



Resistance Thermometers

Ignition Protection Exd

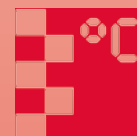


measuring
•
monitoring
•
analysing

TWL-Exd



- Measuring range: -80 ... +600 °C
- Pt 100-sensor class A respectively class B
- Output: Resistance or analogue 4-20 mA
- Thermowells up to 1000, 3000 respectively 5000 mm (depending on model)
- Option: Headtransmitter with HART®-protocol or PROFIBUS®/Fieldbus, display
- For ATEX applications, ignition protection Exd



T2

KOBOLD companies worldwide:

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KOBOLD Messring GmbH
Nordring 22-24
D-65719 Hofheim/Ts.
Head Office:
+49(0)6192 299-0
+49(0)6192 23398
info.de@kobold.com
www.kobold.com



Description

The KOBOLD resistance thermometers comprise a rugged installation fitting made of stainless steel with thread, flange or weld-on connection, a connection head out of aluminium casting and a removable measuring element. The measuring insert can be replaced without emptying the installation, since the customised thermowell remains in the installation and seals the process. The instruments are supplied with the ignition protection Exd as a standard and therefore can be installed in relevant hazardous areas.

A Pt100 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 Pt100 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, 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 with thread-, flange- or weld-on connection are favourably used for the temperature measurement in liquids, solids and gaseous media. The reliable watertightness of these installation methods 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 Exd.

Technical Data

Meas. principle:	Temperature depending resistor
Meas. range:	-30 ... +550 °C or -80 ... +600 °C (others on request)
Sensor:	Pt 100 single- or double-sensor (1 x Pt100 or 2 x Pt100)
Accuracy:	Class A or class B (others on request)
Ambient temperature:	-40 ... +150 °C with ceramic terminal base (without transmitter) -40 ... +85 °C (with transmitter) -20 ... +70 °C (with LCD display) -20 ... +80 °C (with LED display)
Operating pressure:	Up to 250 bar (depending on thermowell) TWL-1: pressureless TWL-3 and sensors without thermowell atmospheric pressure
Connection head:	Form XD with chain (no chain with optional display)
Cable entry:	M 20 x 1.5 standard (others on request)
Materials:	
- Sensor:	Stainless steel 1.4404
- Thermowell:	Stainless steel 1.4404 (others on request)
- Neckpipe:	Stainless steel 1.4404
- Connection head:	Aluminium, painted
- Terminal base:	Ceramic (without transmitter)
Process connection:	
- Thread:	G ½ male, G ¾ male, G1 male, ½" NPT, ¾" NPT, 1" NPT
- DIN-flange:	DN15, 20, 25, 32, 40, 50
- ANSI flange:	½", ¾", 1", 1 ½", 2"
- Weld-in	¾", 1", 1 ¼"
Sensor wiring:	2-, 3- or 4-wire
Output:	Resistance value
Protection:	Connection head IP 54...68 depending on cable gland and sealing sensor IP 68



Technical Data (continued)

ATEX-approval: II 2 GD Ex d IIC T6

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

Display:

- Type: 4 digit LCD or LED

- Supply: loop powered

- Voltage drop out: LCD max. 2.5 V
LED 3.3 V at 4 mA
3.7 V at 20 mA



Order Details (example: TWL-1 1 2 L N D N 5 C A 1)

Model	Sensor specification				
	Type	Sensor type / class	Sensor wiring	Connection head / transmitter	Process connection of sensor
TWL-	0 = without	0 = without 1 = 1 x Pt100, class B (-30...+550 °C) 2 = 2 x Pt100, class B (-30...+550 °C) 3 = 1 x Pt100, class B (-80...+600 °C) 4 = 2 x Pt100, class B (-80...+600 °C) 5 = 1 x Pt100, class A (-30...+550 °C) 6 = 2 x Pt100, class A (-30...+550 °C) 7 = 1 x Pt100, class A (-80...+600 °C) 8 = 2 x Pt100, class A (-80...+600 °C) X = special	0 = without	0 = without (for TWL-0/3)	N ²⁾ = ½" NPT male G = G ½ male X = special
	1 = standard 2 = with nipple union		2 = 2-wire 3 = 3-wire 4 ¹⁾ = 4-wire	L ⁶⁾ = ATEX Exd / without transmitter A ⁷⁾ = ATEX Exd / programmable 2-wire transmitter (model: 5333D) B ⁷⁾ = ATEX Exd / programmable 2-wire transmitter with HART® protocol (model: 5337D) C ^{6/7)} = ATEX Exd / transmitter with PROFIBUS® / Fieldbus® (model: 5350A) X = special option (specify in clear text) for options A, B, C choose sensor wiring code "3"	
	3 = measuring insert		0 = without		

¹⁾ 4-wire only for 1 sensor
²⁾ choose "N" for TWL-2
⁶⁾ Display only available for 4...20 mA or Hart® transmitters. Choose transmitter code A or B
⁷⁾ Please specify the measuring range in clear text while ordering
⁸⁾ Separate programming kit needed



Order Details (continued)

