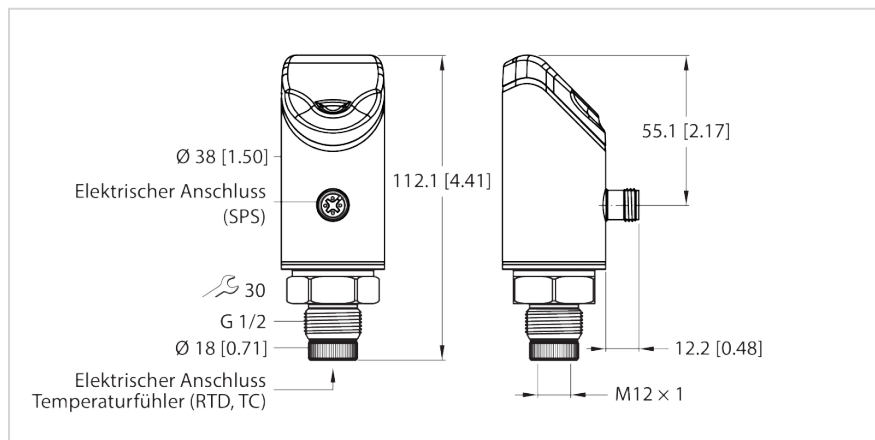


TS720-LI2UPN8-H1141

Temperature detection

With Current or Voltage Output and PNP/NPN Transistor Switching Output



Type designation	TS720-LI2UPN8-H1141
Ident-No.	100003640

Technical data

General data	
Detection type	medium contact
Measuring principle	Media-contacting
Application area	
Measuring element	For connection to probes of the TP series, For connection to probes of the TP product series
Detection area/measuring range	
Temperature display range	-210...1820 °C
Temperature display range	-346...3308 °F
Power supply	
Operating voltage U_B	17...33 VDC
Power consumption	≤ 3 W
Protective measure	SELV, PELV according to DIN EN 61140
Voltage drop at I_e	≤ 2 V
Electrical data	
Output function	NO/NC programmable, PNP/NPN
Short-circuit protection	yes

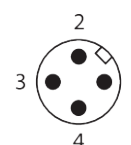
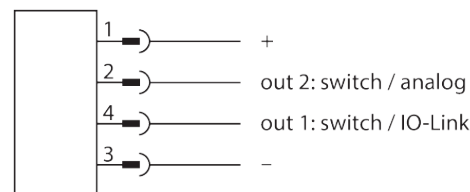
Features

- Processor unit for connecting sensors from the TP product series
- Automatic probe detection
- 4-digit, 2-color (red/green), 12-segment display, rotatable by 180°
- Housing upper section rotatable by 340°
- Compatible with the following temperature sensors:
 - Resistance Temperature Detector (RTD) — Pt100 (2-, 3-, 4-wire) — Pt1000 (2-, 3-, 4-wire)
 - Thermocouples (TC) — type K, B, E, J, N, R, S and T
- 17...33 VDC
- NO/NC contact, PNP/NPN output, analog output (current/voltage), IO-Link
- Various IO-Link mapping profiles can be selected

Technical data

Wire break/reverse polarity protection	yes
Insulation class	III
Response time	100 ms
Interfaces	
Communication protocol	IO-Link
Outputs	
Accuracy (Lin. + Hys. + Rep.)	±0,3 K
Alternative current output	0...20 mA
Current output	4...20 mA
Alternative voltage output	0...5 V
Alternative voltage output	1...6 V
Alternative voltage output	0.5...4,5 V
Voltage output	0...10 V
Current output note	Each invertible
Load resistance current output	≤0,5 kΩ
Load resistance voltage output	≥8 kΩ
Output 1	Switching output or IO-Link mode
Output 2	Analog or switching output
Rated operational current	0,25 A
Release point(s)	Probe dependent: (min. measuring range -0.2 K)... (max. measuring range)
Remark	0.1 % of full scale applies to temperatures > 200 °C
Switching current	≤250 mA
Switching cycles	≥100 Mio.
Switching point accuracy	±0,2 K
Switching point distance	≥0,2 K
Switch point:	Probe dependent: (min. measuring range)...(max. measuring range — 0.2 K)
Voltage output note	Each invertible
Accuracy/deviation	
Repeatability	0,1 K
IO-Link	
IO-Link specification	V 1.1
IO-Link port type	Class A
Transmission physics	corresponds to 3-wire physics (PHY2)
Transmission rate	COM 2 (38.4 kBaud)

