Miniature resistance thermometer
For sanitary applications, with flange connection
Model TR21-A

further approvals
see page 17

Applications

- Sanitary applications
- Food and beverage industry
- Bio and pharmaceutical industry, production of active ingredients

Special features

- Sensor can be calibrated without having to open the process
- 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

Model TR21-A with VARIVENT® connection

Description

The model TR21-A 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 thermowells, whose process connections 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, error signalling per NAMUR NE43 and TAG no. can be adjusted.

For easy calibration or maintenance, the sensor is removable without having to break into the process or disconnect the electrical connection. Thus hygiene risks can be minimised and downtimes can be reduced.

The spring loading, integrated into the union nut, guarantees the contact between the sensor tip and the bottom of the thermowell and thus ensures a short response time and lasting high accuracy. 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. 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 via an M12 x 1 circular connector.

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

Data sheets showing similar products:
Thermowells for sanitary applications; model TW22; see data sheet TW 95.22
Resistance thermometer, with flange connection; model TR22-A; see data sheet TE 60.22
Resistance thermometer, for orbital welding; model TR22-B; see data sheet TE 60.23
Miniature resistance thermometer, for orbital welding; model TR21-B; see data sheet TE 60.27
Miniature resistance thermometer, with welded flange connection; model TR21-C; see data sheet TE 60.28

Specifications

Thermometer with transmitter and output signal 4 ... 20 mA (models TR21-A-xTT, TR21-A-xTB)	
Temperature range	-30 ... +250 °C (-22 ... +482 °F) [1]
Measuring element	■ 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 [3] per 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 per 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 % [4]
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	$R_A \leq (U_B - 10\ V) / 23\ mA$ 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) [6]	EN 61326 emission (group 1, class B) and interference immunity (industrial application) [5], 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} < 4.7 s t_{90} < 12.15 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) Specification is only valid for the measuring element. Depending on the process connection, the deviation can be greater.
4) ±0.2 % for measuring ranges with a lower limit less than 0 °C (32 °F)
5) 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.
6) 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-A-xPx) or Pt1000 (model TR21-A-xRx)	
Temperature range	-30 ... +250 °C (-22 ... +482 °F)
Measuring element	■ Pt100 (measuring current 0.1 ... 1.0 mA) ■ Face-sensitive Pt100 (measuring current 0.1 ... 1.0 mA) [7)] ■ Pt1000 (measuring current 0.1 ... 0.3 mA) ■ Face-sensitive Pt1000 (measuring current 0.1 ... 0.3 mA) [7)]
Temperature at the connector	Max. 85 °C (185 °F)
Connection method	■ 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 [8)] per IEC 60751	■ Class AA [9)] ■ Class A
Response time (per IEC 60751)	t_{50} < 4.7 s t_{90} < 12.15 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 ■ Case with connected connector [10)] ■ Coupler connector, not connected	 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. IP67 per IEC/EN 60529
Weight in kg	Approx. 0.3 ... 2.5 (depending on version)

Ambient conditions	
Ambient temperature range ■ Models TR21-A-xTT, TR21-A-xTB ■ Models TR21-A-xPx, TR21-A-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 ■ Models TR21-A-xTT, TR21-A-xTB ■ Models TR21-A-xPx, TR21-A-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

7) 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.

8) Specification is only valid for the measuring element. Depending on the process connection, the deviation can be greater.

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

10) Not tested at UL

Thermowell model TW22	
Surface roughness	Standard: $R_a \leq 0.76$ µm (SF3 per ASME BPE) Optional: $R_a \leq 0.38$ µm (SF4 per ASME BPE) $R_a \leq 0.38$ µm electropolished (SF4 per ASME BPE)
Materials	Wetted parts: stainless steel 1.4435 (316L, UNS S31603)
Connection to thermometer	G 3/8"
Thermowell diameter	6 mm, optional: stem reduced to 4.5 mm (from $U_1 > 25$ mm)
Insertion length U_1 [9]	Standard: 25, 50, 75, 100, 150, 200 mm other insertion lengths are available as options
Pressure ratings	cf. tables of dimensions

9) For the TR21-A design without thermowell, the insertion length is defined by the dimension l1 (see dimensions in mm).
The thickness of bottom of the thermowell can be neglected for dimensioning. It is offset by the spring travel of the measuring insert.

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-A-xTT, TR21-A-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-A-xPx) or Pt1000 (model TR21-A-xRx)**

Marking:

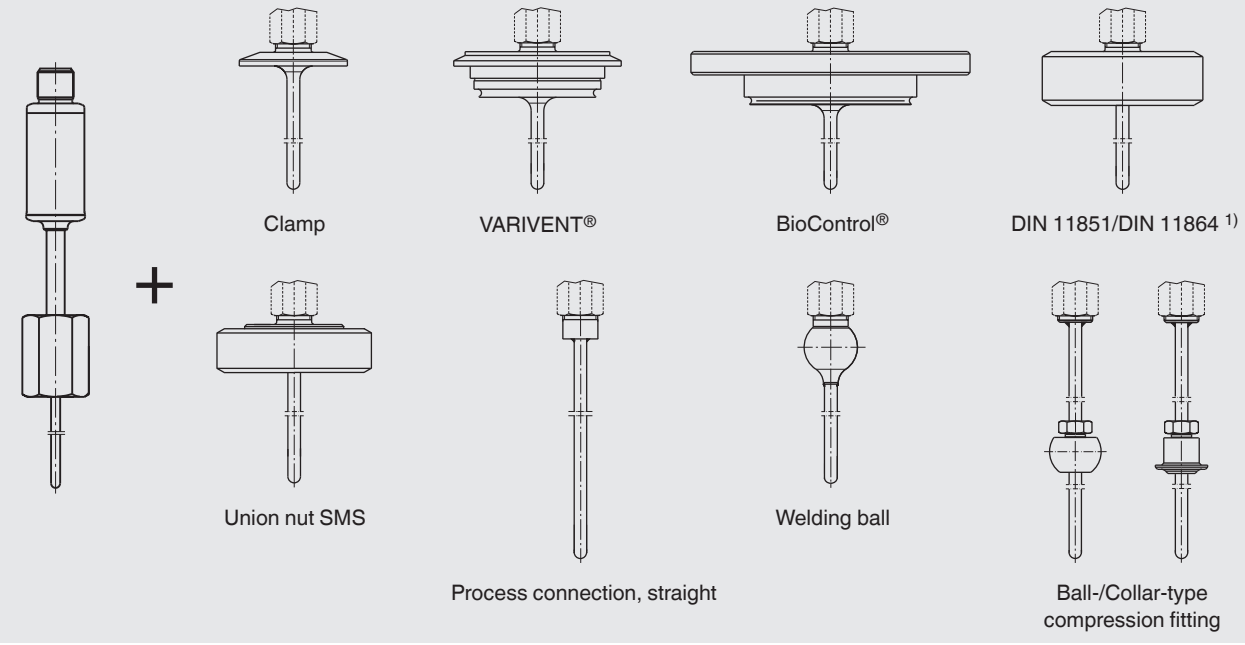
Marking	Temperature class	Ambient temperature range (T_a)	Maximum surface temperature (T_{max}) at the sensor or thermowell tip
II 1G Ex ia IIC T1 - T6 Ga **II 1/2G Ex ia IIC T1 - T6 Ga/Gb** **II 2G Ex ia IIC T1 - T6 Gb**	T6	-50 ... +80 °C	T_M (medium temperature) + self-heating Pay attention to the 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 K/W	(R_{th}) = 335 K/W

