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Pressure Sensors Selection Guide

Description	Photo	Features	Applications	Page
PS Series For use with liquid or gaseous media, the PS pressure sensor is a competitively priced sensor for automation applications.		• High accuracy • Rotatable housing • Relative pressure up to 600 bar (8700 psi) • Absolute pressure up to 25 bar (260 psi) • PNP/NPN programmable • Wide range of configurations	• Food and beverage • Tooling machines • Hydraulics • Pneumatics • Tank Level	A2
PK Series A cost effective sensor for switch point detection in air and gas applications.	 Pico Nano	• Air only • 2 PNP switch points • <i>picofast</i>® connector • Ranges: -29.5 to 0 inHg, 0 to 145 psi • Push button programmable	• Robotics • Pneumatics • Tooling machines	A11
PT Series The PT pressure transmitters offer set ranges - no adjustment needed.		• Range up to 600 bar (8700 psi) • 4-20 mA or 0-10 V analog output • Female 1/4" BSPP or 1/4" NPT male fitting • Stainless steel housing	• Food and beverage • Tooling machines • Hydraulics • Pneumatics • Tank Level • OEM	A17
PT510 Series The PT510 series incorporates significant changes to the sensing element essential for measuring pressure in refrigeration applications.		• Stainless steel diaphragm • Fully welded construction • IP 67	• Refrigeration • Pumping	A21
PT4300 Series Class 1, division 2 area approved.		• 316 Stainless Steel diaphragm • Mechanical construction • Burst pressure up to 20,000 psi	• Oil & gas • Off-shore drilling • Well head pressure	A13
PT4400 Series Class 1, Division 1 area approved when used with an approved barrier.		• Same mechanical construction as PT4300 • Ranges up to 10,000 psi • M12 Connector	• Oil & gas • Gas compression	A15



A Pressure Sensor Designed with Customer Applications in Mind

• High Accuracy

The PS400 and PS500 provide an accuracy rating of ± 0.5 percent of full scale.

• Flexible Mounting Options

Multiple threaded connections and a unique coupling (PS500) make them easy to mount in a variety of applications.

• Easy to Operate

Push buttons and enter keys for quick and easy programming.



• User Friendly

Patented Media Stop prevents leaks in the event of an over pressure situation.

• User Selectable Units

PSI, Bar, Millibar, Inches of water, Inches of mercury, Millimeters of mercury, Feet of water and Meters of water.

• Robust Design

An environmental rating of IP 67 provide operational durability in harsh applications.

Simple Programming

The new high accuracy programmable pressure sensors combine high accuracy and performance with simple programming, resulting in an extremely user friendly sensor. The sensor is easily programmed via three controls: two push buttons for scrolling through programming features, and one recessed enter key. The push buttons are finger operated, and used to make value selections in the menu or to scroll through the various menu options. The recessed button is used to store selected values, and prevents programmed values from being inadvertently altered.

The menu is clear and concise to allow parameters such as set points, reset points, output functions, analog ranges, and a range of special options to be programmed with ease. The menu also includes an optional electronic lockout that disables the push buttons from functioning until the lockout is removed.

Common Applications Include:

- Air compressors
- Hydraulic clamping systems
- Bad filter detection
- Vacuum for pick-up and transfer of product
- Pneumatic systems
- Hydraulic accumulators
- Injection molding machines
- Press machines
- Automotive welding pressure
- Machine coolant
- Pump run dry



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High Accuracy Programmable Pressure Sensor Part Number Key

PS 010V - 5 03 - LI2UPN 8 X - H1141	
Pressure Sensor	Connection
Nominal Pressure Range	H1141 = 4-pin male, M12x1 (<i>eurofast</i> ®)
01VR = -1 to 0 bar gauge (-14.5 to 0 psi)	with LED
001R = 0 to 1 bar gauge (0 to 14.5 psi)	Operating Voltage
001V = -1 to 1 bar gauge (-14.5 to 14.5 psi)	8 = 15(18)...30 VDC
003V = -1 to 2.5 bar gauge (-14.5 to 36 psi)	
010V = -1 to 10 bar gauge (-14.5 to 145 psi)	Electrical Output
016V = -1 to 16 bar gauge (-14.5 to 232 psi)	Output 1
025V = -1 to 25 bar gauge (-14.5 to 362 psi)	Output 2
040V = -1 to 40 bar gauge (-14.5 to 580 psi)	2UPN switching output switching output
100R = 0 to 100 bar gauge (0 to 1450 psi)	LUUPN switching output voltage output
250R = 0 to 250 bar gauge (0 to 3625 psi)	LI2UPN switching output current/switching output
400R = 0 to 400 bar gauge (0 to 5800 psi)	
600R = 0 to 600 bar gauge (0 to 8700 psi)	Pressure Connection
001A = 0 to 1 bar absolute (0 to 14.5 psi)	01 = G1/4" female thread
003A = 0 to 2.5 bar absolute (0 to 36 psi)	02 = 1/4"-18 NPT female thread
010A = 0 to 10 bar absolute (0 to 145 psi)	03 = 1/4"-18 NPT male thread
016A = 0 to 16 bar absolute (0 to 232 psi)	04 = G1/4" male thread
025A = 0 to 25 bar absolute (0 to 362 psi)	05 = 7/16"-20 UNF male thread
	Housing
	4 = Non-rotatable
	5 = Rotatable

High Accuracy Programmable Pressure Sensor Specifications

Electrical Data:

Current Consumption ≤50 mA
Switching Frequency (Discrete) ≤180 Hz
Power-On Effect. Per IEC 947-5-2
Reverse Polarity Protection Yes
Transient Protection EN 60947-5-2
Short-Circuit Protection Yes

EMC Information:

EN 61000-4-2 ESD: 4 KD CK/ 8 KV AD
EN 61000-4-3 HF irradiated: 15 V/m
EN 61000-4-4 Burst: 2 KV
EN 61000-4-5 Surge: 500 V, 12 Ω
EN 61000-4-6 HF conducted: 10 V

Accuracy:

Repeatability ≤0.5% of measuring range
Zero Shift/Span Shift. ≤0.15% of measuring range/°C

Programmable Analog:

Analog Start Point Programmable from
0-75% of measuring range
Analog End Point Programmable from
25-100% of measuring range

Set Points:

Set Point Range 1% - 100% Range
Reset Point Range5% - 99.5% Range

Time Delays:

Minimum Hysteresis ±0.5%
Switching Delay Switch-on and switch-off
delay adjustable from 0 to 50
seconds in steps of 0.1 second

Mechanical Data:

Wetted Parts. Stainless Steel, Viton
Al₂O₃ Ceramic

Temperature Ranges:

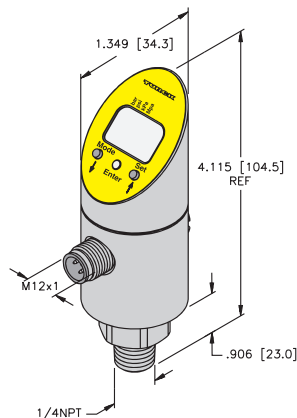
Ambient Temperature -40°to +80°C (-40°to +176°F)
Medium Temperature -25°to +85°C (-40°to +185°F)
Enclosure Rating. Meets NEMA 4, 6, 12, 13 and IP 67
Shock 50 g per IEC 68-2-27
Vibration 20 g (10-200 Hz) per IEC 68-2-6
Burst Protection patented media stop

LED Function/Display:

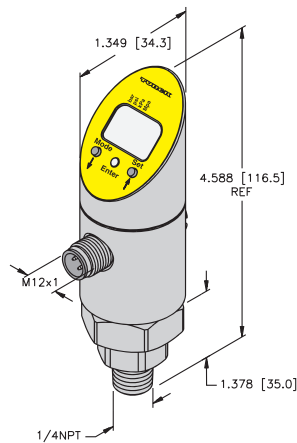
Measuring Value/ 4-digit 7-segment display
Programming
Status Display LEDs indicate output status and
selected measuring units
Display Reaction Time. Slow 600 ms update
Normal 200 ms update
Fast 50 ms update

Housing Styles

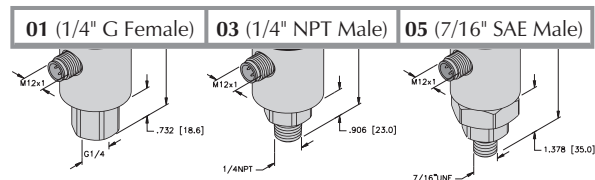
4: Fixed Housing



5: Rotatable Housing



Pressure Connection Options



PRESSURE

Output Options

	LI2UPN8X	LUUPN8X	2UPN8X
Output	Programmable Current: 0-20 mA, 4-20 mA, 20-0 mA, 20-4 mA and 1 PNP/NPN N.O./N.C. or 2 PNP/NPN N.O./N.C.	Programmable Voltage: 0-10 V, 0-5 V, 1-6 V, 10-0 V, 5-0 V, 6-1 V and PNP/NPN, N.O. or N.C.	Dual PNP/NPN N.O. or N.C.
Voltage	18-30 VDC	18-30 VDC	15-30 VDC
Set Point Accuracy (Of Full Scale)	±0.5%	±0.5%	±0.5%
Analog Accuracy** (Of Full Scale)	≤±0.5%	≤±0.5%	N/A
Switching Current	≤200 mA	≤200 mA	≤200 mA
Analog Load	≤500 Ω	≤500 Ω	≤500 Ω
Mating Cordset	RK 4.4T-*	RK 4.4T-*	RK 4.4T-*
Wiring Diagrams			

* Length in meters.

** Accuracy includes linearity, repeatability and hysteresis.

Vacuum Range Sensors

	Range (psi)	Overpressure (psi)	Set Point Range (psi)	Reset Point Range (psi)
01VR	-14.5 0	43.5	-14.36 0.00	-14.43 -0.07
001V	-14.5 14.5	43.5	-14.21 14.50	-14.36 14.36
003V	-14.5 36.3	101.5	-13.99 36.25	-14.25 36.00
010V	-14.5 145.0	362.5	-12.91 145.00	-13.70 144.20
016V	-14.5 232	580.0	-12.04 232.00	-13.27 230.77
025V	-14.5 362.5	942.5	-10.73 362.50	-12.62 360.62
040V	-14.5 580	1450	-8.56 580.00	-11.53 577.1

Relative Range Sensors

	Range (psi)	Burst Pressure (psi)	Set Point Range (psi)	Reset Point Range (psi)
001R	0 14.5	43.5	0.15 14.5	0.07 14.4
100R	0 1450	3625	14.5 1450.0	7.25 1442.8
250R	0 3625	9062.5	36.3 3625.0	18.1 3606.9
400R	0 5800	13050	58.0 5800.0	29.0 5771.0
600R	0 8700	13050	87.0 8700.0	43.5 8656.5

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Housing	Part Number	ID Number	Pressure Range (psig)	Connection	Output
4-Wire DC, Female Connection, Fixed Housing 	PS01VR-401-LI2UPN8X-H1141	M6832100	-14.5 to 0	Female G 1/4	Programmable Current: 0-20 mA, 4-20 mA, 20-0 mA, 20-4 mA and 1 PNP/NPN N.O./N.C. or 2 PNP/NPN N.O./N.C.
	PS001R-401-LI2UPN8X-H1141	M6832101	0 to 14.5		
	PS001V-401-LI2UPN8X-H1141	M6832576	-14.5 to 14.5		
	PS003V-401-LI2UPN8X-H1141	M6832577	-14.5 to 36.25		
	PS010V-401-LI2UPN8X-H1141	M6832578	-14.5 to 145		
	PS016V-401-LI2UPN8X-H1141	M6832579	-14.5 to 232		
	PS025V-401-LI2UPN8X-H1141	M6832580	-14.5 to 362.5		
	PS040V-401-LI2UPN8X-H1141	M6832581	-14.5 to 580		
	PS100R-401-LI2UPN8X-H1141	M6832107	0 to 1450		
	PS250R-401-LI2UPN8X-H1141	M6832108	0 to 3625		
	PS400R-401-LI2UPN8X-H1141	M6832109	0 to 5800		
	PS600R-401-LI2UPN8X-H1141	M6832582	0 to 8700		
4-Wire DC, Male Connection, Fixed Housing 	PS01VR-403-LI2UPN8X-H1141	M6832180	-14.5 to 0	Male NPT 1/4	Programmable Current: 0-20 mA, 4-20 mA, 20-0 mA, 20-4 mA and 1 PNP/NPN N.O./N.C. or 2 PNP/NPN N.O./N.C.
	PS001R-403-LI2UPN8X-H1141	M6832181	0 to 14.5		
	PS001V-403-LI2UPN8X-H1141	M6832600	-14.5 to 14.5		
	PS003V-403-LI2UPN8X-H1141	M6832601	-14.5 to 36.25		
	PS010V-403-LI2UPN8X-H1141	M6832602	-14.5 to 145		
	PS016V-403-LI2UPN8X-H1141	M6832603	-14.5 to 232		
	PS025V-403-LI2UPN8X-H1141	M6832604	-14.5 to 362.5		
	PS040V-403-LI2UPN8X-H1141	M6832605	-14.5 to 580		
	PS100R-403-LI2UPN8X-H1141	M6832187	0 to 1450		
	PS250R-403-LI2UPN8X-H1141	M6832188	0 to 3625		
	PS400R-403-LI2UPN8X-H1141	M6832189	0 to 5800		
	PS600R-403-LI2UPN8X-H1141	M6832606	0 to 8700		

See pages A21-A27 for diaphragm seals.

See pages A28-A29 for pressure accessories.



Housing	Part Number	ID Number	Pressure Range (psig)	Connection	Output
4-Wire DC, Male Connection, Rotatable Housing 	PS01VR-503-LI2UPN8X-H1141	M6832280	-14.5 to 0	Male NPT 1/4	Programmable Current: 0-20 mA, 4-20 mA, 20-0 mA, 20-4 mA and 1 PNP/NPN N.O./N.C. or 2 PNP/NPN N.O./N.C.
	PS001R-503-LI2UPN8X-H1141	M6832281	0 to 14.5		
	PS001V-503-LI2UPN8X-H1141	M6832827	-14.5 to 14.5		
	PS003V-503-LI2UPN8X-H1141	M6832828	-14.5 to 36.25		
	PS010V-503-LI2UPN8X-H1141	M6832829	-14.5 to 145		
	PS016V-503-LI2UPN8X-H1141	M6832830	-14.5 to 232		
	PS025V-503-LI2UPN8X-H1141	M6832831	-14.5 to 362.5		
	PS040V-503-LI2UPN8X-H1141	M6832832	-14.5 to 580		
	PS100R-503-LI2UPN8X-H1141	M6832287	0 to 1450		
	PS250R-503-LI2UPN8X-H1141	M6832288	0 to 3625		
	PS400R-503-LI2UPN8X-H1141	M6832289	0 to 5800		
	PS600R-503-LI2UPN8X-H1141	M6832833	0 to 8700		
4-Wire DC, Male Connection, Rotatable Housing 	PS01VR-505-LI2UPN8X-H1141	M6832851	-14.5 to 0	Male 7/16" SAE	Programmable Current: 0-20 mA, 4-20 mA, 20-0 mA, 20-4 mA and 1 PNP/NPN N.O./N.C. or 2 PNP/NPN N.O./N.C.
	PS001R-505-LI2UPN8X-H1141	M6832852	0 to 14.5		
	PS001V-505-LI2UPN8X-H1141	M6832853	-14.5 to 14.5		
	PS003V-505-LI2UPN8X-H1141	M6832854	-14.5 to 36.25		
	PS010V-505-LI2UPN8X-H1141	M6832447	-14.5 to 145		
	PS016V-505-LI2UPN8X-H1141	M6832855	-14.5 to 232		
	PS025V-505-LI2UPN8X-H1141	M6832856	-14.5 to 362.5		
	PS040V-505-LI2UPN8X-H1141	M6832857	-14.5 to 580		
	PS100R-505-LI2UPN8X-H1141	M6832858	0 to 1450		
	PS250R-505-LI2UPN8X-H1141	M6832859	0 to 3625		
	PS400R-505-LI2UPN8X-H1141	M6832860	0 to 5800		
	PS600R-505-LI2UPN8X-H1141	M6832861	0 to 8700		

See pages A21-A27 for diaphragm seals.
 See pages A28-A29 for pressure accessories.

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Housing	Part Number	ID Number	Pressure Range (psig)	Connection	Output
4-Wire DC, Female Connection, Fixed Housing	PS01VR-401-LUUPN8X-H1141	M6832110	-14.5 to 0	Female G 1/4	Programmable Voltage: 0-10 V, 0-5 V, 1-6 V, 10-0 V, 5-0 V, 6-1 V and 1 NPN/PNP, N.O. or N.C.
	PS001R-401-LUUPN8X-H1141	M6832111	0 to 14.5		
	PS001V-401-LUUPN8X-H1141	M6832528	-14.5 to 14.5		
	PS003V-401-LUUPN8X-H1141	M6832529	-14.5 to 36.25		
	PS010V-401-LUUPN8X-H1141	M6832530	-14.5 to 145		
	PS016V-401-LUUPN8X-H1141	M6832531	-14.5 to 232		
	PS025V-401-LUUPN8X-H1141	M6832532	-14.5 to 362.5		
	PS040V-401-LUUPN8X-H1141	M6832533	-14.5 to 580		
	PS100R-401-LUUPN8X-H1141	M6832117	0 to 1450		
	PS250R-401-LUUPN8X-H1141	M6832118	0 to 3625		
	PS400R-401-LUUPN8X-H1141	M6832119	0 to 5800		
	PS600R-401-LUUPN8X-H1141	M6832534	0 to 8700		
4-Wire DC, Male Connection, Fixed Housing	PS01VR-403-LUUPN8X-H1141	M6832190	-14.5 to 0	Male NPT 1/4	Programmable Voltage: 0-10 V, 0-5 V, 1-6 V, 10-0 V, 5-0 V, 6-1 V and 1 NPN/PNP, N.O. or N.C.
	PS001R-403-LUUPN8X-H1141	M6832191	0 to 14.5		
	PS001V-403-LUUPN8X-H1141	M6832552	-14.5 to 14.5		
	PS003V-403-LUUPN8X-H1141	M6832553	-14.5 to 36.25		
	PS010V-403-LUUPN8X-H1141	M6832554	-14.5 to 145		
	PS016V-403-LUUPN8X-H1141	M6832555	-14.5 to 232		
	PS025V-403-LUUPN8X-H1141	M6832556	-14.5 to 362.5		
	PS040V-403-LUUPN8X-H1141	M6832557	-14.5 to 580		
	PS100R-403-LUUPN8X-H1141	M6832197	0 to 1450		
	PS250R-403-LUUPN8X-H1141	M6832198	0 to 3625		
	PS400R-403-LUUPN8X-H1141	M6832199	0 to 5800		
	PS600R-403-LUUPN8X-H1141	M6832558	0 to 8700		

See pages A21-A27 for diaphragm seals.

See pages A28-A29 for pressure accessories.



Housing	Part Number	ID Number	Pressure Range (psig)	Connection	Output
4-Wire DC, Male Connection, Rotatable Housing 	PS01VR-503-LUUPN8X-H1141	M6832290	-14.5 to 0	Male NPT 1/4	Programmable Voltage: 0-10 V, 0-5 V, 1-6 V, 10-0 V, 5-0 V, 6-1 V and 1 NPN/PNP, N.O. or N.C.
	PS001R-503-LUUPN8X-H1141	M6832291	0 to 14.5		
	PS001V-503-LUUPN8X-H1141	M6832750	-14.5 to 14.5		
	PS003V-503-LUUPN8X-H1141	M6832751	-14.5 to 36.25		
	PS010V-503-LUUPN8X-H1141	M6832752	-14.5 to 145		
	PS016V-503-LUUPN8X-H1141	M6832753	-14.5 to 232		
	PS025V-503-LUUPN8X-H1141	M6832754	-14.5 to 362.5		
	PS040V-503-LUUPN8X-H1141	M6832755	-14.5 to 580		
	PS100R-503-LUUPN8X-H1141	M6832297	0 to 1450		
	PS250R-503-LUUPN8X-H1141	M6832298	0 to 3625		
	PS400R-503-LUUPN8X-H1141	M6832299	0 to 5800		
	PS600R-503-LUUPN8X-H1141	M6832756	0 to 8700		
4-Wire DC, Male Connection, Rotatable Housing 	PS01VR-505-LUUPN8X-H1141	M6832774	-14.5 to 0	Male 7/16" SAE	Programmable Voltage: 0-10 V, 0-5 V, 1-6 V, 10-0 V, 5-0 V, 6-1 V and 1 NPN/PNP, N.O. or N.C.
	PS001R-505-LUUPN8X-H1141	M6832775	0 to 14.5		
	PS001V-505-LUUPN8X-H1141	M6832776	-14.5 to 14.5		
	PS003V-505-LUUPN8X-H1141	M6832777	-14.5 to 36.25		
	PS010V-505-LUUPN8X-H1141	M6832778	-14.5 to 145		
	PS016V-505-LUUPN8X-H1141	M6832779	-14.5 to 232		
	PS025V-505-LUUPN8X-H1141	M6832780	-14.5 to 362.5		
	PS040V-505-LUUPN8X-H1141	M6832781	-14.5 to 580		
	PS100R-505-LUUPN8X-H1141	M6832782	0 to 1450		
	PS250R-505-LUUPN8X-H1141	M6832783	0 to 3625		
	PS400R-505-LUUPN8X-H1141	M6832784	0 to 5800		
	PS600R-505-LUUPN8X-H1141	M6832785	0 to 8700		

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See pages A21-A27 for diaphragm seals.
 See pages A28-A29 for pressure accessories.

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Housing	Part Number	ID Number	Pressure Range (psig)	Connection	Output
4-Wire DC, Female Connection, Fixed Housing	PS01VR-401-2UPN8X-H1141	M6832460	-14.5 to 0	Female G 1/4	Dual PNP/NPN N.O. or N.C.
	PS001R-401-2UPN8X-H1141	M6832461	0 to 14.5		
	PS001V-401-2UPN8X-H1141	M6832462	-14.5 to 14.5		
	PS003V-401-2UPN8X-H1141	M6832463	-14.5 to 36.25		
	PS010V-401-2UPN8X-H1141	M6832464	-14.5 to 145		
	PS016V-401-2UPN8X-H1141	M6832465	-14.5 to 232		
	PS025V-401-2UPN8X-H1141	M6832466	-14.5 to 362.5		
	PS040V-401-2UPN8X-H1141	M6832467	-14.5 to 580		
	PS100R-401-2UPN8X-H1141	M6832468	0 to 1450		
	PS250R-401-2UPN8X-H1141	M6832469	0 to 3625		
	PS400R-401-2UPN8X-H1141	M6832470	0 to 5800		
	PS600R-401-2UPN8X-H1141	M6832471	0 to 8700		
4-Wire DC, Male Connection, Fixed Housing	PS01VR-403-2UPN8X-H1141	M6832494	-14.5 to 0	Male NPT 1/4	Dual PNP/NPN N.O. or N.C.
	PS001R-403-2UPN8X-H1141	M6832495	0 to 14.5		
	PS001V-403-2UPN8X-H1141	M6832496	-14.5 to 14.5		
	PS003V-403-2UPN8X-H1141	M6832497	-14.5 to 36.25		
	PS010V-403-2UPN8X-H1141	M6832498	-14.5 to 145		
	PS016V-403-2UPN8X-H1141	M6832499	-14.5 to 232		
	PS025V-403-2UPN8X-H1141	M6832500	-14.5 to 362.5		
	PS040V-403-2UPN8X-H1141	M6832501	-14.5 to 580		
	PS100R-403-2UPN8X-H1141	M6832502	0 to 1450		
	PS250R-403-2UPN8X-H1141	M6832503	0 to 3625		
	PS400R-403-2UPN8X-H1141	M6832504	0 to 5800		
	PS600R-403-2UPN8X-H1141	M6832505	0 to 8700		

See pages A21-A27 for diaphragm seals.

See pages A28-A29 for pressure accessories.



Housing	Part Number	ID Number	Pressure Range (psig)	Connection	Output
4-Wire DC, Male Connection, Rotatable Housing 	PS01VR-503-2UPN8X-H1141	M6832658	-14.5 to 0	Male NPT 1/4	Dual PNP/NPN N.O. or N.C.
	PS001R-503-2UPN8X-H1141	M6832659	0 to 14.5		
	PS001V-503-2UPN8X-H1141	M6832660	-14.5 to 14.5		
	PS003V-503-2UPN8X-H1141	M6832661	-14.5 to 36.25		
	PS010V-503-2UPN8X-H1141	M6832662	-14.5 to 145		
	PS016V-503-2UPN8X-H1141	M6832663	-14.5 to 232		
	PS025V-503-2UPN8X-H1141	M6832664	-14.5 to 362.5		
	PS040V-503-2UPN8X-H1141	M6832665	-14.5 to 580		
	PS100R-503-2UPN8X-H1141	M6832666	0 to 1450		
	PS250R-503-2UPN8X-H1141	M6832667	0 to 3625		
	PS400R-503-2UPN8X-H1141	M6832668	0 to 5800		
	PS600R-503-2UPN8X-H1141	M6832669	0 to 8700		
4-Wire DC, Male Connection, Rotatable Housing 	PS01VR-505-2UPN8X-H1141	M6832692	-14.5 to 0	Male 7/16" SAE	Dual PNP/NPN N.O. or N.C.
	PS001R-505-2UPN8X-H1141	M6832693	0 to 14.5		
	PS001V-505-2UPN8X-H1141	M6832694	-14.5 to 14.5		
	PS003V-505-2UPN8X-H1141	M6832695	-14.5 to 36.25		
	PS010V-505-2UPN8X-H1141	M6832696	-14.5 to 145		
	PS016V-505-2UPN8X-H1141	M6832697	-14.5 to 232		
	PS025V-505-2UPN8X-H1141	M6832698	-14.5 to 362.5		
	PS040V-505-2UPN8X-H1141	M6832699	-14.5 to 580		
	PS100R-505-2UPN8X-H1141	M6832700	0 to 1450		
	PS250R-505-2UPN8X-H1141	M6832701	0 to 3625		
	PS400R-505-2UPN8X-H1141	M6832702	0 to 5800		
	PS600R-505-2UPN8X-H1141	M6832703	0 to 8700		

See pages A21-A27 for diaphragm seals.

See pages A28-A29 for pressure accessories.

PRESSURE

PK Series Pressure Sensors

PK Series

PK sensors were designed to provide an economical sensor option for switch point detection in air and inert gas applications. The compact sensors are IP 65 rated, and ideal for use in pneumatic and robotic applications.

PK sensors are available in two body styles: the pico and nano style to provide for a broader range of mounting options. The sensor is programmed through easy-to-use push buttons, and the menu may be inverted for additional programming flexibility.

PK sensors provide the two pressure ranges most commonly found in pneumatic applications: -29.5 to 0 inHg and 0 to 145 psi, with 3% accuracy.



PK Sensors - Specifications

Electrical Data:

Response Time	<2.5 ms
Operating Frequency	400 Hz
Supply Voltage	10.8-30 V, keyed residual ripple 10%
Input Current During Programming	<55 mA
Input Current in Normal Operation	<35 mA
Switching Outputs.	2x PNP 250 mA short-circuit proof
Display	3 digit 7 segment display
Ambient Temperature Error	3% of measured value at 0 to 50°C
Repeat Accuracy	0.2% of measured value
Hysteresis Adjustable	0 to 100%
Measuring Range	0....-1 bar / 0....10 bar
Burst Pressure	5 bar / 16 bar

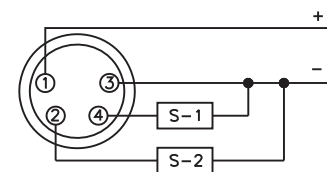
Environmental Conditions:

Protection	IP 65
Measuring Medium	Filtered compressed air, lubricated or unlubricated, inert gases
Emitted Interference.	DIN EN 50081-1
Interference Immunity.	DIN EN 50082-2
High Voltage Test	1000 VDC 1 min
Insulation Resistance	>100 MΩ at 500 VDC
Operating Temperature	-10 to 50°C
Storage Temperature	-20 to 85°C
Permissible Humidity	10 to 90% RH
Shock Resistance	10G XYZ
Vibration Resistance.	10 to 55 Hz, 1.5 mm, 3 planes

Mechanical Data:

Electrical Connector Plug	M8, 4-pin, <i>picofast</i> ®
Measuring Medium Connector	Male 1/8" NPT

Diagram 1





Industrial Automation

TURCK
works

 Industrial
 Automation

PK Sensors - Part Number Key

PK 010R - P 14 - 2UP8X - V1141
Style

PK = Pressure Switch

Range

01VR = -29.5 to 0 inHg

010R = 0 to 145 psi

Body Style

P = Pico

N = Nano

Electrical Connection

 V1141 = 4-pin, M8, *picofast*®

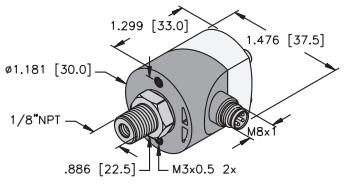
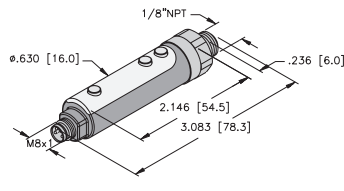
Output Circuitry

2UP8X = 11-30 VDC / 2 N.O./N.C. PNP

Fluid Connection

14 = 1/8" NPT

PRESSURE

Housing	Part Number	ID Number	Pressure Range	Connection	Mating Cordset	Wiring Diagram	Output
Nano, <i>picofast</i>® Quick Disconnect 	PK01VR-N14-2UP8X-V1141	M6833002	-29.5 to 0 inHg	1/8" NPT	PKG 4M-*	1	2 PNP N.O./N.C.
	PK010R-N14-2UP8X-V1141	M6833003	0 to 145 psi	1/8" NPT	PKG 4M-*	1	
Pico, <i>picofast</i> Quick Disconnect 	PK01VR-P14-2UP8X-V1141	M6833006	-29.5 to 0 inHg	1/8" NPT	PKG 4M-*	1	2 PNP N.O./N.C.
	PK010R-P14-2UP8X-V1141	M6833007	0 to 145 psi	1/8" NPT	PKG 4M-*	1	



TURCK

Pressure Instrumentation

PT4300 Pressure Sensor, Class 1 Div 2 Groups A, B, C & D

- UL/cUL 1604 (CSA 213) Class 1 Div 2 Groups A, B, C, D
- High Strength Stainless Steel Construction
- Ranges from Vacuum to 10,000 PSI
- Compatible with Wide Range of Liquids and Gases
- EMI/RFI Protection



The PT4300 is a media isolated stainless steel pressure sensor for use in hazardous areas. With its rugged construction without o-rings or welds, the PT4300 is the solution for pressure measurement for a variety of applications.

