



**GAS PRESSURE REGULATOR**

**356**


**P1 max 500 mbar**

**DN15 - DN 20 - DN 25 - DN 32 - DN 40 - DN 50  
DN 65 - DN 80 - DN 100**



**EN**

**CE-51CL4012/ED01**

**CE**  **II 2G - II 2D**

**CE** **0051**

**MADE IN ITALY**

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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 by using 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) when the inlet pressure (P1) and/or the flow rate (Q) changes. The compensated obturator ensures precision when adjusting the outlet pressure (P2) even in the case of high and sudden variations in the inlet pressure.

It is fitted with:

- a spring to adjust the outlet pressure;
- a safety membrane;
- output pressure test nipple (with some exceptions) to control the outlet pressure (P2). On some models the pressure test nipple is also present on the input;

Reference standards: EN 88-1 – EN 13611.

### 1.2 - KEY OF SYMBOLS



**DANGER:** In the event of inobservance, this may cause damage to tangible goods.



**DANGER:** In the event of inobservance, this may cause damage to tangible goods, 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;
- Are trained in first aid.



### 1.4 - USING NON-ORIGINAL SPARE PARTS

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

## 2.0 - TECHNICAL DATA

- Use : non-aggressive gases of the three families (dry gases)
- Ambient temperature (TS) : -15 ÷ +60 °C
- Maximum operating pressure : 500 mbar
- Class : A (P2 ± 15%)
- Mechanical resistance : Group 2 (according to EN 13611)
- Rp threaded connections in line : (DN 15 - DN 20 - DN 25 - DN 32 - DN 40 - DN 50) according to EN 10226
- Flanged connections that can couple with PN 16 flanges : (DN 65 - DN 80 - DN 100) ISO 7005 / EN 1092-1
- Rc or NPT threaded or ANSI 150 flanged connections : on request
- In compliance with : Regulation (EU) 2016/426 (Appliances burning gaseous fuels)  
ATEX Directive 2014/34/EU

## 2.1 - MODEL IDENTIFICATION

<b>35501216:</b>	Rp 1/2	DN 15	P2: 18÷40 mbar
<b>35501238:</b>	Rp 3/4	DN 20	P2: 18÷40 mbar
<b>35501260:</b>	Rp 1	DN 25	P2: 18÷40 mbar
<b>35501271:</b>	Rp 1 1/4	DN 32	P2: 13÷23 mbar
<b>35501282:</b>	Rp 1 1/2	DN 40	P2: 13÷23 mbar
<b>35501293:</b>	Rp 2	DN 50	P2: 13÷23 mbar
<b>35501301:</b>		DN 65	P2: 13÷27 mbar
<b>35501312:</b>		DN 80	P2: 13÷27 mbar
<b>35501323:</b>		DN 100	P2: 15÷27 mbar

## 3.0 - COMMISSIONING THE DEVICE

EN



### 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;
  - If the device is threaded:
    - make sure that the pipe thread is not too long, to prevent damaging the body of the device when screwing it on;
  - If the device is flanged:
    - 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 to be installed exceeds the weight allowed, suitable mechanical equipment and adequate slings must be used. Necessary precautions must be taken during the handling phases so as not to damage/ruin the external surface of the device.
- If the regulator is not fitted with a filter, it is advisable to install an adequate filter upstream;
- 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 a protection against impacts or accidental contacts if the device is accessible to unqualified personnel.





