Temperature meter TEMEX

Ex I M1 Ex ia I Ma **DMT 03 ATEX E 062 X**

Kirchgaesser Industrieelektronik GmbH

Operating instructions

General

The temperature meter TEMEX is a compact, robust, firedamp-protected meter specially designed for use in mining. It conforms to the harmonised European standards EN 60079-0 and EN 60079-11, as well as to European directive 2014/34/EU (ATEX).

As it has no moving parts, it is maintenance free and does not suffer from wear and tear. The meter can be mounted wherever desired.

Models

The temperature meter TEMEX can be supplied in a variety of mechanical and electrical configurations, details are given in the table on the last page.

The device consists of microprocessor-controlled evaluation electronics and an integrated remote temperature sensor, both with or without local display.

The temperature meter has one or two potential-free optocoupler outputs (TEMEX-*P* not potential-free).

The version TEMEX-EB* has a line monitoring to detect a short-circuit or a line break of the output signal lines.

Model variants

The table of versions on the last page will help you to choose the right model variant for your needs.

The following variants are available:

TEMEX-NFG*, -NHG*, -NMG*, -NPG* and -NSG*, TEMEX-E*G*, -E*A1*, -E*A2* and -E*A3*

The connection cable (max. 30 m) of the remote version is not a part of the delivery and has to be ordered separatly.

Getting started

The device is ready for use as soon as the power supply (and if necessary the remote sensor) is connected.

Automatic operation

The temperature meter does not require manual operation.

Installation

The temperature meter TEMEX is fixed in place via its process connection.

Electrical connection to the meter can be made as desired using the following pin and socket connectors:

- Hydrostar socket type SKK24
- Fixed cable
- Terminals with cable gland M20x1.5
- Machaczek socket type ME2A10
- PROMOS socket type BN4160
- Souriau socket type 845

Maintenance and repairs

The device requires no maintenance. Repairs can and may only be done by the manufacturer. For such repairs to be done, the device is to be sent directly to the manufacturer at the address given below.

Correct use

This temperature meter has been designed and approved for use underground. It can be used for temperature measurement in all areas of underground work.

The device has been constructed for safe use based on the latest technology and taking into account all relevant regulations. However, inappropriate or improper use can be dangerous.

The device must not be converted or changed in any way. The manufacturer shall not be liable for any damage or losses caused by inappropriate or improper use.

Address of the manufacturer

Kirchgaesser Industrieelektronik GmbH
Am Rosenbaum 6
D-40882 Ratingen (Homberg)

Phone: +49 (0)2102 / 955-6
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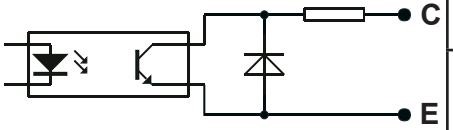
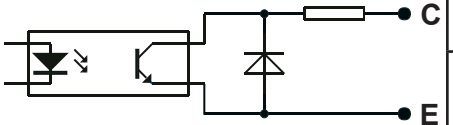
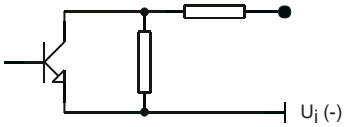
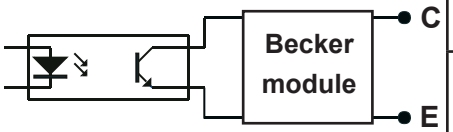
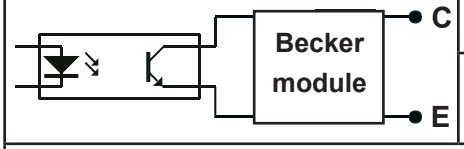
www.kirchgaesser.com

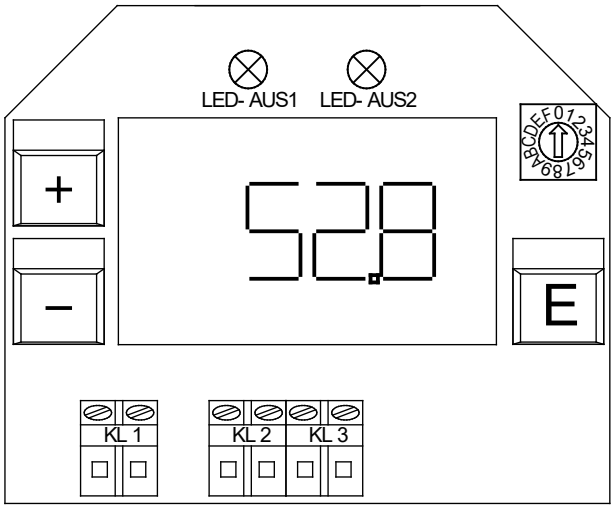
Certified according to DIN EN ISO 9001:2015 QM system

