab unit. Some of these recommendations may be included in specifications:

Storage, handling:

- Store for a maximum of one year at a temperature not exceeding 65°C, and protected from humidity and impacts.
- Handle with care, using appropriate lifting equipment attached to the lifting eyes or the flanges.

Package contents:

- A pressure reducing valve (PN 16, PN 25, or PN 40).
- A calibrating key with calibrating screw and locknut.
- After-Sales Service Manual.
- Two pressure gauges, as required (optional).

Installation instructions:

- Comply with the dimensions of the manhole or provide minimum dimensions for the safety of all personnel.
- Follow the installation drawing defined in the specifications, or failing that, the installation drawing recommended by the manufacturer.
- Clean the piping before installing the Monostab. If this operation is not carried out, the pressure reducing valve may malfunction.

Installing the Monostab:

- Lift the unit by the lifting eyes or the flanges.
- Comply with the direction of installation indicated by the arrow on the body of the unit.
- Provide a support beneath the installation and a restraining system, if necessary.



Maintenance:

The frequency of maintenance depends directly on the quality of the water (raw or drinking, presence of lime scale), frequency of use (main or backup device) and operating range (continuous low flow rates).

Preventive maintenance requires an annual inspection to be carried out. If more frequent servicing is necessary, contact BAYARD Customer Technical Support to examine provisions for the parts subject to stress.

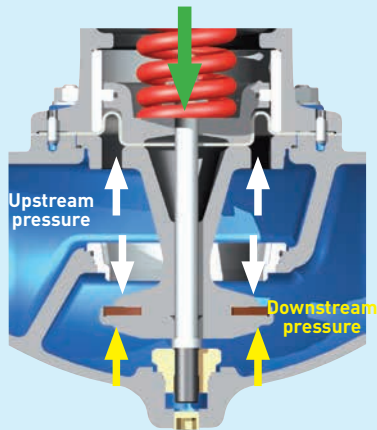
Our experience indicates that a minimum level of preventive maintenance can pre-empt the causes of malfunctions.

Why choose a BAYARD Monostab pressure reducing valve?

Fig. I



Fig. II



1. Simple construction (Fig. I):

- 1 moving part (mobile unit).
- 1 wear part (valve disc), the diaphragm does not wear (no friction).
- Seize-resistant calibration system (stainless steel - brass).

2. Robust construction:

- Ductile iron.
- Stainless steel.
- Bronze.
- Steel (springs).
- Elastomer (seals and valve disc).

3. Proven construction:

- This product has been subject to continuous improvement since 1982.

4. Hydraulic performance:

- Outstanding Kv values.
- Average velocities in the intake section between 1.5 and 4 m/s, making it possible to reduce the unit's diameter relative to the diameter of the pipe.
- If the network can accommodate it, a DN 80 can exceptionally provide 60 m³/h for fire fighting purposes.

5. Safe operation (Fig. II):

- No risk of blockage: upper guide not in the water and lower guide coated with a scale inhibitor.
- No risk of malfunction: as the pressure reducing valve is protected by a strainer box it cannot become blocked and allow the pressure to move downstream.
- If there is a diaphragm leak, the water flows out through the holes in the bonnet, and the unit continues to perform its function. The leakage alerts the operator that maintenance is required.

6. Simplified maintenance (Fig. III):

- The unit can be fully dismantled from above, without having to disconnect the pipe and with no need for any special tools.
- Designed for a minimum number of spare parts. Each reference is common to PN 16 and 25 bar and to 2 or 3 DN.

7. Bayard Customer Technical Support:

Engineers and technicians are available to assist you with any problems you may encounter.

- Commissioning.
- After-Sales Service.
- Management of property.
- Training of operating personnel.
- Projects.
- Pre-Sales Service.

Fig. III



For flow control applications, Bayard also has the Hydrobloc system

Pilot-controlled hydraulic control valves **High-performance and scalable, with a 3-year warranty**

PN 10, 16, 25 and 40 bar depending on application

DN 50 to 1000 depending on application

Ductile iron, cataphoresis/powder epoxy, copper alloy, stainless steel

Raw water and drinking water



Pressure control
Upstream-Downstream Hydrostab



Flow control
Hydro flow limiting valve



Level control
Altitude Hydro

Needle valves **High-performance and accurate**

PN 10 to 160 bar

DN 100 to 2000

Ductile iron, stainless steel, EPDM, bronze

Raw water, drinking water, salt water



Control valves **Accurate and strong**

PN 16 to 25 bar

DN 50 to 150

Ductile iron, stainless steel, EPDM, bronze

Raw water, drinking water, salt water



Your choice in waterflow control



TALIS is always the number one choice whenever water transport or management is required. Our company offers the most appropriate solution for water and energy management, and applications serving industrial and municipal customers. With a complete range of more than 20,000 products, we offer comprehensive solutions for the entire water cycle: pumping, distribution, and connections, ... Our experience, innovative technology, global and specific expertise form the basis for developing sustainable solutions for the efficient handling of the vital resource... water.



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The technical data and performance can be modified without prior notice depending on the technical evolution.

