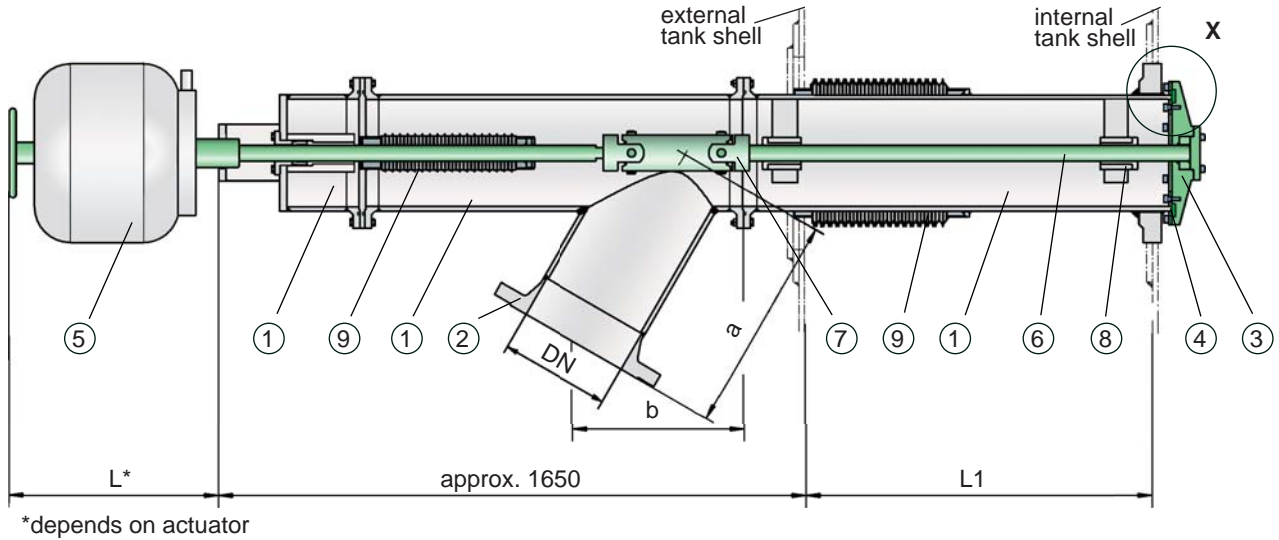




In-tank Valve

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. The in-tank valve is kept open under normal operating conditions. It is only closed for longer shut-downs, 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 advantage of this valve design is that it prevents any leakage from the tank in the event of any external parts of the assembly getting damaged. It also means that maintenance work can be carried out on the actuator without any need to dismantle the pipeline or empty the tank. We recommend to use bottom drain valve PROTEGO® NB/AP for emptying the tank completely.

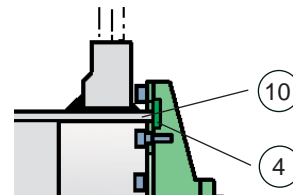
The internal safety valve mainly consists of three housing parts (1) with lateral connecting nozzle (2) for installation of pipeline, valve cone (3) with sealing (4) and pneumatic actuator (5). Required tightness (refer to detail X) is guaranteed by grounded valve seat (10) and gasket. Bushings (8) guide 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 simple pneumatic actuator. The necessary force for closing the valve is generated by compression springs of adequate size built into the actuator. This closing force is assisted further by the column of liquid in the tank, which presses onto the valve cone. The controls are 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



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

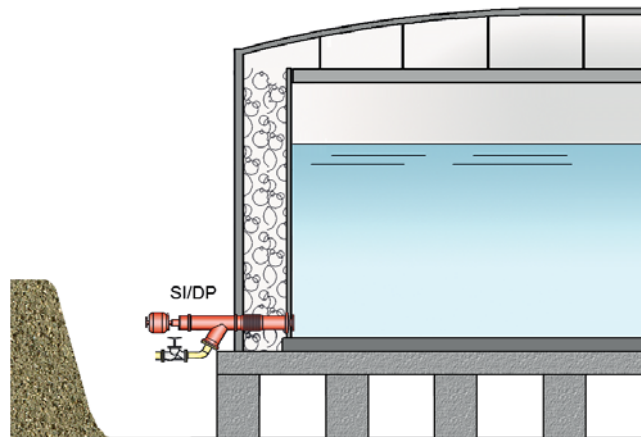
Tank height/Tank diameter (m or ft)

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.



for safety and environment