Applications

Refrigeration	Water management
Industrial OEM equipment	Oil & gas platforms
Pressure instrumentation	Process control
Gas compression & storage	Test stands
Oxygen delivery systems	Hydrogen fuel (316L)

Performance @25°C (77°F)

Accuracy*	<±0.25% BFSL
Stability (1 year)	±0.25%FS, typ
Over pressure protection	2X rated pressure
Burst Pressure	5X or 20,000 psi (whichever is less)
Pressure cycles.	> 100 million

* Accuracy includes non-linearity, hysteresis & non-repeatability

Environmental Data

Operating temperature	-40 to +85°C (-40 to +185°F)
Storage temperature.	-25 to +100°C (-13 to +212°F)
Compensated range	0 to +55°C (-30 to +130°F)
TC zero	<±1.5% of FS
TC span	<±1.5% of FS
Vibration test	10G peak, 20 to 2000 Hz
Shock test	100G, 11 msec, ½ sine
EMI/RFI protection.	Yes
Rating	IP 66

Electrical Data

Output	4-20 mA	1-5 VDC, 1-6 VDC	0-50 mV	0.5-4.5 V Ratiometric
Excitation	10-28 VDC	10-28 VDC	5 VDC, typ	5 VDC, typ
Output impedance	>10k Ω	<100 Ω, nominal	<1100 Ω, nominal	<100 Ω, nominal
Current consumption	20 mA, typ	<10 mA	<5 mA	<10 mA
Bandwidth	(-3dB): DC to 250 Hz	(-3dB): DC to 1 kHz	(-3dB): DC to 5 kHz, min	(-3dB): DC to 1 kHz
Output noise	-	<2 mV RMS	-	<2 mV RMS
Zero offset	<±1% of FS	<±1% of FS	<±2% of FS	<±1% of FS
Span tolerance	<±2% of FS	<±1.5% of FS	<±2% of FS	<±1.5% of FS
Output load	0-800 Ω @10-28 VDC	10k Ω, min	>1M Ω	10k Ω, min
Reverse polarity protection	Yes	Yes	-	No



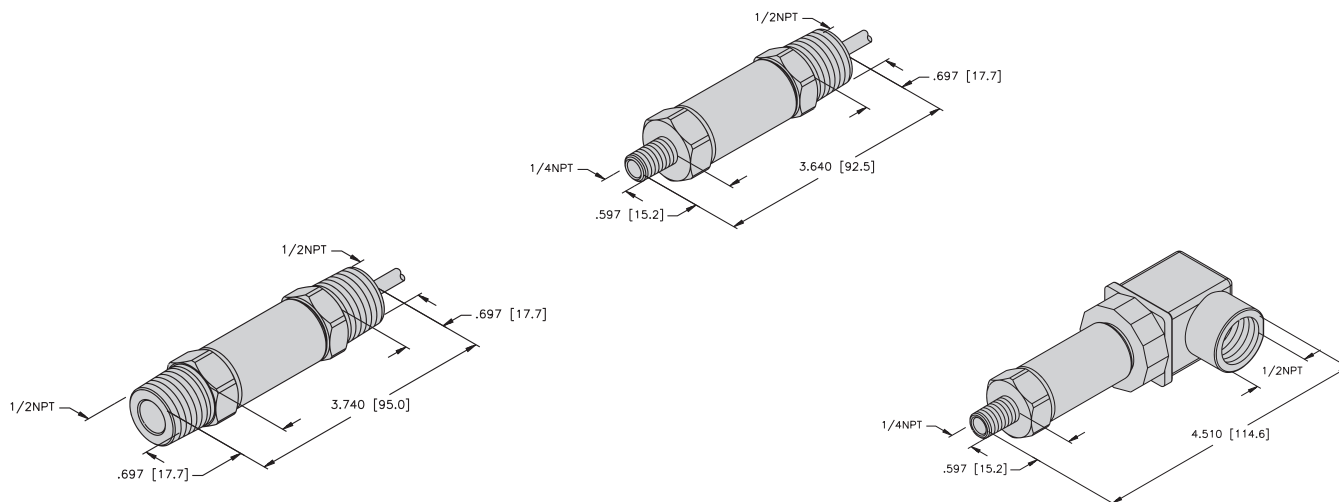
Class 1 Div 2 Pressure Transmitters Part Number Key

Part Number Keys are to assist in IDENTIFICATION ONLY. Consult factory for catalog items not identified.

PT 100PG - 4300 - 03		Li3 - C0244 / D811	*ft
Sensor		Length of Cable	
PT = Pressure Transmitter		2, 4, 6, 10	
Range		Material	
PSIG 25PV = -14.5 to 25 PSI 25PG = 0 to 25 PSI 50PG = 0 to 50 PSI 100PG = 0 to 100 PSI 200PG = 0 to 200 PSI 500PG = 0 to 500 PSI 1000PG = 0 to 1000 PSI 2500PG = 0 to 2500 PSI 5000PG = 0 to 5000 PSI 7500PG = 0 to 7500 PSI 10000PG = 0 to 10000 PSI Bar 2BV = -1 to 2 bar 2BG = 0 to 2 bar 5BG = 0 to 5 bar 10BG = 0 to 10 bar 20BG = 0 to 20 bar 50BG = 0 to 50 bar 100BG = 0 to 100 bar 250BG = 0 to 250 bar 350BG = 0 to 350 bar 500BG = 0 to 500 bar 700BG = 0 to 700 bar		D811 = 316L	
Model		Electrical Connections	
4300 = Class 1 Div 2		VAS = DIN 43650-A C0244 = Conduit, cable, 24AWG	
		Electrical Features	
		Li3 = 4 to 20 mA LU4 = 0.5 to 4.5 V (ratiometric) LU64 = 1 to 5 V LU65 = 1 to 6 V LU71 = 10 mV/V	
		Process Connections	
		02 = 1/4" NPT Female 03 = 1/4" NPT Male 04 = G1/4" Male 16 = 1/2" NPT Male	

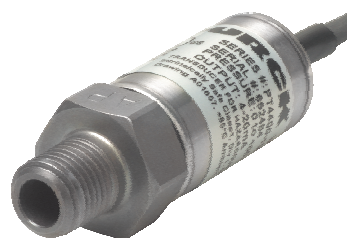
PRESSURE

Dimensional Drawings



PT4400 Pressure Sensor, Class 1 Div 1 Groups C & D

- UL/cUL 913 (CSA 157) Class 1 Div 1 Groups C & D when installed with an approved barrier
- High Strength Stainless Steel Construction
- Ranges up to 10,000 PSI
- Compatible with Wide Range of Liquids and Gases
- EMI/RFI Protection
- No Oil, Welds or Internal O-rings



The PT4400 is a media isolated stainless steel pressure sensor with a wide variety of options. Approved for use in Class 1, Div 1 applications, the PT4400 is the solution for pressure measurement in intrinsically safe areas.

Applications

Pneumatics Water management
 Industrial OEM equipment Hydraulic systems
 Control panels. Data loggers
 HVAC® equipment Hydrogen fuel (316L)

Performance @25°C (77°F)

Accuracy* <±0.25% BFSL
 Stability (1 year) ±0.25%FS, typ
 Over pressure protection 2X rated pressure
 Burst Pressure 5X or 20,000 psi (whichever is less)
 Pressure cycles. > 100 million

* Accuracy includes non-linearity, hysteresis & non-repeatability

Environmental Data

Operating temperature -40 to +85°C (-40 to +185°F)
 Storage temperature. -25 to +100°C (-13 to +212°F)
 Compensated range 0 to +55°C (-30 to +130°F)
 TC zero <±1.5% of FS
 TC span <±1.5% of FS
 Vibration test 10G peak, 20 to 2000 Hz
 Shock test 100G, 11 msec, ½ sine
 EMI/RFI protection. Yes
 Rating IP 66

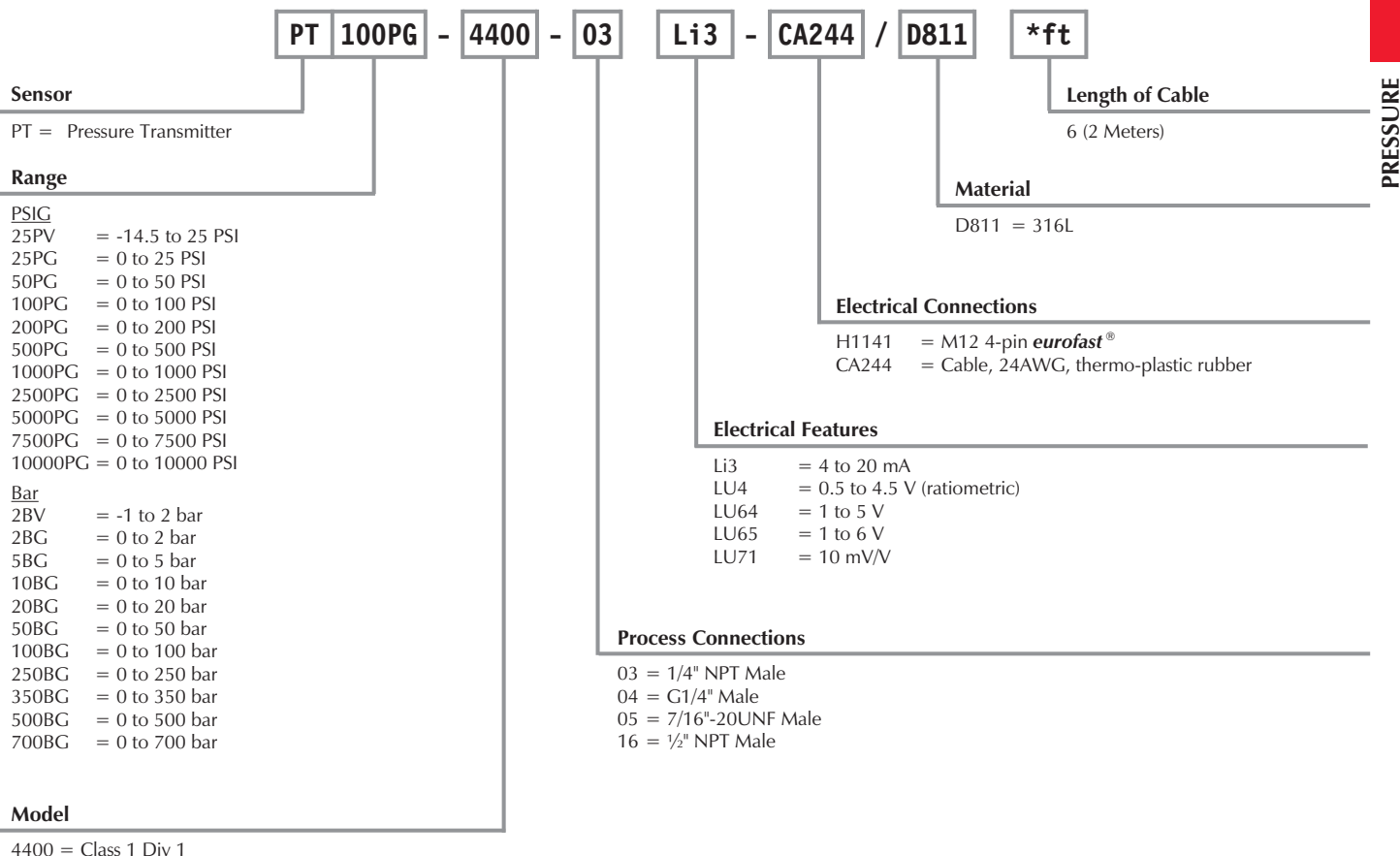
Electrical Data

Output	4-20 mA	1-5 VDC, 1-6 VDC	10mV/V	0.5-4.5 V Ratiometric
Excitation	10-28 VDC	10-28 VDC	5 VDC, typ	5 VDC, typ
Output impedance	>10k Ω	<100 Ω, nominal	<1100 Ω, nominal	<100 Ω, nominal
Current consumption	20 mA, typ	<10 mA	<5 mA	<10 mA
Bandwidth	(-3dB): DC to 250 Hz	(-3dB): DC to 1 kHz	(-3dB): DC to 5 kHz, min	(-3dB): DC to 1 kHz
Output noise	-	<2 mV RMS	-	<2 mV RMS
Zero offset	<±1% of FS	<±1% of FS	<±2% of FS	<±1% of FS
Span tolerance	<±2% of FS	<±1.5% of FS	<±2% of FS	<±1.5% of FS
Output load	0-800 Ω @10-28 VDC	10k Ω, min	>1M Ω	10k Ω, min
Reverse polarity protection	Yes	Yes	-	No

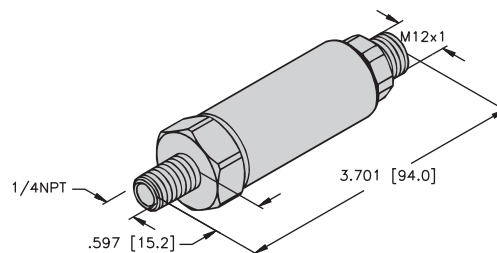
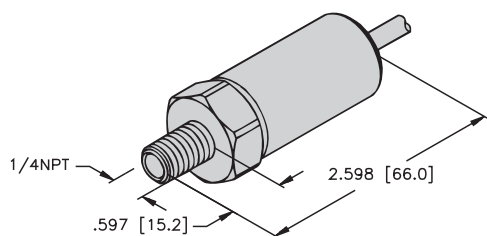


Class 1 Div 1 Pressure Transmitters Part Number Key

Part Number Keys are to assist in IDENTIFICATION ONLY. Consult factory for catalog items not identified.



Dimensional Drawings



TURCK

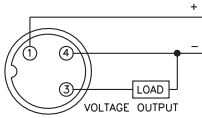
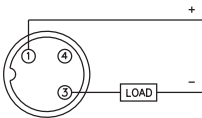
Pressure Instrumentation

PT Pressure Transmitters Scaled in PSI

- Pre-scaled Ranges - No Adjustment Needed
- Output: 4-20 mA or 0-10 V
- IP67
- Robust Ceramic Measuring Element



Performance		
Accuracy	≤0.5% of full scale Total of linearity, hysteresis and repeatability	
Zero Shift	<±0.015% of measuring range / °C	
Span Shift	<±0.015% of measuring range / °C	
Environmental Data		
Ambient Temperature	-40°C to 85°C	
Medium Temperature.	-40°C to +150°C (-40°F to +302°F)	
Enclosure Rating	IP 67	
Housing Material	Stainless Steel 1.430 (AISI 303) / PBT	
Shock Resistance	75 G, 11 ms per IEC 68-2-27	
Vibration Resistance	20 G, 15 mm per IEC 68-2-6	
Wetted Parts	303 Stainless Steel (connection), AL ₂ O ₃ Ceramic (measuring cell), Viton (seal)	
Electrical Data		
Current Consumption.	≤20 mA	
Dynamic Response	<2 ms	
Short-Circuit Protection.	Yes	
Reverse Polarity Protection	Yes	
Mating Cordset	RK 4T-*/S618 (* Length in meters)	
Output	4-20 mA Loop Powered.	0-10 V
Voltage	8-33 VDC.	11.4-33 VDC
Load	≤ $\frac{\text{supply voltage}}{0.02 \text{ A}}$ = Ohm >10 k Ω/ <100 nF	
Wiring Diagrams		





Pressure Transmitter Part Number Key

Part Number Keys are to assist in IDENTIFICATION ONLY. Consult factory for catalog items not identified.

Pressure Transmitter (scaled in psi)

PT **100psig** - **13** - **LI3** - **H1131**

Style

PT = Pressure Transmitter

Pressure Range

-30HG = -30 to 0 in. Hg (vacuum)
 15psig = 0 to 15 psig
 30psig = 0 to 30 psig
 60psig = 0 to 60 psig
 100psig = 0 to 100 psig
 150psig = 0 to 150 psig
 200psig = 0 to 200 psig
 300psig = 0 to 300 psig
 500psig = 0 to 500 psig
 750psig = 0 to 750 psig
 1000psig = 0 to 1000 psig
 2000psig = 0 to 2000 psig
 3000psig = 0 to 3000 psig
 5000psig = 0 to 5000 psig
 7500psig = 0 to 7500 psig

Electrical Connection

H1131 = 3-pin, M12 *eurofast*®

Output Circuitry

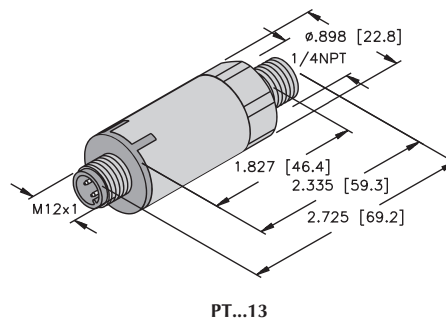
LI3 = 8-33 VDC / 4-20 mA Loop Powered
 LU2 = 11.4-33 VDC / 0-10 V

Fluid Connection

13 = 1/4 Male NPT

PRESSURE

Dimensional Drawings



TURCK

Pressure Instrumentation

PT Pressure Transmitters Scaled in Bar

- Pre-Scaled in Ranges up to 600 Bar
- Relative or Absolute Versions
- IP67
- Robust Ceramic Measuring Element



Performance			
Accuracy	≤0.3% of full scale	Total of linearity, hysteresis and repeatability	
Zero Shift	<±0.015% of measuring range	/ °C	
Span Shift.	<±0.015% of measuring range	/ °C	
Environmental Data			
Ambient Temperature	-40°C to 85°C		
Medium Temperature.	-40°C to +150°C (-40°F to +302°F)		
Enclosure Rating	IP 67		
Housing Material	Stainless Steel 1.430 (AISI 303) / PBT		
Shock Resistance	75 G, 11 ms per IEC 68-2-27		
Vibration Resistance	20 G, 15 mm per IEC 68-2-6		
Wetted Parts (PT)	303 Stainless Steel (connection), AL ₂ O ₃ Ceramic (measuring cell), Viton (seal)		
Electrical Data			
Current Consumption.	≤20 mA		
Dynamic Response	<2 ms		
Short-Circuit Protection	Yes		
Reverse Polarity Protection	Yes		
Mating Cordset	RK 4T-*/S618 (Length in meters)		
Output	4-20 mA Loop Powered.	0-10 V	
Voltage Output	8-33 VDC.	11.4 VDC	
Load	$\leq \frac{\text{supply voltage}}{0.02 \text{ A}} = \text{Ohm} >10 \text{ k } \Omega/ <100 \text{ nF}$		
Wiring Diagram			





Pressure Transmitter Part Number Key

Pressure Transmitter (scaled in bar)

PT 010 R - 11 - LI3 - H1131

Style

PT = Pressure Transmitter

Pressure Range

01V = -1 to 0 bar (-14.5 to 0 psi) (vacuum)
 0.5 = 0 to 0.5 bar (0 to 7.25 psi)
 001 = 0 to 1 bar (0 to 14.5 psi)
 002 = 0 to 1.6 bar (0 to 23.2 psi)
 003 = 0 to 2.5 bar (0 to 36.25 psi)
 004 = 0 to 4 bar (0 to 58 psi)
 006 = 0 to 6 bar (0 to 87 psi)
 010 = 0 to 10 bar (0 to 145 psi)
 016 = 0 to 16 bar (0 to 232 psi)
 025 = 0 to 25 bar (0 to 362.5 psi)
 040 = 0 to 40 bar (0 to 580 psi)
 060 = 0 to 60 bar (0 to 860 psi)
 100 = 0 to 100 bar (0 to 1450 psi)
 160 = 0 to 160 bar (0 to 2320 psi)
 250 = 0 to 250 bar (0 to 3625 psi)
 400 = 0 to 400 bar (0 to 5800 psi)
 600 = 0 to 600 bar (0 to 8700 psi)

Electrical Connection

H1131 = 3-pin, M12 *eurofast*

Output Circuitry

LI3 = 8-33 VDC / 4-20 mA Loop Powered
 LU2 = 11.4-33 VDC / 0-10 V

Fluid Connection

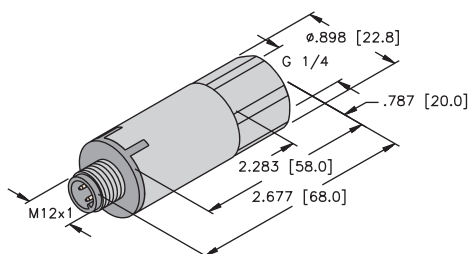
11 = G1/4 Female BSPP
 13 = 1/4 Male NPT

Measurement Type

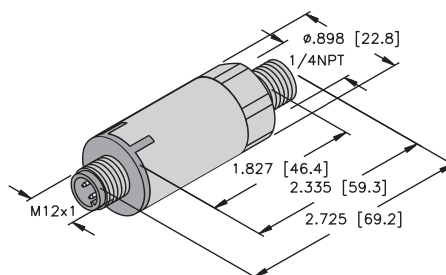
A = Absolute
 R = Relative

PRESSURE

Dimensional Drawing



PT..11



PT...13

TURCK

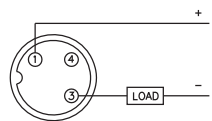
Pressure Instrumentation

PT 510 Pressure Transmitter

- Fully Welded Stainless Steel Measuring Element
- Refrigeration and Pumping Applications
- IP67



Performance	
Accuracy	≤0.5% of full scale Total of linearity, hysteresis and repeatability
Zero Shift	<±0.015% of measuring range / °C
Span Shift	<±0.015% of measuring range / °C
Environmental Data	
Ambient Temperature	-40°C to 85°C
Medium Temperature.	-40°C to +150°C (-40°F to +302°F)
Enclosure Rating	IP 67
Housing Material	Stainless Steel 1.430 (AISI 303) / PBT
Shock Resistance	75 G, 11 ms per IEC 68-2-27
Vibration Resistance	20 G, 15 mm per IEC 68-2-6
Wetted Parts (PT)	303 Stainless Steel (connection), AL ₂ O ₃ Ceramic (measuring cell), Viton (seal)
Wetted Parts (PT510)	303 Stainless Steel (connection), 430 F Stainless Steel (measuring cell)
Electrical Data	
Current Consumption	≤20 mA
Dynamic Response	<2 ms
Short-Circuit Protection	Yes
Reverse Polarity Protection	Yes
Mating Cordset	RK 4T-*/S618 (*=Length in meters)
Output	
Output	4-20 mA Loop Powered
Voltage	8-33 VDC
Current Output	≤ $\frac{\text{supply voltage}}{0.02 \text{ A}}$ = Ohm
Wiring Diagram	





Pressure Transmitter Part Number Key

Pressure Transmitter - PT510

PT510

100psig

- 13

- LI3

- H1131

Style

PT510 = Pressure Transmitter Stainless Steel
Diaphragm

Pressure Range

100psig = 0 to 100 psig (0 to 6.8 bar)
 200psig = 0 to 200 psig (0 to 13.7 bar)
 300psig = 0 to 300 psig (0 to 20.6 bar)
 500psig = 0 to 500 psig (0 to 34.4 bar)

Electrical Connection

H1131 = 3-pin, M12 *eurofast*

Output Circuitry

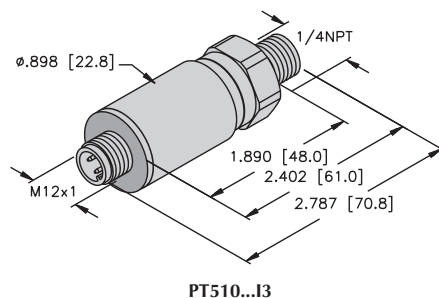
LI3 = 8-33 VDC / 4-20 mA Loop Powered

Fluid Connection

13 = 1/4 Male NPT

PRESSURE

Dimensional Drawing





TURCK

Pressure Instrumentation

TURCK Pressure Sensors and Transmitters with Diaphragms Installed

Operation In pressure applications, there is a need to separate the pressure sensor from the media it is sensing via an isolation device. **TURCK** offers a variety of diaphragm seals that are attached either directly or remotely to the pressure device to provide this isolation. The diaphragms that **TURCK** offers are not available as a separate item. This ensures that the quality of the assembly is maintained for optimum accuracy.

The **TURCK** pressure sensor is attached into the top of the diaphragm housing, which is then filled with fluid. The sensor receives the pressure hydraulically via this internal medium. The lower half of the diaphragm housing adapts to the process connection, and is designed to contain the process medium as it acts against the thin membrane located between the two housings.

Applications Process applications that require the use of a diaphragm include:

- Sanitary applications
- Corrosive processes
- Viscous applications
- Applications where freezing media can clog the sensor



Pressure Transmitter with
S1605 Sanitary Diaphragm

Innovative Pressure Sensor and Diaphragm Solutions

TURCK is the market leader in providing innovative sensor solutions for industrial automation applications. **TURCK's** high quality, high performance pressure sensors and pressure transmitters can be combined with multiple styles of diaphragms to give our customers an infinite selection of unique pressure sensing solutions.

TURCK offers diaphragms in numerous wetted material options, as well as with many different fill fluids. This broad selection provides custom sensing solutions for the most diverse pressure applications. Part numbers should be developed through your **TURCK** representative or application support. In general, the formula below illustrates how to configure a custom sensor and diaphragm assembly.



Pressure Transmitter



Diaphragm Modifier



New Part Number:

PT010R-11-LI3-H1131

+

S1693

=

PT010R-11-LI3-H1131/S1693

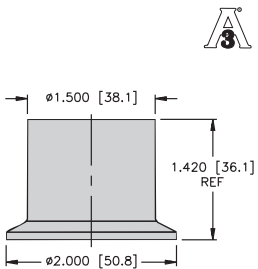
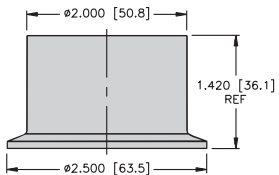
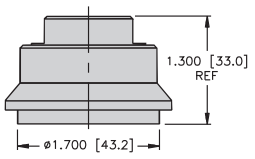
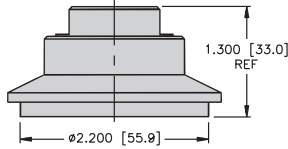


Notes:



TURCK

Pressure Instrumentation

Housing Style	Part Number	Process Connection	Lower Housing	Diaphragm	Upper Housing	Fill Fluid	Maximum Working Pressure at 100°F	Standards
Sanitary Diaphragm 	PT.../S1604 PS.../S1604	1.5 in. Tri-clamp	316 L	316 L	316 L	Neobe M20	600 psi	3A 37-01
Sanitary Diaphragm 	PT.../S1605 PS.../S1605	2.0 in. Tri-clamp	316 L	316 L	316 L	Neobe M20	600 psi	3A 37-01
Sanitary Diaphragm 	PT.../S1691 PS.../S1691	1.5 in. Cherry-Burrel	316 L	316 L	316 L	Neobe M20	250 psi	3A 37-01
Sanitary Diaphragm 	PT.../S1692 PS.../S1692	2.0 in. Cherry-Burrel	316 L	316 L	316 L	Neobe M20	250 psi	3A 37-01

Diaphragm seals must be ordered factory assembled with any **TURCK** pressure sensor or pressure transmitter.
For optional fill fluids and materials see page A30 at the end of this section.

Due to the continuous improvement, dimensions/specifications are subject to change without notice.



Housing Style	Part Number	Process Connection	Lower Housing	Diaphragm	Upper Housing	Fill Fluid	Maximum Working Pressure at 100°F	Standards
Sanitary Diaphragm 	PT.../S1693 PS.../S1693	1.5 in. Bevel Seat	316 L	316 L	316 L	Neobe M20	250 psi	3A 37-01
Sanitary Diaphragm 	PT.../S1694 PS.../S1694	2.0 in. Bevel Seat	316 L	316 L	316 L	Neobe M20	250 psi	3A 37-01
Sanitary Diaphragm 	PT.../S1689 PS.../S1689	Anderson Long Shell	316 L	316 L	316 L	Neobe M20	200 psi	3A 37-01
Sanitary Diaphragm 	PT.../S1695 PS.../S1695	Anderson Short Shell	316 L	316 L	316 L	Neobe M20	200 psi	3A 37-01

Diaphragm seals must be ordered factory assembled with any **TURCK** pressure sensor or pressure transmitter.
 For optional fill fluids and materials see page A30 at the end of this section.

Due to the continuous improvement, dimensions/specifications are subject to change without notice.



