

USERS MANUAL

Balancing valve

zSTA

Fig. 447

Edition: 07/2016

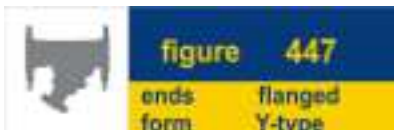
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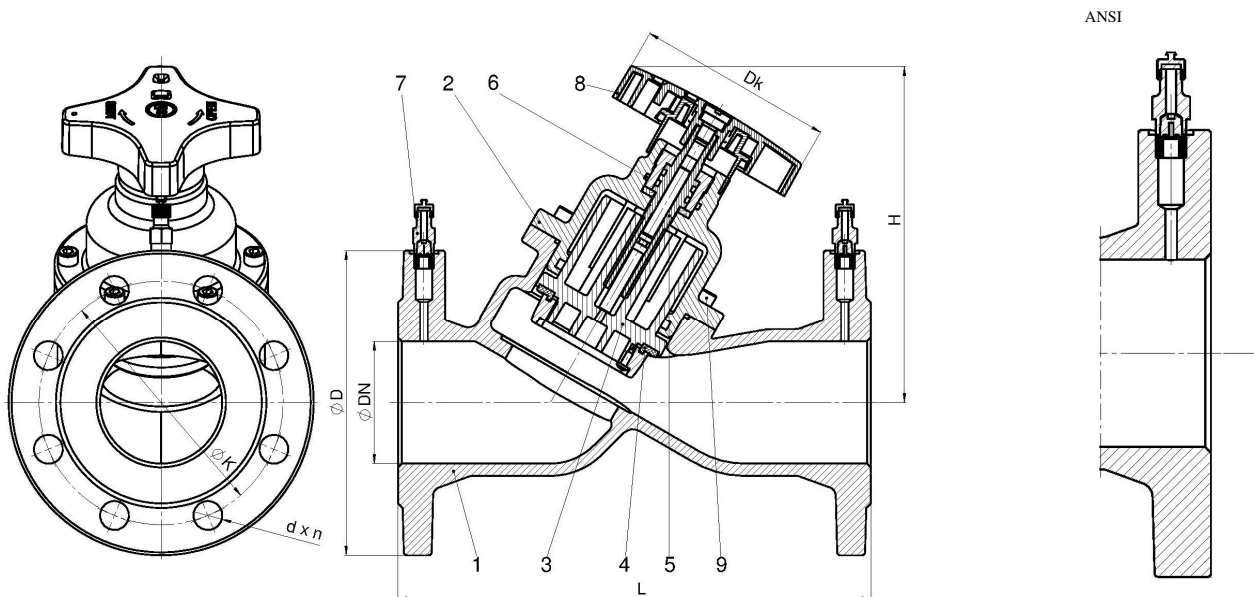
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1. PRODUCT DESCRIPTION



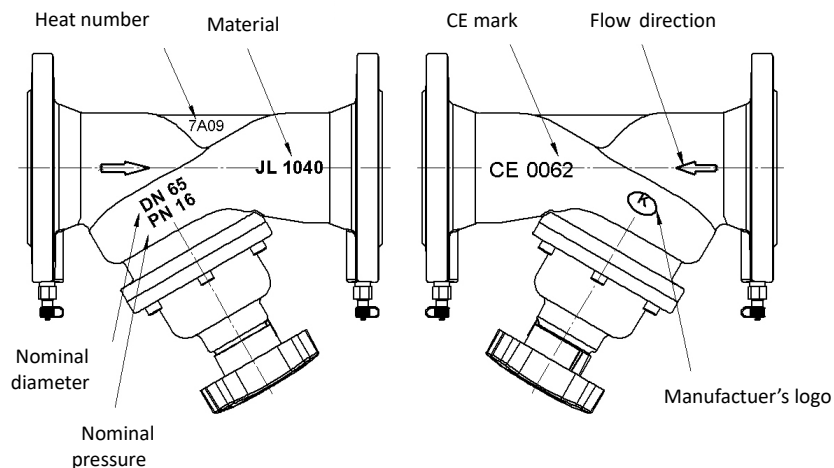
Balancing valves Fig.447 are globe valves with flange ends for connections of Y-type. They are used for medium flow control. The medium flows in the direction indicated on the valve.