Thermowell specification				Length (sensor, thermowell, measuring insert) ⁴⁾ (see drawings)	Options
Thermowell type	Process connection	Process connection size	Nominal pressure (process connection)		
0 = without B = cylindrical, multipart, welded G = cylindrical, bar stock/drilled with stepped shank D = tapered shank, bar stock/drilled X = special option	0 = without (for TWL-3) G = G-thread N = NPT-thread	0 = without (for TWL-3) 4 = 1/2" (not for thermowell D) 5 = 3/4" 6 = 1" X = special	0 = without (for TWL-3) A = PN 25 (only for thermowell B) B = PN 100 (only for thermowell G) C = PN 250 (only for thermowell D)	only for TWL-0 (only thermowell) 0 = without lagging extension "T" 1 = with lagging extension "T" sensor with thermowells (only for TWL-1/TWL-2) A = with standard neckpipe "HL"/ without lagging extension "T" B = with standard neckpipe "HL" and with lagging ext. "T" C ⁵⁾ = without neckpipe "HL"/ with lagging extension "T" D ⁵⁾ = without neckpipe "HL"/ without lagging extension "T" E = with special neckpipe length "HL"/ with lagging ext. "T" F = with special neckpipe length "HL"/ without lagging ext. "T" sensor without thermowells (only for TWL-1/TWL-2) G = with standard neckpipe length "HL" H = with special neckpipe length "HL" J = without neckpipe "HL" X = special option (specify in clear text)	0 = without 1 ⁶⁾ = with LCD display 2 ⁶⁾ = with LED display Y = special option (specify in clear text)
	S ³⁾ = welded	5 = 3/4", only for thermowell G 6 = 1" 7 = 1 1/4", only for thermowell D X = special	B = PN 100 (only for thermowell G) C = PN 250 (only for thermowell D)		
	F = DIN flange	4 = DN 15 (not for thermowell G/D) 5 = DN 20 6 = DN 25 7 = DN 32 8 = DN 40 9 = DN 50 X = special	1 = PN 6 2 = PN 16 3 = PN 40 4 = PN 100 (not for DN 15) X = special		
	A = ANSI flange	4 = 1/2" (not for thermowell G/D) 5 = 3/4" 6 = 1" 8 = 1 1/2" 9 = 2" X = special	5 = 150lbs 6 = 300lbs 7 = 600lbs (not for 1/2") 8 = 900lbs (not for 1/2") 9 = 1500lbs (not for 1/2") X = special		

³⁾ not for thermowell type B

⁴⁾ Immersion length "U" and hole diameter "I" (when ordering a/with thermowell) or "EL" (when ordering without thermowell), neckpipe length "HL" (when different from stdd. i.e. for TWL-1 stdd. is 130 mm, for TWL-2 standard is 150 mm), lagging extension "T" (if ordered) and measuring insert length "ML" (when ordering TWL-3) must be specified in clear text when ordering.

Pls. check lengths very precisely in order to ensure a perfect match between sensor and thermowell.

⁵⁾ not for TWL-2

⁶⁾ Display only available for 4 ... 20 mA or Hart® transmitters. Choose transmitter code A or B

Note: Nominal pressure for TWL-3 and sensors without thermowell is atmospheric pressure.



Order Details for Ordering only the Thermowell (example: **TWL-0000NBG4000**)

Model	Sensor type	Sensor type/class	Sensor Wiring	Connection head/ transmitter	Process connection of temperature sensor ¹⁾
TWL-	0 = without	0 = without	0 = without	0 = without	N ¹⁾ = 1/2" NPT male G = G 1/2 male X = special

¹⁾ choose N for nipple and union version

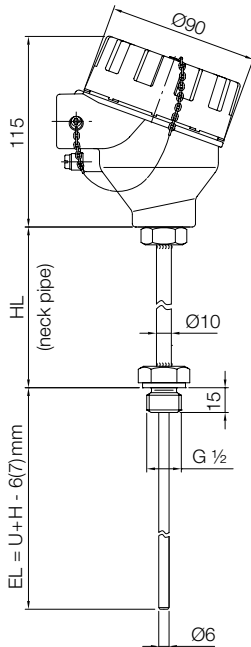
Order Details for Ordering only the Thermowell (continued)

Thermowell specification				Immersion length and lagging extension length ¹⁾	Special option
Thermowell type	Process connection size	Nominal pressure (process connection)	Pressure rating for flange connection		
Please use the specification codes according to order table shown on page 4				0 = without lagging extension "T" 1 = with lagging extension "T"	0 = without Y = option acc. specification

¹⁾ Immersion length "U", hole diameter "i" and lagging extension "T" must be specified in writing. Please check lengths very precise in order to ensure a perfect match of sensor and thermowell.

