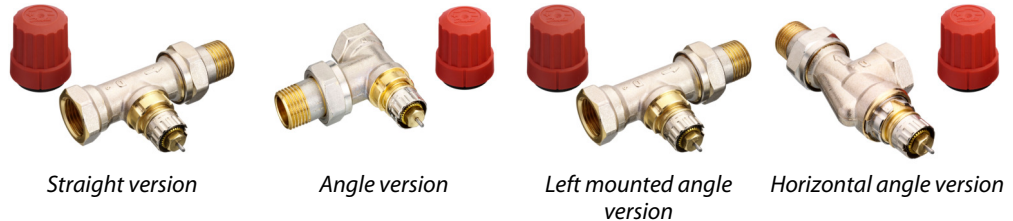


Data Sheet

Valve bodies type RA-N with integrated presetting

Application



All RA-N valve bodies can be used together with all types of thermostatic elements in the RA 2000 series.

To be able to distinguish between other valve bodies of the RA 2000 series the protective cap is equipped with a red setting screw.

The valve bodies are fitted with a k_v limiting device for pre-setting of max. water flow.

Compression fittings for 15 mm, 10 mm or 8 mm copper tube are available for valve body RA-N with 3/8" and 1/2" BSP connections.

The valve body RA-N is used in two-pipe heating systems and is available with the following setting ranges for max. water flow:

Valve bodies are manufactured from brass with nickel plating. The pressure pin of the gland seal is of chromium steel and works in a lifetime lubricated O-ring. The complete gland assembly can be replaced without draining down the system.

RA-N 10:	$k_v = 0.04 - 0.56 \text{ m}^3/\text{h}$
RA-N 15:	$k_v = 0.04 - 0.73 \text{ m}^3/\text{h}$
RA-N 20/25:	$k_v = 0.10 - 1.04 \text{ m}^3/\text{h}$

Should water treatment be used it is essential that dosing instructions of the manufacturer are strictly observed. It is recommended that formulations containing mineral oil are avoided.

The valve bodies are supplied with a protective cap and adjusting screw which can be used for manual regulation during the construction phase.

The protective cap must not be used as a manual shut off device. A special manual shut off device (code no. 013G5000) should be used.

Approved to EN 215

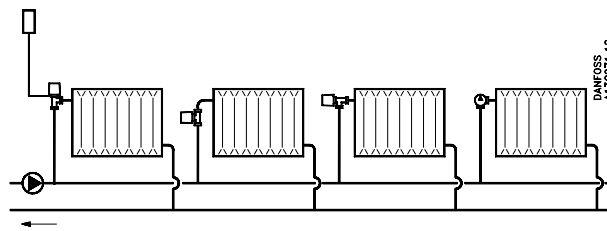


All Danfoss RA 2000 radiator thermostats are manufactured to the highest standards, and are approved to the European standard EN 215 and dimension standard HD 1215, which supersedes BS 6284 1983.

Quality Standards

All Danfoss radiator thermostats are manufactured in factories, assessed and certified by BSI against BS 5750 (ISO 9000).

