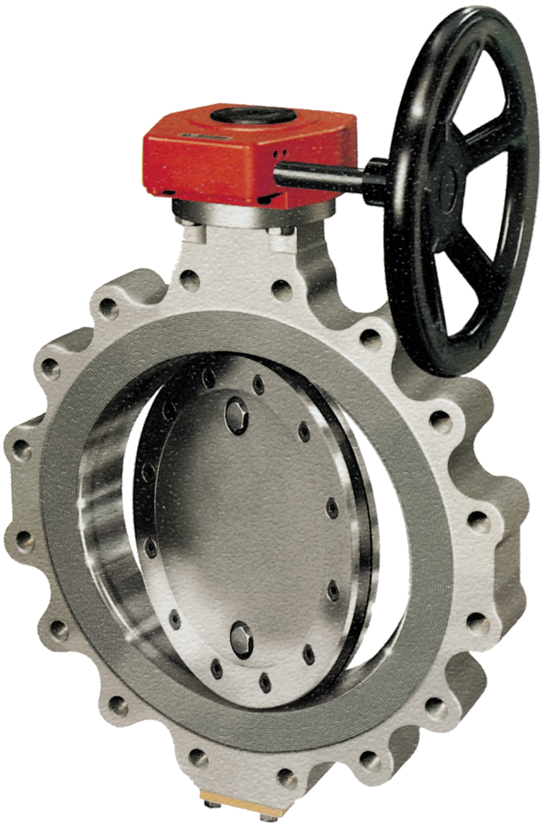
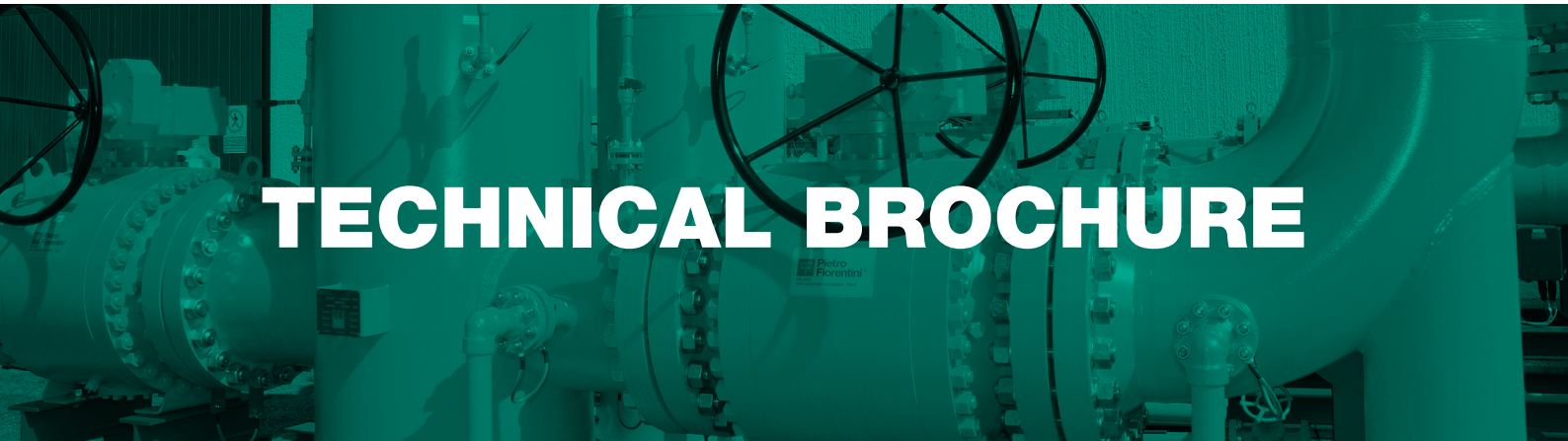
Pietro Fiorentini

BF 31

Butterfly valves





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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.

