

Miniature resistance thermometer For sanitary applications Model TR21-C, with integrated sterile connection

WIKA data sheet TE 60.28



further approvals
see page 14

Applications

- Sanitary applications
- Food and beverage industry
- Pharmaceutical industry, production of active ingredients
- Biotechnology and Life-Science-Engineering
- Creamery, brewery

Special features

- Compact design for space-saving fitting
- Simple and fast electrical connection via M12 x 1 plug connector
- With direct sensor output (Pt100/Pt1000 in 3 or 4-wire version) or integrated transmitter with 4 ... 20 mA output signal, individually parameterisable with free-of-charge WIKAsoft-TT PC configuration software
- Materials and surface finish quality in accordance with standards of hygienic design

Description

The model TR21-C resistance thermometer provides temperature measurement in sanitary applications and can be used for the measurement of liquid and gaseous media in the range of -30 ... +250 °C (-22 ... +482 °F). For application in hazardous areas, intrinsically safe versions are available.

These thermometers are fitted with process connections that meet the stringent requirements, in terms of materials and design, of hygienic measuring points. All electrical components are protected against moisture (IP67 or IP69K).

The resistance thermometer is available with direct sensor output or integrated transmitter, which can be configured individually via the PC configuration software WIKAsoft-TT. Measuring range, damping, fault signal per NAMUR NE43 and TAG no. can be adjusted.



Fig. left: without neck tube, with clamp connection
Fig. right: tapered version, G 1/2

The welded junction between the thermowell and the flange makes the use of a sealing as additional material in those areas redundant which are in contact with the product.

Through the compact design, this resistance thermometer is designed specifically for operation in applications with limited mounting space.

Insertion length, process connection, sensor and connection method can each be selected for the respective application within the order information. The electrical connection is made with an M12 x 1 circular connector.

For applications requiring the sterilisation of the instrument in autoclaves, an especially temperature-resistant instrument version is available.

Specifications

| Thermometer with transmitter and output signal 4 ... 20 mA (models TR21-C-xTT, TR21-C-xTB) | |
|--|---|
| Temperature range | -30 ... +150 °C (-22 ... +302 °F), -30 ... +250 °C (-22 ... +482 °F) ¹⁾ |
| Measuring element | <ul style="list-style-type: none"> ■ Pt1000 ■ Face-sensitive Pt1000 ²⁾ |
| Connection method | 2-wire The lead resistance is recorded as an error in the measurement. |
| Tolerance value of the measuring element in accordance with IEC 60751 | Class A |
| Measuring span | Minimum 20 K, maximum 300 K |
| Measuring deviation of the transmitter per IEC 60770 | ±0.25 K |
| Total measuring deviation in accordance with IEC 60770 | Measuring deviation of the measuring element + the transmitter |
| Basic configuration | Measuring range 0 ... 150 °C (32 ... 302 °F), other measuring ranges are adjustable |
| Analogue output | 4 ... 20 mA, 2-wire |
| Linearisation | Linear to temperature per IEC 60751 |
| Linearisation error | ±0.1 % ³⁾ |
| Switch-on delay, electrical | Max. 4 s (time before the first measured value) |
| Warming-up period | After approx. 4 minutes, the instrument will function to the specifications (accuracy) given in the data sheet. |
| Current signals for error signalling | Configurable in accordance with NAMUR NE43 downscale ≤ 3.6 mA upscale ≥ 21.0 mA |
| Sensor short-circuit | Not configurable, in accordance with NAMUR NE43 downscale ≤ 3.6 mA |
| Sensor current | < 0.3 mA (self-heating can be ignored) |
| Load R _A | $R_A \leq (U_B - 10 \text{ V}) / 23 \text{ mA}$ with R _A in Ω and U _B in V |
| Effect of load | ±0.05 % / 100 Ω |
| Power supply U _B | DC 10 ... 30 V |
| Max. permissible residual ripple | 10 % generated by U _B < 3 % ripple of the output current |
| Power supply input | Protected against reverse polarity |
| Power supply effect | ±0.025 % / V (Depending on the power supply U _B) |
| Influence of the ambient temperature | 0.1 % of span / 10 K T _a |
| Electromagnetic compatibility (EMC) ⁵⁾ | EN 61326 emission (group 1, class B) and interference immunity (industrial application) ⁴⁾ , configuration at 20 % of the full measuring range |
| Temperature units | Configurable °C, °F, K |
| Info data | TAG no., description and user message can be stored in transmitter |
| Configuration and calibration data | Permanently stored |
| Response time (per IEC 60751) | t ₅₀ < 3.3 s t ₉₀ < 9.7 s |
| Electrical connection | M12 x 1 circular connector (4-pin) |
| Autoclavability (option) | Autoclavable with mounted protection cap at connecting plug (for further information see "Ambient conditions") |
| Explosion protection (option) | Intrinsically safe to Ex i (ATEX) gas/dust (for further information see "Further specifications for explosion-protected version") |

Readings in % refer to the measuring span

- 1) The temperature transmitter should therefore be protected from temperatures over 85 °C (185 °F).
- 2) Through their small design, face-sensitive measuring resistors serve to reduce the heat dissipation with short insertion lengths. Available for the temperature range up to 150 °C (302 °F). For thermowell insertion lengths of less than 50 mm, face-sensitive measuring resistors are recommended. For thermowell insertion lengths of less than 11 mm, face-sensitive measuring resistors are generally used.
- 3) ±0.2 % for measuring ranges with a lower limit less than 0 °C (32 °F)
- 4) Use resistance thermometers with shielded cable, and ground the shield on at least one end of the lead, if the lines are longer than 30 m or leave the building. The instrument must be operated grounded.
- 5) During transient interferences (e.g. burst, surge, ESD) take into account an increased measuring deviation of up to 2 %.

