

Newsletter Pres-Vac Vacuum-M valve

The Pres-Vac Vacuum-M valve has been upgraded to fit the challenges of today

History

The vacuum valve has always been treated as a secondary means of venting, because Vacuum in a cargo tank shall be handled carefully and must, if possible, be avoided.

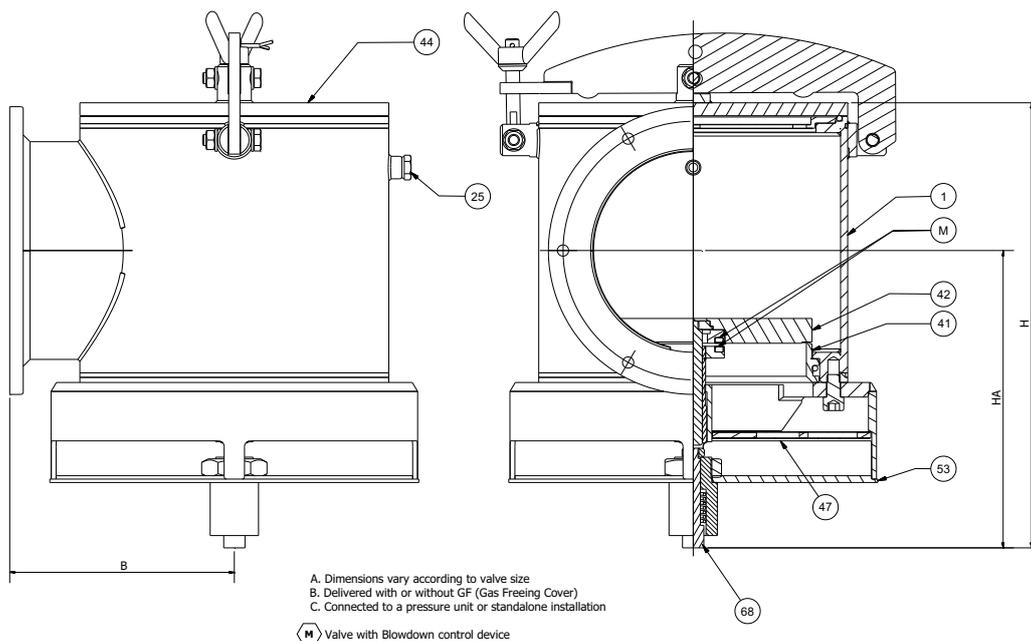
Fresh air into an empty tank full of vapour is not desirable.

The first version of Pres-Vac's Vacuum-M type was introduced in 2006 as a result of the wish to remove the increased pressure drop, a standard vacuum valve introduces when in function.

Design

A standard vacuum valve is designed with weight as the disk and operates by the vacuum disk lifting when vacuum setting is reached. When the valve is fully open a further pressure drop is expected. The valve closes again at the vacuum set point.

It is described in the rules ISO5364 and identified as a modulating valve. The increased pressure drops when the valve opens, has always been a challenge on long venting pipe and it has been difficult to comply with OCIMF.



