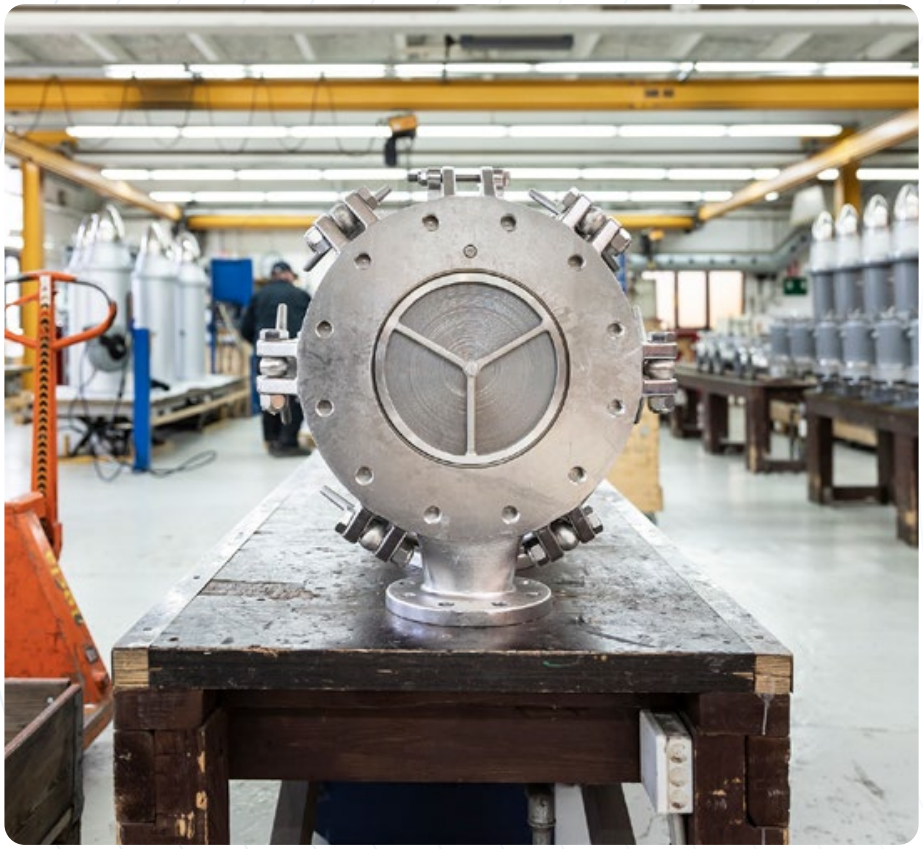
PRES•VAC®

PART OF G&O MARITIME GROUP

RELIABLE VACUUM PRESSURE CONTROL VALVES & VENTING SYSTEMS



CONTENTS

OPERATE WITH MAXIMUM SAFETY **IN THE OFFSHORE AND TANKER SHIPPING INDUSTRY.**

The Pres-Vac PV-ECO & VOC series comprises valves and venting equipment reducing emissions from cargo. Thereby, the equipment ensures cost savings due to reduction of cargo vapour loss during voyage, safety for the crew and the environment.

Our valves are state- of-the-art high velocity pressure/vacuum valves offering the highest possible safety standards, compliance with all rules and regulations and unsurpassed performance.

The PV-VOC valve provides protection against fire hazards and tank over-pressure or vacuum. Furthermore the PV-VOC 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.

COMPLIANT, FLEXIBLE AND **HIGH-QUALITY SOLUTION**

Our solutions protect against unintended overpressure or vacuum while simultaneously protecting against fire risk and ensuring that emissions from the cargo is kept to a minimum.

MAXIMUM SAFETY FOR CREW, VESSEL AND CARGO

- High vertical gas dispersion
- Low noise
- Extensively tested by independent test laboratory
- Integrated leakage protection
- Complaint with ISO15364

COMPLIANCE WITH ALL CURRENT AND FORESEEN REGULATIONS

- No risk of non-compliance
- Complies with the latest standard for fire testing
- Complaint with ISO16852

DESIGNED TO YOUR NEEDS

- The valves can be optimized to effectively meet your venting requirements.
- Compliant with IMO Polar code and OCIMF Guidelines
- Compliant with ATEX (non-spark)

WHY PRES-VAC ENGINEERING?

