BAYARD

Pressure Reducing Valve
Series ‘Monostab’

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.

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).

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.

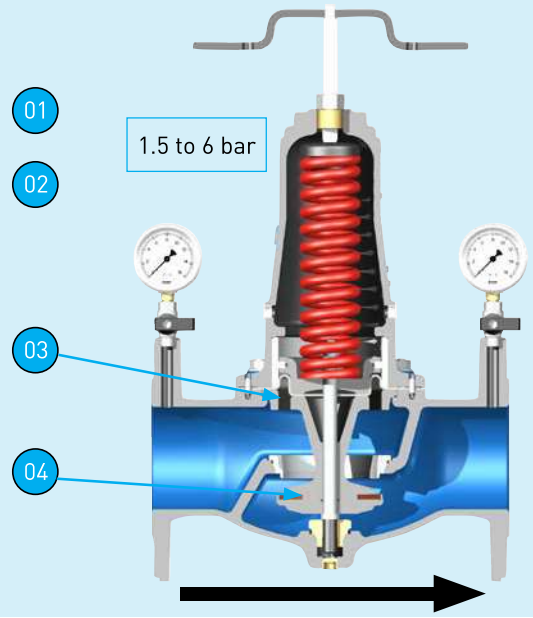
1 - 2. Specifications:
- Modern design.
- Simple construction.
- Robust construction.
- Safe operation.
- Unaffected by variations in upstream pressure and downstream flow requirements.
- Friction-free operation and no risk of blockage.
- Manufactured since 1982.
- Body and bonnet made of ductile iron.
- 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.
- 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
Kv	25	31	72	101

Hydraulic engineer's note:
- The **Kv** is the flow rate in the fully open device in m^3/h with a head loss of 1 bar.

Monostab Pressure Reducing Valve - Operation

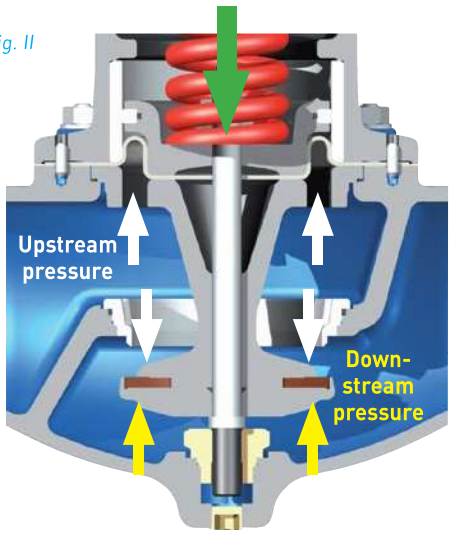
Fig. I



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).
- 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 another 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.

Fig. II



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:*

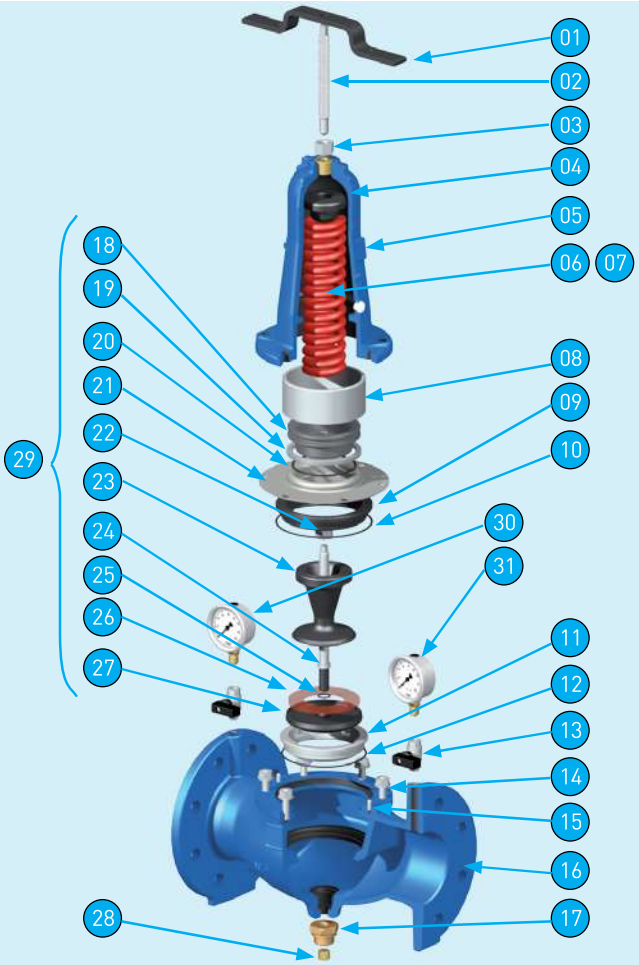
1. *The spring must relax.*
2. *Its resistance decreases.*
3. *The downstream pressure under the valve disc must decrease.*