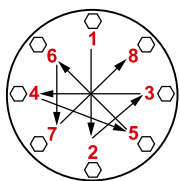
## 3.2 - INSTALLATION (see example in 3.4)

### Threaded devices:

- Assemble the device by screwing it, with the due seals, onto the plant with pipes and/or fittings whose threads are consistent with the connection being attached.
- Do not use the neck of the top cover (**4**) as a lever to help you screw it on, only use the specific tool;
- The arrow, shown on the body (**11**) of the device, needs to be pointing towards the application;

### Flanged devices:

- 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 be free from 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 the said gap by excessively tightening the bolts of the device;
- The arrow, shown on the body (**11**) 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);

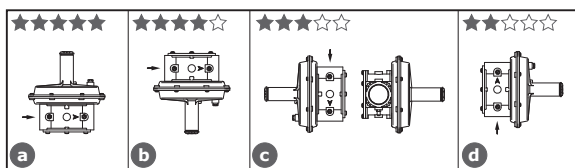


Diameter	DN 65	DN 80	DN 100
Max. torque (N.m)	50	50	80

- Tighten each nut and bolt again clockwise at least once, until the maximum torque has been achieved uniformly;

### Common procedures (threaded and flanged devices):

- The regulator is normally positioned before the utility. Primarily evaluate the possibility of installing the regulator as shown in the installation example in 3.4, namely in an optimal position pos. **a** (see figures below);
- Should this not be possible, the following factors must be considered:
  1. if installed as shown in pos. **b** the maximum P2 value declared on the rating plate could be less by a few mbar.
  2. if installed as shown in pos. **c** the life span of the product could be shorter than the duration that could be obtained if installed in the optimal position **a**;
  3. if installed as shown in pos. **d**, besides that indicated for pos. **c** it is recommended to install a filter after the regulator that protects it from debris that could enter from downstream from above (due to gravity);



- 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;
- If the device is 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 only on the connections (threaded or flanged) of the individual devices;
- In any case, after the installation check the tightness of the system, avoiding to subject 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 device of group II, category 2G and as device of group II, 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.

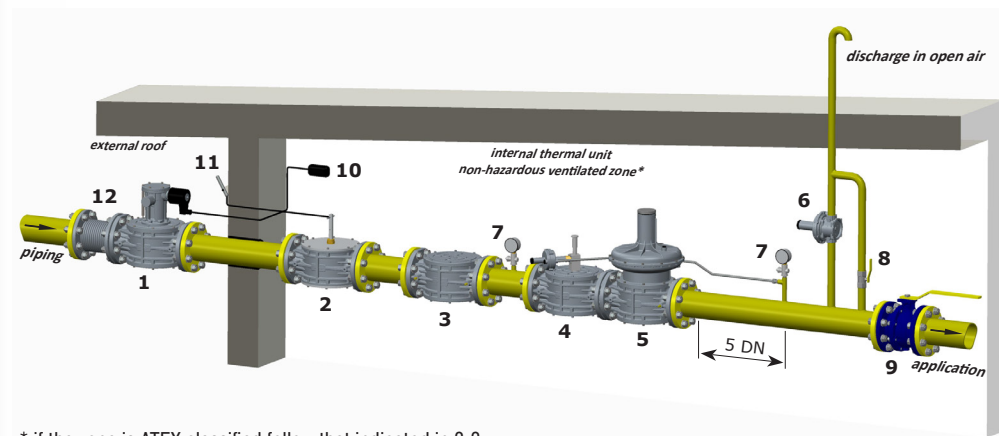
If the device is installed and serviced in full compliance with all the conditions and technical instructions provided in this document, it does not pose a source of specific hazards: in particular, under normal operating conditions, the regulator emits a flammable substance into the atmosphere ONLY if both the working membrane (9) and the safety membrane (7) malfunction: in which case (and only if so), the regulator constitutes a source of emission of explosive atmosphere of continuous degree and, as such, it can generate danger zones 0, 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 (4) can be connected to the outside (using appropriate fittings and pipes) by removing the dust cap (6).

### 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                           |
| <b>5. 356 BOSS pressure regulator</b> | 11. Remote jerk ON/OFF valve lever control |
| 6. Relief valve                       | 12. Expansion joint/anti-vibration mount   |



\* if the zone is ATEX classified follow that indicated in 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 (6) are not clogged.



