

GOVERNORS NORTH AMERICA

Low pressure gas regulators



Review A - Edition 12/2022

**OPERATION, MAINTENANCE
AND WARNING MANUAL**

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1 - INTRODUCTION

PREFACE

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The Manufacturer is in no way responsible for the consequences of any operations performed in a manner different from what is stated in the manual.

GENERAL CONSIDERATIONS

All operating instructions and recommendations described in this manual must be followed to:

- get the best possible performance from the equipment;
- keep the equipment in efficient condition.

Of particular importance is the training of personnel responsible for:

- the use of the equipment in the correct way;
- the application of the indicated safety directions and procedures.

NOTICE

The images in this document are indicative of the product type and may differ in the details.

Revision: A

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1.1 - REVISION HISTORY

Revision index	Date	Review Contents
A	12/2022	First issue

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2 - GENERAL INFORMATION

2.1 - MANUFACTURER IDENTIFICATION

Manufacturer	PIETRO FIORENTINI S.P.A.
Address	Via Enrico Fermi, 8/10 36057 Arcugnano (VI) - ITALY Tel. +39 0444 968511 Fax +39 0444 960468 www.fiorentini.com sales@fiorentini.com

Tab. 2.2.

2.2 - PRODUCT IDENTIFICATION

Equipment	LOW PRESSURE GAS REGULATOR
Series	GOVERNORS NORTH AMERICA
Possible versions	<ul style="list-style-type: none"> • Standard. • Zero. • Ratio. • Goval. • Over Pressure Device (OPD). • Dual Cut.

Tab. 2.3.

2.3 - REGULATORY SYSTEM

PIETRO FIORENTINI S.P.A. with registered office in Arcugnano (Italy) - Via E. Fermi, 8/10, declares that the equipment GOVERNORS NORTH AMERICA subject of this manual is designed, manufactured, tested and controlled in accordance with the requirements of the standards: UNI EN 88-1:2016; UNI 11655:2016, UNI EN 16129:2013 as applicable.

NOTICE

For specific approvals see appropriate section on the Manufacturer's website: <https://www.fiorentini.com>

NOTICE

The original version of the declaration of conformity is delivered together with the equipment and this manual.

2.4 - WARRANTY

PIETRO FIORENTINI S.P.A. guarantees that the equipment has been made with the best materials, with fine workmanship and complies with the quality requirements, specifications and performance envisaged in the order.

The warranty will be considered null and void and PIETRO FIORENTINI S.P.A. will not be responsible for any damage and/or malfunctions:

- for any acts or omissions of the purchaser or end user, or any of their carriers, employees, agents or any third party or entity;
- in the event that the purchaser, or a third party, makes changes to the equipment supplied by PIETRO FIORENTINI S.P.A. without the prior written authorization of the latter;
- in case of non-compliance by the purchaser with the instructions contained in this manual, as supplied by PIETRO FIORENTINI S.P.A.

NOTICE

The warranty conditions are specified in the commercial contract.

2.5 - RECIPIENTS, SUPPLY AND CONSERVATION OF THE MANUAL

The manual is intended for the qualified operator responsible and enabled to use and manage the equipment in all its phases of technical life.

It contains the information necessary for correct use of the equipment, in order to keep its functional and qualitative characteristics unchanged over time. All the information and warnings for correct use in complete safety are also provided.

The manual, like the declaration of conformity and/or test certification, is an integral part of the equipment and must always accompany it in every transfer or change of ownership. It is the user's duty to keep this documentation intact so that it can be consulted throughout the life of the equipment itself.

⚠ WARNING

It is forbidden to remove, rewrite or modify the pages of the manual and their contents.

Keep the manual near the equipment, in an accessible place known to all qualified technicians involved in its use and management.

PIETRO FIORENTINI S.p.A. declines all responsibility for any damage to people, animals and things caused by failure to observe the warnings and operating methods described in this manual.

2.6 - LANGUAGE

The original manual was written in Italian.

Any translations must be made starting from the original manual.

⚠ DANGER

Language translations cannot be fully verified. If an inconsistency is found, the text of the original manual must be followed.

If inconsistencies are found or the text is not understandable:

- suspend all action;
 - contact immediately PIETRO FIORENTINI S.p.A. at the addresses indicated in paragraph 2.1.
-

⚠ WARNING

PIETRO FIORENTINI S.p.A. is only responsible for the information contained in the original manual.

2.7 - SYMBOLS USED IN THE MANUAL

Symbols (some of them conforming to ANSI Z535.4) are used within the manual to:

- emphasize information of relevant importance;
- draw attention to the purpose of proper and safe use of the machine.

Symbol	Definition
	Symbol used to identify important warnings for operator and/or equipment safety.
	Symbol used to identify particularly important information in the manual. The information may also concern the safety of personnel involved in using the equipment.
	Obligation to consult the manual. Indicates a requirement for personnel to consult (and understand) the equipment manual before working with or on it.

Tab. 2.4.

DANGER

DANGER - Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING - Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

CAUTION - Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE

NOTICE - It is used to address practices not related to bodily injury.

SAFETY INSTRUCTIONS

SAFETY INSTRUCTIONS (or equivalent) - These are signs that indicate specific safety-related instructions or procedures.

2.8 - IDENTIFICATION PLATES APPLIED

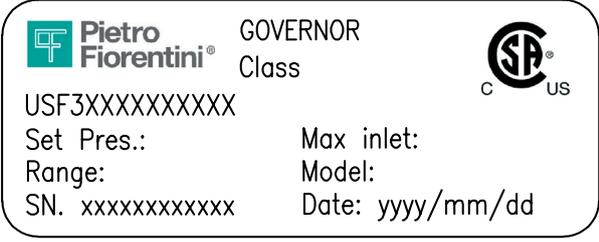
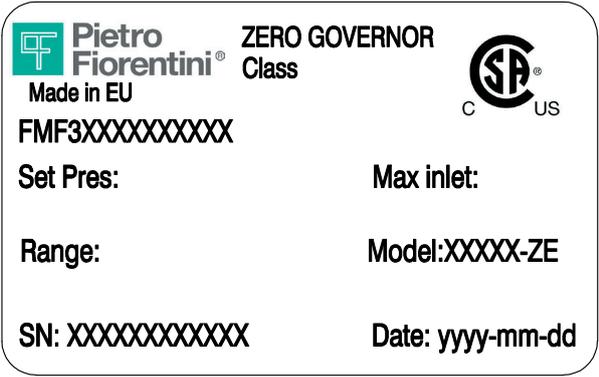
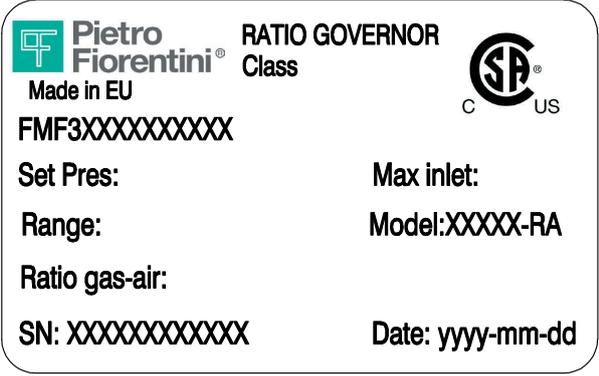
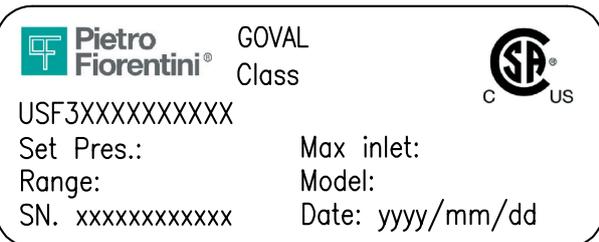
⚠ WARNING

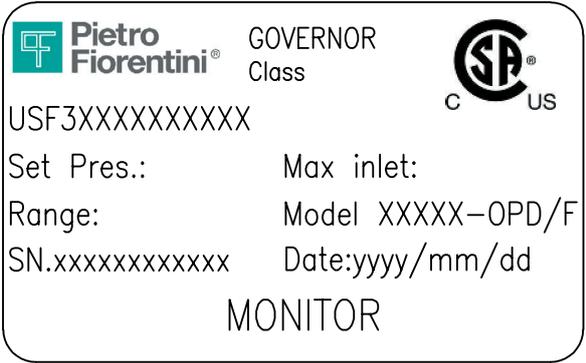
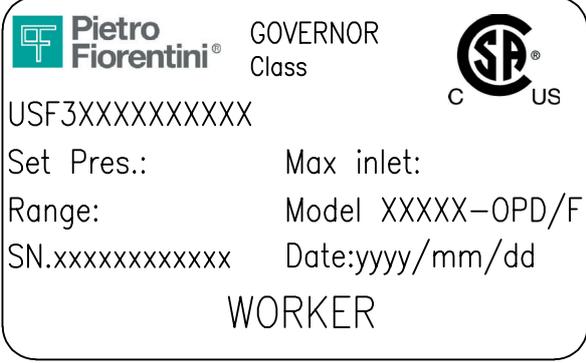
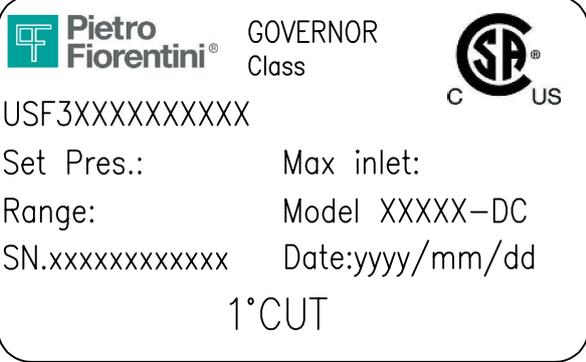
It is absolutely forbidden to remove the identification plates and/or replace them with others. If, for accidental reasons, the plates are damaged or removed, the customer must inform PIETRO FIORENTINI S.p.A.

The equipment and its accessories are equipped with identification plates (Id.1 to Id.7).

The plates bear the identification details of the equipment and its accessories to be quoted if necessary to PIETRO FIORENTINI S.p.A.

List of applied identification plates:

Id.	Type	Image
1	STANDARD CSA LABEL	
2	ZERO LABEL	
3	RATIO LABEL	
4	GOVAL LABEL	

Id.	Type	Image
5	OPD LABEL (MONITOR)	
5a	OPD LABEL (WORKER)	
6	DUAL CUT LABEL (1ST CUT)	
6a	DUAL CUT LABEL (2ND CUT)	
7	IDENTIFICATION PLATE MONITOR	

Tab. 2.5.

2.8.1 - IDENTIFICATION PLATES GLOSSARY

The terms and abbreviations used on the identification plate are described below:

Description	Label terminologies					
	Standard	Russia	Poland	Turkey	Romania	Spain Kroms
Inlet pressure range	bpu	bpu	Pe	Pg max/min	-	bpu
Regulated pressure	pds	Pd	Pa	Pç	-	Pd
Intervention pressure maximum block	Block VIS Slam Shut pdso	ЛЗК Макс Pdso	Zaw.up.	EBÜ	-	Block VIS Slam Shut Pdso Pdsu
Intervention pressure minimum block	Block VIS Slam Shut pdsu	ЛЗК МИН Pdsu	Zaw.szyb- kz.	EBA	-	Block VIS Slam Shut Pdso Pdsu
Minimum rated flow rate	Q pumin	-	-	Q min/max	-	Q Pumin
Maximum rated flow rate	Q pumax	-	Q max	Q min/max	-	Q Pumax
Regulator model	Reg.	per.	Typ	-	FE	Reg.
Regulator manufacturing batch	P.L.	ДАТА	P.L.	Date + barcode	Year	P.L.
Regulator serial number	S.N.	С.н.	No.	barcode	-	S.N.
Rated flow rate of the regulator	-	Q nom	-	-	-	-
Input connection	-	-	DNe	-	DN / Connection	-
Outlet connection	-	-	DNa	-	DN / Connection	-
Operating temperature range	-	-	T3	-	T	-
Accuracy class	-	-	-	ÇT	-	-
Closure class	-	-	-	KT	-	-
Accuracy Group maximum block	-	-	-	ETA	-	-
Accuracy Group minimum block	-	-	-	ETÜ	-	-
Regulator head range	-	-	-	As	-	-
Calibration spring range	-	-	-	-	Wds	-
Maximum block spring range	-	-	-	EBÜ	-	-
Minimum block spring range	-	-	-	EBA	-	-
Design pressure	-	-	-	-	PS	-
Type of fluid	N.G.	-	-	-	Fluid	-
Overflow calibration	-	-	-	-	-	Overflow VAS Relief Valve

Tab. 2.6.

2.9 - MEASUREMENT UNIT GLOSSARY

Measurement type	Unit of measurement	Description
Consumption and Volumetric flow	Sm ³ /h	Standard cubic meters per hour
	SCFH	Standard cubic feet per hour
	Sm ³	Standard cubic meters
	m ³ /h	Cubic meters per hour
	m ³	Cubic meters
Pressure	bar	Bar
	psi	Pounds per square inch
	psia	Pounds per square inch absolute
	psig	Pounds per square inch manometric
	"WC	Inch of water column
Temperature	Pa	Pascal
	°C	Degree Celsius
Tightening torque	K	Kelvin
	Nm	Newton meter
Other measurements	V	Volt
	W	Watt
	lb	Pound
	in	Inch
	Ω	Ohm

Tab. 2.7.

2.10 - QUALIFIED PROFESSIONALS

Qualified operators in charge of using and managing the equipment in all its phases of technical life:

Professional	Definition
<p style="text-align: center;">Installer</p>	<p>Qualified operator able to:</p> <ul style="list-style-type: none"> • handle materials and equipment. • carry out all the operations necessary for a correct and safe installation of the equipment; • carry out all the operations necessary for the correct functioning of the equipment and the system in safety; • be able to perform all necessary operations for the de-installation and subsequent disposal of the equipment in accordance with the regulations in the country of installation.
<p style="text-align: center;">Specialized technician/ Maintenance technician</p>	<p>Trained and licensed technician to operate and manage the equipment who must:</p> <ul style="list-style-type: none"> • be able to carry out all the operations necessary for the proper functioning of the equipment and system, guaranteeing their own safety and that of any third parties present; • perform maintenance activities on all parts of the equipment subject to maintenance (board and batteries); • have access to all parts of the device for visual analysis, equipment status checking, adjustments and calibrations; • have proven experience in the correct use of equipment such as those described in this manual and be trained, informed and instructed accordingly.

Tab. 2.8.

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3 - SAFETY

3.1 - GENERAL SAFETY WARNINGS

⚠ WARNING

The equipment described in this manual is:

- a device subject to pressure in pressurized systems;
 - normally included in systems transporting flammable gases (for example: natural gas).
-

⚠ WARNING

If the gas used is a combustible gas, the area where the equipment is installed is called a "danger zone" because there are residual risks of the formation of potentially explosive atmospheres.

In and around "danger zones" it is absolutely:

- necessary there are no effective ignition sources present;
 - prohibited to smoke.
-

⚠ CAUTION

Authorized operators shall not perform operations or interventions on their own initiative that are not within their competence.

Never work on the equipment:

- Under the influence of exciting substances such as, for example, alcohol;
 - In the case of using drugs that can lengthen reaction time.
-

NOTICE

The employer must train and inform operators on how to behave during operations and what equipment to use.

Before installation, commissioning or maintenance, operators must:

- Take note of the safety regulations applicable to the installation site where they are to operate;
- Obtain, when required, the necessary authorizations to operate;
- Equip themselves with the necessary personal protective equipment required in the procedures described in this manual;
- Ensure that the area in which they are to work is equipped with the required collective protections and necessary safety signs.

3.2 - PERSONAL PROTECTIVE EQUIPMENT

NOTICE

Personal Protective Equipment (P.P.E.) means any equipment intended to be worn by the worker for the purpose of protecting him against one or more hazards likely to threaten his safety or health while at work.

Qualified professionals, depending on the type of intervention required, will be notified of (and must use) the appropriate P.P.E. Tab. 3.9. lists the Personal Protective Equipment (P.P.E.) and its description. An obligation is attached to each symbol.

Symbol	Meaning
	Obligation to use protective or insulating gloves. Indicates a requirement for personnel to use protective or insulating gloves.
	Obligation to use safety glasses. Indicates a requirement for personnel to use protective goggles to protect their eyes.
	Obligation to use safety shoes. Indicates a requirement for personnel to use safety shoes to protect their feet.
	Obligation to use noise protection devices. Indicates a requirement for personnel to use earmuffs or earplugs for hearing protection.
	Wear appropriate protective clothes. Indicates a requirement for personnel to wear the specific protective clothing.
	Mandatory use of protective mask. Indicates a requirement for personnel to use masks for respiratory protection in the event of a chemical hazard.
	Mandatory use of protective helmet. Indicates a requirement for personnel to use the protective helmet.
	Obligation to wear high-visibility vest. Indicates a requirement for personnel to use high-visibility vests.

Tab. 3.9.

⚠ WARNING

Each licensed operator is required to:

- take care of his own health and safety and that of other persons in the workplace, on whom the effects of his actions or omissions fall, in accordance with his training, instructions and means provided by the employer;
- use the PPE provided appropriately;
- Immediately report to the employer, manager or supervisor deficiencies in the means and devices as well as any hazardous conditions of which they become aware.

3.3 - OBLIGATIONS AND PROHIBITIONS

The list of obligations and prohibitions to be observed for operator safety is given below:

- carefully read and understand the operation, maintenance and warning manual;
- verify that the downstream equipment is properly sized according to the performance required of the regulator under the actual operating condition;
- view the data on the identification plates and the manual before installing the equipment;
- avoid violent shocks and impacts that could damage the equipment favoring the leakage of pressurized fluid.

It is strictly forbidden to:

- operate in various capacities on the equipment without the PPE specified in the work procedures described in this manual;
- operate in the presence of open flames or approach open flames to the work area;
- smoke near the equipment or while you are working on it;
- use the equipment with parameters different from those indicated on the nameplate;
- use the equipment with fluids other than those indicated in this manual;
- use the equipment outside the operating temperature range stated in this manual;
- install or use the equipment in environments other than those specified in this manual.

3.4 - SAFETY PICTOGRAMS

The following safety pictograms may appear on equipment and/or packaging PIETRO FIORENTINI S.p.A.:

Symbol	Definition
	Symbol used to identify an ELECTRICAL HAZARD.
	Symbol used to identify a GENERIC DANGER.

Tab. 3.10.

⚠ DANGER

It is strictly forbidden to remove the safety pictograms on the equipment.

The user is required to replace the safety pictograms that, as a result of wear and tear, removal or tampering are illegible.

3.5 - NOISE LEVEL

Depending on the operating conditions, usage and required configuration, the equipment may generate noise beyond the limits allowed by the regulations in force in the country of installation.

For the generated noise value of the equipment and further information, please contact PIETRO FIORENTINI S.p.A.

⚠ CAUTION

The requirement to use earmuffs or earplugs to protect the operator's hearing remains in case the noise in the equipment installation environment (depending on specific operating conditions) exceeds 85 dBA.

3.6 - RESIDUAL RISKS

NOTICE

Equipment from GOVERNORS NORTH AMERICA does not fall under the scope of the PED Directive 2014/68/EU.

⚠ WARNING

**In case of functional abnormalities, operation is prohibited.
Contact PIETRO FIORENTINI S.p.A. immediately for necessary guidance.**

The equipment has no residual risk to the operator associated with its normal operation.

The risks associated with the equipment and the principles adopted for their prevention are evaluated below, according to the following classification:

- (a) Elimination and/or reduction of risk.
- (b) Application of appropriate protective measures.
- (c) information to users about residual risks.

3.6.1 - TABLE OF RESIDUAL RISKS DUE TO PRESSURE

Risk and Hazard	Event and Cause	Effect and Consequence	Solution and Prevention
Pressurized gas outlet. Projection of metal and non-pressurized parts.	<ul style="list-style-type: none"> Violent impact. Impact (including from falling due to improper handling, etc.). 	<ul style="list-style-type: none"> Deformation. Broken connections and, if pressurized, even bursting. 	a. Handling and installation by appropriate means to avoid localized stresses. b. Installation in suitable places and spaces with appropriate protection, suitable packaging. c. Information/indications in this manual.
Pressurized gas outlet. Projection of metal and non-pressurized parts.	<ul style="list-style-type: none"> Use of inappropriate fluids. 	<ul style="list-style-type: none"> Corrosion. Embrittlement. Explosion. 	a. The user must verify that the fluid used corresponds to what is stated on the installation sheet.
Pressurized gas outlet. Projection of metal and non-pressurized parts.	<ul style="list-style-type: none"> Operation at temperatures below the minimum allowable temperature. 	<ul style="list-style-type: none"> Embrittlement. Breakage. Explosion. 	a. Install in locations with temperature no lower than the minimum allowable temperature and/or properly insulate the equipment. b. The minimum allowable temperature is given in this manual (refer to section 4.5).
Pressurized gas outlet. Projection of metal and non-pressurized parts. Explosion.	<ul style="list-style-type: none"> Overpressure or exceeding nameplate limits (maximum allowable pressure). 	<ul style="list-style-type: none"> Explosion. Breakage. Cracking. Permanent deformations. 	a. The device has appropriate design safety margins. b. The user should check the maximum pressure available to the equipment. c. The design pressure is given in this manual (refer to section 4.5).
Pressurized fluid output. Projection of metal and non-pressurized parts.	<ul style="list-style-type: none"> Improper fixing of the equipment. 	<ul style="list-style-type: none"> Deformation. Breakage. 	a. The equipment is provided with unified type process connections and compression fittings. b. The installer must ensure proper attachment to the line. c. Information/indications in this manual.
Explosion of the device pressurized fluid output. Projection of metal parts.	<ul style="list-style-type: none"> Operation at temperatures above the maximum allowable temperature. 	<ul style="list-style-type: none"> Reduction in mechanical strength and breakage of the device. Explosion. 	a. The commissioning technician shall equip the plant with suitable control and safety equipment. b. The maximum allowable temperature is given in this manual (refer to section 4.5).
Pressurized gas leakage. Projection of metal and non-pressurized parts.	<ul style="list-style-type: none"> Stray currents, differentials, electrostatic potentials. 	<ul style="list-style-type: none"> Localized corrosion in the device. 	a. The commissioning technician should verify that the equipment is properly grounded.

Risk and Hazard	Event and Cause	Effect and Consequence	Solution and Prevention
<p>Pressurized gas leakage.</p> <p>Projection of metal and non-metal parts.</p>	<ul style="list-style-type: none"> • Humidity. • Environments with aggressive atmosphere. 	<ul style="list-style-type: none"> • Deterioration of exterior surfaces. • corrosion. 	<p>a. The user must intercept the line and contact PIETRO FIORENTINI S.p.A.</p>

Tab. 3.11.

3.6.2 - RESIDUAL RISKS TABLE FOR POTENTIALLY EXPLOSIVE ATMOSPHERES

Tab. 3.12 shows the conditions that can lead to the generation of potentially explosive atmosphere by pressure regulators GOVERNORS NORTH AMERICA.

The table is valid for use with natural gas with a density not exceeding 0.8; for different densities, installation conditions and environmental conditions will also need to be evaluated.

⚠ WARNING

If the gas used is a combustible gas, the area where the equipment is installed is called a “danger zone” because there are residual risks of the formation of potentially explosive atmospheres where it is imperative that no effective ignition sources are present.