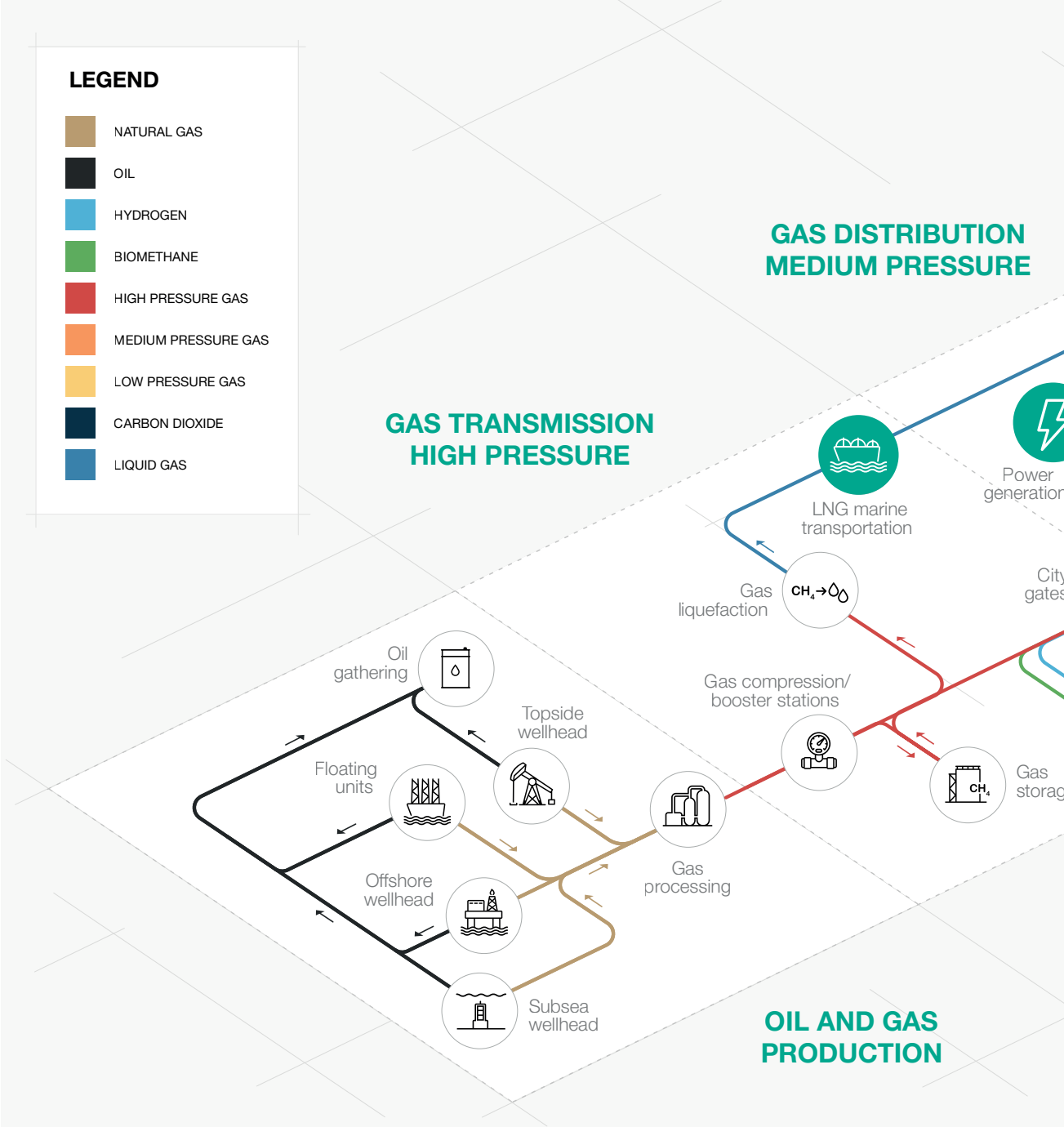
We are in constant evolution to meet our customers' highest expectations in terms of quality and reliability.