Wiring Diagram



Functional principle

The TS+ product series is a compact processing and display unit with a 4-digit, 12-segment display that can be freely rotated by 340°. Compact units with (TS700) and without (TS720) temperature sensors as well as different output variants are available.

Technical data

Frame type	2.2
Programming	FDT/DTM/selection of various mapping profiles
Genauigkeit	±0,1 K
Included in the SIDI GSDML	Yes

Programming

Programming options	Switching logic (PNP, NPN, Auto*), switching/release point; hysteresis/window mode; NO/NC; unit; IO-Link mapping profile; analog output (U, I, Auto*); 0 (4)...20 mA, 0...(5) 10 VDC, 1...6 VDC, 0.5...4.5 VDC; * factory settings
---------------------	--

Mechanical data

Design	With display (external probe)
Construction type designation	TS720
Dimensions	112,1 mm x 38 mm x 50,2 mm
Housing material	Stainless-steel/Plastic, 1.4404 (AISI 316L)/Grilamid TR90 UV/Elastollan C 65 A 15 HPM 000/Ultradid A3X2G5
Electrical connection	Connector, M12 x 1

Ambient conditions

Ambient temperature	-40...+80 °C
Storage temperature	-40...+80 °C
Electromagnetic compatibility (EMC)	EN 61326-2-3: 2013 minimum operating quality: +3.0 K under worst possible conditions
Shock resistance	50 g (11 ms) g (11 ms) DIN EN 60068-2-27
Vibration resistance	20 g (10...3000 Hz), DIN EN 60068-2-6
Protection class	IP66 IP67 IP69K, According to ISO 20653

Tests/approvals

UL registration number	E516036
Approvals	cULus

Reference conditions

Auxiliary power	24 VDC
Atmospheric pressure	860...1060 hPa abs.
Humidity	10...95 % rel.
Temperature	15...+25 °C

Displays/controls

Technical data

Display	4-digit 12-segment display, rotatable by 180°, red or green
Switching state	2 × LEDs, Yellow
Unit display	4 x green LED (°C, °F, K, Ohm)

LED display

LED	Color	Status	Description
PWR	Green	On	Operating voltage applied Device is ready for operation
		Flashing	Operating voltage applied IO-Link communication active (inverted flash with T on 900 ms and T off 100 ms)
FLT	Red	On	Error displayed (For error pattern in combination with other LEDs, see manual)
		Off	No errors displayed
°C	Green	On	Temperature in °C
°F	Green	On	Temperature in °F
K	Green	On	Temperature in K
Ω	Green	On	Resistance in Ω
LOC	Yellow	On	Device locked
		Flashing	“Lock/unlock” process is active
		Off	Device unlocked
I and II (switching point LEDs)	Yellow	On	Switching output -NO: Switching point exceeded/within window (active output) -NC: Switching point undershot/outside window (active output)
		Off	Switching output -NO: Switching point undershot/outside window (inactive output) -NC: Switching point exceeded/within window (inactive output)

Detailed description of the display patterns and flashing codes in accordance with the manual

IO-Link process data image

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
-----	----	----	----	----	----	----	---	---	---	---	---	---	---	---	---	---

Byte n	14-bit process value (TEMP)	State Out 2	State Out 1
-----------	-----------------------------	----------------	----------------