Thermometer with direct sensor output with Pt100 (model TR21-C-xPx) or Pt1000 (model TR21-C-xRx)

| | |
|--|--|
| Temperature range | -30 ... +150 °C (-22 ... +302 °F), -30 ... +250 °C (-22 ... +482 °F) |
| Measuring element | <ul style="list-style-type: none"> ■ Pt100 (measuring current 0.1 ... 1.0 mA) ■ Face-sensitive Pt100 (measuring current 0.1 ... 1.0 mA) ⁶⁾ ■ Pt1000 (measuring current 0.1 ... 0.3 mA) ■ Face-sensitive Pt1000 (measuring current 0.1 ... 0.3 mA) ⁶⁾ |
| Temperature at the connector | Max. 85 °C (185 °F) |
| Connection method | <ul style="list-style-type: none"> ■ 3-wire With a cable length of 30 m or longer, measuring deviations can occur ■ 4-wire The lead resistance can be ignored |
| Tolerance value of the measuring element in accordance with IEC 60751 | <ul style="list-style-type: none"> ■ Class AA ⁷⁾ ■ Class A |
| Response time (per IEC 60751) | t ₅₀ < 3.3 s t ₉₀ < 9.7 s |
| Electrical connection | M12 x 1 circular connector (4-pin) |
| Autoclavability (option) | Autoclavable with mounted protection cap at connecting plug (for further information see "Ambient conditions") |
| Explosion protection (option) | Intrinsically safe to Ex i (ATEX) gas/dust (for further information see "Further specifications for explosion-protected version") |

For detailed specifications for Pt sensors, see Technical information IN 00.17 at www.wika.com.

Case

| | |
|---|---|
| Material | Stainless steel |
| Ingress protection | |
| <ul style="list-style-type: none"> ■ Case with connected connector ⁸⁾ | IP67 and IP69 per IEC/EN 60529, IP69K per ISO 20653 The stated ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection. |
| <ul style="list-style-type: none"> ■ Coupler connector, not connected | IP67 per IEC/EN 60529 |
| Weight in kg | Approx. 0.3 ... 2.5 (depending on version) |

Ambient conditions

| | |
|--|--|
| Ambient temperature range | |
| <ul style="list-style-type: none"> ■ Models TR21-C-xTT, TR21-C-xTB ■ Models TR21-C-xPx, TR21-C-xRx | -40 ... +85 °C (-40 ... +185 °F) -50 ... +85 °C (-58 ... +185 °F) |
| Storage temperature range | -40 ... +85 °C (-40 ... +185 °F) |
| Climate class per IEC 60654-1 | |
| <ul style="list-style-type: none"> ■ Models TR21-C-xTT, TR21-C-xTB ■ Models TR21-C-xPx, TR21-C-xRx | Cx (-40 ... +85 °C or -40 ... +185 °F, 5 ... 95 % r. h.) Cx (-50 ... +85 °C or -58 ... +185 °F, 5 ... 95 % r. h.) |
| Maximum permissible humidity per IEC 60068-2-30 var. 2 | 100 % r. h., condensation allowed |
| Maximum permissible autoclaving conditions | max. 134 °C, 3 bar abs., 100 % r. h., duration 20 min., max. 50 cycles |
| Shock resistance per IEC 60068-2-27 | 50 g, 6 ms, 3 axis, 3 faces, 3 times for each face |
| Salt fog | IEC 60068-2-11 |

Readings in % refer to the measuring span

6) Through their small design, face-sensitive measuring resistors serve to reduce the heat dissipation with short insertion lengths. Available for the temperature range up to 150 °C (302 °F). For thermowell insertion lengths of less than 50 mm, face-sensitive measuring resistors are recommended. For thermowell insertion lengths of less than 11 mm, face-sensitive measuring resistors are generally used.

7) Class accuracy AA only valid in the temperature range 0 ... 150 °C (32 ... 302 °F)

8) Not tested at UL

| Process connection | |
|---------------------------|--|
| Surface roughness | Standard: $R_a \leq 0.76 \mu\text{m}$ (SF3 per ASME BPE) Optional: $R_a \leq 0.38 \mu\text{m}$ (SF4 per ASME BPE) $R_a \leq 0.38 \mu\text{m}$ electropolished (SF4 per ASME BPE) |
| Materials (wetted) | Stainless steel 1.4435 (316L) |
| Connection to thermometer | Welded |
| Thermowell diameter | 6 mm, optional: stem reduced to 4.5 mm (from $U_1 > 25 \text{ mm}$) |
| Pressure ratings | cf. drawings of dimensions or tables of dimensions |

Conditions for outdoor use (for UL approval only)

- The instrument is suitable for applications with pollution degree 3.
- The power supply must be suitable for operation above 2,000 m should the temperature transmitter be used at this altitude.
- The instrument shall be installed in locations sheltered from the weather.
- The instrument shall be installed "sun/UV radiation protected".

Further specifications for explosion-protected version (optional)

- Thermometer with transmitter and output signal 4 ... 20 mA (models TR21-C-xTT, TR21-C-xTB)

Marking:

| Hazardous gas atmosphere | Temperature class | Ambient temperature range (T_a) | Maximum surface temperature (T_{max}) at the sensor or thermowell tip |
|---|-------------------|-------------------------------------|--|
| II 1G Ex ia IIC T1 - T6 Ga II 1/2G Ex ia IIC T1 - T6 Ga/Gb II 2G Ex ia IIC T1 - T6 Gb | T6 | -40 ... +45 °C | T_M (medium temperature) + self-heating (15 K) Pay attention to the specific conditions for safe use. |
| | T5 | -40 ... +60 °C | |
| | T4 | -40 ... +85 °C | |
| | T3 | -40 ... +85 °C | |
| | T2 | -40 ... +85 °C | |
| | T1 | -40 ... +85 °C | |

| Hazardous dust atmosphere | Power P_i | Ambient temperature range (T_a) | Maximum surface temperature (T_{max}) at the sensor or thermowell tip |
|--|-------------|-------------------------------------|--|
| II 1D Ex ia IIIC T135 °C Da II 1/2D Ex ia IIIC T135 °C Da/Db II 2D Ex ia IIIC T135 °C Db | 750 mW | -40 ... +40 °C | T_M (medium temperature) + self-heating (15 K) Pay attention to the specific conditions for safe use. |
| | 650 mW | -40 ... +70 °C | |
| | 550 mW | -40 ... +85 °C | |

