

Installation guide

Thermostat

RT 9E, RT 14E, RT 101E, RT 107E, RT 123E



017R9518

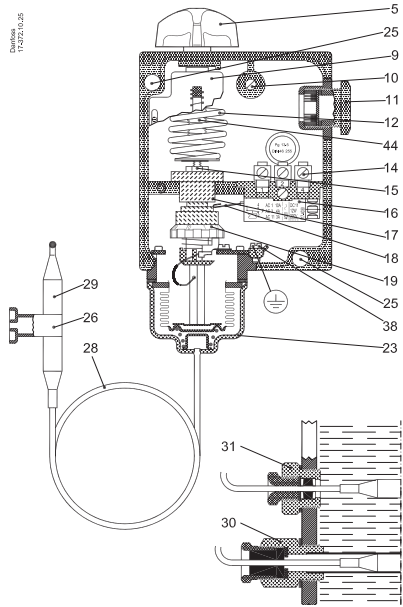


Fig. 1

Approvals and standards:

ATEX: EN 60079-0:2018; EN 60079-11:2012; IECEx: IEC 60079-0:2017; IEC 60079-11:2011
UK-type Examination Certificate: BS EN IEC 60079-0:2018, BS EN IEC 60079-11:2018

Specific conditions of use:

The enclosure fascia has been coated with a layer of stainless steel to prevent the accumulation of electrostatic charge. In order to ensure that there is no accumulation of electrostatic charge on the enclosure, the end user shall ensure that the external metal work of the enclosure is locally bonded to earth. Information on the durability of the coating with regards to use of the equipment is contained within the instruction manual.

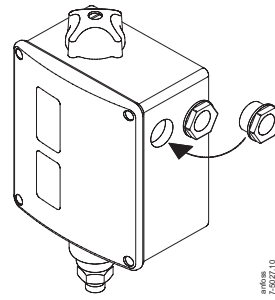
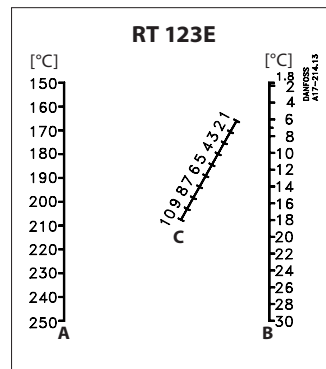
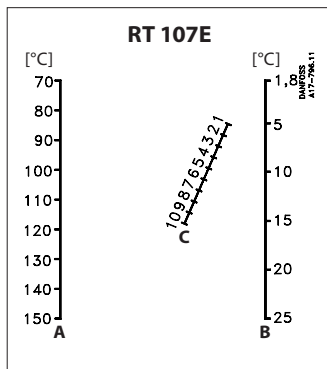
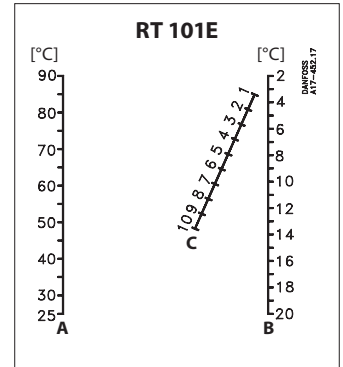
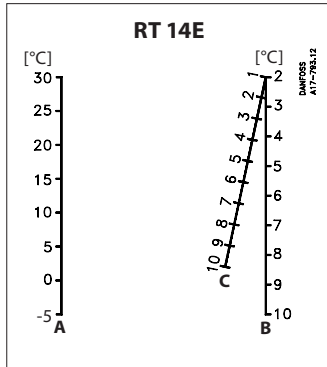
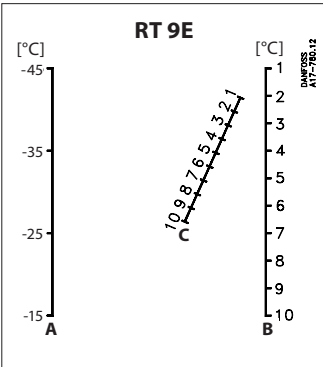


