Pietro Fiorentini

# FT 518

## High-medium pressure gas regulator


Revision A - Edition 06/2024

# USE, MAINTENANCE AND WARNING MANUAL

EN

Pietro Fiorentini

# 1 - INTRODUCTION

## PREFACE


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, maintenance instructions and recommendations described in this manual must be followed. To achieve the best performance and to keep the systems in efficient condition, the Manufacturer recommends that maintenance operations be performed regularly.
Training of the personnel responsible for the equipment both in its use, as well as in its maintenance and application of the safety directions and procedures given in this manual is of particular importance.

Revision: A

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## 1.1 - REVISION HISTORY

| Revision index | Date |
|---|---|
| **A** | 06/2024 |
| **B** | 11/2024 |
| | |

*Tab. 1.1*

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# INDEX

# 2 - GENERAL INFORMATION

## 2.1 - MANUFACTURER IDENTIFICATION

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

*Tab. 2.2*

## 2.2 - PRODUCT IDENTIFICATION

| | |
|---|---|
| **Equipment** | REGOLATORE PER ALTA PRESSIONE |
| **Model** | • FT 518 LP<br>• FT 518 HP |

*Tab. 2.3*

## 2.3 - REGULATORY FRAMEWORK

PIETRO FIORENTINI S.P.A., with registered office in Arcugnano (Italy) - Via E. Fermi, 8/10, declares under its sole responsibility that the equipment covered by this manual, is designed, manufactured, tested and controlled in accordance with the requirements of the standard ANSI B109.4 on gas pressure regulators.

***NOTICE***

**The original version of the declaration of conformity is delivered together with the equipment and this instruction manual for use and warnings.**

## 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 sales contract.**

## 2.5 - SYMBOLS USED IN THE MANUAL

| Symbol | Definition |
|---|---|
|  | Symbol used to identify important warnings for operator and/or equipment safety. |
|  | Symbol used to identify particularly important information in the manual.<br>The information may also concern the safety of personnel involved in using the equipment. |
|  | Mandatory to consult the instruction manual/booklet.<br>Indicates a requirement for personnel to consult (and understand) the operating and warning instructions of the equipment before working with or on it. |

*Tab. 2.4*

**DANGER**

**It signals a hazard with a high level of risk, an imminent hazardous situation that, if not avoided, causes death or serious harm.**

**WARNING**

**It signals a hazard with a medium level of risk, a potentially hazardous situation that, if not avoided, could result in death or serious harm.**

**CAUTION**

**It signals a hazard with a low level of risk, a potential hazardous situation that, if not avoided, could cause minor or moderate harm.**

***NOTICE***

**It signals specific warnings, directions, or notes of special interest unrelated to physical injury and practices for which physical injury is not a credible possibility.**

## 2.6 - 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. disclaims all liability for any damage to people, animals and things caused by failure to observe the warnings and operating methods described in this manual.**

## 2.7 - LANGUAGE

The original manual was written in Italian.
Any translations must be made starting from the original manual.

**⚠ DANGER**

**The Manufacturer is not responsible for any incomplete translations. 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;**
- **Immediately contact the appropriate offices of PIETRO FIORENTINI S.p.A.**

**⚠WARNING**

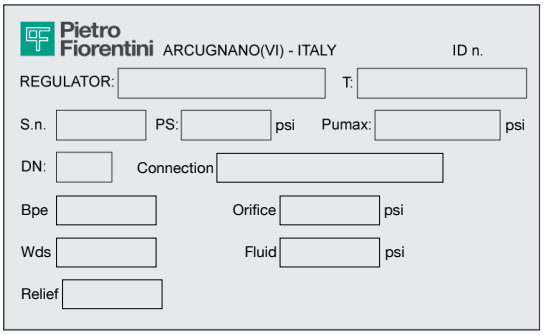
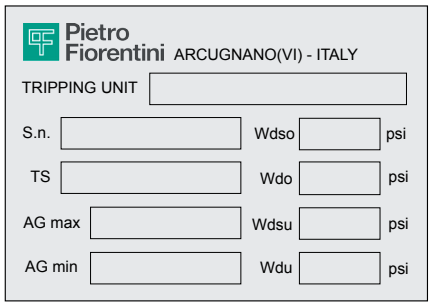
**PIETRO FIORENTINI S.p.A. is only responsible for the information contained in the original manual.**

## 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 appliance and its accessories are equipped with identification plates.
The plates bear the identification details of the equipment and its accessories to be quoted if necessary to PIETRO FIORENTINI S.p.A.
Tab. 2.5 illustrates the identification plates applied:

| Id. | Type | Image |
|---|---|---|
| 1 | • REGULATOR<br>• REGULATOR WITH IN-LINE MONITOR FUNCTION<br>• BUILT-IN MONITOR |  |
| 3 | BUILT-IN<br>SLAM-SHUT VALVE |  |

*Tab. 2.5*

### 2.8.1 - IDENTIFICATION PLATES GLOSSARY

Tab. 2.6 describes the terms and abbreviations used on the identification plates:

| Term | Description |
|---|---|
| **AC** | Accuracy class. |
| **AG max** | Pressure increase slam-shut valves accuracy class.<br>“OPSO” (Over pressure shut off). |
| **AG min** | Pressure decrease safety devices accuracy class.<br>”UPSO”(Under pressure shut off). |
| **bpu** | Inlet pressure range for which the regulator ensures a given accuracy class. |
| **CE** | Mark certifying compliance with applicable European directives. |
| **Cg** | Flow rate coefficient. |
| **Class** | Alphanumeric designation used as a reference in relation to a combination of mechanical and dimensional characteristics of the flanges in accordance with the relevant parts of the EN 1759 series, which includes the word Class followed by a dimensionless integer. |
| **DN** | Nominal size of the connections. |
| **Fail safe mode** | Regulator reaction mode (Fail open or Fail close). |
| **Flange** | Type of flanged connections or type of connection thread. |
| **Fluid** | Type of fluid compatible with the equipment. |
| **ID no.** | Number of the Notified Body involved in the conformity assessment of the equipment. |
| **Pilot** | Pilot family. |
| **PS** | Maximum allowable pressure for which the equipment was designed. |
| **Pumax** | Maximum inlet pressure at which the regulator can operate continuously under specific conditions. |
| **REGULATOR** | Equipment family. |
| **SG** | Shut-off pressure class. |
| **Slam shut device** | Slam-shut valve family. |
| **S.n.** | Serial number of the equipment. |
| **Strength type** | Strength class: Integral strength (IS) or differential strength (DS). |
| **T** | Admissible temperature range (min. and max.) for which the equipment was designed. |
| **Tripping unit** | Pressure switch family. |
| **Type** | Type and family of the accessory. |
| **Wd** | Complete range of set points that can be obtained by the regulator by adjusting and/or replacing some components (e.g. replacement of the valve seat or regulating element, e.g. spring). |
| **Wdo** | Full range of set points for tripping caused by pressure increase of the pressure switch incorporated in the slam-shut valve.<br>This range can be achieved by adjusting and/or replacing the components (for example spring or sensing element). |
| **Wds** | Full range of set points that can be obtained by the regulator by adjustment but without component replacement. |

| Term | Description |
|---|---|
| **Wdso** | Full range of set points for tripping caused by pressure increase of the pressure switch incorporated in the slam-shut valve.<br>This range can be achieved by adjustment but without component replacement. |
| **Wdu** | Full range of set points for tripping caused by pressure drop of the pressure switch incorporated in the slam-shut valve.<br>This range can be achieved by adjusting and/or replacing the components (for example spring or sensing element). |
| **Wdsu** | Full range of set points for tripping caused by pressure drop of the pressure switch incorporated in the slam-shut valve.<br>This range can be achieved by adjustment but without component replacement. |

*Tab. 2.6*

## 2.9 - UNIT OF MEASUREMENT GLOSSARY

| Measurement type | Unit of measurement | Description |
|---|---|---|
| **Volumetric flow rate** | $Sm^3/h$ | Standard cubic meters per hour |
| | Scfh | Standard cubic feet per hour |
| **Pressure** | bar | Unit of measurement in the CGS system |
| | psi | Pounds per square inch |
| | “wc | inch of water column |
| | Pa | Pascal |
| **Temperature** | °C | Celsius degree |
| | °F | Fahrenheit degree |
| | K | Kelvin |
| **Tightening torque** | Nm | Newton meter |
| | ft-lbs | Foot-pounds |
| **Sound pressure** | dB | Decibels |
| **Other measurements** | V | Volt |
| | W | Watt |
| | Ω | Ohm |

*Tab. 2.7*

## 2.10 - QUALIFIED PROFESSIONALS

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

| Professional | Definition |
|---|---|
| **Mechanical maintenance technician** | Qualified technician able to:<br>• carry out preventive/corrective maintenance activities on all mechanical parts of the equipment subject to maintenance or repair;<br>• have access to all parts of the device for visual analysis, equipment status checking, adjustments and calibrations.<br>The mechanical maintenance technician is not authorized to work on live electrical systems (if present). |
| **Electric maintenance technician** | Qualified technician able to:<br>• carry out preventive/corrective maintenance activities on all the electrical parts of the device subject to maintenance or repair;<br>• read wiring diagrams and verify their correct functional cycle;<br>• intervene on the adjustments and on the electrical systems for maintenance, repair and replacement of worn parts.<br>The electrical maintenance technician can operate in the presence of voltage inside the electrical panels, junction boxes, control equipment, etc. only if he is a suitable person (PEI).<br>For the general prescriptions, refer to the CEI EN 50110-1:2014 standard. |
| **Worker in charge of transport, handling, unloading its placement on site** | Operator qualified to:<br>• use lifting equipment;<br>• handle materials and equipment.<br>The lifting and handling of the equipment must be done by strictly following the instructions provided by the Manufacturer and in compliance with the regulations in force in the place of installation of the equipment itself. |
| **Installer** | Qualified operator able to:<br>• carry out all the operations necessary for a correct and safe installation of the equipment;<br>• carry out all the operations necessary for the correct functioning of the equipment and the system in safety. |
| **User's technician** | Technician trained and qualified to use and manage the equipment for the activities for which it was supplied. He/she must:<br>• be able to carry out all the operations necessary for the proper operation of the equipment and system, guaranteeing their own safety and that of other personnel present;<br>• have proven experience in the correct use of equipment such as those described in this manual and be trained, informed and instructed accordingly.<br>The technician can carry out maintenance only if authorized/qualified. |

*Tab. 2.8*

# 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 intoxicating agents such as, for example, alcohol;**
- **in the case of using drugs that can slow down 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

In Tab. 3.9, Personal Protective Equipment (PPE) and its description are shown. An obligation is attached to each symbol.
Personal protective equipment means any equipment intended to be worn by the worker for the purpose of protecting him/her against one or more hazards likely to threaten his/her safety or health while at work.
For the assigned workers, depending on the type of work required, the most appropriate PPE of the following will be reported and should be used:

| Symbol | Meaning |
|---|---|
|  | **Mandatory to use protective or insulating gloves.**<br>Indicates a requirement for personnel to use protective or insulating gloves. |
|  | **Mandatory to use safety goggles.**<br>Indicates a requirement for personnel to use protective goggles to protect their eyes. |
|  | **Mandatory to use safety shoes.**<br>Indicates a requirement for personnel to use safety shoes to protect their feet. |
|  | **Mandatory to use noise protection devices.**<br>Indicates a requirement for personnel to use earmuffs or earplugs for hearing protection. |
|  | **Mandatory to wear appropriate protective clothes.**<br>Indicates a requirement for personnel to wear the specific protective clothing. |
|  | **Mandatory use of protective mask.**<br>Indicates a requirement for personnel to use masks for respiratory protection in the event of a chemical hazard. |
|  | **Mandatory to use hard hat.**<br>Indicates a requirement for personnel to use the hard hat. |
|  | **Mandatory to wear high-visibility vest.**<br>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 - RESIDUAL RISKS

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.

### 3.3.1 - TABLE OF RESIDUAL RISKS DUE TO PRESSURE

| Risk and Hazard | Event and Cause | Effect and Consequence | Solution and Prevention |
|---|---|---|---|
| **Pressurized gas outlet.**<br><br>**Projection of metal and non-pressurized parts.** | • Violent impact;<br>• Impact (also from falling due to improper handling, etc.). | • Deformation;<br>• Broken connections and, if pressurized, even bursting. | a. Handling and installation by appropriate means to avoid localized stresses.<br>b. Installation in suitable places and spaces with appropriate protection, suitable packaging.<br>c. Information in the instructions for use and warnings. |
| **Pressurized gas outlet.**<br><br>**Projection of metal and non-pressurized parts.** | • Use of inappropriate fluids. | • Corrosion;<br>• Embrittlement;<br>• Explosion. | a. The user must verify that the fluid used corresponds to what is stated on the rating plate. |
| **Pressurized gas outlet.**<br><br>**Projection of metal and non-pressurized parts.** | • Operation at temperatures below the minimum allowable temperature. | • Embrittlement;<br>• Breaking;<br>• Explosion. | a. Install in locations with temperature no lower than the minimum allowable temperature and/or properly insulate the equipment.<br>b. The minimum allowable temperature is indicated on the nameplate. |
| **Pressurized gas outlet.**<br><br>**Projection of metal and non-pressurized parts.**<br>**Explosion.** | • Overpressure or exceeding rating plate limits (maximum allowable pressure) | • Explosion;<br>• Breakage;<br>• Cracking;<br>• Permanent deformations. | a. The device has appropriate design safety margins.<br>b. The user should check the maximum pressure available to the equipment.<br>c. The maximum allowable pressure is highlighted in the appropriate plate on the equipment. |
| **Fall of equipment.** | • Hazardous handling. | • Deformation;<br>• Cracking;<br>• Breaking. | b. The user must equip himself with appropriately sized lifting equipment.<br>c. The above requirements are given in the operating and warning instructions of the equipment. |
| **Fluid output at pressure.**<br>**Projection of metal and non-pressurized parts.** | • Improper fixing of the equipment. | • Deformation;<br>• Breaking. | a. The equipment is provided with unified type process connections and compression fittings.<br>b. The user must ensure proper attachment to the line.<br>c. Indications in the instructions for use and warnings. |

| Risk and Hazard | Event and Cause | Effect and Consequence | Solution and Prevention |
|---|---|---|---|
| **Explosion of the pressurized fluid outlet device. Projection of metal parts.** | • Operation at temperatures above the maximum allowable temperature. | • Reduction in mechanical strength and breakage of the device;<br>• Explosion. | a. The user must equip the plant with suitable control and safety equipment.<br>b. The maximum allowable temperature is indicated on the nameplate. |
| **Pressurized gas leakage.** | • Maintenance of the device with the system in operation. | • Inappropriate opening of pressurized chambers. | a. The user shall perform any maintenance with the equipment not in operation.<br>b. The above requirements are given in the instructions for use and warning. |
| **Pressurized gas leakage.**<br><br>**Projection of metal and non-pressurized parts.** | • External loads bearing on the device. | • Deformation;<br>• Crack formation;<br>• If pressurized, also burst. | a. With the exception of what is provided in the design, the user must verify that additional concentrated loads do not bear on the equipment. |
| **Pressurized gas leakage.**<br><br>**Projection of metal and non-pressurized parts.** | • Stray currents, differentials, electrostatic potentials. | • Localized corrosion in the device. | b. The user shall equip the equipment with the necessary means of protection and grounding.<br>c. The above requirements are given in the instructions for use and warning. |
| **Pressurized gas leakage.**<br><br>**Projection of metal and non-pressurized parts.** | • Humidity;<br>• Environments with aggressive atmosphere. | • Deterioration of exterior surfaces;<br>• Corrosion. | a. The user should periodically check the condition of the exterior surfaces.<br>b. The above requirements are given in the instructions for use and warning. |

*Tab. 3.10*

### 3.3.2 - RESIDUAL RISKS TABLE FOR POTENTIALLY EXPLOSIVE ATMOSPHERES

Tab. 3.11 shows the conditions that can lead to the generation of potentially explosive atmosphere respectively:

- of the pressure regulator
- of the monitor
- of the slam-shut valve

Considering that the silencer has no active functional parts, in this analysis it is considered as an integral part of the regulator. 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.**
**No effective sources of ignition are absolutely necessary in and around the "danger zones."**

| Operating conditions | Potentially explosive atmosphere | Normative References | Management measures included in the operating and warning instructions |
|---|---|---|---|
| **First start-up** | No | • During the production cycle, the external tightness of the equipment is checked at a value of 1.1 PS.<br>• Before commissioning, the external tightness of the portion of the system on which the equipment is installed is tested at a convenient pressure (as specified in EN 12186 and EN 12279). | The instructions for use indicate the need to meet the requirements of EN 12186 and EN 12279. |
| **Normal operating conditions** | No | The above point applies, as well as:<br>• the installation of the equipment is outdoors or in a naturally ventilated room (according to EN 12186 and EN 12279);<br>• the installation is subject to supervision in accordance with applicable national regulations, good practice, and the equipment manufacturer's instructions (in accordance with EN 12186 and EN 12279). | The instructions for use state that:<br>• the environment in which the equipment is installed must meet the requirement stated in EN 12186 and EN 12279;<br>• periodic inspection and maintenance should be carried out during surveillance in accordance with applicable national regulations (if any) and the manufacturer's specific recommendations. |

| Operating conditions | Potentially explosive atmosphere | Normative References | Management measures included in the operating and warning instructions |
|---|---|---|---|
| **Breakage of the control head diaphragm (malfunction)** | No | This event should be considered as a rare malfunction.<br>All atmospheric pressure chambers bounded on at least one side by a diaphragm must be routed to a safe area (as per EN 12186 and EN 12279). | The instructions for use indicate the need to meet the requirements given in EN 12186 and EN 12279. |
| **Breakage of other non-metallic parts (malfunction)** | No | This type of malfunction is not reasonably expected since it involves static (outward) seals. | - |
| **Decommissioning** | No | • Pressure reduction of the section of the system where the equipment is installed must be accomplished with appropriate venting lines routed to a safe area (as per EN 12186 and EN 12279).<br>• Exhaust of residual gas should be done as indicated above. | In the instructions for use, the need to meet the requirements given in EN 12186 and EN 12279 is indicated |
| **Restart** | No | • After a new regulator assembly, an external leak test should be performed at a convenient pressure value as specified by the manufacturer.<br>• Before commissioning, the external tightness of the portion of the system on which the equipment is installed is tested at a convenient pressure (as specified in EN 12186 and EN 12279). | The instructions for use state:<br>• The minimum conditions for performing external leak tests;<br>• The need to meet the requirements outlined in EN 12186 and EN 12279. |

*Tab. 3.11*

## 3.4 - OBLIGATIONS AND PROHIBITIONS

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

It is mandatory to:

- carefully read and understand the operating and warning instructions;
- 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 before installing the equipment;
- avoid violent shocks and impacts that could damage the equipment resulting in the leakage of pressurized fluid.

It is forbidden to:

- operate in various capacities on the equipment without the PPE specified in the work procedures described in these operating and warning instructions;
- 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 rating plate;
- use the equipment with fluids other than those indicated on the rating plate and in these operating and warning instructions;
- use the equipment outside the operating temperature range stated on the rating plate and in these operating and warning instructions;
- maintain the equipment with the portion of the plant, on which the equipment is installed, in operation;
- install or use the equipment in environments other than those specified in these operating and warning instructions.

## 3.5 - 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 HAZARD. |

*Tab. 3.12*

**⚠ DANGER**

**It is strictly forbidden to remove the pictograms and safety labels on the equipment.**
**The user is required to replace pictograms and safety labels that, as a result of wear and tear, removal or tampering are illegible.**

## 3.6 - NOISE LEVEL

Depending on the operating conditions, usage and required configuration, the equipment may generate noise other than that 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 ear muffs or earplugs to protect the operator's hearing remains if noise in the equipment installation environment (depending on specific operating conditions) exceeds 85 dBA.**

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# 4 - DESCRIPTION AND OPERATION

## 4.1 - GENERAL DESCRIPTION

The FT 518 equipment is a direct-operated pressure regulator for medium and high pressure that reduces the pressure of the incoming gas. The value of the downstream pressure (Pd) varies according to:

- the inlet pressure value
- the required flow rate within the operating conditions of the equipment

The main elements of the equipment are:

| Pos. | Description | Pos. | Description |
|---|---|---|---|
| 1 | Regulator body | 6 | Control shaft |
| 2 | Adjusting head | 7 | Lever mechanism |
| 3 | Plug | 8 | Plug rod |
| 4 | Diaphragm protection disc | 9 | Adjustment spring |
| 5 | Diaphragm | 10 | Relief spring |

*Tab. 4.13*

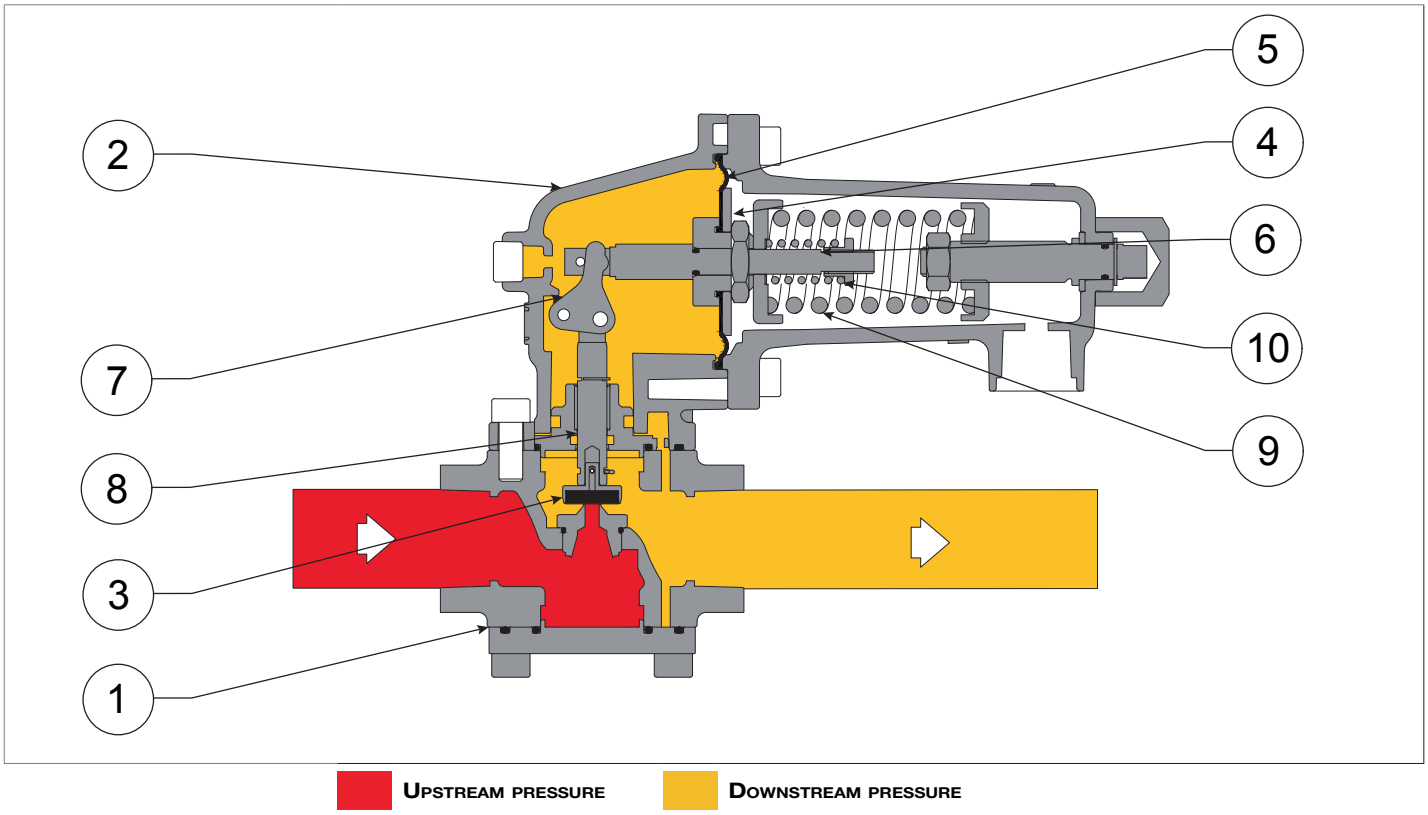


*Fig. 4.1. General description FT 518*

### 4.1.1 - REGULATOR REACTION MODES

The FT 518 equipment is a direct-operated regulator with a "fail open" reaction, i.e. it opens in case of:

- rupture of the main diaphragm
- lack of downstream pressure signal.

## 4.2 - OPERATION

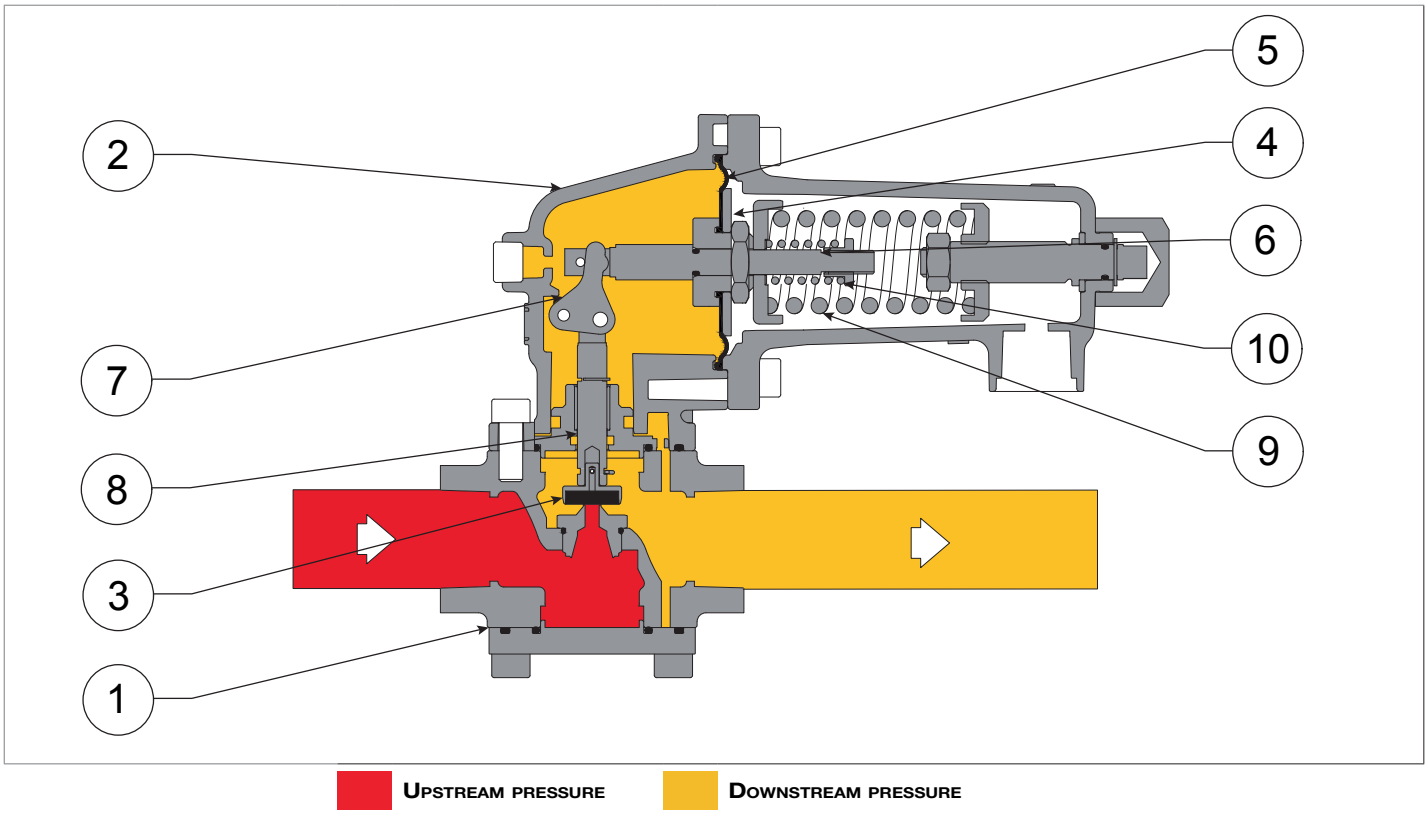


*Fig. 4.2. Operation FT 518*

In the absence of pressure and with calibration spring (9) charged, the plug (3) is held in the open position by the coupling of the plug rod (8) with the lever mechanism (7).

The outlet pressure (Pd) is controlled by comparing the load on the calibration spring (9) with the thrust that the outlet pressure (Pd) itself exerts on the diaphragm (5).

In this comparison, the following are considered:
- the weight of the moving equipment
- the dynamic thrusts acting on the plug.

The plug balance (3) is affected by the inlet pressure (Pu), the downstream pressure (Pd), the required flow rates, and the diameter of the installed seat.

The movement of the diaphragm (5) is transmitted from the drive shaft (6) and lever mechanism (7) to the plug rod (8) and plug (3).

Under normal operating conditions, the plug (3) is positioned to keep the pressure (Pd) around the chosen calibration value.

FT 518 can also be equipped with an internal relief to vent gas to the outside when the pressure at the control point exceeds the set pressure. This phenomenon is caused by short-term events such as gas overheating with zero flow rate or water hammers due to abrupt shut-off valve closures.

When the regulator is closed, any overpressure raises the diaphragm protection disc (4), exceeding the load of the springs (9, 10). In this way, a small bypass allows the overpressure to be relieved.

The presence of the active relief also protects the plug (3) from damage from sudden increases in downstream pressure (Pd). In case of increased downstream pressure (Pd), the diaphragm protection disc (4) rests on the top cover (2), limiting the stroke of the plug (3).

| Operating conditions | Operational consequences | Final outcome |
|---|---|---|
| **Decrease in downstream pressure (Pd) due to:**<br>• **increase in the required flow rate;**<br>• **drop in upstream pressure (Pu).** | • Thrust on the diaphragm (5) is less than the load of the calibration spring (9)<br>• The diaphragm (5) is lowered<br>• The plug (3) moves to the open position | Increasing the downstream pressure (Pd) until the preset calibration value is restored. |
| **Increased downstream pressure (Pd) due to:**<br>• **drop in the required flow rate;**<br>• **increase in upstream pressure (Pu).** | • Thrust on the diaphragm (5) is less than the load of the calibration spring (9)<br>• The diaphragm (5) rises<br>• The plug (3) moves to the closed position | Decreasing the downstream pressure (Pd) until the preset calibration value is restored. |

*Tab. 4.14*

## 4.3 - INTENDED USE

### 4.3.1 - INTENDED USE

The equipment in question is intended for:

| Operation | Allowed | Not Allowed | Processing environment |
|---|---|---|---|
| **Downstream pressure regulation due to:** | Gaseous fluids, non-corrosive, preliminarily filtered. | • Liquids.<br>• Any product other than the one allowed. | Installations for the transport and distribution of natural gas for the supply of networks for use:<br>• civil;<br>• industrial. |

*Tab. 4.15*

The equipment in question is used as the main regulator and regulator with in-line monitor function.
It 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 indications to work safely are:
- use within the limits stated on the identification plate and on this manual;
- compliance with the procedures of the user manual;
- execution of routine maintenance in the times and in the manner indicated;
- execution of extraordinary maintenance in case of need;
- do not tamper with and/or bypass the safety devices.

### 4.3.2 - 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 machine in operation in all circumstances;
- behavior resulting from carelessness;
- behavior resulting from the use of the equipment by unqualified and unsuitable persons;
- use of the equipment differently than envisaged in the paragraph “4.3.1 - 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. disclaims all responsibility in relation to any damage caused to things or people and considers any type of warranty on the equipment lapsed.

### 4.3.3 - TYPES OF FLUIDS

The equipment works with combustible gases used:
- in pressure control stations;
- in transportation and distribution networks.
- in commercial and industrial plants (after verification by contacting the Manufacturer).

***NOTICE***

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

## 4.4 - TECHNICAL CHARACTERISTICS/PERFORMANCE

The FT 518 equipment is a regulator for medium and high pressure.
FT 518 is a "top entry" type regulator that allows easy maintenance and application of accessories in the field.
The main specifications of this regulator are:

| Technical features | |
|---|---|
| **Maximum allowable pressure** | Up to 1000 psi |
| **Ambient temperature range** | -40 °F + 140 °F |
| **Inlet gas temperature range** | -4°F + 140°F |
| **Inlet pressure range (bpu)** | 20- 1000 psi |
| **Possible adjustment range (Wd)** | • LP version: 5- 125 psi<br>• HP version: 110- 500 psi |
| **Minimum differential pressure** | 7 psi |
| **Accuracy class (AC)** | up to 10 (depending on operating conditions) |
| **Shut-off pressure class (SG)** | up to 10 (depending on operating conditions) |

*Tab. 4.16*

| Coefficients Cg and K1 | | | | | | |
|---|---|---|---|---|---|---|
| **Seat diameter** | 3/32” | 1/8” | 3/16” | 1/4” | 3/8” | 1/2” |
| **Coefficient Cg** | 7.1 | 13 | 27.8 | 50 | 110 | 150 |
| **Coefficient K1** | 110 | 110 | 110 | 110 | 110 | 110 |

*Tab. 4.17*

## 4.5 - POSSIBLE CONFIGURATIONS

The FT 518 equipment can have different configurations through the installation one of the following accessories:

- Built-in monitor PM/518
- Built-in SB/518 slam-shut valve

The installation of the accessories can be carried out directly in the factory or, at a later time, directly in the field.

***NOTICE***

**The installation of accessories is described in the relevant chapter of this manual.**

### 4.5.1 - REGULATOR WITH IN-LINE MONITOR FUNCTION

The regulator with monitor function (1) has the task of keeping the value of the downstream pressure (Pd) within the predetermined limits in case of failure of the main regulator.

The regulator with monitor function is installed upstream of the main pressure regulator and has a sensing line connected downstream of the main regulator. The internal sensing line is inhibited.

When tripped, the unbalancing forces change from the monitor mode in the fully open position to the monitor mode in the working position. For better adjustment, in the regulator with in-line monitor function, it is preferable to mount the valve seat with a diameter of 3/8" or larger.

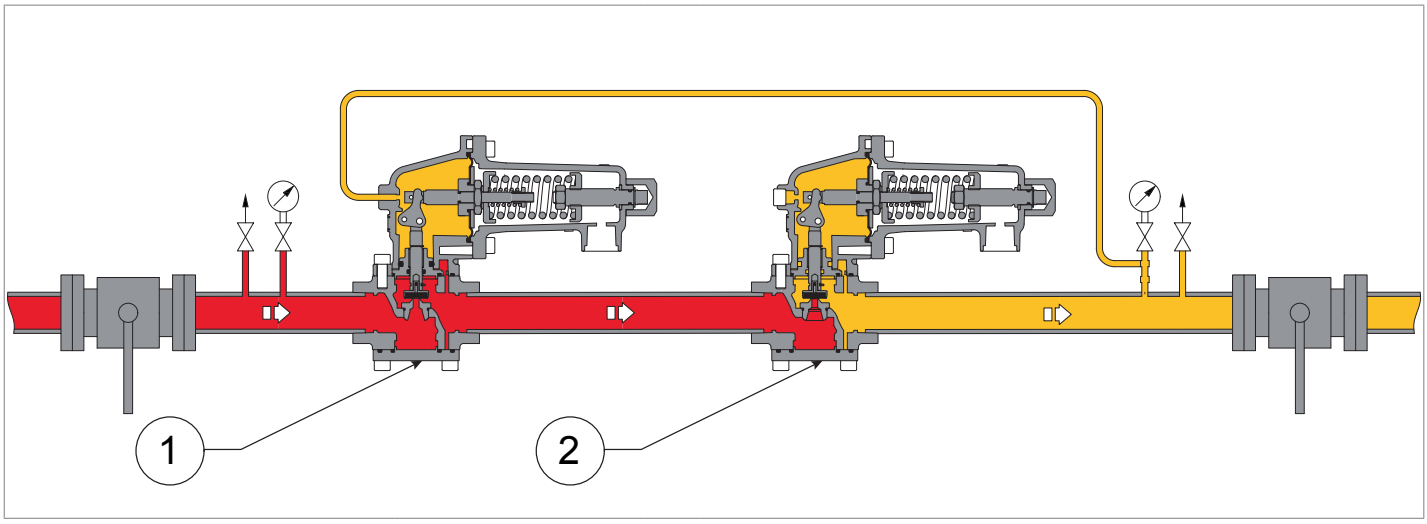


*Fig. 4.3. FT 518 with in-line monitor*

## IN-LINE REGULATOR-MONITOR OPERATION IN STANDBY CONDITIONS

The regulator with monitor function, during normal operation, is open due to its higher calibration of the main regulator calibration (2).

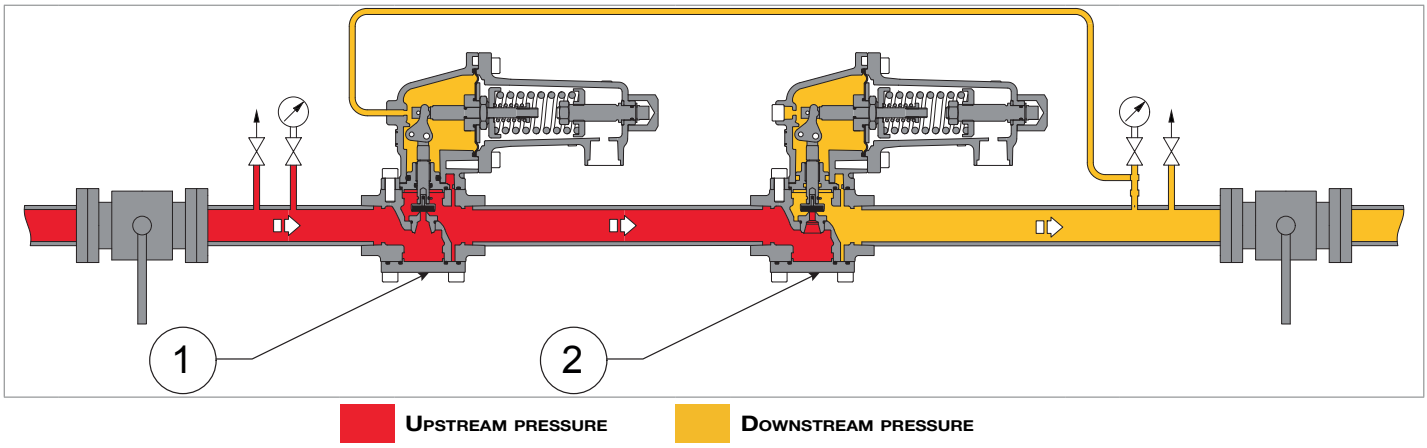


*Fig. 4.4. In-line regulator-monitor operation in standby conditions*

## IN-LINE MONITOR OPERATION UNDER MAIN REGULATOR FAULTY CONDITIONS

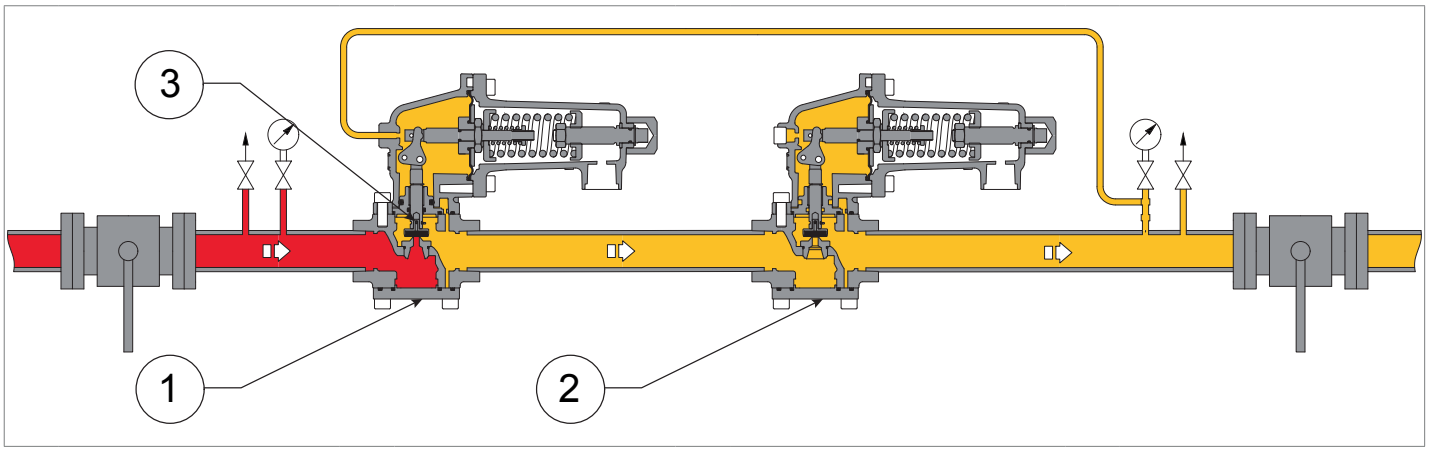


*Fig. 4.5. In-line monitor operation under main regulator faulty conditions*

In case of failure of the main regulator (2), the regulator with in-line monitor function (1) will trip keeping the downstream pressure value (Pd) within the value established for the calibration of the latter.

If, during operation, the following should occur:

| Operating conditions | Operational consequences | Final outcome |
|---|---|---|
| **Decrease in downstream pressure (Pd) due to:**<br>• **increase in the required flow rate;**<br>• **drop in upstream pressure (Pu).** | Imbalance that causes the plug to open (3). | Increasing the downstream pressure (Pd) until the preset calibration value is restored. |
| **Increased downstream pressure (Pd) due to:**<br>• **drop in the required flow rate;**<br>• **increase in upstream pressure (Pu).** | Imbalance that causes the plug to close (3). | Decreasing the downstream pressure (Pd) until the preset calibration value is restored. |

*Tab. 4.18.*

### 4.5.2 - INCORPORATED MONITOR

The FT 518 equipment may include the installation of the built-in monitor PM/518.

The built-in monitor (1) has the task of keeping the value of the pressure downstream of the main regulator (2) within the pre-determined limits in case of failure of the latter.

The built-in monitor (1) is installed upstream of the main regulator (2). Having higher calibration than the main regulator, it is in the fully open position during normal operation.

#### 4.5.2.1 - BUILT-IN MONITOR PM/518

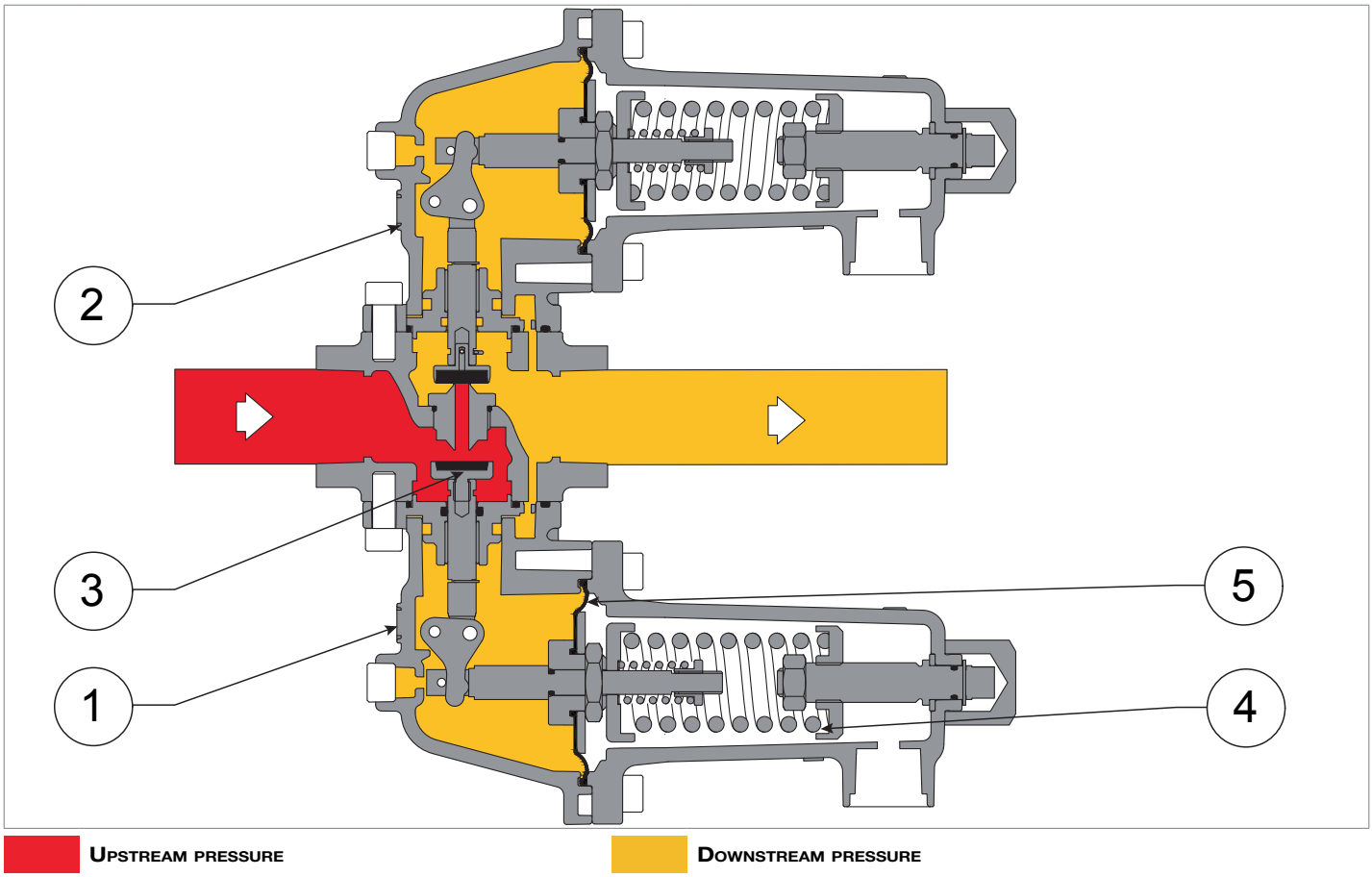


*Fig. 4.6. Built-in monitor PM/518*

During normal operation, the plug (3) is held in the open position by the calibration spring load (4).

In the event of failure of the main regulator (2), the downstream pressure (Pd) is controlled by the comparison between the load of the calibration spring (4) and the force that the downstream pressure exerts on the diaphragm (5).

The unbalancing forces change from the monitor mode in the fully open position to the monitor mode in the working position. For better adjustment in the built-in monitor, it is preferable to mount the valve seat with a small diameter.

If, during operation, the following should occur:

| Operating conditions | Operational consequences | Final outcome |
|---|---|---|
| **Decrease in downstream pressure (Pd) due to:**<br>• **increase in the required flow rate;**<br>• **drop in upstream pressure (Pu).** | • Thrust on the diaphragm (5) is less than the load of the spring (4)<br>• The diaphragm (5) is lowered<br>• The plug (3) moves to the open position | Increasing the downstream pressure (Pd) until the preset calibration value is restored. |
| **Increased downstream pressure (Pd) due to:**<br>• **drop in the required flow rate;**<br>• **increase in upstream pressure (Pu).** | • Thrust on the diaphragm (5) is higher than the load of the spring (4)<br>• The diaphragm (5) rises<br>• The plug (3) moves to the closed position | Decreasing the downstream pressure (Pd) until the preset calibration value is restored. |

*Tab. 4.19.*

### 4.5.3 - SLAM-SHUT VALVE

The slam-shut valve is a safety device that has the task of intercepting the gas flow if the pressure value at the control point exceeds the calibration value of the valve itself.
The slam-shut valve is incorporated to the main body of the equipment and consists of:

- a control system;
- the slam-shut mechanism.

If tripped, the slam-shut valve closes the regulator supply.

#### 4.5.3.1 - BUILT-IN SB/518 SLAM-SHUT VALVE

The built-in SB/518 slam-shut valve can be operated:

- from the pressure switch;
- with remote control (optional).

The main features of the built-in SB/518 slam-shut valve are:

- tripping due to increase and / or decrease of the downstream pressure;
- design pressure: 1000 psi;
- precision of intervention (AG): 5% of the calibration value for pressure increase; 15% of the calibration value for pressure decrease
- built-in bypass to balance pressures and facilitate device reset.

