

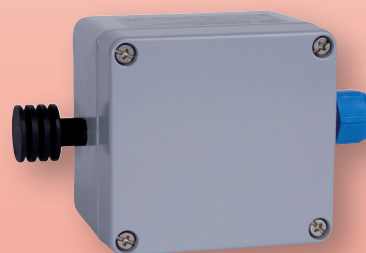


Resistance Thermometers according to DIN Ignition Protection Exia



measuring
•
monitoring
•
analysing

TWL-Exia



- Measuring range: -80...+600 °C
- Pt 100-sensor class A respectively class B
- Output: resistance or analogue 4-20 mA
- Thermowells according to DIN 43772
- Special sensor length available
- Option: headtransmitter with HART® protocol, or PROFIBUS®/Fieldbus
- For ATEX applications, ignition protection Exia



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T2



Description

The KOBOLD resistance thermometers model TWL comprise a rugged installation fitting made of stainless steel with thread, flange or weld-on connection, a connection head form B out of aluminium casting and a removable measuring insert (exceptions are models TWL-ST, -SN and -SA). The measuring insert can be replaced without emptying the process (TWL-ST, -SN, -SA excepted). The instruments are supplied with the ignition protection Exia as a standard and therefore can be installed in relevant hazardous areas.

A Pt 100 temperature sensor according to IEC 751, category A or B is fitted in the measuring insert as standard. Depending on customer request the temperature sensor can be carried out as 2-, 3- or 4-wire circuit.

Alternatively these sensors can be designed as single or double resistance thermometers. Exceptional the 4-wire version, which can only be build with one Pt 100 due to lack of space.

As an option the resistance thermometers can be supplied with a head transmitter. Transmitter with a standard 4-20 mA signal and transmitter with HART® protocol or with PROFIBUS®/Fieldbus are there to choose from.

Beside the available resistance thermometers according to DIN-standard, there are customised versions relating to the immersion length, the connection head, the materials, the process connection or the tolerance classes deliverable on request.

Head Transmitter

Resistance thermometers with head transmitter are used whenever a measuring signal must be transported long distance without any disturbance.

The head transmitter which is encapsulated in epoxide resin is located right in the connection head and delivers a temperature-linear output signal of 4-20 mA. The head transmitter is available with standardised communication systems just like HART® protocol or PROFIBUS®/Fieldbus.

Applications

The resistance thermometers are favourably used for the temperature measurement in liquids, solids and gaseous media. The reliable watertightness of this installation method for gauge pressure and vacuum is an important criteria for selection.

Application areas are located in the air-conditioning and cooling industry, the heating-, furnace-, mechanical- and apparatus construction as well as in the complete industry.

For all applications in hazardous areas, the instruments are supplied with the ignition protection Exia.

Technical Details

Meas. principle:	temperature depending resistor
Meas. range:	-80 ... +600 °C, (-40 ... +85 °C TWL-ST)
Sensor:	Pt 100, single- or double-sensor (1 x Pt 100 or 2 x Pt 100)
Accuracy:	class A or class B (others on request)
Ambient temperature:	-40 ... +150 °C (-40 ... +85 °C TWL-ST) with ceramic terminal base -40 ... +85 °C with transmitter -40 ... +85 °C for room temperature sensor
Operating Pressure:	max. 250 bar (depending on TWL version, see order details)
Connection head:	form B with chain except TWL-ST : Aluminium or polycarbonate connection head TWL-SN and TWL-SA: without connection head
Materials:	
- Sensor:	stainless steel 1.4404 (exception: TWL-D and TWL-ST, others on request)
- Neckpipe:	stainless steel 1.4404 (exception: TWL-D, others on request)
- Connection head:	aluminium, painted (TWL-ST: Polycarbonate)
- Terminal base:	ceramic (without transmitter)
Process connection:	thread G ½ male, G1 male flange DN 25 weld-on sleeve Ø 24 h7, others on request
Sensor wiring:	2-, 3- or 4-wire
Protection:	connection head IP 65 sensor IP 68
ATEX-approval:	Ⓔ II 1 GD Exia IIC T4...T6/ Ex iaD 20 IP65 T85 °C -20 °C ≤ Ta ≤ +60 °C
Head transmitter:	
- Output:	analogue output 4-20 mA
- Communication:	HART®-protocol, PROFIBUS®/Fieldbus
- Minimum meas. span:	standard transmitter 25 K transmitter with HART® 10 K transmitter with PROFIBUS®/ Fieldbus™ 5 K
- Supply voltage:	8-35 V _{DC} for standard transmitter and transmitter with HART® 9-32 V _{DC} for transmitter with PROFIBUS®/Fieldbus™

