
PRES·VAC
PV-ECO SERIES
High velocity pressure/vacuum valves
G&O MARITIME GROUP
MARINE LIFE WITHOUT FOOTPRINTS

The Pres-Vac PV-ECO series comprises state-of-the-art high velocity pressure/vacuum valves offering the highest possible safety standards, compliance with all rules and regulations and unsurpassed operational performance.

The PV-ECO valve provides protection against fire hazards and tank overpressure or vacuum. Furthermore the PV-ECO valve secures that gas emissions are kept at a minimum.

For more than 60 years Pres-Vac has led the development of high velocity pressure/vacuum valves and our products offer an unmatched safety record: More than 100,000 valves have been installed without causing any safety incident on a vessel.

SUMMARY	
Type	PV-ECO valve
Capacities	Up to 3,100 Nm^3/h
Materials	AISI 316 L

MAIN FUNCTIONS AND FEATURES

Safety

- The PV-ECO valve is designed, tested and manufactured to provide maximum safety for crew, cargo and vessel.
- The pressure unit has been designed to ensure that the efflux velocity is always above the required minimum of 30 m/s and typically between 60-100 m/s.
- The cone of the pressure unit has been optimized to secure vertical vapour dispersing, which combined with the high efflux velocity ensures, that gas is safely led away from deck.
- The PV-ECO valve has been extensively fire tested at the world's leading test laboratory in Germany. Tests include endurance burn testing and flash-back testing in accordance with all relevant rules.
- The resilient seal provides protection against leakage and reduces emissions to virtually zero.

Pres-Vac is ISO 9001 certified to ensure consistency of the high quality products that Pres-Vac is known for.

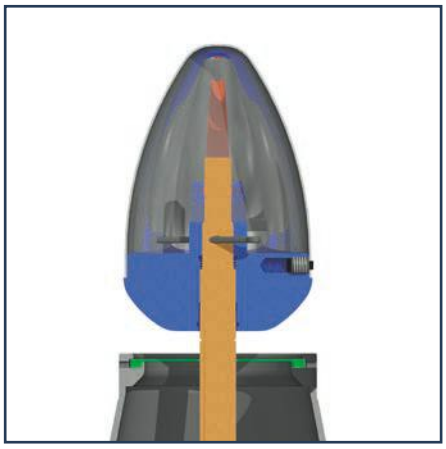
Compliance with rules and regulations

- The PV-ECO valve is designed, tested and manufactured to be in compliance with all existing and foreseen international regulations.
- In 2013 the European Commission adopted EN ISO 16852:2010 as a new standard for testing of flame arrestors to be installed onboard marine vessels. As the first P/V valve on the market, The PV-ECO valve has been designed, tested and approved to comply with this new standard.

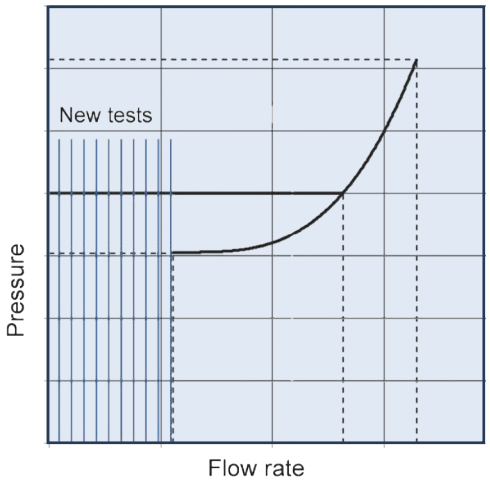
FORCE TECHNOLOGY

IMO

Flashback testing at low flow rates in accordance with EN ISO 16852:2010. The flashback tests shall be performed on pipe lengths equal to or longer than the pipe length, on which the valves are to be installed. This is mandatory according to EN ISO 16852:2010.



Vertical vapor dispersing and high efflux velocity.

