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Enjoy your Job for your Health, with PROSAVE Safety Devices

# Top Reliability, Smart Design, Valuable Product and Better Life

## Smart HIGH VELOCITY PRESSURE / VACUUM RELIEF VALVE (with Gas Free Cover)

Great product
beyond good!

## SMART-HV Series

International patented

Approved for crude oil, products and IMO type Ⅱ or Ⅲ chemical tankers carrying dangerous flammable cargoes of a Maximum Experimental Safe Gap(MESG) with 0.65mm and 0.9mm

PROSAVE

# *Smart HIGH VELOCITY PRESSURE / VACUUM RELIEF VALVE*

*(with Gas Free Cover)*


This valve is also designed for devices to prevent the passage of flame into cargo tanks in tankers and to relieve excessive over pressure or under vacuum of cargo tanks during cargo loading, discharging, ballasting and thermal variations.

**Meet**
EC Directive 2009 / 26 / EC
(5th Amendment)
IMO MSC/Circ.677 & 1009
MSC,1/Circ,1324
ISO 15364: 2007
Vapor control system of USCG
EN 12874: 2001

## Applied International Rule Requirements

**Solas Regulation 59.1.2**
The venting arrangements shall be so designed and operated as to ensure that neither pressure nor vacuum in cargo tanks shall exceed design parameters and be such as to provide for :
**.1** the flow of the small volumes of vapour, air or inert gas mixtures caused by thermal variations in a cargo tank in all case through pressure/vacuum valves ; and
**.2** the passage of large volumes of vapour, air or inert gas mixtures during cargo loading and ballasting, or during discharging.
**.3** a secondary means of allowing full flow relief of vapour, air or inert gas mixtures to prevent over-pressure or under-pressure in the event of failure of the arrangements in 1.2.2. Alternatively, pressure sensors may be fitted in each tank protected by the arrangement required in 1.2.2, with a monitoring system in the ship's cargo control room or the position form which cargo operations are normally carried out. such monitoring equipment shall also provide and alarm facility which is activated by detection of over-pressure or under-pressure conditions within a tank.
**1.3.3** If cargo loading and ballasting or discharging of a cargo tank or cargo tank group is intended, which is isolated from a common venting system, that cargo tank or cargo group shall be fitted with a means for over-pressure or under-pressure protection as required in paragraph 1.2.3.

**IMO MSC/Circ,677**
Revised standards for the design, testing and locating of devices to prevent the passage of flame into cargo tankers

**IMO MSC/Circ,1009**
Amendments to the revised standards for the design, testing and locating of devices to prevent the passage of flame into cargo tanks in tankers(MSC/Circ.677)

**IMO MSC,1/Circ,1324**
Amendments to the revised standards for the design, testing and location of devices to prevent the passage of flame into cargo tanks in tankers (MSC/CIRC.677, AS AMENDED BY MSC/CIRC.1009)

**International Standard 15364; 2007**
Ships and marine technology-pressure/vacuum valves for cargo tanks

**IMO MSC/Circ.450 Rev.1**
Revised factors to be taken into consideration when designing cargo tank venting and gas-freeing arrangement

**IMO MSC/Circ.585**
Standard for Vapor Emission Control System

**IMO MSC/Circ.731**
Revised factors to be taken into consideration when designing cargo tank venting and Gas-freeing arrangement

**API 2000** - Flow test procedure

**EN 12874 : 2001**
Flame arresters-Performance requirements, test methods and limits for use

# Changed IMPORTANT REGULATIONS

## NEW IMO Regulation for Product & Chemical carriers, MSC.1/Circ,1324

**1. The Maritime Safety Committee approved the following amendments to MSC/Circ.677:**

1. Paragraph 1.2.3 is replaced with the following:

1.2.3 These Standards are intended for devices protecting cargo tanks containing crude oil, petroleum products and flammable chemicals. In the case of the carriage of chemicals, the test media referred to in section 3 can be used for products having an MESG of 0.9 mm and greater. However, devices for chemical tankers certified for the carriage of products with an MESG* less than 0.9 mm should be tested with the following media based on the apparatus group assigned as per column "i" of the IBC Code, chapter 17:

1. Apparatus Group II B - ethylene (MESG = 0.65 mm); and
2. Apparatus Group II C - hydrogen (MESG = 0.28 mm).

Where no apparatus group is assigned in column "i", the device should be tested in accordance with the requirements for Apparatus Group II B.

2. Subparagraph .4 of paragraph 4.1 is replaced with the following:

"4 approved location for installation, including maximum or minimum length of pipe, if any, between the device and the atmosphere and the apparatus group assigned to the tested device;".