	Body material	A			C
	Type	72			
1	Body	EN-GJL-250 5.1301 (ex. JL1040)			EN-GJS-400-18-LT 5.3103 (ex. JS1025)
2	Bonnet	CuZn36Pb2As CW602N for DN 40-50	EN-GJL-250 5.1301 (ex. JL1040) for DN 65-150	EN-GJS-500-7 5.3200 (ex. JS1050) for DN 200-300	EN-GJS-400-18-LT 5.3103 (ex. JS1025) for DN 350-400
3	Disc	PPS			EN-GJS-400-18-LT 5.3103 (ex. JS1025) + CuSn5Zn5Pb5
4	Disc gasket	EPDM			
5	Stem	CuZn36Pb2As			
6	O-ring	EPDM			
7	Pressure tap G ¹ / ₄	CuZn36Pb2As			
8	Hand-wheel	Poliamid PA 6.6			
9	Screw	8.8 A2A			
Max. temperature		120°C			

Valves produced by ZETKAMA, including balancing valves, have a permanent marking compliant with the requirements of PN-EN19. The marking facilitates technical identification and contains:

- DN nominal diameter (mm),
- nominal pressure PN (bar),
- body and cover material marking,
- arrow indicating the direction of flow,
- manufacturer marking,
- heat number,
- CE marking, for valves covered by Directive 2014/68/UE. (from DN 65)

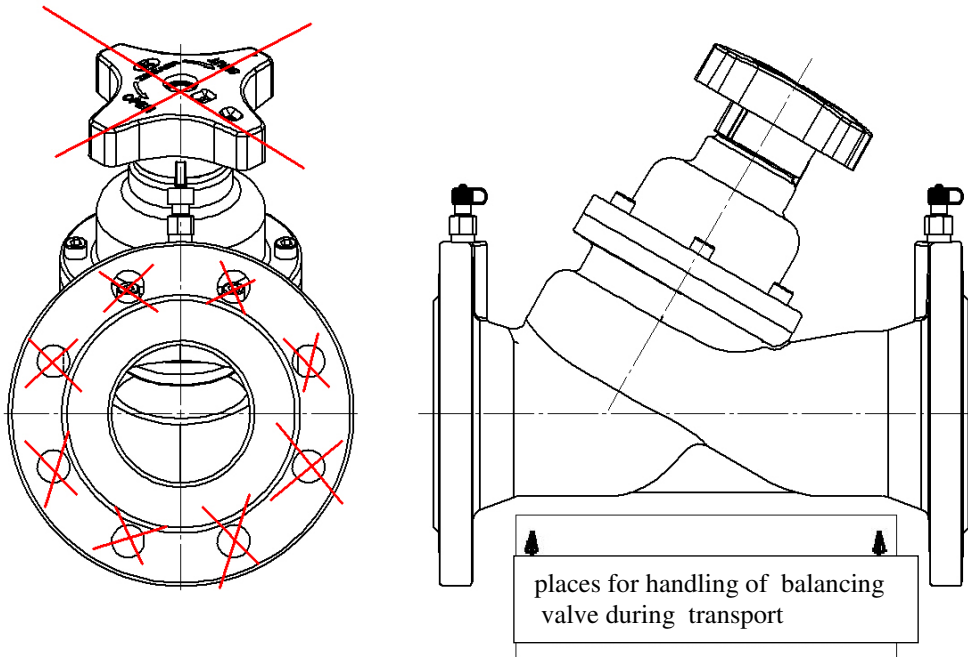


2. REQUIREMENTS FOR MAINTENANCE STAFF

The staff assigned to assembly, operating and maintenance tasks should be qualified to carry out such jobs. During valve operation heat parts of the valve, for example handwheel, body or bonnet parts could cause burn. If necessary the user should fit insulation shields and warning boards.