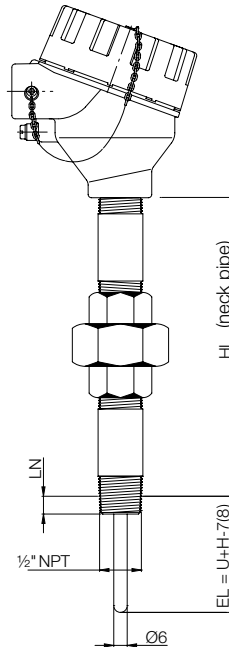
Dimensions Temperature Sensor TWL-1

Illustration without thermowell*



Dimensions Temperature Sensor TWL-2

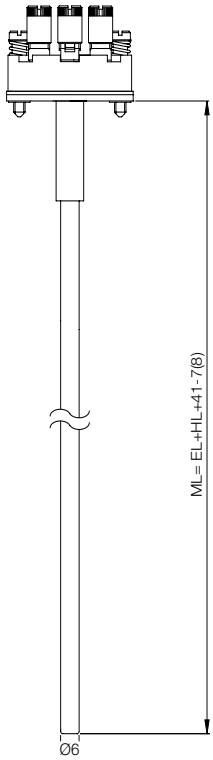
Illustration without thermowell*



- HL** = neckpipe length
standard 130 mm for TWL-1
standard 150 mm for TWL-2
- EL** = immersion length
EL = U+H-7 mm for thermowell type B
U+H-8 mm for thermowell type G/D
- U** = immersion length thermowell
(see drawing thermowell)
- H** = length see thermowell
- LN** = screw-in-length by hand
(approx. 8.1 mm at 1/2" NPT)

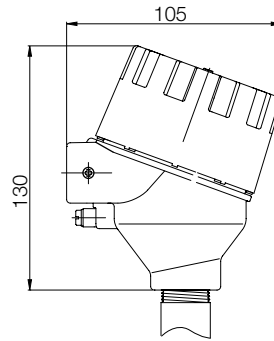
* For Ex-applications an adequate thermowell is needed

Dimensions Measuring Insert TWL-3

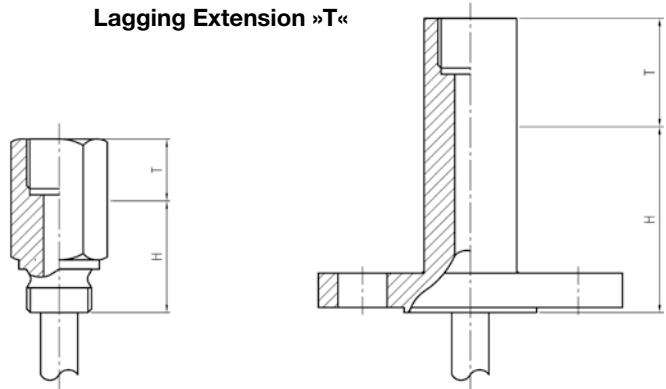


HL = neckpipe length
 EL = immersion length
 ML = measuring insert length

Dimensions Connection Head with Display

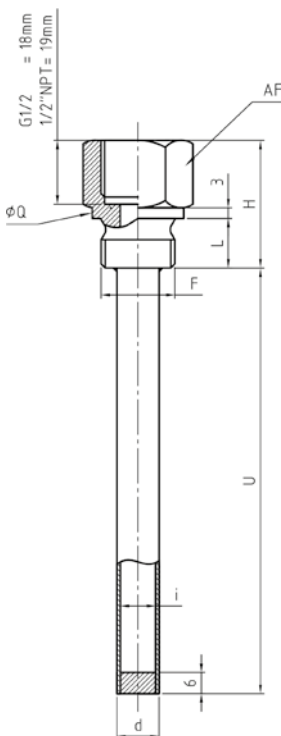


Lagging Extension »T«



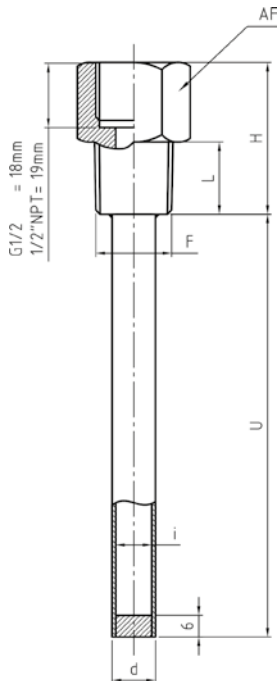
Dimensions Thermowell »B«

Cylindrical thermowell, welded, with process connection G-thread (max. PN25 at 20°C)



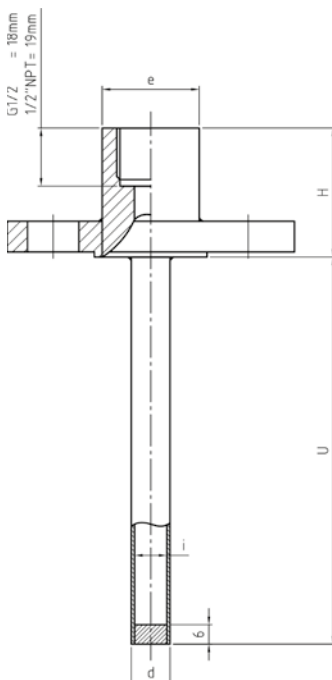
Process connection	Max. total length	AF	F	i	d	H	L	Q
G-thread	5000 mm	27	G ½ B	10	12	36	14	26
				12	14			
		36	G ¾ B	10	12	38	16	31.7
				12	14			
		41	G 1 B	10	12	40	18	39
				12	14			

