



Manufacturer of shut-off and control valves

## TECHNICAL DATA SHEET

**Diaphragm pressure regulator “up to itself” with pilot control ELEPHANT PVB3-1313N-F DN50-200 16 bar cast iron, flanged**



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## 1. GENERAL PRODUCT INFORMATION

1.1. Product name: Diaphragm pressure regulator “up to itself” with pilot control ELEPHANT PVB3-1313N-F Du50-200 16 bar cast iron, flanged.

1.2. Purpose. Diaphragm pressure regulator “up to itself” with pilot control (hereinafter - MRDP) is designed to maintain the pressure of the working medium at the valve inlet by changing its flow rate, as well as to create a back pressure of the liquid in areas with height difference.

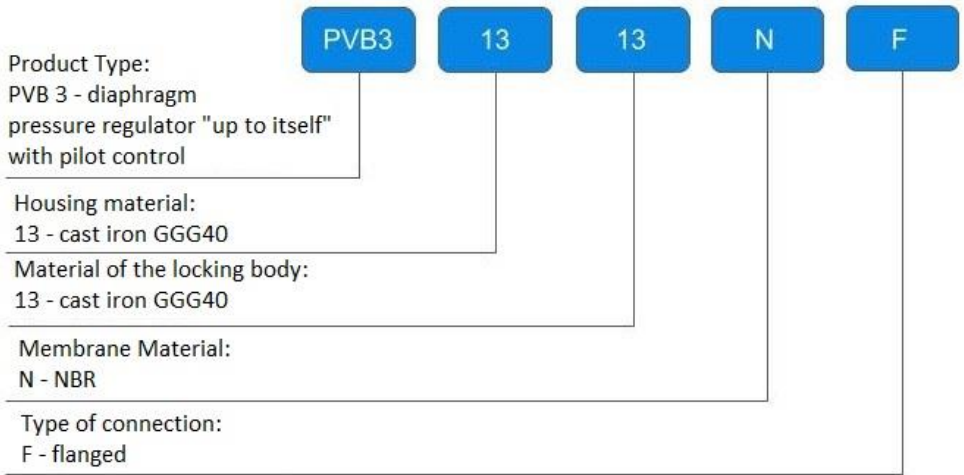
1.3. Working principle. The inlet pressure value is sensed by the energy of the medium supplied to a small pilot valve hydraulically connected to the pipeline, called a pilot. The valve closes completely when the upstream pressure falls below the set pressure. When the pressure upstream of the valve exceeds the set pressure, the pilot opens a port to discharge fluid from the control chamber, the valve opens ajar and maintains the upstream pressure at the set pressure (relieving only the overpressure). When the upstream pressure to the valve becomes lower than the set pressure, the valve closes again.



*\* the image may differ from the original*



#### 1.4. Deciphering of the designation:



## 2. BASIC TECHNICAL DATA AND CHARACTERISTICS

Table 1: Technical parameters.

Nominal diameter DN, mm	50 - 200
Nominal pressure PN, bar	16
Setting pressure, bar	0,5 ÷ 10
Working medium temperature t, °C	-10 to 80
Working medium	cold and hot water, steam, air
Working medium flow direction	arrow on the valve body
Tightness class	A
Pipeline connection	flange
Mounting position	horizontal / vertical
Body material	GGG40 cast iron
Areas of application	heating, water and heat supply, ventilation and air conditioning systems
Average service life, years	10
Completeness	valve; impulse tubes

