

# Aperflux 851

High - Medium Pressure Gas Regulator



**TECHNICAL BROCHURE**

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**Pietro Fiorentini USA Inc.**

606 Park Drive | Weirton, WV 26062, United States of America | +1 304 232 9115  
fio.westvirginia@fiorentini.com

**Pietro Fiorentini S.p.A.**

Via E.Fermi, 8/10 | 36057 Arcugnano, Italy | +39 0444 968 511  
sales@fiorentini.com

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aperflux851\_technicalbrochure\_USA\_revB

# Who we are

We are a global organization that specializes in designing and manufacturing technologically advanced solutions for natural gas treatment, transmission and distribution systems.

We are the ideal partner for operators in the Oil & Gas sector, with a business solutions that span the whole natural gas chain.

We are constantly evolving to meet our customers' highest expectations in terms of quality and reliability.

Our aim is to be a step ahead of the competition, with customized technologies and an after-sale service program undertaken with the highest level of professionalism.



## Pietro Fiorentini advantages



Localized technical support

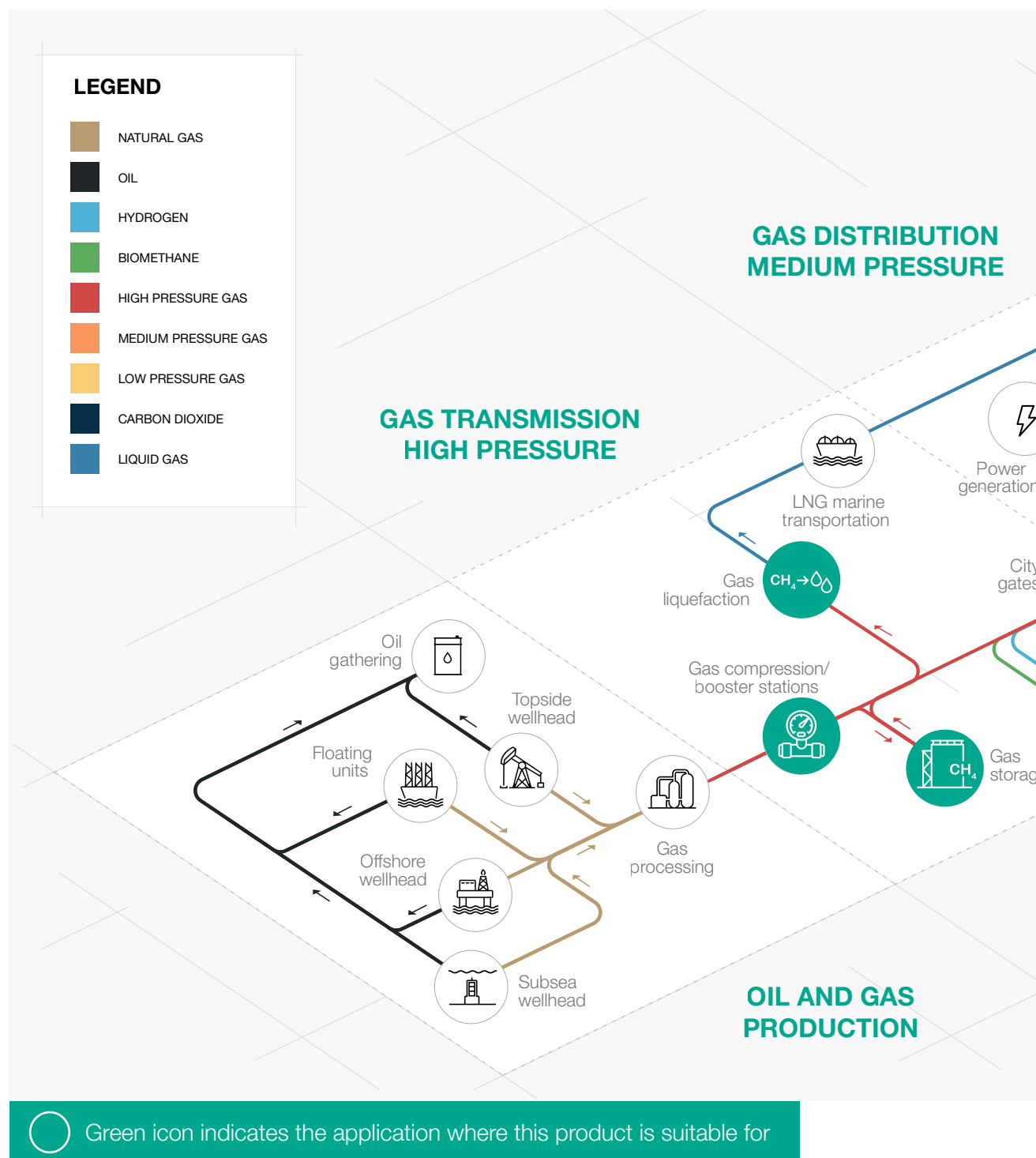


Experience since 1940

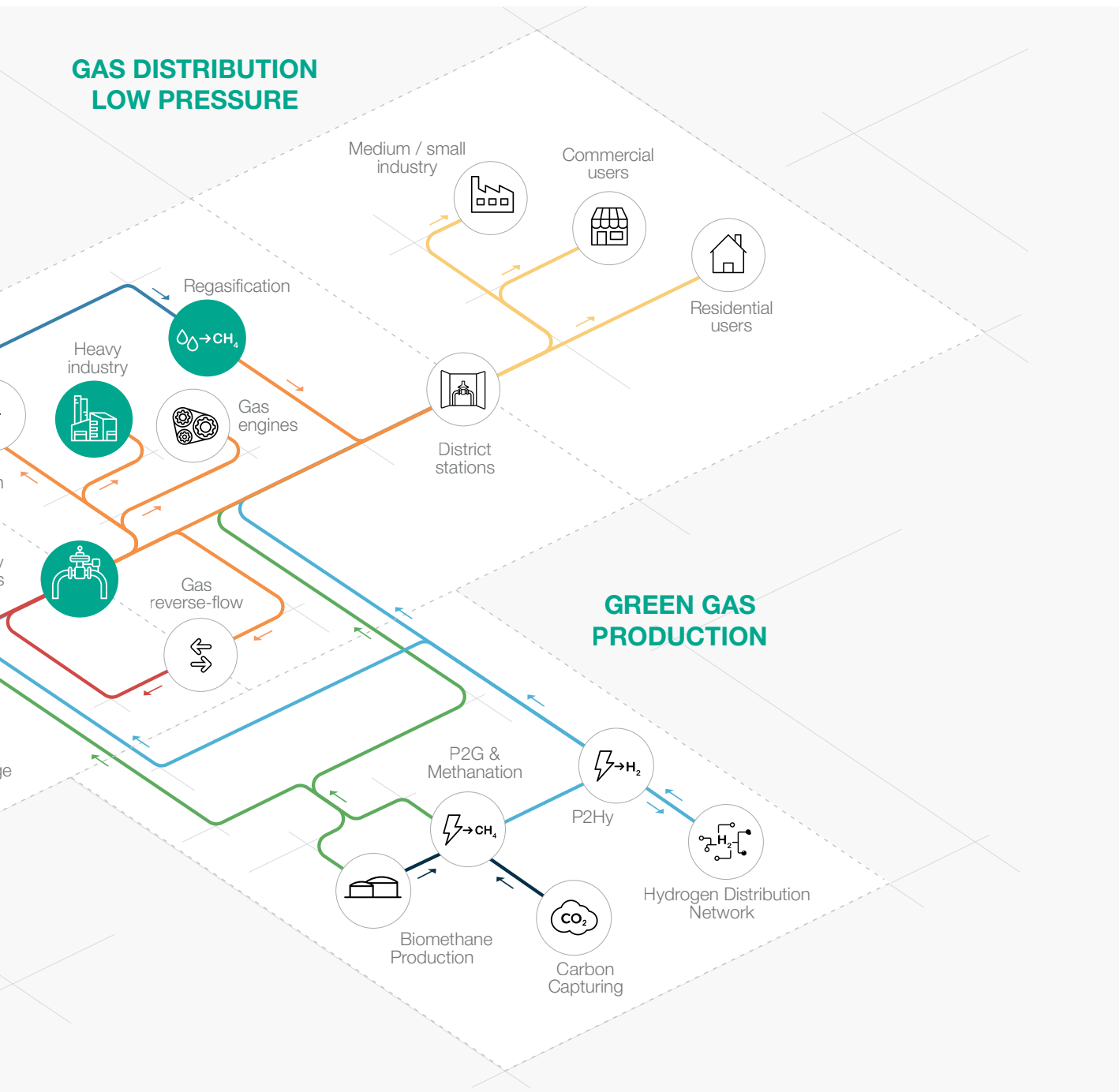


Operating in over 100 countries

# Area of Application







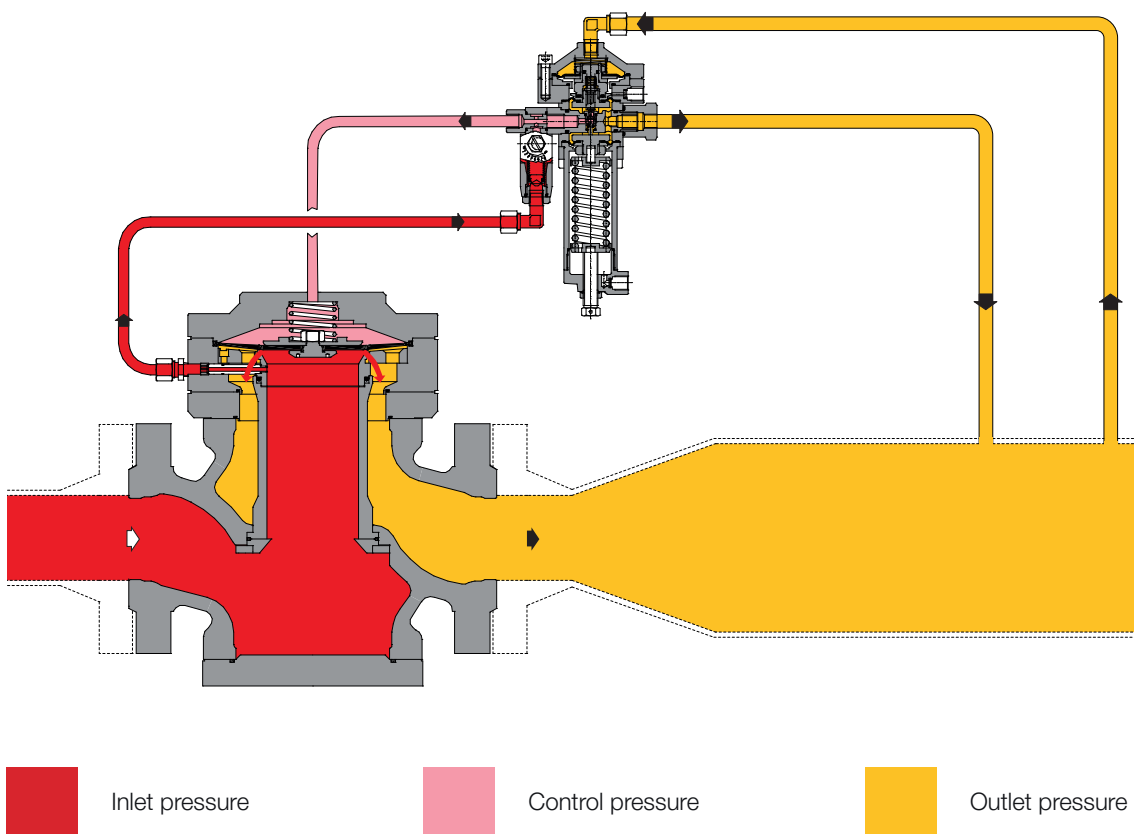
**Figure 1** Area of application map

# Introduction

**Aperflux 851** is one of the **pilot-operated gas pressure regulators** designed and manufactured by Pietro Fiorentini.

This device is suitable for use with previously filtered non-corrosive gases, and it is mainly used for high-pressure transmission systems and for medium pressure natural gas distribution networks.

According to the European Standard EN 334, it is classified as **Fail Open**.



**Figure 2** Aperflux 851

# Features

**Aperflux 851** is a **pilot-operated** device for high pressure and medium pressure with a unique **dynamic balancing system** which ensures an **outstanding turn down ratio** combined with an extremely **accurate outlet pressure control**.

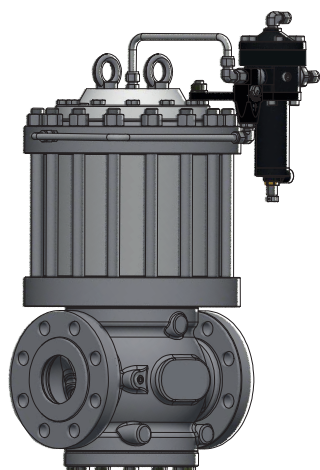
**Aperflux 851** is a balanced pressure regulator. This means that the controlled outlet pressure is not affected by variations in the inlet pressure and flow during its operation. Therefore a balanced regulator can have a single-size orifice for all pressure and flow conditions.