Screw-in resistance thermometer form 2G with neckpipe, protection Exia,
thermowell G ½ male according to DIN 43772 (with neckpipe), p_{max} 10 bar

Model	Immersion length "EL"	Process connection	Sensor type/ category ²⁾	Wiring	Connection head	Head transmitter	Special option
TWL-B94	10 = 100 Ø 8x6 mm 16 = 160 Ø 8x6 mm 25 = 250 Ø 8x6 mm 40 = 400 Ø 8x6 mm XX ¹⁾ = special length Ø 8x6 mm	2 = G ½ AG	1 = 1 xPt 100 cat. B -80...+600°C 2 = 2 xPt 100 cat. B -80...+600°C 3 = 1 xPt 100 cat. A -80...+600°C 4 = 2 xPt 100 cat. A -80...+600°C	2 = 2-wire 3 = 3-wire 4 ³⁾ = 4-wire	G = form B, with chain Y = special connec- tion head (to be specified in writing)	0 = without A ⁴⁾ = programmable transmitter 2-wire (5333D) B ⁴⁾ = transmitter with HART® protocol 2-wire (5335D) C ⁴⁾ = transmitter PROFIBUS®/ Fieldbus™ (5350B)	0 = without Y = acc. description

¹⁾ Please specify special length in writing

²⁾ Maximum temperature +750°C on request

³⁾ Only with 1x Pt100

⁴⁾ Please specify measuring range in writing

Screw-in resistance thermometer form 2G with neckpipe, protection Exia,
thermowell G 1 male according to DIN 43772, p_{max} 10 bar

Model	Immersion length "EL"	Process connection	Sensor type/ category ²⁾	Wiring	Connection head	Head transmitter	Special option
TWL-CB4	10 = 100 Ø 10x8 mm 16 = 160 Ø 10x8 mm 25 = 250 Ø 10x8 mm 40 = 400 Ø 10x8 mm XX ¹⁾ = special length Ø 10x8 mm	4 = G 1 AG	1 = 1 xPt 100 cat. B -80...+600°C 2 = 2 xPt 100 cat. B -80...+600°C 3 = 1 xPt 100 cat. A -80...+600°C 4 = 2 xPt 100 cat. A -80...+600°C	2 = 2-wire 3 = 3-wire 4 ³⁾ = 4-wire	G = form B, with chain Y = special connec- tion head (to be specified in writing)	0 = without A ⁴⁾ = programmable transmitter 2-wire (5333D) B ⁴⁾ = transmitter with HART® protocol 2-wire (5335D) C ⁴⁾ = transmitter PROFIBUS®/ Fieldbus™ (5350B)	0 = without Y = acc. description

¹⁾ Please specify special length in writing

²⁾ Maximum temperature +750°C on request

³⁾ Only with 1x Pt100

⁴⁾ Please specify measuring range in writing



Screw-in resistance thermometer form 3G with neckpipe, protection Exia, tapered thermowell G 1 male according to DIN 43772 for faster response time, p_{max} 30 bar