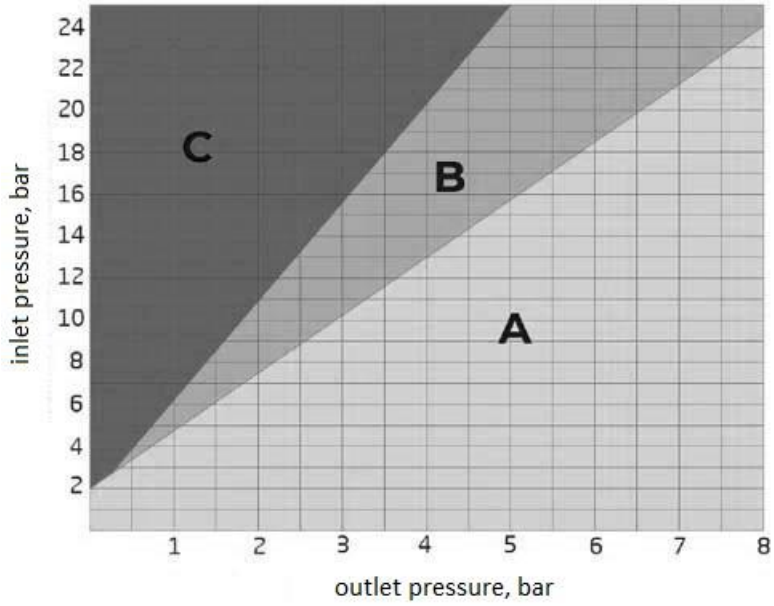
Table 2. Hydraulic characteristics.

	Conditional flow capacity Kv, m <sup>3</sup> /h	Maximum flow rate, m <sup>3</sup> /h
DN50	39	65
DN65	39	65
DN80	100	169
DN100	156	260
DN150	350	585
DN200	622	1 040

\* values are given for water with a density of 1000 kg/m<sup>3</sup> at a pressure drop of 1 bar.

### Кавитационный график





- A – recommended operating range
- B - initial cavitation
- C - cavitation noise



### 3. BASIC MATERIALS

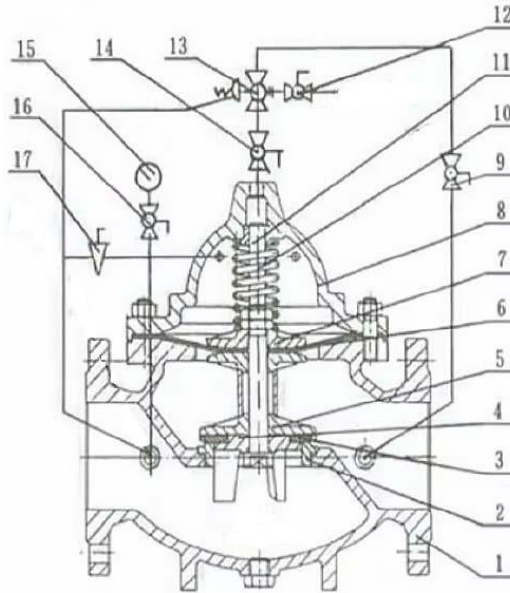


Table 3: Specification of materials.

Nº	Part Name	Material
1	Body	cast iron GGG40
2	Seat	cast iron GGG40
3	Seal	NBR
4	Stem	stainless steel 304
5	Disc	cast iron GGG40
6	Diaphragm	NBR
7	Disc	cast iron GGG40
8	Cover	cast iron GGG40
9	Ball Valve	(not included)
10	Spring	spring steel
11	Stem	stainless steel 304
12	Ball Valve	(not included)



Continuation of Table 3

№	Part name	Material
13	Pilot	bronze
14	Ball valve	(not included)
15	Pressure gauge	(not included)
16	Ball valve	(not included)
17	Needle valve	(not included)