Operating conditions	Potentially explosive atmosphere	Normative References	Management measures included in the operation, maintenance and warning manual
First start-up	No	<ul style="list-style-type: none"> During the production cycle, the external tightness of the equipment is verified according to UNI 11655:2016. Prior to commissioning, the external tightness of the portion of the system on which the equipment is installed is checked according to the requirements applicable at the place of installation (when installed in pressure-reducing systems, the requirements of UNI EN 12186:2014 and UNI EN12279:2007 shall be met). 	The manual indicates the need to perform external leakage testing and, when applicable, meet the requirements of UNI EN 12186:2014 and UNI EN 12279:2007.
Normal operating conditions	No	<p>The previous point applies and also the installation:</p> <ul style="list-style-type: none"> of the equipment is outdoors or in a naturally ventilated environment according to the requirements applicable at the place of installation, or when applicable according to EN 12186:2014 and EN 12279:2007; is subject to supervision according to applicable national regulations, good practice, and the instructions of the Equipment Manufacturer. 	<p>The manual states that:</p> <ul style="list-style-type: none"> the environment, if any, in which the equipment is installed shall meet the ventilation requirement for the installation site, or, when applicable as outlined in EN 12186:2014 and EN 12279:2007; periodic inspection should be carried out during surveillance in accordance with applicable national regulations (if any) and the Manufacturer's specific recommendations.
Breakage of the membranes	No	This event should be considered as a rare malfunction.	The manual indicates the need to meet periodic verification requirements in accordance with the requirements at the place of installation.
Breakage of other non-metallic parts (malfunction)	No	This type of malfunction is not reasonably expected since it involves static (outward) seals, which cannot generate any external leakage.	-

Operating conditions	Potentially explosive atmosphere	Normative References	Management measures included in the operation, maintenance and warning manual
Decommissioning	No	<ul style="list-style-type: none"> Pressure reduction of the section of the system in which the equipment is installed must take place in a suitably ventilated environment. Discharge of residual gas should be done as indicated above. 	The manual states the need to operate in an appropriately ventilated environment.
Restart	No	<ul style="list-style-type: none"> After a new regulator assembly, an external leak test should be performed at a convenient pressure value as specified by the Manufacturer. Prior to commissioning, the external tightness of the portion of the system on which the equipment is installed is checked according to the requirements applicable at the place of installation (when installed in pressure-reducing systems, the requirements of UNI EN 12186:2014 and UNI EN12279:2007 shall be met). 	The manual indicates: <ul style="list-style-type: none"> the minimum conditions for performing external leak tests of the equipment; the need to perform external leakage verification of the installation and, when applicable, meet the requirements of UNI EN 12186:2014 and UNI EN 12279:2007.

Tab. 3.12.

4 - DESCRIPTION AND OPERATION

4.1 - VERSIONS, MODELS AND CONFIGURATIONS

NOTICE

The different versions of the equipment must be:

- contractually established;
- set up only at the establishments PIETRO FIORENTINI S.p.A.

Typical versions of GOVERNORS NORTH AMERICA are listed in Tab. 4.13:

Type	Description	Image
Version Standard	<p>This version has a max. inlet pressure of 0.5 bar and can be supplied with:</p> <ul style="list-style-type: none"> • internal filtration element to protect the plugs; • block valve for maximum and minimum downstream pressure. 	
Version Zero	<p>This version can be used as a zero device, that is, keeping the downstream pressure at zero as the flow demand changes.</p>	
Version Ratio	<p>This version can be used as a gas/air ratio device by keeping gas/air mixing constant as the flow rate changes.</p> <p>NOTICE It is possible to calibrate the device to achieve 1:1 gas/air mixing.</p>	
Version Goval	<p>This version has, compared to the standard version, a max inlet pressure extended to 1 bar.</p>	
Version OPD	<p>This version features two regulators in series, the regulator:</p> <ul style="list-style-type: none"> • upstream has a monitor function; • downstream functions as a regulator. 	

Type	Description	Image
Version Dual Cut	This version features two regulators in series that function as a two-stage regulator.	
Painted version	This version is suitable for: <ul style="list-style-type: none"> marine environments (against salt corrosion); atmospheres with high humidity. 	-

Tab. 4.13.

The different models of the GOVERNORS NORTH AMERICA are identified, based on the type of connections, as shown in Tab. 4.14.:

Regulator Name/Model	Version	Connections
30051	-	1/2"
30052	-	3/4"
30053	-	1"
30150	High capacity	1/2"
30151	High capacity	3/4"
30152	High capacity	1"
30153	-	1"1/4"
30154	-	1"1/2"
30155	-	2"
30156	-	DN65
30157	-	DN80
30158	-	DN100

Tab. 4.14.

4.1.1 - SURFACE TREATMENTS

NOTICE

Surface treatments (special painting, anticorrosive treatments, galvanizing,...) are provided for specific needs and/or special environmental conditions.

4.2 - GENERAL DESCRIPTION

The equipment is a self-operated low-pressure regulator suitable for gaseous fluids such as:

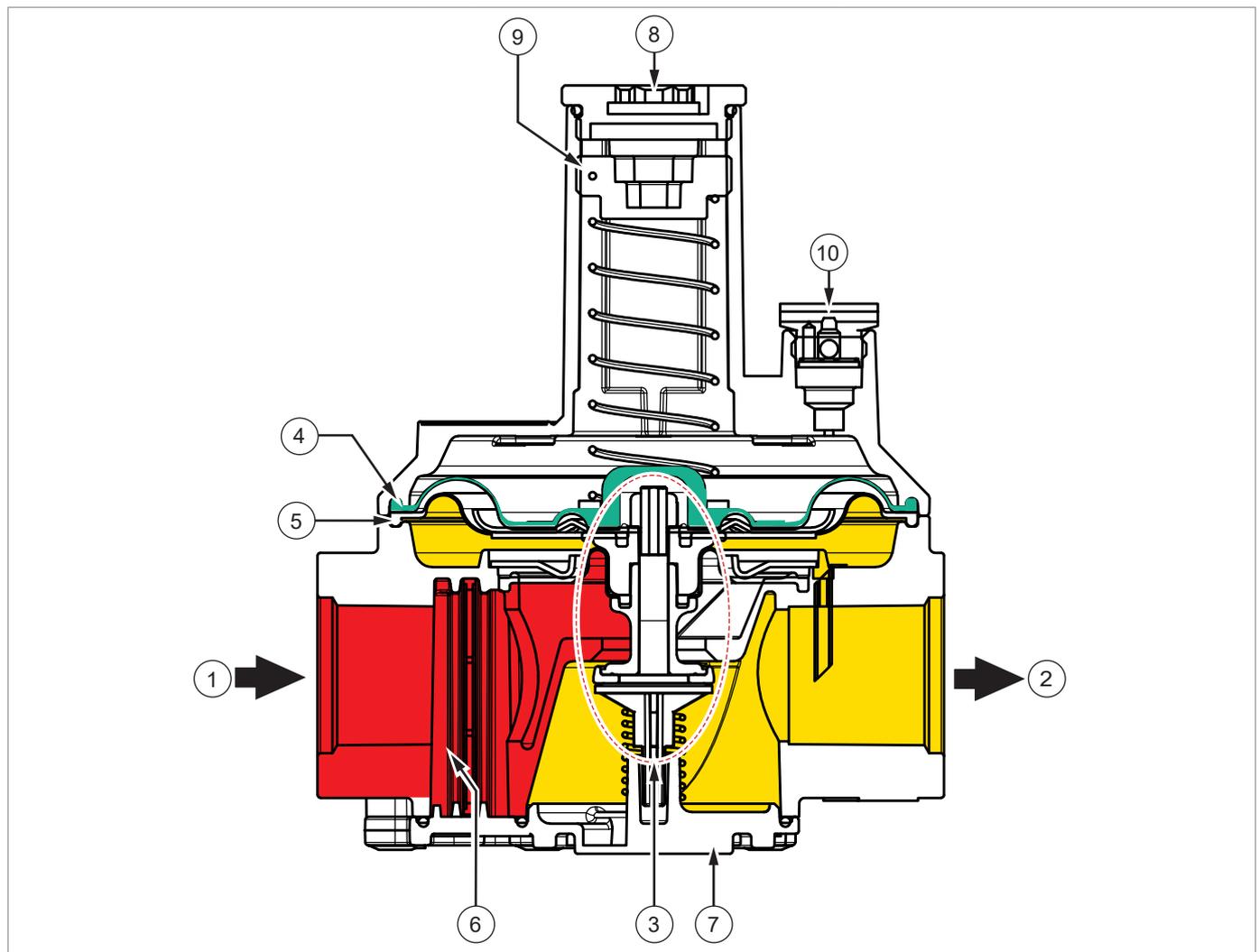
- natural gas;
- LPG;
- propane gas;
- non-corrosive gases.

The balanced plug system, guarantees a constant outlet pressure value as the inlet pressure and the required flow rate change.

The main elements of the equipment are shown in Tab. 4.15.:

Pos.	Description	Pos.	Description
1	Inlet connection	6	Filter cartridge (optional)
2	Outlet connection	7	Lower cover
3	Balanced plug	8	Top cap
4	Safety membrane	9	Setting ring nut
5	Working membrane	10	Vent limiter

Tab. 4.15.



 **UPSTREAM (INLET) PRESSURE**

 **DOWNSTREAM (OUTLET) PRESSURE**

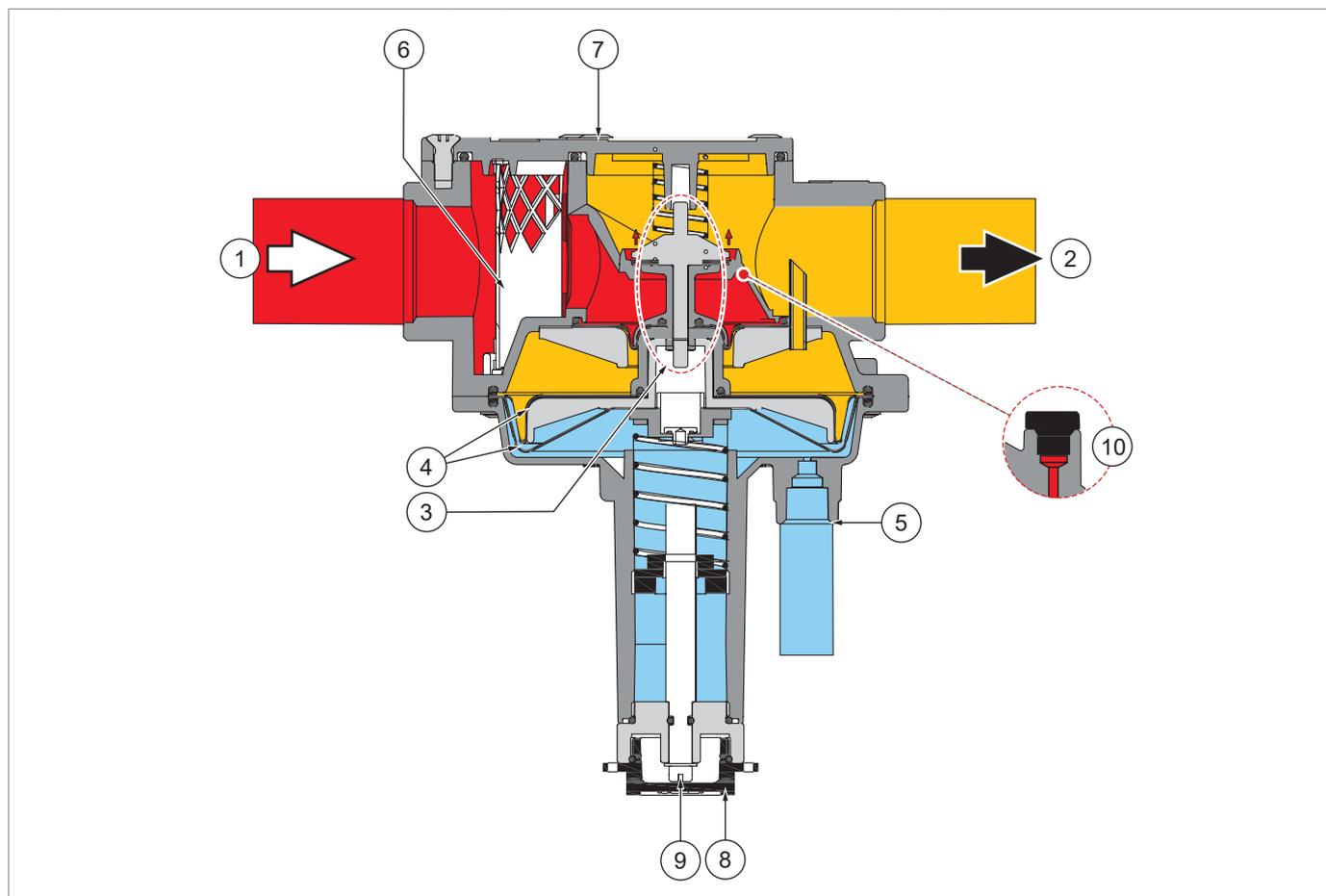
Fig. 4.1. General description

4.2.1 - ZERO VERSION DESCRIPTION

The main elements of the zero version are shown in Tab. 4.16.:

Pos.	Description	Pos.	Description
1	Inlet connection	6	Filter cartridge (optional)
2	Outlet connection	7	Lower cover
3	Balanced plug	8	Top cap
4	Double membrane (work and safety)	9	Setting screw
5	Vent threaded connection	10	By-pass

Tab. 4.16.



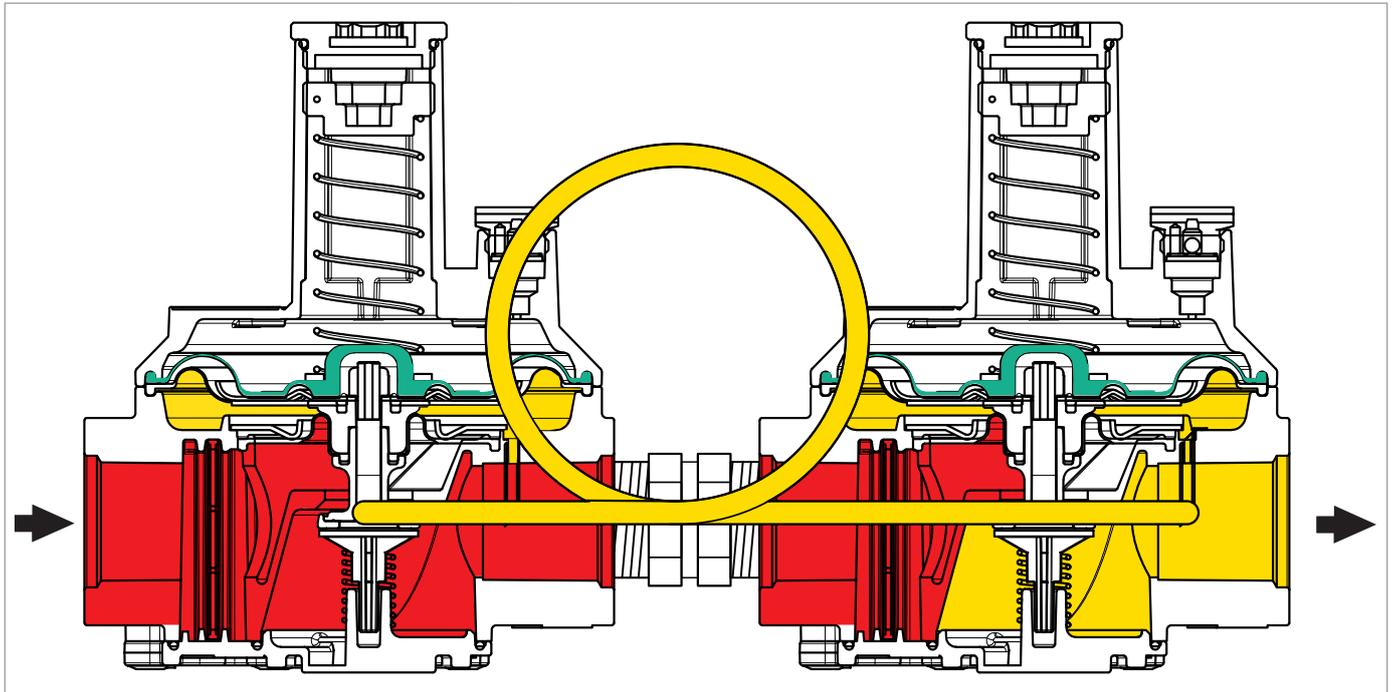
■ **UPSTREAM (INLET) PRESSURE**
■ **DOWNSTREAM (OUTLET) PRESSURE**
■ **AIR PRESSURE**

Fig. 4.2. Zero version general description

4.2.2 - OPD VERSION DESCRIPTION

NOTICE

See Section 4.2 "General Description" for the location of the main elements of the OPD version.



 **UPSTREAM (INLET) PRESSURE**

 **DOWNSTREAM (OUTLET) PRESSURE**

Fig. 4.3. OPD version

4.2.3 - DUAL CUT VERSION DESCRIPTION

NOTICE

See Section 4.2 "General Description" for the location of the main elements of the Dual Cut version.

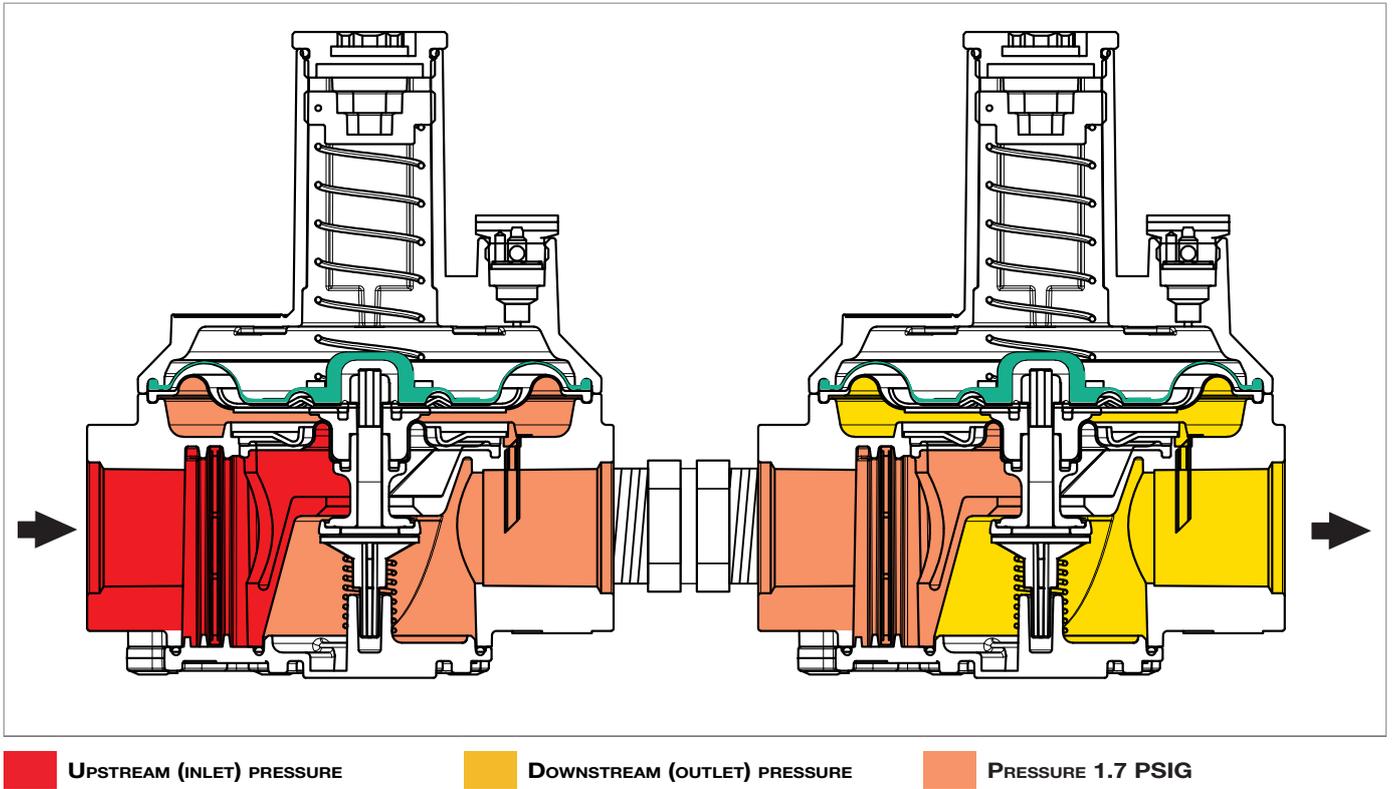


Fig. 4.4. Dual Cut Version

4.3 - OPERATION

The GOVERNORS NORTH AMERICA are regulators:

- self-activated;
- for low pressure;
- with safety membrane.

In Tab. 4.17. the operation of the equipment is described in a simplified way:

Phase	Description
1	The upstream pressure (A): <ul style="list-style-type: none"> • feeds the regulator; • is adjusted by the balanced plug system (B) to the value of the downstream pressure (C) required by the user.
2	In the event of working membrane (D) rupture, the presence of the safety membrane (E), limits gas leakage into the atmosphere to 30 l/h.

Tab. 4.17.

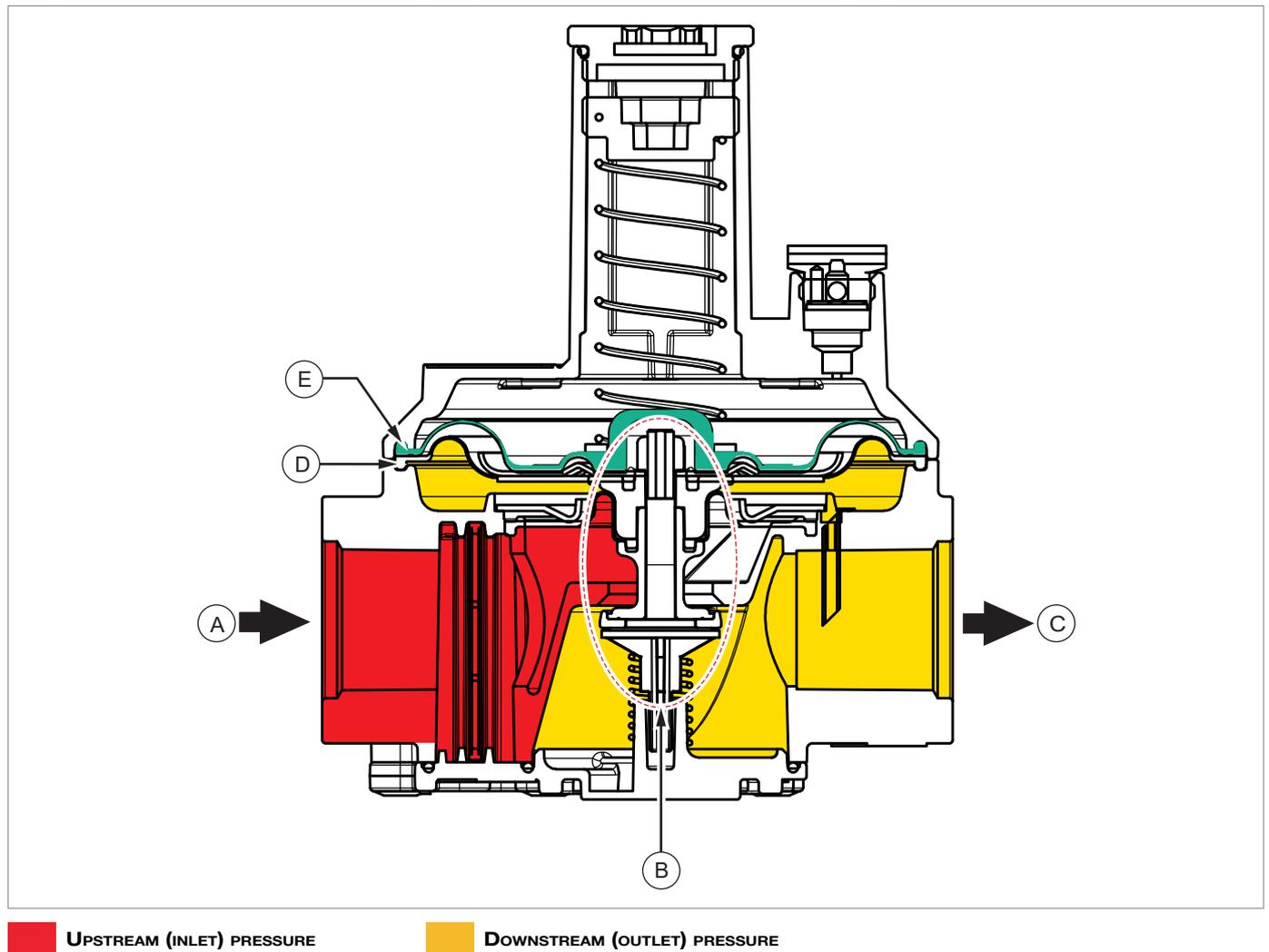


Fig. 4.5. Operation GOVERNORS NORTH AMERICA

4.3.1 - OPD VERSION OPERATION

During normal operation, the monitor regulator (A) does not make any adjustments.

