

BV - BR

Flow rate indicators and controllers



INSTRUCTIONS MANUAL

BAMO MESURES

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and controllers

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CAUTION

Process connection

To avoid the damage of the flow monitor or the installation the following requirements must be fulfilled under any circumstances:

- suitable process connection has to be provided
- connection size to be checked
- thread depth to be checked
- suitable sealing material to be used (liquid sealing material will damage the flow monitor if it gets inside)
- professional sealing

Ambient conditions

- The flow monitor must not be used as a supporting part in a pipe construction.
- The medium must not contain any solid particles. Magnetic particles will accumulate at the magnetic diver and affect the function.
- Before employment of anti-freeze and anti-corrosive check compatibility.

Warning, mounting the unit

The following requirements must be adhered to, otherwise the function of the flow monitor will be affected or the measuring results will be falsified:

- External magnetic fields will influence the switch contact. Keep sufficient distance to magnetic fields (ex. Electric motors).
- Piping, process connections or supports made from ferromagnetic material influence the magnetic field of the flow monitor. Keep a space of 100mm to those materials (ex. steel).
- The accuracy is influenced by cross-section changes, branches or elbows in the piping. Provide a straightening section of 10x DN upstream and 5x DN downstream of the instrument. Never reduce the pipe diameter direct ahead of the instrument!
- With liquids ensure through suitable steps the de-aeration of the instrument.

The instrument must be installed vertical and, flow direction from bottom to top.

PRINCIPLE

The flow rate indicator and/or controller operates on the variable area principle. The cartesian diver (float) has built-in magnets. The reed switch is mounted in an adjustable switch, outside of the flow pipe. The flowing fluid raises the diver in the direction of flow; as soon as the magnetic diver reaches the set-point of the switch, it closes the contact.

As the flow still increases, the diver raises further, i.e. the contact remains closed.

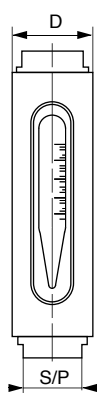
TECHNICAL FEATURES

Pressure limits:	BV-R: 10 bar Brass: B-R 100 bar Stainless steel B-R: 300 bar
Pressure drops:	BV-R: 0.01 – 0.2 bar B-R: 0.02 – 0.4 bar
Temperature limit:	100 °C (factory option: 160 °C)
Diver (float):	Nickel plated brass or stainless steel 316 Ti
Fittings:	Nickel plated brass or stainless steel 316 Ti
Glass window:	Duran 50 (indicators only)
Scale:	in L/min, water at 20°C (otherwise specified) Air: at 1 bar absolute only (see the data sheet)
Seals	Brass: NBR
Stainless steel:	FPM
Guiding tube:	Aluminium alloy
Accuracy:	± 5 % F.S. (for readings, it is recommended to work on flow rates in the last half scale range)
Switch:	N.O. contact
Cable connection:	DIN plug, DIN43650 / Pg 9

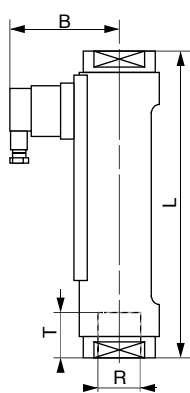
Options (on request)

