



# Aperval

Pressure Regulators

## Pressure Regulators

### Aperval

- Aperval is pilot-controlled pressure regulator for medium and low pressure applications.
- Aperval is normally a fail to open regulator and specifically will open under the following conditions:
  - breakage of main diaphragm;
  - lack of sensing line connection.
- This regulator is suitable for use with previously filtered, non-corrosive gases.

### Modular Design

- The modular design of pressure regulator Aperval allows retrofitting of an emergency monitor PM/182 or slam shut valve and/or silencer on the same body. The Aperval regulator is truly a “top entry design” which allows easy maintenance and/or retrofitting options in the field. The unique dynamic balancing system ensures an outstanding turn down ratio combined with an extreme accurate outlet pressure control.

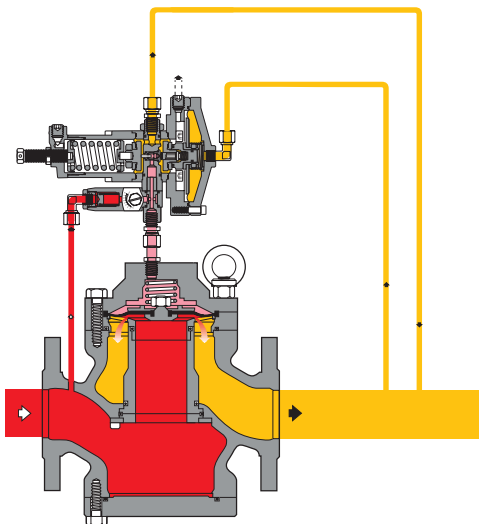
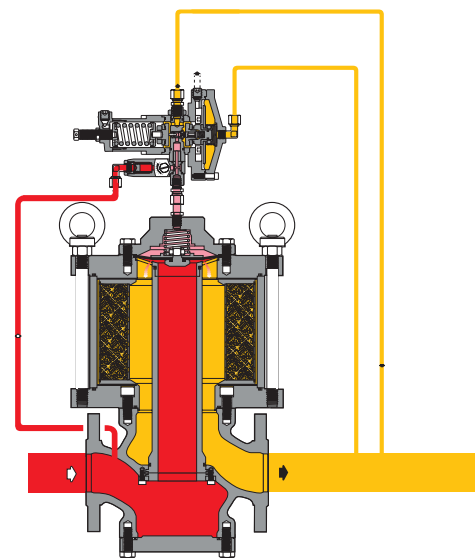


Fig. 1



Aperval + DB

Fig. 2

**DESIGNED  
WITH YOUR  
NEEDS IN MIND**

- COMPACT DESIGN
- EASY MAINTENANCE
- TOP ENTRY
- LOW NOISE

- OUTSTANDING TURN DOWN RATIO
- HIGH ACCURACY
- LOW OPERATION COST
- VERY LOW OPERATING  $\Delta P$

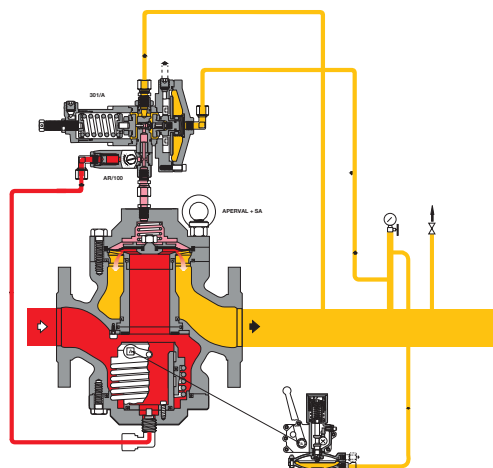
**SILENCER DB/93**
**Aperval**

Whenever certain noise limit is desired, the silencer allows you to considerably reduce the noise level (dBA) up to the required value.

The Aperval pressure regulator can be supplied with an incorporated silencer in either the standard version or version with incorporated slam-shut or incorporated monitor regulator.