If the regulating regulator (B) fails, the monitor regulator (A), through the external pressure tap (C), regulates at a safety pressure normally 70% higher than the regulator pressure (B). The action of the monitor regulator (A) keeps the operating set point below the CSA limit of 2 PSIG.

NOTICE

In the event of failure of the regulating regulator (B), the monitor regulator (A) should limit the downstream outlet pressure without undergoing set point changes.

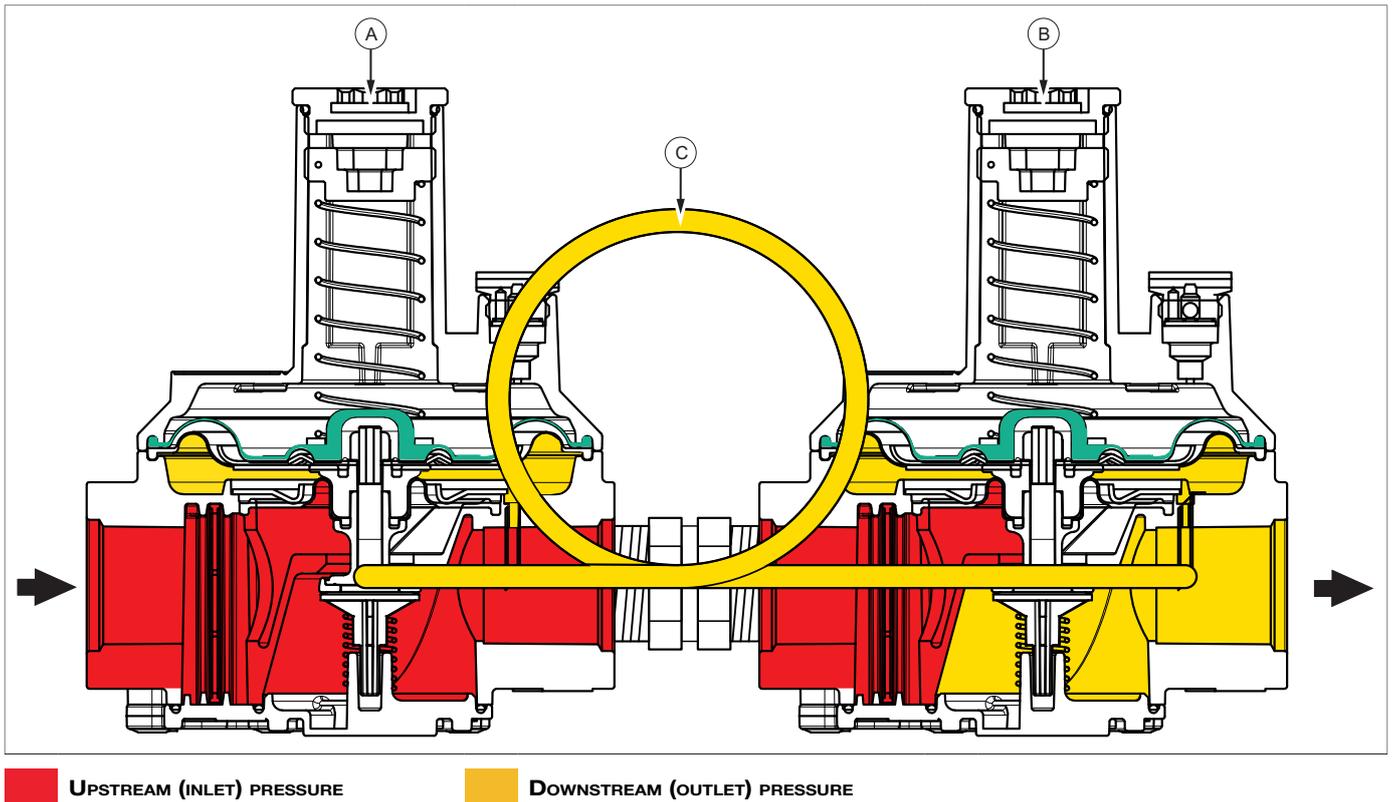


Fig. 4.6. OPD version operation

4.3.2 - DUAL CUT VERSION OPERATION

The Dual Cut version stipulates that the regulator:

- upstream (A) adjusts the pressure to 1.7 PSIG;
- downstream (B) adjusts the pressure to the required outlet pressure.

If the downstream regulator (B) fails, the upstream regulator (A) maintains the outlet pressure below the CSA limit of 2 PSIG.

NOTICE

In the event of failure of the downstream regulator (B), the upstream regulator (A) should limit the downstream outlet pressure without undergoing set point changes.

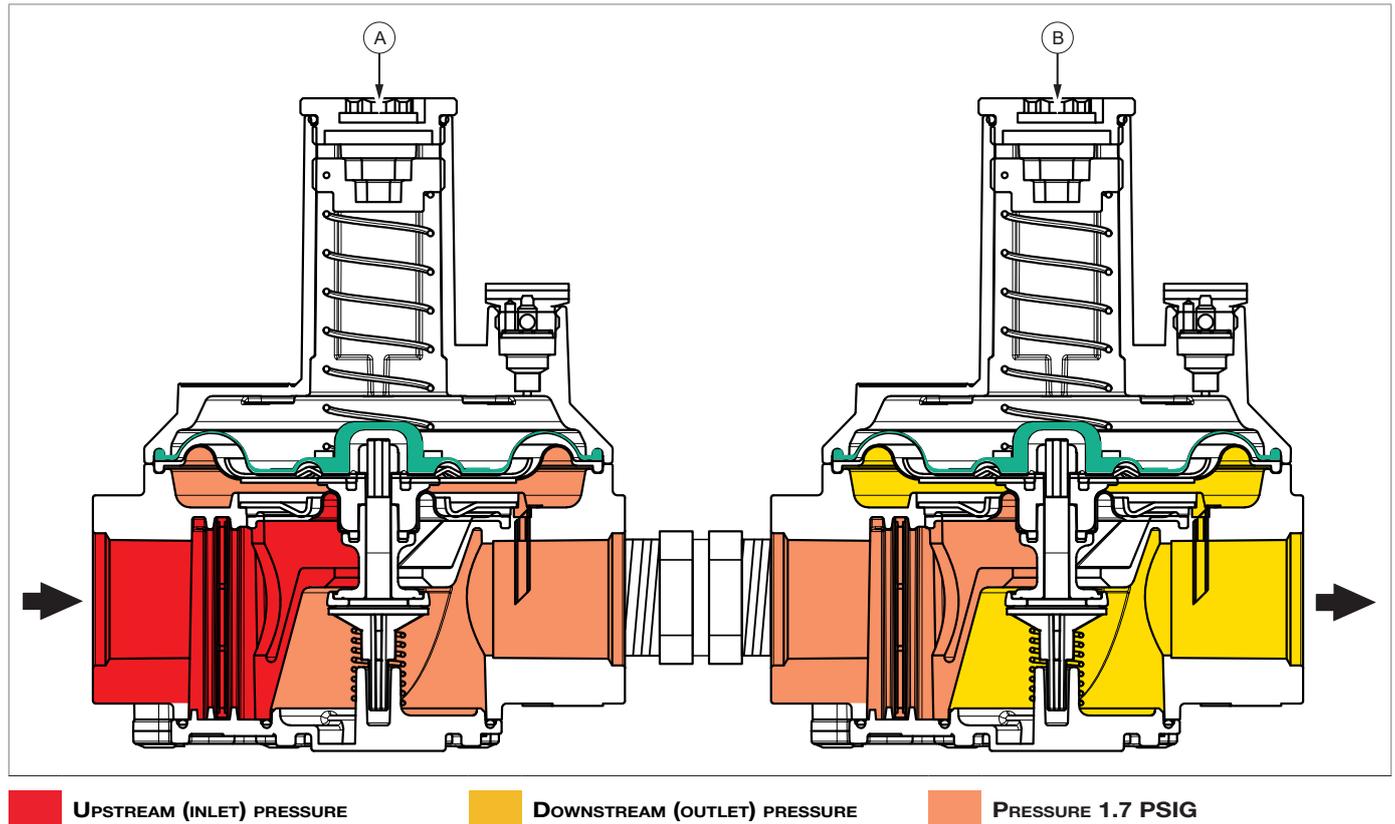


Fig. 4.7. Dual Cut version operation

4.4 - INTENDED USE

4.4.1 - INTENDED USE

NOTICE

The **GOVERNORS NORTH AMERICA** can be installed upstream of:

- utility meters;
- upright columns;
- burners.

The equipment in question is intended for:

Operation	Allowed	Not Allowed	Processing environment
Downstream pressure regulation due to:	Gaseous fluids, not aggressive or corrosive, preliminarily filtered.	<ul style="list-style-type: none"> • Liquids. • Any other product other than the one allowed. 	Installations for the distribution of natural gas or LPG to supply networks for: <ul style="list-style-type: none"> • industrial use; • commercial use; • domestic use.

Tab. 4.18.

The equipment in question has been designed to be used only within the limits indicated on the identification plate and according to the instructions and limits of use given in this manual.

The conditions to work safely are:

- use within the limits stated on the identification plate and in this manual;
- adherence to the procedures of the usage and warning instructions and commissioning (refer to Chapter 8);
- Do not tamper with and/or bypass the safety devices.

4.4.2 - REASONABLY FORESEEABLE MISUSE

Reasonably foreseeable misuse means the use of the equipment in a way not foreseen at the design stage but which may result from easily predictable human behavior:

- corrosive fluids;
- fluids not properly treated upstream;
- liquids;
- instinctive reaction of an operator in the event of a malfunction, accident or failure during the use of the equipment;
- behavior resulting from pressure to keep the equipment in operation in all circumstances;
- conduct resulting from carelessness;
- behavior deriving from the use of the equipment by unqualified and unsuitable persons (children, disabled persons);
- use of the equipment other than as envisaged in the paragraph "Intended use".

Any other use of the equipment than that envisaged must be authorized in advance in writing by PIETRO FIORENTINI S.p.A. In the absence of written permission, the use is considered improper.

In the presence of "improper use", PIETRO FIORENTINI S.p.A. declines all responsibility in relation to any damage caused to things or people and considers any type of warranty on the equipment lapsed.

4.4.3 - TYPES OF FLUIDS

The equipment works with combustible gases used:

- in pressure control stations according to UNI EN 12186:2014 and UNI EN 12279:2007 standards or in LPG conveying installations;
- in commercial plants (subject to verification by contacting PIETRO FIORENTINI S.p.A.).

NOTICE

The equipment, after verification, by contacting the Manufacturer, can also be used with inert gases.

4.5 - TECHNICAL/FUNCTIONAL FEATURES

NOTICE

Refer to CSA 6.22-2011/ANSI Z21.80, CSA 6.18-2002 (R2013), ANSI B109.4-1998 (R2008) for functional performance classification of the equipment.

The main specifications are shown in Tab.4.19:

Technical/functional features		
Design pressure (DP)	Standard Version	0.1 MPa
	Ratio Version Zero Version	0.035 MPa
	Goval Version	0.25 MPa
Ambient temperature of use	Standard Version Goval Version	-5 °F to +140 °F
	Ratio Version Zero Version	14 °F to +140 °F
Inlet pressure range	Standard Version	Wd+0.25 kPa to 50 kPa
	Ratio Version Zero Version	Wd +2 kPa to 35 kPa
	Goval Version	Wd+0.75 kPa to 100 kPa
Downstream pressure regulation range	Standard Version Goval Version	0.5 kPa to 30 kPa
	Ratio Version	0.2 kPa to 15 kPa
	Zero Version	-0.5 kPa to 0.5 kPa
Accessories	<ul style="list-style-type: none"> • Built-in inlet filter. • Inlet and outlet pressure taps. • Vent limiter. 	
Accuracy class (AC)	up to 15	
Closure overpressure (SG)	up to 30 (minimum 0.75 KPa - 7.5 mbar)	
Flow rate coefficients	Refer to Tab.4.21 and Tab.4.22 in section 4.5.1	
Modular connections	<ul style="list-style-type: none"> • Gas (according to UNI EN ISO 228-1:2003). • Flat swivel (according to NF E29-533: 2014 and NF E29-536: 2017). • NPT (according to ASME B1.20.1, excluding metal-to-metal seal connections). • Specials (on request). 	

Tab. 4.19.

4.5.1 - FLOW RATE COEFFICIENTS

In Tab. 4.20 the flow rate coefficients (Cg) of stabilizers without filter as indicated by DIN EN 334 are given:

Flow rate coefficients (stabilizers without filter)													
Version		High flow rate											
Nominal size	[mm]	15	20	25	15	20	25	32	40	50	65	80	100
	[inches]	1/2"	3/4"	1"	1/2"	3/4"	1"	1" 1/4	1" 1/2	2"	2" 1/2	3"	4"
Cg (Standard Version)		80	100	130	190	240	285	680	710	1300	1650	2000	3500
Cg (Zero/Ratio Versions)		-	-	-	160	205	240	580	610	1100	1400	1700	2980
Cg (Goval Version) Pu ≤ 350 bar Pd ≤ 35 mbar		56	70	90	135	170	200	545	570	1200	1480	1800	3150

Tab. 4.20.

In Tab. 4.21 the flow rate coefficients (Cg) of stabilizers with filter as indicated by DIN EN 334 are given:

Flow rate coefficients (stabilizers with filter)													
Version		High flow rate											
Nominal size	[mm]	15	20	25	15	20	25	32	40	50	65	80	100
	[inches]	1/2"	3/4"	1"	1/2"	3/4"	1"	1" 1/4	1" 1/2	2"	2" 1/2	3"	4"
Cg (Standard Version)		68	82	110	135	158	200	460	570	1150	1450	1600	2850
Cg (Zero/Ratio Versions)		-	-	-	116	135	170	390	485	980	1250	1380	2430
Cg (Goval Version) Pu ≤ 350 bar Pd ≤ 35 mbar		56	70	90	108	140	162	440	550	1100	1380	1500	2700

Tab. 4.21.

In Tab. 4.22 flow rate values are given for each model as a function of set point and inlet pressure:

Flow rate in Scfh with filter (flow rate without filter in brackets)				
Model	Set point outlet pressure	Operating inlet pressure		
		14"WC	1 psig	2 psig
31051 ½"	8"WC	386 (360)	552 (649)	785 (923)
	11"WC	218 (256)	511 (601)	785 (923)
31052 ¾"	8"WC	369 (450)	665 (812)	946 (1154)
	11"WC	363 (321)	616 (751)	946 (1154)
31053 1"	8"WC	495 (585)	893 (1,055)	1270 (1154)
	11"WC	353 (417)	825 (977)	1270 (1154)
31150 ½" High Capacity	8"WC	610 (855)	1097 (1,543)	1558 (2193)
	11"WC	433 (609)	10,14 (1,428)	1558 (2193)
31151 ¾" High Capacity	8"WC	714 (1,080)	1284 (1,949)	1824 (2771)
	11"WC	507 (770)	1187 (1,803)	1824 (2771)
31152 1" High Capacity	8"WC	903 (1,283)	1625 (2,314)	2309 (3290)
	11"WC	642 (914)	1503 (2,142)	2309 (3290)
31153 1¼"	8"WC	2,071(3,062)	3,735 (5,522)	5311 (7851)
	11"WC	1,476 (2,183)	3,457 (5,110)	5311 (7851)
31154 1½"	8"WC	2,567 (3,197)	4,629 (5,766)	6581 (8197)
	11"WC	1,829 (2,279)	4,284 (5,336)	6581 (8197)
31155 2"	8"WC	5,179 (5,854)	9,339 (10,557)	13278 (15009)
	11"WC	3,691(4,173)	8,643 (9,336)	13278 (15009)
31156/F 2½"	8"WC	6,530 (7,431)	11,775 (13,999)	16741(19051)
	11"WC	4,655 (5,297)	10,898 (12,401)	16741(19051)
31157/F 3"	8"WC	7,205 (9,007)	12,993 (16,242)	18473 (23092)
	11"WC	12,025 (6,240)	12,025 (15,032)	18473 (23092)
31158/F 4"	8"WC	12,835 (15,762)	23,245 (28,424)	32906 (40411)
	11"WC	9,149 (11,236)	21,420 (26,306)	32906 (40411)

Tab. 4.22.

In Tab. 4.23 flow rate values are given for each model as a function of set point and inlet pressure:

Flow rate in Scfh with filter (flow rate without filter in brackets)				
Model	Set point outlet pressure	Operating inlet pressure		
		14"WC	1 psig	2 psig
31051DC ½"	8"WC	785 (923)	785 (923)	785 (923)
	11"WC	785 (923)	785 (923)	785 (923)
	14"WC	785 (923)	785 (923)	785 (923)
31052DC ¾"	8"WC	946 (1154)	946 (1154)	946 (1154)
	11"WC	946 (1154)	946 (1154)	946 (1154)
	14"WC	946 (1154)	946 (1154)	946 (1154)
31053DC 1"	8"WC	1270 (1500)	1270 (1500)	1270 (1500)
	11"WC	1270 (1500)	1270 (1500)	1270 (1500)
	14"WC	1270 (1500)	1270 (1500)	1270 (1500)
31150DC ½" High Capacity	8"WC	1558 (2193)	1558 (2193)	1558 (2193)
	11"WC	1558 (2193)	1558 (2193)	1558 (2193)
	14"WC	1558 (2193)	1558 (2193)	1558 (2193)
30151DC ¾" High Capacity	8"WC	1824 (2771)	1824 (2771)	1824 (2771)
	11"WC	1824 (2771)	1824 (2771)	1824 (2771)
	14"WC	1824 (2771)	1824 (2771)	1824 (2771)
31152DC 1"	8"WC	2309 (3290)	2309 (3290)	2309 (3290)
	11"WC	2309 (3290)	2309 (3290)	2309 (3290)
	14"WC	2309 (3290)	2309 (3290)	2309 (3290)
31153DC 1¼"	8"WC	5311 (7851)	5311 (7851)	5311 (7851)
	11"WC	5311 (7851)	5311 (7851)	5311 (7851)
	14"WC	5311 (7851)	5311 (7851)	5311 (7851)
31154DC 1½"	8"WC	6581 (8197)	6581 (8197)	6581 (8197)
	11"WC	6581 (8197)	6581 (8197)	6581 (8197)
	14"WC	6581 (8197)	6581 (8197)	6581 (8197)
31155DC 2"	8"WC	13278 (15009)	13278 (15009)	13278 (15009)
	11"WC	13278 (15009)	13278 (15009)	13278 (15009)
	14"WC	13278 (15009)	13278 (15009)	13278 (15009)
31156DC 2½"	8"WC	16741 (19741)	16741 (19741)	16741 (19741)
	11"WC	16741 (19741)	16741 (19741)	16741 (19741)
	14"WC	16741 (19741)	16741 (19741)	16741 (19741)
31157DC 3"	8"WC	18473 (23092)	18473 (23092)	18473 (23092)
	11"WC	18473 (23092)	18473 (23092)	18473 (23092)
	14"WC	18473 (23092)	18473 (23092)	18473 (23092)
31158DC 4"	8"WC	32906 (40411)	32906 (40411)	32906 (40411)
	11"WC	32906 (40411)	32906 (40411)	32906 (40411)
	14"WC	32906 (40411)	32906 (40411)	32906 (40411)

Tab. 4.23.

In Tab. 4.24 flow rate values are given for each model as a function of set point and inlet pressure:

Flow rate in Scfh with filter (flow rate without filter in brackets)				
Model	Set point outlet pressure	Operating inlet pressure		
		14"WC	1 psig	2 psig
31051OPD 1/2"	8"WC	785 (923)	785 (923)	785 (923)
	11"WC	785 (923)	785 (923)	785 (923)
	14"WC	785 (923)	785 (923)	785 (923)
31052OPD 3/4"	8"WC	946 (1154)	946 (1154)	946 (1154)
	11"WC	946 (1154)	946 (1154)	946 (1154)
	14"WC	946 (1154)	946 (1154)	946 (1154)
31053OPD 1"	8"WC	1270 (1500)	1270 (1500)	1270 (1500)
	11"WC	1270 (1500)	1270 (1500)	1270 (1500)
	14"WC	1270 (1500)	1270 (1500)	1270 (1500)
31150OPD 1/2" High Capacity	8"WC	1558 (2193)	1558 (2193)	1558 (2193)
	11"WC	1558 (2193)	1558 (2193)	1558 (2193)
	14"WC	1558 (2193)	1558 (2193)	1558 (2193)
30151OPD 3/4" High Capacity	8"WC	1824 (2771)	1824 (2771)	1824 (2771)
	11"WC	1824 (2771)	1824 (2771)	1824 (2771)
	14"WC	1824 (2771)	1824 (2771)	1824 (2771)
31152OPD 1"	8"WC	2309 (3290)	2309 (3290)	2309 (3290)
	11"WC	2309 (3290)	2309 (3290)	2309 (3290)
	14"WC	2309 (3290)	2309 (3290)	2309 (3290)
31153OPD 1 1/4"	8"WC	5311 (7851)	5311 (7851)	5311 (7851)
	11"WC	5311 (7851)	5311 (7851)	5311 (7851)
	14"WC	5311 (7851)	5311 (7851)	5311 (7851)
31154OPD 1 1/2"	8"WC	6581 (8197)	6581 (8197)	6581 (8197)
	11"WC	6581 (8197)	6581 (8197)	6581 (8197)
	14"WC	6581 (8197)	6581 (8197)	6581 (8197)
31155OPD 2"	8"WC	13278 (15009)	13278 (15009)	13278 (15009)
	11"WC	13278 (15009)	13278 (15009)	13278 (15009)
	14"WC	13278 (15009)	13278 (15009)	13278 (15009)
31156OPD 2 1/2"	8"WC	16741 (19741)	16741 (19741)	16741 (19741)
	11"WC	16741 (19741)	16741 (19741)	16741 (19741)
	14"WC	16741 (19741)	16741 (19741)	16741 (19741)
31157OPD 3"	8"WC	18473 (23092)	18473 (23092)	18473 (23092)
	11"WC	18473 (23092)	18473 (23092)	18473 (23092)
	14"WC	18473 (23092)	18473 (23092)	18473 (23092)
31158OPD 4"	8"WC	32906 (40411)	32906 (40411)	32906 (40411)
	11"WC	32906 (40411)	32906 (40411)	32906 (40411)
	14"WC	32906 (40411)	32906 (40411)	32906 (40411)

Tab. 4.24.

4.6 - SAFETY DEVICES

To avoid tripping of safety devices during normal service (when the utility has no anomalies), flushing purges of the downstream line should not be carried out with the reducer installed.

