Protective solutions

Applications

The blast valve PV-KK-SM/-SMX is an application of the PV-KK blast valve for mounting on blast resistant wall surface or between ducts. It is specifically designed for installation in existing buildings where casting of the valve frame in concrete is not possible. The valve is also applicable to industrial applications with risk of chemical and dust explosions.

The PV-KK-SM/-SMX blast valve is available in single-column configurations of 1 to 6 valve blocks in a standard frame. Multi-column versions are described in a separate document. Contact the manufacturer for the availability of frames with custom dimensions

The number of blocks in valve depends on the air flow requirement at desired pressure drop. When the valve dimensions do not match the opening to be covered, custom made adaptors are available.

Specification

Manufacturer of PV-KK-SM and PV-KK-SMX blast valves is Temet Oy, Helsinki Finland.
The PV-KK-SM/-SMX blast valve block comprises three spring balanced closing elements moving in a slot and closing the air passage against the valve seats in response to both positive and negative (suction) phase of the blast. The valve blocks are mounted in structural steel frames.

PV-KK-SM

The valve is completely corrosion resistant. The valve closing elements are made of special non-corroding aluminum alloy, all springs are made of stainless steel, and the valve body and frame made of structural steel are hot dip galvanized.

PV-KK-SMX

All the components of the valve are made of acid-proof steel. The version is especially designed for off-shore and other marine applications

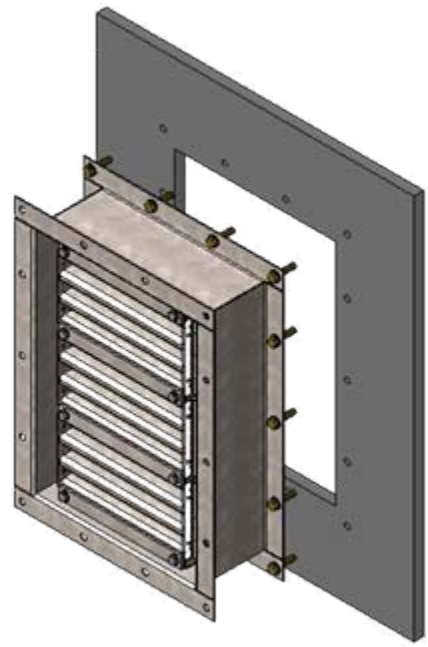
Design Criteria

The PV-KK-SM/-SMX blast valve is designed for a maximum long duration blast load with 100 kPa (1.0 bar) reflected peak pressure. The valve is tested with pressure waves having a finite rise time thus simulating hydrocarbon or dust explosions.

Test and Performance Data

The valve is verified by tests to effectively attenuate slowly rising (rise time = 10…100 ms) long duration (peak duration > 1000 ms) pressure wave loads within the load range up to 100 kPa (1.0 bar).

The valve is designed to function within the operating temperature range of -20…+200ºC.



Test Reports

VTT type test report and additional test data is available upon request.

Installation Alternatives

The valve is designed to be installed primarily onto the blast side of the blast resistant wall. The valve can be in upright or horizontal position or on ceiling/floor.
The valve is installed on a concrete wall by means of anchor bolts of type HILTI HSA M12 x 100. On a steel wall the valve can be installed by welding or bolting using M12 machine bolts.
When welding the valve can also be mounted on the shielded side of the wall.
In duct applications the valve is bolted into duct flanges. The unshielded part of ducting must be blast resistant.

Product Coding

The material and size of the single-column valves are indicated in the product code as follows.