TURCK

Pressure Instrumentation

Housing Style	Part Number	Process Connection	Lower Housing	Diaphragm	Upper Housing	Fill Fluid	Maximum Working Pressure at 100°F
Fully Welded Diaphragm Seal 	PT.../S1685 PS.../S1685	1/4 NPT Female	316 L	316 L	316 L	Silicone DC200	2500 psi
Fully Welded Diaphragm Seal, Clean Out Port 	PT.../S1593 PS.../S1593	1/4 NPT Female	316 L	316 L	316 L	Silicone DC200	2500 psi
General Purpose, Welded Diaphragm 	PT.../S1049 PS.../S1049	1/2 NPT Female	316 L	316 L	316 L	Silicone DC200	2500 psi
General Purpose, Welded Diaphragm, Flush Port 	PT.../S1700 PS.../S1700	1/2 NPT Female	316 L	316 L	Carbon Steel	Silicone DC200	2500 psi

Diaphragm seals must be ordered factory assembled with any **TURCK** pressure sensor or pressure transmitter.
For optional fill fluids and materials see page A30 at the end of this section.

Due to the continuous improvement, dimensions/specifications are subject to change without notice.



Housing Style	Part Number	Process Connection	Lower Housing	Diaphragm	Upper Housing	Fill Fluid	Maximum Working Pressure at 100°F
General Purpose, Welded Diaphragm 	PT.../S1701 PS.../S1701	1/2 NPT Female	316 L	316 L	Carbon Steel	Silicone DC200	2500 psi
General Purpose, Welded Diaphragm, Flush Port 	PT.../S1702 PS.../S1702	1/2 NPT Female	316 L	316 L	Carbon Steel	Silicone DC200	2500 psi
Chemical Resistant, Welded Diaphragm 	PT.../S1731 PS.../S1731	1/2 NPT Female	PVC	Hastelloy C276	316 L	Silicone DC200	200 psi
Chemical Resistant, Welded Diaphragm 	PT.../S1733 PS.../S1733	1/2 NPT Female	PVC	Hastelloy C276	Carbon Steel	Silicone DC200	200 psi

Diaphragm seals must be ordered factory assembled with any **TURCK** pressure sensor or pressure transmitter.
 For optional fill fluids and materials see page A30 at the end of this section.

Due to the continuous improvement, dimensions/specifications are subject to change without notice.

PRESSURE



TURCK

Pressure Instrumentation

Housing Style	Part Number	Process Connection	Lower Housing	Diaphragm	Upper Housing	Fill Fluid	Maximum Working Pressure at 100°F
Flush Mount Diaphragm 	PT.../S1704 PS.../S1704	1-1/2 NPT Male	316 L	316 L	316 L	Silicone DC200	3500 psi
Flush Mount Diaphragm 	PT.../S1705 PS.../S1705	2 NPT Male	316 L	316 L	316 L	Silicone DC200	2500 psi

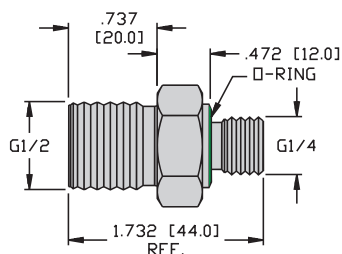
Diaphragm seals must be ordered factory assembled with any **TURCK** pressure sensor or pressure transmitter.

For optional fill fluids and materials see page A30 at the end of this section.

Due to the continuous improvement, dimensions/specifications are subject to change without notice.

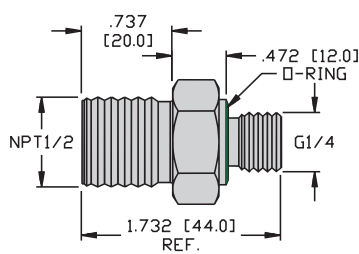
Accessories

Adapter, G1/4 to G1/2
(316 Stainless Steel)
.945 [24.0] across flats



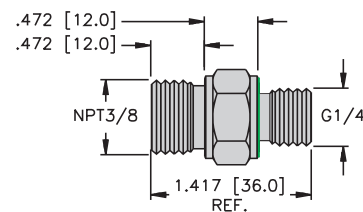
PCV-G1/2A4
(M6835012)

Adapter, G1/4 to 1/2NPT
(316 Stainless Steel)
.748 [19.0] across flats



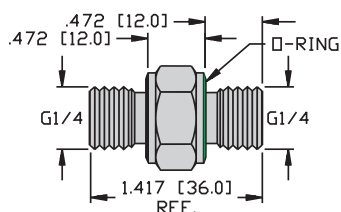
PCV-N1/2A4
(M6835013)

Adapter, G1/4 to 3/8NPT
(316 Stainless Steel)
.945 [24.0] across flats



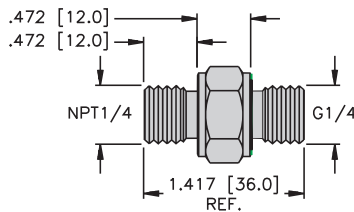
PCV-N3/8A4
(M6835020)

Adapter, G1/4 to G1/4
(316 Stainless Steel)
.748 [19.0] across flats



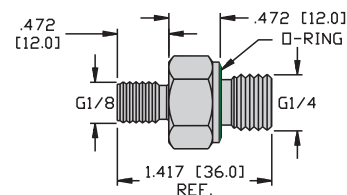
PCV-G1/4A4
(M6835011)

Adapter, G1/4 to 1/4 NPT
(316 Stainless Steel)
.748 [19.0] across flats



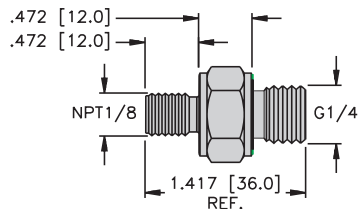
PCV-N1/4A4
(M6835022)

Adapter, G1/4 to G1/8
(316 Stainless Steel)
.748 [19.0] across flats



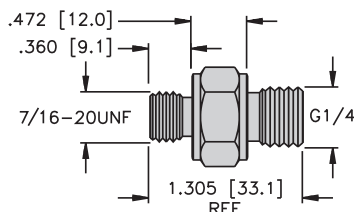
PCV-G1/8A4
(M6835014)

Adapter, G1/4 to 1/8NPT(316
Stainless Steel)
.748 [19.0] across flats



PCV-N1/8A4
(M6835021)

Adapter, G1/4 to 7/16 SAE
(316 Stainless Steel)
.748 [19.0] across flats

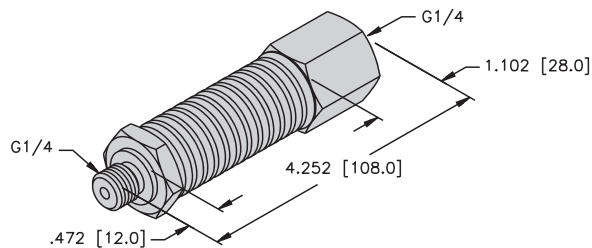


PCV-S7/16A4
(A9136)

PRESSURE

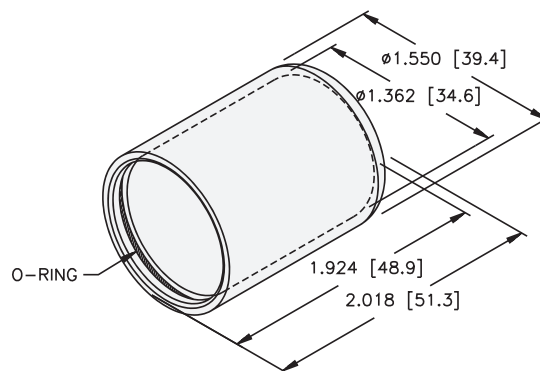
Accessories

Heat Sink (316 Stainless Steel)

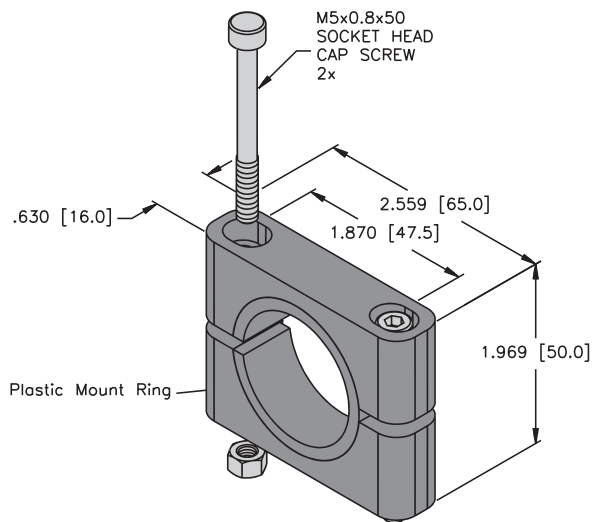
**PCS-G1/4A4**
(M6835015)

Maximum reduction of 40°C at 120°C.
Example: 120°C is reduced to 80°C.

Clear Cap

**PTS-COVER**
(A9350)

Heat Sink (316 Stainless Steel)

**PTS-MB**
(A9422)

Diaphragm Seal Optional Materials

Optional Fill Fluids

Diaphragm Fill Fluids	Application Range (°C)	Specific Gravity at 25°C	Viscosity at 25°C
Silicone DC200-10CS	-45 to 205	0.93	10
Silicone DC 704	0 to 315	1.07	39
Silicone DC 710	5 to 345	1.11	500
Fluorolube FS-5	-40 to 150	1.88	7.8
Halocarbon Oil 6.3	-40 to 235	1.88	10.6
Halocarbon Oil 4.2	-45 to 175	1.85	6.5
Neobee-20	-15 to 205	0.92	9.8



Diaphragm Seal Optional Materials

Optional Materials

Housing Material			
Wetted			Non-Wetted
304 SS (304)	Hast-C22 (HAS2)	Nickel 200 (NICK)	304 SS (304) 316 SS (316) Carbon Steel (STL) Monel 400 (MON)
304L SS (304L)	Hastelloy B-2 (HASB)	PVC	
316 SS (316)	Hastelloy C-276 (HASC)	Tantalum (TANT)	
316Ti SS	Inconel 600 (INC)	Teflon-25%GF (TFGF) (+1500°F max.)	
Carbon Steel (STL)	Inconel 625 (I625)	Titanium GR.4 (TIT)	
Carpenter 20 (C20)	Monel 400 (MON)	Zirconium 702 (ZIRC)	

Diaphragm Material			
Wetted			
304L SS (304L)	Hastelloy B-2 (HASB)	Silver (SILV)	
316L SS (316L)	Hastelloy C-276 (HASC)	Tantalum (TANT)	
321 SS (321)	Inconel 600 (INC)	Teflon Coated Metal	
Buna N (NBR) (1250 psi; +2500°F)	Kalrez 1050LF (KALR)	Teflon (TFE) (1250 psi; +3500°F)	
Carpenter 20 (C20)	Kel-F (KELF) (1250 psi; +4000°F)	Titanium GR4 (TIT)	
(for anti-stick purposes only)	Monel 400 (MON)	Viton A (VIT) (1250 psi; +3500°F)	
Gold (GOLD)	Nickel 200 (NICK)	Zirconium 702 (ZIRC)	
Hast - C22 (HAS2)	Nickel 201 (N201)		

Gasket Material			
Wetted			
	Grafoil (GRAF)	PTFE (3510) (-400°F to +2000°F)	
	Non-Asbestos (4401)	PTFE (K2) (-500°F to +4500°F)	

O-Ring Material			
Wetted			
	Buna N (NBR) (-100°F to +2500°F)	Teflon (TFE) (-400°F to +3500°F)	
	Kalrez (KALR)	Viton A (VIT) (-100°F to +3500°F)	

Pressure Conversion⁽¹⁾

From / To	PSI	KPA	inH ₂ O ⁽²⁾	mmH ₂ O	inHg ⁽³⁾	mmHg	Bar	mBars	Kg/cm ²	gm/cm ²
PSI	1	6.8948	27.7620	705.1500	2.0360	51.7149	0.0689	68.9470	0.0703	70.3070
KPA	0.1450	1	4.0266	102.2742	0.2953	7.5006	0.0100	10.0000	0.0102	10.197
inH ₂ O	0.0361	0.2483	1	25.4210	0.0734	1.8650	0.0025	2.4864	0.0025	2.5355
mmH ₂ O	0.0014	0.0098	0.0394	1	0.0028	0.0734	0.0001	0.0979	0.00001	0.0982
inHg	0.4912	3.3867	13.6195	345.936	1	25.4000	0.0339	33.8639	0.0345	34.532
mmHg	0.0193	0.1331	0.5362	13.6195	0.0394	1	0.0013	1.3332	0.0014	1.3595
Bar	14.5040	100.000	402.180	10215.0	29.5300	750.060	1	1000	1.0197	1019.72
mBars	0.0145	0.1000	0.4022	10.2150	0.0295	0.7501	0.001	1	0.0010	1.0197
Kg/cm ²	14.2233	97.9047	394.408	10018.0	28.9590	735.559	0.9000	980.700	1	1000
gm/cm ²	0.0142	0.0979	0.3944	10.0180	0.0290	0.7356	0.0009	0.9807	0.001	1

(1) Example:

$$1 \text{ mm Hg} = 0.5362 \text{ inH}_2\text{O} = 1.3332 \text{ mBars}$$

$$97 \text{ mm Hg} = 97(0.5362) = 52.0114 \text{ inH}_2\text{O}$$

$$97 \text{ mm Hg} = 97(1.332) = 129.3204 \text{ mBars}$$

(2) at 60°F

(3) at 32°F



Flow Monitors Selection Guide

Housing	Style	Technology	Advantage	Page
FMI 	Magnetic Inductive (MID)	Magnetic Inductive	• Meter for electrically conductive fluids • $\pm 2\%$ of reading accuracy • 0-9.9 GPM or 0-20 GPM models	B3
FTCI 	Digital Read Out (DRO)	Calorimetric	• Displays flow & temperature • Linearized, output for water, water/glycol mixtures, Galden® HT, ZT • Set points for flow & temperature	B7
FCI 	Inline	Calorimetric	• Intrinsically safe models (ATEX approval) • Faster response time than probes • Probe lengths vary for larger pipes • Remote mounting options (requires remote amplifier)	B17
FCS 	Probe	Calorimetric	• Probe lengths vary for larger pipes • Remote mounting options (requires remote amplifier) • Intrinsically safe models (ATEX approval)	B31
FCS.../A 	Airflow	Calorimetric	• Can measure air and other inert gases • Probes and inlines available	B59

A Variety of Flow Sensors for All of Your Flow Applications

TURCK's flow sensor's rugged design and high repeatability brings a new level of reliability to flow monitoring. Many sensors have an enclosure rating of IP 67, in addition to a pressure rating of 1450 psi, while other models are able to withstand aggressive materials such as acids and caustics. **TURCK** flow sensors are available as in-line models, self-contained devices or remote probe styles (with a separate signal processor), and are able to perform in many different applications, such as liquids, gases and air flow. **TURCK** calometric flow monitors have a temperature gradient of 4°C/sec, which allows them to respond rapidly to changes in temperature and makes them especially suited for monitoring coolant flow to weld tips. Our wide range of flow products offer a solution to many flow applications.



TURCK State with No Moving Parts devices that operate on the calorimetric or magnetic inductive principle. With either technology there are no moving parts that may break off or become lodged in the pipeline. Often in impure or "dirty" flow applications, mechanical devices tend to become frozen or stuck in the "open" position making **TURCK** electronic sensors a much better choice in these situations. No matter how demanding your application, you now have a solution that installs easily, performs dependably and does not result in expensive downtime.

Product Features

- All wetted parts are made of Stainless Steel, Titanium, Hastelloy or Teflon
- Omni-directional monitoring allows you to monitor the flow in any direction
- Automatic temperature compensation allows for sudden shifts in flow temperature within specified extremes



TURCK offers longer probe lengths for use in applications where there is a larger pipe, or long standoff, in many different probe style flow sensors. These probes are available in 20 millimeter increments with a maximum length of 220 millimeters. Consult factory for more information.



TURCK

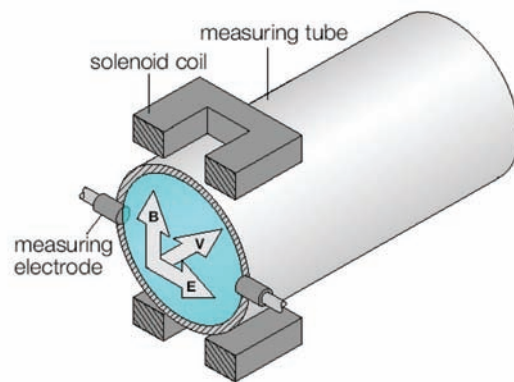
Flow Monitors

FCMI Magnetic Inductive Flow Meter

Widely Applicable Magnetic inductive flow meter was designed for measuring electrically conductive liquids. Its measuring range is ideal for applications with low to medium flow rates.

Magnetic Inductive Principle

based on the inductive principle discovered by Faraday. Freely moving charge carriers in the fluid are driven to the pipe wall due to the magnetic field that permeates the measuring pipe. Because the load is separated, a potential difference is created, which is detected by two laterally mounted electrodes. Based on the known magnetic field and the electrode spacing, the measured potential difference at the electrodes is proportional to the flow speed



Product Features

- Flow meter for a broad range of applications
- Measuring accuracy: 2% of the measured value
- Unobstructed pipe diameter without pressure loss
- Minimum conductivity: $10 \mu\text{S/cm}$
For example: water = $15 \mu\text{S/cm}$
- Push button programming (access code protected)
- Device available with 1 switching output and linear 4-20 mA analog output

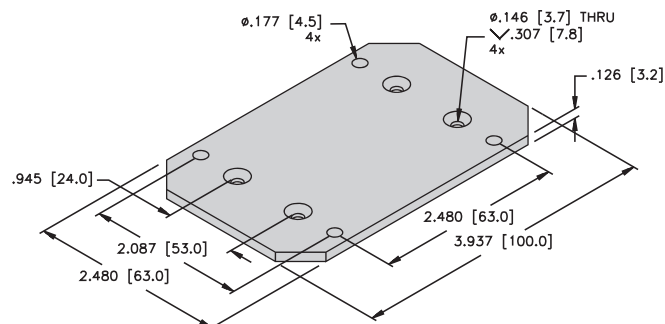


Cost Saving

Magnetic inductive flow meters have no moving parts. The sensor is completely wear-free and resistant to residue in the medium. In contrast to other measuring principles, there is no reduction of the pipe diameter and no obstructions in the flow.

Accessories

The sensor can be secured using the four M4 threaded holes located on the bottom of the housing. An optional mounting plate, FCI-BP, is also available.





Digital Read Out Flow Sensor - Magnetic Inductive Part Number Key

FCMI - 3/8 D08 DYA4P - LI-UP8X - H1141

Sensor Type

FCMI = Flow sensor magnetic inductive

Fluid Connection

3/8 = 3/8" swage

3/4 = 3/4" swage

Inline Diameter

D08 = 8 mm

D12 = 12 mm

Electrical Connection

H1141 = *eurofast*®

Circuitry

LI-UP8X = 1 PNP N.O./N.C. and 4-20 mA

Housing

DYA4P = 316 Stainless Steel with PBT/PVDF

Technical Data:

Operating Voltage 21-26 VDC
 Current Consumption <100 mA
 Switching Output PNP, N.O./N.C. Programmable
 Switching Current. <200mA.
 Analog Output 4-20 mA (Linear)
 Analog Output 2 mA
 Load R_L 200 to 500 Ω

Measuring Tolerance 3/8" Unit:

0.00-1.32 gpm 0.0-5.0 l/min 0.027gpm
 1.33-9.99 gpm 5.1-37.8 l/min $\leq \pm 2\%$ of Measured Value

Measuring Tolerance 3/4" Unit:

0-2.0 gpm <+/- .1gpm
 2.1-20 gpm $\leq \pm 2\%$ of Measured Value

Operating Range See Table 1
 Adjustable Range SP1 See Table 1
 Hysteresis SP1 See Table 1
 Ambient Temperature 0-60°C
 Media Temperature. 5-60°C
 Electrical Conductivity of the Medium $\geq 10 \mu\text{S/cm}$ ($\geq 15 \mu\text{S/cm}$ for Water)
 Switch-on/Switch-off Delay 0-50 s
 Availability Time 6-10 s
 Response Time 0.5 s output can be averaged over 8 seconds.
 Sensor Material A4 (AISI 316Ti) and PVDF
 Process Connection Material A4 (AISI 316Ti)
 Housing Material PBT
 Pressure Resistance 10 Bar
 Flow Rate Display. 7-Segments/3 Digits
 Connection 4-Pole, M12 x 1

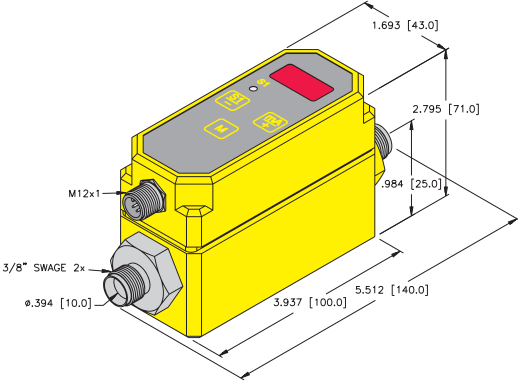
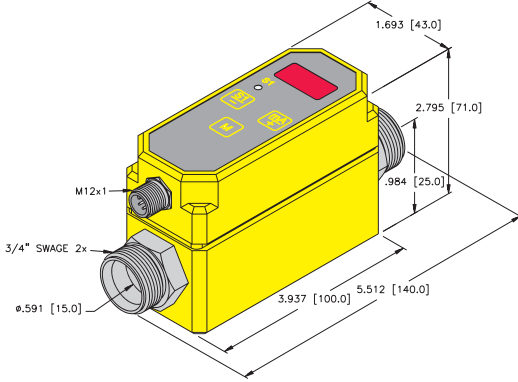
Table 1: Parameter Ranges for Available Models

Size	Detection Range Flow	Adjustment Range SP1	Hysteresis Flow Switch Points	Analog Start Point Range	Analog End Point Range
3/8"	0.0 to 9.99 gpm 0.0 to 37.8 l/min	0.5 to 9.95 gpm 1.8 to 37.8 l/min	0.05 to 1.5 gpm 0.2 to 5.6 l/min	0.0 to 2.5 gpm 0.0 to 9.4 l/min	2.5 to 9.99 gpm 9.4 to 37.8 l/min
3/4"	0.0 to 20 gpm 0.0 to 75.7 l/min	1.0 to 20 gpm 3.7 to 75.7 l/min	0.1 to 2 gpm 0.4 to 7.5 gpm	0.0 to 15 gpm 0.0 to 56.8 l/min	5.0 to 20 gpm 18.9 to 75.7 l/min



TURCK

Flow Monitors

Housing Style	Part Number	ID Number	Flow Detection Range	Output Flow
Inline Magnetic Inductive Flow Meter, Digital Readout, 3/8" Tubing Connection 	FCMI-3/8D08DYA4P-LI-UP8X-H1141	M6870816	0 to 9.99 gpm	4-20 mA Linear Analog w/ 1 PNP N.O./N.C.
Inline Magnetic Inductive Flow Meter, Digital Readout, 3/4" Tubing Connection 	FCMI-3/4D12DYA4P-LI-UP8X-H1141	M6870817	0 to 20 gpm	4-20 mA Linear Analog w/ 1 PNP N.O./N.C.

Compatible Fluids: Conductive fluids $>10 \mu\text{S}/\text{cm}$
Accessories on pages B73-B74.



Industrial Automation

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 Industrial
 Automation

Voltage	Current Consumption (mA)	Switching Current (mA)	Pressure Rating (psi)	Fluid Connection	Media Temp (°C)	Ambient Temp (°C)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagram
21-26 VDC	≤100	200	145	3/8" swage	5-60	0-60	IP 65	RK 4.4T-*	1	Diagram 1
21-26 VDC	≤100	200	145	3/4" swage	5-60	0-60	IP 65	RK 4.4T-*	1	

* Length in meters.

FLOW



TURCK

Flow Monitors

A Digital Read Out Flow Sensor for Your Flow Monitoring Applications

The rugged design and high repeatability of **TURCK's** Digital Read Out (DRO) flow sensor brings a new level of reliability to flow monitoring. This self-contained, fully programmable sensor allows for both flow and temperature monitoring, and features a highly visible three-digit display that can alternate between flow rate and media temperature when required.

The DRO flow monitor allows the user to program set points specific to an application, and can be programmed to perform in many different media, such as water, glycol and Galden HT, ZT. If the fluid is a glycol/water mix, the percentage of glycol can be programmed so that the monitor can adjust to each unique application without the need for factory calibration.

The DRO flow monitor has an adjustable filter to smooth out a variety of erratic flow conditions, and is able to monitor changes in flow as low as 0.2 gallons per minute (gpm) or as fast as 12 gpm.

Typical Applications:

DO flow monitors may be programmed with two different set points that reflect flow rate, or it can be programmed to have the second output monitor temperature. The DO flow monitor also features programmable on and off time delay functions, and allows the user to define hysteresis for both the gpm and temperature set points. It is manufactured with a standard **eurofast**® M12 connector, has a pressure resistance of 145 psi, and can be ordered with a number of different fluid connections, making the DO flow monitor an economical solution for your demanding flow applications.

- Weld tip protection
- Transformer cooling
- Process chamber cooling
- Hot roller coolant





Digital Read Out Flow Monitor Part Number Key

FTCI	-	3/8	D10	A4P	-	2UP8X	-	H1141	Special Option Codes
Sensor Type FTCI = Inline Flow and Temperature Sensor					Electrical Connection H1141 = <i>eurofast</i> ® H1160 = <i>eurofast</i>				
Fluid Connection 3/8 = 3/8" swage 1/2 = 1/2" swage 3/4 = 3/4" swage					Circuitry 2UP8X = Dual PNP N.O./N.C. 4UP8X = 4 PNP N.O./N.C. LI-UP8X = 1 PNP N.O./N.C. and 4-20 mA				
Inline Diameter D10 = 10 mm D15 = 15 mm					Housing A4P = 316 Stainless Steel with PBT				

FLOW



DO Flow - DC

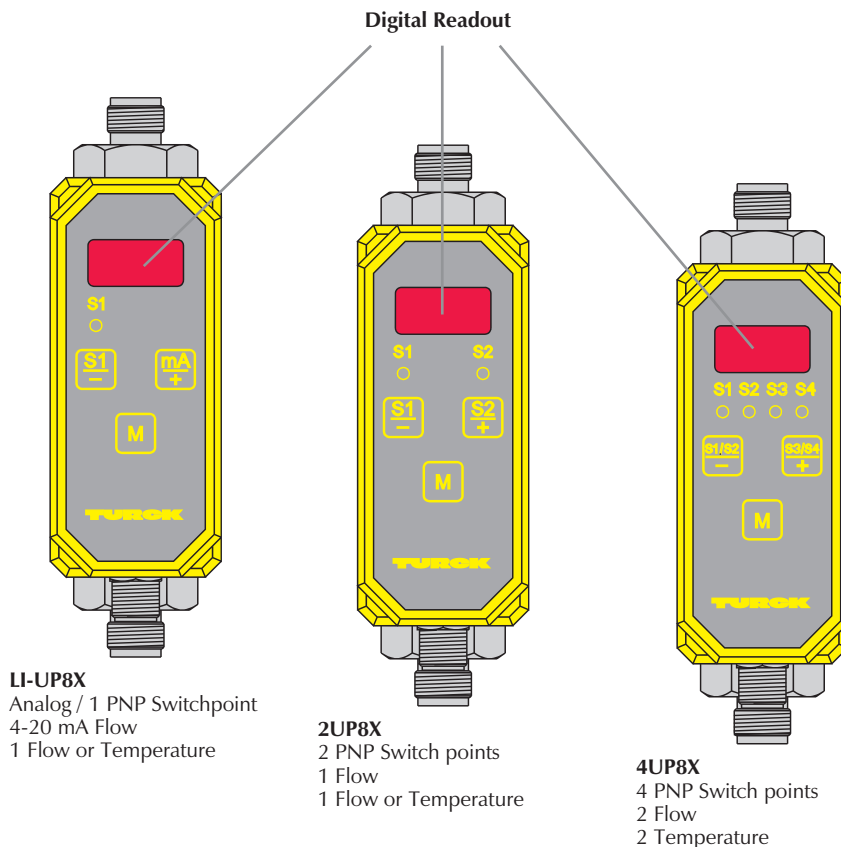
Time Delay Before Availability	2-15 seconds (8 seconds typical)
Response Time	0.5-3 seconds
Maximum Temperature Gradient	4.2°C / Sec.
Temperature Set-point Range	-10 to 90°C
Medium Temperature	-10 to 90°C
Ambient Temperature	0 to 60°C

Product Features

- Selectable media inputs
- Flow/temperature readout
- User programmable set points
- User programmable keypad
- Mounts directly into pipeline
- 3 Digit - highly visible display
- Adjustable on and off delay
- Adjustable filtering
- Low pressure drop
- Solid-state device
- Stainless steel wetted parts
- Password protected programming

Selectable Media

- Water
- Deionized water
- Ethylene glycol (0-70%)
- Galden® HT, ZT



TURCK

Flow Monitors


[Return to Main Selection Guide](#)


Housing Style	Part Number	ID Number	Flow Detection Range (CPM)	Temperature Monitoring Range (°C)	Output 1: Flow	Output 2: Temperature or Flow
Inline Flow Monitor, Digital Readout, 3/8" Tubing Connection 	FTCI-3/8D10A4P-2UP8X-H1141	M6870806	0.2 to 4	-10 to +90	PNP N.O./N.C.	PNP N.O./N.C.
Inline Flow Monitor, Digital Readout, 1/2" Tubing Connection 	FTCI-1/2D10A4P-2UP8X-H1141	M6870807	0.2 to 5	-10 to +90	PNP N.O./N.C.	PNP N.O./N.C.
Inline Flow Monitor, Digital Readout, 3/4" Tubing Connection 	FTCI-3/4D15A4P-2UP8X-H1141	M6870808	1 to 12	-10 to +90	PNP N.O./N.C.	PNP N.O./N.C.