3. TRANSPORT AND STORAGE

Transport and storage should be carried out at temperature from -20° to 65°C , and valves should be protected against external forces influence and destruction of painting layer as well. The aim of painting layer is to protect the valves against rust during transport and storage. Valves should be kept at unpolluted rooms and they should be also protected against influence of atmospheric conditions. There should be applied drying agent or heating at damp rooms in order to prevent condensate formation. The valves should be transported in such a way to avoid handwheel and valve stem damage.



It is not allowed to fit lifting devices to connecting holes and handwheels.

4. FUNCTION

Balancing valves are designed primarily for fine adjustment of the hydraulic installations. They also have presetting, measuring and shut-off functions. The valves can be installed in either the supply or the return pipelines.

5. APPLICATION

- heating industry
- refrigeration and air-conditioning industry
- industrial water
- compressed air
- natural media

The kind of working medium makes some materials to be use or to be prohibited for use. Valves were designed for normal working conditions. In the case that working conditions exceed these requirements (for example for aggressive or abrasive medium) user should ask manufacturer before placing an order.

Corrosion allowance $c_2 = 1 \text{ mm}$ was assumed in the valves.

Working pressure should be adapted to maximum medium temperature according to the table as below.

Balancing valves Fig. 447

Wg EN 1092-2		Temp. [$^{\circ}\text{C}$]
Material	PN/PS	-10 to 120
EN-GJL250	16	16 bar
EN-GJS-400-18-LT	16	16 bar



Protection against exceeding the allowable limit values of pressure and temperature:

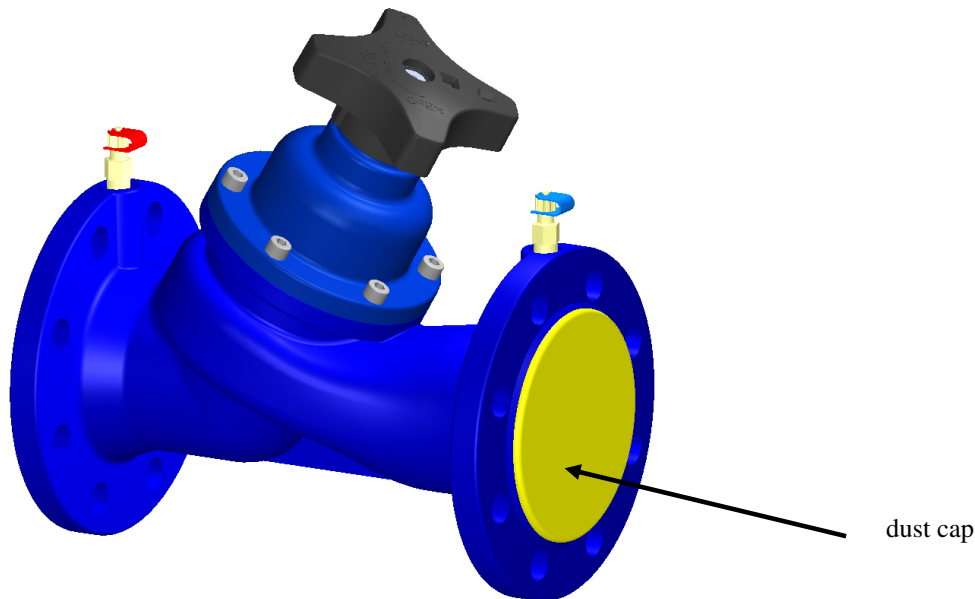
Where, under reasonably foreseeable conditions, the allowable limit values could be exceeded, the pressure equipment must be fitted with appropriate safety devices or there must be the possibility of connecting it to safety devices, unless it is intended to be protected by other safety devices within the unit.

In the case of pressure limiting devices, they shall be designed to ensure that the pressure does not permanently exceed the maximum allowable pressure, PS=16 bar.

6. ASSEMBLY

During the assembly of balancing valves following rules should be observed:

- to evaluate before an assembly if the valves were not damaged during the transport or storage and to make sure that applied valves are suitable for working conditions and medium used in the plant,
- to take off dust caps if the valves are provided with them,



- to check if the valve interior is free of foreign bodies,
- to protect the valves during welding jobs against splinters and to use plastics against excessive temperature,



Pipeline where the valves are fitted should be conducted and assembled in such a way that the valve body is not subjected to bending moment and stretching forces.