4.6.1 - SAFETY MEMBRANE

NOTICE

Tripping of the safety membrane (A) results in replacement of the regulator.

The safety membrane (A) is a device capable of limiting the leakage of gas into the atmosphere if the working membrane (B) ruptures.

The tripping of the safety membrane (A) ensures gas leakage to the atmosphere of a maximum value of 30 l/h. Micro leakage of gas into the atmosphere will enable detection of rupture of the working membrane (B).

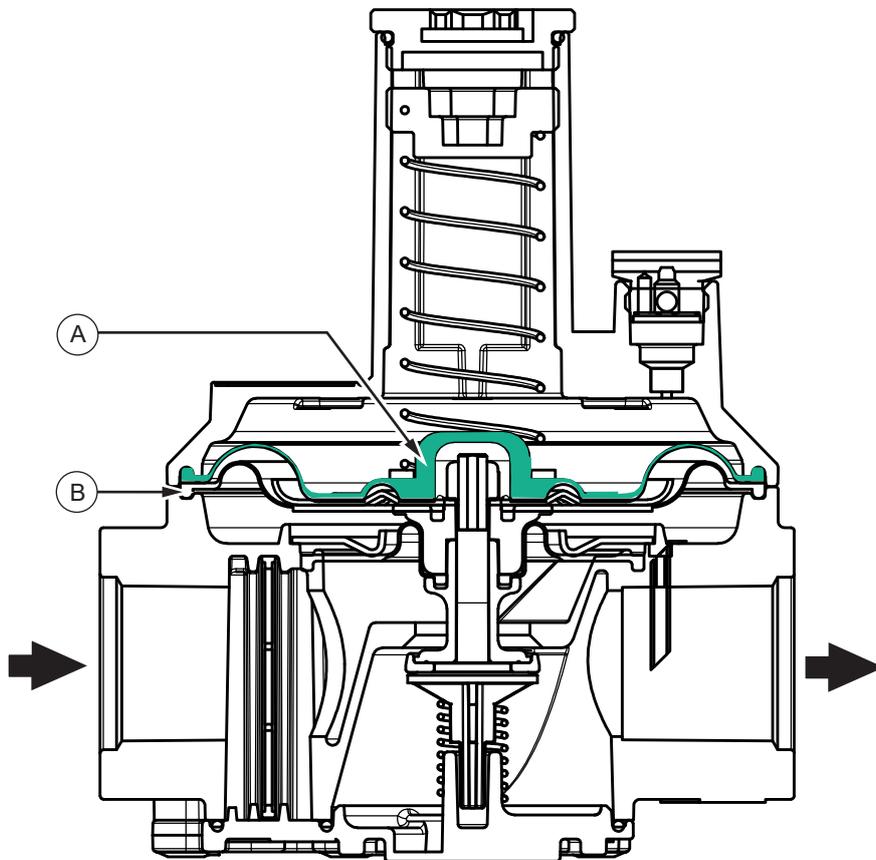


Fig. 4.8. Safety membrane

4.6.2 - VENT LIMITER

NOTICE

The vent limiter should not be used outdoors or in environments exposed to the weather.

The vent limiter (A) is:

- designed in accordance with ANSI Z21.80a-2005 requirements;
- optional.

The vent limiter (A) prevents vent piping to the outside when stabilizer use is planned in enclosed rooms or spaces where limiting the amount of gas leakage due to membrane malfunction is critical.

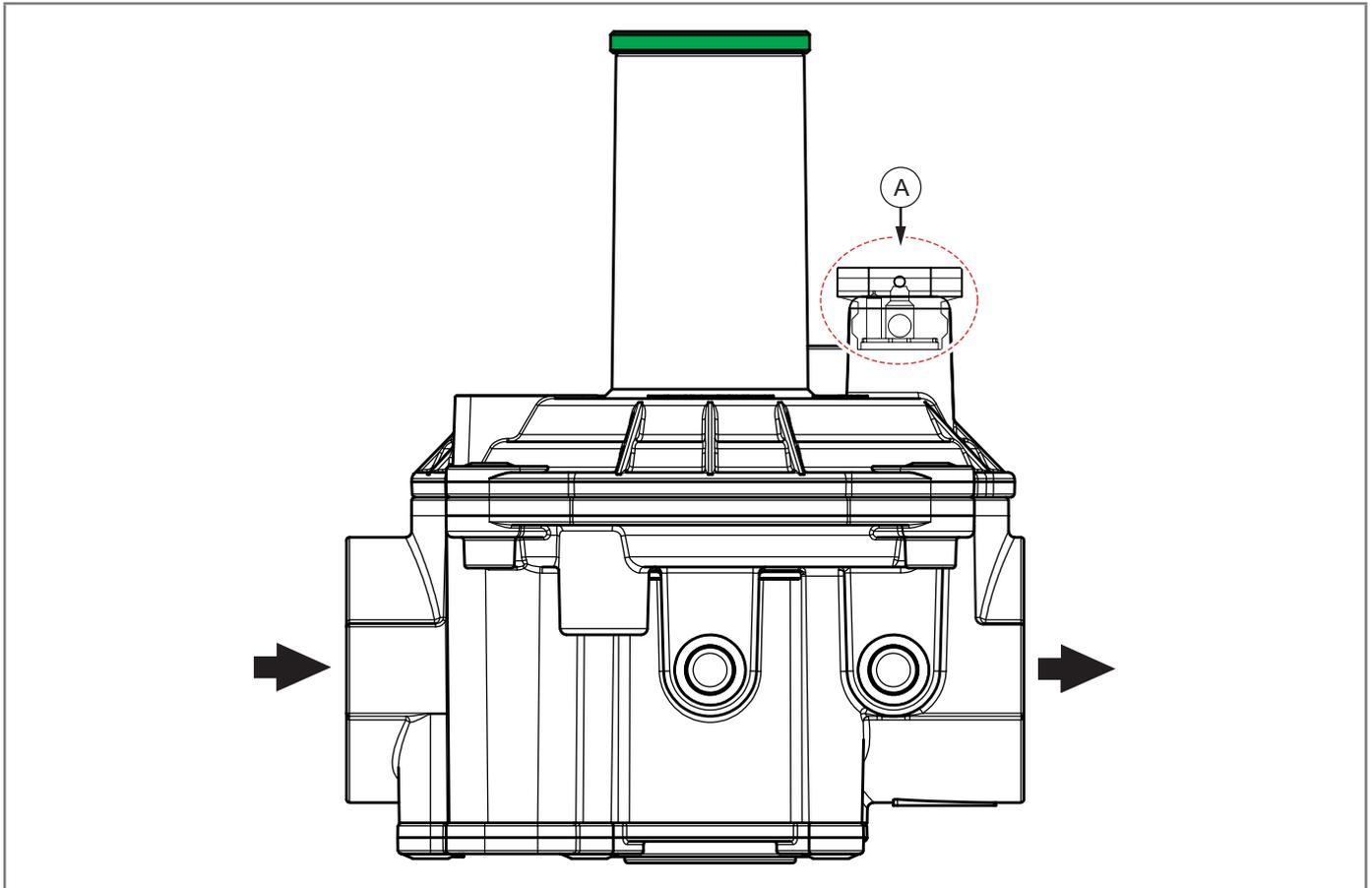


Fig. 4.9. Installation of the vent limiter

4.6.3 - PRESSURE TAP

The pressure tap integrated (A) to the regulator is required for field verification of safety devices:

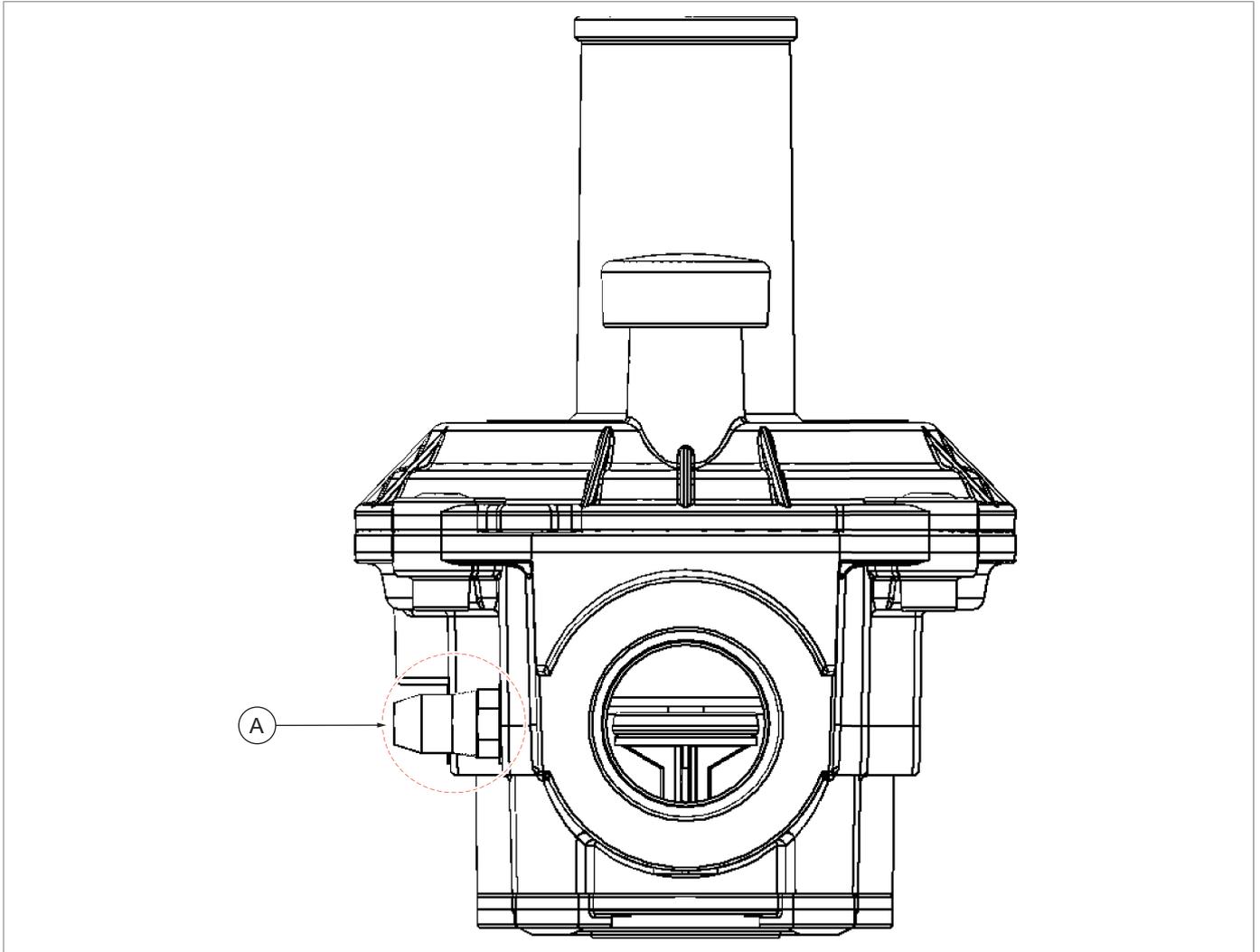


Fig. 4.10. Standard pressure taps

4.6.3.1 - PROCEDURE FOR USE WITH STANDARD PRESSURE TAP

CAUTION

The maximum use pressure for the standard pressure tap is 0.5 bar.

To use the standard pressure tap (A), proceed as shown in Tab.4.25:

Step	Operation
1	Unscrew the locking screw (B).
2	Fit the rubber hose on the tang (C) making sure that the connection ensures tightness.
3	Tighten the sealing screw (B) by checking for leakage from the pressure tap.

Tab. 4.25.

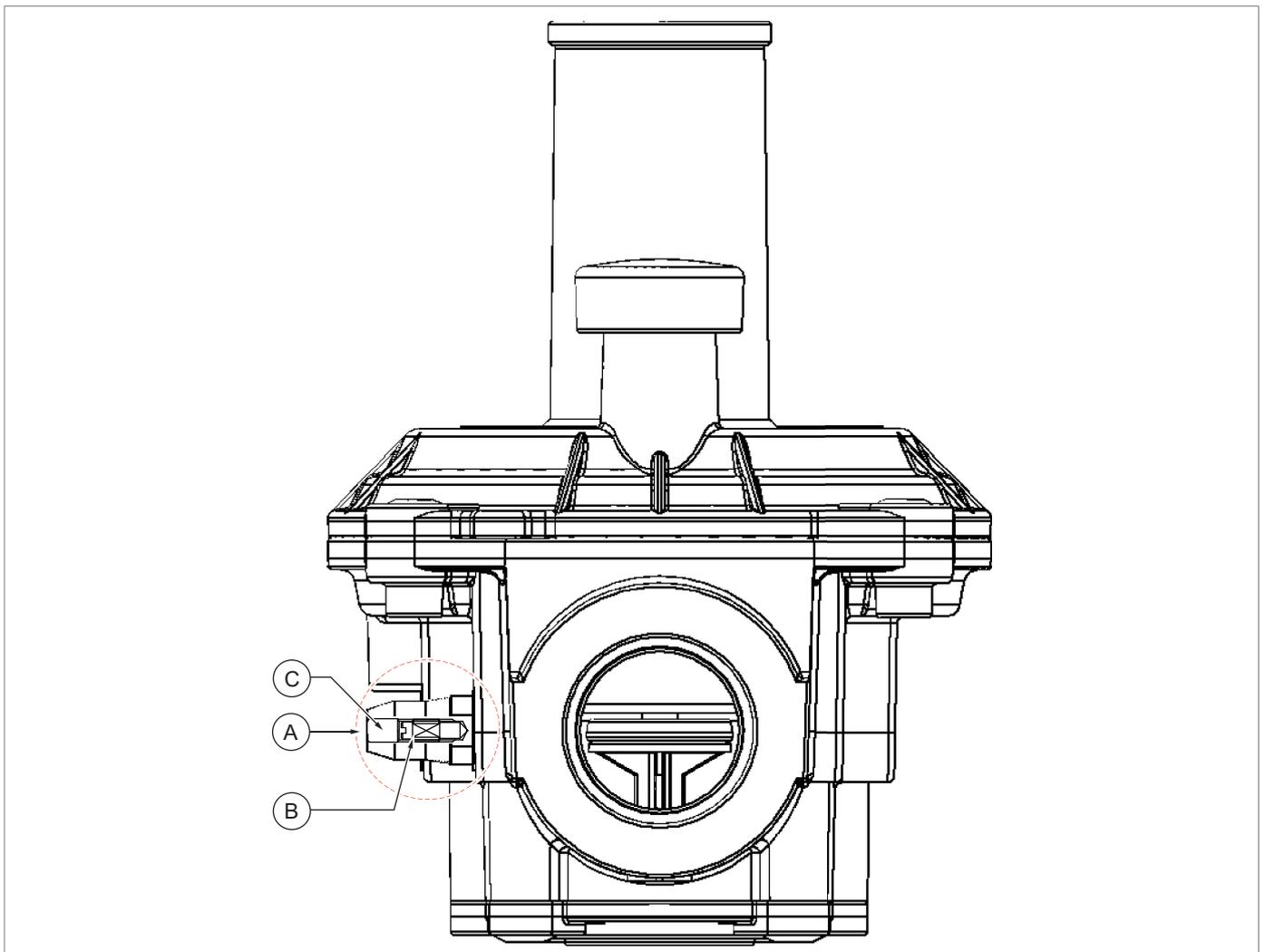


Fig. 4.11. Using standard pressure tap

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5 - TRANSPORT AND HANDLING

5.1 - SPECIFIC WARNINGS FOR TRANSPORT AND HANDLING

NOTICE

The transport and handling activities, in compliance with the regulations in force in the country of destination of the equipment, must be carried out by personnel:

- qualified (specially trained);
- aware of the rules of accident prevention and safety in the workplace;
- authorized to use the lifting equipment and vehicles.

Transport and handling

Operator qualification	<ul style="list-style-type: none"> • Installer.
PPE required	 <p>⚠ WARNING</p> <p>The PPE listed in this chart relates to the risk associated with the equipment. For the PPE required to protect against risks associated with the workplace, installation or operating conditions, refer to:</p> <ul style="list-style-type: none"> • the regulations in force in the country of installation; • <u>any indications provided by the Safety Manager at the installation facility.</u>
Weights and dimensions of the equipment	<p>For dimensions and weights, refer to paragraph 5.2 "Physical characteristics of the equipment".</p>

Tab. 5.26.

5.1.1 - PACKAGING AND FASTENING SYSTEMS USED FOR TRANSPORT

The transport packaging has been designed and manufactured in order to avoid damage during normal transport, storage and handling.

The equipment should be kept in the packaging until installation.

Upon receipt of the equipment, it is necessary to:

- check that the packaging is intact and that no part has been damaged during transport and/or handling;
- immediately report to PIETRO FIORENTINI S.p.A. any damage found.

NOTICE

PIETRO FIORENTINI S.p.A. is not liable for damage to property or persons caused by accidents caused by failure to comply with the instructions given in this manual.

In Tab. 5.27. the types of packaging used are described:

Ref.	Type of packaging	Image
A	Multiple cardboard box (12 pieces)*	
	Multiple cardboard box (24 pieces)*	
B	Single cardboard box	

*Only for versions with 1/2" - 3/4" - 1" connections

Tab. 5.27.

5.2 - PHYSICAL CHARACTERISTICS OF STABILIZER WITH AND WITHOUT FILTER

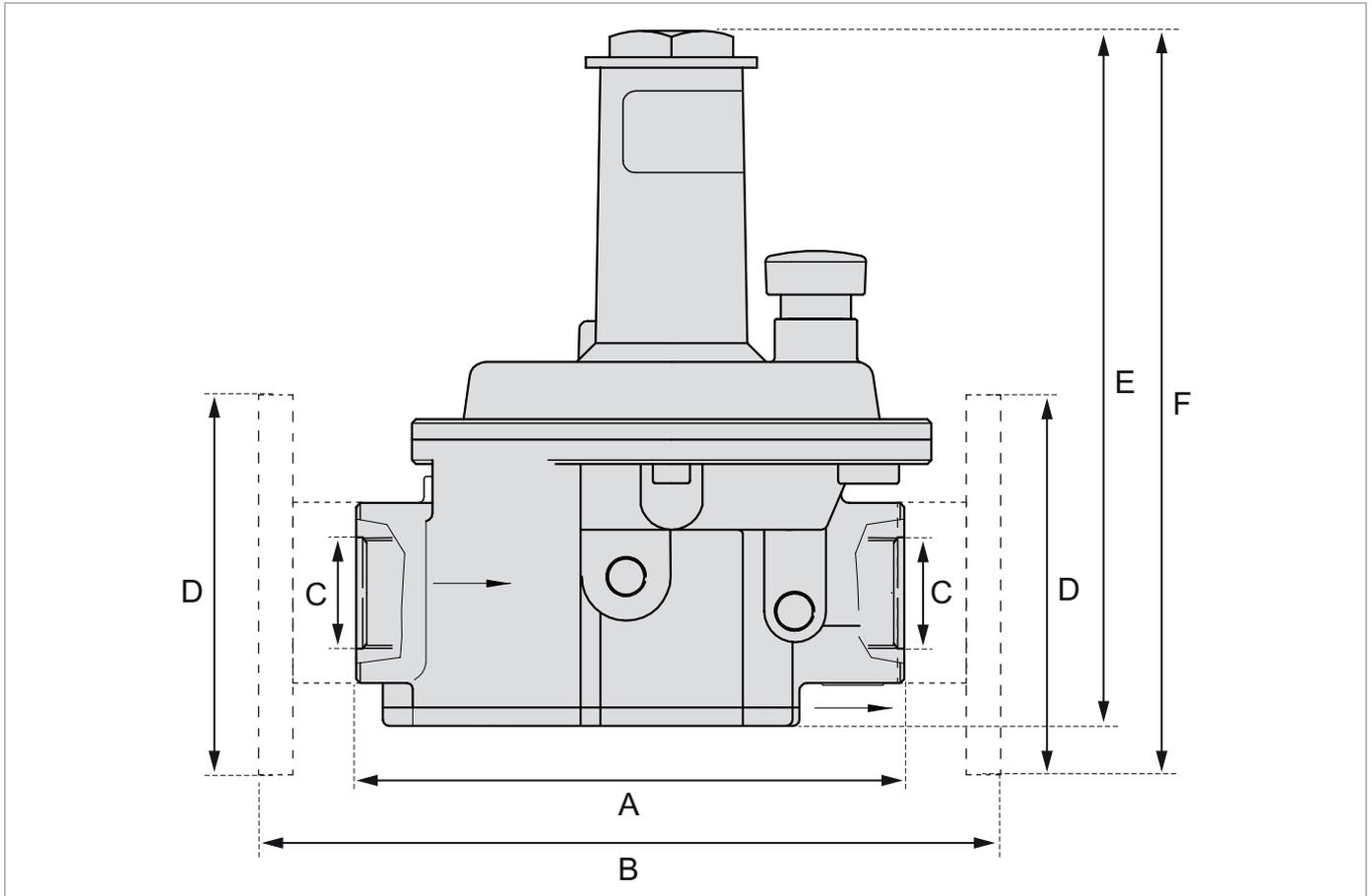
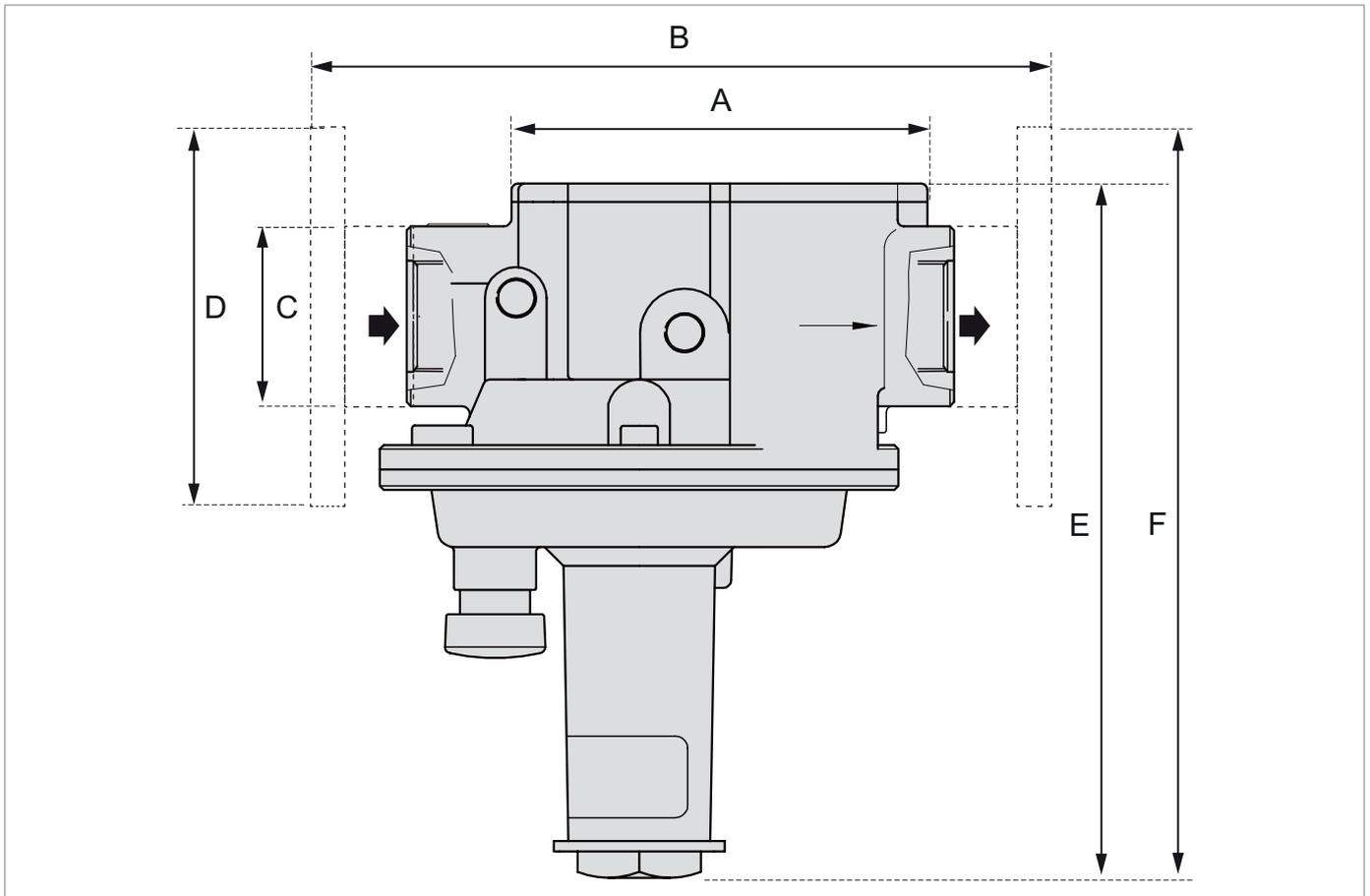


Fig. 5.12. Physical characteristics of stabilizer with and without filter

Dimensions		A	B	C	D	E	F	G*	Weight
Model		[in]	[in]	[NPT]	[in]	[in]	[in]	[in]	[Lbs]
31051	1/2" NPT	4.09	-	1/2"	-	5.59	-	3.78	1.54
31052	3/4" NPT	4.09	-	3/4"	-	5.59	-	3.78	1.54
31053	1" NPT	4.09	-	1"	-	5.59	-	3.78	1.54
31150	1/2" NPT	4.72	-	1/2"	-	6.89	-	4.49	2.75
31151	3/4" NPT	4.72	-	3/4"	-	6.89	-	4.49	2.75
31152	1" NPT	4.72	-	1"	-	6.89	-	4.49	2.75
31153	1 1/4" NPT	7.68	-	1" 1/4	-	10	-	7.56	7.5
31154	1 1/2" NPT	7.68	-	1" 1/2	-	10	-	7.56	7.5
31155	2" NPT	9.29	-	2"	-	12.44	13.74	7.56	12.34
31156 F	2 1/2" Flanged	-	16.9	3"	ANSI 150	-	17.09	12.52	27.56
31157/F	3" Flanged	-	16.9	3"	ANSI 150	-	17.09	12.52	27.56
31158/F	4" Flanged	-	16.9	4"	ANSI 150	-	19.76	12.52	27.56

* G =width of the regulator

Tab. 5.28.