Terminal and pin assignment

	TEMEX-NFG*	TEMEX-NHG*	TEMEX-NMG*	TEMEX-NPG*	TEMEX-NSG*	TEMEX-EB*	TEMEX-EF*	TEMEX-EH*	TEMEX-EK*	TEMEX-EM*	TEMEX-EP*	TEMEX-ES*
Power supply U_i (+)	white	Pin 1	Pin 1	Pin 7	Pin 1	KL 1.2	white	Pin 1	KL 1.2	Pin 1	Pin 7	Pin 1
Power supply U_i (-)	brown	Pin 2	Pin 2	Pin 5	Pin 2	KL 1.1	brown	Pin 2	KL 1.1	Pin 2	Pin 5	Pin 2
Output 1 	yellow	Pin 4	Pin 3	—	Pin 3	—	yellow	Pin 4	KL 2.2	Pin 3	—	Pin 3
	green	Pin 3	Pin 4	—	Pin 4	—	green	Pin 3	KL 2.1	Pin 4	—	Pin 4
Output 2 	—	—	—	—	—	—	pink	—	KL 3.2	Pin 5	—	Pin 5
	—	—	—	—	—	—	grey	—	KL 3.1	Pin 6	—	Pin 6
Output 1 	—	—	—	Pin 4	—	—	—	—	—	—	Pin 4	—
Output 1 	—	—	—	—	—	KL 2.2	—	—	—	—	—	—
	—	—	—	—	—	KL 2.1	—	—	—	—	—	—
Output 2 	—	—	—	—	—	KL 3.2	—	—	—	—	—	—
	—	—	—	—	—	KL 3.1	—	—	—	—	—	—

Terminals and pins not mentioned are not electrically connected!
The outputs of TEMEX-NPG* and TEMEX-EP* are not potential-free.

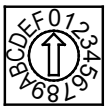
Operation and programming



Function		Display	0 1 2 3 4 5 6 7 8 9 A B C D E F	+	−	E
Measuring		Measuring value	**0**	—	—	—
Output 1	a) Assignment of the output signal: Measuring value (5-15Hz) or limit b) If a) = "limit": Switch function (open or close) when limit value exceeded	Display format: 0 - - 0 a) left digit: 0 = measuring value 1 = limit b) right digit: 0 = closer 1 = opener	**1**	Toggle between 0 (measuring value) and 1 (limit)	Toggle between 0 (closer) and 1 (opener)	Store the displayed value (display flashes)
Output 1	Input limit value	Limit value (absolute value)	**2**	Increase the displayed value	Decrease the displayed value	
Output 1	Input hysteresis of limit function	Hysteresis value (absolute value)	**3**			
Output 2	a) Assignment of the output signal: Measuring value (5-15Hz) or limit b) If a) = "limit": Switch function (open or close) when limit value exceeded	Display format: 0 - - 0 a) left digit: 0 = measuring value 1 = limit b) right digit: 0 = closer 1 = opener	**4**	Toggle between 0 (measuring value) and 1 (limit)	Toggle between 0 (closer) and 1 (opener)	
Output 2	Input limit value	Limit value (absolute value)	**5**	Increase the displayed value	Decrease the displayed value	
Output 2	Input hysteresis of limit function	Hysteresis value (absolute value)	**6**			
Measuring range		Lower range	**7**			
Measuring range		Upper range	**8**			

