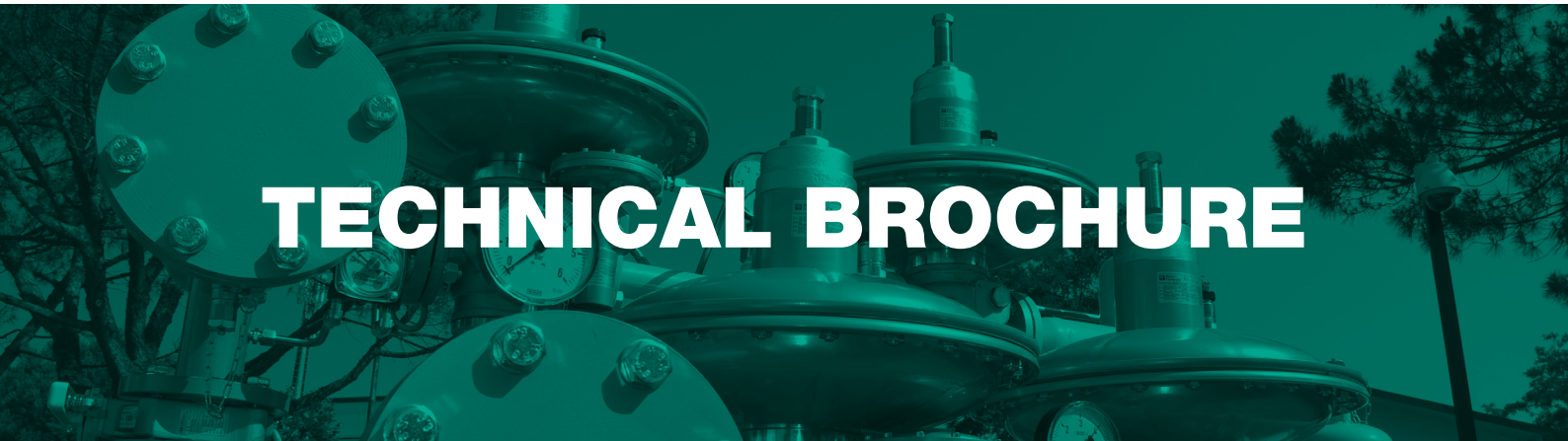
Pietro Fiorentini

Reval 182

Medium Low Pressure Gas Regulator



TECHNICAL BROCHURE

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reval182_technicalbrochure_ENG_revM

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Who we are

We are a global organization specialized 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 offer that goes across the whole natural gas chain.

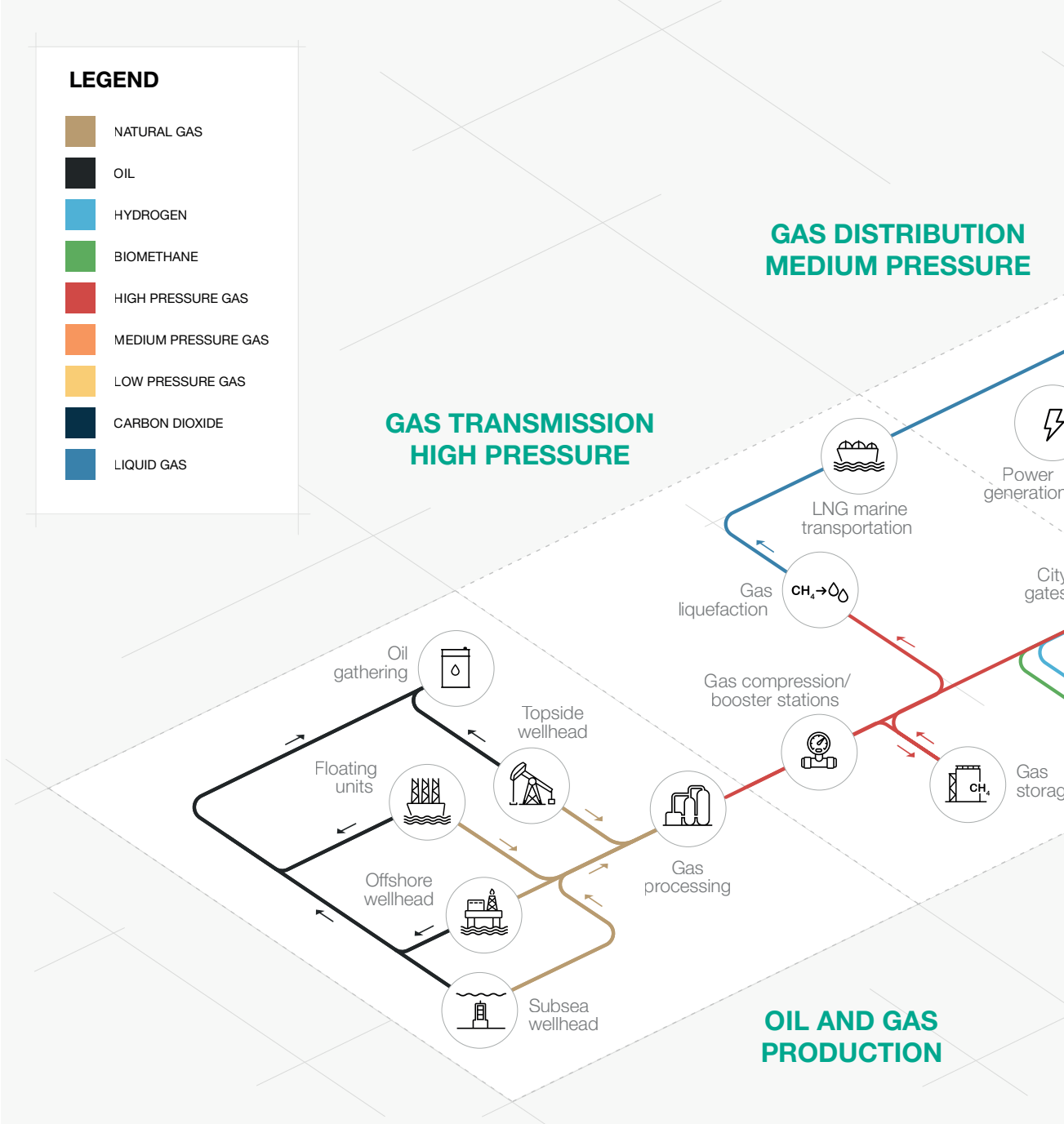
We are in constant evolution to meet our customers' highest expectations in terms of quality and reliability.

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

Pietro Fiorentini advantages

- Localised technical support
- Experience since 1940
- We operate in over 100 countries

Area of Application



Green icon indicates the application where this product is suitable for

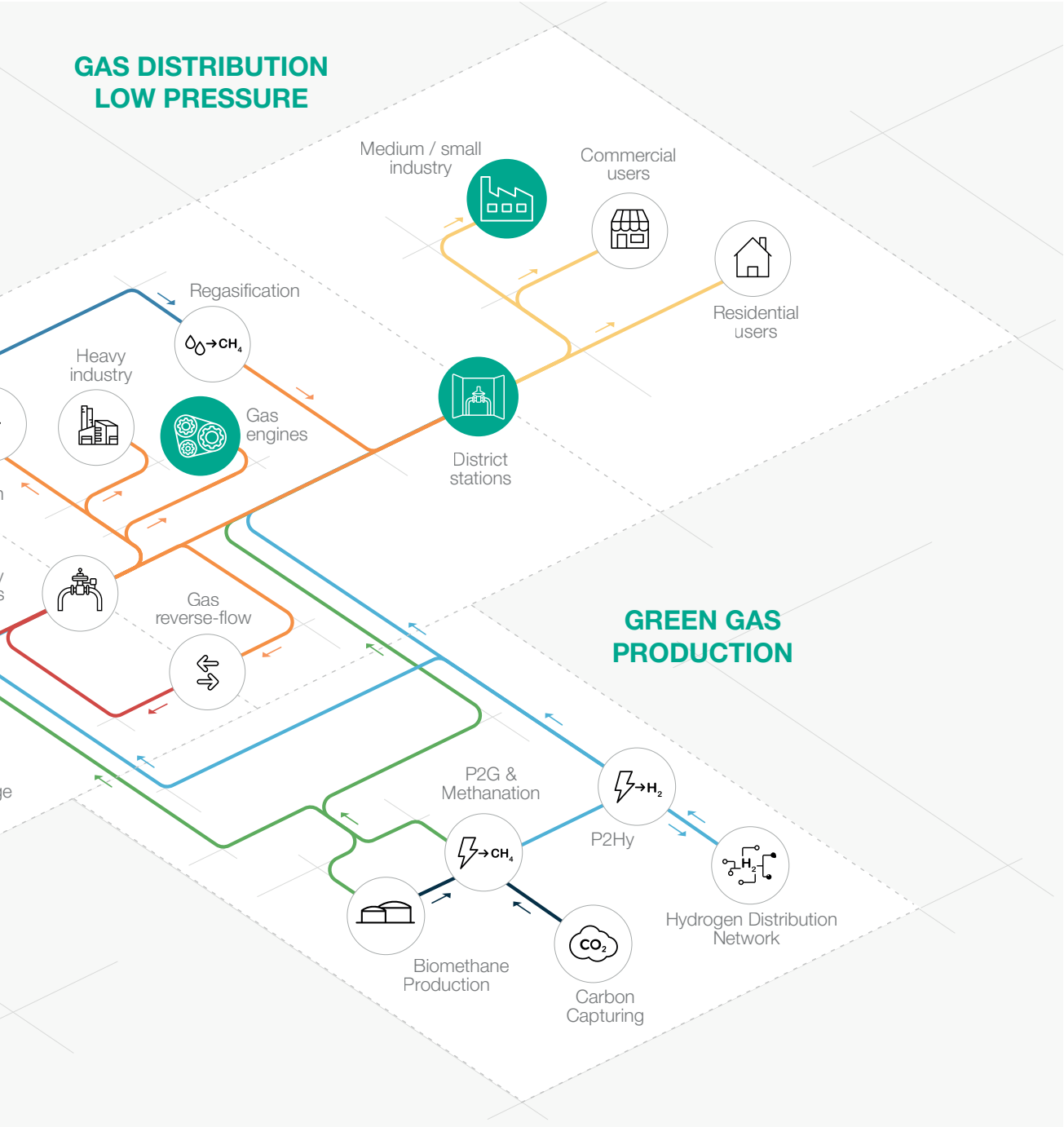


Figure 1 Area of Application Map

Introduction

Reval 182 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 medium and low pressure natural gas distribution networks.