#### 4. WEIGHT AND DIMENSIONAL PARAMETERS

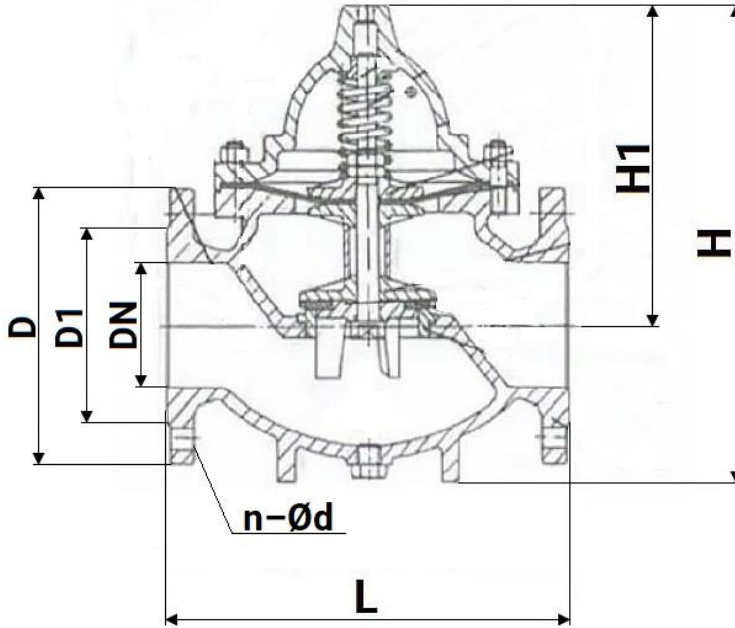


Table 4: Dimensional and weight characteristics.

DN	L, mm	H, mm	H1, mm	D, mm	D1, mm	n-Ød, mm	Weight, kg
50	250	505	90	165	125	4-Ø18	8,5
65	280	520	98	185	145	4-Ø18	10,0
80	310	535	110	200	165	8-Ø18	13,0
100	350	555	120	220	180	8-Ø18	18,0
150	450	645	155	285	240	8-Ø22	31,0
200	550	715	190	340	295	12-Ø22	53,0





## 5. PILOT WIRING DIAGRAM

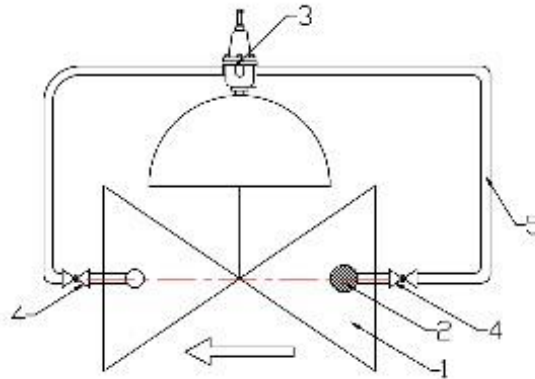


Table 5: Elements of pilot strapping.

Nº	Product Name
1	Main valve
2	Filter
3	Pilot
4	Ball valve
5	Pulse tube



## 6. INSTALLATION INSTRUCTIONS

6.1. Safety precautions during installation and operation of the MRDP must be observed in accordance with the procedure established at the enterprise.

6.2. Installation, operation and maintenance of the MRDP may be performed by the personnel who have studied the MRDP design, safety rules and requirements of this data sheet.

6.3. Before installation MRDPs are subjected to inspection and testing, it is necessary to make sure that there are no foreign objects in internal cavities of MRDPs.

6.4. At the place of installation MRDP should not be subjected to pipeline loads (bending, compression, tension, torsion, warping, vibrations, uneven tightening of fasteners, etc.).

6.5. The MRDP installation location should provide free access to it for installation, dismantling and maintenance works.

6.6. It is necessary to position the MRDP on the pipeline so that the direction of the arrow on the body coincides with the direction of the working medium. The MRDP can be installed both on the horizontal pipeline section (with the cover upwards) and on the vertical section.

6.7. To prevent foreign matter from getting into the MRDP, it is recommended to install a filter before the MRDP.

6.8. The process medium must not contain air, therefore it is necessary to install air vents before and after the main valve. This will avoid the formation of air pockets during operation, as well as ensure the release of air when filling the system and safe drainage without damage to the pipelines due to the formation of a vacuum in the pipeline.

6.9. When installing the MRDP on the pipeline, it is necessary to:

- provide conditions for its inspection, maintenance and repair works;
- use for moving the MRDP its surfaces designed for moving;
- thoroughly flush and blow out the pipeline if sand, cement, welding splashes and other foreign bodies are found in it;
- on all flange connections bolts should be tightened gradually one by one crosswise using a torque wrench when the valve is open;
- connecting flanges of the pipeline should be tightened gradually crosswise using a torque wrench when the valve is open; - connecting flanges of the pipeline should be tightened with a torque wrench when the valve is open.



