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Fax: +49 661 6003-607
Email: mail@jumo.net
Internet: www.jumo.net

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JUMO Process Control, Inc.
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Fax: +1 315 437 5860
Email: info.us@jumo.net
Internet: www.jumousa.com

JUMO Dtrans T100

Screw-inRTD temperature probe with/without transmitter

- For temperatures between -50 to +260 °C
- RoHS conformity for EU and China
- Configuration with setup program via USB interface
- M12 × 1 plug connector; protection type IP67 according ton DIN EN 60529 with inserted machine connector



Brief description

The screw-in RTD temperature probe in a compact design comprises a protection tube with integrated temperature sensor, a process connection, and an attached housing for the transmitter electronic components. The integrated programmable two-wire transmitter converts the resistance value into a current signal.

The screw-in RTD temperature probe with programmable two-wire transmitter is used to measure temperatures from -50 to +150 °C (-58 to +302 °F), with extension tube up to 260 °C (500 °F) (without transmitter: -50 to +200 °C or -58 to +392 °F).

The measuring range, fine adjustment, or measuring circuit monitoring etc. can be configured with a setup program.

The output signal 4 to 20 mA or reversed 20 to 4 mA is available in linearized way (temperature linear). The device is designed for industrial applications and complies with the European standards to guarantee electromagnetic compatibility (EMC).
The transmitter must be protected from temperatures above 85 °C!

Also available as an ATEX/IECEx RTD temperature probe upon request.

Approvals and approval marks

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Technical data

Electrical connection	Machine connector M12 × 1, 4-pole according to IEC 60947-5-2
Process connections	Screw connection G 3/8" Screw connection G 1/2" Screw connection G 1/2" with CIP-compliant conical seal Screw connection G 1/2" with CIP-compliant conical seal PEEK Taper socket with union nut (dairy pipe fitting) Clamping socket (clamp) DIN 32676 Ball welding socket with threaded fitting Welding socket with CIP-compliant conical seal VARIVENT®[a] connections Ball welding sleeve JUMO PEKA hygienic process connection
Protection tubes	Stainless steel 316 L, material-no. 1.4404/1.4435 Stainless steel 316 Ti, material-no. 1.4571 (upon request)
Protection type	IP67 according to DIN EN 60529 with inserted machine connector
Response times	Standard protection tube $t_{0.5}$ = 5 s; $t_{0.9}$ = 12 s; in water 0.4 m/s Stepped down protection tube $t_{0.5}$ = 2 s; $t_{0.9}$ = 5 s; in water 0.4 m/s Standard protection tube $t_{0.5}$ = 40 s; $t_{0.9}$ = 110 s; in air 3.0 m/s Stepped down protection tube $t_{0.5}$ = 21 s; $t_{0.9}$ = 70 s; in air 3.0 m/s Front-flushed sensor PA 388 $t_{0.5}$ = 140 s; $t_{0.9}$ = 380 s; in air 3.0 m/s Front-flushed sensor PA 388 $t_{0.5}$ = 0.7 s; $t_{0.9}$ = 6 s; in water 0.4 m/s

[a] VARIVENT® is a registered trademark of GEA Tuchenhagen.

General Information

Input

Measurement input	
Without transmitter	Pt100 or Pt1000 temperature sensor, DIN EN 60751, class A, B, and/or AA, two or four-wire circuit
With programmable transmitter	Pt1000 temperature sensor, DIN EN 60751, class A, four-wire circuit
Measuring ranges	
Basic type 902815/10, and 902815/41	-50 to +200 °C
Basic type 902815/20	-50 to +150 °C
Basic type 902815/20, and 902815/41	-50 to +260 °C with extension tube
Limit deviations in °C	Class A (standard): ±(0.15 + 0.002 × |t|) °C[a] Class AA: ±(0.10 + 0.0017 × |t|) °C[a] Class B: ±(0.30 + 0.005 × |t|) °C[a]

[a] |t| = temperature in °C regardless of prefix sign

Environmental influences

Ambient temperature range of the head	
Basic type 902815/10, and 902815/41	-30 to +90 °C
Basic type 902815/20, 902815/21, and 902815/41	-30 to +85 °C
Storage temperature range	-30 to +90 °C
Resistance to climatic conditions	According to IEC 60068-2-30 (relative humidity ≤ 95 % with condensation)
Vibration resistance	According to IEC 60068-2-6 (according to GL characteristic line)