According to the European Standard EN 334, it is classified as Fail Close (pilot series 200/A) or Fail Open (pilot series 210/A) according to the installed pilot (except for the PM/182 monitor).

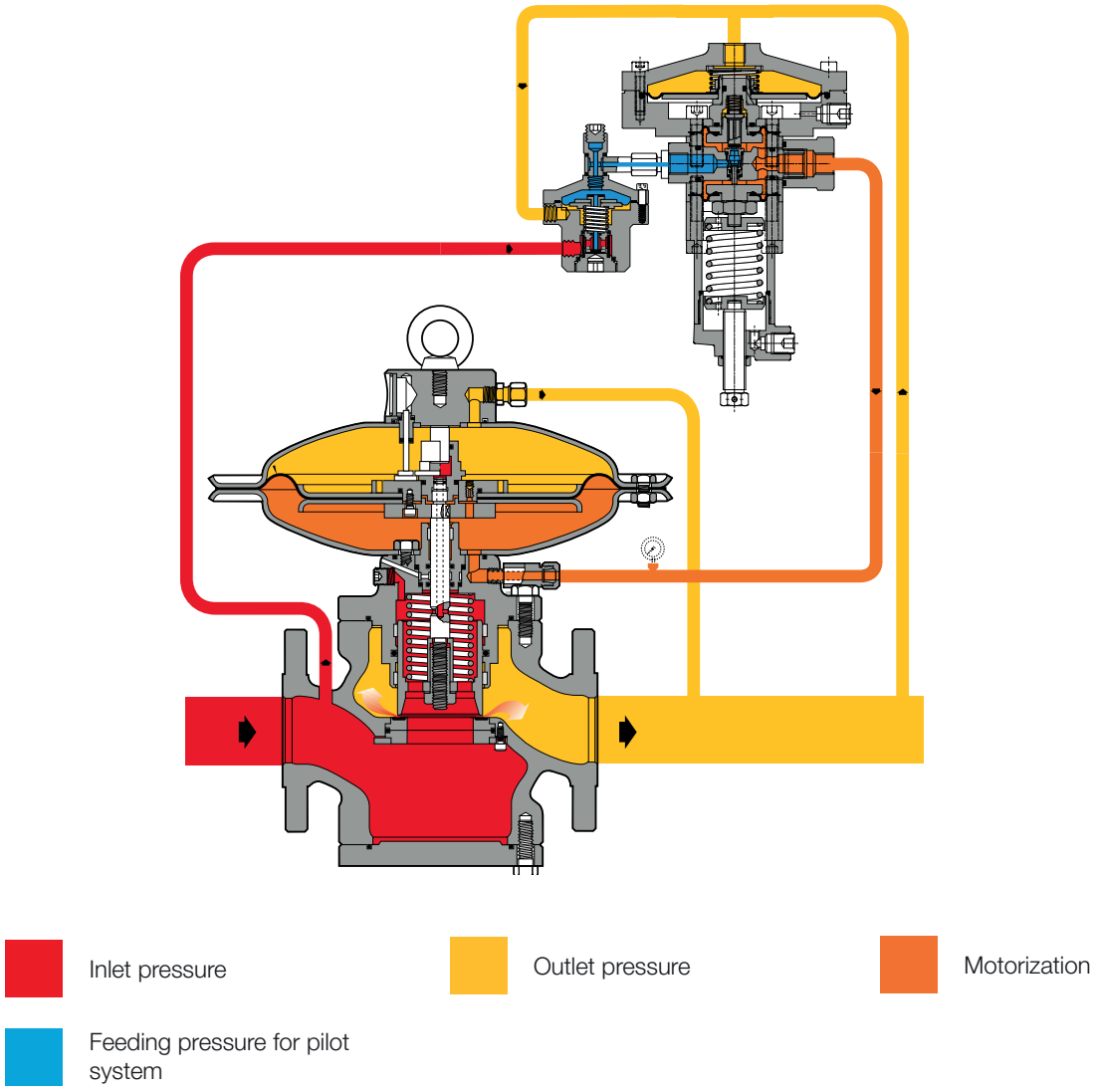


Figure 2 Reval 182

Features and Calibration ranges

Reval 182 is a **pilot-operated** device for medium pressure and low pressure with a unique **dynamic balancing system** which ensures an **outstanding turn down ratio** combined with an extremely **accurate outlet pressure control.**

A balanced pressure regulator it is a pressure regulator where delivery pressure accuracy it is not affected by the fluctuation of the inlet pressure and flow during its operation.
Therefore, a balance pressure regulator can have a single orifice for all pressure and flow operating conditions.

This regulator is suitable for use with previously filtered, non corrosive gases and distribution networks as well as high load industrial applications.

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 adjustement of the regulator is operated via a pilot unit used to load and unload the bleeding pressure from the top chamber.

The modular design of Reval 182 pressure regulators allows retrofitting of an emergency monitor PM/182, slam shut valve SB/82 or VB/93 and/or silencer DB/182 model on the same body.

Figure 3 Reval 182

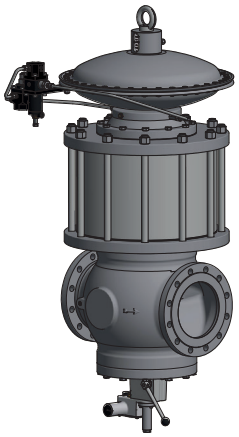


Figure 4 Reval 182 with silencer DB/182 and SB/82

Reval 182 competitive advantages

- Compact and simple design
- High accuracy
- High turn-down ratio
- Fail Close plug and seat regulator
- Built-in pilot filter
- Top Entry
- Easy maintenance
- Built-in accessories
- Balanced type
- Biomethane compatible and 20% Hydrogen blending compatible. Higher blending available on request

Features

Features	Values	
Design pressure* (PS[1] / DP[2])	up to 2.5 MPa up to 25 barg	
Ambient temperature* (TS[1])**	**Standard version** from -20 °C to +60 °C from -4 °F to +140 °F	**Arctic version** from -29°C to + 60°C from -20 °F to +140 °F
Inlet gas temperature*,***	**Standard version** from -20 °C to +60 °C from -4 °F to +140 °F	**Arctic version** from -20 °C to +60 °C from -4 °F to +140 °F
Inlet pressure (MAOP / p_{umax} [1])	from 0.02 to 2.5 MPa from 0.2 to 25 barg	
Range of downstream pressure (Wd[1])	from 0.7 KPa to 1.2 MPa from 7 mbarg to 12 barg	
Available accessories	DB/182 Silencer, PM/182 Monitor, SB/82 Slam shut, SA Slam shut HB/97 Slam shut, opening indicator	
Minimum operating differential pressure (Δp_{min} [1])	0.01 MPa | 0.1 barg	
Accuracy class (AC[1])	up to 2.5 | up to 1% absolute (depending on working conditions)	
Lock-up pressure class (SG[1])	up to 5	
Nominal size (DN[1,2])	DN 25 | 1"; DN 50 | 2"; DN 65 | 2" 1/2; DN 80 | 3"; DN 100 | 4"; DN 150 | 6"; DN 200 | 8"; DN 250 | 10"	
Connections	Class 150 RF or RTJ according to ASME B16.5 and PN16, 25 and 40 according to ISO 7005	

([1]) according to EN334 standard
([2]) 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.
(**) NOTE: Stated temperature range is the operating range for which the equipment's mechanical resistance and leakage rate are guaranteed. Some body materials, if multiple choices are available, may not be suitable for all the available versions shown.
(***) NOTE: Stated temperature range is the range for which the equipment's full performance, including accuracy and lock-up are guaranteed. Some body materials, if multiple choices are available, may not be suitable for all the available versions shown.

Table 1 Features

Materials and Approvals

Part	Material
Body	Cast steel ASTM A216 WCB for all sizes Ductile iron GS 400-18 ISO 1083 for Size ≤ 8”
Heads	Die stamped carbon steel
Stem	AISI 416 Stainless steel
Plug	ASTM A 350 LF2 Nickel coated on sealing surfaces
Seat	Steel + vulcanized rubber
Diaphragm	Rubberized canvas
O-rings	Nitrile Rubber
Compression fittings	In zinc-plated carbon steel according to DIN 2353 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

Reval 182 regulator is designed according to the European standard EN 334.
The regulator reacts in closing (Fail Close) or opening (Fail Open) according to EN 334 depending on the pilot installed.

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*

*Not applicable for regulators with pilot series 210

Pilot ranges and types

Type	Model	Operation	Range Wh		Spring Table web link
			kPa	mbarg	
Main pilot	201/A	Manual	0.7 - 58	7 - 580	TT 475
			MPa	barg	
Main pilot	204/A	Manual	0.02 - 1.2	0.2 - 12	TT 433
Main pilot	214/A	Manual	0.03 - 1.2	0.3 - 12	TT 433

Table 3 Settings table

Pilot adjustment	
Pilot type .../A	Manual setting
Pilot type .../D	Electric remote control setting
Pilot type .../CS	Pneumatic remote control setting
Pilot type .../MP	Magnetic pilot for remote control setting / flow limitation

Table 4 Pilot adjustment table

General link to the calibration tables: **PRESS HERE** or use the QR code:

MAOP for regulators without incorporated slam shut

Size (DN)	25 | 1"			50 | 2"			65 | 2" 1/2			80 | 3"			100 | 4"			150 | 6"			200 | 8"			250 | 10"		
mm		MPa	barg		MPa	barg		MPa	barg		MPa	barg		MPa	barg		MPa	barg		MPa	barg		MPa	barg
S.150	SBR1 DBR CHR SAR SBR2	1.89 1.7 1.6 1.89 4	18.9 17 16 18.9 40	SBR1 DBR CHR SAR SBR2	1.89 1.7 1.6 1.89 4	18.9 17 16 18.9 40	SBR1 DBR CHR SAR SBR2	1.89 1.7 1.6 1.89 4	18.9 17 16 18.9 40	SBR1 DBR CHR SAR SBR2	1.89 1.7 1.6 1.89 4	18.9 17 16 18.9 40	SBR1 DBR CHR SAR SBR2	1.89 1.7 1.6 1.89 4	18.9 17 16 18.9 40	SBR1 DBR CHR SBR2	1.89 1.7 1.6 4	18.9 17 16 40	SBR1 CHR SBR2	1.89 1.6 4	18.9 16 40	SBR1 CHR SBR2	1.89 1.6 4	18.9 16 40

SBR1 = Steel Body Rating
DBR = Ductile iron Body Rating
CHR = Control Head Rating
SAR = slam shut SA Rating
SBR2 = slam shut SB Rating

Table 5

Accessories

For the pressure regulators:

- Cg limiter
- Limit switches
- Position transmitter
- Silencer
- Slam shut valve
- Monitor

For the pilot circuit:

- Supplementary filter CF14 or CF14/D

In-line Monitor

The in-line monitor is generally installed upstream of the active 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 monitor is set at a higher pressure than active regulator.
The Cg coefficients of the worker regulator with an in-line monitor is the same, but during worker regulator sizing it shall be considered the differential pressure drop generated by the fully open in-line monitor. As a practice, to incorporate this effect a Cg reduction of 20% of the worker regulator can be applied.