Mounting accessories

FAS-6-1.4404	100018063
--------------	-----------

Stabilizer for standard temperature sensor TP206

TP-206A-CF-H1141-L100	9910475
-----------------------	---------

Temperature probe for liquid and gaseous media

TP-206A-CF-H1141-L150	9910476
-----------------------	---------

Temperature probe for liquid and gaseous media

TP-206A-CF-H1141-L200	9910477
-----------------------	---------

Temperature probe for liquid and gaseous media

TP-206A-CF-H1141-L300	9910478
-----------------------	---------

Temperature probe for liquid and gaseous media

TP-203A-CF-H1141-L100	9910402
-----------------------	---------

Temperature probe for liquid and gaseous media

TP-203A-CF-H1141-L150	9910403
-----------------------	---------

Temperature probe for liquid and gaseous media

TP-203A-CF-H1141-L200	9910482
-----------------------	---------

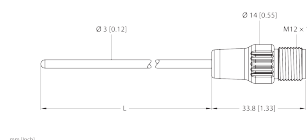
Temperature probe for liquid and gaseous media

Mounting accessories

TP-203A-CF-H1141-L300

9910474

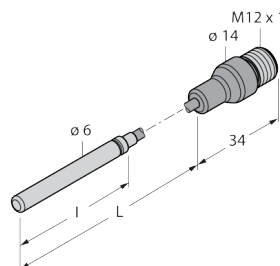
Temperature probe for liquid and gaseous media



TP-306A-CF-H1141-L1000

9910479

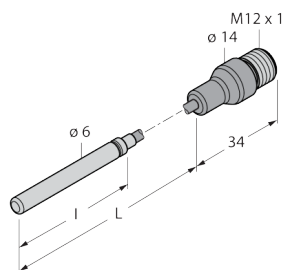
Temperature probe for liquid and gaseous media



TP-306A-CF-H1141-L2000

9910480

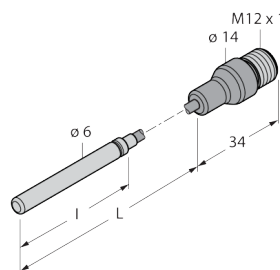
Temperature probe for liquid and gaseous media



TP-306A-CF-H1141-L5000

9910481

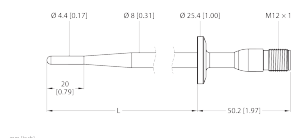
Temperature probe for liquid and gaseous media



TP-504A-TRI3/4-H1141-L035

9910429

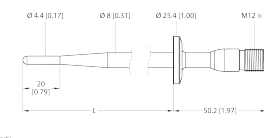
Temperature probe for liquid and gaseous media



TP-504A-TRI3/4-H1141-L100

9910430

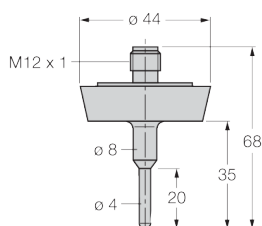
Temperature probe for liquid and gaseous media



TP-504A-DN25K-H1141-L035

9910431

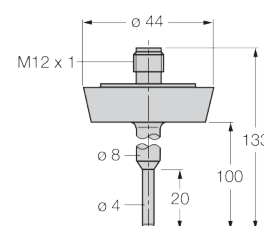
Temperature probe for liquid and gaseous media



TP-504A-DN25K-H1141-L100

9910432

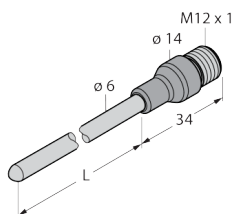
Temperature probe for liquid and gaseous media