**2. Member Governments are invited to apply the amendments to the Revised standards, as amended, to ships constructed on or after 1 January 2013 and to ships constructed before 1 January 2013, no later than the first scheduled dry-docking carried out on or after 1 January 2013.**

## NEW MED(CE) Regulations for Crude, Product & Chemical carriers

Member States shall adopt and publish, by 6 April 2010 at the latest, the laws, regulations and administrative provisions necessary to comply with this Directive,**COMMISSION DIRECTIVE 2009/26/EC of 6 April 2009 amending Council Directive 96/98/EC** on marine equipment
**They shall apply those provisions from 6 April 2010.**

| No | Item designation | Regulation SOLAS 74 where "type approval" is required | Regulations of SOLAS 74 and the relevant resolutions and circulars of the IMO, as applicable | Testing standards | Modules for conformity assessment |
|---|---|---|---|---|---|
| A.1/3.12 | A.1/3.12 Devices to prevent the passage of flame into the cargo tanks in tankers | - Reg. II-2/4,<br>- Reg. II-2/16. | - Reg. II-2/4,<br>- Reg. II-2/16. | - EN 12874 (2001),<br>- ISO 15364 (2007),<br>- IMO MSC/Circ.677,<br>- IMO MSC/Circ.1009. | B + F |

Important performance requirement : The disc of high velocity vent shall not be contacted to seat or stopper, with frequency more than 0.5 Hz. as based on undamped oscillation rule.

# *Smart HIGH VELOCITY PRESSURE / VACUUM RELIEF VALVE*

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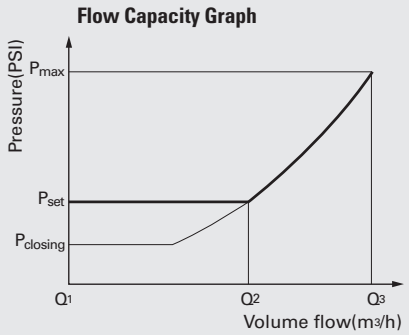
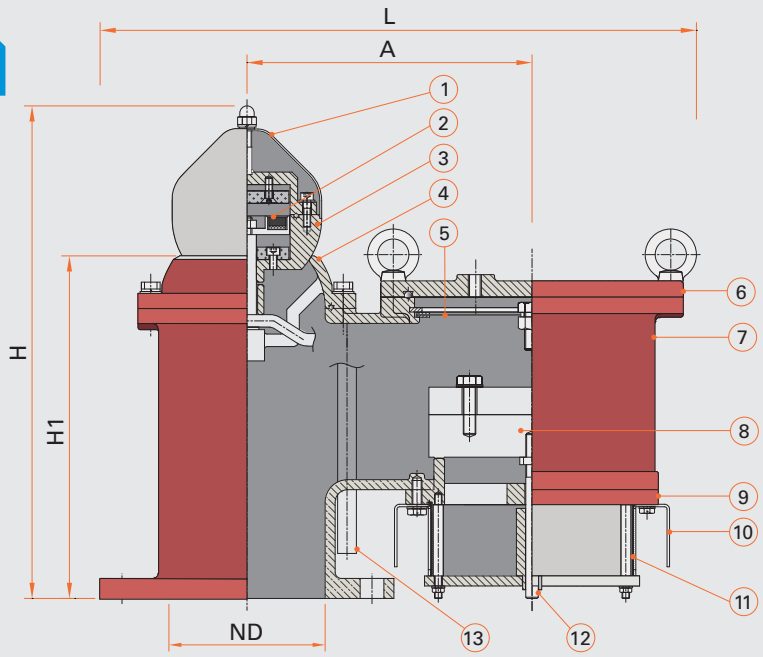
## FEATURES and BENEFITS

1. Reliable operations reduces vapor losses
2. Suaitable and compact design ensures long-term maintenance free life cycle
3. Meet new IMO & MED requirements for cargo vapor flammability
   - MESG 0.9 & 0.65 mm
4. Non-oscillating performance
5. Full lifting and high flow capacity
6. Variable application for usable installation vent pipe length and flow capacity range
7. No peak pressure over opening pressure
8. No need inside maintenance
9. Available outside inspection, cleaning and maintenance without disassembling
10. Adjustable outside opening and closing pressure without exhausting vapor gas