This regulator is suitable for use with previously filtered, non corrosive gases, in natural gas transmission and distribution networks as well as high load industrial application.

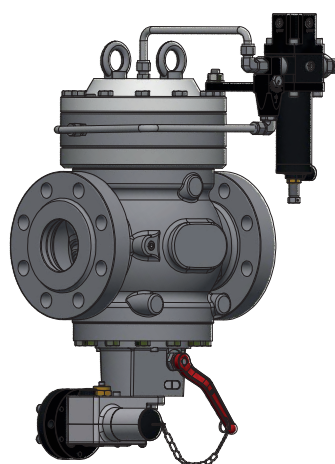
It is a **truly top entry design** which allows an **easy maintenance** of parts directly in the field **without removing the body from the pipework**.

Set point adjustment of the regulator is achieved via a pilot, loading and unloading the pressure in the Aperflux upper diaphragm chamber.

The modular design of Aperflux pressure regulators allows for the factory (or retro-site fitting) of an emergency monitor regulator PM/819 or a slamshut valve SB/82 or HB/97 (depending on size). Additionally an integral silencer DB851 can be installed. All without removing the body from the pipeline.



**Figure 3** Aperflux 851 with DB/851 silencer



**Figure 4** Aperflux 851 with SB/82 slam shut valve

## Aperflux 851 competitive advantages



Balanced type



Operates with low differential pressure



High accuracy



High turn-down ratio



Built-in pilot filter



Top Entry



Easy maintenance



Low noise



Built-in accessories



Biomethane compatible and available with specific versions for full Hydrogen or blending

## Features

| Features                                                          | Values                                                                                     |                                                                          |
|-------------------------------------------------------------------|--------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| Design pressure* (PS <sup>1</sup> / DP <sup>2</sup> )             | up to 10.3 MPa<br>up to 1500 psig                                                          |                                                                          |
| Operating ambient temperature* (TS <sup>1</sup> )                 | <b>Standard version</b><br>from -10 °C to +65 °C<br>from +14 °F to +150 °F                 | <b>Arctic version</b><br>from -40 °C to +65 °C<br>from -40 °F to +150 °F |
| Permissible gas temperature*                                      | <b>Standard version</b><br>from -10 °C to +60 °C<br>from +14 °F to +140 °F                 | <b>Arctic version</b><br>from -20 °C to +60 °C<br>from -4 °F to +140 °F  |
| Inlet pressure range bpu (MAOP / p <sub>umax</sub> <sup>1</sup> ) | from 0.13 to 8.5 MPa<br>from 18.7 to 1232 psig                                             |                                                                          |
| Range of downstream pressure (Wd <sup>1</sup> )                   | from 0.08 to 7.4 MPa<br>from 11.6 to 1073 psig                                             |                                                                          |
| Available accessories                                             | DB/851 Silencer, SB/82 Slam shut, HB/97 Slam shut, PM/819 Monitor, open-status indicator   |                                                                          |
| Minimum differential pressure (Δp <sub>min</sub> <sup>1</sup> )   | 0.05 MPa - recommended 0.2 MPa<br>7.25 psig - recommended 29 psig                          |                                                                          |
| Accuracy class                                                    | up to 2.5% gauge (depending on working conditions)                                         |                                                                          |
| Lock-up pressure class                                            | up to 10% gauge (depending on working conditions)                                          |                                                                          |
| Nominal dimensions (DN <sup>1,2</sup> )                           | DN 25   1"; DN 50   2"; DN 80   3"; DN 100   4"; DN 150   6";<br>DN 200   8"; DN 250   10" |                                                                          |
| Connections*                                                      | Class 150/300/600 RF / RTJ according to ASME B 16.5 or PN 16/25/40 according to EN 1092-1  |                                                                          |

(<sup>1</sup>) according to EN334 standard

(<sup>2</sup>) according to ISO 23555-1 standard

(\*) NOTE: Different functional features and/or extended temperature ranges may be available on request. Stated inlet gas temperature range is the maximum for which the equipment's full performance, including accuracy is guaranteed. Product may have a different pressure or temperature ranges according to the version and/or installed accessories.

**Table 1** Features

# Materials and Approvals

| Part                 | Material                                                                                              |
|----------------------|-------------------------------------------------------------------------------------------------------|
| Body                 | Cast steel ASTM A352 LCC for classes 300 and 600 ASTM A216 WCB for classes 150 and PN16               |
| Cover                | Rolled or forged carbon steel                                                                         |
| Seat                 | Stainless steel for $DN \leq 3"$<br>Carbon Steel with seal edge in stainless steel for size $\geq 4"$ |
| Diaphragm            | Vulcanized rubber                                                                                     |
| Sealing ring         | Nitrile rubber                                                                                        |
| Compression fittings | According to DIN 2353 in zinc-plated carbon steel.<br>Stainless steel on request                      |

**NOTE:** The materials indicated above refer to the standard models. Different materials can be provided according to specific needs.

**Table 2** Materials

## Construction Standards and Approvals

**Aperflux 851** regulator is designed according to European standard EN 334.  
The regulator reacts in opening (Fail Open) according to EN 334.

The product is certified according to European Directive 2014/68/EU (PED).  
Leakage class: bubble tight, better than VIII according to ANSI/FCI 70-3.



EN 334



PED-CE



# Pilot models and ranges

| Type       | Model | Operation | Range Wh    |            | Spring Table web link   |
|------------|-------|-----------|-------------|------------|-------------------------|
|            |       |           | MPa         | psig       |                         |
| Main pilot | 302/A | Manual    | 0.08 - 0.95 | 11.6 - 138 | <a href="#">TT 653</a>  |
| Main pilot | 304/A | Manual    | 0.7 - 4.3   | 101 - 623  | <a href="#">TT 653</a>  |
| Main pilot | 305/A | Manual    | 2 - 6       | 290 - 870  | <a href="#">TT 653</a>  |
| Main pilot | 307/A | Manual    | 4.1 - 7.4   | 595 - 1073 | <a href="#">TT 1146</a> |

**Table 3** Settings table

| Types of pilot adjustment |                                                            |
|---------------------------|------------------------------------------------------------|
| Pilot type .../A          | Manual setting                                             |
| Pilot type .../D          | Electric remote control setting                            |
| Pilot type .../CS         | Pneumatic remote control setting                           |
| Pilot type .../FIO        | Smart unit for remote setting, monitoring, flow limitation |

**Table 4** Pilot adjustment table

General link to the calibration tables: [PRESS HERE](#) or use the QR code:



The pilot system comes complete with an adjustable AR100 restrictor. The flow rate of the pilot system is controlled by the bleed rate through the AR100 restrictor which influences the response time of the regulator.

Pressure drop through the adjustable AR100 restrictor shall be about 0.02 MPa (2.9 psig) at the minimum opening flow of the regulator and about 0.1 MPa (14.5 psig) at the maximum opening flow of the regulator.

**PILOT 302/A**

| Spring part number | Spring color | d   | Lo  | De | Spring range (psig) |       |
|--------------------|--------------|-----|-----|----|---------------------|-------|
|                    |              |     |     |    | Min.                | Max.  |
| US2701800          | Yellow       | 4.5 | 100 | 35 | 11.6                | 16.0  |
| US2702080          | Orange       | 5   | 100 | 35 | 16.0                | 31.9  |
| US2702290          | Red          | 5.5 | 100 | 35 | 31.9                | 50.8  |
| US2702460          | Green        | 6   | 100 | 35 | 50.8                | 81.2  |
| US2702660          | Black        | 6.5 | 100 | 35 | 81.2                | 105.9 |
| US 2702820         | Blue         | 7   | 100 | 35 | 105.9               | 137.8 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 5** TT 653 - PILOT 302/A setting springs

**PILOT 304/A**

| Spring part number | Spring color | d   | Lo  | De | Spring range (psig) |       |
|--------------------|--------------|-----|-----|----|---------------------|-------|
|                    |              |     |     |    | Min.                | Max.  |
| US2702460          | Green        | 6   | 100 | 35 | 101.5               | 188.6 |
| US2702660          | Black        | 6.5 | 100 | 35 | 188.6               | 246.6 |
| US2702820          | Blue         | 7   | 100 | 35 | 246.6               | 464.1 |
| US2703045          | Brown        | 7.5 | 100 | 35 | 464.1               | 623.6 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 6** TT 653 - PILOT 304/A setting springs

**PILOT 305/A**

| Spring part number | Spring color | d   | Lo  | De | Spring range (psig) |       |
|--------------------|--------------|-----|-----|----|---------------------|-------|
|                    |              |     |     |    | Min.                | Max.  |
| US2702820          | Blue         | 7   | 100 | 35 | 290.1               | 478.6 |
| US2703045          | Brown        | 7.5 | 100 | 35 | 478.6               | 609.1 |
| US2703224          | Grey         | 8   | 100 | 35 | 609.1               | 870.2 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 7** TT 653 - PILOT 305/A setting springs

**PILOT 307/A**

| Spring part number | Spring color | d | Lo  | De | Spring range (psig) |        |
|--------------------|--------------|---|-----|----|---------------------|--------|
|                    |              |   |     |    | Min.                | Max.   |
| US2703224          | Grey         | 8 | 100 | 35 | 594.6               | 1073.2 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 8** TT 1146 - PILOT 307/A setting springs



# Accessories

## For the pressure regulators:

- Cg limiter
- Visual opening indicator
- Silencer
- Slam shut valve
- Monitor

## For the pilot circuit:

- Heating cable for preheating pilot circuit
- Electrical heater PPH200
- Supplementary filter CF14 or CF14/D

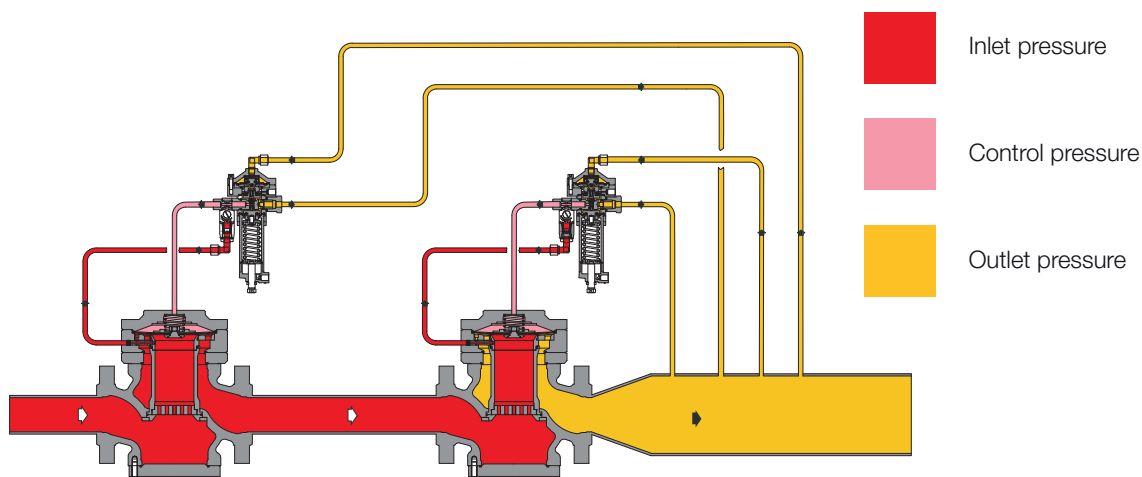
## In-line Monitor

**The in-line monitor is generally installed upstream** of the worker regulator.

Although the function of the monitor regulator is different, the two regulators are virtually identical from the point of view of their mechanical components.

The only difference is that the monitor is set at a higher pressure than the worker regulator.

The Cg coefficient of the active regulator is the same, however during the sizing process, the differential pressure drop generated by the fully open in-line monitor shall be considered. As a general practice to incorporate this effect, a 20% reduction of the worker regulator's Cg value can be applied.



**Figure 5** Aperflux 851 with In-line monitor setup

## PM/819 monitor

**This emergency regulator (monitor) is directly integrated** onto the body of the main regulator. Both pressure regulators, therefore, use the same valve body, although they have independent actuators, pilots and valve seats.

The monitor is normally in the fully open position during normal operation of the worker regulator and takes over in the event of its failure.

The operational characteristics of the PM/819 monitor are the same as for the Reflux 819 regulator (refer to that specific technical brochure).