5.2.1 - PHYSICAL CHARACTERISTICS OF THE ZERO VERSION

Fig. 5.13. Physical characteristics of the Zero version

Dimensions		A	B	C	D	E	F	Weight
Model		[in]	[in]	[NPT]	[NPT]	[in]	[in]	[Lbs]
L150-R150-Y150-V150	1/2"	4.72	-	1/2"	-	67.32	-	8.82
L151-R151-Y151-V151	3/4"	4.72	-	3/4"	-	67.32	-	8.82
L152-R152-Y152-V152	1"	4.72	-	1"	-	67.32	-	8.82
L153-R153-Y153	1" 1/4	7.72	-	1" 1/4	-	94.88	-	70.55
L154-R154-Y154	1" 1/2	7.72	-	1" 1/2	-	94.88	-	70.55
L155-R155-Y155	2"	9.21	-	2"	-	119.29	-	108.03
L156-R156-Y156	2" 1/2 DN65	-	16.93	-	2" 1/2	-	168.70	304.24
L157-R157-Y157	3" DN80	-	16.93	-	3"	-	168.70	304.24
L158-R158-Y158	4" DN100	-	16.93	-	4"	-	168.70	304.24

Tab. 5.29.

5.2.2 - PHYSICAL CHARACTERISTICS OF THE RATIO VERSION

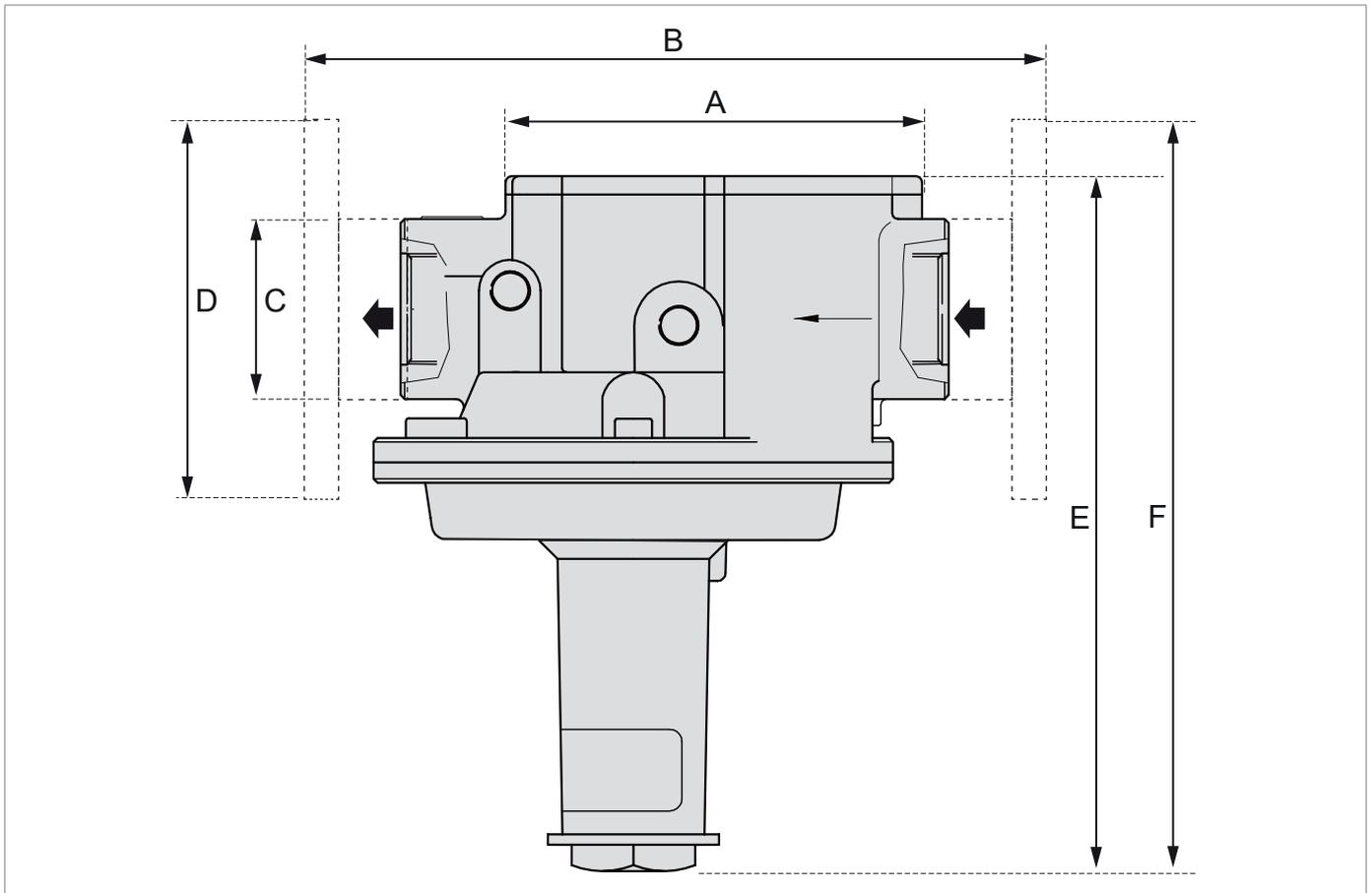


Fig. 5.14. Physical characteristics of the Ratio version

Dimensions		A	B	C	D	E	F	Weight
Model		[in]	[in]	[NPT]	[NPT]	[in]	[in]	[Lbs]
L150-Y150	1/2"	4.72	-	1/2"	-	71.85	-	11.02
L151-Y151	3/4"	4.72	-	3/4"	-	71.85	-	11.02
L152-Y152	1"	4.72	-	1"	-	71.85	-	11.02
L153-Y153	1" 1/4	7.72	-	1" 1/4	-	98.23	-	74.96
L154-Y154	1" 1/2	7.72	-	1" 1/2	-	98.23	-	74.96
L155-Y155	2"	9.21	-	2"	-	122.83	-	114.64
L156-Y156	2" 1/2 DN65	-	16.93	-	2" 1/2	-	172.24	313.06
L157-Y157	3" DN80	-	16.93	-	3"	-	172.24	313.06
L158-Y158	4" DN100	-	16.93	-	4"	-	172.24	313.06

Tab. 5.30.

5.2.3 - PHYSICAL CHARACTERISTICS OF THE OPD AND DUAL CUT VERSIONS

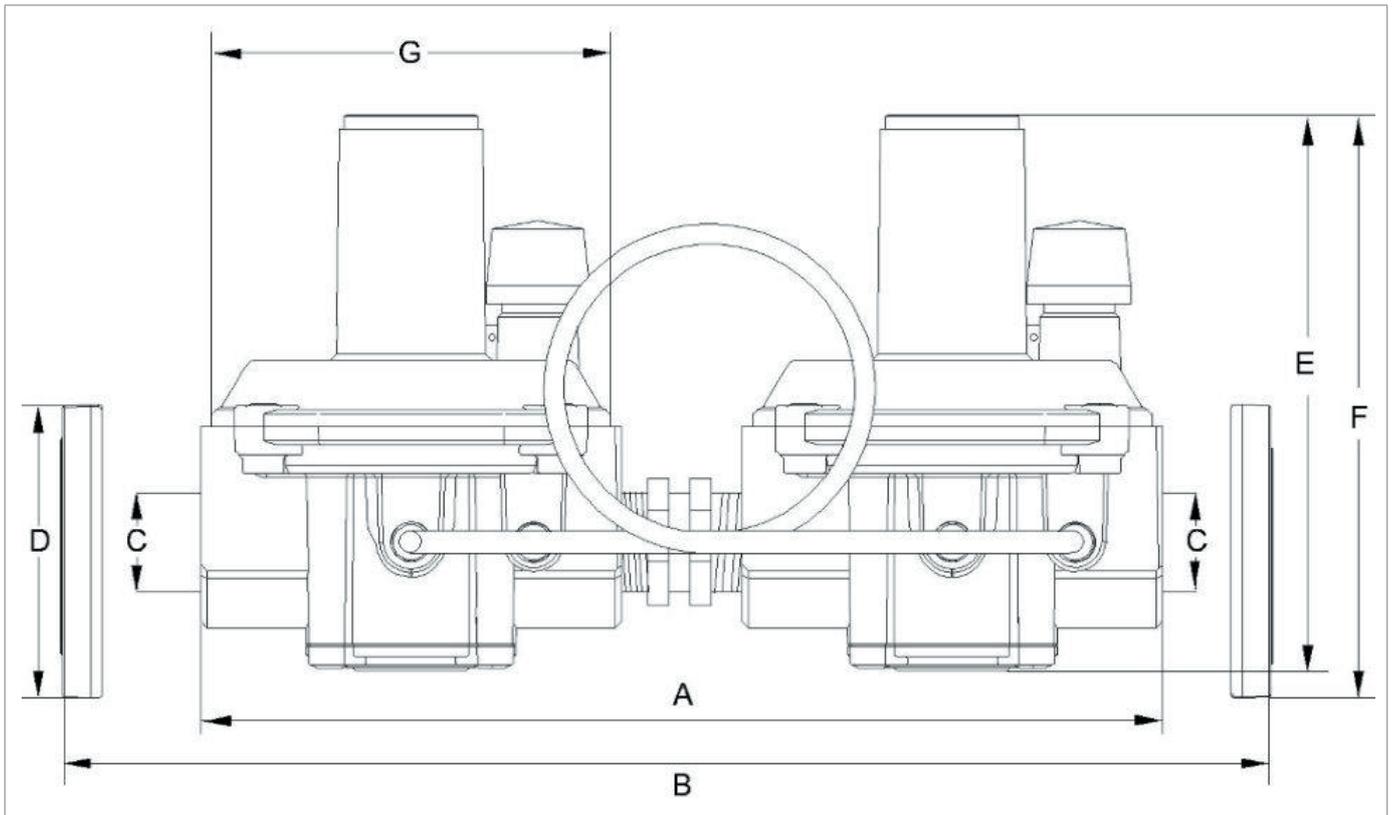


Fig. 5.15. Physical characteristics of the OPD and Dual Cut versions

Dimensions		A	B	C	D	E	F	G*	Weight
Model		[in]	[in]	[NPT]	[in]	[in]	[in]	[in]	[Lbs]
31051	1/2" NPT	8.46	-	1/2	-	5.59	-	3.78	3.25
31052	3/4" NPT	8.46	-	3/4	-	5.59	-	3.78	3.25
31053	1" NPT	8.46	-	1	-	5.59	-	3.78	3.25
31150	1/2" NPT	10.10	-	1/2	-	6.89	-	4.49	5.75
31151	3/4" NPT	10.10	-	3/4	-	6.89	-	4.49	5.75
31152	1" NPT	10.10	-	1	-	6.89	-	4.49	5.75
31153	1 1/4" NPT	16.69	-	1 1/4	-	10	-	7.56	15.5
31154	1 1/2" NPT	16.69	-	1 1/2	-	10	-	7.56	15.5
31155	2" NPT	19.88	-	2	-	12.44	13.74	7.56	25
31156 F	2 1/2" Flanged	-	33.93	3	ANSI 150	-	17.09	12.52	56
31157/F	3" Flanged	-	33.93	3	ANSI 150	-	17.09	12.52	56
31158/F	4" Flanged	-	33.93	4	ANSI 150	-	19.76	12.52	56

* G =width of the regulator

Tab. 5.31.

5.3 - METHOD FOR ANCHORING AND LIFTING THE EQUIPMENT

⚠ DANGER

The use of lifting equipment (if required) for unloading, transporting and handling of packages is reserved only for qualified operators who have received adequate training and instruction (holding the appropriate license when regulations in the country of installation require it) and knowledgeable:

- of accident prevention rules;
 - of safety in the workplace;
 - of the functionality and limitations of the lifting equipment.
-

⚠ DANGER

Before moving a load, make sure that its weight does not exceed the load capacity of the lifting means (and any other equipment) indicated on the specific plate.

⚠ CAUTION

Before moving the equipment:

- remove or firmly secure any moving or hanging component to the load;
 - protect the most delicate equipment;
 - check that the load is stable;
 - make sure you have perfect visibility along the route.
-

5.3.1 - FORKLIFT HANDLING METHOD

⚠ DANGER

It is forbidden to:

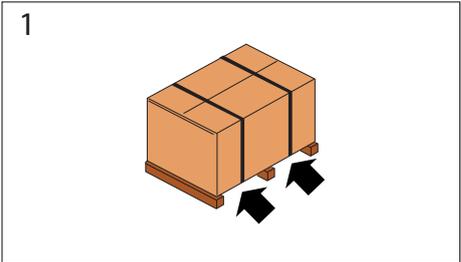
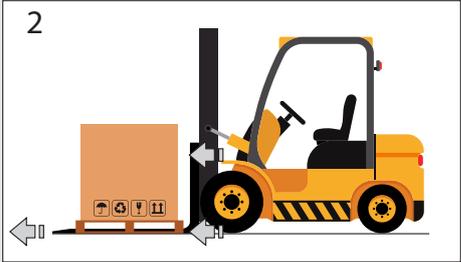
- pass under suspended loads;
- move the load over the personnel working in the site/plant area.

⚠ WARNING

On forklift trucks it is forbidden to:

- transport passengers;
- lift people.

In case the cardboard boxes (single or multiple) are supported by a pallet, proceed as shown in Tab.5.32:

Step	Operation	Image
1	Place the forklift forks under the loading surface.	
2	Make sure that the forks protrude from the front of the load (at least 5 cm), for a sufficient length to eliminate any risk of the transported load tipping over.	
3	Raise the forks until contact with the load. NOTICE If necessary, secure the load to the forks with clamps or similar devices.	
4	Slowly lift the load by a few tens of centimeters to check its stability making sure that the center of gravity of the load is positioned in the center of the lifting forks.	

Step	Operation	Image
5	Tilt the mast backwards (toward the driver's seat) to take advantage of the tipping moment and ensure greater stability of the load during transport.	
6	Adjust the transport speed according to the flooring and the type of load, avoiding sudden maneuvers. ⚠ WARNING If: <ul style="list-style-type: none"> • encumbrances along the route; • particular operating situations; do not allow the operator a perfect view, the assistance of an operator on the ground is required, placed outside the range of action of the lifting means, with the task of signaling.	-
7	Place the load in the chosen installation area.	-

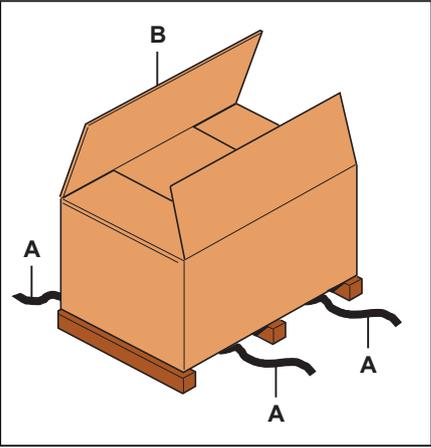
Tab. 5.32.

5.4 - UNPACKING

Packing removal	
Operator qualification	<ul style="list-style-type: none"> Installer.
PPE required	 <p>WARNING</p> <p>The PPE listed in this chart relates to the risk associated with the equipment. For the PPE necessary to protect against risks associated with the workplace or operating conditions, refer to:</p> <ul style="list-style-type: none"> the regulations in force in the country of installation; <u>any indications provided by the Safety Manager at the installation facility.</u>

Tab. 5.33.

To unpack the equipment in the cardboard box, proceed as specified in Tab.5.34:

Step	Operation	Image
1	Remove the straps (A).	
2	Remove the packing box (B).	
3	Remove the clips that secure the equipment to the base (when present).	
4	Move the equipment from the base to the place intended for it. <p>NOTICE</p> <p><u>To manually handle the packages, if their size/weight requires it, employ at least 2 operators.</u></p>	

Tab. 5.34.

NOTICE

After removing all packing materials, check for any anomalies.

In the presence of anomalies:

- do not perform the installation operations;
- contact PIETRO FIORENTINI S.p.A. communicating the data shown on the identification plate of the equipment.

5.4.1 - PACKAGING DISPOSAL

NOTICE

Separate the various materials making up the packaging and dispose of them in compliance with the regulations in force in the country of installation.

5.5 - STORAGE AND ENVIRONMENTAL CONDITIONS

⚠ WARNING

Protect the regulator from blows and shocks, even accidental, until installation.

The minimum environmental conditions expected if the equipment is to be stored for a long period are given in Tab.5.40. Compliance with these conditions guarantees the stated performance:

Terms and conditions	Data
Maximum storage period	5 years.
Temperature	Not higher than 40°C
Humidity	Not more than 70%
Radiation and light sources	Away from radiation and light sources as per UNI ISO 2230:2009 standard

Tab. 5.35.

5.5.1 - STORAGE LONGER THAN THE MAXIMUM ALLOWABLE DURATION

NOTICE

After a storage period exceeding the maximum allowed (5 years), the equipment must be scrapped.

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6 - COMMISSIONING/MAINTENANCE EQUIPMENT

6.1 - EQUIPMENT LIST

Installation/commissioning/maintenance equipment use	
Operator qualification	<ul style="list-style-type: none"> • Installer. • Specialized technician/Maintenance technician.
PPE required	<div style="display: flex; align-items: center;">  </div> <p>⚠ WARNING</p> <p>The PPE listed in this chart relates to the risk associated with the equipment. For the PPE required to protect against risks associated with the workplace, installation or operating conditions, refer to:</p> <ul style="list-style-type: none"> • the regulations in force in the country of installation; • <u>any indications provided by the Safety Manager at the installation facility.</u>

Tab. 6.36.

We list the types of equipment required for installation, commissioning and maintenance:

Ref.	Type of equipment	Image
A	Double polygonal socket wrench.	
B	Hexagonal male bent wrench.	
C	Phillips screwdriver.	
D	Slotted screwdriver.	

Tab. 6.37.

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7 - INSTALLATION

7.1 - INSTALLATION PRE-REQUISITES

7.1.1 - ENVIRONMENTAL CONDITIONS

⚠ WARNING

For the safe use of the equipment, respecting the permitted environmental conditions, follow the data on the plate applied and any accessories (refer to paragraph 2.8 "Identification plates applied").

⚠ WARNING

The equipment should be installed away from the weather and direct sunlight.

The place of installation must be suitable for safe use of the equipment.

The installation area of the equipment must have lighting that guarantees the operator good visibility during the work phases on the equipment.

7.1.2 - STORAGE LONGER THAN THE MAXIMUM ALLOWABLE DURATION

⚠ WARNING

It is prohibited to install the equipment after storage longer than the maximum allowed (5 years).
After more than the maximum allowable storage period, the equipment must be scrapped.

7.1.3 - CHECKS BEFORE INSTALLATION

In relation to its **design pressure (DP)**, the equipment does not require any additional upstream safety device to protect against possible overpressure when, for the upstream reduction station, the maximum downstream incidental pressure is:

$$\text{MIPd} \leq 1.1 \text{ DP}$$

MIPd = maximum value of downstream incidental pressure (for more information see UNI EN 12186:2014).

⚠ CAUTION

Where the installation of the equipment requires the application of compression fittings in the field, these must be installed according to the instructions of the manufacturer of the fittings.

The choice of fittings must be compatible with:

- **the specified use for the equipment;**
 - **plant specifications when foreseen.**
-

Before proceeding with the installation you must make sure that:

- The direction of flow is adhered to as indicated on the equipment;
- At least one upstream shutoff valve is present;
- At least one downstream shutoff valve is present;
- the data on the identification plates affixed to the equipment (refer to section 2.8 of the manual) correspond to what is required by or from the connected combustion appliances;
- the equipment has not been damaged during transport;
- the intended installation space meets current safety requirements and is protected from possible mechanical damage, away from heat sources or open flames, in a dry place and protected from external agents;
- there are no impediments that may hinder installation operations;
- inlet and outlet pipes are at the same level and capable of bearing the weight of the equipment;
- on the inlet/outlet connections, mechanical stresses are totally absent;
- the pipe inlet/outlet connections are parallel, clean and undamaged;
- the inside of the upstream pipe is clean and free of processing residues such as welding slag, sand, paint residues, water, etc....

7.2 - INSTALLATION-SPECIFIC SAFETY WARNINGS

⚠ WARNING

Before proceeding with the installation phase, make sure that the upstream and downstream valves installed on the line are closed.

⚠ WARNING

The installation could also take place in environments at risk of explosion and this implies the adoption of all the necessary prevention and protection measures.

For these measures, please refer to the regulations in force at the place of installation.

⚠ WARNING

Near the equipment it is forbidden to:

- use open flames (for example, for welding operations);
 - smoke.
-

⚠ WARNING

The equipment installation room must:

- ensure good ventilation;
 - comply with the ambient temperature of use as stated in Section 4.5 ("Technical features/performance").
-

⚠ WARNING

The installer must:

- use the fittings and gaskets supplied with the equipment by PIETRO FIORENTINI S.p.A.
 - secure the swivels (when provided) according to the tightening torques specified in the standards: NF E29-533: 2014 and NF E29-536: 2017.
-

⚠ CAUTION

Avoid using the equipment as a reference template (can be supplied upon request).

