

## USER MANUAL

**BALANCING VALVE zSTA**

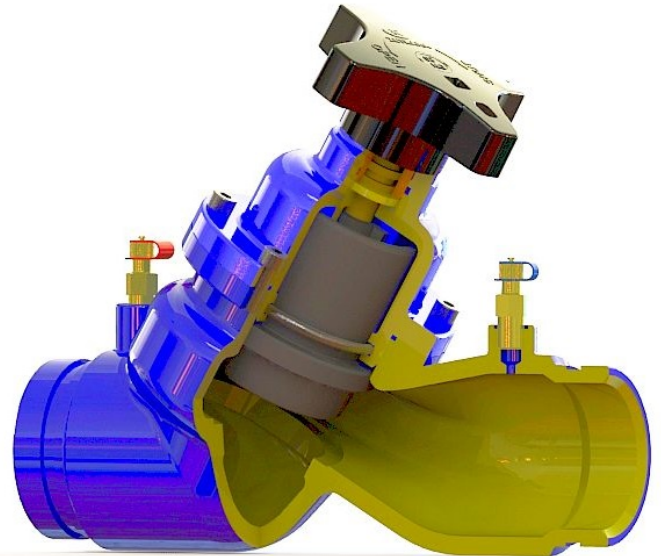
**Fig. 447 grooved ends**

**Edition: 1/2016  
 Date: 01.07.2016**

### CONTENTS

1. Product description
2. Requirements for maintenance staff
3. Transport and storage
4. Function
5. Application
6. Assembly
7. Maintenance
8. Service and repair
9. Valve Setting
10. Measuring instrument T 650.
11. Reasons of operating disturbances and remedy
12. Valve service discontinuity
13. Warranty terms

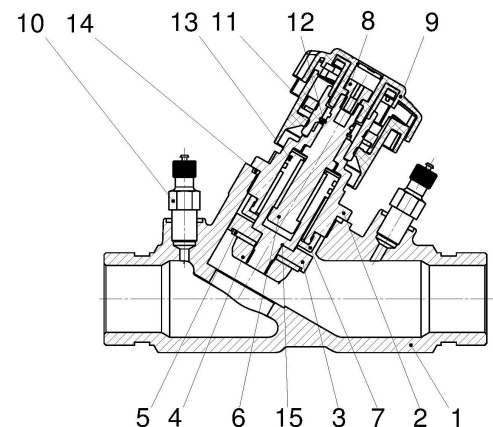
#### 1. PRODUCT DESCRIPTION



Balancing valves Fig.447 are globe valves with oblique body, with grooved ends for connections of Victualic type. They are used for medium flow control. The medium flows in the direction indicated on the valve.

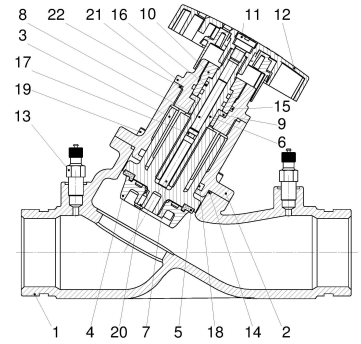
	Material	A
	Design	72
1	Body	EN-GJL-250 JL 1040
2	Cover	CuZn36Pb2As
3	Plug	Structural plastic
4	Adjustment ring	Structural plastic
5	Plug seal	EPDM
6	Stem	CuZn36Pb2As
7	Turn limiter	CuZn36Pb2As
8	Knob screw	A2
9	Knob	POLIAMID PA6.6
10	Measuring tap	CuZn36Pb2As
11	Gasket	Cu
12	Locking ring	Spring steel
13	O-ring	EPDM
14	O-ring	EPDM
15	O-ring	EPDM
<b>Max. temperature</b>		<b>120°C</b>