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Transmitter

Input

Smallest measuring span	10 K
Sampling rate	1 measurement per second
Input filter	Digital filter 2nd order Filter constant can be set from 0 to 125 s

Measuring circuit monitoring

Measuring range underflow	Linear decrease to 3.8 mA (according to NAMUR recommendation 43)
Measuring range overflow	Linear increase to 20.5 mA (according to NAMUR recommendation 43)
Probe short-circuit/ probe and cable break	≤ 3.6 mA or ≥ 21.0 mA (configurable)
Current limiting in the event of a probe short circuit or probe break	≤ 25 mA

Output

output signal	Load-independent direct current 4 to 20 mA, 20 to 4 mA
Transmission behavior	Temperature-linear
Maximum burden (R_B)	$R_B = (U_b - 8\ V) \div 23\ mA$, max. 600 Ω
Burden influence	≤ ±0.02 % per 100 Ω[a]
Setting time for temperature changes	≤ 5 s
Setting time after switch-on or reset	≤ 5 s
Electronic measuring accuracy	0.1 K o 0.08 %[b, c]

[a] The %-specifications refer to the measuring range end value of 20 mA.

[b] The %-specifications refer to the set measuring span; the greater value is valid.

[c] The deviation of the temperature sensor must be added to ensure the measuring accuracy of the transmitter.

Electrical data

Voltage supply (U_b)	DC 8 to 35 V (Pin 1 = +, Pin 3 = -) Use only with SELV or PELV supply systems (according to DIN EN 61140)
Protection rating	III (according to DIN EN 61140)
Galvanic isolation	No galvanic isolation between sensor and output
Insulation resistance	> 100 MΩ at DC 100 V Measured at room temperature between connection terminals and housing
Reverse voltage protection	Yes
Influence of the voltage supply	≤ ±0.01 % per V deviation from 24 V[a]

[a] The %-specifications refer to the measuring range end value of 20 mA.

Environmental influences

Ambient temperature influence	≤ ±(15 ppm/K × [measuring range end value + 200] + 50 ppm/K × set measuring range) × Δυ Δυ = deviation of the ambient temperature from the reference temperature
Calibration/reference conditions	DC 24 V at 25 °C ±5 °C (77 °F ±9 °F)
Electromagnetic compatibility (EMC)	DIN EN 61326
Interference emission	Class B[a]
Interference immunity	Industrial requirement

[a] The product is suitable for industrial use as well as for households and small businesses.

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Approvals and approval marks

	Testing agency	-
	Certificate no.	-
	Inspection basis	-
	Valid for	Extra code 658 in conjunction with safety temperature limiter and safety temperature monitor 70115X, Extra code 659 in conjunction with temperature transmitter dTRANS T06 SIL according to data sheet 707071, Extra code 665 in conjunction with DIN rail temperature transmitter dTRANS T07 SIL according to data sheet 707083, Basic type 902815/10, and 902815/40 in conjunction with declaration of manufacturer
	Testing agency	-
	Certificate no.	-
	Inspection basis	-
	Valid for	Extra code 658 in conjunction with safety temperature limiter and safety temperature monitor 70115X, Extra code 659 in conjunction with temperature transmitter dTRANS T06 SIL according to data sheet 707071, Extra code 665 in conjunction with DIN rail temperature transmitter dTRANS T07 SIL according to data sheet 707083, Basic type 902815/10, and 902815/40 in conjunction with declaration of manufacturer