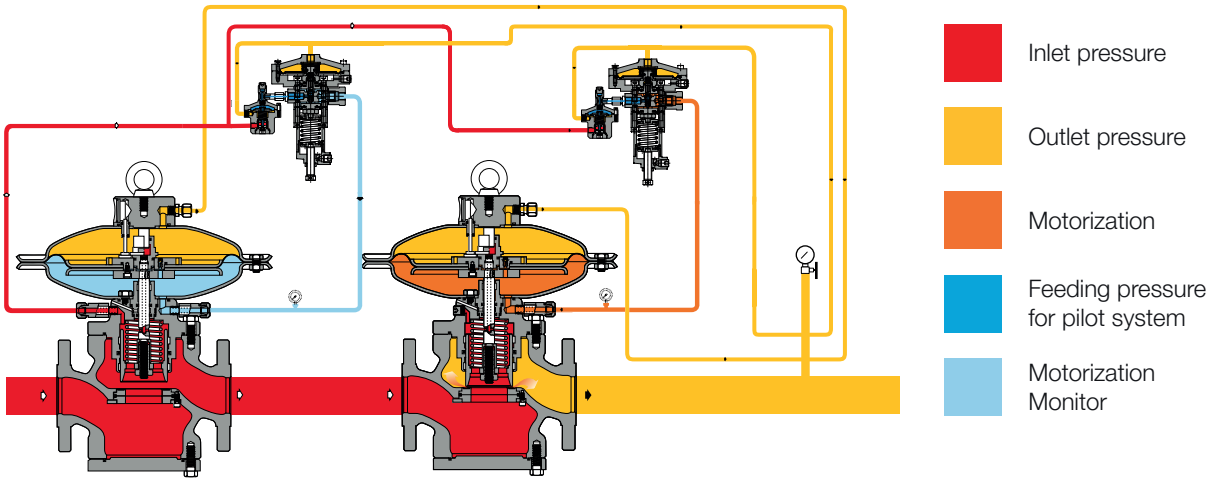


Figure 5 Reval 182 inline monitor

Monitor PM/182

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 fully open position during normal operation of the active regulator and takes over on in the event of its failure.

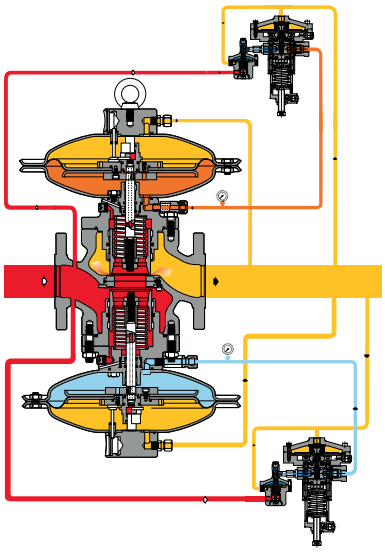
The operational characteristics of the PM/182 monitor are the same as for the Reval 182 regulator.

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

This solution allows the construction of reduction pressure 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.**

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



- Inlet pressure
- Outlet pressure
- Motorization Monitor
- Motorization
- Feeding pressure for pilot system

Figure 6 Reval 182 with PM/182

Type	Model	Operation	Range Wh		Spring Table web link
			MPa	barg	
Main pilot	201/A	Manual	0.0007 - 0.058	0.007 - 0.58	TT 475
Main pilot	204/A	Manual	0.02 - 1.2	0.2 - 12	TT 433

Table 6 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 .../MP	Magnetic pilot for remote control setting / flow limitation

Table 7 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	barg	
Accelerator	V/25 BP	Manual	0.0015 – 0.02	0.015 – 0.2	TT 00601
Accelerator	V/25 MP	Manual	0.02 – 0.06	0.2 – 0.6	TT 00601
Accelerator	M/A	Manual	0.03 - 2	0.3 - 20	TT 354

Table 8 Accelerator adjustment table

General link to the calibration tables: **PRESS HERE** or use the QR code:

Silencer DB/182

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

The Reval 182 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 rely to the fact that noise absorption takes place at the same point where the noise is generated, thus preventing its propagation.

With the built-in silencer, the Cg 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 Reval 182 version as well as those with incorporated slam shut or monitor, **without the need to modify the main piping**.

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

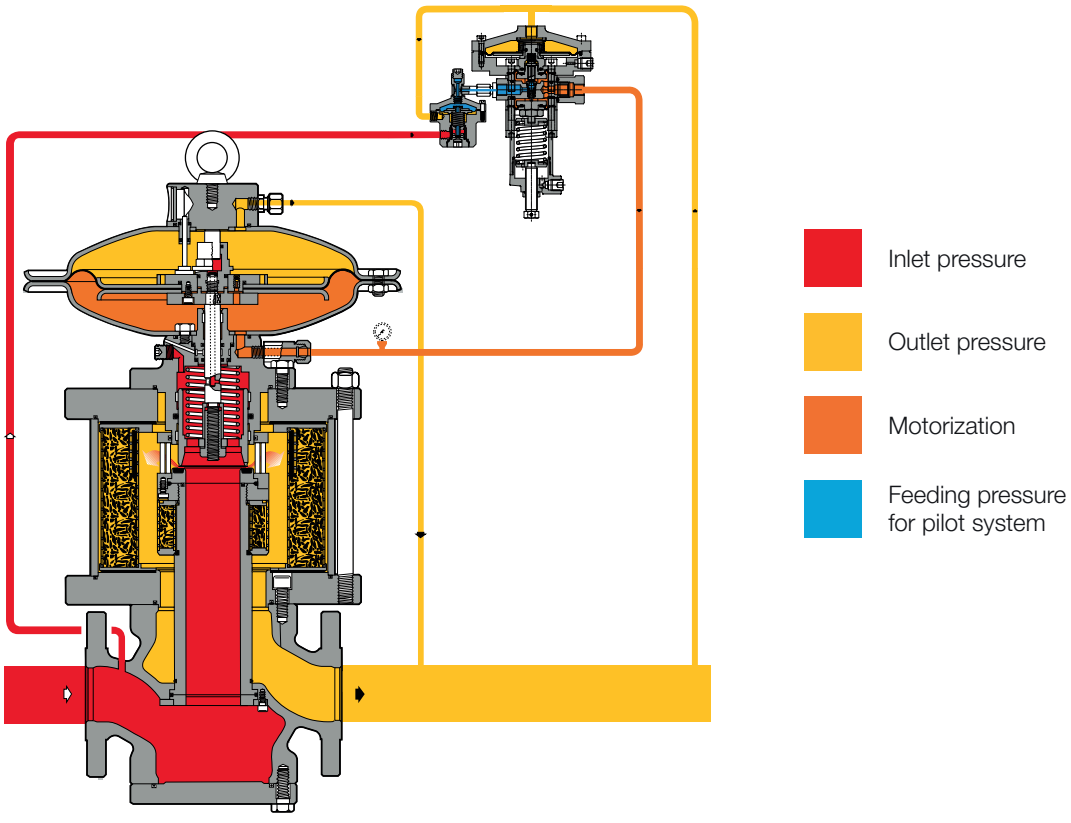


Figure 7 Reval 182 with silencer DB/182

The chart below represents the silencer effectiveness based on some common reference conditions for 2", 3"and 4". For actual calculations at specific desired conditions please refer to the online sizing tool or contact your closest Pietro Fiorentini representative.

- Pd 0.02 MPa | 0.2 barg NO Silencer
- Pd 0.05 MPa | 0.5 barg NO SILENCER
- Pd 0.2 MPa | 2 barg NO Silencer
- Recommended noise limit (85 dBA at 1 mt | 3 feet)
- Pd 0.02 MPa | 0.2 barg DB/182
- Pd 0.05 MPa | 0.5 barg DB/182
- Pd 0.2 MPa | 2 barg DB/182