DN 40-50

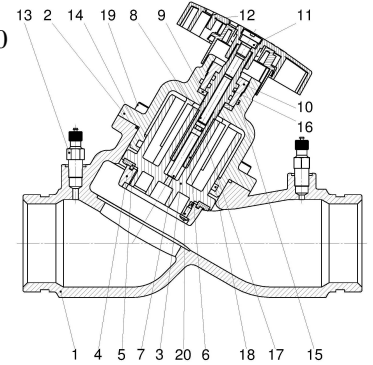


	Material	A
	Design	72
1	Body	EN-GJL-250 JL 1040
2	Cover	EN-GJL-250 JL 1040
3	Plug	Structural plastic
4	Adjustment ring	
5	Plug seal	EPDM
6	Stem	CuZn36Pb2As
7	Opening limiter	
8	Screw	CuZn37
	Gasket	CuZn36Pb2As
10	Nut	
11	Knob screw	CuZn37
12	Hand wheel	POLIAMID PA6.6
13	Measuring tap	C35E
14-18	O-rings	EPDM
19	Cylinder screw	8.8 A2A
20	Self-tapping screw	A2
21	Top cover (only DN65)	EN-GJL-250 JL 1040
22	O-ring (only DN65)	EPDM
Max. temperature		120°C

DN 65

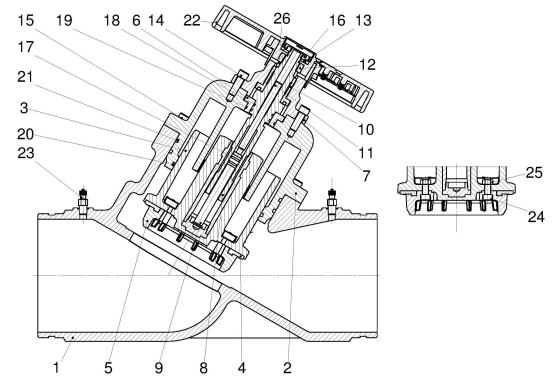


DN 80-150



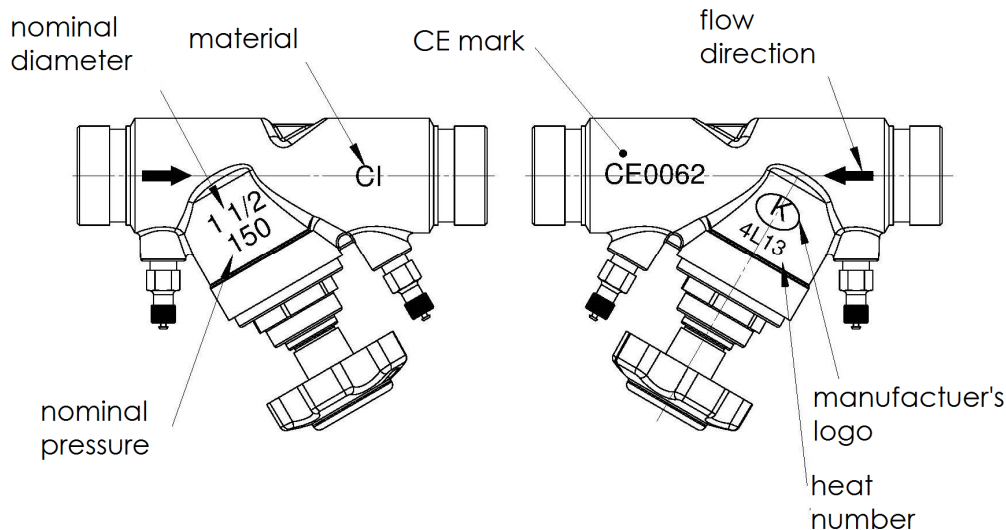
	Material	A
	Design	72
1	Body	EN-GJL-250 JL 1040
2	Cover	EN-GJS-500-7 JS 1050
3	Plug	Structural plastic
4	Plug seal	
5	Adjustment ring	Structural plastic
6	Sleeve	CuZn36Pb2As
7	Top cover	
8	Stem	CuZn36Pb2As
9	Opening limiter	
10	Guide sleeve	CuZn40Pb2
11	Screw	X5CrNi 18-10
12	Wheel cube	CuZn40Pb2
13	Gasket	CuZn40Pb2
14	Cylinder screw	8.8 A2A
15	Cylinder screw	8.8 A2A
16	Nut	5 A2A
17-21	O-rings	EPDM
22	Hand wheel	POLIAMID PA6.6
23	Measuring tap	G1/4"
24	Cylinder screw	A2-70
25	Nut	A2-70
26	Piston sleeve	CuZn40Pb2
Max. temperature		120°C

DN 200 - 300



Fittings 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 (inch),
- nominal pressure PN (class 150),
- body and cover material marking,
- arrow indicating the direction of flow,
- manufacturer marking,
- heat number,
- CE marking, for valves covered by Directive 97/23/EC. (from DN 65)



## 2. Requirements for maintenance staff

The staff assigned to assembly, operating and maintaining tasks should be qualified to carry out such jobs.

