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ZETKAMA

USER MANUAL

Bellow control valve with pneumatic actuator and positioner	Fig. 236	Edition: 1/2020 Date: 03.04.2020

CONTENTS

1. GENERAL

1.1. DESIGNATIONS USED IN THE MANUAL

Safety instructions, the non-observance of which may endanger the operating personnel and the device.

Safety instructions which, if not followed, may pose a risk of electric shock

Safety instructions which, if not followed, may cause a thermal hazard (burns)

CAUTION Safety instructions which, if not followed, may endanger the valve and its operation.

1.2. GENERAL REMARKS

The presented manual contains information, tips and warnings ensuring safe operation of shut-off and control valves controlled by pneumatic drives with a positioner.

Non-compliance with the user's manual releases the manufacturer from all obligations and guarantees

CAUTION The valve may only be used for its intended purpose. The application of the valve and its pressure and temperature limits are described in the catalogue card and in this manual

CAUTION Personnel approved for assembly and operation of the valve must have the necessary qualifications

CAUTION For actuator valves, it is essential to comply with the operating instructions for the actuator, which is supplied with the actuator by the actuator manufacturer.

2. SAFETY

The manual contains basic installation and operating instructions that should be observed. National regulations on occupational health and safety as well as internal regulations issued by the user regarding working conditions, equipment operation and safety must also be observed.

Users and personnel employed for assembly, operation and maintenance work must read the manual before carrying them out. Staff must be trained and qualified

In addition to the standard safety rules, instructions regarding additional fittings equipment – pneumatic actuators, positioners and additional equipment. These instructions are available for download from the manufacturer's website.

The safe operation of valves with actuators can be guaranteed provided that they have been used for their intended purpose and the pressure and temperature values given in the catalogue card and in this manual are met.

Performing unauthorized modifications and the use of non-original parts is unacceptable, it may damage the rebuilt valves and installations and cause a health hazard to personnel. This will also void the warranty and the user will be responsible for any resulting damage

The electrical installation of the valve drive must be carried out in accordance with the requirements of regulations and standards regarding electrical installations and the instructions regarding the given drive by electricians having appropriate qualifications.

For the compliance of the power supply and control system with applicable regulations and directives, the responsibility lies with the installer of the electrically operated valve in the workplace.

3. TRANSPORT AND STORAGE

Valves with pneumatic actuators and positioner are delivered to the user in operational readiness

CAUTION

During transport, the motorized valve must not be hung by the drive components.
Appropriate slings and transport ropes must be used for transport

CAUTION

When transporting valves with actuators, pay attention to the dangers arising from their high weight.

Loading and unloading can be performed only by authorized personnel with appropriate qualifications by means of appropriate equipment and slings intended for these purposes. It is not allowed to attach lifting devices to the connection holes.

Transport and storage should be carried out at temperatures from –20º to 65ºC, and the valves must be protected against external forces and damage to the paint coat. The paint coating is designed to protect the fittings against corrosion during transport and storage. The valves with drives should be stored in rooms free of dirt and protected against atmospheric influences. In damp areas, use a drying agent or heating to prevent condensation.

4. OPERATIONAL DATA AND TECHNICAL DOCUMENTATION

4.1. MARKINGS

The bellow control valves have a permanent marking in accordance with the requirements of the standard PN-EN19. Marking facilitates technical identification and includes:

- nominal diameter DN (mm),
- nominal pressure PN (bar),
- identification of the body and cover material,
- arrow indicating the direction of flow,
- symbol of the manufacturer,
- date of casting,
- CE mark for valves subject to Directive 2014/68/UE. The CE symbol only from DN32

Markings for actuators, positioners and additional equipment are on the housings and detailed information in the operating instructions.

4.2. APPLICATION

Bellows control valves with a pneumatic actuator and a positioner are used for smooth flow control. The stem is sealed through a flexible bellow and an additional stuffing box. The valve has the option of using two variants of pneumatic actuators, normally open SPO and normally closed SPZ, as well as two types of positioners:

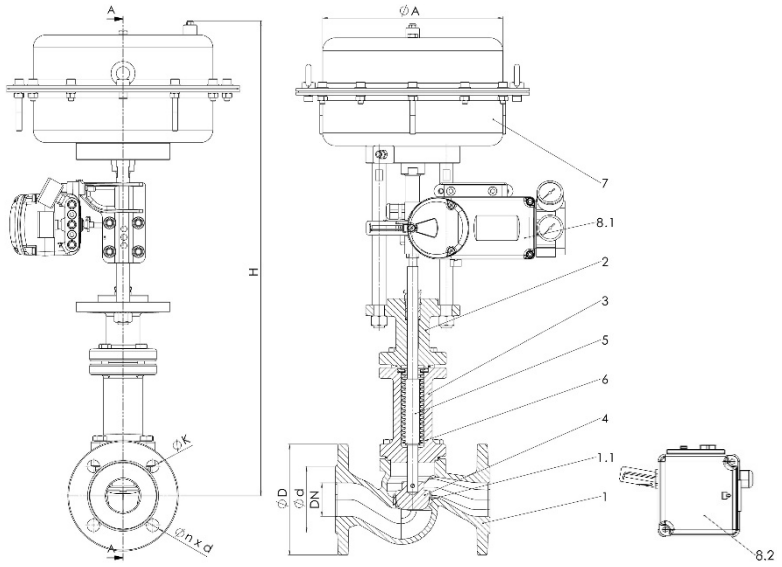
- SRI 986 – electro-pneumatic positioner controlled by 4-20mA current as standard,
- SRD998 – intelligent positioner with built-in display, adjustment is done with a knob, 4-20mA current controlled, diagnostics and auto-calibration possible.

More information in the operating instructions available on the manufacturer's website

Valve application:

- cold and hot industrial water installations,
- steam installations,
- heating and central heating installations,
- refrigeration and air conditioning installations,

4.3. MATERIALS AND DIMENSIONS



Item	Part name	Material		
1	Body	EN – GJL-250 5.1301 (ex. JL1040)	EN – GJS-400 – 18-LT 5.3103 (ex.JS1025)	GP240GH 1.0619
1.1	Body ring	X20Cr13 1.4021		DN15-50 X20Cr13 1.4021 DN65-150 Stellit
2	Upper cover	EN – GJS-400 – 18-LT 5.3103 (ex.JS1025)		EN – GJS-400 – 18-LT 5.3103 (ex.JS1025)
3	Bottom cover	EN – GJS-400 – 18-LT 5.3103 (ex.JS1025)		EN – GJS-400 – 18-LT 5.3103 (ex.JS1025)
4	Disc	X20Cr13 1.4021		
5	Stem	X20Cr13 1.4021		
6	Bellow	X6CrNiMoTi-17-12-2 1.4571		
7	Actuator	SPO (normally open actuator) SPZ (normally closed actuator)		
8.1	Positioner	SRD998 – intelligent positioner		
8.2		SRI 986 – electro-pneumatic positioner		

DN		15	20	25	32	40	50	65	80	100	125	150
L ((mm)		130	150	160	180	200	230	290	310	350	400	480
PN16	D (mm)	95	105	115	140	150	165	185	200	220	250	285
	K (mm)	65	75	85	100	110	125	145	160	180	210	240
	nxd (mm)	4x14	4x14	4x14	4x19	4x19	4x19	4x19	8x19	8x19	8x19	8x23
PN25	D (mm)	95	105	115	140	150	165	185	200	235	270	300
	K (mm)	65	75	85	100	110	125	145	160	190	220	250
	nxd (mm)	4x14	4x14	4x14	4x19	4x19	4x19	8x19	8x19	8x23	8x28	8x28
PN40	D (mm)	95	105	115	140	150	165	185	200	235	270	300
	K (mm)	65	75	85	100	110	125	145	160	190	220	250
	nxd (mm)	4x14	4x14	4x14	4x18	4x18	4x18	8x18	8x18	8x22	8x26	8x26
H (SPO;SPZ 280)		615	615	620	630	650	656	710	708	744	810	832
H (SPO;SPZ 530)		-	-	-	-	-	707	760	758	795	861	883
H (SPO;SPZ 1000)		-	-	-	-	-	-	820	818	855	921	943

4.4. TECHNICAL PARAMETERS

The operating pressure must be adjusted to the maximum temperature of the medium as per the table below

Acc. to EN 1092-2	**PN**		**-10 ÷120°C**	**150°C**	**200°C**	**250°C**	**300°C**	**350°C**		
EN – GJL-250	**16**	bar	16	14,4	12,8	11,2	9,6	-		
EN – GJS-400 – 18-LT	**16**		16	15,5	14,7	13,9	12,8	11,2		
EN – GJS-400 – 18-LT	**25**		25	24,3	23	21,8	20	17,5		
Acc. to EN 1092-1	**PN**		**-20÷ -10°C**	**-10÷ 50°C**	**10-100°C**	**150°C**	**200°C**	**250°C**	**300°C**	**350°C**
GP240GH+N	**40**	bar	30	40	37,1	35,2	33,3	30,4	27,6	25,7