Principles



Data and Ordering

Type	Design	Connections		Pre-setting								
		Inlet	Outlet	k_v -max. ¹⁾ (m ³ /h at $\Delta p = 1$ bar)								k_{vs}
		Rp	R	1	2	3	4	5	6	7	N	N
RA-N 10	Angle	3/8	3/8	0.04	0.08	0.12	0.19	0.25	0.33	0.38	0.56	0.65
	Straight	3/8	3/8	0.04	0.08	0.12	0.19	0.25	0.33	0.38	0.56	0.65
	Horiz. angle	3/8	3/8	0.04	0.08	0.12	0.19	0.25	0.33	0.38	0.56	0.65
	Right angle	3/8	3/8	0.04	0.08	0.12	0.19	0.25	0.33	0.38	0.56	0.65
	Left angle	3/8	3/8	0.04	0.08	0.12	0.19	0.25	0.33	0.38	0.56	0.65
RA-N 15	Angle	1/2	1/2	0.04	0.09	0.16	0.25	0.36	0.43	0.52	0.73	0.90
	Straight	1/2	1/2	0.04	0.09	0.16	0.25	0.36	0.43	0.52	0.73	0.90
	Horiz. angle	1/2	1/2	0.04	0.09	0.16	0.25	0.36	0.43	0.52	0.73	0.90
	Right angle	1/2	1/2	0.04	0.09	0.16	0.25	0.36	0.43	0.52	0.73	0.90
	Left angle	1/2	1/2	0.04	0.09	0.16	0.25	0.36	0.43	0.52	0.73	0.90
RA-N 20	Angle	3/4	3/4	0.10	0.15	0.17	0.26	0.35	0.46	0.73	1.04	1.40
	Straight	3/4	3/4	0.10	0.15	0.17	0.26	0.35	0.46	0.73	1.04	1.40
	Horiz. angle	3/4	3/4	0.16	0.20	0.25	0.35	0.47	0.60	0.73	0.80	1.00
RA-N 25	Angle	1	1	0.10	0.15	0.17	0.26	0.35	0.46	0.73	1.04	1.40
	Straight	1	1	0.10	0.15	0.17	0.26	0.35	0.46	0.73	1.04	1.40

Type	Design	Max work. press.	Max diff. ²⁾ press	Test	Max work. temp.	Code no.
		bar	bar	bar	°C	
RA-N 10	Angle	10	0.6	16	120	013G0011
	Straight	10	0.6	16	120	013G0012
	Horiz. angle	10	0.6	16	120	013G0151
	Right angle	10	0.6	16	120	013G0231
	Left angle	10	0.6	16	120	013G0232
RA-N 15	Angle	10	0.6	16	120	013G0013
	Straight	10	0.6	16	120	013G0014
	Horiz. angle	10	0.6	16	120	013G0153
	Right angle	10	0.6	16	120	013G0233
RA-N 20	Left angle	10	0.6	16	120	013G0234
	Angle	10	0.6	16	120	013G0015
	Straight	10	0.6	16	120	013G0016
RA-N 25	Horiz. angle	10	0.6	16	120	013G0155
	Angle	10	0.6	16	120	013G0037
	Straight	10	0.6	16	120	013G0038

¹⁾ The k_v -value indicates the water flow (Q) in m³/h at a pressure drop (Δp) across the valve of 1 bar;

$$K_v = Q : \sqrt{\Delta p}$$

At setting N the k_v -value is stated according to EN 215, at $X_p = 2K$ i.e. the valve is closed at 2 °C higher room temperature. At lower settings the X_p value is reduced to 0.5K of the setting value 1. The k_{vS} -value states the flow Q at a maximum lift, i.e. at fully open valve at setting N.

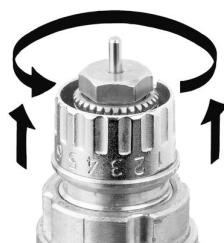
²⁾ Working pressure = static + differential pressure. The maximum differential pressure specified is the maximum pressure at which the valves give satisfactory regulation. As with any device which imposes a pressure drop in the system, noise may occur under certain flow/pressure conditions. To ensure quiet operation, maximum pressure drop should not exceed 30 to 35 kPa. The differential pressure can be reduced by the use of the Danfoss differential pressure regulators types AVD, AVDL, AVDS, IVD or ASV-P.

Accessories

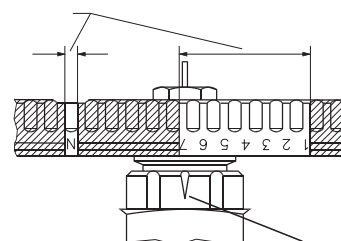
Product	Dimension	For valve body	Code no.
Gland seal	-	All RA valves	013G0290
Compression fitting for steel and copper tubes	Rp 3/8 x Ø10 mm	RA-N 10	013G4100
	Rp 3/8 x Ø12 mm		013G4102
	Rp 1/2 x Ø10 mm	RA-N 15	013G4110
	Rp 1/2 x Ø12 mm		013G4112
	Rp 1/2 x Ø15 mm		013G4115

All accessories comes in boxes of 10 pcs.