Compatible Fluids: Water, Deionized Water, Ethylene Glycol (0-70%), Galden® HT, ZT.
Accessories on pages B73-B74.

Material

Housing	PBT
Wetted Parts	316 Ti Stainless Steel
O-Ring	FKM



Industrial Automation

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 Industrial
 Automation

Voltage	Current Consumption (mA)	Switching Current (mA)	Pressure Rating (psi)	Fluid Connection	Media Temperature (°C)	Ambient Temperature (°C)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagram
21.6-26.4 VDC	≤100	200	290	3/8" swage	0 to +60	-10 to +90	IP 65	RK 4.4T-*	1	Diagram 1
21.6-26.4 VDC	≤100	200	290	1/2" swage	0 to +60	-10 to +90	IP 65	RK 4.4T-*	1	
21.6-26.4 VDC	≤100	200	290	3/4" swage	0 to +60	-10 to +90	IP 65	RK 4.4T-*	1	

* Length in meters.

FLOW

TURCK

Flow Monitors


[Return to Main Selection Guide](#)


Housing Style	Part Number	ID Number	Flow Detection Range (GPM)	Temperature Monitoring Range (°C)	Output 1 & 2: Flow	Output 3 & 4: Temperature
Inline Flow Monitor, Digital Readout, 3/8" Tubing Connection	FTCI-3/8D10A4P-4UP8X-H1160	M6870814	0.2 to 4	-10 to +90	PNP N.O./N.C.	PNP N.O./N.C.
Inline Flow Monitor, Digital Readout, 1/2" Tubing Connection	FTCI-1/2D10A4P-4UP8X-H1160	M6870815	0.2 to 5	-10 to +90	PNP N.O./N.C.	PNP N.O./N.C.
Inline Flow Monitor, Digital Readout, 3/4" Tubing Connection	FTCI-3/4D15A4P-4UP8X-H1160	M6870813	1 to 12	-10 to +90	PNP N.O./N.C.	PNP N.O./N.C.

Compatible Fluids: Water, Deionized Water, Ethylene Glycol (0-70%), Galden® HT, ZT.
Accessories on pages B73-B74.



Voltage	Current Consumption (mA)	Switching Current (mA)	Pressure Rating (psi)	Fluid Connection	Media Temperature (°C)	Ambient Temperature (°C)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagram
21.6-26.4 VDC	≤100	200	290	3/8" swage	-10 to -90	0 to +60	IP 65	RKC 6T-*	1	Diagram 1
21.6-26.4 VDC	≤100	200	290	1/2" swage	-10 to -90	0 to +60	IP 65	RKC 6T-*	1	
21.6-26.4 VDC	≤100	200	290	3/4" swage	-10 to -90	0 to +60	IP 65	RKC 6T-*	1	

* Length in meters.

TURCK

Flow Monitors



Housing Style	Part Number	ID Number	Flow Detection Range (CPM)	Temperature Monitoring Range (°C)	Output 1: Flow or Temperature	Output 2: Flow
Inline Flow Monitor, Digital Readout, 3/8" Tubing Connection 	FTCI-3/8D10A4P-LI-UP8X-H1141	M6870809	0.2 to 4	-10 to +90	PNP N.O./N.C.	Analog 4-20 mA
Inline Flow Monitor, Digital Readout, 1/2" Tubing Connection 	FTCI-1/2D10A4P-LI-UP8X-H1141	M6870810	0.2 to 5	-10 to +90	PNP N.O./N.C.	Analog 4-20 mA
Inline Flow Monitor, Digital Readout, 3/4" Tubing Connection 	FTCI-3/4D15A4P-LI-UP8X-H1141	M6870811	1 to 12	-10 to +90	PNP N.O./N.C.	Analog 4-20 mA

Compatible Fluids: Water, Deionized Water, Ethylene Glycol (0-70%), Galden® HT, ZT.
 Accessories on pages B73-B74.



Voltage	Current Consumption (mA)	Switching Current (mA)	Pressure Rating (psi)	Fluid Connection	Media Temperature (°C)	Ambient Temperature (°C)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagram
21.6-26.4 VDC	≤100	200	290	3/8" swage	-10 to +90	0 to +60	IP 65	RK 4.4T-*	1	Diagram 1
21.6-26.4 VDC	≤100	200	290	1/2" swage	-10 to +90	0 to +60	IP 65	RK 4.4T-*	1	
21.6-26.4 VDC	≤100	200	290	3/4" swage	-10 to +90	0 to +60	IP 65	RK 4.4T-*	1	

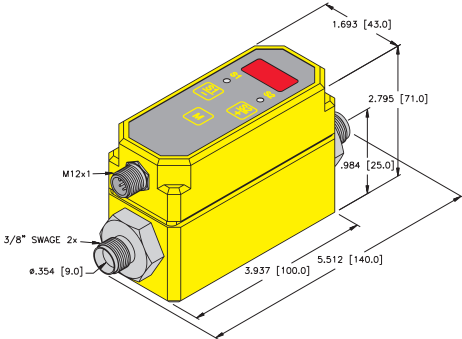
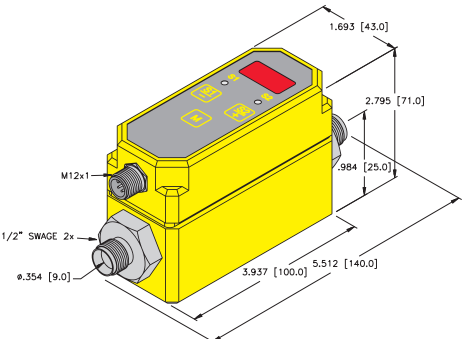
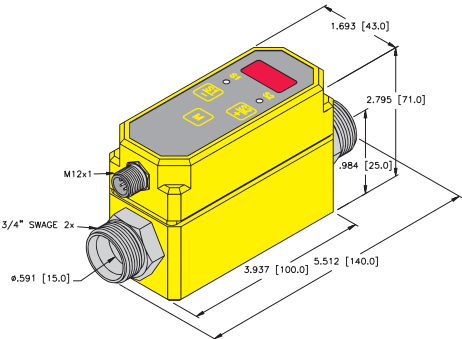
* Length in meters.

FLOW



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Flow Monitors

Housing Style	Part Number	ID Number	Flow Detection Range (water)	Temperature Monitoring Range (°C)	Output
Inline Flow Monitor, Digital Readout, 3/8" Tubing Connection 	FCI-D10A4P-2ARX-H1160/D201	M6870679	0.2 to 4 GPM	-18 to +100	Dual Relay N.O.
	FCI-D10A4P-2ARX-H1160/D203 (water only)	M6870680	0.2 to 4 GPM	-18 to +100	Dual Relay N.O.
Inline Flow Monitor, Digital Readout, 1/2" Tubing Connection 	FCI-D10A4P-2ARX-H1160/D205	M6870681	0.2 to 5 GPM	-18 to +100	Dual Relay N.O.
Inline Flow Monitor, Digital Readout, 3/4" Tubing Connection 	FCI-D10A4P-2ARX-H1160/D209	M6870684	1 to 12 GPM	-18 to +100	Dual Relay N.O.

Compatible Fluids: Water, Deionized Water, Ethylene Glycol (0-70%), Galden® HT, ZT.
Accessories on pages B73-B74.

Material

Housing	PBT
Wetted Parts	316 Stainless Steel
O-Ring	FKM



Voltage	Load Current/ Analog Load	Pressure Rating (psi)	Fluid Connection	Ambient Temperature (°C)	Media Temperature (°C)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagram
21.6-26.4 VDC	≤0.5 A at 30 VDC ≤1 A at 36 VAC	290	3/8" swage	0 to +60	-18 to +100	IP 65	RKC 6T-*	1	Diagram 1
21.6-26.4 VDC	≤0.5 A at 30 VDC ≤1 A at 36 VAC	290	3/8" swage	0 to +60	-10 to +95	IP 65	RKC 6T-*	1	
21.6-26.4 VDC	≤0.5 A at 30 VDC ≤1 A at 36 VAC	290	1/2" swage	0 to +60	-18 to +100	IP 65	RKC 6T-*	1	
21.6-26.4 VDC	≤0.5 A at 30 VDC ≤1 A at 36 VAC	290	3/4" swage	0 to +60	-18 to +100	IP 65	RKC 6T-*	1	

* Length in meters.

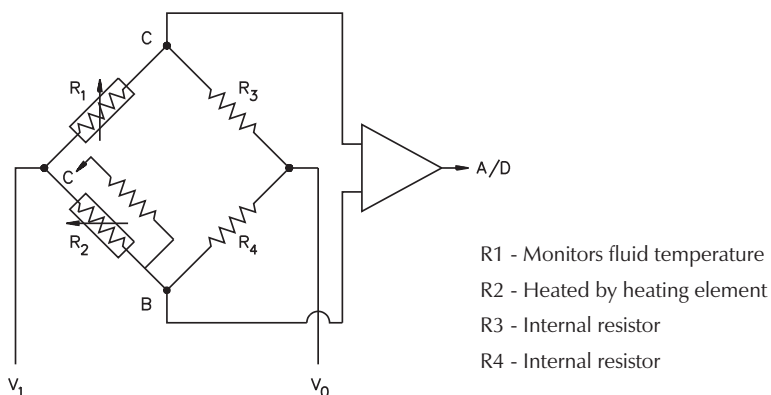
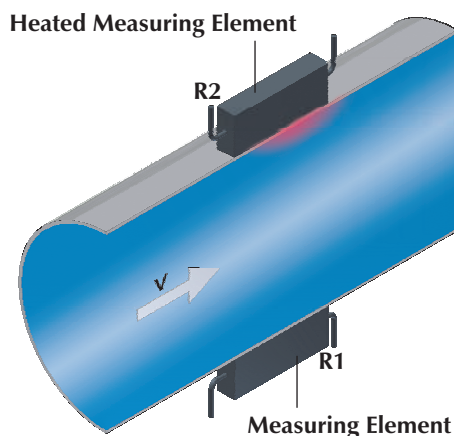
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Flow Monitors

Principles of Operation for Inline Flow Sensors

TURCK inline flow monitors operate using the calorimetric flow principle, which detects the transfer of heat in thermally conductive fluids. The temperature detecting elements are platinum RTDs. One of the elements (R1) detects the temperature of the fluid in the pipe and the resistor (R2) is connected to a heater. The heating element heats R2 to a temperature that is slightly above the temperature of the surrounding fluid. When there is no fluid flow, the difference between R1 and R2 remains constant. As the fluid moves through the sensor, heat is conducted away from the heated element causing the temperature of R2 to decrease. This heat loss causes the differential resistance input to the amplifier where the various outputs are generated.

With **TURCK's** inline flow monitor, the temperature elements are bonded directly to the outside of a flow through tube. This construction provides fast response times, low flow rate detection and pulsed flow monitoring. Additionally, viscous fluids can flow freely through the fully ported sensor, since the flow does not need to be disrupted to be detected.



The resistance difference is measured by a Wheatstone bridge circuit. A change in resistance difference causes a change in bridge voltage. The flow set point is determined by comparing the bridge voltage to a reference voltage.

Benefits of Inline Flow Sensors:

- No pressure loss
- Wide range of flow rates
- Fast response time
- Stackable

Applications:

- Flow/No flow
- Dispensing applications
- Viscous fluids
- Low and/or pulsing flows

See probe section (B31-B32?) for more information on the following:

- Response time
- Temperature gradient
- Time delay before availability
- Effects of housing material



Inline Flow Sensor Part Number Key

FCI - TC D04 A4P - AP8X - H1141 **Special Option Codes**

Sensor Type

FCI = Inline Flow Sensor

Fluid Connection

TC = Tubing Connection
 N1/8 = 1/8 NPT
 N1/4 = 1/4 NPT
 N3/4 = 3/4 NPT
 Blank = G1/4

Inline Diameter (millimeters)

D03 = 3 mm
 D04 = 4 mm
 D06 = 6 mm
 D08 = 8 mm
 D09 = 9 mm
 D10 = 10 mm
 D11 = 11 mm
 D20 = 20 mm

Electrical Connection

H1141 = *eurofast*®, 4-pin
 H1140 = *eurofast*, 4-pin
 H1160 = *eurofast*, 6-pin

Circuitry

AP8X = N.O. PNP
 AN8X = N.O. NPN
 ARX = N.O. Relay
 RRX = N.C. Relay
 LIX = 4-20 mA
 NA = Remote (requires MK or MS 96)
 NAEX = Intrinsically Safe
 2ARX = Dual N.O. Relay

Housing

A4 = 316 Stainless Steel
 A4P = 316 Stainless Steel with PBT Housing
 CTP = Ceramic / PTFE / PBT
 HC22 = Hastelloy C22

Special Option Codes

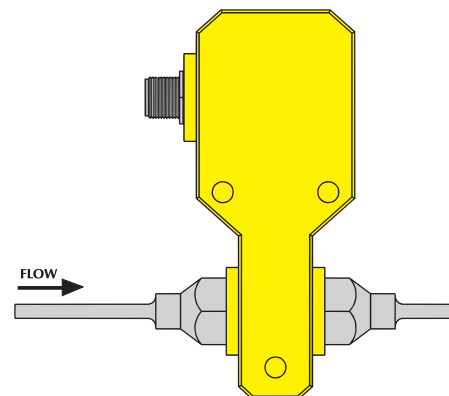
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D Number

/D038 = 3/8 in. Tubing Connection
 /D014 = Tri-Clamp Connection

FLOW

Proper Orientation For Self Contained Inline



Self Contained Inline - DC

Time Delay Before Availability. . . . 5-15 seconds (8 seconds typical)
 Response Time 0.5-3 seconds
 Maximum Temperature Gradient . . 6.6°C / Sec.



Remote Inline - DC

Time Delay Before Availability. . . . 2-15 seconds (8 seconds typical)
 Response Time 1-13 seconds (2 seconds typical)
 Maximum Temperature Gradient . . 4.2°C / Sec.

Set-up – Operating and Display Functions

Self Contained Inline



6 LEDs for flow rate status indication:



4 x green: degree of set point overrange
 (1, 2, 3, or 4 green LEDs are lit)

1 x yellow: flow is at/above set point
 1 x red: flow is below set point



≥ 20 mA
 > 16 mA
 > 12 mA
 > 8 mA
 > 4 mA
 ≤ 4 mA



Switch Point Versions

Potentiometer for adjustment of flow switch point



Analog Versions

Potentiometer for adjusting the 4 mA to the medium



Potentiometer for adjusting the span to 20 mA (not all applications may reach 20 mA)

TURCK

Flow Monitors



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Housing Style	Part Number	ID Number	Flow Detection Range (water)	Flow Detection Range (oil)	Output
Inline Flow Monitor, PBT Housing 	FCI-TCD04A4P-ARX-H1140	M6870626	1-200 ml/min.	Consult Factory	Relay N.O.
	FCI-TCD04A4P-AP8X-H1141	M6870656	1-200 ml/min.	Consult Factory	PNP N.O.
Inline Flow Monitor, PBT Housing 	FCI-D04A4P-AP8X-H1141	M6870640	15-1000 ml/min.	Consult Factory	PNP N.O.
Inline Flow Monitor, PBT Housing 	FCI-D08A4P-ARX-H1140/D038	M6870647	100-6000 ml/min.	Consult Factory	Relay N.O.
Inline Flow Monitor, PBT Housing 	FCI-D10A4P-AP8X-H1141	M6870642	100-6000 ml/min.	Consult Factory	PNP N.O.
	FCI-D10A4P-ARX-H1140	M6870644	100-6000 ml/min.	Consult Factory	Relay N.O.

Technical data on pages B17-B18.

Accessories on page B73-B74.

† 3/8 Compression fitting: FSV-SS 3/8 KIT

Material

Housing	PBT
Cable Connector	303 Stainless Steel
Wetted Parts	316 Ti Stainless Steel



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Voltage	Current Consumption (mA)	Switching Current/ Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagrams
21.6-26.4 VDC	≤50 mA	≤1 A at 30 VDC ≤1 A at 36 VAC	14.5	4 mm Tube	0 to +60	0 to +60	IP 67	RK 4.4T-*	1	Diagram 1
21.6-26.4 VDC	≤50 mA	≤200 mA	14.5	4 mm Tube	0 to +60	0 to +60	IP 67	RK 4T-*	2	Diagram 2
21.6-26.4 VDC	≤50 mA	≤200 mA	290	G 1/4	0 to +60	0 to +80	IP 67	RK 4T-*	2	
21.6-26.4 VDC	≤50 mA	≤1 A at 30 VDC ≤1 A at 36 VAC	290	3/8 swage†	0 to +60	0 to +80	IP 67	RK 4.4T-*	1	
21.6-26.4 VDC	≤50 mA	≤200 mA	290	G 1/4	0 to +60	0 to +80	IP 67	RK 4T-*	2	
21.6-26.4 VDC	≤50 mA	≤1 A at 30 VDC ≤1 A at 36 VAC	290	G 1/4	0 to +60	0 to +80	IP 67	RK 4.4T-*	1	

* Length in meters.

FLOW

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[illegible]

Technical drawing of a yellow mechanical part with dimensions in inches and millimeters:

- Overall length: 2.638 [67.0]
- Overall width: 2.523 [59.0]
- Overall height: 4.370 [111.0]
- Distance from left face to center of front hole: 1.969 [50.0]
- Distance from left face to center of rear hole: 2.236 [6.0] 3x
- Distance from left face to center of bottom hole: 1.181 [30.0]
- Distance from left face to center of top hole: 1.772 [45.0]
- Distance from left face to center of front hole: .984 [25.0]
- Distance from left face to center of rear hole: .370 [9.4]
- Thread specification: M12x1

Housing	PBT
Cable Connector	303 Stainless Steel
Wetted Parts	316 Ti Stainless Steel



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Voltage	Current Consumption (mA)	Switching Current/ Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagrams
21.6-26.4 VDC	≤60 mA	≤200 mA	290	3/4 NPT	0 to +60	0 to +80	IP 67	RK 4T-*	2	Diagram 1
21.6-26.4 VDC	≤60 mA	≤1 A at 30 VDC ≤1 A at 36 VAC	290	3/4 NPT	0 to +60	0 to +80	IP 67	RK 4.4T-*	1	Diagram 2
21.6-26.4 VDC	≤60 mA	≤400 mA	290	1/2" Tri-clamp	0 to +60	-20 to +80	IP 67	RK 4.4T-*	2	

* Length in meters.

FLOW

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Flow Monitors



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Housing Style	Part Number	ID Number	Flow Detection Range (water)	Flow Detection Range (oil)	Output
Inline Flow Monitor, PBT Housing 	FCI-TCDO4A4P-LIX-H1141	M6870655	1-200 ml/min.	Consult Factory	4-20 mA Non-linear
Inline Flow Monitor, PBT Housing 	FCI-D04A4P-LIX-H1141	M6870641	15-1000 ml/min.	Consult Factory	4-20 mA Non-linear
Inline Flow Monitor, PBT Housing 	FCI-D10A4P-LIX-H1141	M6870643	100-6000 ml/min.	Consult Factory	4-20 mA Non-linear
Inline Flow Monitor, PBT Housing 	FCI-N3/4D20A4P-LIX-H1141	M6870676	4-30 L/min.	Consult Factory	4-20 mA Non-linear

Technical data on pages B17-B18.

Accessories on page B73-B74.

Material

Housing	PBT
Cable Connector	303 Stainless Steel
Wetted Parts	316 Ti Stainless Steel



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Voltage	Current Consumption (mA)	Switching Current/ Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagram
21.6-26.4 VDC	≤50 mA	≤500 Ω	14.5	4 mm Tube	0 to +60	0 to +80	IP 67	RK 4T-*	1	Diagram 1
21.6-26.4 VDC	≤50 mA	≤500 Ω	290	G 1/4	0 to +60	0 to +80	IP 67	RK 4T-*	1	
21.6-26.4 VDC	≤50 mA	≤500 Ω	290	G 1/4	0 to +60	0 to +80	IP 67	RK 4T-*	1	
21.6-26.4 VDC	≤60 mA	≤500 Ω	290	3/4 NPT	0 to +60	0 to +80	IP 67	RK 4T-*	1	

* Length in meters.

FLOW

TURCK

Flow Monitors



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Housing Style	Part Number	ID Number	Flow Detection Range (water)	Flow Detection Range (oil)	Output
Inline Flow Monitor, Chemical Resistant, Hastelloy Wetted Parts 	FCI-N1/4D04HC22P-AP8X-H1141	M6870621	15-1000 ml/min.	Consult Factory	PNP N.O.
Inline Flow Monitor, Chemical Resistant, Hastelloy Wetted Parts 	FCI-N1/4D10HC22P-AP8X-H1141	M6870622	100-6000 ml/min.	Consult Factory	PNP N.O.
Inline Flow Monitor, Chemical Resistant, PTFE/Ceramic, Viton Wetted Parts 	FCI-N1/8D06CTP-ARX-H1140	M6870651	20-3000 ml/min.	Consult Factory	Relay N.O.
	FCI-N1/8D06CTP-AP8X-H1141	M6870652	20-3000 ml/min.	Consult Factory	PNP N.O.

Technical data on pages B17-B18.

Accessories on page B73-B74.

Material

Housing
Cable Connector
Wetted Parts

PBT
303 Stainless Steel
Hastelloy C22
PTFE/FKM/AL₂O₃ Ceramic
Viton



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Voltage	Current Consumption (mA)	Switching Current/ Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagrams
21.6-26.4 VDC	≤50 mA	≤200 mA	290	1/4 NPT	0 to +60	0 to +60	IP 67	RK 4T-*	1	Diagram 1 Diagram 2
21.6-26.4 VDC	≤50 mA	≤200 mA	290	1/4 NPT	0 to +60	0 to +60	IP 67	RK 4T-*	1	
21.6-26.4 VDC	≤50 mA	1 A at 60 VDC	72.5	1/8 NPT	0 to +60	0 to +60	IP 67	RK 4.4T-*	2	
21.6-26.4 VDC	≤50 mA	≤200 mA	72.5	1/8 NPT	0 to +60	0 to +60	IP 67	RK 4T-*	1	

* Length in meters.

FLOW

Technical data on pages B17-B18.
Accessories on page B73-B74.
Remote amplifiers on pages B69-B70.

**Housing
Cable Connector
Wetted Parts**

PBT/316 Ti Stainless Steel
303 Stainless Steel
316 Ti Stainless Steel



Industrial Automation

Voltage	Switching Current /Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagram
Remote Amplifier	Remote Amplifier	290	G 1/4	-20 to +70	0 to +80	IP 67	RK 4.4T-*	1	Diagram 1
Remote Amplifier	Remote Amplifier	290	G 1/4	-20 to +70	0 to +80	IP 67	RK 4.4T-*	1	
Remote Amplifier	Remote Amplifier	290	3/8 swage	-20 to +70	0 to +80	IP 67	RK 4.4T-*	1	

* Length in meters.

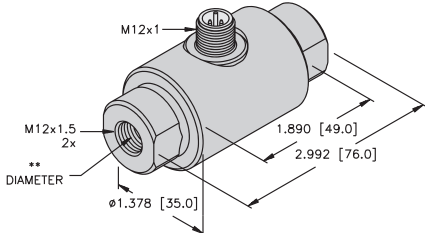
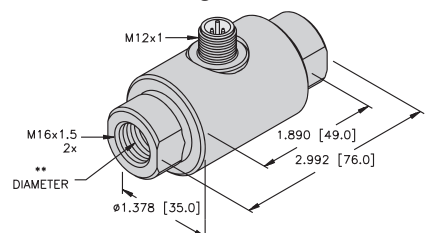
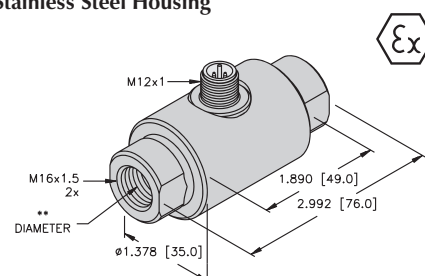
FLOW

TURCK

Flow Monitors



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Housing Style	Part Number	ID Number	Flow Detection Range (water)	Flow Detection Range (oil)	Output
Remote Inline Flow Monitor, Stainless Steel Housing 	FCI-D03A4-NA-H1141/M12	M6870635	5-150 ml/min.	15-300 ml/min.	Remote Amplifier
Remote Inline Flow Monitor, Stainless Steel Housing 	FCI-D03A4-NA-H1141/M16	M6870633	5-150 ml/min.	15-300 ml/min.	Remote Amplifier
	FCI-D09A4-NA-H1141/M16	M6870631	30-900 ml/min.	90-1800 ml/min.	
Remote Inline Flow Monitor, Intrinsically Safe, Stainless Steel Housing 	FCI-D09A4-NAEX-H1141/M16	M6870634	50-900 ml/min.	150-1800 ml/min.	Remote Amplifier

Technical data on pages B17-B18.

Accessories on page B73-B74.

Remote amplifiers on pages B69-B70.

** D03 = 3 mm; D09 = 9 mm

Material

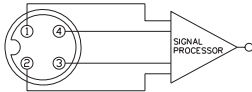
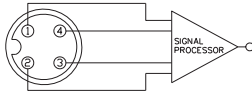
Housing

316 Ti Stainless Steel

Industrial Automation

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Voltage	Switching Current /Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagrams
Remote Amplifier	Remote Amplifier	145	M12x1.5	-25 to +70	0 to +80	IP 67	RK 4.4T-*	1	Diagram 1 
	Remote Amplifier	145	M16x1	-25 to +70	0 to +80	IP 67	RK 4.4T-*	1	Diagram 2 
Remote Amplifier	Remote Amplifier	87	M16x1	-25 to +60	-25 to +80	IP 67	RK 4.41T-*	2	

* Length in meters.

FLOW

TURCK

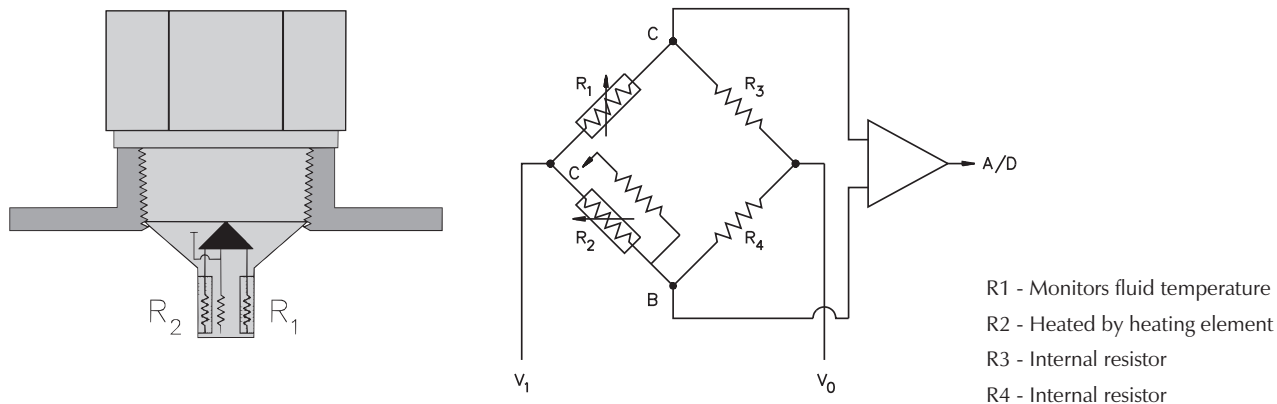
Flow Monitors

Principles of Operation for Probe Style Flow Sensors

TURCK flow controls monitor the flow speed of liquids and gasses without using mechanical parts. These solid state flow switches operate on the calorimetric principle: the measure of heat transfer from an object to a fluid.

The **TURCK** solid state flow monitors use two temperature dependent resistors. One of the resistors (R1) monitors the temperature of the surrounding fluid. The other resistor (R2) is connected to a heating element. The heating element heats R2 to a temperature that is slightly above the surrounding fluid temperature. When there is no fluid flow, the difference in resistance between R1 and R2 is a fixed value. As fluid moves over the flow monitor probe, heat is conducted away from the heating element causing the temperature on R2 to decrease. This heat loss changes the difference in resistance between R1 and R2.

The resistance difference is measured by a Wheatstone bridge circuit. A change in resistance difference causes a change in the bridge voltage. The flow set point is determined by comparing the bridge voltage to a reference voltage.



Operating Range

Heat loss on the heating element will likewise determine the sensitivity of the monitor. The heat loss becomes a function of flow velocity and thermal conductivity of the fluid. The lower the thermal conductivity of the fluid, the faster the fluid has to flow to be detected.

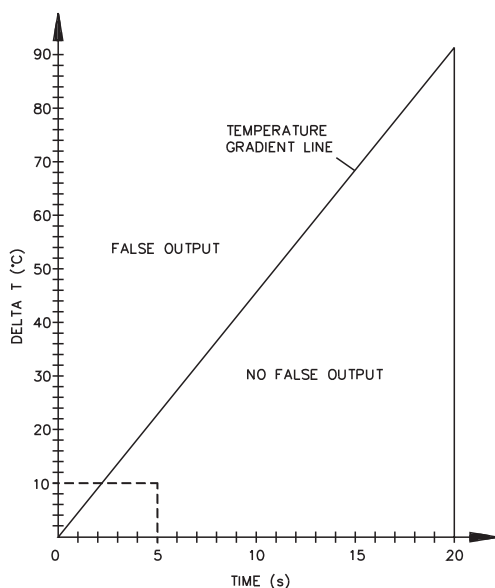
Flow monitor operating ranges vary from one type of fluid to another. These operating ranges are proportional to the speed of the fluid that the monitor can detect. For example, at the same flow rate, air can conduct only a fraction of the heat away from the heating element compared to water.

Response Time

Response Time

The switch-on time is the time required for the flow monitor to detect and indicate that the flow speed is increasing. The switch-off time is the time required for the flow monitor to detect and indicate that the flow speed is decreasing.