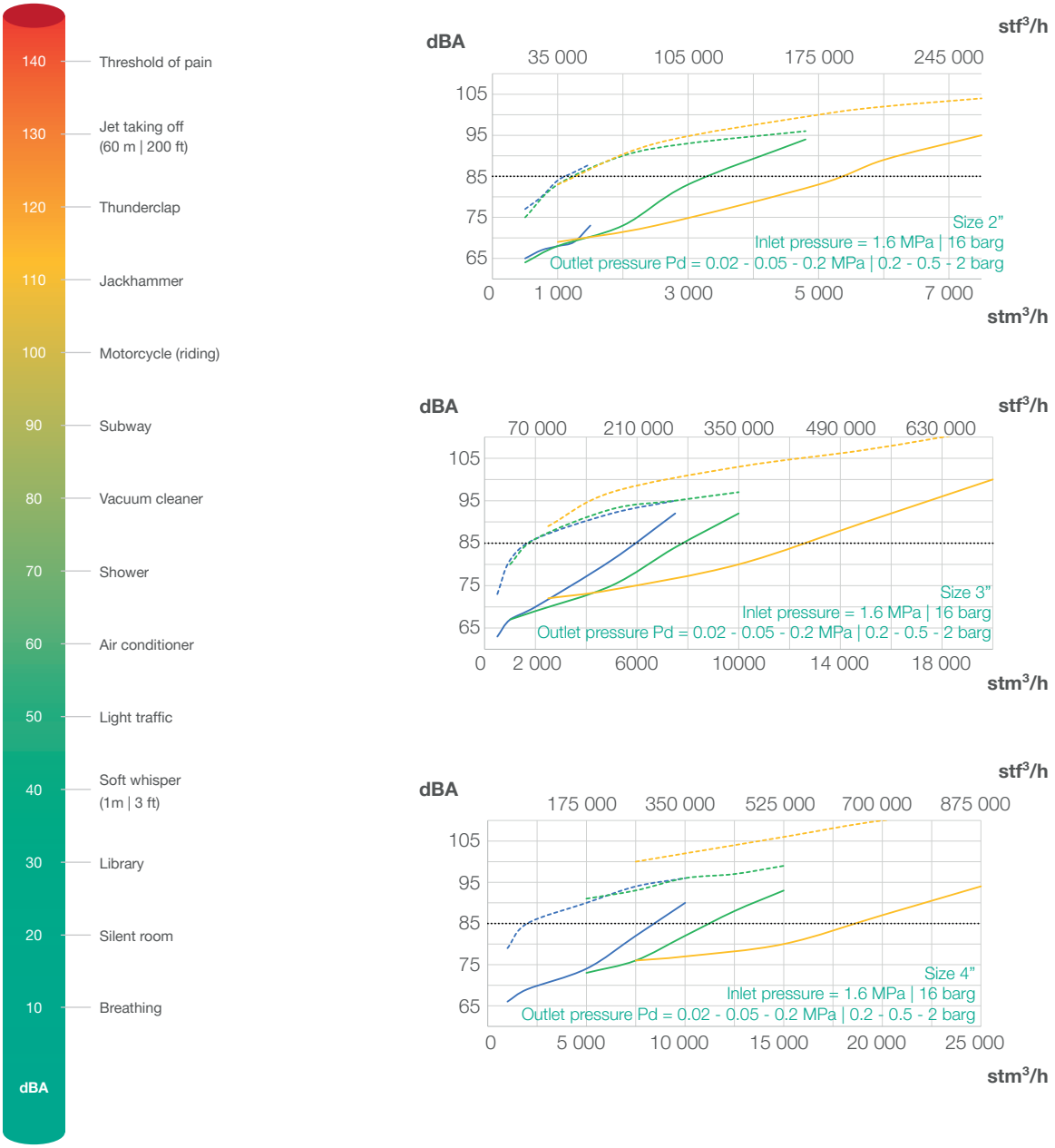


Chart 1 Reval 182's silencer efficiency charts

Slam Shut SA,SB/82 or HB/97

The Reval 182 pressure regulator offers the possibility of installing an **incorporated slam shut valve** SB/82, HB/97 or SA, depending on the regulator size, and this can be done either during the manufacturing process or be retrofited in the field.

SB/82 is available for all sizes, while HB/97 is available from 4” only.
SA is available up to 4”.

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
- UPSO — Under Pressure Shut-Off
- Internal by-pass
- Push botton for tripping test
- Compact dimensions
- Easy maintenance
- Remote tripping option
- Limit switch option

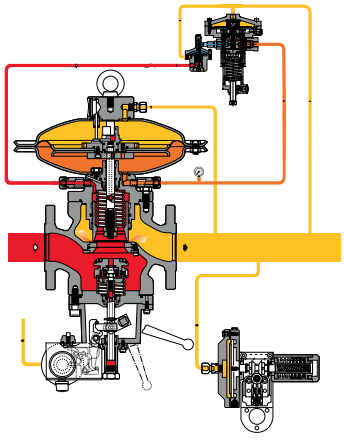


Figure 8 Reval 182 with SB/82

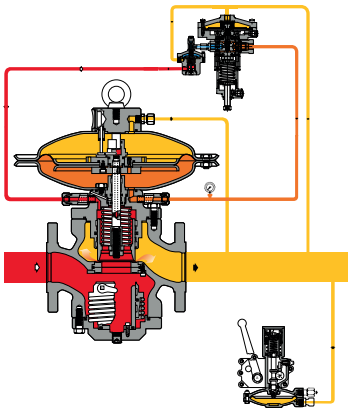


Figure 9 Reval 182 with SA

- Inlet pressure
- Motorization
- Outlet pressure
- Feeding pressure for pilot system

Pressure switch types and ranges					
SSV Type	**Model**	**Operation**	**Range Wh**		**Spring Table web link**
			KPa	**mbarg**	
SA	91	OPSO	2.5 - 110	25 - 1100	TT 1381
		UPSO	1 - 90	10 - 900	
SA	92	OPSO	70 - 500	700 - 5000	TT 1381
		UPSO	25 - 301	250 - 3010	
SSV Type	**Model**	**Operation**	**Range Wh**		**Spring Table web link**
			MPa	**barg**	
SA	93	OPSO	0.3 - 1.33	3 - 13.3	TT 1381
		UPSO	0.08 - 0.77	0.8 - 7.7	
SB/82	102M	OPSO	0.02 - 0.55	0.2 - 5.5	TT 1331
		UPSO	0.02 - 0.28	0.2 - 2.8	
SB/82	102MH	OPSO	0.02 - 0.55	0.2 - 5.5	TT 1331
		UPSO	0.28 - 0.55	2.8 - 5.5	
SB/82	103M	OPSO	0.2 - 2.2	2 - 22	TT 1331
		UPSO	0.02 - 0.8	0.2 - 8	
SB/82	103MH	OPSO	0.2 - 2.2	2 - 22	TT 1331
		UPSO	0.8 - 1.9	8 - 19	
HB/97	102M	OPSO	0.02 - 0.55	0.2 - 5.5	TT 1331
		UPSO	0.02 - 0.28	0.2 - 2.8	
HB/97	102MH	OPSO	0.02 - 0.55	0.2 - 5.5	TT 1331
		UPSO	0.28 - 0.55	2.8 - 5.5	
HB/97	103M	OPSO	0.2 - 2.2	2 - 22	TT 1331
		UPSO	0.02 - 0.8	0.2 - 8	
HB/97	103MH	OPSO	0.2 - 2.2	2 - 22	TT 1331
		UPSO	0.8 - 1.9	8 - 19	

Table 9 Settings table

Pilot series 210 fail to open (optional)

The pilot series 210/A is a mechanical device which enables the working principle and the setpoint modifications of pilot operated gas pressure regulators. The pilot is optimized to enhance the accuracy and minimize the lock-up.

This model specifically allow to have a **fail-to-open regulator in case of pilot's failure**.

The pilot series 210/A is not certified for PED-CE applications.

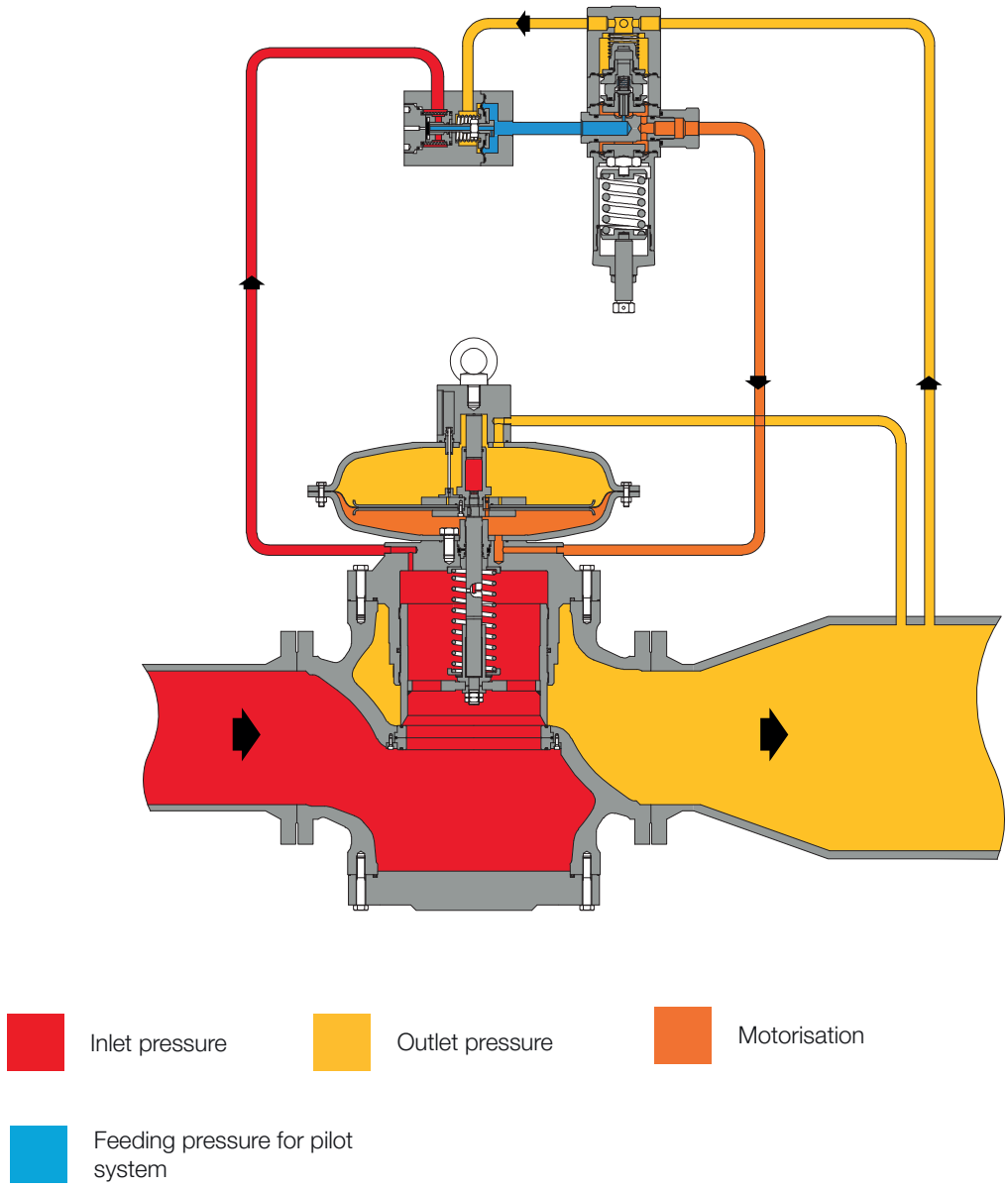
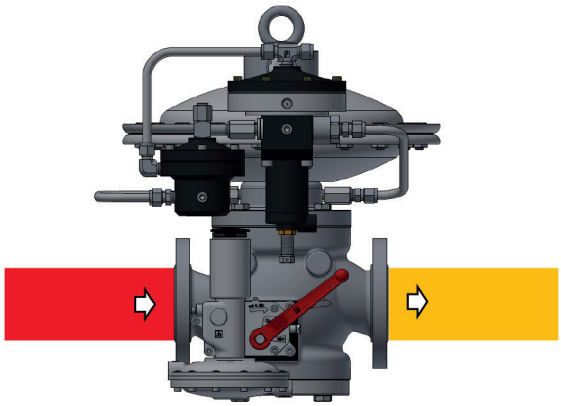


