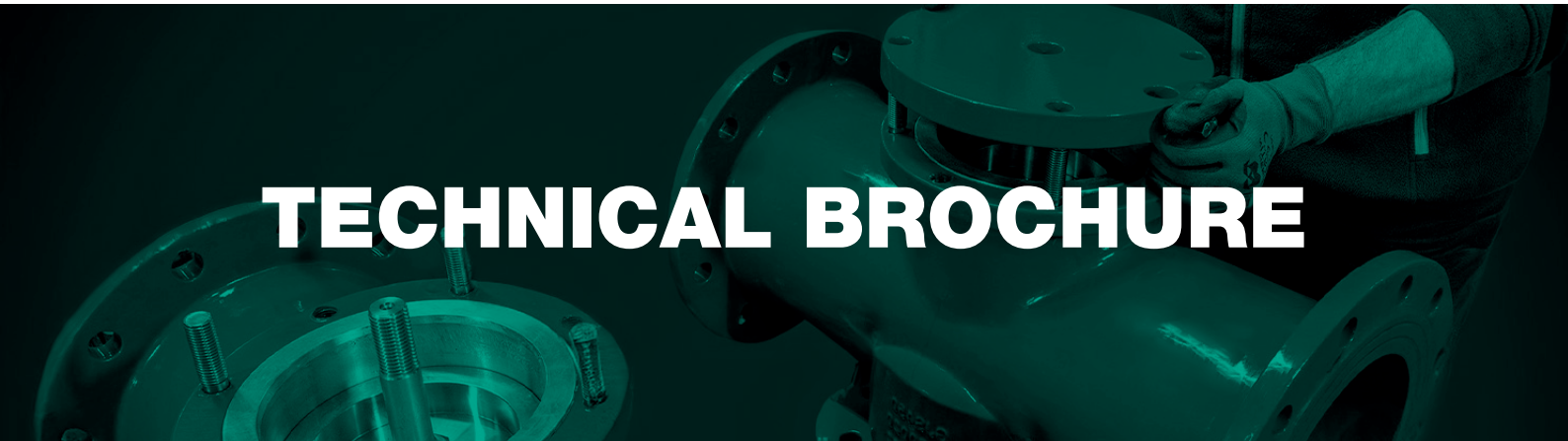
Pietro Fiorentini

RITEC

Non-slam check valve for surge prevention



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RITEC_technicalbrochure_ENG_revB

Non-slam check valve for surge prevention **RITEC**

The non-slam check valve RITEC are specifically designed to ensure drop-tight backflow prevention, minimizing surge events. As the name suggests, these valves close smoothly without slamming, thereby avoiding pressure spikes. The obturator of a non-slam check valve RITEC has an internal spring that opposes the opening flow pressure. When the fluid flow is strong enough, the spring compresses and the valve opens. As the flow rate decreases, the spring gradually pushes the disc back toward the seat, ensuring a smooth closure before flow reversal occurs, effectively preventing water hammer. The needle-shaped body maximizes resistance to cavitation and noise, while minimizing head loss.

Applications

- Downstream of pumps
- In derivation from the main line to prevent backflow from downstream
- Downstream of control valves
- Main supply lines of buildings and cooling applications
- Between two separate systems to ensure the separation

Accessories

- Pressure measurement kit.

Additional features

- AC system for low flow stability and increased resistance to cavitation
- CP system with triple stage energy dissipation for low flow stability and severe cavitation

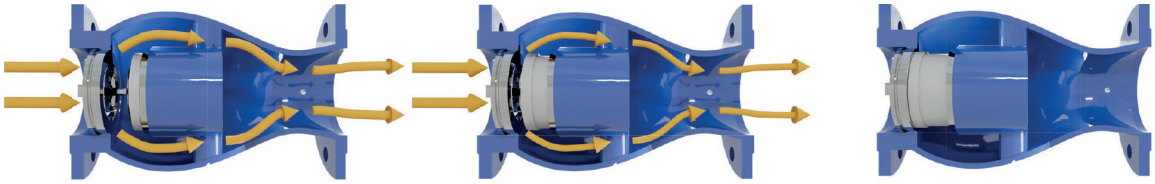
Note to the engineer

- Inlet and outlet pressure, and flow rate are required for the proper sizing
- The valve can be installed in horizontally or vertically; for diameters above 200 mm, horizontal installation is recommended
- A minimum length of 3 DN downstream of the valve is recommended for the best accuracy

