

# ZERO PRESSURE REGULATOR AND GAS/AIR RATIO CONTROL

Serie IRZ...



**ITALPUMP**



## DESCRIPTION

This device can be used as:

- Zero governor: keeps the downstream pressure at zero even changing the flow request;
- Air/gas ratio device: keeps constantly the air/gas ratio even changing air pressure.

**Pmax = 500 mbar**

If used as ratio regulator, it is possible to set it to obtain an air/gas mixing =1:1 or, using the modification kit a mix proportional from a ratio 1:2 to a ratio 1:10.

It can be supplied even on version with mixing gas/air ratio 2:1 – 10:1 (DN32-DN100).

DN 15, DN 20 and DN 25 connections are available in compact version.

## IDENTIFICATION

IRZ C 0 02N B

Zero gas pressure regulator **série IRZ...**

B = biogas

**Types**

C = COMPACT version

**Ratio gas/air**

0 = ratio gas/air = 1:1  
1 = ratio gas/air = 1:2 ÷ 1:10  
2 = ratio gas/air = 2:1 ÷ 10:1

**Connections**

| Threaded |                 |          |                   | Flanged |        |           |             |
|----------|-----------------|----------|-------------------|---------|--------|-----------|-------------|
| Code     | GAS             | Code NPT | NPT               | Code    | PN 16  | Code ANSI | ANSI PN 16  |
| 02       | DN 15 (G 1/2")  | 02N      | DN 15 (NPT 1/2")  | 32      | DN 32  | 32A       | DN 32 ANSI  |
| 03       | DN 20 (G 3/4")  | 03N      | DN 20 (NPT 3/4")  |         | DN 40  | 40A       | DN 40 ANSI  |
| 04       | DN 25 (G 1")    | 04N      | DN 25 (NPT 1")    |         | DN 50  | 50A       | DN 50 ANSI  |
| 05       | DN 32 (G 1"1/4) | 05N      | DN 32 (NPT 1"1/4) |         | DN 65  | 08A       | DN 65 ANSI  |
| 06       | DN 40 (G 1"1/2) | 06N      | DN 40 (NPT 1"1/2) |         | DN 80  | 09A       | DN 80 ANSI  |
| 07       | DN 50 (G 2")    | 07N      | DN 50 (NPT 2")    |         | DN 100 | 10A       | DN 100 ANSI |
|          |                 |          |                   |         |        |           |             |
|          |                 |          |                   |         |        |           |             |
|          |                 |          |                   |         |        |           |             |
|          |                 |          |                   |         |        |           |             |

**NOTE: not all combinations are possible  
Please contact the technical department.**

## GENERAL DATA

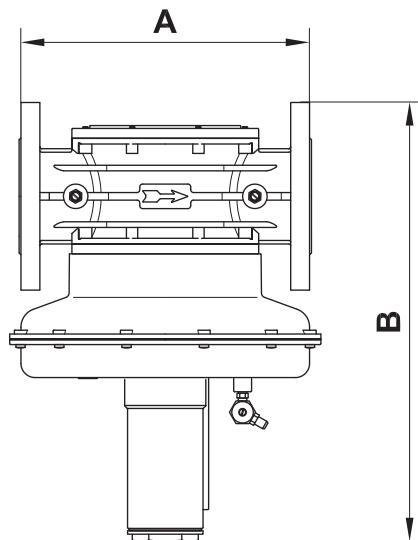
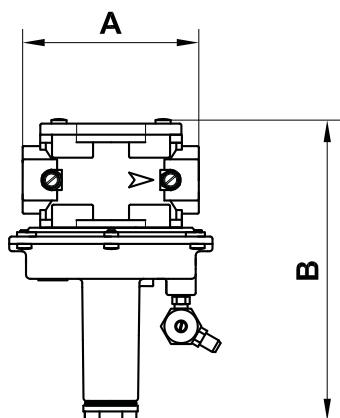
### TECHNICAL DATA