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

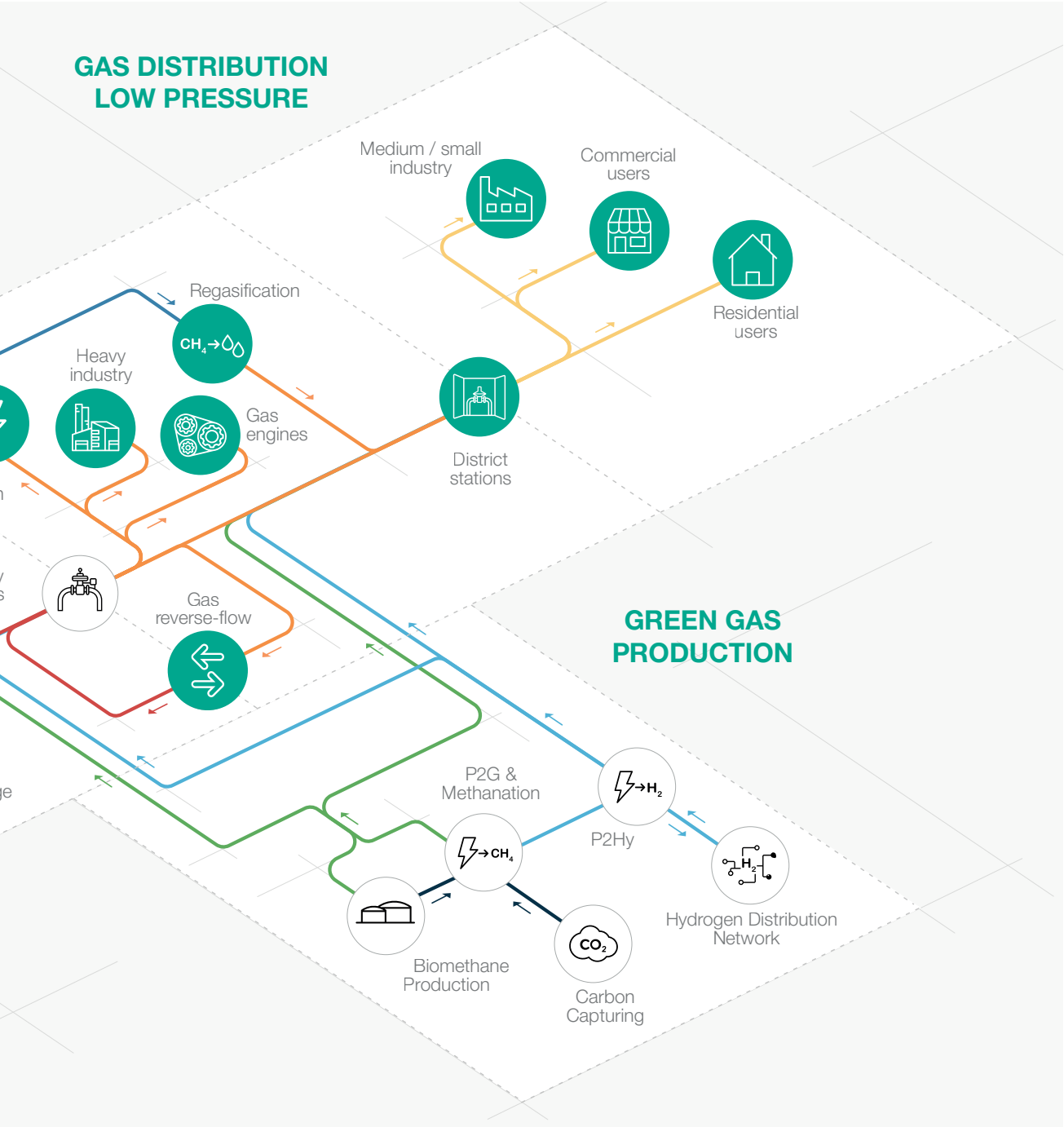


Figure 1 Area of Application Map

Introduction

The **butterfly valve BF 31** is an interception device able to guarantee low pressure losses. It may be used also for intercepting liquids when a hermetic seal, low pressure losses and compact construction in the flow direction are required.
Suitable for use with natural gas and previously filtered non-corrosive gases, it is mainly used in medium and low pressure gas distribution networks.

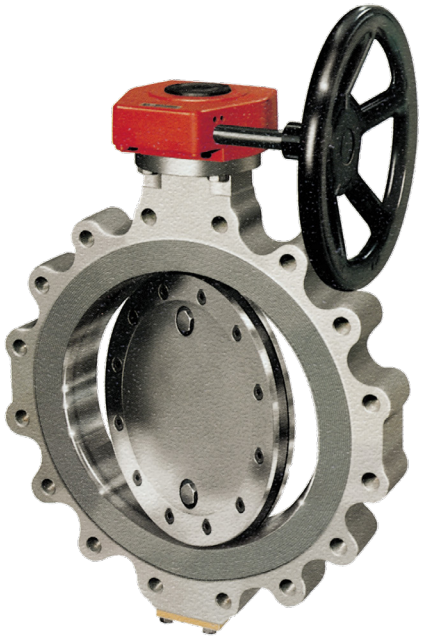


Figure 2 BF 31

The peculiar features of these valves are the following:

- Hermetic internal seal with shut valve
- Small pressure losses
- Possibility of rotating the butterfly of 360° with consequent self-cleaning of the seat without removing the body from the piping
- Not fixed assembly on the piping, since the two flow directions are possible
- Butterfly with sealing rings.
- Chromium-plated body spherical seat for ensuring:
  - a longer life with hermetic internal seal
  - low control torques
- High reliability
- Construction according to UNI 11354 standard
- Face-to-face according to UNI 11354 and ISO 5752, MSS - SP 67, BS 5155-74 standard.