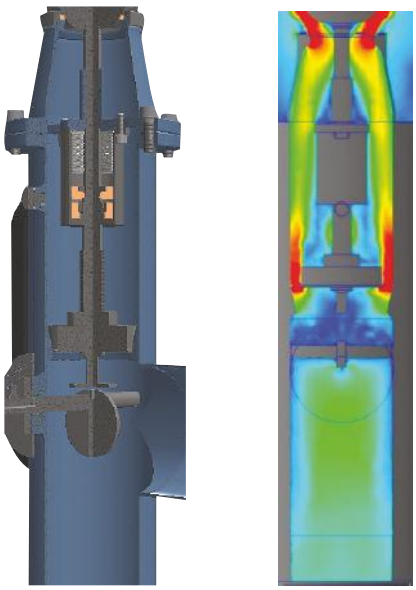


MAIN FUNCTIONS AND FEATURES

Effective relief of tank pressure

The PV-ECO valve provides effective control and management of the tank pressure. If pressure exceeds the specified opening pressure, the valve will open immediately and relieve the excess pressure. Similarly, if pressure during discharging gets below the specified opening pressure, the valve will open and relieve the vacuum. The PV-ECO valve has an advanced flow control design to manage tank pressure:

- The tank pressure valve is controlled by a combination of magnet and weight forces to secure that the valve does not create a pressure surge during opening.
- A patented combination of a booster plate and pressure control ring secures that the valve has a soft opening and closing phase securing efficient operations also at low flow rates.
- A patented, integrated dampener secures that the valve can operate non-hammering and non-oscillating also at long pipe lengths.

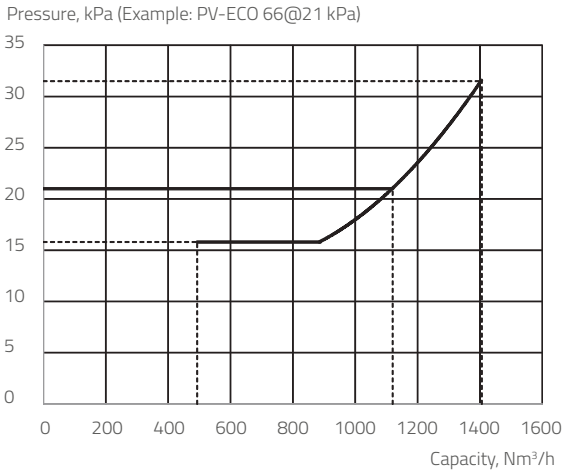


Advanced flow control

High closing pressure

The patented new flow control system secures that the PV-ECO valve has a very high closing pressure reducing blow down to 5-6 kPa.

This means substantial reductions in loss of inert gas and cargo vapour compared to other P/V valves.



Low noise level

The PV-ECO valve is designed to minimise noise during operations. By optimising the nozzle design, the noise level of the PV-ECO valve has been reduced by 10-15 dB compared to other designs. In many applications hearing protection will not be required.

Noice reduced design

MAIN FUNCTIONS AND FEATURES

Additional features

The PV-ECO valve has been made easier to maintain by the following features:

- The number of parts has been reduced by 30 % and the valve is very simple to disassemble and maintain.
- The weight of the valve has been significantly reduced.
- Check lift can be maintained without disassembly of valve.
- Easy calibration of setting after over-haul
- Regular maintenance can be performed by onboard crew.
- Replaceable vacuum flame arrestor and replaceable gasfreeing cover screen arrestor
- The integrated resilient seat can be replaced and reduces disc/seat wearing to zero.

Configured to your requirement

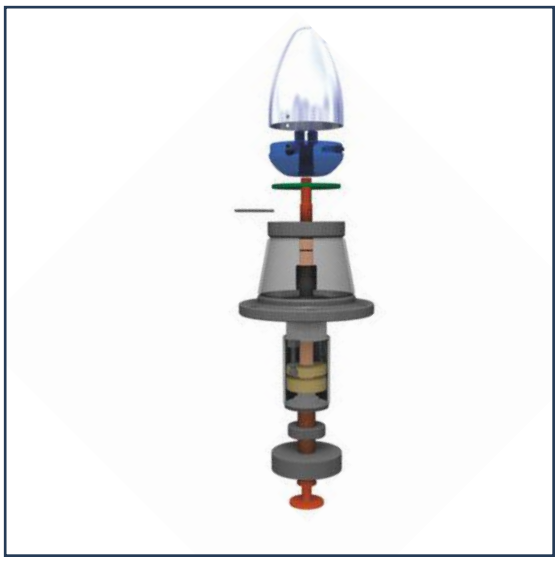
Pres-Vac P/V valves are individually configured to suit your specific requirements:

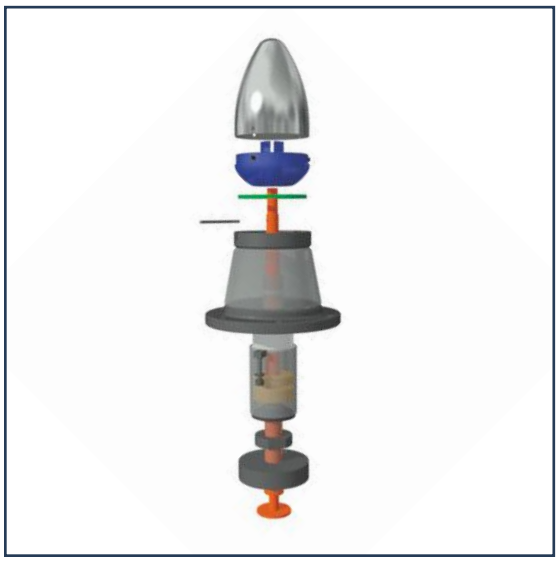
- 9 different sizes of pressure units combined with 7 different sizes of vacuum units
- Variable flange size
- All flange standards available
- Optional integrated gas freeing cover
- Options include electric heating, coating and high pressure dual valves
- Two different product versions

Operations and maintenance made simple

The PV-ECO valve has been designed to simplify operation and maintenance. Daily operations by the crew are made simple by the following features:

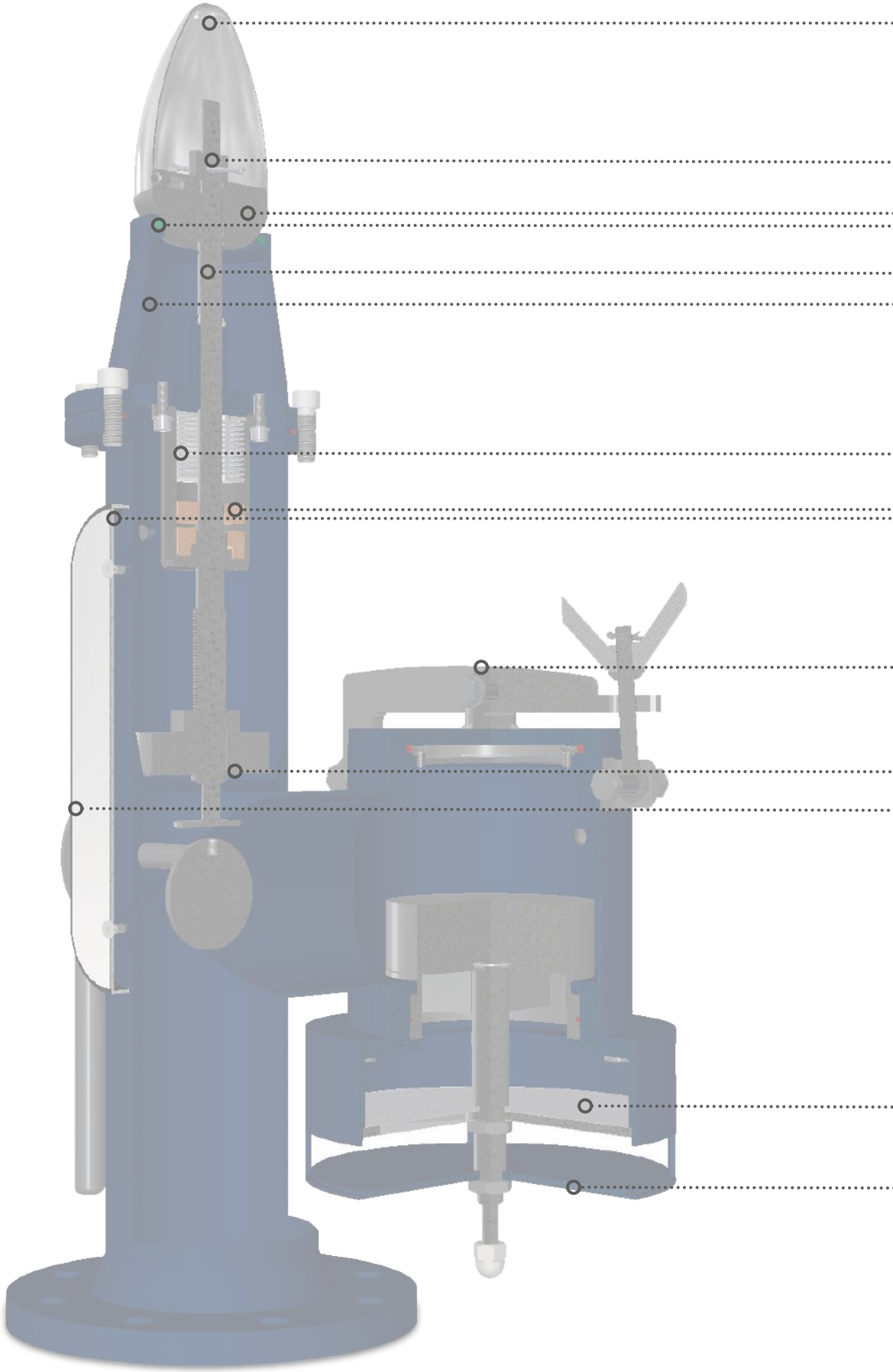
- New two-way operating full stroke check lift
- Visual inspection of all moving parts
- Dirt indicator
- Hinged type gas freeing cover