Bolted joints on the pipeline must not cause additional stress resulted from excessive tightening, and fastener materials must comply with working conditions of the plant.

- to apply expansion pipe joints in order to reduce influence of pipeline thermal expansion,



To assembly the valve in such a way that flow direction comply with an arrow placed on the body,

- correct acting of the valve requires suitably long straight pipelines: 5 x DN before the valve and 2 x DN after it,
- during painting of pipeline the valve stem, and plastic parts as well as vernier pitch should be protected ,
- valves can be assembled in any position, however it is recommended to install the valve with handwheel downwards,
- before plant startup, especially after repairs carried out, flush out the pipelines through entirely open valves
- strainer (wire mesh filter) installed before the valve increases certainty of its correct action.

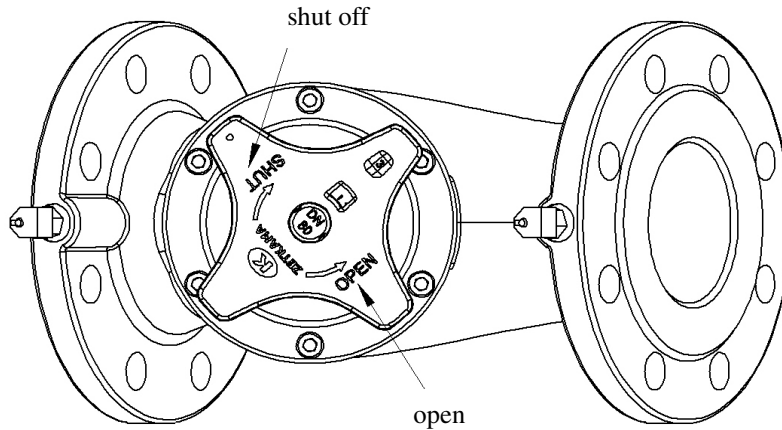


The responsibility for correct selection of the valve to the operating conditions, distribution and installation is borne by system designer, contractor and user.

7. MAINTENANCE

During maintenance following rules should be observed:

- startup process – sudden changes of pressure and temperature should be avoided when starting the plant,
- valve is closed by turning the handwheel clockwise when looking from above the handwheel (according to arrow direction marked on the handwheel),
- valve is opened by turning the handwheel counter-clockwise.



When closing does not exceed a value of “0” on the scale



It is prohibited to use additional lever when turning the handwheel

- operation of installed valves can be checked by repeated opening and closing



In order to assure safety performance, each valve (especially rarely used) should be surveyed on regular basis. Inspection frequency should be laid down by user.

8. SERVICE AND REPAIR

Balancing Valves Figure 447 does not require maintenance, provided that they are used for its intended purpose.



Before taking up any service jobs it is necessary to make sure, if medium supply to the pipeline was shut off, if the pressure was decreased up to atmospheric pressure, if the medium was removed and plant cooled down.

