

JUMO GmbH & Co. KG

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JUMO Instrument Co. Ltd.

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JUMO Process Control, Inc.

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JUMO Dtrans T100

Screw-in RTD Temperature Probe with/without Transmitter

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

The screw-in RTD temperature probe in compact design type comprises a protection tube with integrated temperature sensor, a process connection, and an attached case for the transmitter electronics. 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 °C to +150 °C (-58 °F to +302 °F), with extension tube up to 260 °C (500 °F) (without transmitter: -50 °C to +200 °C or -58 °F to +392 °F).

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

The output signal 4 to 20 mA or reversed 20 to 4 mA is available in a linearized way (temperature linear). The device is designed for industrial applications and complies with the respective European standards to guarantee electromagnetic compatibility (EMC).

The transmitter must be protected from temperatures above 85 °C!

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



Approvals/approval marks (see "Technical data")



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Technical data

Electrical connection	Machine connector M12 × 1, 4-pin according to IEC 60947-5-2 FIXCON-compatible
Process connection	Screw connection G 3/8 Screw connection G 1/2 Screw connection G 1/2 with CIP-compliant conical seal with EHEDG certification Taper socket with union nut (dairy fitting) Clamping socket (clamp) DIN 32676 Ball weld-in socket with threaded fitting Welding socket with CIP-compliant conical seal Varivent-connection with EHEDG certification Spherical welding sleeve JUMO PEKA with EHEDG certification
Protection tube	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 time	Water 0.4 m/s standard protection tube $t_{0,5} = 5$ s; $t_{0,9} = 12$ s Water 0.4 m/s stepped down protection tube $t_{0,5} = 2$ s; $t_{0,9} = 5$ s Air 3.0 m/s standard protection tube $t_{0,5} = 40$ s; $t_{0,9} = 110$ s Air 3.0 m/s stepped down protection tube $t_{0,5} = 21$ s; $t_{0,9} = 70$ s
Measuring insert without transmitter	Pt100 or Pt1000 temperature sensor, DIN EN 60751, class A, B and/or AA (1/3 DIN B), two or four-wire circuit
with programmable transmitter	Pt1000 temperature sensor, DIN EN 60751, four-wire circuit

Technical data (general)

Input

Measuring input without transmitter	Pt100 or Pt1000 temperature sensor, DIN EN 60751, class A, B and/or AA (1/3 DIN B), 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	-50 to +200 °C
Basic type 902815/20	-50 to +150 °C
Basic type 902815/21	-50 to +260 °C with extension tube
Limit deviations	$0.15 + 0.002 \times t ^a$, class A (standard) $0.10 + 0.0017 \times t ^a$, class AA (1/3 DIN B) 1/3 DIN B) $0.30 + 0.005 \times t ^a$, class B

^a |t| is the numerical value of the temperature in °C regardless of the prefix.

Environmental influences

Ambient temperature range of the head	
Basic type 902815/10	-30 to +90 °C
Basic type 902815/20 and 902815/21	-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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Technical data (transmitter)

Input

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

Measuring circuit monitoring

Underrange	Linear decrease to 3.8 mA (according to NAMUR recommendation 43)
Overrange	Linear increase to 20.5 mA (according to NAMUR recommendation 43)
Probe short circuit/ probe/cable break	≤ 3.6 mA or ≥ 21.0 mA (configurable)
Current limiting in the event of 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
Maximal burden (R_B)	$R_B = (U_b - 8 \text{ V}) \div 23 \text{ mA}$, max. 600 Ω
Burden influence	$\leq \pm 0.02$ % per 100 Ω^a
Setting time in the event of temperature changes	≤ 5 s
Setting time after switch-on or reset	≤ 5 s
Electronic measuring accuracy	0.1 K or 0.08 % ^{b,c}

^a %-specifications refer to the measuring range end value of 20 mA.

^b %-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 = -), Only use with SELV or PELV supply systems (according to DIN EN 61140)
Protection rating	III (according to DIN 61140)
Galvanic isolation	No galvanic isolation between sensor and output
Leakage resistance	> 100 M Ω at DC 100 V measured at room temperature between terminals and case
Reverse voltage protection	Yes
Influence of the voltage supply	$\leq \pm 0.01$ % per V deviation from 24 V ^a

^a %-specifications refer to the measuring range end value of 20 mA.