Fig. 2



A: Range setting
B: Differential obtained
C: Differential setting

Fig. 3

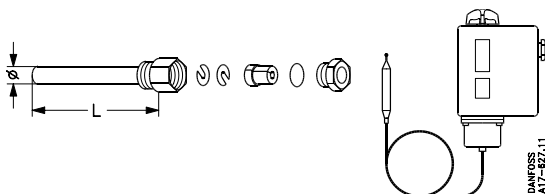


Fig. 4

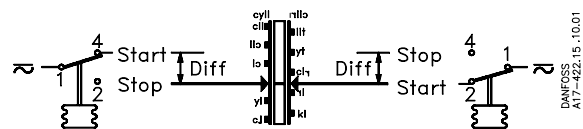


Fig. 5

017R9518

Info for UK customers only: Danfoss Ltd., 22 Wycombe End, HP9 1NB, GB

Імпортер: ТОВ з іі "Данфосс ТОВ" 04080, Київ 80, п/с 168, Україна

| Product marking | | Technical data | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|--------------------------------|----|------|------------|--|-------|-----------|-----|--------|---------|-----|---------|---------|--|---------|----------|---------------------------------|-------------|-----------|-----|----------------------------------|---|--|--|--------------|---------------------------|--|--|------------------------|--|--|--|--|--|
| <p>Ex ia IIC T6...T1 Gb -20 °C ≤ Ta ≤ 65 °C DEMKO 14 ATEX 1406X IECEX ULD 14.0013X UL21UKEX2021X Ci = 0.5 nF Ii = 0.5 A Li = 0.2 uH Pi = 1 W Ui = 29 V</p> | | <table border="1"> <thead> <tr> <th>Type</th> <th>Range [°C]</th> <th>Max. permissible bulb temperature [°C]</th> </tr> </thead> <tbody> <tr> <td>RT 9E</td> <td>-45 – -15</td> <td>150</td> </tr> <tr> <td>RT 14E</td> <td>-5 – 30</td> <td>150</td> </tr> <tr> <td>RT 101E</td> <td>25 – 90</td> <td>300</td> </tr> <tr> <td>RT 107E</td> <td>70 – 150</td> <td>215</td> </tr> <tr> <td>RT 123E</td> <td>150 – 250</td> <td>300</td> </tr> </tbody> </table> | | | Type | Range [°C] | Max. permissible bulb temperature [°C] | RT 9E | -45 – -15 | 150 | RT 14E | -5 – 30 | 150 | RT 101E | 25 – 90 | 300 | RT 107E | 70 – 150 | 215 | RT 123E | 150 – 250 | 300 | | | | | | | | | | | | | | |
| Type | Range [°C] | Max. permissible bulb temperature [°C] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RT 9E | -45 – -15 | 150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RT 14E | -5 – 30 | 150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RT 101E | 25 – 90 | 300 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RT 107E | 70 – 150 | 215 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RT 123E | 150 – 250 | 300 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>Temperature class</th> <th>Process temperature limit [°C]</th> </tr> </thead> <tbody> <tr> <td>T1</td> <td>300</td> </tr> <tr> <td>T2</td> <td>289</td> </tr> <tr> <td>T3</td> <td>194</td> </tr> <tr> <td>T4</td> <td>129</td> </tr> <tr> <td>T5</td> <td>94</td> </tr> <tr> <td>T6</td> <td>79</td> </tr> </tbody> </table> | | Temperature class | Process temperature limit [°C] | T1 | 300 | T2 | 289 | T3 | 194 | T4 | 129 | T5 | 94 | T6 | 79 | <table border="1"> <tr> <td>Permissible ambient temperature</td> <td colspan="3">-20 – 65 °C</td> </tr> <tr> <td>Intrinsically safe specification</td> <td colspan="3"> Ui = 29 V Ii = 0.5 A Pi = 1 W Ci = 0.5 nF Li = 0.2 μH </td> </tr> <tr> <td rowspan="3">Contact load</td> <td colspan="3">max. 100 mA, 30 V AC / DC</td> </tr> <tr> <td colspan="3">min. 1 mA, 5 V AC / DC</td> </tr> <tr> <td colspan="3">Must be used with a certified Ex ia barrier satisfying the input parameters.</td> </tr> </table> | | | Permissible ambient temperature | -20 – 65 °C | | | Intrinsically safe specification | Ui = 29 V Ii = 0.5 A Pi = 1 W Ci = 0.5 nF Li = 0.2 μH | | | Contact load | max. 100 mA, 30 V AC / DC | | | min. 1 mA, 5 V AC / DC | | | Must be used with a certified Ex ia barrier satisfying the input parameters. | | |
| Temperature class | Process temperature limit [°C] | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T1 | 300 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T2 | 289 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T3 | 194 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T4 | 129 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T5 | 94 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| T6 | 79 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Permissible ambient temperature | -20 – 65 °C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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Installation