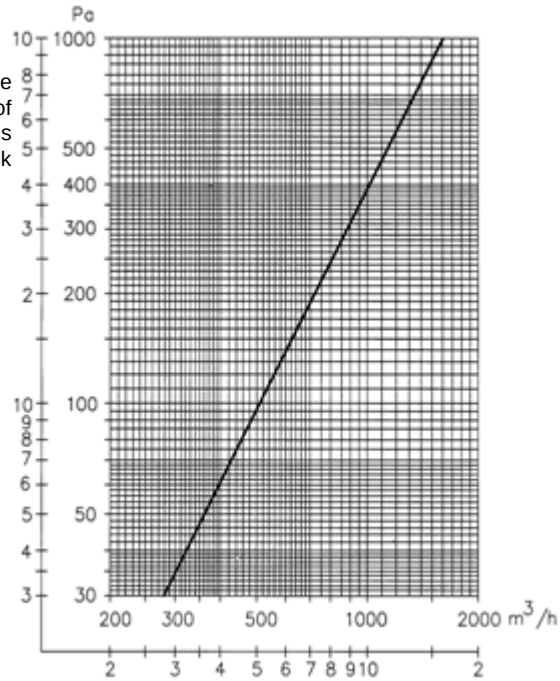
PV-KK-SM-number for hot dip galvanized steel

PV-KK-SMX-number for acid-proof steel

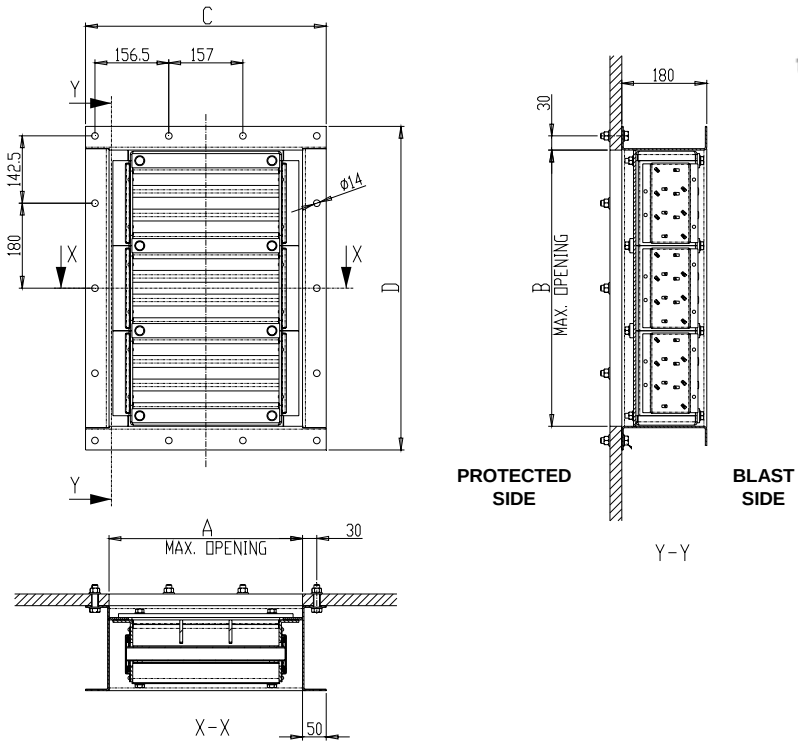
where **number** = number of valve blocks

Air Flow Characteristics

Air flow characteristics of one PV-KK-SM/-SMX blast valve block are given in the opposite chart. The flow curve is measured at 20 °C corresponding to air density of 1.2 kg/m³. The required number of valve blocks in a specific application is determined by dividing the total air flow by the air flow capacity of one valve block at desired pressure drop.



Dimensions of Single-column PV-KK-SM/-SMX Blast Valve



Key characteristics of the valves are given below relating to legends in the drawings (steel wall installation as example). The same figures apply to the PV-KK-SMX versions. Note that the size of opening to be covered depend on wall material due to the safety margin in bolting.

VALVE TYPE CODE	Concrete wall		Steel wall		C	D	Air flow at 100 Pa (m³/h)	Air flow at 200 Pa (m³/h)	Air flow at 300 Pa (m³/h)	Total weight (kg)
	A_{max}	B_{max}	A_{max}	B_{max}						
PV-KK-SM-1	260	125	410	225	510	325	500	720	900	20
PV-KK-SM-2	260	255	410	405	510	505	1000	1440	1800	38
PV-KK-SM-3	260	435	410	585	510	685	1500	2160	2700	55
PV-KK-SM-4	260	615	410	765	510	865	2000	2880	3600	72
PV-KK-SM-5	260	795	410	945	510	1045	2500	3600	4500	89
PV-KK-SM-6	260	975	410	1125	510	1225	3000	4320	5400	106

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