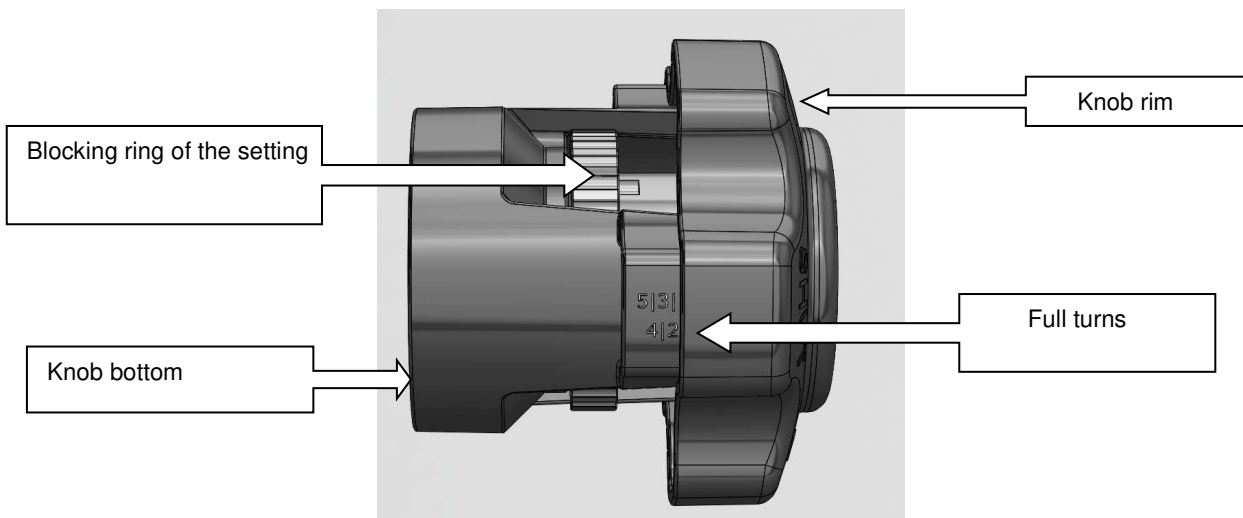
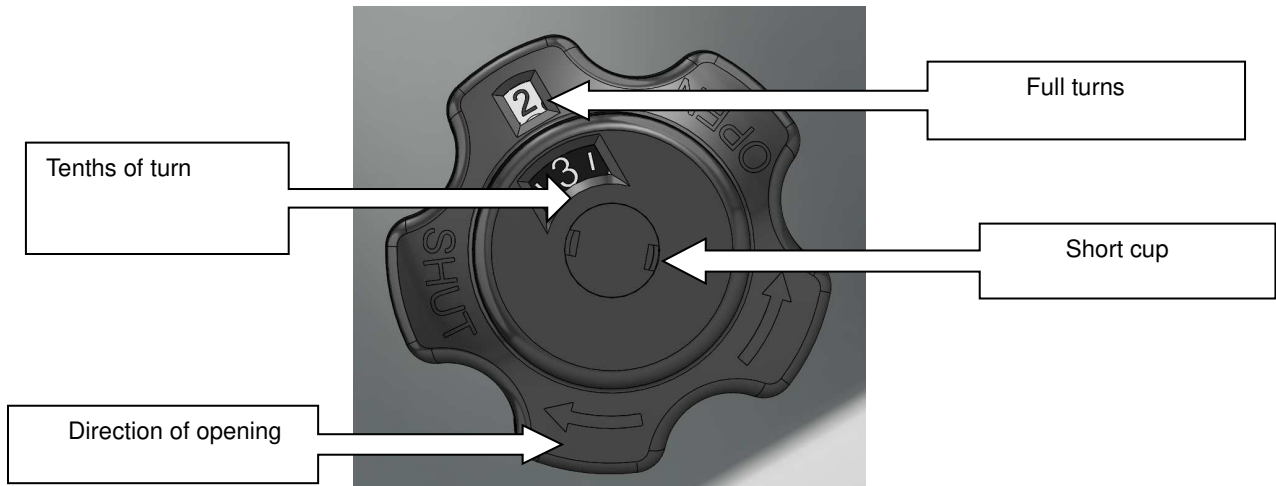
- All service and repair jobs should be carried out by authorized staff using suitable tools and original spare parts.
- Before disassembly of complete valve from the pipeline or before service, the pipeline should be out of operation.
- During service and repair jobs it is necessary to use personal health protectives in pursuance of existing threat.
- After valve disassembly it is necessary to replace flange connection gaskets between valve and pipeline .
- Everytime when valve bonnet was disassembled sealing surface should be cleaned. During assembly it should be applied new gasket of the same type as previously used.
- Body-bonnet bolt connections should be tighten when the valve is at open position,
- The bolts should be tighten evenly and crosswise by torque wrench.

- Before valves re-assembly in the pipeline it is necessary to check valve operation and tightness of all connections. Tightness test should be carried out with water pressure of 1,5 nominal pressure of the valve.