Overview of combinations



1) Process connections per DIN 11864-2 and DIN 11864-3, see “Dimensions of the process connections in mm”

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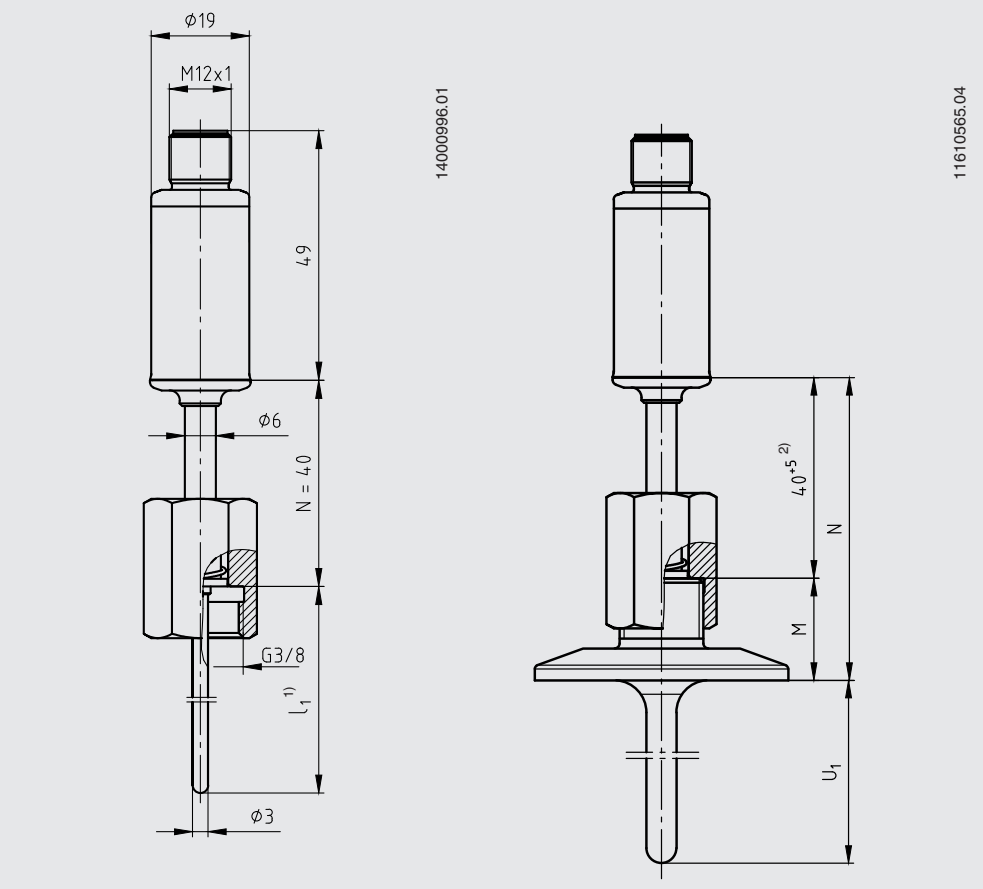
Dimensions in mm



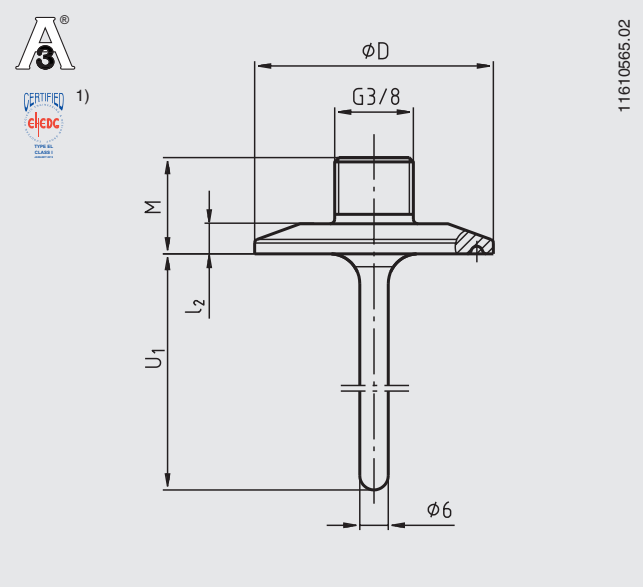
Legend:
l_1 Sensor insertion length
N Neck length
M Neck tube length
U_1 Insertion length

1) In the event of replacement, calculate the sensor insertion length, l_1, as follows:
$l_{1\ (TR21\text{-}A)} = U_1 + M$

2) The tolerance specification is dependent on the spring travel of the sensor/probe

Dimensions of the process connections in mm (thermowells model TW22)