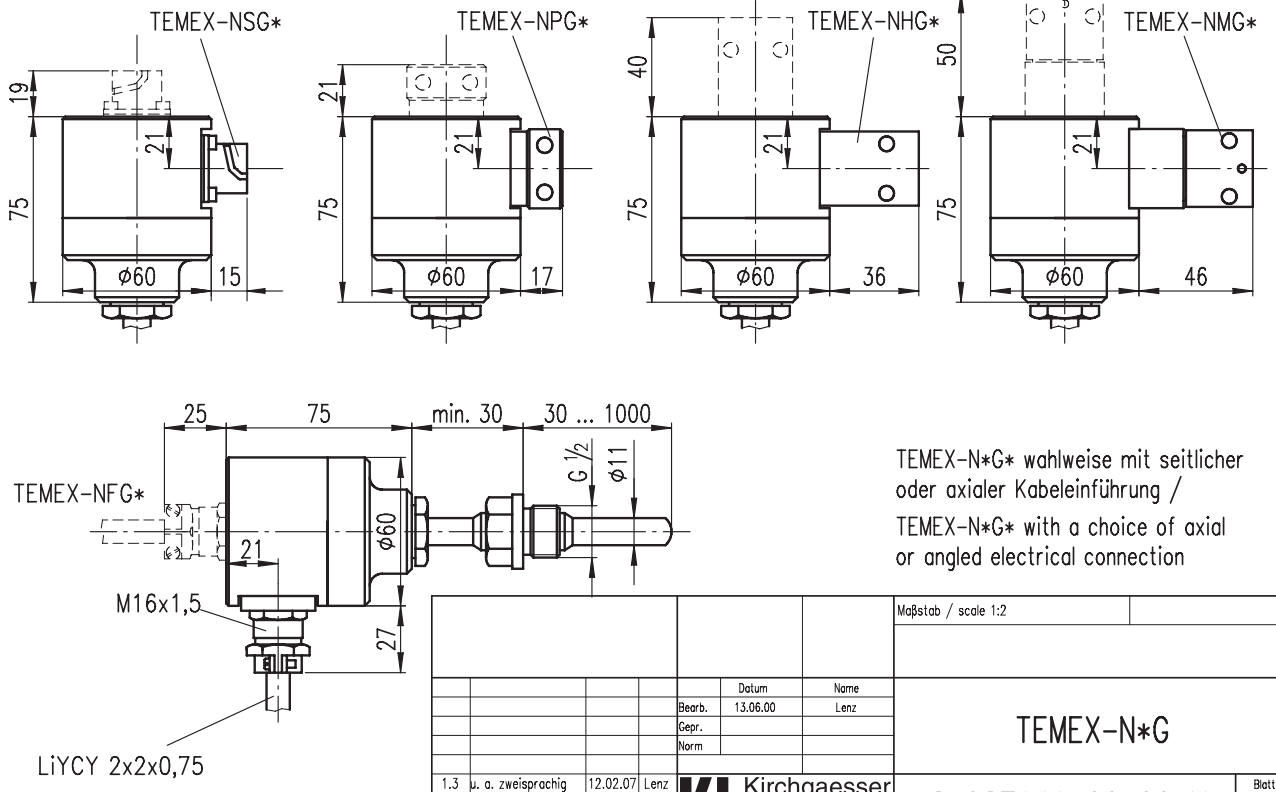
Note!
You need to push the buttons long enough to change the displayed value.
For example: If you push the "E" button too short, a new value will not be stored.

Ex I M1 Ex ia I Ma **DMT 03 ATEX E 062 X**

Function	Display		+	–	E
No function	- - - 9	**9**	—	—	—
No function	- - - A	**A**			
No function	- - - B	**B**			
Fixed frequency output (5 Hz)	- - - C	**C**			
Fixed frequency output (10 Hz)	- - - D	**D**			
Fixed frequency output (15 Hz)	- - - E	**E**			
Service	- - - F	**F**			

Troubleshooting				
Displayed error	**Reason**	**Remedy**	**Output behaviour**	
			Frequency	Limit
ERR8 ERR9 ERRA ERRF	Error between remote sensor and evaluation unit	Check connection cable	4 Hz	Limit underrun
	With integrated sensor: internal error	Contact Kirchgaesser		
"0" left-aligned	Measuring value smaller than value for the lower range	—	4.5 Hz	
"1" left-aligned	Measuring value higher than value for the upper range		16 Hz	Limit overrun

Dimension sheets



					Datum	Name
				Bearb.	13.06.00	Lenz
				Gepr.		
				Norm		
1.3	u. a. zweisprachig	12.02.07	Lenz			
1.2	Angaben aktualisiert	27.10.03	Kuhrig			
1.1	Titel geänd., Sourieau	10.02.03	Lenz			
Zust.	Änderung	Datum	Name			