On request
With chromium-plated butterfly
With stainless steel butterfly
With not threaded of flanging holes
Body and butterfly materials for low temperature Service
For high vacuum

Table 1 On request

Features

Features	Values
Maximum working pressure	DN 300 ÷ 600 16 bar (UNI PN16) DN 300 ÷ 600 19 bar (ANSI 150 RF)
Working temperature	According to the sealing ring (see relevant tab.).
Fluids	Water, gas, compressed air, hydrocarbons
Nominal dimensions DN	DN 300 ÷ 600
Flanged connections	UNI PN16; class ANSI 150 RF
(*) REMARK: Different functional features and/or extended temperature ranges available on request. Stated temperature ranges are the maximum for which the equipment's full performance, including accuracy, are fulfilled. Standard product may have a narrower range.	

Table 2 Features

Materials

Part	Material
Body	P355NH EN10028-3
Butterfly	ASTM A516 Gr.70 + ENG (25 µm)
Stem	X16CrNi16-2 EN10088-3 (AISI 431)
Fixing screws for sealing ring	X5CrNi18-10 EN10088-3 (AISI 304)
Sleeve	Self-lubricating sleeve
Reinforced sealing ring	
REMARK: The materials indicated above refer to the standard models. Different materials can be provided according to specific needs.	

Table 3 Materials

Sealing

Commercial Name	Abbreviation	Usual Denomination	Intermittent Duty	Continuous duty	Abrasion Resistance	Ageing Resistance	Compression Set	Norma Field of Application
HYCAR PERBUNAM.N KRYNAC	NBR	Nitrile Rubber	- 10 °C +130 °C	- 10 °C +100 °C	B	B	B	Suitable for natural gas (methane), water, air, olis, greases, non aromatic solvents, diluted acid solution.
VITON TECNOFLON FLUOREL	FKM	Fluoridized Rubber	- 10 °C +250 °C	- 10 °C +150 °C	B	E	E	Exceptional resistance against chemi-cal agents and at high tempera-tures; suitable for strong acids, aromatic and aliphnatic solvents, ethers and alcohol, town gas.
D = FAIRLY GOOD			**B** = GOOD			**E** = VERY GOOD		

Table 4 Sealings

Pressure losses

The pressure losses of the valve with the butterfly at a fully-open position may be calculated with the followings equations:

$$\Delta p = \frac{d \cdot q^2}{Cv\,m^2} \text{ for liquids [1]} \qquad \Delta p = \frac{d \cdot (273{,}16 + t)}{230782{,}6 \cdot Cv\,m^2} \cdot \frac{q^2}{Pm+Pb} \text{ for gas [2]}$$

where

Δp = pressure losses in mbar

d = specific gravity of liquids [1] (water = 1) and gas [2] (air = 1)

Cvm = flow coefficient (m^3/h water flow rate at 15°C which flows through the valve at fully-open position with a 1 mbar pressure difference between upstream and downstream)

q =flow rate in m^3/h for liquids in Stm^3/h for gas

Pm = gas static pressure at the valve inlet in bars

Pb = local atmospheric pressure (1,013 bars)

t = inlet temperature in °C

The equation [2] is valid for $\frac{\Delta P}{Pm + Pb} \leq 20$

Sometimes the Cv flow coefficient is used (water flow rate in USGPM at the 60° F which flows through the valve at fully-open position with a 1 psi difference between upstream and downstream).

Cvm = 0,0274 • Cv

For a rapid calculation of the pressure losses it is possible to make reference to TT 465 table.

The losses calculated is such way are referred to the valve with the butterfly at a fully-open position.
With the butterfly in chocked position, the losses may be calculated with the same above mentioned equationd, by using, however, the Cvm or the Cv percentage related to the opening angle of the butterfly itself.

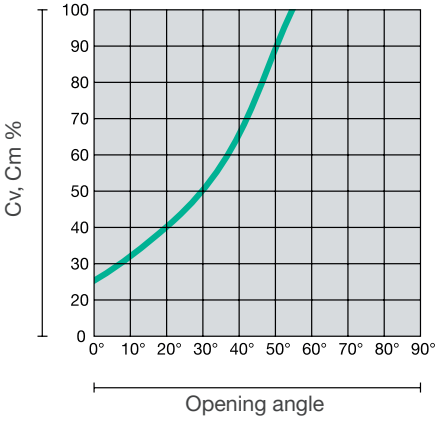


Figure 3 BF 31 CM, Cvm curves

CV, Cvm Values						
DN	12" 300	14" 350	16" 400	18" 450	20" 500	24" 600
CV	7.500	10.000	13.000	17.500	22.000	32.000
Cvm	203,5	274	356,2	479,5	602,8	876,8

Table 5 BF 31 CV, Cvm values

Torque

Torque Nm				
DN		Pmin 0,5 bar	Pmax 10 bar	Pmax 16 bar
300	12”	92	115	260
350	14”	200	350	495
400	16”	240	350	650
450	18”	270	360	705
500	20”	480	800	1170
600	24”	520	1050	1690

Values measured during testing on valves assembled for at least 8 days and lubricated with grease (gasket and seals).

