

# Syncroflux

Valves



**TECHNICAL BROCHURE**

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**[www.f Fiorentini.com](http://www.f Fiorentini.com)**

# 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



Localised technical support

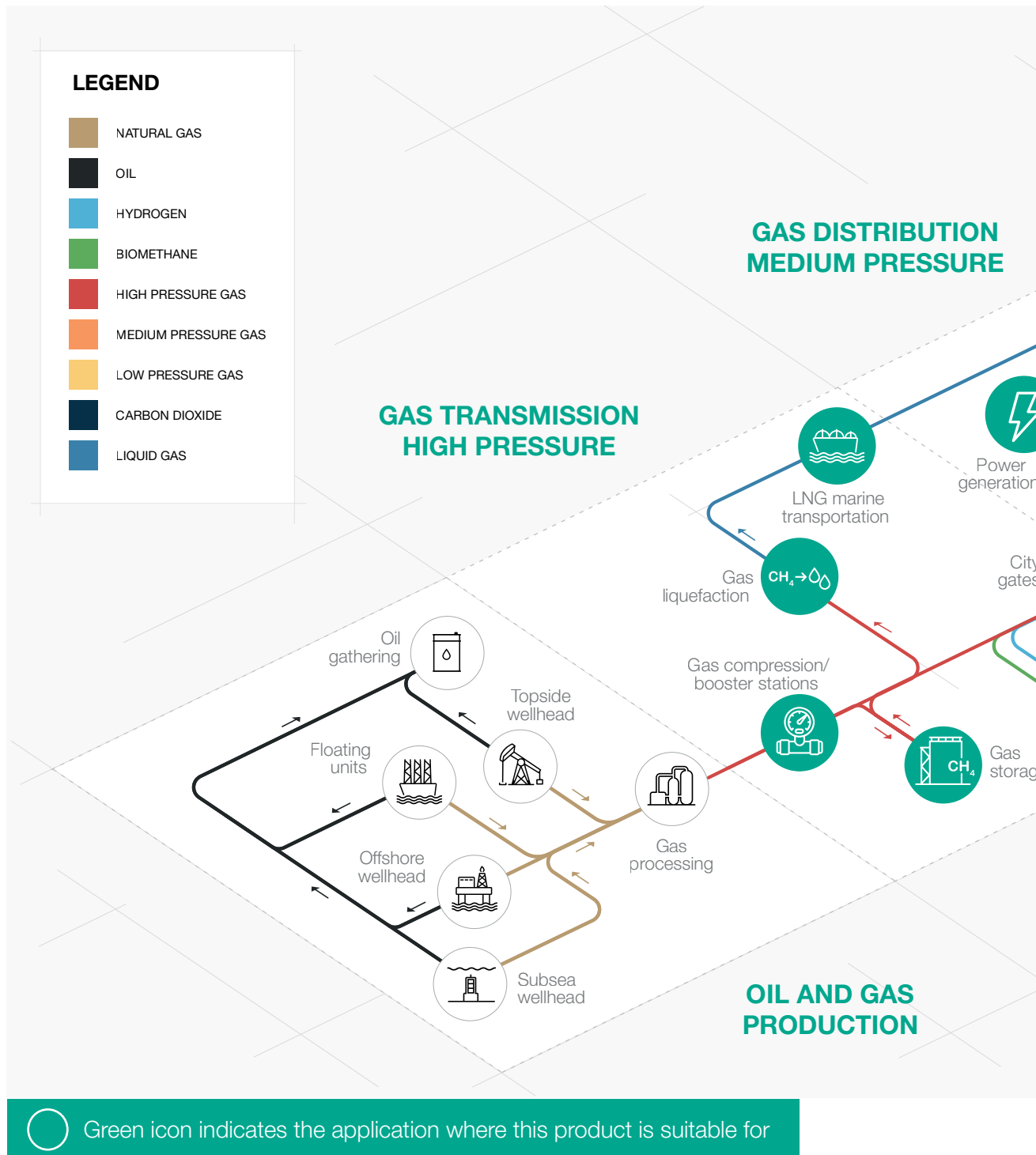


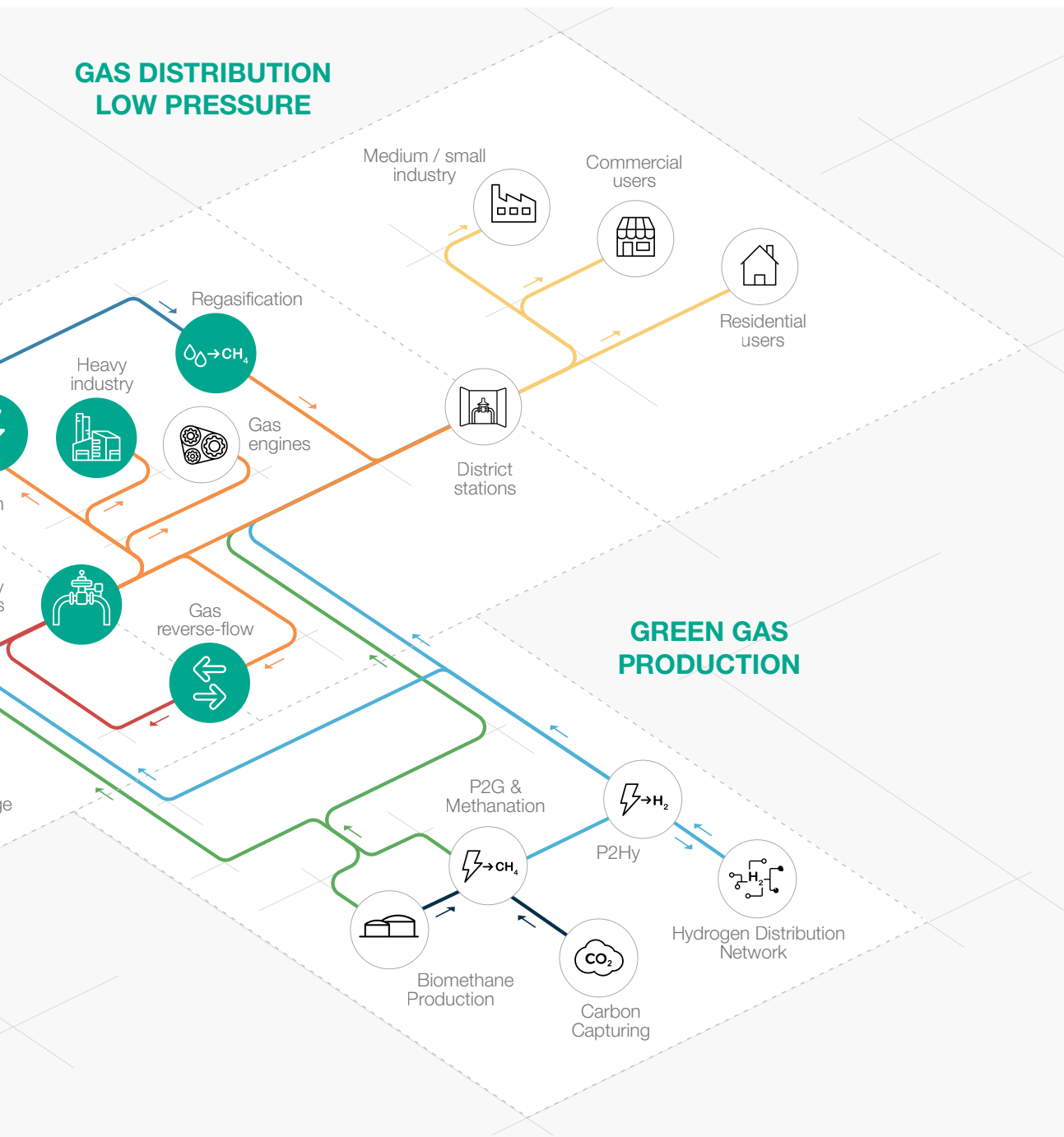
Experience since 1940



Operating in over 100 countries

# Area of Application





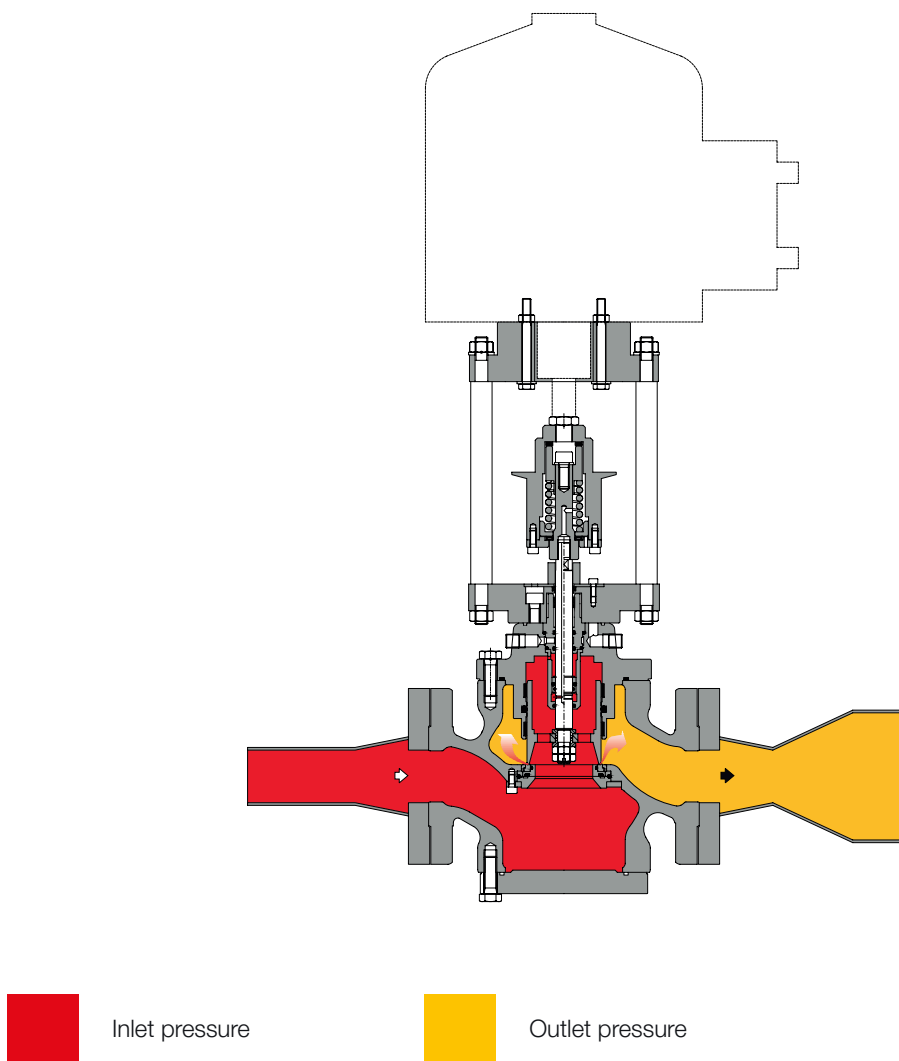
**Figure 1** Area of Application Map

# Introduction

The **Syncroflux** is a **quick opening regulating valve** with an electric actuator.

It is mainly used for **pressure and/or flow control applications**. This regulating valve is suitable for use with previously filtered, non corrosive gases, in natural gas transmission, power plants fuel gas skids and distribution networks as well as high load industrial applications.

It has a top-entry body suitable for flanged coupling.



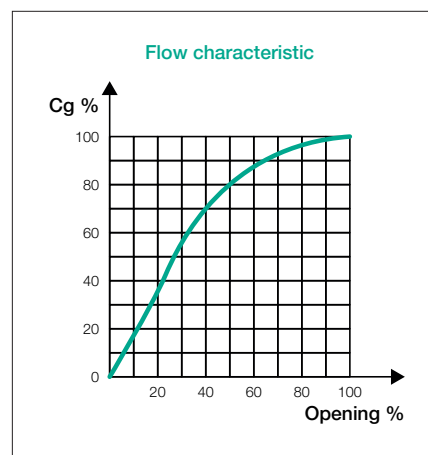
**Figure 2** Syncroflux

# Features and benefits

The **Syncroflux** is a **electrically operated** regulating valve with a unique **dynamic balancing system** which ensure an **outstanding turn down ratio** combined with an extremely **accurate outlet pressure control**.

