

REGOLATORE DI PRESSIONE PER GAS
 GAS PRESSURE REGULATOR
 REGULATEUR DE PRESSION POUR GAZ
 REGULADOR DE PRESIÓN PARA GAS



CE II 2G - II 2D

CE 0497

MADE IN ITALY

	IT	EN	FR	ES
Range pressione di esercizio Operating pressure range Plage de pression de fonctionnement Rango de la presión de funcionamiento	Pe: 1÷2 bar			
Attacchi filettati / Threaded connections Raccords filetés / Conexiones roscadas	DN 15 - DN 20 - DN 25 - DN 32 - DN 40 - DN 50			
Attacchi filettati a 90° / Threaded connections at 90° Raccords filetés à 90° / Conexiones roscadas a 90°	DN 15 - DN 20 - DN 25 - DN 32 - DN 40 - DN 50			
	DN 25* - DN 32 - DN 40 - DN 50 - DN 65 - DN 80 - DN 100			
Attacchi flangiati / Flanged connections Raccords à brides / Conexiones embridadas	* su richiesta con flange girevoli	* with swivel flanges on request	* sur demande avec brides tournantes	* bajo petición con bridas locas
Norma di riferimento / Reference standard Norme de référence / Patrón de referencia	EN 88-2			
In conformità a In conformity with Conforme a Conforme	Direttiva PED 2014/68/UE	PED Directive 2014/68/EU	Directive PED 2014/68/UE	Directiva PED 2014/68/UE

2.0 - TECHNICAL DATA

- Use : non-aggressive gases of the three families (dry gases)
- Ambient temperature (TS) : -15 ÷ +60 °C
- Operating pressure range (Pe) : 1 ÷ 2 bar
- Accuracy class : AC10 (P2 ± 10%)
- Closing pressure class : SG30 (P2 + 30%)
- 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
- Rp threaded connections at 90° : (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 25* - DN 32 - DN 40 - DN 50 - DN 65 - DN 80 - DN 100) ISO 7005 / EN 1092-1
- NPT threaded or ANSI 150 threaded connections: on request
- Filter element (only models FRG/2MC) : filtering 50µm
- In compliance with : PED Directive 2014/68/EU - ATEX Directive 2014/34/EU

* DN 25 with swivel flanges on request.

2.1 - MODEL IDENTIFICATION

- RG/2MC:** Pressure regulator for gas without filter - (connections in line)
- FRG/2MC:** Pressure regulator for gas with built-in filter - (connections in line)
- RG/2MCR:** Pressure regulator for gas without filter - (connections at 90° see figure 2 and 4)
- FRG/2MCR:** Pressure regulator for gas with built-in filter - (connections at 90° see figure 2 and 4)

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;

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.



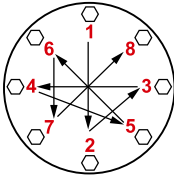
3.2 - INSTALLATION (see example in 3.4)

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);



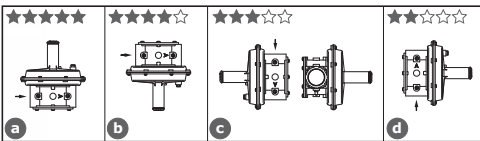
Diameter	DN 25	DN 32	DN 40	DN 50	DN 65	DN 80	DN 100
Max. torque (N.m)	30	50	50	50	50	50	80

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

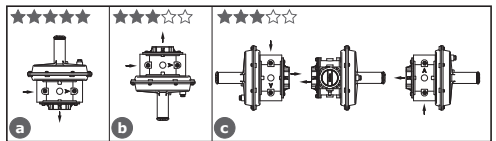
Common procedures (threaded and flanged devices):

- 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 Pa value declared on the rating plate could be less by a few mbar.
NOTE: for versions with 90° connections, 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);
 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);

Connections in line



90° connections (closed line output)



- 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.

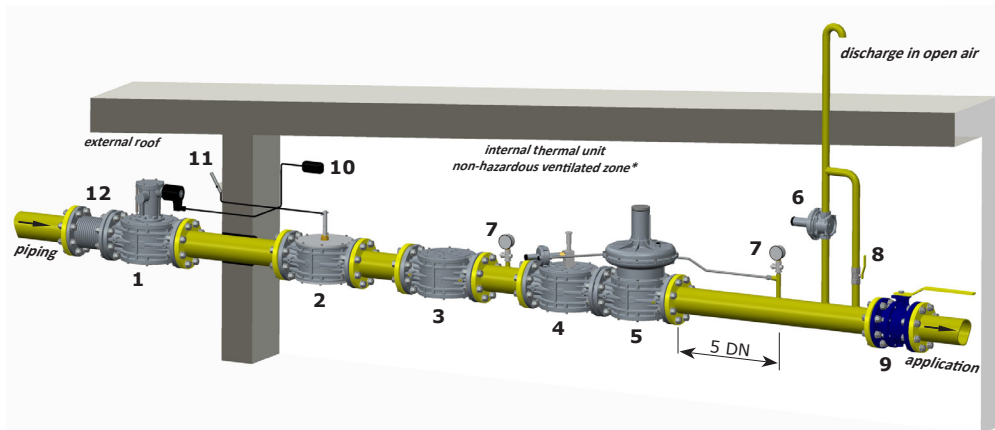
If the device is installed and serviced in full compliance with all the conditions and technical instructions provided in this document, it does not pose a source of specific hazards: in particular, under normal operating conditions, the regulator emits a flammable substance into the atmosphere **ONLY** 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. M16/RM N.C. Manual reset solenoid valve | 7. Pressure gauge and relative button |
| 2. SM jerk ON/OFF valve | 8. Vent valve |
| 3. FM gas filter | 9. Ball valve |
| 4. OPSO series MVB/1 MAX shut off valve | 10. Gas detector |
| 5. RG/2MC pressure regulator | 11. SM remote jerk ON/OFF valve lever control |
| 6. MVS/1 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 Pa 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 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 Pa (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 Pa.

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:

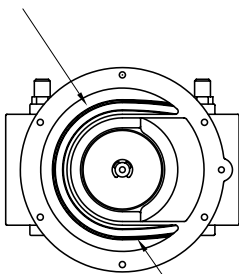
1. for DN 15 ÷ DN 50 connections make sure that the centre pin (10) is centred in the guide of the bottom cover (16);
 2. for DN 65 - DN 80 - DN 100 connections pay attention to the Teflon split ring (14): when reassembling the bottom cover (16) it must be placed inside the specific guide (as shown in figure 6);
- Tighten the screws gradually, following a "cross" pattern, until the torque (tolerance -15%) indicated in table 2 on page 41 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.

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

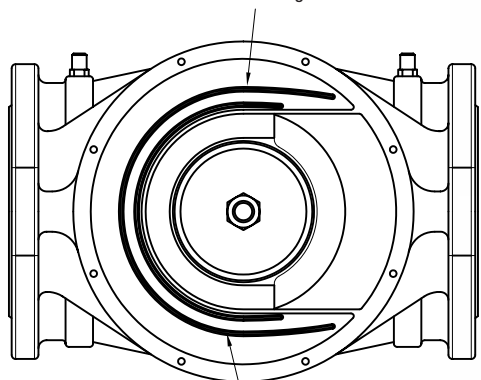
Filter element guides



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