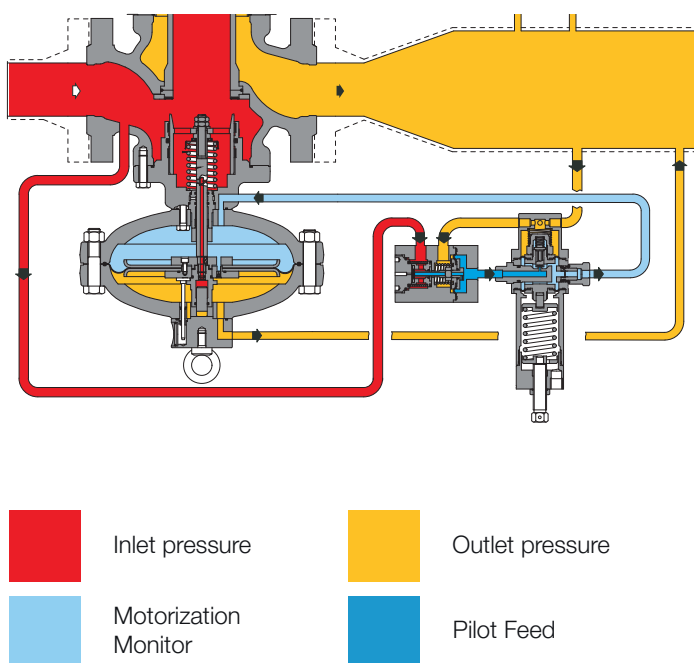
The Cg coefficients of regulators having an incorporated monitor is 5% lower than those for standard version.

This solution allows the construction of pressure reduction lines with compact dimensions.

Another great advantage offered by the incorporated monitor regulator is that **it can be installed at any time**, even on an existing regulator, **without major changes to the pipework**.

The main characteristics of this device are:

-  Compact dimensions
-  Completely independent
-  "Fail to close" action
-  Built-in pilot filter
-  Visual opening indicator
-  Easy maintenance
-  Limit switch option
-  Accelerator option



**Figure 6** Aperflux 851 with PM/819

| Type       | Model | Operation | Range Wh   |            | Spring Table web link   |
|------------|-------|-----------|------------|------------|-------------------------|
|            |       |           | MPa        | psig       |                         |
| Main pilot | 204/A | Manual    | 0.03 - 4.3 | 4.35 - 623 | <a href="#">TT 433</a>  |
| Main pilot | 205/A | Manual    | 2 - 6      | 290 - 870  | <a href="#">TT 799</a>  |
| Main pilot | 207/A | Manual    | 4.1 - 7.4  | 595 - 1073 | <a href="#">TT 1146</a> |

**Table 9** Settings table

| Types of pilot adjustment |                                                            |
|---------------------------|------------------------------------------------------------|
| Pilot type .../A          | Manual setting                                             |
| Pilot type .../D          | Electric remote setting control                            |
| Pilot type .../CS         | Pneumatic remote setting control                           |
| Pilot type .../FIO        | Smart unit for remote setting, monitoring, flow limitation |

**Table 10** Pilot adjustment table

The monitor regulator can be equipped with an additional pilot called “accelerating valve” to enable a quick response time during the monitor take over. According to PED the accelerating valve is required on the monitor when acting as a safety accessory.

| Type               | Model | Operation | Range Wh |            | Spring Table web link  |
|--------------------|-------|-----------|----------|------------|------------------------|
|                    |       |           | MPa      | psig       |                        |
| Accelerating valve | M/A   | Manual    | 0.03 - 2 | 4.4 - 290  | <a href="#">TT 354</a> |
| Accelerating valve | M/A1  | Manual    | 2 - 6.3  | 290 - 913  | <a href="#">TT 892</a> |
| Accelerating valve | M/A2  | Manual    | 4 - 7.5  | 580 - 1087 | <a href="#">TT 892</a> |

**Table 11** Accelerating valve adjustment table

General link to the calibration tables: [PRESS HERE](#) or use the QR code:



**PILOT 204/A**

| Spring part number | Spring color | d   | Lo | De | Spring range (psig) |       |
|--------------------|--------------|-----|----|----|---------------------|-------|
|                    |              |     |    |    | Min.                | Max.  |
| US2701260          | White        | 3.5 | 60 | 35 | 4.3                 | 14.5  |
| US2701530          | Yellow       | 4   | 60 | 35 | 14.5                | 29.0  |
| US2702070          | Orange       | 5   | 60 | 35 | 29.0                | 87.0  |
| US2702450          | Red          | 6   | 60 | 35 | 87.0                | 174.0 |
| US2702815          | Green        | 7   | 60 | 35 | 174.0               | 262.0 |
| US2703220          | Black        | 8   | 60 | 35 | 262.0               | 406.1 |
| US2703420          | Blue         | 8.5 | 60 | 35 | 406.1               | 623.6 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 12** TT 433 - PILOT 204/A setting springs

**PILOT 205/A**

| Spring part number | Spring color | d   | Lo  | De | Spring range (psig) |       |
|--------------------|--------------|-----|-----|----|---------------------|-------|
|                    |              |     |     |    | Min.                | Max.  |
| US2702820          | Blue         | 7   | 100 | 35 | 290.0               | 435.1 |
| US2703045          | Brown        | 7.5 | 100 | 35 | 435.1               | 638.2 |
| US2703224          | Grey         | 8   | 100 | 35 | 638.2               | 870.2 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 14** TT 799 - PILOT 205/A setting springs

**PILOT 207/A**

| Spring part number | Spring color | d | Lo  | De | Spring range (psig) |        |
|--------------------|--------------|---|-----|----|---------------------|--------|
|                    |              |   |     |    | Min.                | Max.   |
| US2703224          | Grey         | 8 | 100 | 35 | 594.6               | 1073.2 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 15** TT 1146 - PILOT 207/A setting springs

**M/A ACCELERATING VALVE**

| Spring part number | Spring color | d   | Lo | De | Spring range (psig) |       |
|--------------------|--------------|-----|----|----|---------------------|-------|
|                    |              |     |    |    | Min.                | Max.  |
| US2701260          | White        | 3.5 | 60 | 35 | 4.3                 | 14.5  |
| US2701530          | Yellow       | 4   | 60 | 35 | 14.5                | 29.0  |
| US2702070          | Orange       | 5   | 60 | 35 | 29.0                | 87.0  |
| US2702450          | Red          | 6   | 60 | 35 | 87.0                | 174.0 |
| US2702815          | Green        | 7   | 60 | 35 | 174.0               | 262.0 |
| US2703220          | Black        | 8   | 60 | 35 | 262.0               | 406.1 |
| US2703420          | Blue         | 8.5 | 60 | 35 | 406.1               | 623.6 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 13** TT 354 - M/A ACCELERATING VALVE setting springs



#### M/A ACCELERATING VALVE

| Spring part number | Spring color | d   | Lo | De | Spring range (psig) |       |
|--------------------|--------------|-----|----|----|---------------------|-------|
|                    |              |     |    |    | Min.                | Max.  |
| US2701260          | White        | 3.5 | 60 | 35 | 4.3                 | 14.5  |
| US2701530          | Yellow       | 4   | 60 | 35 | 14.5                | 30.4  |
| US2702070          | Orange       | 5   | 60 | 35 | 30.4                | 79.8  |
| US2702450          | Red          | 6   | 60 | 35 | 79.8                | 159.5 |
| US2702815          | Green        | 7   | 60 | 35 | 159.5               | 290.1 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 16** TT 354 - M/A ACCELERATING VALVE setting springs

#### M/A1 ACCELERATING VALVE

| Spring part number | Spring color | d   | Lo  | De | Spring range (psig) |       |
|--------------------|--------------|-----|-----|----|---------------------|-------|
|                    |              |     |     |    | Min.                | Max.  |
| US2702820          | Blue         | 7   | 100 | 35 | 290.1               | 478.6 |
| US2703045          | Brown        | 7.5 | 100 | 35 | 478.6               | 623.6 |
| US2703224          | Grey         | 8   | 100 | 35 | 623.6               | 913.7 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 17** TT 892 - M/A1 ACCELERATING VALVE setting springs

#### M/A2 ACCELERATING VALVE

| Spring part number | Spring color | d | Lo  | De | Spring range (psig) |        |
|--------------------|--------------|---|-----|----|---------------------|--------|
|                    |              |   |     |    | Min.                | Max.   |
| US2703224          | Grey         | 8 | 100 | 35 | 580.1               | 1087.7 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 18** TT 892 - M/A2 ACCELERATING VALVE setting springs

## DB/851 silencer

Whenever certain noise limit is desired, an additional silencer allows to considerably reduce the noise level (dBA).

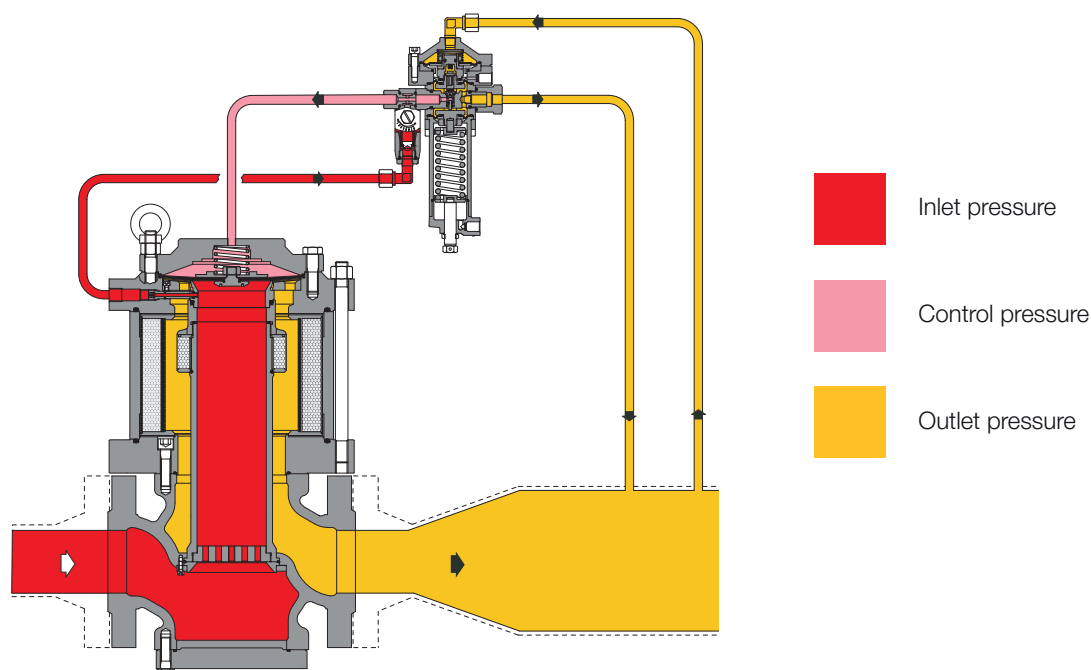
Aperflux 851 pressure regulator can be supplied with an **incorporated silencer** in either the standard version or version with incorporated slam shut or monitor regulator.

The high efficiency noise absorption takes place at the point where the noise is generated, thus preventing its propagation.

With the built-in silencer, the  $C_g$  valve coefficient is 5% lower than the corresponding version without.

Given the modular arrangement of the regulator, the silencer may be retrofitted to both standard Aperflux 851 version as well as those with incorporated slam shut or monitor, **without the need to modify the main piping**.