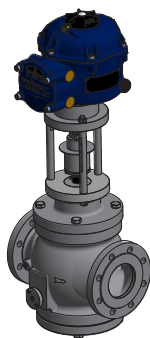
The Syncroflux is a balanced regulating valve. This means that variation of the inlet pressure does not affect the valve's control position.

The Syncroflux quick opening flow characteristic provides for maximum change in flow rate at low valve travels with a nearly linear relationship. Additional increases in valve travel gives sharply reduced variations in flow rate.

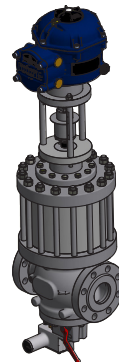


It is a **truly top entry design** which allows an **easy maintenance** of parts directly in the field **without removing the body from the pipework**.

The modular design of the Syncroflux regulating valve allows for the factory installation (or onsite retro-fitting) of a slamshut valve SB/82 or HB/97 (depending on size). Additionally an integral silencer DB819 can be installed. All without removing the body from the pipeline.



**Figure 3** Syncroflux



**Figure 4** Syncroflux with SB/82

## Syncroflux competitive advantages



Compact and simple design



High accuracy



High turn-down ratio



Electric motor control



Balanced type



Top Entry



Easy maintenance



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 10.2 MPa up to 102 barg
Ambient temperature* (TS <sup>1</sup> )	from -20 °C to +60 °C from -4 °F to +140 °F
Inlet gas temperature*	from -20 °C to +60 °C from -4 °F to +140 °F
Available Accessories	DB/819 Silencer, slam shut SB/82 and HB/97
Nominal size (DN <sup>1,2</sup> )	DN 25   1"; DN 50   2"; DN 80   3"; DN 100   4"; DN 150   6"; DN 200   8"; DN 250   10"
Connections	ANSI 150, 300 and 600 according to ASME B16.5 and PN 16 according EN 1092
End to end dimensions	according to EN 334
<sup>(1)</sup> according to EN334 standard <sup>(2)</sup> according to ISO 23555-1 standard <sup>(*)</sup> 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 A 352 LCC for classes ANSI 600 and 300 Cast steel ASTM A 216 WCB for classes Ansi 150 and PN 16/40
Motor's coupling flange	ASTM A350 LF2
Stem	AISI 416 stainless steel
Plug	ASTM A 350 LF2 Nickel coated on sealing surface
Valve seat	Nitrile Rubber Vulcanized on a metal support
Sealing ring	Nitrile rubber
Connection 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

The **Syncroflux** regulating valve is designed according to the European standard EN 334 and EN 1092.

The product is certified according to European Directive 2014/68/EU (PED).

Leakage class: bubble tight, better than class VIII according to ANSI/FCI 70-3.



EN 334



EN 1092



PED-CE

# Maximum allowable operating pressure

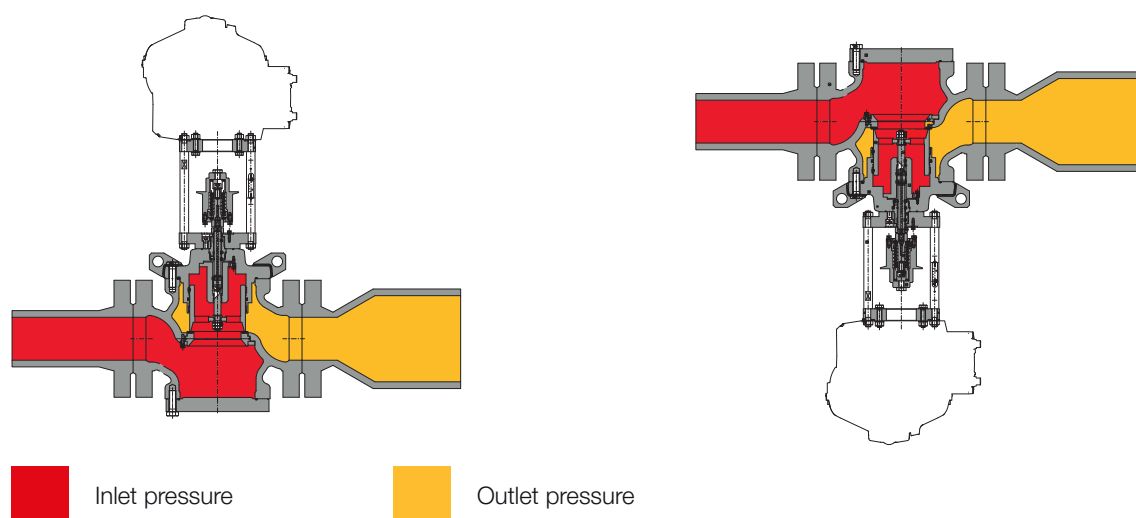
Design pressure ( $p_s$ according to EN334)				
Version	Body		Slam shut	
	MPa	barg	MPa	barg
PN16 Steel body	1.60	16	1.60	16
PN16 cast iron body	1.60	16	1.60	16
#150 steel body	1.89	18.9	1.89	18.9
#150 ductile iron body	1.7	17	1.7	17
#300 ductile iron body	5.17	51.7	5.17	51.7
#600 ductile iron body	10.20	102	10.20	102