- Use:  
not aggressive gases of the 3 families (dry gases)
- Threaded connections Rp:  
(DN 15 ÷ DN 50) according to EN 10226
- Flanged connections PN 16:  
(DN 65 ÷ DN 100) according to ISO 7005
- On request ANSI 150 flanged connections
- Outlet pressure range:  
from 0,2 to 120 mbar
- Connection for control line: to Rp 1/4"
- Inlet pressure: up to 500 mbar for zero pressure appliance and air/gas ratio
- Environment temperature: -15 ÷ +60 °C
- Group: 2
- Filtration: 50 µm (on request other filtration qualities)
- Filtration class: G 2 (according to EN 779)

### MATERIALS

- Die-cast aluminium (UNI EN 1706)
- OT-58 brass (UNI EN 12164)
- 11S aluminium (UNI 9002-5)
- Galvanized and 430 F stainless steel (UNI EN 10088)
- NBR rubber (UNI 7702)
- Nylon 30% glass fibre (UNI EN ISO 11667)
- Viledon

## DIMENSIONS

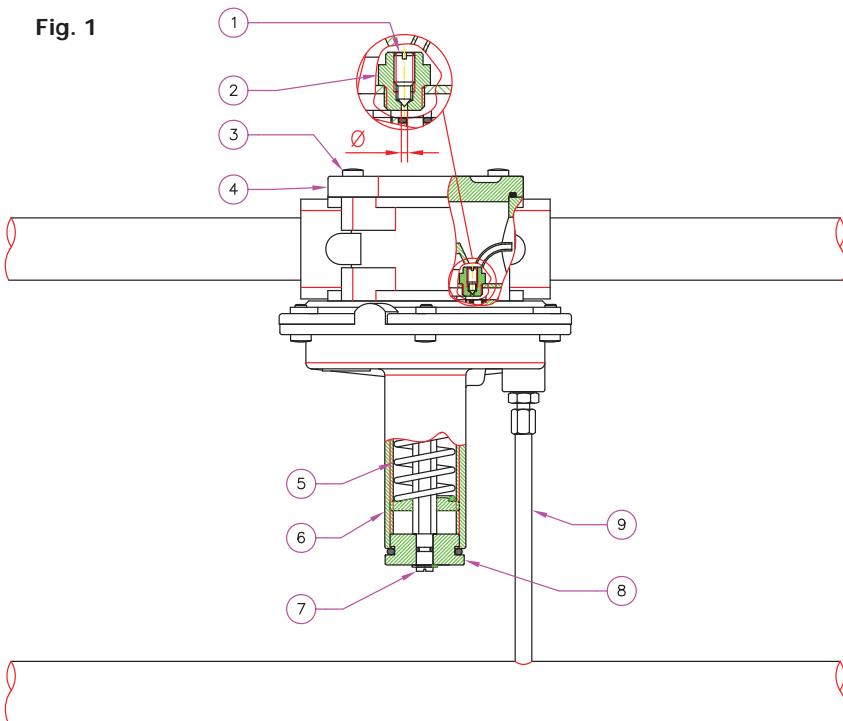


| Overall dimensions in mm |                      |     |                     |     |
|--------------------------|----------------------|-----|---------------------|-----|
|                          | Connections threaded |     | Connections flanged |     |
|                          | A                    | B   | A                   | B   |
| DN 15 (compact)          | 120                  | 155 | -                   | -   |
| DN 20 (compact)          | 120                  | 155 | -                   | -   |
| DN 25 (compact)          | 120                  | 155 | -                   | -   |
| DN 15                    | 120                  | 193 | -                   | -   |
| DN 20                    | 120                  | 193 | -                   | -   |
| DN 25                    | 120                  | 193 | -                   | -   |
| DN 32                    | 160                  | 245 | 230                 | 285 |
| DN 40                    | 160                  | 245 | 230                 | 285 |
| DN 50                    | 160                  | 245 | 230                 | 285 |
| DN 65                    | -                    | -   | 290                 | 471 |
| DN 80                    | -                    | -   | 310                 | 478 |
| DN 100                   | -                    | -   | 350                 | 504 |