Cylindrical thermowell, welded, with process connection NPT-thread (max. PN25 at 20 °C)



Process connection	Max. total length	AF	F	i	d	H	L
NPT-thread	5000 mm	27	1/2" NPT	10	12	42	20
				12	14		
		27	3/4" NPT	10	12	43	20
				12	14		
		36	1" NPT	10	12	46	24
				12	14		

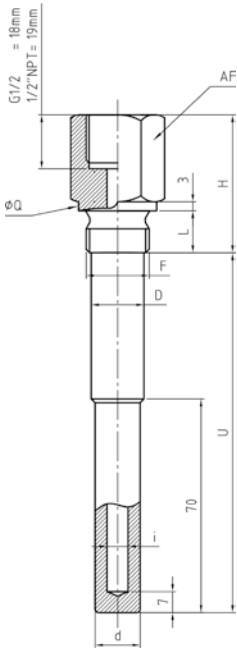
Cylindrical thermowell, welded, with process connection flange acc. DIN or ANSI (max. PN6...40 at 20 °C)



Process connection	Max. total length	i	d	H	e	
with flange	5000 mm	10/12	12/14	40	30	
						ANSI 1/2"
						ANSI 3/4"
					ANSI 1"	
					ANSI 1 1/2"	
		35				
			ANSI 2"			
		10/12	12/14	40	30	
						DIN DN 15
						DIN DN 20
35						
	DIN DN 25					
DIN DN 32						
DIN DN 40						
DIN DN 50						

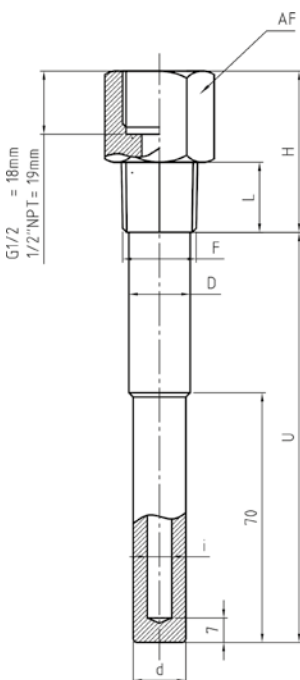
Dimensions Thermowell Model TWL-...G...

Cylindrical thermowell, bar stock/drilled with stepped shank and process connection G-thread (max. PN 100 at 20°C)



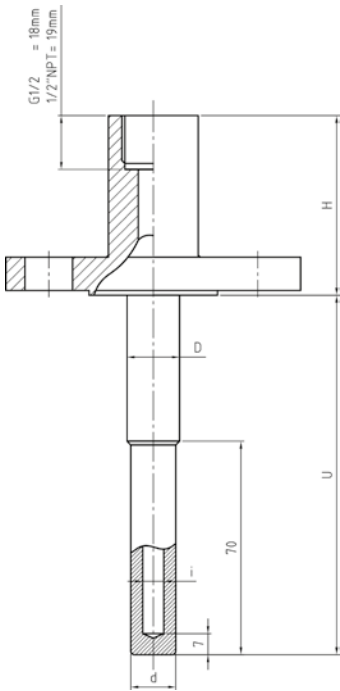
Process connection	Max. total length	AF	F	i	d	D	H	L	Q
G-thread	1000 mm	27	G 1/2 B	7-8-9	15	17.5	46	14 for 1/2	26
				10-12	17.5	17.5			
		36	G 3/4 B	7-8-9	15	18	51	16 for 3/4	31.7
				10-12	18	21			
		41	G 1 B	7-8-9	15	21	51	18 for 1"	39
				10-12	18	25			

Cylindrical thermowell, bar stock/drilled with stepped shank and process connection NPT-thread (max. PN 100 at 20°C)



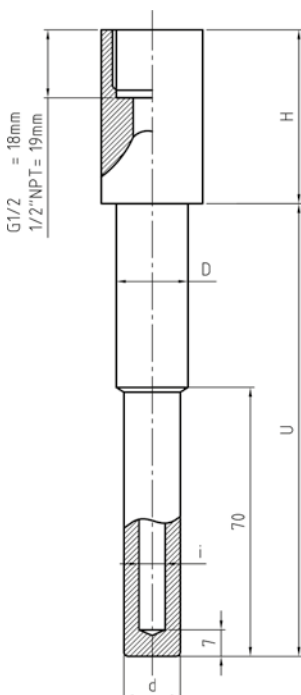
Process connection	Max. total length	AF	F	i	d	D	H	L
NPT-thread	1000 mm	27	1/2" NPT	7-8-9	15	17.5	46	20
				10-12	17.5	17.5		
		27	3/4" NPT	7-8-9	15	18	51	24
				10-12	18	21		
		36	1" NPT	7-8-9	15	21	51	24
				10-12	18	25		

Cylindrical thermowell, bar stock/drilled with stepped shank and process connection flange acc. DIN or ANSI (max. PN 100 at 20°C)