Environmental influences

Ambient temperature influence	$\leq \pm (15 \text{ ppm/K} \times (\text{measuring range end value} + 200) + 50 \text{ ppm/K} \times \text{set measuring range}) \times \Delta v$ Δv = 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
Interference immunity	Industrial requirements

Approvals/approval marks

Approval mark	Testing agency	Certificate/certification number	Inspection basis	Valid for
EHEDG	TUM MAK	No. 02/2006	Document No. 8	Process connection 997 JUMO PEKA
EHEDG	TUM MAK	No. 03/2006	Document No. 8	Process connection 380 screw connection with CIP- compliant conical seal

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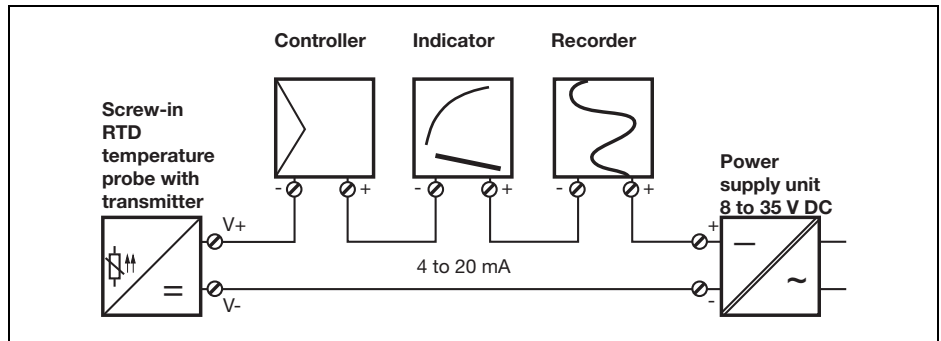
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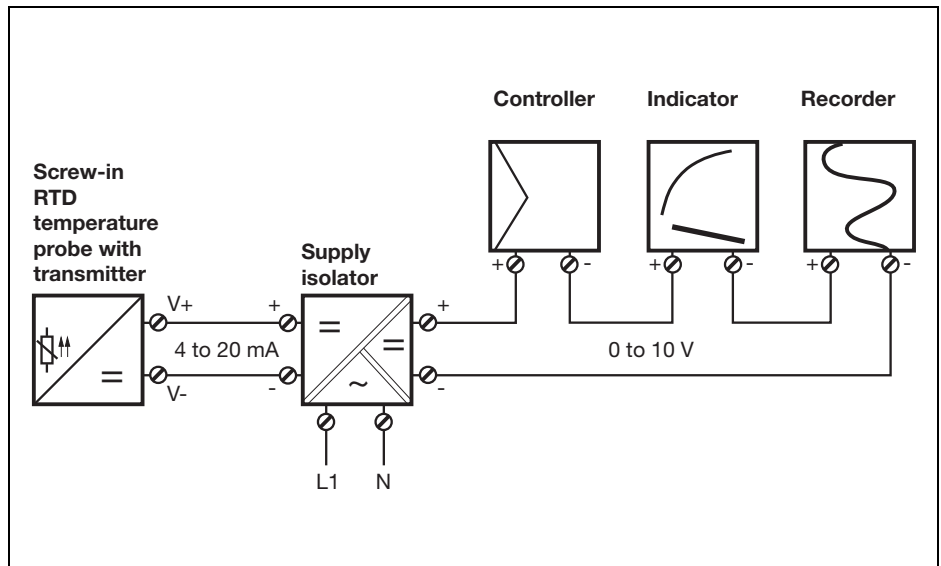


Connection example with transmitter

Connection example with power supply unit

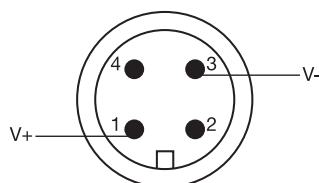
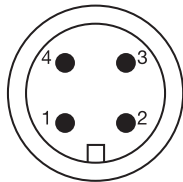


Connection example with supply isolator



Connection diagram

Machine connector M12 x 1, 4-pin according to IEC 60947-5-2



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

Electrical connection		Terminal assignment
Basic type 902815/10 without transmitter		
Screw-in RTD temperature probe in two-wire circuit		
Screw-in RTD temperature probe in four-wire circuit		
Basic type 902815/20 and 902815/21 with programmable transmitter		
Voltage supply DC 8 to 35 V		1 3 V+ V-
Current output 4 to 20 mA		
Setup communication via special configuration cable (for configuration only, continuous operation is not admissible)		2 4