Model	Immersion length "EL"	Process connection	Sensor type/ category ²⁾	Wiring	Connection head	Head transmitter	Special option
TWL-G94	16 = 160 \varnothing 8x6 mm 25 = 250 \varnothing 8x6 mm 28 = 280 \varnothing 8x6 mm XX ¹⁾ = special length \varnothing 8x6 mm	4 = G 1 AG	1 = 1 xPt 100 cat. B -80...+600°C 2 = 2 xPt 100 cat. B -80...+600°C 3 = 1 xPt 100 cat. A -80...+600°C 4 = 2 xPt 100 cat. A -80...+600°C	2 = 2-wire 3 = 3-wire 4 ³⁾ = 4-wire	G = form B, with chain Y = special connection head (to be specified in writing)	0 = without A ⁴⁾ = programmable transmitter 2-wire (5333D) B ⁴⁾ = transmitter with HART® protocol 2-wire (5335D) C ⁴⁾ = transmitter PROFIBUS®/ Fieldbus™ (5350B)	0 = without Y = acc. description

¹⁾ Please specify special length in writing

²⁾ Maximum temperature +750 °C on request

³⁾ Only with 1x Pt100

⁴⁾ Please specify measuring range in writing

Immersion resistance thermometer form 1, protection Exia, thermowell according to DIN 43772 with adjustable flange, p_{max} 10 bar

Model	Immersion length "EL"	Process connection	Sensor type/ category ⁴⁾	Wiring	Connection head	Head transmitter	Special option
TWL-1F4	50 = 500 \varnothing 15 mm 71 = 710 \varnothing 15 mm 1T = 1000 \varnothing 15 mm T4 = 1400 \varnothing 15 mm 2T = 2000 \varnothing 15 mm XX ¹⁾ = special length \varnothing 15 mm	B = adjustable G ¾ male st.st. C = aluminium sliding flange DIN 43743	1 = 1 xPt 100 cat. B -80...+600°C 2 = 2 xPt 100 cat. B -80...+600°C 3 = 1 xPt 100 cat. A -80...+600°C 4 = 2 xPt 100 cat. A -80...+600°C	2 = 2-wire 3 = 3-wire 4 ³⁾ = 4-wire	G = form B, with chain Y = special connection head (to be specified in writing)	0 = without A ⁴⁾ = programmable transmitter 2-wire (5333D) B ⁴⁾ = transmitter with HART® protocol 2-wire (5335D) C ⁴⁾ = transmitter PROFIBUS®/ Fieldbus™ (5350B)	0 = without Y = acc. description

¹⁾ Please specify special length in writing

²⁾ Maximum temperature +750 °C on request

³⁾ Only with 1x Pt100

⁴⁾ Please specify measuring range in writing

**Weld-on resistance thermometer form 4, protection Exia,
thermowell according to DIN 43772, p_{max} 250 bar**

Model	Immersion length EL/L [mm]	Process connection	Sensor type/ category ³⁾	Wiring	Connection head	Head transmitter	Special option
TWL-D	1406 = 65/140 (D1) st.st. 1.4571 2412 = 125/200 (D2) st.st. 1.4571 4406 = 65/200 (D4) st.st. 1.4571 5412 = 125/260 (D5) st.st. 1.4571 XXXX ¹⁾ = special length	0 = weld-on	1 = 1xPt 100 cat. B -80...+600°C 2 = 2xPt 100 cat. B -80...+600°C 3 = 1xPt 100 cat. A -80...+600°C 4 = 2xPt 100 cat. A -80...+600°C	2 = 2-wire 3 = 3-wire 4 ⁴⁾ = 4-wire	G = form B, with chain Y = special connec- tion head (to be specified in writing)	0 = without A ⁵⁾ = programmable transmitter 2-wire (5333D) B ⁵⁾ = transmitter with HART® protocol 2-wire (5335D) C ⁵⁾ = transmitter PROFIBUS®/ Fieldbus™ (5350B)	0 = without Y = acc. description
	1906 ²⁾ = 65/140 (D1) st.st. 1.4903 2912 ²⁾ = 125/200 (D2) st.st. 1.4903 4906 ²⁾ = 65/200 (D4) st.st. 1.4903 5912 ²⁾ = 125/260 (D5) st.st. 1.4903 XXXX ¹⁾ = special length						