Process connection		Max. total length	i	d	D	H	e	
flange	ANSI 3/4"	1000 mm	7-8-9	15	17.5	60	30	
			10-12	17.5	17.5			
	ANSI 1"		7-8-9	15	18			
			10-12	18	21			
	ANSI 1 1/2"		7-8-9	15	21		35	
			10-12	18	25			
	ANSI 2"		7-8-9	15	21	60	30	
			10-12	18	25			
	DIN DN 20		7-8-9	15	17.5			
			10-12	17.5	17.5			
	DIN DN 25		7-8-9	15	18			35
			10-12	18	21			
DIN DN 32	7-8-9	15	21					
	10-12	18	25					
DIN DN 40	7-8-9	15	21					
	10-12	18	25					
DIN DN 50	7-8-9	15	21					
	10-12	18	25					

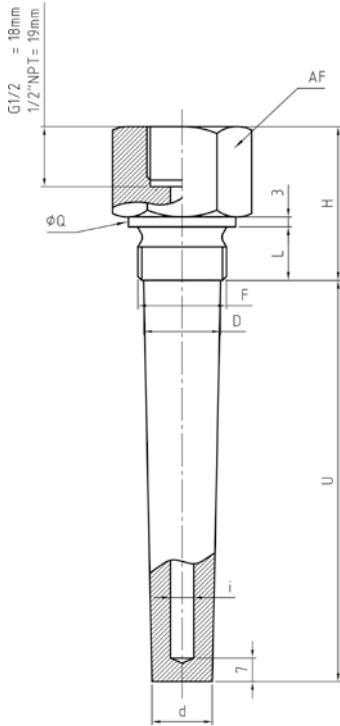
Cylindrical thermowell, bar stock/drilled with stepped shank and process connection for weld-on (max. PN 100 at 20°C)



Process connection		Max. total length	F	i	d	D	H
for weld-on	DN 3/4"	1000 mm	26.9	7-8-9	15	19	46
				10-12	18		
	DN 1"		7-8-9	15	22	51	
			10-12	18			

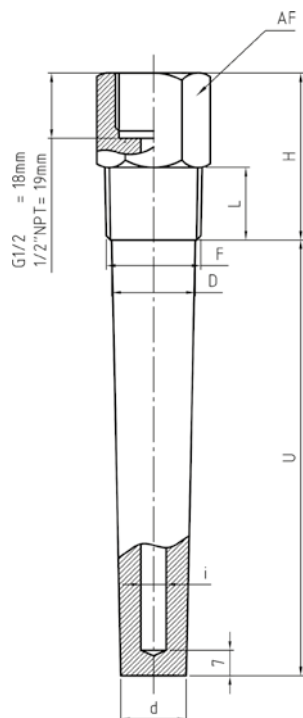
Dimensions Thermowell Model TWL-...D...

Tapered shank, bar stock/drilled thermowell with process connection G-thread (max. PN250 at 20 °C)



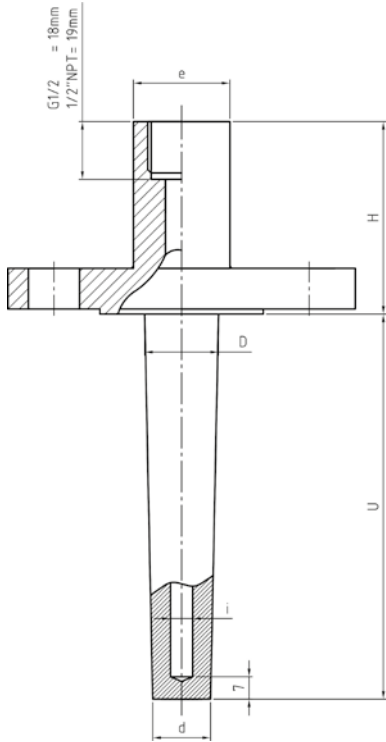
Process connection	Max. total length	AF	F	i	d	D	H	L	Q
G-thread	1000 mm	36	G 3/4 B	7-8-9	18	23	46	20	31.7
				10-12	21				
		41	G 1 B	7-8-9	18	29	51	25	39
				10-12	21				

Tapered shank, bar stock/drilled thermowell with process connection NPT-thread (max. PN250 at 20 °C)



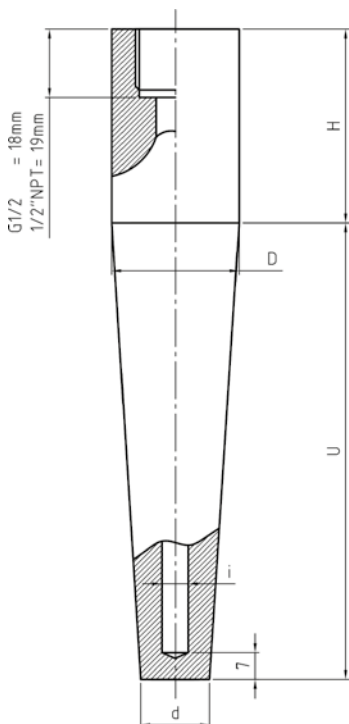
Process connection	Max. total length	AF	F	i	d	D	H	L
NPT-thread	1000 mm	27	3/4" NPT	7-8-9	18	23	46	20
				10-12	21			
		36	1" NPT	7-8-9	18	29	51	24
				10-12	21			