With the built-in silencer, the  $C_g$  and  $K_G$  valve coefficients are 5% lower than the corresponding version without the silencer. Given the modular arrangement of the regulator, the silencer may be retrofitted to both standard Aperval version as well as those with incorporated slam-shut or monitor, without any need to piping modification.

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

**SLAM SHUT SA**
**Aperval**


The Aperval pressure regulator offers the possibility of installing an incorporated slam shut valve SA valve, and this can be done either during the manufacture process or be retrofitted in the field. Retrofitting can be done without modifying the pressure regulator assembly.

The  $C_g$  and  $K_G$  coefficients of a regulator plus incorporated slam-shut system are 5 or 10% (depending on the slam shuth type) lower than those for standard versions.

The main characteristics of this device are:

- intervention for over pressure and/or under pressure
- manual re-setting with internal by-pass activated by the lever mechanism;
- manual push button control;
- compact dimensions;
- easy maintenance;
- optional pneumatic or electromagnetic remote control;
- optional installation remote signal devices (contact switches or proximity switches).

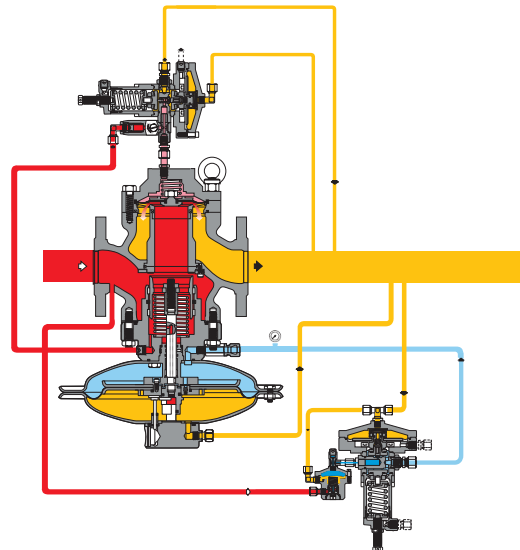


Fig. 4

This emergency regulator (monitor) is directly integrated to 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 operational characteristics of the PM/182 monitor are the same as for the Reval 182 regulator.

The  $C_g$  and  $K_G$  coefficients of regulator having an incorporated monitor are 5% lower than those for standard version.

Another great advantage offered by the incorporated monitor regulator is that it can be installed at any time, even on an already existing regulator, without piping modification. This solution allows the construction of reduction lines with compact dimensions.

## MAIN FEATURES

## Aperval

- > Design pressure: up to 362 PSIG (25 bar)
- > Temperature: Pietro Fiorentini regulators are suitable for a minimum operating ambient temperature of  $-31^{\circ}\text{F}$  to  $140^{\circ}\text{F}$  if the following conditions are met:
  - Inlet flowing gas temperature shall be always higher than  $-4^{\circ}\text{F}$ ;
  - Inlet flowing gas shall filtered, clean and without any liquid impurities;
- > Range of inlet pressure bpe: 7.25 to 362 PSIG (0.5 to 25 bar)
- > Range of outlet pressure Wh: 2" w.c. to 137.5 PSIG (5 mbar to 9500 mbar) depending on installed pilot
- > Minimum working differential pressure: 6.52 PSIG (450 mbar)
- > Maximum working differential pressure: 275.5 PSIG (19 bar)
- > Accuracy class AC: up to 2.5
- > Closing pressure class SG: up to 5
- > Available size DN: 1", 2", 2"1/2, 3", 4"
- > Flanging: class 150 RF or RTJ according to ANSI B16.5 and PN25/40 according to ISO 7005.

**MATERIALS**
**Aperval**

<b>Body</b>	Cast steel ASTM A216 WCB for all sizes Ductile iron GS 400-18 ISO 1083 for all size
<b>Head covers</b>	Rolled or forged carbon steel
<b>Valve seat</b>	Technopolymer
<b>Diaphragm</b>	Vulcanized rubber
<b>Seals</b>	Nitrile rubber
<b>Compression fittings</b>	According to DIN 2353 in zinc-plated carbon steel

The characteristics listed above are referred to standard products. Special characteristics and materials for specific applications may be supplied upon request.