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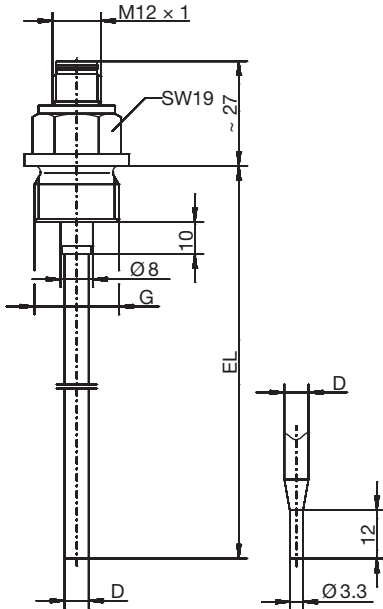
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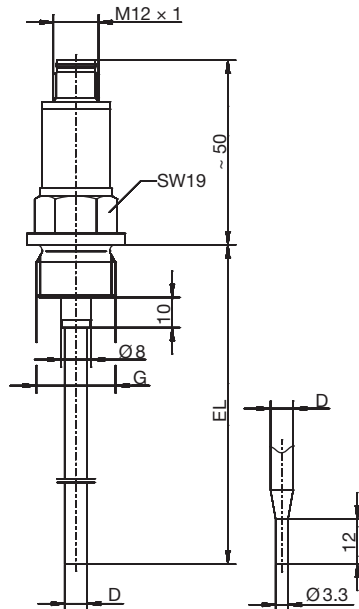


Dimensions

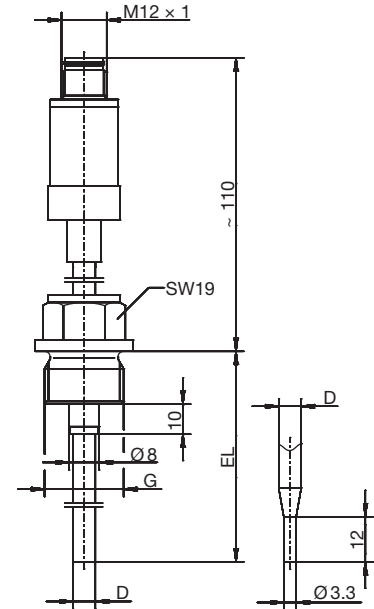
Basic types



Basic type 902815/10
without transmitter

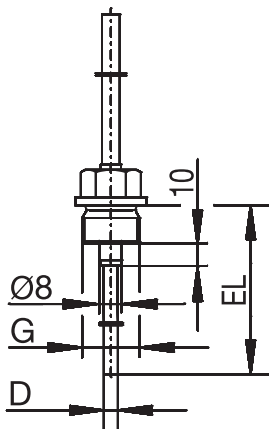


Basic type 902815/20
with transmitter

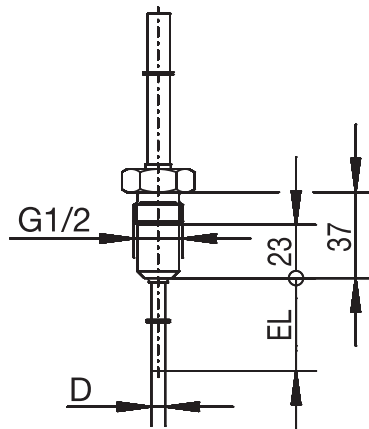


Basic type 902815/21
with transmitter and extension tube

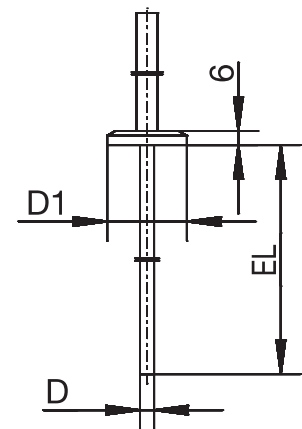
Process connections PA



PA	G
103	3/8
104	1/2



PA	
380	



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

Screw connection

Screw connection with CIP-compliant
conical seal

Clamping socket according to DIN 32676
(clamp)