Table 6 Torque values

Optional controls

Pietro Fiorentini butterfly valves can be supplied with the following controls on request.

			
Manual lever	**Adapter range**	**Extension**	**Manual handwheel**

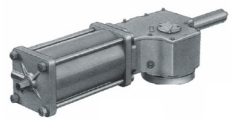
		
Double acting pneumatic actuator	**Single acting pneumatic actuator**	**Electric actuator**

Table 7 Available optional controls

Weights and Dimensions

BF 31

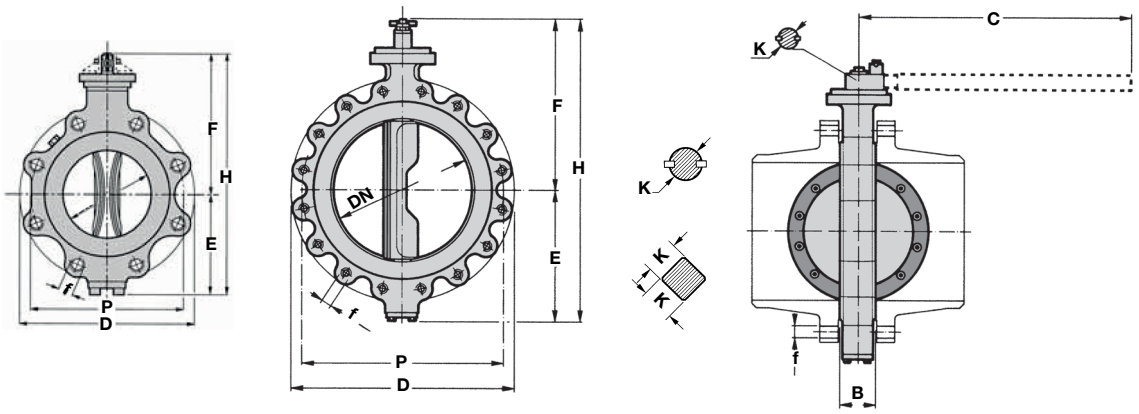


Figure 4 BF 31 dimensions

Weights and Dimensions (for other connections please contact your closest Pietro Fiorentini representative)													
	Size (DN) - [mm] **Size (DN)** - inches	**300** **12”**		**350** **14”**		**400** **16”**		**450** **18”**		**500** **20”**		**600** **24”**	
		[mm]	inches	[mm]	inches	[mm]	inches	[mm]	inches	[mm]	inches	[mm]	inches
	B	77	3.0	77	3.0	102	4.0	114	4.5	127	5.0	154	6.1
	C	660	26.0	660	26.0	-	-	-	-	-	-	-	-
	E	270	10.6	285	11.2	330	13.0	355	14.0	390	15.4	475	18.7
	F	365	14.4	393	15.5	452	17.8	498	19.6	525	20.7	620	24.4
	H	647	25.5	704	27.7	785	30.9	866	34.1	918	36.1	1100	43.3
	K	32f8		32f8		40f8		40f8		40f8		50f8	
UNI PN 16	D	460	18.1	520	20.5	580	22.8	640	25.2	715	28.1	833	32.8
	P	410	16.1	470	18.5	525	20.7	585	23.0	650	25.6	770	30.3
	f	25	1.0	25	1.0	30	1.2	30	1.2	33	1.3	36	1.4
	N° screw	12		16		16		20		20		20	
	screw	M22		M22		M27		M27		M30		M33	
ANSI 150	D	483	19.0	534	21.0	597	23.5	635	25.0	699	27.5	833	32.8
	P	432	17.0	476	18.7	540	21.3	578	22.8	635	25.0	749	29.5
	f	25	1.0	29	1.1	29	1.1	33	1.3	33	1.3	35	1.4
	N° screw	12		12		16		16		20		20	
	screw	M22		M27		M27		M30		M30		M33	
	Tubing Connections	Øe 10 x Øi 8 (on request imperial sizing)											
	Weight	Kg	lbs	Kg	lbs	Kg	lbs	Kg	lbs	Kg	lbs	Kg	lbs
		69	152	83	183	137	302	184	406	215	474	480	1059

Table 8 Weights and dimensions

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