• **IMPORTANT:** The leak test of the piping must be performed while avoiding to subject the membrane of the regulator (therefore, the downstream pipe section) to a pressure higher than 300 mbar. Use special manual gas closing devices to prevent 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 (6) 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 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 calibration 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;

It is the responsibility of the final user or installer to define the frequency of these checks based on the severity 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 outlet pressure P2 (unless specifically requested) is factory set with the top cover (4) positioned as shown in 3.2 a and with the adjustment screw (2) set approximately at the minimum calibration value.

If the regulator is installed in different positions, check and reset the outlet pressure P2.

Adjust the outlet pressure as follows:

- Unscrew the cap (1);
- Unscrew the adjustment screw (2) and set it to the minimum calibration allowed (threaded end of the top cover (4));
- 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 (2) 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);
- Screw the cap (1) back on and if necessary, seal it in that position using the appropriate seal holes (if present);
- Use pressure outlets (13) 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.

Replace the spring as follows:

- Unscrew and remove the cap (1) from the top cover (4);
- Completely loosen and take out the adjustment screw (2);
- Remove the spring washer (26);
- Remove the spring (3) from the top cover (4) and replace it with the new spring;
- Place the washer (26) on the new spring once again;
- Tighten the adjustment screw (2) and after starting the system as shown in 4.0, set the outlet pressure to the desired value as shown in 4.2;
- Screw the cap (1) back on and if necessary, seal it in that position using the appropriate seal holes (if present);



## 5.0 - MAINTENANCE



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

### Check the condition of the filtering element (21) as follows\*

- Loosen the fastening screws (17) and very carefully remove the bottom cover (16) from the body (11);
- Extract the filter element and check its conditions. Blow it and clean it and, if necessary, replace it (see figures "a" and "b" below for the positioning);
- Check the conditions of the sealing O-Ring of the bottom cover (16) and replace if necessary;
- Make sure the sealing O-Ring (18) of the bottom cover (16) is inside the relevant groove before putting it back on;
- Reassemble the bottom cover (16) and secure it in its original position, being very careful not to "pinch" or damage the O-ring during tightening.

#### IMPORTANT:

1. for DN 15 ÷ DN 50 connections make sure that the centre pin (10) is centred in the guide of the bottom cover (16);
  2. for DN 65 - DN 80 - DN 100 connections pay attention to the Teflon split ring (14): when reassembling the bottom cover (16) it must be placed inside the specific guide (as shown in figure 3);
- Tighten the screws gradually, following a "cross" pattern, until the torque (tolerance -15%) indicated in table 2 on page 13 is reached. Use a calibrated torque wrench to do this.
  - Check the body/cover seal;

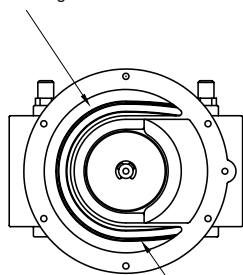
**NOTE:** for internal inspections, it is recommended to:

- Also check the obturator's integrity and, if necessary, replace the rubber seal (15);
- Replace the seals before reassembling.
- It is recommended to contact the Technical Department to check or replace the membranes.

EN

**fig. a:** DN 15 ÷ DN 50 cover without bottom cover

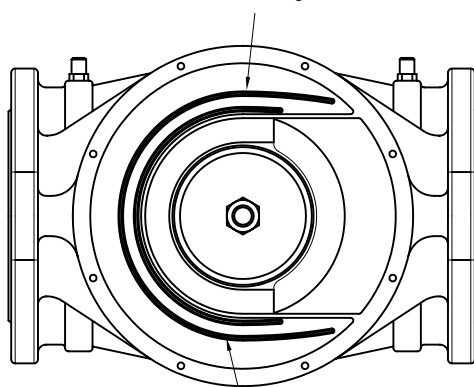
Filter element guides



The filter element must be placed inside these guides

**fig. b:** DN 65 ÷ DN 100 cover without bottom cover

Filter element guides



The filter element must be placed inside these guides

\* Only for versions equipped with an internal filter.