Setting

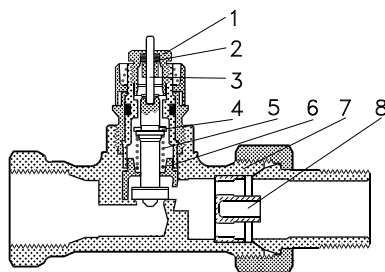


Presetting area



Reference mark

Operating Principle



1. Gland seal
2. O-Ring
3. Pressure pin
4. Seal
5. Regulation spring
6. Setting dial
7. Valve body
8. k_v -nozzle

The radiator thermostats consist of the thermostatic elements of the RA 2000 series and the valve body RA-N. The element and the valve body are ordered separately.

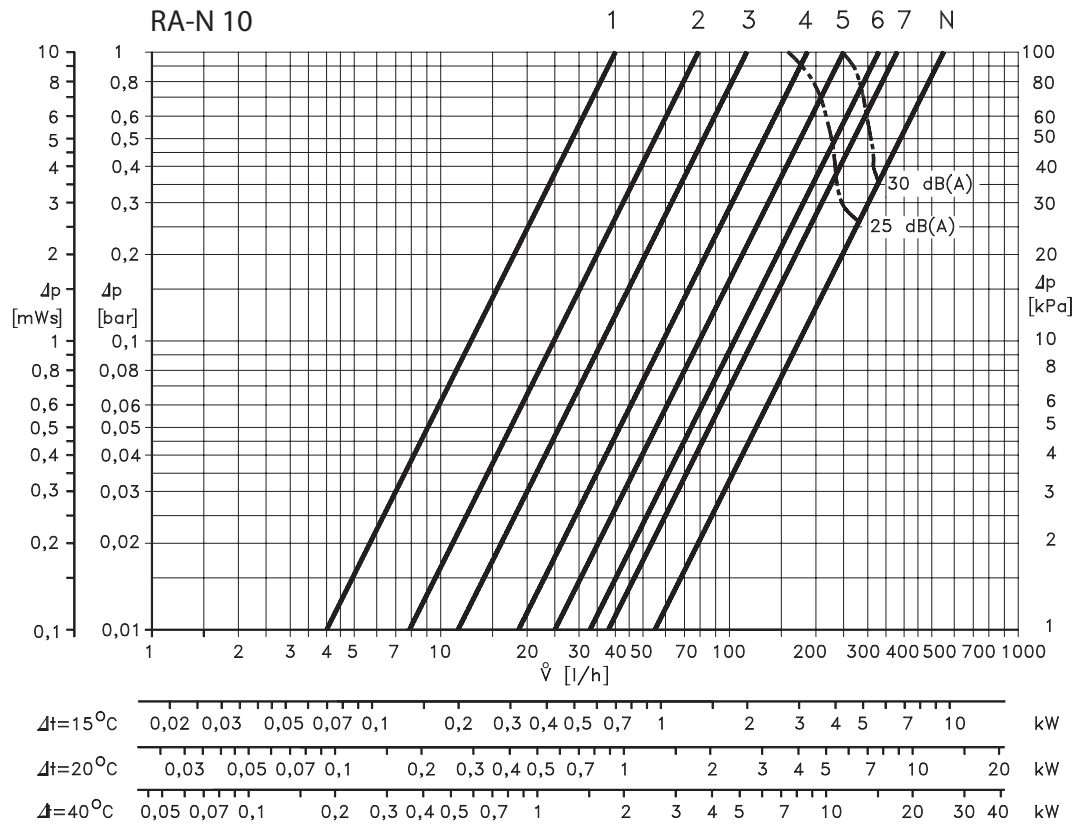
A clamping band with Allen screw ensures a simple, firm connection between element and valve body. The gland seal of the valve can be changed in operation, i.e. with water and pressure on the system.

