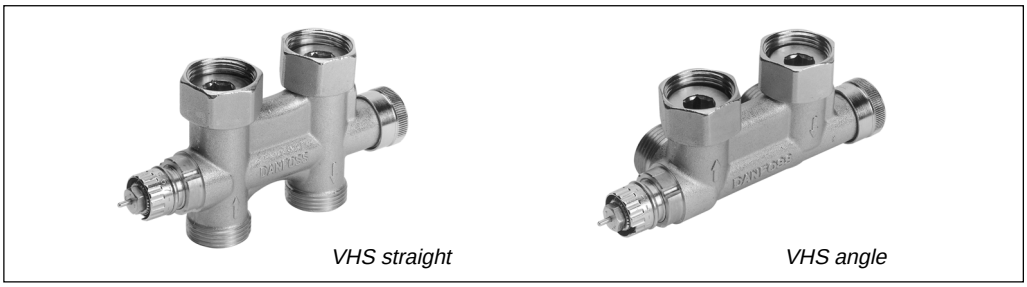
Data sheet

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

Application

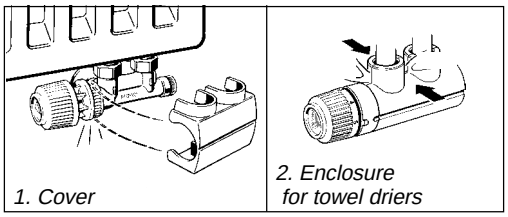


VHS straight *VHS angle*

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.

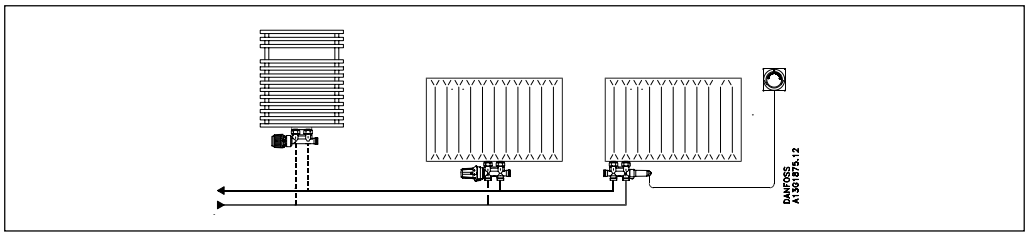
To avoid the occurrence of scale and corrosion in the system, the composition of the heating water should comply with VDI guidelines 2035.



1. Cover *2. Enclosure for towel driers*

To ensure an appealing finish different types of valve covers are available:
1. In white ABS material (RAL 9010) which is suitable for wet lacquering or in black PPO suitable for electrostatic powder lacquering.
2. Enclosure designed for towel dryers with angled valves.

System layout



Ordering and data

Type: VHS-UN 15		Connection (ISO 228-1)		Settings								
				k_v-values[1) 3)]								kvs
Version	**Code no.**	Radiator	System	1	2	3	4	5	6	7	N	N
Angular	**013G4741**	R 1/2	G 3/4A	0.02	0.04	0.07	0.12	0.19	0.27	0.33	0.48	0.57
Straight	**013G4742**											
Angular	**013G4743**	G 3/4										
Straight	**013G4744**											

1) The k_v values represent the flow volume (Q) in m^3/h at a pressure drop (Δp) through the valve of 1 bar. $k_v = Q : \sqrt{\Delta p}$. 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.

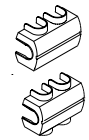
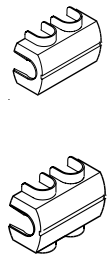
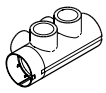
3) If sensors RAW/RAS/RAE/ remote setting unit is used, the P-band increases by a factor of 1.6. Manufacturer's value is at "N" setting.

	k_v at X_p = 2	k_{vs}
VHS-UN 15	0.39	0.57

Temperature and pressures [2)]