Working conditions

Fluid: treated water	Maximum temperature 70°C
Maximum operating pressure	25 bar

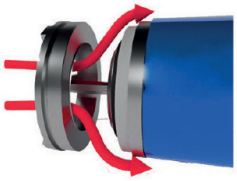
Operating principle



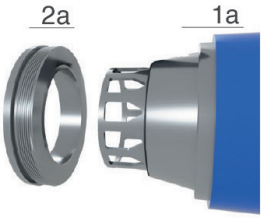
When the flow is in the designed direction, the spring is compressed accordingly, allowing full opening of the valve passage. The needle-shaped body ensures maximum resistance to cavitation and noise, while minimizing head loss.

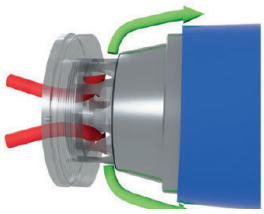
The valve remains open due to the pressure differential, which ensures drop-tight performance even at low operating pressures and in the absence of water hammer. This feature is particularly beneficial when the check valve is installed near pumps in power-off scenarios.

If the flow tends to reverse, the spring pushes the obturator against the seat, ensuring a perfect drop-tight seal. The fast-closing action anticipates the returning water column, preventing momentum buildup and effectively mitigating water hammer.



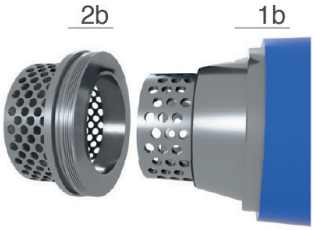
Standard version

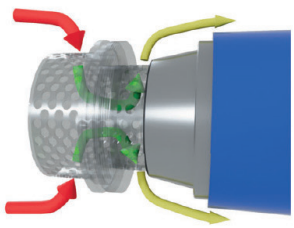




AC version for low-flow stability and cavitation prevention

The AC anti-cavitation trim includes a mobile block with integrated seat and gasket holder (1a, 2a), specifically designed to increase the allowable pressure ratio and resistance to cavitation. At the same time, it enhances valve stability, ensuring maximum accuracy even in case of no-flow.



