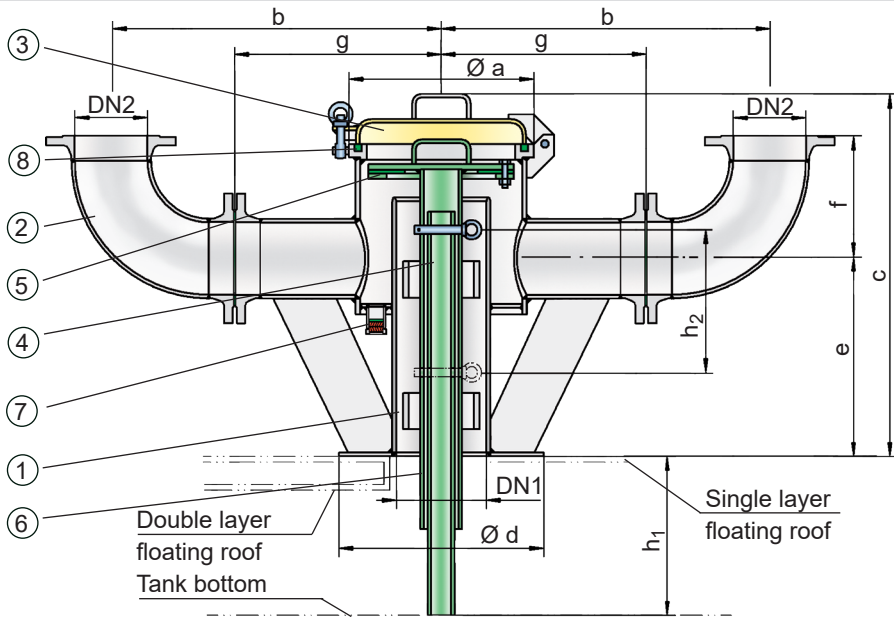
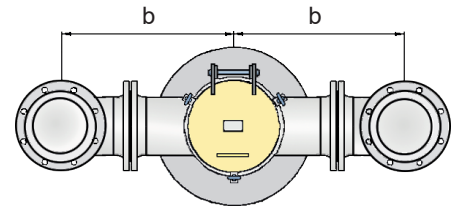


## Vent Valve, Lift-actuated

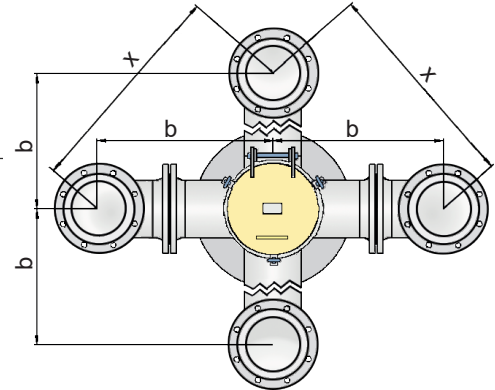
### PROTEGO® AL-DK-D



Top view AL-DK-D



Top view AL-DK-D-4



#### Function and Description

PROTEGO® lift-actuated vent valves type AL-DK-D provide automatic venting of floating roof tanks when the floating roof is lowered onto its supports and the tank is either drained or refilled. When the floating roof is in its lowest position, the valve is forced to open through lift actuation, which prevents inadmissible vacuum during final draining or inadmissible pressure during refilling.

Lift-actuated vent valves PROTEGO® AL-DK-D can be combined with atmospherically deflagration-proof and endurance burning-proof vent caps.

The PROTEGO® AL-DK-D valve consists of a housing (1) with a sheet metal panel to be welded onto the floating roof or a flange for mounting on a mating flange, two or four flanged connection nozzles (2) for installation of vent caps, cover (3), lift (4) including valve disc (5), lift pipe (6), and the condensate drain valve (7) which can be designed to be flame transmission proof. The condensate drain is sealed by a flat gasket attached to the valve disk (5). The cover (3) is sealed by a sealing cord (8).

As the lowest position of the floating roof varies for operation and assembly, specify the dimensions  $h_1$  and  $h_2$ :

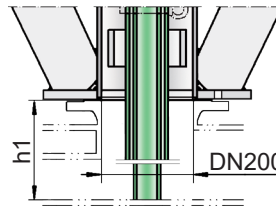
$h_1$ : Distance between the lower edge of the connection of the equipment and the tank bottom at the lowest level of the floating roof in the operating position (operating position with an empty tank).