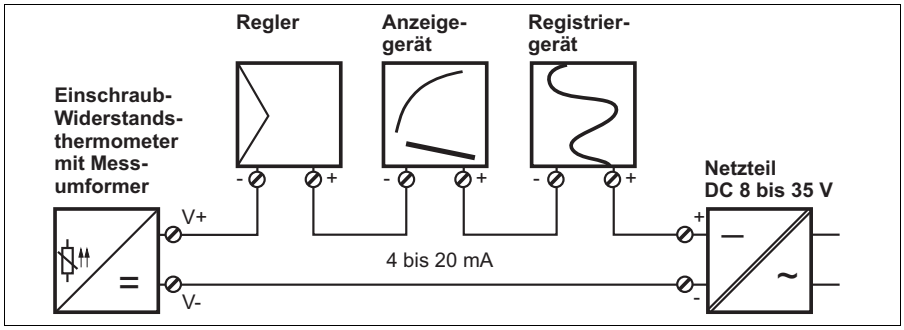
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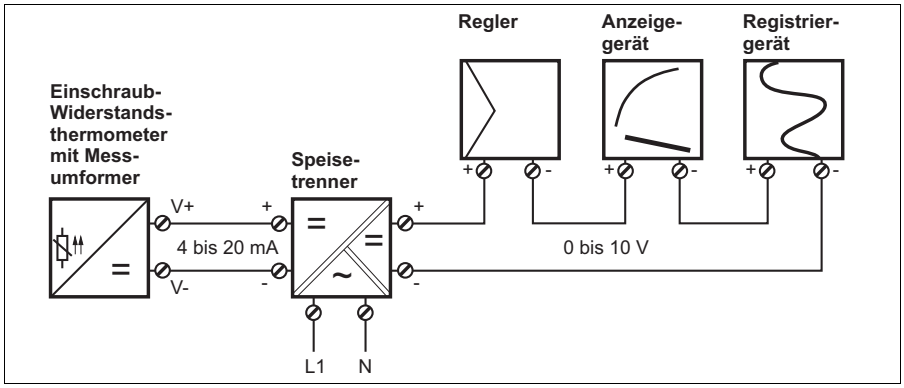
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Connection examples with transmitter

Connection example with power supply unit



Connecting example with supply isolator

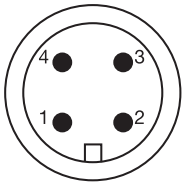


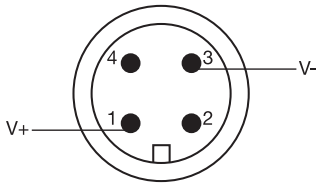
Connection diagram

The connection diagram in the data sheet provides information on product selection.

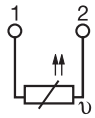
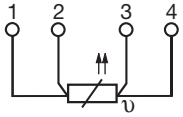
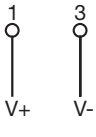
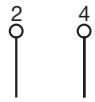
For the electrical connection, only use the installation instructions or the operating manual.

Machine connector M12 × 1, 4-pole, according to IEC 60947-5-2





Warning:
Do not connect pin 2 and pin 4 to voltage!

Electrical connection	Terminal assignment
Basic type 902815/10 and 902815/40 without transmitter	
Screw-in RTD temperature probe in two-wire circuit	
Screw-in RTD temperature probe in four-wire circuit	
Basic type 902815/20, 902815/21, and 902815/41 with programmable transmitter	
Voltage supply DC 8 to 35 V 	
Current output 4 to 20 mA 	
Setup communication via special configuration cable (only for configuration - continuous operation is not admissible)	

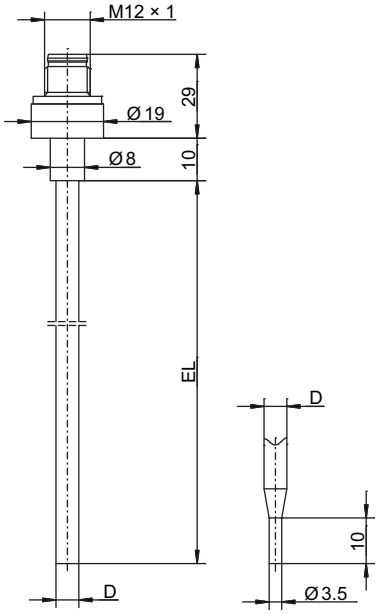
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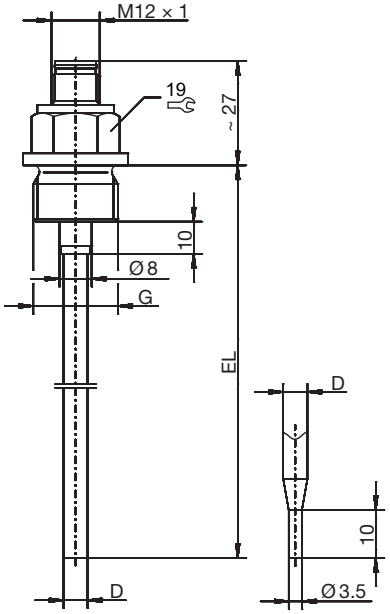
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Dimensions