Maßstab / scale 1:2

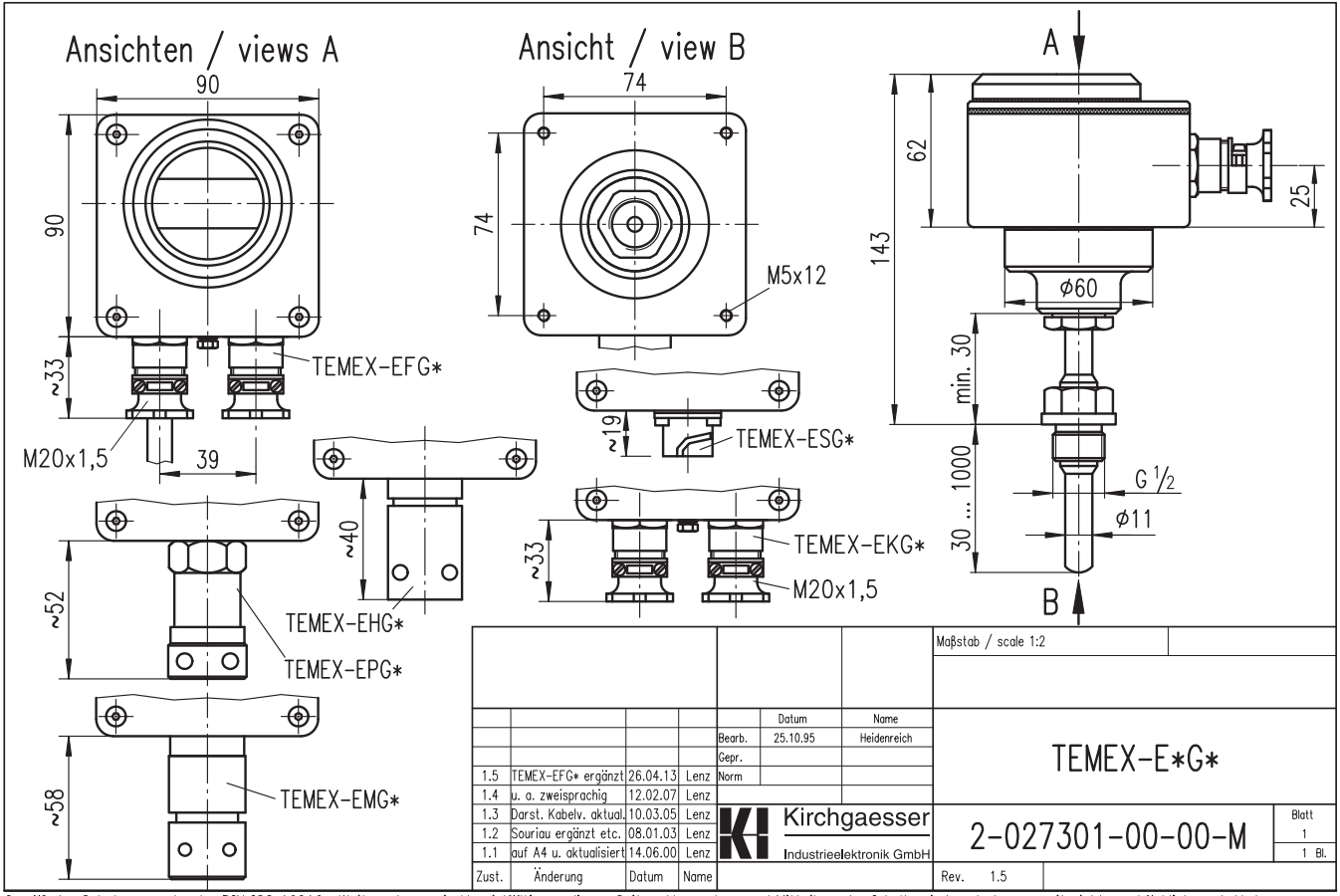
TEMEX-N*G

Kirchgaesser Industrieelektronik GmbH

2-027141-00-00-M

Blatt 1 / 1 Bl.