During valve operation heat parts of the valve, e.g. body or cover parts could cause burn. If necessary the user should put insulation shields and warning signs.

## 3. TRANSPORT AND STORAGE

Transport and storage should be carried out at a temperature from -20o to 65°C, and vent 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 drying agent or heating at damp rooms in order to prevent condensate formation. The valves should be transported in a manner that does not damage the valve pin.



**It is unacceptable to mount lifting devices with a handwheel.**

## 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

Working medium requires or prohibits the use of certain materials. The valves are designed for normal conditions of use. In the case that working conditions exceed these requirements, e.g. in the case of aggressive or abrasive factors, a user should make an inquiry to the manufacturer before ordering.

Working pressure should be adjusted to the maximum temperature of the medium, as shown below.

Balancing valve Fig. 447

		Temperature [° C]
Material	PN	-10 to 120
EN-GJL250	16	16 bar

## 6. ASSEMBLY

At the assembly of balancing valves, observe the following rules:

- evaluate before an assembly if the vent valves were not damaged during transport or storage, and make sure that applied valves are suitable for working conditions and the media in the system,
- remove the caps if the balancing valves are provided with them
- check if the vent valve body is free of solid particles,
- during e.g. welding, protect valves against splinters and used plastics against excessive temperature,



**Pipeline, on which valves are mounted, should be arranged and mounted so the valve body is not transmitting bending moments and is not extended.**

- use compensators in order to reduce the impact of thermal expansion of pipelines,



**Install the valve so that flow direction comply with an arrow placed on the body.**

- - Correct operation of the valve requires suitably long straight sections: 5 x DN up and 2 x DN downstream
- during pipeline painting valve parts made of plastic and scale of the valve must be protected,
- valves can be mounted in any position, recommend position of the valve is wheel down,
- before starting the installation, especially after repairs, the pipeline should be flushed through with the fully opened valve,
- installation of mesh filter before the valve increases certainty of its correct functioning

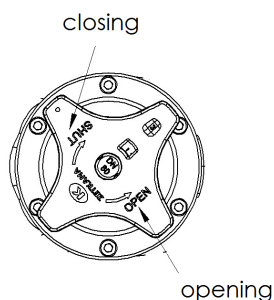


**The responsibility for correct selection of the valve to the operating conditions, distribution and installation is borne by system designer, contractor and user.**

## 7. MAINTENANCE

During operation the following rules should be observed:

- process of starting up –commissioning should be conducted in a manner that eliminates the occurrence of sudden changes in temperature and pressure,
- close the valve by turning it to the right, looking down on the wheel (in the direction marked on the wheel)
- open the valve by turning it to the left



when closing do not exceed the value of "0 - 0" on the wheel



the use of additional leverage when turning the wheel is prohibited

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



To ensure the safe operation of each valve, especially of the ones that are rarely used, they should be regularly monitored. Inspection frequency should be determined by the user.

## 8. Service and repair

Balancing valves Fig. 447 do not require any maintenance provided that they are used in accordance with their intended use



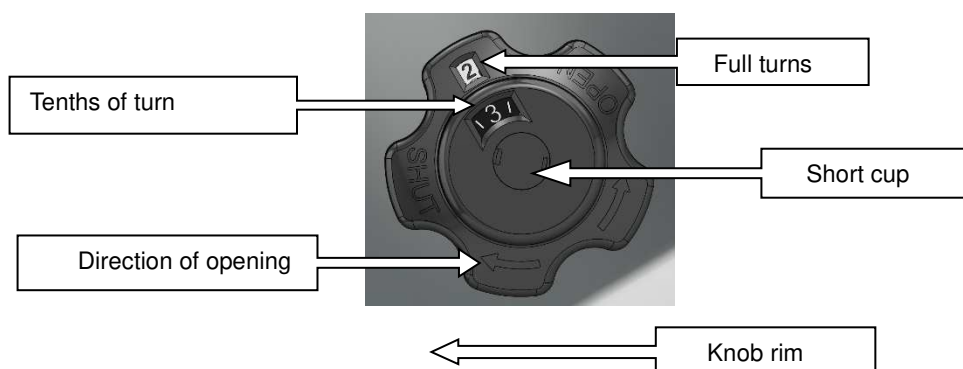
Before taking up any service jobs make sure that the flow of medium in the pipeline was cut off, the pressure was reduced to ambient pressure, medium was removed and the plant was cooled down..

