

BOSSTM

GAS PRESSURE REGULATOR

356

DN125 - DN 150



CE  II 2G - II 2D

MADE IN ITALY

EN

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1.0 - GENERAL INFORMATION

This manual shows you how to safely install, operate and use the device.

The instructions for use **ALWAYS** need to be available in the facility where the device is installed.

ATTENTION: installation/maintenance needs to be carried out by qualified staff (as explained in section 1.3) by using suitable personal protective equipment (PPE).

For any information pertaining to installation/maintenance or in case of problems that cannot be solved with the instructions, contact the manufacturer at the address and phone numbers provided on the last page.

1.1 - DESCRIPTION

Device which supplies a preset and constant "downstream" pressure value (P2) (within the intended operating limits) according to variations in the inlet pressure (P1) and/or the flow rate (Q). The compensated obturator ensures precision when adjusting the outlet pressure (P2) even with high and sudden variations in the inlet pressure.

It is fitted with:

- a spring to adjust the outlet pressure;
- an outlet pressure test nipple (with some exceptions) to control the outlet pressure (P2). On some models, the pressure test nipple is also installed on the input;

Component designed for industrial use in industrial sites.

Reference standards: EN 88-1 – EN 13611.

1.2 - KEY OF SYMBOLS



DANGER: Inobservance may cause damage to property.



DANGER: Inobservance may cause damage to property, to people and/or pets.



ATTENTION: Attention is drawn to the technical details intended for qualified staff.

1.3 - QUALIFIED STAFF

These are people who:

- Are familiar with product installation, assembly, start-up and maintenance;
- Know the regulations in force in the region or country pertaining to installation and safety;
- Have first-aid training.



1.4 - USING NON-ORIGINAL SPARE PARTS

- To perform maintenance or change parts (e.g. spring, membrane, etc.) **ONLY** manufacturer-recommended spare parts must be used. Using different parts not only voids the product warranty, but could compromise correct operation of the device.
- The manufacturer is not liable for malfunctions caused by unauthorised tampering or use of non-original spare parts.



1.5 - IMPROPER USE

- The product must only be used for the purpose it was built for.
- It is not allowed to use fluids other than those expressly stated.
- The technical data set forth on the rating plate must not, under any circumstances, be exceeded. The end user or installer is in charge of implementing correct systems to protect the device, which prevent the maximum pressure indicated on the rating plate from being exceeded.
- The manufacturer is not responsible for any damage caused by improper use of the device.

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2.0 - TECHNICAL DATA

• Use	: non-aggressive gases of the three families (dry gases)
• Ambient temperature (TS)	: $-15 \div +60$ °C
• Maximum operating pressure	: 0.5 bar
• Minimum flow rate	: 50 m ³ /h gas
• Class	: A (P2 \pm 15%)
• Mechanical resistance	: Group 2 (according to EN 13611)
• Flanged connections that can be coupled to PN 16 flanges	: (DN 125 - DN 150) ISO 7005 / EN 1092-1
• ANSI 150 flanged connections	: on request
• In compliance with	: ATEX Directive 2014/34/EU

2.1 - MODEL IDENTIFICATION

35501334: DN 125 P2: 15÷30 mbar

35501335: DN 150 P2: 15÷30 mbar

3.0 - COMMISSIONING THE DEVICE



3.1 - OPERATIONS PRIOR TO INSTALLATION

- It is necessary to close the gas upstream of the device prior to installation;
- Make sure that the line pressure **DOES NOT EXCEED** the maximum pressure declared on the product label;
- Protective caps (if any) must be removed prior to installation;
- The pipes and inside of the device must be clear of any foreign bodies;
- **IMPORTANT:** to avoid possible pumping and/or disturbances in the gas flow, a straight pipe section equal to at least 5 DN must be installed (downstream of the regulator).
- **IMPORTANT:** install manual gas closing devices (e.g. ball valves) upstream and downstream of the regulator to protect it from any pipe leak test;
- Make sure the inlet and outlet counter-flanges are perfectly coaxial and parallel in order to prevent unnecessary mechanical stress to the body. Also calculate the space to insert the seal gasket;
- With regard to tightening operations, equip yourself with one or two calibrated torque wrenches or other controlled locking tools;
- The safety regulations on handling loads in force in the country of installation must be complied with. If the device being installed exceeds the allowed weight, suitable mechanical equipment and adequate slings must be used. IT IS recommended to use special lifting eyebolts (**16**). NECESSARY precautions must be taken during the handling phases to avoid damaging/ruining the external surface of the device.
- It is recommended to install a suitable filter upstream of the device;
- With outdoor installation, it is advisable to install a protective roof to prevent rain from oxidising or damaging parts of the device.