| Weight (kg)     |                         |                        |
|-----------------|-------------------------|------------------------|
|                 | Connections<br>threaded | Connections<br>flanged |
| DN 15 (compact) | 0.85                    | -                      |
| DN 20 (compact) | 0.85                    | -                      |
| DN 25 (compact) | 0.85                    | -                      |
| DN 15           | 1,4                     | -                      |
| DN 20           | 1,4                     | -                      |
| DN 25           | 1,4                     | -                      |
| DN 32           | 3,3                     | 4,5                    |
| DN 40           | 3,3                     | 4,5                    |
| DN 50           | 3,3                     | 4,5                    |
| DN 65           | -                       | 12,2                   |
| DN 80           | -                       | 12,6                   |
| DN 100          | -                       | 17,8                   |

## COMPONENTS and CALIBRATION

**Fig. 1**



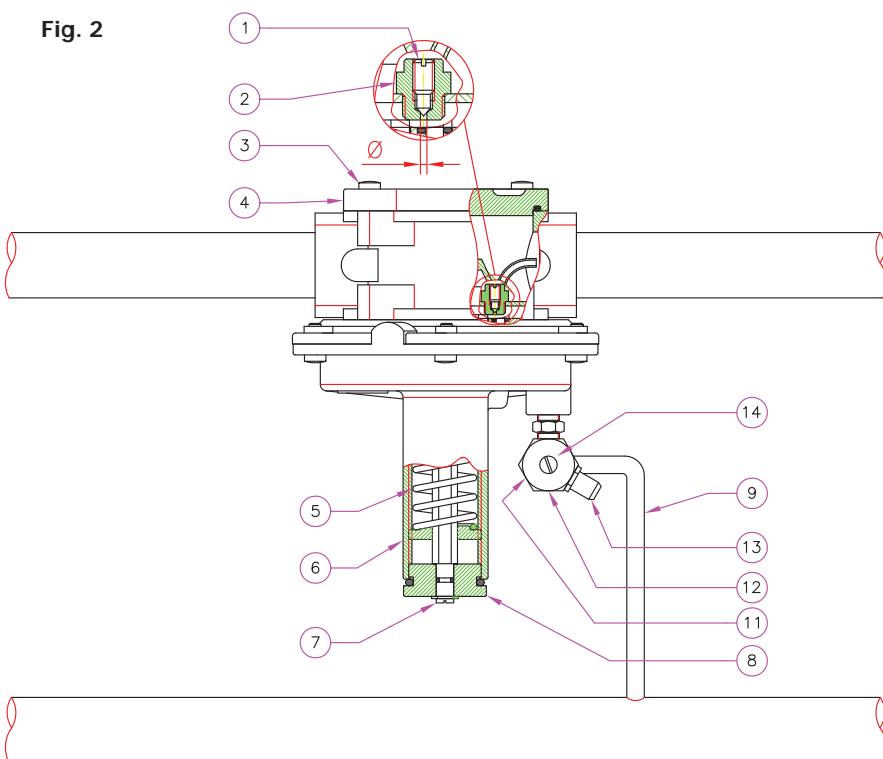
### Ratio gas/air = 1:1

This connection is used when the plant require that the gas pressure be equal to the air one.

1. Cap screw by-pass hole
2. By-pass
3. Cover fixing screws
4. Cover
5. Setting spring
6. Funnel
7. Zero calibration screw
8. Closing cap
9. Net/air pipe fitting (not supplied)

For application as air/gas ratio regulator = 1:1, the upstream gas pressure must be higher than the maximum command pressure. The ratio regulator is command from the air pressure line. The downstream gas pressure is regulated with a ratio 1:1 comparing the control air pressure. The burner power can be changed acting on air regulation part. The pressure fluctuations in the burner room act in an equivalent way on the air and gas flow. In this way the gas/air mixing does not get changes. Acting on the regulation screw (7) for the regulator setting checking with a pressure gauge the gas outlet pressure and the air pressure.