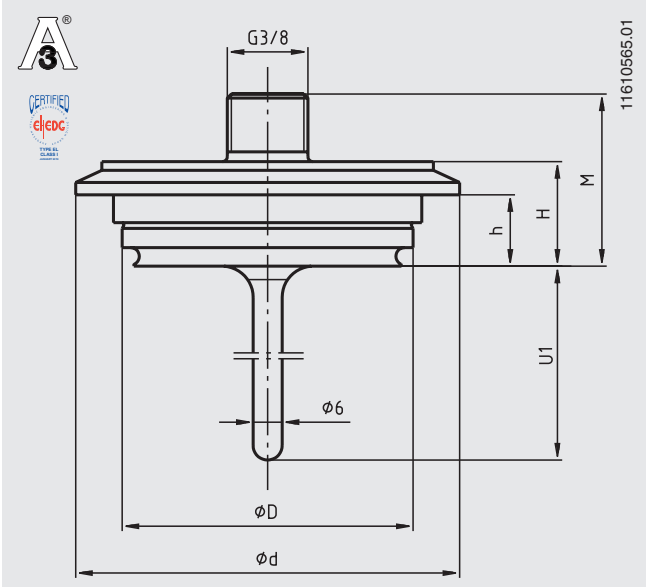
Clamp process connection



U_1 = variable insertion length

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

VARIVENT® process connection



U_1 = variable insertion length

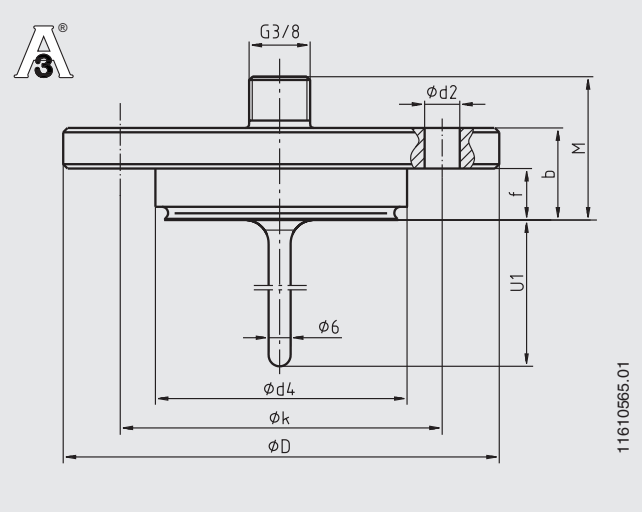
Dimensions for clamp process connection

Process connection	Nominal width in mm/inch	PN in bar	Dimensions in mm			Weight in kg
			Ø D	M	l_2	
DIN 32676 for pipes per DIN 11866 row A	DN 10 ... 20	25	34.0	20.35	6.35	0.2
	DN 25 ... 40	25	50.5	20.35	6.35	0.3
	DN 50	16	64.0	20.35	6.35	0.4
DIN 32676 for pipes per DIN 11866 row B	13.5 ... 17.2	25	25.0	18.75	4.75	0.2
	21.3 ... 33.7	25	50.5	20.35	6.35	0.3
	42.4 ... 48.3	16	64.0	20.35	6.35	0.3
DIN 32676 for pipes per DIN 11866 row C	½" ... ¾"	25	25.0	18.75	4.75	0.2
	1" ... 1 ½"	25	50.5	20.35	6.35	0.3
	2"	16	64.0	20.35	6.35	0.4
Tri-clamp per ASME BPE	½" ... ¾"	13.8	25.0	18.75	4.75	0.2
	1" ... 1 ½"	13.8	50.5	20.35	6.35	0.3
	2"	13.8	64.0	20.35	6.35	0.4
	2 ½"	13.8	77.5	20.35	6.35	0.5
	3"	13.8	91.0	20.35	6.35	0.6
	4"	13.8	119.0	20.35	6.35	0.8
ISO 2852	DN 12 ... 21.3	16	34.0	20.35	6.35	0.2
	DN 25 ... 38	16	50.5	20.35	6.35	0.3
	DN 40 ... 51	16	64.0	20.35	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	M	Ø d	H	h	
Form B	DN 10, DN 15	25	31	34	52.7	20	13.65	0.3
Form F	DN 25, DN 32	25	50	32	66.0	18	12.30	0.4
Form N	DN 40, DN 50	25	68	32	84.0	18	12.30	0.6

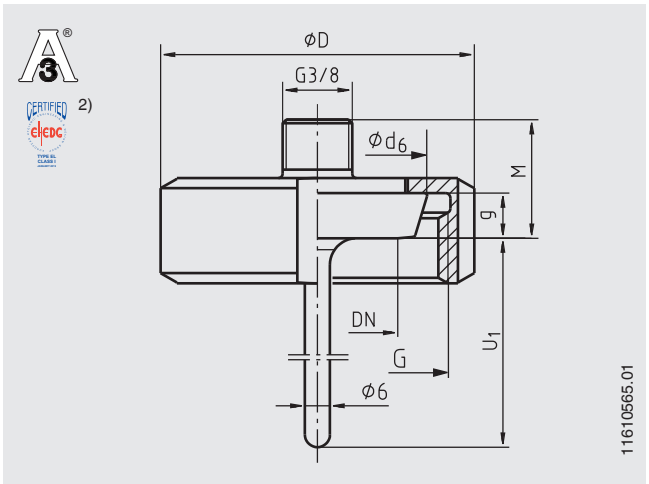
NEUMO BioControl® process connection



U_1 = variable insertion length

For fitting into a flow-through housing, the insertion length U_1 and the thermowell diameter must be matched. For angular housings, the insertion length U_1 must be specified by the customer.
The cases are not part of the scope of delivery of the resistance thermometers and can be ordered as a separate item. For a detailed description of the BioControl® cases, see data sheet AC 09.14.