A set of Pg13.5 cable gland is attached to the RT in a separate bag. To ensure IP66 (units with automatic reset) or IP54 (units with external reset) grade of RT enclosure it is necessary to assemble this gland as shown in the fig. 2. If this gland is not used with a cable, a metal blinding should be also assembled.

RT units can be fitted in any position. Use the mounting holes (25). With outdoor installation, the unit should be protected against rainfall. The bulb should be fixed to the wall by means of a bulb holding bracket (26). If it is desired to install the bulb in a water or brine tank, this can be done by using either a capillary stuffing box (31) or a bulb pocket (30). If bulb pocket is to be used, for correct bulb fitting see fig. 4.

Electrical connection

See fig. 5.
 START = make. STOP = break. DIFF. = differential.
 Cable diameter: 6 – 14 mm.
 The earth terminal (38) should be connected to earth.
 Wire dimension: min. 0,75mm²

Adjustment

Set the thermostat for minimum actuating temperature (range setting). Setting is done by rotating the knob (5), at the same time reading the main scale (9).

The differential is set by rotating the differential adjusting nut (19) according to the nomogram concerned (fig. 3).

Maximum actuating temperature is the sum of the temperature setting and the differential.

Example:
 An RT 123E is required to regulate the temperature in a drying oven. Max. temperature 188 °C, min. temperature 180 °C, differential 188 °C - 180 °C = 8 °C.

1. Set the thermostat on 180 °C with the knob (5).
2. Set the differential adjusting nut (19) on number 3 which can be found by reading off the nomogram for the RT 123E in fig. 3.

In general, turning the knob automatically moves both the maximum and minimum actuating temperatures (break and make) up or down because of the fixed differential. On the other hand, turning the differential adjusting nut only, alters the maximum actuating temperature.



Safety requirements

1. The refrigeration system must always comply with European Ex installation standard, EN 60079-14, any local directive and legislation as well as any other regulation applying in the area of installation.
2. RT-E temperature control must be used only with reliable means of limiting the voltage and current to prevent sparks between the contact surfaces. The equipment to be used for electrical load limiting must be certified for gas group IIC. Also RT-E thermostat must be installed as a part of IIC electrical installation.
3. Cable and cable entries approved for the application must be used. Cables must not be in contact with sharp edges. The cable must be connected with adequate stress relief in order to prevent that pulling forces can be carried through the cable to the terminal.
4. The cycle frequency of the RT-E switch must be kept as low as possible to prevent fatigue failure on the bellows. The vibration level must be kept as low as possible.
5. It is recommended to regularly check the function of the RT-E switch.
6. Only apparatus designed, constructed and released by Danfoss must be used for application concerned. Danfoss can accept no responsibility in case of alterations made on the thermostats or the use of them against the instructions of Danfoss.
7. Any overload of the RT switch must be prevented. Overloaded or damaged apparatus must be exchanged.
8. Only authorised persons, who are certified in installing and maintaining refrigeration system may do the installation, maintenance and exchange of the switch. Use only appropriate tools.
9. Dispose of the switch in an environmentally-friendly way.
10. RTE switches must be installed in area where is low risk of mechanical damage.
11. Components within the equipment can exceed the enclosure temperature by 1K (1 °C). When the media temperature exceeds 80 °C, it is the responsibility of the user to ensure that the media temperature does not cause a thermal ignition risk on parts between the media and the switch enclosure. Maximum media temperature on temperature switch with 2m or longer capillary tube is 300 °C.
12. Isolation of the intrinsically safe circuit to ground and to the contact mounting screw has been verified through 500 VACrms dielectric strength testing, carried out in accordance with IEC 60079-11:2011 section 10.3.
13. Surface of the front cover is sputtered with stainless steel - avoid abrasion.
14. Power must be switched off before maintenance and opening the RT-E.