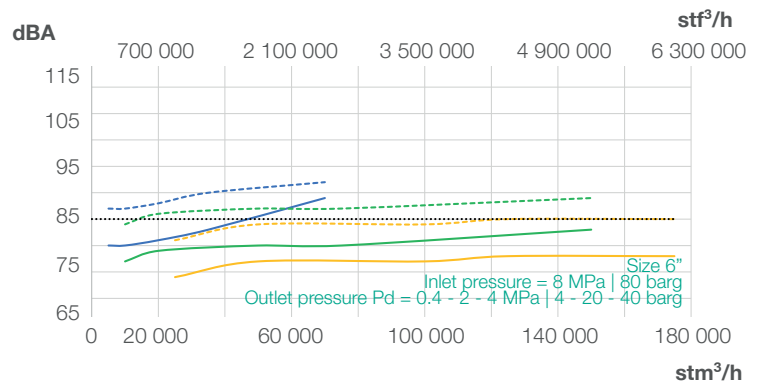
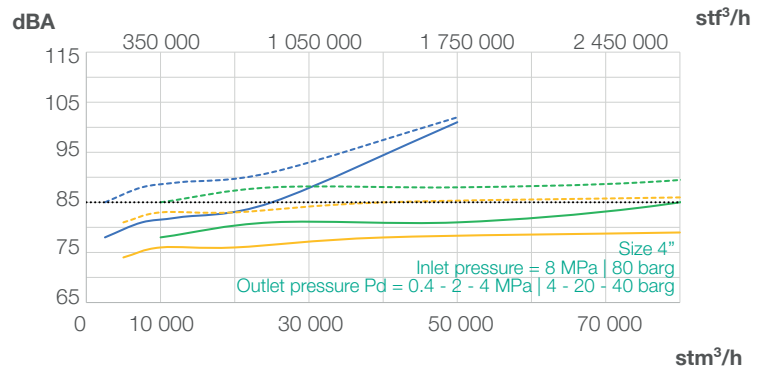
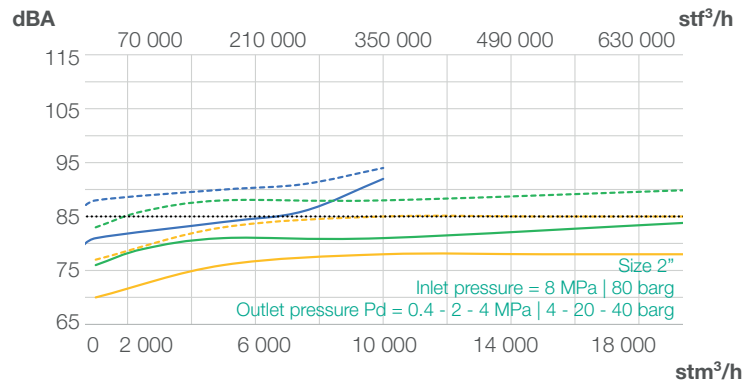
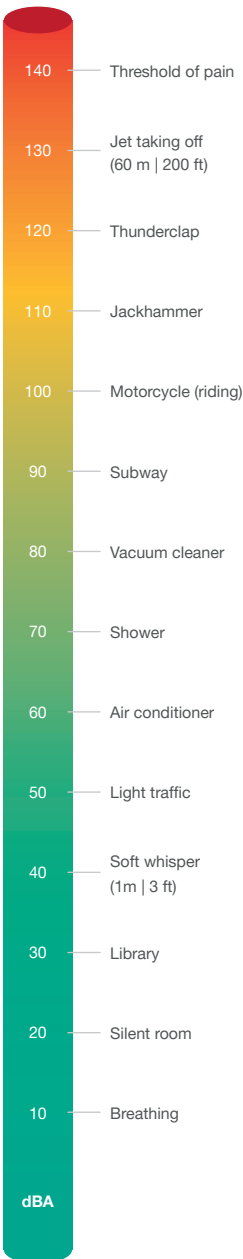
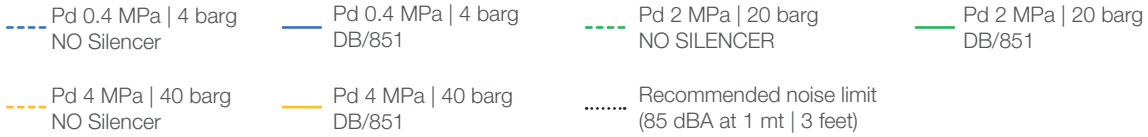
Pressure reduction and control operate in the same manner as the standard version.



**Figure 7** Aperflux 851 with Silencer DB/851

## High - Medium Pressure Gas Regulator

The chart below represents the silencer effectiveness based on some common reference conditions for 2", 4" and 6". For actual calculations at specific desired conditions please refer to the online sizing tool or contact your closest Pietro Fiorentini representative.



**Chart 1** Aperflux 851's silencer efficiency charts

## SB/82 or HB/97 slam shut valve

Aperflux 851 pressure regulator offers the possibility of installing an **SB/82 or HB/97 incorporated slam shut valve**, depending on the regulator size, and this can be done either during the manufacturing process or be retrofitted in the field.

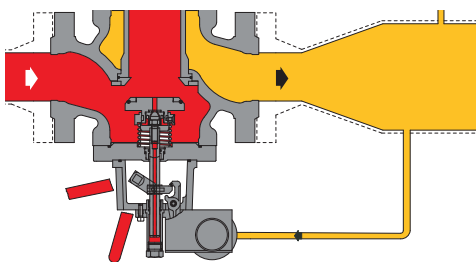
SB/82 is available for all sizes, while HB/97 is available from 4" to 10" only.

**Retrofitting can be done without modifying** the pressure regulator assembly.

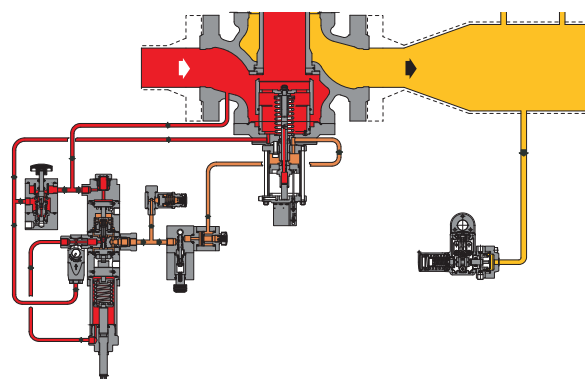
With the built-in slam shut, the Cg valve coefficients is 5% lower than the corresponding version without.

The main characteristics of this device are:

- |                                                                                                                   |                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
|  OPSO Over Pressure Shut-Off     |  Compact dimensions       |
|  UPSO Under Pressure Shut-Off    |  Easy maintenance         |
|  Internal by-pass              |  Remote tripping option |
|  Push button for tripping test |  Limit switch option    |



**Figure 8** Aperflux 851 with SB/82



**Figure 9** Aperflux 851 with HB/97





**Pressure switch** types and ranges

| SSV Type | Model  | Operation | Range Wh    |               | Spring Table web link   |
|----------|--------|-----------|-------------|---------------|-------------------------|
|          |        |           | MPa         | psig          |                         |
| SB/82    | 102M   | OPSO      | 0.02 - 0.55 | 2.9 - 79.8    | <a href="#">TT 1331</a> |
|          |        | UPSO      | 0.02 - 0.28 | 2.9 - 40.6    |                         |
| SB/82    | 102MH  | OPSO      | 0.02 - 0.55 | 2.9 - 79.8    | <a href="#">TT 1331</a> |
|          |        | UPSO      | 0.28 - 0.55 | 40.6 - 79.8   |                         |
| SB/82    | 103M   | OPSO      | 0.2 - 2.2   | 29.0 - 319.1  | <a href="#">TT 1331</a> |
|          |        | UPSO      | 0.02 - 0.8  | 2.9 - 116.0   |                         |
| SB/82    | 103MH  | OPSO      | 0.2 - 2.2   | 29.0 - 319.1  | <a href="#">TT 1331</a> |
|          |        | UPSO      | 0.8 - 1.9   | 116.0 - 275.6 |                         |
| SB/82    | 104M   | OPSO      | 1.5 - 4.5   | 217.6 - 652.7 | <a href="#">TT 1331</a> |
|          |        | UPSO      | 0.16 - 1.8  | 23.2 - 216.1  |                         |
| SB/82    | 104MH  | OPSO      | 1.5 - 4.5   | 217.6 - 652.7 | <a href="#">TT 1331</a> |
|          |        | UPSO      | 1.8 - 4.1   | 216.1 - 594.7 |                         |
| SB/82    | 105M   | OPSO      | 3 - 9       | 435.1 - 1305  | <a href="#">TT 1331</a> |
|          |        | UPSO      | 0.3 - 4.4   | 43.5 - 638.2  |                         |
| SB/82    | 105MH  | OPSO      | 3 - 9       | 435.1 - 1305  | <a href="#">TT 1331</a> |
|          |        | UPSO      | 4.4 - 9     | 638.2 - 1305  |                         |
| HB/97    | 103    | OPSO      | 0.13 - 1.1  | 18.9 - 159.5  | <a href="#">TT 984</a>  |
|          |        | UPSO      | 0.04 - 0.68 | 5.8 - 98.6    |                         |
| HB/97    | 104    | OPSO      | 1 - 3.15    | 145.0 - 456.9 | <a href="#">TT 984</a>  |
|          |        | UPSO      | 0.1 - 2.06  | 14.5 - 298.8  |                         |
| HB/97    | 105    | OPSO      | 2.5 - 7.6   | 362.6 - 1102  | <a href="#">TT 985</a>  |
|          |        | UPSO      | 0.25 - 5    | 362.6 - 725.2 |                         |
| HB/97    | 105/92 | OPSO      | 5.8 - 8.5   | 841.2 - 1232  | <a href="#">TT 985</a>  |
|          |        | UPSO      | 4.5 - 7.5   | 652.7 - 1087  |                         |

**Table 19** Settings table

General link to the calibration tables: [PRESS HERE](#) or use the QR code:



**Mod. 102M/102MH - Max pressure**

| Spring part number | Spring color | d   | Lo | De | Spring range (psig) |      |
|--------------------|--------------|-----|----|----|---------------------|------|
|                    |              |     |    |    | Min.                | Max. |
| US2701260          | White        | 3.5 | 60 | 35 | 2.90                | 11.6 |
| US2701530          | Yellow       | 4   | 60 | 35 | 11.6                | 23.2 |
| US2701790          | Yellow/black | 4.5 | 60 | 35 | 23.2                | 37.7 |
| US2702280          | White/red    | 5.5 | 60 | 35 | 37.7                | 79.8 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 20** TT 1331 - Mod. 102M/102MH - Max pressure setting springs

**Mod. 102M - Min pressure**

| Spring part number | Spring color | d   | Lo | De | Spring range (psig) |      |
|--------------------|--------------|-----|----|----|---------------------|------|
|                    |              |     |    |    | Min.                | Max. |
| US2700513          | Red          | 2   | 40 | 15 | 0.7                 | 2.9  |
| US2700713          | Green        | 2.3 | 40 | 15 | 2.9                 | 5.8  |
| US2700750          | Black        | 2.5 | 40 | 15 | 5.8                 | 11.6 |
| US2700985          | Brown        | 3   | 40 | 15 | 11.6                | 40.6 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 21** TT 1331 - Mod. 102M - Min pressure setting springs

**Mod. 102MH - Min pressure**

| Spring part number | Spring color | d | Lo | De | Spring range (psig) |      |
|--------------------|--------------|---|----|----|---------------------|------|
|                    |              |   |    |    | Min.                | Max. |
| US2700985          | Brown        | 3 | 40 | 15 | 40.6                | 60.9 |
| US2700980          | Blue         | 3 | 35 | 15 |                     |      |
| US2700985          | Brown        | 3 | 40 | 15 | 60.9                | 79.8 |
| US2700985          | Brown        | 3 | 40 | 15 |                     |      |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 22** TT 1331 - Mod. 102MH - Min pressure setting springs

**Mod. 103M/103MH - Max pressure**

| Spring part number | Spring color | d   | Lo | De | Spring range (psig) |       |
|--------------------|--------------|-----|----|----|---------------------|-------|
|                    |              |     |    |    | Min.                | Max.  |
| US2701530          | Yellow       | 4   | 60 | 35 | 29.0                | 58.0  |
| US2701790          | Yellow/black | 4.5 | 60 | 35 | 58.0                | 108.8 |
| US2702280          | White/red    | 5.5 | 60 | 35 | 108.8               | 217.5 |
| US2702450          | Red          | 6   | 60 | 35 | 217.5               | 319.1 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 23** TT 1331 - Mod. 103M/103MH - Max pressure setting springs

## High - Medium Pressure Gas Regulator

### Mod. 103M - Min pressure

| Spring part number | Spring color | d   | Lo | De | Spring range (psig) |       |
|--------------------|--------------|-----|----|----|---------------------|-------|
|                    |              |     |    |    | Min.                | Max.  |
| US2700464          | Orange       | 1.7 | 40 | 15 | 2.9                 | 7.3   |
| US2700513          | Red          | 2   | 40 | 15 | 7.3                 | 11.6  |
| US2700713          | Green        | 2.3 | 40 | 15 | 11.6                | 24.7  |
| US2700750          | Black        | 2.5 | 40 | 15 | 24.7                | 58.0  |
| US2700985          | Brown        | 3   | 40 | 15 | 58.0                | 116.0 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 24** TT 1331 - Mod. 103M - Min pressure setting springs

### Mod. 103MH - Min pressure

| Spring part number | Spring color | d | Lo | De | Spring range (psig) |       |
|--------------------|--------------|---|----|----|---------------------|-------|
|                    |              |   |    |    | Min.                | Max.  |
| US2700985          | Brown        | 3 | 40 | 15 | 116.0               | 188.5 |
| US2700980          | Blue         | 3 | 35 | 15 |                     |       |
| US2700985          | Brown        | 3 | 40 | 15 | 188.5               | 275.6 |
| US2700985          | Brown        | 3 | 40 | 15 |                     |       |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 27** TT 1331 - Mod. 103MH - Min pressure setting springs

### Mod. 104M/104MH - Max pressure

| Spring part number | Spring color | d   | Lo | De | Spring range (psig) |       |
|--------------------|--------------|-----|----|----|---------------------|-------|
|                    |              |     |    |    | Min.                | Max.  |
| US2702280          | White/Red    | 5.5 | 60 | 35 | 217.6               | 435.1 |
| US2702450          | Red          | 6   | 60 | 35 | 435.1               | 652.6 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 25** TT 1331 - Mod. 104M/104MH - Max pressure setting springs

### Mod. 104M - Min pressure

| Spring part number | Spring color | d   | Lo | De | Spring range (psig) |       |
|--------------------|--------------|-----|----|----|---------------------|-------|
|                    |              |     |    |    | Min.                | Max.  |
| US2700713          | Green        | 2.3 | 40 | 15 | 23.2                | 43.5  |
| US2700750          | Black        | 2.5 | 40 | 15 | 43.5                | 116.0 |
| US2700985          | Brown        | 3   | 40 | 15 | 116.0               | 261.1 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 26** TT 1331 - Mod. 104M - Min pressure setting springs