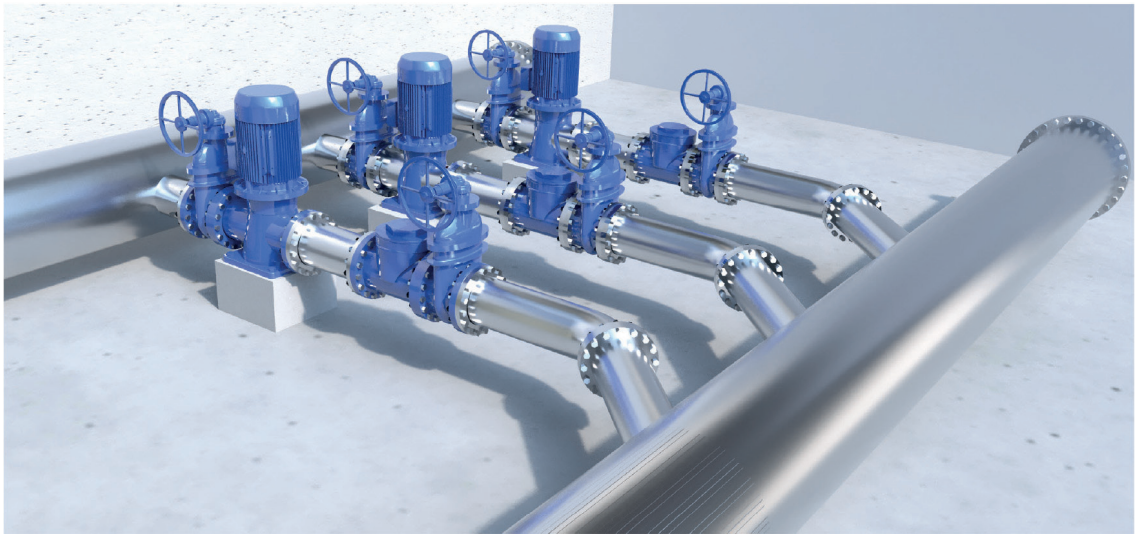


CP anti-cavitation version

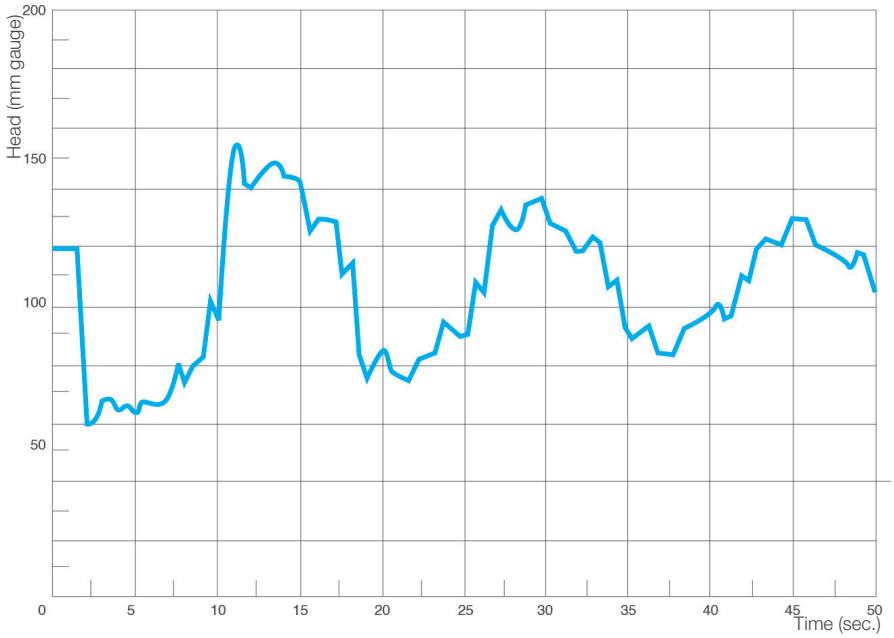
The CP system features different seat and gasket holder (1b, 2b) engineered for double energy dissipation between upstream and downstream. The holes can be customized to suit the specific project requirements and desired performance.

Conventional check valve installation layout

The installation layout below shows a conventional non-anti-slam check valve, including sectioning devices for maintenance.

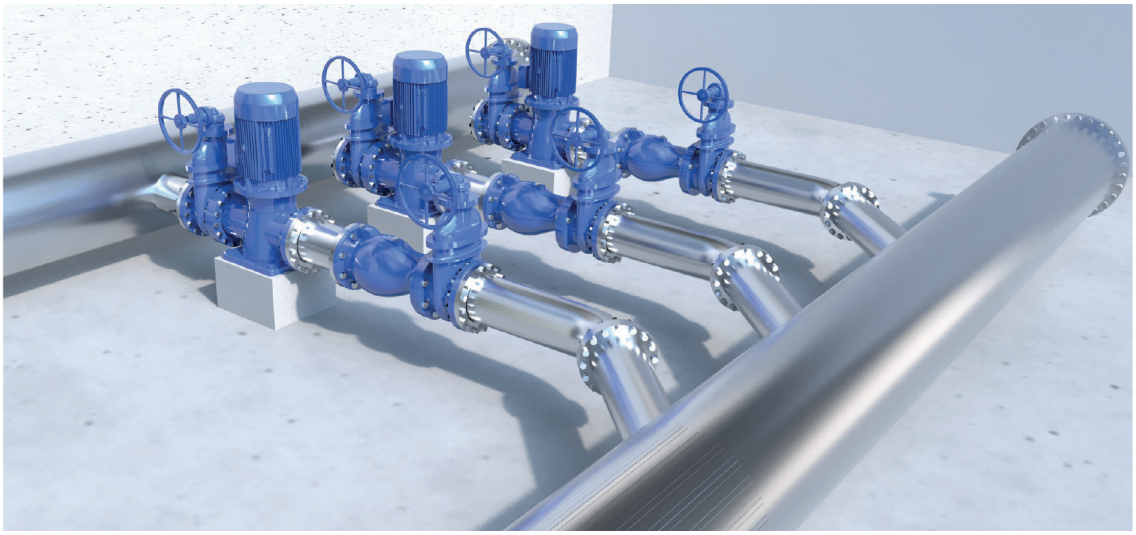


The plot illustrates an example of a power failure at a pumping station equipped with traditional non-anti-slam check valves. It clearly shows the devastating effects of water hammer, posing serious risks to the system and connected equipment.