9. VALVE ADJUSTMENT FOR Fig. 447

DN40-50

The valve opening degree can be read on the dial and its lateral part



The number of rotations between the closed and fully open positions is – 5

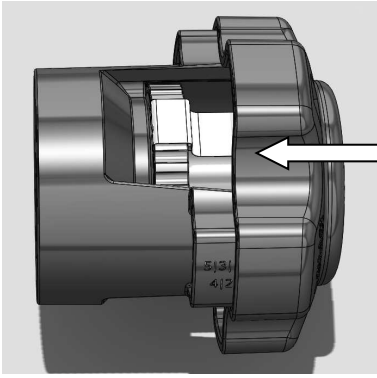


If the valve will not open, check the position of the locking ring of the setting.
If necessary, remove it toward the rim of the knob.

Set the valve on the adjustment 2,3 is done as follows:

1. Close the valve completely and check the scale 0-0
2. Open the valve to position 2.2 and turn the locking ring until the moment of touching the surface of the bottom knob
3. Twist off the knob on the adjustment 2.3

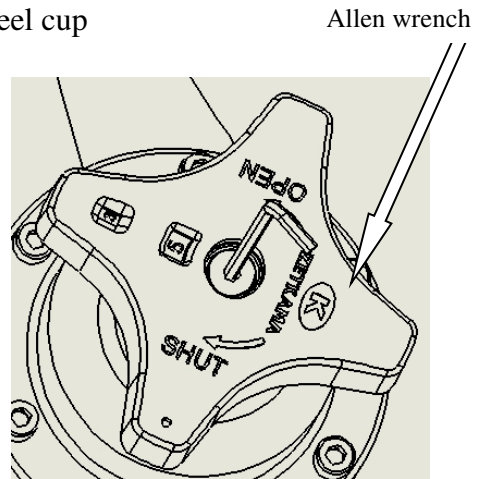
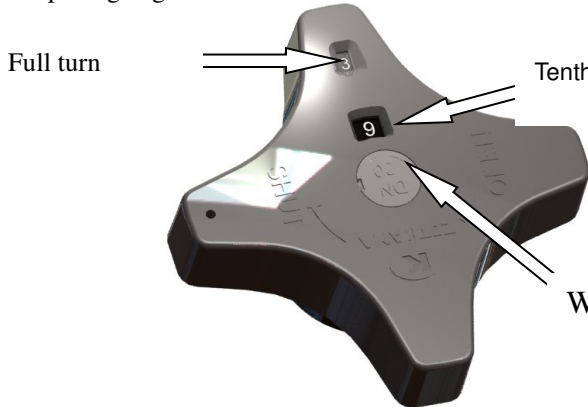
Blocking the adjustment



In order to protect against adjustment changes, you can apply a seal

- Setting of the valve diameters DN65-400

The valve opening degree can be read on the dial



Number of turns between the locations closing and fully open is:

- 8 - DN 65 and 80
- 8.5 - for 100.125 and 150 DN
- 11 - DN 200.250 and 300
- 18 - for DN 350
- 24 - for DN 400

Set the valve on the 3.5 is done as follows:

1. Remove the wheel cap
2. Close the valve completely and check the scale 0-0.
3. Open the valve to position 3.5 of a turn.
4. Screw allen key screw located in the stem until it stops.
5. Replace the wheel cap

- For a proper setting of the valve position should be used tabulation of the characteristics of the valve and charts drawn up for each size of valve,
 So adjusted balancing valve can be closed many times now, but it can be open up to adjusted value only .

Kv values for specific adjustment of Fig. 447:

n	DN 40	DN 50	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300	DN 350	DN400
	Kv [m ³ /h]											
0,5	2,73	2,66	12,5	5,9	5,6	8,3	7,9	27,5	43,5	44,9		
1	4,49	3,73	21,9	8,0	9,6	13,0	14,8	38,6	62,3	57,1		
2	8,55	8,88	31,1	11,8	16,6	23,7	29,7	54,6	87,3	89,8		
3	13,81	17,60	40,1	16,7	34,0	51,2	83,7	99,9	163,9	140,7	152	153
4	19,22	25,50	49,3	31,2	71,4	106,5	183,7	216,2	345,3	331,7	260	220
5	22,36	32,15	57,5	65,0	107,4	160,9	247,1	341,2	543,3	634,1	400	455
6			71,8	89,3	135,0	201,9	298,2	430,1	694,0	825,1	670	724
7			80,4	102,7	159,9	239,8	342,2	507,6	823,7	1017,8	967	1090
8			88,8	113,4	177,9	270,8	376,8	560,8	925,3	1169,7	1190	1398
8,5					184,7	285,1	390,2					
9								619,3	1022,4	1285,1	1344	1620
10								667,2	1110,2	1394,1	1490	1820
11								710,0	1187,5	1504,1	1610	2000
12											1712	2168
13											1810	2320
14											1910	2440
15											1992	2560
16											2070	2672
17											2140	2770
18											2215	2860
19												2950
20												3023
21												3090
22												3150
23												3200
24												3262

