



**Maintenance-free
soft-seated
balancing and shut-off valves
with flow rate and
temperature sensor**

flanged

**PN 16
DN 15-200**

DN 250-350

Maintenance-free metal-seated
balancing and shut-off valve type BOA®-H see page 3

Applications

- Hot water heating systems up to 120 °C
- Cold-water air-conditioning systems
- Not suitable for fluids containing mineral oils, steam or fluids liable to attack EPDM and uncoated cast iron, for example in open cooling circuits.

Operating data

- Maximum permissible pressure 16 bar
- Maximum permissible temperature -10 to +120 °C

Fluids handled

- Hot water for heating systems, with or without glycol (max. 50%)
- Cold water for air-conditioning systems, with or without glycol (max. 50%)
- The fluid should meet the requirements laid down in the technical instruction leaflet TCh 1466 of the German Association for Technical Supervision (VdTÜV).

Materials

- Body: lamellar graphite cast iron EN-GJL 250
- For further details, see list of materials.

Design

- Sensor (IP 54 plug) for flow rate and temperature measurement as well as nominal diameter identification
- Straight-way globe valve with slanted seat and vertical bonnet
- Non-rotating stem with protected, external thread
- Non-rising handwheel, locking device, travel stop
- Compact throttling valve plug with EPDM coating as soft main and back seat
- Maintenance-free stem seal with EPDM profile
- Free from asbestos, CFC and PCB
- Face-to-face length EN 558/14
- Exterior coating: blue similar to RAL 5002

The valves satisfy the safety requirements of Annex I of the European Pressure Equipment Directive 97/23/EC (PED) for fluids in Group 2.

Standard variants

- Electrical actuators (DN 15 to 200)

Accessories

- Measurement tap access tube for insulated valves
 - Set A: 50 mm
 - Set B: 85 mm
 - Set C: 115 mm
- Lead-sealable cap (prevents unauthorised actuation) as assembly set

Additional information

- The installation instructions on page 5 must be observed!
- Precise flow measurement requires the use of a BOATRONIC® M-2, M-420 measuring computer as described in type series booklet 7134.1.
- Flow characteristics 7128.4 for presetting
- Operating instructions for BOATRONIC® M-2, M-420: 7134.8
- Operating instructions 0570.8

When using the valve for low-temperature fluids, please note section 5.1 of the operating instructions 0570.8 for details on insulation.