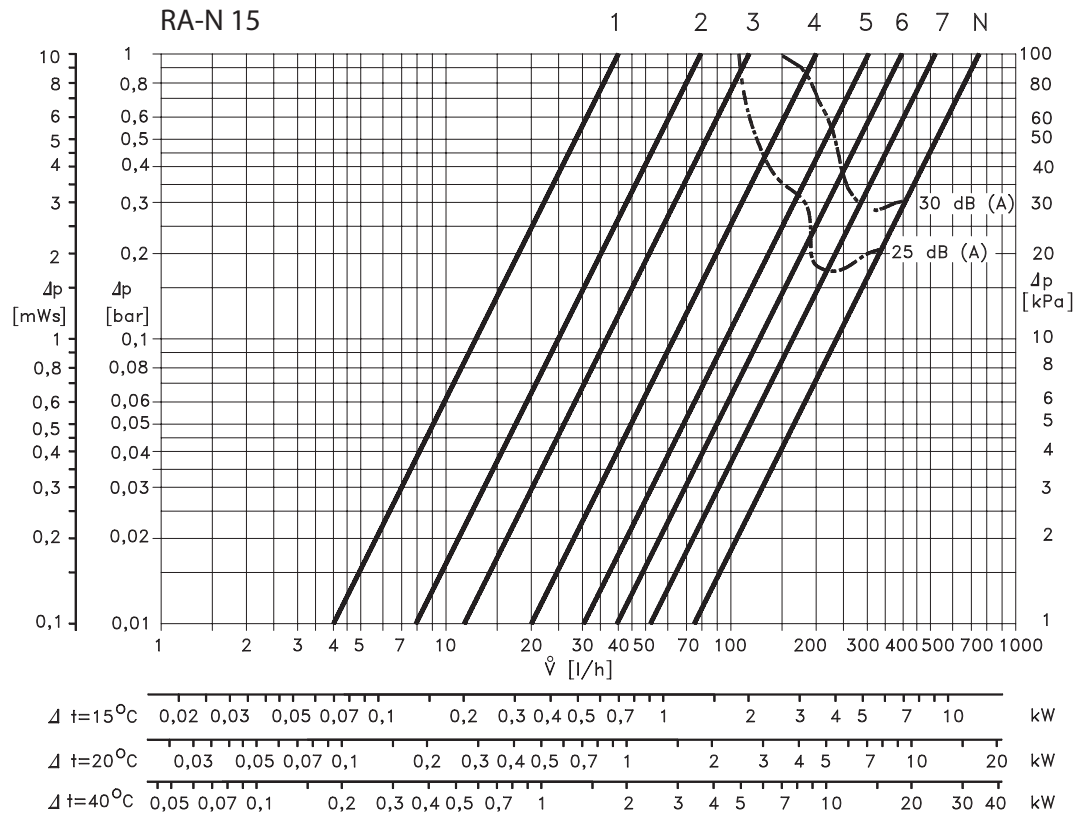
Valve body and other metal parts	Ms 58, brass
Kv-limiter	PPS
O-ring	EPDM
Valve cone	NBR
Pressure pin and valve spring	Chrome steel
Nozzle	PP

The valve bodies are nickel-plated on the outside.

Max ambient temperature	60 °C
Max medium temperature	120 °C
Max working pressure	10 bar
Test pressure	16 bar