Union nut process connection DIN 11851 with conical coupling (milk thread fitting)



U_1 = variable insertion length

2) In combination with
- ASEPTO-STAR k-flex upgrade gaskets from Kieselmann GmbH, Germany or
- SKS gasket set DIN 11851 EHEDG from Siersema Komponenten

Dimensions for NEUMO BioControl® process connection

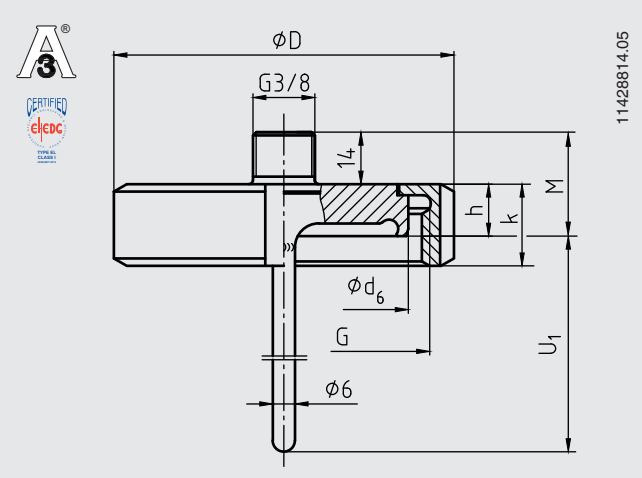
Case size	Nominal width in mm	PN in bar	Dimensions in mm								Weight in kg
			U_1 3)	Ø d_4	Ø D	M	f	b	Ø k	Ø d_2	
Size 25	DN 8	16	5	30.5	64	34	11	20	50	4 x Ø 7	0.4
	DN 10	16	6	30.5	64	34	11	20	50	4 x Ø 7	0.4
	DN 15	16	9	30.5	64	34	11	20	50	4 x Ø 7	0.4
	DN 20	16	11	30.5	64	34	11	20	50	4 x Ø 7	0.4
Size 50	DN 25	16	15	50.0	90	41	17	27	70	4 x Ø 9	0.8
	DN 40	16	20	50.0	90	41	17	27	70	4 x Ø 9	0.8
	DN 50	16	25	50.0	90	41	17	27	70	4 x Ø 9	0.8
	DN 65	16	35	50.0	90	41	17	27	70	4 x Ø 9	0.8
	DN 80	16	45	50.0	90	41	17	27	70	4 x Ø 9	0.8
	DN 100	16	55	50.0	90	41	17	27	70	4 x Ø 9	0.8
Size 65	DN 40	16	20	68.0	120	41	17	27	95	4 x Ø 11	1.4
	DN 50	16	25	68.0	120	41	17	27	95	4 x Ø 11	1.4
	DN 65	16	35	68.0	120	41	17	27	95	4 x Ø 11	1.4
	DN 80	16	45	68.0	120	41	17	27	95	4 x Ø 11	1.4
	DN 100	16	55	68.0	120	41	17	27	95	4 x Ø 11	1.4

Dimensions for union nut process connection DIN 11851 with conical coupling (milk thread fitting)

Nominal width in mm	PN in bar	Dimensions in mm					Weight in kg
		Ø d_6	G	Ø D	M	g	
DN 20	40	36.5	RD 44 x 1/6	54	25	8	0.4
DN 25	40	44.0	RD 52 x 1/6	63	27	10	0.5
DN 32	40	50.0	RD 58 x 1/6	70	27	10	0.6
DN 40	40	56.0	RD 65 x 1/6	78	27	10	0.8
DN 50	25	68.5	RD 78 x 1/6	92	28	11	0.9

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

Process connection, aseptic threaded pipe connection DIN 11864-1 with form A liner, for pipes in accordance with DIN 11866 row A, B and C



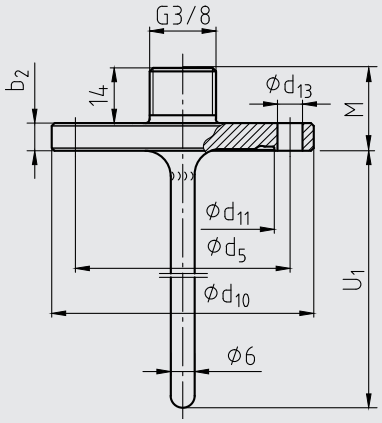
U_1 = variable insertion length

Nominal width of pipe	Nominal pressure in bar	Outer diameter of pipe	Pipe schedule	Inner diameter of pipe	Process connection					Aseptic O-ring	Weight in kg
DN / OD	PN		s		Ø D	M	G	h	k		
DIN 11866 row A or metric											
10	40	13	1.5	10	38	23	RD 28 x 1/8	9	18	12 x 3.5	1.2
15	40	19	1.5	16	44	23	RD 34 x 1/8	9	18	18 x 3.5	1.2
20	40	23	1.5	20	54	24	RD 44 x 1/6	10	20	22 x 3.5	1.25
25	40	29	1.5	26	63	26	RD 52 x 1/6	12	21	28 x 3.5	1.4
32	40	35	1.5	32	70	27	RD 58 x 1/6	13	21	34 x 5	1.45
40	40	41	1.5	38	78	27	RD 65 x 1/6	13	21	40 x 5	1.6
50	25	53	1.5	50	92	28	RD 78 x 1/6	14	22	52 x 5	1.7
DIN 11866 row B or ISO											
8 (13.5)	40	13.5	1.6	10.3	38	23	RD 28 x 1/8	9	18	12 x 3.5	1.2
10 (17.2)	40	17.2	1.6	14	44	23	RD 34 x 1/8	9	18	16 x 3.5	1.2
15 (21.3)	40	21.3	1.6	18.1	54	24	RD 44 x 1/6	10	20	20 x 3.5	1.3
20 (26.9)	40	26.9	1.6	23.7	63	26	RD 52 x 1/6	12	21	26 x 3.5	1.4
25 (33.7)	40	33.7	2	29.7	70	27	RD 58 x 1/6	13	21	32 x 5	1.5
32 (42.4)	25	42.4	2	38.4	78	27	RD 65 x 1/6	13	21	40.5 x 5	1.6
40 (48.3)	25	48.3	2	44.3	92	28	RD 78 x 1/6	14	22	46.6 x 5	1.7
DIN 11866 row C or ASME BPE											
1/2"	40	12.7	1.65	9.4	38	23	RD 28 x 1/8	9	18	12 x 3.5	1.2
3/4"	40	19.05	1.65	15.75	44	23	RD 34 x 1/8	9	18	18 x 3.5	1.2
1"	40	25.4	1.65	22.1	63	26	RD 52 x 1/6	12	21	24 x 3.5	1.4
1 1/2"	40	38.1	1.65	34.8	78	27	RD 65 x 1/6	13	21	37 x 5	1.6
2"	25	50.8	1.65	47.5	92	28	RD 78 x 1/6	14	22	50 x 5	1.7