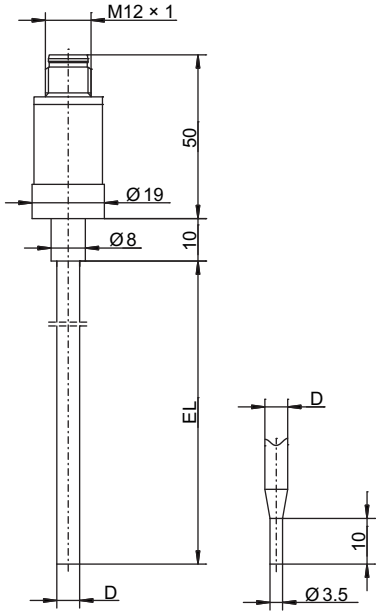
Basic types



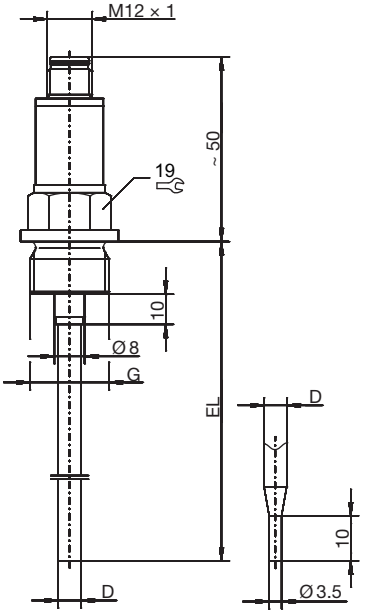
Basic type 902815/10
with process connection PA 000



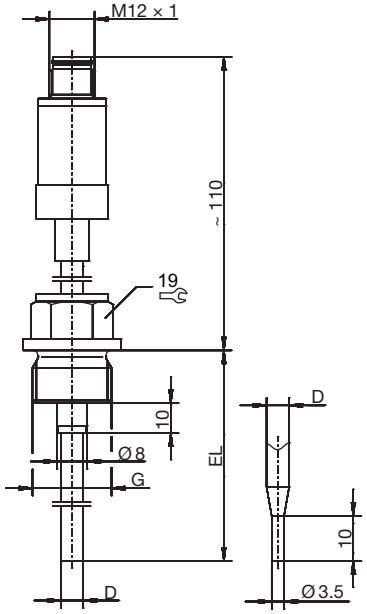
Basic type 902815/10
with process connection PA 104



Basic type 902815/20
with process connection PA 000



Basic type 902815/20
with process connection PA 104

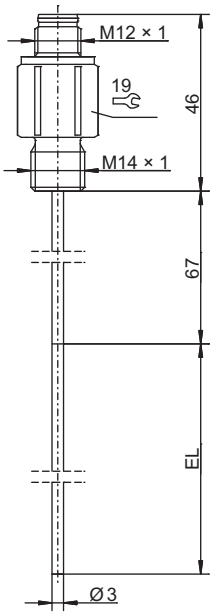


Basic type 902815/21
with process connection PA 104

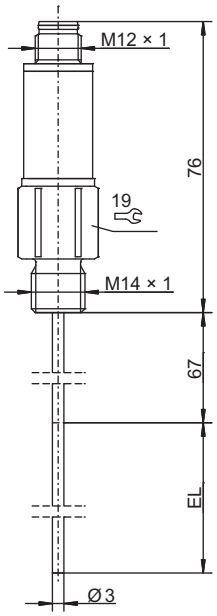
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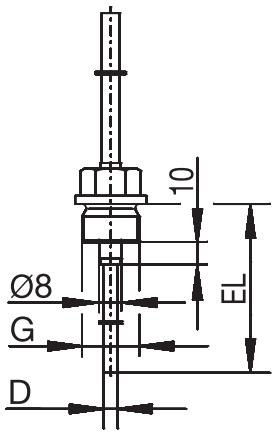