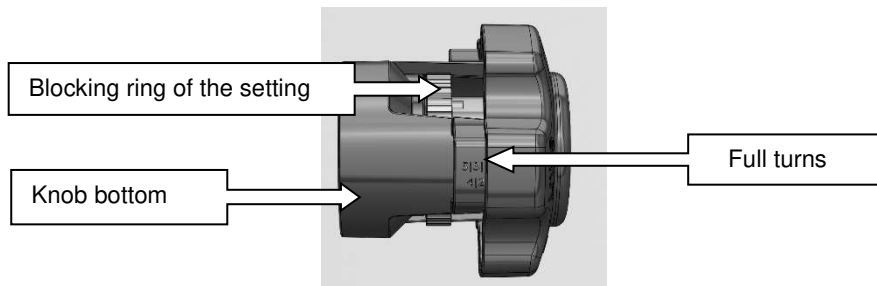
- All service and repair jobs should be carried out by authorised staff using suitable tools and original spare parts.
  - Before removing the complete valve from the pipeline or before service works, the particular section of the pipeline should be excluded from the operation.
  - At maintenance and repair work personal protection equipment pursuant to existing threat should be used,
  - each time when the cover is removed, clean the valve sealing surface and apply new gasket of the same type as previously used
  - tightening the screw connections of the covers must be made with the open valve opened
  - screws should be tighten evenly and crosswise.
- during valve 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 x nominal pressure of the valve.

## 9. VALVE SETTING Fig. 447

DN 40-50

The degree of opening of the valve can be read on the wheel and the side part.





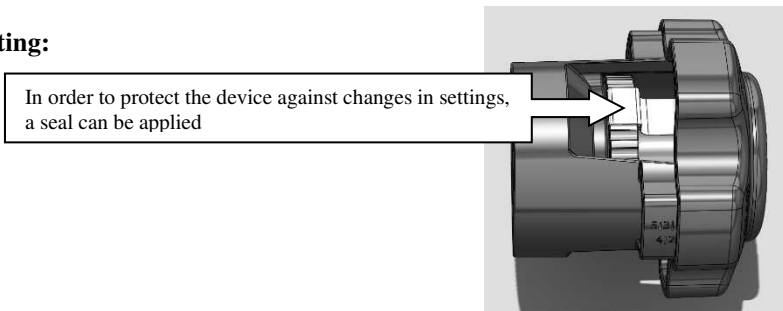
The number of rotations between the closed and fully open positions is - 5

**⚠** 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.

**Setting valve to 2.3 is performed as follows:**

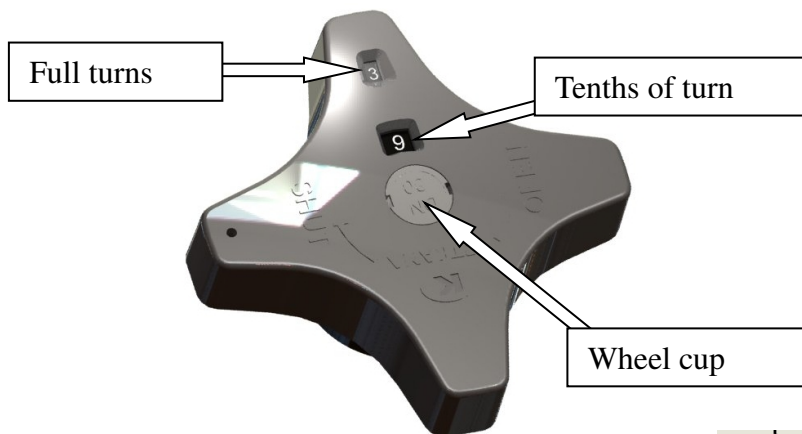
1. Unscrew the locking ring of the setting in the direction of the knob rim.
2. Close the valve completely and check the scale 0-0 on the knob.
3. Open the valve to the position 2.2 of the rotation and twist the locking ring of the setting until it touches the surface of the bottom of the knob.
4. Loosen the knob on the setting 2.3