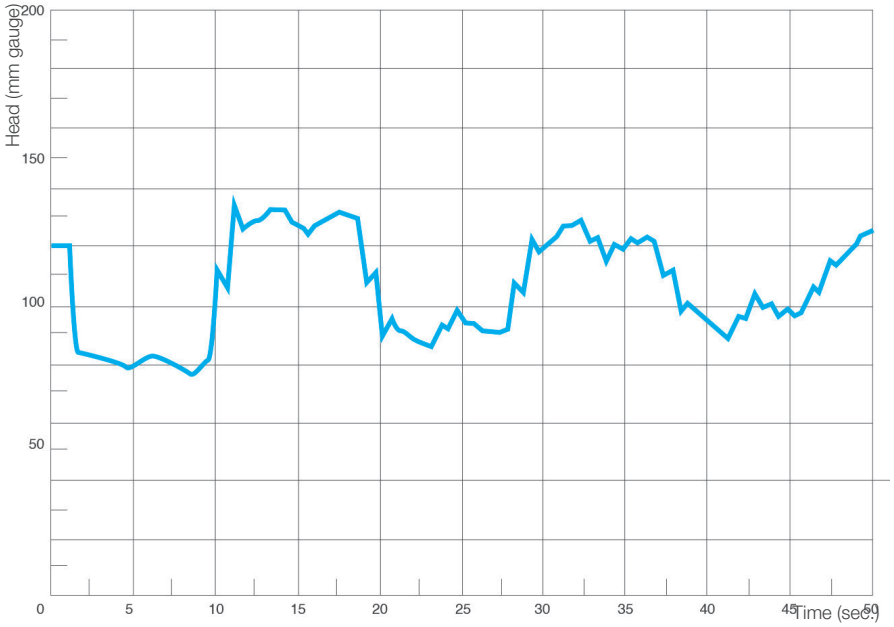


RITEC installation layout

The recommended layout for the RITEC non-slam check valve is shown below. It is recommended to install sectioning devices for maintenance, and filters should be provided to prevent dirt and foreign bodies from entering inside the valve.