30% fewer parts

DESIGN



Optimised nozzle design
Reduces noise and provides high gas dispersion.

Setting calibration
Easy calibration of setting after overhaul.

Integrated resilient seal
Zero leakage with replaceable resilient seal.

Visual inspection of disc/seat
Simple inspection for maintenance.

Full open mark
Indicates when the valve is 100% open.

Stainless steel housing and parts
Simple, chemical resistent and rigid design.

Dampener
Part of advanced flow control system.

Enclosure
Magnet and dampener protected from environment.

Dirt Indicator
Easy check for valve fouling.

Hinged type gas freeing cover
Ensures quick and safe gas freeing operation.

Booster plate / pressure control ring
Part of the advanced flow management system.

Check lift
a. Two-way full stroke check lift
b. Can be maintained without disassembly of valve.

IIB flame screen in vacuum valve
Replaceable as a wear part.

Mechanical protection of flame screen
Protects the vacuum valve from external impacts.

CUSTOM CONFIGURATION AND OPTIONS

Specific requirements
The PV-ECO valve is always configured to meet the specific requirement of every single customer.

Different vessel designs need different venting requirements for pressure and vacuum valves. Furthermore, vessel designs tend to use different piping arrangement and consequently require different flange sizes and flange standards.

The pressure side of the valve can be delivered in four different sizes and the vacuum side can be delivered in three different sizes. The pressure and vacuum sides can be freely combined to deliver the combination most suitable for your vessel. All the combinations can be delivered in different flange sizes and with all flange standards.

Furthermore, Pres-Vac offers a broad range of options for the PV-ECO valve:

- integrated gas freeing cover
- electric, steam or thermal heating
- custom coating
- high-pressure dual valve

Custom solutions and special requirements can be delivered upon request.

Option: Integrated gas freeing cover
- The gas freeing cover is installed as an integrated version on top of the vacuum valve. It can easily be operated without using any tools.
- The design is made in a way that the cover releases the maximum amount of vapour that the size of the piping allows.