Process connection aseptic flange DIN 11864-2, form A for pipes in accordance with DIN 11866 row A

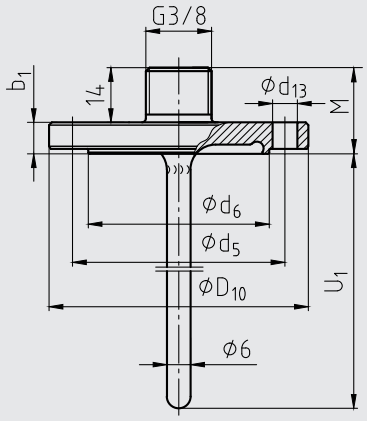
Flange with notch

Aseptic flange with notch, DIN 11864-2 form A



Flange with groove

Aseptic flange with groove DIN 11864-2 form A



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U_1 = variable insertion length

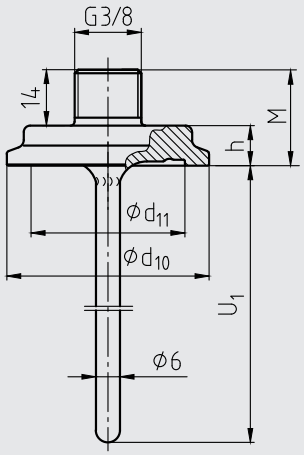
Process connection	Nominal width in mm	PN in bar	Dimensions in mm									Weight in kg
			M	b_1	b_2	Ø d_5	Ø d_6	Ø d_{10}	Ø d_{11}	Ø d_{13}	Aseptic O-ring	
Flange with notch	DN 10	25	24	-	10	37	-	54	22.4	4 x Ø 9	12 x 3.5	0.2
	DN 15	25	24	-	10	42	-	59	28.4	4 x Ø 9	18 x 3.5	0.25
	DN 20	25	24	-	10	47	-	64	32.4	4 x Ø 9	22 x 3.5	0.3
	DN 25	25	24	-	10	53	-	70	38.4	4 x Ø 9	28 x 3.5	0.1
	DN 32	25	24	-	10	59	-	76	47.7	4 x Ø 9	34 x 5	0.4
	DN 40	25	24	-	10	65	-	82	53.7	4 x Ø 9	40 x 5	0.5
	DN 50	16	24	-	10	77	-	94	65.7	4 x Ø 9	52 x 5	0.6
Flange with groove	DN 10	25	25.5	11.5	-	37	22.3	54	-	4 x Ø 9	12 x 3.5	0.25
	DN 15	25	25.5	11.5	-	42	28.3	59	-	4 x Ø 9	18 x 3.5	0.3
	DN 20	25	25.5	11.5	-	47	32.3	64	-	4 x Ø 9	22 x 3.5	0.3
	DN 25	25	25.5	11.5	-	53	38.3	70	-	4 x Ø 9	28 x 3.5	0.4
	DN 32	25	25.5	11.5	-	59	47.6	76	-	4 x Ø 9	34 x 5	0.45
	DN 40	25	25.5	11.5	-	65	56.6	82	-	4 x Ø 9	40 x 5	0.6
	DN 50	16	25.5	11.5	-	77	65.6	94	-	4 x Ø 9	52 x 5	0.7

Connections for pipes in accordance with DIN 11866 row B (ISO pipes) and row C (ASME pipes) available on request.

Aseptic clamp process connection, DIN 11864-3, form A for pipes in accordance with DIN 11866 row A

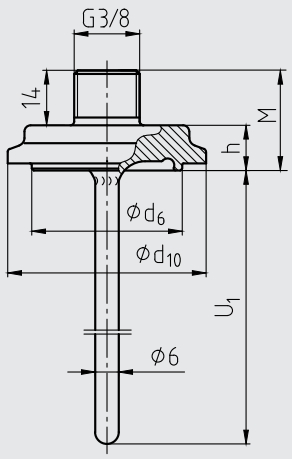
Clamp with notch

Aseptic clamp with notch DIN 11864-3 form A



Clamp with groove

Aseptic clamp with groove DIN 11864-3 form A



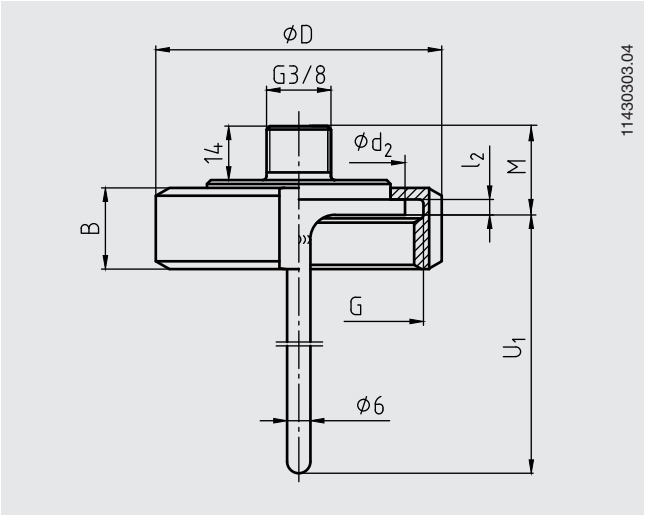
11431318.04

U_1 = variable insertion length

Process connection	Nominal width in mm	PN in bar	Dimensions in mm						Weight in kg
			M	Ø d_6	Ø d_{10}	Ø d_{11}	h	Aseptic O-ring	
Clamp with notch	DN 10	40	25.5	-	34	22.4	11.5	12 x 3.5	0.2
	DN 15	40	25.5	-	34	28.4	11.5	18 x 3.5	0.2
	DN 20	40	25.5	-	50.5	32.4	11.5	22 x 3.5	0.3
	DN 25	40	25.5	-	50.5	38.4	11.5	28 x 3.5	0.3
	DN 32	40	25.5	-	50.5	47.7	11.5	34 x 5	0.3
	DN 40	40	25.5	-	64	53.7	11.5	40 x 5	0.4
	DN 50	25	27.5	-	77.5	65.7	13.5	52 x 5	0.5
Clamp with groove	DN 10	40	27	22.3	34	-	13	12 x 3.5	0.2
	DN 15	40	27	28.3	34	-	13	18 x 3.5	0.2
	DN 20	40	27	32.3	50.5	-	13	22 x 3.5	0.3
	DN 25	40	27	38.3	50.5	-	13	28 x 3.5	0.3
	DN 32	40	27	47.6	50.5	-	13	34 x 5	0.3
	DN 40	40	27	53.6	64	-	13	40 x 5	0.4
	DN 50	25	29	65.6	77.5	-	15	52 x 5	0.5

Connections for pipes in accordance with DIN 11866 row B (ISO pipes) and row C (ASME pipes) available on request.

