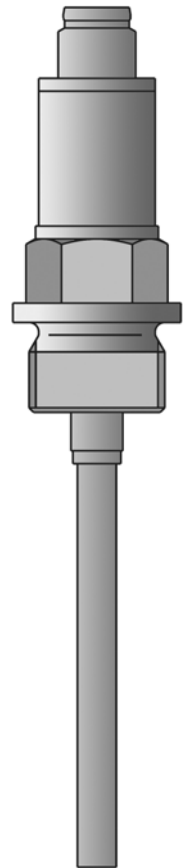


# JUMO Dtrans T100

Screw-in RTD temperature probe  
with transmitter



**B 902815.0**  
Operating Instructions





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# 1 Introduction

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The screw-in RTD temperature probe, which has a compact design, consists of a sheath with an integrated temperature sensor, a process connection, and an attached housing for the transmitter electronics. The built-in programmable 2-wire transmitter converts the resistance value into a current signal.

The screw-in RTD temperature probe with programmable 2-wire transmitter is used for measuring temperatures from -50 to +150 °C (-58 to +302 °F), with an extension up to 260 °C (500 °F). The version without transmitter can be used to measure temperatures from -50 to +200 °C or -58 to +392 °F.

The range, fine calibration, measuring circuit monitoring etc. can all be configured through the setup program.

The 4 to 20 mA or (reversed) 20 to 4 mA output signal that is provided is linear with temperature. The instrument is designed for industrial application and complies with the European standards for assuring electromagnetic compatibility (EMC).

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

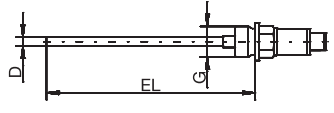
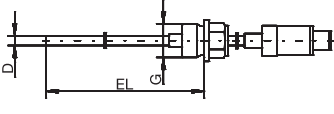
**Product is not intended for Export to the USA!**

# 2 Identifying the instrument version

## 2.1 Type designation

Order details: **JUMO Dtrans T100**  
**Screw-in RTD temperature probe with transmitter**  
**- Product is not intended for Export to the USA! -**

### (1) Basic type

	902815/20	Screw-in RTD temperature probe with programmable transmitter, connection: M12 × 1 machine connector, parts in contact with the medium electrolytically polished; surface roughness $Ra \leq 0.8 \mu\text{m}$	
	902815/21	Screw-in RTD temperature probe with programmable transmitter, connection: M12 × 1 machine connector, high-temperature version with extension, parts in contact with the medium electrolytically polished; surface roughness $Ra \leq 0.8 \mu\text{m}$	
		<b>(2) Operating temperature in °C</b>	
X	370	-50 to +150 °C (max. transmitter temperature 85 °C)	
X	386	-50 to +260 °C (max. transmitter temperature 85 °C)	
		<b>(3) Measuring insert</b>	
X	1013	1 × Pt1000 in 4-wire circuit	
		<b>(4) Tolerance class according to EN 60751</b>	
X	2	Class A (standard)	
		<b>(5) Sheath diameter D in mm</b>	
X	6	Ø 6 mm	
		<b>(6) Fitting length EL in mm (EL 50 ... 500)</b>	
X	50	50 mm	
X	100	100 mm	
X	150	150 mm	
X	200	200 mm	
X	...	please specify in plain text (50 mm steps)	

## 2 Identifying the instrument version

### (7) Process connection (PA)

xx	000	none (max. transmitter temperature 85 °C)
xx	103	G 3/8 (3/8" pipe) thread
xx	104	G 1/2 (1/2" pipe) thread
xx	380	G 1/2 (1/2" pipe) thread with CIP-compliant conical seal and EHEDG certification
xx	601	taper nipple with cap nut DN 10 DIN 11851 (milk pipe fitting)
xx	604	taper nipple with cap nut DN 25 DIN 11851 (milk pipe fitting)
xx	605	taper nipple with cap nut DN 32 DIN 11851 (milk pipe fitting)
xx	611	clamping nipple (clamp) DN 10/20 according to DIN 32676
xx	613	clamping nipple (clamp) DN 25/40 (1"/1.5") according to DIN 32676
xx	616	clamping nipple (clamp) DN 50 (2") according to DIN 32676
xx	617	clamping nipple (clamp) 2.5" similar according to DIN 32676
xx	681	weld-in ball socket with clamping thread
xx	682	weld-in socket with CIP-compliant conical seal
xx	684	Varivent connection DN 15/10 with EHEDG certification
xx	685	Varivent connection DN 32/25 with EHEDG certification
xx	686	Varivent connection DN 50/40 with EHEDG certification
xx	840	ball weld-in pocket (material 316 Ti)
xx	997	JUMO PEKA with EHEDG certification