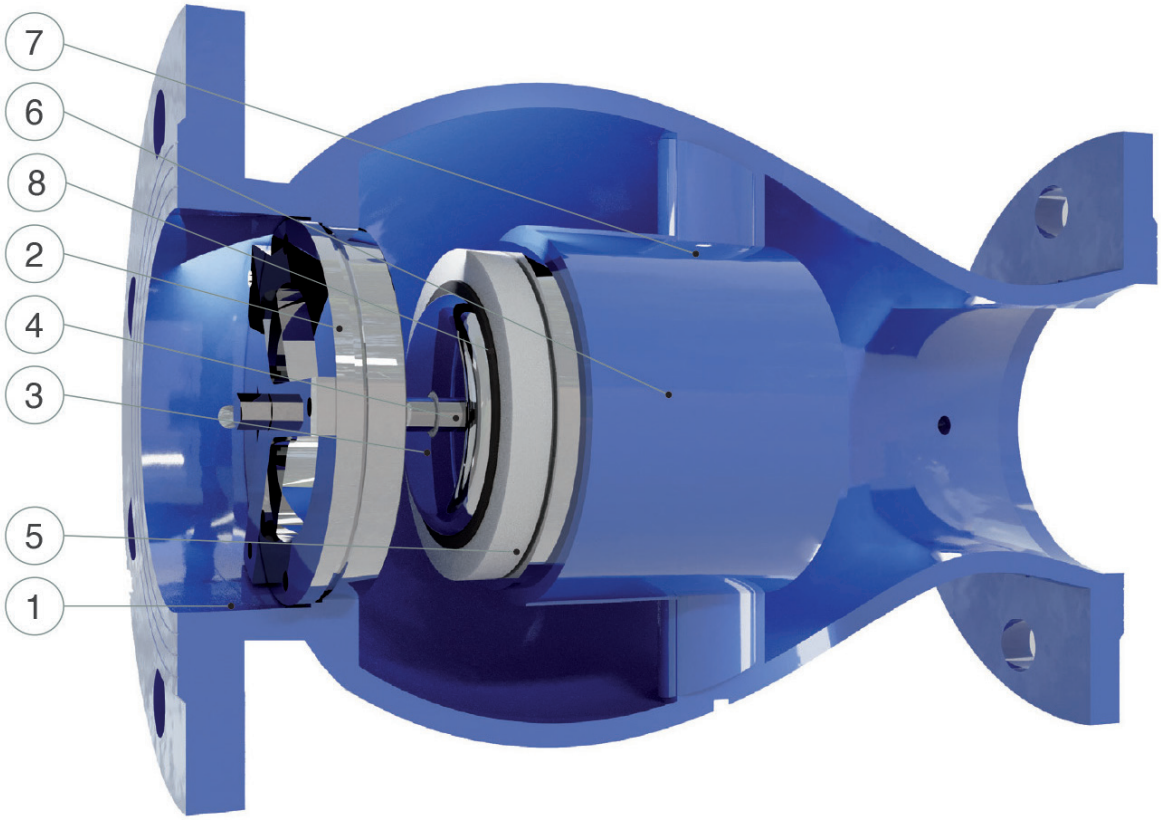


The plot illustrates a power failure scenario in a pumping station equipped with RITEC check valves. The water hammer effect is noticeably mitigated due to the valve's operational efficiency and specialized design.



Technical details

RITEC - Standard version



N.	Component	Standard material	Optional
1	Body	ductile cast iron GJS 450-10	
2	Seat	stainless steel AISI 316	
3	Standard system	stainless steel AISI 304/303	stainless steel AISI 316
4	Piston	stainless steel AISI 304/303	stainless steel AISI 316
5	Guiding bush	Bronze	
6	Control chamber	ductile cast iron GJS 450-10	
7	Pressure ports	stainless steel AISI 304	
8	Plane gasket	EPDM	

The list of materials and components is subject to changes without notice.

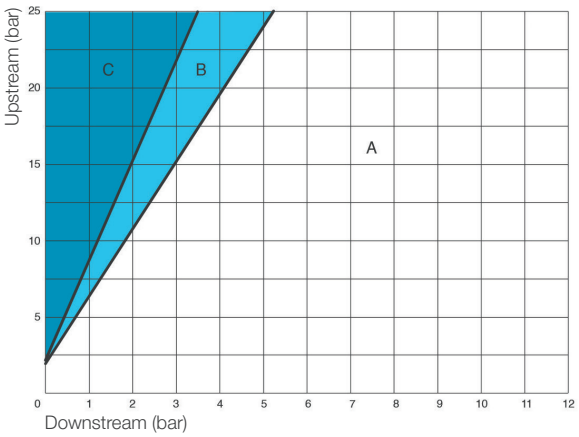
Technical data

RITEC - Standard version

Head loss coefficient

The Kv coefficient represents the flow rate that flows through the fully open valve, generating a head loss of 1 bar.

DN (mm)	50	80	100	150	200	250	300	400	500	600
Kv (m^3/h)/bar	20	47,5	72	219	372	891	1401	2618	3900	5167

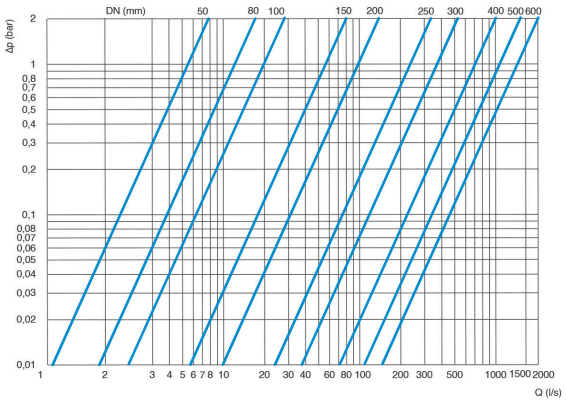


Cavitation chart

It is important to analyze cavitation, as it can result in serious damage, noise, and vibration. The cavitation chart must be used to determine whether the operating point, obtained by intersecting the upstream pressure (Y-axis) and downstream pressure (X-axis), falls within one of the three zones, defined as follows:

- A: Recommended operating conditions;
- B: Noise cavitation;
- C: Damage cavitation.

The chart is applicable to valves operating in modulating conditions with an opening percentage between 35% and 40%, under standard water temperature and at elevations below 300 meters.



