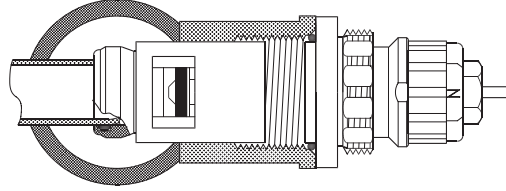


# Data Sheet

## Integrated Presetting Valves, Series 4

For normal volume flows, type RA-N and for small volume flows, type RA-U

### Application



The Danfoss series 4 integrated valves were developed in view of the German energy-saving regulation and DIN 4701/10. They are fitted with built-in presetting and installed in radiators.

The valve types RA-N and RA-U differ in appearance in the colour of the setting ring for the factory presetting:

RA-N and RA-U integrated valves can be used in single and two-pipe installations.

The gland seal of the valve can be replaced while the system is in operation.

In comparison with series 3, the integrated valve has the same capacity at a lower stroke.

The proportional band (P-band) is reduced for the valve by around 0.5 K, depending on the sensor.

The P-band is usually 2-3 K, depending on the selected valve and sensor type. The combination of RA 2000 and integrated valve series 4 reduces the P-band by 1 K. This reduces the energy consumption and can be documented in accordance with DIN 4701/10 for construction.

To avoid calcification and corrosion, it is important for the composition of the circulating water to comply with the VDI 2035 guidelines.

Danfoss thermostatic sensors types RA 2000 and RAW with patented snap sockets as well as Danfoss thermo-hydraulic actuators can be installed directly onto the integrated valve.

### Ordering and Data

Valve Type	Danfoss code	Connection	Presetting										Max. water temp. °C	Differential pressure <sup>3)</sup>		Test Pressure bar	Operation bar
			k <sub>v</sub> values <sup>1)2)</sup>											Rec. bar	Tech. bar		
			1	2	3	4	5	6	7	N	N						
RA-N	013G1488	G ½ A	0.11	0.16	0.22	0.30	0.38	0.47	0.57	0.71	0.95	120	0.05-0.2	0.6	16	10	
RA-N	013G1489	G ½ A	0.11	0.16	0.22	0.30	0.38	0.47	0.57	0.71	0.95						
RA-N	013G1490	G ½ A	0.11	0.16	0.22	0.30	0.38	0.47	0.57	0.71	0.95						
RA-U	013G1401	G ½ A	0.03	0.06	0.11	0.16	0.22	0.27	0.33	0.43	0.74						
RA-U	013G1402	G ½ A	0.03	0.06	0.11	0.16	0.22	0.27	0.33	0.43	0.74						
RA-U	013G0483	G ½ A	0.03	0.06	0.11	0.16	0.22	0.27	0.33	0.43	0.74						

<sup>1)</sup> The k<sub>v</sub> value indicates the water flows (V) in m<sup>3</sup>/h at a pressure drop (Δp) across the valve of 1 bar ( $k_v = V \cdot \sqrt{1/\Delta p}$ ). At setting N, the k<sub>v</sub> values are stated as Xp = 1 K. At lower preset values, for the given k<sub>v</sub> values Xp will be reduced until it is approximately 0.5 K at presetting 1.

The table shows the average measured values for integrated valves without radiator.

The k<sub>vs</sub> values indicate the valve capacity, when the valve is fully open.

<sup>2)</sup> When using a RAW sensor or a remote setting element, the P band will be increased by a factor of 1.6 (at setting "N", according to EN 215).

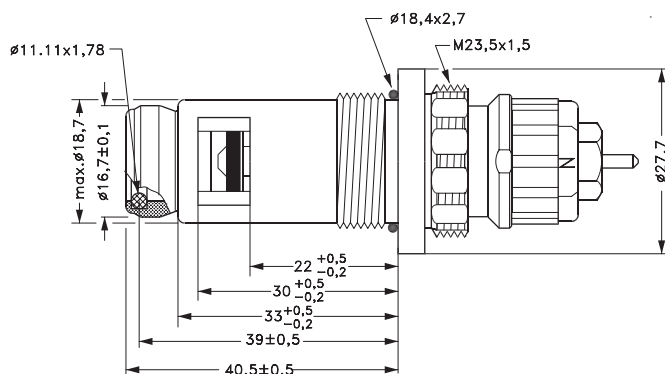
<sup>3)</sup> The technical differential pressure indicates the upper limit for a proper valve function. In most two-pipe systems the recommended differential pressure is sufficient. In order to achieve a noiseless function, we recommend installing automatic bypass valves or automatic balancing valves in smaller systems. If pump differential pressure exceeds the recommended max. valve differential pressure, it is recommended that a differential pressure controller type ASV-P is added to the system.

### Spare Parts and Accessories

Product	Order No.
Gland seal, 10 pcs. <sup>1)</sup>	013G0290
Red protective cap for RA-N	013G0951
Yellow protective cap for RA-U	013G0952
Small O-ring	633B0244
Big O-ring	633B0387

<sup>1)</sup> The gland seal of the valve can be replaced while the system is in operation.