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

Accessories

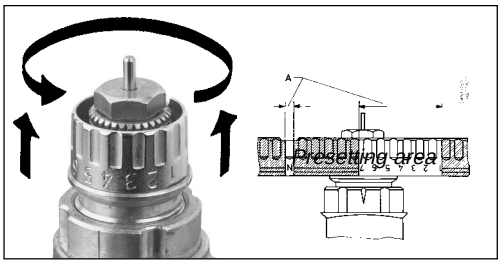
Product		Code no.
	Cover* for VHS valve for panel radiators, straight pattern White RAL 9016, suitable for wet lacquering**	**013G4774**
	Cover* for VHS avlve for panel radiators, angle pattern White RAL 9016, suitable for wet lacquering**	**013G4775**
	Cover* for VHS valve for towel rail radiators, straight pattern White RAL 9010, suitable for wet lacquering**	**013G4672**
	Cover* for VHS valve for towel rail radiators, straight pattern White RAL 9016, suitable for wet lacquering**	**013G4674**
	Cover* for VHS valve for towel rail radiators, angle pattern White RAL 9010, suitable for wet lacquering**	**013G4671**
	Cover* for VHS valve for towel rail radiators, angle pattern White RAL 9016, suitable for wet lacquering**	**013G4673**
	Cover for VHS valve, straight pattern, chrome	**013G4780**
	Cover for VHS valve, angle pattern, chrome	**013G4779**
	Enclosure* for VHS valve for towel rail radiators, angle pattern White RAL 9010, suitable for wet lacquering**	**013G4751**
	Enclosure* for VHS valve for towel rail radiators, angle pattern White RAL 9016, suitable for wet lacquering**	**013G4755**
	Sealing cone incl. seal for valve radiator with 3/4" ext. thread (20 pcs.)	**003L0294**
	Self-sealing connection nipple for valve radiator with G½ int. thread (20 pcs.)	**003L0295**
	Double rosette (PVC) for pipe diameter Ø 12-24 mm (min. distance 50 mm)	**192H0161**
	Manual handwheel for all RA type valves (valve diff. pressure max. 0.6 bar)	**013G5002**
	Fill-and-drain fitting, not nickel-plated, with 3/4" ext. thread and hose nozzle	**003L0152**
	Connection bracket for sensors without snap-lock connection (10 pcs.)	**013G4925**
	Cover for VHS, nickel-plated	**003L0153**

* Requires a sensor with snap-lock.

**Guidelines for lacquering are enclosed in the product carton.

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



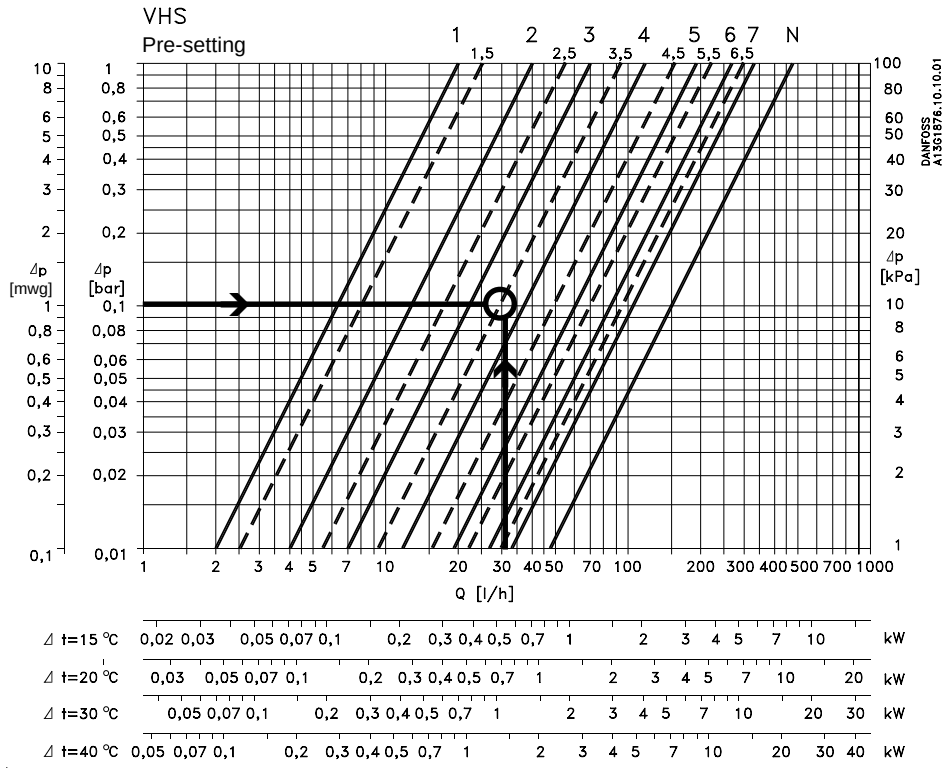
Danfoss pre-settable valve bodies incorporate easy setting adjustment collars with clearly engraved setting markers from **1** - **7** and **N**. Setting can be made quickly and precisely, without the need for tools, as follows:

- 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.

Capacity



Capacities, using RA 2000 sensor elements at a P-band between 0.5 K and 2 K.

The capacity range of the VHS matches today's radiator performance figures.

The amount by which the room temperature changes during operation is termed the P-band of a valve. This change is necessary to move the valve from the closed position to that at which the required volume flow (depending on dimensions) is achieved.

With the excellent control performance of RA2000 and RAW sensing elements, the valve should be sized for a P-band between 0.5 and 2K to achieve optimum energy saving under 'small room' temperature change conditions.