Tapered shank, bar stock/drilled thermowell with process connection flange acc. DIN or ANSI (max. PN250 at 20°C)



Process connection		Max. total length	i	d	D	H	e
flange	ANSI 1"	1000 mm	7-8-9	18	23	60	30
			10-12	21			
	ANSI 1 1/2"		7-8-9	18	29		35
			10-12	21			
	ANSI 2"		7-8-9	18	29		35
			10-12	21			
	DIN DN 25		7-8-9	18	23	60	30
			10-12	21			
	DIN DN 32		7-8-9	18	29		35
			10-12	21			
	DIN DN 40		7-8-9	18	29		35
			10-12	21			
DIN DN 50	7-8-9	18	29	35			
	10-12	21					

Tapered shank, bar stock/drilled thermowell with process connection for weld-on (max. PN250 at 20°C)



Process connection		Max. total length	i	d	D	H
for weld-on	DN 1"	1000 mm	7-8-9	18	33.4	51
			10-12	21		
	DN 1 1/4"		7-8-9	18	38.1	51
			10-12	21		



Resistance Thermometers according to DIN Ignition Protection Exia



measuring
•
monitoring
•
analysing

TWL-Exia



Fieldbus
FOUNDATION



- 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: head transmitter with HART® protocol, or PROFIBUS®/Fieldbus
- For ATEX applications, ignition protection Exia



KOBOLD companies worldwide:

ARGENTINA, AUSTRALIA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHILE, CHINA, COLOMBIA, CZECHIA, EGYPT, FRANCE, GERMANY, GREAT BRITAIN, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, REPUBLIC OF KOREA, ROMANIA, SINGAPORE, SPAIN, SWITZERLAND, TAIWAN, THAILAND, TUNISIA, TURKEY, USA, VIETNAM

KOBOLD Messring GmbH
Nordring 22-24
D-65719 Hofheim/Ts.
Head Office:
+49(0)6192 299-0
+49(0)6192 299-23398
info.de@kobold.com
www.kobold.com

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 Data

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	Options
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 connection head (to be specified in writing)	0 = without A ⁴⁾ = programmable transmitter 2-wire (5333D) B ⁴⁾ = transmitter with HART® protocol 2-wire (5337D) C ⁴⁾ = transmitter PROFIBUS®/ Fieldbus™ (5350B) for options A, B, C choose sensor wiring code "3"	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	Options
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 connection head (to be specified in writing)	0 = without A ⁴⁾ = programmable transmitter 2-wire (5333D) B ⁴⁾ = transmitter with HART® protocol 2-wire (5337D) C ⁴⁾ = transmitter PROFIBUS®/ Fieldbus™ (5350B) for options A, B, C choose sensor wiring code "3"	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	Options
TWL-G94	16 = 160 Ø 8x6 mm	4 = G 1 AG	1 = 1 xPt 100 cat. B -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	0 = without Y = acc. description
	25 = 250 Ø 8x6 mm		2 = 2 xPt 100 cat. B -80...+600°C			A ⁴⁾ = programmable transmitter 2-wire (5333D)	
	28 = 280 Ø 8x6 mm		3 = 1 xPt 100 cat. A -80...+600°C			B ⁴⁾ = transmitter with HART® protocol 2-wire (5337D)	
	XX ¹⁾ = special length Ø 8x6 mm		4 = 2 xPt 100 cat. A -80...+600°C			C ⁴⁾ = transmitter PROFIBUS®/ Fieldbus™ (5350B)	
						for options A, B, C choose sensor wiring code "3"	

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	Options
TWL-1F4	50 = 500 Ø 15 mm	B = adjus- table G ¾ male st.st.	1 = 1 xPt 100 cat. B -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	0 = without Y = acc. description
	71 = 710 Ø 15 mm		2 = 2 xPt 100 cat. B -80...+600°C			A ⁴⁾ = programmable transmitter 2-wire (5333D)	
	1T = 1000 Ø 15 mm		3 = 1 xPt 100 cat. A -80...+600°C			B ⁴⁾ = transmitter with HART® protocol 2-wire (5337D)	
	T4 = 1400 Ø 15 mm	C = alumi- nium sliding flange DIN 43743	4 = 2 xPt 100 cat. A -80...+600°C			C ⁴⁾ = transmitter PROFIBUS®/ Fieldbus™ (5350B)	
	2T = 2000 Ø 15 mm		for options A, B, C choose sensor wiring code "3"				
	XX ¹⁾ = special length Ø 15 mm						