Safety-related maximum values for the current loop circuit (+ and - connections):

| Parameters | Hazardous gas atmosphere | Hazardous dust atmosphere |
|--|--------------------------|---------------------------|
| Terminals | + / - | + / - |
| Voltage U_i | DC 30 V | DC 30 V |
| Current I_i | 120 mA | 120 mA |
| Power P_i | 800 mW | 750/650/550 mW |
| Effective internal capacitance C_i | 29.7 nF | 29.7 nF |
| Effective internal inductance L_i | Negligible | Negligible |
| Maximum self-heating at the sensor or thermowell tip | 15 K | 15 K |

■ Thermometer with direct sensor output with Pt100 (model TR21-C-xPx) or Pt1000 (model TR21-C-xRx)

Marking:

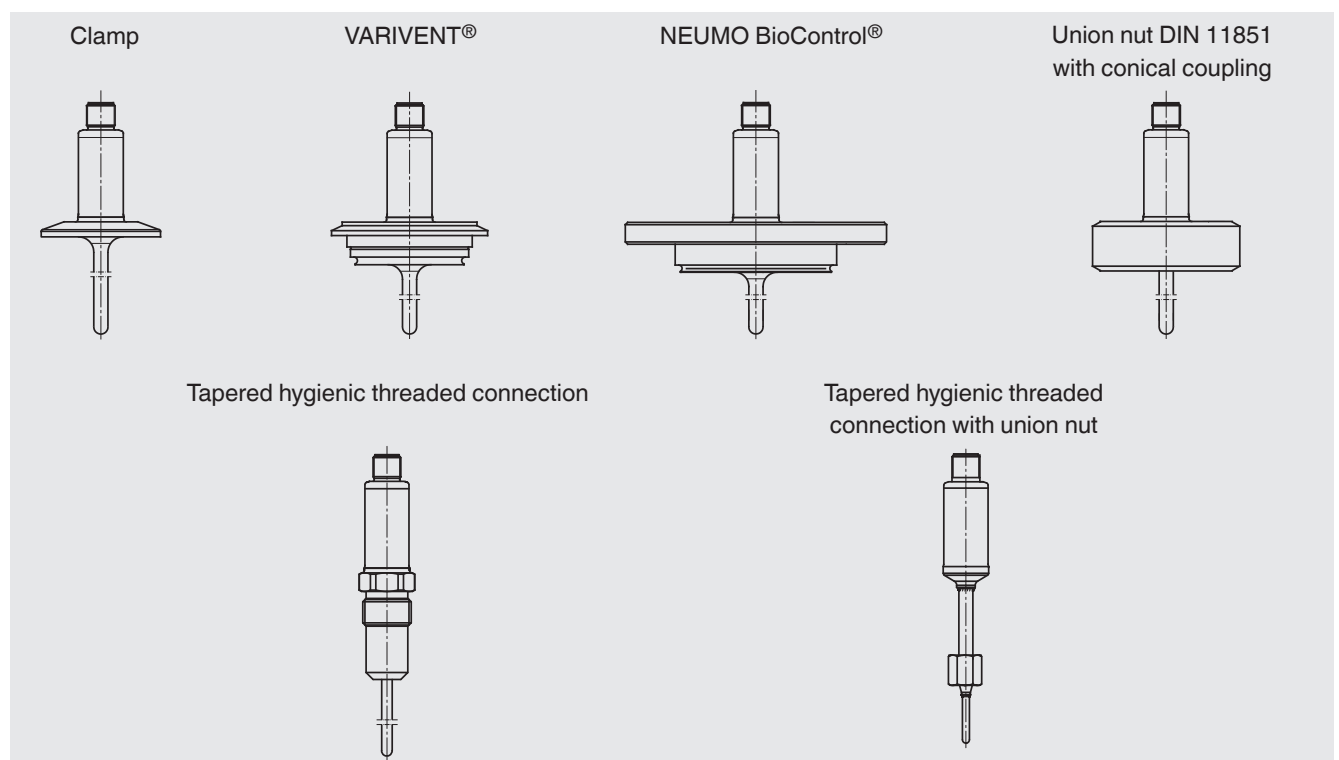
| Marking | Temperature class | Ambient temperature range (T_a) | Maximum surface temperature (T_{max}) at the sensor or thermowell tip |
|---|-------------------|-------------------------------------|---|
| II 1G Ex ia IIC T1 - T6 Ga II 1/2G Ex ia IIC T1 - T6 Ga/Gb II 2G Ex ia IIC T1 - T6 Gb | T6 | -50 ... +80 °C | T_M (medium temperature) + self-heating Pay attention to the specific conditions for safe use. |
| | T5 | -50 ... +85 °C | |
| | T4 | -50 ... +85 °C | |
| | T3 | -50 ... +85 °C | |
| | T2 | -50 ... +85 °C | |
| | T1 | -50 ... +85 °C | |

| Marking | Power P_i | Ambient temperature range (T_a) | Maximum surface temperature (T_{max}) at the sensor or thermowell tip |
|--|-------------|-------------------------------------|---|
| II 1D Ex ia IIIC T135 °C Da II 1/2D Ex ia IIIC T135 °C Da/Db II 2D Ex ia IIIC T135 °C Db | 750 mW | -50 ... +40 °C | T_M (medium temperature) + self-heating Pay attention to the specific conditions for safe use. |
| | 650 mW | -50 ... +70 °C | |
| | 550 mW | -50 ... +85 °C | |

Safety-related maximum values for the current loop circuit (connections in accordance with pin assignment 1 - 4):