Work with the 'Green-Ship' certified global leader in the maritime and offshore industry.

The Pres-Vac valves are designed, tested and manufactured to provide maximum safety for crew, cargo and vessel

We offer a range of pressure/vacuum valves for venting systems designed specifically for the marine industry, so you can regulate the flow of gases on board ships. Our ship valves are built to withstand harsh marine environments, ensuring optimal safety and efficiency of the vessel's operations.

For more than 70 years, we have pioneered the development of high velocity pressure/vacuum valves to the tanker shipping industry.

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 (PV-ECO) Breather functionality (PV-VOC)

OUR VALVES ARE 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 and regulations.

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

METHANOL:
Venting Valves for methanol storage, endurance burn certified and tested according to IMO/677–1009/1324, ISO15364 and ISO16852 latest edition.

VOC-ECO AND VOC-POV:
Series comprises high velocity pressure/vacuum valves for product- and chemical carriers and crude oil tankers respectively and offer the highest possible safety standards and unsurpassed operational performance. These valves provide protection against fire hazards and tank overpressure or vacuum while securing that gas emissions are kept at a minimum

HOW PRES-VAC WORK

EFFECTIVE RELIEF OF TANK PRESSURE
The valves provide 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-valves have 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.

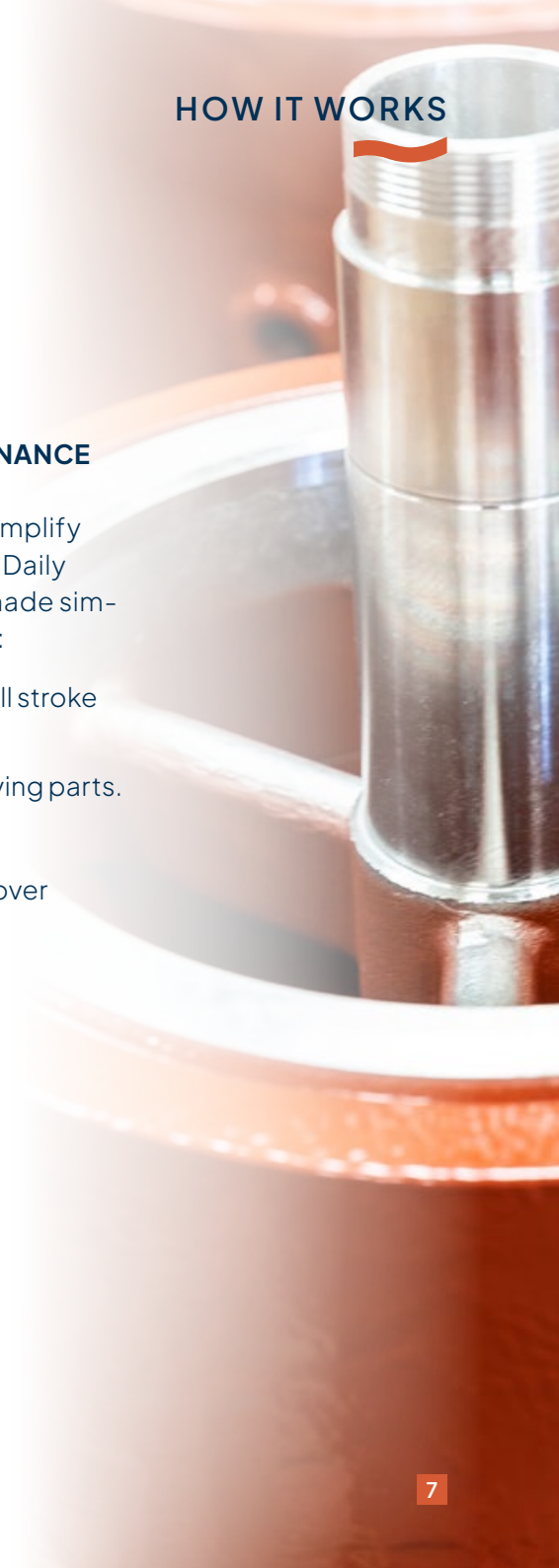
LOW NOISE LEVEL
The valves are designed to minimise noise during operations and is reduced by 10–15 dB compared to other designs.