Capacities



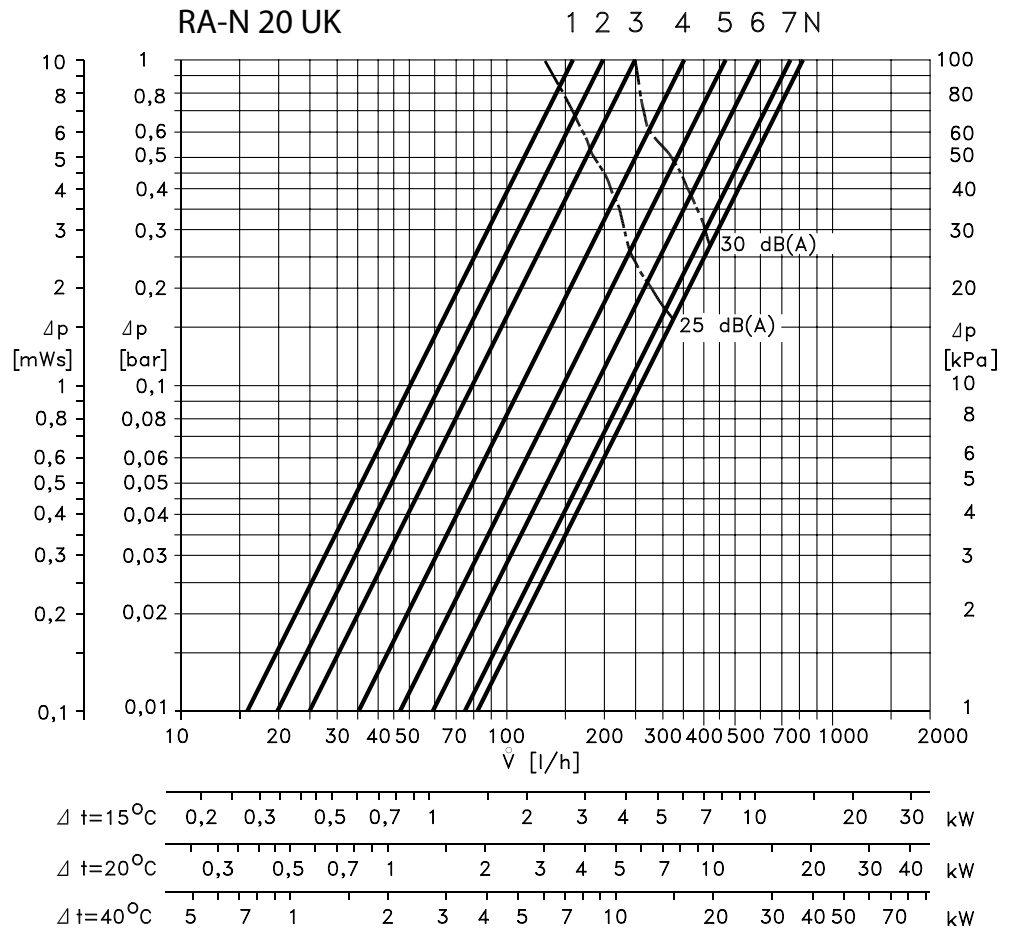


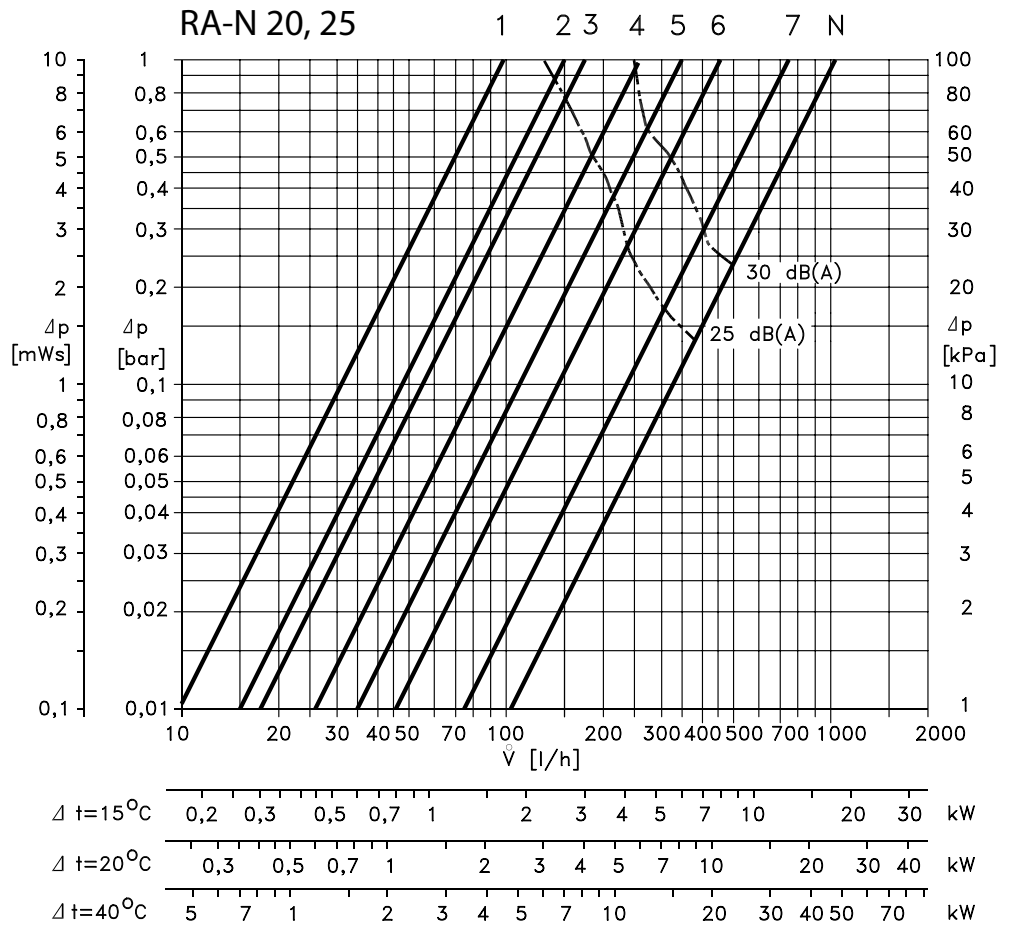
Sizing example:

Required heat:		0.7 kW
Cooling across radiator:		20° C
Flow through radiator:	$Q = \frac{0.7}{20 \times 1.16} = 0.03 \text{ m}^3/\text{h} = 0.0083 \text{ l/s}$	
Pressure drop across valve:		$\Delta p = 1 \text{ mwg}$
Valve setting:	RA-N 10	2
	RA-N 15	2
	RA-N 20/25	1

Alternatively the setting can be read directly in the table "Data and Ordering".

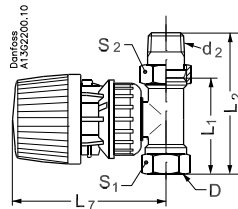
$$K_v = \frac{Q \text{ (m}^3/\text{h)}}{\sqrt{\Delta p \text{ (bar)}}$$



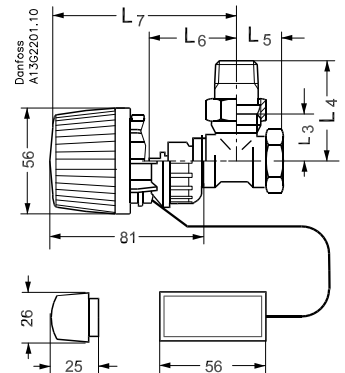


Note As with any device which imposes a pressure drop in the system, noise may occur under certain flow/ pressure conditions. To ensure quiet operation, maximum pressure drop should not exceed 30-35 kPa (3-3.5 mwg).

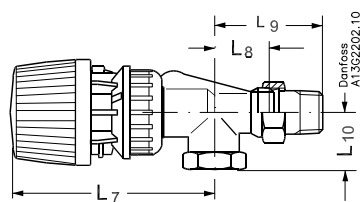
Dimensions



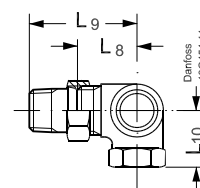
Straight valve body with thermostatic sensor RA 2990



Angle valve body with thermostatic sensor RA 2990



UK-angle valve body with thermostatic sensor RA 2990



Right mounted angle valve

Type	ISO 7-1			L ₁	L ₂	L ₃	L ₄	L ₅	L ₆	L ₇	L ₈	L ₉	L ₁₀	Arc. flats	
	DN	D	d ₂											S ₁	S ₂
RA-N 10	10	R _p 3/8	R 3/8	50	75	24	49	20	47	96	27	52	22	22	27
RA-N 10 UK	10	R _p 3/8	R 3/8						59	108	26	51	22	22	27
RA-N 15	15	R _p 1/2	R 1/2	50	82	26	53	23	47	96	30	58	26	27	30
RA-N 15 UK	15	R _p 1/2	R 1/2						60	109	29	57	27	27	30
RA-N 20	20	R _p 3/4	R 3/4	65	98	30	63	26	52	101				32	37
RA-N 20 UK	20	R _p 3/4	R 3/4						61	110	34	66	30	32	37
RA-N 25	20	R _p 1	R 1	90	125	40	75	34	52	101				41	46

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