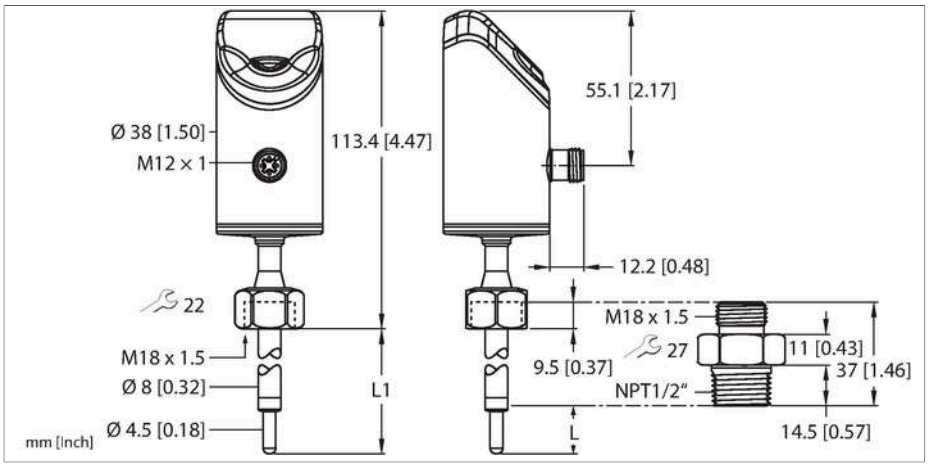
TS700-L016-16-LI2UPN8-H1141
Temperature Detection – With Current or Voltage Output and PNP/NPN Transistor Switching Output





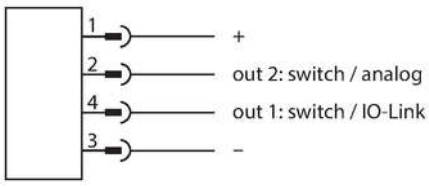
Technical data

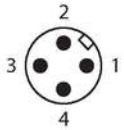
Type	TS700-L016-16-LI2UPN8-H1141
ID no.	100004380
Temperature range	
Measuring range	-50…150 °C
Temperature operating range	-58…302 °F
Accuracy	± 0.15 °C + 0.002 •|t| (-30…300 °C)
Measuring element	Pt-1000 probe, DIN EN 60751, class A
Response time	t0.5 = 3.5 s/t0.9 = 9.5 s in water at 0.2 m/s
Immersion depth (L)	16 mm
Pressure resistance	300 bar
Operating voltage	17…33 VDC
Protective measure	SELV, PELV according to DIN EN 61140
Short-circuit/reverse polarity protection	yes / yes
Insulation class	III
Output 1	Switching output or IO-Link mode
Output 2	analog or switching output
Switching output	
Communication protocol	IO-Link
Output function	NO/NC programmable, PNP/NPN
Switching point accuracy	± 0.2 K
Rated operational current	0.25 A
Release position	-50…+149.8 °C
Switching point	-49.8…+150 °C
Switching point distance	≥ 0.2 K
Switching cycles	≥ 100 mil.

Features

- Screw-in adapter with process connection NPT1/2" male thread included in delivery
- 4-digit, 2-colored, 12-segment display, rotatable by 180°
- Upper part of housing can be rotated up to 340°
- Materials in contact with media: 1.4404 (316L), CR O-ring
- Immersion length: 16 mm
- 17…33 VDC
- NO/NC contact, PNP/NPN output, analog output (current/voltage), IO-Link
- Various IO-Link mapping profiles can be selected

Wiring diagram





Functional principle

The TS+ product series is a compact processing 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.

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Technical data

Analog output	
Current output	4…20 mA
Alternative current output	0…20 mA
Current output note	Each invertible
Voltage output	0…10 V
Alternative voltage output	0… 5 V
Alternative voltage output	1… 6 V
Alternative voltage output	0.5…4.5 V
Voltage output note	Each invertible
Accuracy (Lin. + Hys. + Rep.)	± 0.3 K
Remark	0.1% of full scale applies to temperatures > 200 °C
Repeatability	0.1 K
IO-Link	
IO-Link specification	V 1.1
Transmission physics	corresponds to 3-wire physics (PHY2)
Frame type	2.2
Transmission rate	COM 2 (38.4 kBaud)
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
Housing material	Stainless-steel/Plastic, 1.4404 (AISI 316L)/Grilamid TR90 UV
Process connection	1/2" NPT male thread
Electrical connection	Connectors, M12 × 1
Protection class	IP6K6K / 6K7 / 6K9K
Ambient temperature	-40…+80 °C
Storage temperature	-40…+85 °C
Shock resistance	50 g (11 ms) , DIN EN 60068-2-27
Vibration resistance	20 g (10…3000 Hz), DIN EN 60068-2-6
Reference conditions acc. to IEC 61298-1	
Temperature	15…+25 °C
Atmospheric pressure	860…1060 hPa abs.
Humidity	10…95 % rel.
Auxiliary power	24 VDC

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Technical data

Display	
Display	4-digit, two-colored (green/red), 12-segment display, rotatable by 180°
Switching state	2 × LEDs, Yellow
Unit display	4 x green LED (°C, °F, K, Ohm)
Included in delivery	Screw-in adaptor with process connection 1/2" NPT male thread