Max. admissible closing pressures for the SOP actuator - normally open actuator

Actuator	**Supply pressure (kPa)**	**Nominal diameter DN**										
		15	**20**	**25**	**32**	**40**	**50**	**65**	**80**	**100**	**125**	**150**
		Maximum differential pressure (bar)										
SPO 280 (A=230)	**140**	21,5	16,8	11,7	7,9	5,8	3,6	-	-	-	-	-
	250	40	40	35,3	23,7	17,6	11	-	-	-	-	-
	400	40	40	40	40	34,2	21,5	-	-	-	-	-
SPO 530 (A=330)	**140**	-	-	-	-	-	4,9	2,9	2	1,3	-	-
	250	-	-	-	-	-	19	11,1	7,7	5,1	-	-
	400	-	-	-	-	-	38,7	22,7	15,7	10,5	-	-
SPO 1000 (A=474)	**140**	-	-	-	-	-	-	6,6	4,6	3	2	1,4
	250	-	-	-	-	-	-	22,5	15,6	10,4	6,9	4,9
	400	-	-	-	-	-	-	44	30,6	20,5	13,6	9,6

Max. differential pressure of closing for the SPZ actuator - normally closed actuator

Actuator	**Opening pressure (kPa)**	**Nominal diameter DN**										
		15	**20**	**25**	**32**	**40**	**50**	**65**	**80**	**100**	**125**	**150**
		Maximum differential pressure (bar)										
SPZ 280 (A=230)	**230**	25,0	16,0	9,0	3,0	-	-	-	-	-	-	-
SPZ 530 (A=330)	**250**	-	25,0	25,0	18,0	9,0	3,0	1,0	-	-	-	-
SPZ 1000 (A=474)	**310**	-	-	-	-	25,0	14,0	7,0	4,0	1,0	-	-

5. ASSEMBLY

Personnel directed to assembly, maintenance and operation works should be qualified to perform these works. If mechanical actuators are used on the valve, please observe the Operating Instructions for these actuators. If during operation of the valves hot parts of the body or cover can cause burns, the user is obliged to protect them against contact.

CAUTION Valves may only be installed by trained personnel

The pipeline to which the valves are mounted should be laid and mounted so that the valve body does not transfer bending moments and is not stretched.

The steam pipes must be routed in such a way as to prevent water accumulation

Valves must not be used in installations where their operating parameters exceed the permissible values.

Valves must not be used for media other than those prescribed for their use

The medium flow direction must be in the direction indicated by the arrow on the valve body.

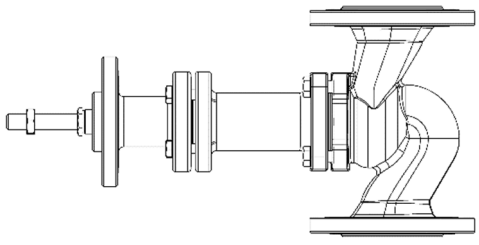
Connection of electric drives may only be carried out by trained and qualified personnel in accordance with the drive manufacturer's instructions which is supplied with the drive.

The control valve with actuator should be mounted with the spindle axis vertically with the actuator located above the valve

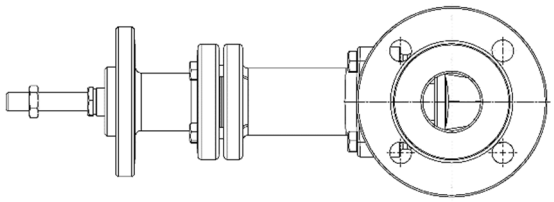
The installation of shut-off fittings on the vertical and horizontal pipelines in the horizontal position of the valve is allowed, shown in the figures below.

The weight of the drive must not exceed the permissible values:

Valve nominal diameter [DN]	Permissible drive weight [kg]
15-20	20
25-32	25
40-50	35
65-100	45
125-150	55



Installation on a vertical pipeline



Installation on a horizontal pipeline

Do not mount the valve with the actuator pointing downwards

It is forbidden to load valves with actuators with additional external forces

The following rules must be observed during installation:

- before installation, determine whether the valves are not damaged during shipment or storage,
- make sure that the used valves are suitable for working conditions and media in the given plant,
- pay attention to the flow direction of the medium, indicated by an arrow on the body,
- remove plugs if there are any,
- check the flanges of the pipeline on which the valve will be mounted, they should be smooth, coaxial and parallel to each other so that they do not cause additional stress when they are screwed with the valves,
- valves with actuators should be mounted so that the spindle axis is in vertical position,
- screw connections on the pipeline must not introduce additional stresses due to excessive tightening, and the type of materials of fasteners must be adapted to the operating parameters of the installation,
- when painting the pipeline, protect the valve stem and drive components,
- for welding the valves must be protected from splashes and the used plastics from excessive heat

The occurrence of a leak in the stuffing box indicates damage to the bellow. The upper part of the valve should be replaced immediately.

