

FRATELLI



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**COSTRUZIONE ACCESSORI ENOLOGICI
CHIMICI - FARMACEUTICI
LATTIERO-CASEARI**

Bomporto, 24.11.2003

art. 25 LAVEGGI PRESSURE COMPENSATING VALVE

USE:

The Laveggi pressure compensating valve is a safety overpressure and depression valve for deposit tanks, in which liquids stagnate under normal pressure (atmospheric pressure). It hinders automatically the coming up of inadmissible overpressure or depression which can arise during filling or emptying or even as a consequence of an alteration of the volume of the stored liquid, caused by fluctuations of temperature. In other words, the tank breathes through this valve.

TECHNICAL CHARACTERISTICS:

The Laveggi pressure compensating valve is extremely sensitive. During the filling process and in case of volume increase of the content caused by variations of the temperature, the valve opens itself even with 2 cm column of water (0,002 bar) overpressure. While emptying or in case of volume reduction, the valve reacts at a depression of approximately 5 cm column of water (0,005 bar). At an overpressure or depression of about 10 cm column of water, the valve section is completely open. The opening immediately creates pressure compensation and guarantees safe protection of the tank against possible damage. Even human mistakes are eliminated beforehand in case of manually handled valves or lids.

The Laveggi pressure compensating valve is a very simple construction. It is made of a pressure and a vacuum part, both working separately. The use of a surface having a very tight seal, nearly excludes the risk of gluing or restraining, making maintenance of the valve almost unnecessary. A protection lid avoids dirt filtering from the outside. This lid can be removed and, if necessary, the essential parts can easily be taken off and cleaned. During the filling process, the liquid can easily flow without increasing the pressure.

MATERIALS:

The metallic components - springs and screws - are made of stainless steel 18/8 (AISI 304), while the other components are made of food corrosion

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resistant plastic with a constant temperature of 70°C and a fusion temperature of 115°C.

CONNECTION POSSIBILITIES WITH THE TANK:

The valve seat is provided with an internal thread Rd 78x1/6" DIN 405 allowing to screw it on any female union Ø 50 DIN 11851. By means of intermediate connections pieces exceeding Ø 50 the connection possibilities are unlimited. The connection possibilities of the Laveggi pressure compensating valve are numerous and easily adaptable to each type of tank (plastic material, steel, concrete). Moreover, the valve operates perfectly in any position.

CHARACTERISTICS OF THE FLOW:

It is important to underline that the quantity of liquid added to or taken out of the tank cannot exceed the quantity of air or gas introduced or let off through the pressure compensating valve. The decisive factor of the quantity of air or gas passing little by little through the valve is the difference of the internal and external pressure of the tank, normally corresponding to the atmospheric pressure. In case of a critical ratio of pressures and flow without leakage, the quantity flowing through the valve would be at the maximum. Generally the resistance of the tank offers a pressure difference tolerably inferior to the critical difference. But, as any other flow, the latter is characterized by leakage, therefore the maximum quantity is never achieved.

APPLICATION IN PRATICE:

A general idea of the application of the Laveggi pressure compensating valve is given by the example of a filling and emptying process of a tank having a flow speed of 2 m/s through a diameter section of Ø 100 and a maximum pressure load capacity of 0,5 kg/cm² (an overpressure of 500 cm) and of 0,01 kg/cm² (a depression of 10 cm).

1st FILLING:

At an overpressure of 0,5 kg/cm² the pressure compensating valve lets flow out 568,700 l/h of air. Approximately 56,000 l/h of liquid flow through the pipe Ø 100 at a speed of 2 m/s and enters the tank.

Therefore, the quantity of air flowing through the pressure compensating valve at an overpressure of 0,5 kg/cm² exceeds the quantity of liquid introduced into the tank. The ratio of the two figures 568,700 and 56,000 means that during the filling process the tank is protected ten times as much.

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2nd EMPTYING:

At a depression of 0,01 kg/cm² the pressure compensating valve lets flow through 113,400 l/h of air. At a speed of 2 m/s and a pipe Ø 100, 56,000 l/h of liquid leave the tank. The quantity of air flowing through the valve at a depression of 0,01 kg/cm² into the tank is much higher than the quantity of liquid flowing out of the tank.

The ratio of the two figures 113,400 and 56,000 means that during the emptying process the tank is protected twice. The example shows that the starting point of each operation lies in the capacity per hour of the pump used for the filling and emptying process of the tank. The example demonstrates that the Laveggi pressure compensating valve is able to overcome all technological problems of modern wineries .