The VAC-M 2020

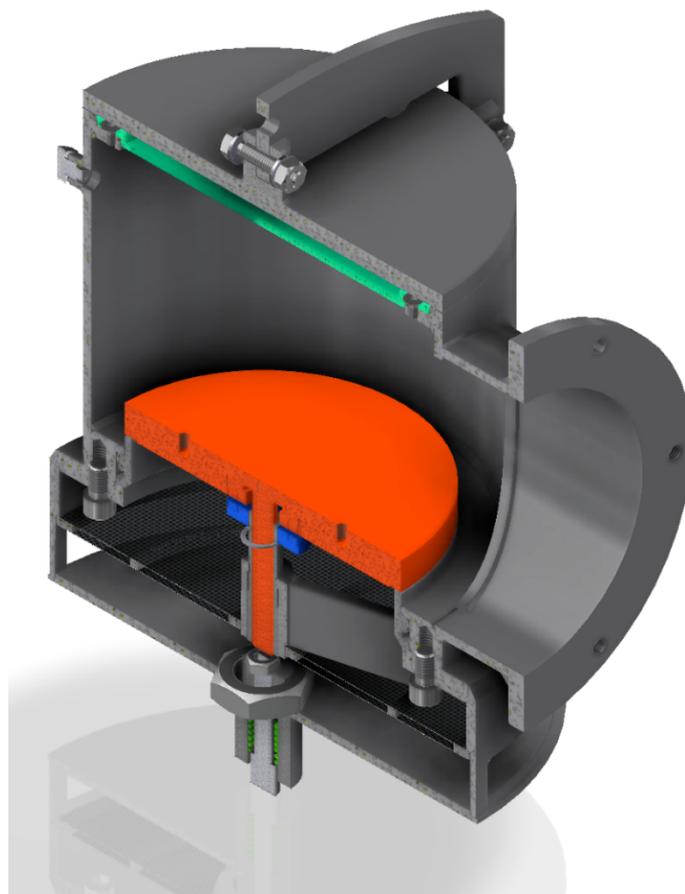
OCIMF's guidance states that the venting system to be working inside an overpressure of 10% above the setting is very hard to comply with; especially on the pressure side and vacuum side when using a standard weight loaded PV- valve, unless an oversized valve is installed and doing so, will introduce other problems.

The aim, handling this pressure situation, is to reduce the weight of the moving parts, changing the standard vacuum valves performance on long venting lines so the valve does not add pressure drop to the vent system when in open phase.

The only way to do this is to lower the weight of the internal moving parts and introduce a magnet as a compensate for the missing weight to obtain the requested opening setting.

The design of a Vacuum-M valve has the benefit of all sides:

1. No pressure increases while if function. Complete flat rule curve adding no pressure when opening
2. Due to the magnet weight combination, the reseating is as close to the opening setting as possible.
3. Simple built-up construction
4. Easy to maintain in mint condition
5. Consist of fewer parts, fast to disassemble
6. All items are located inside the vacuum house, well protected
7. Existing PV-ECO, PV-VOC and HS-ISO vacuum valves can be upgraded.



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The VAC-M 2020 built-up

The construction is a built-up, where all the major part involved in the performance of the valve is located inside the valve house fully protected against seawater harsh environment.

The housing for the PV-ECO is made entirely out stainless steel.

The housing for the PV-VOC is made entirely out fabricated steel.

The housing for the HS-ISO is made entirely out casted material.

All houses can be upon request made of high-grade material like SAF2205 or further.

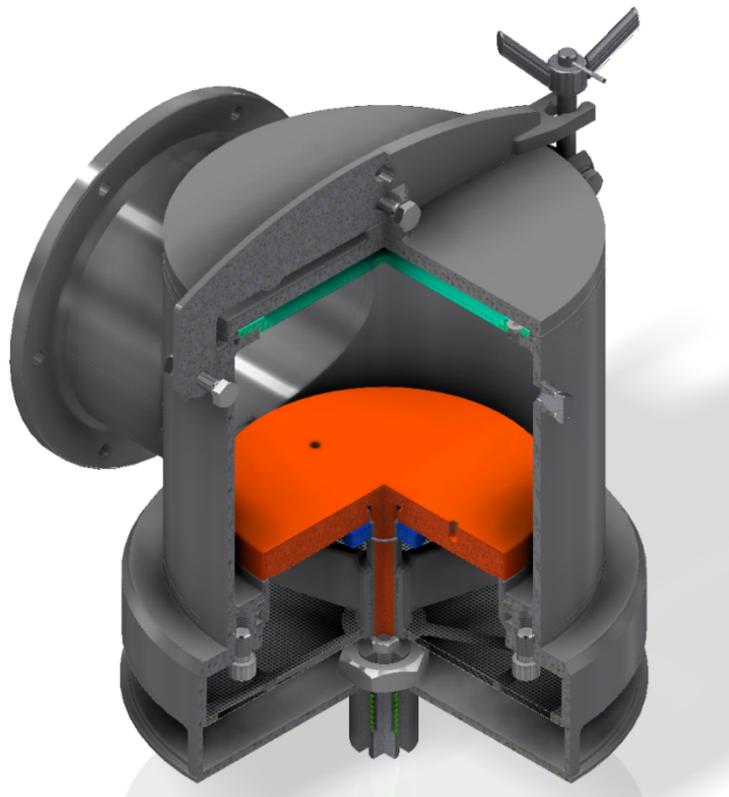
All inner parts seat and disk are made of high-grade stainless steel.