Purchase order data

Balancing and shut-off valve

1. BOA-Control® IMS according to type series booklet 7128.1
2. PN 16
3. DN 15-350
4. Standard variants



Test and operating pressures

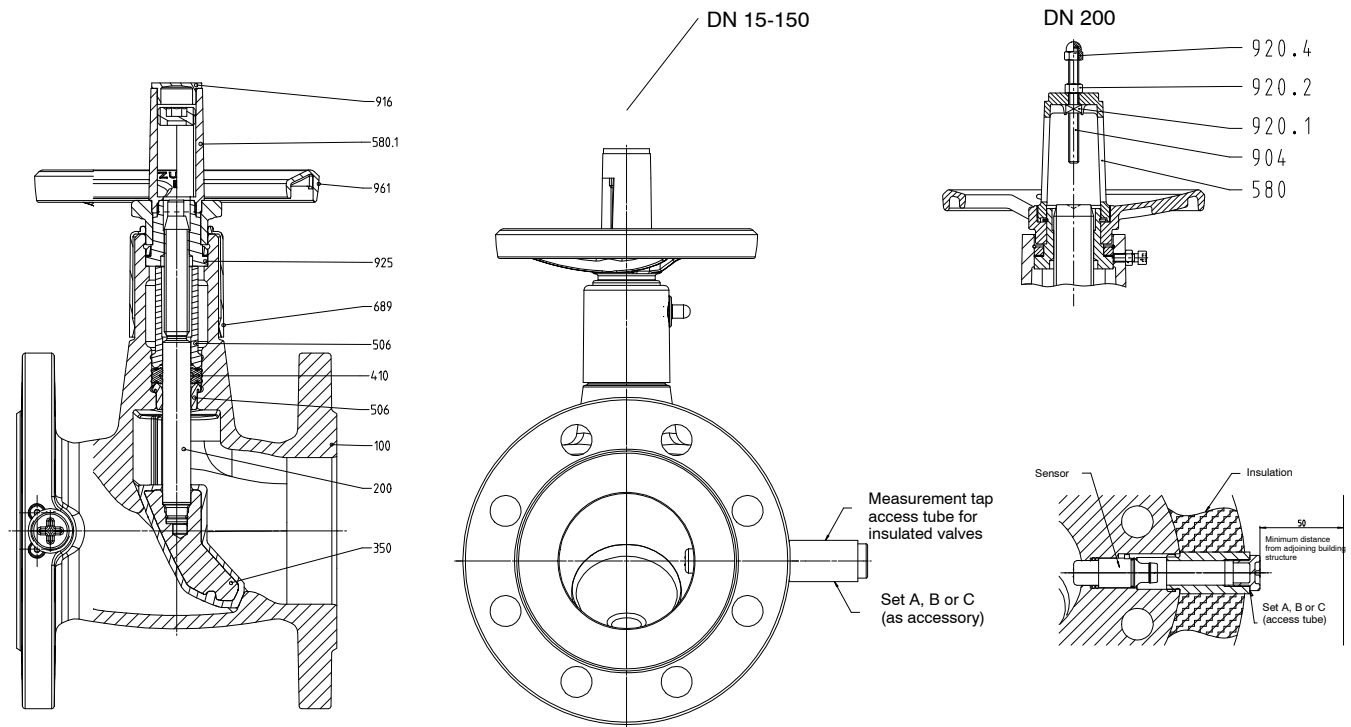
Nominal pressure PN	Nominal diameter DN	Material	Shell/Body pressure test with water		Max. permissible operating pressures in bar at temperatures in °C, to EN 1092-2 -10 to +120 °C ³⁾	Permissible differential pressure	
			P10, P11 bar ¹⁾	P12 bar ²⁾		DN	Δp in bar
16	15-300	EN-GJL-250	24	17.6	16	250	9
	350	EN-GJS-400-18-LT			16	300/350	6

¹⁾ DIN EN 12266-1 (P10, P11)

²⁾ DIN EN 12266-1 (P12 Leakage rate A)