Option: Compliance with OCIMF 10% requirement
- The vacuum valve can be designed to meet the OCIMF requirement of max 10% vacuum increase below set point

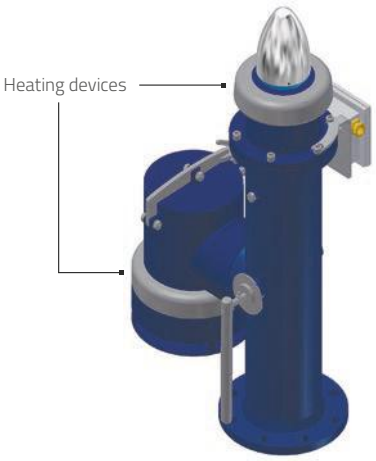
Easily operated gas freeing cover

CUSTOM CONFIGURATION AND OPTIONS

Option: Electric, steam or thermal heating

- The pressure unit and the vacuum unit can be equipped with heating device. This prevents ice accretion*, which will result in malfunction. The heating will also prevent certain cargoes with a high pour point from crystallising, as the temperature can be kept at a suitable level.

* Ice accretion occurs when waves or heavy rain is present with surface temperatures at or below freezing. A layer of ice will accumulate and prevent the valve from functioning properly.



Option: Custom coating

- As a standard the PV-ECO is delivered in stainless steel without coating. However, it is possible to deliver the PV-ECO valve in any colour.

Option: High pressure dual valve

- The valves can be delivered with high pressure unit for special chemical applications or high pressure requirements to reduce vapour emissions. The valves can be adjusted for specific needs.

Dual nozzle valve

SUPERIOR AND ULTIMATE VERSIONS

The PV-ECO valve is available in two different versions:

PV-ECO ULTIMATE

You should choose a PV-ECO Ultimate, if you are particularly concerned about leakage protection, loss of inert gas, disc/seat and flame screen maintenance costs.

The PV-ECO Ultimate delivers all the features of the PV-ECO Superior and three additional safety and maintenance features:

- Seat with integrated resilient seal.
  - The integrated resilient seal provides ultimate leakage protection and also reduces wearing of disc and seat.
- Seats and discs in extra high grade steel
  - To reduce maintenance costs and further extend the durability of the valves, the PV-ECO Ultimate is delivered with seat and disc on both pressure and vacuum side in SAF.
- Flame screens in AISI 316 L stainless steel.
  - To reduce wearing from high corrosive cargoes and to extend maintenance intervals, flame screens are deliv-ered in AISI 316 L stainless steel.

PV-ECO SUPERIOR

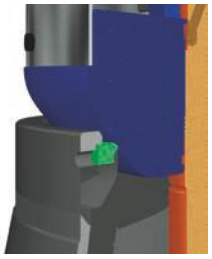
You should choose the PV-ECO Superior, if your focus is to get a safe and very reliable P/V valve of high quality.

Main features:

- Optimal safety
- Compliance with all current rules and regulations Low noise
- Low blow down
- Simple operations and maintenance

Resiliant seal

- Elimination of leakage
- Reduction of wear and tear
- Easy replacement
- Made of an advanced, non-flamable material.
- Suitable for chemical and oil products



With resilient seal

Without resilient seal

CUSTOMER BENEFITS

Maximum safety for crew, vessel and cargo

- High vertical gas dispersion
- Low noise
- Extensively tested by independent test laboratory
- Integrated leakage protection (Ultimate version)

Compliance with all current and foreseen regulations

- No risk of non-compliance
- Complies with the latest European standard for fire testing

Designed to your needs

- The valves can be optimized to effectively meet your venting requirements.

Excellent operational performance

- The combination of weight and magnetic force protects against pressure surges and secures high closing pressure.
- Leakage protection ensures maximum safety, minimises loss of inert gas and cargo vapour.

Low maintenance costs

- Modular design of the valve makes replacement of wear parts and spare parts simple.
- Lifetime availability of spare parts and global netwok of service centres.