**Mod. 104MH - Min pressure**

| Spring part number | Spring color | d | Lo | De | Spring range (psig) |       |
|--------------------|--------------|---|----|----|---------------------|-------|
|                    |              |   |    |    | Min.                | Max.  |
| US2700985          | Brown        | 3 | 40 | 15 | 261.1               | 435.1 |
| US2700980          | Blue         | 3 | 35 | 15 |                     |       |
| US2700985          | Brown        | 3 | 40 | 15 | 435.1               | 594.6 |
| US2700985          | Brown        | 3 | 40 | 15 |                     |       |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 31** TT 1331 - Mod. 104MH - Min pressure setting springs

**Mod. 105M/105MH - Max pressure**

| Spring part number | Spring color | d   | Lo | De | Spring range (psig) |        |
|--------------------|--------------|-----|----|----|---------------------|--------|
|                    |              |     |    |    | Min.                | Max.   |
| US2702280          | White/Red    | 5.5 | 60 | 35 | 435.1               | 942.7  |
| US2702450          | Red          | 6   | 60 | 35 | 942.7               | 1305.3 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 28** TT 1331 - Mod. 105M/105MH - Max pressure setting springs

**Mod. 105M - Min pressure**

| Spring part number | Spring color | d   | Lo | De | Spring range (psig) |       |
|--------------------|--------------|-----|----|----|---------------------|-------|
|                    |              |     |    |    | Min.                | Max.  |
| US2700713          | Green        | 2.3 | 40 | 15 | 43.5                | 101.5 |
| US2700750          | Black        | 2.5 | 40 | 15 | 101.5               | 232.1 |
| US2700985          | Brown        | 3   | 40 | 15 | 232.1               | 638.1 |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 29** TT 1331 - Mod. 105M - Min pressure setting springs

**Mod. 105MH - Min pressure**

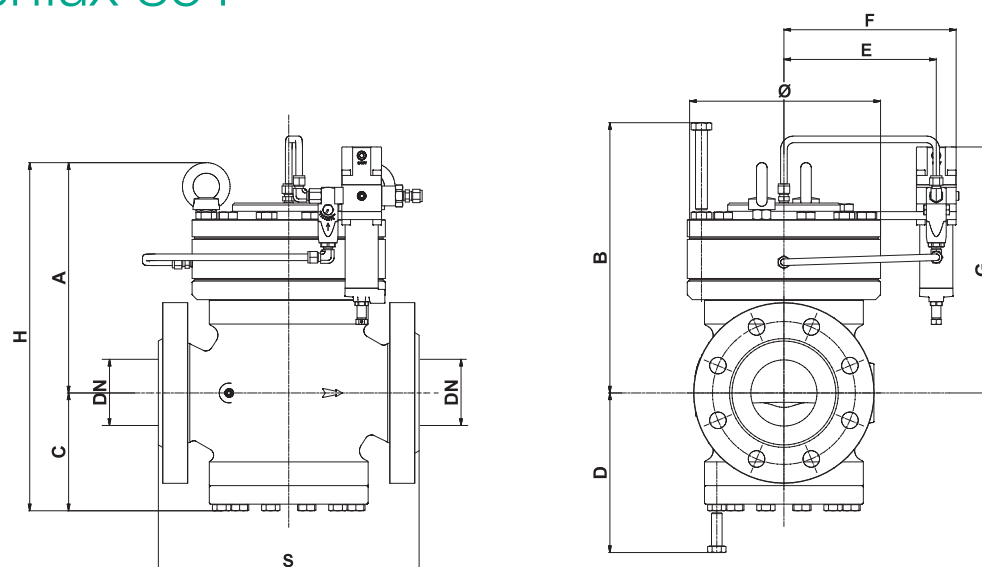
| Spring part number | Spring color | d | Lo | De | Spring range (psig) |        |
|--------------------|--------------|---|----|----|---------------------|--------|
|                    |              |   |    |    | Min.                | Max.   |
| US2700985          | Brown        | 3 | 40 | 15 | 638.1               | 870.2  |
| US2700980          | Blue         | 3 | 35 | 15 |                     |        |
| US2700985          | Brown        | 3 | 40 | 15 | 870.2               | 1305.3 |
| US2700985          | Brown        | 3 | 40 | 15 |                     |        |

**d** = Wire Diameter (mm)   **Lo** = Spring Length (mm)   **De** = External Diameter (mm)

**Table 30** TT 1331 - Mod. 105MH - Min pressure setting springs

# Weights and Dimensions

## Aperflux 851



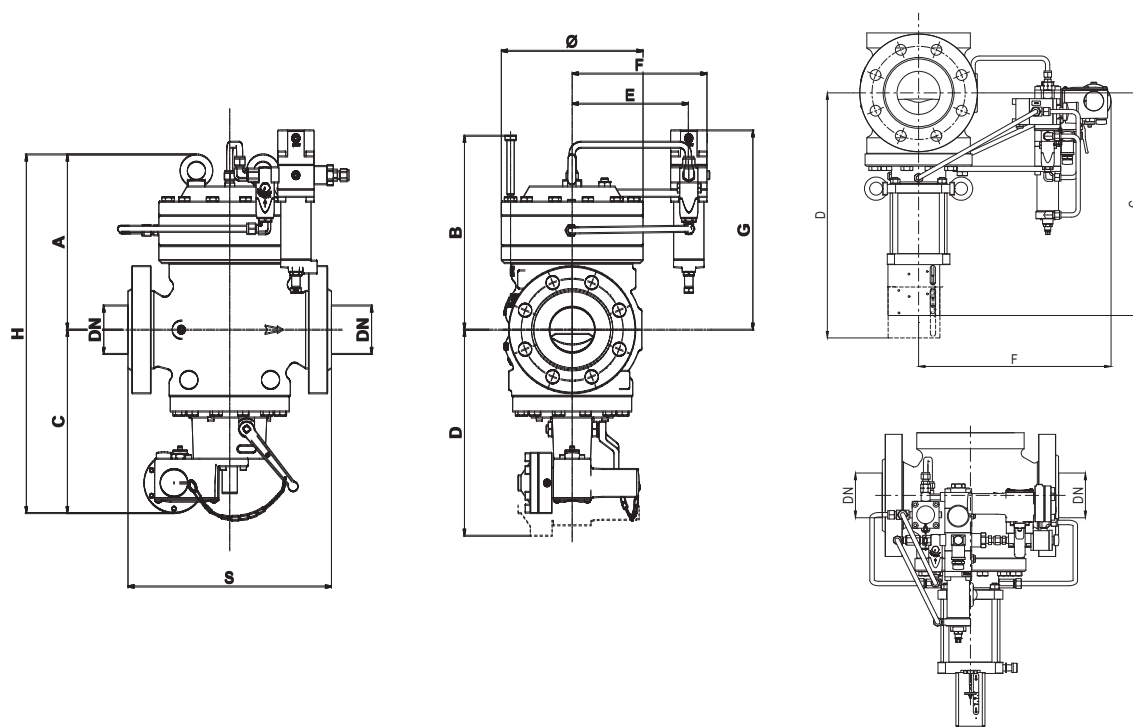
**Figure 10** Aperflux 851 dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)

| Size (DN) - [mm]   | 25       |        | 50   |        | 80   |        | 100  |        | 150  |        | 200  |        | 250  |        |
|--------------------|----------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|
| Size (DN) - inches | 1"       |        | 2"   |        | 3"   |        | 4"   |        | 6"   |        | 8"   |        | 10"  |        |
|                    | [mm]     | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches |
| S - ANSI 150/PN16  | 183      | 7.21"  | 254  | 10"    | 298  | 1.75"  | 352  | 13.88" | 451  | 17.75" | 543  | 21.38" | 673  | 26.50" |
| S - ANSI 300       | 197      | 7.75"  | 267  | 0.52"  | 317  | 2.48"  | 368  | 14.49" | 473  | 18.62" | 568  | 22.38" | 708  | 27.88" |
| S - ANSI 600       | 210      | 8.25"  | 286  | 1.25"  | 336  | 3.25"  | 394  | 15.52" | 508  | 20.00" | 609  | 23.98" | 752  | 29.62" |
| Ø                  | 125      | 4.9"   | 160  | 6.3"   | 245  | 9.6"   | 290  | 11.4"  | 385  | 15.2"  | 490  | 19.3"  | 615  | 24.2"  |
| A                  | 200      | 7.9"   | 230  | 9.1"   | 300  | 11.8"  | 340  | 13.4"  | 420  | 16.5"  | 455  | 17.9"  | 580  | 22.8"  |
| B                  | 230      | 9.1"   | 260  | 10.2"  | 340  | 13.4"  | 380  | 15.0"  | 470  | 18.5"  | 510  | 20.1"  | 520  | 20.5"  |
| C                  | 100      | 3.9"   | 130  | 5.1"   | 150  | 5.9"   | 190  | 7.5"   | 240  | 9.4"   | 265  | 10.4"  | 340  | 13.4"  |
| D                  | 130      | 5.1"   | 160  | 6.3"   | 200  | 7.9"   | 250  | 9.8"   | 300  | 11.8"  | 320  | 12.6"  | 440  | 17.3"  |
| E                  | 140      | 5.5"   | 145  | 5.7"   | 190  | 7.5"   | 210  | 8.3"   | 260  | 10.2"  | 315  | 12.4"  | 370  | 14.6"  |
| F                  | 160      | 6.3"   | 175  | 6.9"   | 220  | 8.7"   | 240  | 9.4"   | 290  | 11.4"  | 345  | 13.6"  | 415  | 16.3"  |
| G                  | 260      | 10.2"  | 280  | 11.0"  | 350  | 13.8"  | 380  | 15.0"  | 450  | 17.7"  | 490  | 19.3"  | 380  | 15.0"  |
| H                  | 300      | 11.8"  | 360  | 14.2"  | 450  | 17.7"  | 530  | 20.9"  | 660  | 26.0"  | 720  | 28.3"  | 920  | 36.2"  |
| Tubing Connections | 1/4" NPT |        |      |        |      |        |      |        |      |        |      |        |      |        |
| Weight             | Kg       | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    |
| ANSI 150/PN16      | 20       | 44     | 35   | 77     | 76   | 168    | 115  | 254    | 235  | 518    | 335  | 739    | 700  | 1543   |
| ANSI 300           | 21       | 46     | 36   | 79     | 82   | 181    | 128  | 282    | 257  | 567    | 395  | 871    | 750  | 1653   |
| ANSI 600           | 22       | 49     | 38   | 84     | 85   | 187    | 138  | 304    | 290  | 639    | 435  | 959    | 850  | 1874   |

**Table 32** Weights and dimensions

## Aperflux 851+ SB/82 or HB/97



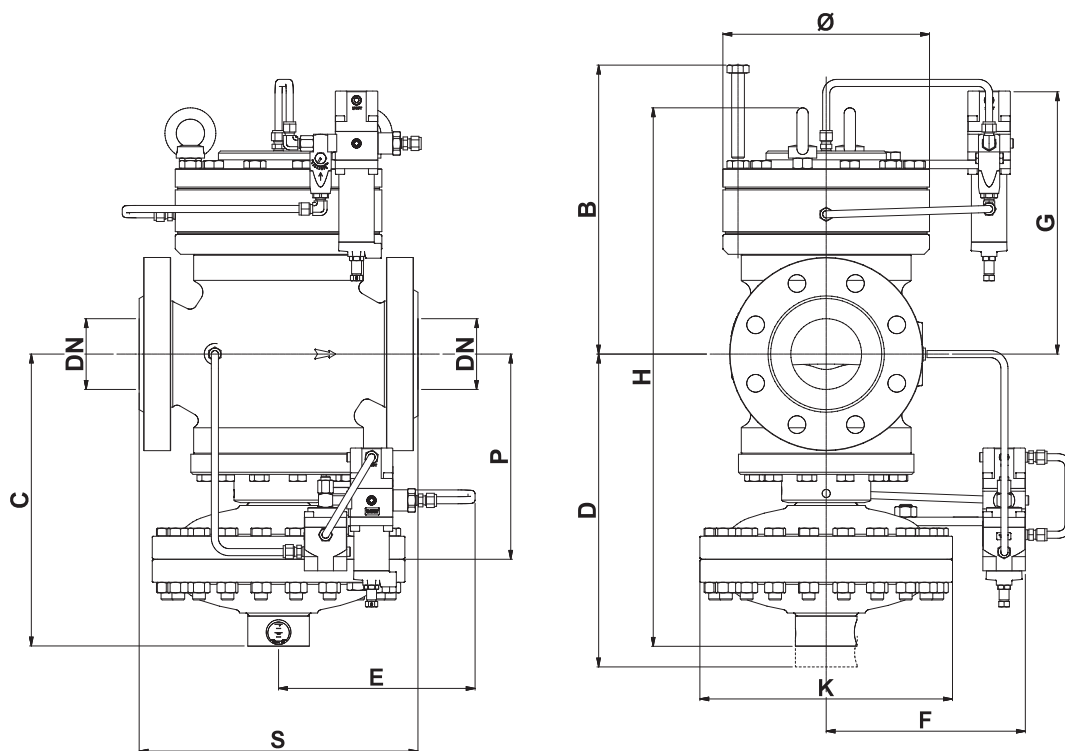
**Figure 11** Aperflux 851 + SB/82 or HB/97 dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)