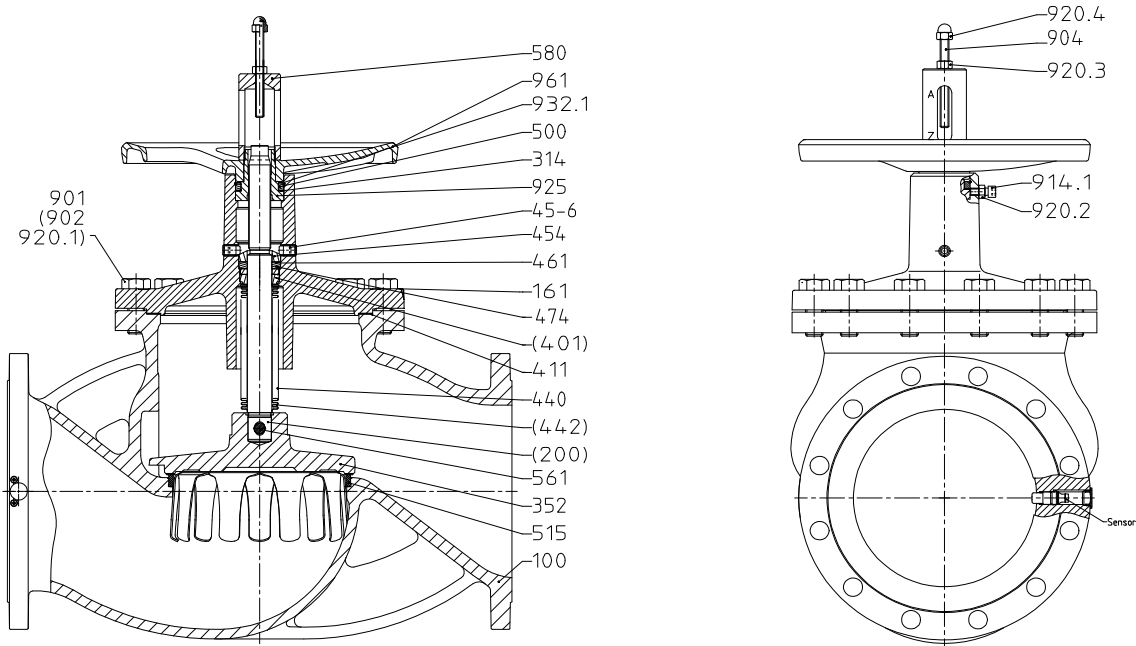
³⁾ Static load

BOA-Control[®] IMS, type BOA[®]-Compact, DN 15-200

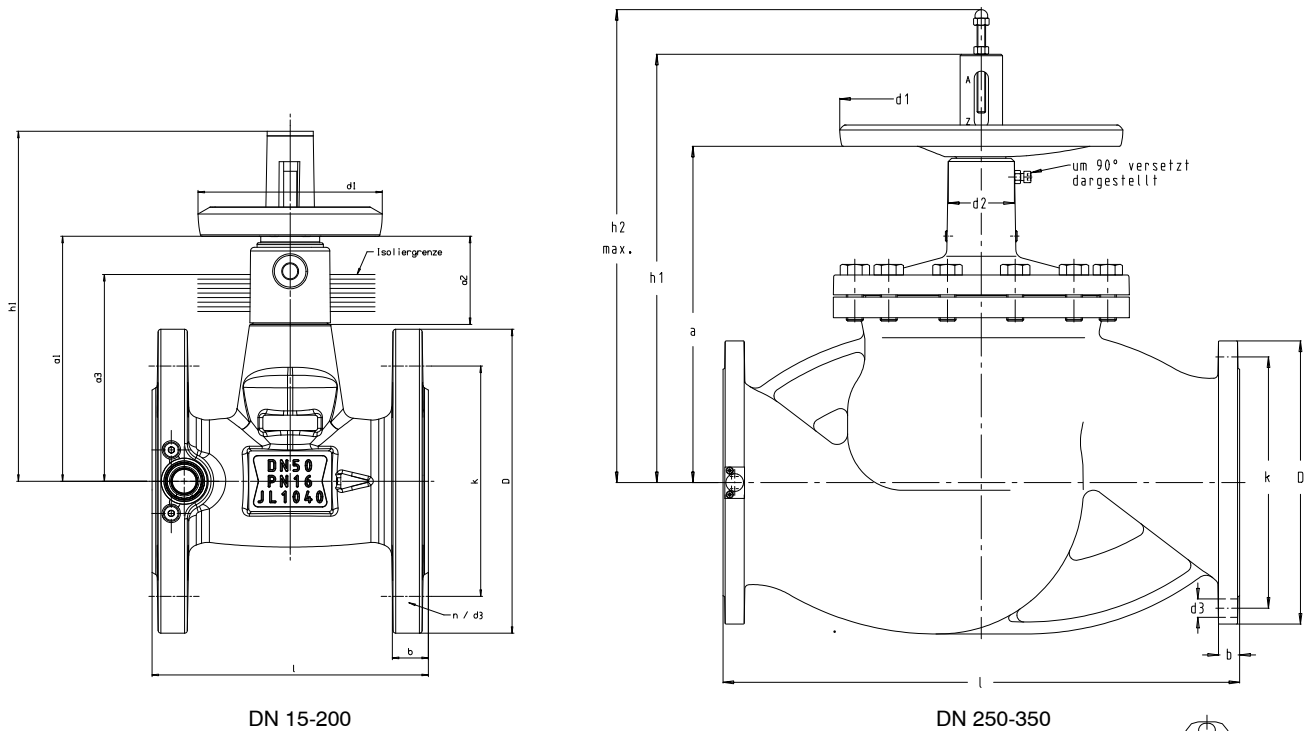


Materials

Part No.	Description	Material
100	Body	EN-GJL-250 (JL1040)
200	Stem	Stainless steel, min. 13% Cr
350	Valve plug	Cast iron/EPDM
410	Profile joint	Elastomer EPDM
506	Retaining ring	Plastic Galvanised steel DN 200
580.1	Cap	Plastic, glass fibre reinforced, impact resistant
689	Insulation cap	Plastic
903	Travel stop	Galvanised steel
904	Locking device	Galvanised steel
916	Plug	Plastic
925	Stem nut	Galvanised steel
961	Handwheel	Aluminium, die-cast DN 15-25: Plastic, glass-fibre reinforced DN 200: Grey cast iron
Sensor	Fitted in the body	PEEK