7.3 - GENERAL INFORMATION ABOUT THE LINE

The equipment must be installed on the line respecting:

- the direction of gas flow as indicated by the arrow on the equipment itself;
- the correct mounting position:

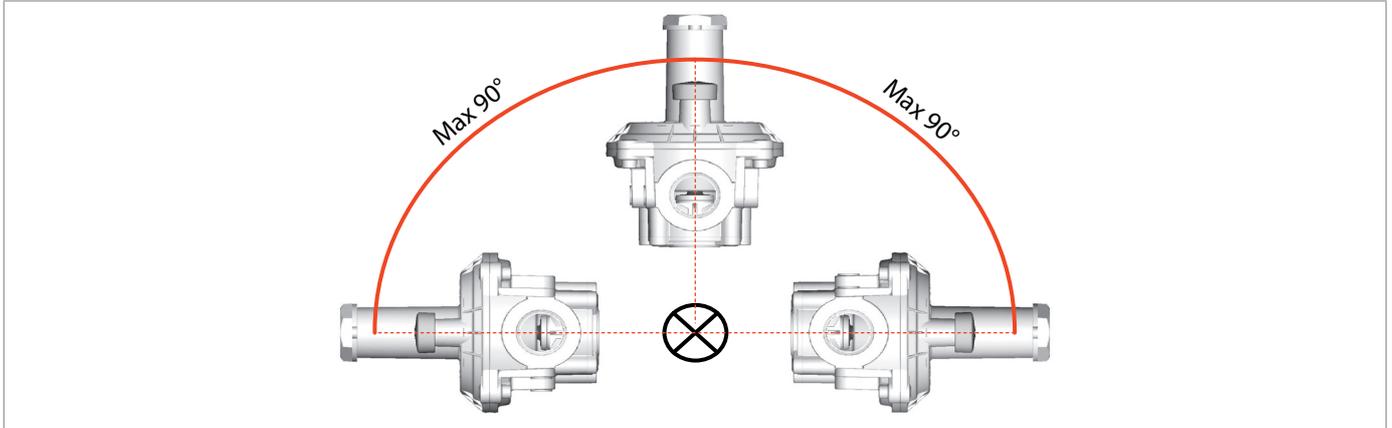


Fig. 7.16. Correct mounting position of the Standard/Goval versions

NOTICE

When the device is used in gas pressure reduction stations, it must be installed at least according to the requirements of UNI EN 12186:2014 or UNI EN 12279:2007.

The vents of the equipment must be channeled according to UNI EN 12186: 2014 or UNI EN 12279: 2007 or the standards in force at the place of installation of the equipment.

7.3.1 - INSTALLATION TYPE (STANDARD/GOVAL VERSION)

The following must be present in the standard installation of the equipment and the Goval version:

Pos.	Description
A	Pressure regulator.
B	Shut-off valve upstream of the regulator (A).
C	Shut-off valve downstream of the regulator (when required).
D	Burner.

Tab. 7.38.

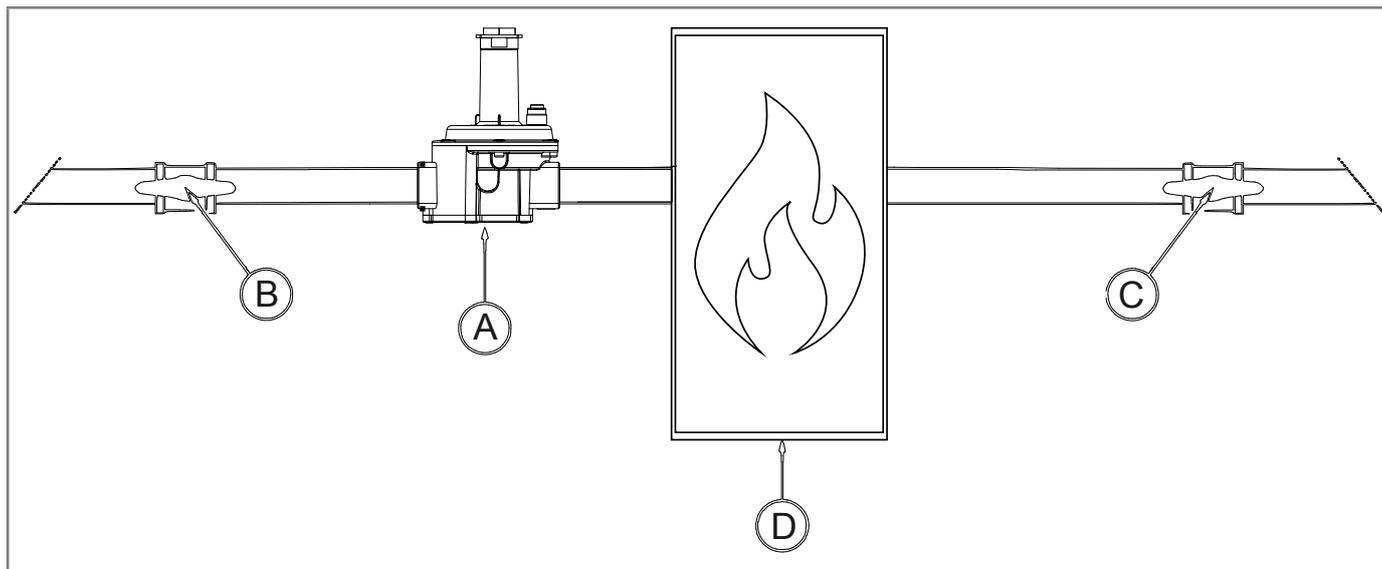


Fig. 7.17. Example of installation of the Standard/Goval versions

7.3.2 - ZERO VERSION INSTALLATION

When installing the equipment in the Zero version, there must be:

Pos.	Description
A	Filter
B	Solenoid valve
C	Zero version regulator
D	Motor

Tab. 7.39.

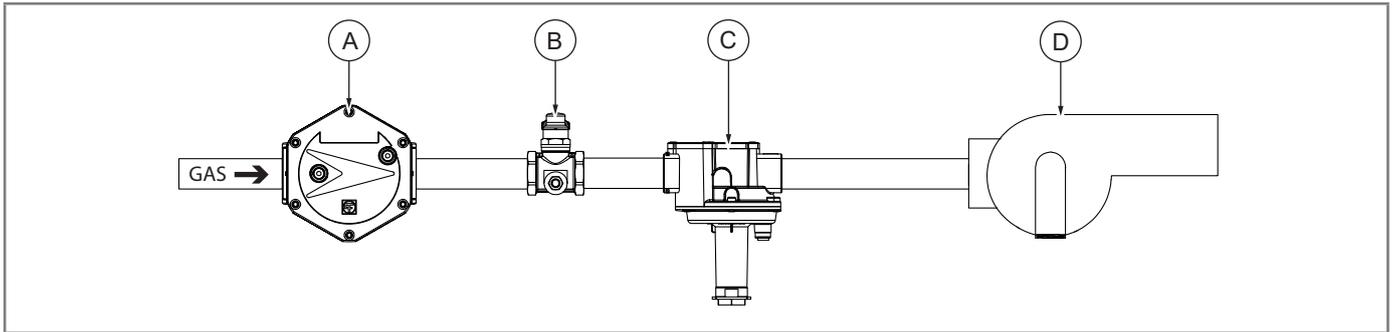


Fig. 7.18. Zero version installation examples

7.3.3 - RATIO VERSION INSTALLATION

When installing the equipment in the Ratio version, there must be:

Pos.	Description
A	Filter
B	Ratio version regulator ratio 1:1
C	Solenoid valve
D	Solenoid valve

Tab. 7.40.

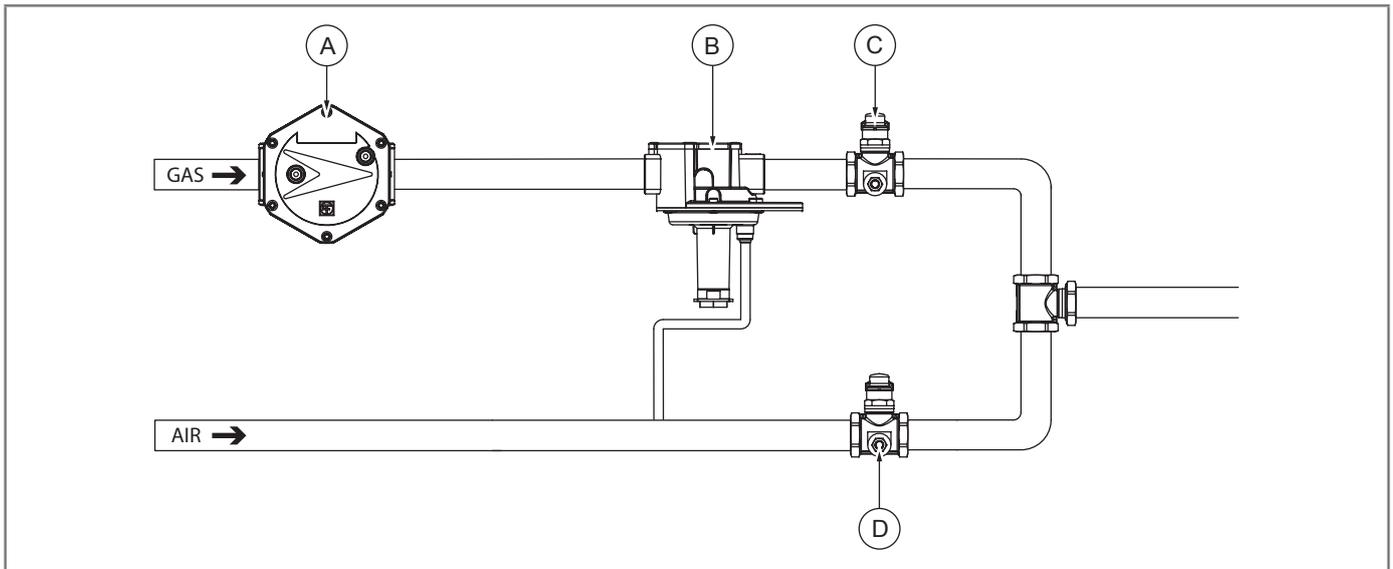


Fig. 7.19. Ratio version installation examples

7.3.4 - INSTALLATION TYPE (OPD/DUAL CUT VERSION)

When installing the OPD and Dual Cut versions, there must be:

Pos.	Description
A	Pressure regulator.
B	Shut-off valve upstream of the regulator (A).
C	Shut-off valve downstream of the regulator (when required).
D	Burner.

Tab. 7.41.

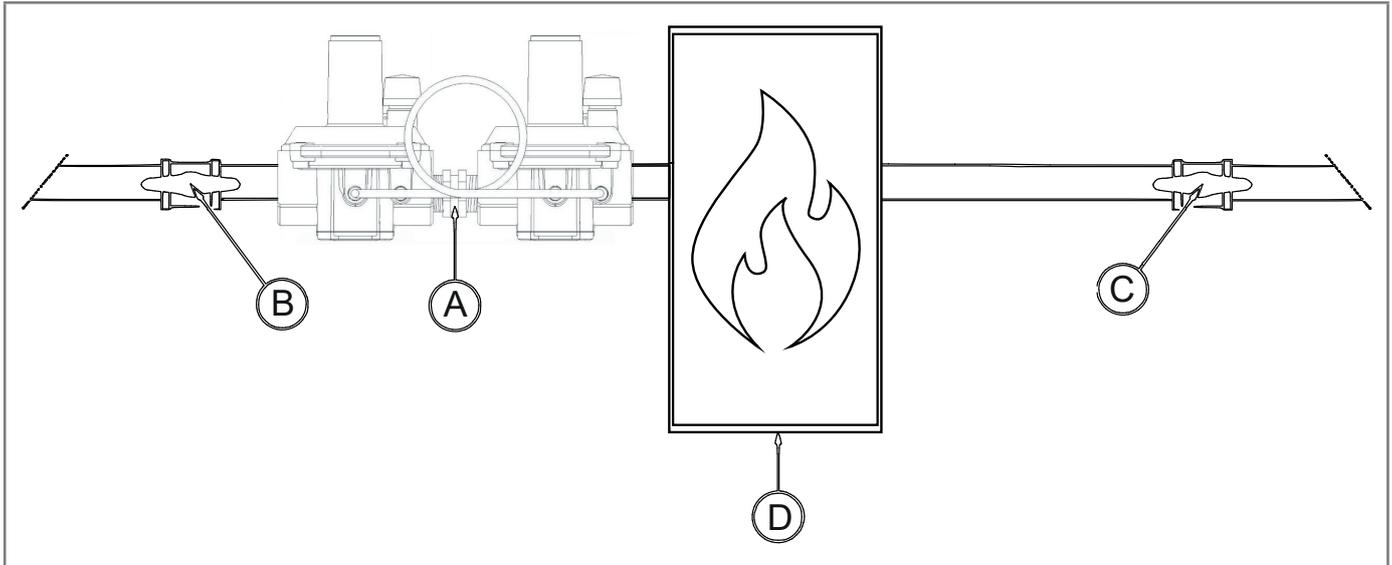


Fig. 7.20. Example of installation of the OPD/Dual Cut versions

7.4 - INSTALLATION PROCEDURES

Installation	
Operator qualification	<ul style="list-style-type: none"> Installer.
PPE required	 <p>WARNING</p> <p>The PPE listed in this chart relates to the risk associated with the equipment. For the PPE required to protect against risks associated with the workplace, installation or operating conditions, refer to:</p> <ul style="list-style-type: none"> the regulations in force in the country of installation; <u>any indications provided by the Safety Manager at the installation facility.</u>

Tab. 7.42.

NOTICE

- With natural gas or other non-corrosive gases that do not have re-condensation phenomena, it is possible to mount the equipment in any flow direction.
- In installations for LPG use, mounting positions with upward outflow are recommended to be avoided.

To install the equipment, proceed as shown in Tab. 7.43.:

Step	Operation
1	Apply the checks in Section 7.1.3 ("Checks before installation").
2	Remove any packaging/protection of the equipment (if any).
3	Purge the line of contained air.
4	<p>Make the connection making sure that:</p> <ul style="list-style-type: none"> the inlet and outlet pipes do not exert excessive bending or tensile forces on the body of the equipment in relation to the misalignment of the pipes. If necessary, bracket the inlet/outlet piping for proper alignment; inlet and outlet piping connections and/or terminals are suitable and compatible with the fittings on the equipment. <p>NOTICE</p> <ul style="list-style-type: none"> With swivel fittings, use the gaskets provided by PIETRO FIORENTINI S.p.A. When assembling directly to the equipment body, use only cylindrical GAS connections (ref. UNI EN ISO 228-1).

Tab. 7.43.

NOTICE

The warranty will be considered void and PIETRO FIORENTINI S.p.A. will not be responsible for any damage and/or malfunction if the fittings used during installation are not those supplied.

7.4.1 - POST-INSTALLATION INDICATIONS

⚠ CAUTION

Check when installation is complete:

- the ignition of connected combustion appliances;
- the operating pressure in dynamic phase with variable flow rates and static phase with zero flow rate.

⚠ WARNING

Ensure that all connections are tightened properly to avoid any leakage during commissioning.

⚠ WARNING

Protect the equipment from blows and shocks, even accidental.

7.5 - EQUIPMENT ADJUSTMENTS

NOTICE

All regulators are calibrated to the values required by the Customer directly at the factory PIETRO FIORENTINI S.p.A.

No further adjustments need to be made.

Calibration values are indicated on the identification plate (refer to Section 2.8).

Adjustment	
Operator qualification	<ul style="list-style-type: none"> • Installer.
PPE required	<div style="display: flex; align-items: center;">  </div> <p>⚠ WARNING</p> <p>The PPE listed in this chart relates to the risk associated with the equipment. For the PPE required to protect against risks associated with the workplace, installation or operating conditions, refer to:</p> <ul style="list-style-type: none"> • the regulations in force in the country of installation; • any indications provided by the Safety Manager at the installation facility.

Tab. 7.44.

NOTICE

The pressure of the relief valve does not require to be adjusted in the field.

⚠ WARNING

Contact PIETRO FIORENTINI S.p.A. for further requirements.

It is prohibited to make unauthorized changes on the equipment without permission from PIETRO FIORENTINI S.p.A.

7.5.1 - STANDARD VERSION ADJUSTMENTS

In case it is necessary, for standard regulators with or without block valves, to change the setting values in order to increase or decrease the operating pressure, proceed as shown in Tab.7.45:

Step	Operation	Equipment required
1	Remove the top cap (A) of the regulator.	-
2	Turn the ring nut (B): <ul style="list-style-type: none"> • clockwise to increase the downstream pressure; • counterclockwise to decrease the downstream pressure. 	Hexagonal wrench CH 11 mm
3	Replace the top cap (A) of the regulator.	-

Tab. 7.45.

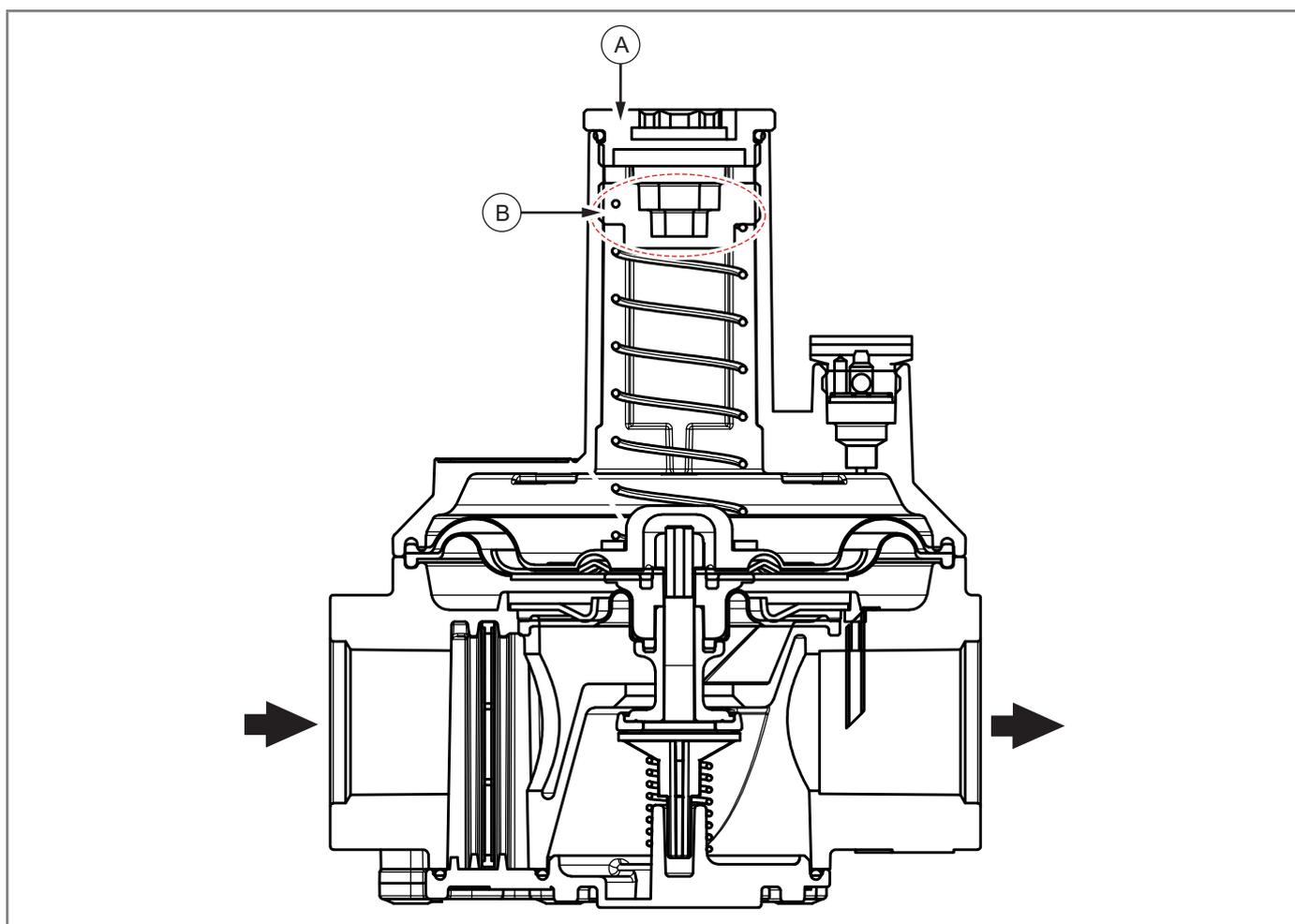


Fig. 7.21. Operating pressure adjustment (Standard version)

NOTICE

Small calibration variations of $\pm 10\%$ from the value on the identification plate (see Section 2.8 "Identification plates applied") can be made only by observing the spring ranges in the tables in Chapter 10 ("Calibration tables").

7.5.2 - ZERO VERSION ADJUSTMENTS

In case it is necessary to change the calibration values of the Zero version regulator in order to increase or decrease the zero pressure, proceed as shown in Tab.7.46:

Step	Operation	Equipment required
1	Remove the top cap (A) of the regulator.	-
2	Turn the ring nut (B): <ul style="list-style-type: none"> • clockwise to increase the downstream pressure; • counterclockwise to decrease the downstream pressure. 	Hexagonal wrench CH11 mm
3	Replace the top cap (A) of the regulator.	-

Tab. 7.46.

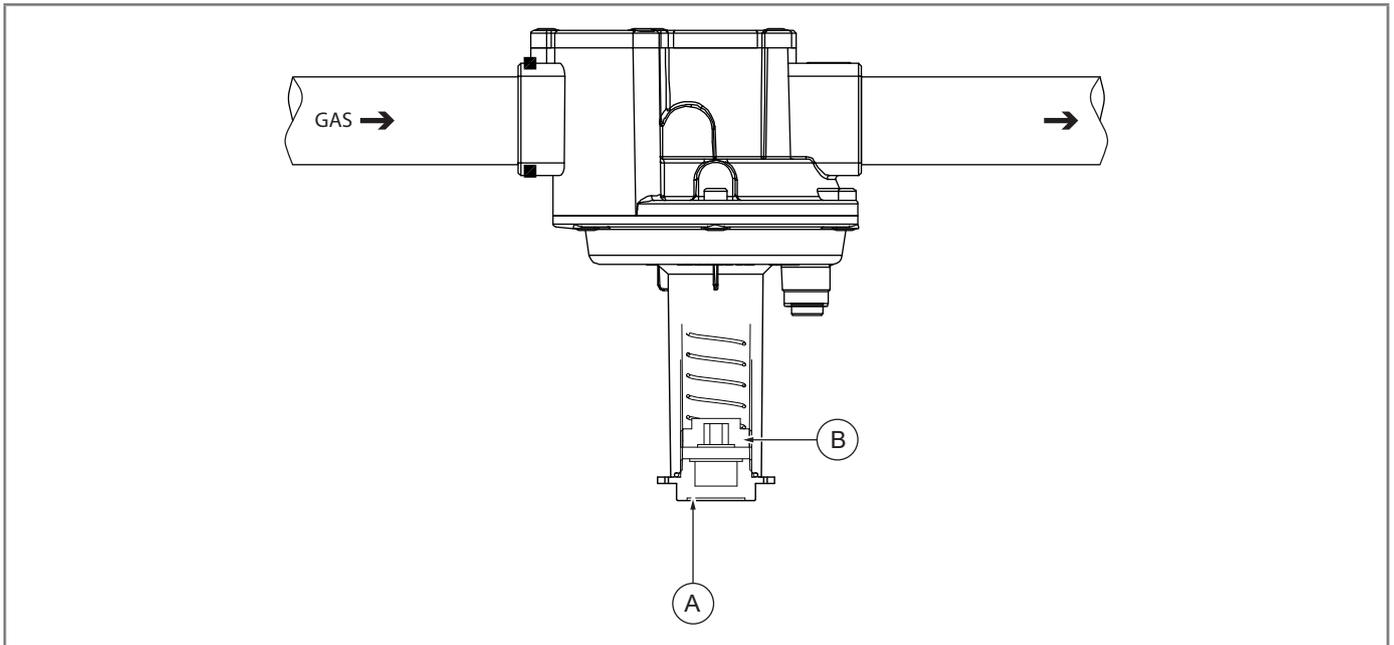


Fig. 7.22. Zero version operating pressure regulation

7.5.3 - RATIO VERSION ADJUSTMENTS

NOTICE

The ratio regulator is driven by air line pressure.