| Size (DN) - [mm]   | 25       |        | 50   |        | 80   |        | 100  |        | 150  |        | 200  |        | 250  |        |
|--------------------|----------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|
| Size (DN) - inches | 1"       |        | 2"   |        | 3"   |        | 4"   |        | 6"   |        | 8"   |        | 10"  |        |
|                    | [mm]     | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches |
| S - ANSI 150/PN16  | 183      | 7.21"  | 254  | 10"    | 298  | 1.75"  | 352  | 13.88" | 451  | 17.75" | 543  | 21.38" | 673  | 26.50" |
| S - ANSI 300       | 197      | 7.75"  | 267  | 0.52"  | 317  | 2.48"  | 368  | 14.49" | 473  | 18.62" | 568  | 22.38" | 708  | 27.88" |
| S - ANSI 600       | 210      | 8.25"  | 286  | 1.25"  | 336  | 3.25"  | 394  | 15.52" | 508  | 20.00" | 609  | 23.98" | 752  | 29.62" |
| Ø                  | 125      | 4.9"   | 160  | 6.3"   | 245  | 9.6"   | 290  | 11.4"  | 385  | 15.2"  | 490  | 19.3"  | 615  | 24.2"  |
| A                  | 200      | 7.9"   | 230  | 9.1"   | 300  | 11.8"  | 340  | 13.4"  | 420  | 16.5"  | 455  | 17.9"  | 580  | 22.8"  |
| B                  | 230      | 9.1"   | 260  | 10.2"  | 340  | 13.4"  | 380  | 15.0"  | 470  | 18.5"  | 510  | 20.1"  | 520  | 20.5"  |
| C with SB/82       | 215      | 8.5"   | 240  | 9.4"   | 270  | 10.6"  | 300  | 11.8"  | 375  | 14.8"  | 450  | 17.7"  | 680  | 26.8"  |
| C with HB/97       | -        | -      | -    | -      | -    | -      | 518  | 20.4"  | 645  | 25.4"  | 687  | 27.0"  | 796  | 31.3"  |
| D with SB/82       | 320      | 12.6"  | 370  | 14.6"  | 420  | 16.5"  | 480  | 18.9"  | 600  | 23.6"  | 665  | 26.2"  | 900  | 35.4"  |
| D with HB/97       | -        | -      | -    | -      | -    | -      | 650  | 25.6"  | 835  | 32.9"  | 900  | 35.4"  | 1060 | 41.7"  |
| E                  | 140      | 5.5"   | 145  | 5.7"   | 190  | 7.5"   | 210  | 8.3"   | 260  | 10.2"  | 315  | 12.4"  | 370  | 14.6"  |
| F with HB/97       | -        | -      | -    | -      | -    | -      | 358  | 14.1"  | 410  | 16.1"  | 445  | 17.5"  | 510  | 20.1"  |
| F                  | 160      | 6.3"   | 175  | 6.9"   | 220  | 8.7"   | 240  | 9.4"   | 290  | 11.4"  | 345  | 13.6"  | 415  | 16.3"  |
| G                  | 260      | 10.2"  | 280  | 11.0"  | 350  | 13.8"  | 380  | 15.0"  | 450  | 17.7"  | 490  | 19.3"  | 380  | 15.0"  |
| H                  | 415      | 16.3"  | 470  | 18.5"  | 570  | 22.4"  | 640  | 25.2"  | 795  | 31.3"  | 905  | 35.6"  | 1260 | 49.6"  |
| Tubing Connections | 1/4" NPT |        |      |        |      |        |      |        |      |        |      |        |      |        |
| Weight             | Kg       | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    |
| ANSI 150/PN16      | 27       | 60     | 44   | 97     | 86   | 190    | 130  | 287    | 260  | 573    | 400  | 882    | 750  | 1653   |
| ANSI 300           | 27       | 60     | 46   | 101    | 92   | 203    | 145  | 320    | 290  | 639    | 470  | 1036   | 800  | 1764   |
| ANSI 600           | 30       | 66     | 48   | 106    | 96   | 212    | 155  | 342    | 320  | 705    | 510  | 1124   | 900  | 1984   |

**Table 33** Weights and dimensions

# Aperflux 851 + PM/819

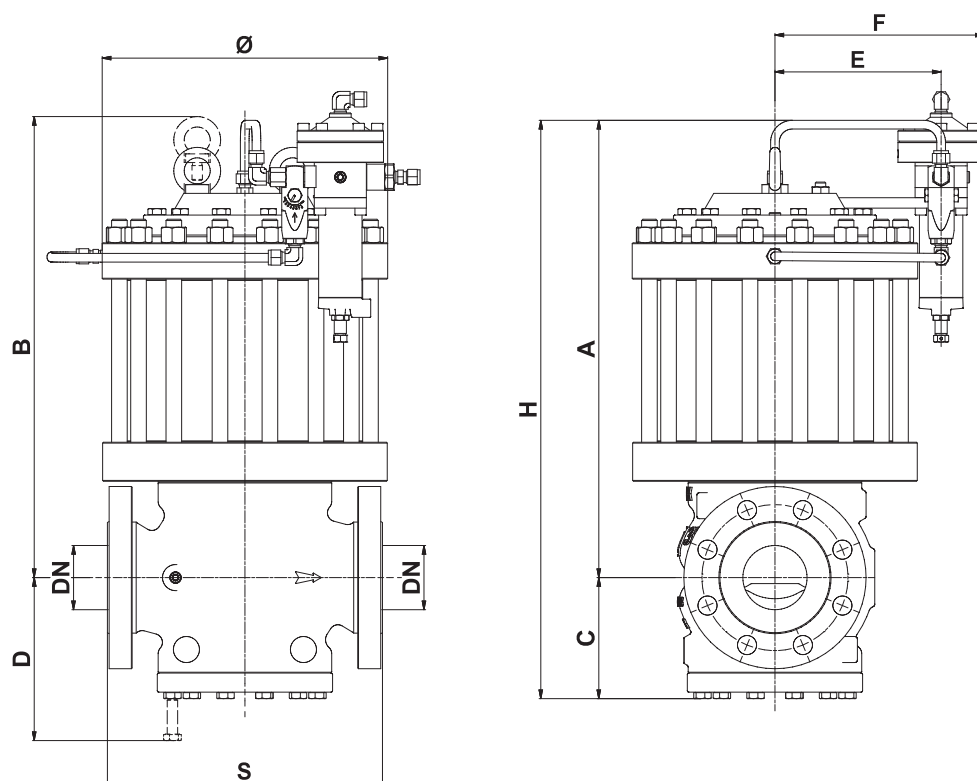


**Figure 12** Aperflux 851 + PM/819 dimensions

| Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative) |          |        |      |        |      |        |      |        |      |        |      |        |      |        |
|-------------------------------------------------------------------------------------------------------------|----------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|
| Size (DN) - [mm]                                                                                            | 25       |        | 50   |        | 80   |        | 100  |        | 150  |        | 200  |        | 250  |        |
| Size (DN) - inches                                                                                          | 1"       |        | 2"   |        | 3"   |        | 4"   |        | 6"   |        | 8"   |        | 10"  |        |
|                                                                                                             | [mm]     | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches |
| S - ANSI 150/PN16                                                                                           | 183      | 7.21"  | 254  | 10"    | 298  | 1.75"  | 352  | 13.88" | 451  | 17.75" | 543  | 21.38" | 673  | 26.50" |
| S - ANSI 300                                                                                                | 197      | 7.75"  | 267  | 0.52"  | 317  | 2.48"  | 368  | 14.49" | 473  | 18.62" | 568  | 22.38" | 708  | 27.88" |
| S - ANSI 600                                                                                                | 210      | 8.25"  | 286  | 1.25"  | 336  | 3.25"  | 394  | 15.52" | 508  | 20.00" | 609  | 23.98" | 752  | 29.62" |
| Ø                                                                                                           | 125      | 4.9"   | 160  | 6.3"   | 245  | 9.6"   | 290  | 11.4"  | 385  | 15.2"  | 490  | 19.3"  | 615  | 24.2"  |
| B                                                                                                           | 230      | 9.1"   | 260  | 10.2"  | 340  | 13.4"  | 380  | 15.0"  | 470  | 18.5"  | 510  | 20.1"  | 520  | 20.5"  |
| C                                                                                                           | 320      | 12.6"  | 350  | 13.8"  | 430  | 16.9"  | 490  | 19.3"  | 650  | 25.6"  | 750  | 29.5"  | 680  | 26.8"  |
| D                                                                                                           | 410      | 16.1"  | 430  | 16.9"  | 530  | 20.9"  | 600  | 23.6"  | 735  | 28.9"  | 850  | 33.5"  | 900  | 35.4"  |
| E                                                                                                           | 370      | 14.6"  | 370  | 14.6"  | 410  | 16.1"  | 410  | 16.1"  | 485  | 19.1"  | 485  | 19.1"  | 370  | 14.6"  |
| F                                                                                                           | 270      | 10.6"  | 270  | 10.6"  | 310  | 12.2"  | 310  | 12.2"  | 385  | 15.2"  | 385  | 15.2"  | 415  | 16.3"  |
| G                                                                                                           | 260      | 10.2"  | 280  | 11.0"  | 350  | 13.8"  | 380  | 15.0"  | 450  | 17.7"  | 490  | 19.3"  | 380  | 15.0"  |
| H                                                                                                           | 520      | 20.5"  | 580  | 22.8"  | 730  | 28.7"  | 830  | 32.7"  | 1070 | 42.1"  | 1205 | 47.4"  | 1380 | 54.3"  |
| K                                                                                                           | 278      | 10.9"  | 278  | 10.9"  | 360  | 14.2"  | 360  | 14.2"  | 510  | 20.1"  | 510  | 20.1"  | 610  | 24.0"  |
| P                                                                                                           | 170      | 6.7"   | 200  | 7.9"   | 260  | 10.2"  | 290  | 11.4"  | 320  | 12.6"  | 370  | 14.6"  | 500  | 19.7"  |
| Tubing Connections                                                                                          | 1/4" NPT |        |      |        |      |        |      |        |      |        |      |        |      |        |
| Weight                                                                                                      | Kg       | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    |
| ANSI 150/PN16                                                                                               | 33       | 73     | 68   | 150    | 135  | 298    | 160  | 353    | 370  | 816    | 525  | 1157   | 1100 | 2425   |
| ANSI 300                                                                                                    | 34       | 75     | 70   | 154    | 138  | 304    | 165  | 364    | 390  | 860    | 585  | 1290   | 1150 | 2535   |
| ANSI 600                                                                                                    | 35       | 77     | 72   | 159    | 148  | 326    | 190  | 419    | 420  | 926    | 625  | 1378   | 1250 | 2756   |