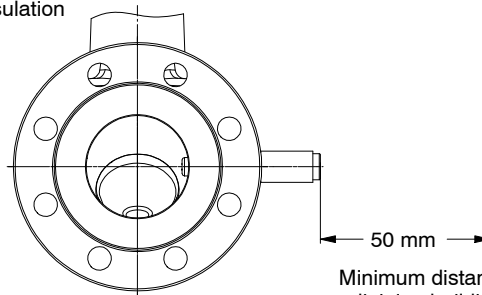
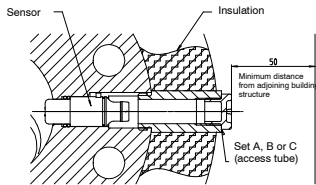
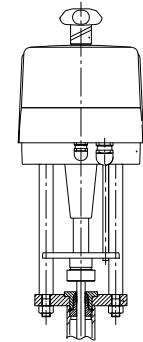
BOA-Control® IMS, type BOA® -H, DN 250-350

Materials

Part No.	Description	DN	Material	Material No.
100	Body	250-300	EN-GJL-250	JL1040
		350	EN-GJS-400-18-LT	JS1025
161	Bonnet	250-300	EN-GJL-250	JL1040
		350	EN-GJS-400-18-LT	JS1025
314	Thrust bearing		Stainless steel/PTFE	
352	Throttling valve plug		C22+N-NP	
411	Joint ring		CrNiSt graphite	
440	Bellows set consisting of:			
200	Stem		Stainless steel, min. 13 % Cr	
401	Weld ring		Stainless steel	
442	Bellows		X 6 CrNi 18 10	1.4541
454	Stuffing box ring		Stainless steel	
45-6	Stuffing box screw		Galvanised steel	
461	Gland packing		Pure graphite	
474	Thrust ring		Stainless steel	
500	Ring		Galvanised steel	
515	Seat ring		Stainless steel	
561	Grooved pin		Steel	
580	Cap		Galvanised steel	
901	Hex. head bolt		8.8 on EN-GJL-250 version	
902	Stud		CK 35 V on EN-GJS-400-18-LT version	
904	Grub screw		Galvanised steel	
914	Socket head cap screw		Galvanised steel	
920.1	Hex. nut		C 35 on EN-GJS-400-18-LT version	
920.2	Hex. nut		Galvanised steel	
920.3	Hex. nut		Galvanised steel	
920.4	Nut		Plastic	
925	Stem nut		Coated steel	
961	Handwheel		EN-GJL-250	JL1040
Sensor	Fitted in the body		PEEK	

Dimensions and installation variants


DN 15-200

DN 250-350

 Dimensions a_2 , d_2 and d_3 :
 Clearance for insulation

 With access tube for insulated valves
 Minimum distance from adjoining building structure

 with electric actuator
 DN 15-200

Dimensions (mm)												Weight	Insulation thickness in mm / Set variant ¹⁾				
PN	DN	l	h ₁	d ₁	d ₂ ≈	a ₁	a ₂	D	k	n x d ₃	b	approx. kg	0-10	11-20	21-30	31-40	41-50
16	15	115	156	80	35	105	46	95	65	4 x 14	14	2.3	Set A	Set A	Set A	Set A	Set B
	20	120						105	75		16	2.7	Set A	Set A	Set A	Set A	Set B
	25	125						115	85		16	3.0	Set A	Set A	Set A	Set B	Set B
	32	130	179	100		122		140	100	4 x 19	18	4.8	Set A	Set A	Set A	Set B	Set B
	40	140									150	110	18	5.5	Set A	Set A	Set A
	50	150	189	43	131	165	125	20	6.9	Set A	Set A	Set A	Set B	Set B			
	65	170	252	125	47	174	66	185	145	20	10.0	Set A	Set A	Set A	Set B	Set B	
	80	180			52	185	76	200	160	22	12.5	Set A	Set A	Set A	Set B	Set B	
	100	190	298	160	63	215	73	220	180	8 x 19	24	17.1	Set A	Set A	Set A	Set B	Set B
	125	200	373		200	85	270	115	250	210	26	26.5	Set A	Set A	Set B	Set B	Set B
150	210	386	250	282	113		285	240	8 x 23	26	31.0	Set A	Set A	Set B	Set B	Set B	
200	230	693	315	136	434	174	340	295	12 x 23	30	71.0	Set A	Set B	Set B	Set B	Set B	