The built-in SB/518 slam-shut valve consists of (see Fig. 4.7):

| Pos. | Description | | |
|---|---|---|---|
| 1 | Plug | 6 | Intervention spring for pressure increase |
| 2 | Reset knob | 7 | Intervention spring for pressure reduction |
| 3 | Coupling device | 8 | Spring support |
| 4 | Rod | 9 | Control shaft |
| 5 | Diaphragm | 10 | Probe |

*Tab. 4.20.*

**OPERATION**

In the control head (C), the downstream pressure (Pd) acts on the diaphragm (5), which integral with the control shaft (9) receives an opposite force through the springs (6, 7), which determines the intervention by increase or decrease in pressure.

In case of intervention due to pressure increase:

- the downstream pressure (Pd) exceeds the calibration value
- the load on the diaphragm (5) increases until the spring resistance is overcome (6)
- translation of the control shaft (9) moves the probe (10) through the cam, disengaging the lever mechanism and causing the valve seat to be closed by the plug (1).

In case of intervention due to pressure reduction:

- the downstream pressure (Pd) decreases below the calibration value
- the load on the diaphragm (5) decreases until it is overridden by the spring load (7)
- translation of the control shaft (9) moves the probe (10) through the cam, disengaging the lever mechanism and causing the valve seat to be closed by the plug (1).

To reset the slam-shut valve:

- pull the reset knob (2) downward until it creates a bypass
- wait for the upstream pressure (Pu) to pass downstream of the plug (1), balancing it
- pull the reset knob (2) down until the linkage is re-coupled
- insert the reset knob (2) into its seat.

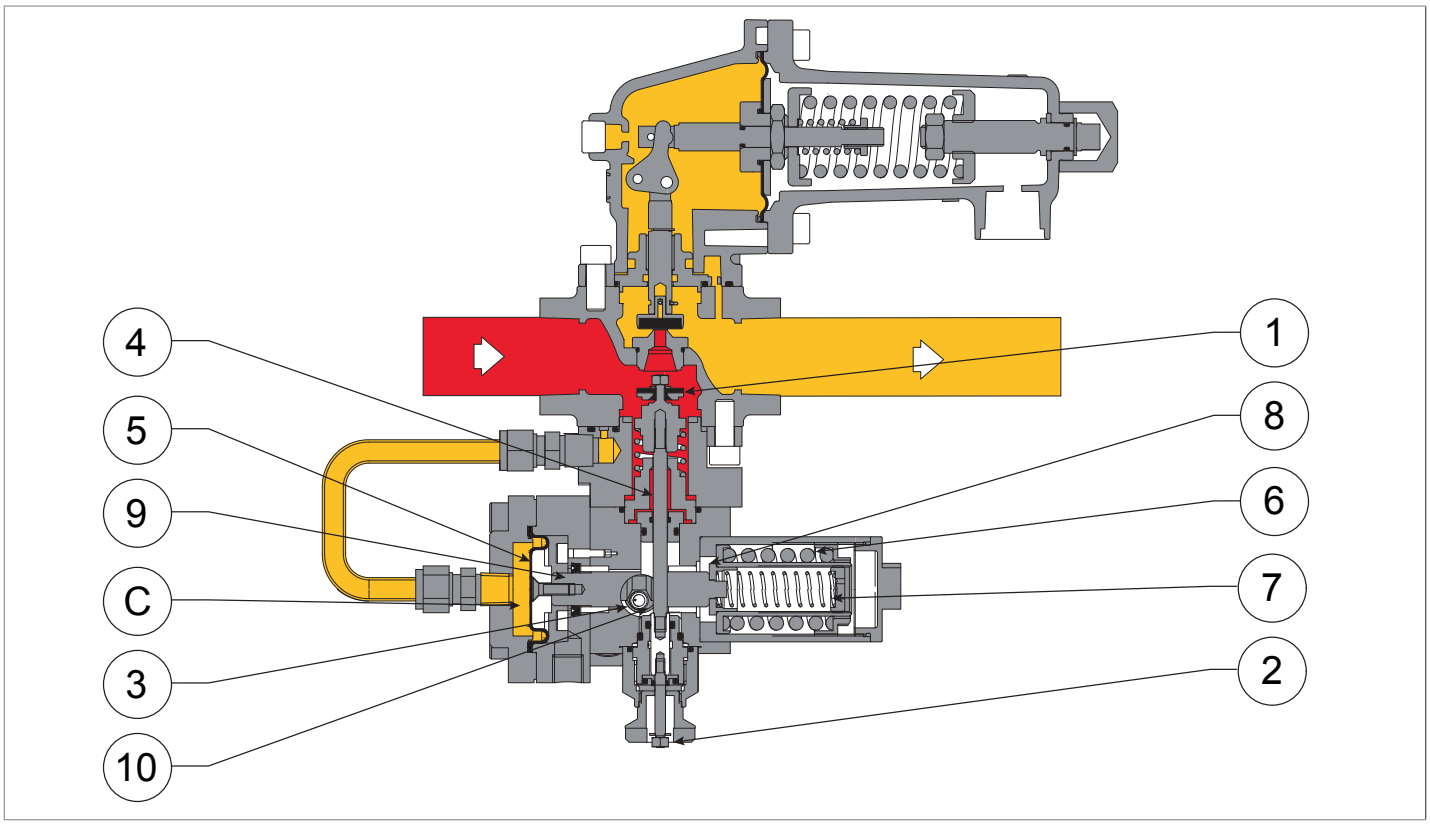


*Fig. 4.7. FT 518 with built-in SB/518 slam-shut valve*

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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.**

| Transportation by forklift or crane | |
|---|---|
| **Operator qualification** | Worker in charge of transport, handling, unloading and placement on site |
| **PPE required** |  <br>**⚠WARNING**<br>**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:**<br>• **the regulations in force in the country of installation;**<br>• **any indications provided by the Safety Manager at the installation facility.** |
| **Lifting gear** | Hoist crane, forklift or suitable similar means. |
| **Weights and dimensions of the equipment** | Refer to paragraph “5.2 - Physical characteristics of the equipment” for dimensions and weights. |

*Tab. 5.21*

### 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 and spare parts must be kept in their respective packaging until they are installed.
Upon receipt of the equipment:

- 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 due to failure to comply with the instructions given in this manual.**

Tab. 5.22 shows the types of packaging used:

| Ref. | Type of packaging | Image |
|---|---|---|
| A | Cardboard box |  |
| B | Wooden box |  |
| C | Pallet |  |

*Tab. 5.22*

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## 5.2 - PHYSICAL CHARACTERISTICS OF THE EQUIPMENT

### 5.2.1 - FT 518

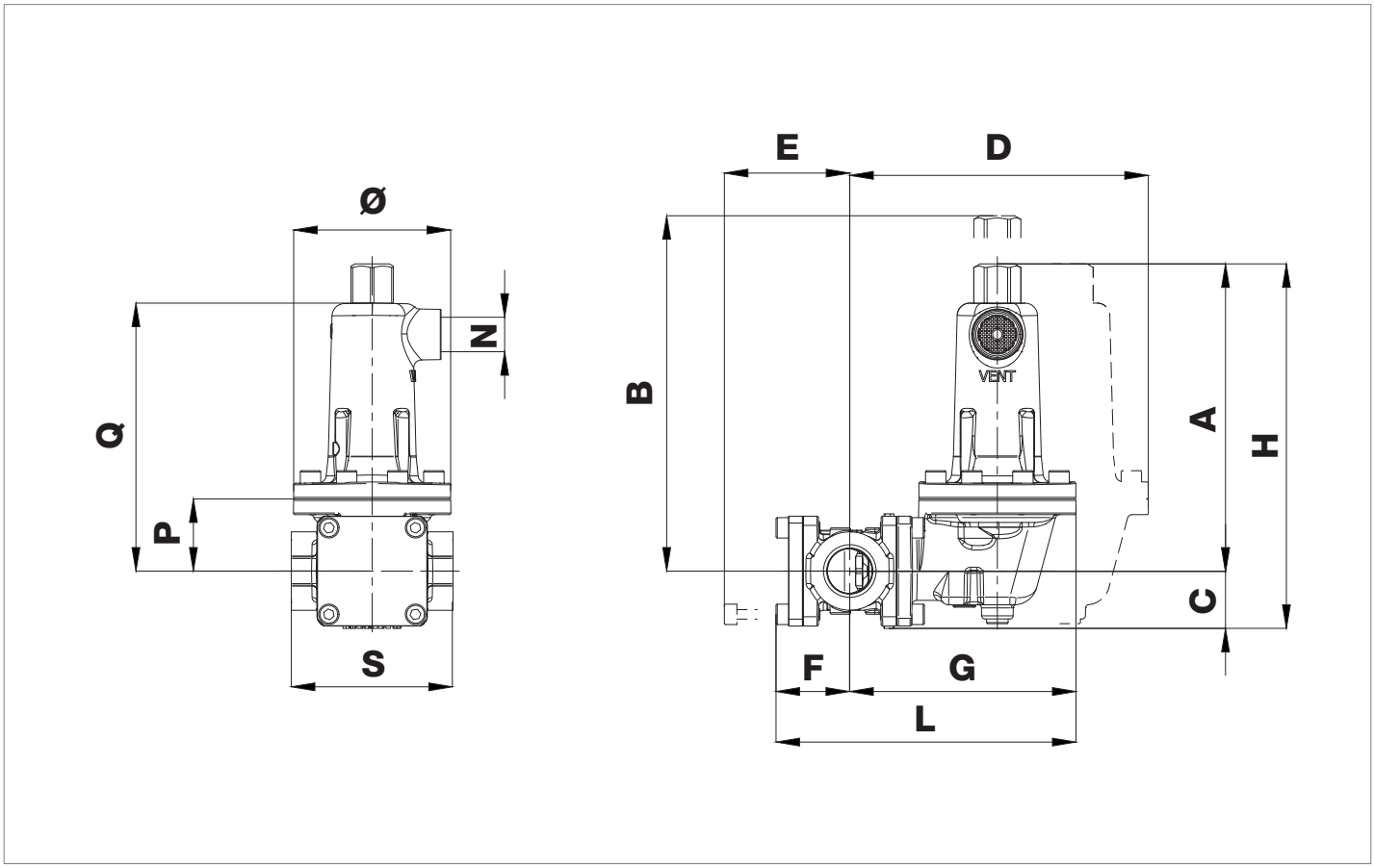



*Fig. 5.8. Physical characteristics FT 518*

| Clearances and dimensions FT 518 [inches] | |
|---|---|
| **A** | 7.7” |
| **B** | 8.4” |
| **C** | 1.4” |
| **D** | 6.38” |
| **E** | 3.46” |
| **F** | 1.85” |
| **G** | 5.65” |
| **H** | 9.1” |
| **L** | 7.5” |
| **P** | 1.8” |
| **Q** | 6.73” |
| **S** | DN 20, DN 25: 4<br>DN 50: 5.2 |
| **Ø** | 3.94” |
| **PULSE** | 1/4 NPT |
| **VENTING** | 3/4 NPT |

*Tab. 5.23*

| Weights [lbs] | |
|---|---|
| **1” NPT**<br>**3/4 NPT** | 7.7 |
| **2” NPT** | 10.1 |

*Tab. 5.24*

### 5.2.2 - FT 518 + PM/518

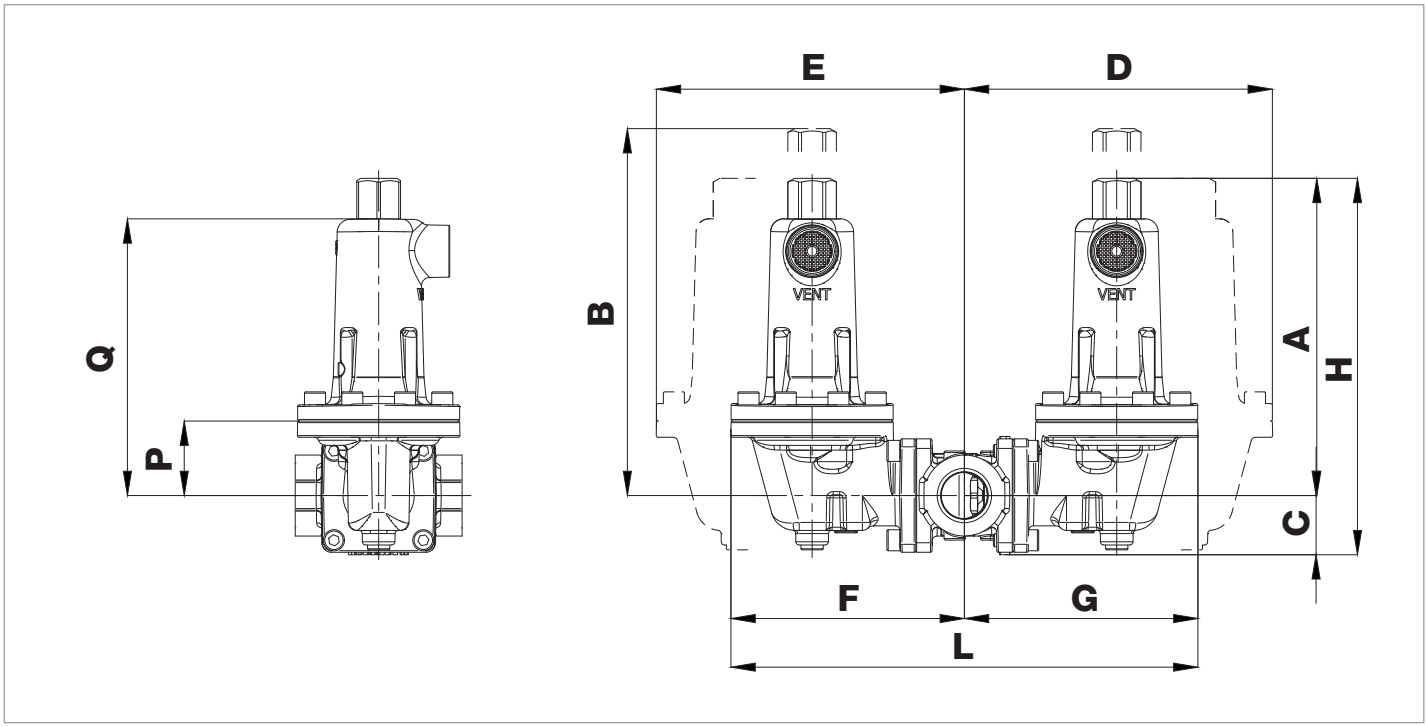



*Fig. 5.9. Physical characteristics FT 518 + PM/518*

| Clearances and dimensions FT 518 + PM/518 [inches] | |
|---|---|
| **A** | 7.7” |
| **B** | 8.4” |
| **C** | 1.4” |
| **D** | 6.38” |
| **E** | 6.38” |
| **F** | 5.65” |
| **G** | 5.65” |
| **H** | 9.1” |
| **L** | 11.3” |
| **P** | 1.8” |
| **Q** | 6.73” |
| **S** | DN 20, DN 25: 4<br>DN 50: 5.2 |
| **Ø** | 3.94” |
| **PULSE** | 1/4 NPT |
| **VENTING** | 3/4 NPT |

*Tab. 5.25*

| Weights [lbs] | |
|---|---|
| **1” NPT**<br>**3/4 NPT** | 12.12 |
| **2” NPT** | 14.5 |

*Tab. 5.26*

### 5.2.3 - FT 518 + SB/518

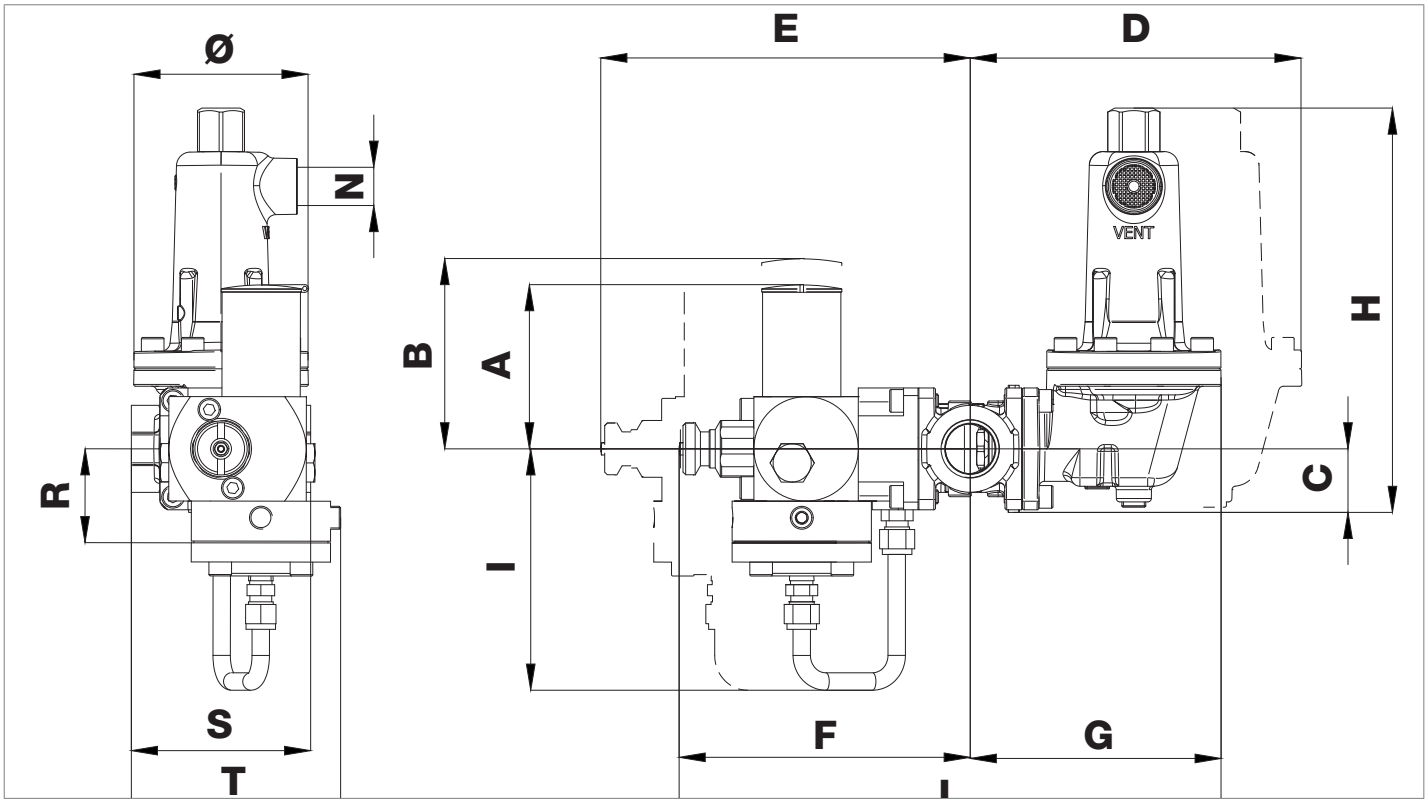



*Fig. 5.10.* *Physical characteristics FT 518 + SB/518*

| Clearances and dimensions FT 518 + SB/518 [inches] | |
|---|---|
| **A** | 3.7” |
| **B** | 4.0” |
| **C** | 1.4” |
| **D** | 6.38” |
| **E** | 7.4” |
| **F** | 6.6” |
| **G** | 5.65” |
| **H** | 9.1” |
| **L** | 6.0” |
| **P** | 12.3” |
| **Q** | 2.15” |
| **S** | DN 20, DN 25: 4<br>DN 50: 5.2 |
| **T** | 5.2” |
| **Ø** | 3.94” |
| **PULSE** | 1/4 NPT |
| **VENTING** | 3/4 NPT |

*Tab. 5.27*

| Weights [lbs] | |
|---|---|
| **1” NPT**<br>**3/4 NPT** | 16.3 |
| **2” NPT** | 18.7 |

*Tab. 5.28*

## 5.3 - METHOD FOR ANCHORING AND LIFTING THE 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.**

**⚠ WARNING**

**The unloading, transport and handling activities must be carried out by operators qualified for such operations and specially trained:**

- **on accident prevention rules;**
- **on safety in the workplace;**
- **on the use of the lifting equipment.**

**⚠ 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**

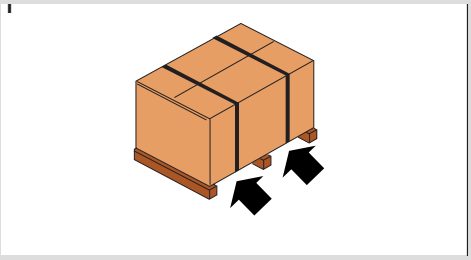
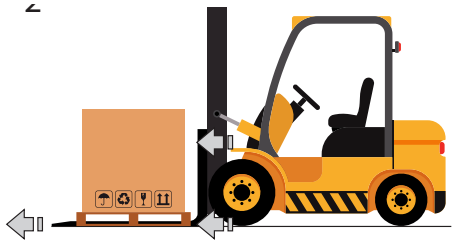
**On forklift trucks it is forbidden to:**

- **transport passengers;**
- **lift people.**

**NOTICE**

**The packaging must always be handled in an upright position.**

Proceed as described in Tab. 5.29:

| 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.<br>**NOTICE**<br>**If necessary, secure the load to the forks with clamps or similar devices.** |  |
| 4 | Slowly lift the load by a few dozens of centimeters and check its stability making sure that the center of gravity of the load is in the middle 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.<br>**⚠WARNING**<br>**If:**<br>• **encumbrances along the route;**<br>• **particular operating situations;**<br>**do not allow the operator to have a perfect view, the assistance of an operator on the ground is required, standing outside the range of action of the lifting means, with the task of signaling.** | - |
| 7 | Place the load in the chosen installation area. | - |

*Tab. 5.29*

### 5.3.2 - CRANE HANDLING METHOD

**⚠WARNING**

**It is compulsory to use chains, cables and eyebolts marked CE or marked with marks/conformity markings in accordance with the provisions in force in the place of installation. Do not use chains connected to each other by bolts.**

**Always check that:**

- **the safety catch of the hook returns to its initial position;**
- **the cables are in excellent condition with adequate cross-section.**

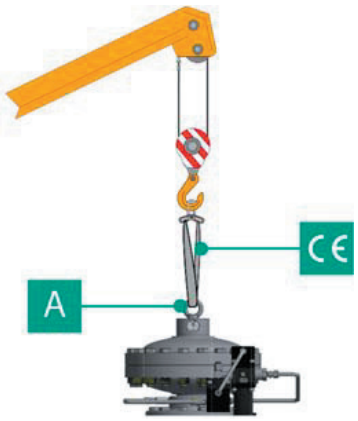
**It is forbidden to:**

- **scrape the load on the ground;**
- **operate near power lines;**
- **stand within the range of action of the crane.**

***NOTICE***

**The packaging must always be handled in an upright position.**

The handling of the equipment must be performed using the lifting points provided on the equipment itself. To carry out the transport correctly, proceed as in Tab. 5.30:

| Step | Operation | Image |
|---|---|---|
| 1 | Hook the lifting cable or chain to the appropriate supports (A).<br>**⚠WARNING**<br>**The lifting point is sized to lift only the equipment and not other parts of the plant connected to it.** |  |
| 2 | Slightly lift the load making sure that the cables or chains are tight.<br>***NOTICE***<br>**Verify that the load is properly balanced.** | |
| 3 | Move the load avoiding sudden maneuvers. | |
| 4 | Place the load in the chosen installation area. | |

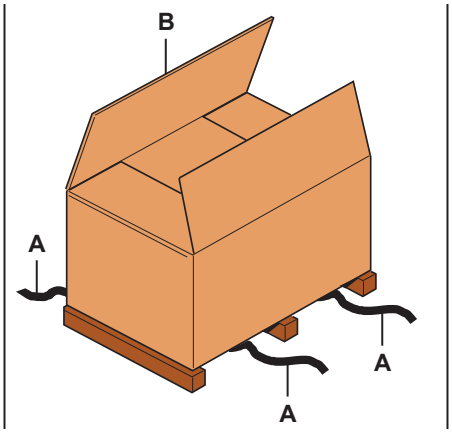
*Tab. 5.30*

## 5.4 - UNPACKING

| Packing removal | |
|---|---|
| **Operator qualification** | • Worker in charge of transport, handling, unloading its placement on site;<br>• Installer. |
| **PPE required** |  <br>**⚠WARNING**<br>**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:**<br>**• the regulations in force in the country of installation;**<br>**• any indications provided by the Safety Manager at the installation facility.** |

*Tab. 5.31*

To unpack the equipment in the cardboard box, proceed as described in Tab. 5.32:

| 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.<br>***NOTICE***<br>**To manually handle the packages, if their size/weight requires it, employ at least 2 operators.** | |

*Tab. 5.32*

***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

If the equipment is to be stored for a long period, the minimum envisaged environmental conditions are shown. Only compliance with these requirements can guarantee the declared performance:

| Conditions | Data |
|---|---|
| **Maximum storage period** | Maximum 3 years.<br>**NOTICE**<br>**For installations in subsequent periods, consult the paragraph "5.5.1 - Pre-installation warnings after prolonged storage".** |
| **Temperature** | Not higher than 25°C |
| **Humidity** | Not more than 70% |
| **Radiation** | Far from radiation sources as per UNI ISO 2230:2009 standard |

*Tab. 5.33*

### 5.5.1 - PRE-INSTALLATION WARNINGS AFTER PROLONGED STORAGE

For installations following storage periods exceeding 3 years, it is necessary to check the conditions of all rubber parts and, if these are deteriorated, replace them so as to be able to guarantee correct operation of the equipment.
To replace the rubber parts of the equipment, refer to chapter "Maintenance and functional testing".

**NOTICE**

**PIETRO FIORENTINI S.p.A. recommends checking the state of conservation of the rubber parts for periods of inactivity or storage exceeding 3 years.**

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# 6 - INSTALLATION

## 6.1 - INSTALLATION PRE-REQUISITES

### 6.1.1 - PERMISSIBLE ENVIRONMENTAL CONDITIONS

**⚠WARNING**

**For the safe use of the equipment, respecting the permitted environmental conditions, follow the data on the plate of the regulator and any accessories (refer to paragraph z).**

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.

### 6.1.2 - CHECKS BEFORE INSTALLATION

For the **allowable pressure PS** of the equipment, see Tab. 6.34 and Tab. 6.35:

| Allowable pressure (according to EN 334) | | |
|---|---|---|
| **Version** | **Regulator body** | **Built-in slam-shut valve** |
| | **psi** | **psi** |
| All versions | 1000 | 1000 |

*Tab. 6.34*

| Allowable pressure (according to EN 334) | | |
|---|---|---|
| **Reference** | **Control head** | |
| | **FT 518 LP** | **FT 518 HP** |
| | **psi** | **psi** |
| Lid | 750 | 750 |
| Diaphragm | 250 | 750 |
| Maximum differential | 200 | 650 |

*Tab. 6.35*

**⚠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 intended dimensions of the installation site are compatible with the dimensions of the equipment;
- there are no impediments to the maintenance operations of the employees;
- upstream and downstream pipes are at the same level and capable of bearing the weight of the equipment;
- the inlet and outlet connections of the pipes are aligned on the flanges;
- the input and output connections of the equipment are clean and have not been damaged;
- the inside of the upstream pipe is clean and free of processing residues such as welding slag, sand, paint residues, water, etc.

| **Installation** | |
|---|---|
| **Operator qualification** | Installer |
| **PPE required** |  <br>**⚠WARNING**<br>**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:**<br>• **the regulations in force in the country of installation;**<br>• **any indications provided by the Safety Manager at the installation facility.** |
| **Equipment required** | Refer to chapter “7 - Commissioning/maintenance equipment”. |

*Tab. 6.36*

## 6.2 - 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.**

## 6.3 - GENERAL INFORMATION ABOUT CONNECTIONS

The equipment must be installed in the line with the arrow on the body facing in the direction of gas flow.
In in-line installation as well as in square installation, the following must be present (see Fig. 6.11 and Fig. 6.12):

| Pos. | Description |
|---|---|
| 1 | 1 **shut-off valve upstream** of the equipment. |
| 2 | 2 **vent valves** placed one upstream and one downstream of the equipment. |
| 3 | 2 **pressure gauges** placed one upstream and one downstream of the equipment. |
| 4 | 1 **pressure** regulator. |
| 5 | 1 **downstream shut-off valve**. |

*Tab. 6.37*

FT 518 can have external (Fig. 6.11) or internal (Fig. 6.12) sensing line.

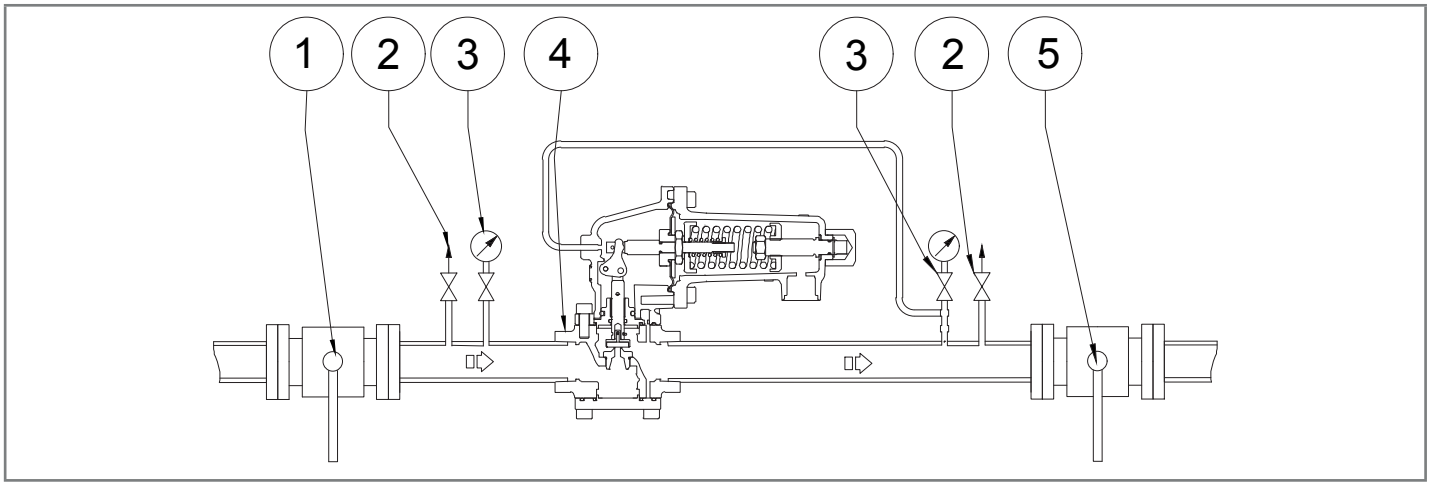



*Fig. 6.11. In-line installation, external sensing line*

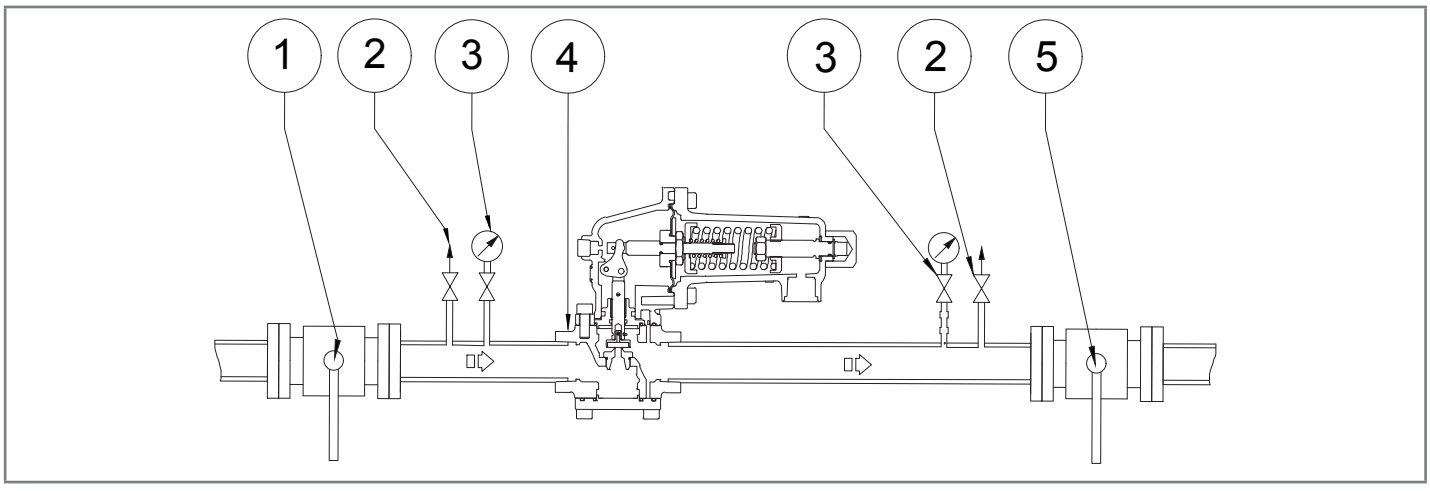


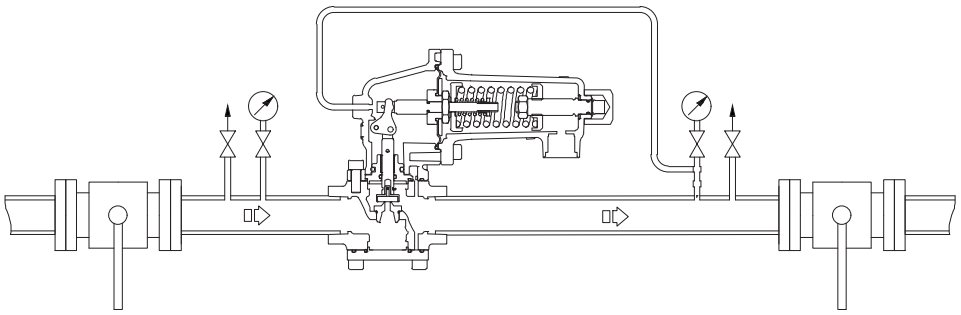
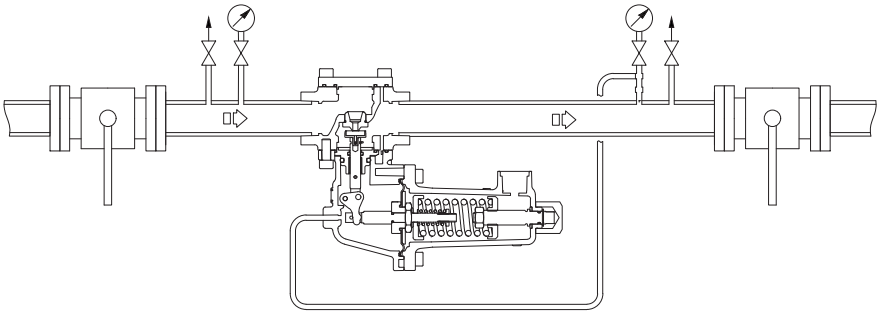
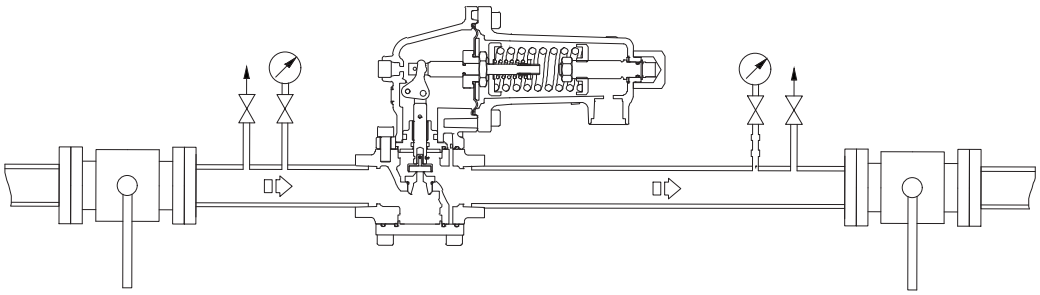
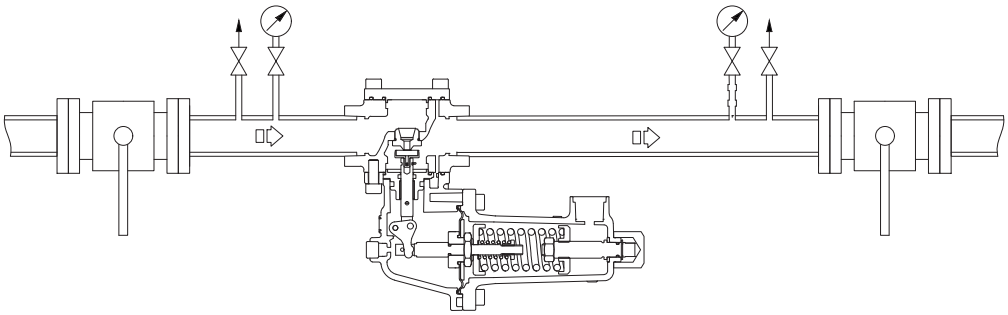

*Fig. 6.12. In-line installation, internal sensing line*

**NOTICE**

**The vents of the equipment must be channeled according to standards in force at the place of installation of the equipment.**

## 6.4 - INSTALLATION LOCATIONS OF THE REGULATOR

Tab. 6.38 illustrates the typical regulator positions:

| Sensing lines | Installation location |
|---|---|
| External sensing line standard position |  |
| External sensing line inverted position |  |
| Internal sensing line standard position |  |
| Internal sensing line inverted position |  |

*Tab. 6.38.*

## 6.5 - INSTALLATION PROCEDURES

### 6.5.1 - EQUIPMENT INSTALLATION PROCEDURE

| Step | Operation |
|---|---|
| 1 | Connect the equipment to the pipeline in the section of the line designated for it. |
| 2 | Make sure there are no external leaks. |

*Tab. 6.39*

**NOTICE**

**For installation carried out after maintenance, replace the gaskets.**

### 6.5.2 - CONNECTING THE SENSING LINES TO THE DOWNSTREAM PIPELINE

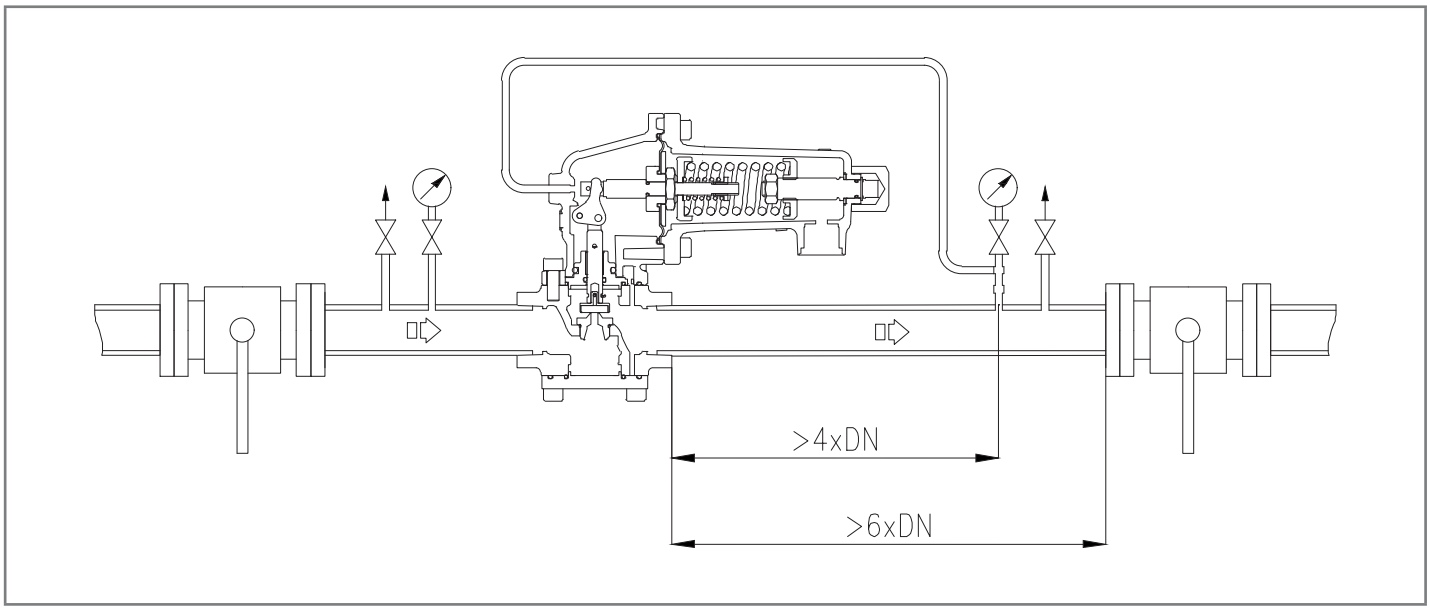



*Fig. 6.13. Connecting sensing lines to the downstream pipeline*

To obtain a good regulation it is essential that:

- the downstream shut-off valve is placed at least 6 times the nominal diameter of the tube downstream of the regulator;
- downstream sensing lines are placed on a straight section of pipe (of uniform diameter) with a length equal to at least 4 times the nominal diameter of the pipe itself;

For optimal performance, the velocity of the fluid under pressure at the setting point does not exceed the following values:

Vmax = 30 m/s for Pa < 72.52 psi
Vmax = 25 m/s for Pa < 72.52 psi

As limit of use, the velocity of the fluid under pressure at the setting point does not exceed the following values:

Vmax = 40 m/s for Pa < 72.52 psi

To calculate the flow rate use the following formula:

$$V = 0.0498\ x\ \frac{Q}{DN^2}\ x\ \frac{14.504 - 0{,}002xPd}{14.504 + Pd}$$

**V =** gas speed in ft/sec
**Q =** Scfh gas flow rate
**DN =** nominal pipe diameter in inches
**Pd =** outlet pressure of the regulator in psi

**NOTICE**

**All pneumatic connections to be made in the field must have pipes with a minimum internal diameter of 8 mm.**

To avoid the collection of impurities and condensation in the pipes of the sensing lines it is necessary that:

- pipe connections are always welded on the top or at max 90° to the axis of the pipe (refer to Fig. 6.14);
- the hole on the pipe has no burrs or internal protrusions;
- The slope of the pipeline is always 5-10% towards the connection of the downstream pipe.

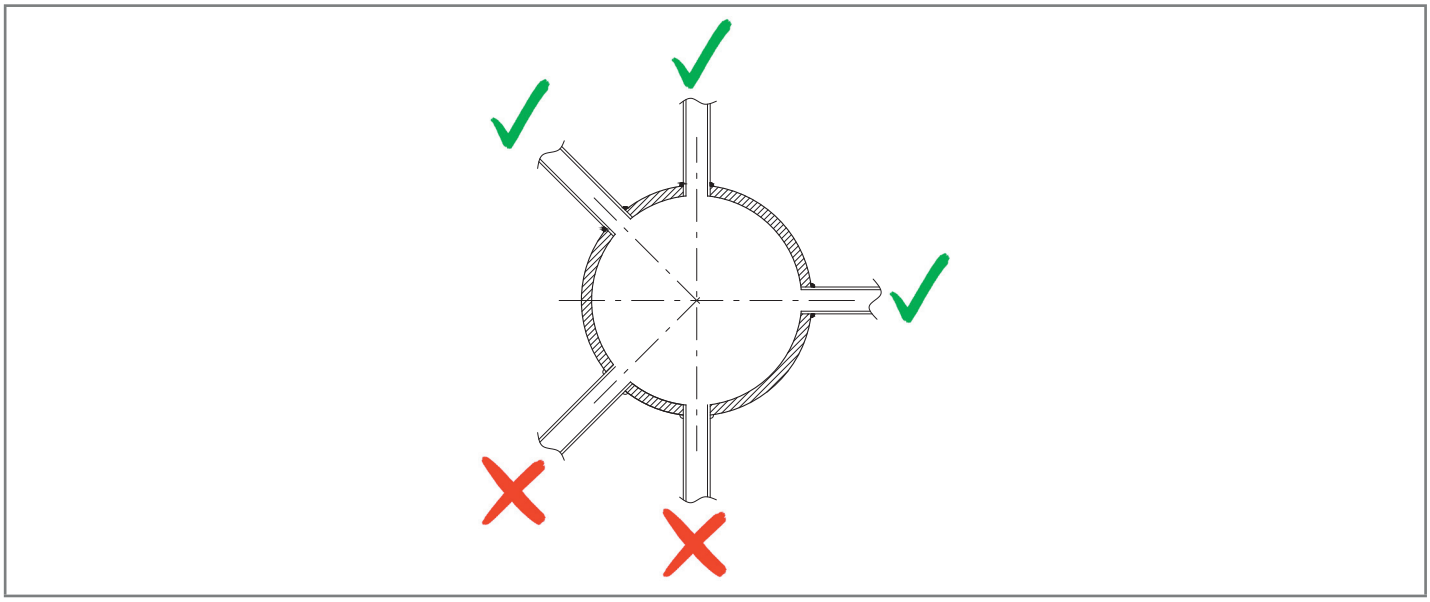


*Fig. 6.14. Welded pipe connections*

In case there is a sensing line, connect the connections of the equipment as follows:

- 1 and 2 sensing lines of the control head of the main regulator and the regulator with built-in monitor or monitor function;
- 3 and 4 free sockets;
- 5 and 6 sensing lines of the slam-shut valve when present.

**NOTICE**

**It is not recommended to interpose shut-off valves on the sensing lines in case a multiple sensing line is present.**

**In any case, follow the regulations in force at the place of installation and use of the equipment.**

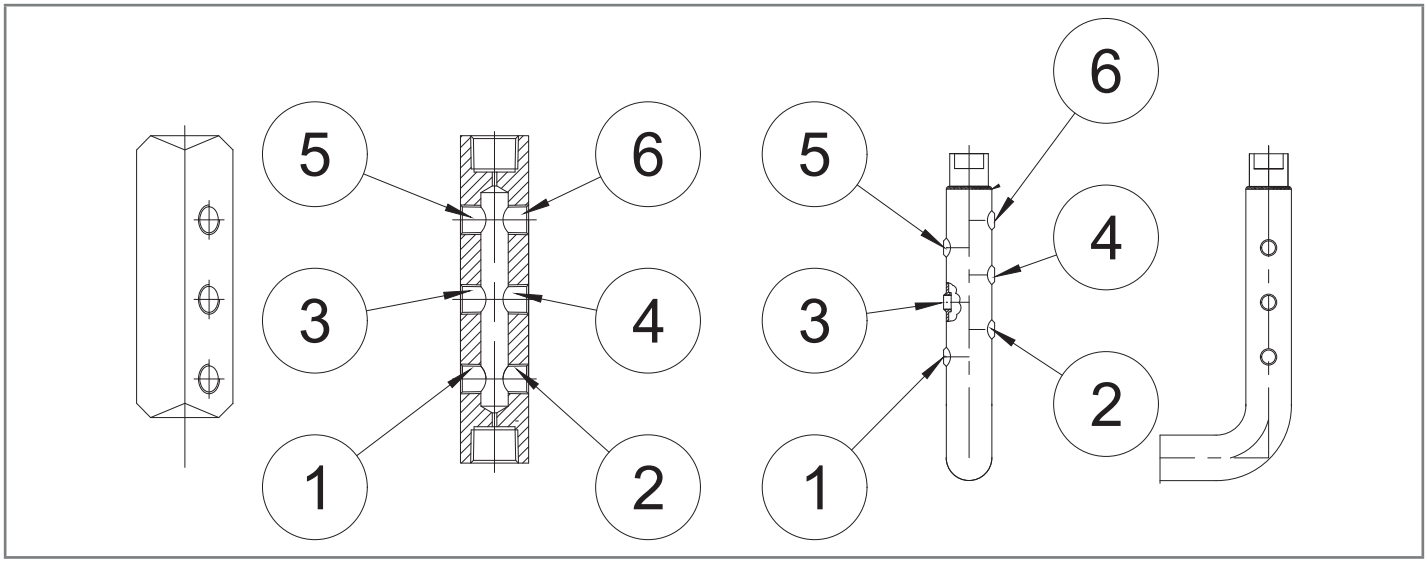



*Fig. 6.15. Equipment connections*

## 6.6 - POST-INSTALLATION AND PRE-COMMISSIONING VERIFICATION

In service you need to make sure that all connections are:

- properly secured/tightened to avoid any leakage during commissioning;
- connected correctly.