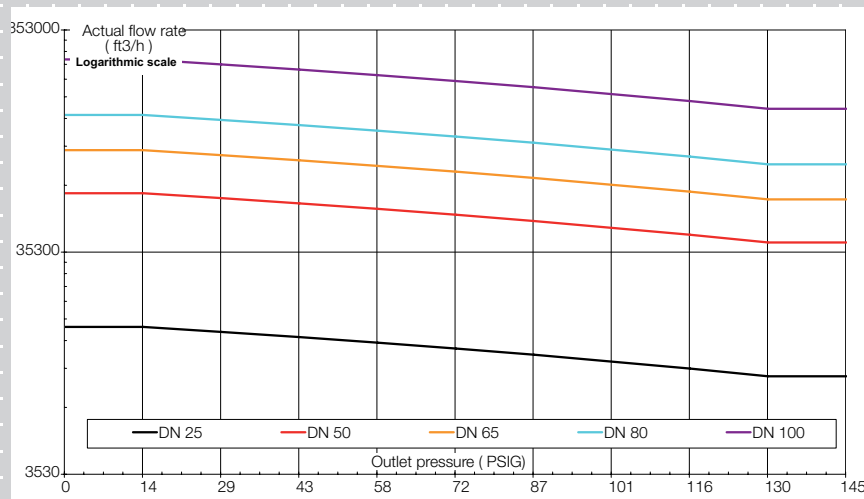
**Aperval**

<b>Nominal diameter (mm)</b>	25	50	65	80	100
<b>Size (inches)</b>	1"	2"	2"1/2	3"	4"
<b>C<sub>g</sub> flow coefficient</b>	584	1978	3530	4525	6719
<b>K<sub>G</sub> flow coefficient</b>	613	2077	3706	4751	7055
<b>K1 body shape factor</b>	90	101	101	101	101

For sizing formula refer to [www.fiorentini.com/sizing](http://www.fiorentini.com/sizing)

**CAUTION:**

The graph gives a quick reference of maximum recommended regulator capacity depending on selected size. Values are expressed in actual ft<sup>3</sup>/h of Natural gas (s.g. 0.6): to have the data directly in Nm<sup>3</sup>/h it is necessary to multiply the value by the outlet pressure value in bar – absolute.



## PILOTS

## Aperval

Aperval regulators are equipped with series 300 pilot as listed below:

- 301/. control range Wh: 2" W.c. to 1.45 PSIG; (5 mbar to 100 mbar)
- 301/.TR control range Wh: 1.45 to 29 PSIG; (0.1 to 2 bar)
- 302/. control range Wh: 11.6 to 137 PSIG; (0.8 to 9.5 bar)

Pilots may be adjusted manually or remotely

## Pilot adjustments

## Aperval

<b>Pilot type .../A</b>	Manual setting
<b>Pilot type .../D</b>	Electric remote setting control
<b>Pilot type .../CS</b>	Pneumatic remote setting control

**F.I.O.** Smart unit for remote pressure regulator setting, pressure reducing station monitoring and indirect flow measurement (Reflux 819 - all models - and Reval 182 only)

## Restrictor

The pilot loop is completed with a device called restrictor, external to the pilot.

