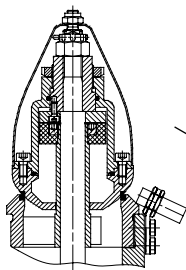


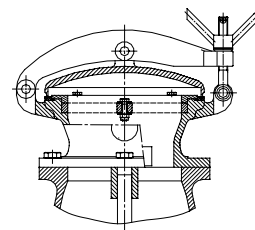
Type HS-ISO

(shown with options)

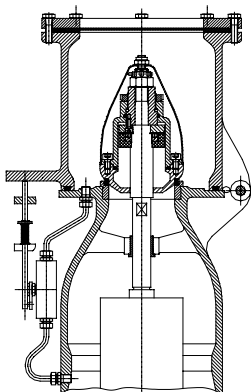
PROXIMITY SWITCH FOR
STAND-BY VALVES



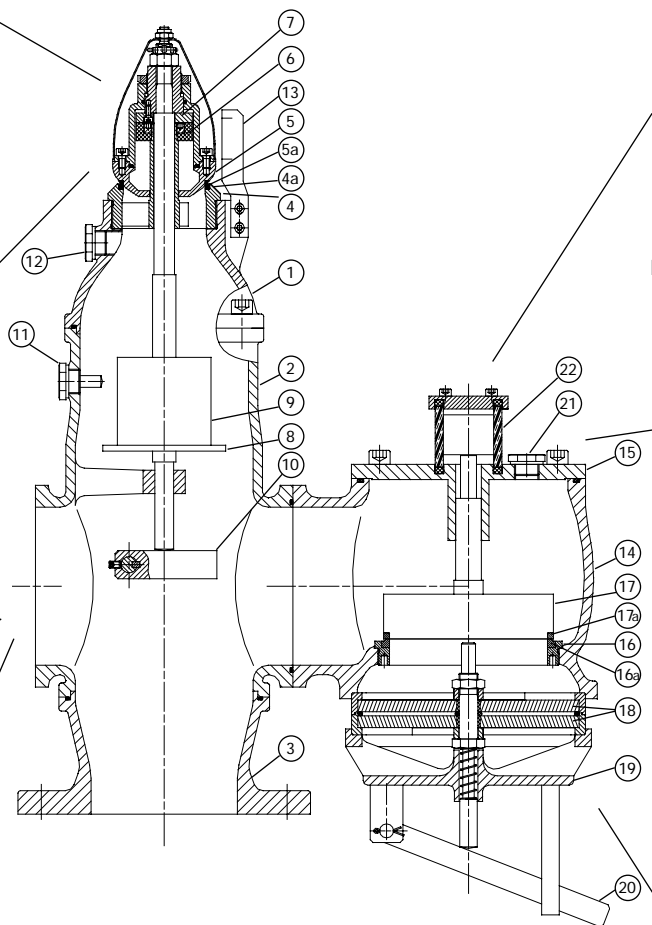
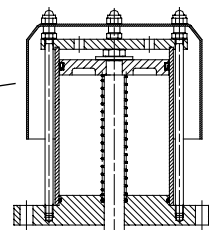
GAS-FREEING COVER
WITH SIGHT GLASS FOR
VAC DISC POSITION



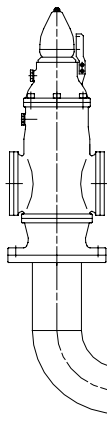
ZERO-EMISSION KIT
FOR SPECIAL CARGO



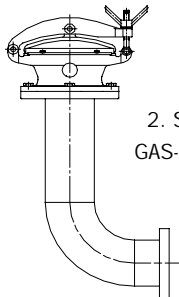
SELF-CLOSING VALVE TO
PREVENT CARGO ESCAPE
FROM SUNKEN VESSEL



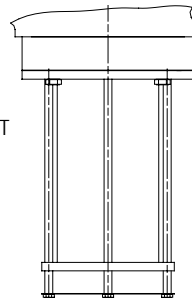
1. DUAL NOZZLE
FOR IMPROVED GAS
DISPERSION OF
SMALL VOLUME