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	Options
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 = 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 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 (5337D) C ⁵⁾ = transmitter PROFIBUS [®] / Fieldbus [™] (5350B) for options A, B, C choose sensor wiring code "3"	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	Options
TWL-F94	22 = 225 (size \varnothing 12...8 mm) 28 = 285 (size \varnothing 12...8 mm) 34 = 345 (size \varnothing 12...8 mm) XX ¹⁾ = special length	4 = DN 25	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 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 (5337D) C ⁴⁾ = transmitter PROFIBUS [®] / Fieldbus [™] (5350B) for options A, B, C choose sensor wiring code "3"	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	Options
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	B ³⁾ = transmitter with HART® protocol 2-wire (5337D)	
	0016 = 160		318				
	0025 = 250		408				
	0040 = 400		558				
	XXXX ¹⁾ = special length		acc. to special length				
	0022 = 225	3F	318	3 = 1 x Pt 100 cat. A -80... +600°C	4 ³⁾ = 4-wire	C ³⁾ = transmitter PROFIBUS®/ Fieldbus™ (5350B)	
	0028 = 285		378				
	0034 = 345		438				
	XXXX ¹⁾ = special length		acc. to special length				
	0016 = 160	3G	318	4 = 2 x Pt 100 cat. A -80... +600°C		for options A, B, C choose sensor wiring code "3"	
	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 (5337D) C ³⁾ = transmitter PROFIBUS [®] /Fieldbus [™] (5350B) for options A, B, C choose sensor wiring code "3"	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 1/2 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

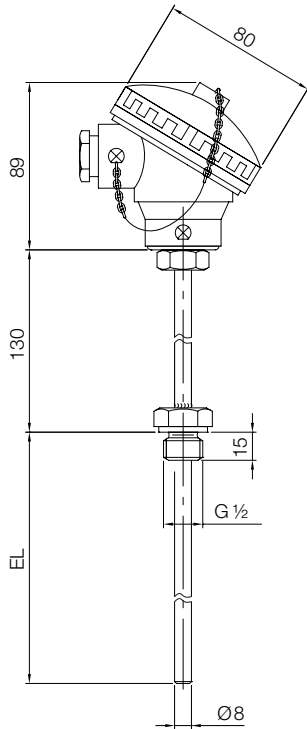
Insertion resistance thermometer with cable, protection Exia, p_{max} 10 bar

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

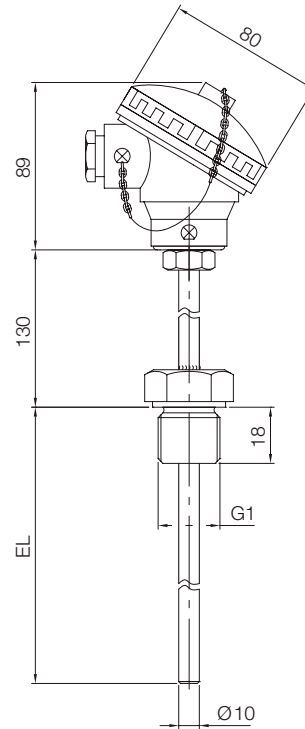
¹⁾ Please specify special length in writing ²⁾ Only with 1x Pt100 ³⁾ Please specify special length cable 'CL' (standard model 1000 mm) in writing

Dimensions [mm]

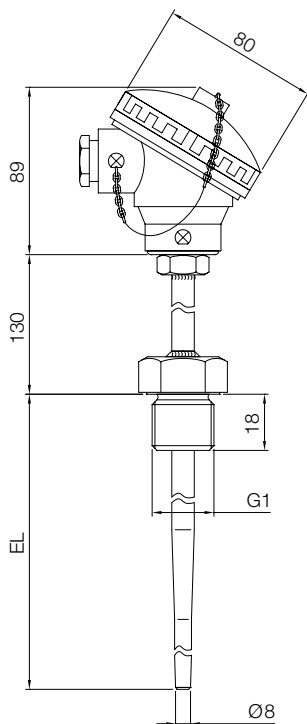
TWL-B...



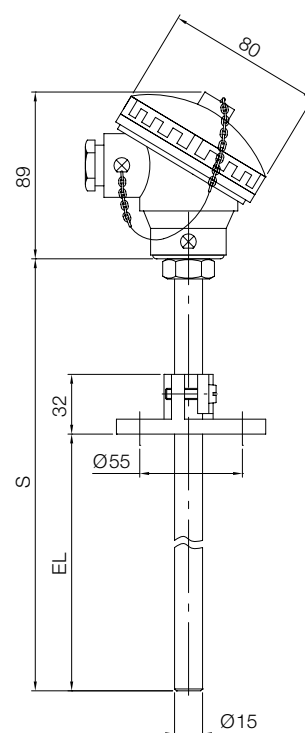
TWL-C...



TWL-G...



TWL-1F...