ADDITIONAL FEATURES
The valves are easier to maintain by the following features:

- Reduced no. of parts (by 30%) and the valve is very simple to disassemble and maintain.
- Reduced weight of the valve.
- 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 gas-freeing cover screen arrestor.
- Disc/seat wearing reduced to zero by replaceable integrated resilient seat.

OPERATIONS AND MAINTENANCE MADE SIMPLE
The valves are 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



PRES-VAC ECO

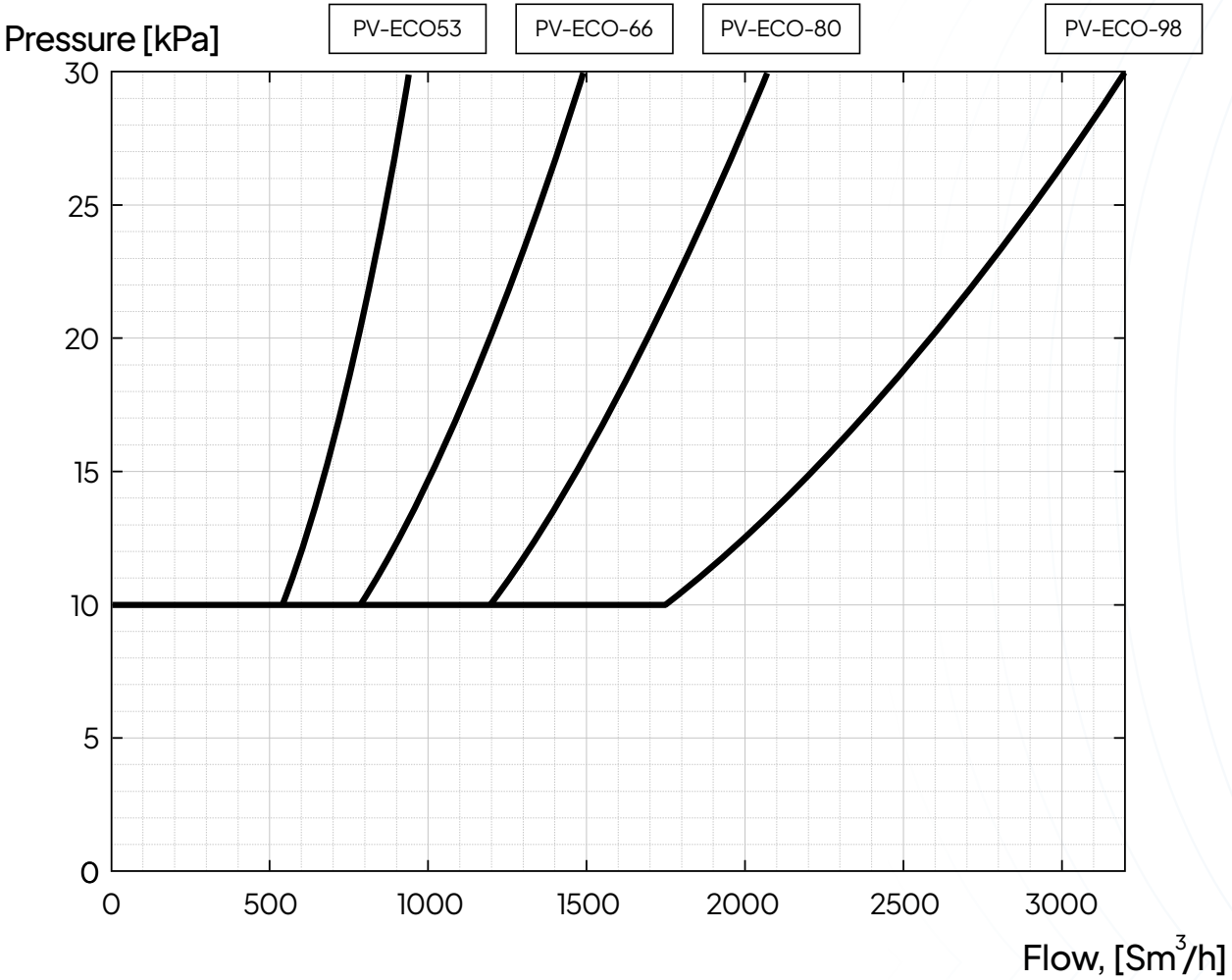
A patented, integrated dampener secures that the valve can operate non-hammering and non-oscillating also at long pipe lengths.