Basic type 902815/40
with process connection PA 120



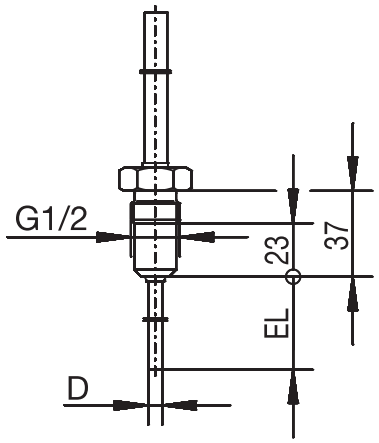
Basic type 902815/41
with process connection PA 120

Process connections



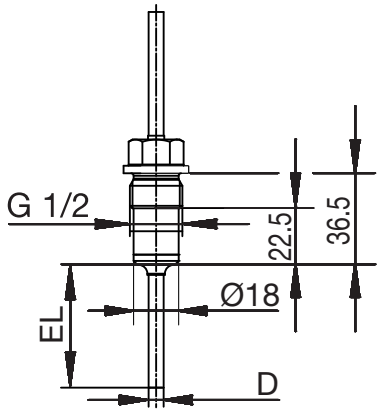
PA	G
103	3/8"
104	1/2"

Screw connection



PA	G
380	1/2"

Screw connection
with CIP-compliant conical seal



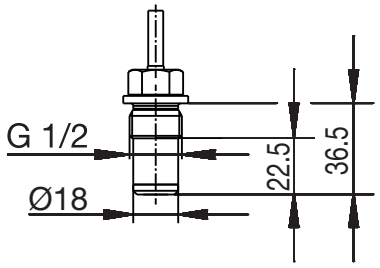
PA	G
387	1/2"

Screw connection
with PEEK sealing

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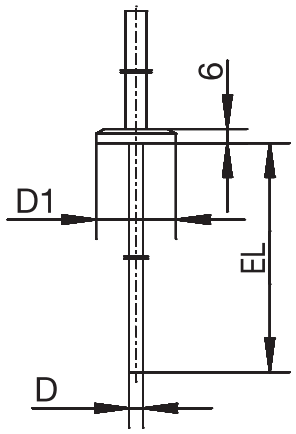
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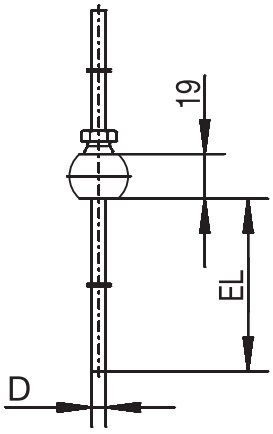
PA	G
388	1/2"

Screw connection
with PEEK sealing front-flush



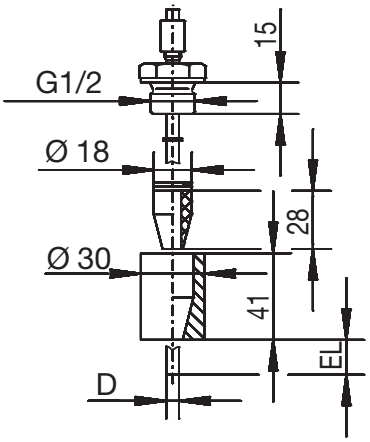
PA	DN	D1
-	-	Ø 25
611	10/20	Ø 34
613	25/1"	Ø 50,5
613	40/1,5"	Ø 50,5
616	50/2"	Ø 64
617	2,5"	Ø 77,5

Clamping socket according to DIN 32676
(clamp)



