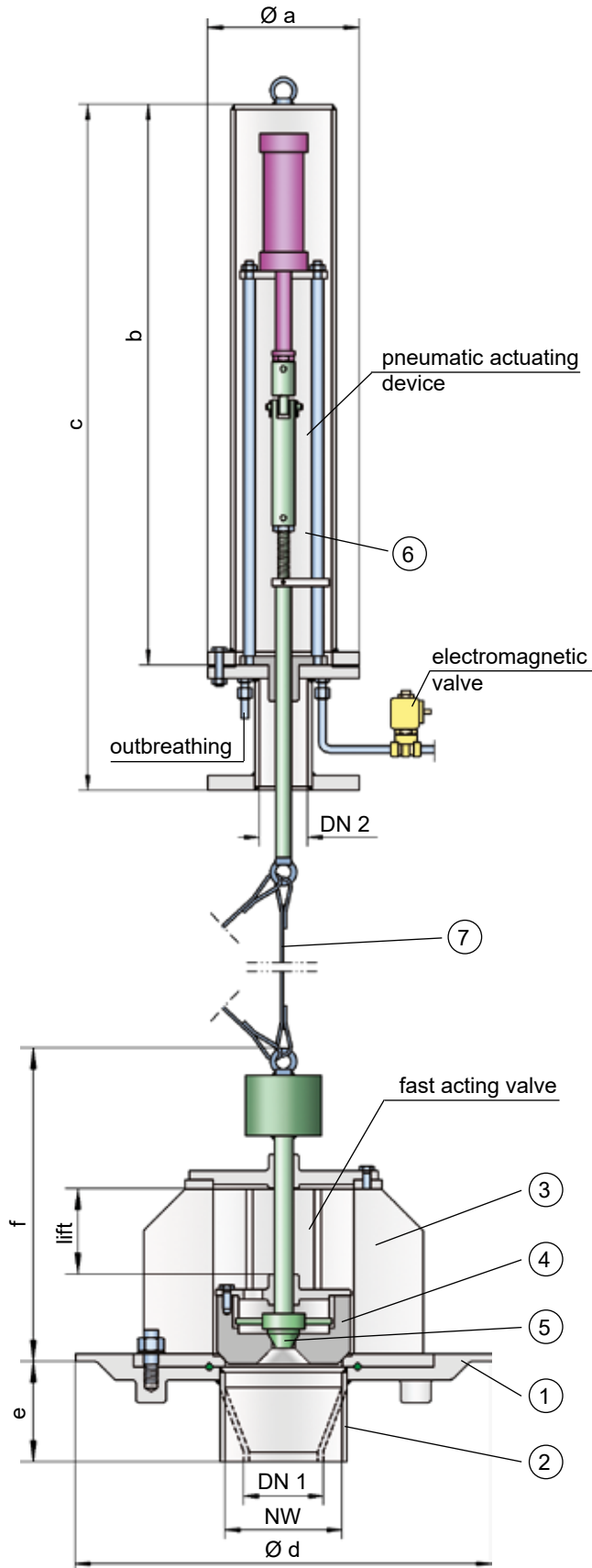




# In-tank Valve with Pneumatic Actuator

## PROTEGO® NB/AP



### Function and Description

PROTEGO® NB/AP in-tank valves are used in storage tanks for cryogenic liquids in order to seal off discharge lines in the event of an accident or emergency (pipe bursting). These devices meet the requirements of API 625.

The device consists of the bottom plate (1) which has to be welded onto the vessel bottom; a nozzle (2) which has to be welded to the discharge line; the flanged fast-acting valve (3) with valve piston (4) and release valve cone (5); and the complete pneumatic actuating device (6) which is mounted onto the roof of the tank. The required tightness is ensured by a lapped metallic valve pallet and relief valve cone.

The quick-release valve (3) and the actuating system (6) are connected by an actuator cable (7). An additional emergency cable enables the quick-release valve to be opened if the main actuator rope is damaged.

During normal operation, a pneumatic cylinder holds the valves in the open position. The pneumatic cylinder is actuated by a control line to lift the valve piston. The bottom valve is only closed in an emergency. In the event of an energy drop, the valve piston, due to its own weight, falls onto the valve seat which closes the bottom valve. (fail safe concept).

The valve design is independent of the nominal size. The nominal size DN 1 is determined by the nominal size of discharge line.

Material selection depends on the substance and the operating temperature.

If fast acting valve is open, resistance coefficient is 1.5.



## Design Types and Specifications

Table 1: Dimensions									Dimensions in mm / inches
NW	DN 1	DN 2	a	b	c	d	e	f	Hub
150 / 6"	100 / 4"	80 / 3"	200 / 7.87	1130 / 44.49	1430 / 56.30	550 / 21.65	155 / 6.10	465 / 18.31	160 / 6.30
150 / 6"	150 / 6"	80 / 3"	200 / 7.87	1130 / 44.49	1430 / 56.30	550 / 21.65	175 / 6.89	465 / 18.31	160 / 6.30
200 / 8"	200 / 8"	80 / 3"	200 / 7.87	1130 / 44.49	1430 / 56.30	600 / 23.62	175 / 6.89	470 / 18.50	160 / 6.30
250 / 10"	250 / 10"	80 / 3"	200 / 7.87	1130 / 44.49	1430 / 56.30	740 / 29.13	175 / 6.89	485 / 19.09	160 / 6.30

Table 2: Material of fast action bottom drain valve		
Bottom plate with nozzle	*	
Valve housing with valve cone	Stainless Steel	
Sealing ring	*	* Upon request.
Actuator rope	Stainless Steel	

Table 3: Material of actuating device	
Housing	Stainless Steel
Actuator spindle	Stainless Steel
Guide bushing	Brass
Seal	PTFE
Protective cap	Stainless Steel
Pneumatic cylinder	Aluminum

Table 4: Flange connection type DN 2
EN 1092-1, Form B, PN 40 or upon request.

### Selection and Design

The main process data and product properties of the stored substance, as well as the temperature of the stored substance, determine the material for the specific valve. Subsequently, the **nominal diameter** and the **type of connection** are checked and selected.

The in-tank valve is available in nominal sizes of DN 100/4" to DN 250/10", where the connection for the pneumatic actuating device has a nominal size of DN 80/3".

The length of the actuator cable and of the emergency cable is determined by the tank height. The final adjustment is completed during installation.

The standard material of the bottom plate is stainless steel. Other materials are available upon request.

The position is indicated by inductive proximity switches. The control and regulating valves can be designed and provided upon customer request.

### Necessary Data for Specification

- Stored substance
- Operating temperature T (°C or °F)
- Operating pressure p (bar or psi)
- Connection size DN 1
- Tank height (m or ft)

### Application Example