Mounting accessories

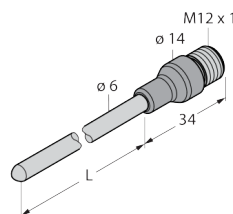
TP-206KK1-CF-H1141-L100 100017085

Temperature probe for liquid and gaseous media



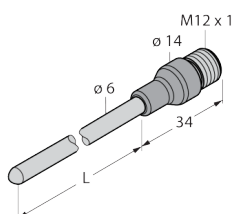
TP-206KK1-CF-H1141-L150 100017084

Temperature probe for liquid and gaseous media



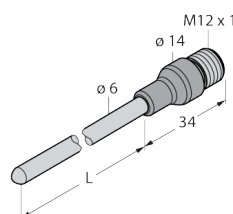
TP-206KK1-CF-H1141-L200 100017083

Temperature probe for liquid and gaseous media



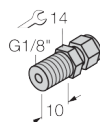
TP-206KK1-CF-H1141-L500 100017082

Temperature probe for liquid and gaseous media



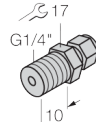
CF-M-3-G1/8-A4 9910405

Compression fitting for direct mounting of temperature probes; probe diameter 3 mm; process connection G1/8" male thread



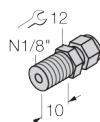
CF-M-3-G1/4-A4 9910407

Compression fitting for direct mounting of temperature probes; probe diameter 3 mm; process connection G1/4" male thread



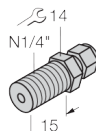
CF-M-3-N1/8-A4 9910406

Compression fitting for direct mounting of temperature probes; probe diameter 6 mm; process connection 1/8" NPT male thread

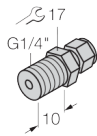
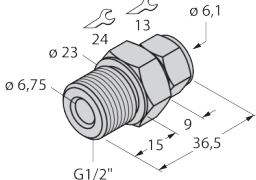
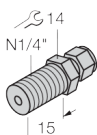
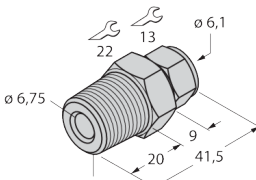
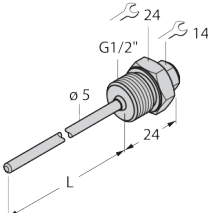
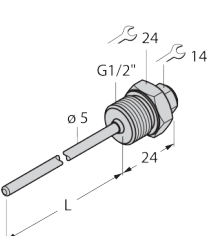
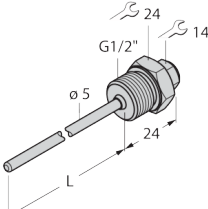
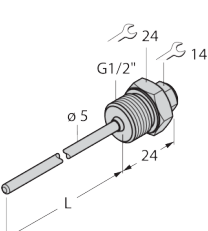


CF-M-3-N1/4-A4 9910408

Compression fitting for direct mounting of temperature probes; probe diameter 3 mm; process connection 1/4" NPT male thread



Mounting accessories

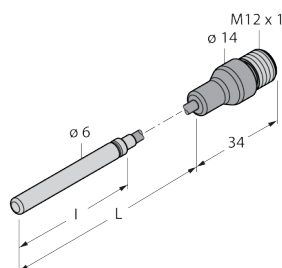
CF-M-6-G1/4-A4	9910483	Compression fitting for direct mounting of temperature probes; probe diameter 6 mm; process connection G1/4" male thread	CF-M-6-G1/2-A4	9910530	Compression fitting for direct mounting of temperature probes; probe diameter 6 mm; process connection G1/2" male thread
					
CF-M-6-N1/4-A4	9910484	Compression fitting for direct mounting of temperature probes; probe diameter 6 mm; process connection 1/4" NPT male thread	CF-M-6-N1/2-A4	9910529	Compression fitting for direct mounting of temperature probes; probe diameter 6 mm; process connection 1/2" NPT male thread
					