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.

ECO-certified range of settings from 5–70kPa

CONFIGURED TO YOUR REQUIREMENT
Pres-Vac ECO 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


Pressure [kPa]
PV-ECO53
PV-ECO-66
PV-ECO-80
PV-ECO-98
30
25
20
15
10
5
0
0
500
1000
1500
2000
2500
3000
Flow, [Sm3/h]

PRES-VAC VOC

The patented PV-VOC pressure/vacuum valve is designed to optimize the VOC performance. Using fluid dynamic simulation software in connection with testing, we have achieved a performance that benefits all stages in the operation of an oil tanker. This includes filling, topping, breathing or VOC savings in accordance with the VOC management procedure required by IMO/MSC/Circ.680.

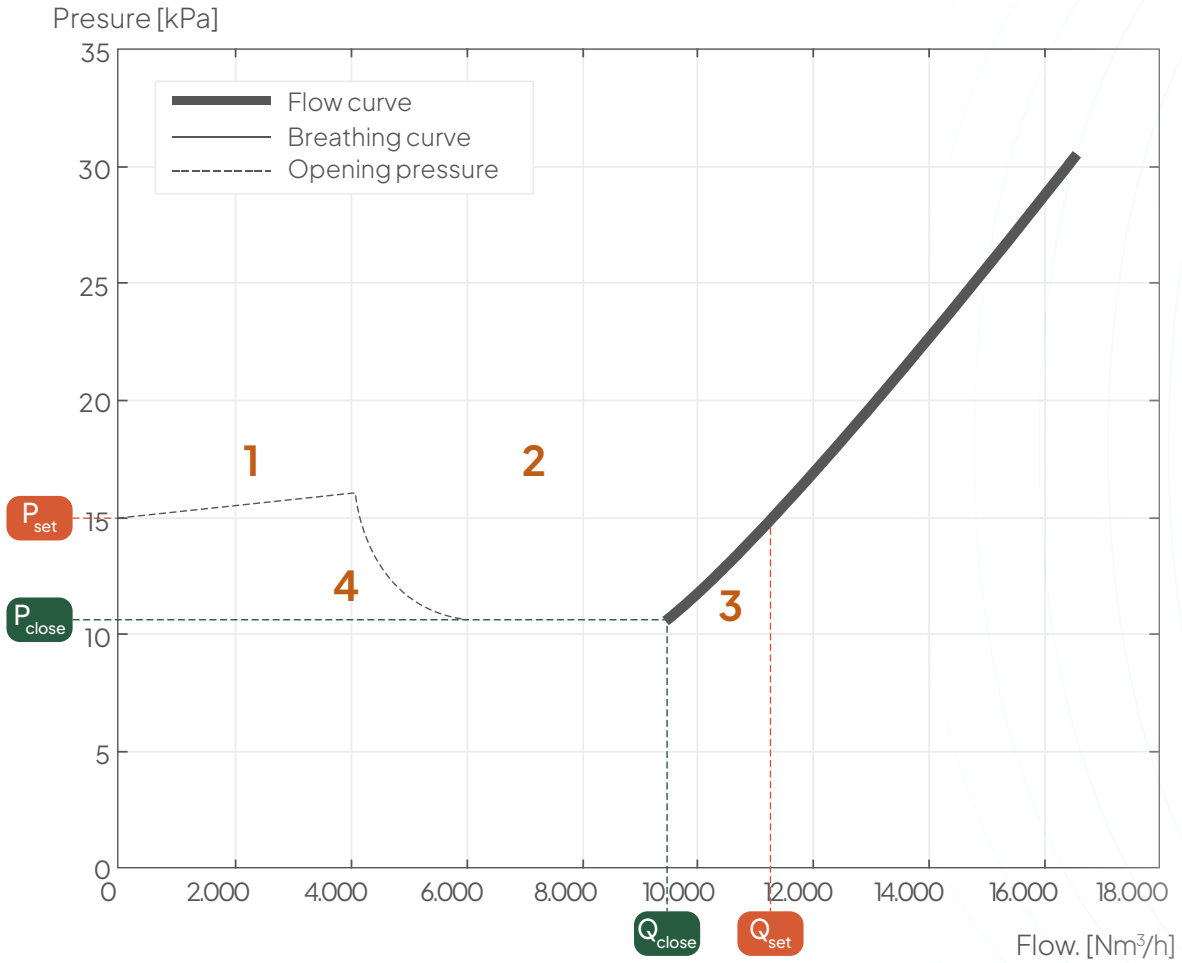
PERFORMANCE IN 4 PHASES:

1. **The breathing phase**
When the vessel is in voyage and the only influences on the pressure in the cargo tank are the thermal variation and the movements of the ships, the valve will be in the breathing phase. The breather performance will ensure that the pressure is kept on top of the cargo avoiding any unnecessary emission of VOC. The valve performance is characterised by the ability to open and close at the same pressure level. This performance is kept until approximately 50% of the total flow capacity is reached. Then the valve will enter the fully open phase.

2. **The fully open phase**
The valve will enter the fully open phase, when the vessel is loading and the full flow capacity is required. The pressure unit will open up fully and ensure, that the pressure is maintained at the opening setting level. The design of the valve ensures a steady, non-oscillating behaviour keeping a constant pressure in the venting system, until the loading has finished. The valve will then enter the closing phase.

3. **The closing phase**
When the cargo tank is getting close to full, the loading rate will decrease and the valve will enter the closing phase. The valve will start closing, still keeping a sufficient pressure on the cargo. The closing phase will be performed while ensuring that the blow down will be as small as possible. The valve will still be open in this phase, but the performance will stop the evaporation of the cargo.

4. **Topping off phase**
When the cargo tank is almost full (closing towards 98%) the topping of the tank will result in a significant decrease of the loading rate in order to avoid the cargo from creating a sudden overpressure. This will force the valve into the final closing phase. In this phase, the valve will close at the same pressure as it opened, thus preserving the VOC in the cargo tank in compliance with the IMO/MSC/Circ. 680.