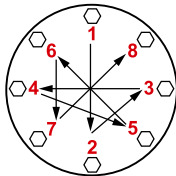
- According to the plant geometry, check the risk of an explosive mixture arising inside the piping;
- If the regulator is installed near other devices or as part of an assembly, compatibility between the regulator and these devices must be evaluated beforehand;
- Provide protection against impact or accidental contact if the device is accessible to unqualified staff.



3.2 - INSTALLATION (see example in 3.4)

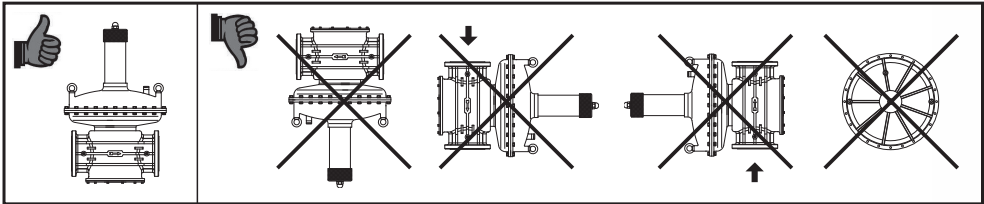
- Assemble the device by flanging it, with the due seals, onto the plant with pipes whose flanges are consistent with the connection being attached. The gaskets must not have any defects and must be centred between the flanges;

- If, after installing the gaskets, there is still an excessive space in between, do not try to reduce said gap by excessively tightening the bolts of the device;
- The arrow, shown on the body (**6**) of the device, needs to be pointing towards the application;
- Insert the relative washers inside the bolts in order to prevent damage to the flanges during tightening;
- When tightening, be careful not to “pinch” or damage the gasket;
- Tighten the nuts or bolts gradually, in a “cross” pattern (see the example below);
- Tighten them, first by 30%, then by 60% and finally 100% of the maximum torque (see the table below according to EN 13611);



Diameter	DN 125	DN 150
Max. torque (N.m)	160	160

- Tighten each nut and bolt again clockwise at least once, until the maximum torque has been achieved uniformly;
- The regulator is normally positioned before the application. **ONLY** install the device in the position permitted (see the figure below and installation example in 3.4);



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- During installation, avoid debris or metal residues from getting into the device;
- To guarantee mechanical tension-free assembly, we recommend using compensating joints, which also adjust to the pipe's thermal expansion;
- **IMPORTANT:** connect the pulse outlet (**13**) with a G 3/8 fitting downstream of the regulator (see installation example in 3.4)
- If the device needs to be installed in a ramp, it is the installer's responsibility to provide suitable supports or correctly sized supports to properly hold and secure the assembly. Never, for any reason whatsoever, leave the weight of the ramp resting only on the connections (threaded or flanged) of the individual devices;
- In any case, after installation check the tightness of the system, without subjecting the membrane of the regulator (therefore, the downstream pipe section) to a pressure higher than 300 mbar.

3.3 - INSTALLATION IN PLACES WHERE THERE IS THE RISK OF EXPLOSION (DIRECTIVE 2014/34/EU)

The regulator complies with Directive 2014/34/EU as a group II equipment, category 2G and as group II equipment, category 2D; consequently, it is suited for installation in zones 1 and 21 (besides zones 2 and 22) as classified in Annex I of Directive 99/92/EC.

The regulator is not suited for use in zones 0 and 20 as defined in the aforementioned Directive 99/92/EC.

To determine the qualification and size of the danger zones, please refer to standard IEC EN 60079-10-1.