**Fig. 2**



### Ratio gas/air = 1:2 – 1:10

This link is used when the plant requires that the gas pressure would be lower than the air one.

1. Cap screw by-pass hole
2. By-pass
3. Cover fixing screws
4. Cover
5. Setting spring
6. Funnel
7. Zero calibration screw
8. Closing cap
9. Net/air pipe fitting (not supplied)
11. Exhaust hole in air discharging
12. Proportional gas/air ratio control device
13. Pressure nipple
14. Ratio gas/air calibration screw

The ratio regulator is actuated from the air line pressure.

The outlet gas pressure is setted with a proportional ratio settable from 1:2 to 1:10 comparing to the air control pressure.

It is possible to change the burner power acting on air setting unit.

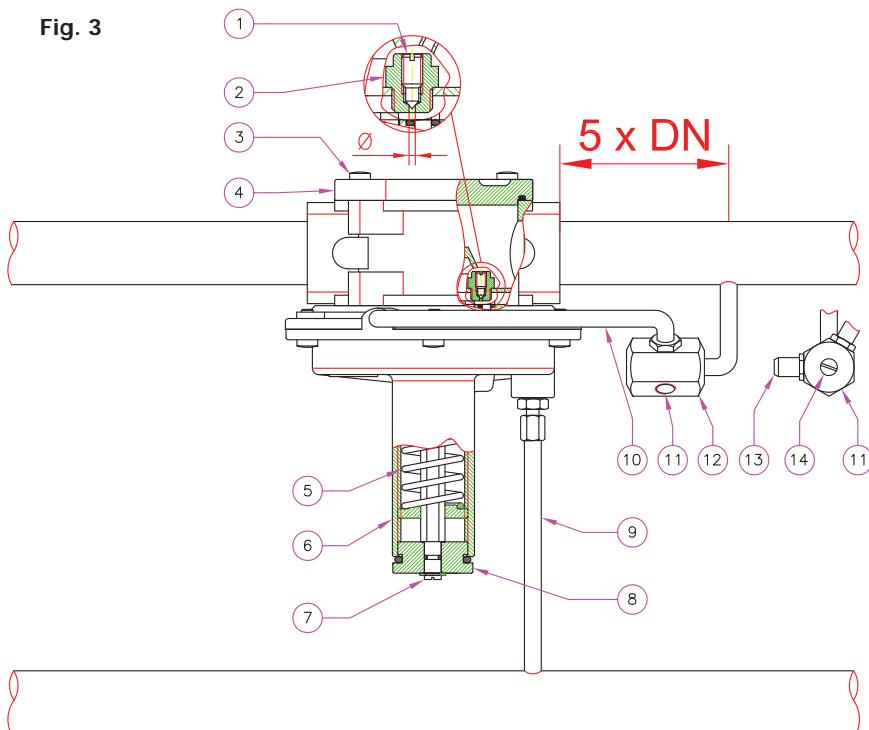
Before mounting the proportional ratio kit (12) it is needed to make the correct setting of the regulator in gas/air = 1:1 (see fig. 1).

Be sure the exhausting hole (11) (in air) is not blocked.

Acting on setting screw (14) till obtaining the gas/air ratio desired checking with a pressure gauge the gas outlet pressure and the air pressure.

## COMPONENTS and CALIBRATION

**Fig. 3**



**Ratio gas/air = 2:1 – 10:1**

This connection is used when the plant requires the gas pressure is higher than the air one.

1. Cap screw by-pass hole
2. By-pass
3. Cover fixing screws
4. Cover
5. Setting spring
6. Funnel
7. Zero calibration screw
8. Closing cap
9. Net/air pipe fitting (not supplied)
10. Ratio proportional KIT connection tube (not supplied)
11. Exhaust hole (channel in the combustion room)
12. Proportional gas/air ratio control device
13. Pressure nipple
14. Ratio gas/air calibration screw

The ratio regulator is actuated from the air line pressure. The outlet gas pressure is setted with a proportional ratio settable from 2:1 to 10:1 comparing to the air control pressure.