**Table 3** Design pressure of body and slam shut

## Accessories

- High performance electric motor
- Silencer
- Slam shut valve

## Recommended installations



**Figure 5** Syncroflux recommended installation

## DB/819 silencer

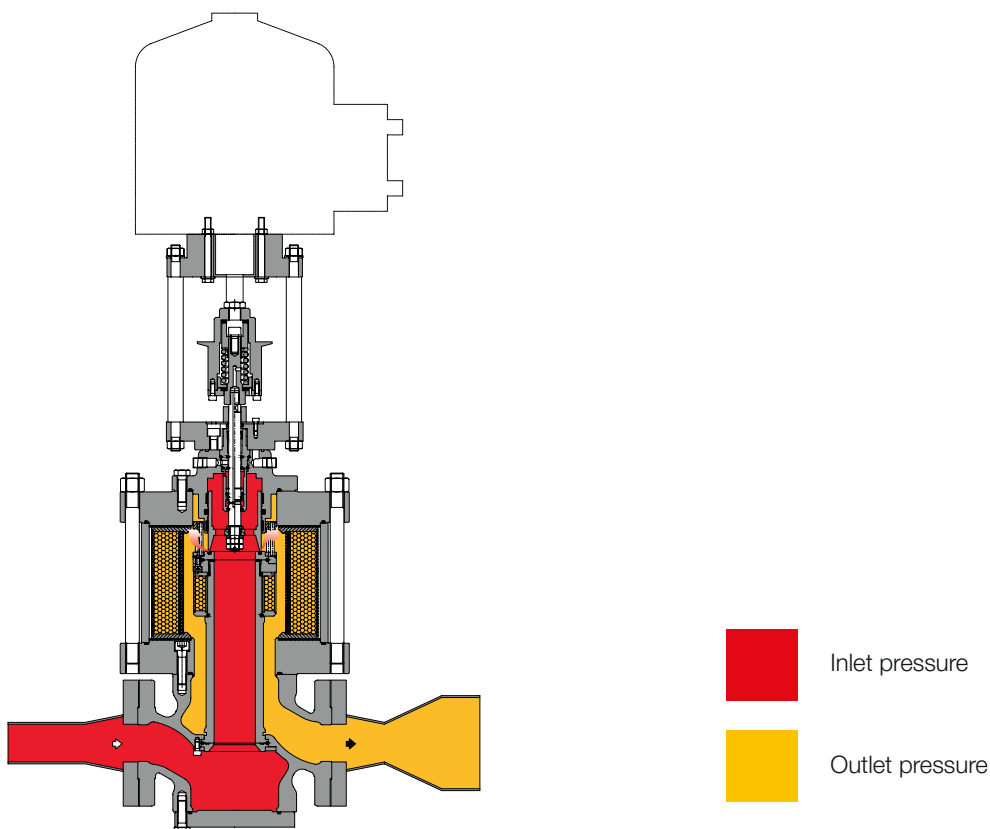
Whenever certain noise limit is desired, an additional silencer allows to considerably reduce the noise level (dBA).

The Syncroflux regulating valve 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.

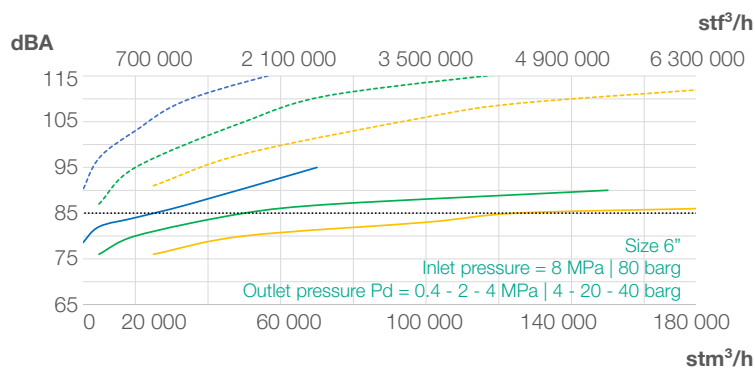
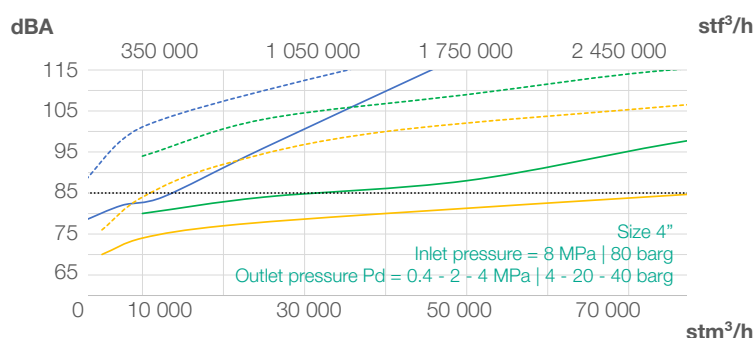
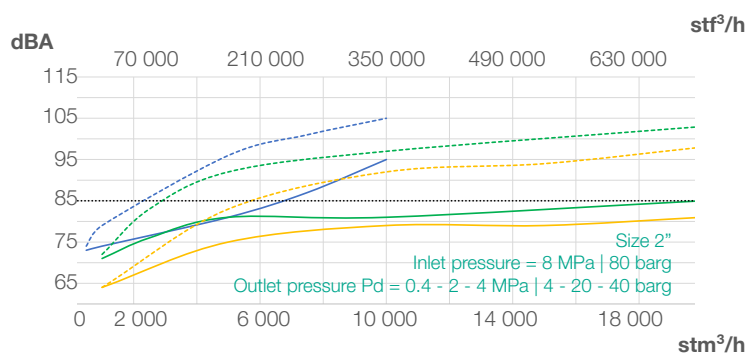
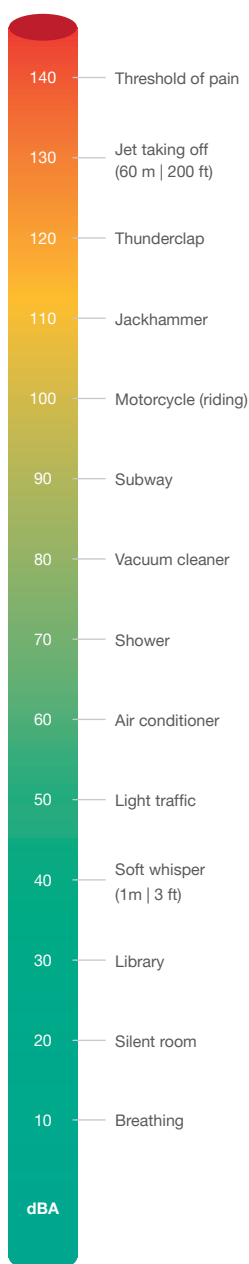
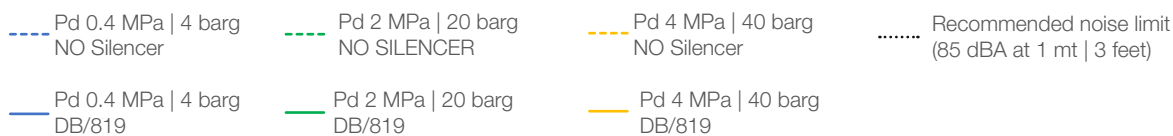
With the built-in silencer, the Cg valve coefficient is 5% lower than the corresponding version without.