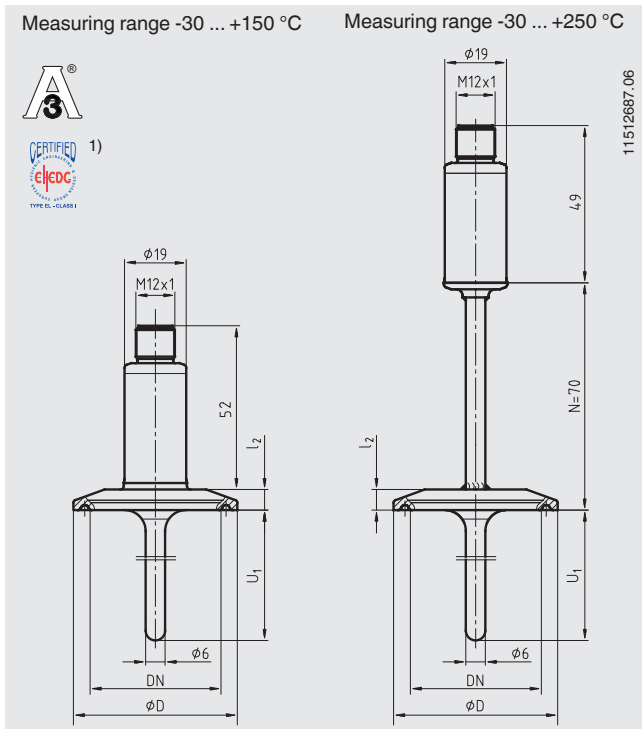
| Parameters | Gas applications | Dust applications |
|--|------------------------------|------------------------------|
| Terminals | 1 - 4 | 1 - 4 |
| Voltage U_i | DC 30 V | DC 30 V |
| Current I_i | 550 mA | 250 mA |
| Power P_i | 1.500 mW | 750/650/550 mW |
| Effective internal capacitance C_i | Negligible | Negligible |
| Effective internal inductance L_i | Negligible | Negligible |
| Maximum self-heating at the sensor or thermowell tip | $(R_{th}) = 335 \text{ K/W}$ | $(R_{th}) = 335 \text{ K/W}$ |

Overview of the process connections



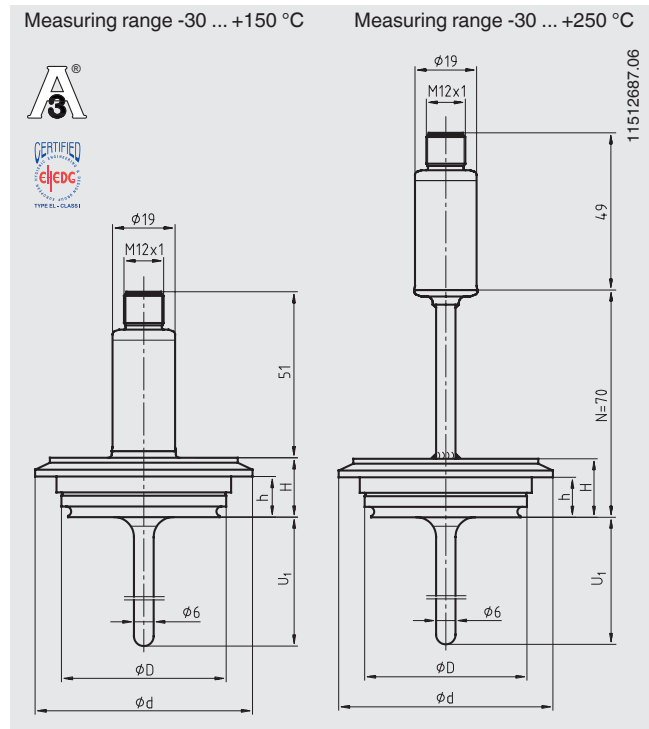
Dimensions in mm

Clamp process connection



- 1) In combination with
 - Kalrez/Stainless steel gasket from Dupont de Nemours, Switzerland or
 - T-ring seals from Combifit International B. V., Netherlands

VARIVENT® process connection



VARIVENT® is a registered trademark of the company GEA Tuchenhagen.