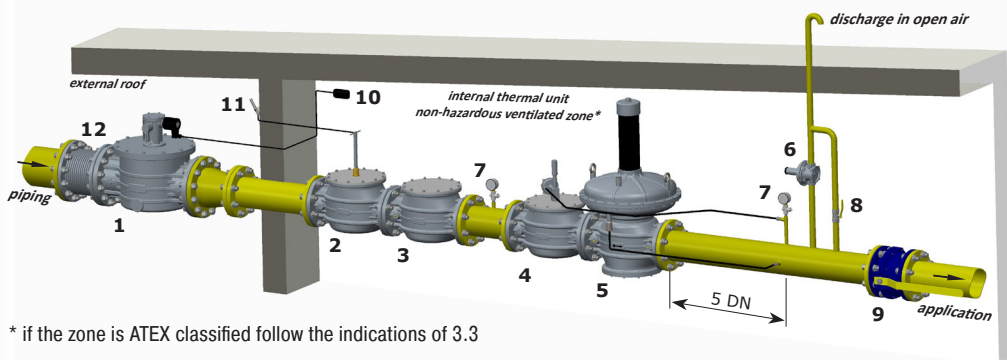
If the device is installed and serviced in full compliance with all the conditions and technical instructions provided in this document, it does not pose a source of specific hazards: in particular, under normal operating conditions, the regulator emits a flammable substance into the atmosphere **ONLY** if the working membrane (**15**) malfunctions: in which case (and only if) the regulator constitutes a source of emission of explosive atmosphere of continuous degree and, as such, can generate danger zones 99/92, as defined in Directive 99/92/EC.

In particularly critical installation conditions (unattended areas, poor maintenance or poor ventilation) and especially if there are potential sources of ignition and/or hazardous equipment near the regulator in regular operation, as they may generate electric arcs or sparks, a preliminary assessment of the compatibility between the regulator and such equipment must be carried out.

In any case, every useful precaution must be adopted so as to prevent the regulator from generating zones 0: for example, annually verify regular operation, possibility of changing the degree of emission of the source or intervening on the external explosive substance discharge. For this purpose the threaded hole of the top cover (3) can be connected to the outside (using appropriate fittings and pipes) by removing the dust cap (4).

3.4 - GENERIC EXAMPLE OF AN INSTALLATION

- | | |
|---------------------------------------|--|
| 1. Manual reset solenoid valve | 7. Pressure gauge and relative button |
| 2. Jerk ON/OFF valve | 8. Vent valve |
| 3. Gas filter | 9. Ball valve |
| 4. OPSO shut off valve | 10. Gas detector |
| 5. 356 BOSS pressure regulator | 11. Remote jerk ON/OFF valve lever control |
| 6. Relief valve | 12. Expansion joint/anti-vibration mount |



* if the zone is ATEX classified follow the indications of 3.3



4.0 - FIRST START-UP

Before commissioning, verify that:

- all of the instructions on the rating plate, including the direction of flow, are observed;
- the holes of the dust cap (4) are not clogged.



• **IMPORTANT:** The leak test of the piping must be performed without subjecting the membrane of the regulator (therefore, the downstream pipe section) to a pressure higher than 300 mbar. Use special manual gas closing devices to avoid damaging the regulator;

- The pressurisation manoeuvre of the equipment must be carried out very slowly so as to avoid possible damage.

NOTE: under no circumstances should a blind cap be placed instead of the dust cap (4) as the regulator may not work;

- Open the downstream vent valve partially;
- Slowly open the upstream shut-off devices (e.g. solenoid valves, OPSO shut-off valve, etc.);
- Wait until the downstream pressure stabilises at the calibration value P2 of the spring (indicated on the rating plate);
- Close the vent valve;
- Check the tightness of all the system gaskets and check the internal/external tightness of the regulator;
- Open the downstream shut-off valve very slowly;
- Check the operation of the regulator.



4.1 - RECOMMENDED PERIODIC CHECKS

- Use a suitable calibrated tool to ensure the bolts are tightened as indicated in 3.2;
- Check the tightness of the flanged/threaded connections on the system;
- Check the tightness and operation of the regulator;

The final user or installer is responsible for defining the frequency of these checks based on the extent of the service conditions.



4.2 - ADJUSTING THE OUTLET PRESSURE

Before starting the system, make sure that the spring supplied with the regulator is suitable for the desired adjustment pressure. The P2 output pressure (unless specifically requested) is factory set at approximately the minimum calibration value. Adjust the outlet pressure as follows:

- Set the adjustment screw **(1)** at minimum calibration;
- Start the system or make sure there is a minimum flow downstream of the regulator;
- To increase the pressure calibration downstream of the regulator, tighten the adjustment screw **(1)** to the desired value. Perform the reading with a calibrated pressure gauge, installed downstream of the regulator to at least 5 DN (see example in 3.4);
- Use pressure outlets **(11)** on the device only for zero flow or very low flow measurements.



4.3 - REPLACING THE SPRING



The step must be carried out without gas inside the regulator.