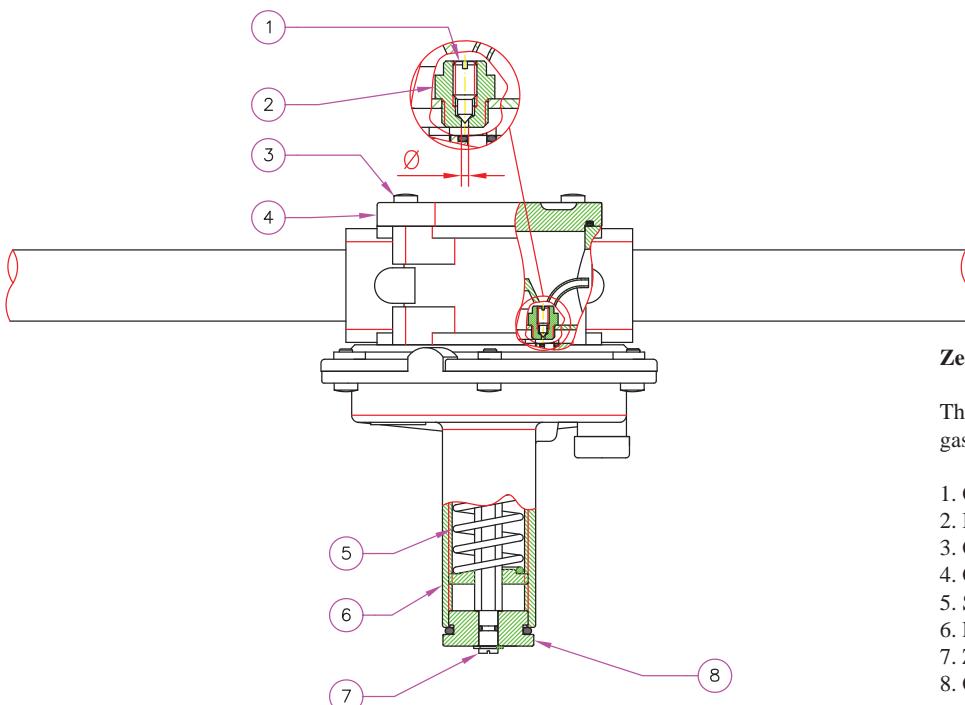
It is possible to change the burner power acting on air setting unit.

Before mounting the proportional ratio kit (12) it is needed to make the correct setting of the regulator in gas/air = 1:1 connecting directly the pipe (10) downstream the regulator.

Channel the relief (11) in the combustion room throw the proper connection.

Act on the regulation screw (14) till obtaining the desired gas/air ratio checking with a pressure gauge the outlet gas pressure and the air pressure.