Figure 10 Reval 182 with fail to open pilot series 210

Gas flow

Standard version with SSV model SA

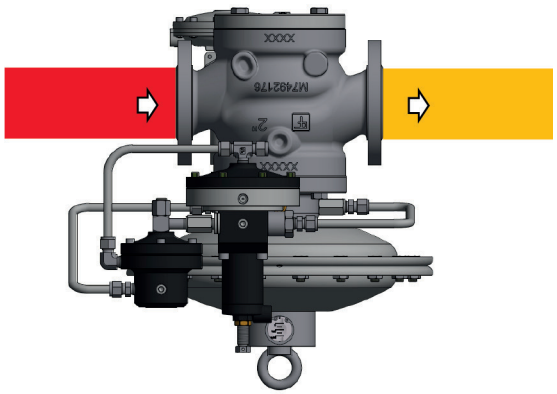


Inlet pressure

Outlet pressure

Figure 11 Reval 182 standard version gas flow

Upside down version with SSV model SA

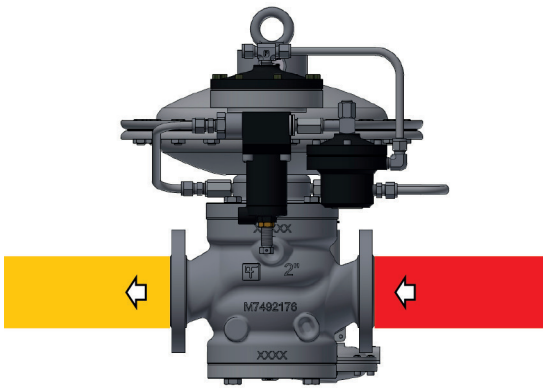


Inlet pressure

Outlet pressure

Figure 12 Reval 182 standard version gas flow upside down

Right to left gas flow version with SSV model SA

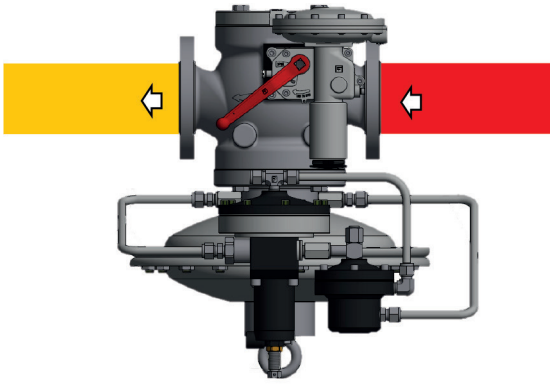


Inlet pressure

Outlet pressure

Figure 13 Reval 182 version right to left gas flow

Right to left gas flow version upside down with SSV model SA



Inlet pressure

Outlet pressure

Figure 14 Upside down Reval 182 version right to left gas flow

Weights and Dimensions

Reval 182

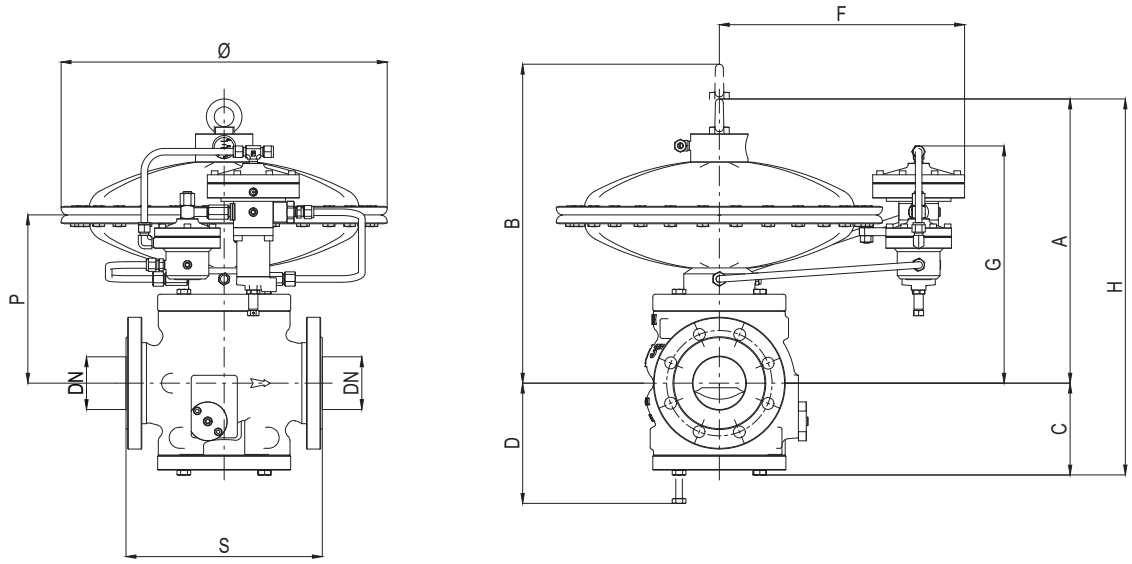


Figure 15 Reval 182 dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)								
	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches
Size (DN)	25 | 1”	50 | 2”	65 | 2” 1/2	80 | 3”	100 | 4”	150 | 6”	200 | 8”	250 | 10”
S - ANSI 150/PN 16	183 | 7.25”	254 | 10”	276 | 10.88”	298 | 11.75”	352 | 13.88”	451 | 17.75”	546 | 21.38”	673 | 26.5”
Ø	375 | 14.76”	375 | 14.76”	495 | 19.49”	495 | 19.49”	495 | 19.49”	630 | 24.80”	630 | 24.80”	630 | 24.80”
A	320 | 12.60”	350 | 13.78”	430 | 16.93”	430 | 16.93”	470 | 18.50”	550 | 21.65”	680 | 26.8”	755 | 29.7”
B	410 | 16.14”	430 | 16.93”	530 | 20.87”	530 | 20.87”	600 | 23.62”	735 | 28.94”	770 | 30.3“	845 | 33.3”
C	100 | 3.94”	130 | 5.12”	140 | 5.51”	150 | 5.90”	190 | 7.48”	220 | 8.66”	260 | 10.24”	310 | 12.20”
D	130 | 5.12”	160 | 6.30”	180 | 7.08”	200 | 7.87”	250 | 9.84”	270 | 10.63”	315 | 12.40”	398 | 15.67”
F	350 | 13.78”	350 | 13.78”	410 | 16.14”	410 | 16.14”	410 | 16.14”	475 | 18.70”	475 | 18.70”	470 | 18.50”
G	250 | 9.84”	285 | 11.22”	330 | 12.99”	340 | 13.36”	370 | 14.57”	400 | 15.75”	450 | 17.72”	570 | 22.5”
H	430 | 16.93”	480 | 18.90”	570 | 22.40”	580 | 22.83”	660 | 25.98”	770 | 30.31”	940 | 37”	1065 | 41.9”
P	170 | 6.70”	205 | 8.07”	250 | 9.84”	260 | 10.24”	290 | 11.42”	320 | 12.60”	415 | 16.3”	470 | 18.50”
Tubing Connections	Øe 10 x Øi 8 (on request imperial sizing)							

Weight	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs
ANSI 150/PN 16	33 | 73	50 | 110	58 |128	70 | 154	110 | 242	195 | 430	300 | 661	580 | 1279

Table 10 Weights and dimensions

Reval 182 + SB/82 or HB/97

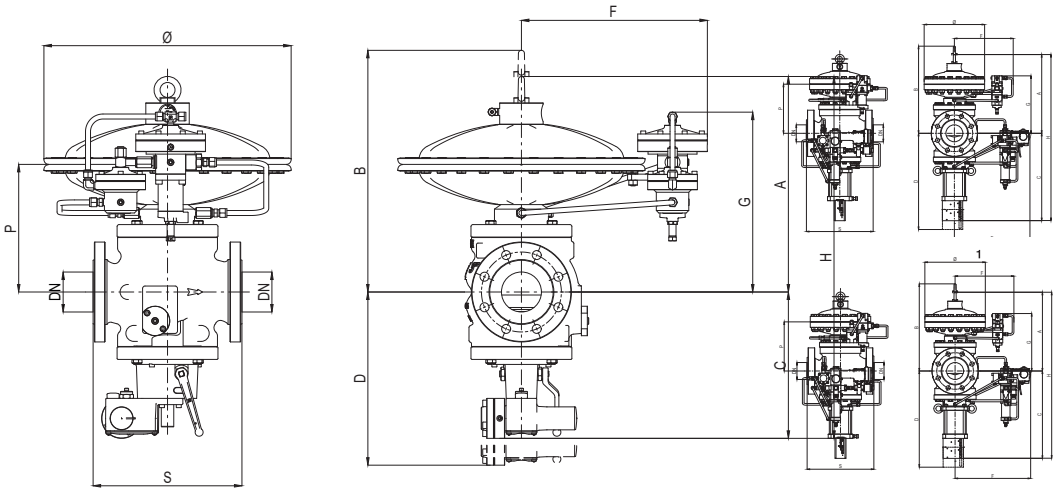


Figure 16 Reval 182 + SB/82 or HB/97 dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)								
	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches
Size (DN)	25 | 1”	50 | 2”	65 | 2” 1/2	80 | 3”	100 | 4”	150 | 6”	200 | 8”	250 | 10”
S - ANSI 150/PN16	183 | 7.25”	254 | 10”	276 | 10.88”	298 | 11.75”	352 | 13.88”	451 | 17.75”	543 | 21.38”	673 | 26.5”
Ø	375 | 14.76”	375 | 14.76”	495 | 19.49”	495 | 19.49”	495 | 19.49”	630 | 24.80”	630 | 24.80”	630 | 24.80”
A	320 | 12.60”	350 | 13.78”	430 | 16.93”	430 | 16.93”	470 | 18.50”	550 | 21.65”	680 | 26.8”	755 | 29.7”
B	410 | 16.14”	430 | 16.93”	530 | 20.87”	530 | 20.87”	600 | 23.62”	735 | 28.94”	770 | 30.3”	845 | 33.3”
C with SB/82	300 | 11.8”	300 | 11.8”	315 | 12.4”	335 | 13.19”	360 | 14.17”	430 | 16.93”	475 | 18.70”	550 | 21.65”
C with HB/97	-	-	-	-	518 | 20.39”	645 | 25.39”	687 | 27.05”	796 | 31.34”
D with SB/82	390 | 15.3”	390 | 15.35”	425 | 16.73”	445 | 17.52”	500 | 19.68”	615 | 24.21”	695 | 37.36”	800 | 31.50”
D with HB/97	-	-	-	-	650 | 25.59”	835 | 32.87”	900 | 35.43”	1060 | 41.7”
F	350 | 13.78”	350 | 13.78”	410 | 16.14”	410 | 16.14”	410 | 16.14”	475 | 18.70”	475 | 18.70”	470 | 18.50”
F1	-	-	-	-	358 | 14.09”	410 | 16.14”	445 | 17.52”	510 | 20.08”
G	250 | 9.84”	285 | 11.22”	330 | 12.99”	340 | 13.36”	370 | 14.57”	400 | 15.75”	450 | 17.72”	570 | 22.5”
H with SB/82	620 | 24.41”	650 | 25.59”	745 | 29.33”	765 | 30.12”	830 | 32.68”	980 | 38.58”	1155 | 45.5”	1305 | 51.4”
H with HB/97	-	-	-	-	988 | 38.90”	1195 | 47.05”	1457 | 57.4”	1566 | 61.7”
P	170 | 6.70”	205 | 8.07”	250 | 9.84”	260 | 10.24”	290 | 11.42”	320 | 12.60”	415 | 16.3”	470 | 18.50”
Tubing Connections	Øe 10 x Øi 8 (on request imperial sizing)							