- 6.10. Install the MRDP in the following sequence:
- install and fasten the regulator between the mating flanges of the pipeline in accordance with the installation drawing of the facility. Ensure that the direction of the pointer arrow on the body coincides with the direction of the working medium flow;
  - install gaskets between the flanges and fasten the flanges with fasteners. The gaskets should be installed without misalignment and correspond to the DN of the product.
- 6.11. In order to avoid formation of water hammer and pressure surges it is necessary to open the shut-off valves at the valve inlet by smooth and slow movements, without jerks.
- 6.12. To start the MRDP it is necessary to smoothly open the stop valves upstream and downstream of the valve and fill the pipelines and internal cavities of the valve with medium up to the operating pressure.
- 6.13. Set up the TIRF as follows:
- make sure that the shut-off valves upstream and downstream of the valve are fully open;
  - tighten the pilot spring using the adjusting bolt;
  - loosen the nut on the valve cover until the air is completely displaced from the chamber and screw it back in;
  - slowly turn the adjusting bolt to loosen the pilot spring tension until the valve setting pressure is reached;
  - tighten the pilot locking nut.



## **7. MAINTENANCE INSTRUCTIONS**

7.1. After start-up and setting of the required value of the regulated parameter the MRDP does not require further maintenance in the course of its operation, except for periodic external inspection within the period established by the schedule, depending on the system operation mode, but at least once every six months.

7.2. During the inspection the correctness of adjustment, presence or absence of medium leakage, external mechanical damage and foreign objects interfering with the operation of the MRDP are checked.

## **8. REPAIR INSTRUCTIONS**

8.1. Routine repairs are performed to maintain or restore the performance of the MRDP and consist of replacing the diaphragm, seals, and gaskets. Routine repair is performed by a non-disassembled method, where the components are still assigned to a particular instance of the MRDP.

8.2. When disassembling and assembling the MRDP, it is necessary to protect sealing and guiding surfaces of assembly units and parts, threads from mechanical damage.

8.3. Personnel performing current repairs shall have the qualification of a mechanic of repair or mechanical assembly works not lower than the third grade.

8.4. If a malfunction is detected, the MRDP should be dismantled from the pipeline for current repair. It is allowed to replace the failed components without removing the MRDP from the pipeline, if it is possible to take the MRDP out of operation during the repair (pressure shutdown).



## **9. SECURITY MEASURES**

9.1. Safety requirements for installation and operation of the MRDP in accordance with the procedure established at the enterprise.

9.2. MRDP operation is allowed only in the presence of operational documentation and safety instructions approved by the head of the enterprise-consumer and taking into account the specifics of MRDP application in a particular technological process.

9.3. The operating personnel may be allowed to service the MRDP only after receiving appropriate safety instructions.

9.4. The pressure and temperature of the working environment of the facility where the MRDP is installed, as well as the spring of the operating regulator may pose a danger to the life and health of the operating personnel.

9.5. It is strictly forbidden to carry out any work if the MRDP is under pressure of the working environment.

9.6. In order to avoid injuries it is not allowed to perform any actions in the area of the spring of the operating MRDP.



## 10. POSSIBLE MALFUNCTIONS AND REMEDIES

Table 6: Possible faults and remedies.

Nº	Fault	Possible cause	Remedy
1	The TIRF is not opening.	Shut-off valves installed upstream and downstream of the MRDP are closed.	Open the shut-off valves.
		Ball valves in the MRDP piping are closed (if any).	Open the ball valves in the piping.
		Excessive compression of the pilot valve spring.	Use the pilot valve adjusting bolt to adjust the pressure as described in section 6.13.
2	TIRF does not close.	Ball valves in the MRDP piping are closed (if any).	Open the ball valves or adjust the needle valve.
		The pilot spring is not compressed.	Use the pilot valve adjusting bolt to adjust the pressure as described in section 6.13.
		*MRDP membrane damage.	Replace the diaphragm.
3	Unstable regulation.	Presence of air in the control chamber of the MRDP.	Remove air. To do this, open the drain hole on the cover of the MPDP.

\* MRDP If there are ball valves in the MRDP piping, close the valves in the pilot piping and open the drain hole on the MRDP cover. If water continues to flow out, the diaphragm is damaged.