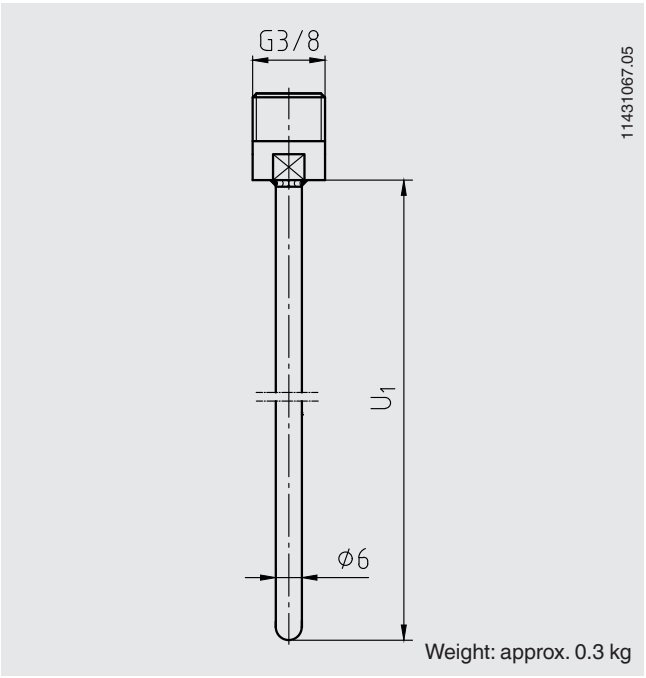
Union nut process connection SMS



U_1 = variable insertion length

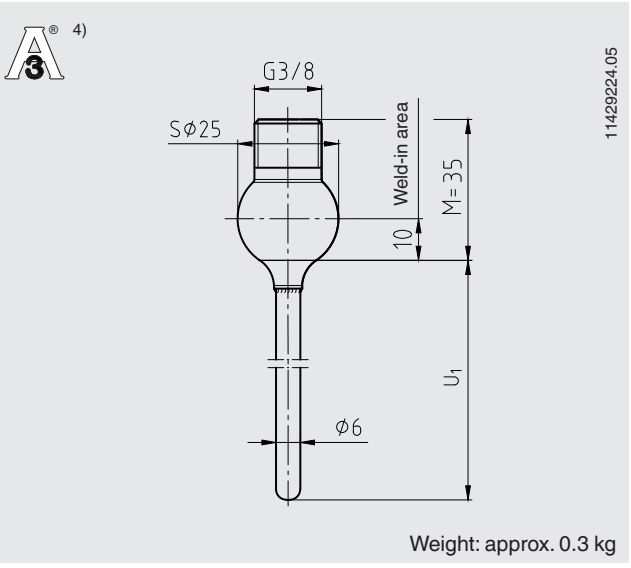
Nominal width in inch	PN in bar	Dimensions in mm						Weight in kg
		Ø D	M	Ø d_2	B	l_2	G	
1"	40	51	22	35.5	25	3.5	RD 40 x 1/6	0.4
1½"	40	74	23	55	25	4	RD 60 x 1/6	0.8
2"	40	84	23	65	26	4	RD 70 x 1/6	1.0

Process connection, straight, Ø 6 mm, basic shape for compression fitting



Weight: approx. 0.3 kg

Welding ball process connection

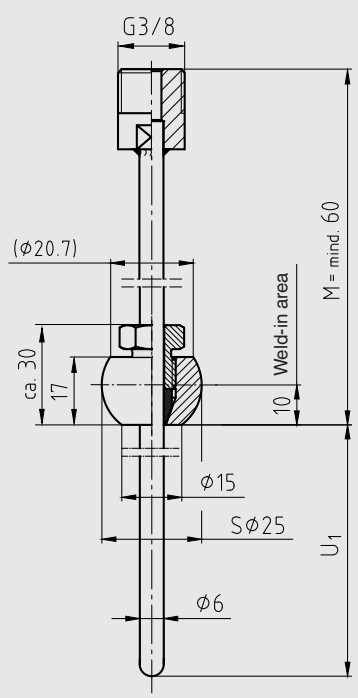


Weight: approx. 0.3 kg

4) In order to meet the 3-A standard, the weld seam has to be carried out with a minimum radius of 3.2 mm on the product side. In this way, no weld defects, such as recesses or gaps, remain.

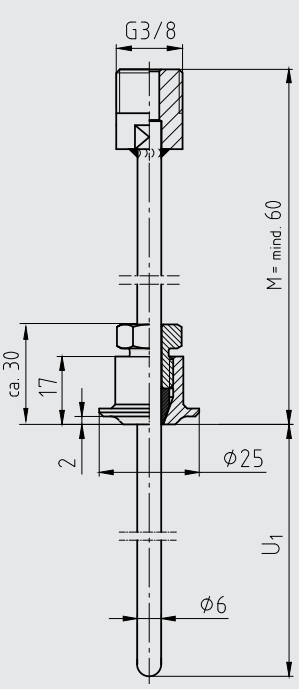
Compression fitting process connection

Ball-type compression fitting



Weight: approx. 0.3 kg

Collar-type compression fitting



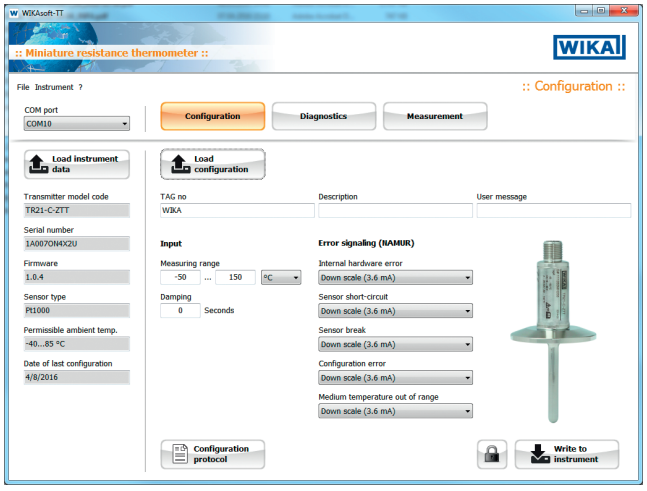
Weight: approx. 0.3 kg

Other process connections and nominal widths available on request.