Weight	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs
ANSI 150/PN 16 with SB/82	45 | 99	56	70 | 154	88 | 194	132 | 291	246 | 542	354 | 780	680 | 1500
ANSI 150/PN 16 with HB/97	-	-	-	-	122 | 269	236 | 520	308 | 679	624 | 1376

Table 11 Weights and dimensions

Reval 182 + SA

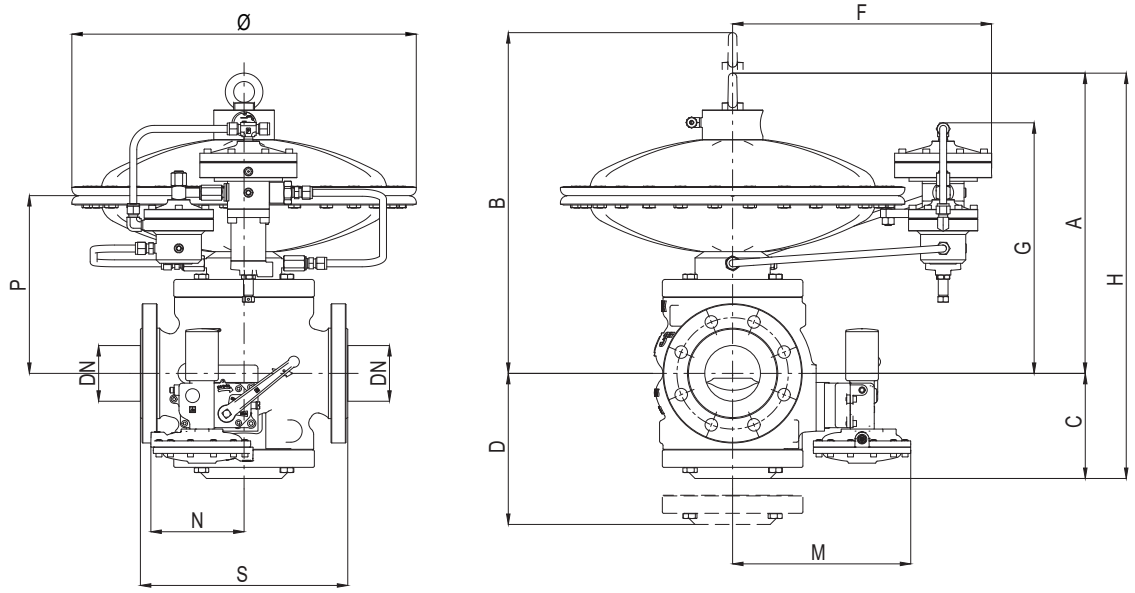


Figure 17 Reval 182 + SA dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)					
	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches
Size (DN)	25 | 1”	50 | 2”	65 | 2” 1/2	80 | 3”	100 | 4”
S - ANSI 150/PN16	183 | 7.25”	254 | 10”	276 | 10.88”	298 | 11.75”	352 | 13.88”
Ø	375 | 14.76”	375 | 14.76”	495 | 19.49”	495 | 19.49”	495 | 19.49”
A	320 | 12.60”	350 | 13.78”	430 | 16.93”	430 | 16.93”	470 | 18.50”
B	410 | 16.14”	430 | 16.93”	530 | 20.87”	530 | 20.87”	600 | 23.62”
C	145 | 5.71”	161 | 6.34”	178 | 7.01”	185 | 7.28”	205 | 8.07”
D	212 | 8.35”	255 | 10.04”	292 | 11.50”	322 | 12.68”	330 | 12.99”
F	350 | 13.78”	350 | 13.78”	410 | 16.14”	410 | 16.14”	410 | 16.14”
G	250 | 9.84”	285 | 11.22”	330 | 12.99”	340 | 13.36”	370 | 14.57”
H	465 | 18.31”	511 | 20.12”	608 | 23.94”	615 | 24.21”	874 | 34.41”
P	170 | 6.70”	205 | 8.07”	250 | 9.84”	260 | 10.24”	290 | 11.42”
L	98 | 3.86”	146 | 5.75”	146 | 5.75”	146 | 5.75”	146 | 5.75”
M	194 | 7.64”	219 | 8.62”	232 | 9.13”	246 | 9.68”	263 | 10.35”
N	125 | 4.92”	125 | 4.92”	125 | 4.92”	125 | 4.92”	130 | 5.12”
Tubing Connections	Øe 10 x Øi 8 (on request imperial sizing)				

Weight	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs
ANSI 150/PN 16	35 | 77	52 | 115	60 | 132	72 | 159	113 | 249

Table 12 Weights and dimensions

Reval 182 + PM/182

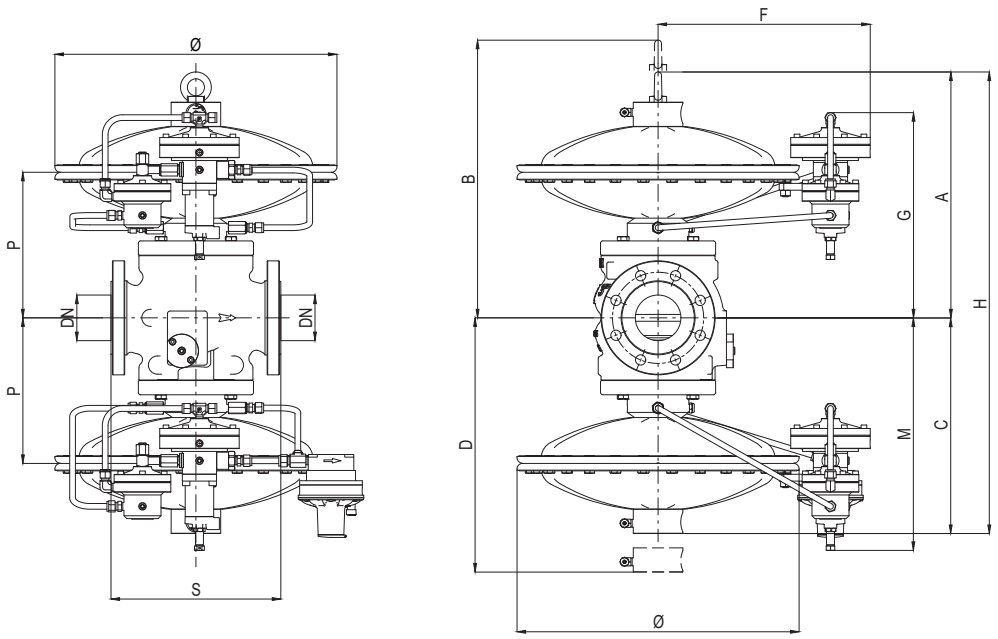


Figure 18 Reval 182 + PM/182 dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)							
	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches
Size (DN)	25 | 1”	50 | 2”	65 | 2” 1/2	80 | 3”	100 | 4”	150 | 6”	200 | 8”
S - ANSI 150/PN 16	183 | 7.25”	254 | 10”	276 | 10.88”	298 | 11.75”	352 | 13.88”	451 | 17.75”	543 | 21.38”
Ø	375 | 14.76”	375 | 14.76”	495 | 19.49”	495 | 19.49”	495 | 19.49”	630 | 24.80”	630 | 24.80”
A	320 | 12.60”	350 | 13.78”	430 | 16.93”	430 | 16.93”	470 | 18.50”	550 | 21.65”	680 | 26.8”
B	410 | 16.14”	430 | 16.93”	530 | 20.87”	530 | 20.87”	600 | 23.62”	735 | 28.94”	770 | 30.3”
C	260 | 10.24”	290 | 11.42”	370 | 14.57”	380 | 14.96”	410 | 16.14”	490 | 19.29”	590 | 23.23”
D	410 | 16.14”	430 | 16.93”	530 | 20.87”	530 | 20.87”	600 | 23.62”	735 | 28.94”	850 | 33.46”
F	350 | 13.78”	350 | 13.78”	410 | 16.14”	410 | 16.14”	410 | 16.14”	475 | 18.70”	475 | 18.70”
G	250 | 9.84”	285 | 11.22”	330 | 12.99”	340 | 13.36”	370 | 14.57”	400 | 15.75”	450 | 17.72”
H	640 | 25.20”	700 | 27.56”	860 | 33.86”	860 | 33.86”	940 | 37.01”	110 | 4.33”	1270 | 50.0”
P	170 | 6.70”	205 | 8.07”	250 | 9.84”	260 | 10.24”	290 | 11.42”	320 | 12.60”	415 | 16.3”
M	260 | 10.24”	295 | 11.61”	340 | 13.39”	350 | 13.78”	380 | 14.96”	410 | 16.14”	460 | 18.11”
Tubing Connections	Øe 10 x Øi 8 (on request imperial sizing)						

Weight	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs
ANSI 150/PN 16	54 | 119	75 | 165	85 | 187	100 | 220	150 | 330	255 | 562	395 | 871