$h_2$ : Distance between the lowest level of the floating roof in the maintenance position and the lowest level of the floating roof in the operating position (operating position with an empty tank).

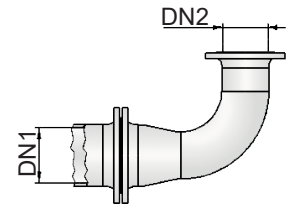
If the floating roof supports are changed from operating position to maintenance position, the lift has to be extended as well. This is done with an adjustable locking pin that is secured with a split pin.

The valve is not flame transmission proof.

Screwed version



Version with reducer



Based on a hazard analysis with regard to material selection and function, the valves have no potential ignition sources. As a result, they are not subject to the European Explosion Protection Directive (ATEX) when used in explosive atmospheres.

#### Special Features and Advantages

- the device is used for automatic venting and breathing of floating roof tanks in the low position of the floating roof
- robust construction and therefore long lifetime
- when converting from operating to maintenance position, the lift pipe must be extended; adjustment is made by means of an adjustment option using a locking pin
- the valve is not flame transmission proof
- depending on requirements, two or four deflagration- and endurance burning-proof atmospheric flame arresters can be installed

## Designs and Specifications

Two designs are available:

Vent valve with two connections

**AL-DK-D**

Vent valve with four connections

**AL-DK-D-4**

Tabelle 1: Maßtabelle			Dimensions in mm / inches	
	AL-DK-D		AL-DK-D-4	
DN1	200 / 8"	200 / 8"	200 / 8"	200 / 8"
DN2*	150 / 6"	200 / 8"	150 / 6"	200 / 8"
a	350 / 13.78	350 / 13.78	350 / 13.78	350 / 13.78
b*	905 - 1580 / 35.63 - 62.02	830 - 1580 / 32.68 - 62.02	689 - 1950 / 27.13 - 76.77	689 - 1950 / 27.13 - 76.77
c	870 / 34.25	870 / 34.25	870 / 34.25	870 / 34.25
d	600 / 23.62	600 / 23.62	600 / 23.62	600 / 23.62
e	415 / 16.34	415 / 16.34	415 / 16.34	415 / 16.34
f	370 / 14.57	370 / 14.57	370 / 14.57	370 / 14.57
g	460 / 18.11	460 / 18.11	460 / 18.11	460 / 18.11
x*			974-1950 / 38.35-76.77	974-1950 / 38.35-76.77
Weight (kg)*	max. 254	max. 277	max. 392	max. 489

\* The dimensions and weight vary depending on the type of endurance burning flame arrester.

**Table 2: Material**

Housing	Steel	Special materials upon request.
Valve guide	Stainless Steel	
Gasket	FPM	

**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

The required amount and nominal size DN is determined based on the calculated flow rate from the thermal venting and pump rate in lowest floating roof position (Nm<sup>3</sup>/h or CFH) and on the maximum acceptable tank pressure  $p_T$  (mbar / inch W.C.) according to the flow capacity charts. Special designs are available upon request.

Flow rates and pressure losses of vent caps PROTEGO® EB or PROTEGO® BE/HR-400 have to also considered according to the appropriate charts in the relevant data sheets.

## Necessary Data for Specification

Stored product

Tank diameter (m or ft)

Tank height (m or ft)

Support height  $h_1$  (operating position with empty tank)

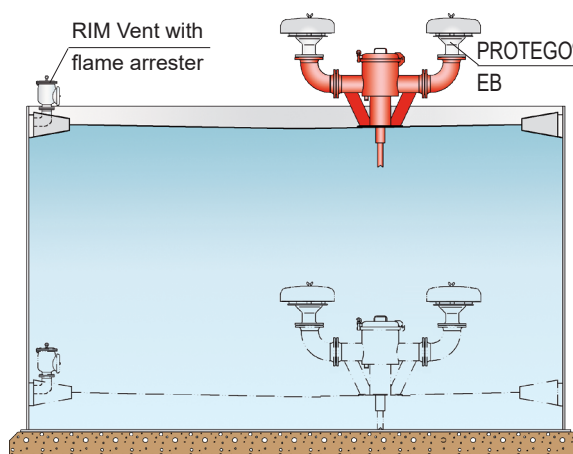
Support height  $h_2$  (lifted assembly position)

Maximum allowable tank pressure  $p_T$  (mbar or inch W.C.)