Accessories

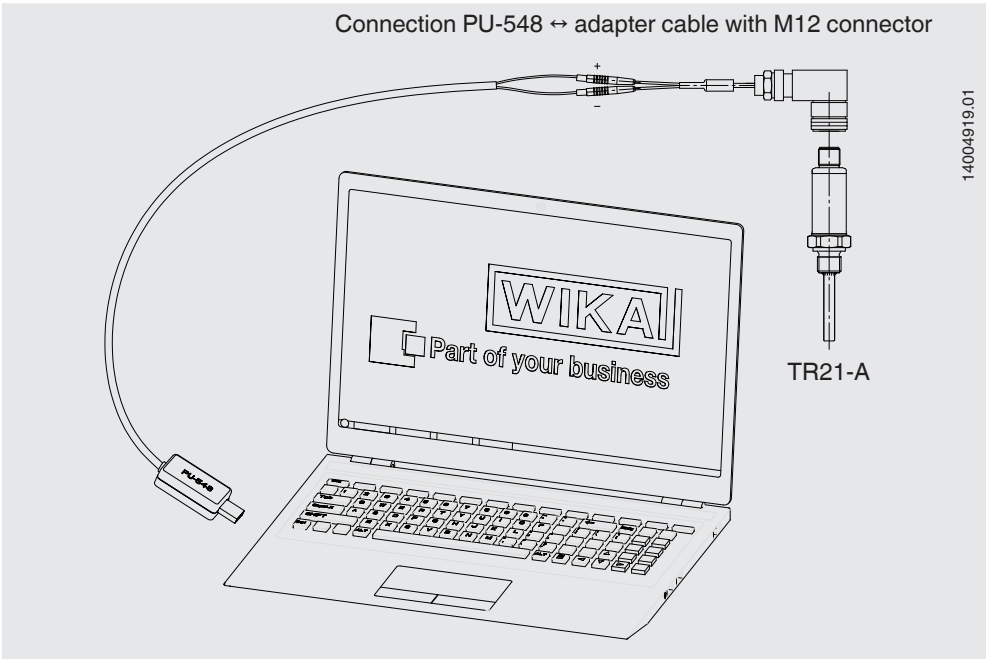
Model	Special features		Order no.
Programming unit Model PU-548 	■ Easy to use ■ LED status display ■ Compact design ■ No further voltage supply needed, neither for the programming unit nor for the transmitter (replaces programming unit model PU-448)		14231581
Adapter cable M12 to PU-548 	Adapter cable for the connection of a model TR21-A 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 ■ 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 ■ 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 ■ 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 ■ Temperature range -40 ... +80 °C ■ Not for hazardous areas	Cable length 3 m	14137169
		Cable length 5 m	14137170

Configuration software WIKAsoft-TT



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

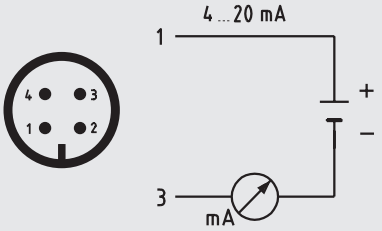
Connecting PU-548 programming unit



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

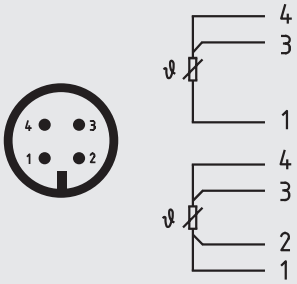
Electrical connection

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

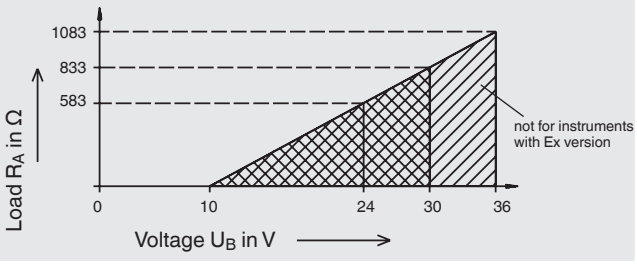


Pin	Signal	Description
1	L+	10 ... 30 V
2	VQ	not connected
3	L-	0 V
4	C	not connected