Table 13 Weights and dimensions

Reval 182 + DB/182

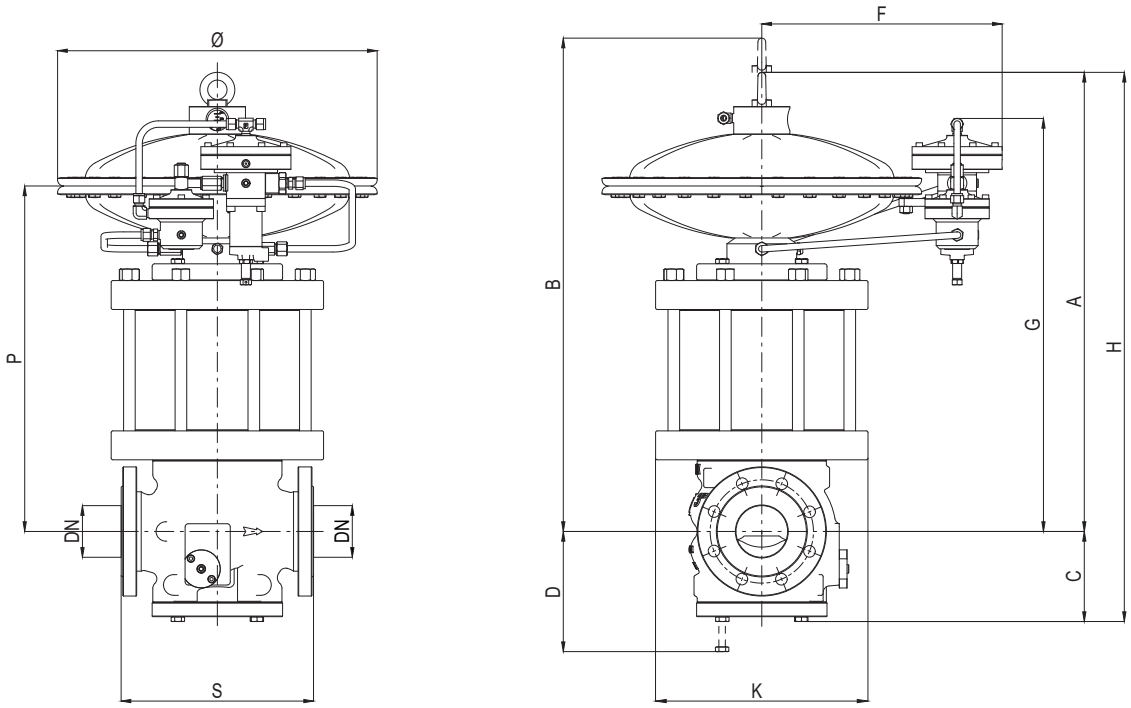


Figure 19 Reval 182 + DB/182 dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)								
	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches
Size (DN)	25 | 1”	50 | 2”	65 | 2” 1/2	80 | 3”	100 | 4”	150 | 6”	200 | 8”	250 | 10”
S - ANSI 150/PN 16	183 | 7.25”	254 | 10”	276 | 10.88”	298 | 11.75”	352 | 13.88”	451 | 17.75”	543 | 21.38”	673 | 26.5”
Ø	375 | 14.76”	375 | 14.76”	495 | 19.49”	495 | 19.49”	495 | 19.49”	630 | 24.80”	630 | 24.80”	630 | 24.80”
A	520 | 20.5”	550 | 21.7”	650 | 25.6”	675 | 26.6”	755 | 29.7”	920 | 36.2”	1080 | 42.5”	1250 | 49.2”
B	610 | 24”	640 | 25.2”	780 | 30.7”	785 | 30.9”	895 | 35.2”	1120 | 44”	1170 | 46.1”	1340 | 52.8”
C	100 | 3.94”	130 | 5.12”	140 | 5.51”	150 | 5.90”	190 | 7.48”	220 | 8.66”	260 | 10.24”	310 | 12.20”
D	130 | 5.12”	160 | 6.30”	180 | 7.08”	200 | 7.87”	250 | 9.84”	270 | 10.63”	315 | 12.40”	398 | 15.67”
F	350 | 13.78”	350 | 13.78”	410 | 16.14”	410 | 16.14”	410 | 16.14”	475 | 18.70”	475 | 18.70”	470 | 18.50”
G	450 | 17.7”	480 | 18.9”	550 | 21.6”	585 | 23”	655 | 25.8”	770 | 30.3”	890 | 35.0”	1040 | 41”
H	820 | 32.3”	850 | 33.5”	965 | 38”	1010 | 39.8”	1115 | 44”	1350 | 53”	1340 | 52.8”	1560 | 61.4”
P	370 | 14.6”	400 | 15.7”	470 | 18.5”	505 | 19.9”	575 | 22.6”	690 | 27.2”	810 | 31.9”	960 | 38”
K	215 | 8.5”	295 | 11.6”	325 | 12.8”	325 | 12.9”	390 | 15.4”	480 | 18.8”	600 | 23.6”	700 | 27.4”
Tubing Connections	Øe 10 x Øi 8 (on request imperial sizing)							

Weight	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs
ANSI 150/PN 16	44 | 97	84 | 185	88 | 194	112 | 247	178 | 392	339 | 747	536 | 1181	900 | 1984

Table 14 Weights and dimensions

Reval 182 + DB/182 + SB/82 or HB/97

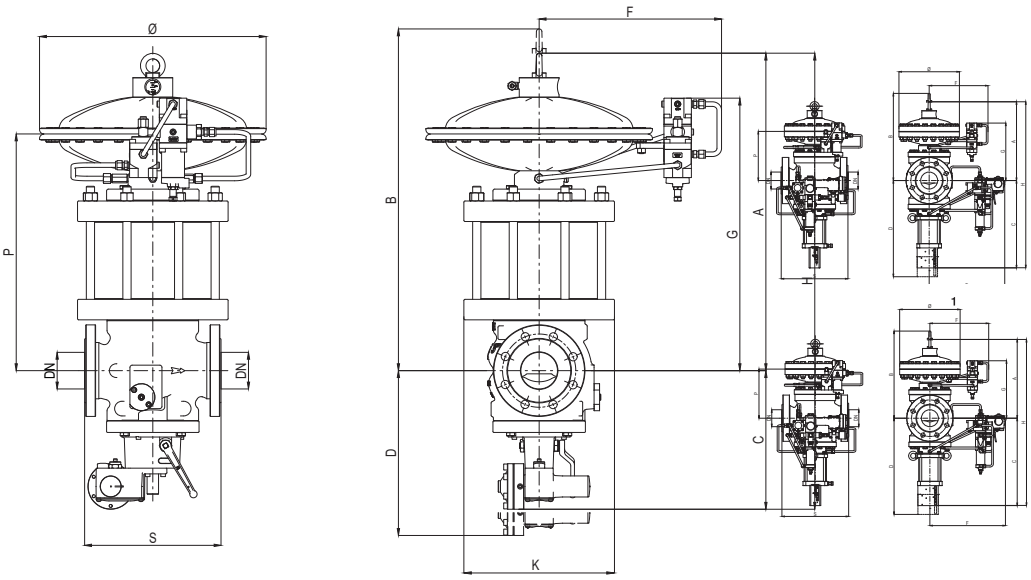


Figure 20 Reval 182 + DB/182 + SB/82 or HB/97 dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)								
	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches
Size (DN)	25 | 1”	50 | 2”	65 | 2” 1/2	80 | 3”	100 | 4”	150 | 6”	200 | 8”	250 | 10”
S - ANSI 150/PN16	183 | 7.25”	254 | 10”	276 | 10.88”	298 | 11.75”	352 | 13.88”	451 | 17.75”	543 | 21.38”	673 | 26.5”
Ø	375 | 14.76”	375 | 14.76”	495 | 19.49”	495 | 19.49”	495 | 19.49”	630 | 24.80”	630 | 24.80”	630 | 24.80”
A	520 | 20.5”	550 | 21.7”	650 | 25.6”	675 | 26.6”	755 | 29.7”	920 | 36.2”	1080 | 42.5”	1250 | 49.2”
B	610 | 24”	640 | 25.2”	780 | 30.7”	785 | 30.9”	895 | 35.2”	1120 | 44”	1170 | 46.1”	1340 | 52.8”
C with SB/82	300 | 11.8”	300 | 11.8”	315 | 12.4”	335 | 13.2”	360 | 14.2”	430 | 16.9”	475 | 18.7”	550 | 21.6”
C with HB/97	-	-	-	-	518 | 20.39”	645 | 25.39”	687 | 27.05”	796 | 31.34”
D with SB/82	390 | 15.3”	390 | 15.3”	425 | 16.7”	445 | 17.5”	500 | 19.7”	615 | 24.2”	695 | 27.4”	800 | 31.5”
D with HB/97	-	-	-	-	650 | 25.59”	835 | 32.87”	900 | 35.43”	1060 | 41.7”
F	350 | 13.78”	350 | 13.78”	410 | 16.14”	410 | 16.14”	410 | 16.14”	475 | 18.70”	475 | 18.70”	470 | 18.50”
F1	-	-	-	-	358 | 14.09”	410 | 16.14”	445 | 17.52”	510 | 20.08”
G	250 | 9.8”	480 | 18.9”	550 | 21.7”	585 | 23.03”	655 | 25.8”	770 | 30.3”	890 | 35.0”	1040 | 40.9”
H with SB/82	820 | 32.3”	850 | 33.5”	965 | 38”	1010 | 39.8”	1115 | 44”	1350 | 53”	1555 | 61.2”	1800 | 70.9”
H with HB/97	-	-	-	-	650 | 25.59”	835 | 32.87”	1767 | 69.6”	2046 | 80.6”
P	370 | 14.6”	400 | 15.7”	470 | 18.5”	505 | 19.9”	575 | 22.6”	690 | 27”	810 | 31.9”	960 | 38.0”
Tubing Connections	Øe 10 x Øi 8 (on request imperial sizing)							

Weight	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs
ANSI 150/PN 16 with SB/82	56 | 123	90 | 198	100 | 220	130 | 287	200 | 441	390 | 860	590 | 1301	1000 | 2205
ANSI150/PN 16 with HB/97	-	-	-	-	196 | 432	380 | 838	534 | 1177”	944 | 2081