## 11. TRANSPORTATION AND STORAGE CONDITIONS

11.1. MRDP may be transported by any type of transport in accordance with the current cargo transportation rules and in compliance with the following requirements:

- transportation conditions should correspond to storage conditions in accordance with the procedure established at the enterprise;
- The MRDP must be packed and secured inside the crate;
- during loading and unloading, the packing crate must not be thrown or tilted.

11.2. MRDP should be stored in the manufacturer's packaging in closed warehouses at temperature from 5 to 50°C and relative humidity up to 80%, ensuring safety of the packaging and serviceability of the valves during the warranty period. Packing variant in accordance with the procedure established at the enterprise.

11.3. MRDP in long-term storage are subject to periodic inspection at least once a year. In case of violation of preservation, perform preservation again. Apply preservation lubricant on degreased clean and dry surface of parts. Degreasing should be performed with a clean rag soaked in gasoline.

11.4. In order to put into operation the MRDP, which has been fully preserved for long-term storage, it should be de-preserved by removing the preservation lubricant with a rag and then degreasing it with gasoline in accordance with the procedure established at the enterprise.

## 12. UTILIZATION

12.1. The product is disposed of in accordance with the procedure established at the enterprise (remelting, burial, resale).

12.2. Before sending the valve for disposal, the residual working medium shall be removed from the valve. Methods of removal of the working medium and decontamination of the valve must be approved in accordance with the established procedure at the company operating the valve.



### 13. WARRANTY OBLIGATIONS

13.1. Warranty period - 12 months from the date of commissioning, but not more than 18 months from the date of sale.

13.2. The warranty applies to equipment installed and used in accordance with the installation instructions and product specifications described in this data sheet.

13.3. The manufacturer guarantees compliance of the product with safety requirements, provided that the consumer complies with the rules of transport, storage, installation and operation.

13.4. The warranty covers all defects caused by the fault of the manufacturer.

13.5. The warranty does not apply:

- parts and materials of the product subject to wear and tear;
- for cases of damage caused by:
  - modifications to the original design of the product;
  - violation of general installation recommendations;
  - faults caused by improper maintenance and storage; improper operation and use of the equipment.

### 14. WARRANTY TERMS

14.1. Claims to the quality of the goods may be made during the warranty period.

14.2. Defective products are repaired or exchanged for new ones free of charge during the warranty period. ELEPHANT decides whether to replace or repair the product. The replaced product or its parts resulting from the repair shall become the property of 'ELEPHANT'.

14.3. Costs related to dismantling, installation and transport of the defective product during the warranty period shall not be reimbursed to the Buyer.

14.4. If the claim is unfounded, the Buyer shall pay the costs of diagnostics and expertise of the product.

14.5. Products are accepted for warranty repair (as well as for return) fully assembled.





## WARRANTY CARD № \_\_\_\_\_

№	Product Name	Packs

Name and address of the trading organisation \_\_\_\_\_

Date of sale \_\_\_\_\_ Seller's signature \_\_\_\_\_

Stamp or seal of the trading organisation \_\_\_\_\_ Acceptance stamp \_\_\_\_\_

I agree with the terms and conditions of the warranty:

Buyer \_\_\_\_\_ (signature)

Warranty period - 12 months from the date of commissioning, but not more than 18 months from the date of sale.

For warranty repairs, complaints and product quality claims, please contact ELEPHANT at: Carrer d'Aragó,264,3-1,08007 Barcelona, Spain E-mail address: sales@valveelephant.com.

When making a complaint about the quality of goods, the buyer shall present the following documents:

1. A free-form application, which shall specify:
  - name of the organisation or full name of the buyer, actual address, contact telephone numbers;
  - name and address of the organisation that carried out the installation;
  - basic parameters of the system in which the product was used;
  - a brief description of the defect.
2. Document confirming the purchase of the product (delivery note, receipt)..
3. Act of hydraulic test of the system in which the product was installed.
4. This completed warranty card.

A note on the return or exchange of goods \_\_\_\_\_

Date: « \_\_\_ » \_\_\_\_\_ 202\_\_ r. Caption \_\_\_\_\_