### (8) Sheath material

xx	24	stainless steel 316 L (Mat. Ref. 1.4404 / 1.4435)
xx	26	stainless steel 316 Ti (Mat. Ref. 1.4571) (on request)

### (9) Extra codes

xx	000	none
xx	100	customized factory setting (please specify parameters in plain text)
xx	310	sheath stepped down from 6 mm dia. to 3.3 mm dia.
xx	810	weld-in socket (only for process connection 380)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)						
<b>Order code</b>	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	-	<input type="text"/>	/	<input type="text"/>	,... <sup>1</sup>	
<b>Order example</b>	902815/20	-	370	-	1013	-	2	-	6	-	100	-	104	-	24 / 000

<sup>1</sup>. List extra codes in sequence, separated by commas.

## **2 Identifying the instrument version**

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### **2.2 Scope of delivery**

- 1 Operating Instructions B 902815.0

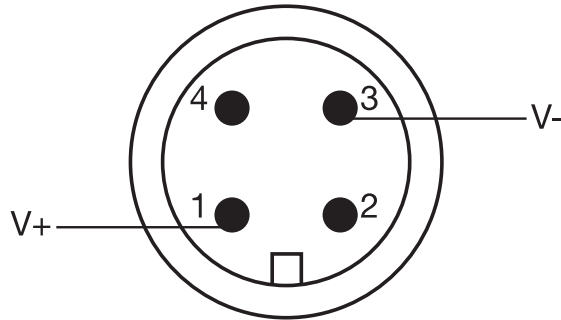
### **2.3 Accessories for programmable 2-wire transmitter**

- Setup program on CD-ROM, multilingual, Part No. 90/00485016
- Configuration cable, 4-pole, with plug and socket M12 × 1 and RJ-45 Western plug, Part No. 90/00484692
- PVC connecting cable, 4-pole with M12 × 1 socket, length 2 meters, Part No. 90/00404585
- PC interface with USB/TTL converter and USB cable, Part No. 90/00456352
- Transmitter supply units 1-way and 4-way (data sheet 707500)
- Isolating amplifier and supply isolator for electrical isolation of standard signals and voltage supply for 2-wire transmitter (data sheet 707510)

## 3 Installation

### 3.1 Connection diagram

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



#### **Warning**

Do not make any connections to pins 2 and 4!

<b>Electrical connection</b>	<b>Pin</b>
Voltage supply 8 to 35 V DC	1 3     ○ ○     V+ V-
Current output 4 to 20 mA	1 3     ○ ○     V+ V-
Setup communication via special configuration cable (for configuration only, continuous operation is not permissible)	2 4     ○ ○ 



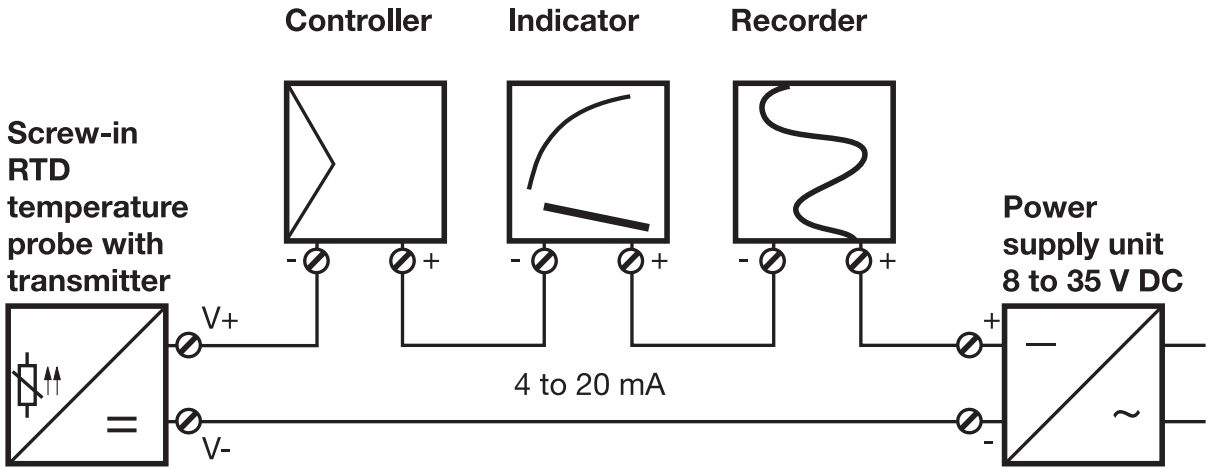
#### **Caution**

After the machine connector has been plugged in correctly, care must be taken that the prescribed voltage supply is applied and the pins are assigned correctly during connection. If this is not observed, the instrument will be destroyed.