THW-3-G1/2-A4-L050	9910443	Protective tube for mounting temperature probes; probe diameter 3 mm; process connection G1/2" male thread; immersion depth 50 mm	THW-3-G1/2-A4-L100	9910444	Protective tube for mounting temperature probes; probe diameter 3 mm; process connection G1/2" male thread; immersion depth 100 mm
					
THW-3-G1/2-A4-L200	9910487	Protective tube for mounting temperature probes; probe diameter 3 mm; process connection G1/2" male thread; immersion depth 200 mm	THW-3-G1/2-A4-L250	9910446	Protective tube for mounting temperature probes; probe diameter 3 mm; process connection G1/2" male thread; immersion depth 250 mm
					

Mounting accessories

TP-306A-CF-H1141-L5500

100024018

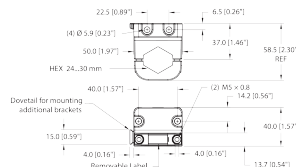
Temperature probe for liquid and gaseous media



FAM-30-PA66

100018384

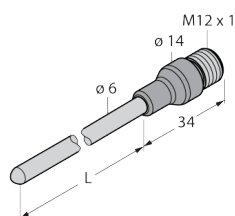
Mounting bracket; variable wrench size 24...30 mm; removable labeling plate 20 × 9 mm



TP-206KK1-CF-H1141-L1000

100034627

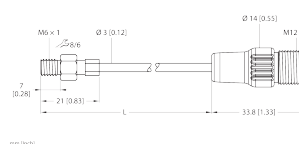
Temperature probe for liquid and gaseous media



TP-203A-M6-H1141-L100-I7

100041106

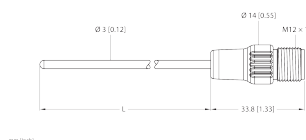
Temperature probe for liquid and gaseous media



TP-203KK1-CF-H1141-L150

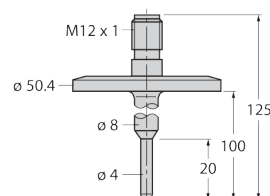
100045292

Temperature probe for liquid and gaseous media



TP-504A-TRI1.5-H1141-L100/ S3645

Temperature probe for liquid and gaseous media



TP-201.5A-CF-H1141-L100

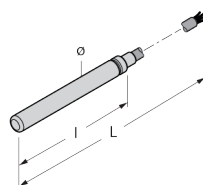
100048177

Temperature probe for liquid and gaseous media

TP-305.5A-M6-L1036

100051152

Temperature probe for liquid and gaseous media

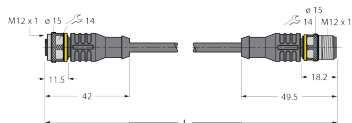


Connection accessories

RKC4.4T-2-RSC4.4T/TEL

6625208

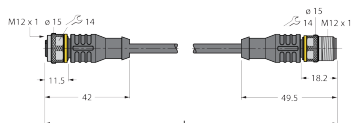
Extension cable, M12 female connector, straight, 4-pin to M12 male connector, straight, 4-pin, cable length: 2 m, jacket material: PVC, black; cULus approval



RKC4.4T-2-RSC4.4T/TXL

6625608

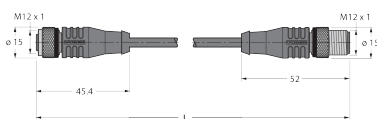
Extension cable, M12 female connector, straight, 4-pin to M12 male connector, straight, 4-pin; cable length: 2 m, jacket material: PUR, black; cULus approval



HT-WAK4-2-HT-WAS4/S2430

8038668

High-temperature-resistant extension cable, M12 female connector, straight, 4-pin to M12 male connector, straight, 4-pin; cable length: 2 m, jacket material: PTFE, white



RKH4.4-2-RSH4.4/TFG

6933472

Food and beverage extension cable, M12 female connector, straight, 4-pin to M12 male connector, straight, 4-pin; cable length: 2 m, jacket material: TPE, gray; approval: Ecolab, FDA