Given the modular arrangement of the regulator, the silencer may be retrofitted to both standard Syncroflux version as well as those with incorporated slam shut or monitor, **without modifying the main piping**. Pressure reduction and control operate the same manner as standard version.



**Figure 6** Syncroflux with DB/819 silencer

The charts below represent 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** Syncroflux silencer efficiency charts

## SB/82 or HB/97 slam shut









The Syncroflux regulating valve 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.

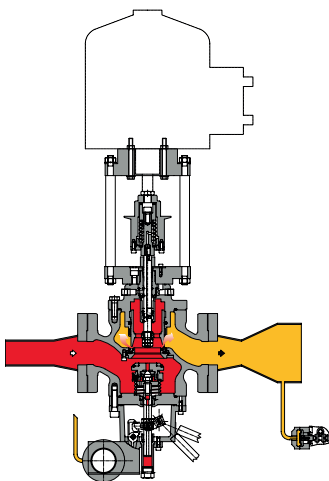
SB/82 is available for all sizes, while HB/97 is available from 4" to 10" only.

**Retrofitting can be done without modifying** the regulating valve assembly.

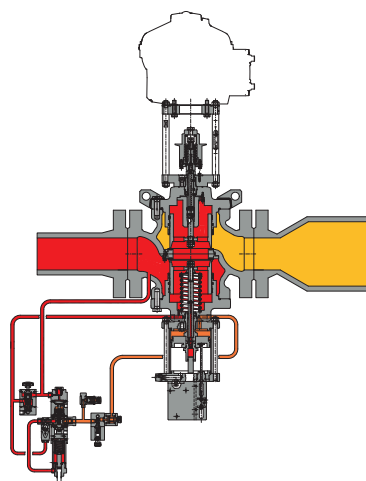
With the built-in slam shut, the Cg valve coefficients is 5% lower than the corresponding version without.

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 7** Syncroflux with SB/82



**Figure 8** Syncroflux with HB/97

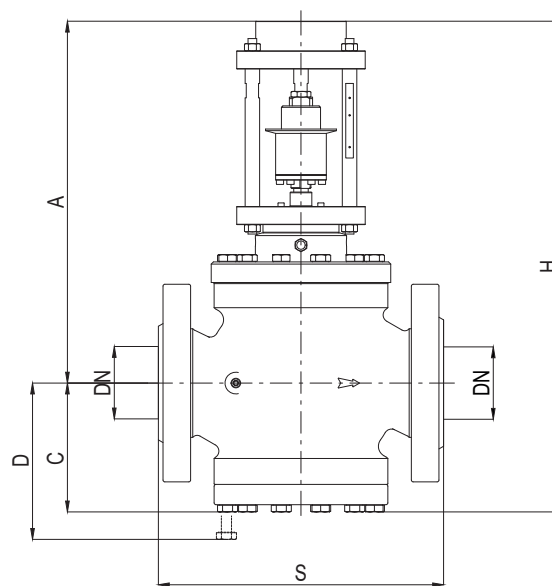


Pressure switch types and ranges					
SSV Type	Model	Operation	Range Wh		Spring Table web link
			MPa	barg	
SB/82	102M	OPSO	0.02 - 0.55	0.2 - 5.5	<a href="#">TT 1331</a>
		UPSO	0.02 - 0.28	0.2 - 2.8	
SB/82	102MH	OPSO	0.02 - 0.55	0.2 - 5.5	<a href="#">TT 1331</a>
		UPSO	0.28 - 0.55	2.8 - 5.5	
SB/82	103M	OPSO	0.2 - 2.2	2 - 22	<a href="#">TT 1331</a>
		UPSO	0.02 - 0.8	0.2 - 8	
SB/82	103MH	OPSO	0.2 - 2.2	2 - 22	<a href="#">TT 1331</a>
		UPSO	0.8 - 1.9	8 - 19	
SB/82	104M	OPSO	1.5 - 4.5	15 - 45	<a href="#">TT 1331</a>
		UPSO	0.16 - 1.8	1.6 - 18	
SB/82	104MH	OPSO	1.5 - 4.5	15 - 45	<a href="#">TT 1331</a>
		UPSO	1.8 - 4.1	18 - 41	
SB/82	105M	OPSO	3 - 9	30 - 90	<a href="#">TT 1331</a>
		UPSO	0.3 - 4.4	3 - 44	
SB/82	105MH	OPSO	3 - 9	30 - 90	<a href="#">TT 1331</a>
		UPSO	4.4 - 9	44 - 90	
HB/97	103	OPSO	0.13 - 1.1	1.3 - 11	<a href="#">TT 984</a>
		UPSO	0.04 - 0.68	0.4 - 6.8	
HB/97	104	OPSO	1 - 3.15	10 - 31.5	<a href="#">TT 984</a>
		UPSO	0.1 - 2.06	1 - 20.6	
HB/97	105	OPSO	2.5 - 7.6	25 - 76	<a href="#">TT 985</a>
		UPSO	0.25 - 5	2.5 - 50	
HB/97	105/92	OPSO	5.8 - 8.5	58 - 85	<a href="#">TT 985</a>
		UPSO	4.5 - 7.5	45 - 75	