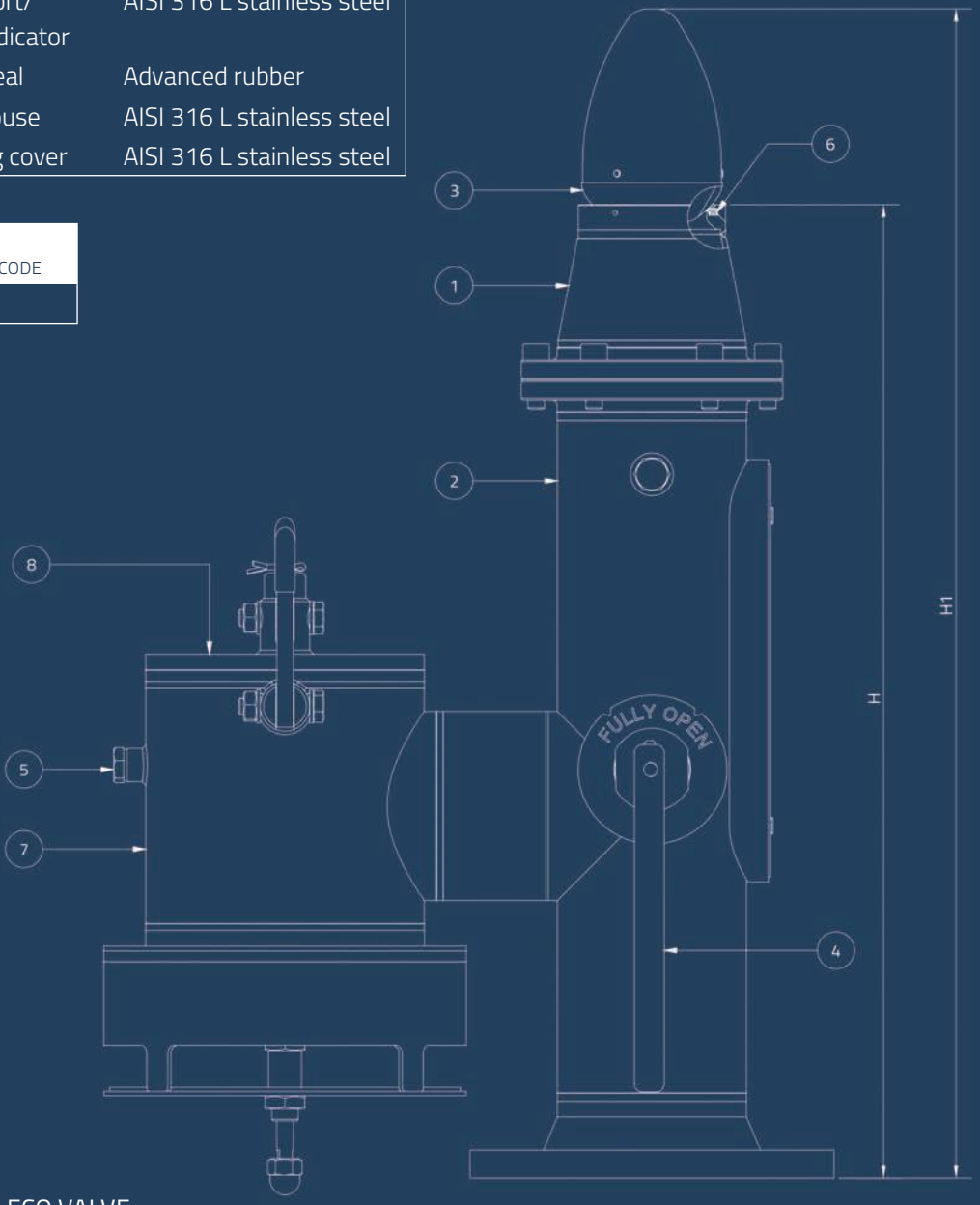
Emission Reduction

- High closing pressure

ITEM	DESCRIPTION	MATERIAL
1	Upper valve house	AISI 316 L stainless steel
2	Valve house	AISI 316 L stainless steel
3	Pressure disc	AISI 316 L stainless steel
4	Full stroke check lift	AISI 316 L stainless steel
5	Flushing port/ cleaning indicator	AISI 316 L stainless steel
6	Resilient seal	Advanced rubber
7	Vacuum house	AISI 316 L stainless steel
8	Gas freeing cover	AISI 316 L stainless steel

AVAILABLE FLANGE STANDARDS
DIN PN6, DIN10, DIN16, JIS 5K, JIS 10K ANSI 150, ANSI 300

GAS GROUP ACCORDING TO THE IBC CODE
IIB (including IIA)