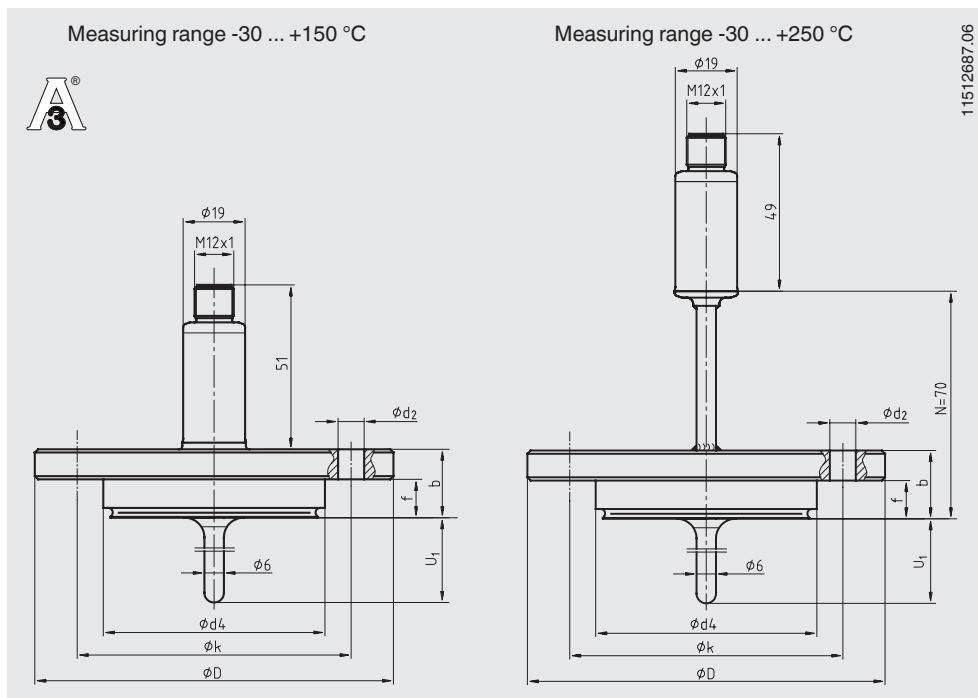
Dimensions for clamp process connection

| Process connection | Nominal width in mm/inch | PN in bar | Dimensions in mm | | Weight in kg |
|---|--------------------------|-----------|------------------|----------------|--------------|
| | | | Ø D | l ₂ | |
| DIN 32676 for pipes per DIN 11866 row A | DN 10 ... 20 | 25 | 34.0 | 6.35 | 0.2 |
| | DN 25 ... 40 | 25 | 50.5 | 6.35 | 0.3 |
| | DN 50 | 16 | 64.0 | 6.35 | 0.4 |
| DIN 32676 for pipes per DIN 11866 row B | 13.5 ... 17.2 | 25 | 25.0 | 4.75 | 0.2 |
| | 21.3 ... 33.7 | 25 | 50.5 | 6.35 | 0.3 |
| | 42.4 ... 48.3 | 16 | 64.0 | 6.35 | 0.3 |
| DIN 32676 for pipes per DIN 11866 row C | ½" ... ¾" | 25 | 25.0 | 4.75 | 0.2 |
| | 1" ... 1 ½" | 25 | 50.5 | 6.35 | 0.3 |
| | 2" | 16 | 64.0 | 6.35 | 0.4 |
| Tri-clamp | ½" ... ¾" | 13.8 | 25.0 | 4.75 | 0.2 |
| | 1" ... 1 ½" | 13.8 | 50.5 | 6.35 | 0.3 |
| | 2" | 13.8 | 64.0 | 6.35 | 0.4 |
| | 2 ½" | 13.8 | 77.5 | 6.35 | 0.5 |
| | 3" | 13.8 | 91.0 | 6.35 | 0.6 |
| ISO 2852 | DN 12 ... 21.3 | 16 | 34.0 | 6.35 | 0.2 |
| | DN 25 ... 38 | 16 | 50.5 | 6.35 | 0.3 |
| | DN 40 ... 51 | 16 | 64.0 | 6.35 | 0.4 |

Dimensions for VARIVENT® process connection

| Process connection | Nominal width in mm | PN in bar | Dimensions in mm | | | | Weight in kg |
|--------------------|---------------------|-----------|------------------|------|----|-------|--------------|
| | | | Ø D | Ø d | H | h | |
| Form B | DN 10, DN 15 | 25 | 31 | 52.7 | 20 | 13.65 | 0.3 |
| Form F | DN 25, DN 32 | 25 | 50 | 66.0 | 18 | 12.30 | 0.4 |
| Form N | DN 40, DN 50 | 25 | 68 | 84.0 | 18 | 12.30 | 0.6 |

NEUMO BioControl® process connection



BioControl® is a registered trademark of the company NEUMO.

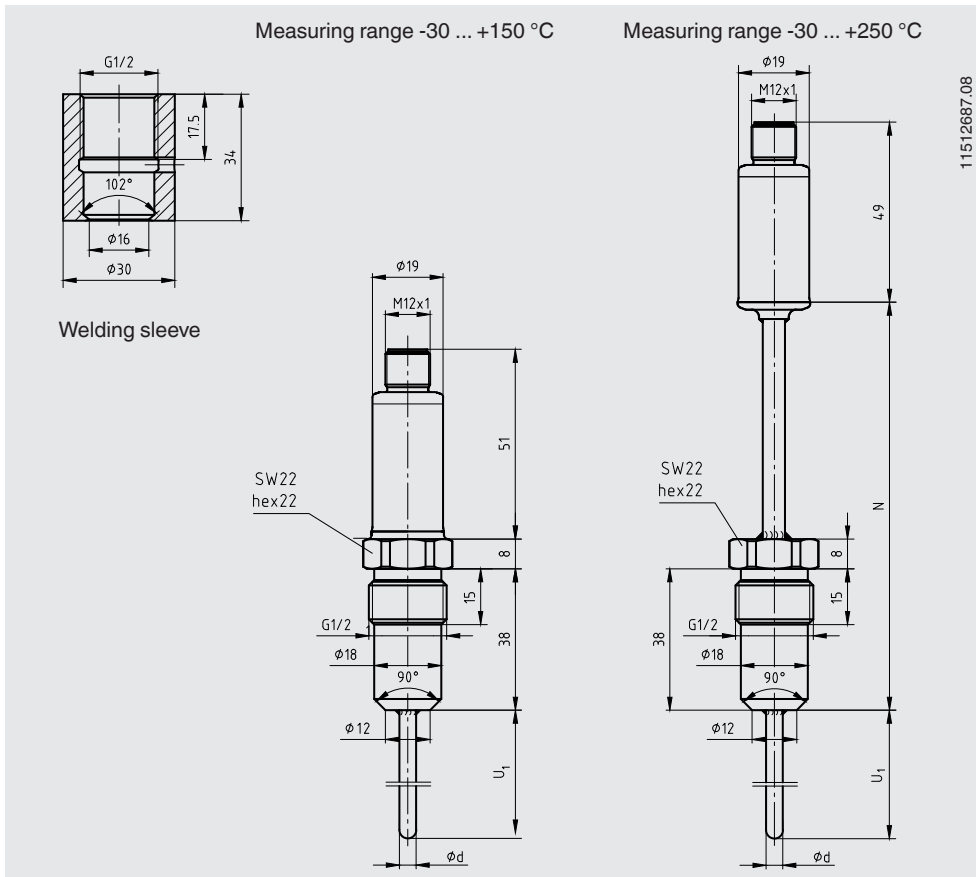
For a detailed description of the BioControl® cases, see data sheet AC 09.14.