Seals:	FPM or EPDM
Contacts:	Change over contact / ATEX Ex versions

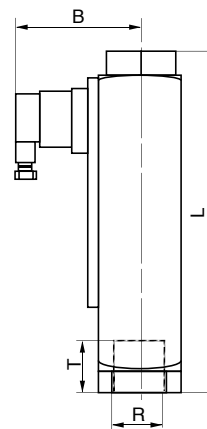
Type	Range L/mn	R	Codes		Dimensions mm					Mass g
			Brass	S.S. 316 Ti	D	L	B	T	S/P	
BV - 1 R	0,1 - 1,5	¼"	720 200	720 400	43	132	67	14	32	625
BV - 3 R	0,2 - 3	¼"	720 210	720 410	43	132	67	14	32	625
BV - 8 R	0,3 - 8	¼"	720 220	720 420	43	132	67	14	32	625
BV - 12 R	1 - 12	¼"	720 230	720 430	43	132	67	14	32	625
BV - 18 R	2 - 18	½"	720 240	720 440	43	163	67	15	32	650
BV - 35 R	3 - 35	¾"	720 245	720 445	50	152	70	18	41	1 000
BV - 50 R	4 - 50	1"	720 250	720 450	50	152	70	18	41	1 000
BR - 1 R	0,1 - 1,5	¼"	720 300	720 500	30	130	65	14	27	800
BR - 3 R	0,2 - 3	¼"	720 310	720 510	30	130	65	14	27	800
BR - 8 R	0,3 - 8	¼"	720 320	720 520	30	130	65	14	27	800
BR - 12 R	1 - 12	¼"	720 330	720 530	30	130	65	14	27	800
BR - 18 R	2 - 18	½"	720 340	720 540	30	148	65	15	27	850
BR - 35 R	3 - 35	¾"	720 345	720 545	40	152	70	18	34	1 350
BR - 50 R	4 - 50	1"	720 350	720 550	40	152	70	18	34	1 350



BV - R



B - R



SWITCH POINT ADJUSTMENT

- Loosen the lock screw of the switch contact and shift the switch contact against flow direction to the stop.
The switch contact should be closed.
- Adjust the desired flow rate. In case the flow monitor is not installed, use a non magnetic rod (ex. pencil) to shift the float in flow direction to achieve a congruence with the graduation of the desired flow rate on the scale (upper edge of float = reference point).
- Shift the switch contact in flow direction until the contact opens.
- Tighten the lock screw of the switch contact.

Hints:

- The adjusted switch point corresponds to the switch off point of the switch contact with decreasing flow.
- The actual switch position can be checked by means of a universal tester.
- The above description of the adjustment refers to the normally open contact.

MAINTENANCE

Due to the few moving parts the instruments do not require much service.

A functional check and service on a regular base will not only increase the lifetime and reliability of the instrument, but of the entire plant.

The service intervals depend on

- the pollution of the media
- environmental conditions (ex. vibrations)

During maintenance at least the following points should be checked:

- operation of the switch contact
- leakage test of the instrument
- free movement of the float

It is the obligation of the user to lay down appropriate service intervals depending on the application.

Hints:

- The free movement of the diver and the operation of the switch contact can be checked by varying the flow and observing the switch contact status.
- In most cases purification can be achieved by flushing the instrument with clean media. In obstinate cases (ex. calcareous deposits) cleaning can be done with commercial purifier, as long as the purifier is not aggressive against the material of the instrument.

FAULT FINDINGS

The switch contact does not react:

The switch contact is permanently in break position

1. No flow

check for medium flow

2. Flow to low or switch contact adjusted to high

Adjust switch point to a lower flow
Use instrument with different range

3. Incorrect reduced (pipe diameter to small)

reduce according to the pipe (straightening section of 10x DN upstream and 5x DN downstream)

4. Diver got stuck (polluted)

Clean the instrument and ensure free movement of the diver

5. Switch contact faulty

Eliminate the reason for the fault (short circuit, overload)
Exchange switch contact

The switch contact is permanent in made position

1. Flow to high and switch contact adjusted to low

Reduce flow
Adjust switch contact to a higher flow

2. Diver got stuck (polluted)

Clean the instrument and ensure free movement of the diver

3. Switch contact faulty

Eliminate the reason for the fault (short circuit, overload)
Exchange switch contact

Switch point does not match with actual flow

1. No medium specific scale

Adapt the switching by using a correction table

2. Incorrect reduced

reduce according to straightening section of 10x DN upstream and 5x DN downstream

3. Instrument polluted

clean the instrument. A filter may be mounted on the pipe line

4. Instrument defect

Return instrument for repair and calibration.