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 humid facilities, it is necessary to use driers or heating to avoid condensation.
- At the end of its service life, the product is to 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.

For damage caused by:

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

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

The warranty also excludes maintenance work, other manufacturers’s assembling units, 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
- CE-51CL4012/ED01 = certification pin number
- P1 max = Maximum pressure at which product operation is guaranteed
- TS = Temperature range within which product operation is guaranteed
- P2 = Outlet pressure range
- Cl. A = Tolerance on P2 ( A= ± 15% )
- Gr. 2 = Mechanical resistance group 2 in accordance with EN 13611
- EN 88-1 = Product reference regulation
- CE 0051 = Conformity with Regulation (EU) 2016/426 followed by Notified Body No.
- CE Ex = 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 2<sup>nd</sup> week
  - 1728 = progressive job order number for the indicated year
  - 00002 = progressive number referring to the quantity of the lot



Lodge Way House, Lodge Way,  
Harlestone Road,  
Northampton NN5 7UG.

Mod: **DN 50 BOSS 356**  
**P1 max: 500 mbar**  
**P2: 13-23 mbar**  
**CE-51CL4012/ED01 CL A Gr.2 EN 88-1**

**CODE: 35501293**  
**TS: -15+60 °C**

 **0051**

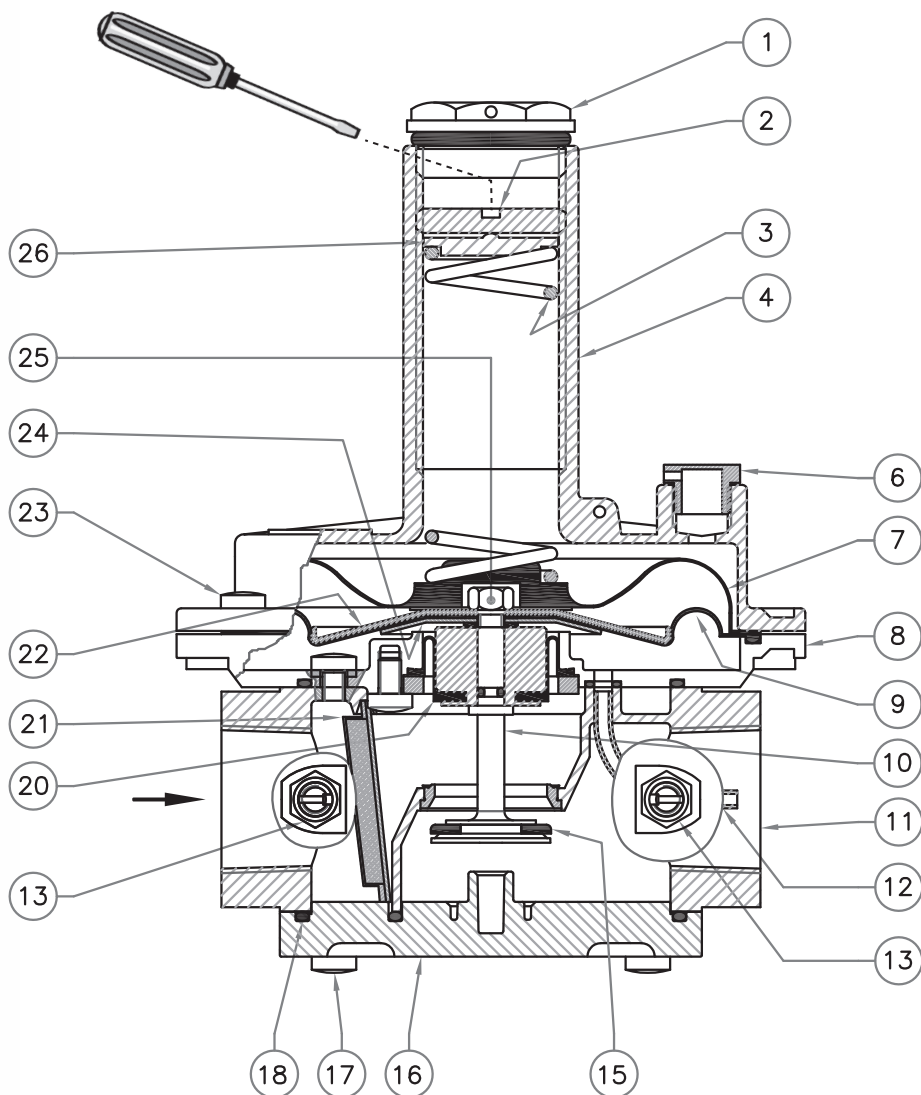
 **II2G**  
**II2D**

**year: 2020**   **Lot: U2002**   **1728/00002**

EN

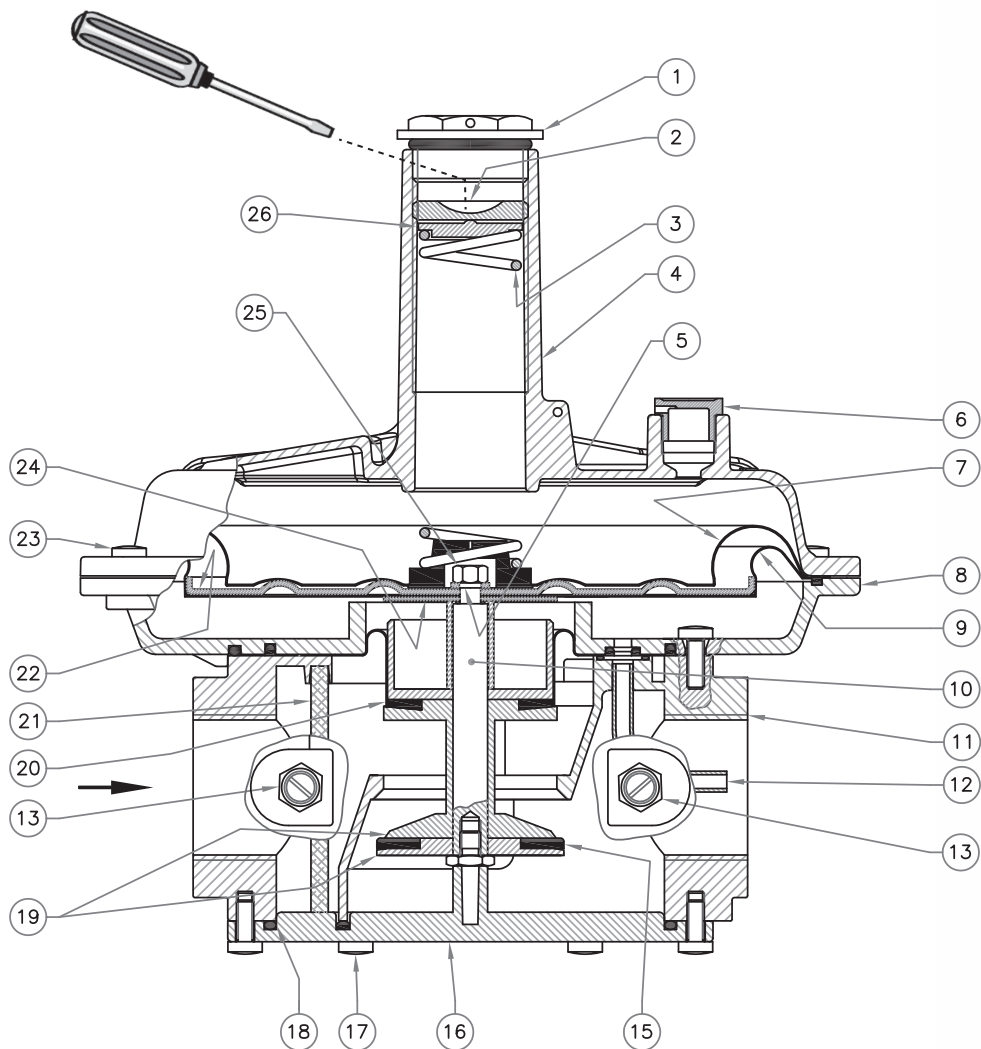
**fig. 1**

Threaded connections in line  
DN 15 - DN 20 - DN 25



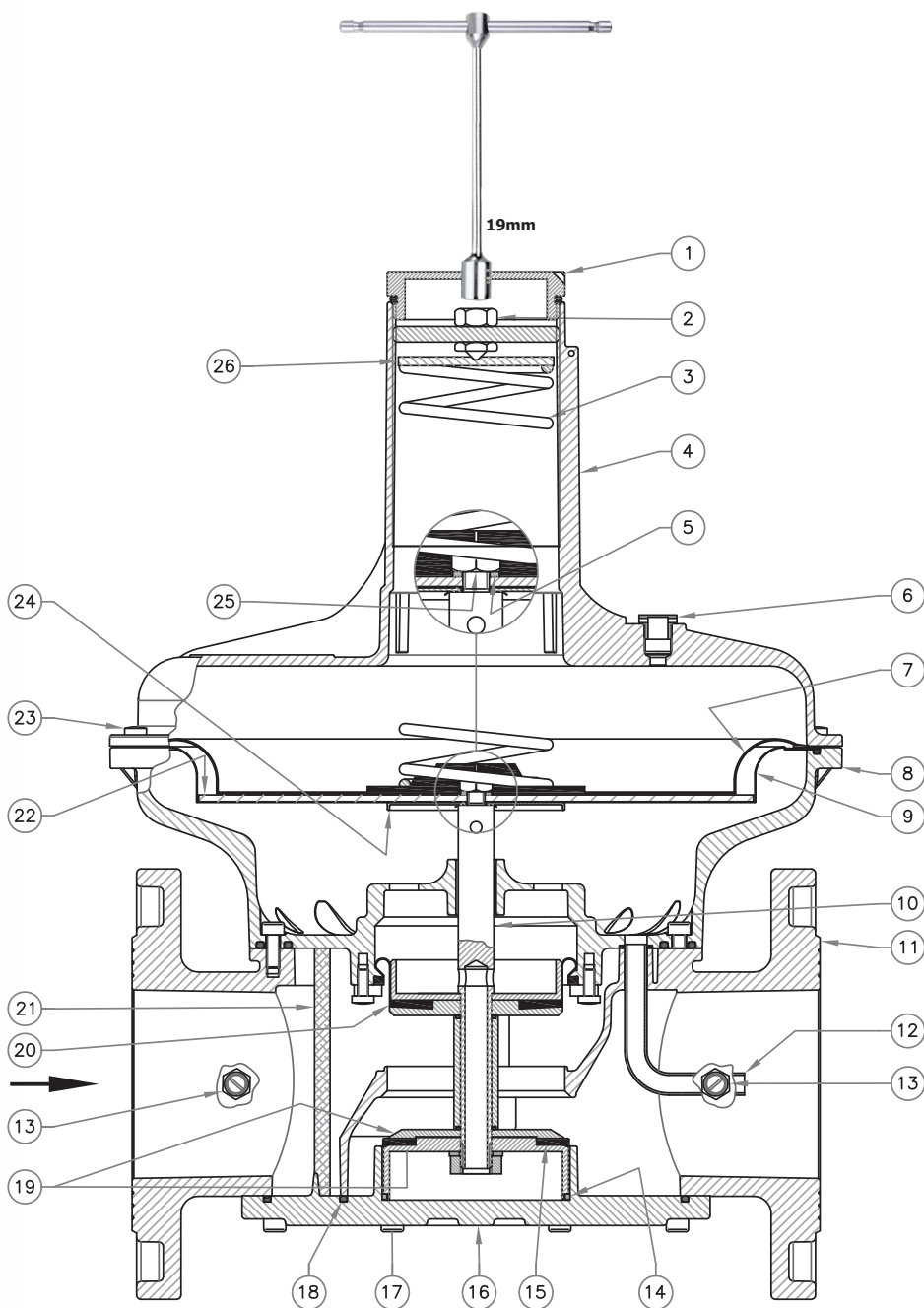
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**fig. 2**  
Threaded connections in line  
DN 32 - DN 40 - DN 50