Graph 1
Temperature Gradient for Stainless Steel Housing



Graph 1 can be used to determine if the **TURCK** flow monitor can compensate for a temperature change to a sensed medium. The dotted line in the graph indicates that a 10°C change has occurred in a time period of 5 seconds. Points (5,10) intersect in the “No False Output” region of the graph. This example illustrates an acceptable degree of temperature change in the application. As a result, the flow monitor can compensate for the fluid temperature change.

$$\text{Fahrenheit} = (1.8 \times ^\circ\text{C}) + 32$$

Temperature Gradient

The temperature gradient of a fluid indicates the change in fluid temperature within a specified time (unit of measure: °C (°F)/min). The temperature gradient of a device defines the maximum temperature rise that can be compensated by the monitor without malfunction.

The monitor has the ability to compensate for sudden thermal shifts within the specified extremes. Sudden temperature changes exceeding the specified tolerances (temperature error) may cause the device to malfunction. Only when the monitor has adapted to the new temperature, will it provide an accurate measurement.

The temperature gradient for **TURCK** flow monitors is 4°C/second. This is 15 times higher than standard flow devices, which makes for a particularly accurate switch-point stability during variations in temperature.

The sensitivity to temperature rise of **TURCK** flow monitors has been reduced to a minimum (<12 s) and can accurately be determined in advance.

Time Delay Before Availability

The availability is the time required, after power has been applied, for the flow monitor to reach a stable operating condition. The availability provides the time needed to energize the flow monitor and for the flow monitor to stabilize at the fluids temperature.

Effects of Housing Material

The response time and temperature gradient is dependent on the housing material. Flow monitors that use Teflon® have a low thermal conductivity causing a slower response time to fluid temperature changes and to changes in the flow speed.

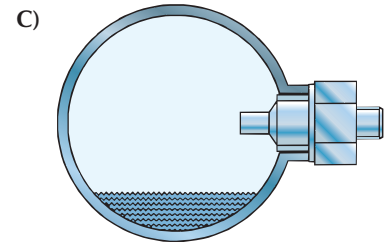
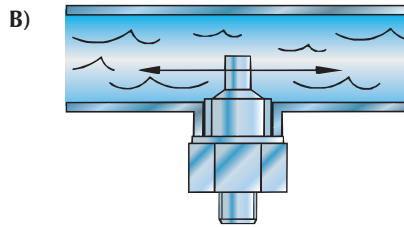
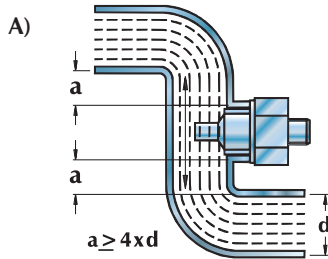
TURCK

Flow Monitors

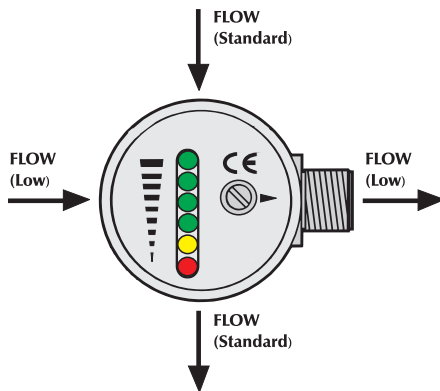
Flow Monitor Mounting Instructions

Areas of turbulent flow occur whenever there is a change in the pipe construction (e.g. pipe inlets, pipe outlets, pipe elbows). To avoid an inaccurate output, the following guidelines should be observed:

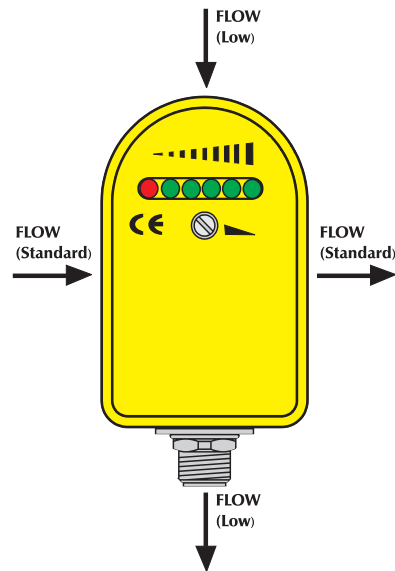
- A) Pay special attention to the minimum distance ($a \geq 4 \times d$) to tube bend and intersections.
- B) Flow monitor must be mounted from below in applications where medium does not completely fill the pipe.
- C) If a possibility of deposit build-up exists, mount the flow monitor at the side of the pipe.



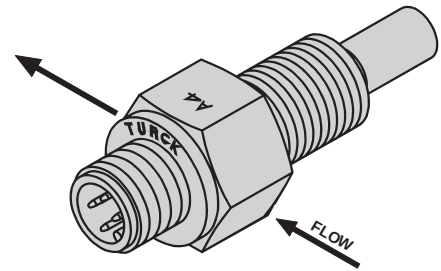
Proper Orientation For Self-Contained Metal Housing



Proper Orientation For Self-Contained Plastic Housing



Proper Orientation For Remote Insertion Probe

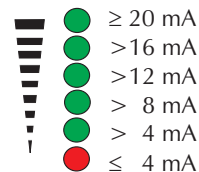
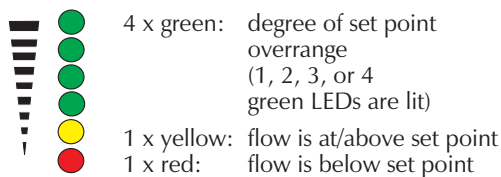


Set-up – Operating and Display Functions

Self Contained Insertion Probe



6 LEDs for flow rate status indication:



Sealing screw (on front of device) covers the potentiometer.

Potentiometer for the adjustment of flow switch point. With analog devices the potentiometer is used to set the measuring range.

FLOW



A4	= 316 Stainless Steel Housing and Probe
A2P	= 303 Stainless Steel Probe with PBT Housing
A4P	= 316 Stainless Steel Probe with PBT Housing
AL	= 303 Stainless Steel Probe
HB	= Hastelloy B
HC22	= Hastelloy C22
T	= Dyflor (PVDF)
TN	= Titanium w/B3 Coating

/A	= Airflow
/L	= Probe Length in mm
/D100	= +120°C (+248°F)
/D500	= 500 Bar rating
/D014	= Tri-clamp fitting

H1141 = **euromast**[®]
H1140 = **euromast**
B1151 = **minimast**[®]
B3141 = **microfast**[®]
B3151 = **microfast**

2AP8X	= Dual N.O. PNP
AP8X	= N.O. PNP
AN8X	= N.O. NPN
ARX	= N.O. Relay
RRX	= N.C. Relay
LIX	= 4-20 mA
NA	= Remote (requires MK or MS 96)
NAEX	= Intrinsically Safe



Plastic Self Contained Insertion Probe - DC/AC

Time Delay Before Availability	2-15 seconds (8 seconds typical)
Response Time (DC)	1-15 seconds (2 seconds typical)
Response Time (AC)	1-13 seconds (2 seconds typical)
Maximum Temperature Gradient	4.2°C / Sec.



Stainless Steel Self Contained Insertion Probe - DC

Time Delay Before Availability	2-15 seconds (8 seconds typical)
Response Time	1-15 seconds (2 seconds typical)
Maximum Temperature Gradient	4.2°C / Sec.



Chemical Resistant Self Contained Insertion Probe - DC

Time Delay Before Availability	5-50 seconds (30 seconds typical)
Response Time	5-50 seconds (30 seconds typical)
Maximum Temperature Gradient	0.05°C / Sec.



Remote Insertion Probe - DC

Time Delay Before Availability	2-15 seconds (8 seconds typical)
Response Time	1-13 seconds (2 seconds typical)
Maximum Temperature Gradient	4.2°C / Sec.



Remote Chemical Resistant Insertion Probe - DC

Time Delay Before Availability	5-50 seconds (30 seconds typical)
Response Time	5-50 seconds (30 seconds typical)
Maximum Temperature Gradient	1°C / Min.

Intrinsically Safe Parameters

Approval	Ex 112G, EEx Ib IIC T6
Maximum Power	0.69 W
Internal Inductance / Capacitance	Negligible
Temperature Class	T6: $T_M \leq 50^\circ\text{C}$ T5: $T_M \leq 65^\circ\text{C}$ T4: $T_M \leq 70^\circ\text{C}$



Housing Style	Part Number	ID Number	Flow Detection Range (water)	Flow Detection Range (oil)	Output
Self-Contained Plastic Housing	FCS-N1/2A4P-AP8X-H1141	M6871032	1-150 cm/sec.	3-300 cm/sec.	PNP N.O.
Self-Contained Plastic Housing, Dual Set Points	FCS-N1/2A4P-2AP8X-H1140	M6871009	1-150 cm/sec.	3-300 cm/sec.	Dual PNP N.O.
Self-Contained Plastic Housing, Flow and Temperature Set Points	FTCS-N1/2A4P-2AP8X-H1140	M6870036	1-150 cm/sec. Temperature 0 to +80°C	3-300 cm/sec. Temperature 0 to +80°C	Dual PNP N.O.

Technical data on pages B31-B34.

Accessories on page B73-B74.

Material

Housing	PBT
Cable Connector	303 Stainless Steel
Wetted Parts	316 Ti Stainless Steel



Voltage	Current Consumption (mA)	Switching Current/ Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagrams
19.2-28.8 VDC	≤60 mA	≤400 mA	1450	½ NPT	-25 to +70	-20 to +80	IP 65	RK 4T-*	1	Diagram 1
19.2-28.8 VDC	≤60 mA	≤400 mA	1450	½ NPT	-25 to +70	-20 to +80	IP 65	RK 4.4T-*	2	Diagram 2
19.2-28.8 VDC	≤60 mA	≤400 mA	1450	½ NPT	-25 to +70	-20 to +80	IP 65	RK 4.4T-*	3	Diagram 3

* Length in meters.

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Flow Monitors



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Housing Style	Part Number	ID Number	Flow Detection Range (water)	Flow Detection Range (oil)	Output
Self-Contained Plastic Housing 	FCS-N1/2A4P-LIX-H1141	M6871041	5-150 cm/sec.	N/A	4-20 mA Linear (water only)
Self-Contained Plastic Housing 	FCS-G1/2A4P-LIX-H1141	M6870056	5-150 cm/sec.	N/A	4-20 mA Linear (water only)
Self-Contained Plastic Housing 	FCS-N1/2A4P-LIX-H1141/D037	M6871043	5-150 cm/sec.	10-300 cm/sec.	4-20 mA Non-linear

Technical data on pages B31-B34.

Accessories on page B73-B74.

Material

Housing	PBT
Cable Connector	303 Stainless Steel
Wetted Parts	316 Ti Stainless Steel



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Voltage	Current Consumption (mA)	Switching Current/ Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagram
21.6-26.4 VDC	≤100 mA	≤500 Ω	1450	½ NPT	-20 to +70	0 to +70	IP 65	RK 4T-*	1	Diagram 1
21.6-26.4 VDC	≤100 mA	≤500 Ω	1450	G ½	-20 to +70	0 to +70	IP 65	RK 4T-*	1	
21.6-26.4 VDC	≤100 mA	≤500 Ω	1450	½ NPT	-20 to +70	0 to +70	IP 65	RK 4T-*	1	

* Length in meters.

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Housing Style	Part Number	ID Number	Flow Detection Range (water)	Flow Detection Range (oil)	Output
Self-Contained Plastic Housing 	FCS-N1/2A4P-ARX-B1151/115VAC	M6871025	1-150 cm/sec.	3-300 cm/sec.	Relay N.O.
	FCS-N1/2A4P-RRX-B1151/115VAC	M6871046	1-150 cm/sec.	3-300 cm/sec.	Relay N.C.
	FCS-N1/2A4P-ARX-B1151/230VAC	M6871038	1-150 cm/sec.	3-300 cm/sec.	Relay N.O.
Self-Contained Plastic Housing 	FCS-N1/2A4P-ARX-B3141/115VAC	M6871037	1-150 cm/sec.	3-300 cm/sec.	Relay N.O.
	FCS-N1/2A4P-ARX-B3151/115VAC	M6871027	1-150 cm/sec.	3-300 cm/sec.	

Technical data on pages B31-B34.
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Material

Housing	PBT
Cable Connector	303 Stainless Steel
Wetted Parts	316 Ti Stainless Steel



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Voltage	Current Consumption (mA)	Switching Current / Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagrams
97.8-132.2 VAC	≤60 mA	≤2 A at 60 VDC	1450	½ NPT	-20 to +70	-20° to +80	IP 65	RKM 50-*	1	Diagram 1
97.8-132.2 VAC	≤60 mA	≤2 A at 60 VDC	1450	½ NPT	-20 to +70	-20° to +80	IP 65	RKM 50-*	2	Diagram 2
195.5-264.5 VAC	≤30 mA	≤2 A at 60 VDC	1450	½ NPT	-20 to +70	-20 to +80	IP 65	RKM 50-*	5	Diagram 3
97.8-132.2 VAC	≤60 mA	≤2 A at 60 VDC	1450	½ NPT	-20 to +70	-20 to +80	IP 65	KB 4T-*/S727	3	Diagram 4
	≤60 mA	≤2 A at 60 VDC	1450	½ NPT	-20 to +70	-20 to +80	IP 65	KB 5T-*	4	
										Diagram 5

* Length in meters.

FLOW



Housing Style	Part Number	ID Number	Flow Detection Range (water)	Flow Detection Range (oil)	Output
Self-Contained 316 Stainless Steel Housing 	FCS-N1/2A4-AP8X-H1141	M6871004	1-150 cm/sec.	3-300 cm/sec.	PNP N.O.
	FCS-N1/2A4-AN8X-H1141	M6871010	1-150 cm/sec.	3-300 cm/sec.	NPN N.O.
	FCS-N1/2A4-ARX-H1140	M6871035	1-150 cm/sec.	3-300 cm/sec.	Relay N.O.
Self-Contained 316 Stainless Steel Housing 	FCS-G1/2A4-AP8X-H1141	M6870004	1-150 cm/sec.	3-300 cm/sec.	PNP N.O.
Self-Contained 316 Stainless Steel Housing 	FCS-G1/4A4-ARX-H1140	M6870102	1-150 cm/sec.	3-300 cm/sec.	Relay N.O.
	FCS-G1/4A4-AP8X-H1141	M6870101	1-150 cm/sec.	3-300 cm/sec.	PNP N.O.

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Material

Cable Connector	303 Stainless Steel
Wetted Parts	316 Ti Stainless Steel



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Voltage	Current Consumption (mA)	Switching Current / Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagrams
19.2-28.8 VDC	≤70 mA	≤400 mA	1450	½ NPT	-25 to +80	-20 to +80	IP 67	RK 4T-*	1	Diagram 1
19.2-28.8 VDC	≤70 mA	≤400 mA	1450	½ NPT	-25 to +80	-20 to +80	IP 67	RK 4T-*	2	Diagram 2
19.2-28.8 VDC	≤70 mA	≤1 A at 60 VDC	1450	½ NPT	-25 to +80	-20 to +80	IP 67	RK 4.4T-*	3	Diagram 3
19.2-28.8 VDC	≤70 mA	≤400 mA	1450	G ½	-25 to +80	-20 to +80	IP 67	RK 4T-*	1	
19.2-28.8 VDC	≤70 mA	≤1 A at 60 VDC	1450	G 1/4	-25 to +80	-20 to +80	IP 67	RK 4.4T-*	3	
19.2-28.8 VDC	≤70 mA	≤1 A at 60 VDC	1450	G 1/4	-25 to +80	-20 to +80	IP 67	RK 4T-*	1	

* Length in meters.

FLOW

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Housing Style	Part Number	ID Number	Flow Detection Range (water)	Flow Detection Range (oil)	Output
Self Contained Sanitary, 316L Stainless Steel Housing 	FCS-50A4-AP8X-H1141/D014	M6872025	1-150 cm/sec.	3-300 cm/sec.	PNP N.O.
2" Tri-Clamp 	FCS-64A4-AP8X-H1141/D014	M6872034	1-150 cm/sec.	3-300 cm/sec.	PNP N.O.

Technical data on pages B31-B34.
Accessories on page B73-B74.

Material

Cable Connector	303 Stainless Steel
Wetted Parts	316 Ti Stainless Steel



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Voltage	Current Consumption (mA)	Switching Current / Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagram
21.6-26.4 VDC	≤70 mA	≤400 mA	1450	1.5 in. Tri-clamp	-20 to +80 **(+100)	-20 to +80	IP 67	RKV 4T-*	1	Diagram 1
21.6-26.4 VDC	≤65 mA	≤400 mA	1450	2 in. Tri-clamp	0 to +80 **(+100)	0 to +80	IP 67	RKV 4T-*	1	

* Length in meters.

** Sensor may be heated to 100°C for 10 minutes without damage.

FLOW



Housing Style	Part Number	ID Number	Flow Detection Range (water)	Flow Detection Range (oil)	Output
Self Contained Chemical Resistant, PVDF Housing 	FCS-G1/2DY-AP8X-H1141	M6870003	1-70 cm/sec.	2-100 cm/sec.	N.O. PNP
Self Contained Chemical Resistant, PVDF Housing 	FCS-G1/2DY-AP8X	M6870005	1-70 cm/sec.	2-100 cm/sec.	N.O. PNP

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Material

Housing	PVDF
Wetted Parts	PVDF



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Voltage	Current Consumption (mA)	Switching Current /Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
21.6-26.4 VDC	≤70 mA	≤400 mA	72	G ½	-25 to +70	-10 to +80	IP 67	RKK 4T-*	1	Diagram 1 Diagram 2
21.6-26.4 VDC	≤70 mA	≤400 mA	72	G ½	-25 to +70	-10 to +80	IP 67	2M/PTFE	2	

* Length in meters.

FLOW



Housing Style	Part Number	ID Number	Flow Detection Range (water)	Flow Detection Range (oil)	Output
Remote Insertion Probe, Stainless Steel Housing 	FCS-N1/2A4-NA	M6871309	1-150 cm/sec.	3-300 cm/sec.	Remote Amplifier
Remote Insertion Probe, Stainless Steel Housing 	FCS-N1/2A4-NA-H1141	M6871303	1-150 cm/sec.	3-300 cm/sec.	Remote Amplifier
Remote Insertion Probe, Stainless Steel Housing 	FCS-N3/4A4-NA-H1141	M6871304	1-150 cm/sec.	3-300 cm/sec.	Remote Amplifier

Technical data on pages B31-B34.
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Remote amplifiers on pages B69-B72.

Material

Housing	316 Ti Stainless Steel
Cable Connector	303 Stainless Steel
Wetted Parts	316 Ti Stainless Steel



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Voltage	Switching Current / Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
Remote Amplifier	Remote Amplifier	1450	½ NPT	-25 to +80	-25 to +80	IP 67	2M/PVC	1	Diagram 1 Diagram 2
Remote Amplifier	Remote Amplifier	1450	½ NPT	-25 to +80	-25 to +80	IP 67	RK 4.4T-*	2	
Remote Amplifier	Remote Amplifier	1450	¾ NPT	-25 to +80	-25 to +80	IP 67	RK 4.4T-*	2	

* Length in meters.

FLOW



Housing Style	Part Number	ID Number	Flow Detection Range (water)	Flow Detection Range (oil)	Output
Remote Insertion Probe, Stainless Steel Housing 	FCS-G1/4A4-NA-H1141	M6870304	1-150 cm/sec.	3-300 cm/sec.	Remote Amplifier
Remote Insertion Probe, Stainless Steel Housing 	FCS-G1/2A4-NA-H1141	M6870303	1-150 cm/sec.	3-300 cm/sec.	Remote Amplifier
Remote Insertion Probe, High Pressure, Stainless Steel Housing 	FCS-GL1/2A4-NA-H1141/D500	M6870425	1-150 cm/sec.	3-300 cm/sec.	Remote Amplifier

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Material

Housing	316 Ti Stainless Steel
Cable Connector	303 Stainless Steel
Wetted Parts	316 Ti Stainless Steel



Voltage	Switching Current /Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagram
Remote Amplifier	Remote Amplifier	1450	G 1/4	-25 to +80	-25 to +80	IP 67	RK 4.4T-*	1	Diagram 1
Remote Amplifier	Remote Amplifier	1450	G 1/2	-25 to +80	-25 to +80	IP 67	RK 4.4T-*	1	
Remote Amplifier	Remote Amplifier	1000 (dynamic) 5600 (static)	GL 1/2	-25 to +80	-25 to +80 100 for 10 min.	IP 67	RK 4.4T-*	1	

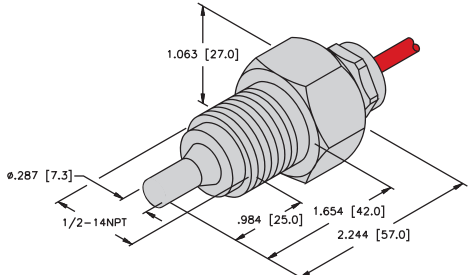
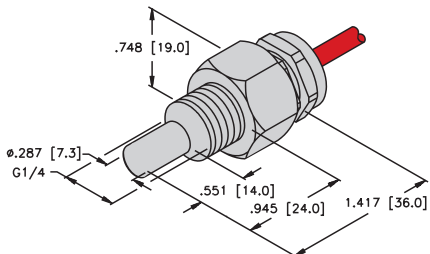
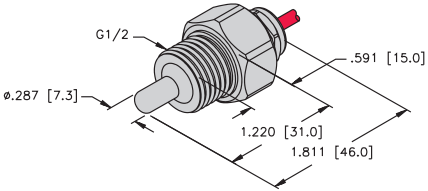
* Length in meters.

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Housing Style	Part Number	ID Number	Flow Detection Range (water)	Flow Detection Range (oil)	Output
Remote Insertion Probe, High Temperature, Stainless Steel Housing 	FCS-N1/2A4-NA/D100	M6871412	1-150 cm/sec.	3-300 cm/sec.	Remote Amplifier
Remote Insertion Probe, High Temperature, Stainless Steel Housing 	FCS-G1/4A4-NA/D100	M6870411	1-150 cm/sec.	3-300 cm/sec.	Remote Amplifier
Remote Insertion Probe, High Temperature, Stainless Steel Housing 	FCS-G1/2A4-NA/D100	M6870412	1-150 cm/sec.	3-300 cm/sec.	Remote Amplifier

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Material

Housing	316 Ti Stainless Steel
Wetted Parts	316 Ti Stainless Steel



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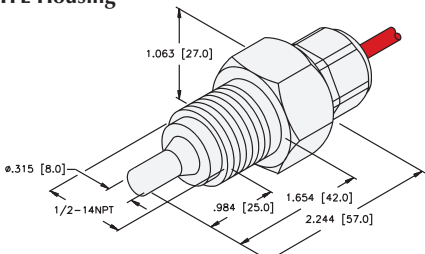
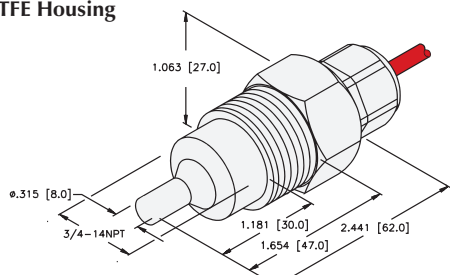
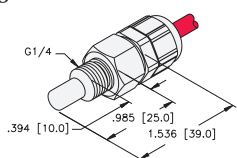
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Voltage	Switching Current /Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Cable Length/ Cable Mat.	Wiring Diagram #	Wiring Diagram
Remote Amplifier	Remote Amplifier	1450	½ NPT	-25 to +80	+10 to +120	IP 68	2M/PTFE	1	Diagram 1
Remote Amplifier	Remote Amplifier	1450	G 1/4	-25 to +80	+10 to +120	IP 68	2M/PTFE	1	
Remote Amplifier	Remote Amplifier	1450	G ½	-25 to +80	+10 to +120	IP 68	2M/PTFE	1	

FLOW



Housing Style	Part Number	ID Number	Flow Detection Range (water)	Flow Detection Range (oil)	Output
Remote Insertion Probe, Chemical Resistant, PTFE Housing 	FCS-N1/2T-NA	M6871422	1-70 cm/sec.	2-100 cm/sec.	Remote Amplifier
Remote Insertion Probe, Chemical Resistant, PTFE Housing 	FCS-N3/4T-NA	M6871312	1-70 cm/sec.	2-100 cm/sec.	Remote Amplifier
Remote Insertion Probe, Chemical Resistant, PTFE Housing 	FCS-G1/4T-NA	M6870310	1-70 cm/sec.	2-100 cm/sec.	Remote Amplifier

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Material

Housing	PTFE
Wetted Parts	PTFE



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Voltage	Switching Current /Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Cable Length/ Cable Mat.	Wiring Diagram #	Wiring Diagram
Remote Amplifier	Remote Amplifier	72	½ NPT	-25 to +60	-10 to +80	IP 68	2M/PTFE	1	Diagram 1
Remote Amplifier	Remote Amplifier	72	3/4 NPT	-25 to +60	-10 to +80	IP 68	2M/PTFE	1	
Remote Amplifier	Remote Amplifier	72	G 1/4	-25 to +60	-10 to +80	IP 68	2M/PTFE	1	

FLOW

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* B3 coating is used for resistance to abrasive materials.



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Voltage	Switching Current / Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
Remote Amplifier	Remote Amplifier	1450	G ½	-25 to +80	-20 to +80	IP 67	RK 4.4T-*	1	Diagram 1 Diagram 2
Remote Amplifier	Remote Amplifier	1450	GL ½	-25 to +80	-20 to +80	IP 67	RK 4.4T-*	1	
Remote Amplifier	Remote Amplifier	1450	G ½	-25 to +80	-20 to +80	IP 68	2M/PTFE	2	
Remote Amplifier	Remote Amplifier	1450	1.5 in. Tri-clamp	-20 to +80	-20 to +120	IP 68	2M/PTFE	2	

* Length in meters.

FLOW

Housing Style

Part Number

ID Number

Flow Detection Range (water)

Flow Detection Range (oil)

Output

Remote Insertion Probe, Intrinsically Safe, Stainless Steel Housing

FCS-N1/2A4-NAEX-H1141

M6871322

1-100 cm/sec.

3-200 cm/sec.

Remote Amplifier

Remote Insertion Probe, Intrinsically Safe, Stainless Steel Housing

FCS-N1/2A4-NAEX

M6871423

1-100 cm/sec.

3-200 cm/sec.

Remote Amplifier

Remote Insertion Probe, Intrinsically Safe, Stainless Steel Housing

FCS-G1/4A4-NAEX

M6870315

1-100 cm/sec.

3-200 cm/sec.

Remote Amplifier

Remote Insertion Probe, Intrinsically Safe, Stainless Steel Housing

FCS-GL1/2A4-NAEX/D500

M6870431

1-100 cm/sec.

3-200 cm/sec.

Remote Amplifier

Remote amplifiers on pages B69-B72.

Housing Cable Connector Wetted Parts

316 Ti Stainless Steel
303 Stainless Steel
316 Ti Stainless Steel



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Voltage	Switching Current /Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
Remote Amplifier	Remote Amplifier	1450	½ NPT	-25 to +85	-25 to +85	IP 67	RK 4.41T-*	1	Diagram 1 Diagram 2
Remote Amplifier	Remote Amplifier	1450	½ NPT	-25 to +85	-25 to +85	IP 68	2M/PUR	2	
Remote Amplifier	Remote Amplifier	1450	G 1/4	-25 to +85	-25 to +85	IP 68	2M/PUR	2	
Remote Amplifier	Remote Amplifier	1000 (dynamic) 5600 (static)	GL ½	-25 to +85	-25 to +85	IP 68	2M/PUR	2	

* Length in meters.

FLOW

Air Flow Monitor Part Number Key

Insertion Probe Sensor



Sensor Type

FCS = Insertion Probe Flow Sensor

Fluid Connection

N1/2 = ½ NPT
M18 = M18x1
K20 = 20 mm / Flange
G1/2 = G1/2 (½ BSPP)
GL1/2 = G1/2 (½ BSPP with additional threading)

Housing

A4	= 316 Stainless Steel Housing and Probe
A2P	= 303 Stainless Steel Probe with PBT Housing

Special Option Code

/A = Airflow
/D041 = G1/4 Threaded Adapter Block
/D067 = Extended Analog Range
/D087 = 1/4 NPT Threaded Adapter Block

Electrical Connection

H1141 = *euromast*®

Circuitry

AP8X = N.O. PNP
AN8X = N.O. NPN
LIX = 4-20 mA
NA = Remote (requires MK or MS 96)
NAEX = Intrinsically Safe



Self Contained Airflow - DC

Time Delay Before Availability	20-40 seconds (30 seconds typical)
Response Time	1-5 seconds (2 seconds typical)
Maximum Temperature Gradient	3.3°C / Sec.



Intrinsically Safe Remote Airflow - DC

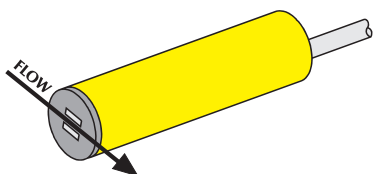
Time Delay Before Availability	2-15 seconds (8 seconds typical)
Response Time	1-13 seconds (2 seconds typical)
Maximum Temperature Gradient	10°C / Min.