The restrictor listed below is available:

- **AR 100**: variable restrictor to adjust regulator response time complete with integral filter at the inlet.  
Standard supply with all pilots of 300 Series

## PRESSOSTATIC DEVICE

## Aperval

MOD. SA	MIN.	MAX
<b>./31</b>	0.14 - 13.05	0.36 - 15.95
<b>./32</b>	3.62 - 43.51	10.15 - 72.51
<b>./33</b>	11.6 - 111.67	43.51 - 192.9

values in PSIG(g)

## OPTIONALS

## Aperval

### For Regulator

- reduced cage
- flow-limiting devices
- steel fittings, single or dual sealing

### For Pilot

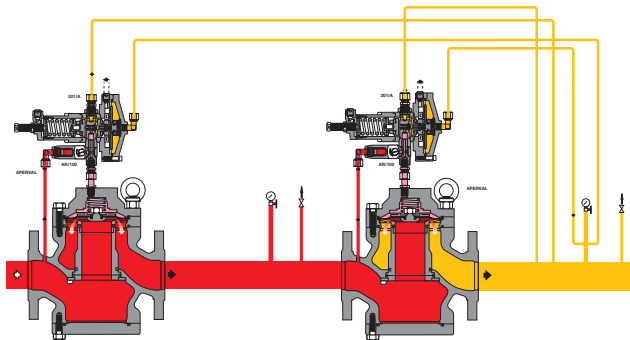
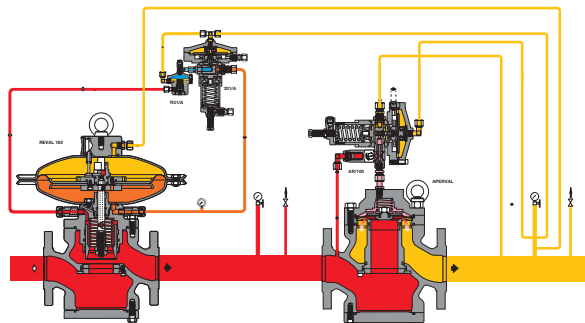
- supplementary filter CF 14
- dehydrating filter CF 14/D

**IN-LINE MONITOR**
**Aperval**

The monitor is generally installed upstream of the main regulator. Depending on service specification, the monitor may be chosen as follow:

- > Aperval pressure regulator. identical to the main regulator (fig.5). the only difference is that monitor is set at a higher pressure than the main regulator.
- > Reval 182 pressure regulator (fig.6).

The  $C_G$  and  $K_G$  coefficients of the regulator plus in-line monitor system are about 20% lower than those of the regulator alone.

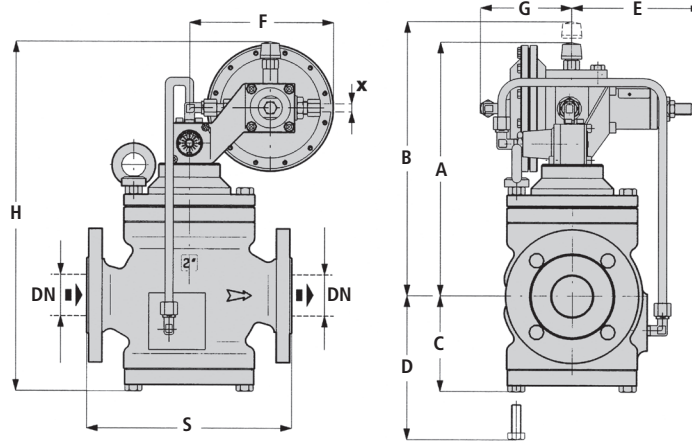

**Fig. 5**

**Fig. 6**
**M/A ACCELERATOR**
**Aperval**
**Only for monitor type Reval or PM 182**

When the monitor is required to take over rapidly in the event of a main regulator failure, an M/A accelerator pilot installation on the monitor is recommended. Installation of the accelerator is mandatory when monitor is used as safety accessory according to PED directive. This device, connected by sensing line to the downstream pressure, discharges the gas enclosed in the motorization chamber of the monitor regulator, allowing the monitor to take over faster.

The set point of M/A accelerator is usually higher than set point of the monitor by 4.35 to 7.25 PSIG.

A V/25 accelerator is available too with pressure set range  $W_{ho}$  0.2 to 87 PSIG.

In case of working monitor configuration (two stage pressure cut with monitor override) the accelerator may not be necessary.