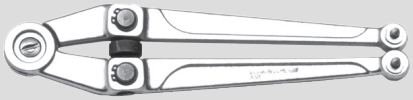
# 7 - COMMISSIONING/MAINTENANCE EQUIPMENT

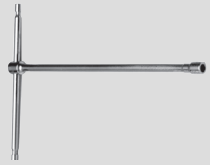
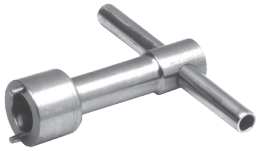
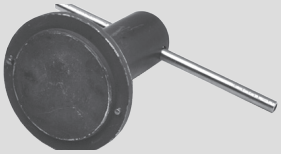
## 7.1 - EQUIPMENT LIST

| Commissioning/maintenance equipment use | |
|---|---|
| **Operator qualification** | • Mechanical maintenance technician;<br>• Electrical maintenance technician;<br>• Installer;<br>• User technician. |
| **PPE required** |  <br>**⚠WARNING**<br>**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:**<br>• **the regulations in force in the country of installation;**<br>• **any indications provided by the Safety Manager at the installation facility.** |

*Tab. 7.40*

Tab. 7.41 shows the types of equipment needed to commission and service the equipment:

| Ref. | Type of equipment | Image |
|---|---|---|
| **A** | Combination wrench |  |
| **B** | Adjustable roller wrench |  |
| **C** | Needle roller compass wrench |  |
| **D** | Double polygonal socket wrench |  |
| **E** | Hexagonal male bent wrench |  |
| **F** | Hexagonal male "T" wrench |  |

| Ref. | Type of equipment | Image |
|---|---|---|
| **G** | Hexagonal socket "T" wrench |  |
| **H** | Phillips screwdriver |  |
| **I** | Slotted screwdriver |  |
| **L** | O-ring extraction tool |  |
| **M** | Ring pliers |  |
| **N** | Fiorentini special key |  |
| **O** | Fiorentini special key |  |
| **P** | Fiorentini special tool |  |

*Tab. 7.41*

## 7.2 - EQUIPMENT NEEDED FOR THE DIFFERENT CONFIGURATIONS

Each table is distinguished by:

| Term | Description |
|---|---|
| **Ch.** | Key, referring to the equipment shown in Tab. 7.41. |
| **Code** | Code, referring to equipment. |
| **DN** | Nominal diameter of the reference configuration. |
| **L.** | Length, referring to equipment. |
| **Ref.** | Equipment reference. |
| **Type** | Type (size) or code of equipment. |

*Tab. 7.42.*

| FT 518 | | | | |
|---|---|---|---|---|
| **Equipment** | | **Size [inches]** | | |
| **Ref.** | **Type** | **3/4”** | **1”** | **2”** |
| **A** | Ch. | 17-19-24 | 17-19-24 | 17-19-24 |
| **D** | Ch. | 22 | 22 | 22 |
| **E** | Ch. | 6 - 1/4” | 6 - 1/4” | 6 - 1/4” |
| **F** | Ch. | 6 - 1/4” | 6 - 1/4” | 6 - 1/4” |
| **G** | Ch. | 8-11-15-22-24 | 8-11-15-22-24 | 8-11-15-22-24 |

*Tab. 7.43*

| FT 518 + PM/518 | | | | |
|---|---|---|---|---|
| **Equipment** | | **Size [inches]** | | |
| **Ref.** | **Type** | **3/4”** | **1”** | **2”** |
| **A** | Ch. | 17-19-24 | 17-19-24 | 17-19-24 |
| **D** | Ch. | 22 | 22 | 22 |
| **E** | Ch. | 6 - 1/4” | 6 - 1/4” | 6 - 1/4” |
| **F** | Ch. | 6 - 1/4” | 6 - 1/4” | 6 - 1/4” |
| **G** | Ch. | 8-11-15-22-24 | 8-11-15-22-24 | 8-11-15-22-24 |

*Tab. 7.44*

| FT 518 + SB/518 | | | | |
|---|---|---|---|---|
| **Equipment** | | **Size [inches]** | | |
| **Ref.** | **Type** | **3/4”** | **1”** | **2”** |
| **A** | Ch. | 17-19-24 | 17-19-24 | 17-19-24 |
| **D** | Ch. | 22-27 | 22-27 | 22-27 |
| **E** | Ch. | 3-4-6-8 - 1/4” | 3-4-6-8 - 1/4” | 3-4-6-8 - 1/4” |
| **F** | Ch. | 3-4-6-8 - 1/4” | 3-4-6-8 - 1/4” | 3-4-6-8 - 1/4” |
| **G** | Ch. | 8-11-15-22-24-27 | 8-11-15-22-24-27 | 8-11-15-22-24-27 |

*Tab. 7.45*

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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.**
**The interdiction area must be marked with signs and/or boundaries.**

***NOTICE***

**Commissioning must be carried out by authorized and licensed personnel.**

The equipment is delivered already calibrated.
Even if the built-in monitor PM/518 or the built-in slam-shut valve SB/518 are mounted on the equipment, they will already be calibrated.

***NOTICE***

**It is possible that for various reasons (e.g., vibration during transport) the calibration of equipment accessories may vary, while remaining within the values indicated on the identification plates.**

Before commissioning the equipment, it is necessary to verify that:
- All shut-off valves (inlet, outlet, bypass if any) are closed;
- the gas is at a temperature within the limits indicated on the nameplate.

| Commissioning | |
|---|---|
| **Operator qualification** | • Installer;<br>• Licensed technician. |
| **PPE required** |  <br>**⚠WARNING**<br>**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:**<br>• **the regulations in force in the country of installation;**<br>• **any indications provided by the Safety Manager at the installation facility.** |
| **Equipment required** | Refer to chapter “7 - Commissioning/maintenance equipment”. |

*Tab. 8.46*

## 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.**

**⚠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.**

Commissioning can be performed by following two different procedures:

| Types of commissioning | |
|---|---|
| **Insertion of an inert fluid** | Pressurizing the equipment by inserting an inert fluid (e.g., nitrogen) to avoid potentially explosive mixtures for services with combustible gases.<br>**⚠WARNING**<br>**During the pressurization phase, always check the equipment for leaks.** |
| **Direct insertion** | Direct insertion of the gas into the pipes by keeping the gas velocity within the pipes as limited as possible (maximum allowable value of 5 m/s). |

*Tab. 8.47*

## 8.3 - VERIFICATION OF PROPER COMMISSIONING

Completely sprinkle the equipment with a foaming solution (or equivalent control system) in order to verify the tightness of the external surfaces of the regulator and connections made during installation.

## 8.4 - CALIBRATION OF ACCESSORIES PRESENT

***NOTICE***

**To perform proper calibration of the equipment and the accessories present, refer to the accuracy class shown on the identification plates (see section 2.8).**

## 8.5 - REGULATOR COMMISSIONING PROCEDURE

In the application consisting of several pressure control lines, it is recommended to commission one line at a time starting with the one with the lowest set-point.
The set-point value is recalled on the test certificate attached to each piece of equipment.

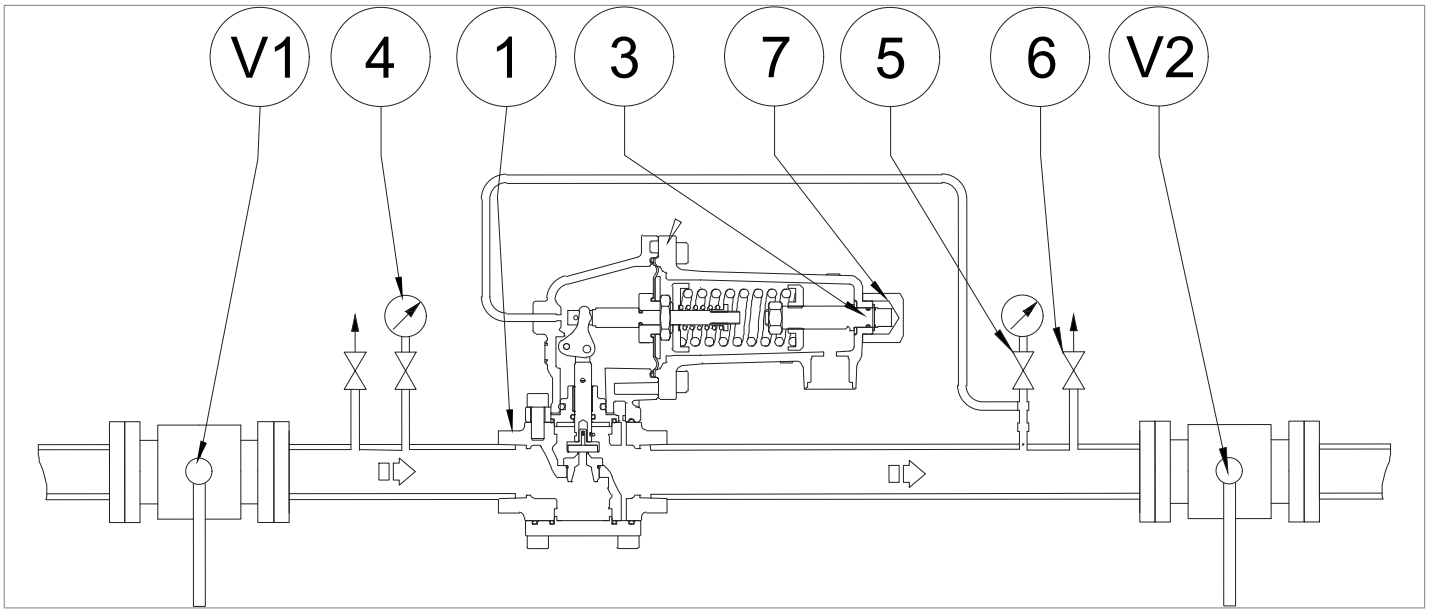



*Fig. 8.16. Commissioning of the regulator with external sensing line*

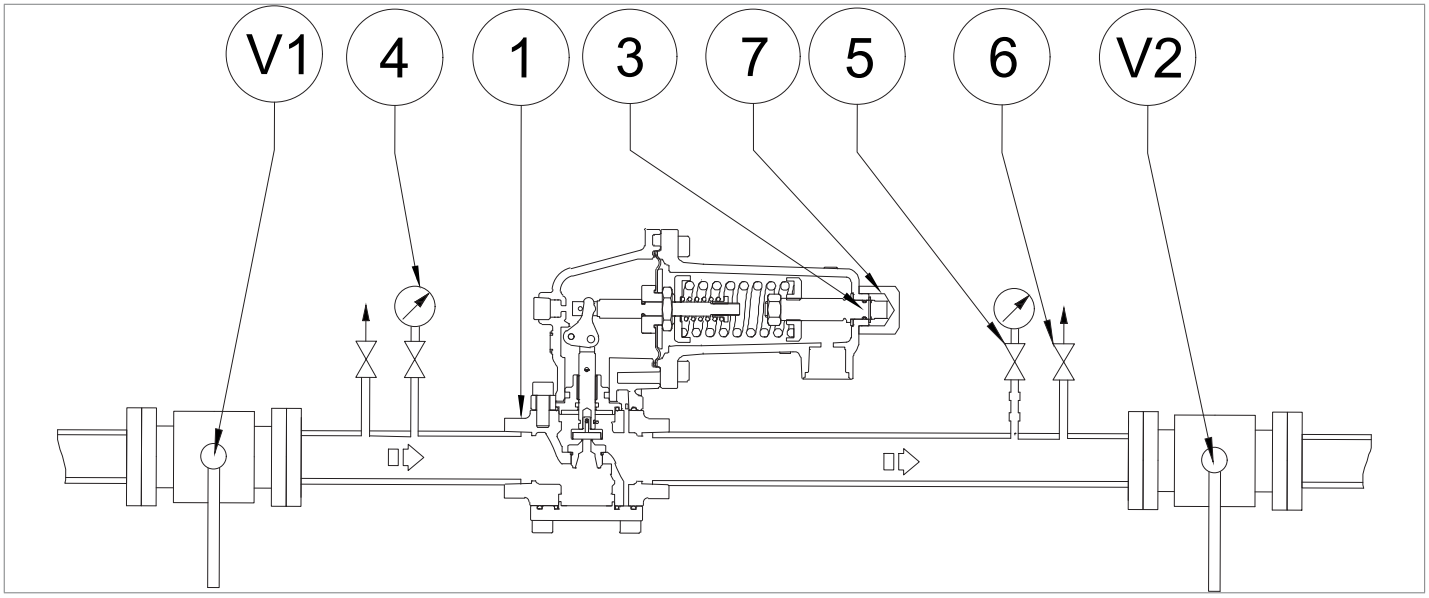



*Fig. 8.17. Commissioning of regulator with internal sensing line*

| Step | Operation |
|---|---|
| 1 | Remove the cap (7) from the regulator (1). |
| 2 | Partially open the drain cock (6). |
| 3 | Very slowly open the upstream shut-off valve (V1).<br>**NOTICE**<br>**Check the pressure by referring to the pressure gauge (4) located upstream.** |
| 4 | Check the pressure of the line inlet pipe by referring to the upstream pressure gauge (4). |
| 5 | To calibrate the regulator (1) to the required calibration value, turn the adjusting screw (3):<br>• clockwise to increase the pressure value<br>• counterclockwise to decrease the pressure value<br>**NOTICE**<br>**Check the pressure by referring to the pressure gauge (5) located downstream.** |
| 6 | Close the drain cock (6). |
| 7 | Check that the downstream pressure (Pd), after an increment phase, does not exceed the closing pressure value:<br>• HP header: up to SG 20<br>• LP header: up to SG 30<br>**NOTICE**<br>**If the downstream pressure exceeds the shutdown pressure value, refer to Chapter 9 "Trouble-shooting" to remove the causes of malfunctions.** |
| 8 | Check with a foaming substance the tightness of all joints located between the shut-off valves (V1, V2). |
| 9 | Insert the cap (7) into the regulator (1). |
| 10 | Very slowly open the downstream shut-off valve (V2) until the pipeline is completely flooded.<br>**NOTICE**<br>• **If the pressure of the downstream pipeline is lower than the calibration pressure, partialize the opening of the downstream shut-off valve (V2) so as not to exceed the value of the maximum flow rate of the system.**<br>• **Check the pressure by referring to the downstream pressure gauge (5).** |

*Tab. 8.48.*

## 8.6 - COMMISSIONING PROCEDURE OF THE REGULATOR AND THE REGULATOR WITH IN-LINE MONITOR FUNCTION

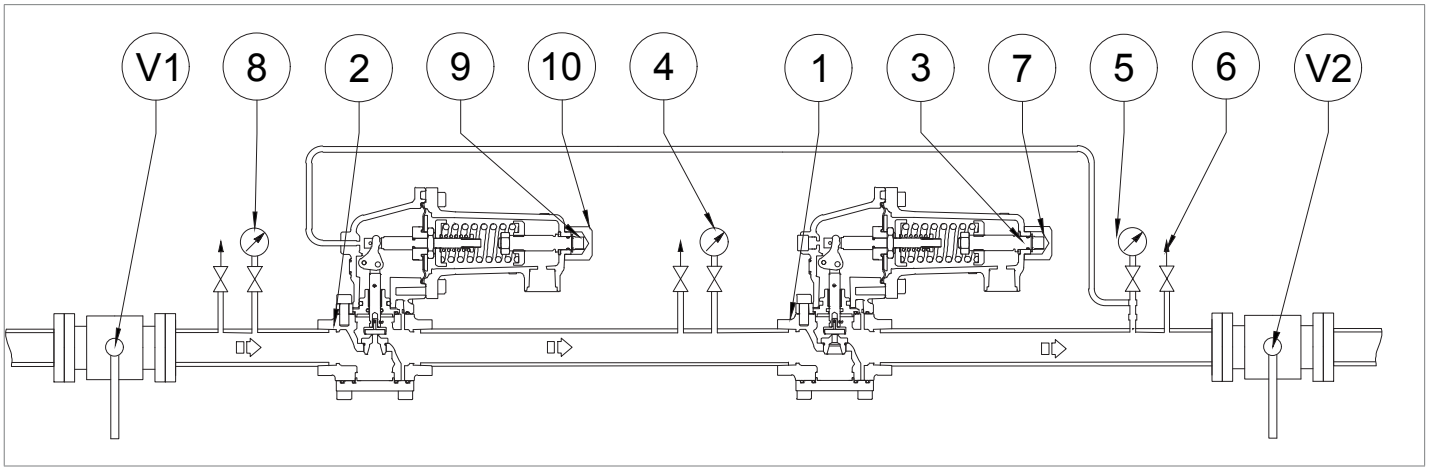



*Fig. 8.18. Commissioning of in-line regulator and monitor with external sensing line*

| Step | Operation |
|---|---|
| 1 | Remove the cap (7) from the main regulator (1). |
| 2 | To calibrate the main regulator (1), turn the adjusting screw (3):<br>• clockwise to increase the pressure value<br>• counterclockwise to decrease the pressure value<br>**NOTICE**<br>**Check that the calibration value of the main regulator (1) is higher than the calibration value of the in-line monitor (2), referring to the pressure gauge (5) located downstream.** |
| 3 | Remove the cap (10) from the regulator in inline monitor function (2). |
| 4 | Partially open the drain cock (6). |
| 5 | Very slowly open the upstream shut-off valve (V1), checking that the downstream pressure (Pd) indicated by the downstream pressure gauge (5) does not exceed the required setting value by more than 50%. |
| 6 | Check the pressure of the line inlet pipe by referring to the upstream pressure gauge (8). |
| 7 | To calibrate the regulator with in-line monitor function (2) to the required calibration value, turn the adjusting screw (9):<br>• clockwise to increase the pressure value<br>• counterclockwise to decrease the pressure value<br>**NOTICE**<br>**Check the pressure by referring to the pressure gauge (5) located downstream.** |
| 8 | Close the drain cock (6). |
| 9 | Check that the downstream pressure (Pd), after an increment phase, does not exceed the closing pressure value:<br>• HP header: up to SG 20<br>• LP header: up to SG 30 |
| 10 | Partially open the drain cock (6). |

| Step | Operation |
|---|---|
| 11 | To calibrate the main regulator (1) to the required calibration value, turn the adjusting screw (3):<br>• clockwise to increase the pressure value<br>• counterclockwise to decrease the pressure value<br>**NOTICE**<br>**Check the pressure by referring to the pressure gauge (5) located downstream.** |
| 12 | Verify that the regulator with in-line monitor function (2) is fully open (100%).<br>**NOTICE**<br>**The main regulator (1) is fully open, when the pressure indicated on the intermediate pressure gauge (4) is the same as the upstream pressure gauge (8).** |
| 13 | Close the drain cock (6). |
| 14 | Check that the downstream pressure (Pd), after an increment phase, does not exceed the closing pressure value:<br>• HP header: up to SG 20<br>• LP header: up to SG 30 |
| 15 | Insert the cap (10) into the regulator in monitor function (2). |
| 16 | Check with a foaming substance the tightness of all joints located between the shut-off valves (V1, V2). |
| 17 | Insert the cap (7) into the main regulator (1). |
| 18 | Slowly open downstream shut-off valve (V2) until the pipeline is completely flooded.<br>**NOTICE**<br>• **If the pressure of the downstream pipeline is lower than the calibration pressure, partialize the opening of the downstream shut-off valve (V2) so as not to exceed the value of the maximum flow rate of the system.**<br>• **Check the pressure by referring to the downstream pressure gauge (5).** |

*Tab. 8.49.*

## 8.7 - COMMISSIONING PROCEDURE OF THE REGULATOR WITH BUILT-IN MONITOR

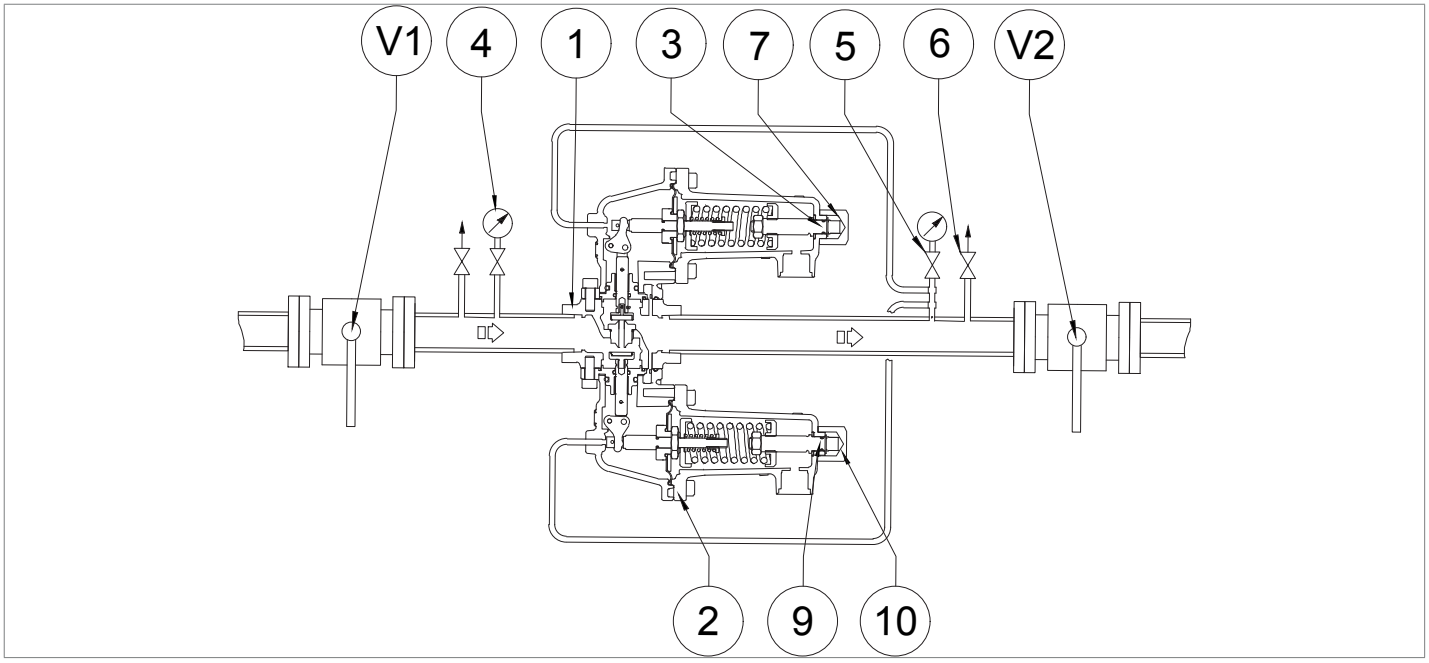



*Fig. 8.19. Built-in regulator and monitor with external sensing line*

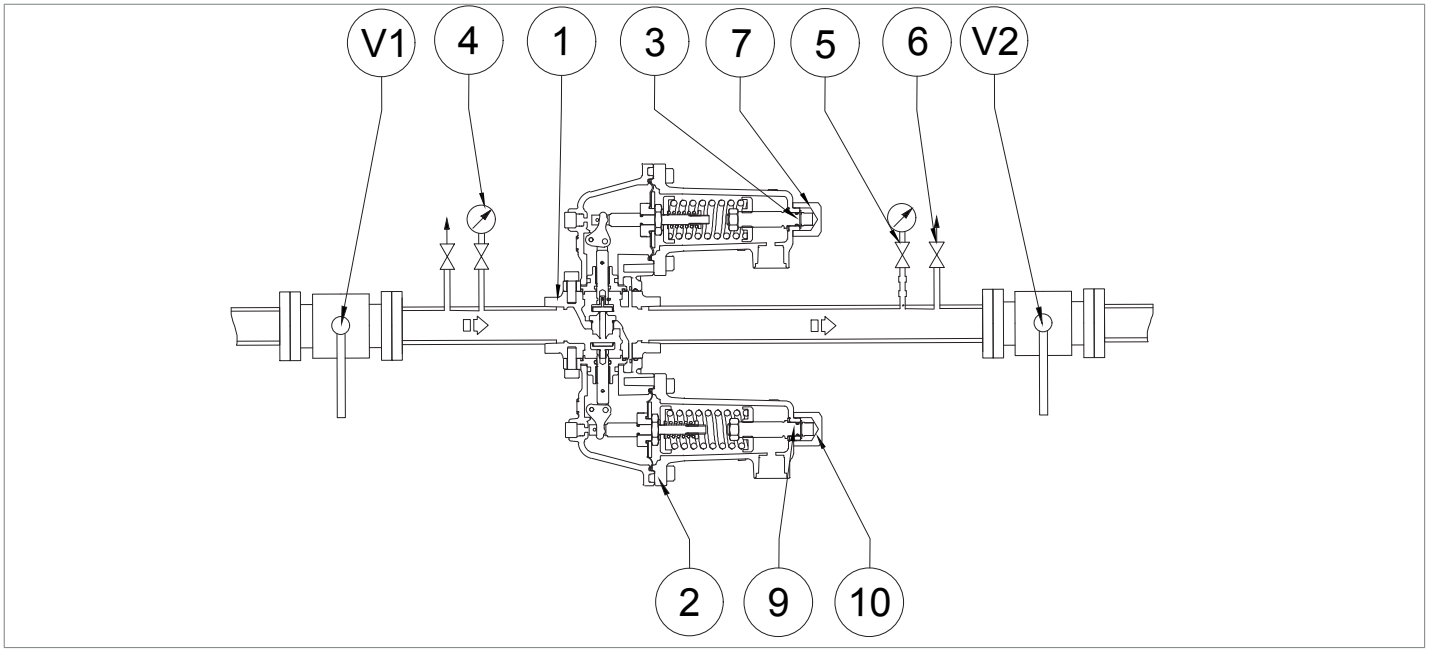



*Fig. 8.20. Built-in regulator and monitor with internal sensing line*

| Step | Operation |
|---|---|
| 1 | Remove the cap (7) from the main regulator (1). |
| 2 | To calibrate the main regulator (1), turn the adjusting screw (3):<br>• clockwise to increase the pressure value<br>• counterclockwise to decrease the pressure value<br>**NOTICE**<br>**Check that the calibration value of the main regulator (1) is higher than the calibration value of the in-line monitor PM/518 (2), referring to the pressure gauge (5) located downstream.** |
| 3 | Remove the cap (10) from the built-in monitor PM/518 (2). |
| 4 | Partially open the drain cock (6). |
| 5 | Very slowly open the upstream shut-off valve (V1), checking that the downstream pressure (Pd) indicated by the downstream pressure gauge (5) does not exceed the required setting value by more than 50%. |
| 6 | Check the pressure of the line inlet pipe by referring to the upstream pressure gauge (4). |
| 7 | To calibrate the built-in monitor PM/518 (2) to the required calibration value, turn the adjustment screw (9):<br>• clockwise to increase the pressure value<br>• counterclockwise to decrease the pressure value<br>**NOTICE**<br>**Check the pressure by referring to the pressure gauge (5) located downstream.** |
| 8 | Close the drain cock (6). |
| 9 | Check that the downstream pressure (Pd), after an increment phase, does not exceed the closing pressure value of the built-in monitor PM/518 (2):<br>• HP header: up to SG 20<br>• LP header: up to SG 30 |
| 10 | Partially open the drain cock (6). |
| 11 | To calibrate the main regulator (1) to the required calibration value, turn the adjusting screw (3):<br>• clockwise to increase the pressure value<br>• counterclockwise to decrease the pressure value<br>**NOTICE**<br>**Check the pressure by referring to the pressure gauge (5) located downstream.** |
| 12 | Close the drain cock (6). |
| 13 | Check that the downstream pressure (Pd), after an increment phase, does not exceed the closing pressure value of the main regulator (1):<br>• HP header: up to SG 20<br>• LP header: up to SG 30 |
| 14 | Insert the cap (10) into the built-in PM/518 monitor (2). |

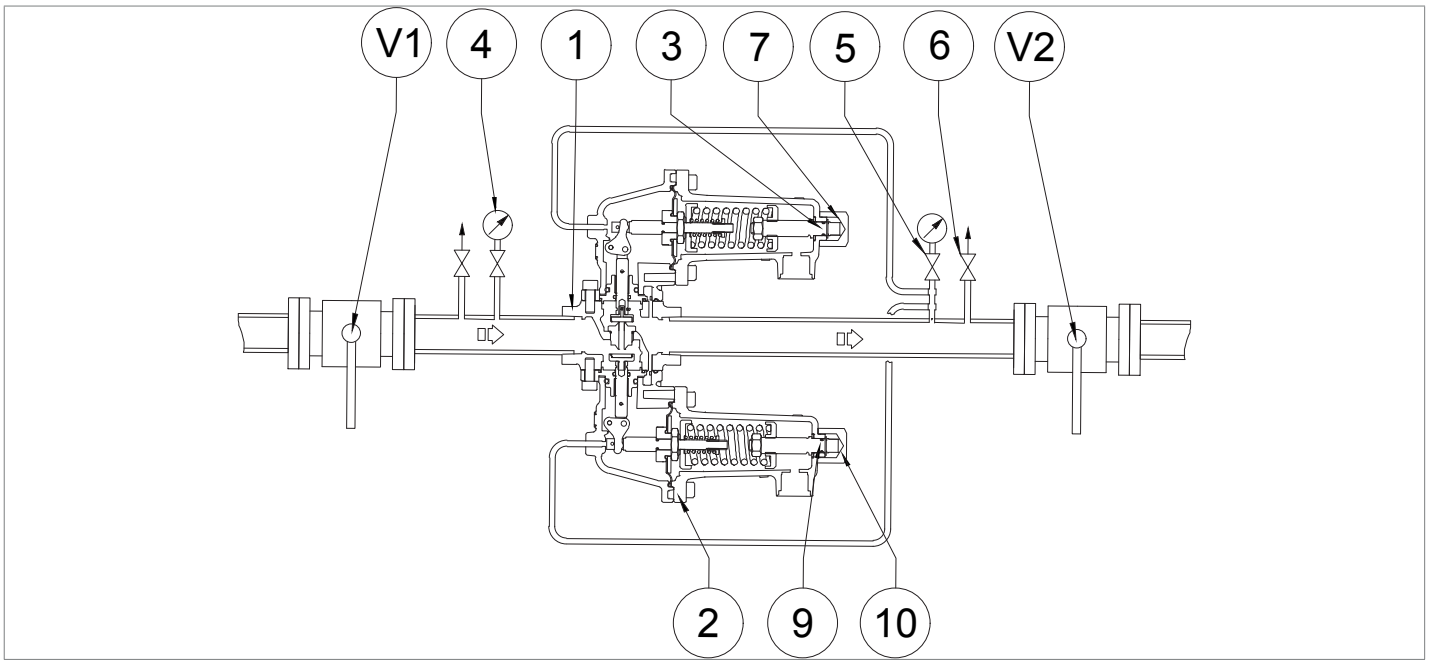



*Fig. 8.19* *Built-in regulator and monitor with external sensing line*

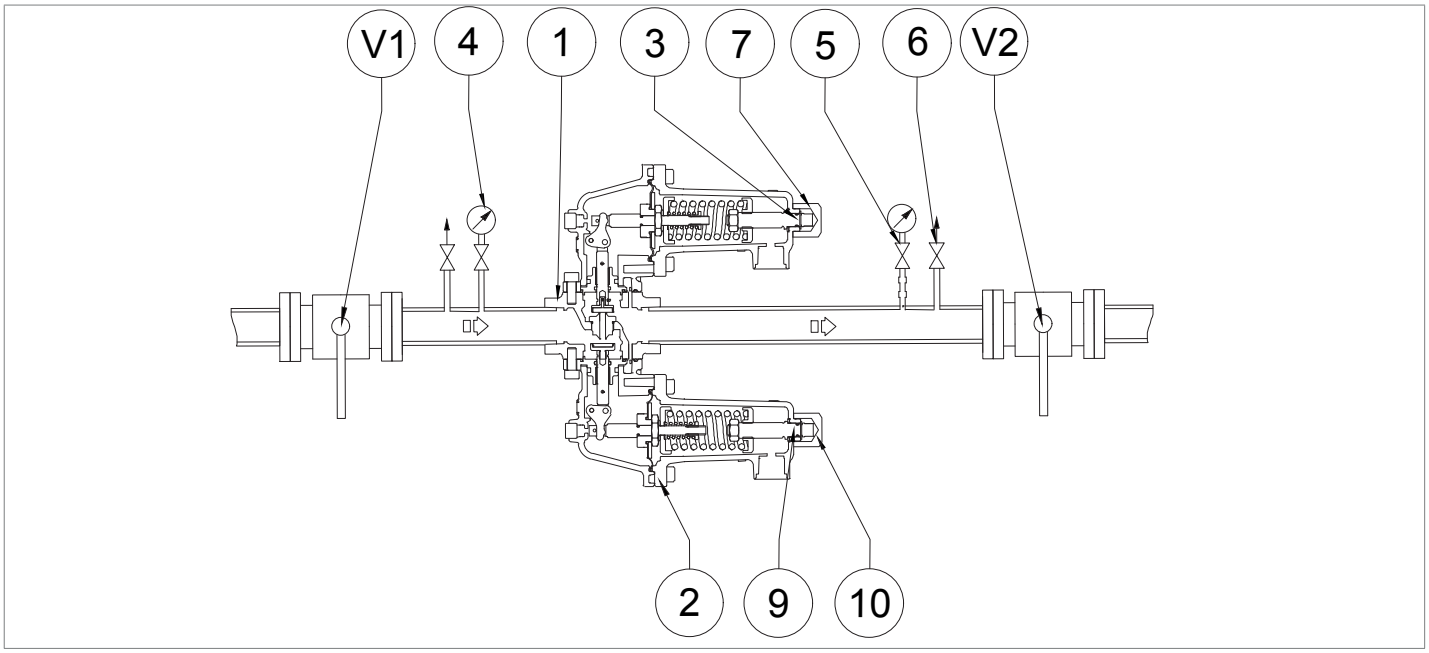



*Fig. 8.20* *Built-in regulator and monitor with internal sensing line*

| Step | Operation |
|---|---|
| 15 | Check with a foaming substance the tightness of all joints located between the shut-off valves (V1, V2). |
| 16 | Insert the cap (7) into the main regulator (1). |
| 17 | Slowly open downstream shut-off valve (V2) until the pipeline is completely flooded.<br>**NOTICE**<br>• **If the pressure of the downstream pipeline is lower than the calibration pressure, partialize the opening of the downstream shut-off valve (V2) so as not to exceed the value of the maximum flow rate of the system.**<br>• **Check the pressure by referring to the downstream pressure gauge (5).** |

*Tab. 8.50.*

## 8.8 - PRESSURIZATION WITH EXTERNAL SOURCE

For lines where the slam-shut valve (2) is installed, it is possible to pressurize the chamber (A) of the main regulator head (1) using an external source.

Pressurization can occur:

- with external lines;
- manually.

The pressure input is monitored using pressure gauges or transducers.
For proper discharge of the pressure input, ensure the presence of an additional drain cock (3).

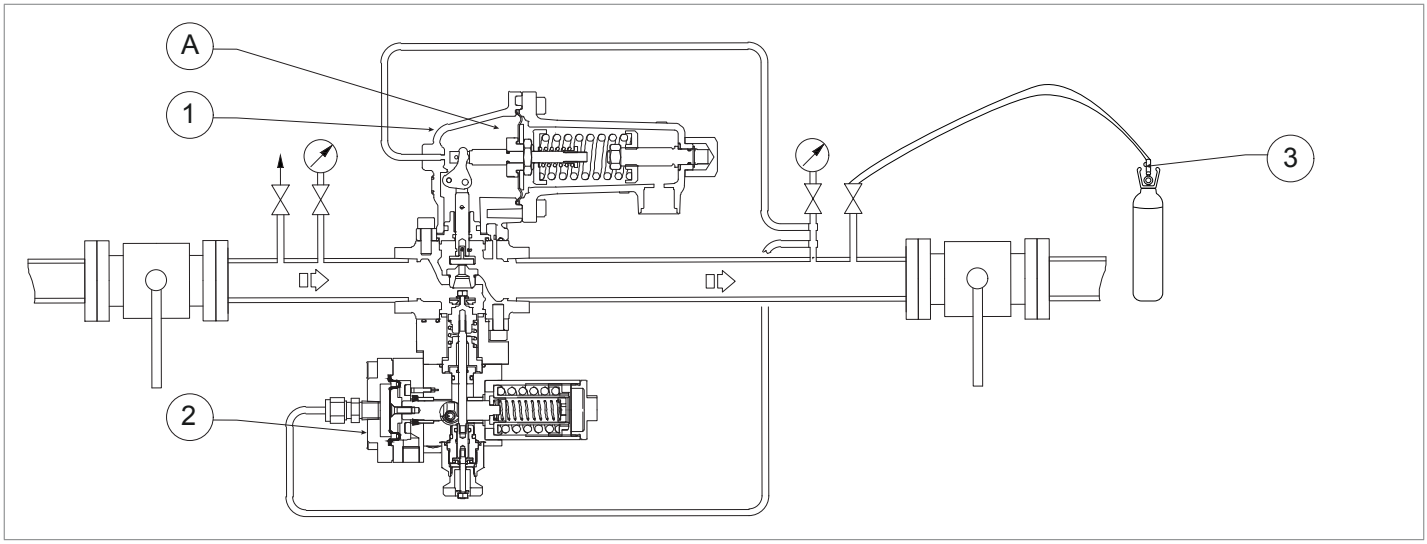



*Fig. 8.21. Pressurization with external source*

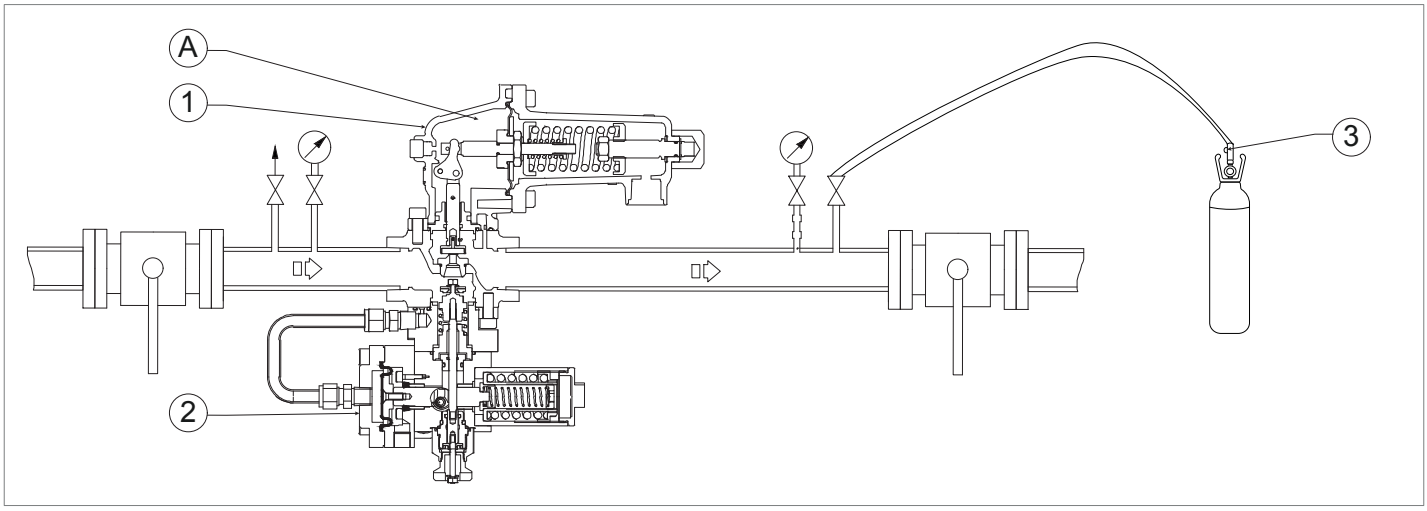



*Fig. 8.22. Pressurization with external source*

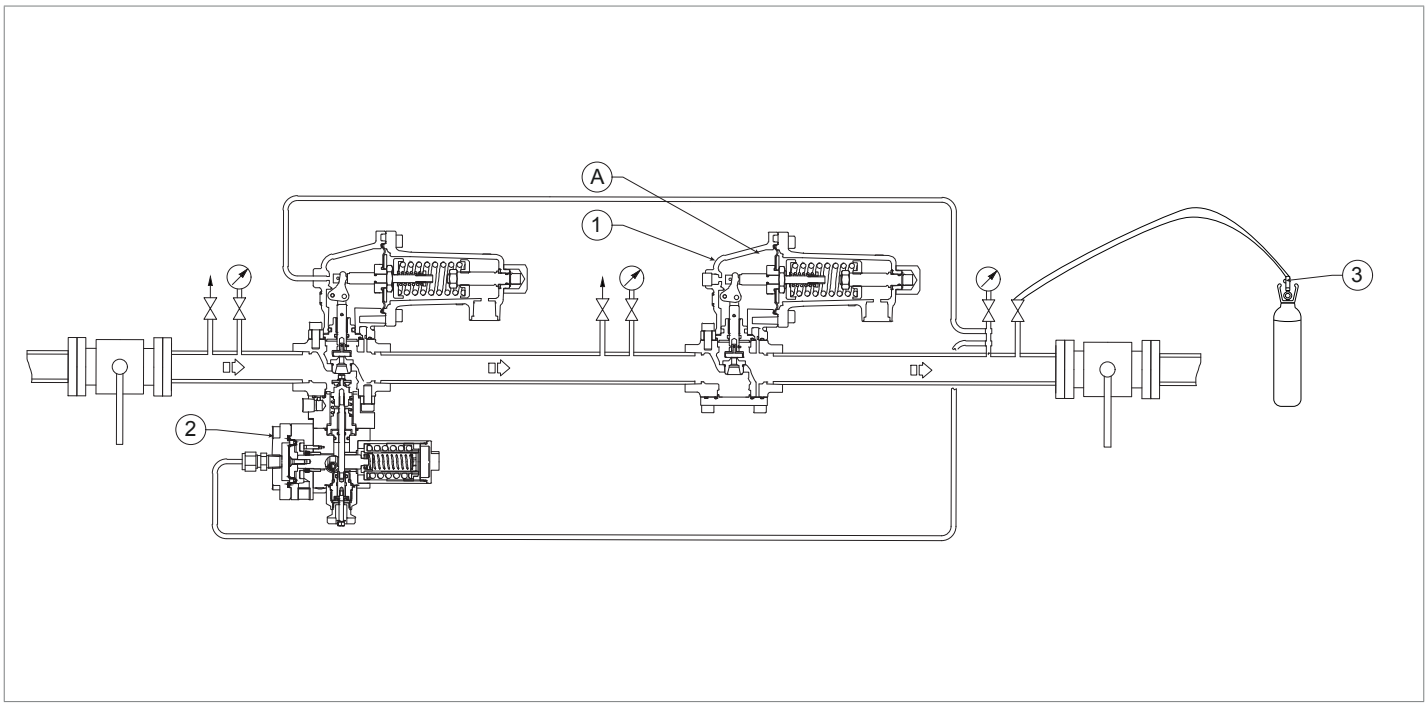



*Fig. 8.23.* *Pressurization with external source*

## 8.9 - COMMISSIONING PROCEDURE OF THE REGULATOR AND BUILT-IN SLAM-SHUT VALVE

### 8.9.1 - LEAK TEST OF THE BUILT-IN SLAM-SHUT VALVE

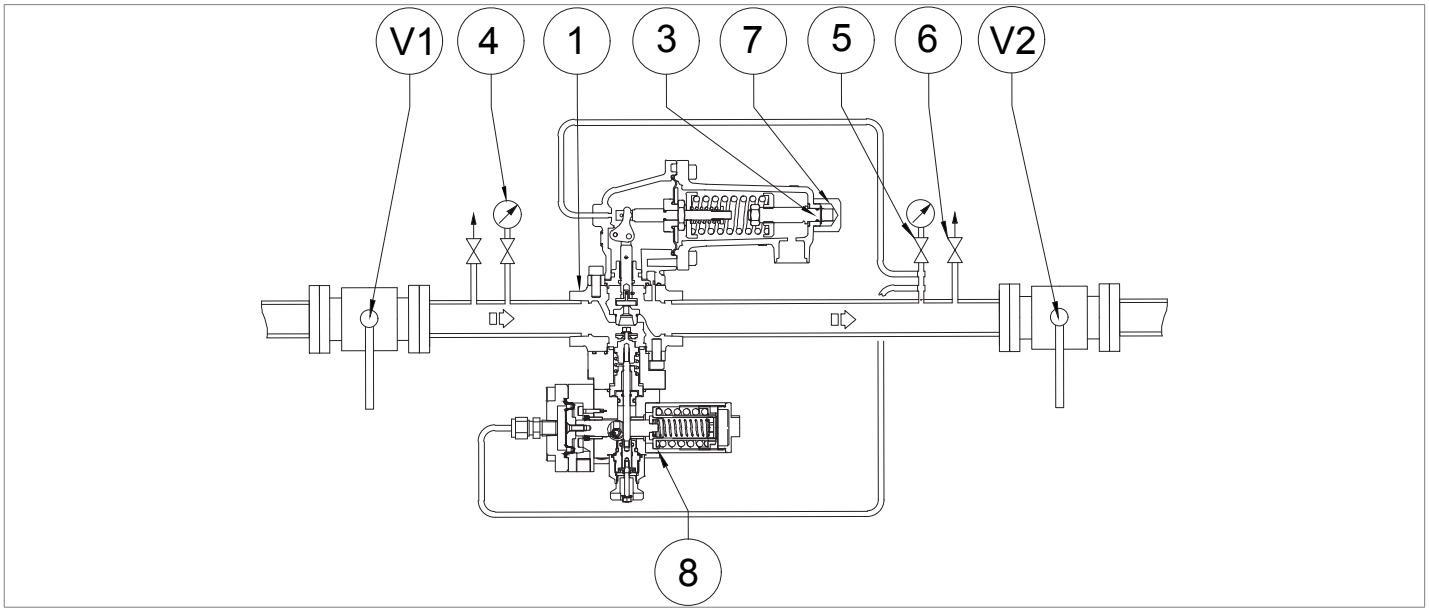



*Fig. 8.24. Built-in regulator and slam-shut valve with external sensing line*

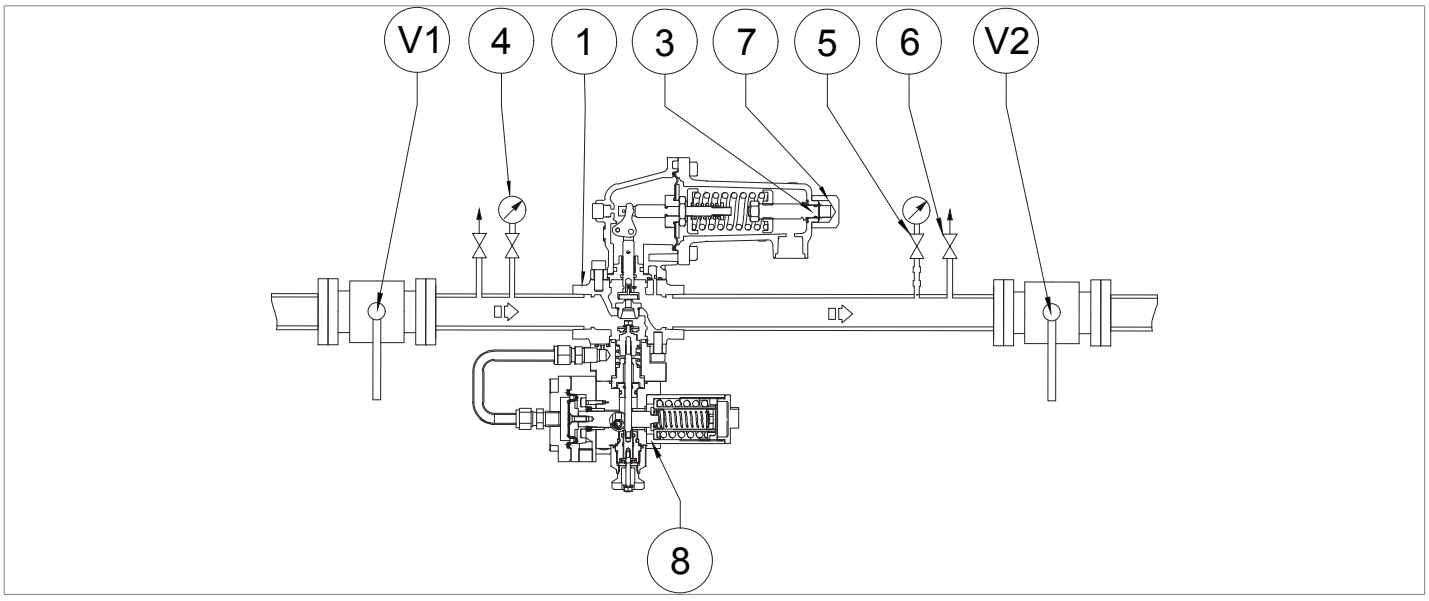



*Fig. 8.25. Built-in regulator and slam-shut valve with internal sensing line*

| Step | Operation |
|---|---|
| 1 | Check that the slam-shut valve is in the closed position. |
| 2 | Open the drain cock (6) to completely drain the downstream section. |
| 3 | Slowly open the upstream shut-off valve (V1). |
| 4 | Check the internal seal of the slam-shut valve through the drain valve (6).<br>**NOTICE**<br>• **Check the seal with a foaming substance;**<br>• **In case of leakage, refer to chapter 10 "Fault finding and troubleshooting" to remove the causes of malfunctions.** |