**Table 34** Weights and dimensions

## Aperflux 851+ DB/851



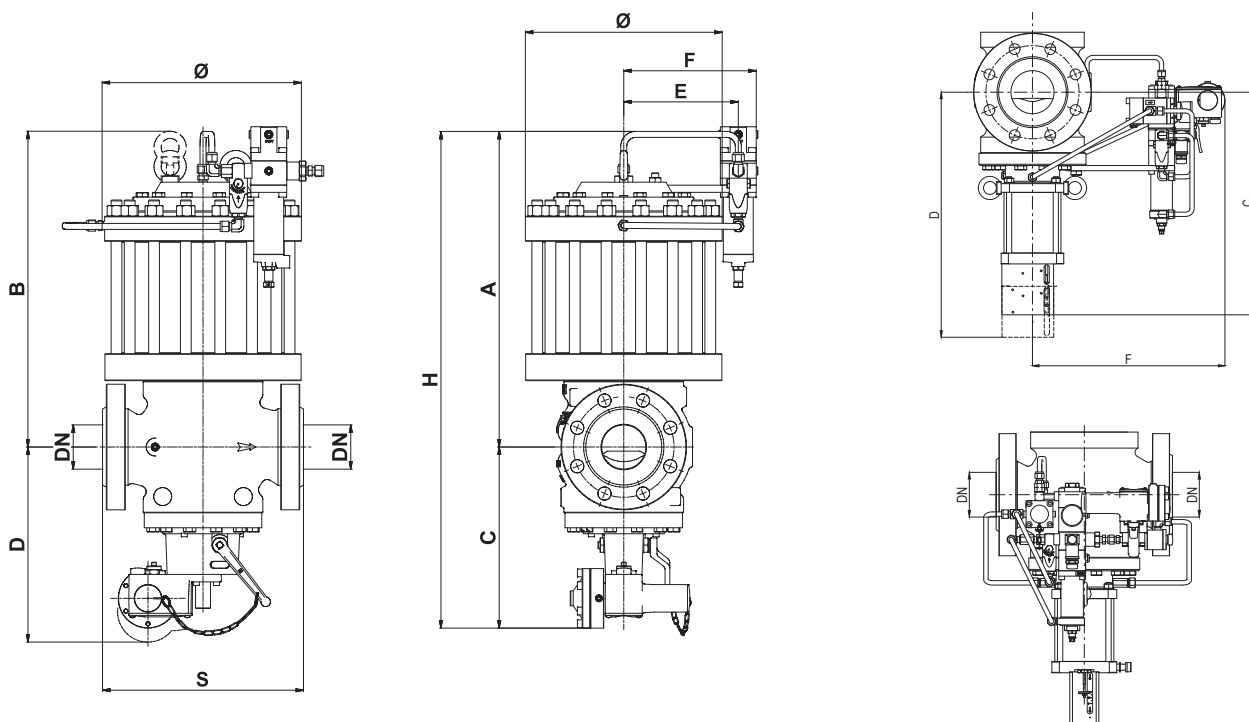
**Figure 13** Aperflux 851 + DB/851 dimensions

| Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative) |          |        |      |        |      |        |      |        |      |        |      |        |      |        |
|-------------------------------------------------------------------------------------------------------------|----------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|
| Size (DN) - [mm]                                                                                            | 25       |        | 50   |        | 80   |        | 100  |        | 150  |        | 200  |        | 250  |        |
| Size (DN) - inches                                                                                          | 1"       |        | 2"   |        | 3"   |        | 4"   |        | 6"   |        | 8"   |        | 10"  |        |
|                                                                                                             | [mm]     | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches |
| S - ANSI 150/PN16                                                                                           | 183      | 7.21"  | 254  | 10"    | 298  | 1.75"  | 352  | 13.88" | 451  | 17.75" | 543  | 21.38" | 673  | 26.50" |
| S - ANSI 300                                                                                                | 197      | 7.75"  | 267  | 0.52"  | 317  | 2.48"  | 368  | 14.49" | 473  | 18.62" | 568  | 22.38" | 708  | 27.88" |
| S - ANSI 600                                                                                                | 210      | 8.25"  | 286  | 1.25"  | 336  | 3.25"  | 394  | 15.52" | 508  | 20.00" | 609  | 23.98" | 752  | 29.62" |
| Ø                                                                                                           | 220      | 8.7"   | 300  | 11.8"  | 330  | 13.0"  | 390  | 15.4"  | 480  | 18.9"  | 645  | 25.4"  | 740  | 29.1"  |
| A                                                                                                           | 355      | 14.0"  | 420  | 16.5"  | 500  | 19.7"  | 570  | 22.4"  | 715  | 28.1"  | 910  | 35.8"  | 1025 | 40.4"  |
| B                                                                                                           | 465      | 18.3"  | 530  | 20.9"  | 625  | 24.6"  | 695  | 27.4"  | 850  | 33.5"  | 1045 | 41.1"  | 1085 | 42.7"  |
| C                                                                                                           | 100      | 3.9"   | 130  | 5.1"   | 150  | 5.9"   | 190  | 7.5"   | 240  | 9.4"   | 265  | 10.4"  | 340  | 13.4"  |
| D                                                                                                           | 130      | 5.1"   | 160  | 6.3"   | 200  | 7.9"   | 250  | 9.8"   | 300  | 11.8"  | 320  | 12.6"  | 440  | 17.3"  |
| E                                                                                                           | 162      | 6.4"   | 196  | 7.7"   | 216  | 8.5"   | 241  | 9.5"   | 234  | 9.2"   | 237  | 9.3"   | 262  | 10.3"  |
| F                                                                                                           | 192      | 7.6"   | 226  | 8.9"   | 246  | 9.7"   | 271  | 10.7"  | 264  | 10.4"  | 267  | 10.5"  | 292  | 11.5"  |
| H                                                                                                           | 455      | 17.9"  | 550  | 21.7"  | 650  | 25.6"  | 760  | 29.9"  | 980  | 38.6"  | 1175 | 46.3"  | 1215 | 47.8"  |
| Tubing Connections                                                                                          | 1/4" NPT |        |      |        |      |        |      |        |      |        |      |        |      |        |
| Weight                                                                                                      | Kg       | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    |
| ANSI 150/PN16                                                                                               | 673      | 1484   | 100  | 220    | 168  | 370    | 240  | 529    | 391  | 862    | 760  | 1676   | 1240 | 2734   |
| ANSI 300                                                                                                    | 708      | 1561   | 102  | 225    | 177  | 390    | 268  | 591    | 433  | 955    | 834  | 1839   | 1292 | 2848   |
| ANSI 600                                                                                                    | 752      | 1658   | 104  | 229    | 180  | 397    | 278  | 613    | 466  | 1027   | 874  | 1927   | 1392 | 3069   |

**Table 35** Weights and dimensions



# Aperflux 851 + DB/851 + SB/82 or HB/97

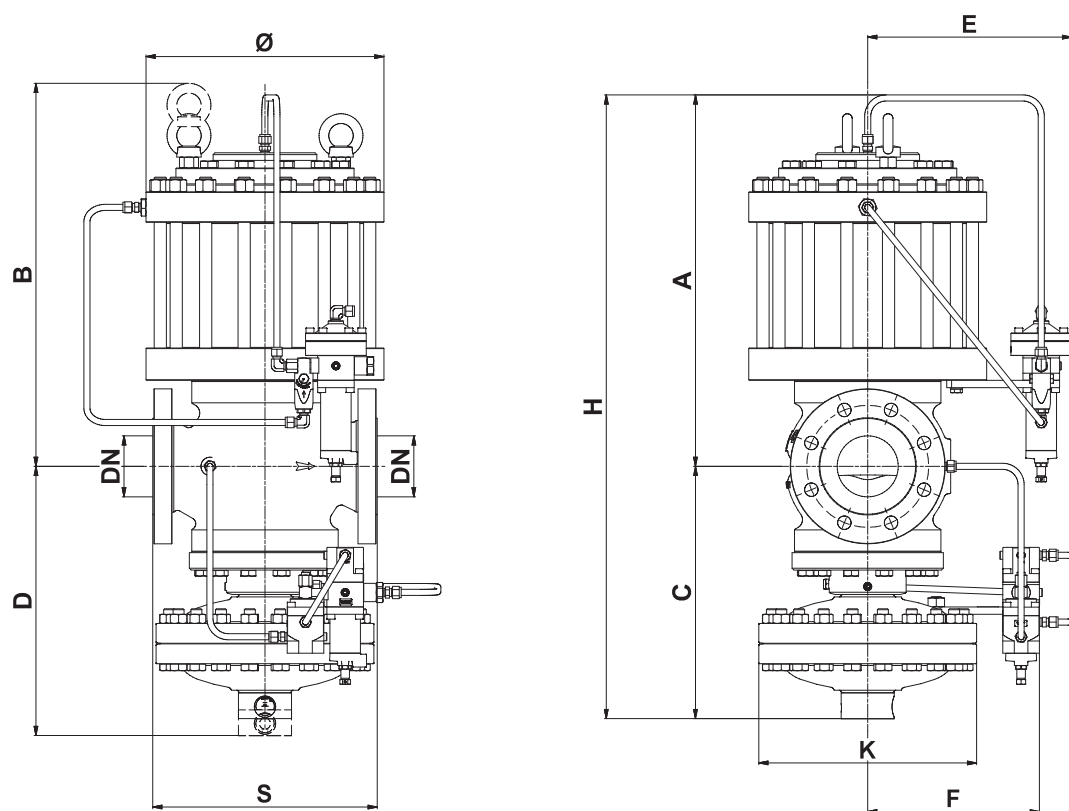


**Figure 14** Aperflux 851 + DB/851 + SB/82 or HB/97 dimensions

| Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative) |          |        |      |        |      |        |      |        |      |        |      |        |      |        |
|-------------------------------------------------------------------------------------------------------------|----------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|------|--------|
| Size (DN) - [mm]                                                                                            | 25       |        | 50   |        | 80   |        | 100  |        | 150  |        | 200  |        | 250  |        |
| Size (DN) - inches                                                                                          | 1"       |        | 2"   |        | 3"   |        | 4"   |        | 6"   |        | 8"   |        | 10"  |        |
|                                                                                                             | [mm]     | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches | [mm] | inches |
| S - ANSI 150/PN16                                                                                           | 183      | 7.21"  | 254  | 10"    | 298  | 1.75"  | 352  | 13.88" | 451  | 17.75" | 543  | 21.38" | 673  | 26.50" |
| S - ANSI 300                                                                                                | 197      | 7.75"  | 267  | 0.52"  | 317  | 2.48"  | 368  | 14.49" | 473  | 18.62" | 568  | 22.38" | 708  | 27.88" |
| S - ANSI 600                                                                                                | 210      | 8.25"  | 286  | 1.25"  | 336  | 3.25"  | 394  | 15.52" | 508  | 20.00" | 609  | 23.98" | 752  | 29.62" |
| Ø                                                                                                           | 220      | 8.7"   | 300  | 11.8"  | 330  | 13.0"  | 390  | 15.4"  | 480  | 18.9"  | 645  | 25.4"  | 740  | 29.1"  |
| A                                                                                                           | 335      | 13.2"  | 420  | 16.5"  | 500  | 19.7"  | 570  | 22.4"  | 715  | 28.1"  | 910  | 35.8"  | 1025 | 40.4"  |
| B                                                                                                           | 465      | 18.3"  | 530  | 20.9"  | 625  | 24.6"  | 695  | 27.4"  | 850  | 33.5"  | 1045 | 41.1"  | 1085 | 42.7"  |
| C with SB/82                                                                                                | 215      | 8.5"   | 240  | 9.4"   | 270  | 10.6"  | 300  | 11.8"  | 375  | 14.8"  | 450  | 17.7"  | 680  | 26.8"  |
| C with HB/97                                                                                                | -        | -      | -    | -      | -    | -      | 518  | 20.4"  | 645  | 25.4"  | 687  | 27.0"  | 796  | 31.3"  |
| D with SB/82                                                                                                | 320      | 12.6"  | 370  | 14.6"  | 420  | 16.5"  | 480  | 18.9"  | 600  | 23.6"  | 665  | 26.2"  | 900  | 35.4"  |
| D with HB/97                                                                                                | -        | -      | -    | -      | -    | -      | 650  | 25.6"  | 935  | 36.8"  | 900  | 35.4"  | 1060 | 41.7"  |
| E                                                                                                           | 192      | 7.6"   | 226  | 8.9"   | 246  | 9.7"   | 271  | 10.7"  | 264  | 10.4"  | 267  | 10.5"  | 292  | 11.5"  |
| F with HB/97                                                                                                | -        | -      | -    | -      | -    | -      | 358  | 14.1"  | 410  | 16.1"  | 445  | 17.5"  | 510  | 20.1"  |
| F                                                                                                           | 485      | 19.1"  | 550  | 21.7"  | 645  | 25.4"  | 705  | 27.8"  | 880  | 34.6"  | 1135 | 44.7"  | 1736 | 68.3"  |
| H                                                                                                           | 675      | 26.6"  | 783  | 30.8"  | 912  | 35.9"  | 1007 | 39.6"  | 1216 | 47.9"  | 1517 | 59.7"  | 1712 | 67.4"  |
| Tubing Connections                                                                                          | 1/4" NPT |        |      |        |      |        |      |        |      |        |      |        |      |        |
| Weight                                                                                                      | Kg       | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    | Kg   | lbs    |
| ANSI 150/PN16                                                                                               | 54       | 119    | 109  | 240    | 178  | 392    | 255  | 562    | 416  | 917    | 825  | 1819   | 1290 | 2844   |
| ANSI 300                                                                                                    | 56       | 123    | 112  | 247    | 187  | 412    | 283  | 624    | 466  | 1027   | 909  | 2004   | 1342 | 2959   |
| ANSI 600                                                                                                    | 58       | 128    | 114  | 251    | 191  | 421    | 294  | 648    | 499  | 1100   | 949  | 2092   | 1442 | 3179   |