**Fig. 4**



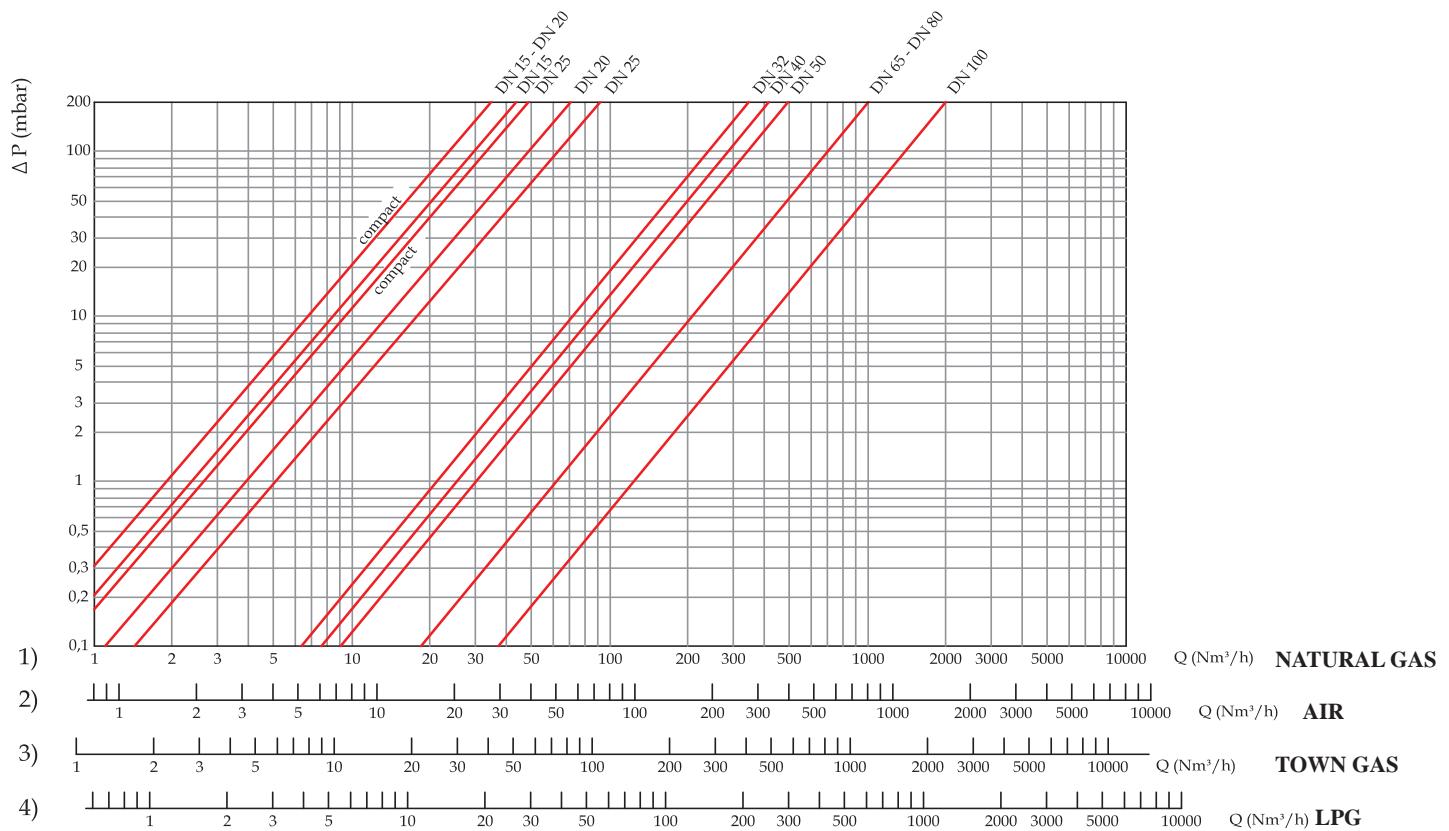
**Zero pressure regulator**

This connection is used when the plant requires that the gas downstream pressure of the regulator is equal to zero.

1. Cap screw by-pass hole
2. By-pass
3. Cover fixing screws
4. Cover
5. Setting spring
6. Funnel
7. Zero calibration screw
8. Closing cap