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UK DECLARATION OF CONFORMITY

Danfoss A/S

Refrigeration & Air-Conditioning Controls

declares under our sole responsibility that the

Product category: Pressure and temperature switches

Type designation(s): RT112E, RT113E, RT1AE, RT116E, RT9E, RT117E, RT260AE, RT262AE, RT14E, RT101E, RT107E, RT121E, RT123E

Covered by this declaration is in conformity with the following directive(s), regulation(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

Equipment and Protective Systems Intended for use in Potentially Explosive Atmospheres Regulations 2016, UKSI

2016 No. 1107

Marking:



Ex ia IIC T6...T1 Gb

Tamb. -20C to +65C

UK-Type Examination Certificate: UL21UKEX2021X

Approved Body: UL International (UK) Ltd, No. 0843

Test basis:

BS EN IEC 60079-0:2018 Explosive atmospheres, Part 0, Equipment-General requirements

BS EN IEC 60079-11:2012 Explosive atmospheres, Part 11, Equipment Protection by Intrinsic safety "i".

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (as amended)

BS EN 63000:2018 Technical documentation for the assessment of electrical and electronics products with respect to the restriction of hazardous substances

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| Date: 2.03.2022 Place of Issue: Grodzisk Maz. | Date: 2.03.2022 Place of Issue: Grodzisk Maz. |
| Issued by: <i>Piotr Chylaszek</i> Signature: Name: Piotr Chylaszek Title: Sr. Spec. Projects & Approvals | Approved by: <i>Lukasz Stasiowski</i> Signature: Name: Lukasz Stasiowski Title: RD&E Manager |

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Classified as Business



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EU DECLARATION OF CONFORMITY

Danfoss A/S

Refrigeration & Air-Conditioning Controls

declares under our sole responsibility that the

Product category: Pressure and temperature switches

Type designation(s): RT112E, RT113E, RT1AE, RT116E, RT9E, RT117E, RT260AE, RT262AE, RT14E, RT101E, RT107E, RT121E, RT123E

Covered by this declaration is in conformity with the following directive(s), standard(s) or other normative document(s), provided that the product is used in accordance with our instructions.

Explosive or Protective Systems Intended for use in Potentially Explosive Atmospheres, Directive 2014/34/EU

Marking:



Ex ia IIC T6...T1 Gb

Tamb. -20C to +65C

EC-Type Examination Certificate: DEMKO 14 ATEX 1406X, Rev. 4

Notifying Body: UL Demko, No.: 0539

Test basis:

EN 60079-0:2018 Explosive atmospheres, Part 0, Equipment-General requirements

EN 60079-11:2012 Explosive atmospheres, Part 11, Equipment Protection by Intrinsic safety "i".

RoHS Directive 2011/65/EU including amendment 2015/863

EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronics products with respect to the restriction of hazardous substances

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| Date: 2021.08.12 Place of Issue: Grodzisk Maz. | Date: 2021.08.12 Place of Issue: Grodzisk Maz. |
| Issued by: <i>Piotr Chylaszek</i> Signature: Name: Piotr Chylaszek Title: Atex Authorized Person | Approved by: <i>Lukasz Stasiowski</i> Signature: Name: Lukasz Stasiowski Title: RD&E Manager |

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