| Case size | Nominal width in mm | PN in bar | Dimensions in mm | | | | | | | Weight in kg |
|-----------|---------------------|-----------|---------------------|-------------------|-----------------|----|----|-----------------|----------------------|--------------|
| | | | U_1 ²⁾ | $\varnothing d_4$ | $\varnothing D$ | f | b | $\varnothing k$ | $\varnothing d_2$ | |
| Size 25 | DN 8 | 16 | 5 | 30.5 | 64 | 11 | 20 | 50 | 4 x $\varnothing 7$ | 0.4 |
| | DN 10 | 16 | 6 | 30.5 | 64 | 11 | 20 | 50 | 4 x $\varnothing 7$ | 0.4 |
| | DN 15 | 16 | 9 | 30.5 | 64 | 11 | 20 | 50 | 4 x $\varnothing 7$ | 0.4 |
| | DN 20 | 16 | 11 | 30.5 | 64 | 11 | 20 | 50 | 4 x $\varnothing 7$ | 0.4 |
| Size 50 | DN 25 | 16 | 15 | 50.0 | 90 | 17 | 27 | 70 | 4 x $\varnothing 9$ | 0.8 |
| | DN 40 | 16 | 20 | 50.0 | 90 | 17 | 27 | 70 | 4 x $\varnothing 9$ | 0.8 |
| | DN 50 | 16 | 25 | 50.0 | 90 | 17 | 27 | 70 | 4 x $\varnothing 9$ | 0.8 |
| | DN 65 | 16 | 35 | 50.0 | 90 | 17 | 27 | 70 | 4 x $\varnothing 9$ | 0.8 |
| | DN 80 | 16 | 45 | 50.0 | 90 | 17 | 27 | 70 | 4 x $\varnothing 9$ | 0.8 |
| | DN 100 | 16 | 55 | 50.0 | 90 | 17 | 27 | 70 | 4 x $\varnothing 9$ | 0.8 |
| Size 65 | DN 40 | 16 | 20 | 68.0 | 120 | 17 | 27 | 95 | 4 x $\varnothing 11$ | 1.4 |
| | DN 50 | 16 | 25 | 68.0 | 120 | 17 | 27 | 95 | 4 x $\varnothing 11$ | 1.4 |
| | DN 65 | 16 | 35 | 68.0 | 120 | 17 | 27 | 95 | 4 x $\varnothing 11$ | 1.4 |
| | DN 80 | 16 | 45 | 68.0 | 120 | 17 | 27 | 95 | 4 x $\varnothing 11$ | 1.4 |
| | DN 100 | 16 | 55 | 68.0 | 120 | 17 | 27 | 95 | 4 x $\varnothing 11$ | 1.4 |

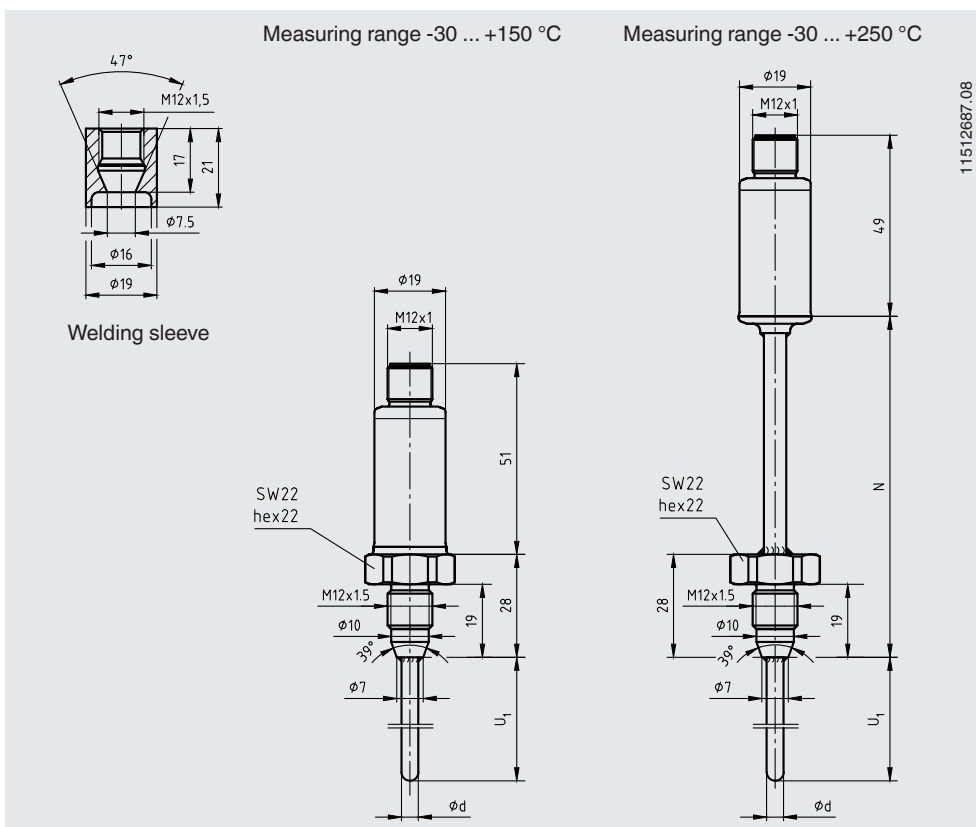
2) Recommended insertion length for installation in BioControl® flow-through housing; other insertion lengths are possible.

Tapered hygienic threaded connection process connection

■ Process connection G 1/2

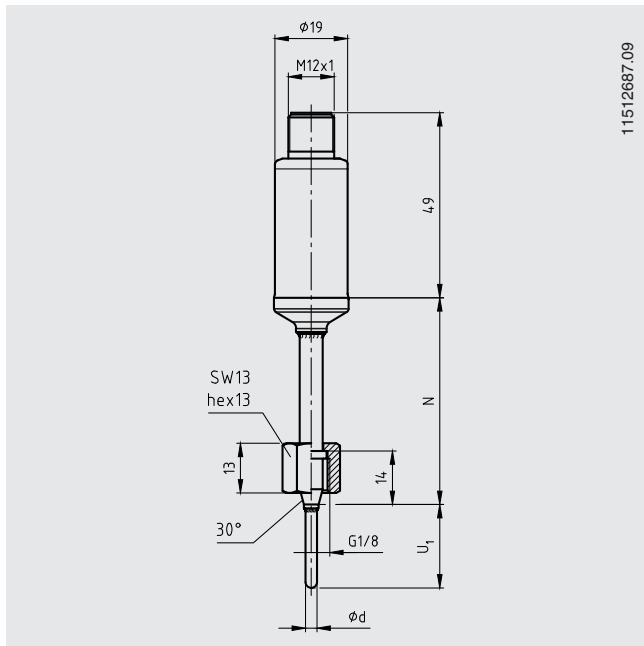


■ Process connection M12 x 1.5



Tapered hygienic threaded connection process connection with union nut

■ Process connection G 1/8

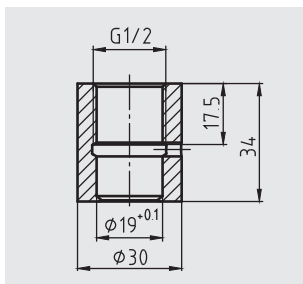


Other process connections and nominal widths available on request.