**Locking the setting:**



**DN 65-300**

The degree of opening of the valve can be read on the knob

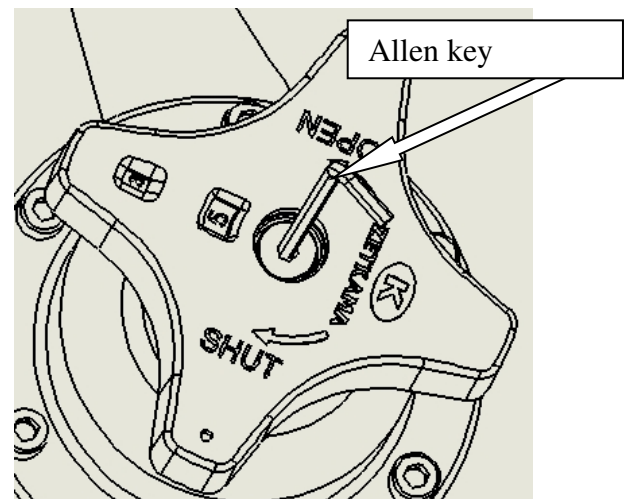


The number of rotations between the closed and fully open positions is:

- 8 – for DN 65 and 80
- 8,5 – for DN 100,125 and 150
- 11 – for DN 200,250 and 300

Setting valve to 3.5 is performed as follows:

1. Remove the wheel cap
2. Close the valve completely and check the scale 0-0.
3. Open the valve to a position of 3.5 turn.
4. Screw the screw with an allen key inside the spindle until it stops.
5. Fit the wheel cap



- for the proper adjustment of valve opening, tabulation and flow charts drawn up for each valve size should be used,

So adjusted balancing valve can be closed many times now, but its opening is only possible to the set value.

**Kv values for the various settings for the valve Fig. 447:**

n	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200	DN250	DN300
	Kv [m <sup>3</sup> /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	7,9	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
4	19,22	25,50	48,4	29,3	71,4	106,5	183,7	216,2	345,3	331,7
5	22,36	32,15	55,8	62,4	106,6	160,9	244,1	341,2	543,3	634,1
6			68,9	85,0	133,0	199,7	289,3	430,1	694,0	825,1
7			76,1	96,3	157,0	237,5	332,5	507,6	823,7	1017,8
8			83,3	104,3	173,4	266,9	368,6	560,8	925,3	1169,7
8,5					180,5	280,0	383,4			
9								619,3	1022,4	1285,1
10								667,2	1110,2	1394,1
11								710,0	1187,5	1504,1

n - the number of turns of the wheel

**10. Measuring instrument T650.**

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 to 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

<b>Fault</b>	<b>Possible cause</b>	<b>Remedy</b>
No flow	Valve closed	Open the valve
	Caps were not removed	Remove the caps
Low flow	Valve not sufficiently open	Open the valve
	Contaminated filter	Clean or replace the strainer
	Clogged pipeline system	Check the pipeline
Difficult to control valves	Dry spindle	Oil the spindle
Leakage on the spindle	Contaminated o-rings	Replace the O-rings
Leakage on the seat	Improper closing	Tighten the hand wheel without using auxiliary tools
	Damaged seat or plug	Replace the valve. Turn to the supplier or manufacturer
	Too high pressure difference	Check that the valve is installed in accordance with the flow direction marked on the valve.
	Medium contaminated with solid objects	Clean the valve. Install the filter before the valve.

## 12. Valve service discontinuity

All obsolete and dismantled valves must not be disposed of with household waste. The 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 user manual and they are operated according to technical conditions and parameters described in ZETKAMA's catalogue cards. The warranty period is 18 months from assembly date, however not longer than 24 months from 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.

Address:

ZETKAMA Sp. z o.o.  
ul. 3 Maja12 57-410 Ścinawka Średnia  
Telefon (0048) (74) 8652111  
Telefax (0048) (74) 8652101  
WWW: [http:// www.zetkama.com](http://www.zetkama.com)