EN

**fig. 3**  
 Flanged connections  
 DN 65 - DN 80 - DN 100



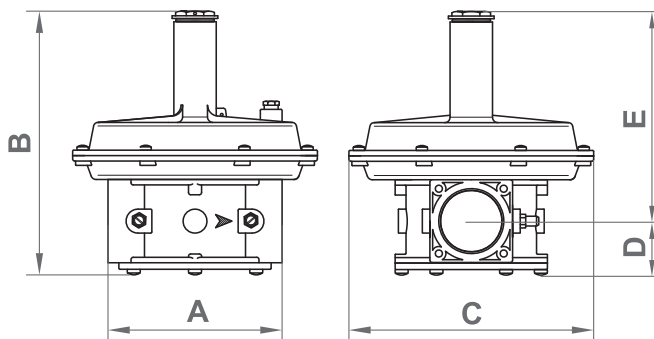
1. Closing cap
2. Adjustment screw P2
3. Calibration spring
4. Top cover
5. Toothed washer (except DN 15-20-25)
6. Dust cap
7. Safety membrane
8. Flange

9. Working membrane
10. Centre pin (on DN 15-20-25 obturator pin)
11. Body
12. Sensor tube
13. Pressure test nipple
14. Teflon ring (only on DN 65-80-100)
15. Sealing washer
16. Bottom cover
17. Bottom cover clamping screws

18. Bottom cover sealing O-Ring
19. Obturator
20. Compensation membrane
21. Filter element
22. Top disk for membrane
23. Top cover clamping screws
24. Bottom disk for membrane
25. Membrane/disc fixing nut
26. Spring washer

Overall dimensions in mm

Threaded connections in line	Flanged connections	holes	A	B=(D+E)	C	D	E
Rp DN 15 - Rp DN 20 Rp DN 25		-	120	194	140	38,5	155,5
Rp DN 32 - Rp DN 40 Rp DN 50		-	160	242	225	48,5	193,5
	PN 16 - ANSI 150 DN 65	4	290	456	330	90	366
	PN 16 DN 80	8	310	463	330	97	366
	ANSI 150 DN 80	4	290	456	330	90	366
	PN 16 - ANSI 150 DN 100	8	350	502	330	106	396



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

### Screw

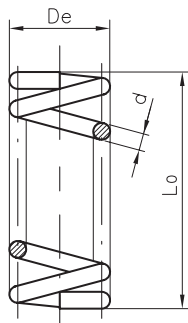
Screw		M5	M6
Max. torque (N.m)	Galvanised	6	10
	Stainless Steel	4,5	7,5