6. OPERATION

CAUTION

Before operating the valve with pneumatic drive for the first time, check the correct operation of the actuator and positioner

During initial start-up, check for leakage at the valve connections and through the valve gland. If there is a leak on the connecting flanges, tighten the screws until the leak is eliminated. In the event of a leak through the gland in the stuffing box valves, tighten the gland until the leak is eliminated. The occurrence of leakage through the stuffing box in the bellow valves indicates damage to the bellows, in this case the upper part of the valve should be replaced immediately.

Use extreme caution when handling the valve when it is mounted on a pipeline through which hot and/or aggressive medium flows.

During operation, the following rules should be observed:

- commissioning process - commissioning should be conducted in a way that eliminates the occurrence of sudden changes of temperature and pressure,
- in the event of a power outage or compressed air loss, the SPO actuator will open the valve, the SPZ actuator will close the valve (see drive manual),
- the operation of the installed valves can be checked by repeated opening and closing,
- to ensure safe operation, each valve, especially the one that is rarely operated should be regularly inspected

7. MAINTENANCE AND REPAIR

All service and repair works should be performed by qualified personnel using suitable tools and genuine replacement parts.

Before removing the complete valve from the pipeline or before maintenance, the given pipeline section should be put out of service and permanently disconnect electric and pneumatic power supply from the actuator and positioner.

In the event of leakage and leakage of a medium that is not neutral to the environment, protective measures must be taken.

CAUTION

To ensure safe operation, each valve, especially the one that is rarely operated, should be regularly inspected and maintained. The frequency of maintenance is determined by the user depending on the operating conditions, but at least once a month.

For maintenance and repair work:

- reduce the pressure and temperature of the valve to a safe level,
- use personal protective equipment appropriate to the risk involved,
- after removing the valve, replace the seals with which the valve is connected to the pipeline system,
- tightening of screw fasteners of covers should be done in the open state of the valve,
- when reassembling the valves, it is necessary to check the valve function and tightness of all connections before restarting

Tightening torques for screws:

Screw	Torque
M8	15-20 Nm
M10	35 -40 Nm
M12	65 – 70 Nm
M16	140 -150

8. CAUSES OF OPERATIONAL DISTURBANCES AND THEIR REMOVAL

When searching for causes of faulty operation of the valve, it is essential to comply with the safety regulations and guidelines in this manual.

Disturbance	Possible cause	Removal
No flow	Closed valve	Open the valve
	The flange caps have not been removed	Remove flange caps
Poor flow	Valve not open enough	Open the valve
	Dirty filter	Clean or replace the mesh
	Pipeline system clogged	Check the pipeline
Difficult valve control	Gland packing too tight	Slightly loosen the gland nuts
Leakage on the stem	Leaking gland packing	Tighten the gland fixing nuts until tight
	Bellow damage	Tighten the gland until it is tight. Replace the upper part of the valve as soon as possible.
Leakage on the socket	Incorrect closing	Check the correct operation of the drive torque switches and drive position switches
	Damaged socket or disc	Replace the valve. Turn to supplier or manufacturer.
	Too much pressure difference	Select the appropriate drive for the specified pressure difference
	Medium contaminated with solids	Clean the valve. Install the filter before valve.
Connection flange fracture	The fastening screws were tightened unevenly	Install a new valve

- when reassembling the valves, it is necessary to check the valve function and tightness of all connections before restarting. The leak test should be carried out with water at a pressure equal to 1.5 x the nominal pressure of the valve.

9. DECOMMISSIONING

After decommissioning and dismantling the valves must not be disposed of with household waste. Valves are made of recyclable materials. Deliver them to a recycling centre.

10. GUARANTEE CONDITIONS

- ZETKAMA grants a quality guarantee ensuring the proper functioning of its products, provided that they are installed in accordance with the user's manual and operated in accordance with the technical conditions and parameters specified in the ZETKAMA technical sheets. The guarantee period is 18 months from the date of installation, but not longer than 24 months from the date of sale.
- Assembly of third party parts and construction changes made by user as well as natural wear are not covered by the guarantee.
- The user should inform ZETKAMA about hidden defects immediately after they are found.
- The complaint must be made in writing.

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