*Tab. 8.51.*

### 8.9.2 - COMMISSIONING OF THE REGULATOR AND BUILT-IN SLAM-SHUT VALVE

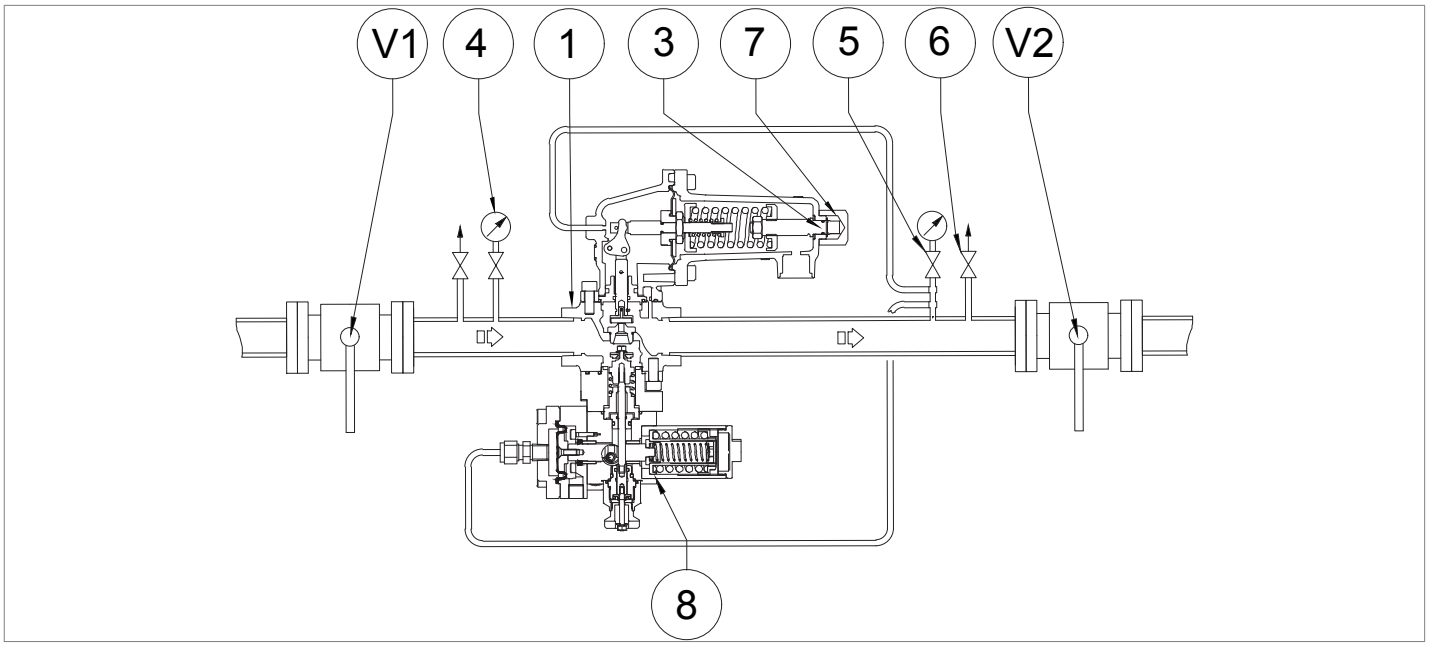



*Fig. 8.26.* *Built-in regulator and slam-shut valve with external sensing line*

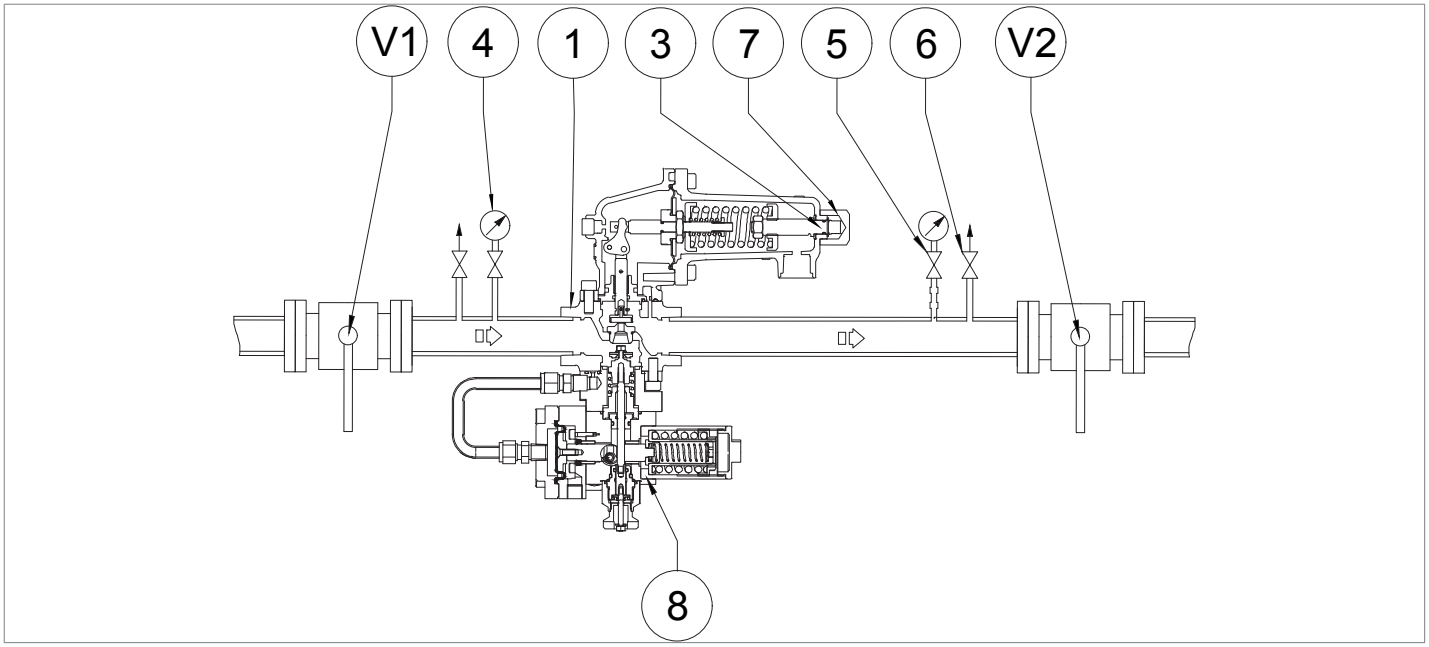



*Fig. 8.27.* *Built-in regulator and slam-shut valve with internal sensing line*

| Step | Operation |
|---|---|
| 1 | Remove the cap (7) from the regulator (1). |
| 2 | Check that the drain cock (6) is partially open. |
| 3 | Check that the slam-shut valve (8) is in the closed position. |
| 4 | Partially open the upstream shut-off valve (V1), checking the pressure value indicated by the upstream pressure gauge (4). |
| 5 | Perform the internal leakage test of the LA slam-shut valve, referring to paragraph 8.9.1.<br>**NOTICE**<br>**In case of leakage, refer to chapter 10 "Fault finding and troubleshooting" to remove the causes of malfunctions.** |
| 6 | Slowly pressurize the control line, acting on the slam-shut valve knob (refer to the "Operation" section of paragraph 4.5.3.1), checking that the downstream pressure (Pd) indicated by the downstream pressure gauge (5) does not exceed the required calibration value by more than 50%. |
| 7 | When the regulator is put into service, the pressure of the downstream pressure gauge (5) will be equal to the setting value of the main regulator.<br>**NOTICE**<br>**In the first pressurization phase of the line, the pressure of the downstream pressure gauge (5) may exceed the required calibration value, depending on the response time of the regulator.** |
| 8 | Fully open the upstream shut-off valve (V1). |
| 9 | Check the pressure switch settings of the slam-shut valve by referring to paragraph 8.9.3. |
| 10 | If the downstream pressure (Pd) is not at the required calibration value, act as below:<br>• value of downstream pressure (Pd) less than the required calibration value: load the calibration spring by turning the adjustment ring nut (3) clockwise<br>• value of downstream pressure (Pd) higher than the required calibration value: discharge the calibration spring by turning the adjustment ring nut (3) counterclockwise |
| 11 | Check the downstream pressure (Pd) by referring to the downstream pressure gauge (5). |
| 12 | Close the drain cock (6). |
| 13 | Check that the downstream pressure (Pd), after an increment phase, does not exceed the closing pressure value of the main regulator (1):<br>• HP header: up to SG 20<br>• LP header: up to SG 30 |
| 14 | Check all connections between shut-off valves (V1, V2) for tightness with a foaming substance. |
| 15 | In case external leakage is found, eliminate the leakage points and repeat the procedure from step 7. |
| 16 | Very slowly open the downstream shut-off valve (V2) until the pipeline is completely flooded.<br>**NOTICE**<br>• **If the pressure of the downstream pipeline is lower than the calibration pressure, partialize the opening of the downstream shut-off valve (V2) so as not to exceed the value of the maximum flow rate of the system.**<br>• **Check the pressure by referring to the downstream pressure gauge (5).** |
| 17 | Insert the cap (7) into the main regulator (1). |

*Tab. 8.52.*

### 8.9.3 - PRESSURE SWITCH CALIBRATION PROCEDURE FOR THE BUILT-IN SLAM-SHUT VALVE

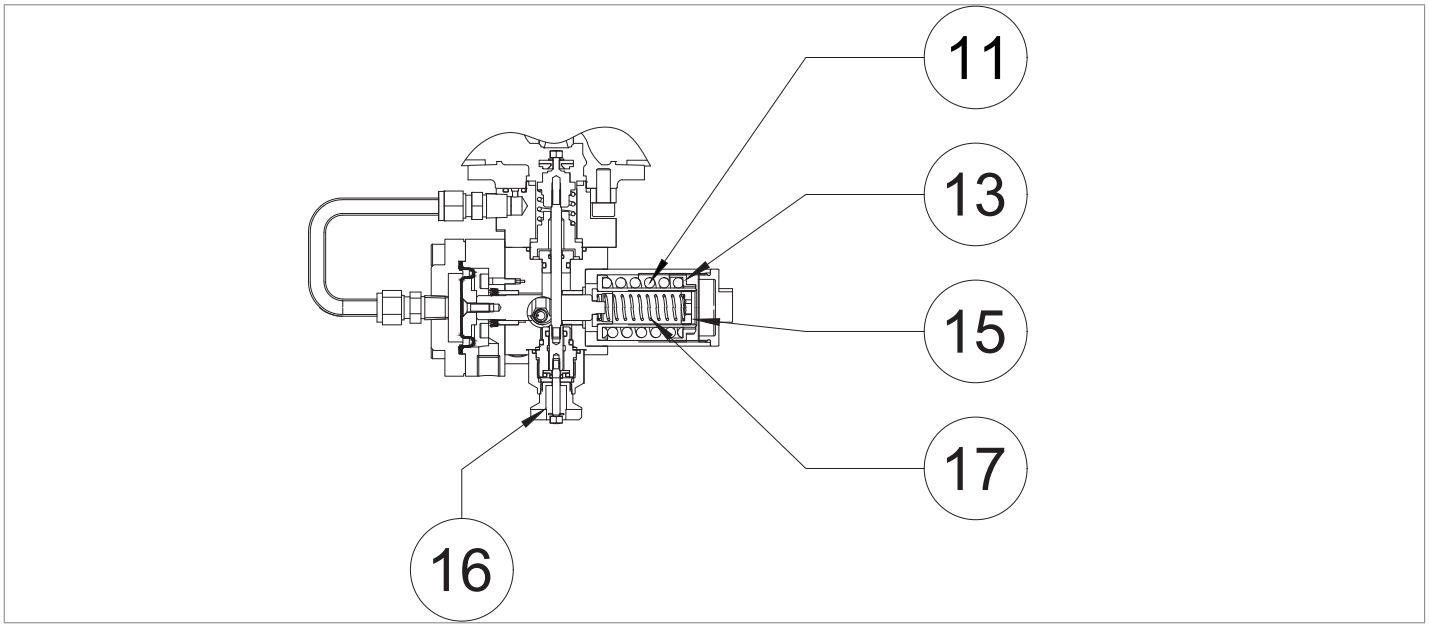



*Fig. 8.28. Regulator, in-line monitor and built-in slam-shut valve*

**CALIBRATION OF SPRING TO TRIP FOR MAXIMUM PRESSURE**

| Step | Operation |
|---|---|
| 1 | Increase the downstream pressure to the slam-shut valve's tripping value by connecting an external pressure source to the drain valve (Fig. 8.24 ref. 6) placed on the downstream pipeline, making sure to open an additional drain cock.<br>**NOTICE**<br>**Check the pressure by referring to the pressure gauge (Fig. 8.24, ref. 5) placed downstream of the main regulator.**<br>**If the slam-shut valve:**<br>• **trips before the expected pressure value: tighten (clockwise) the adjustment ring nut (13) so as to compress the spring (11) more;**<br>• **does not trip at the expected pressure value: unscrew (counterclockwise) the adjustment ring nut (13), so as to relieve the spring (11).** |
| 2 | Decrease the pressure of the downstream section by opening the drain cock (Fig. 8.24, ref. 6) to bring it up to the calibration value of the main regulator. |
| 3 | Close the additional drain cock (Fig. 8.24, ref. 6). |
| 4 | Arm the slam-shut valve by acting on the reset lever (16). |
| 5 | Repeat steps 2-3-4 at least three times.<br>**NOTICE**<br>**The calibration value must comply with the operating limits indicated on the nameplate.** |
| 6 | Disconnect the external pressure source from the drain cock (Fig. 8.24, ref. 5). |

*Tab. 8.53.*

## CALIBRATION OF SPRING FOR TRIPPING BY MINIMUM PRESSURE (IF ANY)

| Step | Operation |
|---|---|
| 1 | Partially open the drain cock (Fig. 8.24, ref. 6) in the atmosphere and keep it open for the next steps. |
| 2 | Turn the adjustment ring nut counterclockwise Fig. 8.24, ref. 3) of the regulator to decrease the downstream pressure (Pd) to the minimum pressure required for the slam-shut valve to trip.<br>**NOTICE**<br>**Check the value of the slam-shut valve tripping pressure indicated by the downstream pressure gauge (Fig. 8.24, ref. 5).** |
| 3 | If the slam-shut valve:<br>• trips before the expected pressure value: unscrew (counterclockwise direction) the adjustment ring nut (Fig. 8.24, ref. 3) so as to unload the spring (Fig. 8.28, ref. 17);<br>• does not trip at the expected pressure value: screw (clockwise) the adjustment ring nut (Fig. 8.24, ref. 3), so as to compress the spring more (Fig. 8.28, ref. 17). |
| 4 | **After verifying that the slam-shut valve trips at the preset value, act as follows:**<br>1. Close the air vent valve (Fig. 8.24, ref. 6)<br>2. Slowly open the upstream shut-off valve (V1) until the downstream pressure value (Pd) reaches the regulator's set value, referring to the downstream pressure gauge (Fig. 8.24, ref. 5)<br>3. Close the upstream shut-off valve (V1)<br>4. Slowly and partially open the air vent valve (Fig. 8.24, ref. 6) to decrease the downstream pressure by referring to the downstream pressure gauge (Fig. 8.24, ref. 5) until the minimum pressure trip value is reached<br>5. Verify the correct calibration of the minimum spring by repeating steps 2-3-4 at least three times<br>6. Perform calibration of the main regulator referring to par. 8.5 |
| 5 | Open the slam-shut valve by acting on the reset knob (Fig. 8.28, ref. 16) and keep it open manually. |
| 6 | Turn the adjustment screw clockwise (Fig. 8.24, ref. 3) to increase the downstream pressure to the set value of the regulator. |
| 7 | Arm the slam-shut valve by acting on the reset knob (Fig. 8.28, ref. 16). |
| 8 | Close the drain cock (Fig. 8.24, ref. 6). |

*Tab. 8.54.*

## 8.10 - COMMISSIONING OF THE REGULATOR, REGULATOR WITH IN-LINE MONITOR FUNCTION AND SLAM-SHUT VALVE

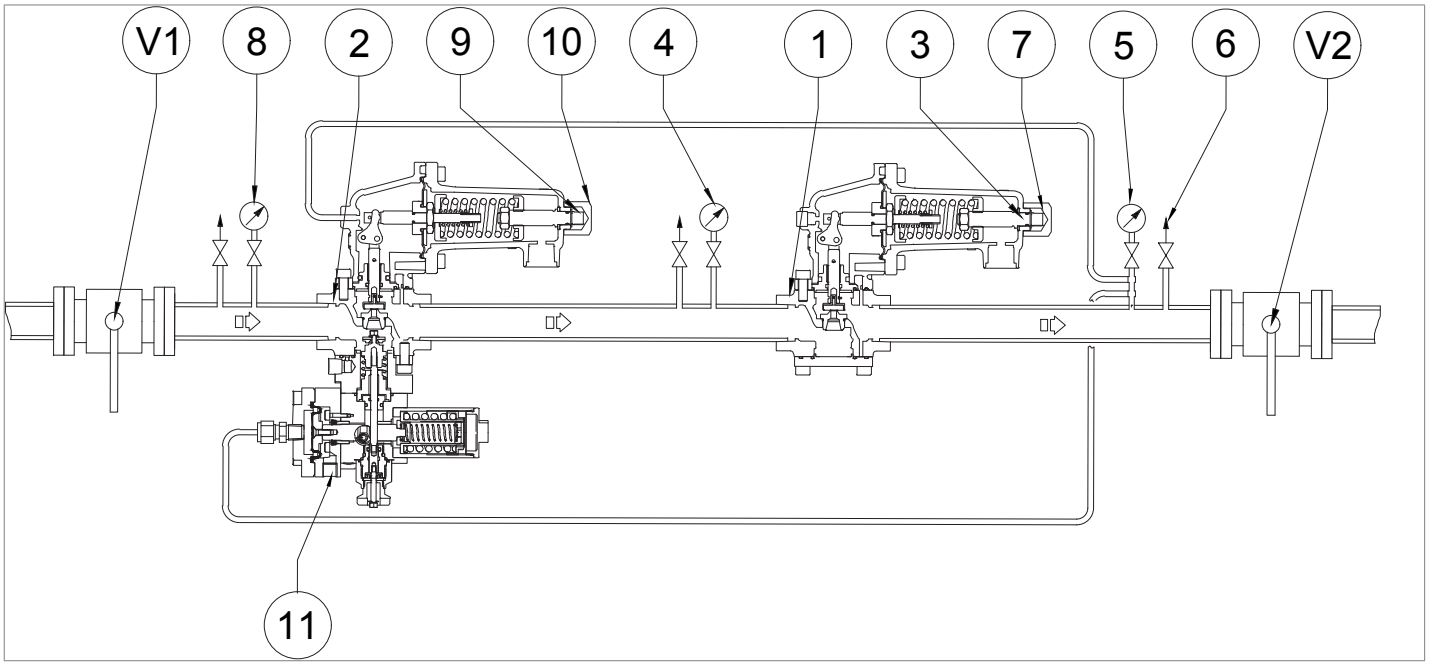



*Fig. 8.29. Regulator, in-line monitor and built-in slam-shut valve*

| Step | Operation |
|---|---|
| 1 | Remove the cap (10) from the regulator in inline monitor function (2). |
| 2 | Remove the cap (7) from the main regulator (1). |
| 3 | Check that the built-in slam-shut valve (11) is in the closed position. |
| 4 | Check that the calibration value of the main regulator (1) is higher than the calibration value of the in-line monitor (2) |
| 5 | Partially open the drain cock (6). |
| 6 | Very slowly open the upstream shut-off valve (V1). |
| 7 | Perform the internal leakage test of the LA slam-shut valve, referring to paragraph 8.9.1.<br>**NOTICE**<br>**In case of leakage, refer to Chapter 9 "Fault finding and troubleshooting" to remove the causes of malfunctions.** |
| 8 | Slowly pressurize the control line, acting on the knob of the slam-shut valve (refer to to the "Operation" section of par. 4.5.3.1), checking that the downstream pressure (Pd) indicated by the down-stream pressure gauge (5) does not exceed the required calibration value by more than 50%. |
| 9 | At the time the regulator enters into service, the pressure of the downstream pressure gauge (5) will be equal to the calibration value of the main regulator |
| 10 | Fully open the upstream shut-off valve (V1). |
| 11 | Check the setting of the slam-shut valve pressure switch by referring to par. 8.9.3. |
| 12 | Check the downstream pressure (Pd) by referring to the downstream pressure gauge (5). |

| Step | Operation |
|---|---|
| 13 | Close the drain cock (6). |
| 14 | Check the closing pressure, according to the following values:<br>• HP header: up to SG 20<br>• LP header: up to SG 30 |
| 15 | Partially open the drain cock (6). |
| 16 | Verify that the regulator with in-line monitor function (2) is fully open (100%).<br>**NOTICE**<br>**The main regulator (1) is fully open, when the pressure indicated on the intermediate pressure gauge (4) is the same as the upstream pressure gauge (8).** |
| 17 | Close the drain cock (6). |
| 18 | Check that the downstream pressure (Pd), after an increment phase, does not exceed the closing pressure value:<br>• HP header: up to SG 20<br>• LP header: up to SG 30 |
| 19 | Insert the cap (7) into the main regulator (1). |
| 20 | Insert the cap (10) into the regulator in monitor function (2). |
| 21 | Check with a foaming substance the tightness of all joints located between the shut-off valves (V1, V2). |
| 22 | Slowly open downstream shut-off valve (V2) until the pipeline is completely flooded.<br>**NOTICE**<br>• **If the pressure of the downstream pipeline is lower than the calibration pressure, partialize the opening of the downstream shut-off valve (V2) so as not to exceed the value of the maximum flow rate of the system.**<br>• **Check the pressure by referring to the downstream pressure gauge (5).** |

*Tab. 8.55.*

## 8.11 - CALIBRATION OF DEVICES

### 8.11.1 - PRESSURE SWITCH MOD. 100

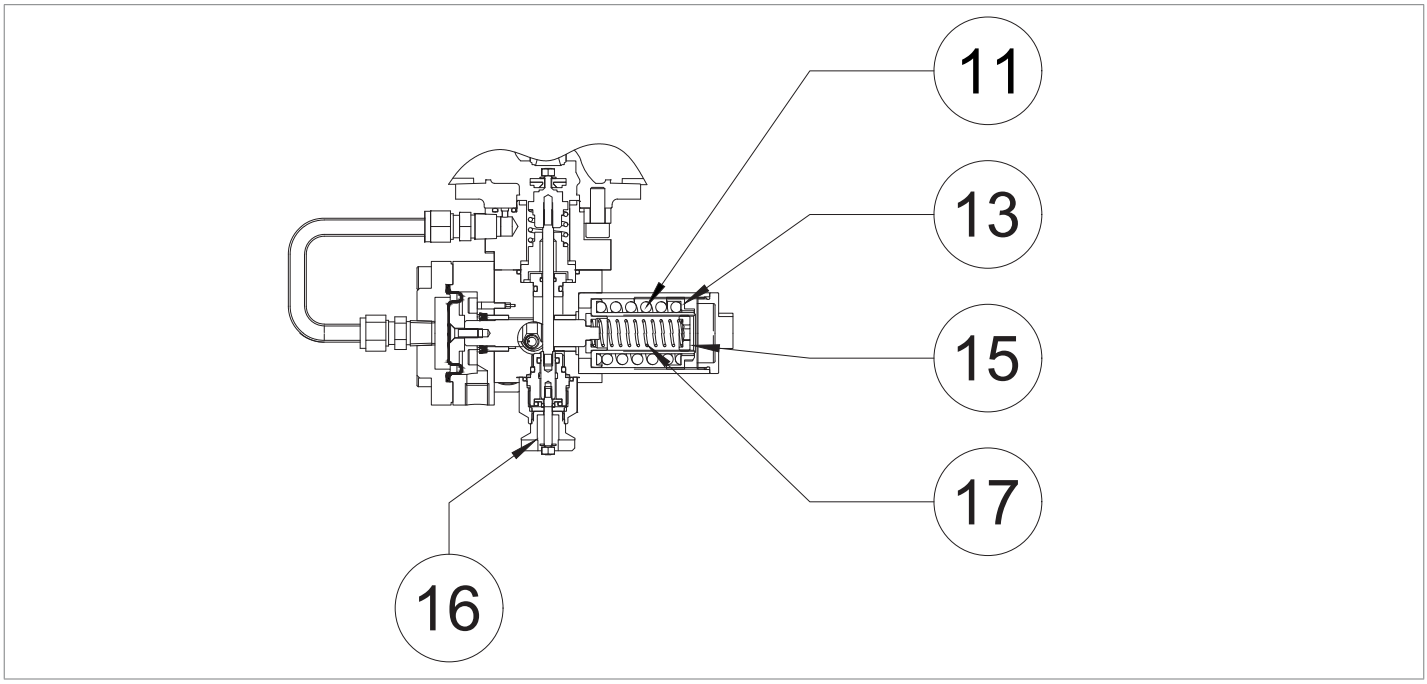



*Fig. 8.30. Pressure switches mod. 100*

Act on the maximum ring nut (13):
- counterclockwise to decrease the slam-shut trip pressure;
- clockwise to increase the slam-shut trip pressure.

Act on the minimum ring nut (15):
- counterclockwise to decrease the slam-shut trip pressure;
- clockwise to increase the slam-shut trip pressure.

**NOTICE!**

**For calibration ranges, refer to chapter “13 - Calibration and flow rate tables”.**

# 9 - MAINTENANCE AND FUNCTIONAL TESTING

## 9.1 - GENERAL WARNINGS

**⚠ DANGER**

- **Maintenance operations must be performed by personnel trained in workplace safety, qualified and authorized for the activities inherent in the equipment.**
- **Each maintenance operation requires a thorough and specialized knowledge of the equipment, the operations required, the risks involved, and the proper procedures for operating it safely.**
- **Repair or maintenance work not provided for in this manual may be carried out only with prior approval from PIETRO FIORENTINI S.p.A.. No liability related to damage to persons or property can be attributed to PIETRO FIORENTINI S.p.A. for interventions other than those described or performed in a manner other than those indicated.**

**⚠ WARNING**

**Before carrying out any work, it is important to make sure that the line on which the equipment is installed:**

- **has been intercepted upstream and downstream;**
- **has been discharged.**

**After releasing pressure from the line, trip the slam-shut valve.**

**⚠ WARNING**

**When in doubt, it is forbidden to operate. Contact PIETRO FIORENTINI S.p.A. for necessary clarification.**

Operation and/or use of the equipment includes interventions that become necessary as a result of normal use such as:

- inspections and monitoring;
- functional verifications;
- routine maintenance;
- extraordinary maintenance.

***NOTICE***

**Maintenance interventions are closely related:**

- **to the quality of the transported gas (impurities, moisture, gasoline, corrosive substances);**
- **to the efficiency of filtration;**
- **to the conditions under which the equipment is used.**

Good management of the equipment requires to:

- comply with the intervals specified in the manual for functional checks and routine maintenance.
- not exceeding the time interval between interventions. The time interval is intended to be the maximum acceptable; it can be shortened instead;
- promptly check the cause of any abnormalities such as excessive noise, fluid leakage or the like and remedy them. Removing any causes of anomalies and/or malfunctions in a timely manner prevents further damage to equipment and ensures the safety of operators;

Before beginning equipment disassembly operations, it should be ensured that:

- spare parts and parts used in replacements have appropriate requirements in order to ensure the original performance of the equipment. Use genuine recommended spare parts;
- the operator has the necessary equipment (refer to chapter “7 - Commissioning/maintenance equipment”).

**NOTICE**

**Recommended replacement parts are unambiguously identified with tags indicating:**

- **the assembly drawing number of the equipment in which they can be used (see Chapter 12 "Recommended Spare Parts");**
- **the location shown on the equipment assembly drawing.**

Equipment maintenance operations are operationally divided into three main categories:

| Commissioning maintenance operations | |
|---|---|
| **Periodic checks and inspections** | All those checks that the operator must perform on a periodic basis for the proper maintenance and operation of the equipment. |
| **Routine maintenance** | All those operations that the operator needs to carry out in a preventive manner to ensure proper operation of the equipment over time. Routine maintenance includes:<br>• inspection;<br>• control;<br>• adjustment;<br>• cleaning;<br>• lubrication;<br>• replacement;<br>of all spare parts. |
| **Extraordinary maintenance** | All those operations that the operator has to perform when the equipment needs it.<br>**⚠WARNING**<br>**Extraordinary maintenance:**<br>• **requires a thorough and specialized knowledge of the equipment, the operations required, the risks involved, and the proper procedures for operating it safely;**<br>• **is reserved for qualified, trained and licensed technicians.** |

*Tab. 9.56*

## 9.2 - PERIODIC CHECKS AND VERIFICATIONS OF PROPER OPERATION

| Periodic checks and inspections | |
|---|---|
| **Operator qualification** | Mechanical maintenance technician |
| **PPE required** |  <br>**⚠WARNING**<br>**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:**<br>• **the regulations in force in the country of installation;**<br>• **any indications provided by the Safety Manager at the installation facility.** |

*Tab. 9.57*

Tab. 9.58 lists the checks and tests, i.e., operations that do not require any manual intervention on the individual equipment. Some can be replaced by monitoring carried out from a remote point by means of appropriate remote control devices:

| Activity Description | Equipment/Accessories Involved | Evaluation criterion | Minimum frequency |
|---|---|---|---|
| **Significant performance check*** | Pressure regulators | • Absence of fluctuations in regulated pressure.<br>• Values of significant pressures within established limits. | Monthly |
| | Gas flow lock type safety devices (external position indicator) | • Completely open position. | |
| | Standby monitor (external position indicator) | • Completely open position. | |
| **Equipment external state visual inspection** | All | • Absence of visible damage.<br>• External surface protection as UNI 9571-1:2012. | Semiannual |

*Tab. 9.58*

** These checks can be performed remotely in the presence of a remote control system capable of analyzing significant performance related to the equipment and sending alerts/alarms when predetermined thresholds are reached.*

## 9.3 - ROUTINE MAINTENANCE

### 9.3.1 - GENERAL SAFETY WARNINGS

**DANGER**

- **Put the equipment in a safe condition (close the downstream and then upstream shut-off valve, drain the line completely);**
- **Make sure the pressure upstream and downstream of the equipment is "0".**

**WARNING**

**After releasing pressure from the line, trip the slam-shut valve.**

***NOTICE***

**Before installing new sealing elements (O-ring, diaphragm, etc.), their integrity should be checked.**

### 9.3.2 - FREQUENCY OF REPLACEMENT OF COMPONENTS SUBJECT TO WEAR AND TEAR

**NOTICE**

**The following directions apply only to the components of the equipment.**

The non-metallic parts of the individual equipment concerned are divided into the following categories:

| Preventive maintenance operations | |
|---|---|
| **Category 1** | Consider the parts subject to wear and/or abrasion where by:<br>• Wear and tear means the normal degradation of a part after prolonged use under ordinary operating conditions;<br>• abrasion means the mechanical action on the surface of the involved part resulting from the passage of gas under ordinary operating conditions. |
| **Category 2** | Consider the parts subject to aging only including parts that also require lubrication and/or cleaning activities. |

*Tab. 9.59*

**NOTICE**

**Check the state of wear/abrasion/aging of the components present within the minimum frequency specified in Tab. 9.60.**

| Category | Part description | Evaluation criterion | Minimum replacement frequency |
|---|---|---|---|
| **1** | Sealing rings of non-metal valve seats and plugs | Pressure regulators | 6 years |
| | | Safety devices | |
| | | Pressure safety system equipment | |
| **1** | Nonmetallic parts with internal sealing function of valve seats and accessories of individual equipment | Pilots | 6 years |
| | | Pre-reducers | |
| | | Accelerators | |
| | | Miscellaneous | |
| **1** | Nonmetallic parts with a sealing function between parts of which, at least one, is in motion under ordinary working conditions/ operation | Pressure regulators | 6 years |
| | | Gas flow block type safety devices | |
| | | Relief devices with discharge to atmosphere | |
| **1** | Nonmetallic parts with sealing function involved in disassembly operations during maintenance | Equipment subject to maintenance | 6 years |
| **2** | Non-metallic parts that provide "feedback" (sensitive elements) of the controlled pressure of safety equipment | Safety equipment and/or related accessories | 6 years |

| Category | Part description | Evaluation criterion | Minimum replacement frequency |
|---|---|---|---|
| 2 | Nonmetallic parts with sealing and performance functions (diaphragms) of a piece of equipment | Pressure regulators and related accessories | 6 years |
| | | Gas flow block type safety devices | 6 years |
| | | Relief device with discharge to atmosphere | 6 years |
| 2 | Nonmetallic parts of equipment with internal sealing function: under ordinary operating conditions during maintenance | Relief valves | 6 years |
| | | Control line disconnection equipment | In the presence of ascertained leaks |
| 2 | Non-metallic parts with only static sealing function | Miscellaneous equipment | In the presence of ascertained leaks |
| 2 | Lubricating parts subject to lubrication | Shut-off valves | Yearly |
| | | Other equipment | Yearly |
| 2 | Filter elements | Filters | As needed |

*Tab. 9.60*

## 9.4 - ROUTINE MAINTENANCE PROCEDURES

| Routine maintenance | |
|---|---|
| **Operator qualification** | Mechanical maintenance technician |
| **PPE required** |  <br>**⚠WARNING**<br>**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:**<br>• **the regulations in force in the country of installation;**<br>• **any indications provided by the Safety Manager at the installation facility.** |
| **Equipment required** | Refer to chapter “7 - Commissioning/maintenance equipment”. |

*Tab. 9.61*

## 9.4.1 - TIGHTENING TORQUES

### 9.4.1.1 - FT 518 REGULATOR TIGHTENING TORQUES

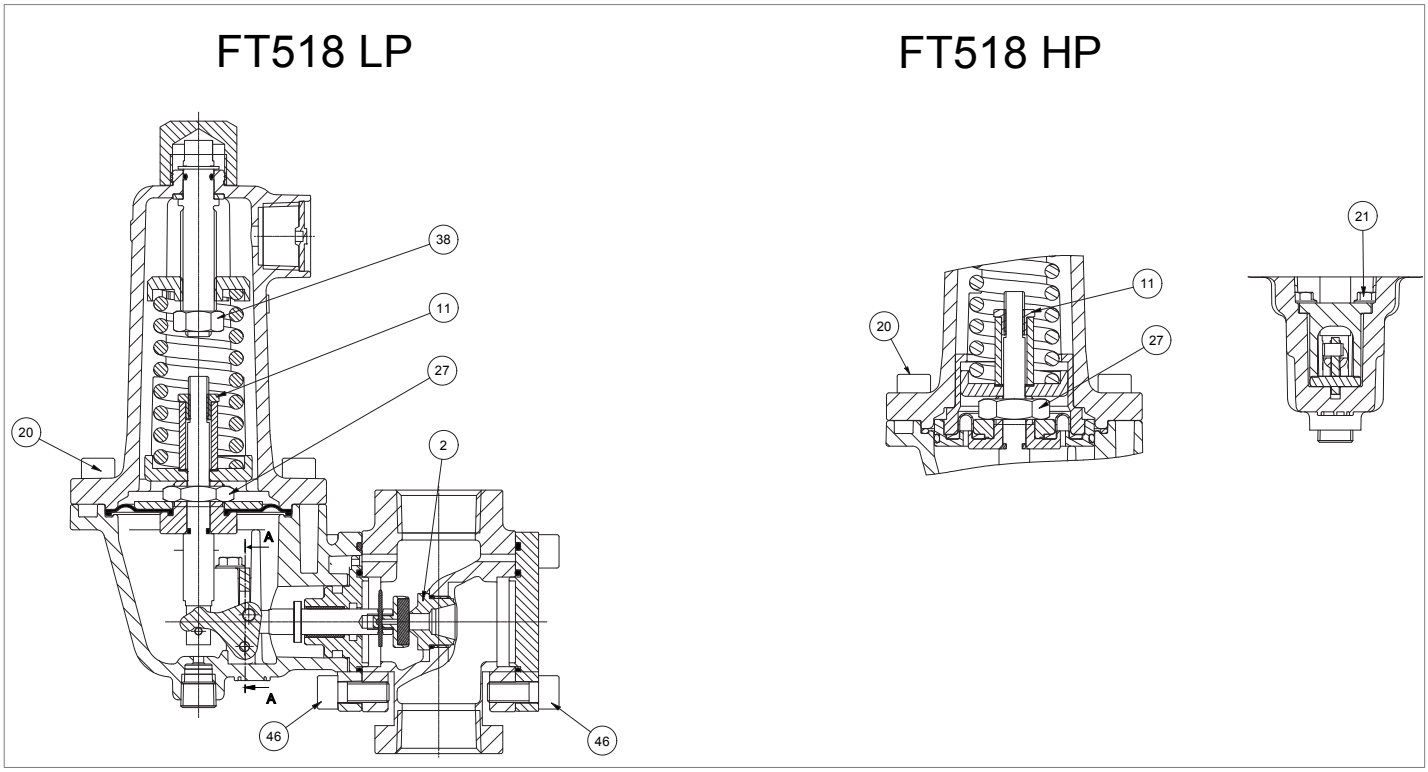



*Fig. 9.31. FT 518 regulator tightening torques*

| FT 518 LP, HP VERSION | | |
|---|---|---|
| **Pos.** | **Description** | **Torque (ft-lb)** |
| 2 | Valve Seat | 26 |
| 11 | Nut | 4 |
| 20 | M8X20 screw | 14 |
| 21 | M5X8 screw | 3 |
| 27 | Nut | 4 |
| 38 | Nut | 14 |
| 46 | M8X20 screw | 14 |

*Tab. 9.62*

### 9.4.1.2 - TIGHTENING TORQUES OF BUILT-IN MONITOR PM/518

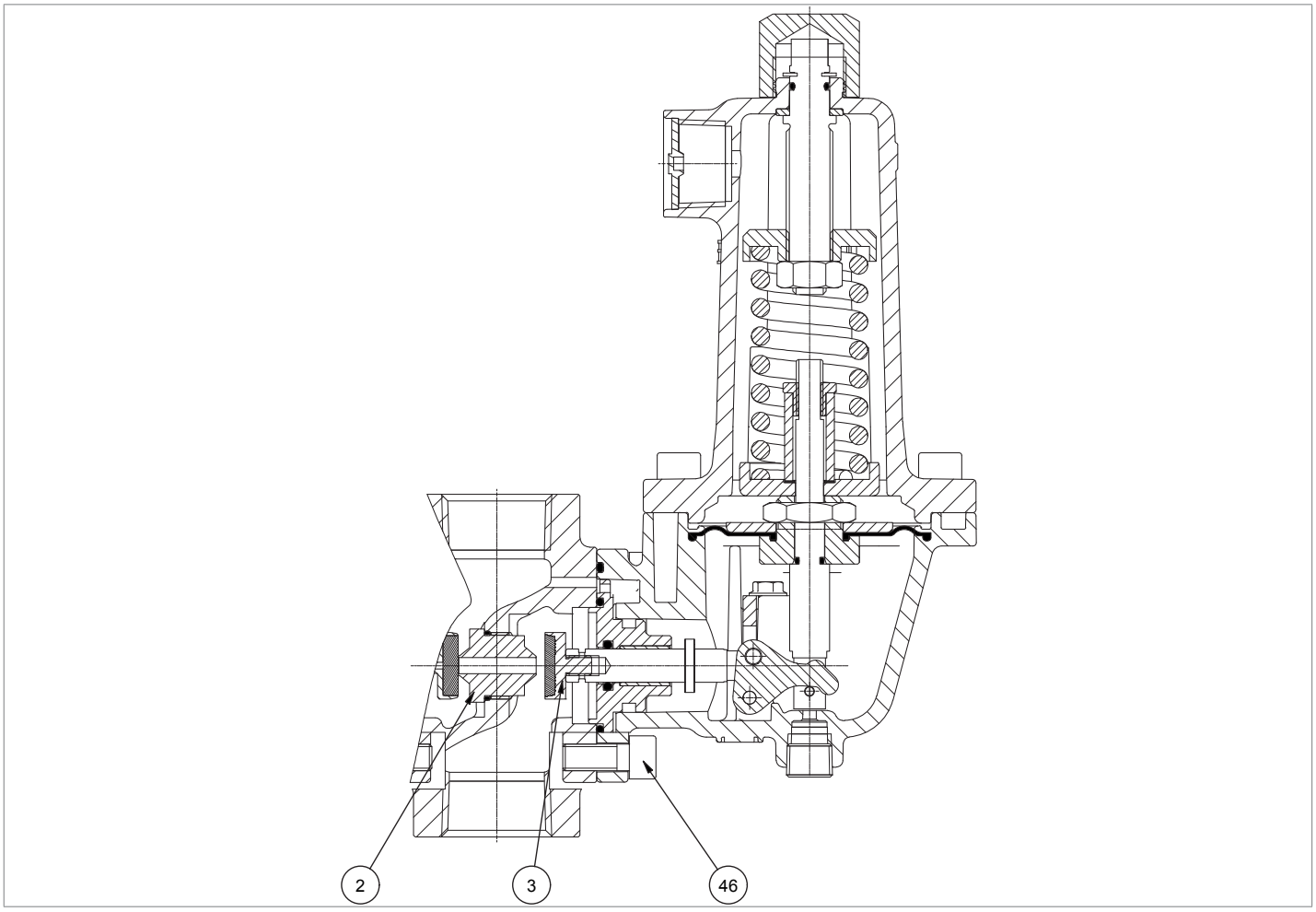



*Fig. 9.32. Tightening torques of built-in monitor PM/518*

| PM/518 VERSION LP, HP | | |
|---|---|---|
| **Pos.** | **Description** | **Torque (ft-lb)** |
| 2 | Valve Seat | 26 |
| 3 | PM/518 Monitor plug | 2 |
| 11 | Nut | 4 |
| 20 | M8X20 screw | 14 |
| 21 | M5X8 screw | 3 |
| 27 | Nut | 4 |
| 38 | Nut | 14 |
| 46 | M8X20 screw | 14 |

*Tab. 9.63*

### 9.4.1.3 - SB/518 BUILT-IN SLAM-SHUT VALVE TIGHTENING TORQUES

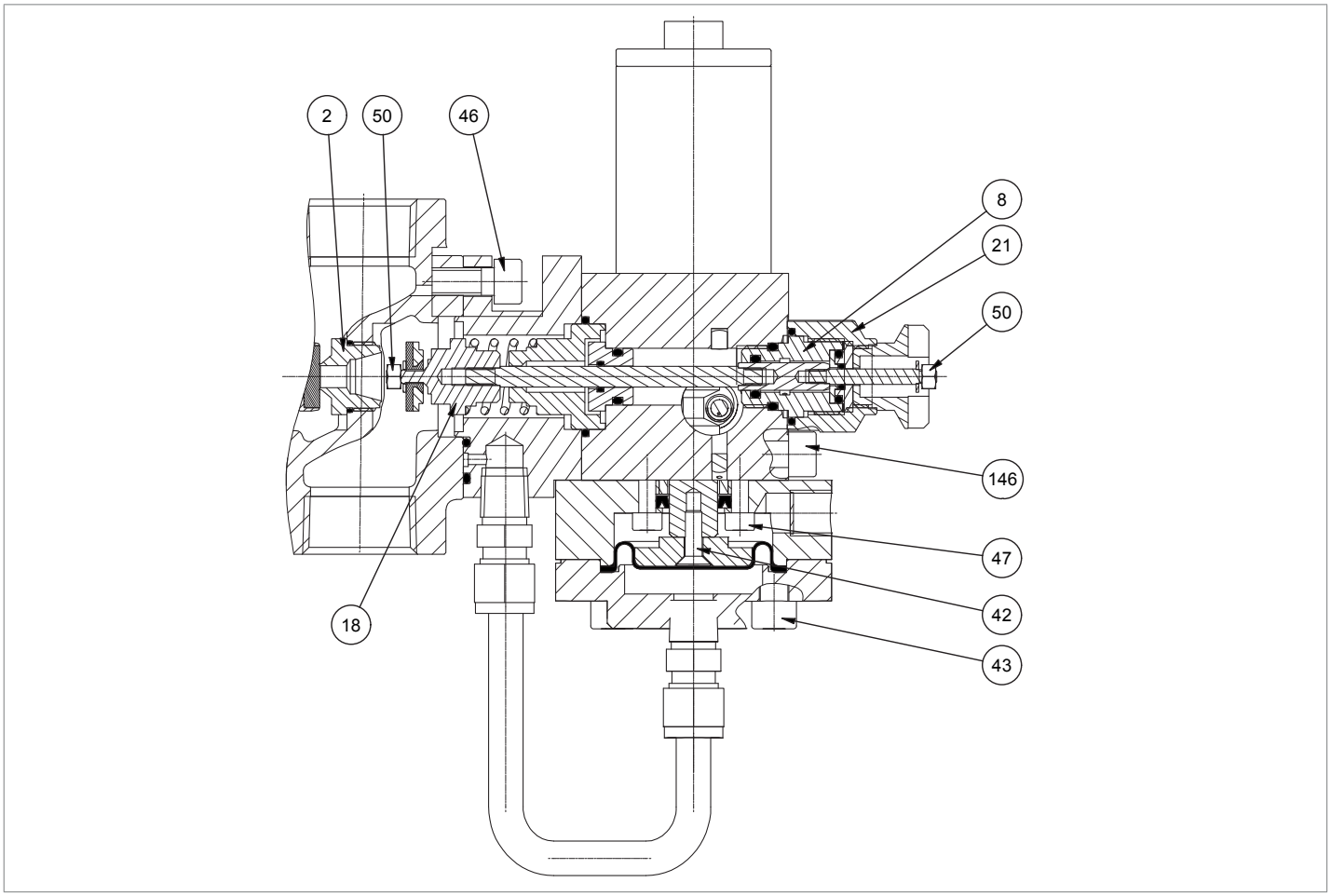



*Fig. 9.33. SB/518 built-in slam-shut valve tightening torques*

| SB/518 | | |
|---|---|---|
| **Pos.** | **Description** | **Torque (ft-lb)** |
| 2 | Valve Seat | 26 |
| 8 | Rod guide | 5 |
| 18 | Plug support | 1.8 |
| 21 | Lock nut | 7 |
| 42 | M5X16 screw | 5 |
| 43 | M8X25 screw | 11 |
| 46 | M8X20 screw | 14 |
| 47 | M5X16 screw | 3 |
| 50 | M4 nut | 1.1 |
| 146 | M8X70 screw | 14 |

*Tab. 9.64*

## 9.4.2 - REPLACEMENT OF ELEMENTS SUBJECT TO WEAR AND ABRASION

### 9.4.2.1 - INITIAL OPERATIONS

**⚠WARNING**

**After releasing pressure from the line, trip the slam-shut valve.**

**⚠CAUTION**

**Before carrying out any work, it is important to make sure that the line on which the regulator is installed has been shut-off upstream and downstream that it has been discharged.**