¹⁾ Please specify special length in writing

²⁾ Stainless steel 1.7380 or 1.7337 on request

³⁾ Maximum temperature +750°C on request

⁴⁾ Only with 1x Pt100

⁵⁾ Please specify measuring range in writing

**Insertion resistance thermometer form 3F, protection Exia flange DN 25 PN 40,
tapered thermowell according to DIN 43772 for faster response time, p_{max} 50 bar**

Model	Immersion length "EL"	Process connection	Sensor type/ category ²⁾	Wiring	Connection head	Head transmitter	Special option
TWL-F94	22 = 225 (size ø12...8 mm) 28 = 285 (size ø12...8 mm) 34 = 345 (size ø12...8 mm) XX ¹⁾ = special length	4 = DN 25	1 = 1xPt 100 cat. B -80...+600°C 2 = 2xPt 100 cat. B -80...+600°C 3 = 1xPt 100 cat. A -80...+600°C 4 = 2xPt 100 cat. A -80...+600°C	2 = 2-wire 3 = 3-wire 4 ³⁾ = 4-wire	G = form B, with chain Y = special connec- tion head (to be specified in writing)	0 = without A ⁴⁾ = programmable transmitter 2-wire (5333D) B ⁴⁾ = transmitter with HART® protocol 2-wire (5335D) C ⁴⁾ = transmitter PROFIBUS®/ Fieldbus™ (5350B)	0 = without Y = acc. description

¹⁾ Please specify special length in writing

²⁾ Maximum temperature +750°C on request

³⁾ Only with 1x Pt100

⁴⁾ Please specify measuring range in writing



Spare measuring insert for resistance thermometer according to DIN 43772 and protection Exia

Model	Immersion length ML [mm]	For form	Measuring insert length	Sensor type/ category ²⁾	Wiring	Head transmitter	Special option	
TWL-M82 Ø 8 mm	0050 = 500	1	528					
	0071 = 710		738					
	001T = 1000		1028					
	00T4 = 1400		1428					
	002T = 2000		2028					
	XXXX ¹⁾ = special length		acc. to special length					
TWL-M62 Ø 6 mm	0010 = 100	2G (Model TWL-CB4 only)	258	1 = 1 x Pt 100 cat. B -80... +600°C	2 = 2-wire	0 = without A ³⁾ = programmable transmitter 2-wire (5333D)	0 = without Y = acc. description	
	0016 = 160		318					
	0025 = 250		408					
	0040 = 400		558					
	XXXX ¹⁾ = special length		acc. to special length					
TWL-M52 Ø 5 mm	0010 = 100	2G (Model TWL-B94 only)	258	2 = 2 x Pt 100 cat. B -80... +600°C	3 = 3-wire 4 ³⁾ = 4-wire	B ³⁾ = transmitter with HART® protocol 2-wire (5335D) C ³⁾ = transmitter PROFIBUS®/ Fieldbus™ (5350B)		
	0016 = 160		318					
	0025 = 250		408					
	0040 = 400		558					
	XXXX ¹⁾ = special length	acc. to special length	3F	318				3 = 1 x Pt 100 cat. A -80... +600°C
	0022 = 225	378						
	0028 = 285	438						
	XXXX ¹⁾ = special length	acc. to special length						
	0016 = 160	3G	318	4 = 2 x Pt 100 cat. A -80... +600°C				
	0025 = 250		408					
	0028 = 280		438					
	XXXX ¹⁾ = special length		acc. to special length					
1406 = 65/140	4	322						
2412 = 125/200		382						
4406 = 65/200		382						
5412 = 125/260		442						
1906 = 65/140		322						
2912 = 125/200		382						
4906 = 65/200		382						
5912 = 125/260		442						
XXXX ¹⁾ = special length	acc. to special length							

¹⁾ Please specify special length in writing
²⁾ Maximum temperature +750 °C on request