- **IMPORTANT:** Springs that are: Grey, Red, Brown use the upper spring guide **(21)** code RP-0150/SX
Spring colours: Yellow, Black use the upper spring guide **(21)** code RP-0155/SX

Replace the spring as follows:

- Completely loosen the adjustment screw **(1)** to the stroke end;
- Unscrew the cap **(22)** from the pipe **(19)**;
- Remove the spring **(20)** from inside the pipe **(19)**;
- If necessary (check spring colour), the upper spring guide **(21)** must be replaced as follows:
 - Remove the pin **(18)**;
 - Keeping the cap **(22)** blocked, turn the fastening screw **(1)** clockwise until the spring guide **(21)** is released from the guide pin **(2)**;
 - Remove the spring guide **(21)** completely by turning it clockwise;
 - Fit the new spring guide at the end of the threaded bar **(23)**;
 - Turn the new spring guide anticlockwise in order to secure the threaded bar **(23)**, until it is coupled with the pin **(2)**;
 - Keeping the cap **(22)** blocked in place, turn the adjustment screw **(1)** anticlockwise until the spring guide is at the opposite end of the threaded bar **(23)**;
 - Reassemble the pin **(18)**.
- Insert the new adjustment spring, making sure to position it correctly inside the lower spring guide **(17)**.
- Screw the cap **(22)** to the pipe **(19)**.
- Adjust the output pressure as indicated in 4.2.



5.0 - MAINTENANCE

No maintenance operations need to be carried out inside the device.

NOTE: if an internal inspection is required, it is recommended to:

- Also check the integrity of the obturator **(9)** and, if necessary, replace the rubber seal **(10)**;
- Replace the gaskets before reassembling.
- It is recommended to contact the Technical Department to check or replace the membrane(s).



- In any case, before carrying out any dismantling operation on the device, make sure that there is no pressurised gas inside.

6.0 - TRANSPORT, STORAGE AND DISPOSAL

- During transport the material needs to be handled with care, avoiding any impact or vibrations to the device;
- If the product has any surface treatments (ex. painting, cataphoresis, etc) it must not be damaged during transport;
- The transport and storage temperatures must observe the values provided on the rating plate;
- If the device is not installed immediately after delivery it must be correctly placed in storage in a dry and clean place;
- In damp facilities, it is necessary to use driers or heating to avoid condensation.
- At the end of its service life, the product must be disposed of in compliance with the legislation in force in the country where this operation is performed.

7.0 - WARRANTY

The warranty conditions agreed with the manufacturer at the time of the supply apply.

Damage caused by:

- Improper use of the device;
- Failure to observe the requirements described in this document;
- Failure to observe the regulations pertaining to installation;
- Tampering, modification and use of non-original spare parts;

is not covered by the rights of the warranty or compensation for damage.

The warranty also excludes maintenance work, the assembly of parts or non-original spare parts, making changes to the device and natural wear.

8.0 - RATING PLATE DATA

The rating plate data (see example provided here) includes the following:

- Manufacturer's name/logo and address
- Mod.: = device name/model followed by the connection diameter
- P1 max = Maximum pressure or inlet pressure range that product operation is guaranteed at
- TS = Temperature range that product operation is guaranteed at
- P2 = Outlet pressure range
- Cl. A = Tolerance on P2 (A = $\pm 15\%$)
- Gr. 2 = Mechanical resistance group 2 in accordance with EN 13611
- EN 88-1 = Product reference regulation
- = In compliance with ATEX Dir. followed by the protection mode
- year = Year of manufacture
- Lot = Product serial number (see explanation below)
 - U2002 = Lot issued in year 2020 in the 2nd week
 - 1728 = progressive job order number for the indicated year
 - 00002 = progressive number referring to the quantity of the lot