**⚠CAUTION**

**During assembly steps, be sure to tighten the screws following the tables (tightening torques) according to the size in which you are servicing.**

Proceed as follows:

| Step | Operation |
|---|---|
| 1 | Unscrew the conical seal fittings to disconnect all power and sensing lines. |

*Tab. 9.65*

### 9.4.2.2 - CROSS PATTERN FOR TIGHTENING SCREWS

When indicated by the maintenance procedures, refer to the following diagram for tightening screws:

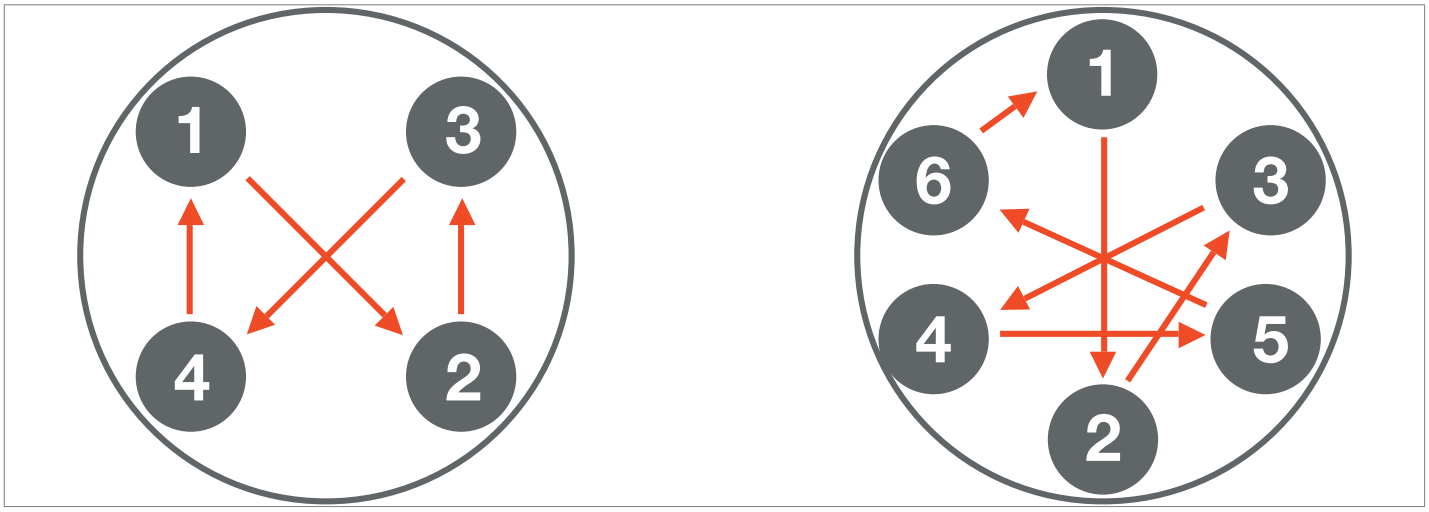



*Fig. 9.34. Cross pattern*

## 9.4.3 - MAINTENANCE PROCEDURE OF REGULATOR FT 518 AND REGULATOR WITH MONITOR FUNCTION

### 9.4.3.1 - FT 518 REGULATOR LP VERSION

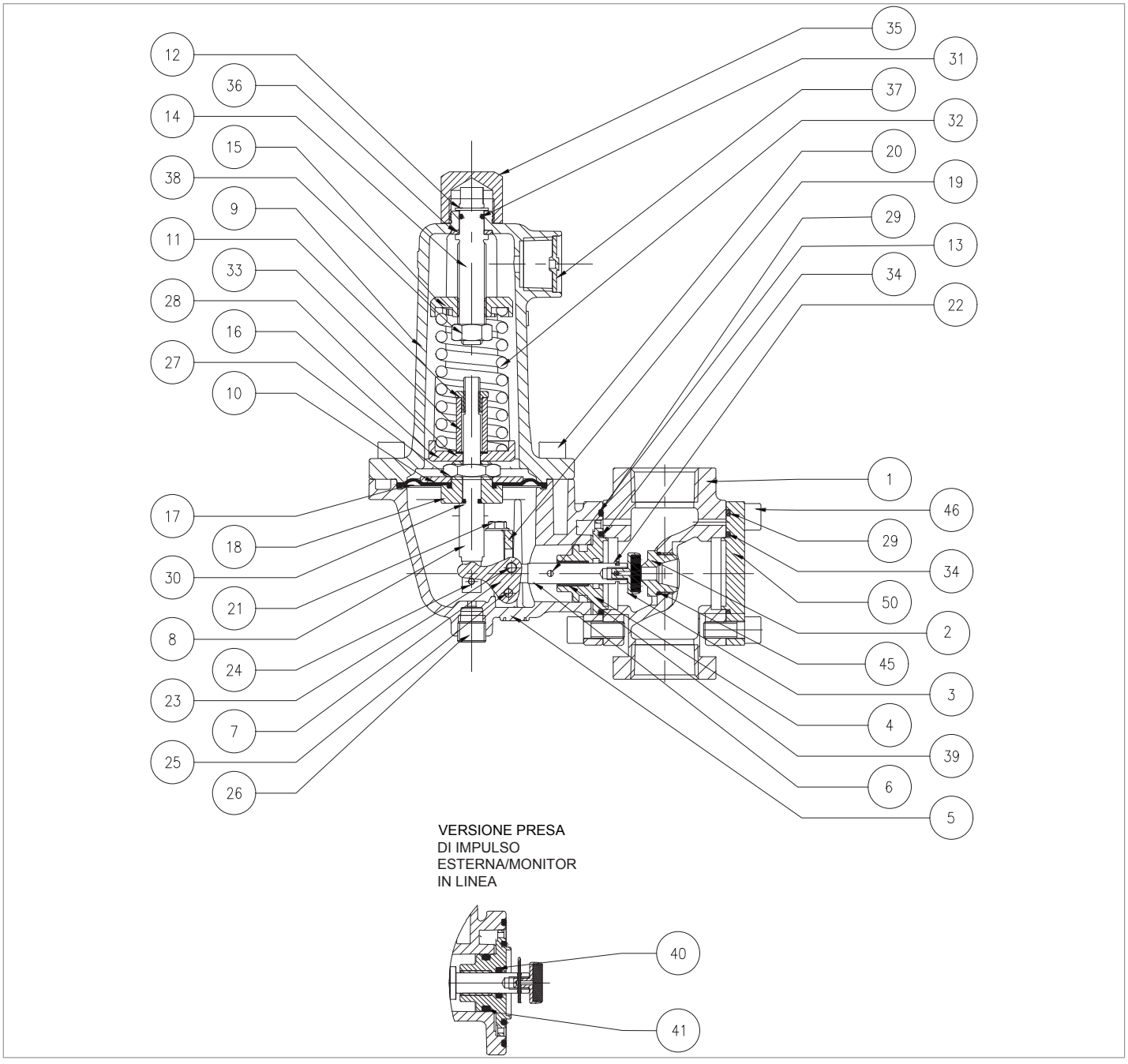
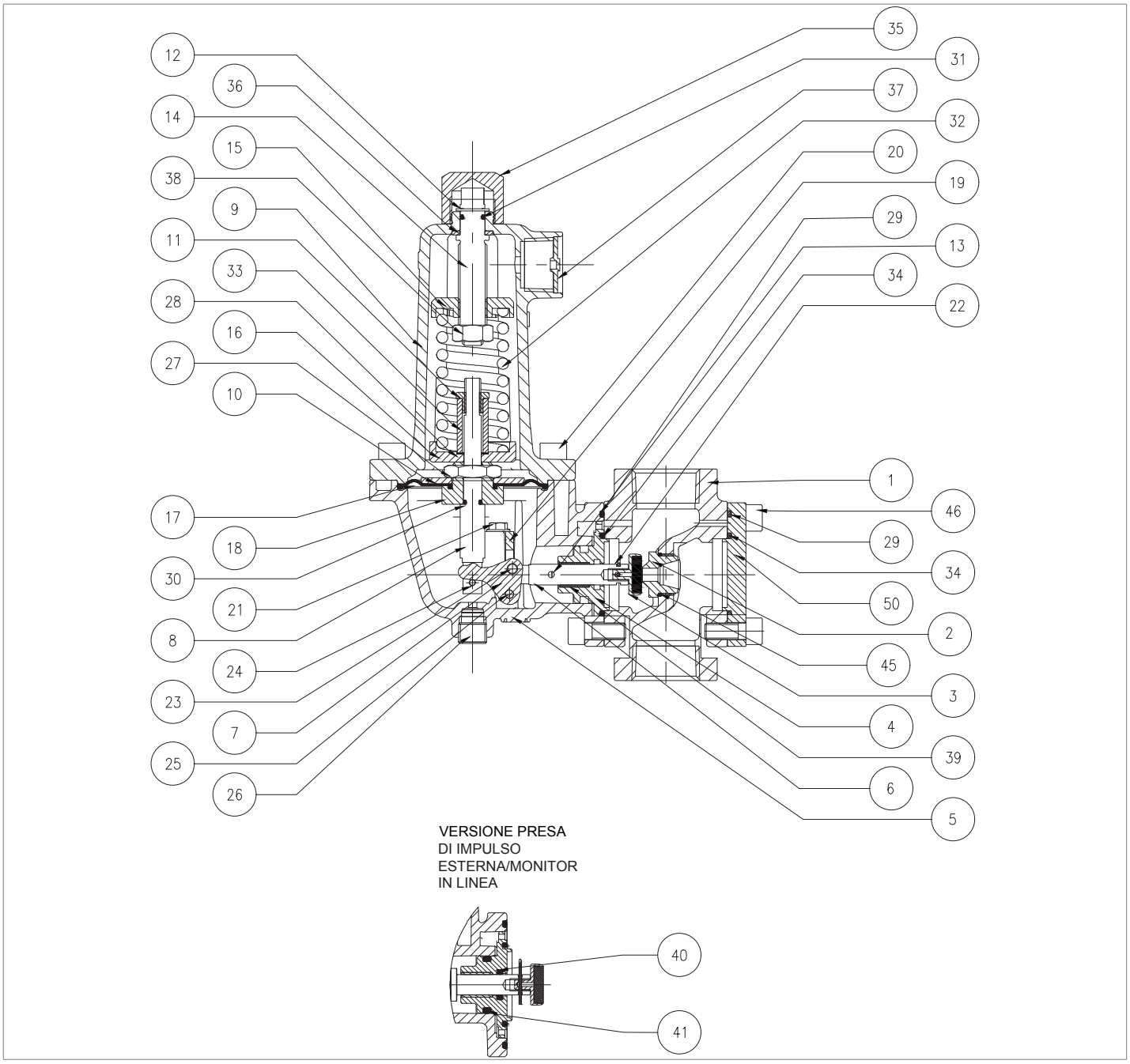


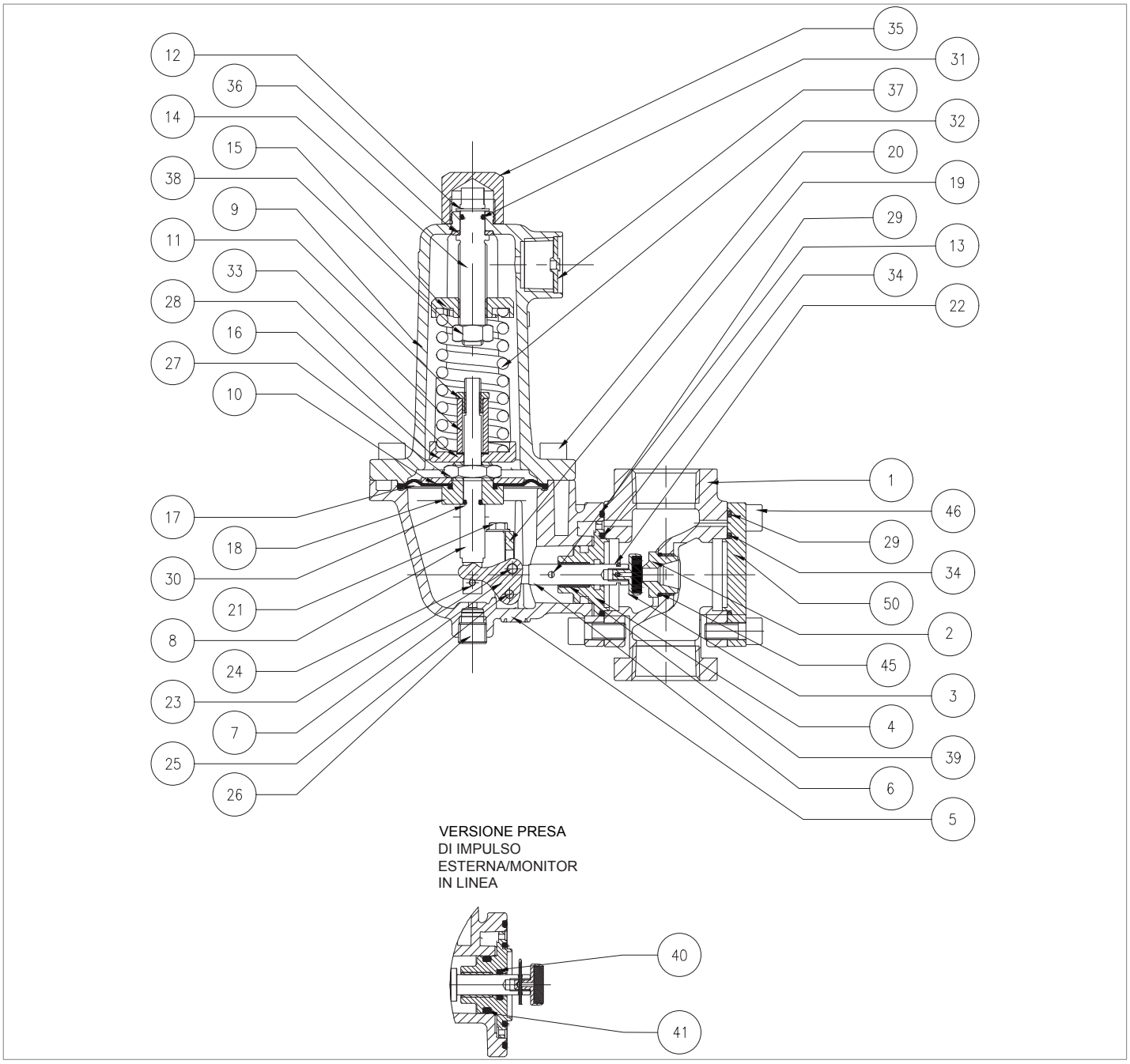

*Fig. 9.35. FT 518 regulator LP version*

| Step | Operation |
|---|---|
| 1 | Unscrew and remove cap (35). |
| 2 | Unscrew adjustment screw (14). |
| 3 | Remove the Seeger ring (12). |
| 4 | Unscrew and remove the screws (20). |
| 5 | Remove the cover (9). |
| 6 | Remove the adjusting screw assembly (14, 31, 36, 15, 38). |
| 7 | Remove and replace the O-ring (31), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 8 | Assemble the adjusting screw unit (14, 31, 36, 15, 38). |
| 9 | Insert the Seeger ring (12). |
| 10 | Remove the spring (32). |
| 11 | Unscrew and remove the screws (46) of the regulator head. |
| 12 | Remove the regulator head |
| 13 | Remove the O-rings (34, 29) from the regulator head, lubricating them with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 14 | Slide off the rod guide assembly (6, 13, 39, 4, 22, 3) by lifting and removing the drive shaft assembly (8, 24, 30, 18, 17, 10, 27, 16, 28, 33, 11).<br>**NOTICE**<br>**This operation is to be carried out simultaneously.** |
| 15 | Remove the relief nut (11). |
| 16 | Remove the relief spring (33). |
| 17 | Remove the anti-friction ring (28). |
| 18 | Remove the spring holder (16). |
| 19 | Unscrew and remove the nut (27). |
| 20 | Slide off the diaphragm protection disc (10). |
| 21 | Pull out the diaphragm (17). |
| 22 | Slide out the diaphragm holder (18). |
| 23 | Remove and replace the O-ring (30) from the diaphragm support (18), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 24 | Position the diaphragm holder (18). |




*FT 518 regulator LP version*

| Step | Operation |
|---|---|
| 25 | Position the replacement diaphragm (17).<br>**NOTICE**<br>**The diaphragm lanyard must be inside the diaphragm seat (17).** |
| 26 | Position the diaphragm protection disc (10).<br>**NOTICE**<br>**The disc beam is positioned toward the diaphragm (17).** |
| 27 | Insert and fasten the nut (27), according to the tightening torque:<br>• Tab. 9.62 |
| 28 | Position the spring holder (16). |
| 29 | Position the anti-friction ring (28). |
| 30 | Position the relief spring (33). |
| 31 | Insert and secure the nut (11). |
| 32 | Remove the cotter pin (22). |
| 33 | Remove the plug (3). |
| 34 | **VALID IN CASE OF EXTERNAL SENSING LINE**<br>Slide out the rod (6). |
| 35 | **VALID IN CASE OF EXTERNAL SENSING LINE**<br>Remove and replace the O-ring (40) from the plug guide (4), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 36 | **VALID IN CASE OF EXTERNAL SENSING LINE**<br>Remove and replace the O-ring (41) from the plug guide (4), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 37 | **VALID IN CASE OF EXTERNAL SENSING LINE**<br>Insert the rod (6). |
| 38 | Insert the replacement plug (3). |
| 39 | Position the cotter pin (22). |
| 40 | Place the rod guide assembly (6, 13, 39, 4, 22, 3) inside the intermediate body (5).<br>**NOTICE**<br>**Take care that the pin (23) fixed on the lever (7) is placed inside the shaft groove (6).** |
| 41 | Insert drive shaft assembly (8, 24, 30, 18, 17, 10, 27, 16, 28, 33, 11).<br>**NOTICE**<br>**Take care that the lever (7) is placed between the pin (24) and the rod (8).** |




*FT 518 regulator LP version*

| Step | Operation |
|---|---|
| 42 | Push the plug (3) inward.<br>**NOTICE**<br>**Check the lowering of the rod (8).** |
| 43 | Remove the valve seat (2) from the body (1). |
| 44 | Remove and replace the O-ring (45) from the valve seat (2), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 45 | Place the valve seat (2) into the body (1), according to the tightening torque:<br>• Tab. 9.62 |
| 46 | Place the replacement O-rings (34, 29) in the regulator head. |
| 47 | Assemble the intermediate body (5) into the body (1). |
| 48 | Insert and fasten the screws (46) of the regulator head according to the tightening torque:<br>• Tab. 9.62<br>**NOTICE**<br>**Tighten the screws according to the cross pattern in paragraph 9.4.2.2.** |
| 49 | Place the spring (32). |
| 50 | Place the cover (9). |
| 51 | Insert and fasten the screws (20) into the cover (9), according to the tightening torque:<br>• Tab. 9.62<br>**NOTICE**<br>**Tighten the screws according to the cross pattern in paragraph 9.4.2.2.** |
| 52 | Put the cap (35) in place. |
| 53 | Unscrew and remove the screws (46) from the blind flange (50). |
| 54 | Remove the blind flange (50). |
| 55 | Remove and replace the O-rings (29, 34) from the blind flange (50), lubricating them with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 56 | Place the blind flange (50) into the body (1). |
| 57 | Insert and fasten the screws (46) in the blind flange (50) according to the tightening torques:<br>• Tab. 9.62<br>**NOTICE**<br>**Tighten the screws according to the cross pattern in paragraph 9.4.2.2.** |

*Tab. 9.66*

**⚠WARNING**

**Make sure that all parts have been assembled correctly.**

### 9.4.3.2 - FT 518 REGULATOR HP VERSION

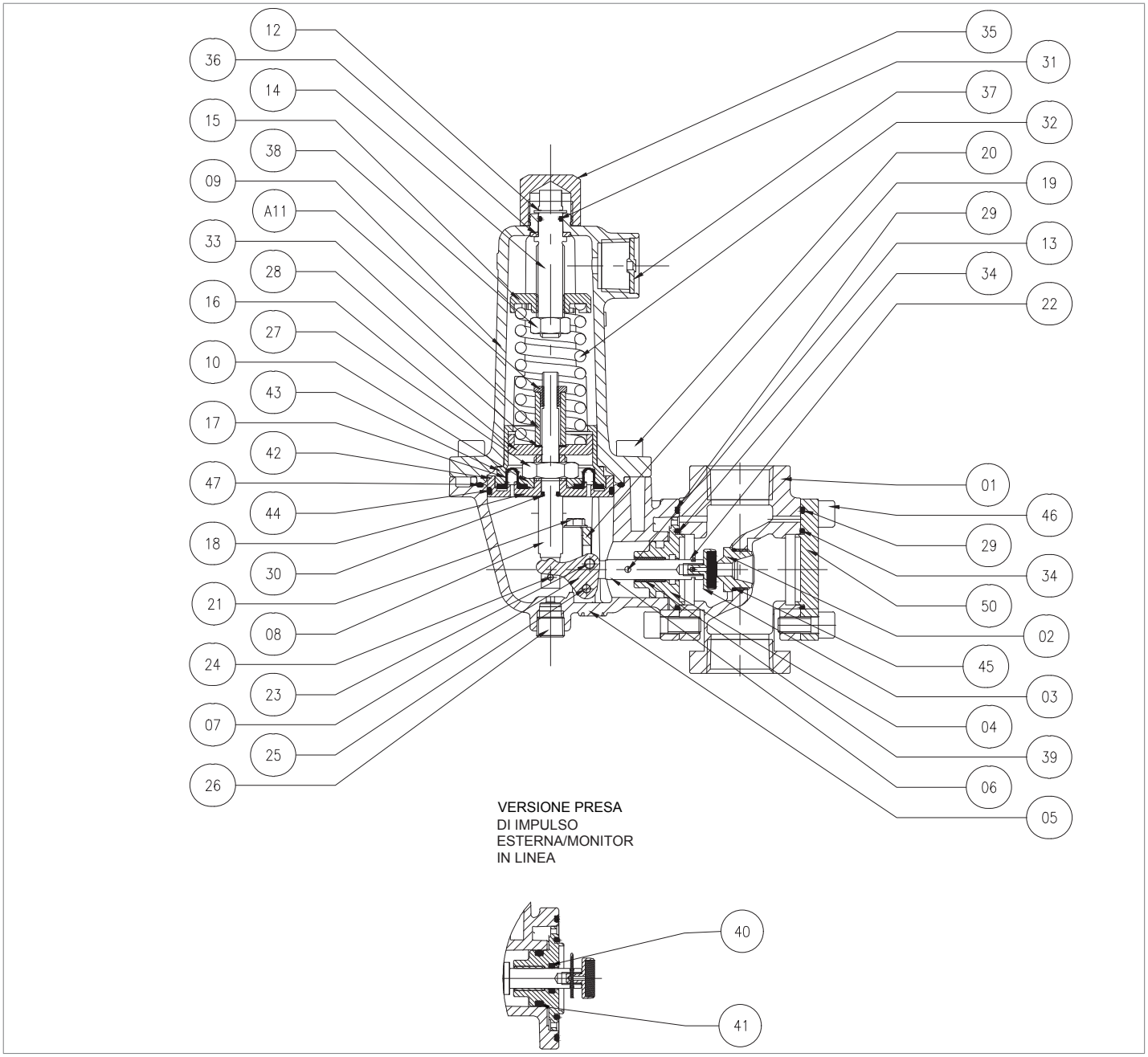
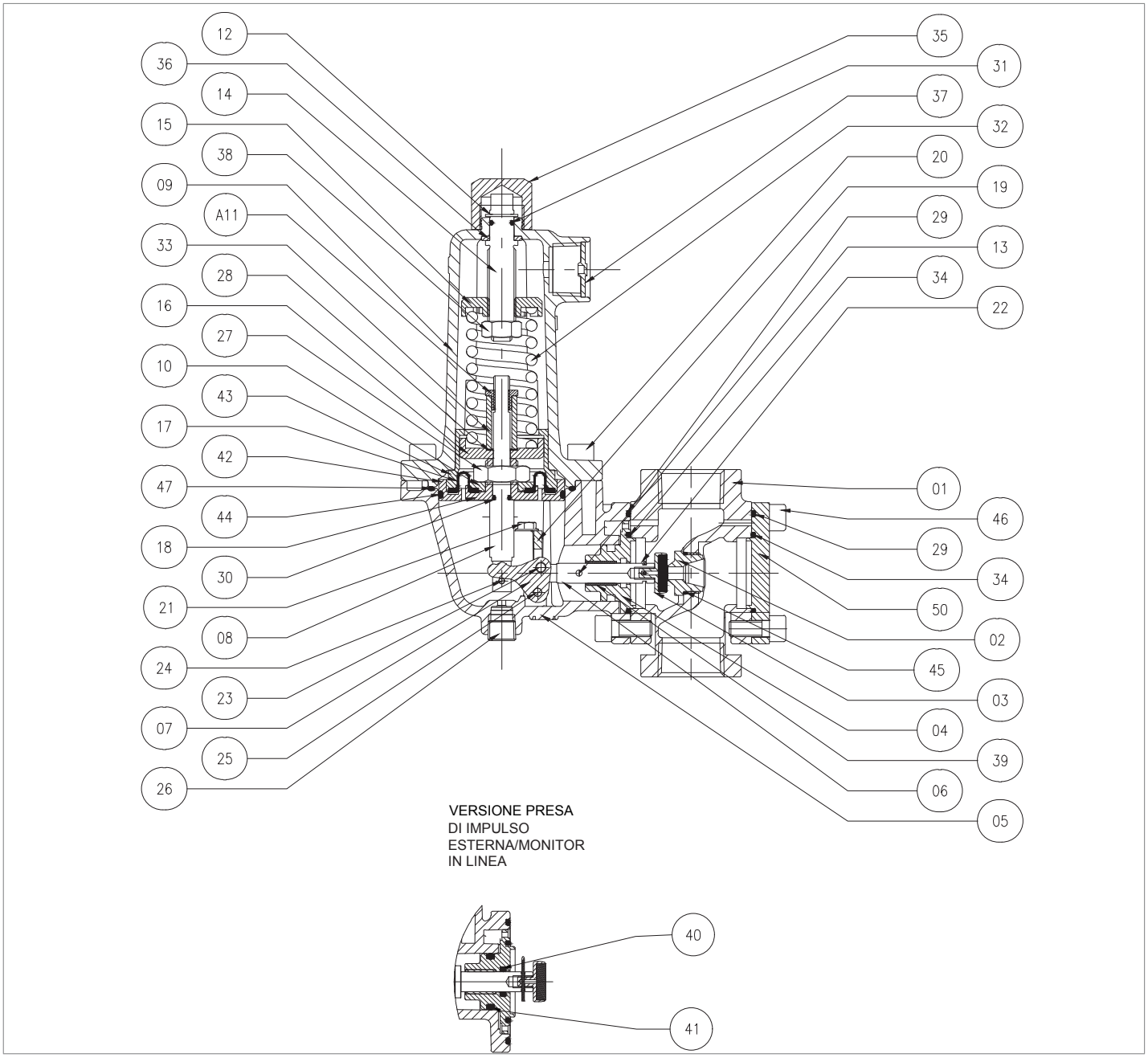


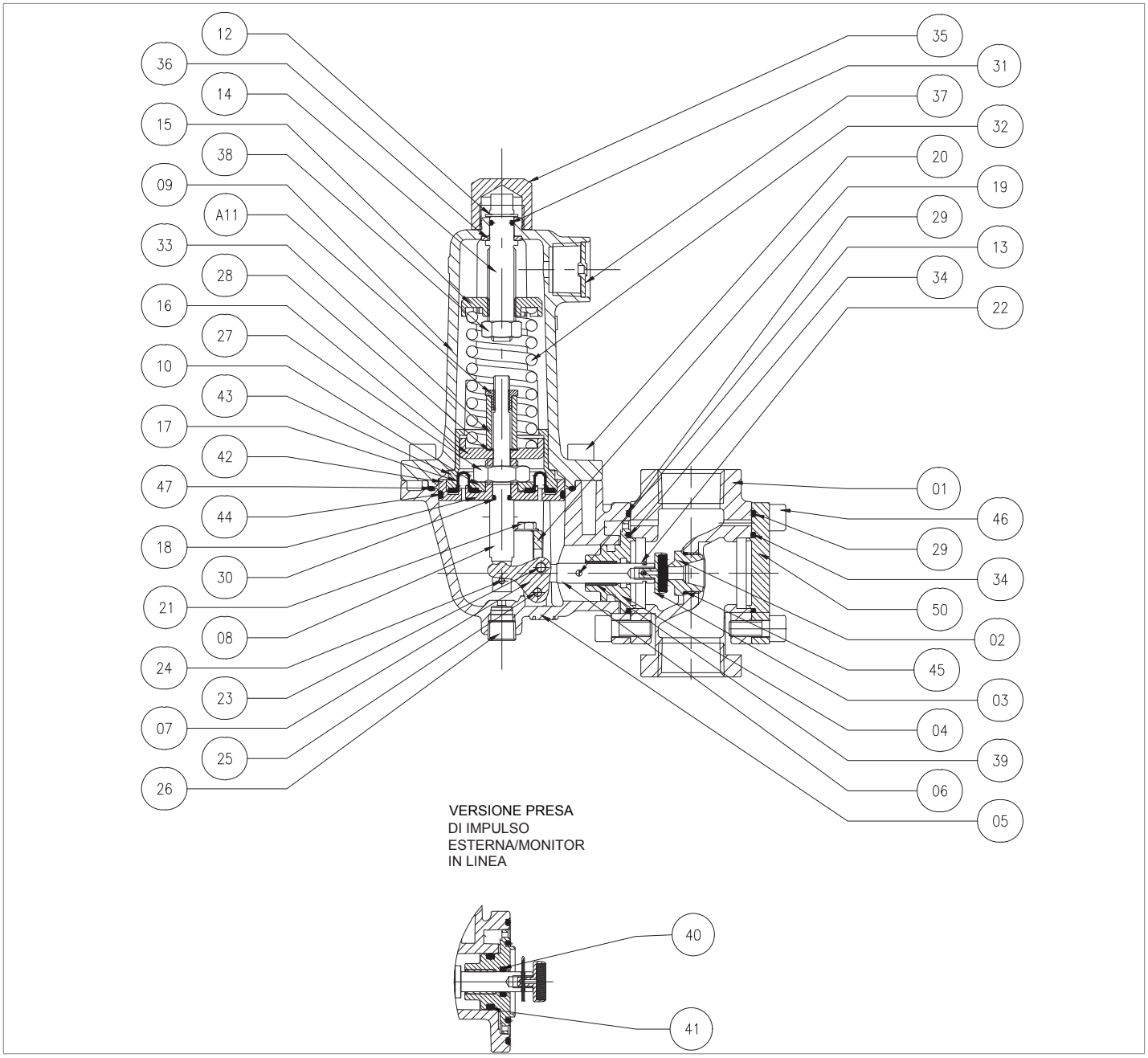

*Fig. 9.36. FT 518 regulator HP version*

| Step | Operation |
|---|---|
| 1 | Unscrew and remove cap (35). |
| 2 | Unscrew adjustment screw (14). |
| 3 | Remove the Seeger ring (12). |
| 4 | Unscrew and remove the screws (20). |
| 5 | Remove the cover (9). |
| 6 | Remove the adjusting screw assembly (14, 31, 36, 15, 38). |
| 7 | Remove and replace the O-ring (31), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 8 | Assemble the adjusting screw unit (14, 31, 36, 15, 38). |
| 9 | Insert the Seeger ring (12). |
| 10 | Remove the spring (32). |
| 11 | Remove the upper reduction disc (43). |
| 12 | Unscrew and remove the screws (46) from the regulator head. |
| 13 | Remove the regulator head. |
| 14 | Remove and replace the O-rings (34, 29) from the regulator head, lubricating them with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 15 | Slide off the rod guide assembly (6, 13, 39, 4, 22, 3) by lifting and removing the drive shaft assembly (8, 24, 30, 18, 17, 10, 27, 16, 28, 33, 11).<br>**NOTICE**<br>**This operation is to be carried out simultaneously.** |
| 16 | Remove the relief nut (11). |
| 17 | Remove the relief spring (33). |
| 18 | Remove the anti-friction ring (28). |
| 19 | Remove the spring holder (16). |
| 20 | Unscrew and remove the nut (27). |
| 21 | Slide off the diaphragm protection disc (10). |
| 22 | Remove the diaphragm (17). |
| 23 | Remove the diaphragm holder (18). |
| 24 | Remove and replace the O-ring (30), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |



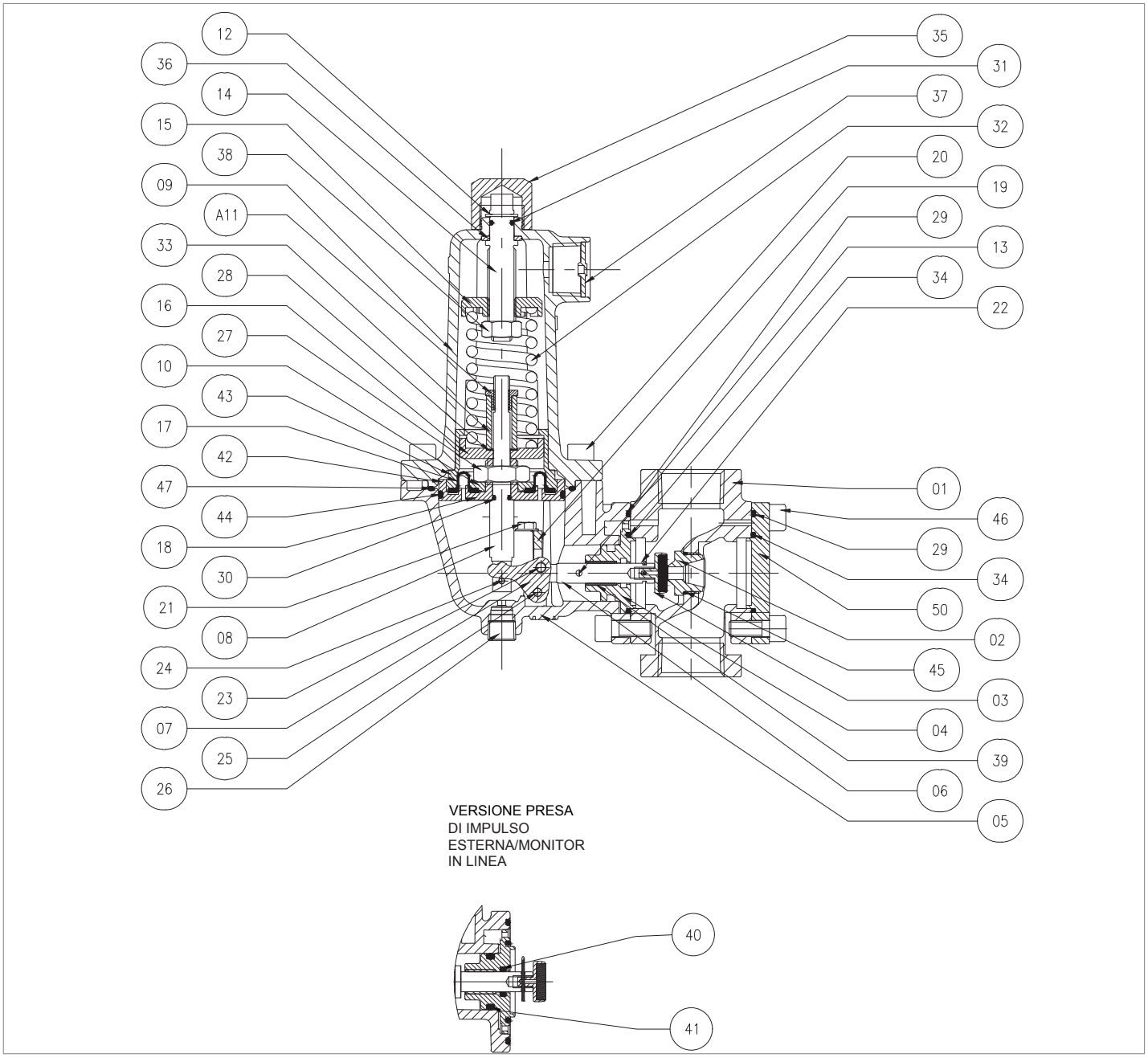

*FT 518 regulator HP version*

| Step | Operation |
|---|---|
| 25 | Position the diaphragm holder (18). |
| 26 | Position the replacement diaphragm (17).<br>**NOTICE**<br>**The diaphragm lanyard must be inside the diaphragm seat (17).** |
| 27 | Position the diaphragm protection disc (10).<br>**NOTICE**<br>**The disc beam is positioned toward the diaphragm (17).** |
| 28 | Insert and fasten the nut (27), according to the tightening torque:<br>• Tab. 9.62 |
| 29 | Position the spring holder (16). |
| 30 | Position the anti-friction ring (28). |
| 31 | Position the relief spring (33). |
| 32 | Insert and fasten the nut (11), according to the tightening torque:<br>• Tab. 9.62 |
| 33 | Remove the cotter pin (22). |
| 34 | Remove the plug (3). |
| 35 | **VALID IN CASE OF EXTERNAL SENSING LINE**<br>Slide out the rod (6). |
| 36 | **VALID IN CASE OF EXTERNAL SENSING LINE**<br>Remove and replace the O-ring (40) from the plug guide (4), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 37 | **VALID IN CASE OF EXTERNAL SENSING LINE**<br>Remove and replace the O-ring (41) from the plug guide (4), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 38 | **VALID IN CASE OF EXTERNAL SENSING LINE**<br>Insert the rod (6). |
| 39 | Insert the replacement plug (3). |
| 40 | Position the cotter pin (22). |
| 41 | Remove the lower reduction disc (42). |
| 42 | Remove and replace the O-ring (44) from the lower reduction disc (42), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |




*FT 518 regulator HP version*

| Step | Operation |
|---|---|
| 43 | Place the lower reduction disc (42) in the intermediate body (5). |
| 44 | Remove and replace the O-ring (47) from the intermediate body (5), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 45 | Place the rod guide assembly (6, 13, 39, 4, 22, 3) inside the intermediate body (5).<br>**NOTICE**<br>**Take care that the pin (23) fixed on the lever (7) is placed inside the shaft groove (6).** |
| 46 | Insert drive shaft assembly (8, 24, 30, 18, 17, 10, 27, 16, 28, 33, 11).<br>**NOTICE**<br>**Take care that the lever (7) is placed between the pin (24) and the rod (8).** |
| 47 | Push the plug (3) inward.<br>**NOTICE**<br>**Check the lowering of the rod (8).** |
| 48 | Remove the valve seat (2) from the body (1). |
| 49 | Remove and replace the O-ring (45) from the valve seat (2), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 50 | Place the valve seat (2) into the body (1), according to the tightening torque:<br>• Tab. 9.62 |
| 51 | Place the replacement O-rings (34, 29) in the regulator head. |
| 52 | Assemble the intermediate body (5) into the body (1). |
| 53 | Insert and fasten the screws (46) of the regulator head, according to the tightening torque:<br>• Tab. 9.62<br>**NOTICE**<br>**Tighten the screws according to the cross pattern in paragraph 9.4.2.2.** |
| 54 | Position the upper reduction disc (43). |
| 55 | Place the spring (32). |
| 56 | Place the cover (9). |
| 57 | Insert and fasten the screws (20) into the cover (9), according to the tightening torque:<br>• Tab. 9.62<br>**NOTICE**<br>**Tighten the screws according to the cross pattern in paragraph 9.4.2.2.** |




*FT 518 regulator HP version*

| Step | Operation |
|---|---|
| 58 | Put the cap (35) in place. |
| 59 | Unscrew and remove the screws (46) from the blind flange (50). |
| 60 | Remove the blind flange (50). |
| 61 | Remove and replace the O-rings (29, 34) from the blind flange (50), lubricating them with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 62 | Place the blind flange (50) into the body (1). |
| 63 | Insert and fasten the screws (46) in the blind flange (50) according to the tightening torques:<br>• Tab. 9.62<br>**NOTICE**<br>**Tighten the screws according to the cross pattern in paragraph 9.4.2.2.** |

*Tab. 9.67*

**⚠WARNING**

**Make sure that all parts have been assembled correctly.**

## 9.4.4 - PM/518 BUILT-IN MONITOR MAINTENANCE PROCEDURE

### 9.4.4.1 - BUILT-IN MONITOR PM/518 LP VERSION

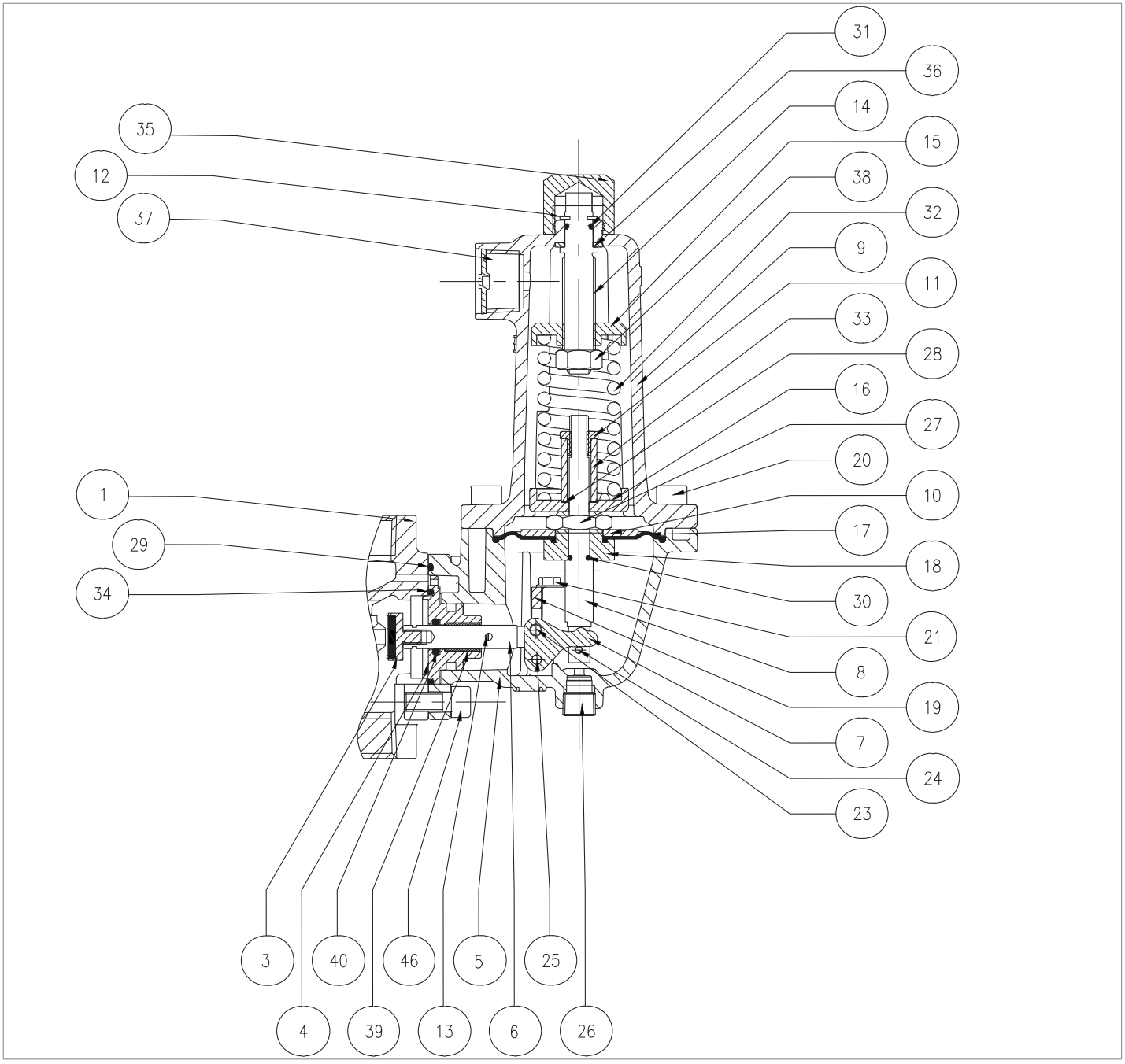
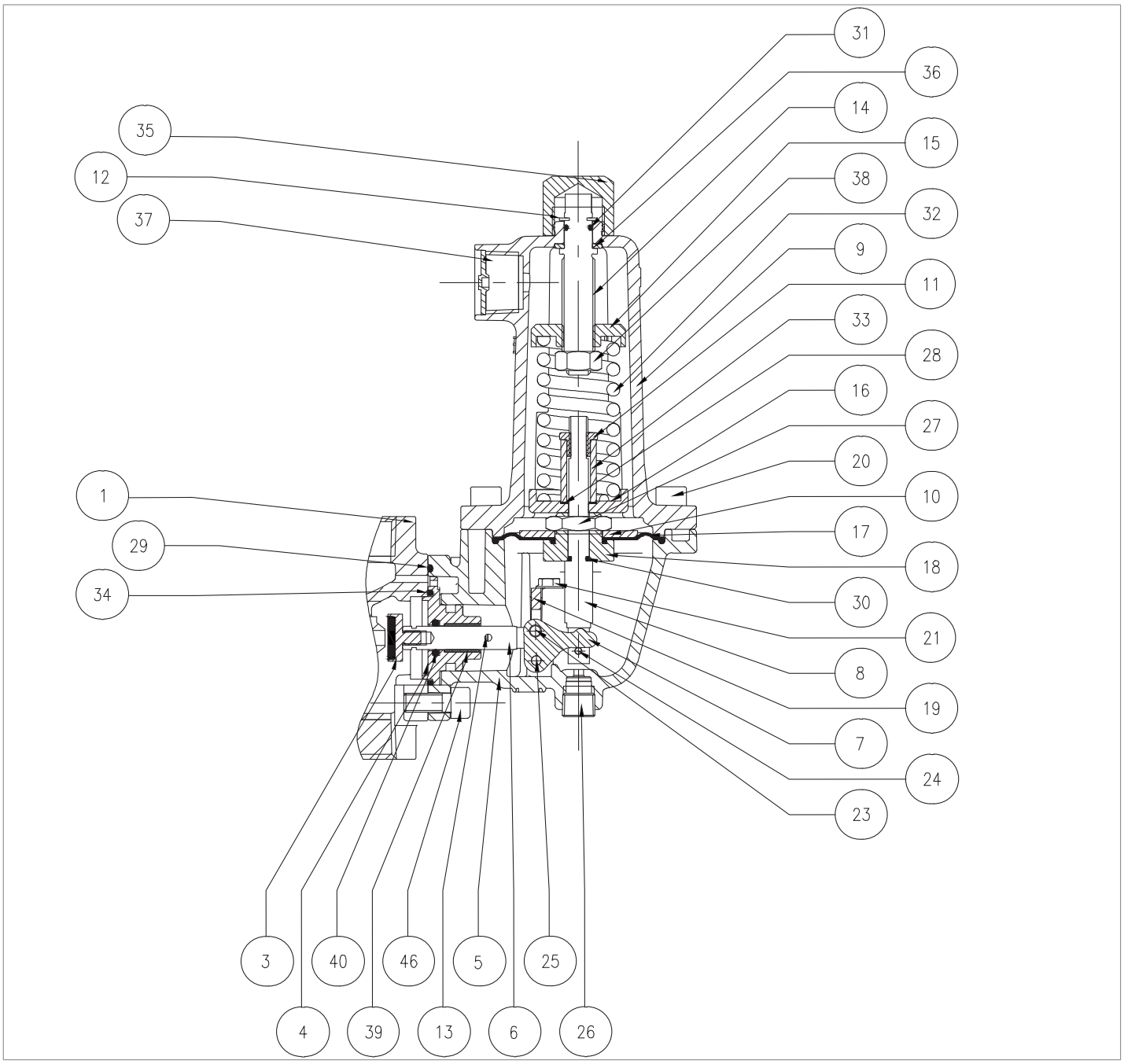