Example of valve sizing

Heat requirement: Q = 0.7 kW

Temperature spread: ΔT = 20 °C

Water volume through radiator:

$$Q = \frac{0,7}{20 \times 1.16} = 0.03 \text{ m}^3/\text{h} = 30 \text{ litres/h}$$

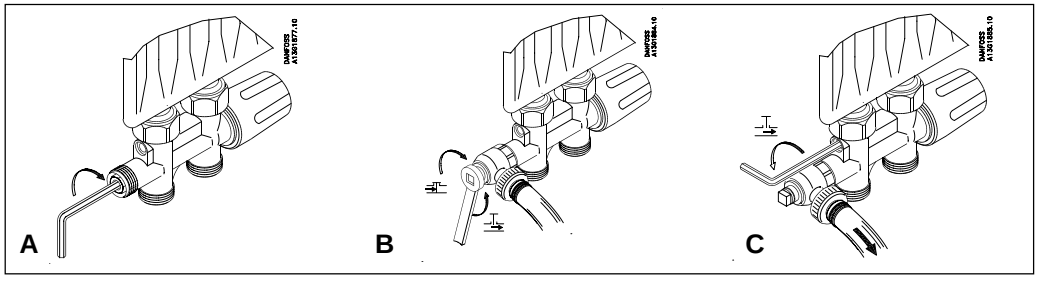
Pressure drop across the valve: Δp = 0.1 bar = 1 mW

Setting at valve: VHS-UN 15: 3.5

Alternatively, the setting can be read directly from the "Ordering and data" table:

$$k_v = \frac{Q \text{ (m}^3/\text{h)}}{\sqrt{\Delta p \text{ (bar)}}}$$

Draining the radiators



Please note:
The static pressure must not exceed 10 bar

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.

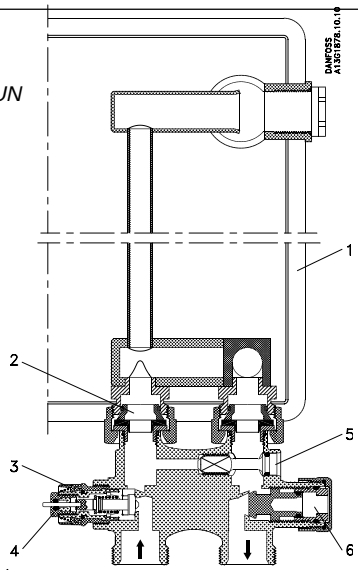
To drain the radiator, first unscrew and remove the valve's metal cover. Then firmly shut off the return with an Allen key (see A).

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.

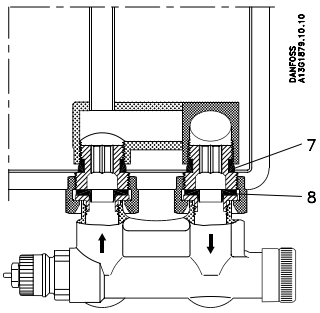
Design

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*

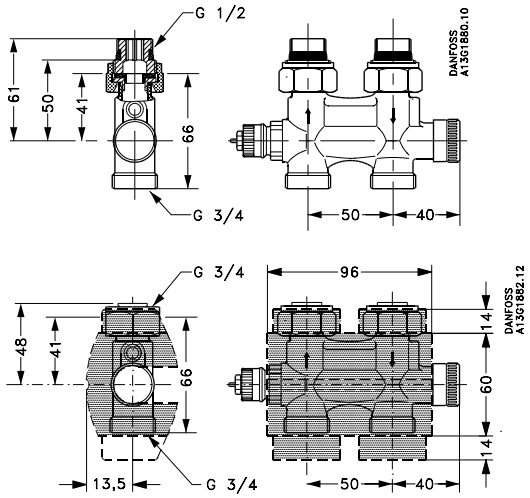


Materials used for parts in water contact

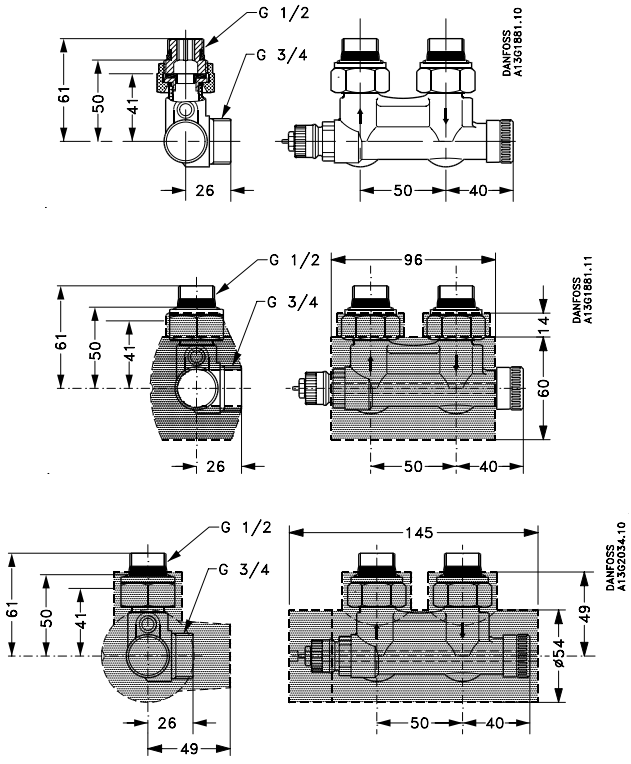
Valve housing and other metal parts	Ms 58
O-rings	EPDM



Dimensions



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



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

Covers are shaded grey.

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