Table 4 Settings table

# Weights and Dimensions

## Syncroflux

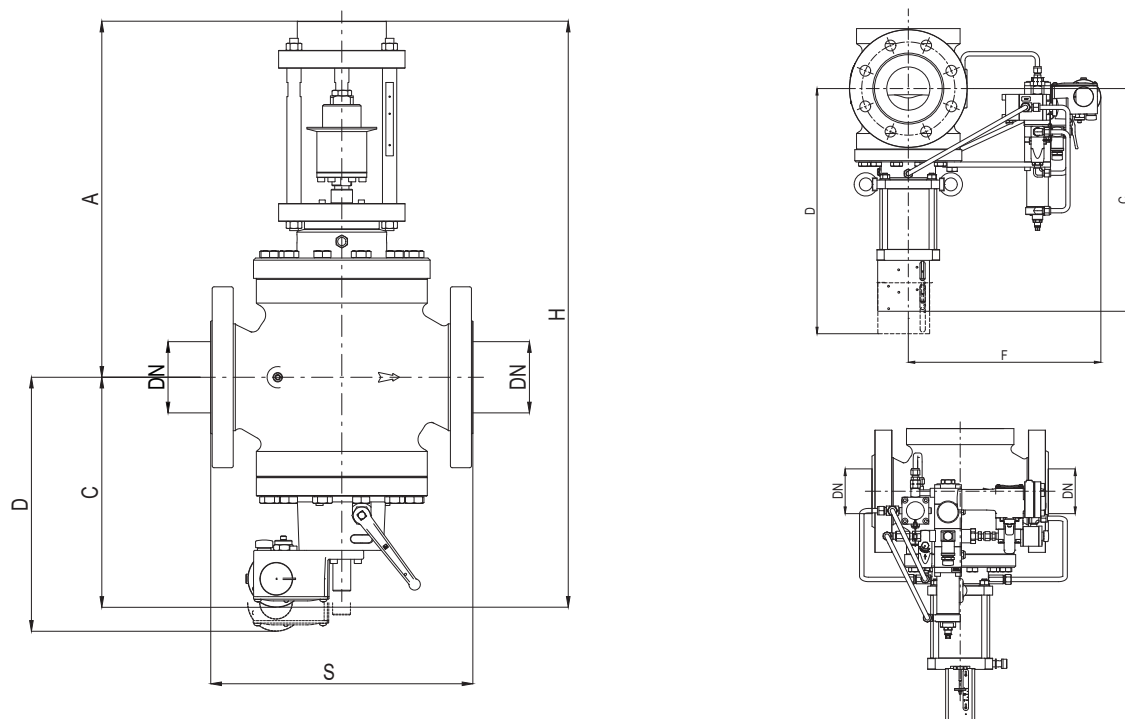


**Figure 9** Syncroflux dimensions

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	184	7.2"	254	10.0"	298	11.7"	352	13.9"	451	17.8"	543	21.4"	673	26.5"
S - ANSI 300	197	7.8"	267	10.5"	317	12.5"	368	14.5"	473	18.6"	568	22.4"	708	27.9"
S - ANSI 600	210	8.3"	286	11.3"	336	13.2"	394	15.5"	508	20.0"	609	24.0"	752	29.6"
A	405	15.9"	436	17.2"	470	18.5"	502	19.8"	576	22.7"	590	23.2"	681	26.8"
C	100	3.9"	130	5.1"	150	5.9"	190	7.5"	225	8.9"	265	10.4"	340	13.4"
D	130	5.1"	160	6.3"	200	7.9"	250	9.8"	275	10.8"	320	12.6"	440	17.3"
H	505	19.9"	566	22.3"	620	24.4"	692	27.2"	801	31.5"	855	33.7"	1021	40.2"
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/PN16	39	86	43	95	58	128	100	220	192	423	298	657	580	1279
ANSI 300	40	88	44	97	62	137	110	243	234	516	360	794	630	1389
ANSI 600	41	90	46	101	65	143	119	262	249	549	385	849	680	1499

**Table 5** Weights and dimensions

# Syncroflux + SB/82 or HB/97



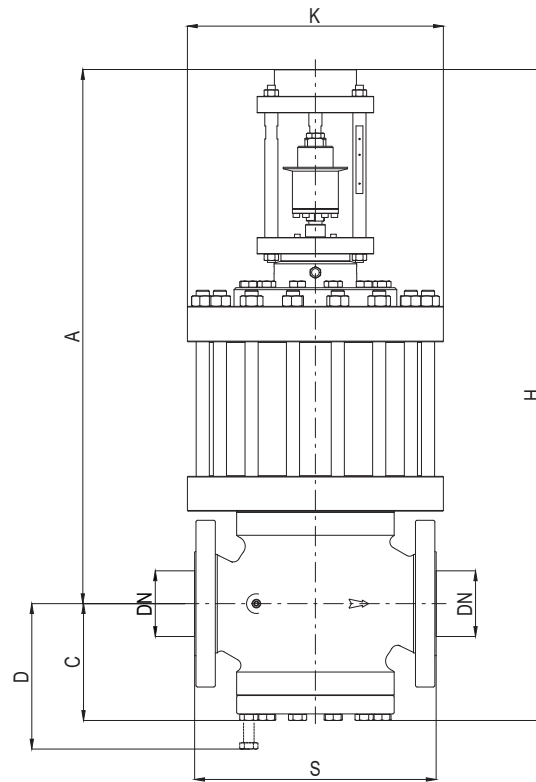
**Figure 10** Syncroflux + SB/82 or HB/97 dimensions