The gas outlet pressure is adjusted 1:1 to the control air pressure.

- You can vary the power of the burner by acting on the air regulator.
- Pressure fluctuations in the combustion chamber act equivalently on gas and air flow rate.

In this way, the gas/air mixture does not change.

In case it is necessary to change the calibration values of the Ratio version regulator in order to increase or decrease the operating pressure, proceed as shown in Tab.7.47.:

Step	Operation	Equipment required
1	Remove the top cap (A) of the regulator.	-
2	Turn the setting screw (B) <ul style="list-style-type: none"> • clockwise to increase the downstream pressure; • counterclockwise to decrease the downstream pressure. <p>NOTICE During adjustment, check the outlet pressure with a pressure gauge.</p>	Slotted screwdriver. Pressure gauge.
3	Replace the top cap (A) of the regulator.	-

Tab. 7.47.

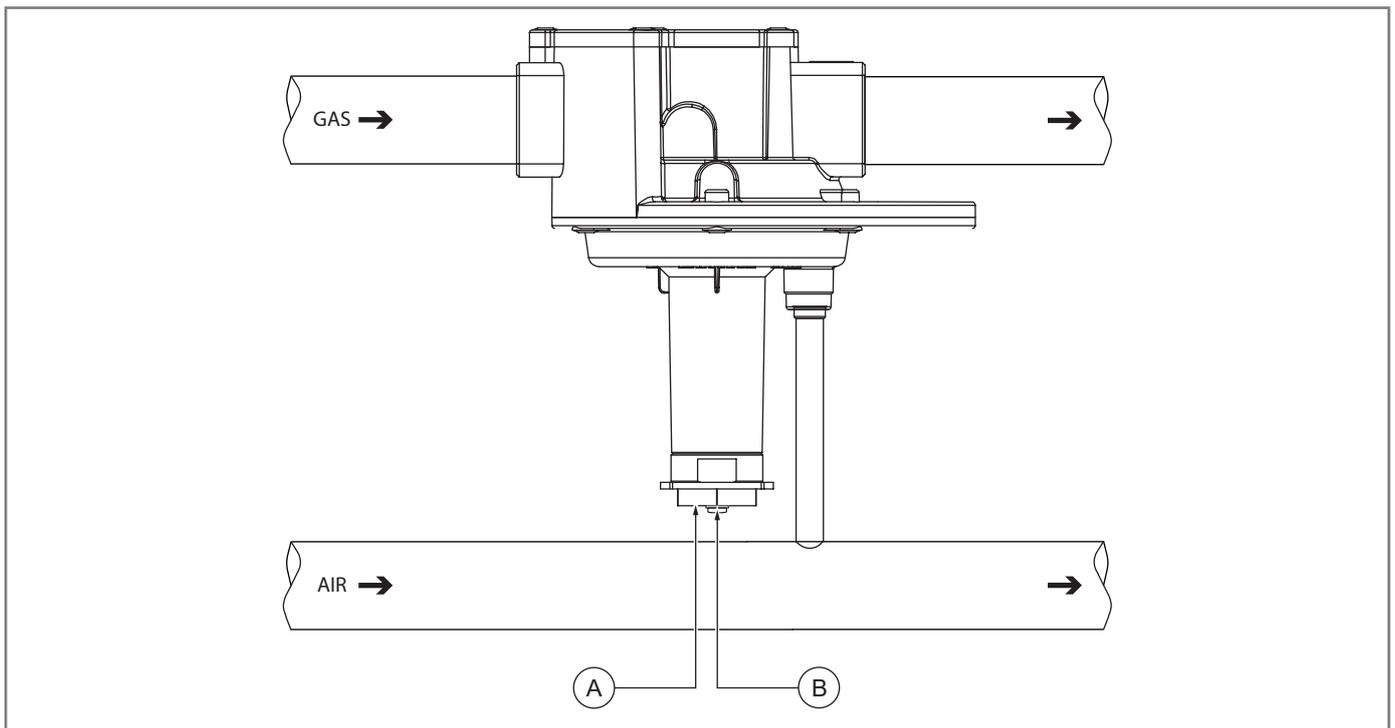


Fig. 7.23. Ratio version operating pressure regulation

7.5.4 - OPD VERSION ADJUSTMENTS

In case it is necessary, change the calibration values of the OPD version regulator, proceed as shown in Tab.7.48:

Step	Operation	Equipment required
1	Remove the top cap (A) of the downstream regulator.	-
2	Turn the ring nut (B) of the downstream regulator: <ul style="list-style-type: none"> clockwise to increase the downstream pressure; counterclockwise to decrease the downstream pressure. 	Hexagonal wrench CH 11 mm
3	Replace the top cap (A) of the downstream regulator.	-

Tab. 7.48.

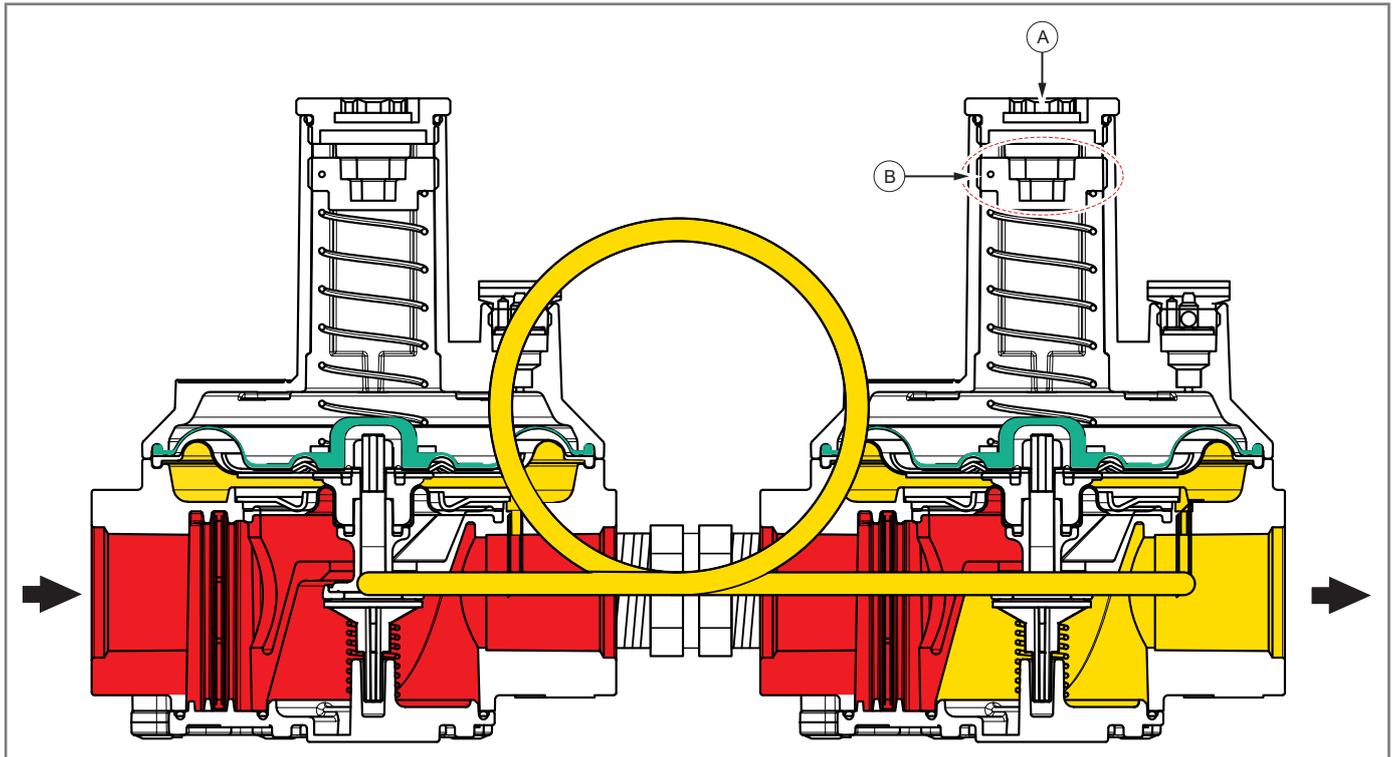


Fig. 7.24. Operating pressure adjustment (Standard version)

NOTICE

Small calibration variations of $\pm 10\%$ from the value on the identification plate (see Section 2.8 "Identification plates applied") can be made only by observing the spring ranges in the tables in Chapter 10 ("Calibration tables").

7.5.5 - DUAL CUT VERSION ADJUSTMENTS

In case it is necessary, change the calibration values of the Dual Cut version regulator, proceed as shown in Tab.7.49:

Step	Operation	Equipment required
1	Remove the top cap (A) of the downstream regulator.	-
2	Turn the ring nut (B) of the downstream regulator: <ul style="list-style-type: none"> clockwise to increase the downstream pressure; counterclockwise to decrease the downstream pressure. 	Hexagonal wrench CH 11 mm
3	Replace the top cap (A) of the downstream regulator.	-

Tab. 7.49.

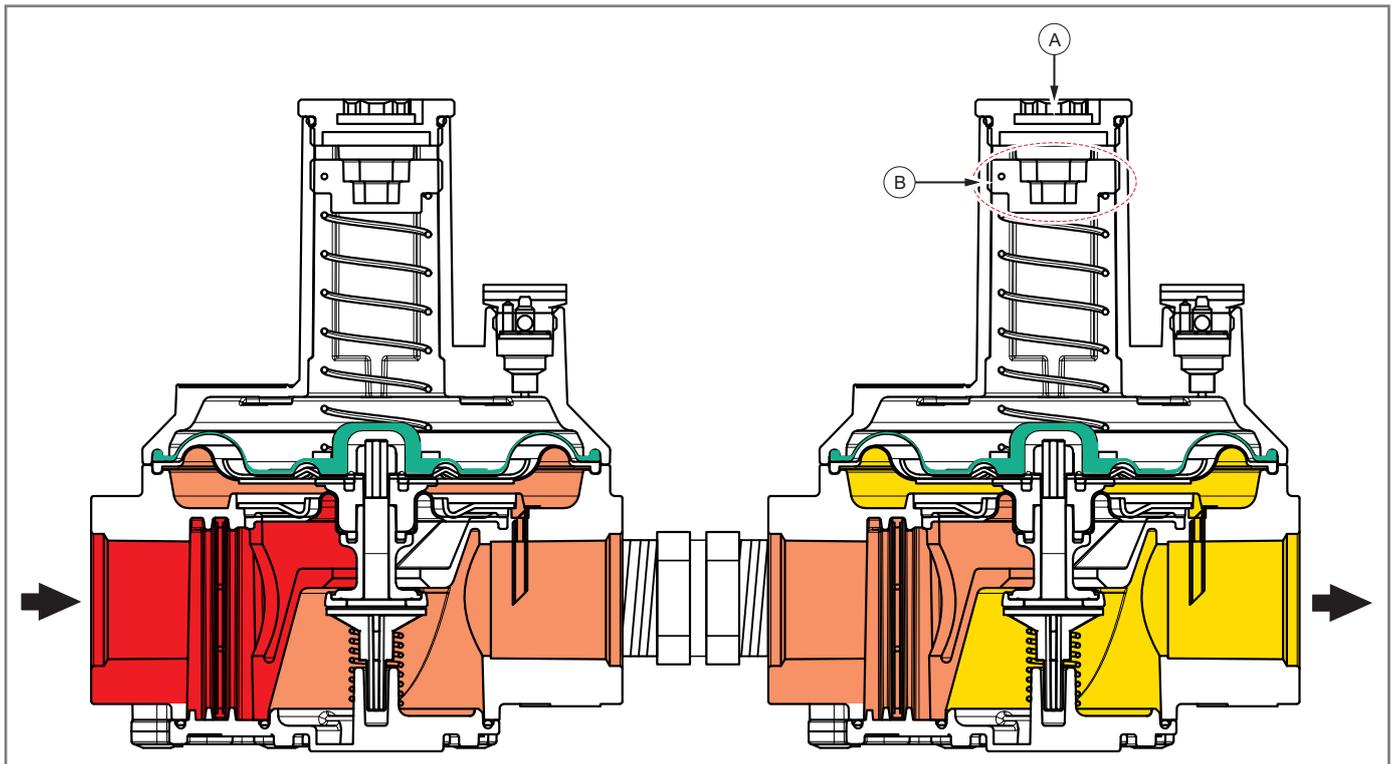


Fig. 7.25. Operating pressure adjustment (Standard version)

NOTICE

Small calibration variations of $\pm 10\%$ from the value on the identification plate (see Section 2.8 "Identification plates applied") can be made only by observing the spring ranges in the tables in Chapter 10 ("Calibration tables").

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8 - COMMISSIONING

8.1 - GENERAL WARNINGS

8.1.1 - SAFETY REQUIREMENTS FOR COMMISSIONING

⚠ DANGER

During commissioning, the risks posed by possible discharges of flammable or noxious gases into the atmosphere must be assessed.

⚠ DANGER

In the case of installation on distribution networks for natural gas, the risk of explosive mixture (gas/air) formation inside the pipes should be considered if an inerting procedure of the line is not adopted.

⚠ WARNING

During commissioning operations, unauthorized personnel must stay out.

NOTICE

Commissioning must be carried out by authorized and licensed personnel.

Before commissioning the equipment, it is necessary to check that all shut-off valves (inlet, outlet, bypass if applicable) are closed.

Commissioning

Operator qualification	<ul style="list-style-type: none"> Commissioning technician.
PPE required	<div style="display: flex; align-items: center; gap: 10px;">      </div> <p>⚠ WARNING</p> <p>The PPE listed in this chart relates to the risk associated with the equipment. For the PPE required to protect against risks associated with the workplace, installation or operating conditions, refer to:</p> <ul style="list-style-type: none"> the regulations in force in the country of installation; any indications provided by the Safety Manager at the installation facility.

Tab. 8.50.

8.2 - PRELIMINARY PROCEDURES FOR COMMISSIONING

⚠ DANGER

Before commissioning the equipment, it is mandatory to ensure that any explosion hazard or source of ignition has been eliminated.

⚠ WARNING

Before commissioning, it is necessary to ensure that:

- the conditions of use are in accordance with the characteristics of the equipment;
 - during the pressurization phase, check the equipment for leaks.
-

⚠ CAUTION

To protect the equipment from damage, the following operations should never be carried out:

- pressurization through a valve located downstream of the equipment itself;
 - depressurization through a valve located upstream of the equipment itself.
-

8.3 - CALIBRATION OF SAFETY DEVICES

NOTICE

The equipment is regulated at the manufacturing plants of PIETRO FIORENTINI S.p.A.

⚠ WARNING

It is prohibited to tamper with or make unauthorized changes on the equipment without permission from PIETRO FIORENTINI S.p.A.

8.4 - COMMISSIONING OF THE REGULATOR

NOTICE

Commissioning must be carried out by authorized and licensed personnel.

Commissioning takes place by direct insertion of the gas into the pipes by limiting the gas velocity within the pipes as limited as possible (maximum allowable value of 20 m/s).

8.4.1 - COMMISSIONING OF THE STANDARD VERSION REGULATOR

For commissioning the regulator with and without block valve (A), proceed as shown in Tab. 8.51.:

Step	Operation
1	Partially open the downstream vent tap when present.
2	Slowly open upstream shutoff devices (e.g. OPSO block valve, valve (B), etc...).
3	Wait for the downstream pressure to stabilize at the spring setting P2 indicated on the plate. NOTICE Refer to Section 2.8 "Identification plates applied" et seq. for the values on the identification plate.
4	Close the vent tap.

Tab. 8.51.

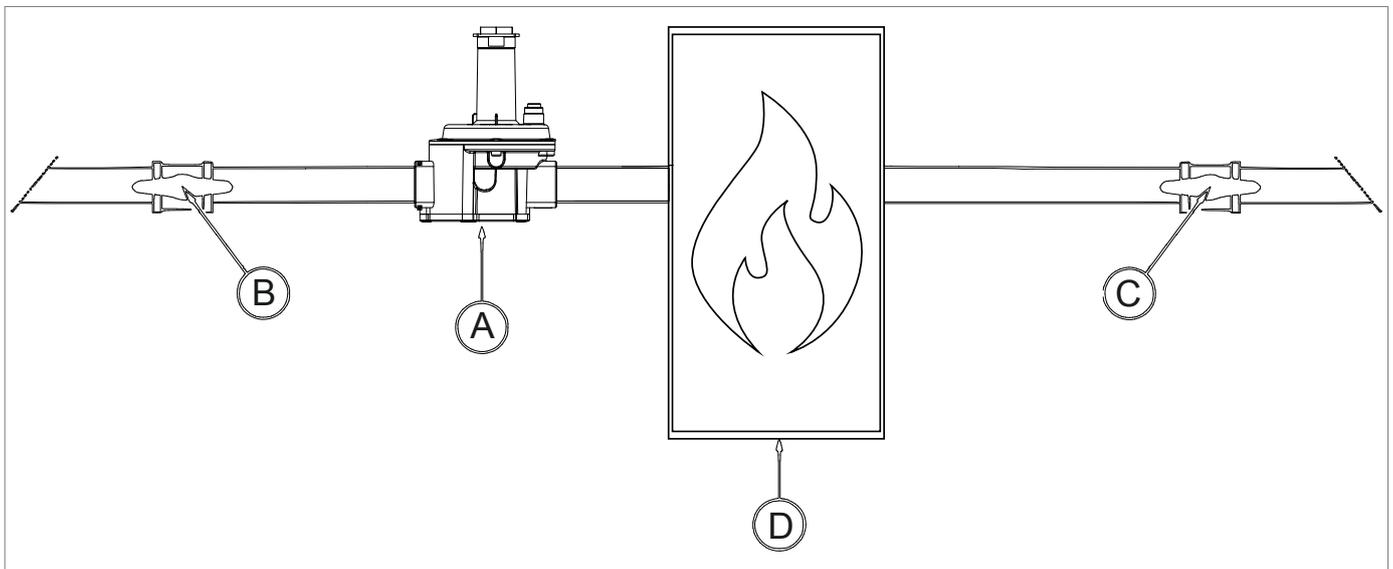


Fig. 8.26. Commissioning (Standard Version)

8.4.2 - COMMISSIONING OF THE ZERO VERSION REGULATOR

For commissioning the Zero (C) version regulator, proceed as shown in Tab. 8.52.:

Step	Operation
1	Partially open the downstream vent tap when present.
2	Slowly open upstream shutoff devices (e.g., solenoid valves, OPSO block valve, etc.).
3	Wait for the downstream pressure to stabilize at the spring setting P2 indicated on the plate. NOTICE Refer to Section 2.8 "Identification plates applied" et seq. for the values on the identification plate.
4	Proceed as indicated in Section 7.5.2 "Zero version adjustments".
5	Close the vent tap.

Tab. 8.52.

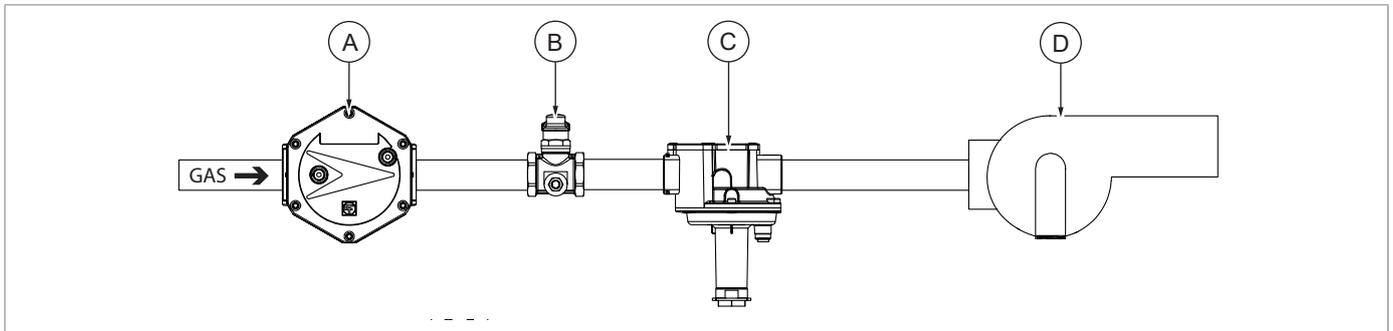


Fig. 8.27. Commissioning (Zero version)

8.4.4 - COMMISSIONING OF THE OPD AND DUAL CUT VERSION REGULATOR

For commissioning the OPD and Dual Cut (A) versions, proceed as shown in Tab. 8.54.:

Step	Operation
1	Partially open the downstream vent tap when present.
2	Slowly open upstream shutoff devices (e.g. OPSO block valve, valve (B), etc...).
3	Wait for the downstream pressure to stabilize at the spring setting P2 indicated on the plate. NOTICE Refer to Section 2.8 "Identification plates applied" et seq. for the values on the identification plate.
4	Close the vent tap.

Tab. 8.54.

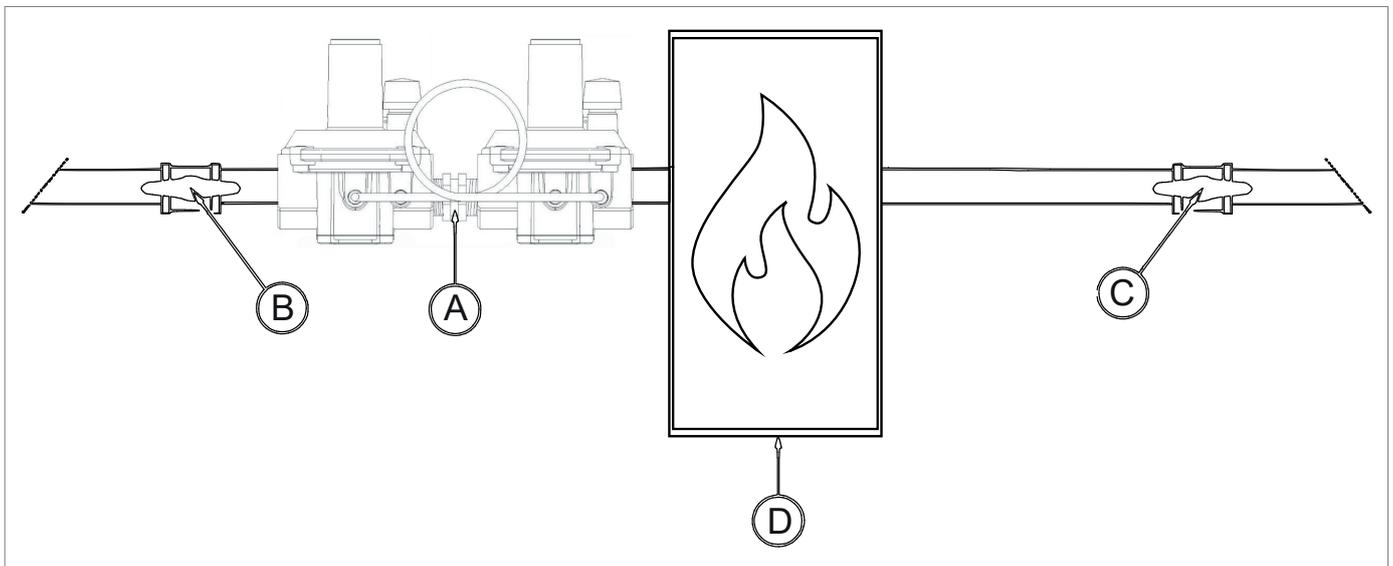


Fig. 8.29. Commissioning (OPD and Dual Cut versions)

8.5 - VERIFICATION OF PROPER COMMISSIONING

Check the tightness of the connections made during equipment installation (refer to Chapter 6 "Installation") through a foaming solution (or equivalent control system).