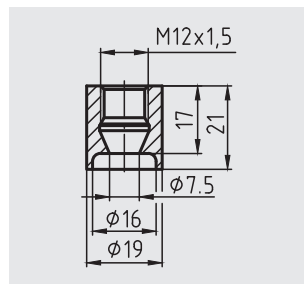
Accessories

| Model | Special features | Order no. | |
|---|---|--|----------|
| Programming unit Model PU-548  | <ul style="list-style-type: none"> ■ Easy to use ■ LED status display ■ Compact design ■ No further voltage supply needed, neither for the programming unit nor for the transmitter <p>(replaces programming unit model PU-448)</p> | 14231581 | |
| Adapter cable M12 to PU-548  | Adapter cable for the connection of a model TR21-C resistance thermometer to the model PU-548 programming unit | 14003193 | |
| M12 sealing cap with mounted PTFE sealing | Sealing cap for protecting the resistance thermometer during sterilisation in autoclaves | 14113588 | |
| M12 connection cable | Cable socket straight, 4-pin, ingress protection IP67 <ul style="list-style-type: none"> ■ Temperature range -20 ... +80 °C ■ Suitable for hazardous areas | Cable length 2 m 14086880 Cable length 5 m 14086883 | |
| | Cable socket straight, 4-pin, ingress protection IP69K, Hygienic Design <ul style="list-style-type: none"> ■ Temperature range -40 ... +80 °C ■ Not for hazardous areas | Cable length 3 m 14137167 Cable length 5 m 14137168 | |
| | Angled socket, 4-pin, ingress protection IP67 <ul style="list-style-type: none"> ■ Temperature range -20 ... +80 °C ■ Suitable for hazardous areas | Cable length 2 m 14086889 Cable length 5 m 14086891 | |
| | Angled socket, 4-pin, ingress protection IP69K, Hygienic Design <ul style="list-style-type: none"> ■ Temperature range -40 ... +80 °C ■ Not for hazardous areas | Cable length 3 m 14137169 Cable length 5 m 14137170 | |
| | Welding sleeves | With tapered hygienic threaded connection G ½ Material: stainless steel 1.4435 (316L) | 11422599 |
| | | With tapered hygienic threaded connection M12 Material: stainless steel 1.4435 (316L) | 11426721 |
| Weld-in help  | Weld-in mandrel for tapered hygienic threaded connection G ½ Material: CuZn alloy (brass) | 11477742 | |
|  | Weld-in mandrel for tapered hygienic threaded connection M12 Material: CuZn alloy (brass) | 11476894 | |