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	184	7.2"	254	10.0"	298	11.7"	352	13.9"	451	17.8"	543	21.4"	673	26.5"
S - ANSI 300	197	7.8"	267	10.5"	317	12.5"	368	14.5"	473	18.6"	568	22.4"	708	27.9"
S - ANSI 600	210	8.3"	286	11.3"	336	13.2"	394	15.5"	508	20.0"	609	24.0"	752	29.6"
A	405	15.9"	436	17.2"	470	18.5"	502	19.8"	576	22.7"	590	23.2"	681	26.8"
C with SB/82	215	8.5"	240	9.4"	270	10.6"	300	11.8"	375	14.8"	450	17.7"	530	20.9"
C with HB/97	-	-	-	-	-	-	518	20.4"	645	25.4"	687	27.0"	796	31.3"
D with SB/82	280	11.0"	330	13.0"	380	15.0"	440	17.3"	560	22.0"	625	24.6"	730	28.7"
D with HB/97	-	-	-	-	-	-	650	25.6"	835	32.9"	900	35.4"	1060	41.7"
F with HB/97	-	-	-	-	-	-	410	16.1"	442	17.4"	475	18.7"	510	20.1"
H with SB/82	620	24.4"	676	26.6"	740	29.1"	802	31.6"	951	37.4"	1040	40.9"	1211	47.7"
H with HB/97	-	-	-	-	-	-	1020	40.2"	1221	48.1"	1277	50.3"	1477	58.1"
Tube 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/PN16 with SB/82	48	106	53	117	68	150	114	251	204	450	350	772	630	1389
ANSI 300 with SB/82	50	110	55	121	75	165	125	276	249	549	415	915	680	1499
ANSI 300 with HB/97	-	-	-	-	-	-	133	293	290	639	448	988	759	1673
ANSI 600 with SB/82	51	112	56	123	78	172	134	295	264	582	440	970	730	1609
ANSI 600 with HB/97	-	-	-	-	-	-	145	320	316	697	474	1045	775	1709

**Table 6** Weights and dimensions



## Syncroflux + DB/819

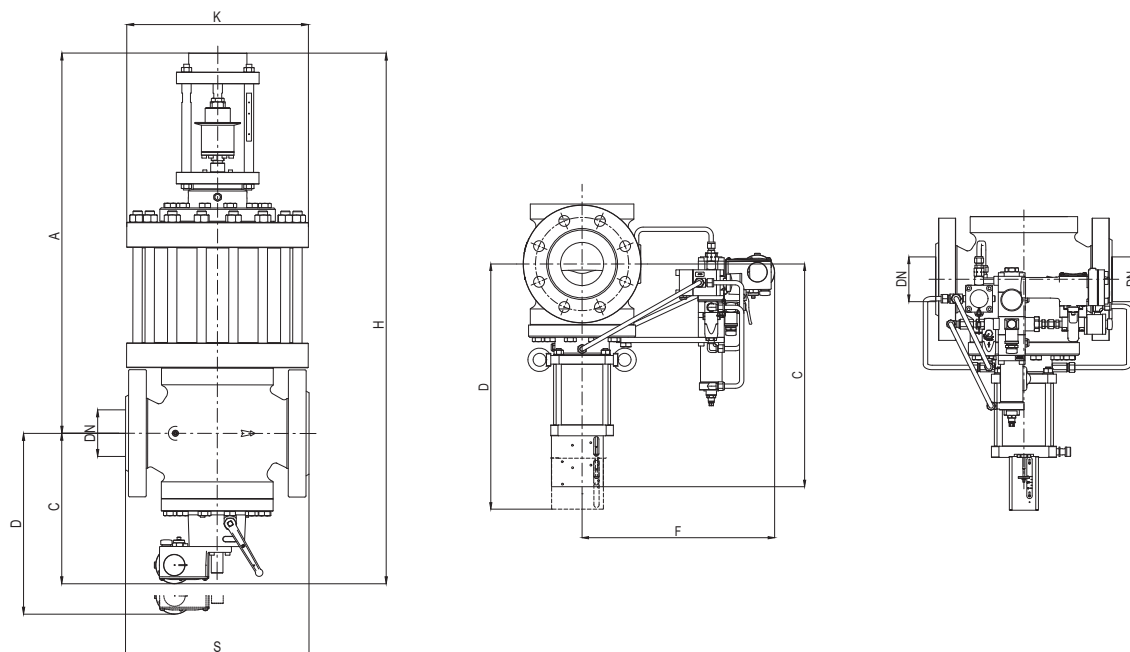


**Figure 11** Syncroflux + DB/819 dimensions

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	184	7.2"	254	10.0"	298	11.7"	352	13.9"	451	17.8"	543	21.4"	673	26.5"
S - ANSI 300	197	7.8"	267	10.5"	317	12.5"	368	14.5"	473	18.6"	568	22.4"	708	27.9"
S - ANSI 600	210	8.3"	286	11.3"	336	13.2"	394	15.5"	508	20.0"	609	24.0"	752	29.6"
A	605	23.8"	661	26.0"	740	29.1"	812	32.0"	861	33.9"	1085	42.7"	1181	46.5"
C	100	3.9"	130	5.1"	150	5.9"	190	7.5"	225	8.9"	265	10.4"	340	13.4"
D	130	5.1"	160	6.3"	200	7.9"	250	9.8"	275	10.8"	320	12.6"	440	17.3"
H	705	27.8"	791	31.1"	890	35.0"	1002	39.4"	1086	42.8"	1350	53.1"	1521	59.9"
K	220	8.7"	300	11.8"	330	13.0"	390	15.4"	480	18.9"	595	23.4"	695	27.4"
Tubing Connections	Øe 10 x Ø 8 (on request imperial sizing)													
Weight	Kg	lbs	Kg	lbs	Kg	lbs	Kg	lbs	Kg	lbs	Kg	lbs	Kg	lbs
ANSI 150/PN16	65	143	108	238	148	326	214	472	449	990	725	1598	960	2116
ANSI 300	67	148	110	243	157	346	243	536	492	1085	815	1797	1060	2337
ANSI 600	66	146	112	247	160	353	252	556	524	1155	840	1852	1110	2447