**Overall dimensions in inches**

Size (mm)	25	50	65	80	100
Inches	1"	2"	2 1/2"	3"	4"
<b>S - Ansi 150/PN 16</b>	7.2	10	10.86	11.73	13.85
<b>A</b>	11.1	12.32	13.42	13.62	16.88
<b>B</b>	11.49	12.71	13.81	14.01	17.28
<b>C</b>	3.46	4.72	5.23	5.59	7.08
<b>D</b>	4.64	6.1	6.61	7.16	9.05
<b>E</b>	6.29	6.29	6.29	6.29	6.29
<b>F</b>	7	7	7	7	7
<b>G</b>	4.52	4.52	4.52	4.52	4.52
<b>H</b>	14.56	17.04	18.66	19.21	37.4

**Tubing Connections**

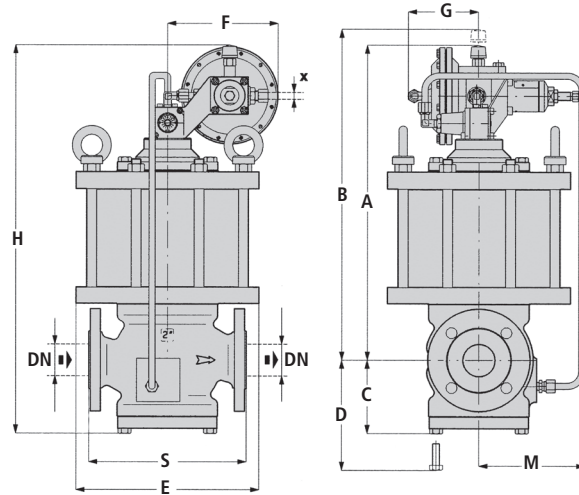
Δe10 x Δi 8

Face to face dimensions S according to IEC 534-3 and EN 334

**Weights in Lbs**

<b>S - Ansi 150/PN 16</b>	44	74.9	99.2	125.6	242.5
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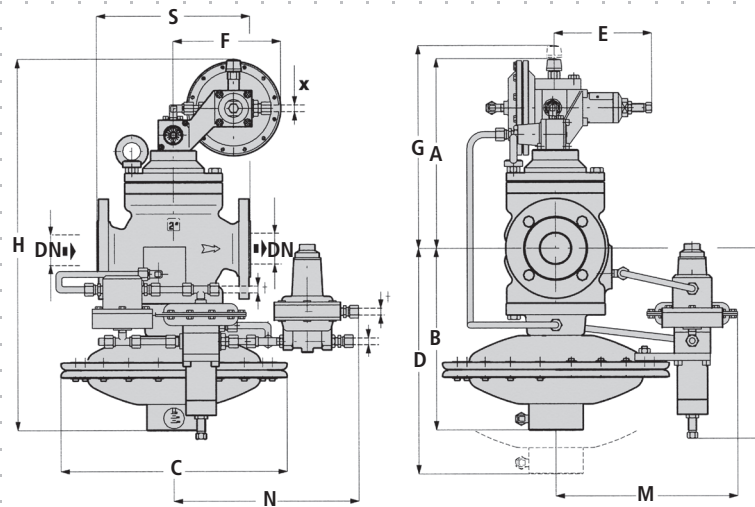


**Overall dimensions in inches**

Size (mm)	25	50	65	80	100
Inches	1"	2"	2 1/2"	3"	4"
S - Ansi 150/PN 16	7.2	10	10.86	11.73	13.85
A	17.67	19.96	22.71	23.66	29.92
B	18.07	20.35	23.11	24.05	27.08
C	3.46	4.72	5.23	5.59	7.08
D	4.64	6.1	6.61	7.16	9.05
E	8.66	11.61	12.79	12.99	15.35
F	7	7	7	7	7
G	4.52	4.52	4.52	4.52	4.52
H	21.14	24.68	27.95	29.25	37
M	4.72	6.22	6.81	6.88	8.07
Tubing Connections	Δe10 x Δi 8				