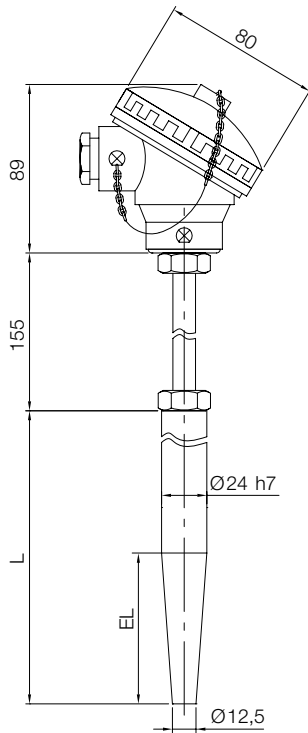


EL = immersion length

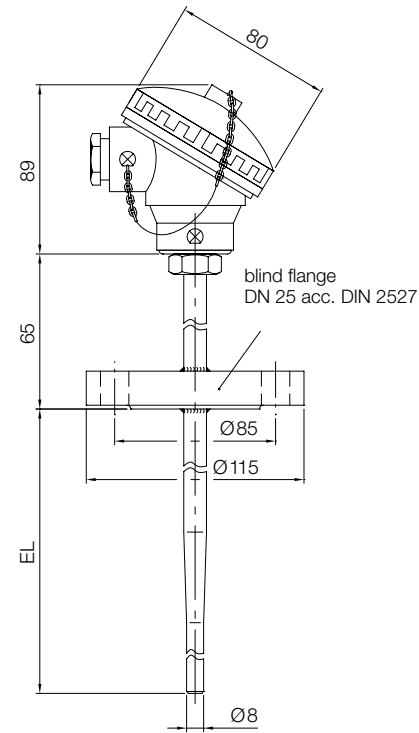
S = overall probe length

Dimensions [mm]

TWL-D...

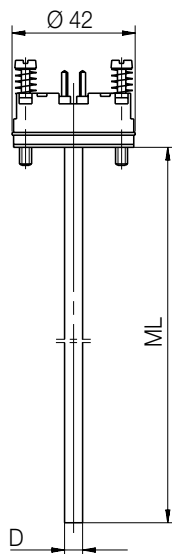


TWL-F...



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

TWL-M...

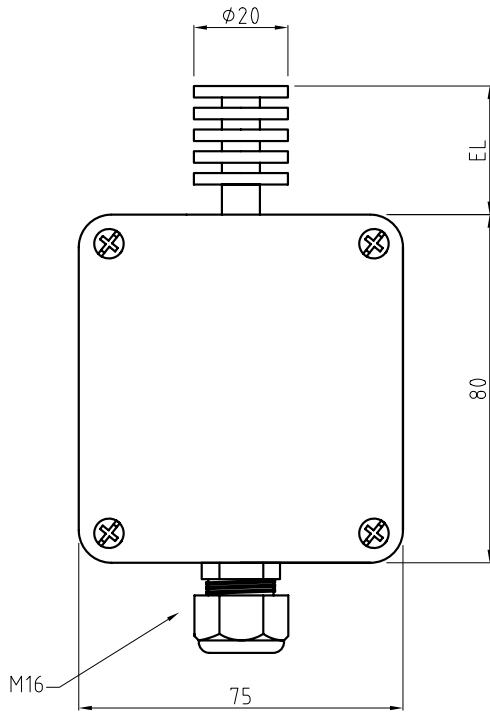


Diameter D	
...M82...	8 mm
...M62...	6 mm
...M52...	5 mm

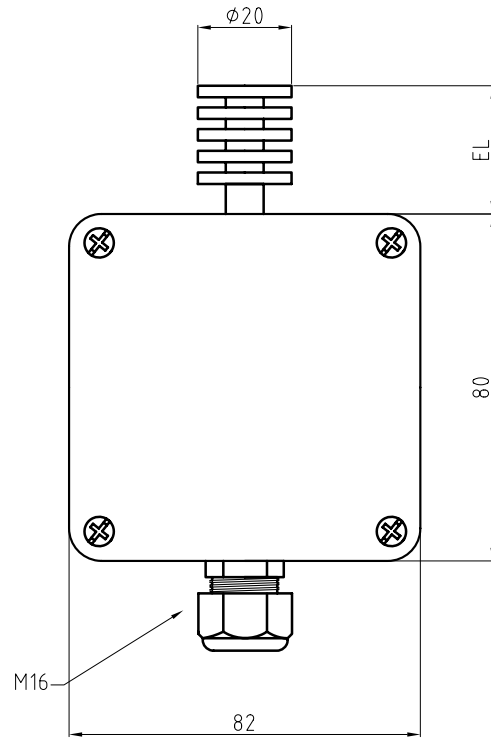
ML = length measuring insert

Dimensions [mm]

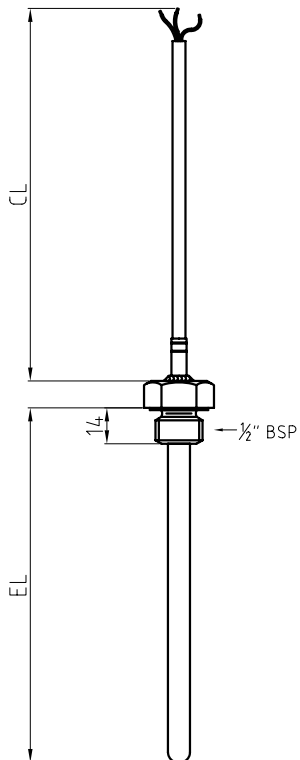
TWL-ST240...A...



TWL-ST240...P...



TWL-SN...



TWL-SA...