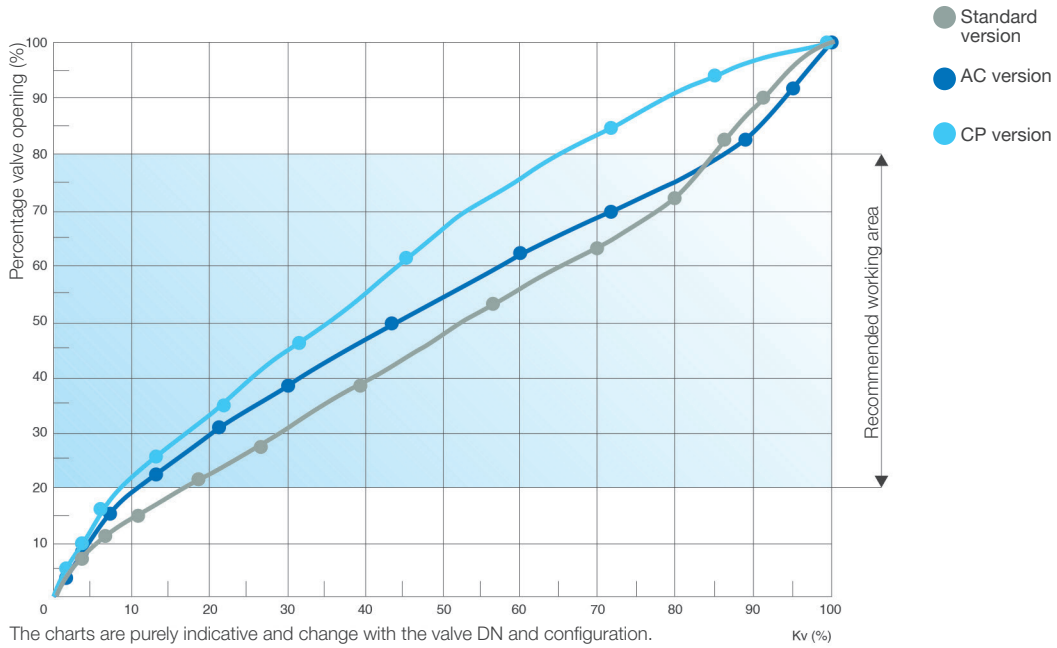
Head loss chart

The chart shows the head loss of RITEC check valve fully open, in relation to flow rate (l/s).

RITEC - Standard, AC and CP versions

Kv vs. valve opening chart

The following chart shows the relationship between the opening percentage of the RITEC standard, AC, and CP versions, and the corresponding Kv values.



The charts are purely indicative and change with the valve DN and configuration.

Working conditions

Treated filtered water	Temperatura massima 70°C
Maximum temperature	25 bar
Minimum pressure on the pilot	0,5 bar (plus head loss)

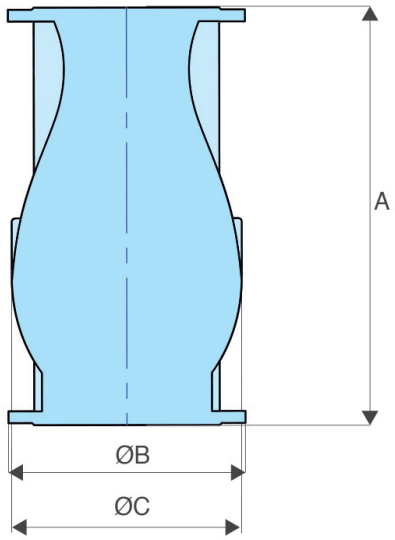
Standard

- Certified and tested in compliance with EN 1074/5
- Pressure rating 25 bar
- Flanges according to EN 1092/2 (different drilling on request)
- Epoxy painting applied through FBT technology blue RAL 5005

Weights and dimensions

DN mm	A mm	B mm	C mm	Weight (Kg)	
				Body	Total
50	230	165	117	10,5	12
80	310	200	170	20	23
100	350	220	219	24,5	27
150	480	300	275	45	60
200	600	340	330	74,5	85
250	730	405	403	142	157
300	850	485	453	200	225
400	1100	645	637	430	480
500	1250	715	715	760	900
600	1450	840	922	1160	1350

All values are approximate, consult PF service for more details.



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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