Dimensions (mm)												Weight	Insulation thickness in mm / Set variant ¹⁾				
PN	DN	l	h ₁	h _{2max}	d ₁	d ₂ ≈	a	D	k	n x d ₃	b	approx. kg	0-10	11-20	21-30	31-40	41-50
16	250	730	606	712	400	93	476	400	355	12 x 28	32	230.0	Set A	Set B	Set B	Set B	Set C
	300	850	650	777	400	93	530	460	410	12 x 28	32	328.0	Set B	Set B	Set B	Set B	Set C
	350	980	650	777	400	93	530	520	470	16 x 28	36	390.0	Set B	Set B	Set B	Set C	Set C

Lengths of sets: Set A = 50 mm, Set B = 85 mm, Set C = 115 mm

1) Selection of extension set depending on nominal diameter and insulation thickness

Insulation in accordance with German energy-saving regulations

Installation instructions

CAUTION

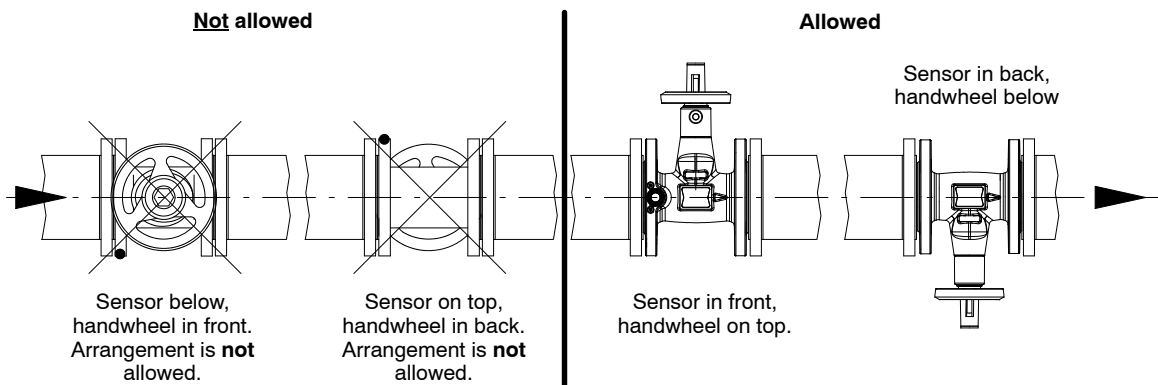
Non-compliance with the following installation instructions may result in failure of the measuring functions.

For measuring purposes, the direction of the flow through BOA-Control[®] IMS balancing and shut-off valves of type BOA-Compact[®] must correspond to that of the arrow embossed on the valve body. An alternating direction of flow is permissible for the shut-off function.

Flow through valve type BOA[®]-H must be in the direction indicated by the embossed arrow on the valve body.

Vertical installation position: For installation in vertical piping, no restrictions apply with regard to the installation position of the valves.

Horizontal installation position: For installation in horizontal piping, it is important to ensure that the sensor is permanently in contact with the fluid. For this reason, installation with "sensor on top" (air bubbles) or "sensor below" (deposits) is not allowed.



For optimum measuring accuracy, the following straight minimum upstream stabilisation distances free from any sources of potential interference must be provided, irrespective of the installation position:

- At least 7 x DN between BOA-Control[®] IMS and single sources of interference such as single 90° bends or open shut-off valves
- At least 30 x DN between BOA-Control[®] IMS and turbulence-producing elements such as pumps or control valves
- Installation in return line is recommended.
- Any sources of potential interference in the upstream stabilisation area (such as, for example, immersion sensors or non-standardised seal elements) must be avoided.

Any sources of interference must be assessed in accordance with EN ISO 5167-1, section 7.3 (previously DIN 1952, section 6).

A downstream stabilisation distance is not required!

Important

Prior to valve mounting, use a clean cloth to remove any dirt from the sensor!