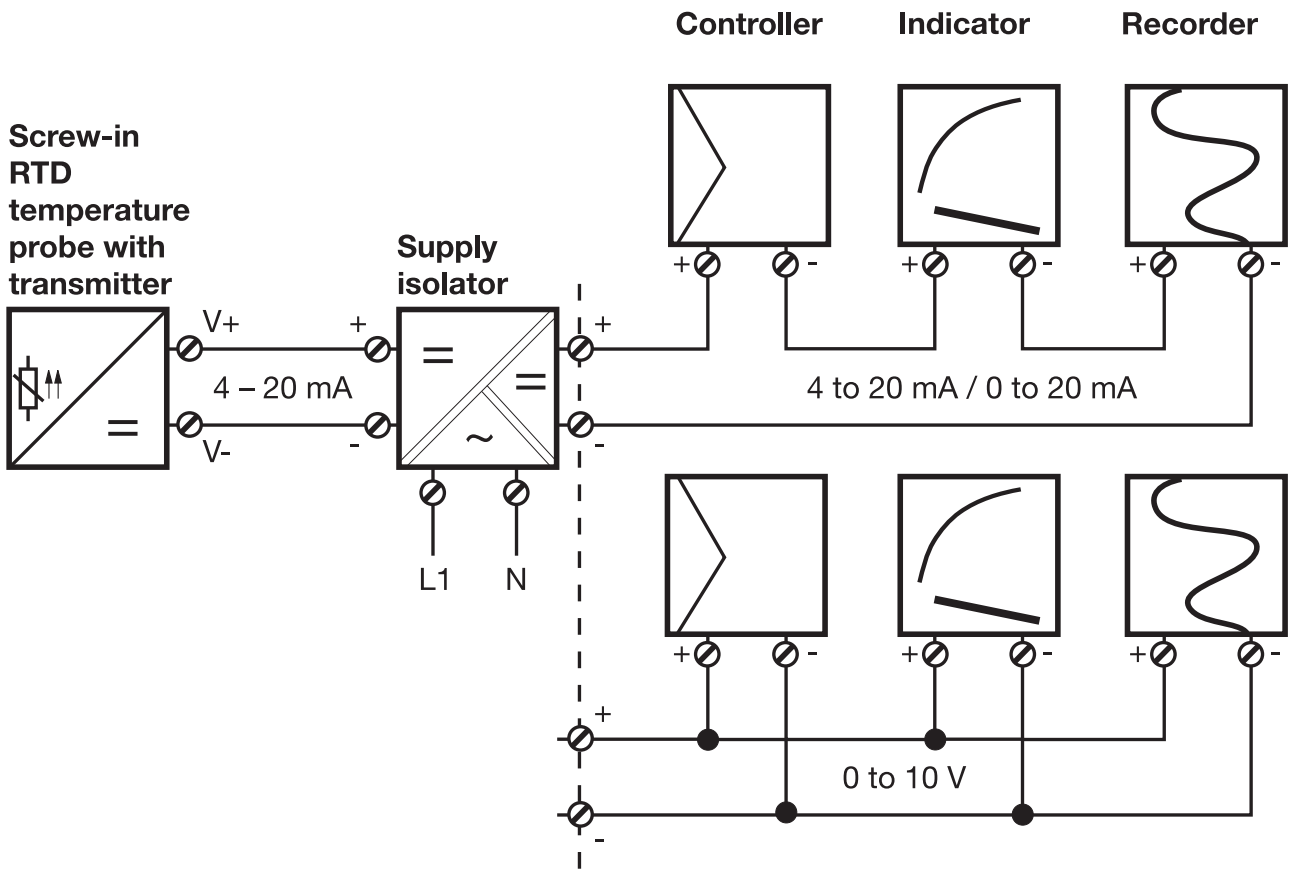


# 3 Installation

## 3.2 Connection example with power supply unit



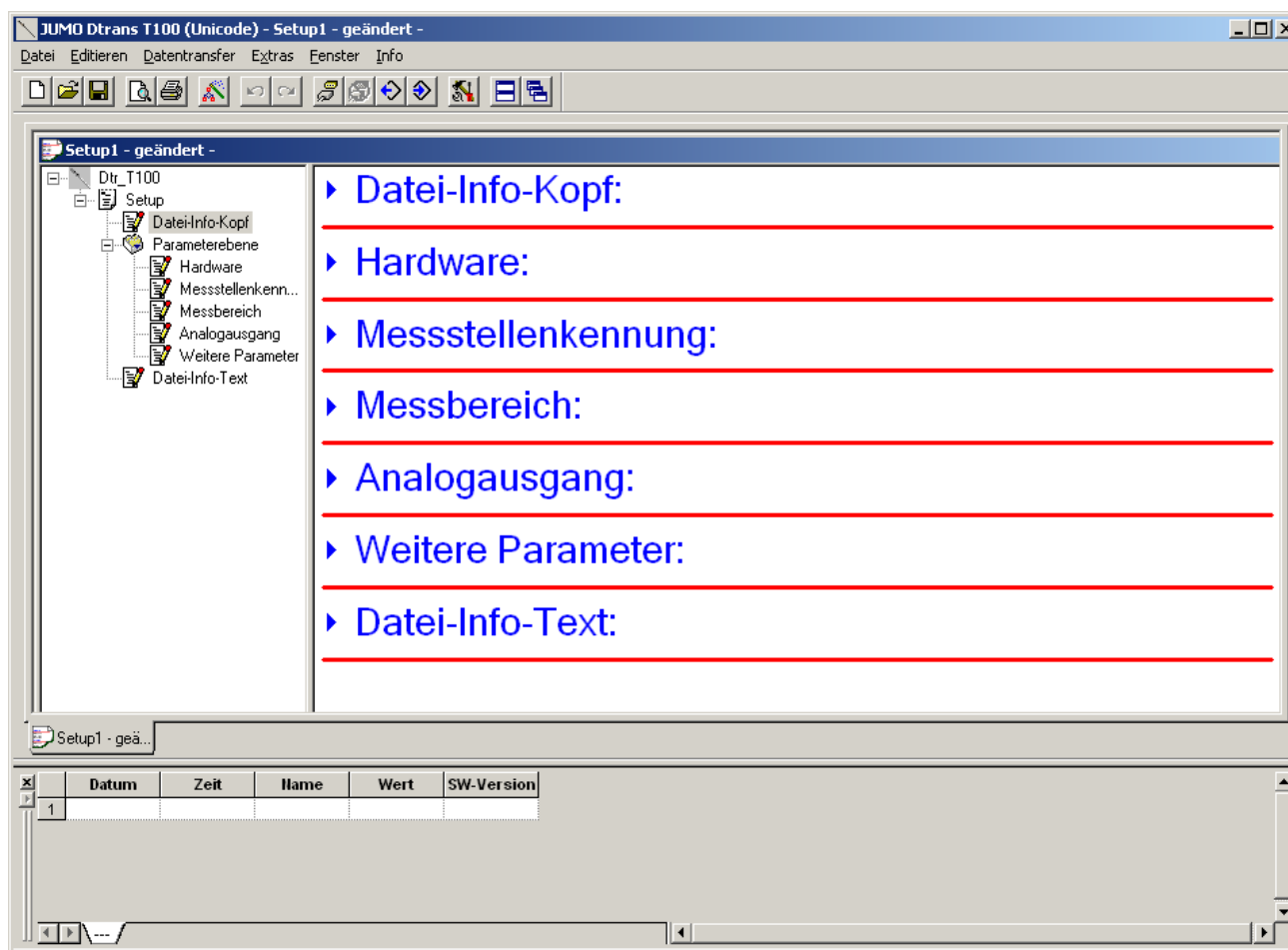
## 3.3 Connection example with supply isolator



## 4 Setup program

### Configuration from a PC

The setup program is available for configuring the programmable 2-wire transmitter from a PC. The connection is made using a special configuration cable with a M12 × 1 plug and M12 × 1 socket, and a RJ-45 Western plug. In addition, you will also need the PVC connecting cable, 2 meters long. The PC interface with USB/TTL converter and USB cable is needed for connecting up to a PC (see accessories for the programmable 2-wire transmitter). If more than one user is administered by the computer, then the user intending to work with the program must be logged in. The user must have administrator rights during the installation. If these instructions are disregarded, complete and fault-free installation cannot be ensured!



In order to configure the 2-wire transmitter, it must be connected to the voltage supply.

If no power supply unit or supply isolator is available, the transmitter can be configured using a 9 V battery as a power source.

## 4 Setup program

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### 4.1 Configurable parameters

Setup level	Parameter	Value range	Factory setting
Hardware	Device type	-	-
Meas. point ID	TAG number	-	-
Measuring range °C or °F, configurable	Offset		0.0 °C
	Range start	-50 to +150 °C	0.0 °C
	Range end	-50 to +260 °C	100.0 °C
Analog output	Reversion of the output	4 to 20 mA/ 20 to 4 mA	4 to 20 mA
	Signal on probe break/short-circuit	<3.8 mA/>21 mA	>21 mA
Further parameters	Filter time constant	0 s/-/-125 s	0.1 s
	Unit	°C/°F	°C

### 4.2 Hardware and software requirements

The following hardware and software requirements must be met for installing and operating the software:

#### Minimum configuration

- Intel Pentium<sup>2</sup> III
- Microsoft Windows<sup>3</sup> 2000 or XP
- 256 MB main memory
- CD drive
- Mouse
- one free USB interface
- 120 MB available on hard disk

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<sup>2</sup> Intel and Pentium are registered trademarks of Intel Corporation.