n – number of handwheel turns

10. T650 BALANCING MEASURING DEVICE.

An electronic measuring instrument can be used for measurements. In order to read data from the device, a mobile device with the Android 7.0 operating system and newer or with the iOS operating system is necessary. The applications have built-in ZETKAMA balancing valve characteristics and the ability to record data. The instrument provides pressure drop measurement and allows direct measurement of the flow rate. A detailed description of the device can be found in the device user's manual.



Measuring instrument specification

Nominal pressure range	1,000kPa or 2,000 kPa
Maximum hypertension	120% of nominal pressure
Linearity error and hysteresis	0.15% from nominal pressure range
Pressure range error from 0 to 5 kPa after zero pressure setting	± 50Pa for minimal pressure range 1 MPa

	± 100Pa for minimal pressure range 2 MPa
Temperature error	0.25%
Medium temperature	-5 to 90°C
Ambient temperature	-5 to 50°C
Storage temperature	+5 to 50°C
Wireless data transfer	Bluetooth Low Energy 5.0
Power supply	AAA alkaline or NiMH rechargeable batteries
Power consumption	20mA Bluetooth
Operation time	According the used battery type 40h Max.
Pressure measurement resetting	Mechanical with hydraulic bypass
Maximum number of records	2000
Maximum number of valves and producers in the database	unlimited
Tightness class	IP65
Validity of calibration	24 months
Dimensions (l x w x d)	140x75x47mm
Weight	440 g

11. REASONS OF OPERATING DISTURBANCES AND REMEDY

- When seeking of valve malfunction reasons safety rules should be strictly obeyed

Fault	Possible reason	Remedy
No flow	Valve closed	Open the valve
	Flange dust caps were not removed	Remove dust caps on the flanges
Poor flow	Valve is not open enough	Open the valve
	Dirty filter	Clean or replace the screen
	Clogged pipeline	Check the pipeline
Control difficulties	Dry stem	Grease the stem
	Gland packing tighten too much (ref. to Fig.443)	Slightly slacken gland nuts. Put attention to keep stuffing box tightness.
Stem leakage	Too much loose on the gland (ref. to Fig. 443)	Tighten the gland untill tightness will be reached If necessary add packing rings in stuffing box. Keep special caution.
	Damaged O-rings (ref. to Fig. 445)	Replace O-rings
Seat leakage	Shut off not correct	Tighten the handwheel without any auxiliary tools.
	Seat or disc damage	Replace the valve and contact supplier or manufacturer
	Pressure difference too much	Check if the valve was assembled according to arrow direction marked on the valve.
	Medium polluted with solid particles	Clean the valve. Fit strainer before the valve.
Broken connecting flange	Bolts tighten unevenly	Replace the valve with new one

12. VALVE SERVICE DISCONTINUITY

All obsolete and dismantled valves must not be disposed with household waste. ZETKAMA valves are made of materials which can be re-used and should be delivered to designated recycling centres.

13. WARRANTY TERMS

ZETKAMA grants quality warranty with assurance for proper operation of its products, providing that assembly of them is done according to the users manual and they are operated according to technical conditions and parameters described in ZETKAMA's catalogue cards. Warranty period is 18 months starting from assembly date, however not longer than 24 months from the sales date.

- warranty claim does not cover assembly of foreign parts and design changes done by user as well as natural wear.
- immediately after detection the user should inform ZETKAMA about hidden defects of the product
- a claim should be prepared in written form.

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