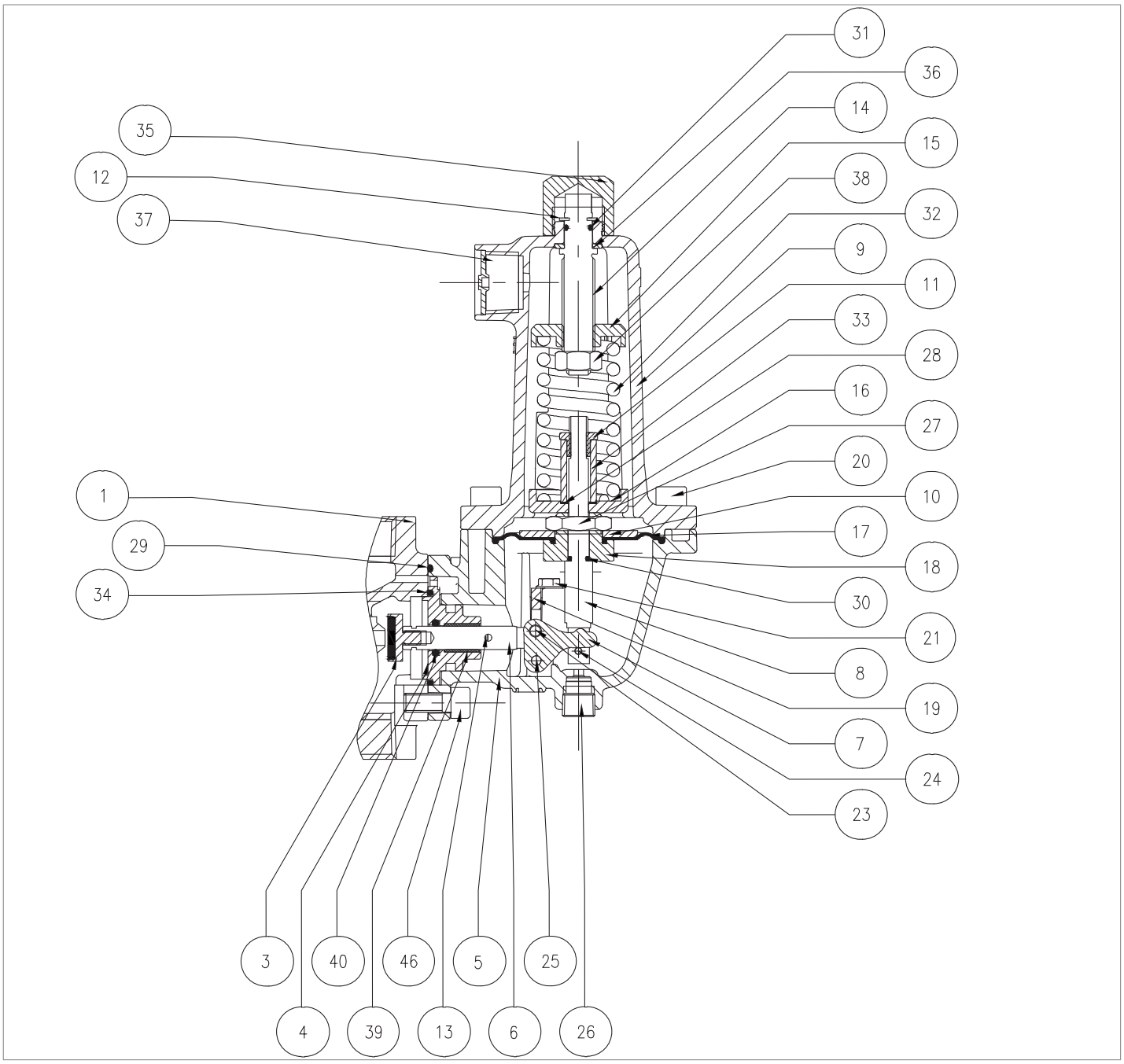

*Fig. 9.37. Built-in monitor PM/518 LP version*

| Step | Operation |
|---|---|
| 1 | Unscrew and remove the cap (35). |
| 2 | Unscrew the adjusting screw (14). |
| 3 | Remove the Seeger ring (12). |
| 4 | Unscrew and remove the screws (20). |
| 5 | Remove the cover (9). |
| 6 | Remove the adjusting screw assembly (14, 31, 36, 15, 38). |
| 7 | Remove and replace the O-ring (31), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 8 | Assemble the adjusting screw unit (14, 31, 36, 15, 38). |
| 9 | Insert the Seeger ring (12). |
| 10 | Remove the spring (32). |
| 11 | Unscrew and remove the screws (46) of the monitor head. |
| 12 | Remove the regulator head. |
| 13 | Remove and replace the O-rings (34, 29) from the regulator head, lubricating them with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 14 | Slide out the rod guide assembly (6, 13, 39, 4, 3) by lifting and removing the drive shaft assembly (8, 24, 30, 18, 17, 10, 27, 16, 28, 33, 11).<br>**NOTICE**<br>**This operation is to be carried out simultaneously.** |
| 15 | Remove the relief nut (11). |
| 16 | Remove the relief spring (33). |
| 17 | Remove the anti-friction ring (28). |
| 18 | Remove the spring holder (16). |
| 19 | Unscrew and remove the nut (27). |
| 20 | Slide off the diaphragm protection disc (10). |
| 21 | Pull out the diaphragm (17). |
| 22 | Slide out the diaphragm holder (18). |
| 23 | Remove and replace the O-ring (30), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 24 | Position the diaphragm holder (18). |




*Built-in monitor PM/518 LP version*

| Step | Operation |
|---|---|
| 25 | Position the replacement diaphragm (17).<br>**NOTICE**<br>**The diaphragm lanyard must be inside the diaphragm seat (17).** |
| 26 | Position the diaphragm protection disc (10).<br>**NOTICE**<br>**The disc beam is positioned toward the diaphragm (17).** |
| 27 | Insert and fasten the nut (27), according to the tightening torque:<br>• Tab. 9.63 |
| 28 | Position the spring holder (16). |
| 29 | Position the anti-friction ring (28). |
| 30 | Position the relief spring (33). |
| 31 | Insert and fasten the nut (11), according to the tightening torque:<br>• Tab. 9.63 |
| 32 | Remove the plug (3). |
| 33 | Slide out the rod (6). |
| 34 | Remove and replace the O-ring (40) from the plug guide (4), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 35 | Insert the rod (6). |
| 36 | Insert the replacement plug (3), according to the tightening torque:<br>• Tab. 9.63 |
| 37 | Place the rod guide assembly (6, 13, 39, 4, 3) inside the intermediate body (5).<br>**NOTICE**<br>**Take care that the pin (23) fixed on the lever (7) is placed inside the shaft groove (6).** |
| 38 | Insert drive shaft assembly (8, 24, 30, 18, 17, 10, 27, 16, 28, 33, 11).<br>**NOTICE**<br>**Take care that the lever (7) is placed between the pin (24) and the rod (8).** |
| 39 | Push the plug (3) inward.<br>**NOTICE**<br>**Check the lowering of the rod (8).** |
| 40 | Place the replacement O-rings (34, 29) in the monitor head. |
| 41 | Assemble the intermediate body (5) into the body (1). |




*Built-in monitor PM/518 LP version*

| Step | Operation |
|---|---|
| 42 | Insert and fasten the screws (46), according to the tightening torque:<br>• Tab. 9.63<br>**NOTICE**<br>**Tighten the screws according to the cross pattern in paragraph 9.4.2.2.** |
| 43 | Place the spring (32). |
| 44 | Place the cover (9). |
| 45 | Insert and fasten the screws (20) into the cover (9), according to the tightening torque:<br>• Tab. 9.63<br>**NOTICE**<br>**Tighten the screws according to the cross pattern in paragraph 9.4.2.2.** |
| 46 | Put the cap (35) in place. |

*Tab. 9.68*

**⚠WARNING**

**Make sure that all parts have been assembled correctly.**

### 9.4.4.2 - BUILT-IN MONITOR PM/518 HP VERSION

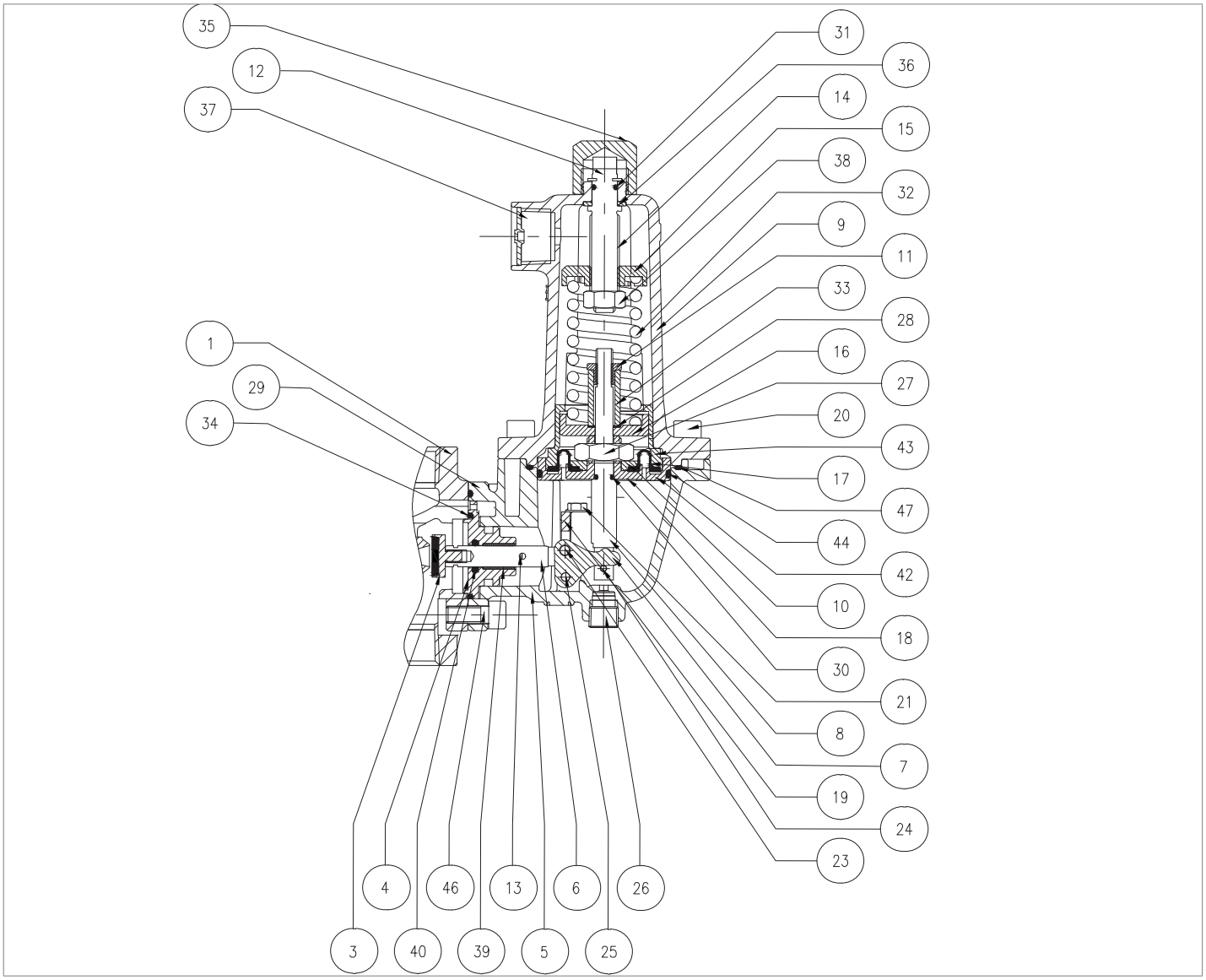
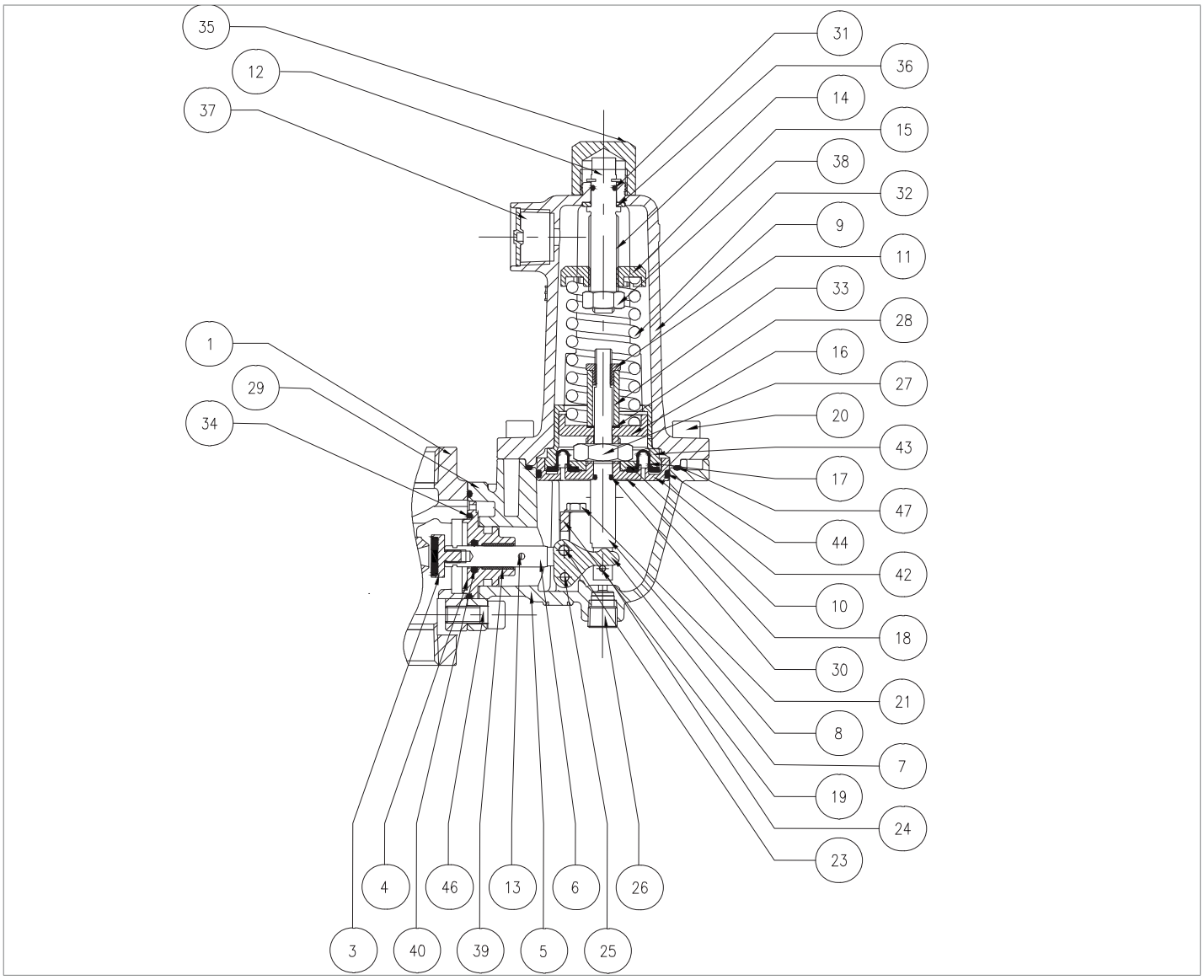


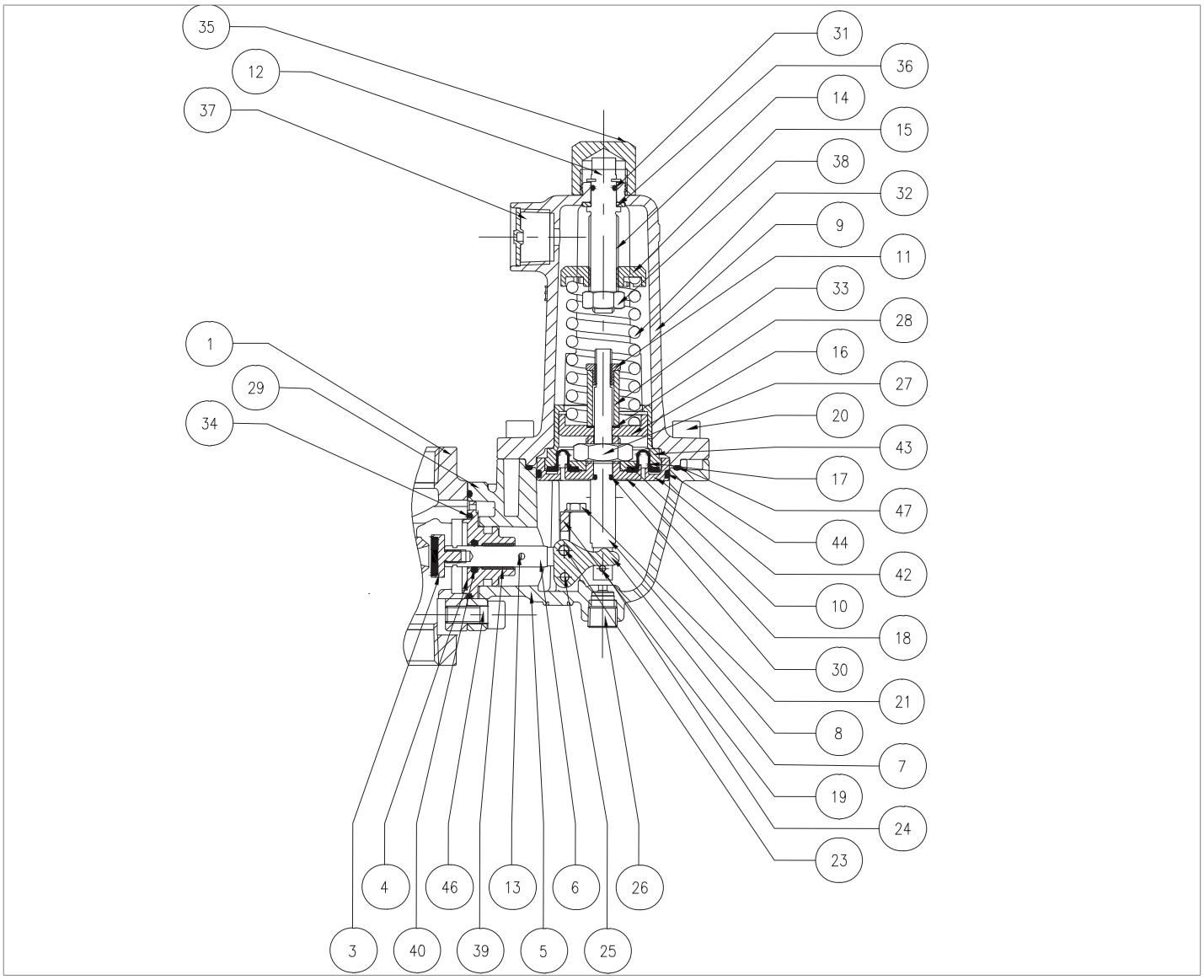

*Fig. 9.38. Built-in monitor PM/518 HP version*

| Step | Operation |
|---|---|
| 1 | Unscrew and remove cap (35). |
| 2 | Unscrew adjustment screw (14). |
| 3 | Remove the Seeger ring (12). |
| 4 | Unscrew and remove the screws (20). |
| 5 | Remove the cover (9). |
| 6 | Remove the adjusting screw assembly (14, 31, 36, 15, 38). |
| 7 | Remove and replace the O-ring (31), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 8 | Assemble the adjusting screw unit (14, 31, 36, 15, 38). |
| 9 | Insert the Seeger ring (12). |
| 10 | Remove the spring (32). |
| 11 | Remove the upper reduction disc (43). |
| 12 | Unscrew and remove the screws (46) from the monitor head. |
| 13 | Remove the regulator head. |
| 14 | Remove and replace the O-rings (34, 29) from the monitor head, lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 15 | Slide out the rod guide assembly (6, 13, 39, 4, 3) by lifting and removing the drive shaft assembly (8, 24, 30, 18, 17, 10, 27, 16, 28, 33, 11).<br>**NOTICE**<br>**This operation is to be carried out simultaneously.** |
| 16 | Remove the relief nut (11). |
| 17 | Remove the relief spring (33). |
| 18 | Remove the anti-friction ring (28). |
| 19 | Remove the spring holder (16). |
| 20 | Unscrew and remove the nut (27). |
| 21 | Slide off the diaphragm protection disc (10). |
| 22 | Remove the diaphragm (17). |
| 23 | Remove the diaphragm holder (18). |
| 24 | Remove and replace the O-ring (30), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 25 | Position the diaphragm holder (18). |




*Built-in monitor PM/518 HP version*

| Step | Operation |
|---|---|
| 26 | Position the replacement diaphragm (17).<br>**NOTICE**<br>**The diaphragm lanyard must be inside the diaphragm seat (17).** |
| 27 | Position the diaphragm protection disc (10).<br>**NOTICE**<br>**The disc beam is positioned toward the diaphragm (17).** |
| 28 | Insert and fasten the nut (27), according to the tightening torque:<br>• Tab. 9.63 |
| 29 | Position the spring holder (16). |
| 30 | Position the anti-friction ring (28). |
| 31 | Position the relief spring (33). |
| 32 | Insert and fasten the nut (11), according to the tightening torque:<br>• Tab. 9.63 |
| 33 | Remove the plug (3). |
| 34 | Slide out the rod (6). |
| 35 | Remove and replace the O-ring (40) from the plug guide (4), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 36 | Insert the rod (6). |
| 37 | Insert the replacement plug (3), according to the tightening torque:<br>• Tab. 9.63 |
| 38 | Remove the lower reduction disc (42). |
| 39 | Remove and replace the O-ring (44) from the lower reduction disc (42), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 40 | Place the lower reduction disc (42) in the intermediate body (5). |
| 41 | Remove and replace the O-ring (47) from the intermediate body (5), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 42 | Place the rod guide assembly (6, 13, 39, 4, 3) inside the intermediate body (5).<br>**NOTICE**<br>**Take care that the pin (23) fixed on the lever (7) is placed inside the shaft groove (6).** |




*Built-in monitor PM/518 HP version*

| Step | Operation |
|---|---|
| 43 | Insert drive shaft assembly (8, 24, 30, 18, 17, 10, 27, 16, 28, 33, 11).<br>**NOTICE**<br>**Take care that the lever (7) is placed between the pin (24) and the rod (8).** |
| 44 | Push the plug (3) inward.<br>**NOTICE**<br>**Check the lowering of the rod (8).** |
| 45 | Remove the valve seat (2) from the body (1). |
| 46 | Remove and replace the O-ring (45) from the valve seat (2), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 47 | Place the valve seat (2) into the body (1), according to the tightening torque:<br>• Tab. 9.63 |
| 48 | Place the replacement O-rings (34, 29) in the monitor head. |
| 49 | Assemble the intermediate body (5) into the body (1). |
| 50 | Insert and fasten the screws (46) of the monitor head, according to the tightening torque:<br>• Tab. 9.63 |
| 51 | Position the upper reduction disc (43). |
| 52 | Place the spring (32). |
| 53 | Place the cover (9). |
| 54 | Insert and fasten the screws (20) into the cover (9), according to the tightening torque:<br>• Tab. 9.63 |
| 55 | Put the cap (35) in place. |

*Tab. 9.69*

**⚠WARNING**

**Make sure that all parts have been assembled correctly.**

## 9.4.5 - SB/518 BUILT-IN SLAM-SHUT VALVE MAINTENANCE PROCEDURE

### 9.4.5.1 - BUILT-IN SB/518 SLAM-SHUT VALVE

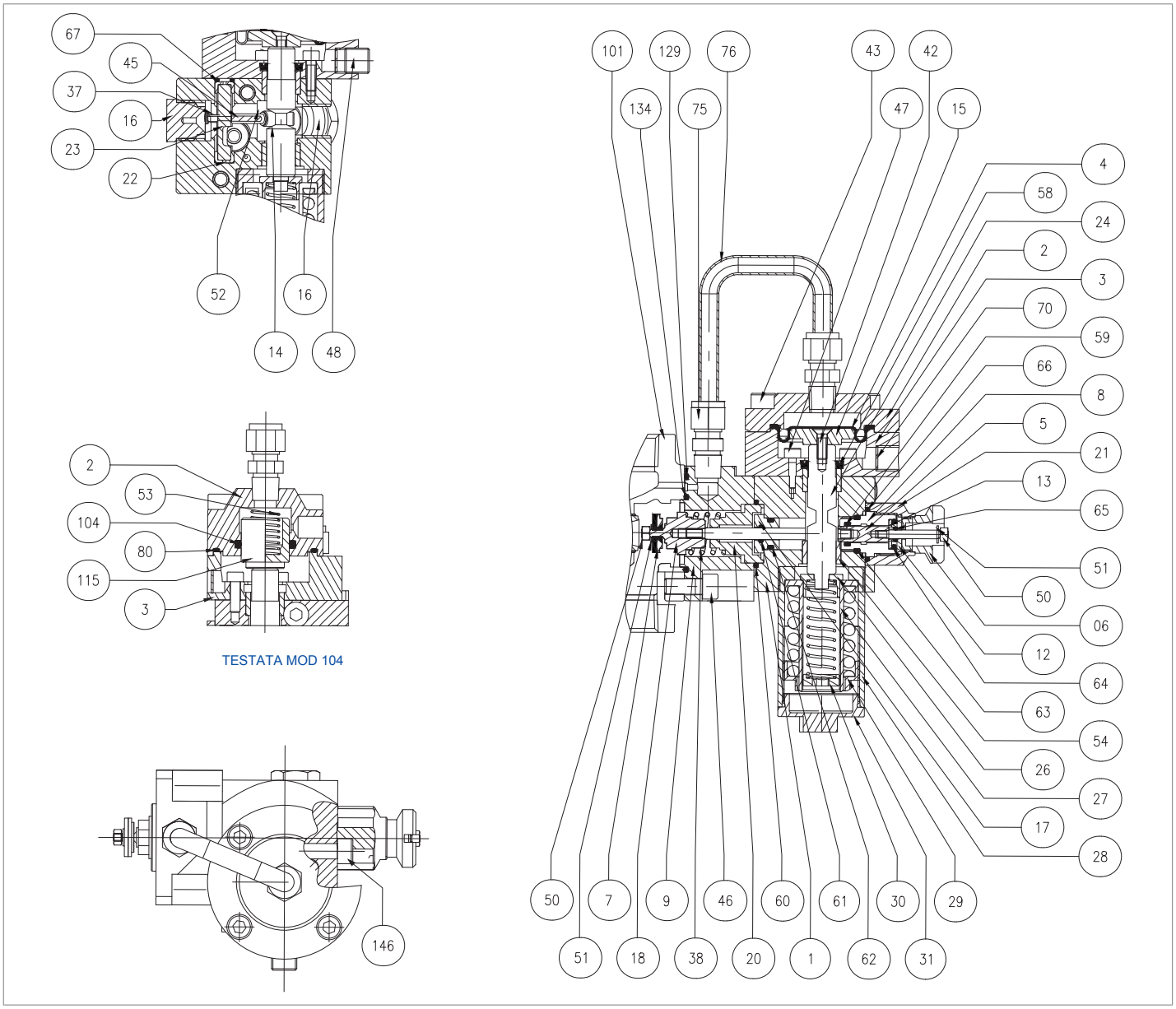
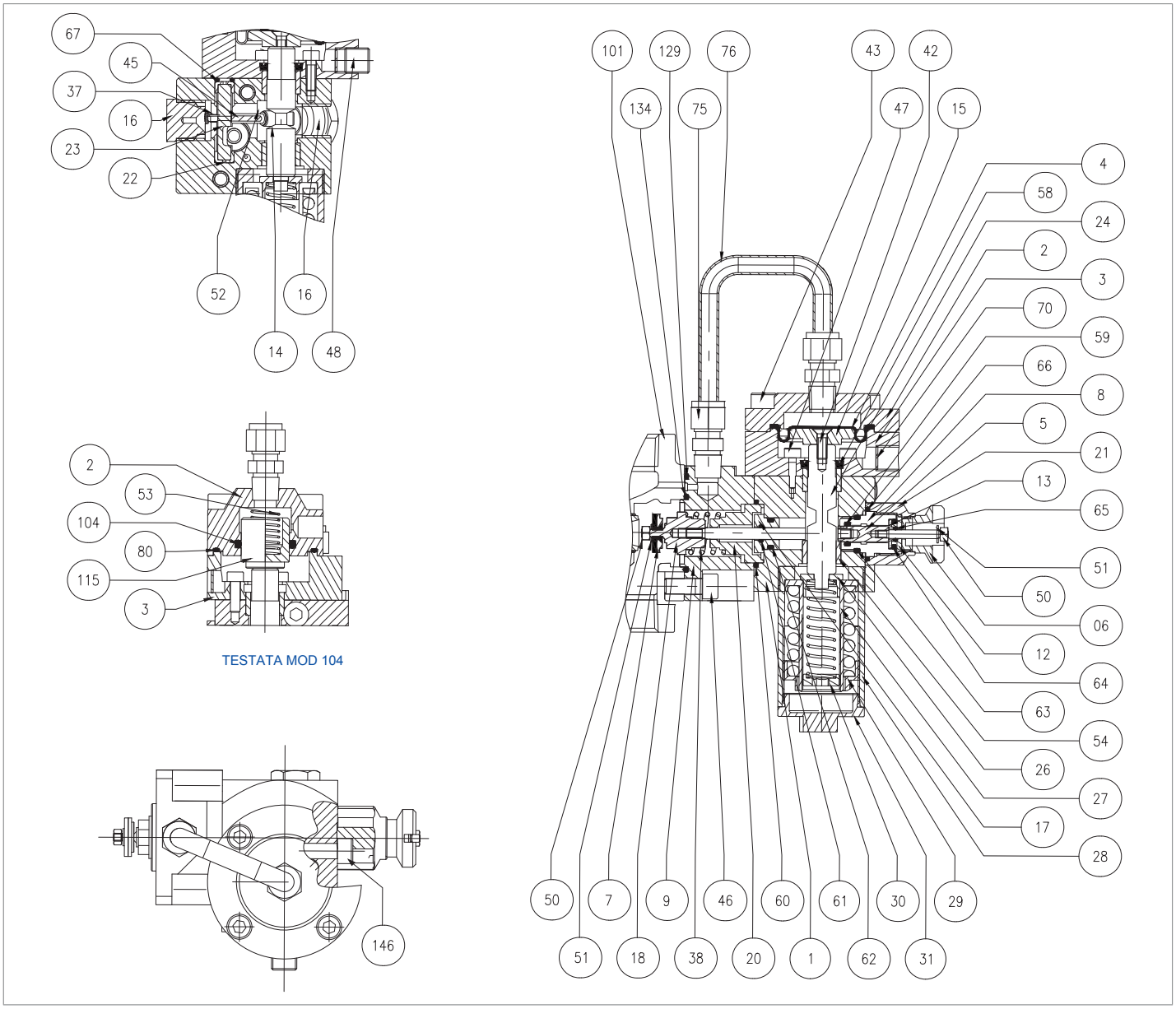


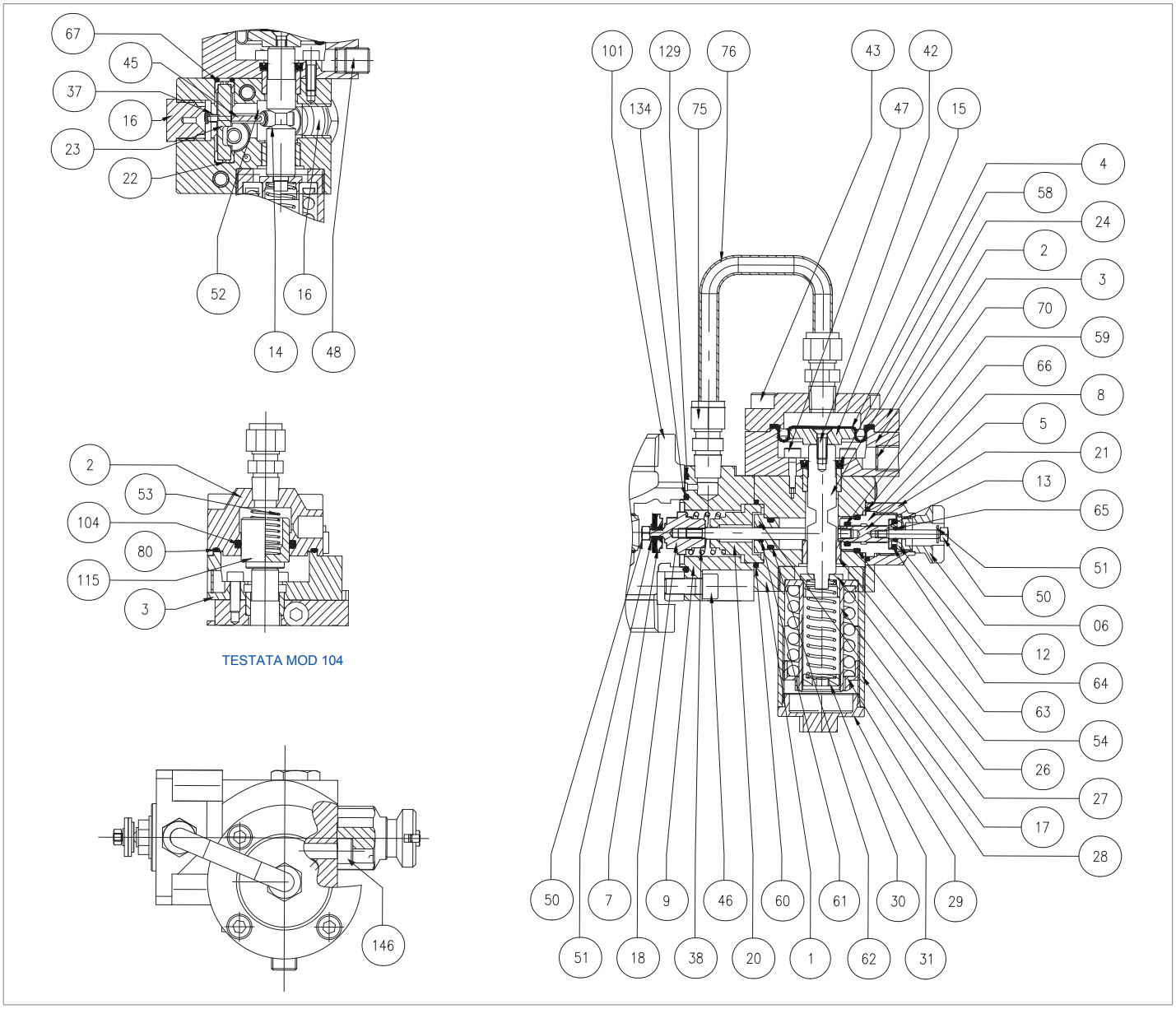

*Fig. 9.39. Built-in SB/518 slam-shut valve*

| Step | Operation |
|---|---|
| 1 | **⚠WARNING**<br>**Check that the slam-shut valve is in the closed position.** |
| 2 | Remove the tube (76) from the sensing line. |
| 3 | Unscrew and remove the screws (146). |
| 4 | Slide the pressure switch off the intermediate flange (9) and place it on a deck with an anti-shock surface. |
| 5 | Unscrew and remove the screws (46). |
| 6 | Remove the intermediate flange (9) from the body (101). |
| 7 | Remove and replace the O-rings (129, 134) from the intermediate flange (9), lubricating them with synthetic grease.<br>***NOTICE***<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 8 | Place the intermediate flange (9) together with the O-rings (129, 134) in the body (101). |
| 9 | Insert and fasten the screws (46), according to the tightening torque:<br>• Tab. 9.64<br>***NOTICE***<br>**Tighten the screws according to the cross pattern in paragraph 9.4.2.2.** |
| 10 | Unscrew and remove the screws (43) from the cover (2). |
| 11 | **VALID FOR PRESSURE SWITCH 104**<br>Remove the cover (2) together with the piston (115), spring (53) and O-rings (104, 80). |
| 12 | **VALID FOR PRESSURE SWITCH 104**<br>Slide out the piston (115) from top to bottom together with the spring (53). |
| 13 | **VALID FOR PRESSURE SWITCH 104**<br>Remove and replace the O-rings (104, 80) from the piston (115), lubricating them with synthetic grease.<br>***NOTICE***<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 14 | **VALID FOR PRESSURE SWITCH 104**<br>Insert the piston (115) together with the spring (53) into the cover (2). |
| 15 | **VALID FOR PRESSURE SWITCH 103**<br>Remove the cover (2). |
| 16 | **VALID FOR PRESSURE SWITCH 103**<br>Remove the diaphragm (4). |
| 17 | **VALID FOR PRESSURE SWITCH 103**<br>Unscrew and remove the screw (42).<br>***NOTICE***<br>**During this step, hold the diaphragm protection disc (15) still.** |



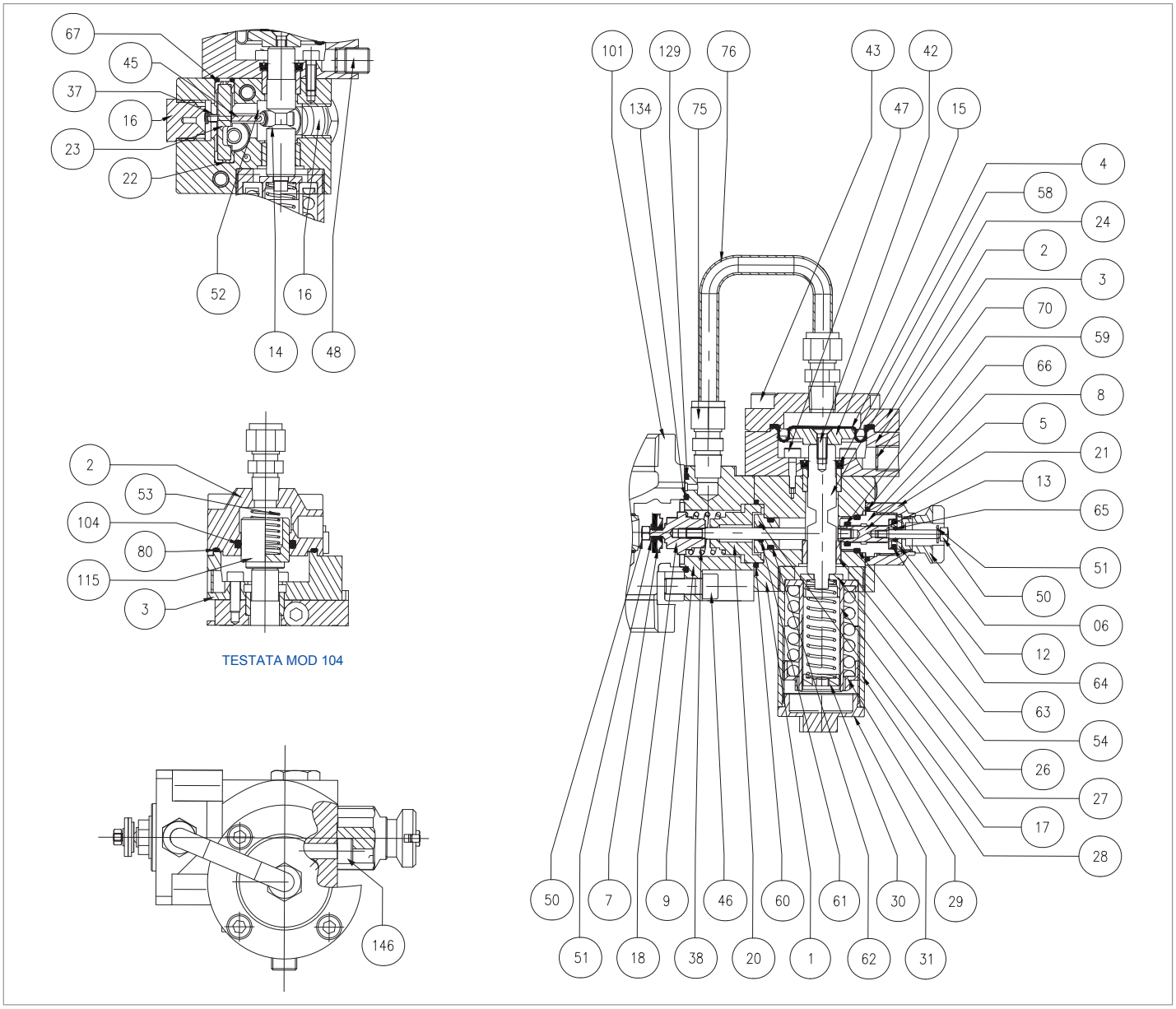

*Built-in SB/518 slam-shut valve*

| Step | Operation |
|---|---|
| 18 | **VALID FOR PRESSURE SWITCH 103**<br>Remove the diaphragm protection disc (15) from the rod (24). |
| 19 | Unscrew and remove the screws (47). |
| 20 | Remove the flange (3) from the slam-shut valve body (1). |
| 21 | Remove the lip ring (58). |
| 22 | Remove and replace the O-ring (67) from the flange (3), lubricating it with synthetic grease.<br>***NOTICE***<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 23 | Unscrew and remove the nut (50) of the gasket (7) together with the washer (51).<br>***NOTICE***<br>**During this step, hold the plug holder (18) in place.** |
| 24 | Remove the gasket (7). |
| 25 | Unscrew and remove nut (50) of reset knob (6) together with washer (51).<br>***NOTICE***<br>**During this step, hold the plug holder (18) in place.** |
| 26 | Slide off from right to left the rod (5), plug holder (18) spring (38), rod guide (20) and valve guide (17) from the body (1). |
| 27 | Remove the reset knob (6) from the lock nut (21). |
| 28 | Unscrew and remove the lock nut (21), O-ring (66) from the balance rod guide (8). |
| 29 | Replace the O-ring (66), lubricating it with synthetic grease.<br>***NOTICE***<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 30 | Unscrew the balancing rod guide (8) together with the protection discs (12, 13) and O-rings (64, 65). |
| 31 | Replace the O-rings (59, 63), lubricating them with synthetic grease.<br>***NOTICE***<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 32 | Remove the protection disc (12). |
| 33 | Remove and replace the O-rings (64, 65) from the protective disc (12), lubricating them with synthetic grease.<br>***NOTICE***<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 34 | Place the protective disc (12). |




*Built-in SB/518 slam-shut valve*

| Step | Operation |
|---|---|
| 35 | Place the balancing rod guide (8), O-rings (59, 63, 64, 65) and protection discs (12, 13). |
| 36 | Unscrew and remove the plug holder (18). |
| 37 | Remove the plug guide (20). |
| 38 | Slide off the valve guide (17) together with the O-rings (61, 62) from the slam-shut valve body (1). |
| 39 | Remove and replace the O-rings (61, 62) from the valve guide (17), lubricating them with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 40 | Place the valve guide (17) and O-rings (61, 62) into the slam-shut valve body (1). |
| 41 | Position the plug guide (20). |
| 42 | Remove and replace the O-ring (60), lubricating it with synthetic grease.<br>**NOTICE**<br>**Before inserting the replacement O-ring, clean the retaining slots with a cleaning solution** |
| 43 | Fix the plug support (18), according to the tightening torque:<br>• Tab. 9.64 |
| 44 | Insert and secure the locking nut (21), together with the O-ring (66), according to the tightening torque:<br>• Tab. 9.64 |
| 45 | Place the reset knob (6) in the lock nut (21). |
| 46 | Place the rod (5), plug holder (18) spring (38), rod guide (20) and valve guide (17) into the body (1) from left to right. |
| 47 | Insert and secure the nut (50) together with the washer (51) in the reset knob (6), according to the tightening torque:<br>• Tab. 9.64<br>**NOTICE**<br>**During this step, manually compress the spring (38).** |
| 48 | Place the gasket (7).<br>**NOTICE**<br>**Place the rubber part of the bypass at the tapered part of the plug holder (18).** |
| 49 | Insert and secure the nut (50) together with the washer (51) of the gasket (7), according to the tightening torque:<br>• Tab. 9.64<br>**NOTICE**<br>**During this step, hold the plug holder (18) in place.** |




*Built-in SB/518 slam-shut valve*

| Step | Operation |
|---|---|
| 50 | Position the replacement lip ring (58).<br>**NOTICE**<br>**The concave part faces the intermediate flange (9).** |
| 51 | Place the flange (3) into the body of the slam-shut valve (1). |
| 52 | Insert and fasten the screws (47), according to the tightening torque:<br>• Tab. 9.64<br>**NOTICE**<br>**Tighten the screws according to the cross pattern in paragraph 9.4.2.2.** |
| 53 | **VALID FOR PRESSURE SWITCH 103**<br>Position the diaphragm protection disc (15). |
| 54 | **VALID FOR PRESSURE SWITCH 103**<br>Insert and fasten the screw (42), according to the tightening torque:<br>• Tab. 9.64 |
| 55 | **VALID FOR PRESSURE SWITCH 103**<br>Place the cover (2) in the flange (3). |
| 56 | **VALID FOR PRESSURE SWITCH 104**<br>Place the cover (2), spring (53), piston (115), O-rings (104, 80) on the flange (3). |
| 57 | Insert and fasten the screws (43), according to the tightening torque:<br>• Tab. 9.64<br>**NOTICE**<br>**Tighten the screws according to the cross pattern in paragraph 9.4.2.2.** |
| 58 | Insert the pressure switch into the intermediate flange (9). |
| 59 | Insert and fasten the screws (146), according to the tightening torque:<br>• Tab. 9.64 |
| 60 | Insert the tube (76) into the sensing line. |

*Tab. 9.70*

**WARNING**

**Make sure that all parts have been assembled correctly.**

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# 10 - FAULT FINDING AND TROUBLESHOOTING

Listed below are the situations (the causes and interventions) that could, over time, occur in the form of malfunctions of various kinds.
These are phenomena related to gas conditions in addition to the natural aging and wear of materials.

## 10.1 - GENERAL WARNINGS

**⚠ DANGER**

**Maintenance operations shall be carried out by qualified personnel:**

- **trained on safety in places also according to the regulations in force at the place of installation of the work equipment;**
- **qualified and authorized for the activities inherent to the equipment.**

**⚠ WARNING**

**No liability related to personal injury or property damage can be attributed to PIETRO FIORENTINI S.p.A. for interventions:**

- **other than those described;**
- **performed in ways other than those indicated;**
- **performed by unsuitable personnel.**

***NOTICE***

**In the event of a malfunction since no qualified personnel are available for the specific task, contact the PIETRO FIORENTINI S.p.A. Authorized Service Center**

## 10.2 - SPECIFIC QUALIFICATION OF THE OPERATOR

| Commissioning | |
|---|---|
| **Operator qualification** | • Mechanical maintenance technician;<br>• Electrical maintenance technician;<br>• Installer;<br>• User technician. |
| **PPE required** |  <br>**⚠WARNING**<br>**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:**<br>• **the regulations in force in the country of installation;**<br>• **any indications provided by the Safety Manager at the installation facility.** |
| **Equipment required** | Refer to chapter “7 - Commissioning/maintenance equipment”. |

*Tab. 10.71*

## 10.3 - TROUBLESHOOTING PROCEDURES

The following steps should be taken for proper troubleshooting:
- close the upstream and downstream shut-off valves;
- refer to the troubleshooting tables listed below.