<sup>3</sup> Microsoft and Windows are registered trademarks of Microsoft Corporation.

## 4 Setup program

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### Recommended configuration

- Intel Pentium 4
- Windows XP
- 512 MB main memory

### 4.3 Fine calibration

Fine calibration means adjustment of the output signal. Fine calibration is carried out with the aid of the setup program. Using the setup program, the 4 mA value (zero) and 20 mA value (full scale) can be calibrated separately.

## 4 Setup program

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### 4.4 Connection arrangement

#### Use

- The PC interface with USB/TTL converter is only designed for service use over a limited period, such as the transfer of setup data.
- It links JUMO devices to a PC through an electrically isolated connection. The RJ-45 Western plug is specially adapted to JUMO devices, and is not suitable for third-party equipment.



Do not confuse the RJ-45 socket with an ISDN or network connection.

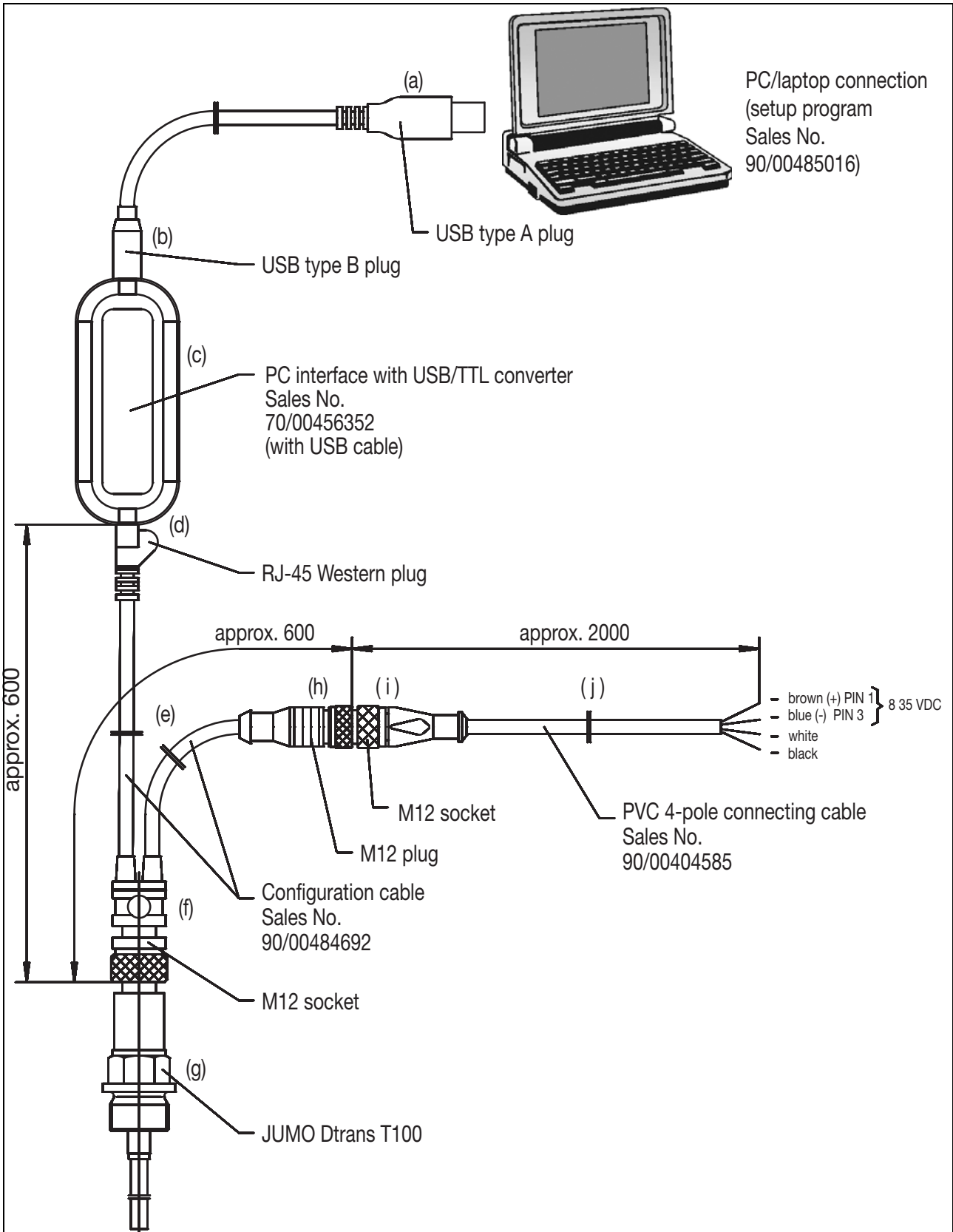
Make the connections for the setup program as described below:

1. First connect the USB type A plug (a) to the PC/laptop and then connect the USB type B plug (b) to the PC interface with USB/TTL converter (c).  
This ensure a safe grounding on the PC/laptop side.
2. Connect the RJ-45 Western plug (d) of the configuration cable (e) to the PC interface with USB/TTL converter (c) and the M12 × 1 socket (f) to the JUMO Dtrans T100 (g).
3. Connect the M12 × 1 socket (i) of the PVC connecting cable (j) to the M12 × 1 plug (h) of the configuration cable (e).
4. Connect the 8 to 35 V DC voltage supply to the PVC connecting cable (j).



Remove the modular cable (not required for this setup, therefore not shown in the diagram) of the PC interface with USB/TTL converter, including two adapters (socket and plug) – will be needed for other devices.

# 4 Setup program

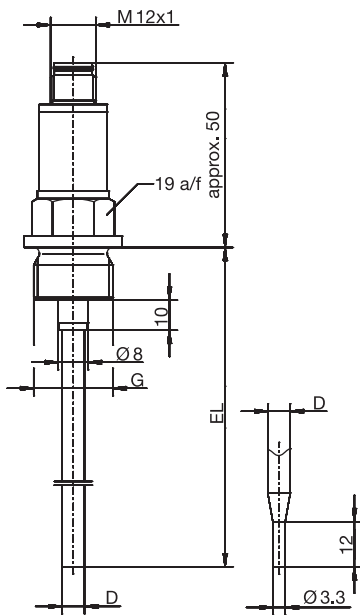


**Diagram 1: Connection arrangement for setup with JUMO Dtrans T100**

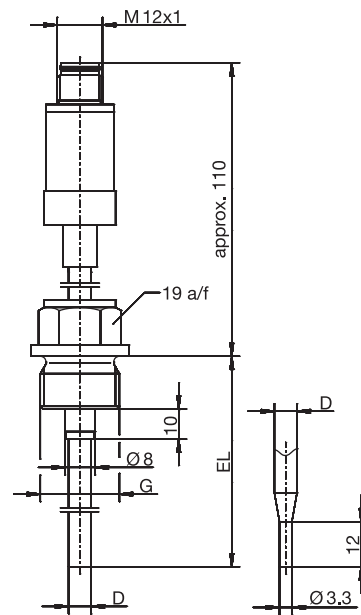
# 5 Dimensions

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## 5.1 Basic types