Intrinsically Safe Parameters

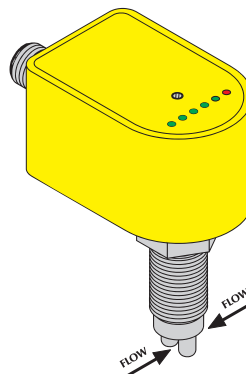
Approval	Ex II 2G, EEx Ib IIC T6
Maximum Power	0.69 W
Internal Inductance / Capacitance.	Negligible
Temperature Class	T6: $T_M \leq 50^\circ\text{C}$
	T5: $T_M \leq 65^\circ\text{C}$
	T4: $T_M \leq 70^\circ\text{C}$

Air Flow Sensor Mounting Instructions

Proper Orientation For Airflow



Proper Orientation For Dual Tips



FLOW

Remote Amplifiers Set-up – Operating Functions

Processor MS96



6 LEDs for flow rate status indication:

- 4 x green: degree of set point overrange (1, 2, 3, or 4 green LEDs are lit)
- 1 x yellow: flow is at/above set point
- 1 x red: flow is below set point



Red LED illuminates when flow is at or above preset temperature



Potentiometer for temperature set-point adjustment (from -20 to +100°C)



Potentiometer to set switch-off delay time which affects the flow monitoring output (terminals 6-8)



Potentiometer (coarse) for operating range adjustment



Potentiometer for fine adjustment of switch point value

Processor MK96



LED display for flow rate status indication:

- 4 x green: degree of set point overrange (1, 2, 3, or 4 green LEDs are lit)
- 1 x yellow: flow is at/above set point
- 1 x red: flow is below set point

- ≥ 20 mA
- > 16 mA
- > 12 mA
- > 8 mA
- > 4 mA
- ≤ 4 mA



Potentiometer (coarse) for operating range adjustment



Potentiometer for fine adjustment of switch point value

Analog versions



Potentiometer for adjusting the 4 mA to the medium

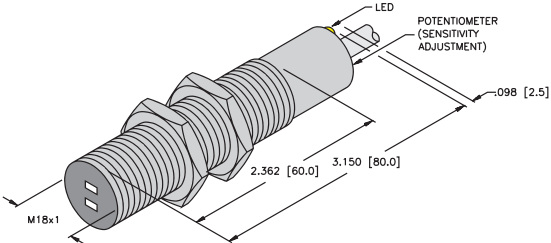
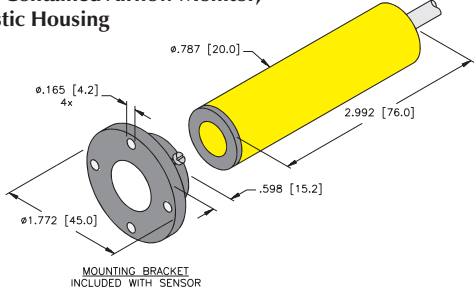
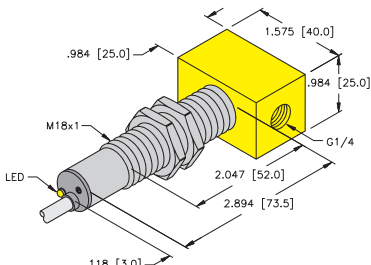
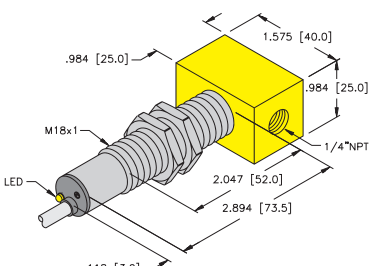


Potentiometer for adjusting the span to 20 mA (not all applications may reach 20 mA)

TURCK Flow Monitors



Return to Main Selection Guide 

Housing Style	Part Number	ID Number	Flow Detection Range (air)	Output
Self Contained Airflow Monitor, Metal Housing 	FCS-M18-AP8X	M6870704	0.5-15 m/sec.	PNP N.O.
Self Contained Airflow Monitor, Plastic Housing 	FCS-K20-AP8X	M6870702	0.5-15 m/sec.	PNP N.O.
Self Contained Airflow Monitor, Metal Housing 	FCS-M18-AP8X/D041	M6870705	0.1-15 m/sec.	PNP N.O.
Self Contained Airflow Monitor, Metal Housing 	FCS-M18-AP8X/D087	M6870800	0.1-15 m/sec.	PNP N.O.

Technical data on pages B59-B60.
Accessories on page B73-B74.

Material

Housing

Delrin/PBT/Nickel Plated Brass/316 Ti



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Voltage	Current Consumption (mA)	Switching Current	Pressure Rating (psi)	Fluid Connection	Ambient Temp. (°C)	Media Temp. (°C)	Protection	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagram
19.2-28.8 VDC	≤70 mA	≤200 mA	145	M18x1	-20 to +70	-20 to +70	IP 67	2M/PVC	1	Diagram 1
19.2-28.8 VDC	≤70 mA	≤200 mA	14.5	20 mm/Flange	-20 to +70	-20 to +70	IP 67	2M/PVC	1	
19.2-28.8 VDC	≤70 mA	≤200 mA	145	G 1/4	-20 to +70	-20 to +70	IP 67	2M/PVC	1	
21.6-26.4 VDC	≤70 mA	≤200 mA	145	1/4 NPT	-20 to +70	-20 to +70	IP 67	2M/PVC	1	

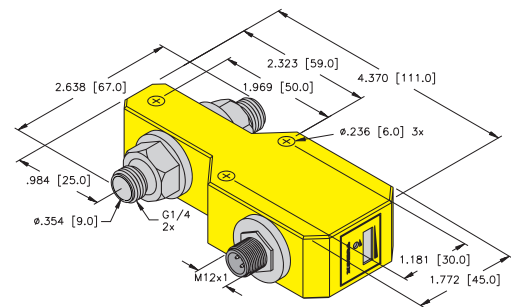
* Length in meters.

FLOW

Technical drawing of the yellow electronic module. Dimensions and labels are as follows:

- Top width: 3.071 [78.0]
- Top thread: GL 1/2
- Top mounting hole diameter: 1.181 [30.0]
- Top mounting hole offset: 1.890 [48.0]
- Front width: 1.732 [44.0]
- Front height: 1.969 [50.0]
- Front mounting hole: M12x1
- Front panel features: LEDs (three colored LEDs), POTENTIOMETER (rotary knob)

Self Contained Inline Airflow Monitor, Plastic Housing





Voltage	Current Consumption (mA)	Switching Current / Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagram
21.6-26.4 VDC	≤80 mA	≤200 mA	435	GL ½	-20 to +70	-20 to +70	IP 67	RK 4T-*	1	Diagram 1
21.6-26.4 VDC	≤50 mA	≤200 mA	290	G 1/4	0 to +60	-20 to +80	IP 67	RK 4T-*	1	

* Length in meters.

TURCK Flow Monitors



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Housing Style	Part Number	ID Number	Flow Detection Range (air)	Output
Self Contained Airflow Monitor, Metal Housing 	FCS-M18-LIX	M6870707	0.5-15 M/sec.	4-20 mA Non-linear
	FCS-M18-LIX/D067	M6870712	0.5-45 M/sec.	
Self Contained Airflow Monitor, Metal Housing 	FCS-M18-LIX/D041	M6870727	0.1-15 M/sec.	4-20 mA Non-linear
	FCS-M18-LIX/D087	M6870822	0.1-15 M/sec.	
Self Contained Airflow Monitor, Plastic Housing 	FCS-K20-LIX	M6870703	0.5-15 M/sec.	4-20 mA Non-linear
Self Contained Airflow Monitor, Plastic Housing 	FCS-GL1/2A2P-LIX-H1141/A	M6870455	0.5-30 M/sec.	4-20 mA Non-linear

Technical data on pages B59-B60.

Accessories on page B73-B74.

* Mounting bracket can be ordered as an accessory. ID Number: M6873011

Material

Housing

Delrin/PBT/Nickel Plated Brass/316 Ti



Voltage	Current Consumption (mA)	Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
19.2-28.8 VDC	≤70 mA	≤500 Ω	145	M18x1	-20 to +70	-20 to +70	IP 67	2M/PVC	1	Diagram 1 Diagram 2
	≤70 mA	≤500 Ω	145	M18x1	-20 to +70	-20 to +70	IP 67	2M/PVC	1	
19.2-28.8 VDC	≤70 mA	≤500 Ω	145	G 1/4	-20 to +70	-20 to +70	IP 67	2M/PVC	1	
	≤70 mA	≤500 Ω	145	1/4 NPT	-20 to +70	-20 to +70	IP 67	2M/PVC	1	
19.2-28.8 VDC	≤70 mA	≤500 Ω	14.5	20 mm/Flange	-20 to +70	-20 to +70	IP 67	2M/PVC	1	
21.6-26.4 VDC	≤80 mA	≤500 Ω	435	GL ½	-20 to +70	-20 to +70	IP 67	RK 4T-*	2	

* Length in meters.

TURCK Flow Monitors



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Housing Style	Part Number	ID Number	Flow Detection Range (air)	Output
Remote Insertion Probe, Intrinsically Safe Airflow Monitor, Stainless Steel Housing 	FCS-N1/2A4-NAEX-H1141/A	M6871428	2-25 M/sec.	Remote Amplifier
Remote Insertion Probe, Intrinsically Safe Airflow Monitor, Stainless Steel Housing 	FCS-GL1/2A4-NAEX0/A	M6870349	2-25 M/sec.	Remote Amplifier

Technical data on pages B59-B60.
Accessories on page B73-B74.
Remote amplifiers on pages B69-B70

Material

Housing 316 Ti Stainless Steel



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Voltage	Switching Current / Analog Load	Pressure Rating (psi)	Fluid Connection	Operating Temp. (°C) (ambient)	Operating Temp. (°C) (fluid)	Protection	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
Remote Amplifier	Remote Amplifier	1450	½ NPT	-25 to +60	-25 to +80	IP 67	RK 4.41T-*	1	Diagram 1 Diagram 2
Remote Amplifier	Remote Amplifier	1450	GL ½	-25 to +60	-25 to +80	IP 68	2M/PUR	2	

* Length in meters.

FLOW

TURCK Flow Monitors



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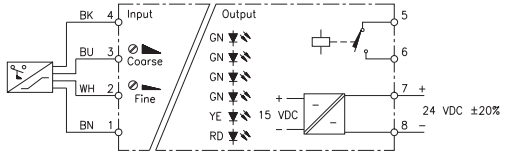
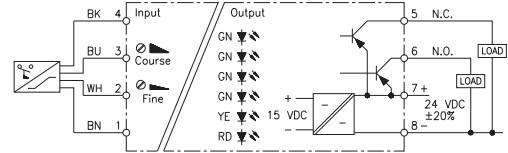
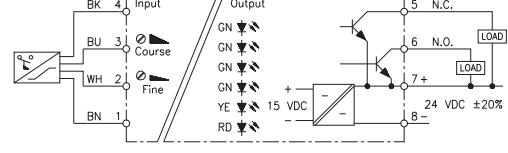
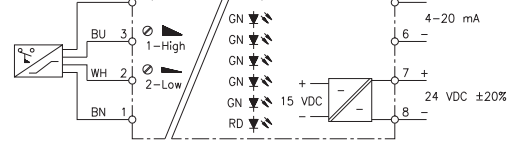


Housing Style	Part Number	ID Number	Features	Output
Remote Amplifiers 	MK 96-11-R/024VDC	M7525090	N.O. Relay Outputs	Relay N.O.
	MK 96-VP01	M7525002	Complimentary PNP Outputs Short-circuit and Reverse Polarity Protection Dual Potentiometer	Complimentary PNP
	MK 96-VN01	M7525003	Complimentary NPN Outputs Short-circuit and Reverse Polarity Protection Dual Potentiometer	Complimentary NPN
	MK 96-LI01	M7525004	Non-linear 4-20 mA Dual Potentiometer	4-20 mA Non-linear

Material

Housing

PC/ABS

Voltage	Mounting	Current Consumption	Protection	Switching Current / Analog Load	Wiring Diagram #	Wiring Diagrams
19.2-28.8 VDC	DIN 50022 or 50035	≤70 mA	IP 20	2 A at 60 VDC	1	Diagram 1 
19.2-28.8 VDC	DIN 50022 or 50035	≤65 mA	IP 20	400 mA	2	Diagram 2 
19.2-28.8 VDC	DIN 50022 or 50035	≤65 mA	IP 20	400 mA	3	Diagram 3 
19.2-28.8 VDC	DIN 50022 or 50035	≤100 mA	IP 20	≤500 Ω	4	Diagram 4 

TURCK Flow Monitors



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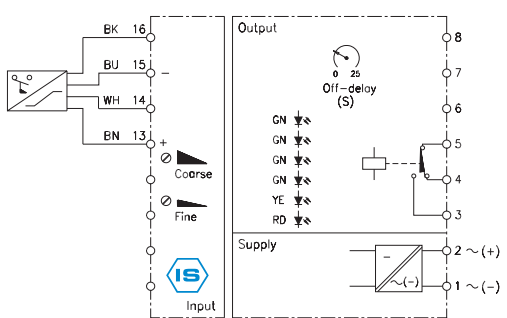
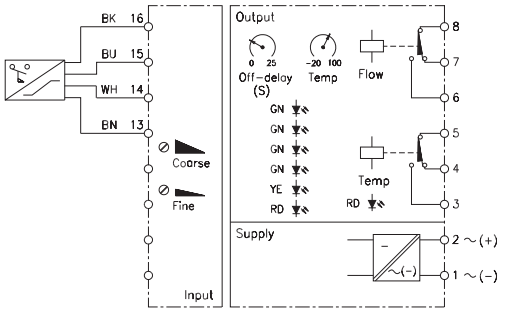


Housing Style	Part Number	ID Number	Features	Output
Signal Processors 	MS96-11Ex0-R/115VAC	M5231402	Intrinsically Safe Zone 1 [EExib] 11C Wire-break Dual Potentiometer Off Delay	Relay N.O./N.C.
	MS96-11Ex0-R/24VDC	M5231407	Intrinsically Safe Zone 1 [EExib] 11C Wire-break Dual Potentiometer Off Delay	Relay N.O./N.C.
Signal Processors 	MS96-12R/115VAC	M5231002	Flow and Temp. Control Wire-break Dual Potentiometer Off Delay	Dual Relay N.O./N.C.
	MS96-12R/024VDC	M5231007	Flow and Temp. Control Wire-break Dual Potentiometer Off Delay	Dual Relay N.O./N.C.

Material

Housing

PC/ABS

Voltage	Mounting	Current Consumption	Protection	Switching Current	Wiring Diagram #	Wiring Diagrams
103.5-126.5 VAC	DIN 50022	≤75 mA	IP 20	≤4 A at 250 VAC	1	Diagram 1  Diagram 2 
21.6-26.4 VDC	DIN 50022	≤125 mA	IP 20	≤4 A at 250 VAC	1	
103.5-126.5 VAC	DIN 50022	≤90 mA	IP 20	≤2 A at 60 VDC	2	
21.6-26.4 VDC	DIN 50022	≤120 mA	IP 20	≤2 A at 60 VDC	2	

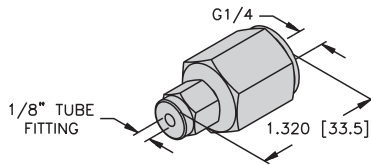
FLOW

TURCK

Flow Monitors

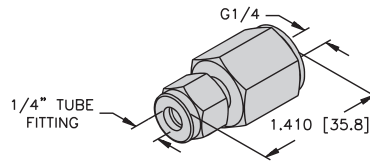
Flow Accessories

Adapter G1/4 to 1/8 in. Tubing
(316 Stainless Steel)



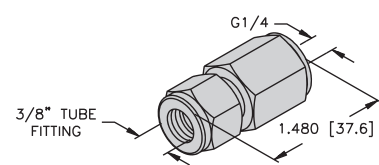
FSV-SS-1/8X1/4
(A2535)

Adapter G1/4 to 1/4 in. Tubing
(316 Stainless Steel)



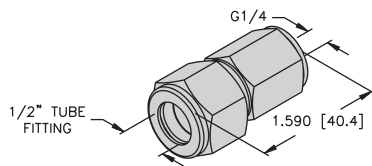
FSV-SS-1/4X1/4
(A2534)

Adapter G 1/4 to 3/8 in. Tubing
(316 Stainless Steel)



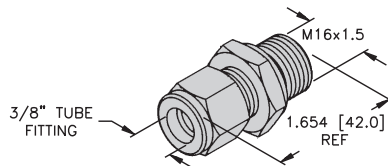
FSV-SS-3/8X1/4
(A2533)

Adapter G1/4 to 1/2 in. Tubing
(316 Stainless Steel)



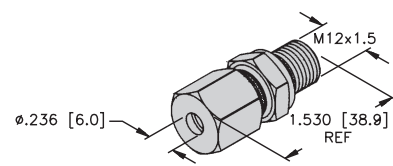
FSV-SS-1/2X1/4
(A2536)

Adapter M16 to 3/8 in. Tubing
(316 Stainless Steel)



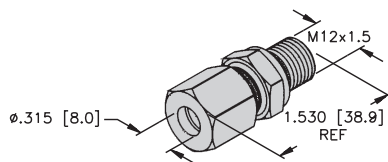
FSV-D3/8-M16
(M6873005)

Adapter M12 to 6 mm Tubing
(316 Stainless Steel)



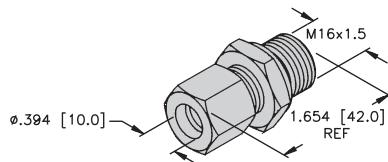
FSV-D06/M12
(M6873002)

Adapter M12 to 8 mm Tubing
(316 Stainless Steel)



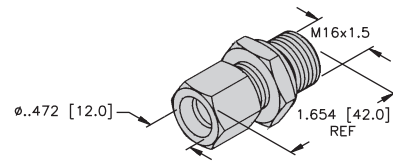
FSV-D08/M12
(M6873004)

Adapter M16 to 10 mm Tubing
(316 Stainless Steel)



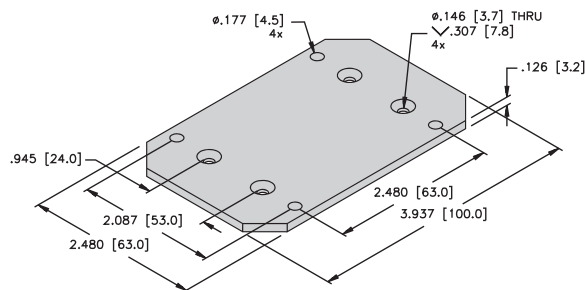
FSV-D10/M16
(M6873001)

Adapter M16 to 12 mm Tubing
(316 Stainless Steel)



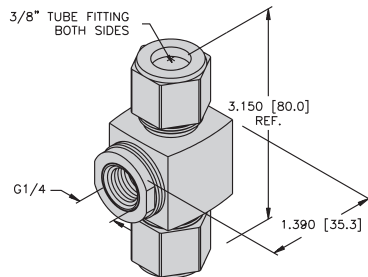
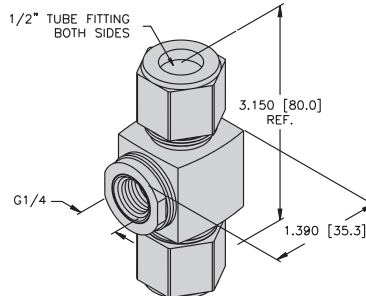
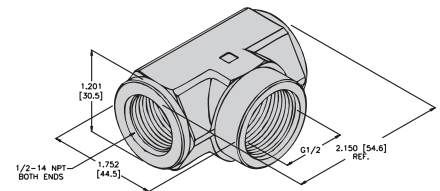
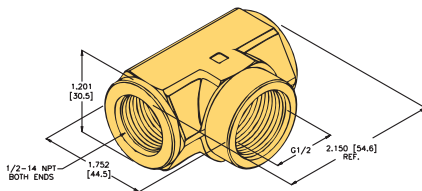
FSV-D12/M16
(M6873003)

Mounting Bracket for FCI or FCMI

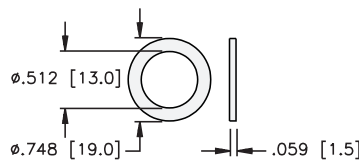


FCI-BP
(A9181)

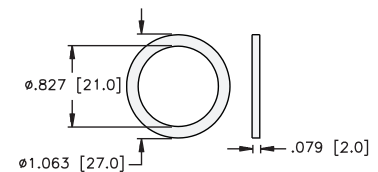
Flow Accessories

Pipe Tee
(316 Stainless Steel)3/8 A4-AK
(A6000)Pipe Tee
(316 Stainless Steel)1/2 A4-AK
(A3420)Pipe Tee
(Stainless Steel)N1/2-G1/2-SST
(A6060)Pipe Tee
(Brass)N1/2-G1/2-BT
(A6050)

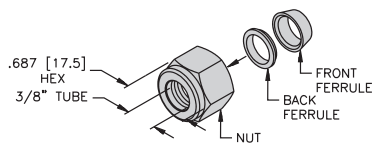
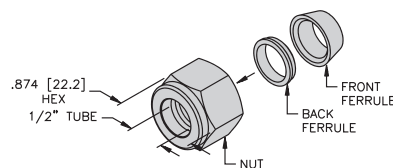
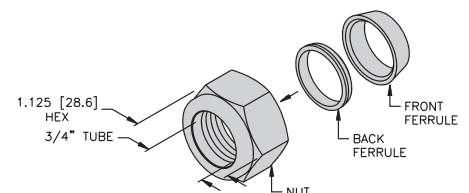
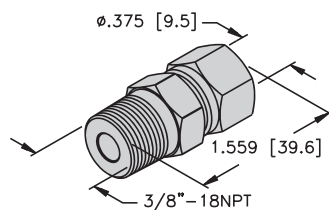
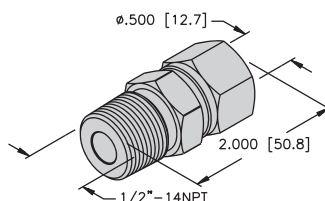
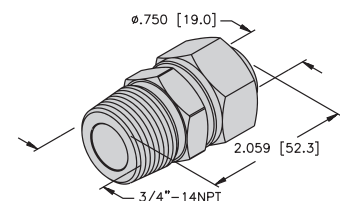
G 1/4 Gasket

FD-G1/4AFM30/34
(M6875010)

G 1/2 Gasket

FD-G1/2AFM30/34
(M6875013)

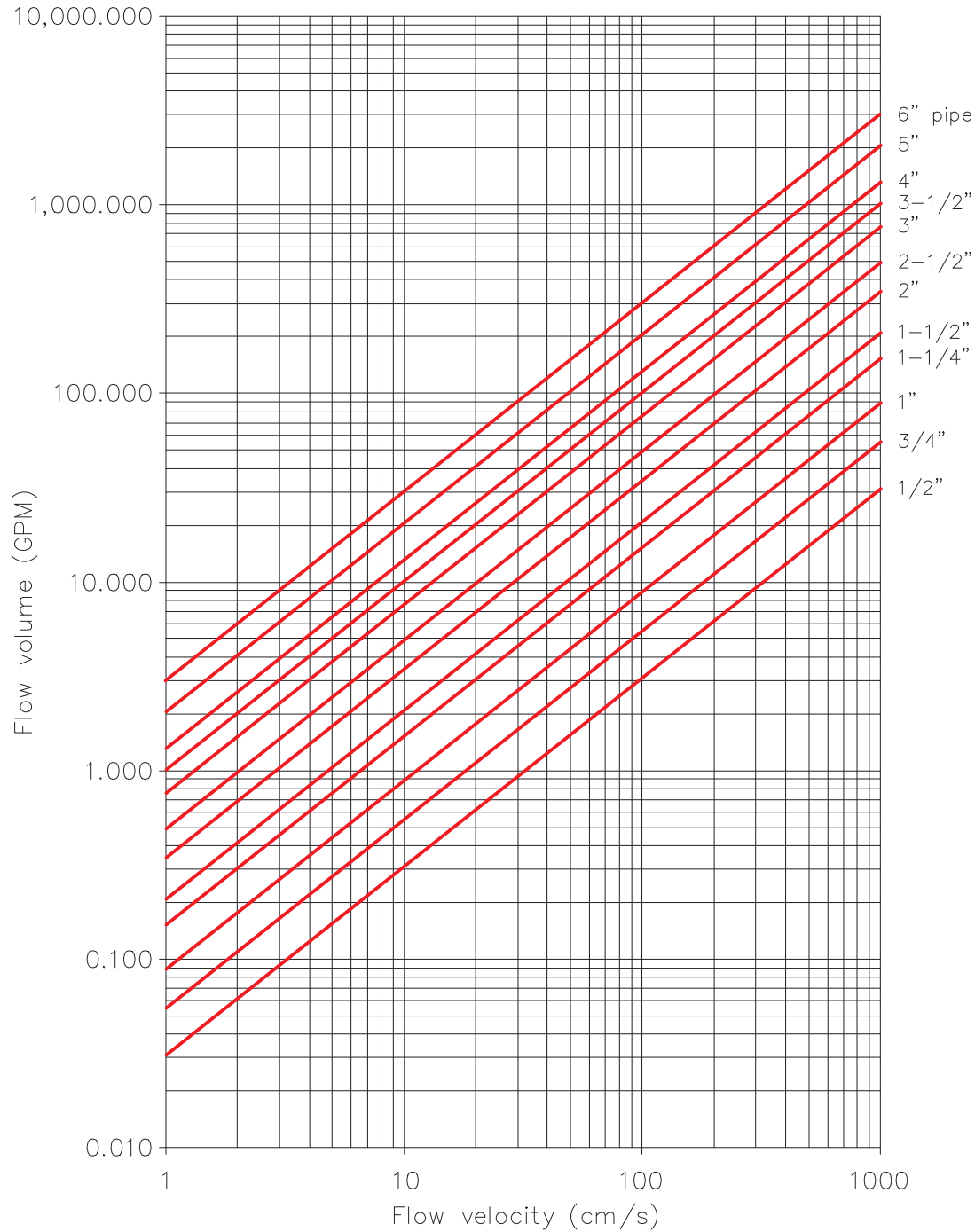
Flow Accessories for FTCI & FCMI

FSV-SS 3/8 KIT (2 sets)
(A9183)FSV-SS 1/2 KIT (2 sets)
(A9184)FSV-SS 3/4 KIT (2 sets)
(A9185)FSV-SS 3/8 TS-NPT
(A9307)FSV-SS 1/2 TS-NPT
(A9305)FSV-SS 3/4 TS-NPT
(A9306)



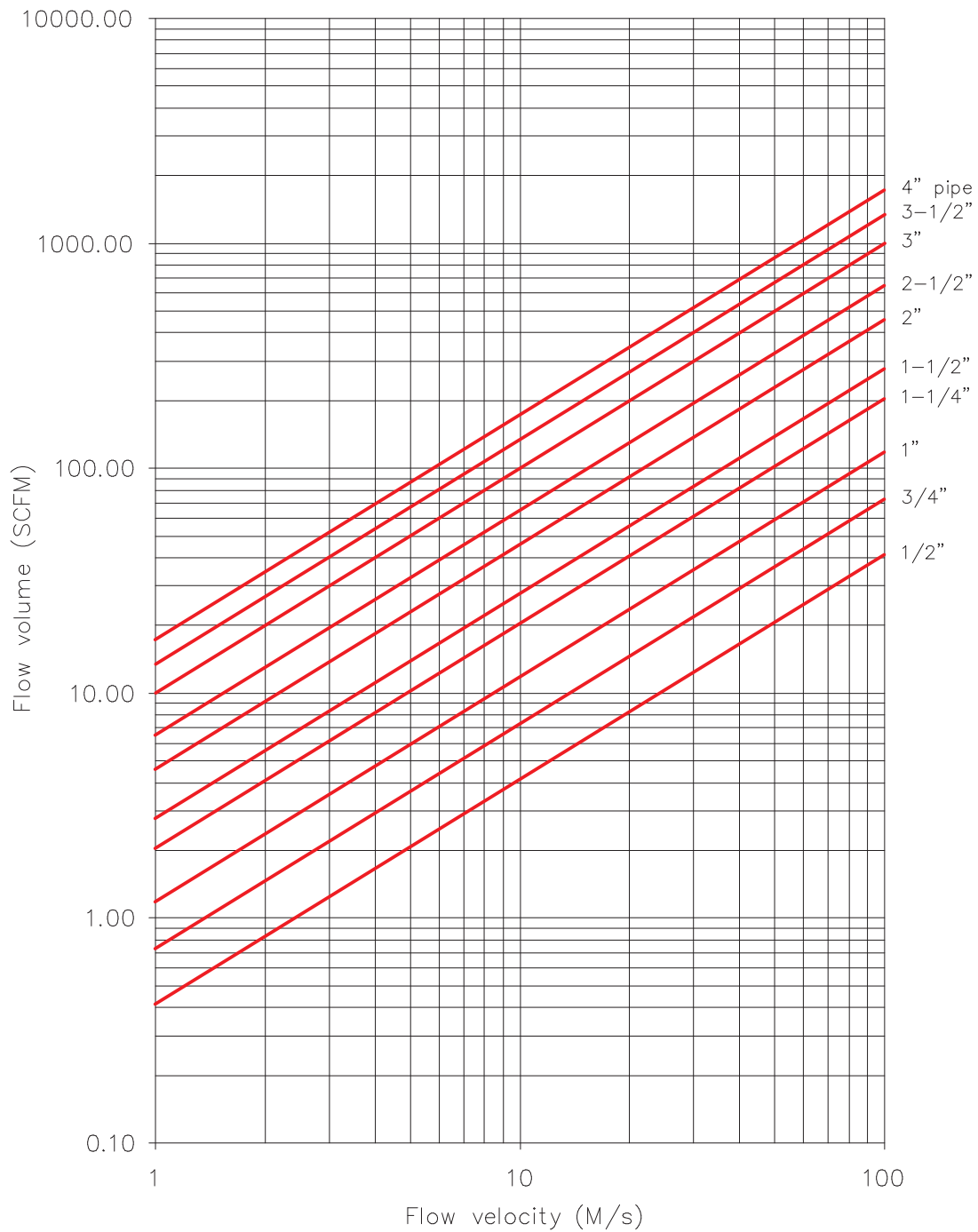
Liquid Flow Conversion Chart (Water)

Flow velocity to flow volume for schedule 40 pipes of various sizes.