## 10.4 - TROUBLESHOOTING TABLES

**NOTICE**

**Refer to chapter “9 - Maintenance and functional testing” for pictures of the regulator FT 518 and its accessories.**

### 10.4.1 - FT 518 REGULATOR TROUBLESHOOTING

| Fault | Equipment | Possible causes | Intervention |
|---|---|---|---|
| **Operating faults** | FT 518 LP | Diaphragm (17) worn out | Replace |
| | | Spring (32) snared or out of plane | Reposition and replace if required |
| | | AC out of class due to spring (32) not suitable | Replace |
| | | SG out of class due to dirty or worn plug (45) | Clean and if necessary replace |
| | | Incorrect rod (6) and lever (7) attachment | Verify assembly |
| | | Incorrect coupling of drive shaft (8) and lever (7) | Verify assembly |
| | | Rod (6) ruined | Check and if necessary replace |
| | | Bushing (39) ruined | Check and if necessary replace |
| | FT 518 HP | Diaphragm (17) worn out | Replace |
| | | Spring (32) snared or out of plane | Reposition and replace if required |
| | | AC out of class due to spring (32) not suitable | Replace |
| | | SG out of class due to dirty or worn plug (45) | Clean and if necessary replace |
| | | Incorrect rod (6) and lever (7) attachment | Verify assembly |
| | | Incorrect coupling of drive shaft (8) and lever (7) | Verify assembly |
| | | Rod (6) ruined | Check and if necessary replace |
| | | Bushing (39) ruined | Check and if necessary replace |
| | | Interface between diaphragm holder (16) and upper reduction disc (43) ruined | Check and if necessary replace |

| Fault | Equipment | Possible causes | Intervention |
|---|---|---|---|
| **Lack of tightness or zero flow rate** | FT 518 LP | Plug (3) damaged | Replace |
| | | Diaphragm holder group (10, 17, 18, 27) blocked | Check coupling with lever (7), clean and reassemble if necessary |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Check attachment with lever (7), clean and reposition if necessary |
| | FT 518 HP | Plug (3) damaged | Replace |
| | | Diaphragm holder group (10, 17, 18, 27) blocked | Check coupling with lever (7), clean and reassemble if necessary |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Check attachment with lever (7), clean and reposition if necessary |
| **Downstream pressure increases during delivery** | FT 518 LP | Diaphragm holder group (10, 17, 18, 27) blocked | Check coupling with lever (7), clean and reassemble if necessary |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Check attachment with lever (7), clean and reposition if necessary |
| | | Downstream sensing line obstructed | Clean |
| | | Plug (17) damaged | Replace |
| | FT 518 HP | Diaphragm holder group (10, 17, 18, 27) blocked | Check attachment with lever (7), clean and reposition if necessary |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Check attachment with lever (7), clean and reposition if necessary |
| | | Downstream sensing line obstructed | Clean |
| | | Plug (17) damaged | Replace |
| **Downstream pressure decreases during delivery** | FT 518 LP | Diaphragm holder group (10, 17, 18, 27) blocked | Reassemble |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Reassemble |
| | | Downstream sensing line obstructed | Clean |
| | | Plug (17) damaged | Replace |
| | FT 518 HP | Diaphragm holder group (10, 17, 18, 27) blocked | Reassemble |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Reassemble |
| | | Downstream sensing line obstructed | Clean |
| | | Plug (17) damaged | Replace |

| Fault | Equipment | Possible causes | Intervention |
|---|---|---|---|
| **External leakage** | FT 518 LP | Sealing failure of the O-ring (29) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (30) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (34) | Clean and if necessary replace |
| | | Diaphragm (17) damaged | Replace |
| | | Screws (20) not tightened according to the tightening torque | Fasten the screws according to the tightening torque in Tab. 9.62 |
| | | Screws (46) not tightened according to the tightening torque | Fasten the screws according to the tightening torque in Tab. 9.62 |
| | FT 518 HP | Sealing failure of the O-ring (29) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (30) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (34) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (44) | Clean and if necessary replace |
| | | Diaphragm (17) damaged | Replace |
| | | Screws (20) not tightened according to the tightening torque | Fasten the screws according to the tightening torque in Tab. 9.62 |
| | | Screws (46) not tightened according to the tightening torque | Fasten the screws according to the tightening torque in Tab. 9.62 |

*Tab. 10.72.*

### 10.4.2 - TROUBLESHOOTING FT 518 WITH IN-LINE MONITOR FUNCTION

| Fault | Equipment | Possible causes | Intervention |
|---|---|---|---|
| **Operating faults** | FT 518 LP/M | Diaphragm (17) worn out | Replace |
| | | Spring (32) snared or out of plane | Reposition and replace if required |
| | | AC out of class due to spring (32) not suitable | Replace |
| | | SG out of class due to dirty or worn plug (45) | Clean and if necessary replace |
| | | Incorrect rod (6) and lever (7) attachment | Verify assembly |
| | | Incorrect coupling of drive shaft (8) and lever (7) | Verify assembly |
| | | Rod (6) ruined | Check and if necessary replace |
| | | Bushing (39) ruined | Check and if necessary replace |
| | | Downstream pressure (Pd) increases when the main regulator is in the closed position and the in-line monitor in the open position | Check the condition of the O-rings (40, 41) and replace if necessary |
| | FT 518 HP/M | Diaphragm (17) worn out | Replace |
| | | Spring (32) snared or out of plane | Reposition and replace if required |
| | | AC out of class due to spring (32) not suitable | Replace |
| | | SG out of class due to dirty or worn plug (45) | Clean and if necessary replace |
| | | Incorrect rod (6) and lever (7) attachment | Verify assembly |
| | | Incorrect coupling of drive shaft (8) and lever (7) | Verify assembly |
| | | Rod (6) ruined | Check and if necessary replace |
| | | Bushing (39) ruined | Check and if necessary replace |
| | | Interface between diaphragm holder (16) and upper reduction disc (43) ruined | Check and if necessary replace |
| | | Downstream pressure (Pd) increases when the main regulator is in the closed position and the in-line monitor in the open position | Check the condition of the O-rings (40, 41) and replace if necessary |

| Fault | Equipment | Possible causes | Intervention |
|---|---|---|---|
| **Lack of tightness or zero flow rate** | FT 518 LP/M | Plug (3) damaged | Replace |
| | | Diaphragm holder group (10, 17, 18, 27) blocked | Check coupling with lever (7), clean and reassemble if necessary |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Check attachment with lever (7), clean and reposition if necessary |
| | FT 518 HP/M | Plug (3) damaged | Replace |
| | | Diaphragm holder group (10, 17, 18, 27) blocked | Check coupling with lever (7), clean and reassemble if necessary |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Check attachment with lever (7), clean and reposition if necessary |
| **Downstream pressure increases during delivery** | FT 518 LP/M | Diaphragm holder group (10, 17, 18, 27) blocked | Check coupling with lever (7), clean and reassemble if necessary |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Check attachment with lever (7), clean and reposition if necessary |
| | | Downstream sensing line obstructed | Clean |
| | | Plug (17) damaged | Replace |
| | FT 518 HP/M | Diaphragm holder group (10, 17, 18, 27) blocked | Check attachment with lever (7), clean and reposition if necessary |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Check attachment with lever (7), clean and reposition if necessary |
| | | Downstream sensing line obstructed | Clean |
| | | Plug (17) damaged | Replace |
| **Downstream pressure decreases during delivery** | FT 518 LP/M | Diaphragm holder group (10, 17, 18, 27) blocked | Reassemble |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Reassemble |
| | | Downstream sensing line obstructed | Clean |
| | | Plug (17) damaged | Replace |
| | FT 518 HP/M | Diaphragm holder group (10, 17, 18, 27) blocked | Reassemble |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Reassemble |
| | | Downstream sensing line obstructed | Clean |
| | | Plug (17) damaged | Replace |

| Fault | Equipment | Possible causes | Intervention |
|---|---|---|---|
| **External leakage** | FT 518 LP | Sealing failure of the O-ring (29) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (30) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (34) | Clean and if necessary replace |
| | | Diaphragm (17) damaged | Replace |
| | | Screws (20) not tightened according to the tightening torque | Fasten the screws according to the tightening torque in Tab. 9.62 |
| | | Screws (46) not tightened according to the tightening torque | Fasten the screws according to the tightening torque in Tab. 9.62 |
| | FT 518 HP | Sealing failure of the O-ring (29) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (30) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (34) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (44) | Clean and if necessary replace |
| | | Diaphragm (17) damaged | Replace |
| | | Screws (20) not tightened according to the tightening torque | Fasten the screws according to the tightening torque in Tab. 9.62 |
| | | Screws (46) not tightened according to the tightening torque | Fasten the screws according to the tightening torque in Tab. 9.62 |

*Tab. 10.73.*

### 10.4.3 - TROUBLESHOOTING BUILT-IN MONITOR PM/518

| Fault | Equipment | Possible causes | Intervention |
|---|---|---|---|
| **Operating faults** | FT 518 + PM/518 LP | Diaphragm (17) worn out | Replace |
| | | Spring (32) snared or out of plane | Reposition and replace if required |
| | | AC out of class due to spring (32) not suitable | Replace |
| | | SG out of class due to dirty or worn plug (45) | Clean and if necessary replace |
| | | Incorrect rod (6) and lever (7) attachment | Verify assembly |
| | | Incorrect coupling of drive shaft (8) and lever (7) | Verify assembly |
| | | Rod (6) ruined | Check and if necessary replace |
| | | Bushing (39) ruined | Check and if necessary replace |
| | | Downstream pressure increases in closure | Check the condition of the O-ring (40) and replace if necessary |
| | FT 518 + PM/518 HP | Diaphragm (17) worn out | Replace |
| | | Spring (32) snared or out of plane | Reposition and replace if required |
| | | AC out of class due to spring (32) not suitable | Replace |
| | | SG out of class due to dirty or worn plug (45) | Clean and if necessary replace |
| | | Incorrect rod (6) and lever (7) attachment | Verify assembly |
| | | Incorrect coupling of drive shaft (8) and lever (7) | Verify assembly |
| | | Rod (6) ruined | Check and if necessary replace |
| | | Bushing (39) ruined | Check and if necessary replace |
| | | Interface between diaphragm holder (16) and upper reduction disc (43) ruined | Check and if necessary replace |
| | | Downstream pressure increases in closure | Check the condition of the O-ring (40) and replace if necessary |

| Fault | Equipment | Possible causes | Intervention |
|---|---|---|---|
| **Lack of tightness or zero flow rate** | FT 518 + PM/518 LP | Plug (3) damaged | Replace |
| | | Diaphragm holder group (10, 17, 18, 27) blocked | Check coupling with lever (7), clean and reassemble if necessary |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Check attachment with lever (7), clean and reposition if necessary |
| | FT 518 + PM/518 HP | Plug (3) damaged | Replace |
| | | Diaphragm holder group (10, 17, 18, 27) blocked | Check coupling with lever (7), clean and reassemble if necessary |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Check attachment with lever (7), clean and reposition if necessary |
| **Downstream pressure increases during delivery** | FT 518 + PM/518 LP | Diaphragm holder group (10, 17, 18, 27) blocked | Check coupling with lever (7), clean and reassemble if necessary |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Check attachment with lever (7), clean and reposition if necessary |
| | | Downstream sensing line obstructed | Clean |
| | | Plug (17) damaged | Replace |
| | FT 518 + PM/518 HP | Diaphragm holder group (10, 17, 18, 27) blocked | Check attachment with lever (7), clean and reposition if necessary |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Check attachment with lever (7), clean and reposition if necessary |
| | | Downstream sensing line obstructed | Clean |
| | | Plug (17) damaged | Replace |
| **Downstream pressure decreases during delivery** | FT 518 + PM/518 LP | Diaphragm holder group (10, 17, 18, 27) blocked | Reassemble |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Reassemble |
| | | Downstream sensing line obstructed | Clean |
| | | Plug (17) damaged | Replace |
| | FT 518 + PM/518 HP | Diaphragm holder group (10, 17, 18, 27) blocked | Reassemble |
| | | Rod guide assembly (3, 4, 6, 13, 22, 29, 34, 39) blocked | Reassemble |
| | | Downstream sensing line obstructed | Clean |
| | | Plug (17) damaged | Replace |

| Fault | Equipment | Possible causes | Intervention |
|---|---|---|---|
| **External leakage** | FT 518 + PM/518 LP | Sealing failure of the O-ring (29) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (30) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (34) | Clean and if necessary replace |
| | | Diaphragm (17) damaged | Replace |
| | | Screws (20) not tightened according to the tightening torque | Fasten the screws according to the tightening torque in Tab. 9.62 |
| | | Screws (46) not tightened according to the tightening torque | Fasten the screws according to the tightening torque in Tab. 9.62 |
| | FT 518 + PM/518 HP | Sealing failure of the O-ring (29) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (30) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (34) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (44) | Clean and if necessary replace |
| | | Diaphragm (17) damaged | Replace |
| | | Screws (20) not tightened according to the tightening torque | Fasten the screws according to the tightening torque in Tab. 9.63 |
| | | Screws (46) not tightened according to the tightening torque | Fasten the screws according to the tightening torque in Tab. 9.63 |

*Tab. 10.74.*

### 10.4.4 - TROUBLESHOOTING BUILT-IN SB/518 SLAM-SHUT VALVE

**⚠WARNING**

**If the built-in slam-shut valve has tripped, close the inlet and outlet valves (V1 and V2) of the line and relieve the pressure before any operation.**

| Fault | Equipment | Possible causes | Intervention |
|---|---|---|---|
| **Operating fault** | BUILT-IN SLAM-SHUT VALVE | Diaphragm (4) worn out | Replace |
| | | Calibration springs snared or out of plane | Reposition and replace if required |
| | | AG out of intervention class due to unsuitable calibration springs | Replace |
| | | Sealing failure due to dirty or worn plug (7) | Clean and if necessary replace |
| **Sealing failure** | BUILT-IN SLAM-SHUT VALVE | Plug (7) damaged | Replace |
| **External leakage** | BUILT-IN SLAM-SHUT VALVE | Sealing failure of the O-ring (29) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (34) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (60) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (63) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (65) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (66) | Clean and if necessary replace |
| | | Sealing failure of the O-ring (67) | Clean and if necessary replace |
| **Failure to rearm** | BUILT-IN SLAM-SHUT VALVE | The downstream pressure is not consistent with the min. and/or max. slam-shut setting | Adjust the downstream pressure and reset the slam-shut valve |
| | | Broken or chipped levers | Change the standard box containing the entire assembly |
| **Incorrect release pressure** | BUILT-IN SLAM-SHUT VALVE | Incorrect max and/or min spring calibration. | Perform the calibration again by turning the ring nuts. If minimum calibration is also required, recalibrate the maximum and minimum springs several times in this sequence |
| | | Lever mechanisms with friction | Change the standard box containing the entire assembly |

*Tab. 10.75*

# 11 - UNINSTALLATION AND DISPOSAL

## 11.1 - 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.**

## 11.2 - QUALIFICATION OF THE OPERATORS IN CHARGE

| Commissioning | |
|---|---|
| **Operator qualification** | Installer |
| **PPE required** |  <br>**WARNING**<br>**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:**<br>• **the regulations in force in the country of installation;**<br>• **any indications provided by the Safety Manager at the installation facility.** |
| **Equipment required** | Refer to chapter “7 - Commissioning/maintenance equipment”. |

*Tab. 11.76*

## 11.3 - UNINSTALLING

**⚠CAUTION**

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

***NOTICE***

**Refer to the installation procedures for uninstalling the equipment (see chapter "6 - Installation") by proceeding in reverse order.**

## 11.4 - INFORMATION NEEDED IN CASE OF RE-INSTALLATION

***NOTICE***

**In case the equipment after uninstallation is to be reused, refer to chapter:**

- **"6 - Installation";**
- **"8 - Commissioning".**

## 11.5 - DISPOSAL INFORMATION

**NOTICE**

**Please remember to comply with the laws 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.**

**NOTICE**

**Proper disposal avoids harm to humans and the environment and promotes the reuse of valuable raw materials.**

The equipment is made of materials that can be recycled by specialized companies.
For proper disposal of the equipment, proceed as shown in Tab. 11.77:

| 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. 11.77*

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

| Material | Disposal/recycling directions |
|---|---|
| **Plastic** | It must be disassembled and disposed of separately. |
| **Lubricants/Oils** | They must be collected and delivered to the appropriate specialized and authorized collection and disposal centers. |
| **Iron** | Dismantle and collect separately.<br>It must be recycled through the appropriate collection centers. |
| **Steel** | Dismantle and collect separately.<br>It must be recycled through the appropriate collection centers. |
| **Aluminum** | Dismantle and collect separately.<br>It must be recycled through the appropriate collection centers. |
| **Pneumatic/electrical components** | They will have to be disassembled to be reused in case they are still in good condition or, if possible, overhauled and recycled. |

*Tab. 11.78*

**NOTICE**

**Refer to “9 - Maintenance and functional testing” to best identify the composition of the equipment and its parts.**

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# 12 - RECOMMENDED SPARE PARTS

## 12.1 - GENERAL WARNINGS

***NOTICE***

**By using spare parts without PIETRO FIORENTINI S.p.A. trademark, the stated performance cannot be guaranteed.**
**It is recommended to use the original PIETRO FIORENTINI S.p.A. spare parts**
**PIETRO FIORENTINI S.p.A. is not responsible for damage caused by the use of non-original spare parts or components.**

## 12.2 - HOW TO REQUEST SPARE PARTS

***NOTICE***

**For specific information, consult the PIETRO FIORENTINI S.p.A. sales network**

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# 13 - CALIBRATION AND FLOW RATE TABLES

## 13.1 - FT 518 REGULATOR CALIBRATION TABLES

| FT 518 LP | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pos.** | **Spring article code** | **Spring color** | **d** | **Lo** | **De** | **Min.** | **Max** |
| **1** | 2701270 | Grey | 3.5 | 100 | 35 | 5.0036 | 9.9927 |
| **2** | 2701541 | White | 4. | | | 10.0073 | 20 |
| **3** | 2701800 | Yellow | 4.5 | | | 20.0145 | 31.9942 |
| **4** | 2702080 | Orange | 5 | | | 32.0087 | 49.9927 |
| **5** | 2702290 | Red | 5.5 | | | 50.0073 | 80 |
| **6** | 2702460 | Green | 6 | | | 80.0145 | 124.9891 |
| **d =** Wire Diameter (mm) **Lo =** Spring Length (mm) **De =** External Diameter (mm) | | | | | | | |

*Tab. 13.79*

| FT 518 HP | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pos.** | **Spring article code** | **Spring color** | **d** | **Lo** | **De** | **Min.** | **Max** |
| **1** | 2702460 | Green | 6 | 100 | 35 | 109.9927 | 219.9855 |
| **2** | 2702660 | Black | 6.5 | | | 220 | 319.9855 |
| **3** | 2702820 | Blue | 7 | | | 320 | 499.9855 |
| **d =** Wire Diameter (mm) **Lo =** Spring Length (mm) **De =** External Diameter (mm) | | | | | | | |

*Tab. 13.80*

## 13.2 - SB/518 SLAM-SHUT VALVE CALIBRATION TABLES

Calibration tables of possible pressure switches in built-in slam-shut valves are provided below:

| SB/518 Mod. 103 - Max pressure | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pos.** | **Spring article code** | **Spring color** | **d** | **Lo** | **De** | **Min.** | **Max** |
| **1** | 2701040 | White/Orange | 3 | 60 | 35 | 14.5033 | 17.4039 |
| **2** | 2701260 | White | 3.5 | | | 17.4184 | 29.005 |
| **3** | 2701530 | Yellow | 4 | | | 29.021 | 52.2117 |
| **4** | 2701790 | Yellow/Black | 4.5 | | | 52.2263 | 87.0196 |
| **5** | 2702070 | Orange | 5 | | | 87.0341 | 108.7745 |
| **6** | 2702280 | White/Red | 5.5 | | | 108.789 | 159.5359 |
| **d =** Wire Diameter (mm) **Lo =** Spring Length (mm) **De =** External Diameter (mm) | | | | | | | |

*Tab. 13.81*

| SB/518 Mod. 103 - Min pressure | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pos.** | **Spring article code** | **Spring color** | **d** | **Lo** | **De** | **Min.** | **Max** |
| **1** | 2700513 | Red | 2 | 40 | 15 | 5.8013 | 14.5033 |
| **2** | 2700713 | Green | 2.3 | | | 14.5178 | 26.1059 |
| **3** | 2700750 | Black | 2.5 | | | 26.1204 | 39.1588 |
| **4** | 2700985 | Brown | 3 | | | 29.1733 | 98.6222 |
| **d =** Wire Diameter (mm) **Lo =** Spring Length (mm) **De =** External Diameter (mm) | | | | | | | |

*Tab. 13.82*

| SB/518 Mod. 104 - Max pressure | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pos.** | **Spring article code** | **Spring color** | **d** | **Lo** | **De** | **Min.** | **Max** |
| **1** | 2701790 | Yellow/Black | 4.5 | 60 | 35 | 145.0326 | 217.5489 |
| **2** | 2702070 | Orange | 5 | | | 217.5635 | 261.0587 |
| **3** | 2702280 | White/Red | 5.5 | | | 261.0732 | 558.3756 |
| **d =** Wire Diameter (mm) **Lo =** Spring Length (mm) **De =** External Diameter (mm) | | | | | | | |

*Tab. 13.83*

| SB/518 Mod. 104 - Min pressure | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Pos.** | **Spring article code** | **Spring color** | **d** | **Lo** | **De** | **Min.** | **Max** |
| **1** | 2700750 | Black | 2.5 | 40 | 15 | 65.2647 | 98.6222 |
| **2** | 2700985 | Brown | 3 | | | 98.6367 | 298.7672 |
| **d =** Wire Diameter (mm) **Lo =** Spring Length (mm) **De =** External Diameter (mm) | | | | | | | |

*Tab. 13.84*

## 13.3 - FT 518 REGULATOR FLOW RATE TABLES

### 13.3.1 - FT 518 - 3/32 STD - LP - 3/4”

| FT 518 3/32 STD - LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1000 | 1000 | 1000 | 1000 | - |
| 150 | 1400 | 1400 | 1400 | 1400 | 1200 |
| 200 | 1800 | 1800 | 1800 | 1800 | 1800 |
| 300 | 2700 | 2700 | 2900 | 2700 | 2600 |
| 500 | 4300 | 4300 | 4400 | 4100 | 4100 |
| 750 | 6400 | 6400 | 6400 | 6400 | 6200 |
| 1000 | 8700 | 8900 | 8900 | 8900 | 8500 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.85*

| FT 518 3/32 STD - LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1300 | 1300 | 1300 | 1300 | - |
| 150 | 1900 | 1900 | 1900 | 1900 | 1900 |
| 200 | 2500 | 2500 | 2500 | 2500 | 2500 |
| 300 | 3600 | 3600 | 3600 | 3600 | 3600 |
| 500 | 5800 | 5800 | 5800 | 5800 | 5800 |
| 750 | 8600 | 8600 | 8600 | 8600 | 8600 |
| 1000 | 11400 | 11400 | 11400 | 11400 | 11400 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.86*

### 13.3.2 - FT 518 - 1/8 STD - LP - 3/4”

| FT 518 1/8 STD - LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1800 | 1500 | 1700 | 1700 | - |
| 150 | 2500 | 2500 | 2500 | 2500 | 2200 |
| 200 | 3200 | 3200 | 3400 | 3200 | 3200 |
| 300 | 4600 | 4600 | 4800 | 4500 | 4500 |
| 500 | 7800 | 7800 | 7600 | 7600 | 7500 |
| 750 | 11700 | 11700 | 11200 | 11300 | 11300 |
| 1000 | 13500 | 14500 | 15600 | 13500 | 14900 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.87*

| FT 518 1/18 STD - LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 2300 | 2300 | 2300 | 2200 | - |
| 150 | 3300 | 3300 | 3300 | 3300 | 2400 |
| 200 | 4300 | 4300 | 4300 | 4300 | 4100 |
| 300 | 6300 | 6300 | 6300 | 6300 | 6300 |
| 500 | 10300 | 10300 | 10300 | 10300 | 10300 |
| 750 | 15300 | 15300 | 15300 | 15300 | 15300 |
| 1000 | 20200 | 20200 | 20200 | 20200 | 20200 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.88*

### 13.3.3 - FT 518 - 3/16 STD - LP - 3/4”

| FT 518 3/16 STD - LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 4300 | 3800 | 3900 | 3600 | - |
| 150 | 5300 | 5300 | 5700 | 5300 | 5000 |
| 200 | 6800 | 7100 | 7500 | 7100 | 7100 |
| 300 | 8900 | 9900 | 10600 | 10300 | 10300 |
| 500 | 9800 | 12400 | 18100 | 17000 | 17000 |
| 750 | 10600 | 14900 | 19100 | 24800 | 25500 |
| 1000 | - | 17700 | 19500 | 29700 | 32900 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.89*

| FT 518 3/16 STD - LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 4900 | 4900 | 4900 | 4600 | - |
| 150 | 7000 | 7000 | 7000 | 7000 | 5100 |
| 200 | 9100 | 9100 | 9100 | 9100 | 8600 |
| 300 | 13400 | 13400 | 13400 | 13400 | 13400 |
| 500 | 21800 | 21800 | 21800 | 21800 | 21800 |
| 750 | 32400 | 32400 | 32400 | 32400 | 32400 |
| 1000 | - | 42900 | 42900 | 42900 | 42900 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.90*

### 13.3.4 - FT 518 1/4 STD - LP - 3/4”

| FT 518 1/4 STD - LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 6400 | 6800 | 6200 | 6600 | - |
| 150 | 7100 | 9900 | 10300 | 9900 | 8200 |
| 200 | 7500 | 11700 | 12800 | 12800 | 12400 |
| 300 | 9200 | 12400 | 17700 | 19100 | 18400 |
| 500 | 9900 | 14500 | 26500 | 27600 | 30100 |
| 750 | - | 15600 | 28300 | 29400 | 47000 |
| 1000 | - | 19500 | 30100 | 30400 | 49500 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.91*

| FT 518 1/4 STD - LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 8300 | 8300 | 8300 | 7900 | - |
| 150 | 11900 | 11900 | 11900 | 11900 | 8700 |
| 200 | 15500 | 15500 | 15500 | 15500 | 14700 |
| 300 | 22700 | 22700 | 22700 | 22700 | 22700 |
| 500 | 34200 | 37200 | 37200 | 37200 | 37200 |
| 750 | - | 48300 | 55200 | 55200 | 55200 |
| 1000 | - | 48300 | 62400 | 73200 | 73200 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.92*

### 13.3.5 - FT 518 - 3/8 STD - LP - 3/4”

| FT 518 3/8 STD - LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 7500 | 12100 | 12400 | 11700 | - |
| 150 | 7800 | 13800 | 14500 | 17700 | 15600 |
| 200 | 10600 | 14500 | 15600 | 24800 | 21200 |
| 300 | - | 16300 | 28300 | 26500 | 31800 |
| 500 | - | 24800 | 31800 | 28300 | 42400 |
| 750 | - | - | 35400 | 35400 | 49500 |
| 1000 | - | - | - | 38900 | 53000 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.93*

| FT 518 3/8 STD - LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 16400 | 16400 | 16400 | 15500 | - |
| 150 | 23600 | 23600 | 23600 | 23600 | 17200 |
| 200 | 30700 | 30700 | 30700 | 30700 | 29100 |
| 300 | - | 45000 | 45000 | 45000 | 45000 |
| 500 | - | 48300 | 62400 | 73600 | 73600 |
| 750 | - | - | 62400 | 104900 | 109400 |
| 1000 | - | - | - | 104900 | 145100 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.94*

### 13.3.6 - FT 518 1/2 STD - LP - 3/4”

| FT 518 1/2 STD - LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 9200 | 19500 | 19500 | 17700 | - |
| 150 | 9900 | 24100 | 24800 | 23000 | 18400 |
| 200 | - | 26500 | 26500 | 26500 | 24100 |
| 300 | - | 28300 | 30100 | 30100 | 35400 |
| 500 | - | - | 35400 | 35400 | 51200 |
| 750 | - | - | - | 46000 | 67100 |
| 1000 | - | - | - | - | 70700 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.95*

| FT 518 1/2 STD - LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 25700 | 25700 | 25700 | 24300 | - |
| 150 | 34200 | 36900 | 36900 | 36900 | 26900 |
| 200 | - | 48100 | 48100 | 48100 | 45500 |
| 300 | - | 48300 | 62400 | 70500 | 70500 |
| 500 | - | - | 62400 | 104900 | 115200 |
| 750 | - | - | - | 104900 | 171200 |
| 1000 | - | - | - | - | 198300 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.96*

### 13.3.7 - FT 518 3/32 STD - HP - 3/4”

| FT 518 3/32 STD - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 1300 | - | - | - | - |
| 200 | 1700 | 1500 | - | - | - |
| 300 | 2500 | 2700 | 2700 | - | - |
| 400 | 3800 | 3400 | 3600 | 3400 | - |
| 500 | 3900 | 4100 | 3900 | 4300 | - |
| 750 | 5900 | 6200 | 6100 | 6600 | 6600 |
| 1000 | 7500 | 7600 | 8200 | 8900 | 8900 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.97*

| FT 518 3/32 STD - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 1600 | - | - | - | - |
| 200 | 2400 | 2100 | - | - | - |
| 300 | 3600 | 3500 | 3300 | - | - |
| 400 | 4700 | 4700 | 4700 | 4000 | - |
| 500 | 5800 | 5800 | 5800 | 5600 | - |
| 750 | 8600 | 8600 | 8600 | 8600 | 8000 |
| 1000 | 11400 | 11400 | 11400 | 11400 | 11300 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.98*

### 13.3.8 - FT 518 1/8 STD - HP - 3/4”

| FT 518 1/8 STD - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 2000 | - | - | - | - |
| 200 | 3100 | 3100 | - | - | - |
| 300 | 3900 | 4600 | 4600 | - | - |
| 400 | 5500 | 5500 | 6100 | 6100 | - |
| 500 | 6800 | 7500 | 7500 | 7500 | - |
| 750 | 9600 | 11300 | 11300 | 11300 | 11900 |
| 1000 | 12200 | 14500 | 15200 | 16100 | 16100 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.99*

| FT 518 1/8 STD - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 2900 | - | - | - | - |
| 200 | 4200 | 3700 | - | - | - |
| 300 | 6300 | 6300 | 5800 | - | - |
| 400 | 8300 | 8300 | 8200 | 7100 | - |
| 500 | 10300 | 10300 | 10300 | 9900 | - |
| 750 | 15300 | 15300 | 15300 | 15300 | 14200 |
| 1000 | 20200 | 20200 | 20200 | 20200 | 20100 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.100*

### 13.3.9 - FT 518 3/16 STD - HP - 3/4”

| FT 518 3/16 STD - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 4800 | - | - | - | - |
| 200 | 6800 | 6200 | - | - | - |
| 300 | 9400 | 10600 | 10600 | - | - |
| 400 | 14200 | 14200 | 14200 | 13500 | - |
| 500 | 16300 | 17400 | 17400 | 17200 | - |
| 750 | 17700 | 25800 | 25100 | 26500 | 26900 |
| 1000 | 21900 | 35400 | 33900 | 35400 | 34300 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.101*

| FT 518 3/16 STD - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 6000 | - | - | - | - |
| 200 | 8900 | 7700 | - | - | - |
| 300 | 13400 | 13200 | 12400 | - | - |
| 400 | 17600 | 17600 | 17500 | 15100 | - |
| 500 | 21800 | 21800 | 21800 | 21000 | - |
| 750 | 32400 | 32400 | 32400 | 32400 | 30200 |
| 1000 | 42900 | 42900 | 42900 | 42900 | 42700 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.102*

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### 13.3.10 - FT 518 1/4 STD - HP - 3/4”

| FT 518 1/4 STD - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 6200 | - | - | - | - |
| 200 | 11000 | 11000 | - | - | - |
| 300 | 15900 | 18400 | 18400 | - | - |
| 400 | 21900 | 24400 | 24100 | 22300 | - |
| 500 | 23000 | 27900 | 30100 | 30100 | - |
| 750 | 28300 | 40700 | 46000 | 48800 | 48500 |
| 1000 | 37100 | 54800 | 62900 | 63600 | 62900 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.103*

| FT 518 1/4 STD - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 10200 | - | - | - | - |
| 200 | 15200 | 13200 | - | - | - |
| 300 | 22700 | 22600 | 21000 | - | - |
| 400 | 30000 | 30000 | 29800 | 25700 | - |
| 500 | 37200 | 37200 | 37200 | 35900 | - |
| 750 | 55200 | 55200 | 55200 | 55200 | 51400 |
| 1000 | 73200 | 73200 | 73200 | 73200 | 72900 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.104*

### 13.3.11 - FT 518 3/8 STD - HP - 3/4”

| FT 518 3/8 STD - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 15900 | - | - | - | - |
| 200 | 17700 | 19500 | - | - | - |
| 300 | 21200 | 29400 | 35600 | - | - |
| 400 | 26500 | 37100 | 51500 | 38900 | - |
| 500 | 31800 | 53000 | 61500 | 49500 | - |
| 750 | 38900 | 56500 | 67100 | 84800 | 84800 |
| 1000 | 49500 | 60100 | 70700 | 88300 | 123600 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.105*

| FT 518 3/8 STD - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 20300 | - | - | - | - |
| 200 | 30000 | 26100 | - | - | - |
| 300 | 45000 | 44700 | 41700 | - | - |
| 400 | 59300 | 59300 | 58900 | 50800 | - |
| 500 | 73600 | 73600 | 73600 | 71100 | - |
| 750 | 109400 | 109400 | 109400 | 109400 | 101900 |
| 1000 | 145100 | 145100 | 145100 | 145100 | 144400 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.106*

### 13.3.12 - FT 518 1/2 STD - HP - 3/4”

| FT 518 1/2 STD - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 14700 | - | - | - | - |
| 200 | 20200 | 21200 | - | - | - |
| 300 | 28300 | 37100 | 35400 | - | - |
| 400 | 40700 | 46000 | 53000 | 49434 | - |
| 500 | 46000 | 56500 | 72400 | 81919 | - |
| 750 | - | - | - | 88275 | 127200 |
| 1000 | - | - | - | 98868 | 134200 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.107*

| FT 518 1/2 STD - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 31700 | - | - | - | - |
| 200 | 47000 | 40800 | - | - | - |
| 300 | 70500 | 69900 | 65200 | - | - |
| 400 | 92900 | 92900 | 92200 | 79500 | - |
| 500 | 115200 | 115200 | 115200 | 111200 | - |
| 750 | - | - | - | 171200 | 159400 |
| 1000 | - | - | - | 227200 | 22600 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.108*

### 13.3.13 - FT 518 3/32 PM/518 LP - 3/4”

| FT 518 3/32 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1000 | 1000 | 1000 | 1000 | - |
| 150 | 1300 | 1400 | 1300 | 1400 | 1200 |
| 200 | 1700 | 1700 | 1600 | 1700 | 1700 |
| 300 | 2600 | 2700 | 2500 | 2500 | 2500 |
| 500 | - | 3900 | 4100 | 3900 | 3900 |
| 750 | - | 5900 | 6100 | 6100 | 6100 |
| 1000 | - | - | - | 8300 | 8200 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.109*

| FT 518 3/32 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1300 | 1300 | 1300 | 1300 | - |
| 150 | 1900 | 1900 | 1900 | 1900 | 1400 |
| 200 | 2500 | 2500 | 2500 | 2500 | 2300 |
| 300 | 3600 | 3600 | 3600 | 3600 | 3600 |
| 500 | - | 5800 | 5800 | 5800 | 5800 |
| 750 | - | 8600 | 8600 | 8600 | 8600 |
| 1000 | - | - | - | 11400 | 11400 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.110*

### 13.3.14 - FT 518 1/8 STD - LP - 3/4”

| FT 518 1/8 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1700 | 1500 | 1600 | 1700 | - |
| 150 | 2400 | 2300 | 2400 | 2500 | 2200 |
| 200 | 3100 | 3100 | 3200 | 3200 | 3100 |
| 300 | 4300 | 4300 | 4600 | 4500 | 4300 |
| 500 | - | 7100 | 7800 | 7600 | 7100 |
| 750 | - | 11000 | 11300 | 11300 | 10300 |
| 1000 | - | - | - | 13100 | 13800 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.111*

| FT 518 1/8 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 2300 | 2300 | 2300 | 2200 | - |
| 150 | 3300 | 3300 | 3300 | 3300 | 2400 |
| 200 | 4300 | 4300 | 4300 | 4300 | 4100 |
| 300 | 6300 | 6300 | 6300 | 6300 | 6300 |
| 500 | - | 10300 | 10300 | 10300 | 10300 |
| 750 | - | 15300 | 15300 | 15300 | 15300 |
| 1000 | - | - | | 20200 | 20200 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.112*

### 13.3.15 - FT 518 3/16 PM/518 LP - 3/4”

| FT 518 3/16 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 3600 | 3800 | 3600 | 3200 | - |
| 150 | 4600 | 5200 | 5500 | 5200 | 4600 |
| 200 | 6200 | 6800 | 7500 | 6800 | 6800 |
| 300 | 8500 | 9600 | 9900 | 9200 | 9800 |
| 500 | - | 11700 | 16600 | 16600 | 16600 |
| 750 | - | 13600 | 18400 | 23000 | 24100 |
| 1000 | - | - | - | 26600 | 30400 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.113*

| FT 518 3/16 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 4900 | 4900 | 4900 | 4600 | - |
| 150 | 7000 | 7000 | 7000 | 7000 | 5100 |
| 200 | 9100 | 9100 | 9100 | 9100 | 8600 |
| 300 | 13400 | 13400 | 13400 | 13400 | 13400 |
| 500 | - | 21800 | 21800 | 21800 | 21800 |
| 750 | - | 32400 | 32400 | 32400 | 32400 |
| 1000 | - | - | - | 42900 | 42900 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.114*

### 13.3.16 - FT 518 1/4 PM/518 LP - 3/4”

| FT 518 1/4 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 5300 | 6400 | 6100 | 6400 | - |
| 150 | 6600 | 9200 | 9900 | 9600 | 7100 |
| 200 | 7100 | 11300 | 12200 | 12400 | 11700 |
| 300 | 8900 | 11300 | 16600 | 18100 | 17000 |
| 500 | - | 13500 | 24800 | 25600 | 28300 |
| 750 | - | 14500 | 27900 | 25300 | 33600 |
| 1000 | - | - | - | 28300 | 35400 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.115*

| FT 518 1/4 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 8300 | 8300 | 8300 | 7900 | - |
| 150 | 11900 | 11900 | 11900 | 11900 | 8700 |
| 200 | 15500 | 15500 | 15500 | 15500 | 14700 |
| 300 | 22700 | 22700 | 22700 | 22700 | 22700 |
| 500 | - | 37200 | 37200 | 37200 | 37200 |
| 750 | - | 48300 | 55200 | 55200 | 55200 |
| 1000 | - | - | - | 73200 | 73200 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.116*

### 13.3.17 - FT 518 3/8 PM/518 LP - 3/4”

| FT 518 3/8 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 7300 | 8900 | 12100 | 8900 | - |
| 150 | 7600 | 13500 | 13800 | 15900 | 14200 |
| 200 | 10600 | 13800 | 15200 | 21200 | 17700 |
| 300 | - | 14900 | 25500 | 25100 | 23000 |
| 500 | - | 22300 | 27900 | 26500 | 31800 |
| 750 | - | - | 35400 | 34300 | 35400 |
| 1000 | - | - | - | 35400 | 38900 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.117*

| FT 518 3/8 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 16400 | 16400 | 16400 | 15500 | - |
| 150 | 23600 | 23600 | 23600 | 23600 | 17200 |
| 200 | 30700 | 30700 | 30700 | 30700 | 29100 |
| 300 | - | 45000 | 45000 | 45000 | 4500 |
| 500 | - | 48300 | 62400 | 73600 | 73600 |
| 750 | - | - | 62400 | 104900 | 109400 |
| 1000 | - | - | - | 104900 | 145100 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.118*

### 13.3.18 - FT 518 1/2 PM/518 LP - 3/4”

| FT 518 1/2 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 9200 | 12400 | 14200 | 12100 | - |
| 150 | 10600 | 14200 | 17700 | 13800 | 14900 |
| 200 | - | 14900 | 19100 | 15900 | 20800 |
| 300 | - | 15900 | 26500 | 30100 | 23000 |
| 500 | - | - | 30100 | 33200 | 35400 |
| 750 | - | - | - | 40700 | 38900 |
| 1000 | - | - | - | - | 42400 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.119*

| FT 518 1/2 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 25700 | 25700 | 25700 | 24300 | - |
| 150 | 34200 | 36900 | 36900 | 36900 | 26900 |
| 200 | - | 48100 | 48100 | 48100 | 45500 |
| 300 | - | 48300 | 62400 | 70500 | 70500 |
| 500 | - | - | 62400 | 104900 | 115200 |
| 750 | - | - | - | 104900 | 171200 |
| 1000 | - | - | - | - | 198300 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.120*

### 13.3.19 - FT 518 3/32 PM/518 HP - 3/4”

| FT 518 3/32 PM/518 HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 1300 | - | - | - | - |
| 200 | 1700 | 1500 | - | - | - |
| 300 | 2500 | 2700 | 2700 | - | - |
| 400 | 3800 | 3400 | 3600 | 3400 | - |
| 500 | 3900 | 4100 | 3900 | 4300 | - |
| 750 | 5900 | 6200 | 6100 | 6600 | 6600 |
| 1000 | 7500 | 7600 | 8200 | 8900 | 8900 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.121*

| FT 518 3/32 PM/518 HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 1600 | - | - | - | - |
| 200 | 2400 | 2100 | - | - | - |
| 300 | 3600 | 3500 | 3300 | - | - |
| 400 | 4700 | 4700 | 4700 | 4000 | - |
| 500 | 5800 | 5800 | 5800 | 5600 | - |
| 750 | 8600 | 8600 | 8600 | 8600 | 8000 |
| 1000 | 11400 | 11400 | 11400 | 11400 | 11300 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.122*

### 13.3.20 - FT 518 1/8 PM/518 HP - 3/4”

| FT 518 1/8 PM/518 HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 2000 | - | - | - | - |
| 200 | 3100 | 3100 | - | - | - |
| 300 | 3900 | 4600 | 4600 | - | - |
| 400 | 5500 | 5500 | 6100 | 6100 | - |
| 500 | 6800 | 7500 | 7500 | 7500 | - |
| 750 | 9600 | 11300 | 11300 | 11300 | 11900 |
| 1000 | 12200 | 14500 | 15200 | 16100 | 16100 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.123*

| FT 518 1/8 PM/518 HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 2900 | - | - | - | - |
| 200 | 4200 | 3700 | - | - | - |
| 300 | 6300 | 6300 | 5800 | - | - |
| 400 | 8300 | 8300 | 8200 | 7100 | - |
| 500 | 10300 | 10300 | 10300 | 9900 | - |
| 750 | 15300 | 15300 | 15300 | 15300 | 14200 |
| 1000 | 20200 | 20200 | 20200 | 20200 | 20100 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.124*

### 13.3.21 - FT 518 3/16 PM/518 HP - 3/4”

| FT 518 3/16 PM/518 HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 4800 | - | - | - | - |
| 200 | 6800 | 6200 | - | - | - |
| 300 | 9400 | 10600 | 10600 | - | - |
| 400 | 14200 | 14200 | 14200 | 13500 | - |
| 500 | 16300 | 17400 | 17400 | 17200 | - |
| 750 | 17700 | 25800 | 25100 | 26500 | 26900 |
| 1000 | 21900 | 35400 | 33900 | 35400 | 34300 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.125*

| FT 518 3/16 PM/518 HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 6000 | - | - | - | - |
| 200 | 8900 | 7700 | - | - | - |
| 300 | 13400 | 13200 | 12400 | - | - |
| 400 | 17600 | 17600 | 17500 | 15100 | - |
| 500 | 21800 | 21800 | 21800 | 21000 | - |
| 750 | 32400 | 32400 | 32400 | 32400 | 30200 |
| 1000 | 42900 | 42900 | 42900 | 42900 | 42700 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.126*

### 13.3.22 - FT 518 1/4 PM/518 HP - 3/4”

| FT 518 1/4 PM/518 HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 6200 | - | - | - | - |
| 200 | 11000 | 11000 | - | - | - |
| 300 | 15900 | 18400 | 18400 | - | - |
| 400 | 21900 | 24400 | 24100 | 22300 | - |
| 500 | 23000 | 27900 | 30100 | 30100 | - |
| 750 | 28300 | 40700 | 46000 | 44200 | 42400 |
| 1000 | 37100 | 54800 | 62900 | 56500 | 54800 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.127*

| FT 518 1/4 PM/518 HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 10200 | - | - | - | - |
| 200 | 15200 | 13200 | - | - | - |
| 300 | 22700 | 22600 | 21000 | - | - |
| 400 | 30000 | 30000 | 29800 | 25700 | - |
| 500 | 37200 | 37200 | 37200 | 35900 | - |
| 750 | 55200 | 55200 | 55200 | 55200 | 51400 |
| 1000 | 73200 | 73200 | 73200 | 73200 | 73200 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.128*

### 13.3.23 - FT 518 3/8 PM/518 HP - 3/4”

| FT 518 3/8 PM/518 HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 11500 | - | - | - | - |
| 200 | 15900 | 18100 | - | - | - |
| 300 | 20500 | 29400 | 30800 | - | - |
| 400 | 26500 | 37100 | 46000 | 38900 | - |
| 500 | 31800 | 53000 | 55800 | 49500 | - |
| 750 | 38900 | 56500 | 60100 | 84800 | 76300 |
| 1000 | 49500 | 60100 | 63600 | 88300 | 106000 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.129*

| FT 518 3/8 PM/518 HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 20300 | - | - | - | - |
| 200 | 30000 | 26100 | - | - | - |
| 300 | 45000 | 44700 | 41700 | - | - |
| 400 | 59300 | 59300 | 58900 | 50800 | - |
| 500 | 73600 | 73600 | 73600 | 711000 | - |
| 750 | 109400 | 109400 | 109400 | 109400 | 101900 |
| 1000 | 145100 | 145100 | 145100 | 145100 | 144400 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.130*

### 13.3.24 - FT 518 1/2 PM/518 HP - 3/4”

| FT 518 1/2 PM/518 HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 14700 | - | - | - | - |
| 200 | 20200 | 21200 | - | - | - |
| 300 | 28300 | 37100 | 31800 | - | - |
| 400 | 40700 | 44200 | 48800 | 49434 | - |
| 500 | 46000 | 53000 | 58300 | 81919 | - |
| 750 | - | - | - | 88275 | 79500 |
| 1000 | - | - | - | 98868 | 113000 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.131*

| FT 518 1/2 PM/518 HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 31700 | - | - | - | - |
| 200 | 47000 | 40800 | - | - | - |
| 300 | 70500 | 69900 | 65200 | - | - |
| 400 | 92900 | 92900 | 92200 | 79500 | - |
| 500 | 115200 | 115200 | 155200 | 111200 | - |
| 750 | - | - | - | 171200 | 159400 |
| 1000 | - | - | - | 227200 | 226000 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.132*

### 13.3.25 - FT 518 - 3/32 STD - LP - 1”

| FT 518 3/32 STD - LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1000 | 1000 | 1000 | 1000 | - |
| 150 | 1400 | 1400 | 1400 | 1400 | 1200 |
| 200 | 1800 | 1800 | 1800 | 1800 | 1800 |
| 300 | 2700 | 2700 | 2900 | 2700 | 2600 |
| 500 | 4300 | 4300 | 4400 | 4100 | 4100 |
| 750 | 5300 | 6400 | 6400 | 6400 | 6200 |
| 1000 | 6400 | 8900 | 8900 | 8900 | 8500 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.133*

| FT 518 3/32 STD - LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1300 | 1300 | 1300 | 1300 | - |
| 150 | 1900 | 1900 | 1900 | 1900 | 1400 |
| 200 | 2500 | 2500 | 2500 | 2500 | 2300 |
| 300 | 3600 | 3600 | 3600 | 3600 | 3600 |
| 500 | 5800 | 5800 | 5800 | 5800 | 5800 |
| 750 | 8600 | 8600 | 8600 | 8600 | 8600 |
| 1000 | 114000 | 114000 | 114000 | 114000 | 11400 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.134*

### 13.3.26 - FT 518 1/8 STD - LP - 1”

| FT 518 1/8 STD - LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1800 | 1500 | 1700 | 1700 | - |
| 150 | 2500 | 2500 | 2500 | 2500 | 2200 |
| 200 | 3200 | 3200 | 3400 | 3200 | 3200 |
| 300 | 4600 | 4600 | 4800 | 4500 | 4500 |
| 500 | 7800 | 7800 | 8000 | 7600 | 7500 |
| 750 | 11700 | 11700 | 12000 | 11300 | 11300 |
| 1000 | 13500 | 15200 | 15600 | 13500 | 14900 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.135*

| FT 518 1/8 STD - LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 2300 | 2300 | 2300 | 2300 | - |
| 150 | 3300 | 3300 | 3300 | 3300 | 2400 |
| 200 | 4300 | 4300 | 4300 | 4300 | 4100 |
| 300 | 6300 | 6300 | 6300 | 6300 | 6300 |
| 500 | 10300 | 10300 | 10300 | 10300 | 10300 |
| 750 | 15300 | 15300 | 15300 | 15300 | 15300 |
| 1000 | 20200 | 20200 | 20200 | 20200 | 20200 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.136*