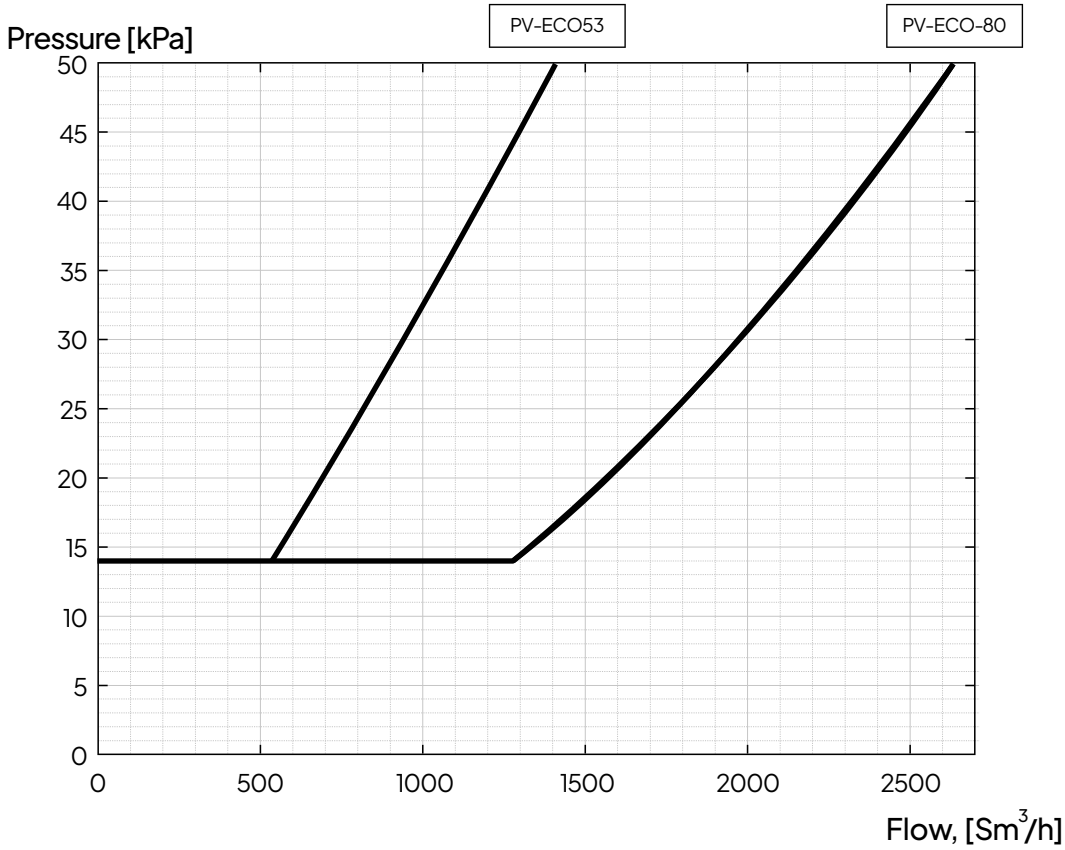

Presure [kPa]
35
30
25
20
15
10
5
0
Flow curve
Breathing curve
Opening pressure
1
2
3
4
P set
P close
0
2.000
4.000
6.000
8.000
10.000
12.000
14.000
16.000
18.000
Q close
Q set
Flow. [Nm³/h]

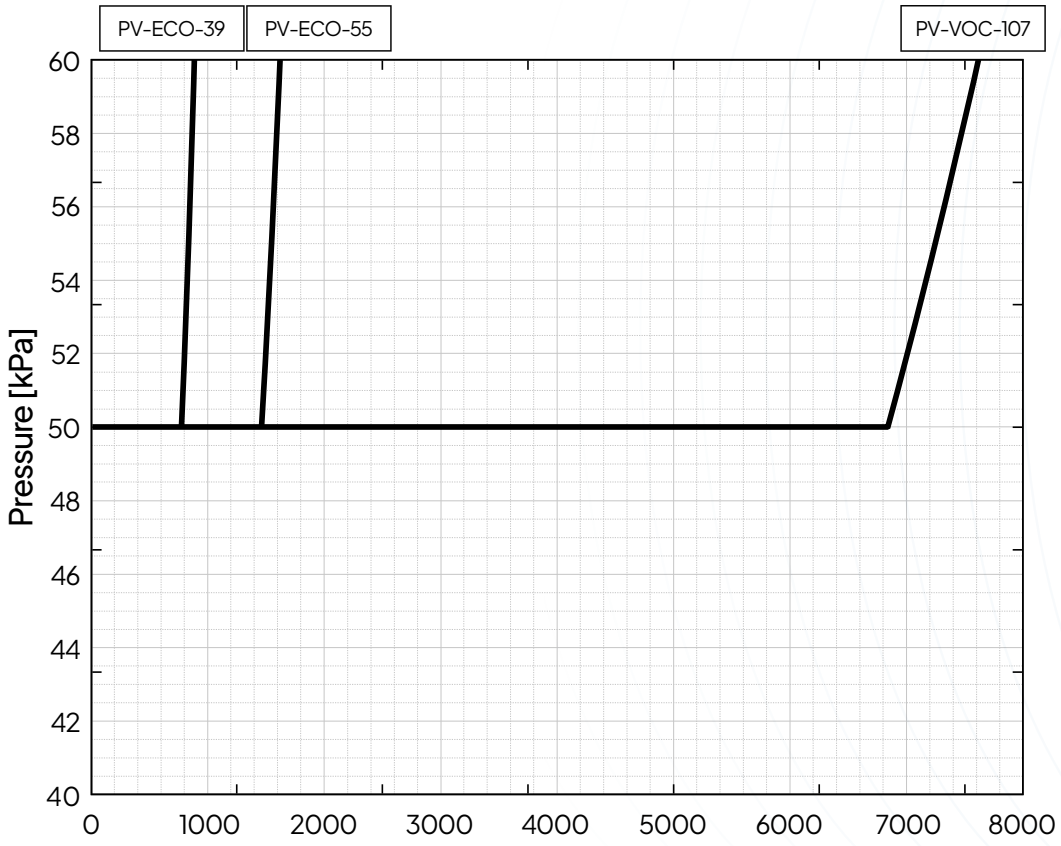
SPECIAL-PURPOSES/HIGH VELOCITY VALVES FOR SPECIAL PURPOSES;

Methanol, ammoniak and inland tankers

The world's first valves designed specifically for Methanol-powered ship engines. These innovative valves mark a significant advancement in ensuring the integrity and safety of onboard storage systems, establishing new benchmarks for reliability, efficiency, and environmental sustainability.