Gas Flow Conversion Chart

Flow velocity to flow volume for schedule 40 pipes of various sizes.



FLOW



TURCK

Temperature Sensors

Temperature Sensors Selection Guide

Description	Photo	Features	Applications	Page
TS Series The TS400/500 temperature sensors are robust stainless steel sensors for PT-100 RTDs.		• High accuracy • Rotatable housing • IP 67 • -50 to 500°C (-58 to 932°F) • PNP/NPN programmable • Wide range of configurations with TP probes	• Food and Beverage • Hydraulics • Cooling lines • Plastics • Pharmaceutical • Metal Forming • Oils	C7
TT Series Available with remote or integral probes, this is an economical temperature transmitter for OEM applications.		• 4-20 mA Analog transmitter • -200 to 850°C • IP 67 • Works with TP probes	• OEM • Food and Beverage • Hydraulics • Cooling lines • Plastics	C11
IM34 Temperature Converters The IM34 will convert a 2, 3 or 4-wire RTD, thermocouple or mV signal to an analog 4-20 mA signal in a non-hazardous area.		• Input: RTD or thermocouples • Output: 4-20 mA • Display model	• Hazardous areas	C12
TP Temperature Probes TP probes are platinum four-wire resistance temperature detectors (RTD).		• PT 100 RTDs • 4-wire • Variety of styles and lengths	• TS series • TT series • IM 34 with cordset	C15
Process Connections Compression fittings or thermowells are necessary for probe installation.		• Stainless Steel • NPT threads • Tri-clamp fittings	• TP series probes	C19

Temperature Sensor Probes

RTDs use electrical resistance to measure temperature. They require a small power source in order to measure resistance. The resistance experienced by the sensor is proportional to the temperature changes being experienced by the media being sensed. RTDs contain a platinum wire that is wrapped around a core or patterned as a thin film on a substrate so that it experiences minimal differential expansion or other strains. RTDs made using platinum, preferred for its linear resistance-temperature relationship, are referred to as Pt-100.



Four wire RTDs are more accurate than two or three wire RTDs. Two wire RTDs only measure the resistance due to temperature change and do not account for lead wire resistance. Three wire RTDs have two wires dedicated to measuring the resistance change due to temperature and a third wire that measures the lead wire resistance. This resistance from the single wire is then doubled to account for both lead wires. In the four wire RTD two wires actually measure the lead wire resistance and two wires measure the resistance due to temperature change, making this the most accurate of the three types of RTDs.

- **Variety of Probes**
 - Lengths up to 2 meters
- **Thermowells**
 - Weld in threaded
- **Compression Fittings**
 - NPT
- **PTS-COVER and PTS-MB (Mounting Bracket) available**

Precise, Reliable Temperature Sensors for Process Automation

Accurately determining temperature is one of the most important tasks in processing and manufacturing industries. Precision, reliability and interface flexibility are just some of the characteristics that make a great temperature sensor. **TURCK's** TS400 and TS500 temperature sensor series provide all these traits and more, and adhere to the high standards consistent with all **TURCK** products.



- **Quality** – Internal and external design features uphold an increased level of reliability.
- **User-Friendly** – Easy to program and maintain.
- **Flexible** – Remote or direct mounting.
- **Benefits** – May be applied across factory and process automation applications.

TS400 and TS500 temperature sensors incorporate design elements that equate to real advantages in your applications. The TS400 and TS500 sensor series are platinum resistance temperature detectors (RTDs), commonly referred to as a Pt-100. Pt-100's are known to be highly precise, repeatable, and provide extremely short response times.

Pt-100's contain a platinum wire that is wrapped around a core or patterned as a thin film on a substrate so that it experiences minimal differential expansion or other strains. As the temperature changes, the controller measures the change in the electrical resistance of the platinum wire. Specifically, the hotter the wire becomes, the higher the value of electrical resistance. Pt-100 RTDs have a nominal resistance of 100 ohms at 0°C with an accuracy of 0.4°C at 50°C. The sensor's operating range varies from -50 to 500°C (-58 to 932°F).





Quality

TS400 and TS500 sensors were designed to handle harsh manufacturing environments.

- High immunity to electromagnetic interference
- Reliable and accurate
- Compact design
- Robust stainless steel housing
- IP 67 environmental protection to increase operational durability

User-Friendly

TS400 and TS500 sensors were designed with the user in mind.

- Simple push-button programming
- Recessed button stores selected values and helps prevent unintentional operational errors
- The entire display can be inverted electronically
- The TS500 version can be rotated 320 degrees
- Does not require regular maintenance calibration
- M12 **eurofast**® connection promotes easy integration in existing applications

Flexible

TS400 and TS500 use state of the art technology to bring you a sensor that facilitates operational efficiency.

- Remote or direct mountable
- Compact, robust housing
- 4-pin M12 **eurofast** connection
- Compatible with 4-wire probes
- Displays output in °C, °F, K and ohms

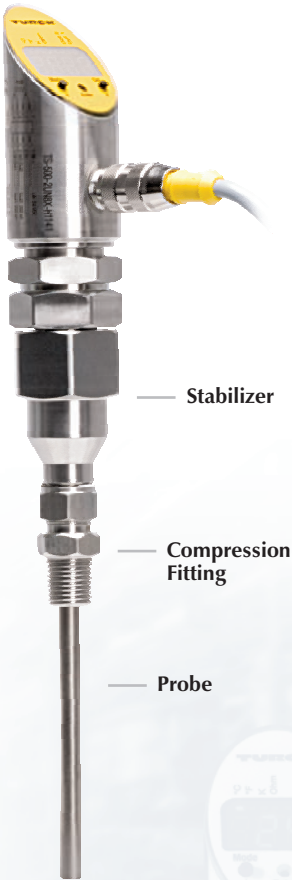
Benefits

TS400 and TS500 temperature sensors allow you to realize immediate benefits in your application.

- May be implemented in nearly all factory or process automation applications
- Housing design permits sensors to be mounted directly next to each other or in restrictive places
- Large, bright LED display
- Versions with multiple outputs available; all are easy to program and use

TURCK Temperature Sensors

Direct Mounting Sensor



Remote Mounting Sensor



Accessories



Stabilizer
(use with TP-203A .. & TP-206A ..)



Remote Cordset
(RK 4.4T-*-RS 4.4T)

Probe Options



TP-104A ..



TP-306A ..



**TP-203A ..
or TP-206A ..**

Process Connection Options



**Compression Fitting
(CF)**



**Thermowell
THW ... TRI**



**Thermowell
THW ... N**

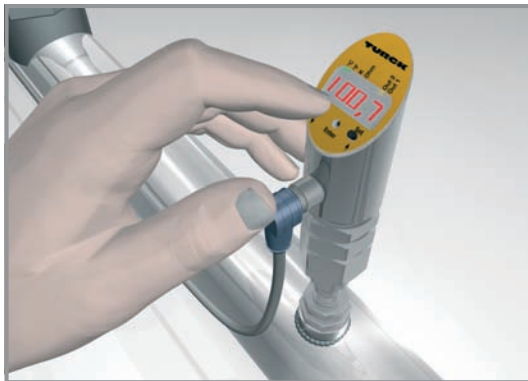


How to Order TS400 and TS500 Sensors and Accessories

1. Determine your desired output and select the TS model that meets your needs.
2. Select the appropriate probe for your application.
 - a) Questions? Call 1-800-554-7769.
3. Choose remote or direct mounting.
 - a) For direct mounting with TP-203 and TP-206, order the stabilizer (STA-3 or STA-6) for applications with vibration.
 - b) For remote mounting, order a mating cordset (RK 4.4T-* -RS 4.4T).
4. Select a process connection.
 - a) For thermowells, order one length (50 mm) shorter than the length of probe you selected in step 2.
 - b) If no thermowell is selected, a compression fitting is needed for mounting the probe.

(Note: The TP-104A does not require a process connection.)

* Length in meters.



Direct Mounting



Remote Mounting

Push Button Programming

TS400 and TS500 sensors allow optimum control. Programming the TS series is made easy with push button programming. The MODE and SET buttons are finger-operated for scrolling through the various menu options. Values for set-points, output functions, analog ranges and a range of special features, such as switch delays and display direction, can be programmed into the sensor. Programmed values are protected by a recessed button that can lock values to further ensure protection. The temperature is constantly displayed on the 4-digit, 7-segment LED display.



TS400/TS500 Temperature Sensor Part Number Key

TS - 400 - LI 2U PN 8 X - H1141									
Style			Connection						
TS = Temperature Sensor			H1141 = 4-pin, M12x1, euromast ® connector						
Housing			With LED Display						
400 = Adjustable, with display, non-rotatable									
500 = Adjustable, with display, rotatable									
Analog Output			Operational Voltage						
LI = Current analog output			8 = 15-30 VDC (switching outputs)						
LU = Voltage analog output			8 = 18-30 VDC (switching and analog outputs)						
Switching Output			Output Logic						
2U = 2 x programmable N.O./N.C. mode			PN = PNP/NPN configurable transistor switching output						
U = 1 x programmable N.O./N.C. mode									

TS400/TS500 Specifications

Electrical Data:

Operating Voltage	15-30 VDC (switching outputs) 18-30 VDC (switching and analog output)
No-Load Current	≤50 mA
SELV. PELV	According to EN 50178
Short-Circuit Protection	Yes
Reverse Polarity Protection	Yes
Insulation Class	III

Switching Output:

Switching Frequency	≤180 Hz
Output Function	2 x PNP or NPN, N.C./N.O. programmable
Voltage Drop at I _e	≤2 V
Rated Operational Current	0.2 A
Switching Point Distance	0.2 °C
Switch Point Range	-49.8° to +500°C (-58° to +932°F)
Reset Point Range	-50° to +499.8°C (-58° to +932°F)

Analog Current Output:

Current Output	4-20 mA, 0-20 mA, 20-4 mA, 20-0 mA programmable
Response Time	<100 ms
Load	≤0.5 kΩ

Analog Voltage Output:

Voltage Output	0-10 V, 0-5 V, 1-6 V, 10-0 V, 5-0 V, 6-1 V programmable
Response Time	<100 ms
Load	≥2 kΩ

Temperature Sensor Accuracy:

Switching Point Accuracy	≤ ± 0.2 °C
Repetition Accuracy	≤ ± 0.1 °C
Analog Output Accuracy (Lin.+Hys.+Rep.)	≤ ± 0.2 °C

Temperature Sensor Housing:

Housing Material	Stainless steel/plastic 1.4404 (AISI 316L)/PC
Electrical Connection	Connector M12x1 (euromast ®), 4-pin with integrated high-speed connection technology.
Sensor Connection	Connector M12x1 (euromast), 4-pin
Coupling Nut Size (with tightening torque)	SW 30 (max. 35 Nm)



TS400/TS500 Specifications - Continued

Display:

Temperature Display	4-digit 7-segment display can be rotated by 180° and switched off
Switch State Display	2 x LED yellow
Measured Value/Programming	Switch/release points; hysteresis/window mode; N.O./N.C.; unit of display; peak value memory
Display of Temperature Unit	4 x LED green (°C, °F, K, Ω)

EMC:

EN 61000-4-2	ESD 4 kV CD / 8 kV AD
EN 61000-4-3	HF radiated: 15 V/m ²
EN 61000-4-4	Burst 2 kV
EN 61000-4-5	Surge 1 kV, 42 Ω
EN 61000-4-6	HF conducted: 10 V

Ambient Conditions:

Medium Temperature.	Directly connected: -50 to +150°C; Remotely connected: -50 to +150°C
Ambient Temperature	-40° to +80°C (-40° to +176°F)
Storage Temperature	-40° to +80°C (-40° to +176°F)
Degree of Protection	IP 67
Vibration Resistance	20 g (10-2000 Hz) according to IEC 68-2-6
Shock Resistance	50 x g (11 ms) according to IEC 68-2-27

TEMPERATURE

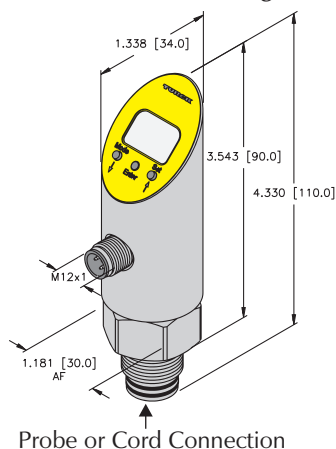


	LI2UPN8X	LUUPN8X	2UPN8X
Output	1 PNP/NPN N.O./N.C. and Programmable Current or 1 PNP/NPN N.O./N.C.	1 PNP/NPN N.O./N.C. and Programmable Voltage	Dual PNP/NPN N.O. or N.C.
Voltage	18-30 VDC	18-30 VDC	15-30 VDC
Switching Current	≤200 mA	≤200 mA	≤200 mA
Analog Load	≤500 Ω	≤500 Ω	N/A
Mating Cordset	RK 4.4T-*	RK 4.4T-*	RK 4.4T-*
Wiring Diagrams			

* Length in meters.

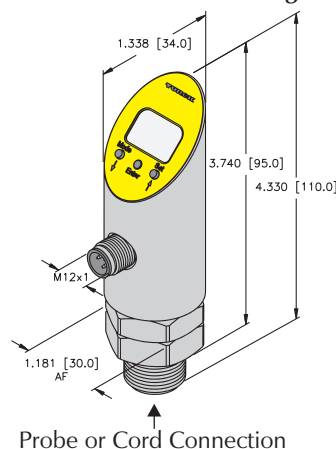
** Accuracy includes linearity, repeatability and hysteresis.

400: Fixed Housing



Probe or Cord Connection

500: Rotatable Housing



Probe or Cord Connection

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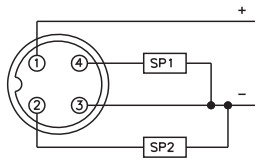
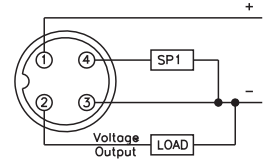
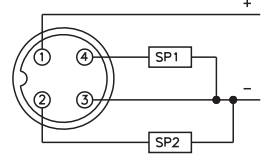
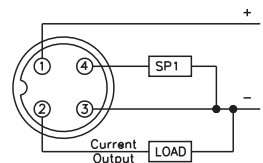
Temperature Sensors



[Return to Main Selection Guide](#)

Housing	Part Number	ID Number	Temperature Range – Remote	Temperature Range – Direct	Output
Temperature Sensor for 4-wire PT100 	TS-400-2UPN8X-H1141	M6840017	-50° to 500°C (-58° to 932°F)	-50° to 150°C (-58° to 302°F)	Dual PNP/NPN N.O./N.C.
	TS-400-LUUPN8X-H1141	M6840008			1 PNP/NPN N.O./N.C. and Programmable Voltage
	TS-400-LI2UPN8X-H1141	M6840007			1 PNP/NPN N.O./N.C. and Programmable Current or 1 PNP/NPN N.O./N.C.
Temperature Sensor for 4-wire PT100, 320° Rotatable Housing 	TS-500-2UPN8X-H1141	M6840018	-50° to 500°C (-58° to 932°F)	-50° to 150°C (-58° to 302°F)	Dual PNP/NPN N.O./N.C.
	TS-500-LUUPN8X-H1141	M6840016			1 PNP/NPN N.O./N.C. and Programmable Voltage
	TS-500-LI2UPN8X-H1141	M6840015			1 PNP/NPN N.O./N.C. and Programmable Current or 1 PNP/NPN N.O./N.C.

For remote probes use cordset RK 4.4T-*RS 4.4T.
See Section F for additional cordset information.

Voltage	Switching Current (mA)	Analog Load	Mating Cordset	Wiring Diagram #	Wiring Diagrams
15-30 VDC	≤200	N/A	RK 4.4T-*	1	Diagram 1 
18-30 VDC	≤ 200	≤500 Ω	RK 4.4T-*	2	Diagram 2 
18-30 VDC	≤200	≤500 Ω	RK 4.4T-*	3	Diagram 3 
15-30 VDC	≤200	N/A	RK 4.4T-*	1	or 
18-30 VDC	≤200	≤500 Ω	RK 4.4T-*	2	
18-30 VDC	≤200	≤500 Ω	RK 4.4T-*	3	

* Length in meters.

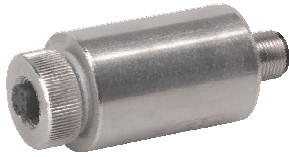
Simple Mounting

After the sensor is mounted, the actual processor unit is attached and fixed using a coupling nut. The sensor can still be rotated and aligned in all directions.

TS500 shown.



TEMPERATURE

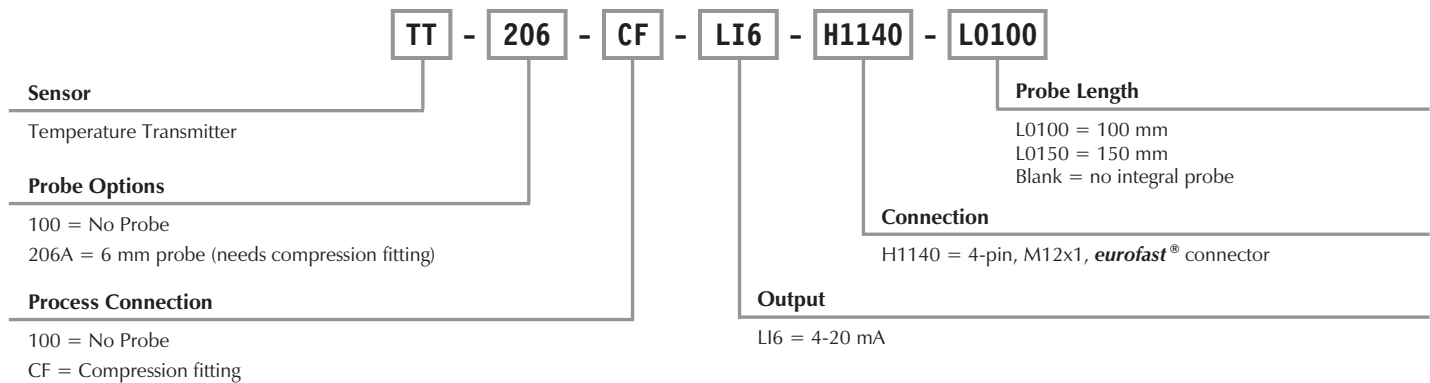


Temperature Transmitters

TURCK temperature transmitters are platinum resistance temperature detectors (RTD's), otherwise known as PT-100's. The temperature transmitter's operating range is set at 0-150°C but other ranges can be achieved by contacting the factory. Models are available with or without integral probes, and are compatible with **TURCK's** TP-Series of probes. The temperature transmitters are made from rugged 316 stainless steel to provide an IP 67 protection rating and provide a 4-20 mA analog signal.

Temperature Transmitter for PT-100 RTDs Part Number Key

Part Number Keys are to assist in IDENTIFICATION ONLY. Consult Factory for catalog items not identified.



Specifications:

Ambient Temperature -40° to +85°C (-40° to +185°F)
 Supply Voltage 8-35 VDC
 Accuracy ±.3°C/°C or ≤ ±.1% of span
 Temperature Effects ±.01°C/°C or ≤ ±.01% of span
 EMC Effects ±.5% of span

Input: RTD PT100

Range -200 to +850°C (0-150°C factory set) use with TP series temperature probes
 Contact factory for presetting of other ranges.

Output:

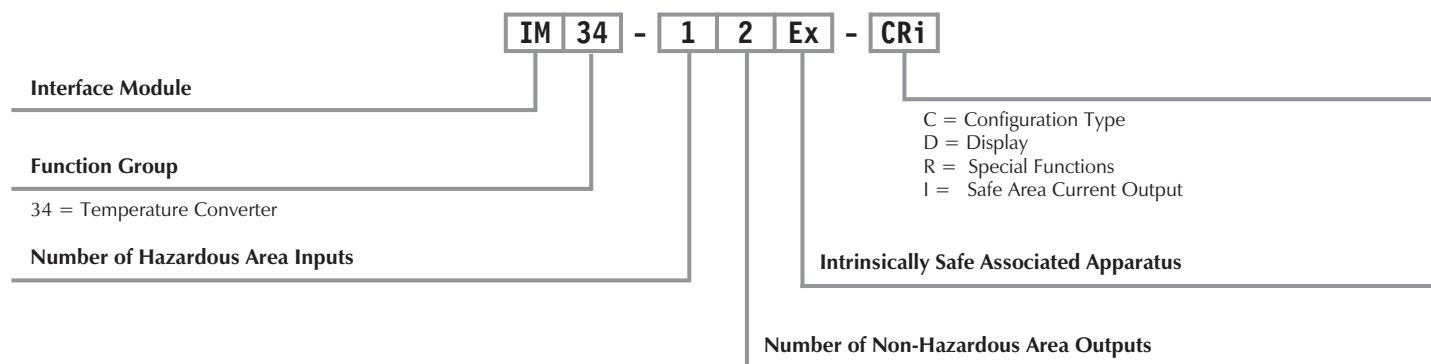
Signal Range 4-20 mA
 Update Time 135 ms
 Max Load Resistance (Vsupply-8)/.023Ω
 Protection IP 67



These units allow several different input types to be configured and used with common 4/20 mA analog input

control cards. Elimination of separate RTD, T/C and mV input cards may consolidate inventory, as well as allow the use of off-the-shelf "Simple Apparatus" components in even the most explosive atmospheres; further reducing costs for installation and maintenance.

Part Number Keys are to assist in IDENTIFICATION ONLY. Consult Factory for catalog items not identified.

**IM34-12Ex-CRi**

IM34-14Ex-CDRi

- Interface Module
- Temperature Converter
- Single Channel Input
- Four Non-Hazardous Area Current Outputs
- Intrinsically Safe Associated Apparatus
- Computer or Remote Configuration
- Alarm Contacts
- Non-Hazardous Current Output
- Universal Voltage Input
- Digital Display


TURCK

Temperature Sensors

Housing	Part Number	ID Number	Range	Output
Temperature Transmitter, for 4-Wire PT100 	TT-100-LI6-H1140	M9910441	0° to 150°C (32° to 302°F) Factory Set*	Analog 4-20 mA
Temperature Transmitter, with Integral Probe 	TT-206A-CF-LI6-H1140-L0100	M9910489	0° to 150°C (32° to 302°F) Factory Set*	Analog 4-20 mA
	TT-206A-CF-LI6-H1140-L0150	M9910490		Analog 4-20 mA

* Other ranges can be obtained by contacting the factory.

/S1792 = 0-150°F



Industrial Automation



Voltage	Analog Load	Probe Length (mm)	Protection	Mating Cordset	Wiring Diagram #	Wiring Diagram
8-35 VDC	1.2 k Ω	N/A	IP 67	RK 4.22T-*	1	Diagram 1
8-35 VDC	1.2 k Ω	100	IP 67	RK 4.22T-*	1	
8-35 VDC	1.2 k Ω	150	IP 67	RK 4.22T-*	1	

* Length in meters.

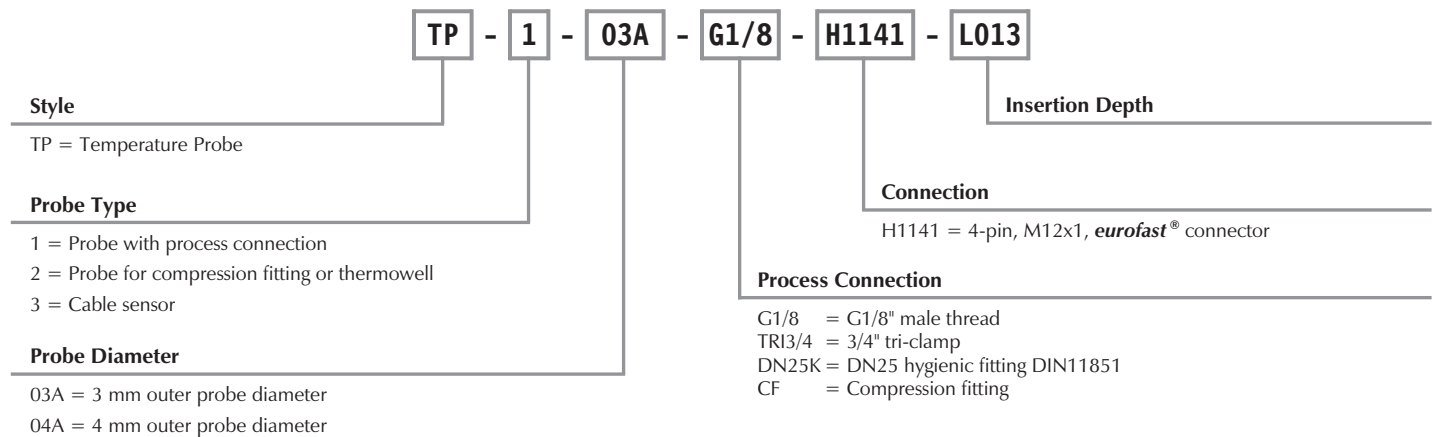
TEMPERATURE



TURCK

Temperature Sensors

Temperature Probes Part Number Key



Temperature Probes Specifications

Probe (TP-104A ..)

Temperature Operating Range	-50° to 120°C (-58° to +248°F)
Ambient Temperature	-20° to 90°C (-4° to +194°F)
Measuring Element	Pt100, DIN EN 60751, Class A
Response Time	t _{0.5} = 3 s; t _{0.9} = 10 s in water at 0.2 m/s
Output Function	4-wire
Reverse Polarity Protection	Yes
Degree of Protection	IP 67
Housing Material	Plastic/Stainless steel
Housing Quality	1.4404 (AISI 316L)
Sensor Material	Stainless steel
Sensor Quality	1.4404 (AISI 316L)
Pressure Rating (psi)	580.15
Connection	Connector, M12x1 (eurofast)
Mechanical Connection	Tri-Clamp 3/4"





Temperature Probes Specifications

Probe (TP-203 .. / TP-206 ..)

Temperature Operating Range	-30° to +500°C (-22° to 932°F) ≤350°C accuracy class A (662°F) ≥350°C accuracy class B (662°F)
Ambient Temperature	-20° to 90°C (-4° to +194°F)
Measuring Element	Pt100, DIN EN 60751, Class A
Response Time	203: $t_{0.5} = 1.5$ s; $t_{0.9} = 6$ s 206: $t_{0.5} = 6$ s; $t_{0.9} = 15$ s
Output Function	4-wire
Reverse Polarity Protection	Yes
Degree of Protection	IP 67
Housing Material	Stainless steel/plastic
Housing Quality	1.4404 (AISI 316L) mineral insulated
Sensor Material	Stainless steel
Sensor Quality	1.4404 (AISI 316L)
Pressure Rating (psi)	1450
Connection	Connector, M12x1 (eurofast ®)
Mechanical Connection	Use a compression fitting or thermowell



Probe (TP-306 ..)

Temperature Operating Range	-50° to +105°C (-58° to +221°F)
Ambient Temperature	-20° to +90°C (-4° to +194°F)
Measuring Element	Pt100, DIN EN 60751, Class A
Response Time	$t_{0.5} = 8$ s; $t_{0.9} = 20$ s in water at 0.2 m/s
Output Function	4-wire
Reverse Polarity Protection	Yes
Degree of Protection	IP 67
Housing Material	Plastic/Stainless steel
Housing Quality	TPE (thermoplastic elastomer)
Sensor Material	Stainless steel
Sensor Quality	1.4404 (AISI 316L)
Pressure Rating (psi)	217
Connection	Connector, M12x1 (eurofast)
Mechanical Connection	Use a compression fitting



TEMPERATURE



Temperature Probes

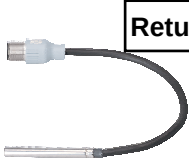
Housing Style	Part Number	ID Number	Temperature Range	Length (mm)
Pt100 Temperature Probe, 3/4" Tri-Clamp, Ø8 mm 	TP-104A-TRI3/4-H1141-L035	M9910429	-50° to +120°C (-58° to +248°F)	35
	TP-104A-TRI3/4-H1141-L100	M9910430		100
Pt100 Temperature Probe, Ø3 mm 	TP-203A-CF-H1141-L100	M9910402	-30° to +350°C (-22° to +662°F)	100
	TP-203A-CF-H1141-L150	M9910403		150
	TP-203A-CF-H1141-L200	M9910482		200
	TP-203A-CF-H1141-L250	M9910404		250
	TP-203A-CF-H1141-L300	M9910474		300
	TP-203A-CF-H1141-L1000	M9910496		1000
Pt100 Temperature Probe, Ø6 mm 	TP-206A-CF-H1141-L100	M9910475		100
	TP-206A-CF-H1141-L150	M9910476		150
	TP-206A-CF-H1141-L200	M9910477		200
	TP-206A-CF-H1141-L300	M9910478		300
	TP-206A-CF-H1141-L500	M9910491		500

Mating cordset for remote connections; RK 4.4T-*-RS 4.4T.

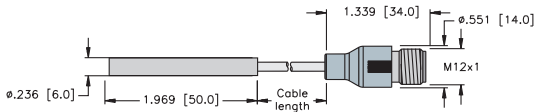
* Length in millimeters.

For technical data see pages C15 - C16.

See Section F for additional cordset information.



Temperature Probes

Housing Style	Part Number	ID Number	Temperature Range	Length (m)
Pt100 Cable Probe, 4-Pin M12x1 eurofast[®], Ø6 mm 	TP-306A-CF-H1141-L1000	M9910479	-50° to +105°C (-58° to +221°F)	1
	TP-306A-CF-H1141-L2000	M9910480		2
	TP-306A-CF-H1141-L5000	M9910481		5

For technical data see page C16.