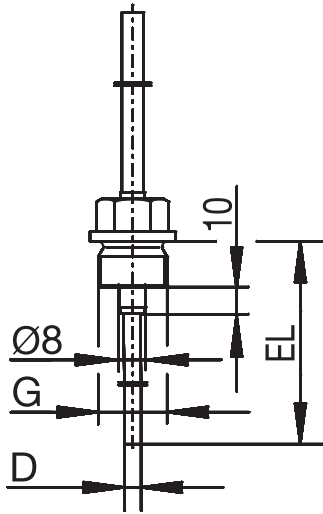
**Basic type 902815/20...**



**Basic type 902815/21...  
with extension**

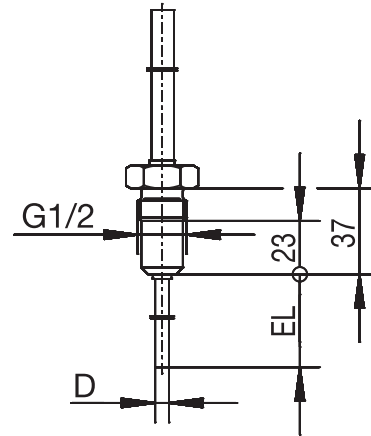
# 5 Dimensions

## 5.2 Process connection PA



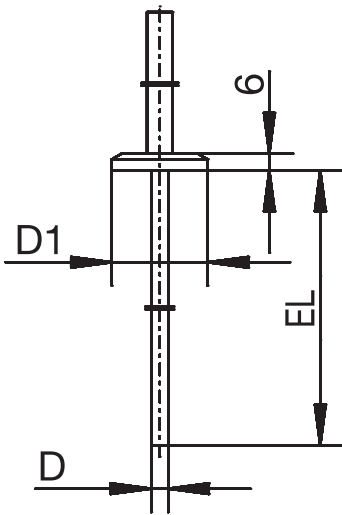
PA	DN
103	3/8
104	1/2

**Screw fitting**



PA	
380	

**Screw fitting with CIP-compliant conical seal**

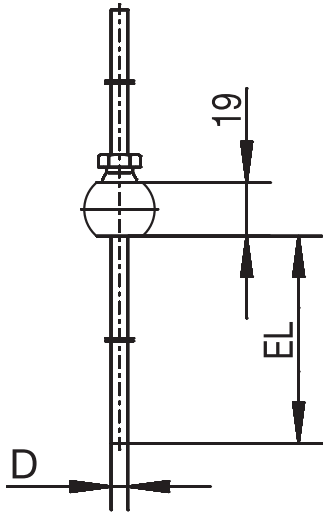


PA	DN	D1	PA	DN	D1
-	-	Ø 25	613	40/1.5"	Ø 50.5
611	10/20	Ø 34	616	50/2"	Ø 64
613	25/1"	Ø 50.5	617	2.5"	Ø 77.5

**Clamping nipple according to DIN 32676 (clamp)**

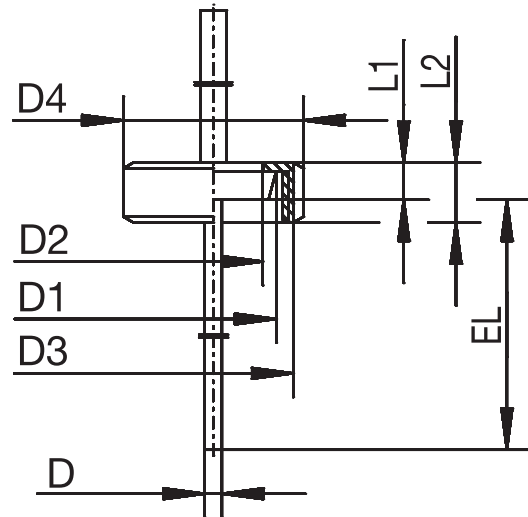


## 5 Dimensions



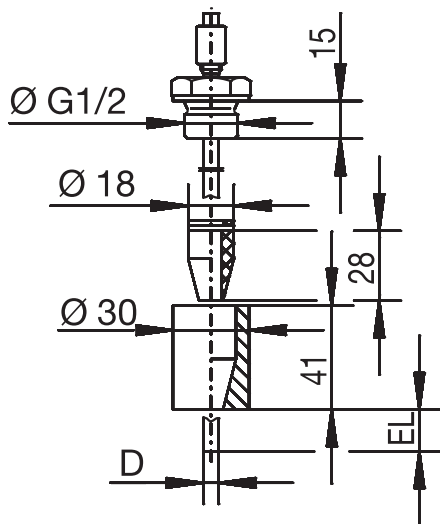
PA	
681	

**Weld-in ball socket  
with clamping nipple**



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

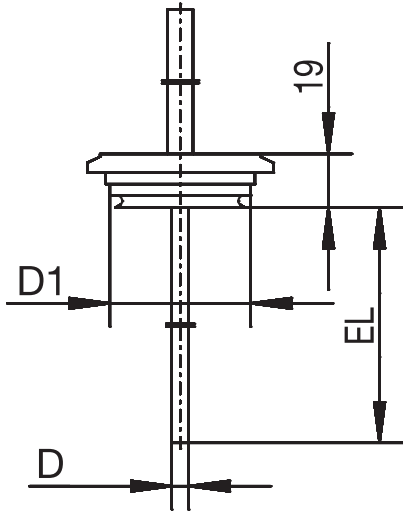
**Taper nipple  
with cap nut  
according to DIN 11851  
(milk pipe fitting)**



PA	
682	

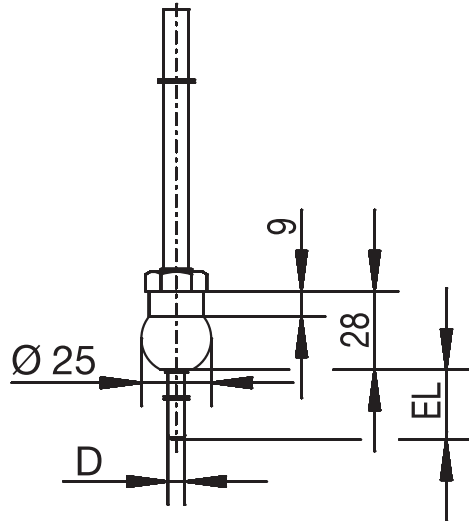
**Weld-in socket  
with CIP-compliant conical seal**