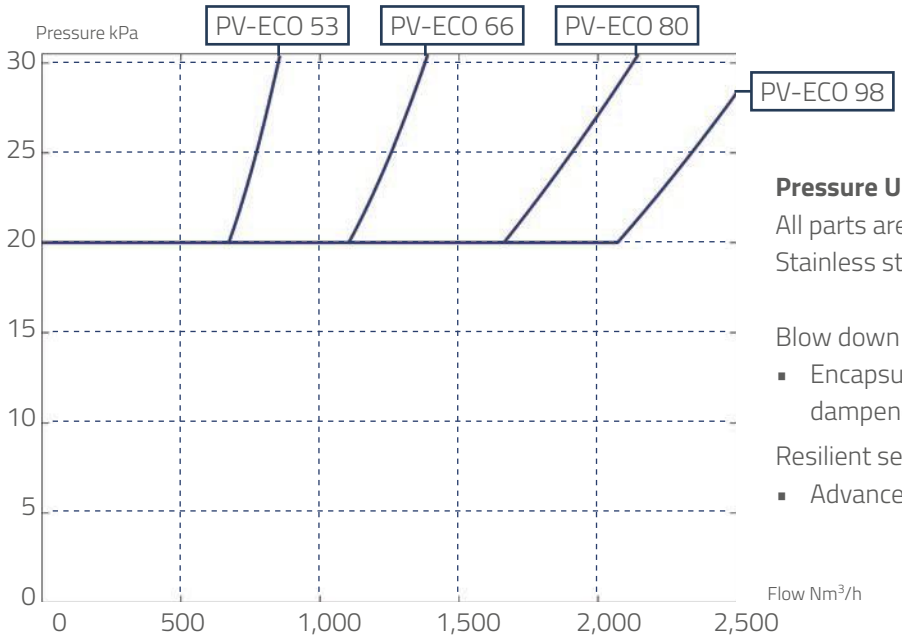
DIMENSIONS PV-ECO VALVE
PRESSURE UNIT

Seat size mm	DN mm	H1 mm	H mm
39	≥ 50	665	567.0
53	≥ 50	665	567.0
55	≥ 80	709	592.5
66	≥ 80	709	592.5
80	≥ 100	835	703.3
98	≥ 125	994.6	837.6

DIMENSIONS PV-ECO VALVE
VACUUM UNIT

Seat size mm	Inlet mm
95	89.0
116	114.3
150	168.3

SPECIFICATIONS



Pressure Unit

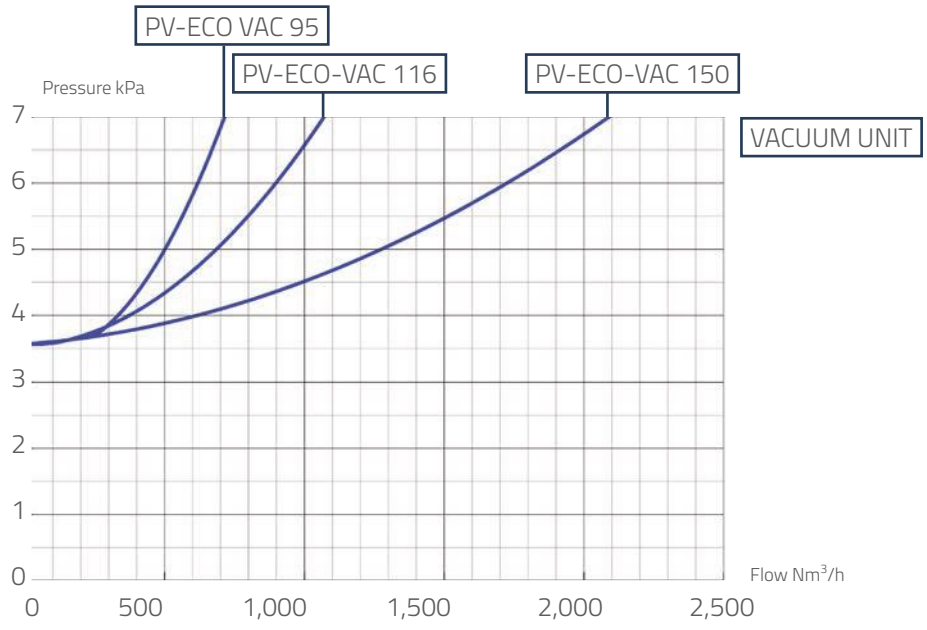
All parts are made of AISI 316 L Stainless steel, apart from:

Blow down control device:

- Encapsulated magnet and dampener

Resilient seal:

- Advanced rubber



SAFETY AND COMPLIANCE

International marine business regulations
The marine sector is regulated by IMO, local government rules and regulations stipulated by leading classification societies. The PV-ECO valve is subjected to severe tests in order to meet these market demands for high quality and safety.