**Weights in Lbs**

S - Ansi 150/PN 16	97	185.1	194	246.9	392.4
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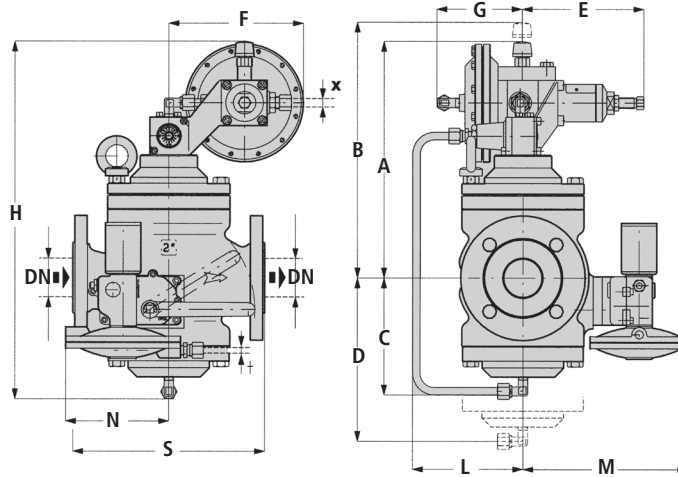
**Overall dimensions in inches**

Size (mm)	25	50	65	80	100
Inches	1"	2"	2 <sup>1</sup> / <sub>2</sub> "	3"	4"
<b>S - Ansi 150/PN 16</b>	7.2	10	10.86	11.73	13.85
<b>A</b>	11.1	12.32	13.42	13.62	16.88
<b>B</b>	10.59	11.81	14.72	14.92	16.29
<b>C</b>	14.76	14.76	19.48	19.48	19.48
<b>D</b>	12.95	15.15	18.66	19.05	21.14
<b>E</b>	6.29	6.29	6.29	6.29	6.29
<b>F</b>	7	7	7	7	7
<b>G</b>	11.49	12.71	13.81	14.01	17.28
<b>H</b>	21.69	24.13	28.14	28.54	33.18
<b>L</b>	9.56	12.4	14.33	14.52	15.9
<b>M</b>	11.81	11.81	13.77	13.77	13.77
<b>N</b>	12.04	12.04	12.2	12.2	12.2
<b>Tubing Connections</b>	Δe10 x Δi 8				

Face to face dimensions S according to IEC 534-3 and EN 334

**Weights in Lbs**

<b>S - Ansi 150/PN 16</b>	90.3	152.1	158.7	191.8	242.5
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**Overall dimensions in inches**

Size (mm)	25	50	65	80	100
Inches	1"	2"	2 <sup>1</sup> / <sub>2</sub> "	3"	4"
S - Ansi 150/PN 16	7.2	10	10.86	11.73	13.85
A	11.49	12.71	13.81	14.01	17.28
B	11.49	12.71	13.81	14.01	17.28
C	5.7	6.33	7	7.28	15.9
D	8.34	10.03	11.49	12.67	25.03
E	6.29	6.29	6.29	6.29	6.29
F	7	7	7	7	7
G	4.52	4.52	4.52	4.52	4.52
H	16.81	18.66	20.43	20.9	32.79
L	3.85	5.74	5.74	5.74	5.74
M	7.63	8.62	12.67	9.68	10.35
N	4.92	4.92	4.92	5.11	5.11
Tubing Connections	Δe10 x Δi 8				

Face to face dimensions S according to IEC 534-3 and EN 334

**Weights in Lbs**

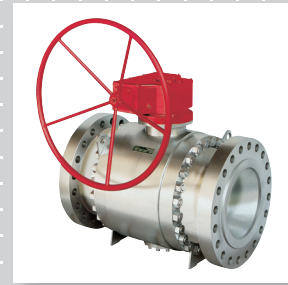
S - Ansi 150/PN 16	48.5	77.1	101.4	130	249.1
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