

Protective solutions

Applications

The multi-column PV-KK blast valve is used as air intake and outlet valve for large air volumes in Civil Defence and military shelters and blast protected industrial facilities in applications where wall space is limited. Typical application is blast protection of air intake and exhaust openings of HVAC plant rooms requiring substantial cooling air flow.

Specification

Manufacturer of PV-KK blast valves is Temet, Helsinki Finland.

The multi-column PV-KK blast valve comprises PV-KK blast valve blocks, I-beams selected on the basis of the blast load requirements and necessary fixing parts. The valve is to be cast in concrete wall. The framework built up of I-beams is of flush design leaving no parts to extent beyond the concrete wall surface. The multi-column PV-KK blast valve is completely corrosion resistant. The special aluminum alloy closing elements are non-corroding, all springs are made of stainless steel, and the valve body and I-beam frame made of structural steel are hot dip galvanized.

Valves for other type of installations are described in separate documents.

Design Criteria

The PV-KK blast valve blocks meet the requirements of the Finnish Ministry of Interior and the Swiss Federal Office of Civil Defence. Details of the PV-KK blast valve design criteria and approvals are featured in Temet leaflet Blast Valve PV-KK, document no. 1274 1010 001-2.

The framework of multi-column PV-KK blast valve must be designed on the basis of the given blast load and the span of the structural opening in the wall. Temet will perform the design of the valve when given the blast load and the required air flow by the customer. Upon request, detailed instructions for performing a dynamic analysis for the wall structure are available from Temet.

Test Reports

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

Product Coding

The size and form of the multi-column valves are indicated in the product code by valve blocks as follows.

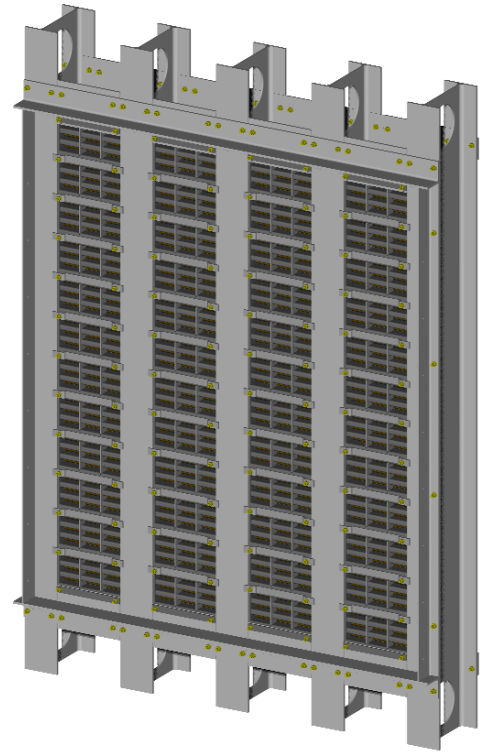
PV-KK-number (columns x rows), for instance PV-KK-48 (4x12)

where

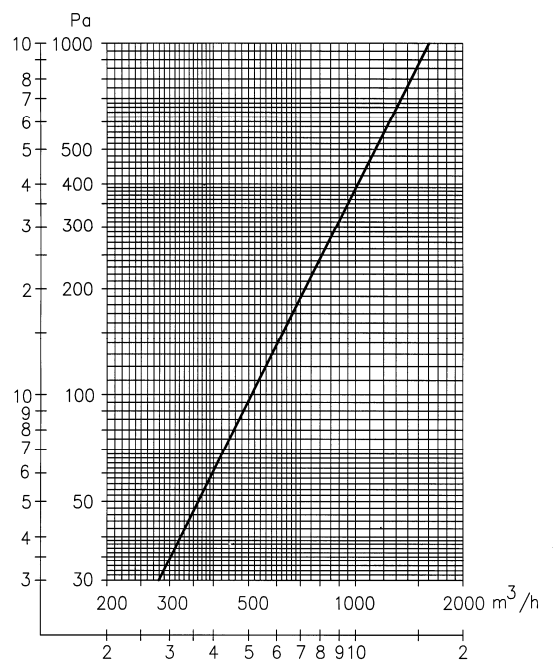
- number = total number of valve blocks
- columns = number of valve block vertical columns
- rows = number of valve block horizontal rows,

when the framework I-beams run vertically as depicted in the above picture.