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

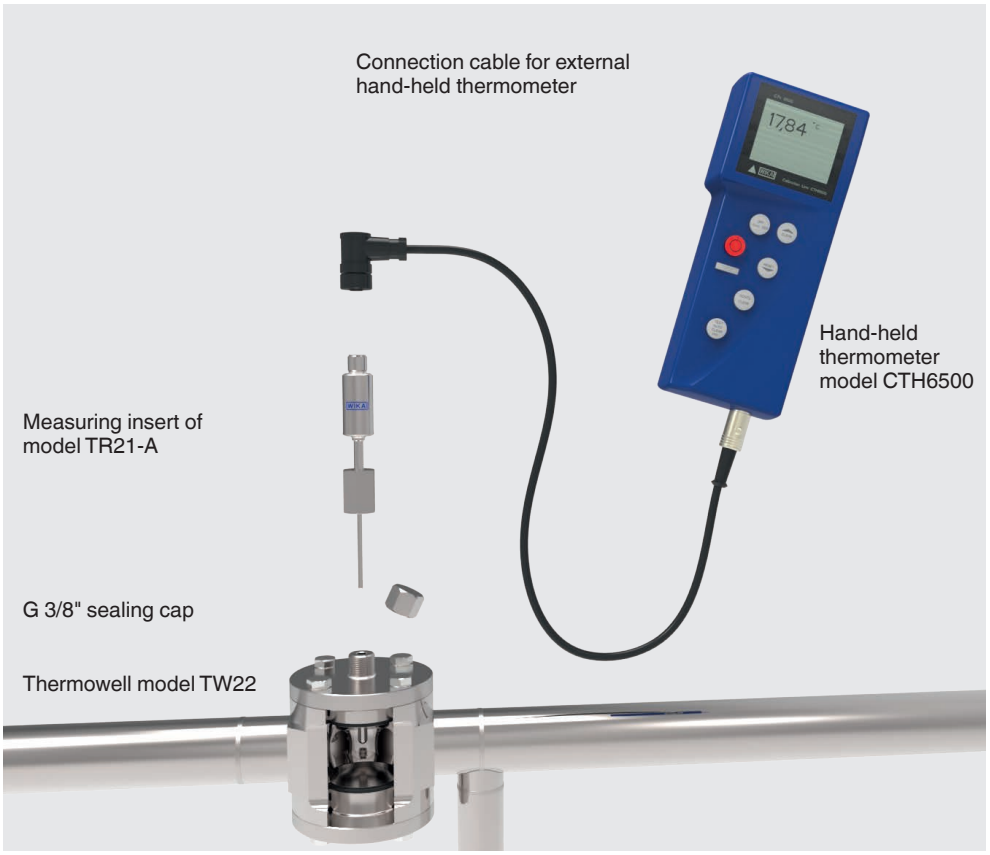


Load diagram
The permissible load depends on the loop supply voltage. For communication with the instrument with programming unit PU-548, a max. load of 350 Ω is admissible.



Application example

Temperature measurement for plant or measuring point validation



The measuring insert of the model TR21-A resistance thermometer, in combination with the model CTH6500 hand-held thermometer and the model TW22 thermowell, offers a simple and effective possibility for sterile validation of a temperature measuring point. Here, in the design phase, a model TW22 thermowell must be integrated in the pipeline, which will serve as the measuring point at a later date. To validate this measuring point, a resistance thermometer measuring insert with a spring-loaded tip is screwed into the thermowell and the temperature read from the connected hand-held thermometer.

The measuring point already available for the validation ensures that the sterile boundaries remain intact. Due to the defined contact pressure of the spring-loaded sensor and the predetermined immersion depth in the pipeline, the temperature measurement is reproducible at any time. The time needed for the measurement is low.

Further components

Components	Order number
G 3/8" sealing cap	14136849
O-ring for use with G 3/8" sealing cap	0478709
Connection cable for the connection of the resistance thermometer model TR21-A to the hand-held thermometer model CTH6500 Cable length 2 m	14131257
Hand-held thermometer model CTH6500 (data sheet CT 55.10)	14007838

Approvals

Logo	Description	Country
CE Ex	**EU declaration of conformity** ■ EMC directive [1)] EN 61326 emission (group 1, class B) and interference immunity (industrial application) ■ RoHS directive ■ ATEX directive (option) Hazardous areas Zone 0 gas [II 1G Ex ia IIC T1 ... T6 Ga] Zone 1 mounting to zone 0 gas [II 1/2G Ex ia IIC T1 ... T6 Ga/Gb] Zone 1 gas [II 2G Ex ia IIC T1 ... T6 Gb] Zone 20 dust [II 1D Ex ia IIIC T135 °C Da] Zone 21 mounting to zone 20 dust [II 1/2D Ex ia IIIC T135 °C Da/Db] Zone 21 dust [II 2D Ex ia IIIC T135 °C Db]	European Union
IEC IECEx	**IECEx (option) - in conjunction with ATEX** Hazardous areas Zone 0 gas [Ex ia IIC T1 ... T6 Ga] Zone 1 mounting to zone 0 gas [Ex ia IIC T1 ... T6 Ga/Gb] Zone 1 gas [Ex ia IIC T1 ... T6 Gb] Zone 20 dust [Ex ia IIIC T135 °C Da] Zone 21 mounting to zone 20 dust [Ex ia IIIC T135 °C Da/Db] Zone 21 dust [Ex ia IIIC T135 °C Db]	International
c SP us	**CSA (option)** ■ Safety (e.g. electr. safety, overpressure, ...) ■ Hazardous areas Class I, division 1 or 2, groups A, B, C, D T1 ... T6 Class I, zone 0 or 1, IIC Ex/AEx ia IIC T1 ... T6 Ga Class II / III, division 1 or 2, groups E, F, G T1 ... T6 / 135 °C Class II / III, zone 20 or 21, Ex/AEx ia IIIC T135 °C Da	USA and Canada
EAC Ex	**EAC (option)** ■ EMC directive [1)] ■ Hazardous areas Zone 0 gas [0 Ex ia IIC T6…T1 Ga X] Zone 1 gas [1 Ex ia IIC T6…T1 Gb X] Zone 20 dust [Ex ia IIIC T80…T440 Da X] Zone 21 dust [Ex ia IIIC T80…T440 Db X]	Eurasian Economic Community
Ex NEPSI	**NEPSI (option)** Hazardous areas Zone 0 gas [Ex ia IT C T1~T6 Ga] Zone 20 dust [Ex iaD 20 T135]	China
c UL us LISTED	**UL - only for instrument version without explosion protection** Safety (e.g. electr. safety, overpressure, ...)	USA and Canada
	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
3-A	**3-A (option) [2)]** Sanitary Standard	USA
EHEDG	**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

Instruments marked with “ia” may also be used in areas only requiring instruments marked with “ib” or “ic”.
If an instrument with “ia” marking has been used in an area with requirements in accordance with “ib” or “ic”, it can no longer be operated in areas with requirements in accordance with “ia” afterwards.

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
BioControl®	yes	no
DIN 11851	yes [3]	yes [4]
DIN 11864-1	yes	yes
DIN 11864-2	yes	yes
DIN 11864-3	yes	yes
Welding ball	yes	no
Compression fitting	no	no
SMS	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 Komponenten 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 / Thermowell / Process connection / Thermowell diameter / Material wetted parts / Insertion length U_1 / Electrical accessories / Certificates / Options

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