2. SIDE-MOUNTED
GAS-FREEING COVER

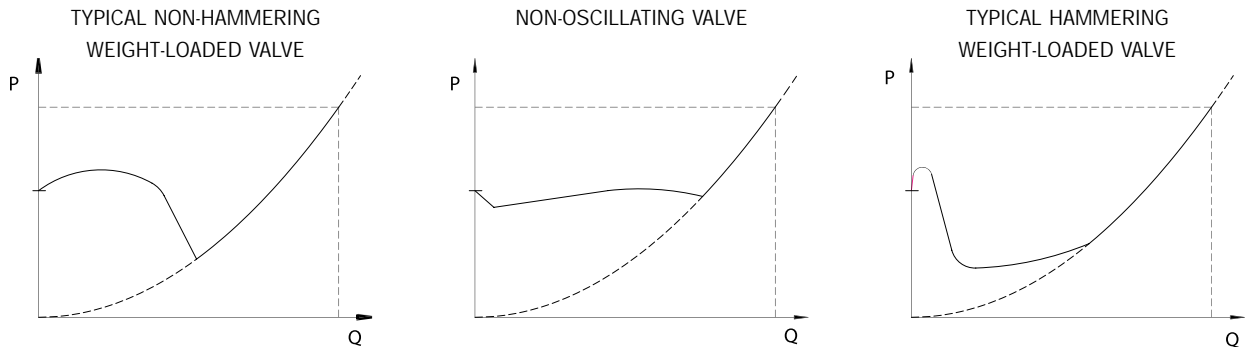


DESICCATOR TO PREVENT
DAMAGE TO
HYGROSCOPIC CARGO



Type HS-ISO

Dynamic characteristics



Parts list

Item	Description	Spec. 1	Spec. 2	Spec. 3
1	Upper valve house	Stainless steel	Cast iron	Cast iron
2	Valve house	Stainless steel	Cast iron	Cast iron
3	Steel adaptor	Stainless steel	Cast iron	Cast iron
4	Pressure seat	Stainless steel	Stainless steel	Bronze
4a	Wear ring (optional)	To be specified	To be specified	To be specified
5	Pressure disc	Stainless steel	Stainless steel	Stainless steel
5a	Wear ring (optional)	To be specified	To be specified	To be specified
6	Blow-down control device	PTFE coated	PTFE coated	PTFE coated
7	Armature	Stainless steel	Stainless steel	Stainless steel
8	Booster plate	Stainless steel	Stainless steel	Stainless steel
9	Weight loading	Stainless steel	Stainless steel	Stainless steel
10	Full stroke check lift	Stainless steel	Stainless steel	Stainless steel
11	Cleaning indicator	Stainless steel	Stainless steel	Stainless steel
12	Flushing port	Stainless steel	Stainless steel	Stainless steel
13	Pres. valve posit. indicator	Stainless steel	Stainless steel	Stainless steel
14	Vacuum house	Stainless steel	Stainless steel	Stainless steel
15	Vacuum cover	Stainless steel	Stainless steel	Stainless steel
16	Vacuum seat	Stainless steel	Stainless steel	Bronze
16a	Wear ring (optional)	To be specified	To be specified	To be specified
17	Vacuum disc	Stainless steel	Stainless steel	Bronze
17a	Wear ring (optional)	To be specified	To be specified	To be specified
18	Flame filter	Stainless steel	Stainless steel	Stainless steel
19	Inlet cover	Stainless steel	Cast iron	Cast iron
20	Full stroke check lift	Stainless steel	Stainless steel	Stainless steel
21	Flushing port	Stainless steel	Stainless steel	Stainless steel
22	Vacuum valve position	PTFE coated	PTFE coated	PTFE coated

Type HS-ISO

High Velocity Vent, 3rd generation equipment, in a patented non-hammering and non-oscillation executing. Compliance with IMO MSC/Circ. 677/Rev. 1; EN 12874; and ISO 15364.

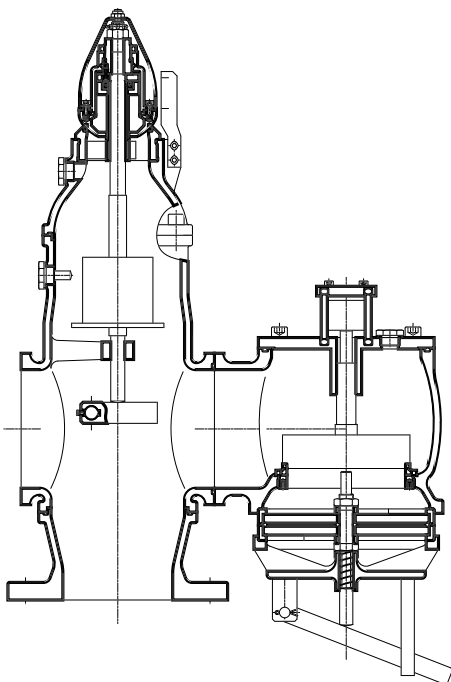
Type HS-ISO high velocity pressure/vacuum relief vent is the response to the first marine cargo tank venting equipment standard from the International Standard Organization. This valve is specifically designed with a view to address in-service maintenance, allow inspection of all vital parts from the outside without use of tools, and allow wear parts to be replaced in-situ. Essential functions are reflected by indicators, which are clearly visible from the outside at all times. Thanks to the patented control system for opening and closing pressures, the valve conforms to requirements for non-hammering and non-oscillation. The control system combines the simplicity and low maintenance advantages of a weight-loaded design with the low dynamic pressure drop of a traditional magnet operated design, while adding the in-service advantages of large net clearance through gas passage-ways to minimize clogging due to fouling from residue/condensate. The control system further allows the designer of the venting system to implement piping of lesser diameter than normal.