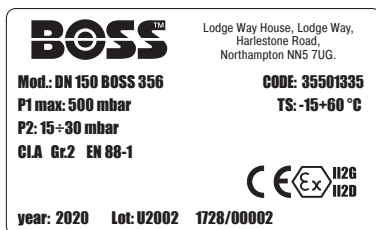
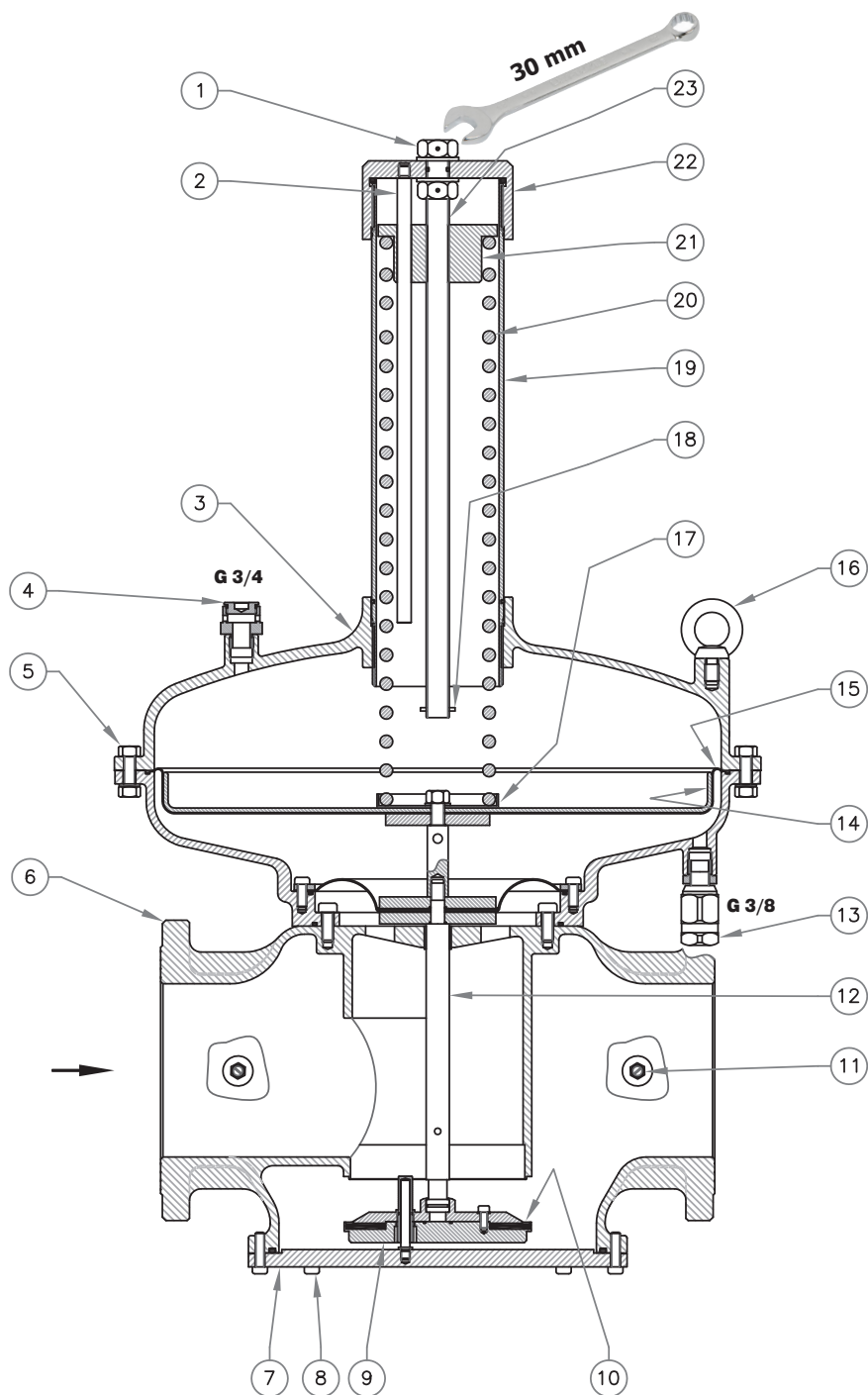


fig. 1
DN 125 - DN 150



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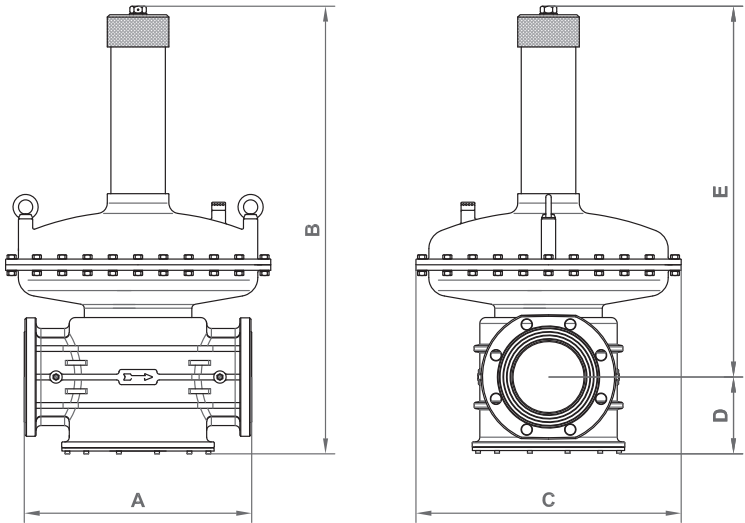
fig. 1