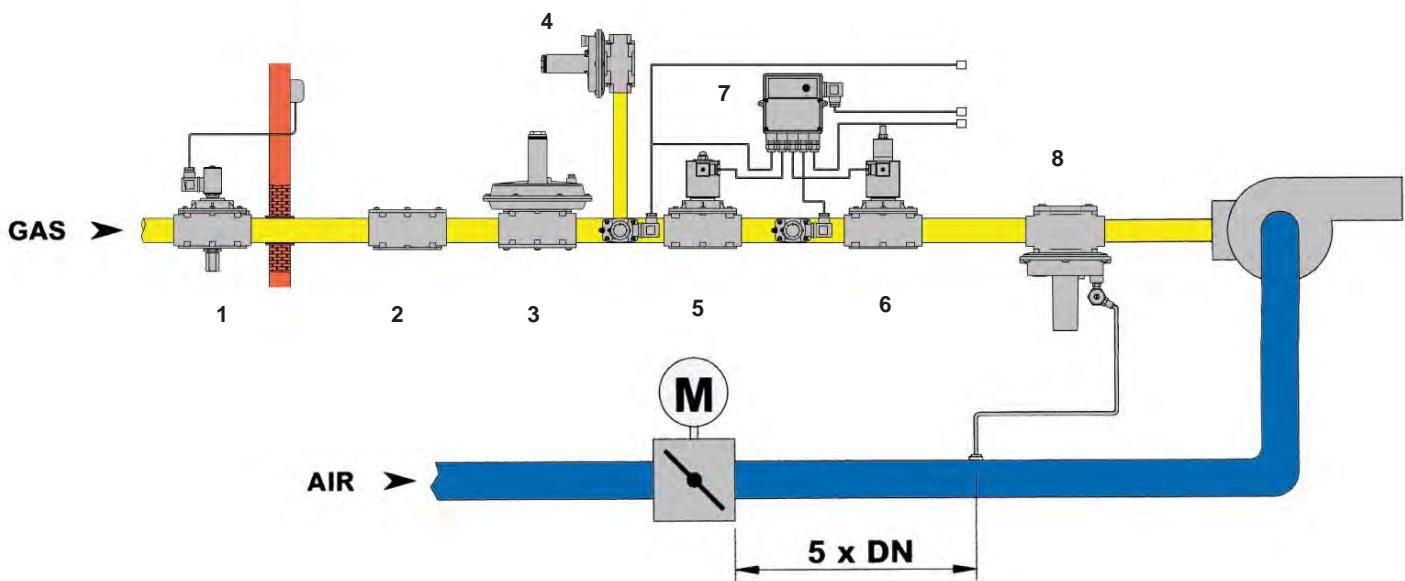
For applications as zero governor act on setting screw (7) for regulator setting checking with a pressure gauge the outlet gas pressure.

## PRESSURE DROP DIAGRAM



### EXAMPLE OF INSTALLATION

1. manual reset solenoid valve IEA
2. gas filter IF
3. filter regulator IFR
4. overflow valve IEL
5. fast opening valve IEL
6. slow opening valve IEL
7. leak tester
8. air/gas ratio control regulator



## INSTALLATION



**Installation must be in compliance with local legislation in force!**

**WARNING: Read carefully the instruction sheet of each product before installing.  
Installation and maintenance operations must be carried out by qualified personnel.**

- The gas supply must be shut off before installation.
- Check that the line pressure **DOES NOT EXCEED** the maximum pressure stated on the product label.
- It must be installed downstream a safety solenoid valve, with the arrow (shown on the body valve) towards the user and in horizontal position (as in the installation example).
- During installation take care not to allow debris or scraps of metal to enter the device.
- If the device is threaded check that the pipeline thread is not too long; overlong threads may damage the body of the device when screwed into place.
- Do not use the spring casing for leverage when screwing into place; use the appropriate tool.
- If the device is flanged check that the inlet and outlet counterflanges are perfectly parallel to avoid unnecessary mechanical stresses on the body of the device. Also calculate the space needed to fit the seal. If the gap left after the seal is fitted is too wide, do not try to close it by over-tightening the device's bolts.
- Always check that the system is gas-tight after installation.
- In order to get an air/gas ratio gas/air = 1:1 you must directly connect the pipe (9) (as connection fig. 1).
- In order to get a gas/air ratio from 1:1 to 1:10 insert the edit kit (12) (proportional regulation device) between the pipe (3) and the connection (1) as per the connection fig.. 2. ensure the exhausting hole (11) (in air) is not blocked.
- To obtain a gas/air ratio from 1:1 to 10:1 insert the edit kit (12) (proportional regulation device) as per the attached fig. 3. The relief (11) must be conveyed in the combustion room.
- For use as zero governor see attached fig. 4.