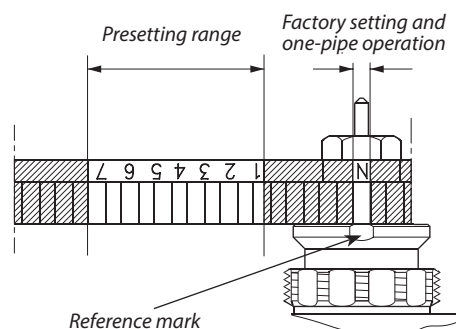
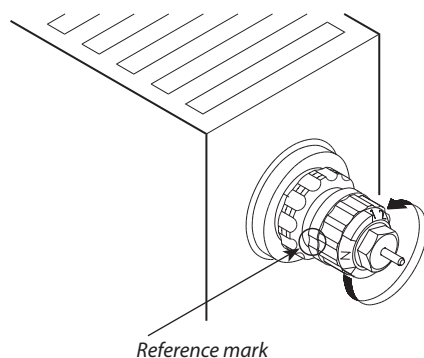
Design and Dimensions



Materials

Part	RA-N	RA-U
Valve housing	Ms 58	Ms 58
Valve seat	Ms 58	Ms 58
Throttle nozzle	PPS	PPS
Setting dial	Plastic	Plastic
O-rings	NBR/EPDM	NBR/EPDM
Valve spindle	PPS	Ms 58
Valve cone	NBR	NBR
Pressure pin and valve spring	Chrome steel	Chrome steel

Presetting



The presetting values of the integrated valves type RA-N and RA-U can be adjusted easily and accurately without the use of tools (factory setting: N):

- Remove the protective cap or sensor
- Find the reference mark
- Turn the setting ring until the calculated presetting aligns with the reference mark.

The presetting is controlled directly without the use of equipment. After installation in the radiator, the reference mark of the valves will not always be positioned in the same place.

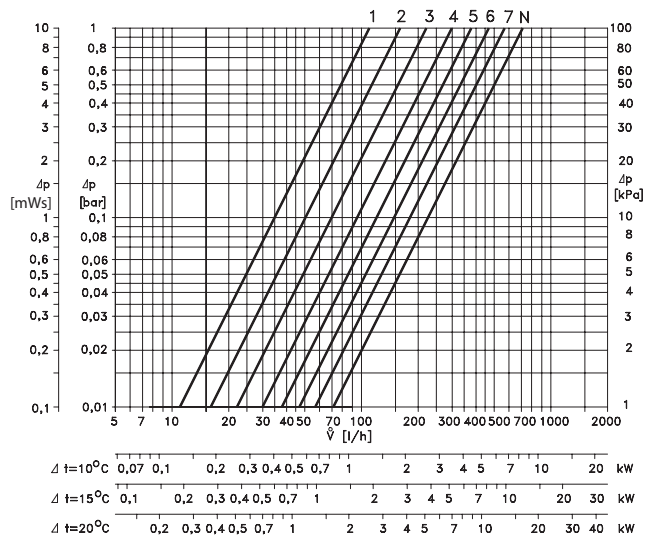
The presetting can be selected infinitely within the range of 1 to 7. Setting to "N" cancels the presetting.

Setting in the shaded areas of the drawing should be avoided. In a one-pipe installation, the setting "N" must be used.

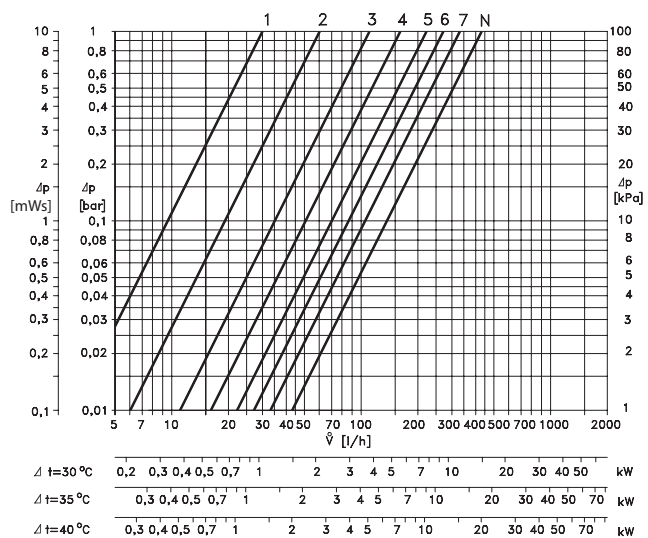
For Danfoss elements RA 2000 and RAW, a theft protection device is available; this also provides added security against unwanted adjustment of the preset values.