³⁾ Only with 1x Pt100
⁴⁾ Please specify measuring range in writing

Ambient resistance thermometer, protection Exia, p_{\max} Atmospheric pressure

Model	Sensor length "EL"	Process connection	Sensor type/category	Wiring	Connection head	Head transmitter	Special option
TWL-ST	24 = 24 mm XX ¹⁾ = special length	0 = wall mounting	1 = 1 x Pt 100 cat. B 2 = 2 x Pt 100 cat. B 3 = 1 x Pt 100 cat. A 4 = 2 x Pt 100 cat. A	2 = 2-wire 3 ⁴⁾ = 3-wire 4 ²⁾ = 4-wire	P = polycarbonate A = aluminium	0 = without A ³⁾ = programmable transmitter 2-wire (5333D) B ³⁾ = transmitter with HART [®] protocol 2-wire (5335D) C ³⁾ = transmitter PROFIBUS [®] /Fieldbus [™] (5350B)	0 = without Y = acc. description

¹⁾ Please specify special length in writing ²⁾ Only with 1x Pt100 ³⁾ Please specify measuring range in writing ⁴⁾ Necessary for head transmitter

Screw-in resistance thermometer with cable, protection Exia, male according to DIN 43772, p_{\max} 10 bar

Model	Immersion length "EL"	Process connection	Sensor type/category	Wiring	Connection cable ³⁾	Head transmitter	Special option
TWL-SN	10 = 100 Ø 6 mm 16 = 160 Ø 6 mm 25 = 250 Ø 6 mm 40 = 400 Ø 6 mm XX ¹⁾ = special length	2 = G ½ male	1 = 1 x Pt 100 cat. B -80...+600°C 2 = 2 x Pt 100 cat. B -80...+600°C 3 = 1 x Pt 100 cat. A -80...+600°C 4 = 2 x Pt 100 cat. A -80...+600°C	2 = 2-wire 3 = 3-wire 4 ²⁾ = 4-wire	S = silicone cable P = PTFE cable X = special length and/or material (to be specified in writing)	0 = without	0 = without Y = acc. description

¹⁾ Please specify special length in writing ²⁾ Only with 1x Pt100 ³⁾ Please specify special length cable 'CL' (standard model 1000 mm) in writing

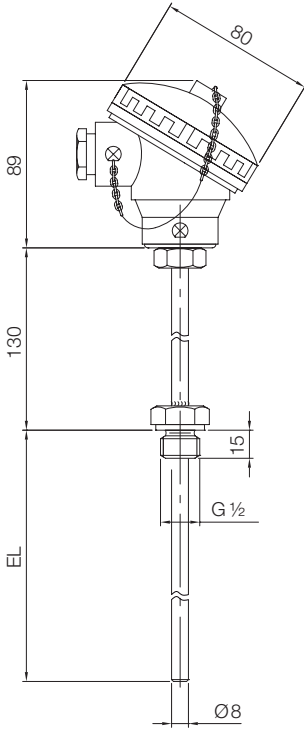
Insertion resistance thermometer with cable, protection Exia, p_{\max} 10 bar

Model	Immersion length "EL"	Process connection	Sensor type/category	Wiring	Connection cable ³⁾	Head transmitter	Special option
TWL-SA	10 = 100 Ø 6 mm 16 = 160 Ø 6 mm 25 = 250 Ø 6 mm 40 = 400 Ø 6 mm XX ¹⁾ = special length	0 = ohne	1 = 1 x Pt 100 cat. B -80...+600°C 2 = 2 x Pt 100 cat. B -80...+600°C 3 = 1 x Pt 100 cat. A -80...+600°C 4 = 2 x Pt 100 cat. A -80...+600°C	2 = 2-wire 3 = 3-wire 4 ²⁾ = 4-wire	S = silicone cable P = PTFE cable X = special length and/or material (to be specified in writing)	0 = without	0 = without Y = acc. description

