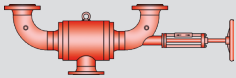
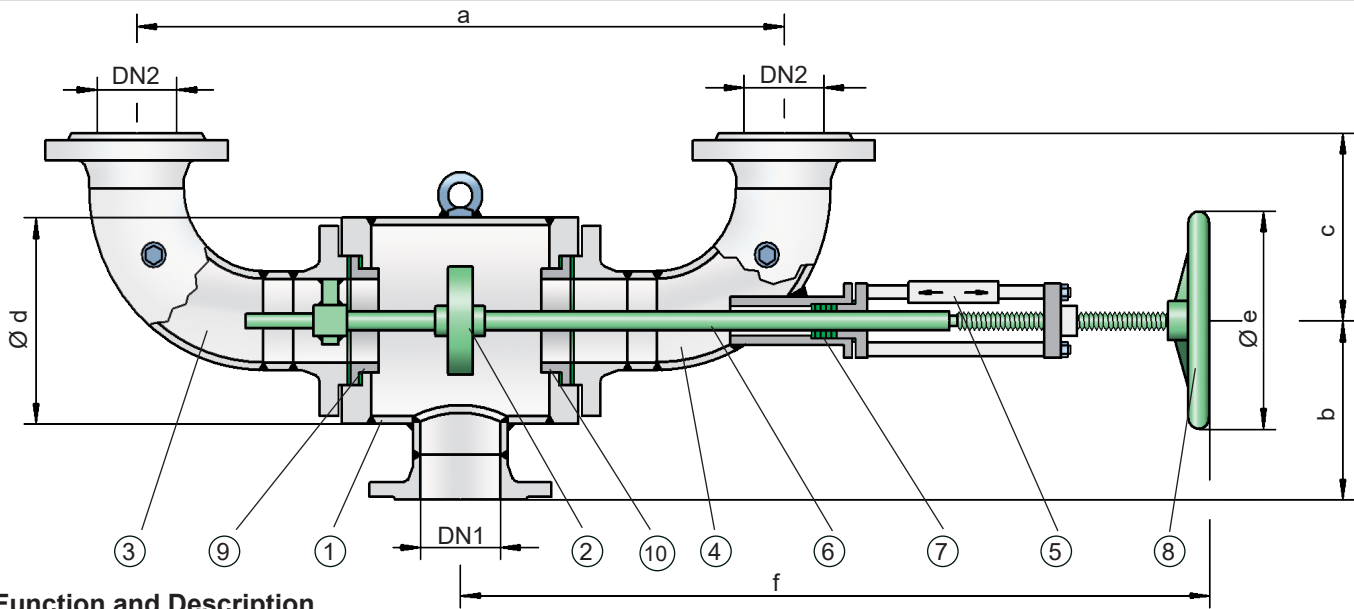


Change-over Valve



PROTEGO® WV/T



Function and Description

PROTEGO® WV/T change-over valves are mainly used together with other valves or safety devices (e.g., PROTEGO® flame arresters) on cryogenic storage tanks and on tanks in process plants in the chemical, petrochemical, and pharmaceutical industries. They increase the operational safety of the equipment to be protected, as each valve or safety device can be checked, maintained, or repaired without interrupting plant operation.

The valves mainly consist of the housing (1) with flange connections DN 1 and two lateral connection elbows (3, 4) with flange connections DN 2 and the valve disc (2). If necessary, it is possible to off-set and turn the connection elbows. The valve seats (9, 10) are replaceable. The valve disc with metallic sealing surface is movable on the valve spindle (6). This ensures good contact pressure with the valve seats (9, 10) even with high temperature differences. The sealing between the valve disc and valve spindle is done by an O-ring. The valve spindle is guided by bushings and sealed to the outside by an adjustable sealing set (7).

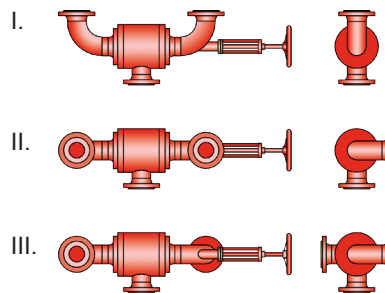
The change-over valve allows the operator to block one valve or safety device at a time by operating the hand wheel (8). In normal operation, the valve disc (2) is in middle position and the gas/liquid flows through both connection elbows. By turning the hand wheel as far as it will go, one of the connecting elbows (3 or 4) is closed while the other one remains open. The actual position of the valve disc is indicated by the position indicator (5) on the valve spindle.

