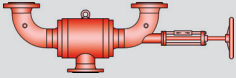
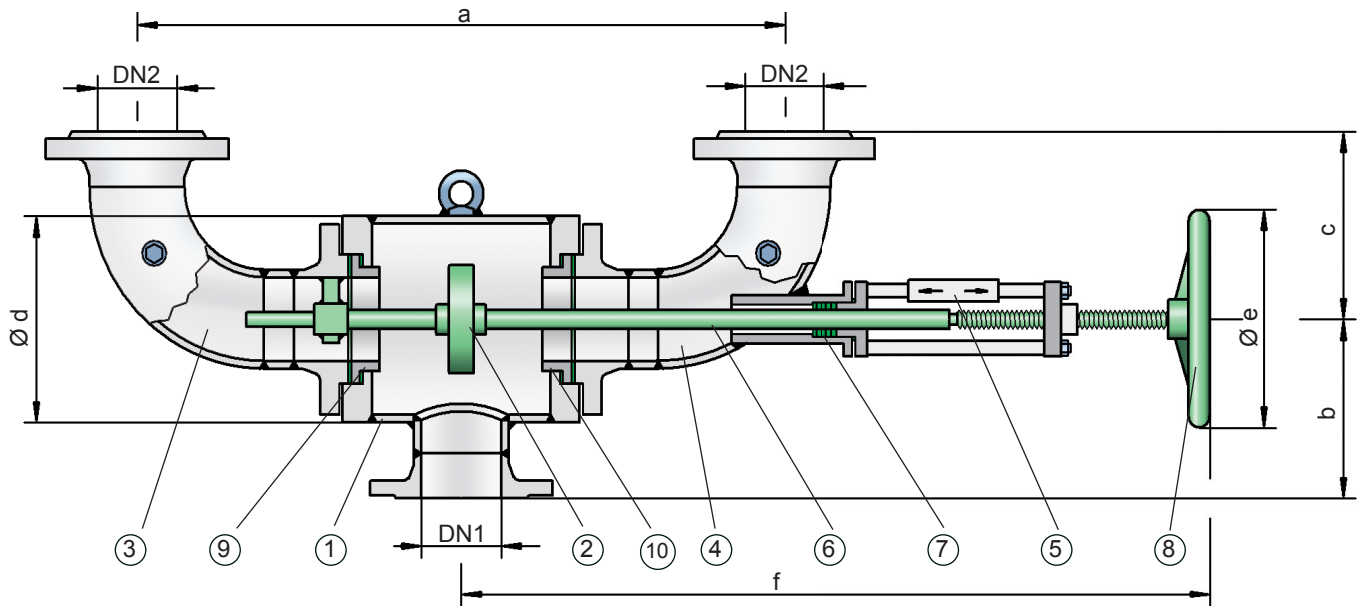


## Change-Over Valve



### PROTEGO® WV/T



#### Function and Description

PROTEGO® change-over valves type WV/T 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 of chemical, petrochemical and pharmaceutical industries. They increase the operating safety of the technical equipment to be protected because each valve or safety device can be checked, maintained or repaired without any service break-down.

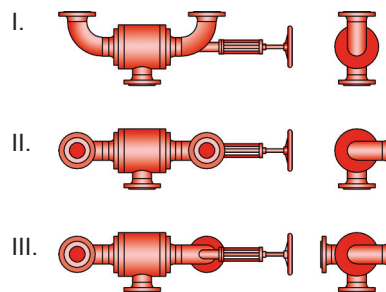
The valves mainly consist of housing (1) with flange connections DN 1 and two lateral connection elbows (3, 4) with flange connections DN 2 and the valve disc (2). If necessary it is possible to displace and turn the connection elbows. The valve seats (9, 10) are replaceable. The valve disc with metallic sealing surface is movable on the valve spindle (6). This ensures good adjustment to the valve seats even with high temperature differences. The sealing between valve disc and valve spindle is provided by an O-ring. The valve spindle is guided by bearing bushings; to the outside it is sealed by an adjustable packing (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 is in central position and the gas/liquid flows through the two connection elbows. By turning the hand wheel to the stop, one of the connection elbows (3 or 4) is blocked while the other one remains open. The actual position of the valve disc can be identified from the position indicator (5) displayed on the valve spindle.

Due to their design and appropriately selected materials the valves are distinguished by their high functional safety and very good flow rates. All elements that affect the function are made out of stainless steel.

Because of the variable nozzle positions the design of the PROTEGO® change-over valves WV/T facilitates connection of valves or other safety devices both with angle or straight through connection without additional adaptors.

#### Positions of nozzles



drag coefficient  $\zeta = 1,2$  for valve in center position  
 $\zeta = 2,6$  if one side of valve closed

Change-over valves of type WV/T stand out by their simple design, easy handling, the option of quick replacement of components that effect the function and consequently 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 transmission proof and do not refer to the European Explosion Protection Directive 94/9/EC, even if installed in explosive atmospheres.

A hazard analysis (which considers the material selection and function of the device) shows that the device doesn't have any potential sources of ignition.

## Design Types and Specifications

Special devices in heatable design can be used under specific operating conditions:

- with crystallizing products or products which tend to form deposits that affect the function
- in use under extreme weather conditions in winter (frost), when product vapour might condensate in the undercooled valve, so ice bridges could develop, which could probably block the valve disc

**Table 1: Dimensions**

Dimensions in mm / inches

	80 / 3"	100 / 4"	150 / 6"	200 / 8"	200 / 8"	250 / 10"
DN1	80 / 3"	100 / 4"	150 / 6"	200 / 8"	200 / 8"	250 / 10"
DN2	80 / 3"	100 / 4"	150 / 6"	150 / 6"	200 / 8"	250 / 10"
a	780 / 30.71	780 / 30.71	960 / 37.80	960 / 37.80	1130 / 46.12	1450 / 57.09
b	250 / 9.84	250 / 9.84	310 / 12.20	310 / 12.20	330 / 13.47	360 / 14.17
c *	303 / 11.93	205 / 8.07	285 / 11.22	285 / 11.22	367 / 14.98	450 / 17.72
d	273 / 10.75	273 / 10.75	324 / 12.76	324 / 12.76	355 / 14.49	457 / 17.99
e	250 / 9.84	250 / 9.84	250 / 9.84	250 / 9.84	400 / 16.33	400 / 15.75
f	905 / 35.63	905 / 35.63	1070 / 42.13	1070 / 42.13	1195 / 48.78	1515 / 59.65
f <sub>min</sub>	810 / 31.89	810 / 31.89	950 / 37.40	950 / 37.40	1170 / 47.76	1360 / 53.54
f <sub>max</sub>	995 / 39.17	995 / 39.17	1190 / 46.85	1190 / 46.85	1310 / 53.47	1695 / 66.73

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

**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 to the material of the plant component. Special models of change-over valves are available for specific requirements.

**Table 3: Flange connection type**

EN 1092-1, Form B1 or DIN 2501, Form C, PN 16; from DN 200 PN 10	EN or DIN	other types upon request
ANSI 150 lbs RFSF	ANSI	

### Selection and Design

Together with the customer our engineers design and specify the valve for the specific case. The relevant plant specification is taken into account when defining the required nominal sizes and connection types. In standard versions the maximum allowable service temperature is +200°C / 392°F under a maximum allowable operating pressure of 6 bar / 87 psi. The device must have sufficient corrosion resistance with regard to the media to be stored or transported. If necessary, designs in special stainless steel quality should be selected.

### Necessary Data for Specification

- Stored medium
- 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



for safety and environment