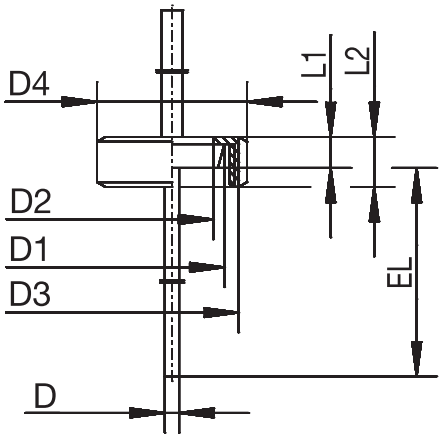
PA	
681	

Ball welding socket
with threaded fitting



PA	
682	

Welding socket
with CIP-compliant conical seal



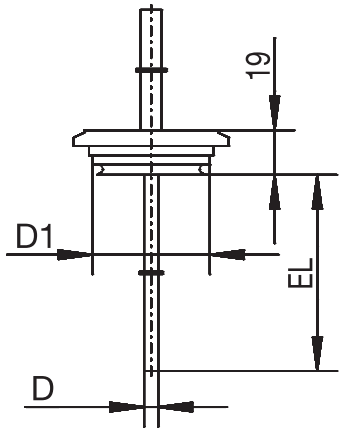
PA	DN	D1	D2	D3	D4	L1	L2
601	10	Ø 22	Ø 18	RD 28 × 1/8	Ø 38	9	18
604	25	Ø 44	Ø 35	RD 52 × 1/6	Ø 63	13	21
605	32	Ø 50	Ø 41	RD 58 × 1/6	Ø 70	13	21

Taper socket with union nut according to DIN 11851
(dairy pipe fitting)

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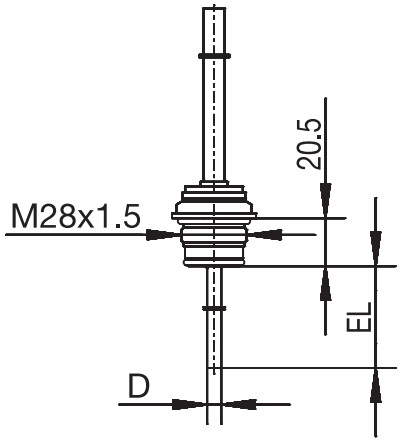
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PA	DN	D1
684	15/10	Ø 31
685	32/25	Ø 50
686	50/40	Ø 68

VARIVENT® connection



VARIVENT®	Clamp	Aseptic	Welding socket
DN 25/32	DN 25/32/40	DN 40	Ø 55 mm
DN 40 - 125	DN 50	DN 50	-
-	-	NKS DN 40	-

JUMO PEKA PA 997 - hygienic process connection, see data sheet 409711

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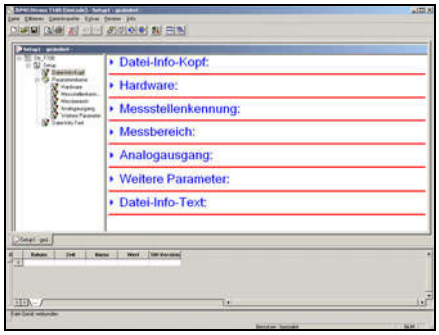
Setup program

The setup program is used for the configuration of the programmable two-wire transmitter using a PC.
For this purpose the following is required:

- Please only use the configuration cable, 4-pole with connector and socket M12 × 1, and Western plug RJ-45 with part no. 00484692.
- PVC connecting cable, length 2,000 mm
- PC interface with USB/TTL converter
- and USB cable

(See also accessories for the programmable two-wire transmitter)

The two-wire transmitter must be connected to a voltage supply for configuration.
If no power supply unit or supply isolator is available, it can also be supplied using a 9 V block battery.



Configurable parameters

Measuring point identification

- TAG number

Measuring range configurable in °C/°F

- Offset
- Measuring range start
- Measuring range end

Analog output

- Reversion of the output
- Signal for probe break/short-circuit

Other parameters

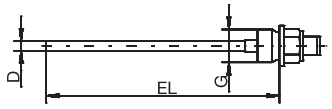
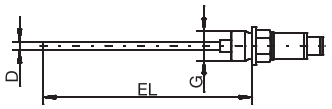
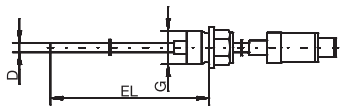
- Filter Time Constant
- Unit