### 13.3.27 - FT 518 - 3/16 STD - LP - 1”

| FT 518 3/16 STD - LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 4300 | 3900 | 3900 | 3600 | - |
| 150 | 5300 | 5300 | 5700 | 5300 | 5000 |
| 200 | 7100 | 7100 | 7500 | 7100 | 7100 |
| 300 | 9900 | 9900 | 10600 | 10300 | 10300 |
| 500 | 14500 | 15200 | 18100 | 17000 | 17000 |
| 750 | 17700 | 21200 | 19100 | 24800 | 25500 |
| 1000 | - | 26500 | 28300 | 33600 | 33600 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.137*

| FT 518 3/16 STD - LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 4900 | 4900 | 4900 | 4900 | - |
| 150 | 7000 | 7000 | 7000 | 7000 | 5100 |
| 200 | 9100 | 9100 | 9100 | 9100 | 8600 |
| 300 | 13400 | 13400 | 13400 | 13400 | 13400 |
| 500 | 21800 | 21800 | 21800 | 21800 | 21800 |
| 750 | 32400 | 32400 | 32400 | 32400 | 32400 |
| 1000 | - | 42900 | 42900 | 42900 | 42900 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.138*

### 13.3.28 - FT 518 1/4 STD - LP - 1”

| FT 518 1/4 STD - LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 6400 | 6800 | 6800 | 6600 | - |
| 150 | 9600 | 9900 | 10300 | 9900 | 8500 |
| 200 | 12400 | 12400 | 128 | 12800 | 12400 |
| 300 | 17000 | 17400 | 17700 | 18400 | 18400 |
| 500 | 18800 | 26500 | 26500 | 30100 | 30100 |
| 750 | - | 30100 | 30100 | 41000 | 46000 |
| 1000 | - | 31800 | 31800 | 49500 | 601000 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.139*

| FT 518 1/4 STD - LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 8300 | 8300 | 8300 | 7900 | - |
| 150 | 11900 | 11900 | 11900 | 11900 | 8700 |
| 200 | 15500 | 15500 | 15500 | 15500 | 14700 |
| 300 | 22700 | 22700 | 22700 | 22700 | 22700 |
| 500 | 37200 | 37200 | 37200 | 37200 | 37200 |
| 750 | - | 55200 | 55200 | 55200 | 55200 |
| 1000 | - | 73200 | 73200 | 73200 | 73200 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.140*

### 13.3.29 - FT 518 - 3/8 STD - LP - 1”

| FT 518 3/8 STD - LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 7800 | 12100 | 12400 | 12100 | - |
| 150 | 14200 | 16300 | 14500 | 17700 | 15600 |
| 200 | 15200 | 24800 | 15600 | 23000 | 28300 |
| 300 | - | 26500 | 28300 | 37100 | 39200 |
| 500 | - | 28300 | 31800 | 60100 | 63600 |
| 750 | - | - | 35400 | 61800 | 95400 |
| 1000 | - | - | - | 63600 | 120100 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.141*

| FT 518 3/8 STD - LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 16400 | 16400 | 16400 | 15500 | - |
| 150 | 23600 | 23600 | 23600 | 23600 | 17200 |
| 200 | 30700 | 30700 | 30700 | 30700 | 29100 |
| 300 | - | 45000 | 45000 | 45000 | 4500 |
| 500 | - | 73600 | 73600 | 73600 | 73600 |
| 750 | - | - | 101000 | 109400 | 109400 |
| 1000 | - | - | - | 145100 | 145100 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.142*

### 13.3.30 - FT 518 1/2 STD - LP - 1”

| FT 518 1/2 STD - LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 14900 | 19500 | 21200 | 19500 | - |
| 150 | 16300 | 24100 | 28300 | 30100 | 21200 |
| 200 | 1700 | 26500 | 33600 | 38900 | 31100 |
| 300 | - | 28300 | 35400 | 53000 | 54800 |
| 500 | - | - | 35400 | 63600 | 100700 |
| 750 | - | - | - | 67100 | 137800 |
| 1000 | - | - | - | - | 141300 |
| **Cg** = 160 **\| K1** = 120 | | | | | |

*Tab. 13.143*

| FT 518 1/2 STD - LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 22900 | 22900 | 22900 | 21600 | - |
| 150 | 32800 | 32800 | 32800 | 32800 | 23900 |
| 200 | 42700 | 42700 | 42700 | 42700 | 40400 |
| 300 | - | 62600 | 62600 | 62600 | 62600 |
| 500 | - | - | 101000 | 102400 | 102400 |
| 750 | - | - | - | 152200 | 152200 |
| 1000 | - | - | - | - | 201900 |
| **Cg** = 160 **\| K1** = 120 | | | | | |

*Tab. 13.144*

### 13.3.31 - FT 518 - 3/32 STD - HP - 1”

| FT 518 3/32 STD - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 1400 | - | - | - | - |
| 200 | 1700 | 1700 | - | - | - |
| 300 | 2500 | 2700 | 2700 | - | - |
| 400 | 3800 | 3600 | 3600 | 3600 | - |
| 500 | 3900 | 4300 | 4500 | 4600 | - |
| 750 | 5900 | 6600 | 6400 | 6700 | 6600 |
| 1000 | 8500 | 9100 | 8900 | 8700 | 8700 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.145*

| FT 518 3/32 STD - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 1600 | - | - | - | - |
| 200 | 2400 | 2100 | - | - | - |
| 300 | 3600 | 3500 | 3300 | - | - |
| 400 | 4700 | 4700 | 4700 | 4000 | - |
| 500 | 5800 | 5800 | 5800 | 5600 | - |
| 750 | 8600 | 8600 | 8600 | 8600 | 8000 |
| 1000 | 11400 | 11400 | 11400 | 11400 | 11300 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.146*

### 13.3.32 - FT 518 1/8 STD - HP - 1”

| FT 518 1/8 STD - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 2200 | - | - | - | - |
| 200 | 3100 | 3200 | - | - | - |
| 300 | 3900 | 5000 | 5000 | - | - |
| 400 | 5500 | 6400 | 6600 | 6200 | - |
| 500 | 7100 | 7800 | 8000 | 8100 | - |
| 750 | 10600 | 11700 | 12100 | 12100 | 11700 |
| 1000 | 15900 | 15900 | 15900 | 16100 | 15200 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.147*

| FT 518 1/8 STD - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 2900 | - | - | - | - |
| 200 | 4200 | 3700 | - | - | - |
| 300 | 6300 | 6300 | 5800 | - | - |
| 400 | 8300 | 8300 | 8200 | 7100 | - |
| 500 | 10300 | 10300 | 10300 | 9900 | - |
| 750 | 15300 | 15300 | 15300 | 15300 | 14200 |
| 1000 | 20200 | 20200 | 20200 | 20200 | 20100 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.148*

### 13.3.33 - FT 518 - 3/16 STD - HP - 1”

| FT 518 3/16 STD - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 4900 | - | - | - | - |
| 200 | 6800 | 7100 | - | - | - |
| 300 | 9900 | 11000 | 11000 | - | - |
| 400 | 14200 | 14400 | 14400 | 13500 | - |
| 500 | 16300 | 17700 | 17400 | 17000 | - |
| 750 | 24100 | 26500 | 26200 | 26200 | 26900 |
| 1000 | 33100 | 34300 | 35700 | 34700 | 34700 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.149*

| FT 518 3/16 STD - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 6000 | - | - | - | - |
| 200 | 8900 | 7700 | - | - | - |
| 300 | 13400 | 13200 | 12400 | - | - |
| 400 | 17600 | 17600 | 17500 | 15100 | - |
| 500 | 21800 | 21800 | 21800 | 21000 | - |
| 750 | 32400 | 32400 | 32400 | 32400 | 30200 |
| 1000 | 42900 | 42900 | 42900 | 42900 | 42700 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.150*

### 13.3.34 - FT 518 1/4 STD - HP - 1”

| FT 518 1/4 STD - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 7800 | - | - | - | - |
| 200 | 11300 | 12100 | - | - | - |
| 300 | 16300 | 18800 | 19100 | - | - |
| 400 | 21900 | 24800 | 25300 | 23700 | - |
| 500 | 26500 | 30400 | 32500 | 32500 | - |
| 750 | 35400 | 47700 | 48100 | 48100 | 48400 |
| 1000 | 59700 | 58300 | 64300 | 62200 | 63600 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.151*

| FT 518 1/4 STD - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 10200 | - | - | - | - |
| 200 | 15200 | 13200 | - | - | - |
| 300 | 22700 | 22600 | 21000 | - | - |
| 400 | 30000 | 30000 | 29800 | 25700 | - |
| 500 | 37200 | 37200 | 37200 | 35900 | - |
| 750 | 55200 | 55200 | 55200 | 55200 | 51400 |
| 1000 | 73200 | 73200 | 73200 | 73200 | 72900 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.152*

### 13.3.35 - FT 518 - 3/8 STD - HP - 1”

| FT 518 3/8 STD - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 13800 | - | - | - | - |
| 200 | 19500 | 22300 | - | - | - |
| 300 | 24800 | 29700 | 35400 | - | - |
| 400 | 39200 | 28900 | 49500 | 42400 | - |
| 500 | 49500 | 51200 | 62200 | 54800 | - |
| 750 | 63600 | 56500 | 67100 | 81300 | 86600 |
| 1000 | 84800 | 63600 | 70700 | 127200 | 128900 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.153*

| FT 518 3/8 STD - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 20300 | - | - | - | - |
| 200 | 30000 | 26100 | - | - | - |
| 300 | 45000 | 44700 | 41700 | - | - |
| 400 | 59300 | 59300 | 58900 | 50800 | - |
| 500 | 73600 | 73600 | 73600 | 71100 | - |
| 750 | 109400 | 109400 | 109400 | 109400 | 101900 |
| 1000 | 145100 | 145100 | 145100 | 145100 | 144400 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.154*

### 13.3.36 - FT 518 1/2 STD - HP - 1”

| FT 518 1/4 STD - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 19500 | - | - | - | - |
| 200 | 26500 | 31800 | - | - | - |
| 300 | 43500 | 47700 | 51200 | - | - |
| 400 | 49500 | 51200 | 67100 | 49434 | - |
| 500 | 59400 | 67100 | 88300 | 81919 | - |
| 750 | - | - | - | 88275 | 141300 |
| 1000 | - | - | - | 98868 | 162500 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.155*

| FT 518 1/2 STD - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 31700 | - | - | - | - |
| 200 | 47000 | 40800 | - | - | - |
| 300 | 70500 | 69900 | 65200 | - | - |
| 400 | 92900 | 92900 | 92200 | 79500 | - |
| 500 | 115200 | 115200 | 115200 | 111200 | - |
| 750 | - | - | - | 171200 | 159400 |
| 1000 | - | - | - | 227200 | 226000 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.156*

### 13.3.37 - FT 518 3/32 PM/518 LP - 1”

| FT 518 3/32 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1000 | 1000 | 1000 | 1000 | - |
| 150 | 1300 | 1400 | 1300 | 1400 | 1200 |
| 200 | 1700 | 1700 | 1600 | 1700 | 1700 |
| 300 | 2600 | 2700 | 2500 | 2500 | 2500 |
| 500 | - | 3900 | 4100 | 3900 | 3900 |
| 750 | - | 5900 | 6000 | 6100 | 6100 |
| 1000 | - | - | - | 8300 | 8200 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.157*

| FT 518 3/32 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1300 | 1300 | 1300 | 1300 | - |
| 150 | 1900 | 1900 | 1900 | 1900 | 1400 |
| 200 | 2500 | 2500 | 2500 | 2500 | 2300 |
| 300 | 3600 | 3600 | 3600 | 3600 | 3600 |
| 500 | - | 5800 | 5800 | 5800 | 5800 |
| 750 | - | 8600 | 8600 | 8600 | 8600 |
| 1000 | - | - | - | 11400 | 11400 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.158*

### 13.3.38 - FT 518 1/8 PM/518 LP - 1”

| FT 518 1/8 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1700 | 1500 | 1600 | 1700 | - |
| 150 | 2400 | 2300 | 2400 | 2500 | 2200 |
| 200 | 3100 | 3100 | 3200 | 3200 | 3100 |
| 300 | 4300 | 4300 | 4600 | 4500 | 4300 |
| 500 | - | 7100 | 7700 | 7600 | 7100 |
| 750 | - | 10600 | 11300 | 11300 | 10300 |
| 1000 | - | - | - | 13100 | 13800 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.159*

| FT 518 1/8 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 2300 | 2300 | 2300 | 2200 | - |
| 150 | 3300 | 3300 | 3300 | 3300 | 2400 |
| 200 | 4300 | 4300 | 4300 | 4300 | 4100 |
| 300 | 6300 | 6300 | 6300 | 6300 | 6300 |
| 500 | - | 10300 | 10300 | 10300 | 10300 |
| 750 | - | 15300 | 15300 | 15300 | 15300 |
| 1000 | - | - | - | 20200 | 20200 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.160*

### 13.3.39 - FT 518 3/16 PM/518 LP - 1”

| FT 518 3/16 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 3600 | 3600 | 3800 | 3200 | - |
| 150 | 4600 | 5200 | 5500 | 5200 | 4600 |
| 200 | 6400 | 6800 | 7500 | 6800 | 6800 |
| 300 | 9200 | 9500 | 9900 | 9200 | 9800 |
| 500 | - | 14200 | 16600 | 16600 | 16600 |
| 750 | - | 19500 | 19500 | 23000 | 24100 |
| 1000 | - | - | - | 30100 | 31100 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.161*

| FT 518 3/16 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 4900 | 4900 | 4900 | 4600 | - |
| 150 | 7000 | 7000 | 7000 | 7000 | 5100 |
| 200 | 9100 | 9100 | 9100 | 9100 | 8600 |
| 300 | 13400 | 13400 | 13400 | 13400 | 13400 |
| 500 | - | 21800 | 21800 | 21800 | 21800 |
| 750 | - | 32400 | 32400 | 32400 | 32400 |
| 1000 | - | - | - | 42900 | 42900 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.162*

## 13.3.40 - FT 518 1/4 PM/518 LP - 1”

| FT 518 1/4 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 5700 | 6400 | 6400 | 6400 | - |
| 150 | 8900 | 9200 | 9900 | 9600 | 7800 |
| 200 | 11700 | 11300 | 12200 | 12400 | 11700 |
| 300 | 15900 | 15900 | 16600 | 17500 | 17000 |
| 500 | 17400 | 24400 | 24800 | 27900 | 28300 |
| 750 | - | 27900 | 27900 | 35400 | 407000 |
| 1000 | - | - | - | 46000 | 53000 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.163*

| FT 518 1/4 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 8300 | 8300 | 8300 | 7900 | - |
| 150 | 11900 | 11900 | 11900 | 11900 | 8700 |
| 200 | 15500 | 15500 | 15500 | 15500 | 14700 |
| 300 | 22700 | 22700 | 22700 | 22700 | 22700 |
| 500 | 37200 | 37200 | 37200 | 37200 | 37200 |
| 750 | - | 55200 | 55200 | 55200 | 55200 |
| 1000 | - | - | - | 73200 | 73200 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.164*

### 13.3.41 - FT 518 3/8 PM/518 LP - 1”

| FT 518 3/8 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 7800 | 8900 | 12100 | 10600 | - |
| 150 | 13800 | 13500 | 13800 | 15900 | 14200 |
| 200 | 14200 | 17000 | 15200 | 21200 | 25100 |
| 300 | - | 21200 | 25500 | 35400 | 38200 |
| 500 | - | 24800 | 27900 | 56500 | 60100 |
| 750 | - | - | 35400 | 60100 | 88300 |
| 1000 | - | - | - | 63600 | 116600 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.165*

| FT 518 3/8 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 16400 | 16400 | 16400 | 16400 | - |
| 150 | 23600 | 23600 | 23600 | 23600 | 17200 |
| 200 | 30700 | 30700 | 30700 | 30700 | 29100 |
| 300 | - | 45000 | 45000 | 45000 | 45000 |
| 500 | - | 73600 | 73600 | 73600 | 73600 |
| 750 | - | - | 101000 | 109400 | 109400 |
| 1000 | - | - | - | 145100 | 145100 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.166*

### 13.3.42 - FT 518 1/2 PM/518 LP - 1”

| FT 518 1/2 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 12800 | 12400 | 15900 | 12800 | - |
| 150 | 14200 | 19100 | 28300 | 17700 | 20500 |
| 200 | - | 19500 | 23000 | 22300 | 26900 |
| 300 | - | 24400 | 28300 | 38900 | 38900 |
| 500 | - | - | 30100 | 60100 | 81300 |
| 750 | - | - | - | 60100 | 88300 |
| 1000 | - | - | - | - | 91900 |
| **Cg** = 160 **\| K1** = 120 | | | | | |

*Tab. 13.167*

| FT 518 1/2 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 22900 | 22900 | 22900 | 21600 | - |
| 150 | 32800 | 32800 | 32800 | 32800 | 23900 |
| 200 | - | 42700 | 42700 | 42700 | 40400 |
| 300 | - | 62600 | 62600 | 62600 | 62600 |
| 500 | - | - | 101000 | 102400 | 102400 |
| 750 | - | - | - | 152200 | 152200 |
| 1000 | - | - | - | - | 201900 |
| **Cg** = 160 **\| K1** = 120 | | | | | |

*Tab. 13.168*

### 13.3.43 - FT 518 3/32 PM/518 HP - 1”

| FT 518 3/32 PM/518 HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 1400 | - | - | - | - |
| 200 | 1700 | 1700 | - | - | - |
| 300 | 2500 | 2700 | 2700 | - | - |
| 400 | 3800 | 3600 | 3600 | 3600 | - |
| 500 | 3900 | 4300 | 4500 | 4600 | - |
| 750 | 5900 | 6600 | 6400 | 6700 | 6600 |
| 1000 | 8500 | 9100 | 8900 | 8700 | 8700 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.169*

| FT 518 3/32 PM/518 HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 1600 | - | - | - | - |
| 200 | 2400 | 2100 | - | - | - |
| 300 | 3600 | 3500 | 3300 | - | - |
| 400 | 4700 | 4700 | 4700 | 4000 | - |
| 500 | 5800 | 5800 | 5800 | 5600 | - |
| 750 | 8600 | 8600 | 8600 | 8600 | 8000 |
| 1000 | 11400 | 11400 | 11400 | 11400 | 11300 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.170*

### 13.3.44 - FT 518 1/8 PM/518 HP - 1”

| FT 518 1/8 PM/518 HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 2200 | - | - | - | - |
| 200 | 3100 | 3200 | - | - | - |
| 300 | 3900 | 5000 | 5000 | - | - |
| 400 | 5500 | 6400 | 6600 | 6200 | - |
| 500 | 7100 | 7800 | 8000 | 8100 | - |
| 750 | 10600 | 11700 | 12100 | 12100 | 11700 |
| 1000 | 15900 | 15900 | 15900 | 16100 | 15200 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.171*

| FT 518 1/8 PM/518 HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 2900 | - | - | - | - |
| 200 | 4200 | 3700 | - | - | - |
| 300 | 6300 | 6300 | 5800 | - | - |
| 400 | 8300 | 8300 | 8200 | 7100 | - |
| 500 | 10300 | 10300 | 10300 | 9900 | - |
| 750 | 15300 | 15300 | 15300 | 15300 | 14200 |
| 1000 | 20200 | 20200 | 20200 | 20200 | 20100 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.172*

### 13.3.45 - FT 518 3/16 PM/518 HP - 1”

| FT 518 3/16 PM/518 HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 4900 | - | - | - | - |
| 200 | 6800 | 7100 | - | - | - |
| 300 | 9900 | 11000 | 11000 | - | - |
| 400 | 14200 | 14400 | 14400 | 13500 | - |
| 500 | 16300 | 17700 | 17400 | 17000 | - |
| 750 | 24100 | 26500 | 26200 | 26200 | 26900 |
| 1000 | 33100 | 34300 | 35700 | 34700 | 34700 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.173*

| FT 518 3/16 PM/518 HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 6000 | - | - | - | - |
| 200 | 8900 | 7700 | - | - | - |
| 300 | 13400 | 13200 | 12400 | - | - |
| 400 | 17600 | 17600 | 17500 | 15100 | - |
| 500 | 21800 | 21800 | 21800 | 21000 | - |
| 750 | 32400 | 32400 | 32400 | 32400 | 30200 |
| 1000 | 42900 | 42900 | 42900 | 42900 | 42700 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.174*

### 13.3.46 - FT 518 1/4 PM/518 HP - 1”

| FT 518 1/4 PM/518 HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 6900 | - | - | - | - |
| 200 | 10500 | 11300 | - | - | - |
| 300 | 15600 | 17700 | 18900 | - | - |
| 400 | 21200 | 23000 | 25100 | 23700 | - |
| 500 | 25500 | 29400 | 32200 | 32500 | - |
| 750 | 34700 | 46000 | 47400 | 48100 | 47700 |
| 1000 | 60100 | 55100 | 63600 | 62200 | 62900 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.175*

| FT 518 1/4 PM/518 HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 10200 | - | - | - | - |
| 200 | 15200 | 13200 | - | - | - |
| 300 | 22700 | 22600 | 21000 | - | - |
| 400 | 30000 | 30000 | 29800 | 25700 | - |
| 500 | 37200 | 37200 | 37200 | 35900 | - |
| 750 | 55200 | 55200 | 55200 | 55200 | 51400 |
| 1000 | 73200 | 73200 | 73200 | 73200 | 72900 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.176*

### 13.3.47 - FT 518 3/8 PM/518 HP - 1”

| FT 518 3/8 PM/518 HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 11700 | - | - | - | - |
| 200 | 17700 | 20900 | - | - | - |
| 300 | 22600 | 28800 | 32200 | - | - |
| 400 | 38200 | 36400 | 45600 | 42400 | - |
| 500 | 48100 | 49500 | 58300 | 54800 | - |
| 750 | 62700 | 68900 | 65700 | 81300 | 74200 |
| 1000 | 82700 | 102400 | 111600 | 111300 | 118000 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.177*

| FT 518 3/8 PM/518 HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 20300 | - | - | - | - |
| 200 | 30000 | 26100 | - | - | - |
| 300 | 45000 | 44700 | 41700 | - | - |
| 400 | 59300 | 59300 | 58900 | 50800 | - |
| 500 | 73600 | 73600 | 73600 | 71100 | - |
| 750 | 109400 | 109400 | 109400 | 109400 | 109400 |
| 1000 | 145100 | 145100 | 145100 | 145100 | 145100 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.178*

### 13.3.48 - FT 518 1/2 PM/518 HP - 1”

| FT 518 1/2 PM/518 HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 15900 | - | - | - | - |
| 200 | 24800 | 23700 | - | - | - |
| 300 | 29400 | 32900 | 37100 | - | - |
| 400 | 43100 | 40700 | 49500 | 49434 | - |
| 500 | 50900 | 53400 | 62900 | 81919 | - |
| 750 | - | - | - | 88275 | 81300 |
| 1000 | - | - | - | 98868 | 123600 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.179*

| FT 518 1/2 PM/518 HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 31700 | - | - | - | - |
| 200 | 4700 | 40800 | - | - | - |
| 300 | 70500 | 69900 | 65200 | - | - |
| 400 | 92900 | 92900 | 92200 | 79500 | - |
| 500 | 115200 | 115200 | 115200 | 111200 | - |
| 750 | - | - | - | 171200 | 159400 |
| 1000 | - | - | - | 227200 | 22600 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.180*

### 13.3.49 - FT 518 3/32 STD LP - 2”

| FT 518 3/32 STD LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1000 | 1000 | 1000 | 1000 | - |
| 150 | 1400 | 1400 | 1400 | 1400 | 1200 |
| 200 | 1800 | 1800 | 1800 | 1800 | 1800 |
| 300 | 2700 | 2700 | 2900 | 2700 | 2600 |
| 500 | 4300 | 4300 | 4400 | 4100 | 4100 |
| 750 | 6800 | 6800 | 6800 | 6800 | 6600 |
| 1000 | 9600 | 9900 | 9600 | 9900 | 9600 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.181*

| FT 518 3/32 STD LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1300 | 1300 | 1300 | 1300 | - |
| 150 | 1900 | 1900 | 1900 | 1900 | 1400 |
| 200 | 2500 | 2500 | 2500 | 2500 | 2300 |
| 300 | 3600 | 3600 | 3600 | 3600 | 3600 |
| 500 | 5800 | 5800 | 5800 | 5800 | 5800 |
| 750 | 8600 | 8600 | 8600 | 8600 | 8600 |
| 1000 | 11400 | 11400 | 11400 | 11400 | 11400 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.182*

## 13.3.50 - FT 518 1/8 STD LP - 2”

| FT 518 1/8 STD LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1800 | 1500 | 1700 | 1700 | - |
| 150 | 2500 | 2500 | 2500 | 2500 | 2200 |
| 200 | 3200 | 3200 | 3400 | 3200 | 3200 |
| 300 | 4600 | 4600 | 4800 | 4500 | 4500 |
| 500 | 7800 | 7800 | 8000 | 7600 | 7500 |
| 750 | 12400 | 12400 | 12000 | 11700 | 11300 |
| 1000 | 16300 | 16300 | 16300 | 15900 | 15600 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.183*

| FT 518 1/8 STD LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 2300 | 2300 | 2300 | 2300 | - |
| 150 | 3300 | 3300 | 3300 | 3300 | 2400 |
| 200 | 4300 | 4300 | 4300 | 4300 | 4100 |
| 300 | 6300 | 6300 | 6300 | 6300 | 6300 |
| 500 | 10300 | 10300 | 10300 | 10300 | 10300 |
| 750 | 15300 | 15300 | 15300 | 15300 | 15300 |
| 1000 | 20200 | 20200 | 20200 | 20200 | 20200 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.184*

### 13.3.51 - FT 518 3/16 STD LP - 2”

| FT 518 3/16 STD LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 4300 | 3900 | 3900 | 3600 | - |
| 150 | 5300 | 5300 | 5700 | 5300 | 5000 |
| 200 | 7100 | 7100 | 7500 | 7100 | 7100 |
| 300 | 10600 | 9900 | 10600 | 10300 | 10300 |
| 500 | 15900 | 15200 | 18100 | 17000 | 17000 |
| 750 | - | 26500 | 23000 | 24800 | 25500 |
| 1000 | - | 33600 | 31800 | 35400 | 35400 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.185*

| FT 518 3/16 STD LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 4900 | 4900 | 4900 | 4600 | - |
| 150 | 7000 | 7000 | 7000 | 7000 | 5100 |
| 200 | 9100 | 9100 | 9100 | 9100 | 8600 |
| 300 | 13400 | 13400 | 13400 | 13400 | 13400 |
| 500 | 21800 | 21800 | 21800 | 21800 | 21800 |
| 750 | - | 32400 | 32400 | 32400 | 32400 |
| 1000 | - | 42900 | 42900 | 42900 | 42900 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.186*

### 13.3.52 - FT 518 1/4 STD LP - 2”

| FT 518 1/4 STD LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 6400 | 6800 | 6800 | 6600 | - |
| 150 | 9600 | 9900 | 10300 | 9900 | 8500 |
| 200 | 12400 | 12400 | 12800 | 12800 | 12400 |
| 300 | 19500 | 17400 | 17700 | 18400 | 19500 |
| 500 | 21200 | 30100 | 26500 | 30100 | 31100 |
| 750 | - | 38900 | 30100 | 42400 | 47700 |
| 1000 | - | - | - | 60100 | 61800 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.187*

| FT 518 1/4 STD LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 8300 | 8300 | 8300 | 8300 | 8300 |
| 150 | 11900 | 11900 | 11900 | 11900 | 11900 |
| 200 | 15500 | 15500 | 15500 | 15500 | 15500 |
| 300 | 22700 | 22700 | 22700 | 22700 | 22700 |
| 500 | 37200 | 37200 | 37200 | 37200 | 37200 |
| 750 | - | 55200 | 55200 | 55200 | 55200 |
| 1000 | - | - | - | 73200 | 73200 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.188*

### 13.3.53 - FT 518 3/8 STD LP - 2”

| FT 518 3/8 STD LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 8900 | 17700 | 15900 | 14200 | - |
| 150 | 22300 | 19500 | 23000 | 21200 | 15600 |
| 200 | 29000 | 26500 | 29000 | 27600 | 28300 |
| 300 | - | 38900 | 42400 | 38900 | 40700 |
| 500 | - | - | - | 60100 | 70700 |
| 750 | - | - | - | 70700 | 107700 |
| 1000 | - | - | - | 88300 | 141300 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.189*

| FT 518 3/8 STD LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 16400 | 16400 | 16400 | 16400 | 16400 |
| 150 | 23600 | 23600 | 23600 | 23600 | 23600 |
| 200 | 30700 | 30700 | 30700 | 30700 | 30700 |
| 300 | - | 45000 | 45000 | 45000 | 45000 |
| 500 | - | - | - | 73600 | 73600 |
| 750 | - | - | - | 109400 | 109400 |
| 1000 | - | - | - | 145100 | 145100 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.190*

## 13.3.54 - FT 518 1/2 STD LP - 2”

| FT 518 1/2 STD LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 15600 | 23000 | 21200 | 20900 | - |
| 150 | 24800 | 26500 | 28300 | 30100 | 21900 |
| 200 | - | 38900 | 38900 | 38900 | 31100 |
| 300 | - | 54800 | 53000 | 53000 | 5300 |
| 500 | - | - | - | 74200 | 123600 |
| 750 | - | - | - | 120100 | 148400 |
| 1000 | - | - | | - | 180100 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.191*

| FT 518 1/2 STD LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 25700 | 25700 | 25700 | 24300 | - |
| 150 | 36900 | 36900 | 36900 | 36900 | 26900 |
| 200 | - | 48100 | 48100 | 48100 | 45500 |
| 300 | - | 70500 | 70500 | 70500 | 70500 |
| 500 | - | - | - | 115200 | 115200 |
| 750 | - | - | - | 171200 | 171200 |
| 1000 | - | - | - | - | 227200 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.192*

### 13.3.55 - FT 518 3/32 STD HP - 2”

| FT 518 3/32 STD HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 1300 | - | - | - | - |
| 200 | 1700 | 1700 | - | - | - |
| 300 | 2500 | 2700 | 2700 | - | - |
| 400 | 3800 | 3600 | 3600 | 3600 | - |
| 500 | 3900 | 4300 | 4500 | 4600 | - |
| 750 | 5900 | 6600 | 6400 | 6700 | 6600 |
| 1000 | 7500 | 9100 | 8900 | 8700 | 8700 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.193*

| FT 518 3/32 STD HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 1600 | - | - | - | - |
| 200 | 2400 | 2100 | - | - | - |
| 300 | 3600 | 3500 | 3300 | - | - |
| 400 | 4700 | 4700 | 4700 | 4000 | - |
| 500 | 5800 | 5800 | 5800 | 5600 | - |
| 750 | 8600 | 8600 | 8600 | 8600 | 8000 |
| 1000 | 11400 | 11400 | 11400 | 11400 | 11300 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.194*

### 13.3.56 - FT 518 1/8 STD HP - 2”

| FT 518 1/8 STD HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 2200 | - | - | - | - |
| 200 | 3100 | 3200 | - | - | - |
| 300 | 3900 | 5000 | 5000 | - | - |
| 400 | 5500 | 6400 | 6600 | 6200 | - |
| 500 | 7100 | 7800 | 8000 | 8100 | - |
| 750 | 10600 | 11700 | 12100 | 12100 | 11700 |
| 1000 | 15900 | 15900 | 15900 | 16100 | 15200 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.195*

| FT 518 1/8 STD HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 2900 | - | - | - | - |
| 200 | 4200 | 3700 | - | - | - |
| 300 | 6300 | 6300 | 5800 | - | - |
| 400 | 8300 | 8300 | 8200 | 7100 | - |
| 500 | 10300 | 10300 | 10300 | 9900 | - |
| 750 | 15300 | 15300 | 15300 | 15300 | 14200 |
| 1000 | 20200 | 20200 | 20200 | 20200 | 20100 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.196*

### 13.3.57 - FT 518 3/16 STD HP - 2”

| FT 518 3/16 STD HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 4900 | - | - | - | - |
| 200 | 6800 | 7100 | - | - | - |
| 300 | 9900 | 11000 | 11000 | - | - |
| 400 | 14200 | 14400 | 14400 | 13500 | - |
| 500 | 16300 | 17700 | 17400 | 17000 | - |
| 750 | 24100 | 26500 | 26200 | 26200 | 26900 |
| 1000 | 33100 | 34300 | 35700 | 34700 | 34700 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.197*

| FT 518 3/16 STD HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 6000 | - | - | - | - |
| 200 | 8900 | 7700 | - | - | - |
| 300 | 13400 | 13200 | 12400 | - | - |
| 400 | 17600 | 17600 | 17500 | 15100 | - |
| 500 | 21800 | 21800 | 21800 | 21000 | - |
| 750 | 32400 | 32400 | 32400 | 32400 | 30200 |
| 1000 | 42900 | 42900 | 42900 | 42900 | 42700 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.198*

## 13.3.58 - FT 518 1/4 STD HP - 2”

| FT 518 1/4 STD HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 7800 | - | - | - | - |
| 200 | 11300 | 1210 | - | - | - |
| 300 | 16300 | 18800 | 19100 | - | - |
| 400 | 21900 | 24800 | 25300 | 23700 | - |
| 500 | 28300 | 30400 | 32500 | 32500 | - |
| 750 | 35400 | 47700 | 48100 | 48100 | 48400 |
| 1000 | 60100 | 58300 | 64300 | 62200 | 63600 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.199*

| FT 518 1/4 STD HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 10200 | - | - | - | - |
| 200 | 15200 | 13200 | - | - | - |
| 300 | 22700 | 22600 | 21000 | - | - |
| 400 | 30000 | 30000 | 29800 | 25700 | - |
| 500 | 37200 | 37200 | 37200 | 35900 | - |
| 750 | 55200 | 55200 | 55200 | 55200 | 51400 |
| 1000 | 73200 | 73200 | 73200 | 73200 | 72900 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.200*

### 13.3.59 - FT 518 3/8 STD HP - 2”

| FT 518 3/8 STD HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 13800 | - | - | - | - |
| 200 | 19500 | 22300 | - | - | - |
| 300 | 24800 | 29700 | 35400 | - | - |
| 400 | 39200 | 38900 | 49500 | 42400 | - |
| 500 | 53000 | 51200 | 62200 | 54800 | - |
| 750 | 74200 | 70700 | 67100 | 81300 | 86600 |
| 1000 | 113000 | 106000 | 113000 | 127200 | 128900 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.201*

| FT 518 3/8 STD HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 20300 | - | - | - | - |
| 200 | 30000 | 26100 | - | - | - |
| 300 | 45000 | 44700 | 41700 | - | - |
| 400 | 59300 | 59300 | 58900 | 50800 | - |
| 500 | 73600 | 73600 | 73600 | 71100 | - |
| 750 | 109400 | 109400 | 109400 | 109400 | 101900 |
| 1000 | 145100 | 145100 | 145100 | 145100 | 144400 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.202*

## 13.3.60 - FT 518 1/2 STD HP - 2”

| FT 518 1/2 STD HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 19500 | - | - | - | - |
| 200 | 26500 | 31800 | - | - | - |
| 300 | 43500 | 49500 | 51200 | - | - |
| 400 | 53000 | 63600 | 67100 | 49434 | - |
| 500 | 70700 | 88300 | 88300 | 81919 | - |
| 750 | - | - | - | 88275 | 141300 |
| 1000 | - | - | - | 98868 | 162500 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.203*

| FT 518 1/2 STD HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 31700 | - | - | - | - |
| 200 | 47000 | 40800 | - | - | - |
| 300 | 70500 | 69900 | 65200 | - | - |
| 400 | 92900 | 92900 | 92200 | 79500 | - |
| 500 | 115200 | 115200 | 115200 | 111200 | - |
| 750 | - | - | - | 171200 | 159400 |
| 1000 | - | - | - | 227200 | 226000 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.204*

### 13.3.61 - FT 518 3/32 PM/518 LP - 2”

| FT 518 3/32 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1000 | 1000 | 1000 | 1000 | - |
| 150 | 1300 | 1400 | 1300 | 1400 | 1200 |
| 200 | 1700 | 1700 | 1600 | 1700 | 1700 |
| 300 | 2600 | 2700 | 2500 | 2500 | 2500 |
| 500 | - | 3900 | 4100 | 3900 | 3900 |
| 750 | - | 6200 | 6200 | 6400 | 6100 |
| 1000 | - | - | - | 8900 | 8900 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.205*

| FT 518 3/32 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 1300 | 1300 | 1300 | - | - |
| 150 | 1900 | 1900 | 1900 | 1900 | - |
| 200 | 2500 | 2500 | 2500 | 2500 | - |
| 300 | 3600 | 3600 | 3600 | 3600 | 3600 |
| 500 | - | 5800 | 5800 | 5800 | 5800 |
| 750 | - | 8600 | 8600 | 8600 | 8600 |
| 1000 | - | - | - | 11400 | 11400 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.206*

### 13.3.62 - FT 518 3/16 PM/518 LP - 2”

| FT 518 3/16 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 3600 | 3600 | 3800 | 3.200 | - |
| 150 | 4600 | 5200 | 5500 | 5200 | 4600 |
| 200 | 6400 | 6800 | 7500 | 6800 | 6800 |
| 300 | 9200 | 9500 | 9900 | 9200 | 9800 |
| 500 | - | 14200 | 16600 | 16600 | 16600 |
| 750 | - | 23000 | 20500 | 23000 | 24100 |
| 1000 | - | - | - | 30800 | 32500 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.207*

| FT 518 3/16 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 4900 | 4900 | 4900 | - | - |
| 150 | 7000 | 7000 | 7000 | 7.00 | - |
| 200 | 9100 | 9100 | 9.100 | 9100 | - |
| 300 | 13400 | 13400 | 13.400 | 13400 | 13400 |
| 500 | - | 21800 | 21800 | 21800 | 21800 |
| 750 | - | 32400 | 32400 | 32400 | 32400 |
| 1000 | - | - | - | 42900 | 42900 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.208*

### 13.3.63 - FT 518 1/4 PM/518 LP - 2”

| FT 518 1/4 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 5700 | 6400 | 6400 | 6400 | - |
| 150 | 8900 | 9200 | 9900 | 9600 | 7800 |
| 200 | 11700 | 11300 | 12200 | 12400 | 11700 |
| 300 | 15900 | 15900 | 16600 | 17500 | 17400 |
| 500 | 17400 | 27200 | 24800 | 27900 | 28300 |
| 750 | - | 33600 | 27900 | 35400 | 42400 |
| 1000 | - | - | - | 51200 | 54800 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.209*

| FT 518 1/4 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 8300 | 8300 | 8300 | - | - |
| 150 | 11900 | 11900 | 11900 | 11900 | - |
| 200 | 15500 | 15500 | 15500 | 15500 | - |
| 300 | 22700 | 22700 | 22700 | 22700 | 22700 |
| 500 | 37200 | 37200 | 37200 | 37200 | 37200 |
| 750 | - | 55200 | 55200 | 55200 | 55200 |
| 1000 | - | - | - | 73200 | 73200 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.210*

### 13.3.64 - FT 518 3/8 PM/518 LP - 2”

| FT 518 3/8 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 7800 | 12400 | 14200 | 12100 | - |
| 150 | 13800 | 14200 | 20500 | 17700 | 14500 |
| 200 | 14200 | 23000 | 26500 | 23000 | 25800 |
| 300 | - | 35400 | 37100 | 40700 | 38200 |
| 500 | - | - | - | 53000 | 65400 |
| 750 | - | - | - | 63600 | 91900 |
| 1000 | - | - | - | 74200 | 116600 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.211*

| FT 518 3/8 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 16400 | 16400 | 16400 | 0 | - |
| 150 | 23600 | 23600 | 23600 | 23600 | 0 |
| 200 | 30700 | 30700 | 30700 | 30700 | 0 |
| 300 | - | 45000 | 45000 | 45000 | 45000 |
| 500 | - | - | - | 73600 | 73600 |
| 750 | - | - | - | 109400 | 109400 |
| 1000 | - | - | - | 145100 | 145100 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.212*

### 13.3.65 - FT 518 1/2 PM/518 LP - 2”

| FT 518 1/2 PM/518 LP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 12800 | 14200 | 15900 | 13500 | - |
| 150 | 14200 | 15900 | 19500 | 20500 | 22300 |
| 200 | - | 24800 | 35400 | 26500 | 3040 |
| 300 | - | 38900 | 46000 | 45200 | 49100 |
| 500 | - | - | - | 54800 | 68900 |
| 750 | - | - | - | 67100 | 95400 |
| 1000 | - | - | - | - | 123600 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.213*

| FT 518 1/2 PM/518 LP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 10 psi | 20 psi | 30 psi | 60 psi | 125 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 100 | 25700 | 25700 | 25700 | - | - |
| 150 | 36900 | 36900 | 36900 | 36900 | - |
| 200 | - | 48100 | 48100 | 48100 | - |
| 300 | - | 70500 | 70500 | 70500 | 70500 |
| 500 | - | - | - | 115200 | 115200 |
| 750 | - | - | - | 171200 | 171200 |
| 1000 | - | - | - | - | 227200 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.214*

## 13.3.66 - FT 518 - 3/32 PM/518 - HP - 2”

| FT 518 3/32 PM/518 - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 1400 | - | - | - | - |
| 200 | 1700 | 1700 | - | - | - |
| 300 | 2500 | 2700 | 2700 | - | - |
| 400 | 3800 | 3600 | 3600 | 3600 | - |
| 500 | 3900 | 4300 | 4500 | 4600 | - |
| 750 | 5900 | 6600 | 6400 | 6700 | 6600 |
| 1000 | 8500 | 9100 | 8900 | 8700 | 8700 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.215*

| FT 518 3/32 PM/518 - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 1600 | - | - | - | - |
| 200 | 2400 | 2100 | - | - | - |
| 300 | 3600 | 3500 | 3300 | - | - |
| 400 | 4.700 | 4700 | 4700 | 4000 | - |
| 500 | 5800 | 5800 | 5800 | 5600 | - |
| 750 | 8600 | 8600 | 8600 | 8600 | 8000 |
| 1000 | 11400 | 11400 | 11400 | 11400 | 11300 |
| **Cg** = 9 **\| K1** = 120 | | | | | |

*Tab. 13.216*

### 13.3.67 - FT 518 - 1/8 PM/518 - HP - 2”

| FT 518 1/8 PM/518 - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 2200 | - | - | - | - |
| 200 | 3100 | 3200 | - | - | - |
| 300 | 3900 | 5000 | 5000 | - | - |
| 400 | 5500 | 6400 | 6600 | 6200 | - |
| 500 | 7100 | 7800 | 8000 | 8100 | - |
| 750 | 10600 | 11700 | 12100 | 12100 | 11700 |
| 1000 | 15900 | 15900 | 15900 | 16100 | 15200 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.217*

| FT 518 1/8 PM/518 - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 2900 | - | - | - | - |
| 200 | 4200 | 3700 | - | - | - |
| 300 | 6300 | 6300 | 5800 | - | - |
| 400 | 8300 | 8300 | 8200 | 7100 | - |
| 500 | 10300 | 10300 | 10300 | 9900 | - |
| 750 | 15300 | 15300 | 15300 | 15300 | 14200 |
| 1000 | 20200 | 20200 | 20200 | 20200 | 20100 |
| **Cg** = 16 **\| K1** = 120 | | | | | |

*Tab. 13.218*

## 13.3.68 - FT 518 - 3/16 PM/518 - HP - 2”

| FT 518 3/16 PM/518 - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 4900 | - | - | - | - |
| 200 | 6800 | 7100 | - | - | - |
| 300 | 9900 | 11000 | 11000 | - | - |
| 400 | 14200 | 14400 | 14400 | 13500 | - |
| 500 | 16300 | 17700 | 17400 | 17000 | - |
| 750 | 24100 | 26500 | 26200 | 26200 | 26.900 |
| 1000 | 33100 | 34300 | 35700 | 34700 | 34700 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.219*

| FT 518 3/16 PM/518 - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 6000 | - | - | - | - |
| 200 | 8900 | 7700 | - | - | - |
| 300 | 13400 | 13200 | 12400 | - | - |
| 400 | 17600 | 17600 | 17500 | 15100 | - |
| 500 | 21800 | 21800 | 21800 | 21000 | - |
| 750 | 32400 | 32400 | 32400 | 32400 | 30200 |
| 1000 | 42900 | 42900 | 42900 | 42900 | 42700 |
| **Cg** = 34 **\| K1** = 120 | | | | | |

*Tab. 13.220*

### 13.3.69 - FT 518 - 1/4 PM/518 - HP - 2”

| FT 518 1/4 PM/518 - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 6900 | - | - | - | - |
| 200 | 10500 | 11300 | - | - | - |
| 300 | 15600 | 17700 | 18900 | - | - |
| 400 | 21200 | 23000 | 25100 | 23700 | - |
| 500 | 26900 | 29400 | 32200 | 32500 | - |
| 750 | 34700 | 46000 | 47400 | 48100 | 47700 |
| 1000 | 60100 | 55100 | 63600 | 62200 | 62900 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.221*

| FT 518 1/4 PM/518 - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 10200 | - | - | - | - |
| 200 | 15200 | 13200 | - | - | - |
| 300 | 22700 | 22600 | 21000 | - | - |
| 400 | 30000 | 30000 | 29800 | 25700 | - |
| 500 | 37200 | 37200 | 37200 | 35900 | - |
| 750 | 55200 | 55200 | 55200 | 55200 | 51400 |
| 1000 | 73200 | 73200 | 73200 | 73200 | 72900 |
| **Cg** = 58 **\| K1** = 120 | | | | | |

*Tab. 13.222*

## 13.3.70 - FT 518 - 3/8 PM/518 - HP - 2”

| FT 518 3/8 PM/518 - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 11700 | - | - | - | - |
| 200 | 17700 | 20900 | - | - | - |
| 300 | 22600 | 28800 | 32200 | - | - |
| 400 | 38200 | 36400 | 45600 | 42400 | - |
| 500 | 49800 | 49500 | 58300 | 54800 | - |
| 750 | 70000 | 68900 | 65700 | 81300 | 74200 |
| 1000 | 106000 | 102400 | 111600 | 111300 | 118000 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.223*

| FT 518 3/8 PM/518 - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 20300 | - | - | - | - |
| 200 | 30000 | 26100 | - | - | - |
| 300 | 45000 | 44700 | 41700 | - | - |
| 400 | 59300 | 59300 | 58900 | 50800 | - |
| 500 | 73600 | 73600 | 73600 | 71100 | - |
| 750 | 109400 | 109400 | 109400 | 109400 | 101900 |
| 1000 | 145100 | 145100 | 145100 | 145100 | 144400 |
| **Cg** = 115 **\| K1** = 120 | | | | | |

*Tab. 13.224*

### 13.3.71 - FT 518 - 1/2 PM/518 - HP - 2”

| FT 518 1/2 PM/518 - HP (maximum recommended flow rate for optimal performance) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 15900 | - | - | - | - |
| 200 | 24800 | 23700 | - | - | - |
| 300 | 31500 | 46700 | 37100 | - | - |
| 400 | 49500 | 60100 | 49500 | 49434 | - |
| 500 | 68200 | 84800 | 62900 | 81919 | - |
| 750 | - | - | - | 88275 | 81300 |
| 1000 | - | - | - | 98868 | 123600 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.225*

| FT 518 1/2 PM/518 - HP (flow rate with regulator in open position, 100% capacity) | | | | | |
|---|---|---|---|---|---|
| **Inlet pressure** | **Outlet pressure** | | | | |
| | 110 psi | 150 psi | 200 psi | 300 psi | 500 psi |
| psi | Scfh | Scfh | Scfh | Scfh | Scfh |
| 150 | 31700 | - | - | - | - |
| 200 | 47000 | 40800 | - | - | - |
| 300 | 70500 | 69900 | 65200 | - | - |
| 400 | 92900 | 92900 | 92200 | 79500 | - |
| 500 | 115200 | 115200 | 115200 | 111200 | - |
| 750 | - | - | - | 171200 | 159400 |
| 1000 | - | - | - | 227200 | 226000 |
| **Cg** = 180 **\| K1** = 120 | | | | | |

*Tab. 13.226*

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