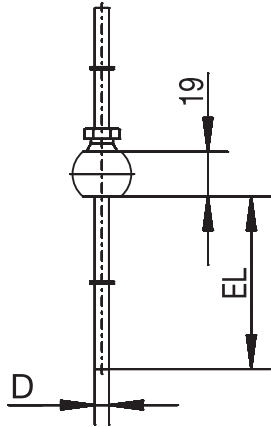
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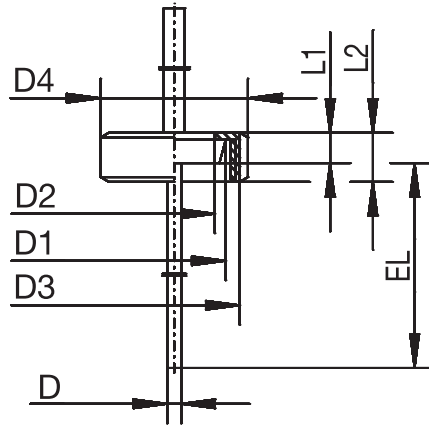
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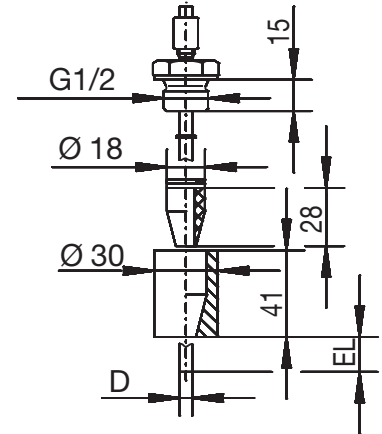
Process connections PA



PA	
681	



PA	DN	D1	D2	D3	D4	L1	L2
601	10	Ø 22	Ø 18	RD 28x1/8	Ø 38	9	18
604	25	Ø 44	Ø 35	RD 52x1/6	Ø 63	13	21
605	32	Ø 50	Ø 41	RD 58x1/6	Ø 70	13	21

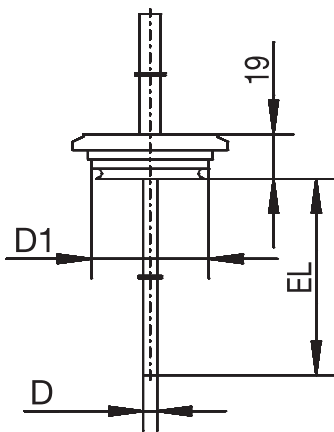


PA	
682	

Ball weld-in socket with threaded fitting

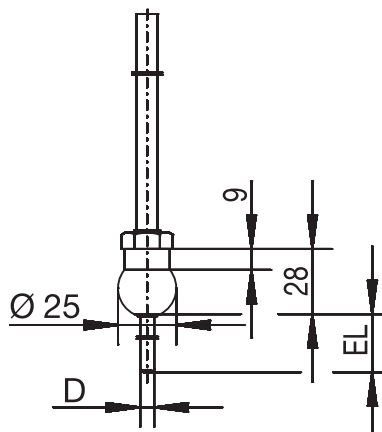
Taper socket with union nut according to DIN 11851 (dairy fitting)

Welding socket with CIP-compliant conical seal



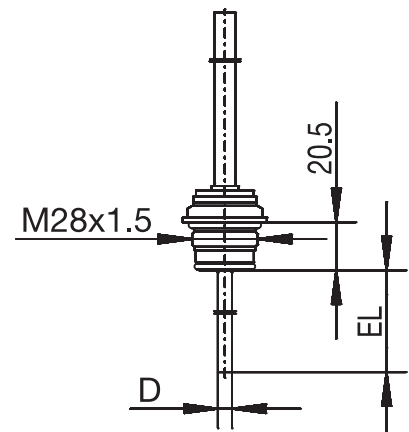
PA	DN	D1
684	15/10	Ø 31
685	32/25	Ø 50
686	50/40	Ø 68

Varivent-connection



PA	
840	

Spherical welding sleeve



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 Process connection adapter, 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.

