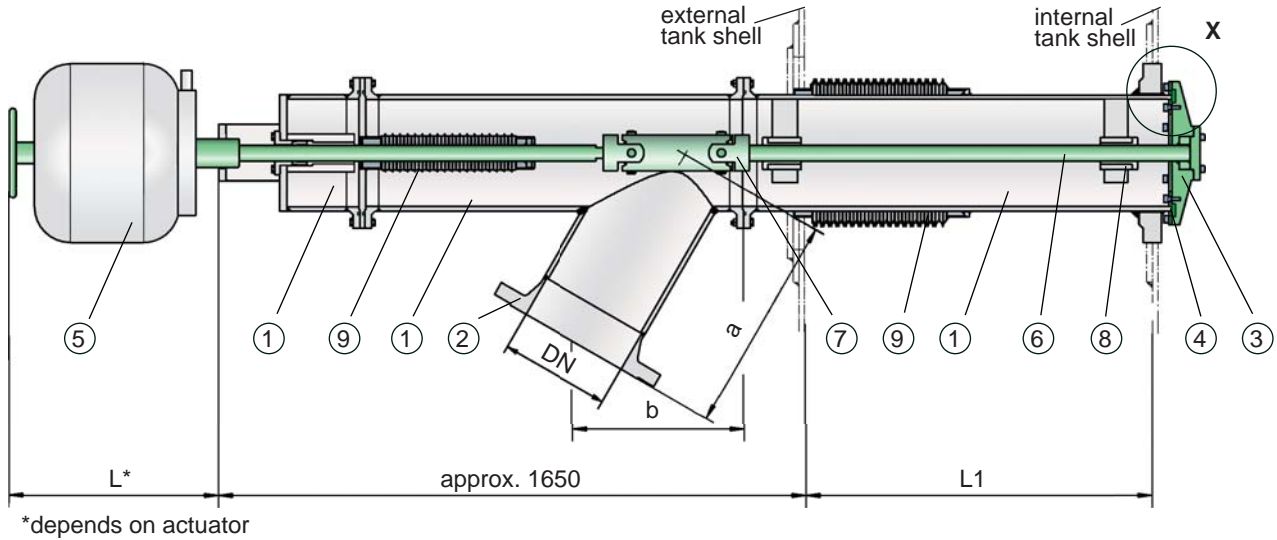




In-tank Valve

Internal Safety Valve

PROTEGO® SI/DP



Function and Description

PROTEGO® SI/DP in-tank valves are used as additional shut-off valves for full containment tank systems, e.g. for storing liquefied gases, cryogenic gases, other low temperature products or chemicals.

Generally a gate valve that is supplied by the user and serves for normal operation is connected to the external nozzle of the housing. During normal operation, the valves are kept in the open position. It is only closed in case of emergency or for necessary repairs to the gate valve.

The key feature of these valve devices is the actual shut-off element that is located inside the tank.

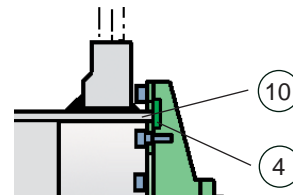
The internal safety valve consists of three housing parts (1) with lateral connecting nozzle (2) for installation of pipeline, valve cone (3) with sealing (4) and pneumatic actuator (5). Required tightness (refer to detail X) is guaranteed by grounded valve seat (10) and gasket. Bushings (8) guide the split valve spindle (6), which is equipped with double Cardan joint (7). Two compensators (9) are provided to support the length modification resulting from temperature variations.

The in-tank valve is operated / opened by a pneumatic actuator. The necessary force for closing the valve is generated by compression springs of adequate size built into the actuator. The controls must be designed in such a way that in the event of any fault, e.g. loss of control media (compressed air for the actuator and/or electrical power for the 3-way solenoid valve), the internal safety valve automatically closes tight.

By attaching an additional component the in-tank valve can also be operated, e.g. opened and closed, via a hand wheel. This attachment needs to be removed for the valve to operate automatically.

Type SI/DP by PROTEGO® is available in a range of nominal sizes. Optionally, the internal safety valve can be equipped with an internal nozzle to connect to a suction and filling pipe or a swing pipe system.

Detail X





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In-Tank Valves

Designs and Specifications

| Table 1: Dimensions | | Dimensions in mm / inches | |
|---------------------|-------------|---------------------------|--|
| DN | a | b | |
| 150 / 6" | 300 / 11.81 | 350 / 13.78 | |
| 200 / 8" | 400 / 15.75 | 400 / 15.75 | |
| 250 / 10" | 500 / 19.68 | 450 / 17.72 | |
| 300 / 12" | 600 / 23.62 | 500 / 19.68 | |

| Table 2: Materialselection | |
|----------------------------|-----------------|
| Design | A |
| Housing | Stainless Steel |
| Valve disc | Stainless Steel |
| Valve spindle | Stainless Steel |
| Spindle sealing | PTFE |
| Bushing | PTFE |
| O-rings | PTFE |

| Table 3: Flange connection type DN | |
|------------------------------------|--------------------------|
| EN 1092-1, Form B1 | other types upon request |
| ASME B16.5; 150 lbs RFSF | |

Selection and Design

Together with the customer our engineers design and specify the valve for each specific application. The relevant plant specifications are taken into account when defining the required nominal sizes and connection types. Also the operating temperature and resulting special operating conditions may require special materials. The mounting flange material must be compatible with the tank material. If there are special requirements for the valve or operating parameters please contact us: If necessary we will arrange for special designs.

Necessary Data for Specification

Stored medium

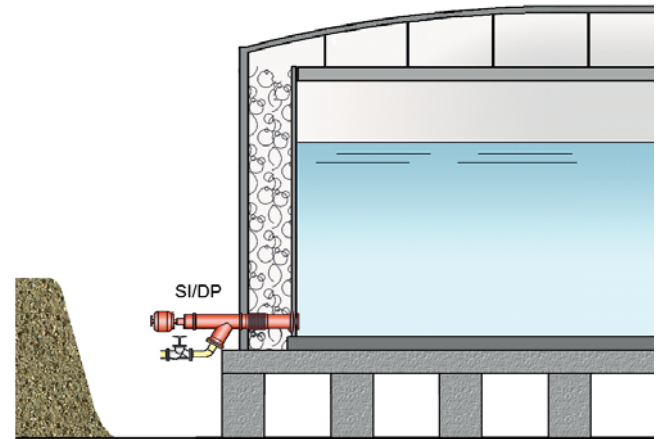
Tank height/Tank diameter (m or ft)

Jacket space L1

Tank material

Connection diameter of drain pipe, DN (mm or inch)

Application Example



In-tank valve PROTEGO® SI/DP for a full containment tank system as per API 625.