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Order details

				(1)	**Basic type**	
			902815/10		Screw-in RTD temperature probe without transmitter, connection M12 × 1 machine connector	
	x		902815/20		Screw-in RTD temperature probe[a] with programmable transmitter[b], connection M12 × 1 machine connector	
		x	902815/21		Screw-in RTD temperature probe[a] mit programmierbarem Messumformer[b], connection M12 × 1 machine connector, high-temperature version with extension tube	
				(2)	**Operating temperature in °C**	
	x		370		-50 to +150 °C (max. transmitter temperature 85 °C)	
x			380		-50 to +200 °C	
		x	386		-50 to +260 °C (max. transmitter temperature 85 °C)	
				(3)	**Measuring insert**	
x			1003		1× Pt100 in two-wire circuit	
x			1005		1× Pt1000 in two-wire circuit	
x			1011		1× Pt100 in four-wire circuit	
x	x	x	1013		1× Pt1000 in four-wire circuit	
x			2003		2× Pt100 in two-wire circuit	
x			2005		2× Pt1000 in two-wire circuit	
				(4)	**Tolerance class according to DIN EN 60751**	
x			1		Class B	
x	x	x	2		Class A	
x			3		Class AA	
				(5)	**Protection tube diameter D in mm**	
x	x	x	0		Without protection tube (only with process connection 388)	
x	x	x	6		Ø 6 mm	
				(6)	**Insertion length EL in mm (EL 50 to 500 mm)**	
x	x	x	0		0 mm (only with process connection 388)	
x	x	x	50		50 mm	
x	x	x	100		100 mm	
x	x	x	150		150 mm	
x	x	x	200		200 mm	
x	x	x	...		Specification in plain text (50 mm increments)	
				(7)	**Process connection PA**	
x	x		000		Without (for basic type 902815/20 max. transmitter temperature 85 °C)	
x	x	x	103		Screw connection G 3/8"	
x	x	x	104		Screw connection G 1/2"	
x	x	x	380		Screw connection G 1/2" with CIP-compliant conical seal	
x	x	x	387		Screw connection G 1/2" with PEEK sealing	
x	x	x	388		Screw connection G 1/2" with PEEK sealing front-flush	
x	x	x	601		Taper socket with union nut DN 10 DIN 11851 (dairy pipe fitting)	
x	x	x	604		Taper socket with union nut DN 25 DIN 11851 (dairy pipe fitting)	
x	x	x	605		Taper socket with union nut DN 32 DIN 11851 (dairy pipe fitting)	
x	x	x	611		Clamping socket (clamp) DN 10/20 DIN 32676	
x	x	x	613		Clamping socket (clamp) DN 25/40 (1"/1.5") DIN 32676	

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x	x	x	616		Clamping socket (clamp) DN 50 (2") DIN 32676
x	x	x	617		Clamping socket (clamp) 2.5" similar to DIN 32676
x	x	x	681		Ball welding socket with threaded fitting
x	x	x	682		Welding socket with CIP-compliant conical seal
x	x	x	684		VARIVENT® connection DN 15/10
x	x	x	685		VARIVENT® connection DN 32/25
x	x	x	686		VARIVENT® connection DN 50/40
x	x	x	997		JUMO PEKA hygienic process connection
				(8)	**Protection tube material**
x	x	x	24		Stainless steel 316 L (material-no. 1.4404/1.4435)
x	x	x	26		Stainless steel 316Ti (material-no. 1.4571) (upon request)
				(9)	**Extra codes**
x	x	x	000		None
	x	x	100		Customer-specific configuration (specifications in plain text)
x	x	x	310		Protection tube stepped down from Ø 6 mm to Ø 3.5 mm
x	x	x	452		Wetted, electrolytically polished parts, surface roughness Ra ≤ 0.8 mm (without thread and welding seams)
x			658		SIL and PL-compliant in conjunction with safety temperature limiter and safety temperature monitor 70115X
x			659		SIL and PL-compliant in conjunction with temperature transmitter dTRANS T06 SIL according to data sheet 707071
x			665		SIL and PL-compliant in conjunction with DIN rail temperature transmitter dTRANS T07 SIL according to data sheet 707083
x	x	x	810		Welding socket (only for process connection 380)

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[b] Specify measuring range in plain text.