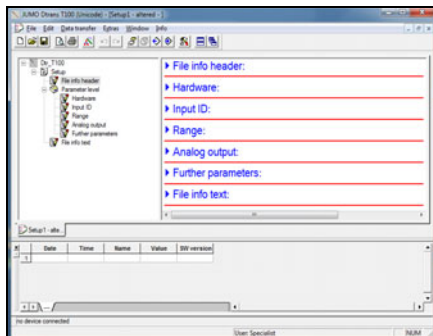
For this purpose the following is required:

- Configuration cable with connector, socket, and Western plug
- PVC-connecting cable, length 2,000 mm
- PC interface with USB/TTL converter and USB cable

(see accessories for 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



Order details

(1) Basic type

902815/10	Screw-in RTD temperature probe without transmitter, connection M12 × 1 machine connector	
902815/20	Screw-in RTD temperature probe ^a with programmable transmitter ^b , connection M12 × 1 machine connector	
902815/21	Screw-in RTD temperature probe ^a with programmable transmitter ^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	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	x	x	1	Class B (standard)
x	x	x	2	Class A
x	x	x	3	Class AA (1/3 DIN B)

(5) Protection tube diameter D in mm

x	x	x	6	Ø 6 mm
---	---	---	---	--------

(6) Insertion length EL in mm (EL 50 to 500 mm)

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	...	Please specify in plain text (50 mm increments)

(7) Process connection PA

x	x	x	000	Without (for basic type 902815/2X 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 with EHEDG certification
x	x	x	601	Taper socket with union nut DN 10 DIN 11851 (dairy fitting)
x	x	x	604	Taper socket with union nut DN 25 DIN 11851 (dairy fitting)
x	x	x	605	Taper socket with union nut DN 32 DIN 11851 (dairy 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
x	x	x	616	Clamping socket (clamp) DN 50 (2") DIN 32676
x	x	x	617	Clamping socket (clamp) 2.5" similar DIN 32676
x	x	x	681	Ball weld-in socket with threaded fitting
x	x	x	682	Welding socket with CIP-compliant conical seal
x	x	x	684	Varivent-connection DN 15/10

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x	x	x	685	Varivent-connection DN 32/25
x	x	x	686	Varivent-connection DN 50/40
x	x	x	840	Spherical welding sleeve (material 316 Ti)
x	x	x	997	JUMO PEKA with EHEDG certification
(8) Protection tube material				
x	x	x	24	Stainless steel 316 L (material-no. 1.4404/1.4435)
x	x	x	26	Stainless steel 316 Ti (material-no. 1.4571) (upon request)
(9) Extra codes				
x	x	x	000	Without
x	x	x	058	SIL- and PL-compatible (only in connection with STB 70115X)
	x	x	100	Customer-specific configuration (specifications in plain text)
x	x	x	310	Protection tube stepped down from Ø 6 mm to Ø 3.3 mm
x	x	x	452	Wetted, electrolytically polished parts, surface roughness Ra ≤ 0.8 µm (without thread and welding joints)
x	x	x	810	Welding socket (only for process connection 380)

^a This JUMO product is licensed under United States and Canadian patents. Purchasers of the JUMO product outside of the United States and Canada should advise JUMO of any planned sales of products incorporating the JUMO product into the United States and Canada.

^b Specify measuring range in plain text.

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

^a List extra codes in sequence, separated by commas.

Scope of delivery

1 device in the ordered version
1 operating manual

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**Stock versions**

Order code	Part no.
902815/10-380-1011-1-6-100-104-24/000	00508463
902815/10-380-1011-3-6-50-104-24/000	00516241
902815/10-380-1011-3-6-150-104-24/000	00516245
902815/10-380-1011-3-6-200-104-24/000	00516246
902815/20-370-1013-2-6-50-104-24/000	00508279
902815/20-370-1013-2-6-100-380-24/452	00513650
902815/20-370-1013-2-6-100-104-24/000	00491506
902815/20-370-1013-2-6-150-000-24/000	00506630
902815/20-370-1013-2-6-200-104-24/000	00503113

Accessories for programmable two-wire transmitter

Description	Part no.
Setup program on CD-ROM, multilingual	00485016
Configuration cable, 4-pin with connector and socket M12 × 1 and Western plug RJ-45	00484692
PVC connecting cable, 4-pin with socket M12 × 1, length 2,000 mm	00404585
5-pin cable socket M12 × 1, straight, without connecting cable to be patched by the customer	00419130
5-pin 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, 1- and 4-way (data sheet 707500)	-
The isolation amplifier and supply isolator for the galvanic isolation of standard signals and voltage supply for the two-wire transmitter (data sheet 707530)	-