**Table 7** Weights and dimensions

# Syncroflux + DB/819 + SB/82 or HB/97



**Figure 12** Syncroflux + DB/819 + 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	184	7.2"	254	10.0"	298	11.7"	352	13.9"	451	17.8"	543	21.4"	673	26.5"
S - ANSI 300	197	7.8"	267	10.5"	317	12.5"	368	14.5"	473	18.6"	568	22.4"	708	27.9"
S - ANSI 600	210	8.3"	286	11.3"	336	13.2"	394	15.5"	508	20.0"	609	24.0"	1252	49.3"
A	605	23.8"	661	26.0"	740	29.1"	812	32.0"	861	33.9"	1085	42.7"	1181	46.5"
C with SB/82	215	8.5"	240	9.4"	270	10.6"	300	11.8"	375	14.8"	450	17.7"	530	20.9"
C with HB/97	-	-	-	-	-	-	518	20.4"	645	25.4"	687	27.0"	796	31.3"
D with SB/82	280	11.0"	330	13.0"	380	15.0"	440	17.3"	560	22.0"	625	24.6"	1230	48.4"
D with HB/97	-	-	-	-	-	-	650	25.6"	835	32.9"	900	35.4"	1060	41.7"
F with HB/97	-	-	-	-	-	-	410	16.1"	442	17.4"	475	18.7"	1010	39.8"
H with SB/82	820	32.3"	901	35.5"	1010	39.8"	1112	43.8"	1236	48.7"	1535	60.4"	1711	67.4"
H with HB/97	-	-	-	-	-	-	1330	52.4"	1506	59.3"	1772	69.8"	1977	77.8"
K	220	8.7"	300	11.8"	330	13.0"	390	15.4"	480	18.9"	595	23.4"	695	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
ANSI 150/PN16 with SB/82	74	163	118	260	158	348	228	503	461	1016	777	1713	1010	2227
ANSI 300 with SB/82	77	170	121	267	170	375	258	569	512	1129	870	1918	1000	2205
ANSI 300 with HB/97	-	-	-	-	-	-	272	600	545	1202	896	1975	1209	2665
ANSI 600 with SB/82	78	172	123	271	173	381	267	589	544	1199	940	2072	1180	2601
ANSI 600 with HB/97	-	-	-	-	-	-	284	626	571	1259	918	2024	1225	2701

**Table 8** Weights and dimensions

# Sizing and Cg

In general, the choice of a regulating valve 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 is available through the on-line Pietro Fiorentini sizing program.

Flow rate coefficient								
Nominal size	25	50	80	100	150	200	250	300
Inches	1"	2"	3"	4"	6"	8"	10"	12"
Cg	575	2220	4937	8000	16607	25933	36525	55000
K1	106.78	106.78	106.78	106.78	106.78	106.78	106.78	106.78

**Table 9** 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 on-line 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 10)  
T = gas temperature ( °C )

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

S = relative density (refere to Table 10)  
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 10** Correction Factor Fc

## Flow rate conversion

$$\text{Stm}^3/\text{h} \times 0.94795 = \text{Nm}^3/\text{h}$$

Nm<sup>3</sup>/h reference conditions:

T= 0 °C; P= 1 barg | T= 32 °F; P= 14.5 psig

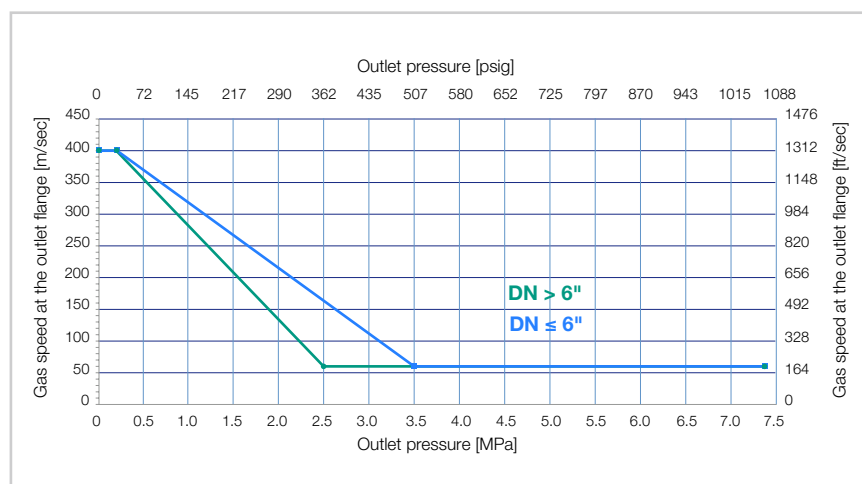
Stm<sup>3</sup>/h reference conditions:

T= 15 °C; P= 1 barg | T= 59 °F; P= 14.5 psig

**Table 11** Flow rate conversion

## CAUTION:

In order to get optimal performance, to avoid premature wear on the regulators components, 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 of the regulator which be calculated by the following formula:



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

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

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

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

# 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

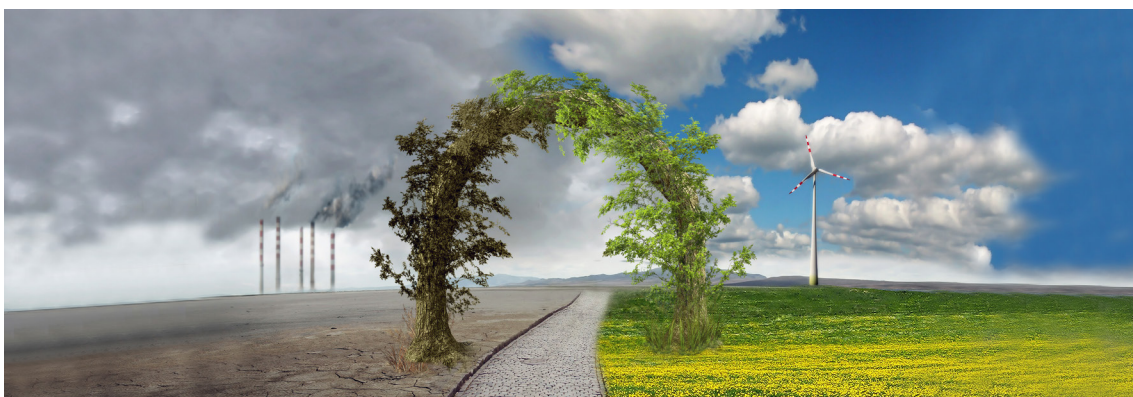
Here at Pietro Fiorentini, we believe in a world capable of improvement through technology and solutions that can shape a more sustainable future. That is why respect for people, society and the environment form the cornerstones of our strategy.



## 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

**TB0039ENG**



The data are not binding. We reserve the right  
to make changes without prior notice.

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**[www.fiorentini.com](http://www.fiorentini.com)**