Depending on the requirements, the position of the change-over valve in normal operation can be in the middle or end position: Middle position, for example, is if a high capacity of relief is required through emergency relief valves controlled in parallel. End position, for example, is with flame arresters that are connected in parallel and can be used or cleaned alternately.

Due to their design and appropriately selected materials, the valves are characterized by their high functional reliability and very good flow rates. All elements are made of stainless steel.

The design of the PROTEGO® WV/T change-over valves allows the following connections to be made in accordance with the variable valve position or other safety devices with both angle or straight connections without additional fittings

Positions of nozzles



resistance coefficient $\zeta = 1,2$ if valve is in the middle position
 $\zeta = 2,6$ if valve closed on one side

PROTEGO® WV/T change-over valves are characterized by their simple design, easy handling, the option of quick replacement of components that affect the function, and by their excellent availability and operational reliability. The lapped metallic sealing surfaces ensure a high degree of tightness even in low temperature ranges.

These valves are not flame-proof and do not fall within the scope of the European Explosion Protection Directive 94/9/EC, even if installed in explosive atmospheres.

Based on a hazard analysis with regard to material selection and function, the valves have no potential ignition sources. This enables unrestricted use in potentially explosive areas.

Design Types and Specifications

For special operating conditions, special heatable designs must be used:

- for products which crystallize or tend to form deposits that negatively affect the function
- when used under extreme weather conditions in winter (frost), when there is the possibility that warm product vapors condensate and freeze in the supercooled valve and ice can build up, blocking the valve discs

Table 1: Dimensions					Dimensions in mm / inches		
DN1	80 / 3"	100 / 4"	150 / 6"	200 / 8"	200 / 8"	250 / 10"	300 / 12"
DN2	80 / 3"	100 / 4"	150 / 6"	150 / 6"	200 / 8"	250 / 10"	300 / 12"
a	780 / 30.71	780 / 30.71	960 / 37.80	960 / 37.80	1130 / 46.12	1450 / 57.09	1650 / 64.96
b	250 / 9.84	250 / 9.84	310 / 12.20	310 / 12.20	330 / 13.47	360 / 14.17	415 / 16.34
c *	303 / 11.93	205 / 8.07	285 / 11.22	285 / 11.22	367 / 14.98	450 / 17.72	525 / 20.67
c**	323 / 12.72	230 / 9.06	317 / 12.48	317 / 12.48	407 / 16.02	483 / 19.01	571 / 22.48
d	273 / 10.75	273 / 10.75	324 / 12.76	324 / 12.76	355 / 14.49	457 / 17.99	500 / 19.68
e	250 / 9.84	250 / 9.84	250 / 9.84	250 / 9.84	400 / 16.33	400 / 15.75	500 / 19.68
f	905 / 35.63	905 / 35.63	1070 / 42.13	1070 / 42.13	1200 / 47.24	1530 / 60.24	1655 / 59.65
f _{min}	810 / 31.89	810 / 31.89	950 / 37.40	950 / 37.40	1080 / 42.52	1360 / 53.54	1470 / 57.87
f _{max}	995 / 39.17	995 / 39.17	1190 / 46.85	1190 / 46.85	1310 / 53.47	1695 / 66.73	2015 / 79.33

* for connection flange DIN PN16 resp. from DN 200 to DIN PN 10

** for connection flange ANSI 150 lbs.

Table 2: Material selection		
Design	A	B
Housing and connection elbows	Steel	Stainless Steel
Valve disc	Hastelloy	Hastelloy
Packing	PTFE	PTFE
Spindle sealing	FPM	FPM
Handwheel	Steel	Steel

The connection flange material must be compatible with the material of the plant component. Special versions are available for special requirements.

Table 3: Flange connection type DN	
EN 1092-1, Form B1	Other types upon request.
ASME B16.5 CL 150 R.F.	

Selection and Design

Together with our engineers, the valve is designed for each specific application. The relevant plant specifications are considered when defining the required nominal sizes and connection types. The maximum allowable operating temperature for standard valves is +200°C/392°F at a maximum allowable operating pressure of 0,5 bar/7.25 psi (special version up to 6 bar/87 psi possible). The device must have sufficient corrosion resistance to the stored substance. If necessary, designs in special stainless steel quality should be selected.

Necessary Data for Specification

- Stored substance
- Service temperature (°C or °F)
- Operating pressure (bar or psi)
- Tank material
- Tank nozzle DN1 (mm or inches)
- Tank nozzle DN2 (mm or inches)
- Position of nozzle I, II or III