9 - MAINTENANCE AND FUNCTIONAL TESTING

9.1 - GENERAL WARNINGS

NOTICE

The equipment does not have periodic checks and maintenance procedures.

⚠ DANGER

No liability related to personal injury or property damage can be attributed to PIETRO FIORENTINI S.p.A. for interventions performed without the authorizations.

⚠ WARNING

In case of doubts or functional abnormalities, operation is prohibited. Contact PIETRO FIORENTINI S.p.A. for necessary clarification.

In case of equipment malfunction, it is necessary to:

Step	Operation
1	Close the downstream shut-off valve of the equipment.
2	Close the upstream shut-off valve of the equipment.
3	Make sure the pressure upstream and downstream of the equipment is "0".
4	Contact PIETRO FIORENTINI S.p.A.

Tab. 9.55.

9.2 - PERIODIC CHECKS AND VERIFICATIONS OF PROPER OPERATION

⚠ DANGER

Checks and inspections should be carried out only by licensed technicians.

Periodic checks and inspections

Operator qualification	<ul style="list-style-type: none"> Commissioning technician.
PPE required	 <p>⚠ WARNING</p> <p>The PPE listed in this chart relates to the risk associated with the equipment. For the PPE required to protect against risks associated with the workplace, installation or operating conditions, refer to:</p> <ul style="list-style-type: none"> the regulations in force in the country of installation; any indications provided by the Safety Manager at the installation facility.

Tab. 9.56.

9.2.1 - FUNCTIONAL CHECKS OF SAFETY DEVICES

To perform functional checks of safety devices, it is necessary:

- that there is a shut-off valve downstream of the regulator in the system;
- that the system is set up with a pressure tap downstream of the regulator or that the regulator is accessorized with an integrated pressure tap (see Section 4.6.3);
- have an external pressure source with pressure control available;
- that the external pressure source is connected to a pressure gauge and a tap with a maximum passage cross-section of 4 mm.

NOTICE

Leakage of gas into the environment must be kept to an absolute minimum.

To minimize gas leakage to the atmosphere, perform the connection/disconnection operations of the external source as quickly as possible.

To check the safety devices, proceed as described in Tab. 9.57.:

Step	Operation
1	Close the valve located downstream of the regulator.
2	Set up the external pressure source with corresponding pressure gauge to monitor pressure. <p>NOTICE</p> <p>The maximum pressure fed downstream of the regulator must not exceed 400 mbar.</p>
3	Connect the external pressure source to the pressure tap present downstream of the system or, if existing, to the pressure tap located on the regulator. <p>NOTICE</p> <p>Refer to section 4.6.3.1 for the use of the pressure tap mounted on the regulator</p>
4a	Check pds (regulated pressure): <ol style="list-style-type: none"> Open the tap of the external pressure source; Verify that the pds value is $\pm 10\%$ from the value indicated on the applied identification plate.
4b	Internal tightness check: <ol style="list-style-type: none"> close the tap of the external pressure source; check that the downstream pressure value is stable over time (wait about 2 minutes).
5	Disconnect the external pressure source tap.

Step	Operation
6	Close the downstream pressure tap (Step 3).
7	Open the shut-off valve closed in Step 1 .
8	Perform commissioning as described in Section 7.4.
9	Check for leaks at the closed pressure tap at Step 6 .

Tab. 9.57.

9.3 - TIGHTENING TORQUES

NOTICE

Refer to the following standards for tightening torques for swivels: NF E29-533: 2014 and NF E29-536: 2017.

9.4 - STABILIZER MAINTENANCE

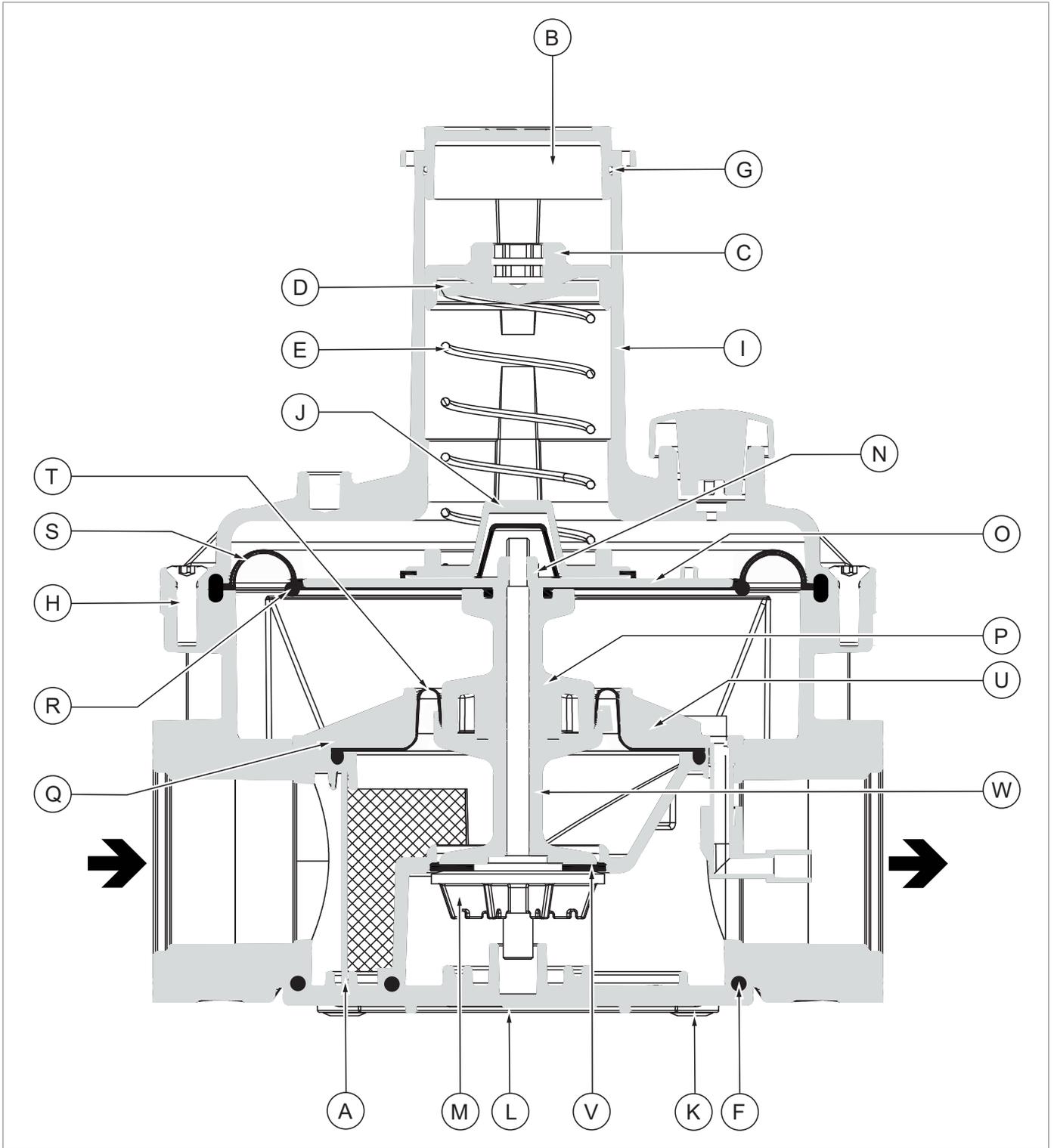


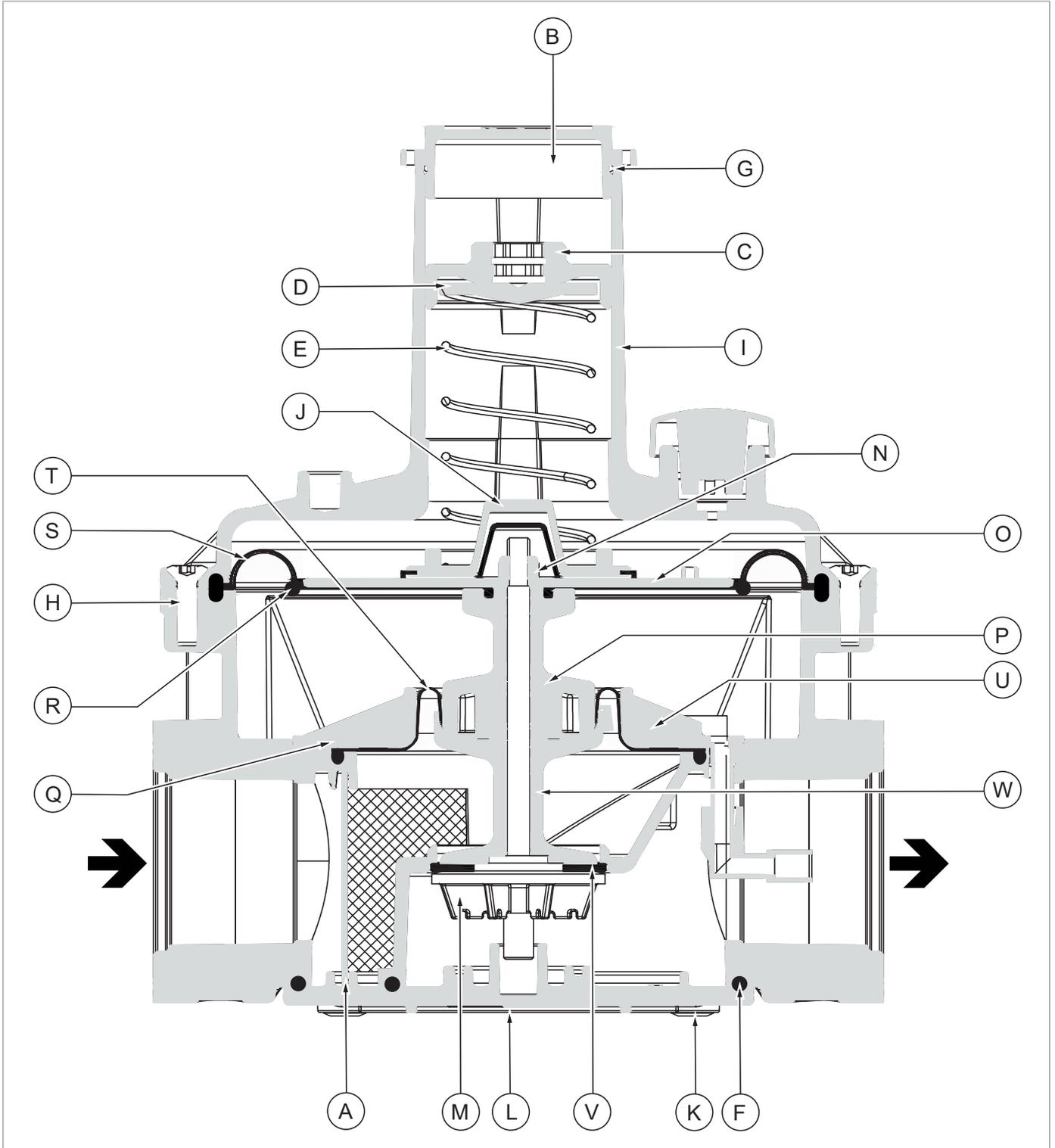
Fig. 9.30. Stabilizer maintenance

NOTICE

The reported maintenance procedures apply to:

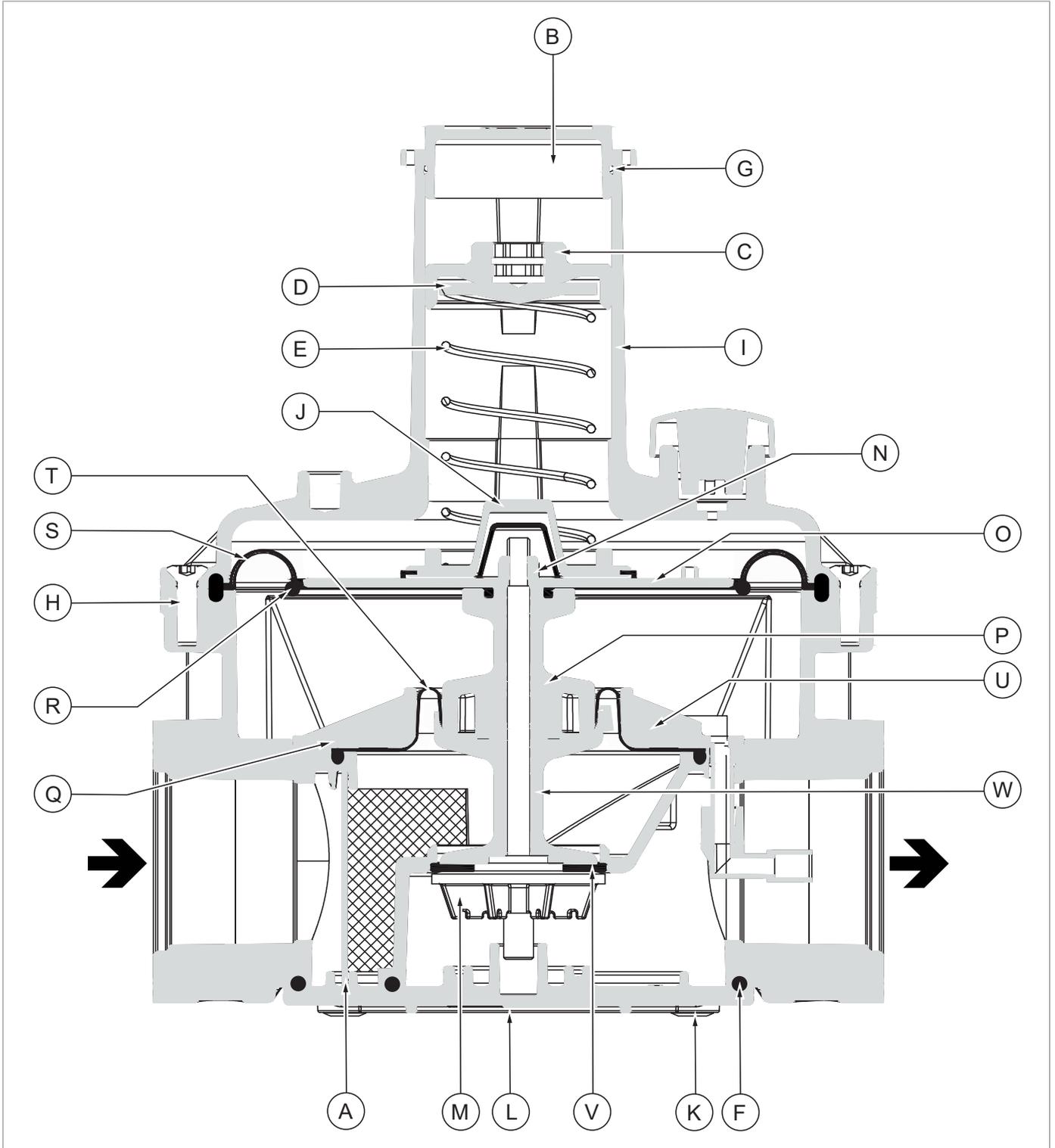
- the entirety of **GOVERNORS NORTH AMERICA** except the PF400 and PF400 Dual Cut versions. In case of failure, when maintenance is not planned, refer to the authorized dealer;
- both regulators (upstream and downstream) of the OPD and Dual Cut versions.

Step	Operation
1	Remove the cap (B) from the top cover (I).
2	Unscrew and remove the adjustment ring nut (C) together with the spring press (D).
3	Remove the calibration spring (E).
4	Unscrew and remove the screws (H). NOTICE <ul style="list-style-type: none"> • Use the equipment (C) in Table 6.35. • For replacement screws, contact the Manufacturer (see section 2.1).
5	Remove the top cover (I).
6	Remove the safety membrane (S).
7	Remove and replace the spring guide (J).
8	Unscrew and remove the screws (K).
9	Remove the lower cover (L).
10	Remove the O-ring (F).
11	Remove the filter element (A).
12	Turn the stabilizer body upside down.
13	Hold the stabilizer body in place using the plug lock.
14	Unscrew the nut (N).
15	Slide out the working membrane disk (O). NOTICE During this step, hold the plug block still.
16	Slide out the plug (M).
17	Slide off the upper spacer (P).
18	Remove the working membrane (R).
19	Unscrew and remove the screws (Q) from the balancing diaphragm lock disk (U).
20	Remove the balancing membrane lock disk (U).
21	Remove the balancing membrane (T).
22	Slide off the lower spacer (V).
23	Position the plug (M). NOTICE <ul style="list-style-type: none"> • The edge of the sealing ring (F) should be facing upward. • Check the cleanliness of the plug base (M).
24	Insert the assembly (M, V) into the body of the stabilizer.
25	Insert the lower spacer (W) into the assembly (F, M).



Stabilizer maintenance

Step	Operation
26	Insert the balancing membrane (T). NOTICE <ul style="list-style-type: none"> • The O-ring of the balancing membrane (T) must be inside the groove. • Check the cleanliness of the groove.
27	Insert the balancing membrane lock disk (U). NOTICE Be careful to center all holes present.
28	Insert and fasten screws (Q) according to the torque values of current guidelines and regulations. NOTICE Grease the holes before inserting the screw.
29	Insert the upper spacer (P). NOTICE The widest part of the spacer faces downward.
30	Insert the working membrane (R). NOTICE <ul style="list-style-type: none"> • The O-ring of the working membrane (R) must be inside the groove. • Check the cleanliness of the groove.
31	Insert the balancing membrane lock disk (U).
32	Insert and secure the nut (N) according to the torque values of current guidelines and regulations.
33	Turn the stabilizer body upside down.
34	Insert the filter element (A). NOTICE Verify the correct position within the housing.
35	Put the O-ring (F) in place. NOTICE Check for cleanliness before inserting the O-ring.
36	Put the lower cover (L) in place. NOTICE If the lower cover does not stop, check the correct position of the filter element (A) and O-ring (F).
37	Insert and fasten screws (K) according to the torque values of current guidelines and regulations. NOTICE Grease the holes before inserting the screw.
38	Insert the safety membrane (S) together with the spring guide (J). NOTICE The spring guide (J) is in the center of the safety membrane (S).



Stabilizer maintenance

Step	Operation
40	Insert the top cover (I). <div style="border: 1px solid black; padding: 2px; display: inline-block;">NOTICE</div> The vent hole is perpendicular to the outlet pipe.
41	Insert and fasten screws (H) according to the torque values of current guidelines and regulations. <div style="border: 1px solid black; padding: 2px; display: inline-block;"> NOTICE!</div> Grease the holes before inserting the screw.
42	Insert the calibration spring (E).
43	Position the spring press (D).
44	Insert and tighten the adjustment ring nut (C).
45	Remove and replace the O-ring (G).
46	Insert cap (B) into the top cover (I).

Tab. 9.58.

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10 - UNINSTALLATION AND DISPOSAL

10.1 - GENERAL SAFETY WARNINGS

⚠ DANGER

Ensure that there are no effective ignition sources in the work area set up for equipment de-installation and/or disposal.

⚠ WARNING

Before proceeding with uninstallation and disposal operations, ensure that the equipment is secured by disconnecting it from all power supplies.

10.2 - QUALIFICATION OF THE OPERATORS IN CHARGE

Commissioning

Operator qualification	<ul style="list-style-type: none"> Installer.
PPE required	 <p>⚠ WARNING</p> <p>The PPE listed in this chart relates to the risk associated with the equipment. For the PPE required to protect against risks associated with the workplace, installation or operating conditions, refer to:</p> <ul style="list-style-type: none"> the regulations in force in the country of installation; any indications provided by the Safety Manager at the installation facility.

Tab. 10.59.

10.3 - UNINSTALLING

⚠ CAUTION

Before uninstalling the equipment, completely drain the fluid in the reduction line and inside the equipment.

For proper uninstallation of the equipment, proceed as shown in Tab. 10.60.:

Step	Operation
1	Close the valve located upstream and the valve located downstream of the regulator.
2	<p>Depressurize the downstream system.</p> <p>NOTICE</p> <p>If there is no downstream pressure tap, loosen the outlet connection from the regulator creating a slight leakage to the outside.</p>
3	<p>Unscrew the outlet and inlet fittings of the regulator.</p> <p>⚠ CAUTION</p> <p>Although the system is depressurized (Step 2), a small gas discharge may occur during disassembly of the inlet fittings.</p>

Tab. 10.60.

10.4 - INFORMATION NEEDED IN CASE OF NEW INSTALLATION

NOTICE

In case the equipment after uninstallation is to be reused, refer to chapters: “Installation” and “Commissioning”.

10.5 - DISPOSAL INFORMATION

NOTICE

- Proper disposal avoids harm to humans and the environment and promotes the reuse of valuable raw materials.
- Please remember to comply with the regulations in force in the country where the equipment is installed.
- Illegal or improper disposal will result in the application of the penalties provided for in the regulations in force in the country of installation.

The equipment is made of materials that can be recycled by specialized companies.
For proper disposal of the equipment, proceed as shown in Tab. 10.61.:

Step	Operation
1	Prepare a large, clutter-free work area so that equipment dismantling operations can be carried out safely.
2	Separate the various components by material type in a way that facilitates recycling through separate collection.
3	Entrust the materials obtained in Step 2 to a specialized company.

Tab. 10.61.

The equipment in all possible configurations consists of the following materials:

Material	Present in	Disposal/recycling indications
Nitrile rubber (TR rubberized fabric)	<ul style="list-style-type: none"> • Membrane • Sealing rings 	It must be disassembled and disposed of separately.
Plastic	<ul style="list-style-type: none"> • Caps • Membrane disks 	It must be disassembled and disposed of separately.
Steel	<ul style="list-style-type: none"> • Springs 	Dismantle and collect separately. It must be recycled through the appropriate collection centers.
Aluminum alloy	<ul style="list-style-type: none"> • Equipment body • Covers 	Dismantle and collect separately. It must be recycled through the appropriate collection centers.

Tab. 10.62.

NOTICE

The materials indicated above refer to the standard models. Different materials may be provided for specific needs.

11 - CALIBRATION TABLES

11.1 - CALIBRATION TABLES

NOTICE

When the value shown on the regulator plate is equal to the minimum or maximum value of a spring listed in the tables below, the spring in the regulator is the one with the minimum range value equal to the calibration value in the data plate.

MODEL STABILIZER		30051/52/53 31051/52/53 (DN 15-20-25 1/2"-3/4"-1")	30150/51/52 31150/51/52 (DN 15-20-25 1/2"-3/4"-1")	30153/54/54F 31153/54/54F (DN 32-40 1"1/4-1"1/2)	30155/55F 31155/55F (DN 50 2")	30156F/57F 30158F (DN 65-80-100)
Range (mbar)	Spring (color)	Spring code				
5 - 13	Green	64470219	64470228	64470246	64470255	64470320
7 - 20	Red	64470220	64470229	64470247	64470256	64470324
10 - 30	White	64470221	64470230	64470248	64470257	64470325
15 - 35	Black	64470397	64470380	64470381	64470382	64470383
25 - 70	Yellow	64470295	64470297	64470299	64470301	64470321
60 - 150	Purple	64470296	64470298	64470300	64470302	64470322
140 - 300	Orange	-	64470235	64470253	64470262	64470323

Tab. 11.63.

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