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)	
Order code		-		-		-		-		-		-		-		/		, ...[a]
Order example	902815/20	-	370	-	1013	-	1	-	6	-	100	-	104	-	24	/	000	

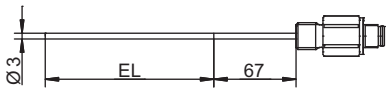
[a] State extra codes one after another, separated by commas.

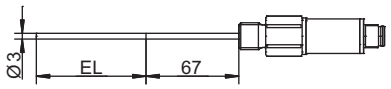
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			(1)	**Basic type**
		902815/40		Screw-in RTD temperature probe without transmitter, connection M12 × 1 machine connector and adaptation system for thermowell 902812/10 (please select associated thermowells in data sheet 902812)
		902815/41		Screw-in RTD temperature probe[a] with programmable transmitter[b], connection M12 × 1 machine connector and adaptation system for thermowell 902812/10 (please select associated thermowells in data sheet 902812)
			(2)	**Operating temperature in °C**
x		380		-50 to +200 °C
	x	386		-50 to +260 °C (max. transmitter temperature 85 °C)
			(3)	**Measuring insert**
x		1003		1× Pt100 in two-wire circuit
x		1005		1× Pt1000 in two-wire circuit
x		1011		1× Pt100 in four-wire circuit
x	x	1013		1× Pt1000 in four-wire circuit
x		2003		2× Pt100 in two-wire circuit
x		2005		2× Pt1000 in two-wire circuit
			(4)	**Tolerance class according to DIN EN 60751**
x		1		Class B
x	x	2		Class A
x		3		Class AA
			(5)	**Protection tube diameter D in mm**
x	x	3		Ø 3 mm
			(6)	**Insertion length EL in mm**
x	x	50		50 mm
x	x	100		100 mm
x	x	150		150 mm
			(7)	**Process connection PA**
x	x	120		Screw connection M14 × 1 for adapting hygienic thermowells
			(8)	**Protection tube material**
x	x	20		Stainless steel
			(9)	**Extra codes**
x	x	000		None
	x	100		Customer-specific configuration (specifications in plain text)
x		658		SIL and PL-compliant in conjunction with safety temperature limiter and safety temperature monitor 70115X
x		659		SIL and PL-compliant in conjunction with temperature transmitter dTRANS T06 SIL according to data sheet 707071
x		665		SIL and PL-compliant in conjunction with DIN rail temperature transmitter dTRANS T07 SIL according to data sheet 707083





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[b] Specify measuring range in plain text.

	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)	
Order code		-		-		-		-		-		-		-		/		, ...[a]
Order example	902815/40	-	380	-	1003	-	1	-	3	-	50	-	120	-	20	/	000	

[a] State extra codes one after another, separated by commas.

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Accessories

for programmable 2-wire transmitter

Designation	Part no.
Setup program on CD-ROM, multilingual	00485016
Configuration cable, 4-pole with connector and socket M12 × 1, and Western plug RJ-45	00484692
PVC connecting cable, 4-pole with socket M12 × 1, length 2,000 mm	00404585
5-pole cable socket M12 × 1, straight, without connecting cable to be patched by the customer	00419130
5-pole cable socket M12 × 1, angled, without connecting cable to be patched by the customer	00419133
PC interface with USB/TTL converter and USB cable	00456352
Power supply units for transmitter, single and 4-fold (data sheet 707500)	-
Isolation amplifier and supply isolator for the galvanic isolation of standard signals and voltage supply for the two-wire transmitter (data sheet 707530)	-

for process connection 997

Designation	Part no.
T piece with PEKA connection DN100	00643582
T-piece with PEKA connection DN80	00643581
T-piece with PEKA connection DN65	00643580
T-piece with PEKA connection DN50	00643579
T-piece with PEKA connection DN40	00643576
T-piece with PEKA connection DN32	00643574
T-piece with PEKA connection DN25	00643555

for process connection 387/388 (EL < DN)

Designation	Part no.
T-piece with screw connection G 1/2" DN100	00772334
T-piece with screw connection G 1/2" DN80	00772333
T-piece with screw connection G 1/2" DN65	00772332
T-piece with screw connection G 1/2" DN50	00772331
T-piece with screw connection G 1/2" DN40	00772330
T-piece with screw connection G 1/2" DN32	00772321
T-piece with screw connection G 1/2" DN25	00772316