The magnet inside is a high-temperature resistant magnet encapsulated for the best protection.

The valve can be serviced from below or the top cover without dismantling the valve.

The flame screen below the valve is fully mechanical protected as required by IMO/MSC/Circ.677.

The design works perfectly and reduces pressure drop significantly. The design has been changed to fit our new PV-ECO and VOC valves as well as the existing HS-ISO valves.

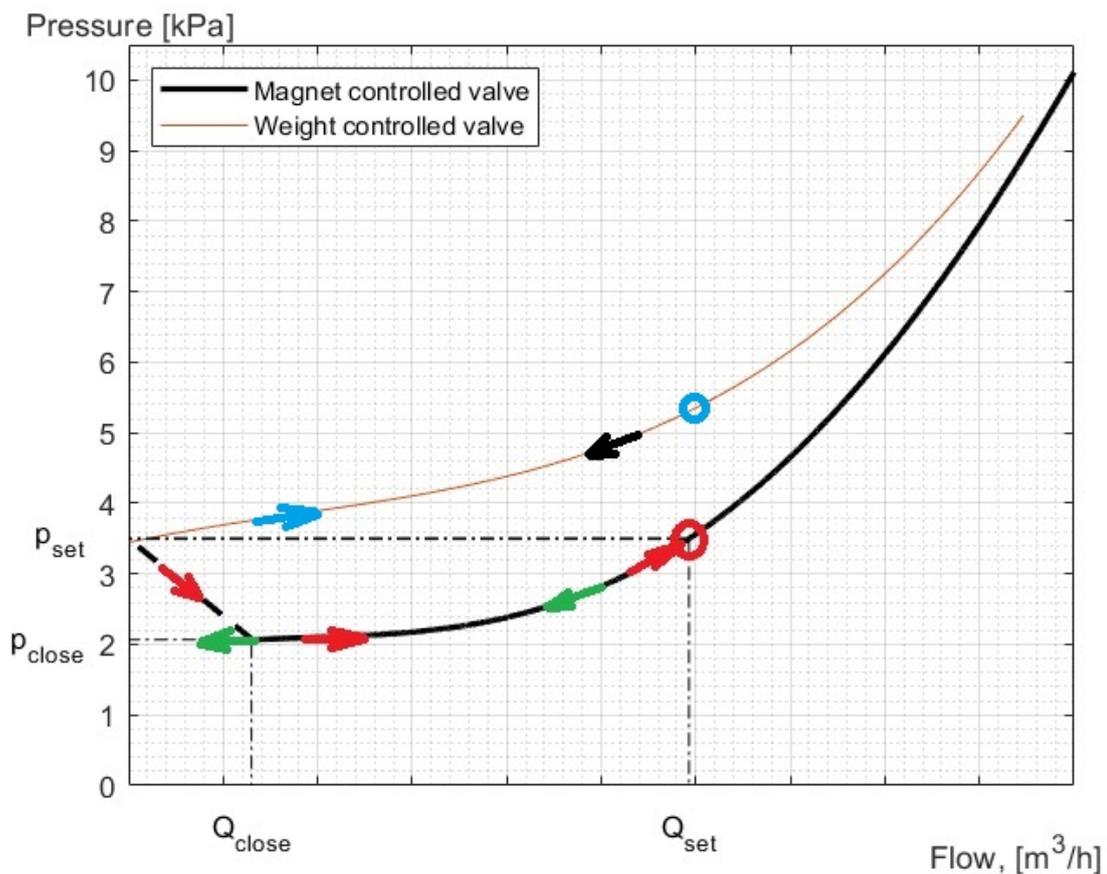


The VAC-M 2020 performance

The performance of the vacuum valve VAC-M equipped with a magnet is outlined below.