**Table 36** Weights and dimensions

## Aperflux 851 + DB/851 + PM/819



**Figure 15** Aperflux 851 + DB/851 + PM/819 dimensions

| Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative) |          |        |          |        |          |        |           |        |           |        |           |        |            |        |
|-------------------------------------------------------------------------------------------------------------|----------|--------|----------|--------|----------|--------|-----------|--------|-----------|--------|-----------|--------|------------|--------|
| Size (DN) - [mm]<br>Size (DN) - inches                                                                      | 25<br>1" |        | 50<br>2" |        | 80<br>3" |        | 100<br>4" |        | 150<br>6" |        | 200<br>8" |        | 250<br>10" |        |
|                                                                                                             | [mm]     | inches | [mm]     | inches | [mm]     | inches | [mm]      | inches | [mm]      | inches | [mm]      | inches | [mm]       | inches |
| S - ANSI 150/PN16                                                                                           | 183      | 7.21"  | 254      | 10"    | 298      | 1.75"  | 352       | 13.88" | 451       | 17.75" | 543       | 21.38" | 673        | 26.50" |
| S - ANSI 300                                                                                                | 197      | 7.75"  | 267      | 0.52"  | 317      | 2.48"  | 368       | 14.49" | 473       | 18.62" | 568       | 22.38" | 708        | 27.88" |
| S - ANSI 600                                                                                                | 210      | 8.25"  | 286      | 1.25"  | 336      | 3.25"  | 394       | 15.52" | 508       | 20.00" | 609       | 23.98" | 752        | 29.62" |
| Ø                                                                                                           | 220      | 8.7"   | 300      | 11.8"  | 330      | 13.0"  | 390       | 15.4"  | 480       | 18.9"  | 645       | 25.4"  | 740        | 29.1"  |
| A                                                                                                           | 355      | 14.0"  | 420      | 16.5"  | 500      | 19.7"  | 570       | 22.4"  | 715       | 28.1"  | 910       | 35.8"  | 1025       | 40.4"  |
| B                                                                                                           | 465      | 18.3"  | 530      | 20.9"  | 625      | 24.6"  | 695       | 27.4"  | 850       | 33.5"  | 1045      | 41.1"  | 1085       | 42.7"  |
| C                                                                                                           | 320      | 12.6"  | 350      | 13.8"  | 430      | 16.9"  | 490       | 19.3"  | 650       | 25.6"  | 750       | 29.5"  | 800        | 31.5"  |
| D                                                                                                           | 410      | 16.1"  | 430      | 16.9"  | 530      | 20.9"  | 600       | 23.6"  | 735       | 28.9"  | 850       | 33.5"  | 900        | 35.4"  |
| E                                                                                                           | 192      | 7.6"   | 226      | 8.9"   | 246      | 9.7"   | 271       | 10.7"  | 264       | 10.4"  | 267       | 10.5"  | 292        | 11.5"  |
| F                                                                                                           | 270      | 10.6"  | 270      | 10.6"  | 310      | 12.2"  | 310       | 12.2"  | 385       | 15.2"  | 385       | 15.2"  | 415        | 16.3"  |
| H                                                                                                           | 685      | 27.0"  | 750      | 29.5"  | 905      | 35.6"  | 995       | 39.2"  | 1260      | 49.6"  | 1530      | 60.2"  | 1545       | 60.8"  |
| Tubing Connections                                                                                          | 1/4" NPT |        |          |        |          |        |           |        |           |        |           |        |            |        |
| Weight                                                                                                      | Kg       | lbs    | Kg       | lbs    | Kg       | lbs    | Kg        | lbs    | Kg        | lbs    | Kg        | lbs    | Kg         | lbs    |
| ANSI 150/PN16                                                                                               | 60       | 132    | 133      | 293    | 223      | 492    | 295       | 650    | 526       | 1160   | 950       | 2094   | 1640       | 3616   |
| ANSI 300                                                                                                    | 62       | 137    | 135      | 298    | 232      | 511    | 325       | 717    | 568       | 1252   | 1024      | 2258   | 1692       | 3730   |
| ANSI 600                                                                                                    | 63       | 139    | 137      | 302    | 235      | 518    | 335       | 739    | 601       | 1325   | 1064      | 2346   | 1792       | 3951   |

**Table 37** Weights and dimensions



# Sizing and Cg

In general, the choice of a regulator is made based on the calculation of the flow rate determined by using the flow rate coefficients (Cg) and the form factor (K1) as indicated by the EN 334 standard.

| Flow rate coefficient |       |       |       |       |       |       |       |
|-----------------------|-------|-------|-------|-------|-------|-------|-------|
| Nominal size          | 25    | 50    | 80    | 100   | 150   | 200   | 250   |
| Inches                | 1"    | 2"    | 3"    | 4"    | 6"    | 8"    | 10"   |
| Cg                    | 480   | 1550  | 3790  | 5554  | 11112 | 17316 | 24548 |
| K1                    | 113.9 | 113.9 | 113.9 | 113.9 | 113.9 | 113.9 | 113.9 |

**Table 38** Flow rate coefficient

For sizing [PRESS HERE](#) or use the QR code:



**Note:** In case you do not have the proper credentials to access, feel free to contact your closest Pietro Fiorentini representative.

In general the online sizing considers multiple variables as the regulator is installed in a system, enabling a better and multiperspective approach to the sizing.

For different gases, and for natural gas with a different relative density other than 0.61 (compared to air), the correction coefficients from the following formula shall be applied.

$$F_c = \sqrt{\frac{175.8}{S \times (273.16 + T)}}$$

S = relative density (refer to Table 39)  
T = gas temperature ( °C )

$$F_c = \sqrt{\frac{316.44}{S \times (459.67 + T)}}$$

S = relative density (refer to Table 39)  
T = gas temperature ( °F )

| Correction Factor Fc |                    |                      |
|----------------------|--------------------|----------------------|
| Gas Type             | Relative Density S | Correction Factor Fc |
| Air                  | 1.00               | 0.78                 |
| Propane              | 1.53               | 0.63                 |
| Butane               | 2.00               | 0.55                 |
| Nitrogen             | 0.97               | 0.79                 |
| Oxygen               | 1.14               | 0.73                 |
| Carbon Dioxide       | 1.52               | 0.63                 |

Note: the table shows the Fc correction factors valid for Gas, calculated at a temperature of 15°C and at the declared relative density.

**Table 39** Correction Factor Fc

| Flow rate conversion                               |
|----------------------------------------------------|
| Stm <sup>3</sup> /h x 0.94795 = Nm <sup>3</sup> /h |

Nm<sup>3</sup>/h reference conditions T= 0 °C; P= 1 barg  
 Stm<sup>3</sup>/h reference conditions T= 15 °C; P= 1 barg

**Table 40** Flow rate conversion

### CAUTION:

In order to get optimal performance, to avoid premature erosion phenomena and to limit noise emissions, it is recommended to check the gas speed, and its compliance with local practice and regulations. The gas speed at the outlet flange may be calculated by means of the following formula:

$$V = 345.92 \times \frac{Q}{DN^2} \times \frac{1 - 0.002 \times Pd}{1 + Pd}$$

V = gas speed in m/s  
 Q = gas flow rate in Stm<sup>3</sup>/h  
 DN = nominal size of regular in mm  
 Pd = outlet pressure in barg

$$V = 0.0498 \times \frac{Q}{DN^2} \times \frac{14.504 - 0.002 \times Pd}{14.504 + Pd}$$

V = gas speed in ft/s  
 Q = gas flow rate in Scfh  
 DN = nominal size of regular in inches  
 Pd = outlet pressure in psi



Sizing of regulators is usually made based on valve Cg value (Table 38).

Flow rates at fully open position and various operating conditions are related by the following formulae where:

Q = flow rate in Scf/h

Pu = inlet pressure in psia

Pd = outlet pressure in psia

- **A** > when the Cg value of the regulator is known, as well as Pu and Pd, the flow rate can be calculated as follows:

- **A-1** in sub critical conditions: ( $P_u < 2 \times P_d$ )

$$Q = 0.216 \times C_g \times P_u \times \sin \left( K_1 \times \sqrt{\frac{P_u - P_d}{P_u}} \right)$$

- **A-2** in critical conditions: ( $P_u \geq 2 \times P_d$ )

$$Q = 0.216 \times C_g \times P_u$$

- **B** > vice versa, when the values of Pu, Pd and Q are known, the Cg value, and hence the regulator size, may be calculated using:

- **B-1** in sub-critical conditions: ( $P_u < 2 \times P_d$ )

$$C_g = \frac{Q}{0.216 \times P_u \times \sin \left( K_1 \times \sqrt{\frac{P_u - P_d}{P_u}} \right)}$$

- **B-2** in critical conditions ( $P_u \geq 2 \times P_d$ )

$$C_g = \frac{Q}{0.216 \times P_u}$$

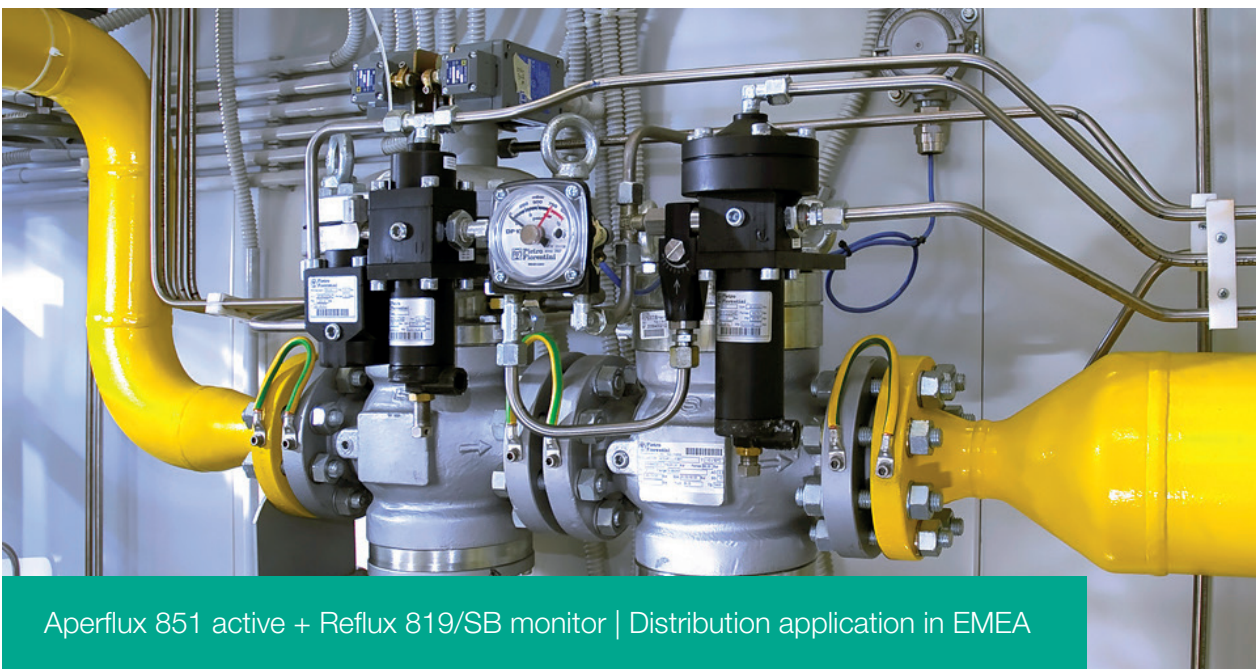
**NOTE:** The sin value is understood to be DEG.

# Installations

Here below, at glance, are some typical installations by application and geographical location. On demand we are available to supply a more comprehensive experience list and/or references.



Aperflux 851/DB | Transmission application in EMEA



Aperflux 851 active + Reflux 819/SB monitor | Distribution application in EMEA



# Customer Centricity

Customer centricity is a way of running your business — implementing a perfect customer experience at each stage of the pipeline. Pietro Fiorentini is one of the main Italian international company with high focus on product and service quality.

The main strategy is to create a stable, long-term relationship, putting the customer's needs first. Lean management and customer centricity are used to improve and maintain the highest level of customer experience.



## Support

Pietro Fiorentini's top priority is to provide support to the client in all phases of project development, during installation, start up and operation. Pietro Fiorentini has developed a highly standardized Intervention-Management-System (IMS), which helps to facilitate the entire process and putting the customer at the forefront of every decision in our process while manufacturing or developing a product to help improve the product and service. With our IMS business model many services are available remotely, avoiding long waiting times, improving service, and avoiding unnecessary expenses.



## Training

Pietro Fiorentini offers training services available for both experienced operators and new customers. The training is offered for all levels of our customers which can include one or all of the following: sizing of equipment, application, installation, operation, maintenance and is prepared according to the level of use and the customer's need.



## Customer Relation Management (CRM)

The service and care of our customers are one of the main missions and vision of Pietro Fiorentini. For this reason, Pietro Fiorentini has enhanced the customer relation management system. This enables us to track every opportunity and request from our customers into one single information point and allows us to coordinate information allowing us to give the customer improved service.



# Sustainability

Here at Pietro Fiorentini, we believe in a world capable of improvement through technology and solutions that can shape a more sustainable future. That is why respect for people, society and the environment form the cornerstones of our strategy.



## Our commitment to the world of tomorrow

While in the past we limited ourselves to providing products, systems and services for the Oil & Gas sector, today we want to broaden our horizons and create technologies and solutions for a digital and sustainable world. We have a particular focus on renewable energy projects to help make the most of our planet's resources and create a future in which the younger generations can grow and prosper.

The time has come to understand how and why we operate now.







# Pietro Fiorentini

**TB0002USA**



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aperflux851\_technicalbrochure\_USA\_revB

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