To avoid thermal damage to the sensor, welding work in the area of the pipe flanges must only be carried out after the valve has been removed.

When a valve of nominal size 250-350 is mounted in downwards direction, make sure that it is fully opened during flushing of the pipeline or during similar procedures to prevent contamination of the bellows.

Mating dimensions - Standards

Face-to-face lengths:	DN 15-200:	EN 558/14, ISO 5752/14
	DN 250-350:	EN 558/1), ISO 5752/1
Flanges:	DIN EN 1092-2, flange type 21	
Flange facing:	DIN EN 1092-2, type B	

Product features - to our customers' benefit

Travel stop with protective cap

Your benefits:

- The valve can be returned to its original setting after closing.
- Added safety against personal injury

Short face-to-face length

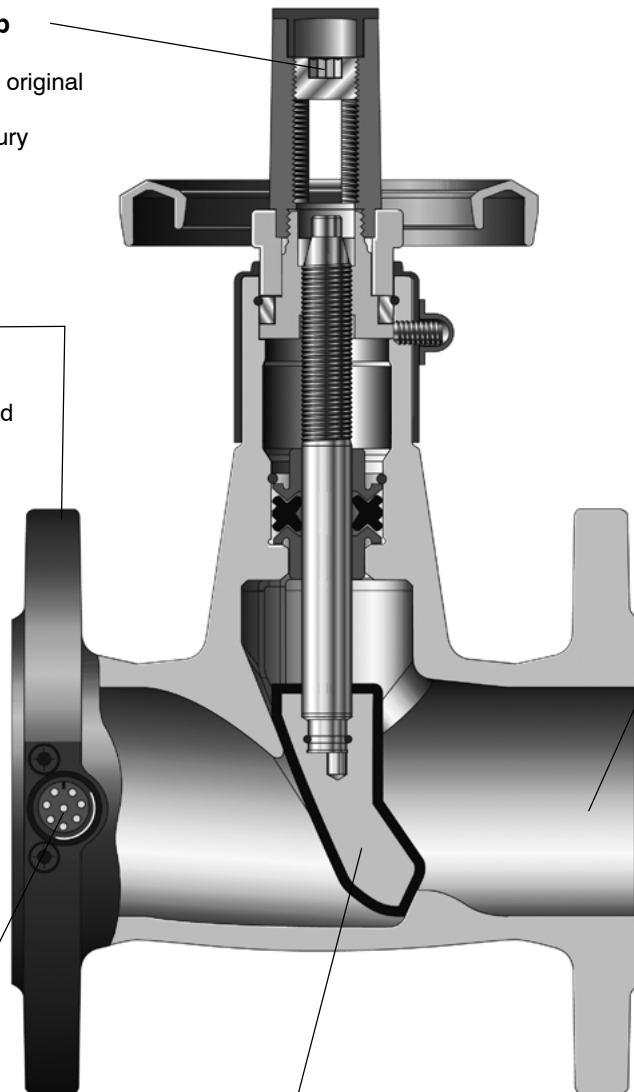
Your benefits:

- Easy to install
- Takes up little space in storage and in the system
- Savings in shipping costs

Integrated calorimetric sensor

Your benefits:

- Direct indication of flow, temperature and nominal diameter, with insulation intact, by means of BOATRONIC® M-2
- Independent of minimum differential pressures and valve travel position
- Constant accuracy across the entire measuring range
- Direct display of flow rate in m³/h whenever valve travel position changes



Locking device

Your benefits:

- Protection against accidental change of valve setting

Hydraulically favourable flow passage

Your benefits:

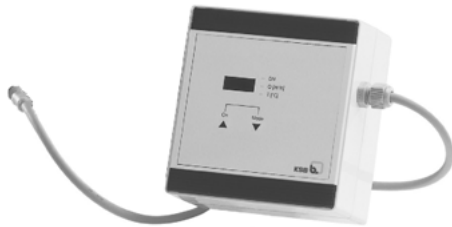
- Minimum pressure drop
- Lower investment and operating costs

Standard throttling/control valve plug

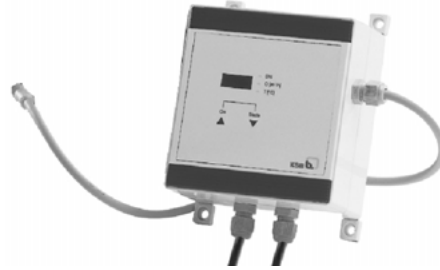
Your benefits:

- One model for shut-off and throttling
- Fewer system components
- Fewer parts to be stored
- Linear flow characteristic

Measuring computer for BOA-Control® IMS valves



BOATRONIC® M-2



BOATRONIC® M-420

Applications

- Direct measurement of the current flow rate and temperature of the fluid in BOA-Control® IMS valves, for example, for the purpose of flow regulation and balancing (BOATRONIC® M-2)
- Permanent measurement of flow rate and fluid temperature as well as measured value transmission, for example for visualisation and control of system conditions (BOATRONIC® M-420)

Operating data

In-service ambient temp.: +5 °C to 50 °C

In-storage ambient temp.: -20 °C to +50 °C

Measuring range: Temperature -10 °C to +120 °C, flow rate at velocities of 0.1 to 2 m/s in the piping

Measuring accuracy: Temperature ± 1.5 K
Flow rate ± 5 % of the measuring range limits for the respective nominal diameter

Additional information

- BOATRONIC® measuring computers can only be used in conjunction with BOA-Control® IMS valves as described in type series booklet 7128.1.
- Operating instructions: 7134.8
- Quick reference operating instructions: 7134.81

Purchase order data

Measuring computer

BOATRONIC® M-2 Ident No. 46000119

BOATRONIC® M-420 Ident No. 46000117

	M-2	M-420
Power supply	9 volt batteries, 2 pcs., alkaline/manganese ¹⁾ 1.5 volt batteries, 6 pcs., AA MIGNON ²⁾	24 V DC ± 10%
Output Q (m ³ /h)	Display Q in m ³ /h	Current output 4 .. 20 mA (0 m/s = 4mA) (2m/s = 20mA)
Output T (-10...120 °C)	Display T in °C	Current output 4 .. 20 mA (-10 °C = 4 mA) (+120 °C = 20 mA)
Current requirement mA	80	95
Low voltage detection	7.2 V -> "bAt" is displayed	-
Terminals: output/power supply	- / 2 battery holder	Quick-connect terminals
Enclosure	IP40	IP54
Safety class	III	III
Shock test, drop from 1 m	successful	successful

¹⁾ delivered until March 2004

²⁾ delivered from 1 April 2004

Activating the RS 485 interface (M-420)

M-420: Information on the RS 485 interface upon request.

Design

BOATRONIC® is designed to be used with balancing and measurement valves of the KSB BOA-Control® IMS series to measure the flow rate and fluid temperature in hot-water heating and cold-water air-conditioning systems. BOATRONIC® also indicates the nominal diameter of the BOA-Control® IMS valve installed in the pipeline.

Three BOATRONIC® models are available.

Type	M-2	M-420
Function	Short-term measurement Mobile device without output	Permanent measurement 4..20 mA current output for Q and T; RS485 interface
Power supply	2 x 9 volt battery *) ***) 6 x 1.5 volt AA MIGNON *) ***)	24 V DC

All units are supplied in cardboard packaging with quick reference operating instructions in four languages (D, GB, F, I).

*) delivered until March 2004

**) delivered from 1 April 2004

***) not included in the scope of supply

Functional description

For flow rate and temperature measurement, BOATRONIC® units must be connected to a BOA-Control® IMS valve equipped with a calorimetric sensor. The special plug on BOATRONIC® is connected to the sensor. The sensor memory contains information on the valve, which is transmitted to BOATRONIC®. BOATRONIC® M-2 is a mobile battery-operated model. BOATRONIC® M-420 must be installed on site and connected to an additional power supply.

CAUTION The connection cable to the sensor is 0.5 m long and must not be changed.

Display/indicator and operating elements

Toggle switch for starting/stopping (M-2 only)

- Operating elements:
- membrane keys
 - "ON" key Programming and display of glycol settings
 - "Mode" key Selection of reading to be shown

- Nominal diameter DN
- Flow rate m³/h
- Temperature °C

- Display/indicator elements:
- Digital display (3 digits)
 - 3 yellow LEDs

Correlation between volume flow rate and output signal for BOATRONIC® M-420