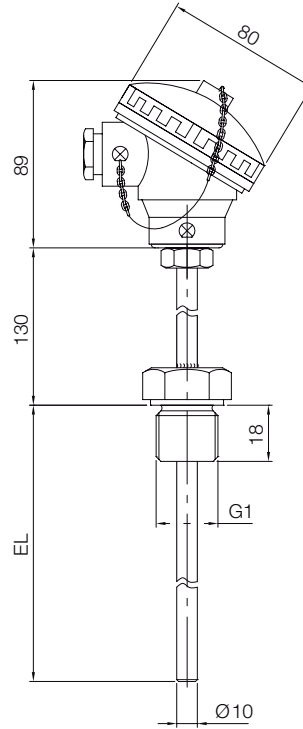
¹⁾ Please specify special length in writing ²⁾ Only with 1x Pt100 ³⁾ Please specify special length cable 'CL' (standard model 1000 mm) in writing

Dimensions

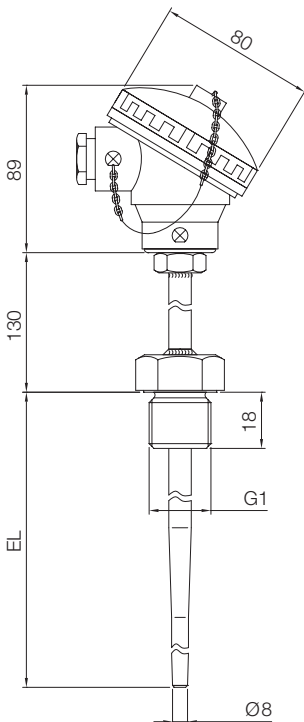
TWL-B...



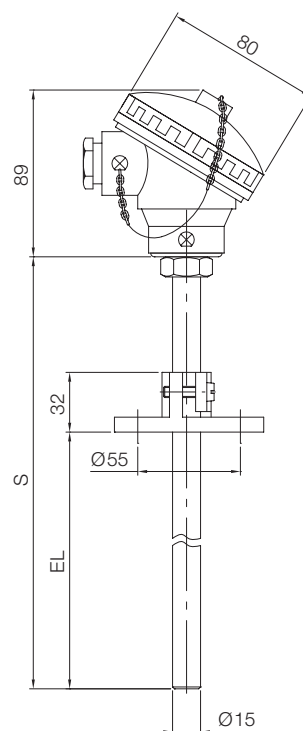
TWL-C...



TWL-G...



TWL-1F...

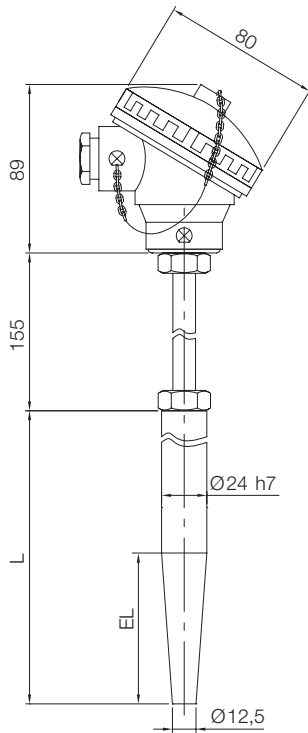


EL = immersion length

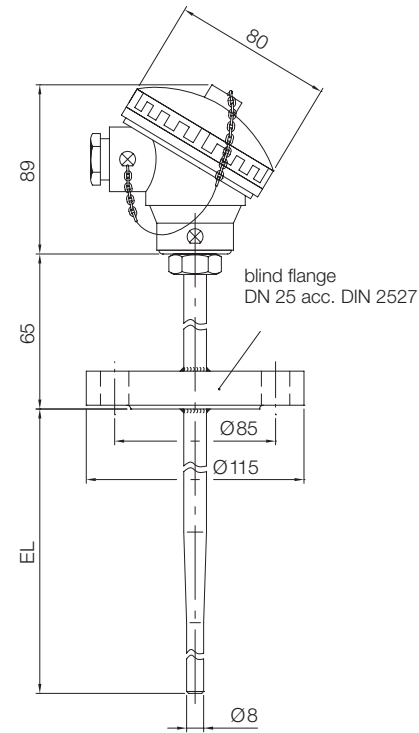
S = overall probe length

Dimensions

TWL-D...

