Data Sheet

Thermostatic sensor RAS-C² with RA-N Presetting Valve

Application

The RAS-C² thermostatic sensor and the RA-N valves are designed for use in 2-pipe domestic heating systems.

The RAS-C² thermostatic sensor is a self-actuating proportional controller with a small P-band. It has a temperature range from 8 to 28°C and is equipped with frost protection setting and positive shut-off for maximum user flexibility.

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

In order to avoid deposition and corrosion the composition of the hot water must be in accordance with the VDI 2035 guideline (Verein Deutscher Ingenieure). It is recommended that formulations containing mineral oil are avoided. Each RA-N valve body is supplied with a red protective cap, 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 is available as an accessory.

A comprehensive range of compression fittings for PEX, AluPEX, copper and steel tubes are available - please require special data sheet for Danfoss compression fittings.

Approvals and Standards

European Standard EN 215

Thermostatic sensors RAS-C² with RA-N presetting valves are manufactured to the highest standards, and are approved to the European standard EN 215.
### Ordering and Specifications

#### RAS-C² thermostatic sensor

<table>
<thead>
<tr>
<th>Type</th>
<th>Design</th>
<th>Setting range</th>
<th>Code no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAS-C²</td>
<td>Built-in sensor, frost protection, positive shut-off</td>
<td>8 - 28 °C</td>
<td>013G6040</td>
</tr>
</tbody>
</table>

#### RA-N radiator valves

<table>
<thead>
<tr>
<th>Type</th>
<th>Design</th>
<th>Connections</th>
<th>Presetting</th>
<th>Max. work. temp.</th>
<th>Code no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA-N 10</td>
<td>Angle Straight</td>
<td>3/8 3/8</td>
<td>0.04 0.08 0.11 0.18 0.21 0.28 0.31 0.43 0.65 120</td>
<td>013G0011 013G0012</td>
<td></td>
</tr>
<tr>
<td>RA-N 15</td>
<td>Angle Straight</td>
<td>1/2 1/2</td>
<td>0.04 0.08 0.12 0.18 0.25 0.32 0.38 0.53 0.90 120</td>
<td>013G0013 013G0014</td>
<td></td>
</tr>
<tr>
<td>RA-N 20</td>
<td>Angle Straight</td>
<td>3/4 3/4</td>
<td>0.09 0.14 0.18 0.25 0.31 0.40 0.51 0.71 1.40 120</td>
<td>013G0015 013G0016</td>
<td></td>
</tr>
<tr>
<td>RA-N 25</td>
<td>Angle Straight</td>
<td>1 1</td>
<td>0.09 0.14 0.18 0.25 0.31 0.40 0.51 0.71 1.40 120</td>
<td>013G0037 013G0038</td>
<td></td>
</tr>
</tbody>
</table>

#### Technical data

Max. working pressure: 10 bar, max. diff. (2) pressure: 0.6 bar, test pressure: 16 bar Max. working temperature 120°C

1) The kv-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 kv-value is stated according to EN 215, at XP = 2K i.e. the valve is closed at 2°C higher room temperature. At lower settings the XP value is reduced to 0.5K of the setting value 1. The kvs-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.

### Accessoires

<table>
<thead>
<tr>
<th>Product</th>
<th>Dimension</th>
<th>For valve body</th>
<th>Code no.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gland seal (10pcs.)</td>
<td>-</td>
<td>All RA-N valves</td>
<td>013G0290</td>
</tr>
<tr>
<td>Compression fitting for steel and copper tubes (10pcs.)</td>
<td>Rp 3/8 x Ø10 mm</td>
<td>RA-N 10</td>
<td>013G4100</td>
</tr>
<tr>
<td></td>
<td>Rp 3/8 x Ø12 mm</td>
<td>RA-N 10</td>
<td>013G4102</td>
</tr>
<tr>
<td></td>
<td>Rp 1/2 x Ø10 mm</td>
<td>RA-N 15</td>
<td>013G4110</td>
</tr>
<tr>
<td></td>
<td>Rp 1/2 x Ø12 mm</td>
<td>RA-N 15</td>
<td>013G4112</td>
</tr>
<tr>
<td></td>
<td>Rp 1/2 x Ø15 mm</td>
<td></td>
<td>013G4115</td>
</tr>
</tbody>
</table>
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**Capacities**

**RA-N 10**

![Graph: RA-N 10 Capacities](image)

**RA-N 15**

![Graph: RA-N 15 Capacities](image)
### Capacities

**RA-N 20/25**

<table>
<thead>
<tr>
<th>Flow through radiator: Q</th>
<th>∆p = 1 mwg</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.0083 l/s</td>
<td>10 kPa</td>
</tr>
</tbody>
</table>

**Sizing example**

Required heat: 0.7 kW
Cooling across radiator: 20°C
Flow through radiator: Q = 0.7 = 0.03 m³/h = 0.0083 l/s
Pressure drop across valve: \( \frac{20 \times 1.16}{0.03} = 1.16 \) mwg

Valve setting:
- RA-N10: 3
- RA-N15: 3
- RA-N 20/25: 4

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

**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).

### Presetting

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

- Remove protective cap/thermostatic sensor
- Find reference mark
- Lift and turn setting ring until acquired presetting aligns with the reference mark.

Presetting can be selected in steps from 1 to 7.

At setting N the valve is fully open. This setting can be used as a flushing position, if the system has to be flushed out because of dirt problems. In one-pipe installations, the setting N must be used.

Settings outside 1 to 7 and N should be avoided.

When the thermostatic sensor has been installed, the presetting is protected against unintended regulation.
Data Sheet

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Design

RAS-C²

RA-N

1. Actuator
2. Setting dial
3. Safety spring
4. Bellows
5. Spindle
6. Socket
7. Union nut

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

Dimensions

<table>
<thead>
<tr>
<th>Type</th>
<th>ISO 7-1</th>
<th>L₁</th>
<th>L₂</th>
<th>L₃</th>
<th>L₄</th>
<th>L₅</th>
<th>L₆</th>
<th>Arc. flats</th>
</tr>
</thead>
<tbody>
<tr>
<td>RA-N 10</td>
<td>G 3/8</td>
<td>50</td>
<td>75</td>
<td>24</td>
<td>49</td>
<td>20</td>
<td>91.9 - 98.8</td>
<td>22</td>
</tr>
<tr>
<td>RA-N 15</td>
<td>G 1/2</td>
<td>55</td>
<td>82</td>
<td>26</td>
<td>53</td>
<td>23</td>
<td>91.9 - 98.8</td>
<td>27</td>
</tr>
<tr>
<td>RA-N 20</td>
<td>G 3/4</td>
<td>65</td>
<td>98</td>
<td>30</td>
<td>63</td>
<td>26</td>
<td>96.9 - 103.8</td>
<td>32</td>
</tr>
<tr>
<td>RA-N 2</td>
<td>G 1/1</td>
<td>90</td>
<td>123</td>
<td>40</td>
<td>75</td>
<td>34</td>
<td>96.9 - 103.8</td>
<td>41</td>
</tr>
</tbody>
</table>

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