Data sheet

VHS valve for parallel and base-connection radiators, with integral pre-setting and shut-off/drain device

Application

The VHS is the ideal control valve for modern base-connection radiators, as well as for universal or bathroom radiators with connection distances of 50mm between flow and return. Quick and easy to install, it will accept standard Danfoss snap-lock sensor elements.

The VHS incorporates an integral presetting mechanism, for quick and accurate system balancing, and a combined shut-off/drain device. Connection to copper, soft steel, alupex and PEX plastic pipes can be carried out with Danfoss clamping joints. An optional fill-and-drain fitting is available.

To avoid the occurrence of scale and corrosion in the system, the composition of the heating water should comply with VDI guidelines 2035.

System layout

Ordering and data

<table>
<thead>
<tr>
<th>Type: VHS-UN 15</th>
<th>Connection (ISO 228-1)</th>
<th>Settings</th>
<th>k_v-values</th>
<th>k_vs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version</td>
<td>Code no.</td>
<td>Radiator</td>
<td>System</td>
<td>1</td>
</tr>
<tr>
<td>Angular</td>
<td>013G4741</td>
<td>G 3/4A</td>
<td>R 1/2</td>
<td>0.02</td>
</tr>
<tr>
<td>Straight</td>
<td>013G4742</td>
<td>G 3/4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angular</td>
<td>013G4743</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Straight</td>
<td>013G4744</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1) The k_v-values represent the flow volume (Q) in m³/h at a pressure drop (∆p) through the valve of 1 bar.

k_v = Q : √∆p. At setting N, the kv-values are given for Xp = 2 K. At lower presettings, Xp is reduced for the kv-values stated to 0.5 K at preset value 1. The k_v-values state Q at full flow, i.e. for a fully opened valve.

2) The stated maximum technical differential pressure indicates the limit for maintaining optimum control. For low-noise operation, system differential pressures should be held within the recommended range. Pumps should never be oversized; select those that generate just sufficient pressure to circulate the required volume of water. From experience, a differential pressure of 0.05-0.2 bar across the valve is adequate in most systems. In systems where it is too high, a Danfoss differential pressure regulator can be used to reduce it.

3) If sensors RAW/RAS/RAE/remote setting unit is used, the P-band increases by a factor of 1.6. Manufacturer’s value is at “N” setting.

VHS-UN 15

<table>
<thead>
<tr>
<th>k_v at X_p = 2</th>
<th>k_v at X_p = N</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.39</td>
<td>0.57</td>
</tr>
</tbody>
</table>

Temperature and pressures

- Max. water temperature: 120 °C
- Recommended differential pressure: 0.05-0.2 bar
- Max. technical differential pressure: 0.6 bar
- Testing pressure: 16 bar
- Max. operating pressure: 10 bar
VHS is suited for connection of copper, soft steel, PE-X plastic and aluminium alloys. Connection is made with the help of Danfoss clamping joints.

Pre-setting

- Remove protective cap or sensor element
- Lift setting collar
- Turn anti-clockwise to the desired engraved setting value. The setting mark always points directly to the radiator connection point.
- Allow setting collar to fall back to its original position

Preset levels can be selected in 0.5 increments between 1 and 7 (see chart on page 3 for flow rates). At setting N the valve is fully open (flushing option).

Settings in the hatched areas should be avoided. A secure method of fitting sensing elements protects against unauthorised tampering with the preset values.

* Requires a sensor with snap-lock.
** Guidelines for lacquering are enclosed in the product carton.
Shut-off and draining
If the sensor element is removed temporarily while the system is under pressure, it should be replaced by an appropriate handwheel – available from Danfoss - to ensure positive and safe shut-off.

To drain the radiator, first unscrew and remove the valve’s metal cover. Then firmly shut off the return with an Allen key (see A).

Fix the drain fitting in position. Drain by turning the square headed drain screw to the left (see B). The rising flow pipe in the radiator can be drained also by loosening the inner hexagonal screw (see C).

The accompanying hose nozzle can be rotated freely.

Example of valve sizing
Heat requirement: \( Q = 0.7 \text{ kW} \)
Temperature spread: \( \Delta T = 20 ^\circ C \)
Water volume through radiator:
\[
Q = \frac{0.7}{20 \times 1.16} = 0.03 \text{ m}^3/\text{h} = 30 \text{ litres/h}
\]
Pressure drop across the valve: \( \Delta p = 0.1 \text{ bar} = 1 \text{ mW} \)
Setting at valve: VHS-UN 15: 3.5
Alternatively, the setting can be read directly from the “Ordering and data” table:
\[
k_s = \frac{Q \text{ (m}^3/\text{h})}{\sqrt{\Delta p \text{ (bar)}}}
\]
Design

1. Radiator
2. Sealing cone
3. Valve insert, presettable, type RA-UN
4. Stuffing box
5. Draining screw for rising pipe
6. Block-off/drain of return
7. Connection nipple (self-sealing)
8. Flat packing

Materials used for parts in water contact

<table>
<thead>
<tr>
<th>Valve housing and other metal parts</th>
<th>Ms 58</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-rings</td>
<td>EPDM</td>
</tr>
</tbody>
</table>

Dimensions

VHS straight pattern
1/2 or 3/4" radiator connection

Covers are shaded grey.

VHS angle pattern
1/2 or 3/4" radiator connection

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