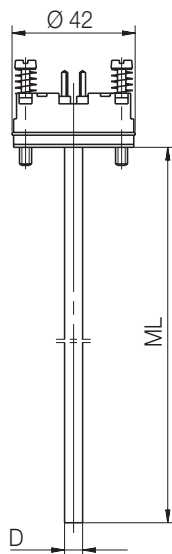


TWL-F...



L = overall length weld-on probe
 EL = immersion length

TWL-M...

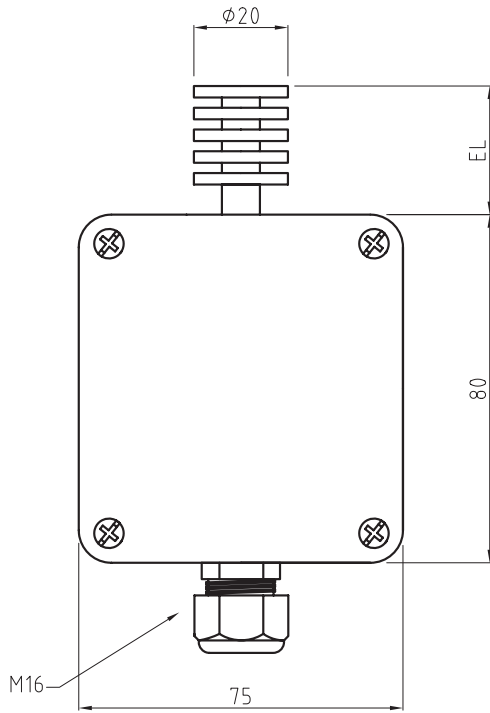


Diameter D	
...M82...	8 mm
...M62...	6 mm
...M52...	5 mm

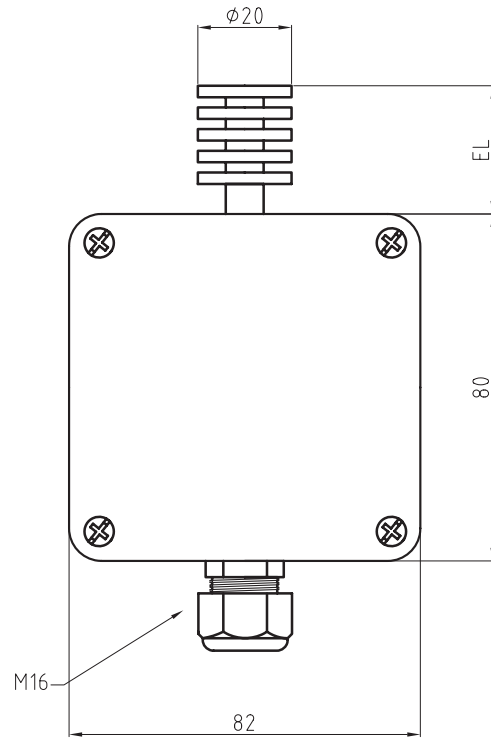
ML = length measuring insert

Dimensions

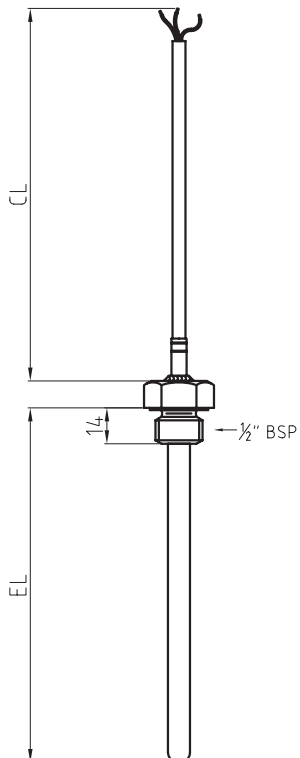
TWL-ST240...A...



TWL-ST240...P...



TWL-SN...



TWL-SA...