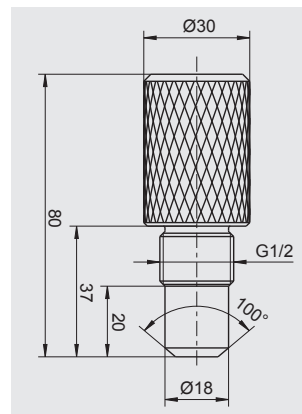
Welding sleeves G ½



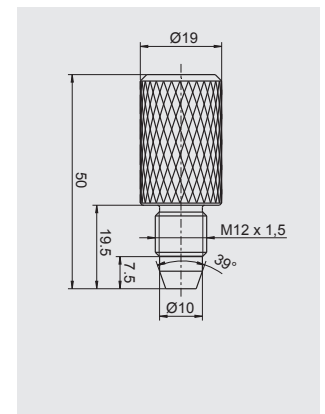
Welding sleeves M12



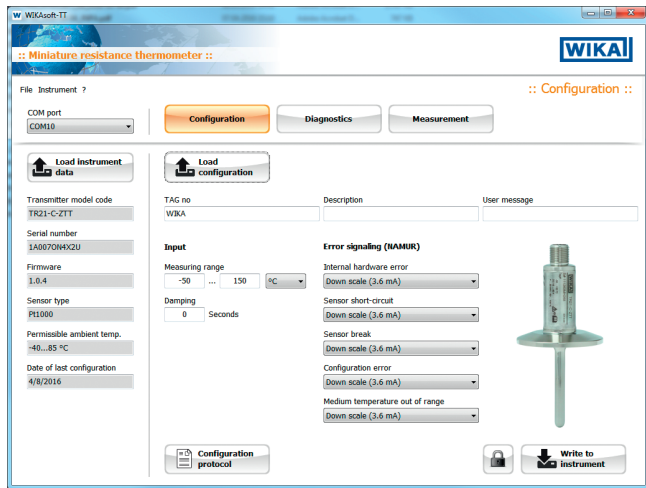
Weld-in mandrel G ½



Weld-in mandrel M12

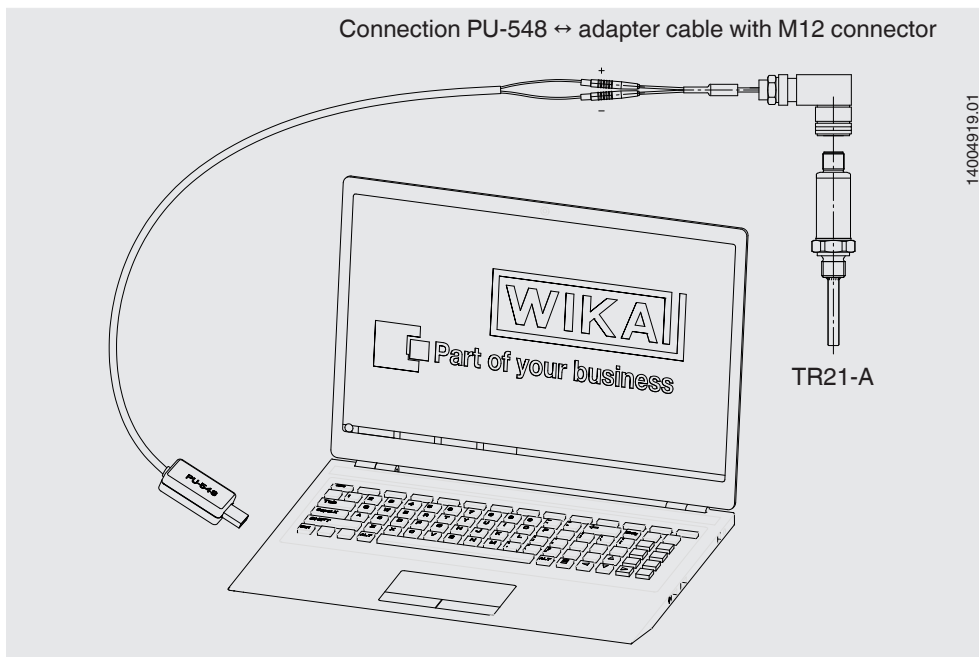


Configuration software WIKAsoft-TT



Configuration software (multilingual) as a download from www.wika.com

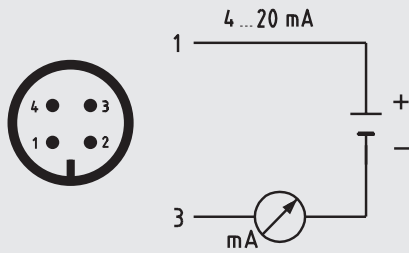
Connecting PU-548 programming unit



(predecessor, programming unit model PU-448, also compatible)

Electrical connection

Output signal 4 ... 20 mA M12 x 1 circular connector (4-pin)

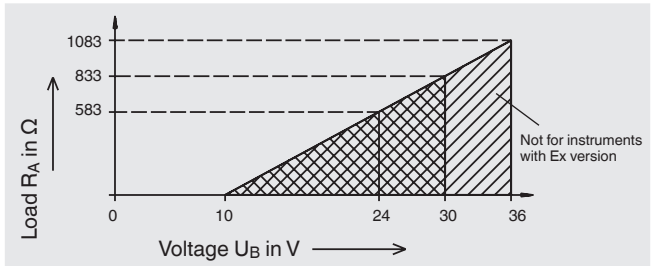
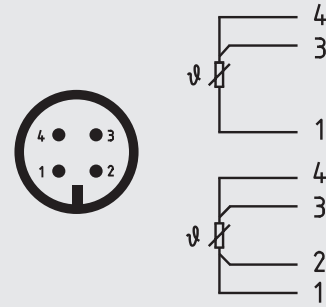


| Pin | Signal | Description |
|-----|--------|---------------|
| 1 | L+ | 10 ... 30 V |
| 2 | VQ | not connected |
| 3 | L- | 0 V |
| 4 | C | not connected |













Load diagram

The permissible load depends on the loop supply voltage. For communication with the instrument with programming unit PU-548, a max. load of 350 Ω is admissible.

Output signal Pt100 sensor M12 x 1 circular connector (4-pin)



Approvals

| Logo | Description | Country |
|--|--|-----------------------------|
|  | EU declaration of conformity <ul style="list-style-type: none"> ■ EMC directive ¹⁾ EN 61326 emission (group 1, class B) and interference immunity (industrial application) ■ ATEX directive (option) Hazardous areas II 1G Ex ia IIC T1 - T6 Ga II 1/2G Ex ia IIC T1 - T6 Ga/Gb II 2G Ex ia IIC T1 - T6 Gb II 1D Ex ia IIIC T135 °C Da II 1/2D Ex ia IIIC T135 °C Da/Db II 2D Ex ia IIIC T135 °C Db | European Union |
|  | IECEx (option) Hazardous areas | International |
|  | CSA <ul style="list-style-type: none"> ■ Safety (e.g. electr. safety, overpressure, ...) ■ Hazardous areas | USA and Canada |
|  | UL (Option) Safety (e.g. electr. safety, overpressure, ...) | USA and Canada |
|  | EAC (option) <ul style="list-style-type: none"> ■ EMC directive ¹⁾ ■ Hazardous areas | Eurasian Economic Community |
|  | GOST (option) Metrology, measurement technology | Russia |
|  | KazInMetr (option) Metrology, measurement technology | Kazakhstan |
| - | MTSCHS (option) Permission for commissioning | Kazakhstan |
|  | BelGIM (option) Metrology, measurement technology | Belarus |
|  | Uzstandard (option) Metrology, measurement technology | Uzbekistan |
|  | NEPSI (option) Hazardous areas | China |
|  | 3-A (option) ²⁾ Sanitary Standard | USA |
|  | EHEDG (option) ²⁾ Hygienic Equipment Design | European Union |

1) Only for built-in transmitter

2) Confirmation of 3-A or EHEDG conformity only valid with separately selectable 2.2 test report

Certificates (option)

- 2.2 test report
- 3.1 inspection certificate
- Manufacturer's declaration regarding Regulation (EC) 1935/2004
- Certificate of the surface roughness of wetted parts
- Hygiene certificates

| Approval | 3-A | EHEDG |
|--------------------------------------|-------------------|-------------------|
| Clamp | yes | yes ⁴⁾ |
| VARIVENT® | yes | yes |
| BioConnect® | yes | no |
| DIN 11851 | yes ³⁾ | yes ⁴⁾ |
| Tapered hygienic threaded connection | no | no |

3) In combination with
- ASEPTO-STAR k-flex upgrade gaskets from Kieselmann GmbH, Germany or
- SKS gasket set DIN 11851 EHEDG from Siersema Componenten Service (S.K.S.) B. V.,
Netherlands

4) In combination with
T-ring seals from Combifit International B. V., Netherlands

Approvals and certificates, see website

Ordering information

Model / Approval / Sensor or transmitter output / Sensor specification or transmitter configuration / Process temperature / Process connection / Thermowell diameter / Material wetted parts / Insertion length U₁ / Neck length / Electrical accessories / Certificates / Options

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