PV-ECO complies with all design and test requirements of:

- IMO MSC/Circ. 677 as amended by IMO MSC/Circ.1009 and IMO MSC.1/Circ. 1324
- EN ISO 16852:2010
- ISO 15364:2007,
- EN 12874:2001
- ISO 15364:2000
- ISO 28300/API 2000

Class authorities and quality assurance
The offered equipment is approved by our notified body, all major classification societies, European inland regulations and Russian river specification.

Pres-Vac Engineering ApS is quality controlled by FORCE and certified in accordance with ISO 9001:2008. Details are available upon request.

In addition the equipment complies with ATEX for onshore based plants and offshore applications like FPSO including compliance with NORSOK. Approval certificates are included in scope of supply and test and material certificates are available against cost; However, they must be specified in the project specification.

The P/V valves suitability for a given application is to be decided by the buyer on basis of the Product Review Document containing a description of the valve in accordance with the requirement of ISO 15364:2007.

Regulatory updates
The equipment is guaranteed to comply with all mandatory and known future rules and regulations applicable to the vessel in question.

IMO MEPC.2/Circ. 19 (December 17th , 2013)
Latest provisional categorization of liquid substances amending chapter 17 of the IBC Code.

SOLAS Reg. II-1/3-12 Noise Code (July 1st , 2014)
Mandatory measurement during sea trial and noise level limits.

MED 9th amendment: New flame testing (December 4th , 2014)
Implementing new flame test requirements by adoption of EN ISO 16852. Requiring additional testing at low flow rates, closing the safety hazard gap in the current flame testing.

Patents and product reliability
The offered equipment is patented and guaranteed free of third party claims against yard and/or owner. The offered non-hammering and non-oscillating P/V valves are covered by US patent. The offered equipment is fully covered by product liability worldwide in respect of manufacturing and engineering.

SERVICE AND MAINTENANCE

Network of service repair centres
Pres-Vac has arranged a Service and Repair Centre network. These centres have the technical skills and marine experience to repair Pres-Vac equipment.

Our Service Repair Centres are conveniently located around the world in order to provide you with rapid access to spare parts and qualified service repair engineers.

The number of Service Repair Centres is steadily growing and new locations will appear in the near future.

Service and Repair Centre skills
Our service engineers have been trained and certified to overhaul Pres-Vac products according to our specifications. Pres-Vac distribute personal ID-cards to these engineers.

Quick supply of spare parts and kits
All Service Repair Centres have spare part kits for Pres-Vac pro-ducts in stock ensuring supply of most parts within 48 hours.

To supplement the ordering of parts, Pres-Vac has developed a series of Maintenance Kits that enable the crew to carry inexpensive parts on board to cover the most common repairs.

● **Pres-Vac Service Repair Centres** ● **Pres-Vac locations**

About Pres-Vac Engineering

For over 60 years, Pres-Vac Engineering has been supplying pressure/vacuum valves and venting equipment to the tanker shipping industry.

Today, we are the worlds' leading supplier of high-velocity pressure/vacuum valves and around 50% of all tanker vessels world-wide use Pres-Vac equipment.

We work with shipyards, naval architects and other partners on all continents. We have a network of highly professional, experienced agents and distributors in all major ship owning and ship building countries.

PRES·VAC

PART OF G&O MARITIME GROUP

Pres-Vac Engineering A/S | Svanevang 3-5 | DK-3450 Allerød | T: (+45) 4817 4055 | W: www.pres-vac.com
G&O Maritime Group | Solvang 22 | DK-3450 Allerød | T: (+45) 4817 4055 | W: www.gomaritimegroup.com

G&O Maritime Group provide value, safety and reliability to the global maritime industry through green, innovative quality solutions.