

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Pressure-Vacuum Relief Valve**with type designation(s)
HS-ISO & HS-ISO-VAC

Issued to

Pres-Vac Engineering A/S
Allerød, Hovedstaden, Denmark

is found to comply with

DNV GL rules for classification – Ships Pt.5 Ch.5 Oil tankers**DNV GL rules for classification – Ships Pt.5 Ch.6 Chemical tankers****Application :****Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.****Design: Combine weight and magnetic loaded high velocity vents and weight loaded vacuum relief valves****Sizes: DN 50 to DN300 (see page 2)**Issued at **Høvik** on **2019-06-17**This Certificate is valid until **2023-12-31**.for **DNV GL**DNV GL local station: **Copenhagen**Approval Engineer: **Adel Samiei**

Zeinab Sharifi
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Product description

high velocity Pressure valve type HS-ISO & vacuum valve type HS-ISO-VAC

The valves HS-ISO-VAC sizes 1,2 & 3 may be delivered with conversion kits with IIB mesh elements

Materials:

Housings:GG20 (according to DIN1691)/GGG-40 (according to DIN1693-1)/Stainless Steel AISI 316

Disc, Seat, Stem: Stainless Steel AISI 316

Flame Screens: Stainless Steel AISI 316

Designed and tested according to:

- IMO MSC/Circ. 677 (as amended by MSC.1/Circ. 1324) Revised Standards for The Design, testing and Locating of Devices to Prevent the Passage of Flame into Cargo Tanks in Tankers
- ISO 15364:2016 – Standard for ships and marine technology – Pressure/vacuum valves for cargo tanks

Application/Limitation

Products covered by this certificate may be used as vents on tanks for cargo on board ships having class notation "Tanker for Oil", "Tanker for Oil Products" or "Tanker for Chemicals" in below conditions:

Pressure valves:

Type Designation	Set Pressure	Max.Pipe length	Pipe size	Outlet Ømm	Min. MESG value /Appertus Group	Maximum Ice thickness
HS-ISO-1	12 kPa	50 m	DN50	83	0,65/IIB	20 mm
HS-ISO-2L	10 kPa	50 m	DN80	116	0,65/IIB	22 mm
HS-ISO-2M	12 kPa	25 m				
HS-ISO-2S	12 kPa	50 m				
HS-ISO-2X	12 kPa	50 m				
HS-ISO-3S	12 kPa	6 m	DN100	151	0,65/IIB	20 mm
HS-ISO-3L	12 kPa	30 m				
HS-ISO-3X	14 kPa	34,5 m				
HS-ISO-4	10 kPa	42 m	DN150	185	0,65/IIB	35 mm
HS-ISO-5	14 kPa	6 m	DN150	215	0,65/IIB	35 mm
	12 kPa		DN 200			
HS-ISO-6	12 kPa	10,5 m	DN200	240	0,65/IIB	42 mm
HS-ISO-7	14 kPa	5 m	DN200	302	0,65/IIB	50 mm
	12 kPa	6 m	DN250			
	12 kPa	16 m	DN300			

Vacuum valves:

Type Designation	Inlet Ø mm	Set pressure	Min. MESG Value*)	Maximum Ice thickness
ISO-VAC-1	95	3.5 kPa	0,65 (with conversion kit) / 0,90	0 mm
ISO-VAC-2	116	3.5 kPa	0,65 (with conversion kit) / 0,90	0 mm
ISO-VAC-3	150	3.5 kPa	0,65 (with conversion kit) / 0,90	0 mm
ISO-VAC-4	180	3.5 kPa	0,90	0 mm
ISO-VAC-5	215	3.5 kPa	0,90	0 mm
ISO-VAC-6	250	3.5 kPa	0,90	0 mm

*) For a pressure-vacuum valve combination, the highest MESG value for either of the units is governing.

The vacuum valves HS-ISO-VAC (without conversion kits) are only to be installed on cargo tanks fitted with inert gas system in accordance with SOLAS Regulation II-2/62.

Maximum loading rate, sizing and location shall be according to the latest revision of MSC/Circ.731.

Installation on board of vessels with class notation of "Tanker for oil" or "Tanker for oil Products" is to comply with the Rules Pt.5 Ch.5 Sec.5.

Installation on board of vessels with class notation of "Tanker for Chemicals" is to comply with the Rules Pt.5 Ch.6 Sec.9.

Cargo tanks connected to the combined pressure-vacuum main vent line must carry the same type of cargo.

Drawings of stand pipes showing hatches and openings are to be approved in each separate case.

A copy of the instruction manual shall be kept on board, and is to include:

- Installation & operating instructions
- Maintenance requirements including cleaning
- A copy of the laboratory report
- Flow test data, incl. flow rates under both positive and negative pressures, operating pressures, operating sensitivity, flow resistance and velocity

Product testing

Each finished device to be visually and dimensionally checked and pneumatically leakage tested at 75 % of the nominal setting according to ISO15364:2016 [6.1] & [10]. According to the instruction manual, acceptance criteria is to be as per ISO15364:2016 Annex I.

Type Approval documentation

Tests carried out

Corrosion test, Hydraulic pressure test, Flow test, Flash back test, Ice test, Endurance burning test (for pressure valve and vacuum valve with conversion kit), Hammering test

Marking of product

For traceability to this type approval each device is at least to be marked with:

- manufacturer's name or trade mark,
- type designation and serial No.,
- size of the outlet/inlet (whichever is applicable),
- approved location for installation, including maximum length of pipe,
- the apparatus group which the device is approved for,
- direction of flow through the device,
- Pressure and vacuum setting,

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.