Pump rate (m<sup>3</sup>/h or CFH)

## Application Examples

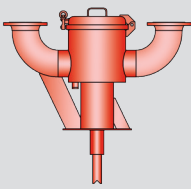
Lift-actuated vent valves PROTEGO® AL-DK-D can be combined with vent caps PROTEGO® BE/HR-400 or PROTEGO® EB which are deflagration-proof and endurance burning-proof.



The applicable data sheets are available in Sec. 2 "Deflagration Flame Arresters, End-of-Line and Vent Caps".



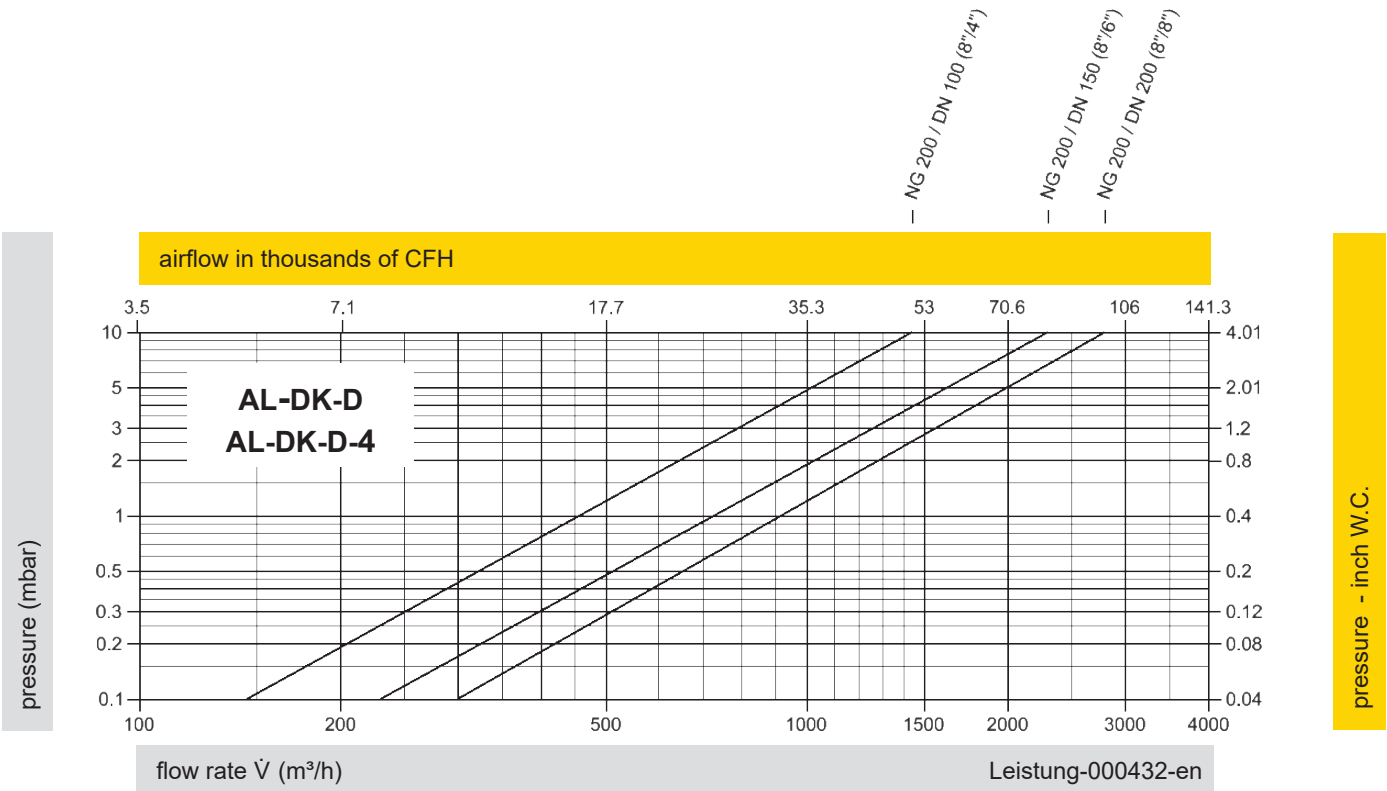
for safety and environment



# Vent Valve, Lift-actuated

## Flow Capacity Chart

### PROTEGO® AL-DK-D-200-DN(-4)



The flow capacity charts have been determined with a calibrated and TÜV certified flow capacity test rig. Volume flow  $\dot{V}$  in (m³/h) and CFH refer to the standard reference conditions of air in ISO 6358 (20°C, 1bar). For conversion to other densities and temperatures, refer to Sec. 1: "Technical Fundamentals."