### EXAMPLE OF REGULATION FOR A GAS/AIR = 1:5 RATIO

Air pressure : 0 ÷ 50 mbar  
Gas pressure : 0 ÷ 10 mbar

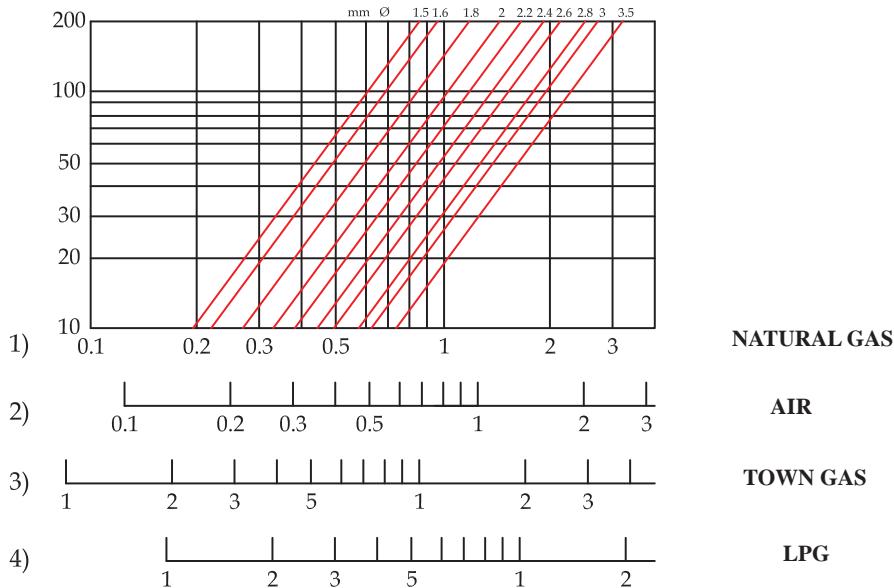
- Setting the regulator for working with gas/air ratio = 1:1 (connection fig. 1).
- Act on the setting screw (7) for setting the regulator checking with a pressure gauge the outlet gas pressure and the air pressure.
- Insert the proportional ratio kit (12) and connect as stated in the fig. 2.
- Act on the regulation screw (7) till obtaining the desired gas/air ratio checking with a pressure gauge the outlet gas pressure and the air pressure.

In these conditions the regulator is set according to the wanted ratio (gas/air = 1:5).  
Pressure will change proportionally from 0 to 10 mbar when the air pressure varies from 0 to 50 mbar.

## BY-PASS VENT VARIATION

The vent "Ø" determines the by-pass (1) flow.

- Remove the by-pass cap-screw (1) after unscrewing the cover (4) screws (3) to use the standard 1,5 mm vent hole (Ø).
- Enlarge the hole (Ø) with larger diameter (max. 3,5 mm) to increase the by pass flow (see diagram).



## MAINTENANCE

Before disassembling the device make sure that there is no pressured gas inside.

- To check the closing obturator unscrew the fixing screws (3), remove the cover (4) and check the obturator is in good working conditions and if necessary change the rubber seal component, then reassemble doing backward the same operation.
- To check the filtering component conditions (15) unscrew the fixing screws (3) and remove the cover (4). Remove the filtering component (15) clean it with water and soap, blow it with compressed air or substitute it if necessary. Reassemble it in its original position, checking it is set in its special guides (16) (see fig. 1).

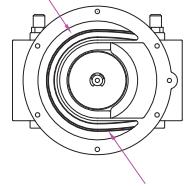


All operations must be carried out only by qualified technicians.

**TO INSERT THE FILTERING COMPONENT:** Position it as in the figure taking care to put it inside the guides.

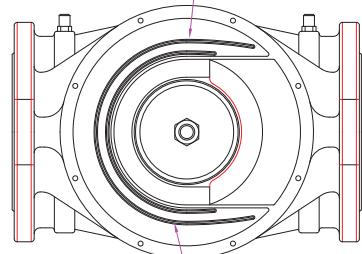
**VIEW: body regulator without bottom cover**

Filtering organ guides



Filtering organ must be put inside these guides

Filtering organ guides



Filtering organ must be put inside these guides

FOR FURTHER INFORMATION PLEASE CONTACT OUR TECHNICAL OFFICE.