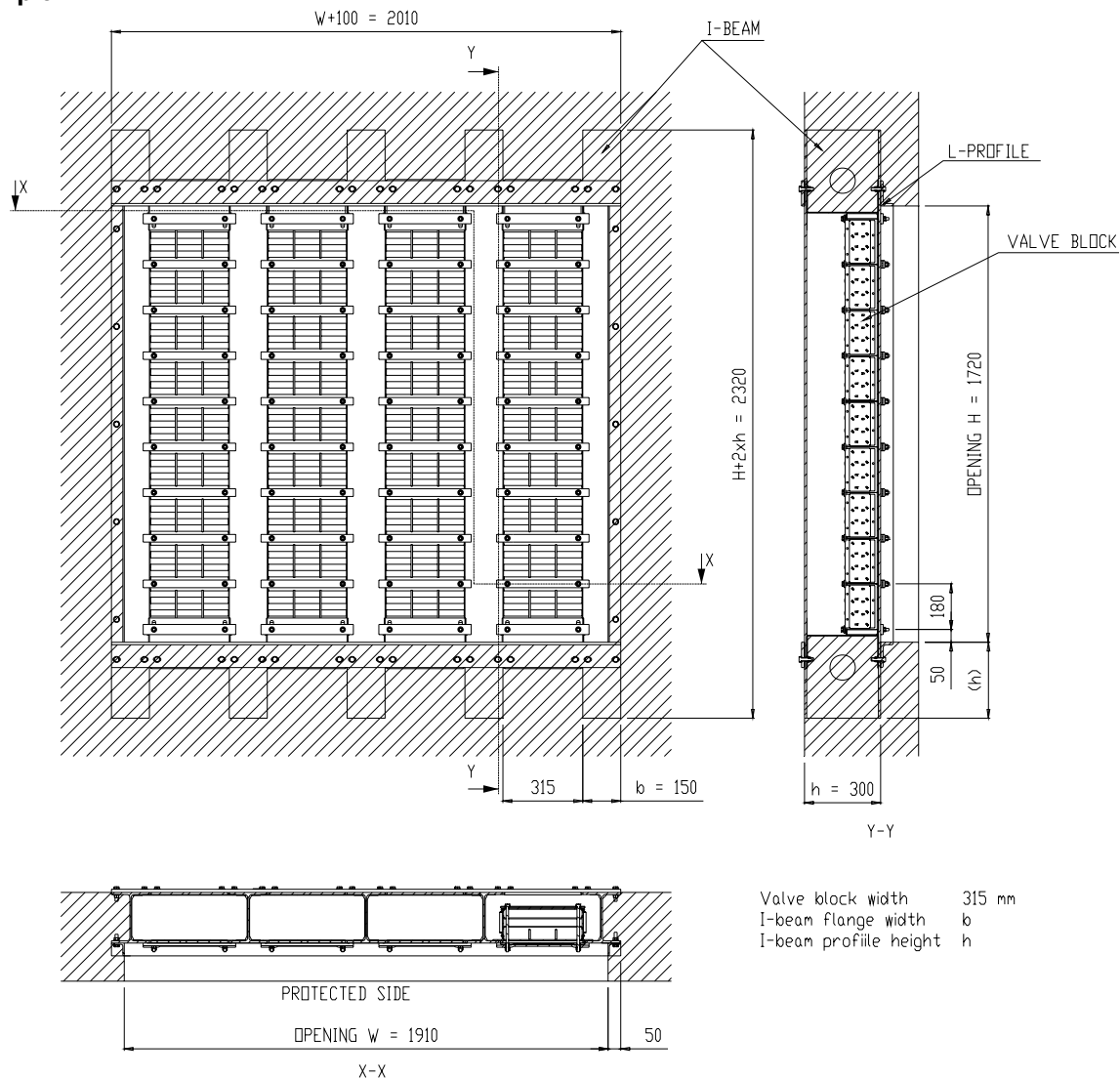
On right: Air flow characteristics of one PV-KK blast valve block measured at 20 °C corresponding to air density of 1.2 kg/m³. The required number of valve blocks is determined by dividing the total air flow by the air flow capacity of one valve block.



PV-KK-48 (4x12) Blast Valve, protected side



Example:



An example of a large multi-column PV-KK blast valve comprising 36 PV-KK blast valve blocks, product code PV-KK-36 (4 x 9).

The air flow capacity of the blast valve wall is 25 920 m³/h respective to pressure drop of 200 Pa. When designed to multiple long duration (peak duration > 70 ms) blast loads having peak reflected overpressure of 1100 kPa (11 bar), the structural beams in this example are IPE 300 having height $h = 300$ mm and flange width $b = 150$ mm. The structural opening in the wall $W \times H$ is 1910 x 1720 mm.

Upon request, Temet will perform the layout design and structural dimensioning of the multi-column blast valves.

Valves are normally fully assembled at factory for direct placement at site. Large valves, typically more than four columns, may be built and delivered in sections for easier transportation and assembled together at the jobsite.

Design - Production – Installation – Maintenance - Consultation