1. Adjustment screw P2
2. Guide pin
3. Top cover
4. Dust cap
5. Top cover clamping screws
6. Body
7. Bottom
8. Bottom fastening screws
9. Obturator
10. Sealing washer
11. Pressure test nipple
12. Centre pin
13. G 3/8 pulse output to connect downstream of the regulator
14. Membrane disc
15. Working membrane
16. Lifting eyebolt
17. Lower spring guide
18. Cylindrical pin
19. Spring container pipe
20. Calibration spring
21. Upper spring guide
22. Closing cap
23. Threaded bar

Table 1

Overall dimensions in mm

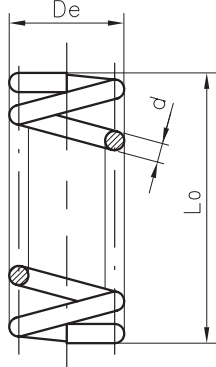
Flanged connections	Holes	A	B=(D+E)	C	D	E
DN 125 - DN 150	8	480	985	560	178	807



The dimensions are provided as a guideline, they are not binding

Table 2

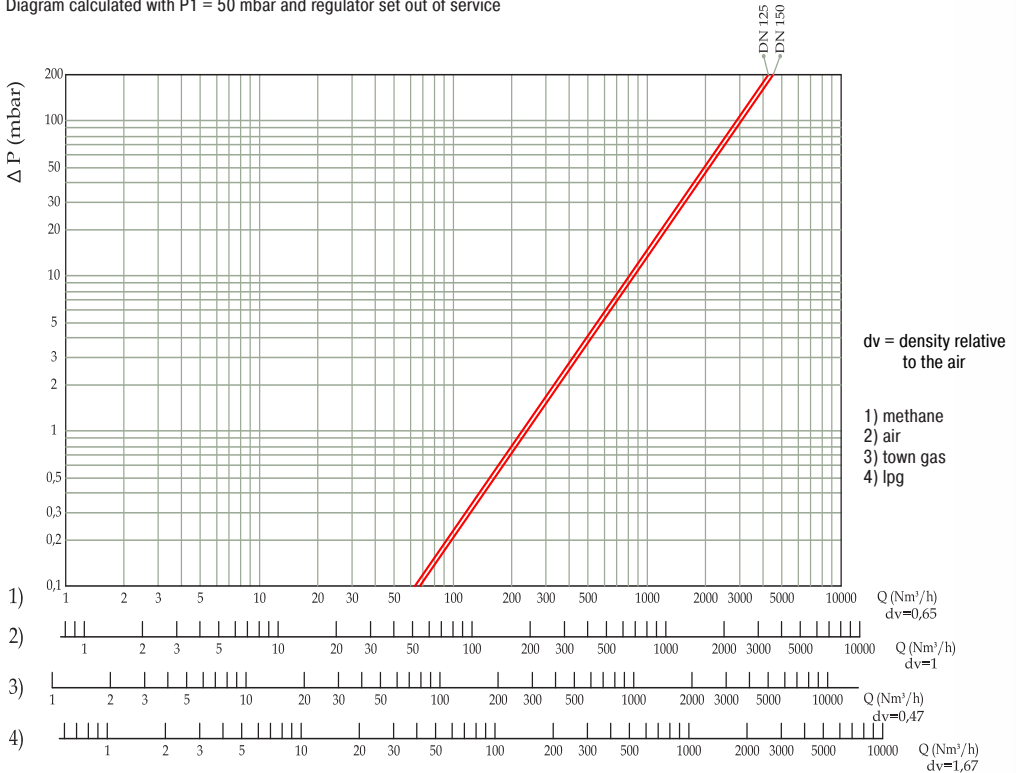
Regulation spring data

Connections	dimensions in mm	Spring code	Spring color	Setting (mbar)	 <p>it= total number of turns</p>
	(d x De x Lo x it)				
DN 125 DN 150	6x100x550x17	MO-8100	neutral	15 ÷ 30*	
	11x100x395x16	MO-8400	red	30 ÷ 150	
	11,5x100x420x14	MO-8500	brown	100 ÷ 250	
	13x100x460x17,5	MO-8600	yellow	230 ÷ 350	
	15x100x460x17,5	MO-8700	black	300 ÷ 450	

* Standard setting

Capacity diagram

Diagram calculated with P1 = 50 mbar and regulator set out of service



We reserve the right to any technical and construction changes.



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