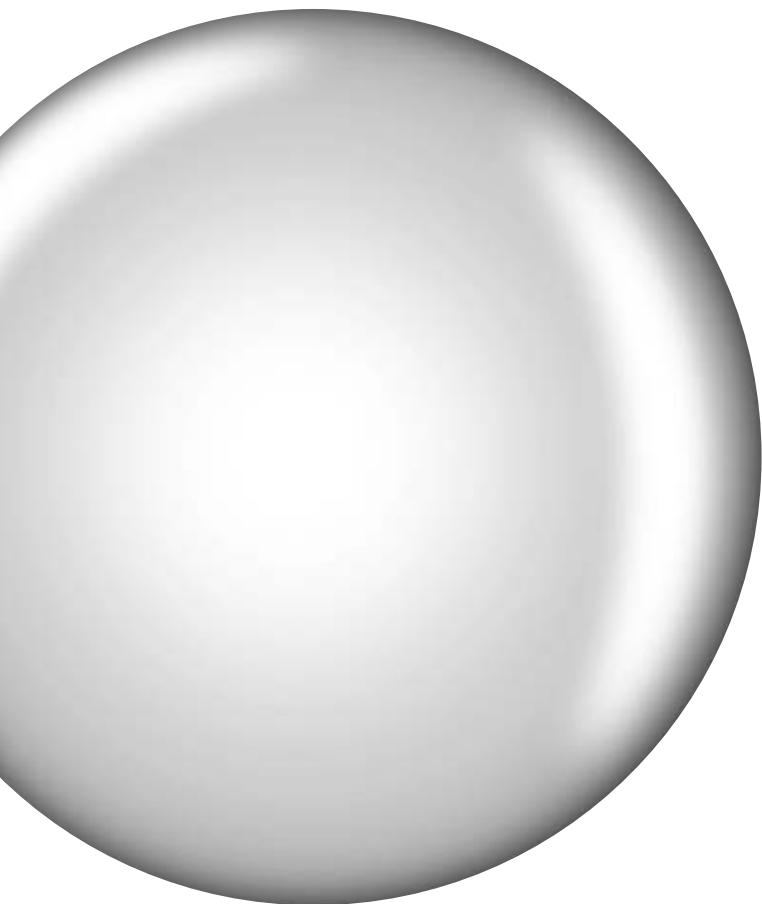


BALLOREX®

Flowmeter



BROEN

BALLOREX® Flowmeter for balancing valves

Application

The Flowmeter can measure the water flow and temperature through the BALLOREX® valve. The Flowmeter is used for commissioning of pipesystems – both on the primary and the secondary side.

Order no.

Flowmeter 5900300-200005

Function

The Flowmeter measures the speed of the flow through the BALLOREX® valve in litres pr. second, but can also be adjusted for read-out in m³ pr. Hour.

The measuring principle is that a turbine wheel in a flowing liquid, has a RPM proportional to the speed of the liquid. The rotations of the turbine wheel generate pulses which are electronically converted and directly readable from the Flowmeter display.

From the 17 keys on the display box, 14 are used for selection of the DN pre-adjustment. 1 key is used for direct temperature measuring and 1 key for separate measuring temperature difference.

The measuring of the temperature is carried out by means of a temperature sensor, build-in on top of the probe, and is read in °C on the display. Further more the external temperature sensor can be used for reading the difference temperature between the sensor on the probe and the external temperature sensor – in this case between flow and return.

Flowmeter construction

The Flowmeter consists of following parts.

- Display box made of ABS – plastic.
- Probe made of chromium plated brass with a build-in temperature sensor.
- External temperature sensor.

The Flowmeter is delivered in a case for carrying. Battery, cables and User's manual are included.



Technical data

Flow:

Measuring principle:	Turbine wheel.
Flow:	Litres/second. (m ³ /hour)
Measuring range:	0,01 – 490,56 l/s.
Resolution:	0,001 – 0,1 l/s.
Tolerance:	Max. +/- 5% (actual flow)

Temperature:

Measuring range:	-10°C - +99°C
Resolution:	0,1°C.
Tolerance:	+/- 1°C

Ambient temperature:	In operation: 0 – 40°C
Storage temperature:	-20°C - +60°C
Working pressure:	Max. 10 bar = 1 MPa
Casing (electronic box):	Protection IP 65.
Battery:	MN 1604 GLRGI 9,0 volt – durability:

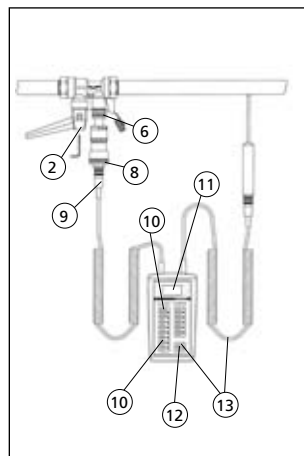
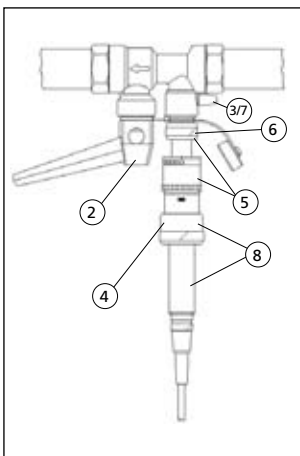
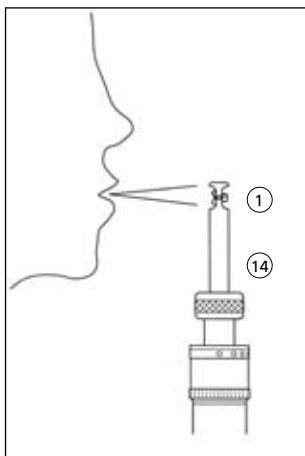
Outline of used descriptions

1. Display box.
2. Keypad.
3. "On/Off"
4. Display.
5. Plug to measuring probe.
6. Sliding measuring probe.
7. Large Union nut.
8. DN probe scale.
9. Knurled swivel nut for fitting measuring probe.
10. Turbine wheel.
11. Temperature sensor.
12. Plug for external temperature sensor.
13. External temperature sensor.



Flow and temperature measuring

1. Check that the turbine wheel runs freely by blowing on the wheel.
2. Open the BALLOREX® valve. Place the handle in the valve's longitudinal direction.
3. Close the metering/drain valve (the handle pointing across the valve).
4. Lock the moveable part of the probe into the probe body by tightening the large union nut.
5. Set the DN value on the probe.
6. Mount and fasten the probe to the metering/drain valve by tightening the small union nut by hand. (Please note, that the flowdirection on the probe must be equal to that on the valve.)
7. Open the metering/drain valve.
8. Loosen the probe from the probe body and insert the moveable part of the probe into the valve. When it meets the internal stop, lock the probe in this position with the union nut.
9. Connect the measuring box to the probe with the cable.
10. Activate "On/Off" key and enter the DN value of the valve. The activated key will have a flashing red light.
11. The result is read on the display as l/s or m³/h (factory setting l/s).
12. The temperature of the media is read from the display by pressing "TEMP °C".
13. Adapt the external temperature sensor to the measuring box if difference temperature is to be measured. When the external sensor is disconnected, the switch on the box should be covered with the plug enclosed. (Casing IP 65)
14. Having finalised the measuring the turbine wheel is cleaned by a light blow in order to dry it (e.g. no water on the turbine wheel).



Max. Read-out for Flowmeter and max. Kv values for BALLOREX® S valves.

DN (nom. diam.)	Max. Read-out.		Kvs m ³ /hour	Max. diff. Pressure bar
	litres/sec.	m ³ /hour		
10/15	0,75	2,70	1,80	2,25
20	1,05	3,78	4,70	0,65
25	1,99	7,19	7,30	0,96
32	3,97	14,29	11,30	1,60
40	5,30	19,08	18,40	1,08
50	11,18	40,25	24,80	2,63
65	16,47	59,29	50,00	1,40
80	25,40	91,44	87,00	1,10
100/125	39,30	141,48	150,00	0,89
150	82,00	295,20	335,00	0,78
200	199,90	719,60	1.568,0	0,21
250	199,90	719,60	1.600,0	0,20
300	199,90	719,60	3.165,0	0,05

Checking and fault finding

Simple checking of measuring probe and display box.

1. Make the turbine wheel rotate by blowing on it (do not use compressed air): observe that the wheel runs freely and does not stop suddenly.
2. The electronic system can be checked by pointing the tip of the probe towards a 50 Hz neon strip and read of various values for each valve dimension. These values should be as follows:

Valve dimension	Read-of value	Tolerance +/-
DN 10/15	0,07	20 %
DN 20	0,10	"
DN 25	0,24	"
DN 32	0,38	"
DN 40	0,60	"
DN 50	1,30	"
DN 65	1,6	"
DN 80	2,50	"
DN 100	3,85	20 %

Trouble shooting

No display	<p>Check that measuring box is "ON".</p> <p>Check battery contacts.</p> <p>Check battery voltage.</p>
Incorrect display	<p>Check that measuring probe is properly connected.</p> <p>Check if DN values on valve and probe match.</p> <p>"Lobat" in display indicates that battery voltage is too low and a new battery is needed.</p> <p>Check that turbine wheel runs freely and is free of foreign bodies.</p> <p>Carry out neon-strip test for correct DN display.</p>

If the problem cannot be found/solved, please send the Flowmeter to your nearest agent or to BROEN BALLOREX® department.