Rev. 1.3



					Datum	Name
				Bearb.	25.10.95	Heidenreich
				Gepr.		
1.5	TEMEX-EFG* ergänzt	26.04.13	Lenz	Norm		
1.4	u. a. zweisprachig	12.02.07	Lenz			
1.3	Darst. Kabelv. aktual.	10.03.05	Lenz			
1.2	Souriau ergänzt etc.	08.01.03	Lenz			
1.1	auf A4 u. aktualisiert	14.06.00	Lenz			
Zust.	Änderung	Datum	Name			

Maßstab / scale 1:2

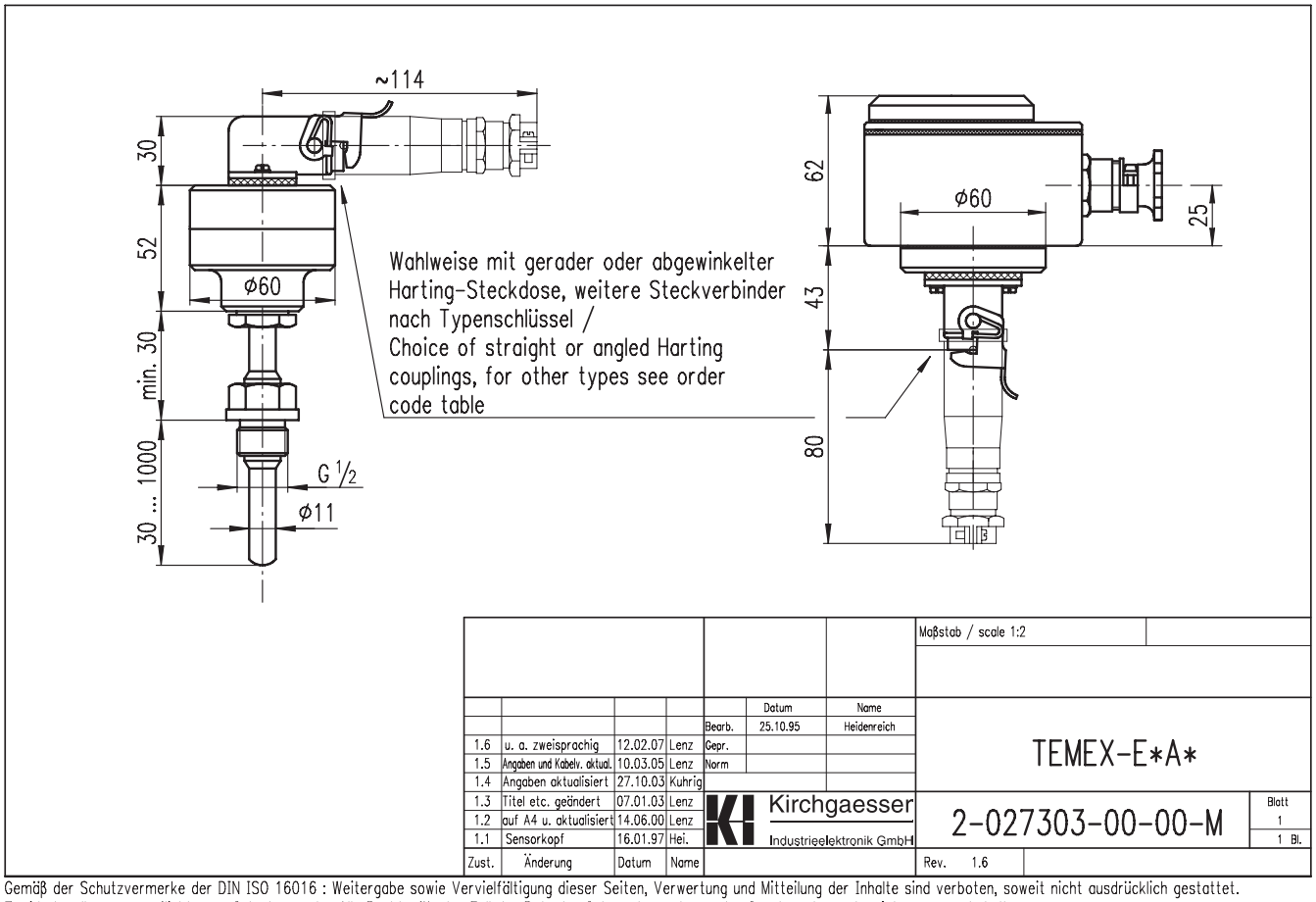
TEMEX-E*G*

Kirchgaesser Industrieelektronik GmbH

2-027301-00-00-M

Blatt 1 / 1 Bl.