## 5 Dimensions



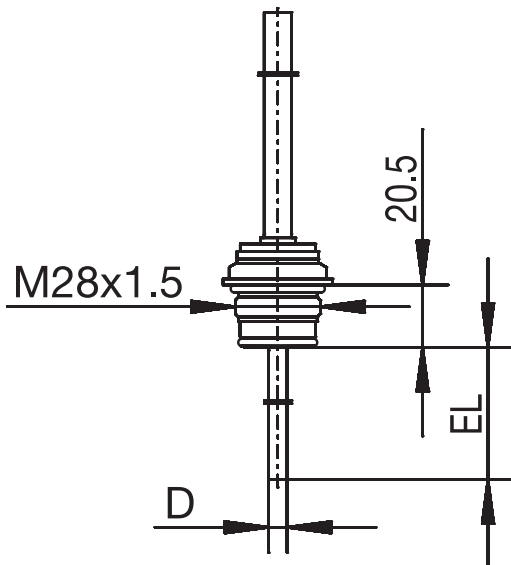
PA	DN	D1
684	15/10	Ø 31
685	32/25	Ø 50
686	50/40	Ø 68

**Varivent connection**



PA	
681	

**Weld-in ball socket**



			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

## 6 Technical data

### Input

Measurement input	Pt1000 temperature sensor, EN 60751, Class A, 4-wire circuit
Measuring ranges	Basic type 902815/20... : -50 to +150 °C Basic type 902815/21... : -50 to +260 °C with extension
Tolerance limits	$0.15 + 0.002 \times  t $ , Class A (standard)   t  is the numerical value for the temperature in °C without taking the sign into account.
Response time	water 0.4 m/s sheath standard $t_{0.5} = 5 \text{ s}$ ; $t_{0.9} = 12 \text{ s}$ water 0.4 m/s sheath stepped $t_{0.5} = 2 \text{ s}$ ; $t_{0.9} = 5 \text{ s}$ air 3.0 m/s sheath standard $t_{0.5} = 40 \text{ s}$ ; $t_{0.9} = 110 \text{ s}$ air 3.0 m/s sheath stepped $t_{0.5} = 21 \text{ s}$ ; $t_{0.9} = 70 \text{ s}$

### Input

Shortest span	10 K
Sampling rate	1 measurement per second
Input filter	1st order digital filter; filter constant is adjustable within the range 0 to 125 s

### Measuring circuit monitoring

Underrange	linear drop down to 3.8 mA (according to NAMUR recommendation 43)
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## 6 Technical data

Overrange	linear rise up to 20.5 mA (according to NAMUR recommendation 43)
Probe short-circuit/ probe or lead break	$\leq 3.6 \text{ mA}$ or $\geq 21.0 \text{ mA}$ (configurable)
Current limiting on probe short-circuit or probe break	$\leq 25 \text{ mA}$

### Output

Output signal	proportional DC current 4 to 20 mA, 20 to 4 mA
Transfer characteristic	linear with temperature
Maximum burden ( $R_B$ )	$R_B = (U_b - 8 \text{ V}) / 23 \text{ mA}$ , max. 600 $\Omega$
Burden error	$\leq \pm 0.02 \text{ \%}/100 \Omega$ the % value refers to the range end value 20 mA.
Settling time on a temperature change	$\leq 5 \text{ s}$
Settling time after a switch-on or reset	$\leq 5 \text{ s}$
Measuring accuracy of electronics	0.1 $^{\circ}\text{C}$ or 0.08 % the % value refers to the measuring span that was set, the larger value applies.

### Electrical data

Voltage supply ( $U_b$ )	8 to 35 V DC (pin 1 = +, pin 3 = -), only for operation on SELV or PELV circuits according to EN 50178
Reverse polarity protection	yes

## 6 Technical data

Voltage supply error	$\leq \pm 0.01 \% / V$ deviation from 24 V the % value refers to the measuring span that was set, the larger value applies.
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### Environmental influences

Ambient temperature range for head	-30 to +85 °C
Storage temperature range	-30 to +90 °C
Ambient temperature error	$\leq \pm (15 \text{ ppm}/^{\circ}\text{C} \times (\text{range end value} + 200) + 50 \text{ ppm}/^{\circ}\text{C} \times \text{measuring range set}) \times \Delta v$ $\Delta v$ = deviation of ambient temperature from the reference temperature
Calibration/reference conditions	24 V DC at 25 °C $\pm$ 5 °C (77 °F $\pm$ 9 °F)
Climatic conditions	according to IEC 68-2-30 (rel. humidity $\leq$ 95 % with condensation)
Vibration strength	according to IEC 68-2-6 (according to GL characteristics)
Electromagnetic compatibility (EMC) - interference emission - interference immunity	EN 61326 Class B industrial requirements
Protection type	IP67 according to DIN 60529 with machine connector plugged in







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