Table 15 Weights and dimensions

Reval 182 + DB/182 + SA

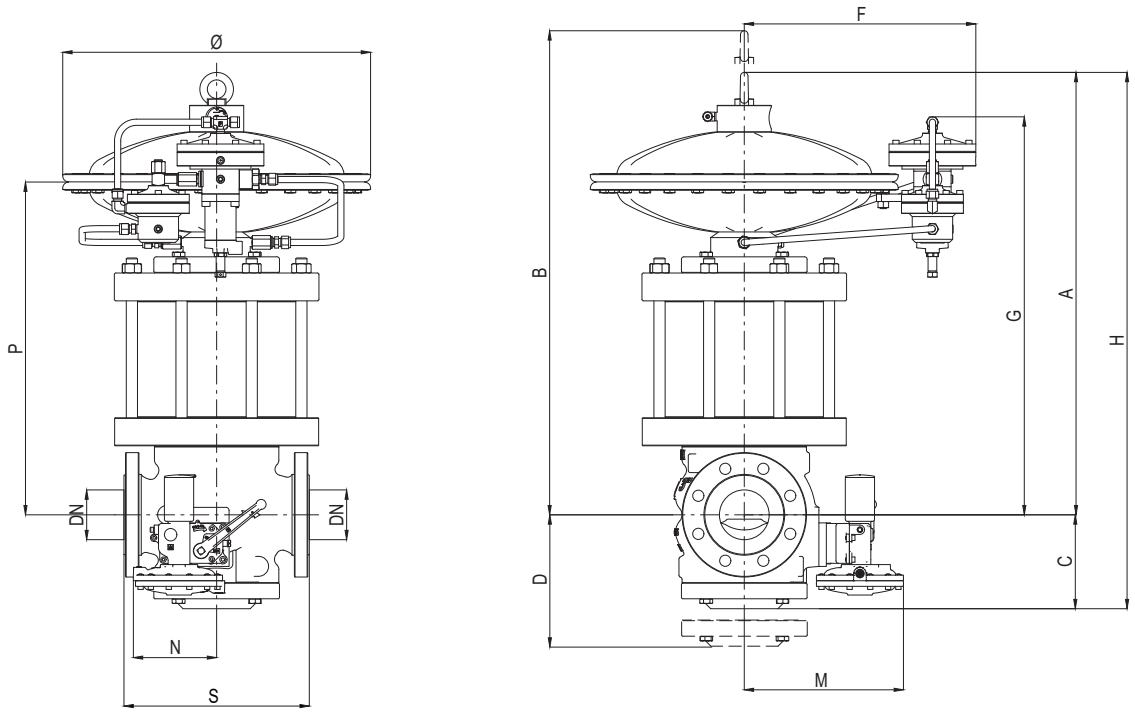


Figure 21 Reval 182 + DB/182 + SA dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)					
	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches
Size (DN)	25 | 1”	50 | 2”	65 | 2” 1/2	80 | 3”	100 | 4”
S - ANSI 150/PN16	183 | 7.25”	254 | 10”	276 | 10.88”	298 | 11.75”	352 | 13.88”
Ø	375 | 14.76”	375 | 14.76”	495 | 19.49”	495 | 19.49”	495 | 19.49”
A	520 | 20.5”	550 | 21.7”	650 | 25.6”	675 | 26.6”	755 | 29.7”
B	610 | 24”	640 | 25.2”	780 | 30.7”	785 | 30.9”	895 | 35.2”
C	145 | 5.71”	161 | 6.34”	178 | 7.01”	185 | 7.28”	205 | 8.07”
D	212 | 8.35”	255 | 10.08”	292 | 11.50”	322 | 12.68”	330 | 12.99”
F	350 | 13.78”	350 | 13.78”	410 | 16.14”	410 | 16.14”	410 | 16.14”
G	250 | 9.84”	480 | 18.90”	550 | 21.65”	585 | 23.03”	655 | 25.79”
H	465 | 18.31”	511 | 20.12”	608 | 23.94”	615 | 24.21”	874 | 34.41”
P	370 | 14.57”	400 | 15.75”	470 | 18.5”	505 | 19.88”	575 | 22.64”
L	98 | 3.86”	146 | 5.75”	146 | 5.75”	146 | 5.75”	146 | 5.75”
M	194 | 7.64”	219 | 8.62”	232 | 9.13”	246 | 9.68”	263 | 10.35”
N	125 | 4.92”	125 | 4.92”	125 | 4.92”	130 | 5.11”	130 | 5.11”
K	215 | 8.5”	295 | 11.6”	325 | 12.8”	325 | 12.8”	390 | 15.3”
Tubing Connections	Øe 10 x Øi 8 (on request imperial sizing)				

Weight	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs
ANSI 150/PN 16	35 | 77	52 | 115	60 | 132	72 | 159	113 | 249

Table 16 Weights and dimensions

Reval 182 + DB/182 + PM/182

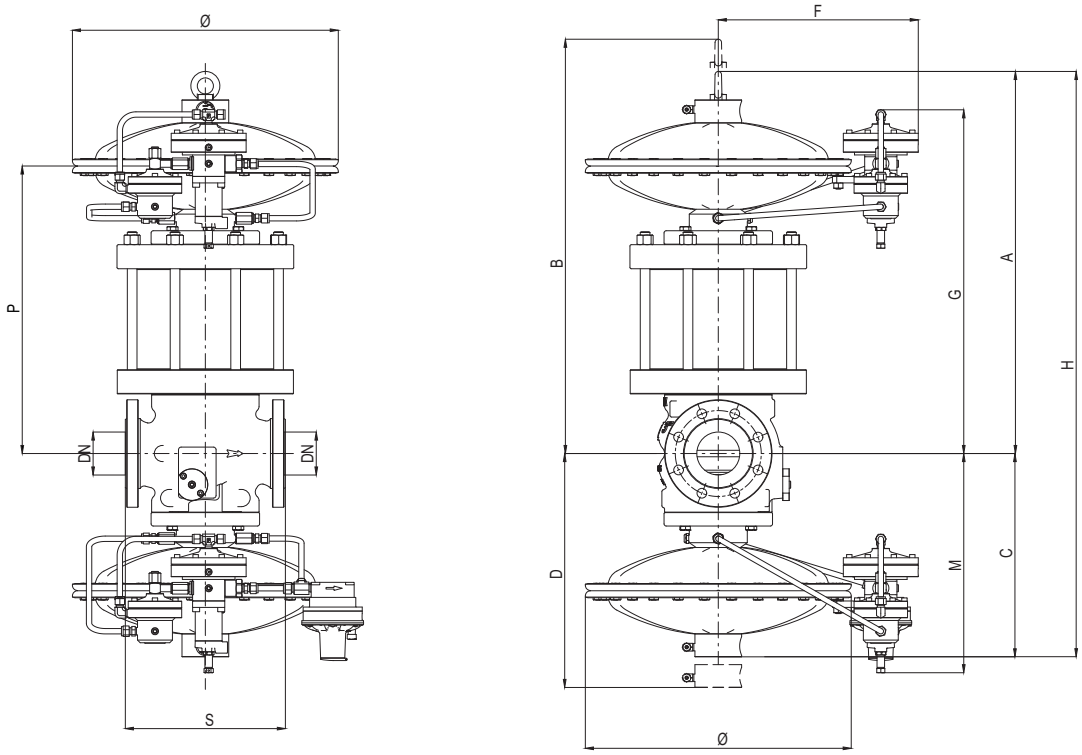


Figure 22 Reval 182 + DB/182 + PM/182 dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)							
	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches	[mm] | inches
Size (DN)	25 | 1”	50 | 2”	65 | 2” 1/2	80 | 3”	100 | 4”	150 | 6”	200 | 8”
S - ANSI 150/PN 16	183 | 7.25”	254 | 10”	276 | 10.88”	298 | 11.75”	352 | 13.88”	451 | 17.75”	543 | 21.38”
Ø	375 | 14.76”	375 | 14.76”	495 | 19.49”	495 | 19.49”	495 | 19.49”	630 | 24.80”	630 | 24.80”
A	520 | 20.5”	550 | 21.7”	650 | 25.6”	675 | 26.6”	755 | 29.7”	920 | 36.2”	1080 | 42.5”
B	610 | 24”	640 | 25.2”	780 | 30.7”	785 | 30.9”	895 | 35.2”	1120 | 44.1”	1170 | 46.1”
C	260 | 10.24”	290 | 11.42”	370 | 14.57”	380 | 14.96”	410 | 16.14”	490 | 19.29”	590 | 23.23”
D	410 | 16.14”	430 | 16.93”	530 | 20.87”	530 | 20.87”	600 | 23.62”	735 | 28.94”	850 | 33.46”
F	350 | 13.78”	350 | 13.78”	410 | 16.14”	410 | 16.14”	410 | 16.14”	475 | 18.70”	475 | 18.70”
G	450 | 17.7”	480 | 18.9”	550 | 21.7”	585 | 23”	655 | 25.8”	770 | 30.3”	890 | 35.0”
H	780 | 30.7”	840 | 33”	1020 | 40.1”	1055 | 41.5”	1165 | 45.8”	1410 | 55.5”	1670 | 65.8”
L	260 | 10.2”	295 | 11.6”	340 | 13.4”	350 | 13.8”	380 | 15”	410 | 16.1”	460 | 18.1”
P	370 | 14.6”	400 | 15.7”	470 | 18.5”	505 | 19.9”	575 | 22.6”	690 | 27.2”	770 | 31.9”
K	215 | 8.5”	295 | 11.6”	325 | 12.8”	325 | 12.8”	390 | 15.4”	480 | 18.8”	600 | 23.6”
Tubing Connections	Øe 10 x Øi 8 (on request imperial sizing)						

Weight	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs	Kg | lbs
ANSI 150/PN 16	65 | 143	109 | 240	115 | 254	142 | 313	218 | 480	399 | 880	631 | 1391

Table 17 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 the use of formulae using the flow rate coefficients (Cg) and the form factor (K1) as indicated by the EN 334 standard. Sizing available through Pietro Fiorentini's online sizing programme.

Flow rate coefficient								
Nominal size	25	50	65	80	100	150	200	250
Inches	1"	2"	2" 1/2	3"	4"	6"	8"	10"
Cg	575	2220	3320	4937	8000	16607	25933	36525
K1	106.78	106.78	106.78	106.78	106.78	106.78	106.78	106.78

Table 18 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 19)
T = gas temperature (°C)

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

S = relative density (refer to Table 19)
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 19 Correction Factor Fc

Flow rate conversion
Stm^3/h x 0.94795 = Nm^3/h

Table 20 Flow rate conversion

Nm^3/h Reference conditions:
T= 0 °C; P= 1 bar(a) | T= 32 °F; P= 14.5 psi(a)
Stm^3/h Reference conditions:
T= 15 °C; P= 1 bar(a) | T= 59 °F; P= 14.5 psi(a)

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^3/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 psig

Sizing of regulators is usually made based on valve Cg value (Table 18).

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

Q = flow rate in Stm^3/h
Pu = inlet pressure in bar (abs)
Pd = outlet pressure in bar (abs).

- **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: (Pu < 2 x Pd)

$$Q = 0.526 \times Cg \times Pu \times \sin\left(K1 \times \sqrt{\frac{Pu - Pd}{Pu}}\right)$$

- **A-2** in critical conditions: (Pu ≥ 2 x Pd)

$$Q = 0.526 \times Cg \times Pu$$

- **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: (Pu<2xPd)

$$Cg = \frac{Q}{0.526 \times Pu \times \sin\left(K1 \times \sqrt{\frac{Pu - Pd}{Pu}}\right)}$$

- **B-2** in critical conditions (Pu ≥ 2 x Pd)

$$Cg = \frac{Q}{0.526 \times Pu}$$

NOTE: The sin value is understood to be DEG.

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

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