## BASIC DRAWING




PROSAVE SMART-HV series
full opening valves





1. Shipyard Name _____
2. Hull No. _____
3. Type of Valve ☐ S-Type ☐ L-Type
4. Connecting Flange ☐ JIS 5K F.F
   ☐ ANSI 150# R.F
5. Pressure/Vacuum Setting
   - PRESSURE : ☐ 1400 mmW.G ☐ 1750mmW.G ☐ 2100mmW.G
   - VACUUM : ☐ -350 mmW.G ☐ -700mmW.G
6. Paint Specification
   ☐ No Paint ☐ Tar Epoxy 200 mic.
   ☐ Shipyard requirement
7. Supply Q'ty / Ship
   SEE SPEC. for CARGO TANK
   SEE SPEC. for SLOP TANK
   SEE SPEC. for RESIDUAL TANK

## DIMENSION TABLE

(unit : mm)

| TYPE | SIZE | N.D | A | H | H1 | L | W.T(kg) |
|---|---|---|---|---|---|---|---|
| SMART-HV-3S/L | 80A | 80 | 173 | 303 | 199 | 369 | 22 |
| SMART-HV-4S/L | 100A | 100 | 183 | 335 | 228 | 399 | 31 |
| SMART-HV-5S/L | 125A | 125 | 228 | 393 | 274 | 477 | 41 |
| SMART-HV-6S/L | 150A | 150 | 257 | 468 | 333 | 539 | 57 |
| SMART-HV-8S/L | 200A | 200 | 328 | 537 | 403 | 679 | 98 |
| SMART-HV-10S/L | 250A | 250 | 400 | 659 | 466 | 813 | 150 |
| SMART-HV-12S/L | 300A | 300 | 443 | 750 | 551 | 896 | 185 |

## BILL OF MATERIAL SELECTION

| NO | DESCRIPTION | SPEC.1 | SPEC.2 | SPEC.3 |
|---|---|---|---|---|
| 1 | DISC CAP | Stainless steel 316 | Stainless steel 316 | Stainless steel 316L |
| 2 | SET PRESSURE ADJUSTER | Capsulated Magnet | Capsulated Magnet | Capsulated Magnet |
| 3 | PRESSURE DISC | Stainless steel 316 | Stainless steel 316 | Stainless steel 316L |
| 4 | PRESSURE SEAT | Cast Steel | Stainless steel 316 | Stainless steel 316L |
| 5 | GAS FREE SCREEN | Stainless steel 316 | Stainless steel 316 | Stainless steel 316L |
| 6 | VACUUM COVER | Cast Iron | Stainless steel 316 | Stainless steel 316L |
| 7 | BODY | Cast Iron | Stainless steel 316 | Stainless steel 316L |
| 8 | VACUUM DISC | Stainless steel 316 | Stainless steel 316 | Stainless steel 316L |
| 9 | VACUUM SEAT | Stainless steel 316 | Stainless steel 316 | Stainless steel 316L |
| 10 | FLAME SCREEN COVER | Carbon Steel | Stainless steel 316 | Stainless steel 316L |
| 11 | FLAME SCREEN | Stainless steel 316 | Stainless steel 316 | Stainless steel 316L |
| 12 | VACUUM CHECK LIFT | Stainless steel 316 | Stainless steel 316 | Stainless steel 316L |
| 13 | PREESURE CHECK LIFT | Stainless steel 316 | Stainless steel 316 | Stainless steel 316L |

# *Smart HIGH VELOCITY PRESSURE / VACUUM RELIEF VALVE*

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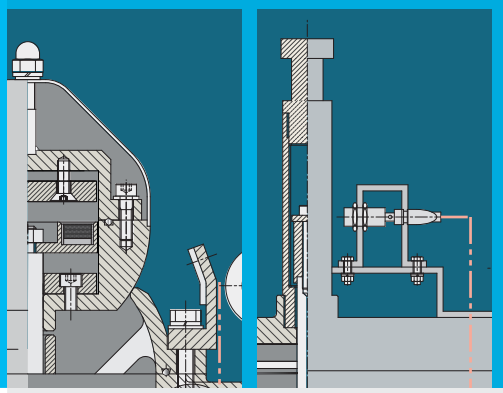
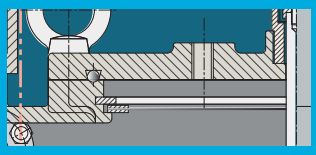
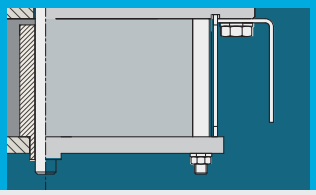
## OPTIONAL FEATURES



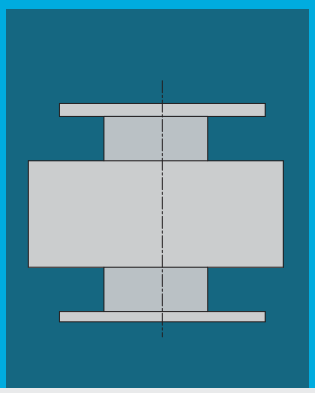
Proximity switches and junction box to indicate position of pressure and vacuum disc