- *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 - Materials



1 - 4. Conditions:

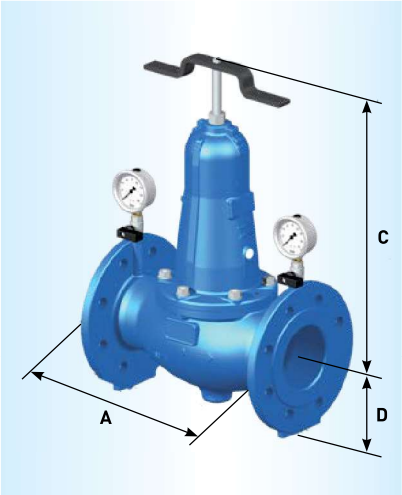
- Downstream control pressures:

Spring - blue = 150 to 600kPa.

- Minimum supply pressure 200kPa, to obtain a downstream pressure setting of 150kPa.
- Accuracy of adjustment = 50 - 100kPa according to the downstream pressure setting.
- Operating temperature: + 1°C to + 65°C.
- Drinking water or screened raw water (2 mm).

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	-	Cast iron GL/EN-GJL-250	EN 1561
05	Bonnet subassembly	1	Cast 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	Cast iron GL/EN-GJL-250	EN 1561
10	Lower cylinder O-ring	1	EPDM	_
11	Seat + gasket	1	Stainless steel/X2CrNi 18-9	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	Cast iron GS/EN-GJS-450-10	EN 1583
17	Stem guide	1	Aluminium bronze/CuAl9Ni3Fe2	EN ISO 1982
18	Upper diaphragm holder	1	Cast 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	Cast 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	Cast iron GL/EN-GJL-250	EN 1561
28	Plug	1	Aluminium bronze/CuAl9Ni3Fe2	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	-	_

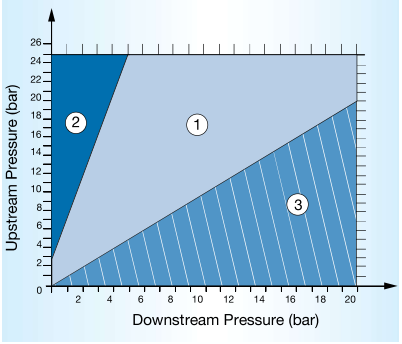
Monostab Pressure Reducing Valve - Installation



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.*
- *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,*
***Area 3 = not possible**.*

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 Customer 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.

1 - 6. Dimensions and weights:

DN	PN	Drilling	A mm	C mm	D mm	C+D mm	Weight kg
50	16	Table D	230	430	86	516	18
65	16	Table D	290	420	100	520	22
80	16	Table D	310	450	112	562	25
100	16	Table D	350	450	112	562	31.3

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.**
- Other exceptional flow rate; fire protection requirements etc

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

DN	50	65	80	100		Average velocity in the section
Available Δp. = 100kPa	174	300	468	708		1.5 m/s
Available Δp. = 100-300kPa	240	396	606	942		2 m/s
Available Δp. > 300kPa	354	600	900	1,416		3 m/s
Exceptional flow rate	474	798	1,200	1,884		4 m/s*

* Accuracy of adjustment is not guaranteed at this velocity

3 - 1 Installation instructions -

- Clean the piping before installing the Monostab. If this operation is not carried out, the pressure reducing valve may malfunction.
- 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.
- Ensure that the area around the valve 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.
- It is recommended that the pressure reducing valve is equipped with an upstream and a downstream isolating valve. These valves 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 to stop foreign bodies before they enter the equipment.
- A dismantling joint will allow the assembly to be self-restrained and dismantled.
- On a downward pipe, install an air release valve immediately downstream of any pressure reducing device.
- On a pipe that is horizontal or rising towards the device (less common), install an air release valve mmediately 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 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.

Why choose the Monostab pressure reducing valve?

1. Simple construction:
- 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 (flow rates)
- 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.

5. Safe operation:
- 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:
- 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.

7. Customer Support:

Technicians are available to assist you with any problems you may encounter.
- Commissioning, After-Sales Service, Training, Projects, Pre-Sales Service.

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