Table 3

## Regulation spring data

Spring code	dimensions in mm ( <b>d</b> x <b>De</b> x <b>Lo</b> x <b>it</b> )	Connections	Setting (mbar)
MO-0402	1,5x29x85x10	DN 15 - DN 20 - DN 25	9 ÷ 28
MO-0500	1,6x29x115x12		18 ÷ 40*
MO-0825	2,2x29x100x12		40 ÷ 110
MO-0900	2,5x29x140x18,5		110 ÷ 150
MO-0970	2,5x29x155x16		150 ÷ 200
MO-0500	1,6x29x115x12	DN 32 - DN 40 - DN 50	8 ÷ 13
MO-0800	2x29x140x16		13 ÷ 23*
MO-0850	2,2x29x140x18		20 ÷ 36
MO-0970	2,5x29x155x16		33 ÷ 58
MO-1000	3,2x29x123x15,5		55 ÷ 100
MO-1370	3,5x29x125x14	DN 65 - DN 80	90 ÷ 190
MO-1070	4x66,5x155x16		7 ÷ 18
MO-1100	4,5x70x200x15,5		13 ÷ 27*
MO-1200	5x70x205x9,5		22 ÷ 58
MO-1400\ZN	6x70x214x10,5		50 ÷ 130
MO-1400\ZN + MO-1800\ZN	6x70x200x10,5 + 5,5x54,5x195x12,5		100 ÷ 200
MO-1070	4x66,5x155x16	DN 100	7 ÷ 16
MO-1100	4,5x70x200x15,5		15 ÷ 27*
MO-1200	5x70x205x9,5		27 ÷ 55
MO-1400\ZN	6x70x200x10,5		55 ÷ 130
MO-1400\ZN + MO-1800\ZN	6x70x200x10,5 + 5,5x54,5x195x12,5		130 ÷ 200

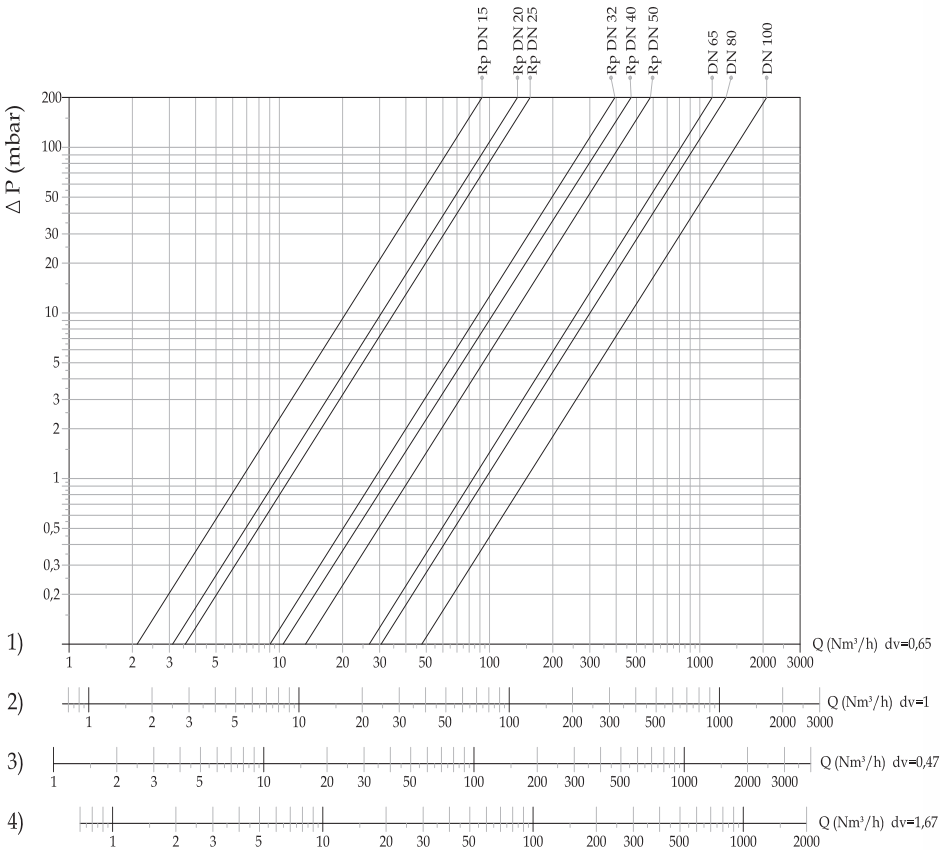
it= total number of turns



\* Standard setting

Capacity diagram

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



dv = density relative to the air

- 1) methane
- 2) air
- 3) town gas
- 4) lpg

We reserve the right to any technical and construction changes.



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