Technical data

Type	TS700-L016-16-LI2UPN8-H1141
ID no.	100004380
Temperature range	
Measuring range	-50…150 °C
Temperature operating range	-58…302 °F
Accuracy	0.15 °C + 0.002 •|t| (-30…300 °C)
Measuring element	Pt-1000 probe, DIN EN 60751, class A
Response time	t0.5 = 3.5 s/t0.9 = 9.5 s in water at 0.2 m/s
Immersion depth (L)	16 mm
Operating voltage	17…33 VDC
Voltage drop at I_e	≤ 2 V
Protective measure	SELV, PELV according to DIN EN 61140
Short-circuit/reverse polarity protection	yes / yes
Protection type and class	IP6K6K / 6K7 / 6K9K / III
Output 1	Switching output or IO-Link mode
Output 2	analog or switching output
Switching output	
Communication protocol	IO-Link
Output function	NO/NC programmable, PNP/NPN
Switching point accuracy	± 0.2 K
Rated operational current	0.25 A
Switching current	≤ 250 mA
Switching point distance	≥ 0.2 K
Switching cycles	≥ 100 mil.
Release position	-50…+149.8 °C
Switching point	-49.8…+150 °C
Analog output	
Current output	4…20 mA
Alternative current output	20…0 mA
Current output note	Each invertible
Voltage output	0…10 V
Alternative voltage output	0… 5 V
Alternative voltage output	1… 6 V

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Technical data

Alternative voltage output	0.5…4.5 V
Voltage output note	Each invertible
Accuracy (Lin. + Hys. + Rep.)	± 0.3 K
Remark	0.1% of full scale applies to temperatures > 200 °C
Repeatability	0.1 K
IO-Link	
IO-Link specification	V 1.1
Programming	FDT/DTM/selection of various mapping profiles
Transmission physics	corresponds to 3-wire physics (PHY2)
Transmission rate	COM 2 (38.4 kBaud)
Frame type	2.2
Genauigkeit	± 0.1 K
Included in the SIDI GSDML	Yes
Ambient temperature	-40…+80 °C
Storage temperature	-40…+85 °C
Vibration resistance	20 g (10…3000 Hz), DIN EN 60068-2-6
Shock resistance	50 g (11 ms) , DIN EN 60068-2-27
Housing material	Stainless-steel/Plastic, 1.4404 (AISI 316L)/Grilamid TR90 UV
Process connection	1/2" NPT male thread
Pressure resistance	300 bar
Electrical connection	Connectors, M12 × 1
Reference conditions acc. to IEC 61298-1	
Temperature	15…+25 °C
Atmospheric pressure	860…1060 hPa abs.
Humidity	10…95 % rel.
Auxiliary power	24 VDC
Display	
Display	4-digit, two-colored (green/red), 12-segment display, rotatable by 180°
Switching state	2 × LEDs, Yellow
Unit display	4 x green LED (°C, °F, K, Ohm)
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
Included in delivery	Screw-in adaptor with process connection 1/2" NPT male thread

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Status LEDs

LED	Color	Status	Description
PWR	Green	On	Operating voltage applied Device is operational
		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 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 of 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)

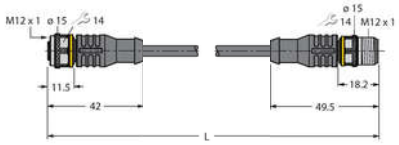
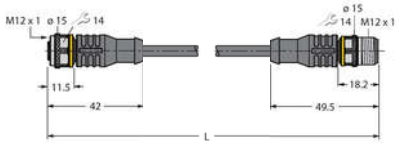
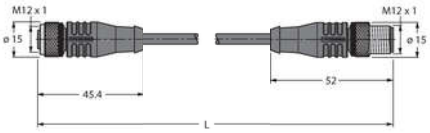
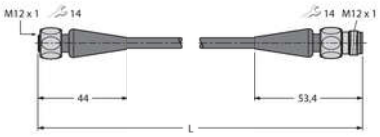
For detailed description of the display patterns and flashing codes, see manual

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

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Accessories

Dimension drawing	Type	ID no.	
	RKC4.4T-2-RSC4.4T/TEL	6625208	Connection cable, M12 female plug, straight, 4-pin, cable length: 2 m, sheath material: PVC, black; cULus approval; other cable lengths and qualities available, see www.turck.com
	RKC4.4T-2-RSC4.4T/TXL	6625608	Extension cable, M12 female, straight, 4-pin to M12 male, straight, 4-pin; cable length: 2 m, jacket material: PUR, black; cULus approval; other cable lengths and qualities available, see www.turck.com
	HT-WAK4-2-HT-WAS4/S2430	8038668	High-temperature-resistant extension cable, M12 female, straight, 4-pin to M12 male, straight, 4-pin; cable length: 2 m, jacket material: PTFE, white; other cable lengths and qualities available, see www.turck.com
	RKH4.4-2-RSH4.4/TFG	6933472	Food and Beverage extension cable, M12 female, straight, 4-pin to M12 male, straight, 4-pin; cable length: 2 m, jacket material: TPE, gray; approval: Ecolab, FDA; other cable lengths and qualities available, see www.turck.com

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