Capacities without Radiator and Fittings

RA-N



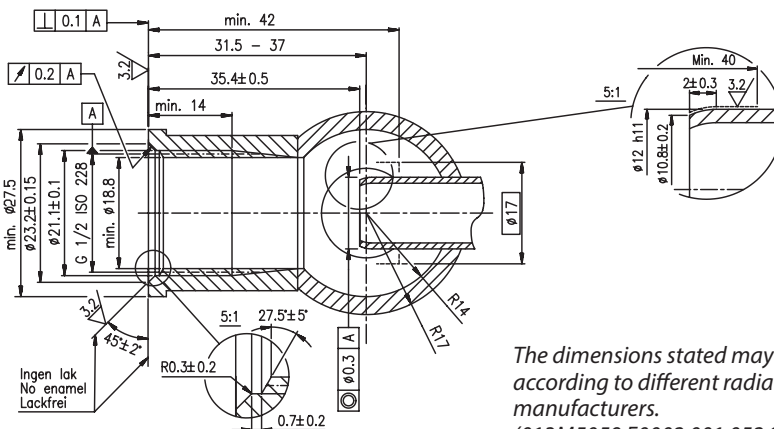
RA-U



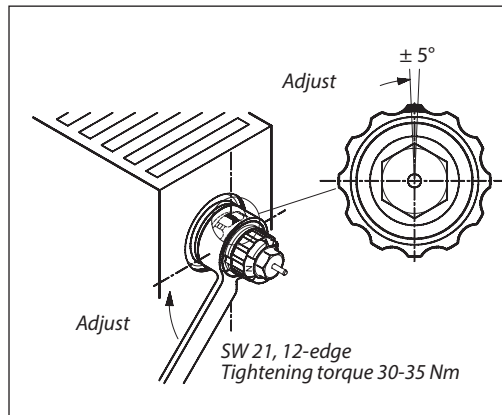
Capacities with Danfoss RA 2000 sensors without radiator and connection fittings:  
 With the presettings N .. 4, the  $k_v$  values are stated as  $X_p = 1 K$ .  $X_p$  is reduced to 0.5 K at lower preset values.

Dimensions

Special fittings for 1/2" version

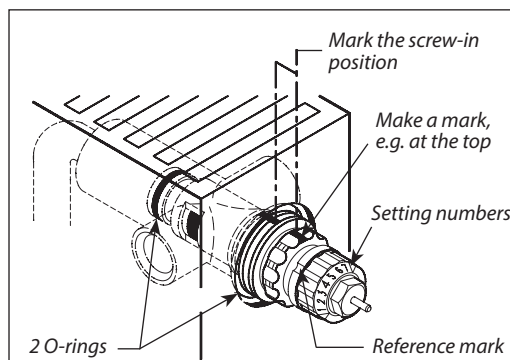


Mounting Instructions



**Installation in the factory/Repeated installation in another radiator**

- Fit the integrated valve in the radiator using a 12-edge wrench, SW 21.
- Tighten using a torque of 30 Nm +5 Nm.
- If required, continue turning until one of the cap thread beads points upwards, illustration 4. Tolerance for adjustment:  $\pm 5^\circ$ .
- The same integrated valve can only be fitted in another radiator a second time (because of the load on the deformation zone).

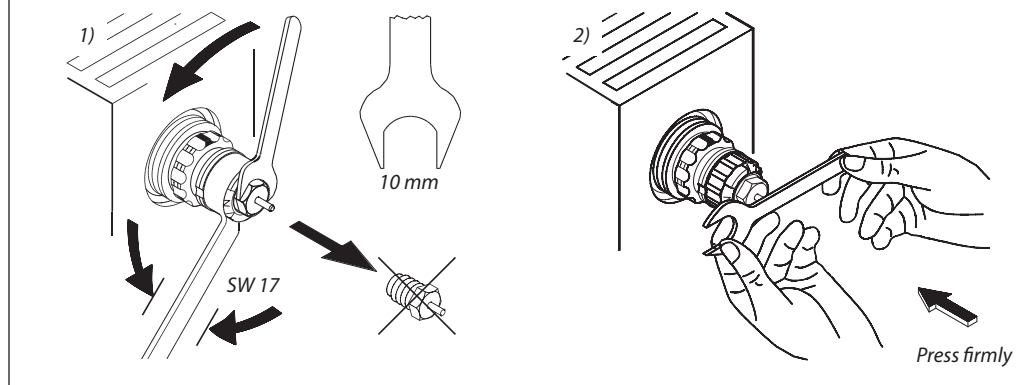


**Removal and fitting in an existing radiator**

- Before removal: Mark the screw-in position on the valve and radiator.
- Remove.
- Fitting: Insert the integrated valve, tighten until the marked-off position has been reached. Setting ring with presetting numbers:
  - Red: RA-N
  - Yellow: RA-U

**Replacing the gland seal**

The gland seal can be replaced under pressure with an SW 10 wrench. The setting ring must be held tightly with a 12-edge wrench, SW 17.



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