- Compatibility with every pipe size and the longest pipe lengths.
- Undergoes a comprehensive series of assessments, including endurance burn tests, flame transmission tests, deflagration tests, and more.
- Compliant with IMO 1621




PV-ECO-39
PV-ECO-55
PV-VOC-107
Pressure [kPa]
60
58
56
54
52
50
48
46
44
42
40
0
1000
2000
3000
4000
5000
6000
7000
8000

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.

QUICK SUPPLY OF SPARE PARTS AND KITS
All Service Repair Centres have spare part kits for Pres-Vac products 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.

For further information regarding service, spare parts and maintenance, please contact us via email: aftersales@pres-vac.com or tel: +45 48174055

G&O MARITIME GROUP
MARKET-LEADING BRANDS IN ONE PIONEERING GROUP

In 2022 HJ Lubricators was acquired by G&O Maritime Group. This drives for opportunities even further on a global scale and benefit shipping companies, striving to make vessels a greener and safer place to work. The companies have a long and proud history of inventing market leading products.

ABOUT G&O MARITIME GROUP
We are a group of sub system providers to the maritime industry, all developing high quality products and enabling our customers through a green transition in the maritime industry. Our brands are divided into 4 divisions:

Propulsion management
Offers vibration compensators, cylinder lubrication systems and piston rod stuffing boxes. We cooperate with engine manufacturers and shipping companies to optimise main engine operations, supporting the important task of utilising new environmentally friendly fuel types.

Tank management
Provides PV valves and protects tank vessels against unintended overpressure or vacuum, whilst simultaneously protecting against fire risk and ensuring that emissions from the cargo is kept to a minimum, as in accordance with IMO standards.

Water & Waste management
Includes incineration plants and biological water purifying plants, securing that waste water is purified before discharge while solid waste and oil sludge is incinerated at high temperatures to reduce SOx and NOx emissions.

Service management
Provides specialised solutions for the maintenance, repair and optimisation of critical marine equipment, ensuring the reliability and longevity of vessel operations. With expertise in boiler systems, automation and spare parts, services are designed to minimise downtime and enhance efficiency.

FUELTECH

Fuel supply and safety systems for dual-fuel vessels, enabling cleaner operations with future fuels like methanol, ammonia, LNG, and LPG.

G&O COMPENSATORS

Compensators that eliminate vibrations at the source, reducing cost, improving comfort and cutting fuel spend.

HECO®

Piston rod stuffing boxes for two-stroke engines continuously improved to live up to new fuel types entering the market.

HJ Lubricators®

Leading global provider of cylinder lubrication systems for two-stroke marine engines.

PRES·VAC®

Valves and venting equipment reducing emissions from cargo whilst keeping vessels, equipment and crews safe daily.

G&O BIOREACTORS

Biological cleaning of grey and black waste water before it is discharged.

ATLAS INCINERATORS®

Incineration of waste and oil sludge, eliminating the need for discharging to shore while reducing emissions from incineration.

Global Boiler Services

Specialised 24/7 solutions for the maintenance, repair and optimisation of marine boilers and critical equipment.

GET YOUR SHIPS AND INSTALLATIONS FUTURE-FIT

Pres-Vac Engineering provide valves and venting equipment that protects tank vessels against unintended overpressure or vacuum. Simultaneously, our valves protect against fire risks and ensure that emissions from the cargo is kept to a minimum and in accordance with IMO standards.

For decades, we have led the development of high velocity pressure/vacuum valves to the tanker shipping industry.

Today, we are the world's leading supplier, and around 50% of all tanker vessels worldwide use Pres-Vac equipment.

Contact us to find out more.

PRES•VAC®

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GET MORE INFORMATION:

Methanol white papers, explainer videos and much more is available online.

Scan the QR and learn more

G&O MARITIME GROUP®

Pres-Vac Engineering A/S | Svanevang 3–5 | DK-3450 Allerød | **P:** +45 48 17 40 55 | **E:** presvac@pres-vac.com

G&O Maritime Group | Lundtoftegardsvej 95 3. | DK-2800 Kongens Lyngby |**E:** info@g-o.dk | **W:** www.gomaritimegroup.com
At G&O Maritime Group we enable our customers during the green transition in the maritime industry