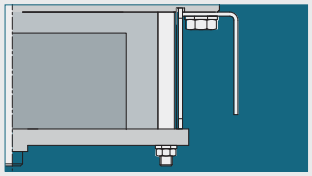
Integral gas-freeing cover



Desiccator to prevent ingress of moist air during vacuum operation



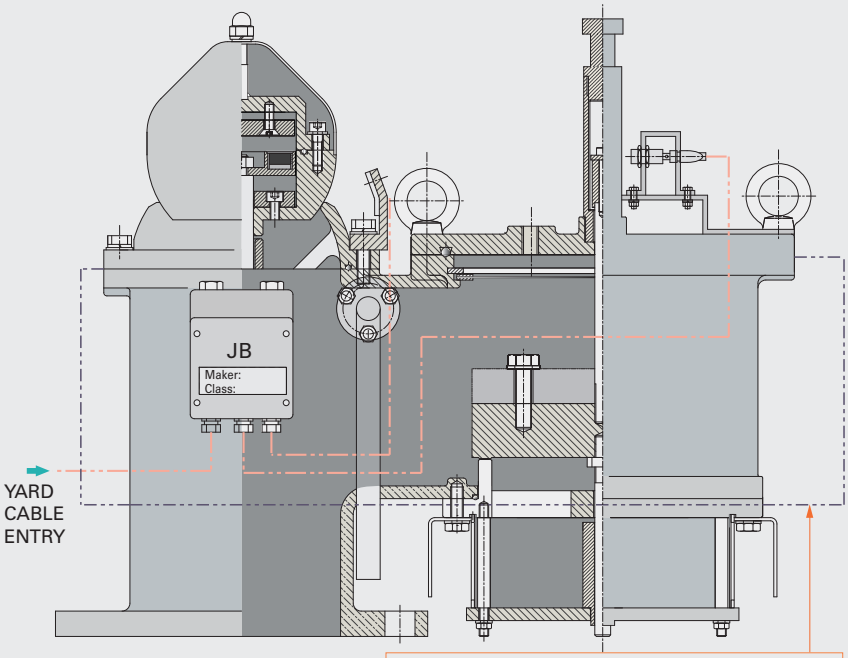
Anti-slushing devices for preventing cargo vapours pollution onto deck



Floats on vacuum side preventing water ingress for installation of inerted ballast tanks


Test bench of opening pressure / vacuum and seat leak test of P/V valves


Test tank




Heating arrangement for ice class vessels

## Quality Control Activities

### - Company Overview

The company is a manufacturer of safety valve for tank, we strive to comply and maintain the quality manual to increase development of new technology, enhance product quality and productively while reducing costs.

### - Scope of Application

This manual was established based on the regulations of ISO 9001 : 2000 and applies to design, development, sales, procurement, manufacturing, inspection, service department and overall organizations.

### - Definition of Terminology

The terminology relating to quality management system in the quality manual are as defined in KS A 9000:2001/ISO 9001 : 2000.

### Approved Classfication

- QUALITY MANAGEMENT SYSTEM ISO 9001;2000
- MAN Diesel & Turbo
- AMERICAN BUREAU OF SHIPPING (ABS)
- Bureau Veritas (BV)
- LLOYD'S REGISTER OF SHIPPING (LR)
- DET NORSKE VERITAS (DNV)
- GERMANISCHER LIOYD (GL)
- NIPPON KAIJI KYOKAI (NK)
- KOREA REGISTER (KR)
- CHINA CLASSIFICATION SOCIETY (CCS)
- REGISTRO ITALIANO NAVALE (RINA)

## World-Wide Service Network

TOP RELIABILITY OF SAFETY & ENVIRONMENT IS THE FIRST

& MOST IMPORTANT

## Products

- Air Release Valves
- Combination Air Release and Air/Vacuum Valve
- Vacuum Breaker Valves
- Pilot Operating Pressure/ Vacuum Valves
- Surge Relief Valves
- Crankcase Explosion Relief Valve
- Explosion Venting Devices
- VOC Emission Protection Devices
- High Velocity Pressure/ Vacuum Valve
- Flame Arrester
- Flame Screen
- Gas Free Cover
- Pressure/Vacuum Relief Valve

## Application Fields

- Offshore & Ocean Gas Plants
- Desalination Plants
- Ballast System for Ships & Offshore Plants
- Sea & Fresh Water Plants
- Marine Tank Ships
- Cryogenic gas Facilities
- Petrochemical Plants
- Tank Terminals
- Marine Engines
- Generators
- Duct

ISO 9001 Registered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