It was concluded at IMO in 1996-97 that tank venting equipment in many cases did not meet reasonable quality levels in ways of in-service performance. The rate of incidents was at unacceptable heights and it was in consequence hereof decided to revise SOLAS (II-2-59) to address redundancy and to invite ISO to provide a standard with focus on mechanical properties, maintenance, and in-service requirements as a supplement to IMO's existing test standard. ISO standard (15364) is now an integral part of SOLAS and the Chemical Code (by reference to IMO MSC/Circ. 677/Rev. 1) and therefore mandatory for all new buildings. The approval of this valve type falls in two parts: 1) Testing for fire safety according to IMO MSC/Circ. 677/Rev. 1 with the notified body under the EU directive for marine equipment,

and 2) review of the mechanical properties of the design by the notified body. Certain minimum issues must be verified and included in the certification, but the main novelty is that the qualification process is now placed with the user(s). Showing a class type approval to MSC/Circ. 677/rev.1 is not adequate; the overall properties of the product must be suitable for the intended application based on the product review under ISO 15364. A "677 approved" valve does not automatically meet the requirements of the ISO standard for any application.

Each configuration is tested and approved for non-hammering and non-oscillation and service restrictions are certified and available for the system designer to verify according to IMO MSC/Circ. 731. The instant reduction of pressure drop at set-point allows the designer under IMO MSC/Circ. 731 to select smaller diameter piping than otherwise needed from a tank pressure calculation point.

From a practical point of view, the most interesting aspect of this design is that all wear parts can be replaced without dismantling the unit. Further, all wear parts can be inspected from the outside and the operational condition of the valve checked to determine when maintenance is necessary.



Main features of type HS-ISO

- Complies with latest (2001) requirements from IMO, EN, API, and ISO
- Prepared for zero-emission upgrade
- Adjustable blow-down value
- Full stroke/self closing check lifts with visual indication from the outside as to the position of the discs
- Minimum stray emission rates according to ISO 15364
- Non-hammering and non-oscillating according to certified service restrictions
- No external or internal drains, completely self-draining to tank
- Net clearances of unsurpassed levels
- Inspection and replacement of wear parts without removing the valve from the point of installation
- Maintenance indicators
- Pressure relief setting is adjustable within pre-fixed range

High velocity pressure/vacuum relief vent

<p>Specifications</p> <p>Type: HS-ISO Dimensions: Drawing Nos. 2388/89 Capacities: See certified curves Settings: See certification Accuracy: ± 1% Ice layer: 20 mm* Installation: See restrictions in cert. Efflux vel.: Constant above 30 m/s. Check lifts: Full stroke/self closing Materials: Cast iron, ductile cast iron, bronze, stainless grades Disc position: Indicated from the outside Function: Controlled opening and closing pressure Capacity: 10,000 m3/h** Wear parts: Replaceable in situ Nom. Sizes: DN 50-400 Inspection: Indication for maintenance from the outside Clearance: Pressure: Items are completely outside tank atmosphere <i>Vacuum:</i> 15 mm</p>	<p>Options</p> <ul style="list-style-type: none"> • Flushing ports • Zero-emission control kit • Heating • Gas-freeing covers • Proximity switches • Wear parts in high grade steel • Desiccators • Water ingress preventing unit • Test kit 	<p>Certification</p> <p>FORCE INSTITUTE according to:</p> <ul style="list-style-type: none"> • IMO MSC/Circ. 677/Rev. 1 • CE • EN • API 2000 • Major classes (endorsed) <p>ISO 15364 Product Review document by the FORCE INSTITUTE is a mandatory appendix to the 677/rev.1 certificate and CE notation.</p> <p>Installation conditions to conform to restrictions under Circ. 677/rev.1 certification.</p>
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*) See certification/ISO review

***) Special versions available for higher rates