Rev. 1.5



						Maßstab / scale 1:2
					Datum	Name
				Bearb.	25.10.95	Heidenreich
1.6	u. a. zweisprachig	12.02.07	Lenz	Gepr.		TEMEX-E*A*
1.5	Angaben und Kabelv. aktual.	10.03.05	Lenz	Norm		
1.4	Angaben aktualisiert	27.10.03	Kuhrig			
1.3	Titel etc. geändert	07.01.03	Lenz	Kirchgaesser Industrieelektronik GmbH		2-027303-00-00-M Blatt 1
1.2	auf A4 u. aktualisiert	14.06.00	Lenz			1 Bl.
1.1	Sensorkopf	16.01.97	Hei.			
Zust.	Änderung	Datum	Name			Rev. 1.6

Ordering examples

Example 1: **TEMEX-NFGAH-20+50L100**

- Standard version without evaluation electronics and local display
- Electrical connection with fixed cable
- Axial cable entry
- Measuring with a semiconductor sensor
- Temperature measuring range: - 20°C to + 50°C
- Sensor length: 100 mm

Example 2: **TEMEX-EMA2OQ0+70L250**

- Remote version with evaluation electronics and local display
- Electrical connection by a Machaczek connector type ME2A10
- Measuring with a high-precision quartz sensor
- Temperature measuring range programmable from 0°C to + 70°C
- Sensor length: 250 mm

Technical data (general)

Measuring principle:	Temperature-sensitive quartz or semiconductor sensor	Type of protection (EN 50014):	EEx ia I
Measuring range (max.):	-20°C to +70°C (quartz) or -20°C to +150°C (semiconductor)	Protection acc. to EN 60529:	IP 65
Measuring uncertainty:	max. ± 0.2 K (quartz) or max. ± 1.8% of end value (semiconductor)	Housing:	Stainless steel
Cable gland:	M20x1.5 Clamping range 8.0 - 11.5 mm Tightening torque 2 Nm	Nominal pressure:	max. 10 MPa (100 bar)
		Ambient temperature:	-20°C to +70°C
		Process temperature:	-20°C to +150°C
		Weight:	depending on version (TEMEX-E*G*: approx 1.5 kg)

Technical data (electrical)

Power supply:	8.5 VDC ≤ Ui ≤ 13.5 VDC	Output circuit (without TEMEX-*P*):	
Current consumption:	10 mA (TEMEX-N*) to 30 mA (TEMEX-E*)	Supply voltage:	max. 30 VDC
		Power consumption:	max. 50 mW
Internal inductances:	negligible or 0.7 µH/m (TEMEX-*F*)	Internal inductances and capacitances:	see power supply
Internal capacitances:	negligible or 110 pF/m (TEMEX-*F*)	Output circuit (only TEMEX-*P*):	
		Supply voltage:	max. 13.5 VDC
Output signal:	Frequency 5 - 15 Hz and limit (only TEMEX-E*)	Internal inductances and capacitances:	see power supply

Special conditions for safe use:

- The length of the connection cable between temperature meter and remote temperature sensor has to be taken into account for the allowable total length of cable at the output of the external intrinsically safe power supply.
- The permanently connected cable for type TEMEX-*F* must be fixed and positioned in this way, so that it is protected against the risk of mechanical damage.

Ordering information

TEMEX - L

Type of device

Without evaluation electronics + display	N
With evaluation electronics + local display	E

Electrical connection

With Becker module and terminals *3	B
With fixed cable connection *4	F
Hydrostar connector type SKK24	H
Terminals with cable glands *3	K
Machaczek connector type ME2A10	M
PROMOS connector type BN4160	P
Souriau connector series 845, size 2	S

Construction

Standard version	G
Remote version with Harting connector	A1
Remote version with Machaczek connector	A2
Remote version with Hydrostar connector	A3
Remote version with Binder connector *5	A4

Special version *1

Special version, to be specified	S

Length of sensor

Sensor length (30 .. 1000 mm)	

Measuring range *2

Temperature measuring range	

Measuring system

High-precision quartz	Q
Semiconductor	H

Cable entry

axial (only TEMEX-N*)	A
sideways (only TEMEX-N*)	S
TEMEX-E*	O

The connection cable (max. 30 m) and the connectors of the remote version are not part of the delivery and have to be ordered separately.

**1 Only necessary with deviations from order code*
2 Only necessary if ordering a TEMEX-N
3 Only TEMEX-E
**4 Standard cable length 5 m*
**5 The following standard connection cables are available: 2 m (part no. UM2), 5 m (part no. UM5), 10 m (part no. UM10) and 20 m (part no. UM20).*