The characteristics of the flow performance displayed below clearly shows the influence of the Magnet compared to the weight solution.

- The red arrow describes the opening phase starting with an immediate pressure drop, slowing working up to the set pressure in fully open condition (the red circle).
- The green arrow describes the closing phase starting from full open (the red circle) closing along the parable 1.4kpa below opening setting.
- The opening phase of the weight loaded standard vacuum valve is described by the blue arrow with the blue circle describing when the weight loaded vacuum valve is fully open.
- The black arrow describes the closing phase of the weight loaded valve starting from fully open at the blue circle closing at the set pressure.



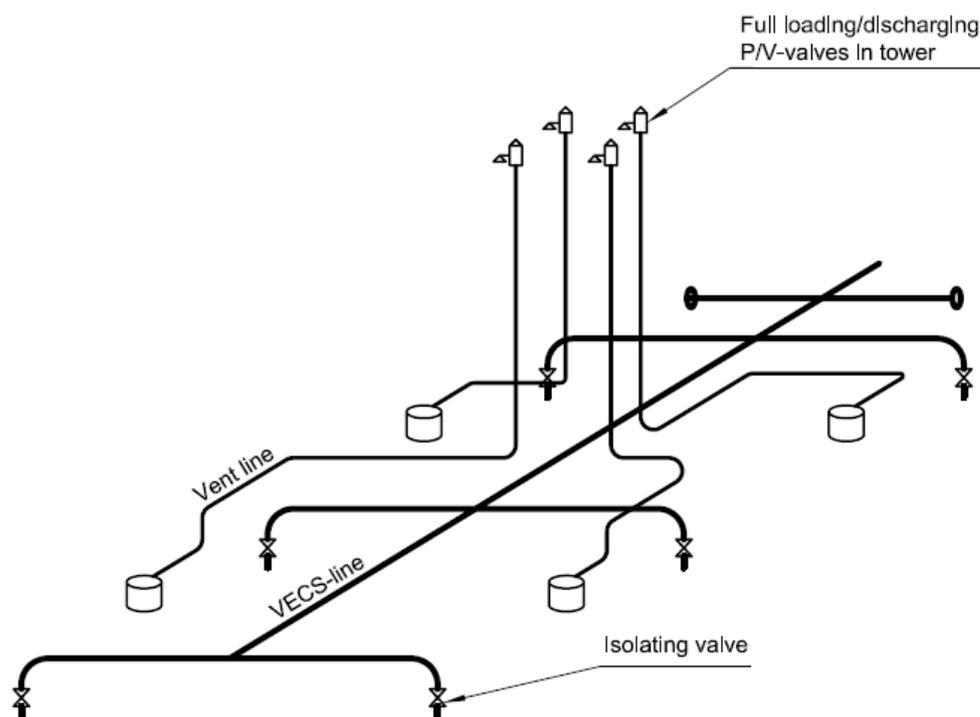
Recommendation

It is in the interest of all, that operating a vessel in this case a tanker is done in the utmost safety manner and that every means is done to ensure the safety of the crew, vessel and cargo.

A ship is operating under limitations set by the authorities and it is the responsibility of the manufacturer delivering equipment to the vessel, that the device is suitable according to the rules and regulation set for the vessel.

In the case of the vacuum valve, it is recommended to look at the vent pipe where the device is installed to evaluate if the upgrading/installation of the Pres-Vac vacuum-magnet valve is beneficial for the safety of the vessel.

If the vent pipe is long a pressure drop in the vent pipe is to be added to the pressure drop across the vacuum valve and if this can be reduced significantly by upgrading/installing the Pres-Vac vacuum valve of the magnetic type, then it is highly recommended to do so.



Please contact us should you need additional information or an offer for upgrading/installation of the vacuum-M valve designed by Pres-Vac Engineering A/S.