Rotatable Display

TS400 and TS500 sensors may also be installed horizontally. The display may be electronically inverted 180 degrees by software incorporated within the sensor.



TEMPERATURE



Thermowell Part Number Key

THW - 3 - G1/8 - A4 - L013

Thermowell

Probe Diameter

3 = 3 mm probe diameter
6 = 6 mm probe diameter

Process Connection

G1/8 = G1/8" male thread
N1/8 = 1/8" NPT male thread
G1/4 = G1/4" male thread
N1/4 = 1/4" NPT male thread
G1/2 = G1/2" male thread
N1/2 = 1/2" NPT male thread
TRI3/4 = 3/4" tri-clamp
DN25K = DN25 hygienic fitting thread DIN 11851
UNI25 = Universal weld Ø25 mm

Insertion Depth

Material

A4 = Stainless steel AISI316L



Compression Fittings Part Number Key

CF - M - 3 - G1/8 - A4

Compression Fitting

Compression Ring Material

M = AISI316L
P = PTFE

Probe Diameter

3 = 3 mm outer diameter
6 = 6 mm outer diameter

Material

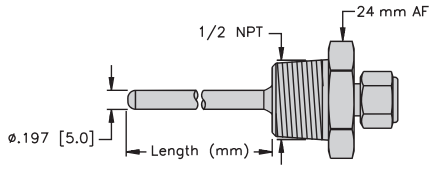
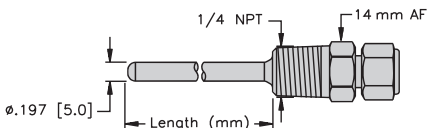
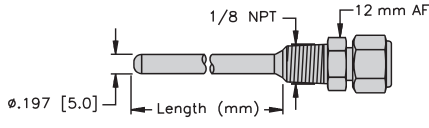
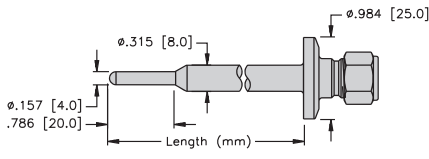
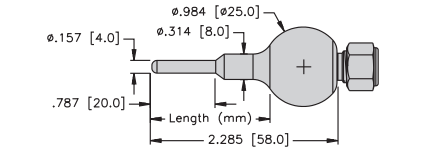
A4 = Stainless steel AISI316L

Process Connection

G1/8 = G1/8" male thread
N1/8 = 1/8" NPT male thread
G1/4 = G1/4" male thread
N1/4 = 1/4" NPT male thread
N1/2 = 1/2" NPT male thread



Thermowells

Housing Style	Part Number	ID Number	Process Connection	Length (mm)	Compatible Probe Diameter	Pressure Rating (psi)
Thermowell, 1/2" Male NPT 	THW-3-N1/2-A4-L050	M9910447	1/2" NPT	50	3 mm	5800
	THW-3-N1/2-A4-L100	M9910448	1/2" NPT	100	3 mm	5800
	THW-3-N1/2-A4-L150	M9910449	1/2" NPT	150	3 mm	5800
	THW-3-N1/2-A4-L250	M9910450	1/2" NPT	250	3 mm	5800
Thermowell, 1/4" Male NPT 	THW-3-N1/4-A4-L050	M9910416	1/4" NPT	50	3 mm	5800
	THW-3-N1/4-A4-L100	M9910420	1/4" NPT	100	3 mm	5800
	THW-3-N1/4-A4-L150	M9910424	1/4" NPT	150	3 mm	5800
	THW-3-N1/4-A4-L200	M9910428	1/4" NPT	200	3 mm	5800
Thermowell, 1/8" Male NPT 	THW-3-N1/8-A4-L050	M9910414	1/8" NPT	50	3 mm	5800
	THW-3-N1/8-A4-L100	M9910418	1/8" NPT	100	3 mm	5800
	THW-3-N1/8-A4-L150	M9910422	1/8" NPT	150	3 mm	5800
	THW-3-N1/8-A4-L200	M9910426	1/8" NPT	200	3 mm	5800
Thermowell, 3/4" Tri-Clamp 	THW-3-TRI3/4-A4-L035	M9910433	3/4" Tri-Clamp	35	3 mm	580
	THW-3-TRI3/4-A4-L050	M9910451	3/4" Tri-Clamp	50	3 mm	580
	THW-3-TRI3/4-A4-L100	M9910452	3/4" Tri-Clamp	100	3 mm	580
	THW-3-TRI3/4-A4-L150	M9910453	3/4" Tri-Clamp	150	3 mm	580
	THW-3-TRI3/4-A4-L250	M9910454	3/4" Tri-Clamp	250	3 mm	580
Thermowell, Universal Weld 	THW-3-UNI25-A4-L035	M9910502	Weld	35	3 mm	1450
	THW-3-UNI25-A4-L100	M9910503	Weld	100	3 mm	1450

Note: Material is AISI 316L/1.4404

TEMPERATURE



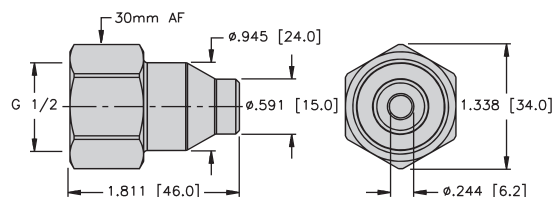
Thermowells

Housing Style	Part Number	ID Number	Process Connection	Length (mm)	Compatible Probe Diameter	Pressure Rating (psi)
Thermowell, 1/2" Male NPT 	THW-6-N1/2-A4-L050	M9910463	1/2" NPT	50	6 mm	5800
	THW-6-N1/2-A4-L100	M9910464	1/2" NPT	100	6 mm	5800
	THW-6-N1/2-A4-L150	M9910465	1/2" NPT	150	6 mm	5800
	THW-6-N1/2-A4-L250	M9910466	1/2" NPT	250	6 mm	5800
Thermowell, 3/4" Tri-Clamp 	THW-6-TRI3/4-A4-L050	M9910467	3/4" Tri-Clamp	50	6 mm	580
	THW-6-TRI3/4-A4-L100	M9910468	3/4" Tri-Clamp	100	6 mm	580
	THW-6-TRI3/4-A4-L150	M9910469	3/4" Tri-Clamp	150	6 mm	580
	THW-6-TRI3/4-A4-L250	M9910470	3/4" Tri-Clamp	250	6 mm	580

Note: Material is AISI 316L/1.4404

Stabilizer Accessories for Direct Mounting

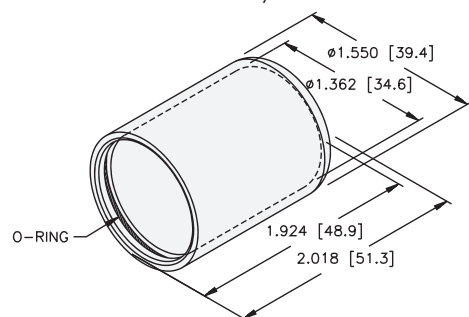
Stabilizer for 6 mm Temperature Probe



STA-6
(M6835023)

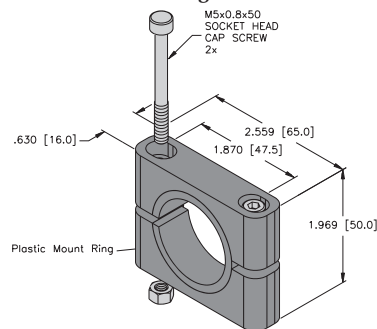
Accessories

Harsh Duty Cover



PTS-COVER
(A9350)

Mounting Bracket



PTS-MB
(A9422)



Compression Fittings

Housing Style	Part Number	ID Number	Compatible Probe Diameter	Compression Fitting	Temperature Range	Pressure Rating (psi)
Compression Fitting, 1/4" Male NPT 	CF-M-3-N1/4-A4	M9910408	3 mm	Metal	350°C (662°F)	580
	CF-P-3-N1/4-A4	M9910412	3 mm	PTFE	100°C (212°F)	87
Compression Fitting, 1/8" Male NPT 	CF-M-3-N1/8-A4	M9910406	3 mm	Metal	350°C (662°F)	580
	CF-P-3-N1/8-A4	M9910410	3 mm	PTFE	100°C (212°F)	87
Compression Fitting, 1/4" Male NPT 	CF-M-6-N1/4-A4	M9910484	6 mm	Metal	350°C (662°F)	580
	CF-P-6-N1/4-A4	M9910486	6 mm	PTFE	100°C (212°F)	87
Compression Fitting, 1/2" Male NPT 	CF-M-6-N1/2-A4	A0950	6 mm	Metal	350°C (662°F)	580

Note: Material is AISI 316L/1.4404

Mounts in Compact Spaces

With a housing diameter of 34 mm, multiple temperature sensors can fit in tight spaces.



TEMPERATURE



Level Sensors Selection Guide

Product Selection

High/Low Level Detection

levelprox®

Capacitive Sensor

Ultrasonic Sensor
(switching output)

Conductive Probe

Pressure Sensor
(switching output)

Continuous Level Detection

R16 Level Probe

Ultrasonic Sensor
(analog output)

Pressure Sensor
(analog output)



Product	Media detected		Continuous Level	Point Level	Non-Intrusive
	Liquid	Dry Goods			
<i>levelprox</i>	X			X	X
Capacitive Sensor	X	X*		X	X
Ultrasonic Sensor	X	X*	X	X	X
Conductive Probe	X			X	
R16 Level Probe	X		X		
Pressure Sensor	X		X	X	

* Target dependent.



Capacitive Sensors	Housing	Features	Applications	Page
BC and BCF Capacitive Sensors Capacitive sensors detect non-metallic targets. TURCK's sensors come in barrels and flat packs to meet difficult application needs.	5.5 mm 	Flat and QPak Housings • Embeddable • Flush Mount • BCF sensors are noise immune • Point Level Detection • Variety of rectangular housing	• Food and Beverage • Semiconductor • Pharmaceutical • Packaging • Plastics • OEM	D13
	8 mm 			D13
	10 mm 			D15
	14 mm 			D15
	20 mm 			D17 - D20
	20 mm 			D21
	40 mm 			D23
	80 mm 			D23



Capacitive Sensors	Housing	Features	Applications	Page
BC and BCF Capacitive Sensors Capacitive sensors detect non-metallic targets. TURCK's sensors come in barrels and flat packs to meet difficult application needs.	12 & 18 mm 	Metal Barrels • 12, 18 and 30 mm barrels • 3 - 10 mm embeddable ranges	• Food and Beverage • Semiconductor • Pharmaceutical • Packaging • Plastics • OEM	D25 - D27
	30 mm 			D33 - D35
	12 & 18 mm 	Plastic Barrels • Can “see-through” sight glasses and plastic tanks • High temperature versions up to 100°C • Chemically resistant versions • BCF sensors are noise immune		D25, D29 - D31
	30 MM 			D37 - D39
	30 mm 			D37 - D41
	34 mm 			D43
	34 mm 			D41, D45

<i>levelprox</i> ®	Housing	Features	Applications	Page
T50 and M30 levelprox TURCK's levelprox is an ultrasonic sensor that non-invasively detects point level in metal tanks.		- Two detection modes : - Reverb - Echo - Tri-clamp mounting (T50) - Variety of mounting kits - FM approval	- Stainless Steel tanks - Food and Beverage - Washdown (T50) - Pharmaceutical	D51



R16 Level Probe	Housing	Features	Applications	Page
R16 Level Probe The R16 level probe uses magnetostrictive technology to monitor the position of a magnetic float along the sensing rod.		• Liquid Level Sensor • Continuous level detection • FM approvals • IP 68	• Food and Beverage • Pharmaceutical • Hazardous areas	D56

Conductive Rods	Housing	Features	Applications	Page
Conductive Rods Resistance between two steel rods is measured to determine the level of the conductive liquid.		• Point level detection • Adjustable sensitivity • Single set points • Multiple Inputs • On/Off delay • Programmable outputs	• Wastewater • Hazardous areas	D75

LEVEL

Ultrasonic Sensors	Housing	Features	Applications	Page
Ultrasonic Sensors TURCK's ultrasonic sensors emit an ultrasonic pulse that reflects back from any object in its sonic cone. The time taken for this echo to return to the sensor is proportional to the distance of the object.	18 mm Barrels 	• Switch points • Analog output • Flat packs • Barrels	• Bulk Storage • Package Handling • Dry Goods Level • Liquid Level • Stacking	D91
	30 mm Barrels 			D93
	47 mm Barrels 			D95
	40 mm Rectangular 			D97
	40 mm Quick Disconnect 			D99

Capacitive Sensors Work Where Others Don't!

TURCK Presents... The Industry's Most Extensive Line of Capacitive Sensors

You may know that **TURCK** has the broadest product offering in inductive sensors, but did you also know that we have the most extensive line of capacitive sensors?

TURCK's Q-Pak® capacitive sensors are available in packages up to 10 times narrower than conventional barrel-style sensors. Also our PVDF sensors offer incredible resistance to harsh chemical environments found in the semiconductor and chemical industries.

Liquid Level Detection Capacitive sensors have the ability to "see through" lower dielectric materials, such as plastic or glass, to detect higher dielectric ones. This allows capacitive sensors to detect levels of many types of materials either directly through the wall for plastic tanks, or by utilizing a sight glass or tank well for metal tanks. With **TURCK's** Intrinsically Safe NAMUR sensors, PVDF models and Teflon® tank wells, even explosive or corrosive materials can be safely sensed.

Grain and Plastic Pellet Detection Capacitive sensors allows for detection of a variety of granular or powdered materials. Capacitive sensors are widely used to monitor the level of plastic pellets in the hoppers of injection molding machines. **TURCK's** new "BCF" line of sensors are ideal for this application.

TURCK Intrinsically Safe NAMUR sensors are also used in grain elevators to monitor the levels of materials ranging from rice and barley malt to corn and soybeans.

Sensitivity Adjustment

Capacitive sensors can be adjusted two ways in order to sense a target consistently.

1. **Physical adjustment** - moving the sensor towards or away from the target is the preferred method of adjusting sensitivity when the sensor is not in direct contact with the target. This allows materials to be moved into or out of range while leaving the sensor at the factory setting or after re-calibration to the nominal operating distance S_n .
2. **Adjustment of the potentiometer** - turning the potentiometer in a clockwise direction increases the sensitivity of the sensor. The potentiometer is factory-set for an operating distance of 0.7 to 0.8 S_n to a grounded standard target (Figure 5). It should be adjusted in increments of no greater than a quarter-turn (Figure 6). Increasing the sensitivity results in a greater operating distance to both conductive and non-conductive targets.

Figure 5

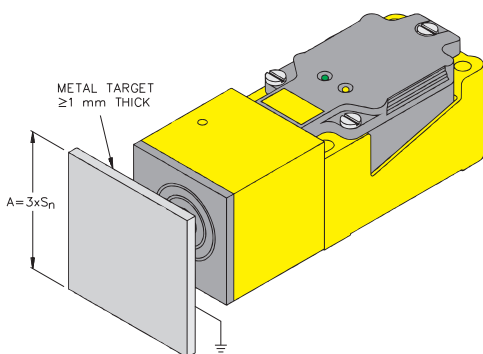
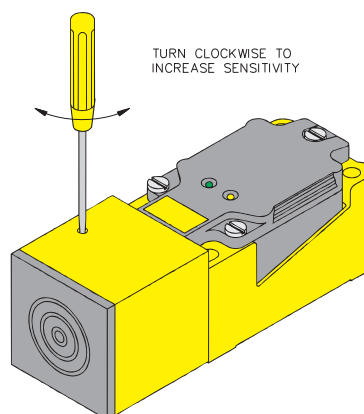
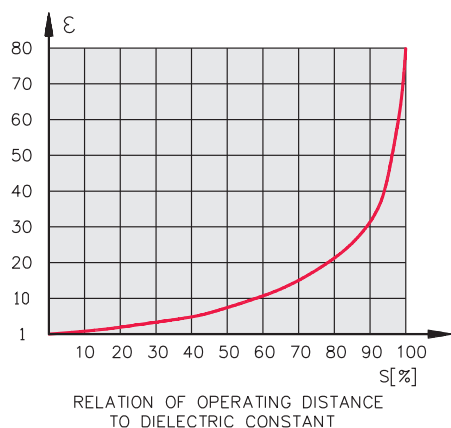


Figure 6



When sensing non-conductive targets, the larger the dielectric constant of a material, the greater the achievable operating distance (Figure 7). Adjusting the potentiometer affects the total curve; for example, if the potentiometer is adjusted for less sensitivity, it will have less operating distance to all materials.

Figure 7



In general terms, the larger the dielectric constant of a material, the greater the achievable operating distance.

When detecting organic materials the sensing distance will depend largely on the water content ($\epsilon_{\text{water}} = 88$).

It should be noted that a large increase in sensitivity will cause the sensor to become nonembeddable, and may result in an unstable switching point that can be influenced by environmental changes such as temperature, humidity, dust, etc.

At adjustments of $S > S_n$, the differential travel (hysteresis) can also increase.

Applications

- **Liquid Level Control** for both explosive and non-explosive materials.
- **Package Inspection** for product content and/or fill level.
- **Wire-Break Detection** for wire sizes down to .003".
- **Plastic Pellet Detection** in a hopper for injection molding processes.
- **Grain or Food Products Level Detection**; intrinsically safe models available.
- **Small Metal Parts Detection**; greater sensing range than comparable inductive sensors.

Operating Principle

The active element is formed by two metallic electrodes positioned much like an "opened" capacitor (Figure 1). Electrodes A and B are placed in a feedback loop of a high frequency oscillator. When no target is present, the sensor's capacitance is low, therefore the oscillation amplitude is small. When a target approaches the face of the sensor, it increases the capacitance. This increase in capacitance results in an increased amplitude of oscillation. The amplitude of oscillation is measured by an evaluating circuit that generates a signal to turn on or off the output (Figure 2).

Figure 1

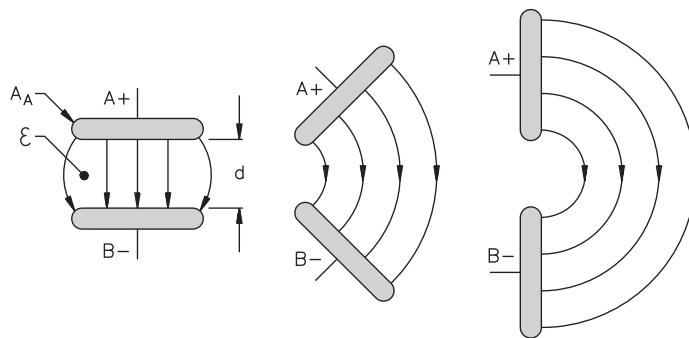
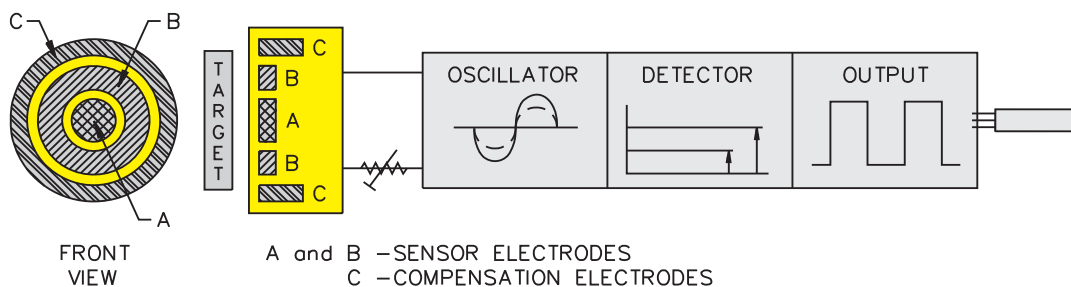


Figure 2



Operating Principle

Capacitance is a function of the surface area of either electrodes (A or B), the distance between the electrodes (d), and the dielectric constant of the material (ϵ) between the electrodes (Figure 1).

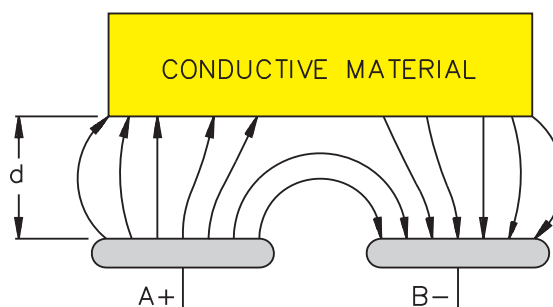
$$C = \frac{\epsilon \times A}{d}$$

C = capacitance of sensor
 A = surface area of either electrode
 d = distance between two electrodes
 ϵ = dielectric constant of material between the electrodes

When a **Conductive Target** enters the sensor's field, it forms a counter electrode to the active face of the sensor, thus decreasing the distance between the electrodes (d) and increasing their average surface area (Figure 3). The capacitance with a metal target present is always greater than the capacitance of the circuit in the absence of the target.

Reduction factors for different metals are not a consideration when using capacitive sensors.

Figure 3

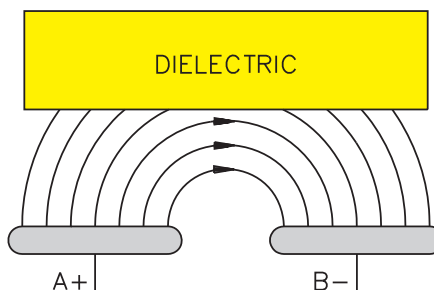


CAPACITIVE

When a **Non-Conductive Target** enters the sensor's field, it acts as an electrical insulator between electrodes A and B (Figure 4).

The dielectric constant of the material (ϵ) is a measure of its insulation properties. All liquids and solids have a greater dielectric constant than air ($\epsilon_{\text{air}} = 1$). Therefore, the capacitance with a non-metallic target present is always greater than the capacitance of the circuit in the absence of the target.

Figure 4





TURCK

Level Sensors - Capacitive

Sensitivity Adjustments: Adjusting the sensitivity of the capacitive sensor in order to reliably detect the target material. Although the potentiometer is factory set for an operating distance of 0.7 to 0.8 times the rated operating distance, it can be easily changed. Some sensors even feature a remote potentiometer, allowing adjustments to be made in locations away from the sensor.

Most **TURCK** capacitive sensors are listed as embeddable. By increasing the sensitivity, the embeddable sensor can be changed into a non-embeddable version with enhanced sensing capabilities.

Noise Immunity: were originally designed for use in level detection applications in areas that were generally far away from other electrical equipment. As factory automation has become more prevalent throughout industrial markets, these capacitive sensors have gravitated into new environments where electrical noise levels are greatly increased. Electrical noise can be produced by various sources including variable frequency drives, electro mechanical motors and standard walkie-talkie devices. These “noisy” environments can have adverse effects on sensing devices causing them to operate improperly and unreliably.

TURCK recognizes this and has developed a new circuit for its capacitive sensors. These new “BCF” sensors incorporate a **unique filter principle**, making them immune to most industrial noise. This principle involves a fixed oscillator frequency combined with a rectifier filter providing superior noise immunity over the competition.

These two innovative electrical techniques give **TURCK** the best defense against industrial noise. The list of specifications and test results below demonstrates how **TURCK** meets or exceeds all of the rigid standards established by CE. In fact, the criteria set forth by CE is so stringent that most capacitive sensors offered on the market today cannot pass any or all of these testing requirements. If you have a capacitive sensor application located in a “noisy” environment choose the new “BCF” sensors from **TURCK** to ensure your process operates smoothly.



Test Type		TURCK “BCF” Noise Immune Capacitive Sensors	CE “Product” Standard	CE “Generic” Standard
Immunity to Electrostatic Discharge (ESD)	IEC 1000-4-2 EN 61000-4-2	8 kV Direct Contact 30 kV Airborne	4 kV Direct Contact 8 kV Airborne	4 kV Direct Contact 8 kV Airborne
Immunity to Radiated Electromagnetic Fields. Radio Frequency Interference (RFI)	3 V/M 80-1000 MHz	15 V/M 80-1000 MHz	3 V/M 80-1000 MHz	10V/M 80-1000 MHz
Immunity to Electrical Fast Transients (Burst-High Voltage)	IEC 1000-4-4 EN 61000-4-4	3000 V	2000 V	2000 V
Immunity to Conducted R.F. Voltage (Line coupled Noise)	IEC 1000-4-6 EN 61000-4-6	>10 V 150 kHz-230 MHz	Undefined	10 V 150 kHz-80 MHz
Immunity to Surges (lightning strike)	IEC 255-5	1 kV, 500 Ω DC 5 kV, 500 Ω AC	1 kV, 500 Ω DC	Undefined



Capacitive Sensor Part Number Key

B C 20			K 40 SR			F Z 3 X2			Wiring Options	Special Option Codes
Mounting			Principle of Operation			Rated Operating Distance (mm)			Housing Style	
B = Embeddable N = Nonembeddable			C = Capacitive CF = Capacitive (Noise immune)						Barrel - Metal M = Partial Threading, Chrome Plated Brass Barrel - Plastic K = Smooth KT = PVDF, Smooth P = Full Threading PT = PVDF, Full Threading S = Partial Threading Rectangular Q = Metal or Plastic, Various Rectangular Styles QF = Plastic, Rectangular - Flat Limit Switch CP = <i>combiprox</i> [®] , Plastic Housing, Terminal Chamber Base with Removable Sensor Head	
									Number of LEDs Examples: Blank = No LEDs X2 = 2 LEDs Voltage Range AC: 3 = 20-250 VAC (Not SCP) DC: 4 = 10-65 VDC, Polarity Protected, Pulsed SCP** 6 = 10-30 VDC, Polarity Protected, Pulsed SCP** **SCP = Short-Circuit and Overload Protection	
									Output N = NPN Transistor (Current Sinking) P = PNP Transistor (Current Sourcing) Z = 2-Wire AC	
									Output Function A = Normally Open (N.O.) F = Connection Programmable (N.O. or N.C.) R = Normally Closed (N.C.) V = Complementary Outputs: One N.O., One N.C. Y0 = NAMUR Output, Requires Switching Amplifier	
									Housing Modifier SR = Straight Terminal Chamber	

CAPACITIVE

Wiring Options

A) Connectorized Sensor

BC10-M30-AP4X-

H1 1 4 1

Connector Family

B1 = *minifast*[®], Metal, Male
B2 = *minifast*[®], Plastic, Male
B3 = *microfast*[®], Metal, Male
H1 = *eurofast*[®], Metal or Plastic, Male
V1 = *picofast*[®], Metal, Male

Factory Code

Example:
1 = Standard
3 = N.C. DC Output on Pin 4 (for US)

Number of Pins

Connector / Sensor Transition

1 = Straight

B) Potted Cable

BC 5-S18-AP4X-

7M

Cable Length

Blank = 2 Meter cable
7M = 7 Meter cable

C) Cable / Connector Option

BCF 5-S18-AP4X-

0.2 - RS 4T

Cable Length

0.2 Meter cable

Connector

RS 4T = *eurofast*, Male



TURCK

Level Sensors - Capacitive

3-Wire DC Capacitive - AP6X, AN6X

Ripple.	≤10%
Differential Travel (Hysteresis).	2-20% (5% typical)
Voltage Drop Across Conducting Sensor	≤1.8 V at 200 mA
Trigger Current for Overload Protection.	≥220 mA
Off-State (Leakage) Current	<100 µA
No-Load Current	≤15 mA
Power-On Effect	Per IEC 947-5-2
Reverse Polarity Protection	Yes
Wire-Break Protection	Yes
Transient Protection.	Per EN 60947-5-2
Shock.	30 g, 11 ms
Vibration	55 Hz, 1 mm Amplitude in all 3 Planes
Repeatability	≤2% of Rated Operating Distance
Temperature Drift.	<±20% of Rated Operating Distance
Short-circuit Protection	Yes

4-Wire DC Capacitive - VP4X, VN4X

Ripple.	≤10%
Differential Travel (Hysteresis).	2-20 (5% typical)
Voltage Drop Across Conducting Sensor	≤1.8 V at 200 mA
Trigger Current for Overload Protection.	≥220 mA
Leakage (Off-State) Current	<100 µA
No-Load Current	≤15 mA
Power-On Effect	Per IEC 947-5-2
Reverse Polarity Protection	Incorporated
Wire-Break Protection	Incorporated
Transient Protection.	Per EN 60947-5-2
Shock.	30 g, 11 ms
Vibration	55 Hz, 1 mm Amplitude in all 3 Planes
Repeatability	≤2% of Rated Operating Distance
Temperature Drift.	<±20% of Rated Operating Distance
Short-circuit Protection	Yes



2-Wire AC Capacitive - AZ3X

Line Frequency	40-60 Hz
Differential Travel (Hysteresis).	3-15% (5% typical)
Voltage Drop Across Conducting Sensor	≤6.0 V at 400 mA
	8 & 12 mm ≤6.0 V at 100 mA
Continuous Load Current	≤400 mA
	8 & 12 mm ≤100 mA
Off-State (Leakage) Current	≤1.7 mA
Minimum Load Current.	≥5.0 mA
Inrush Current	≤8.0 A (≤10 ms, 5% Duty Cycle)
Power-On Effect	Per IEC 947-5-2
Transient Protection.	Per EN 60947-5-2
Shock.	30 g, 11 ms
Vibration	55 Hz, 1 mm Amplitude in all 3 Planes
Repeatability	≤2% of Rated Operating Distance
Short-circuit Protection	No

2-Wire DC NAMUR Capacitive - Y1X

Differential Travel (Hysteresis).	1-10% (5% typical)
Nominal Voltage	8.2 VDC (EN60947-5-6)
Resistance Change from	
Nonactivated to Activated Condition	typical <1.0 to >8.0 kΩ
Resulting Current Change	≥2.2 mA to ≤1.0 mA
Recommended Switching Point for	
Remote Amplifier	>1.2 to <2.1 mA, typ. 1.55 mA ON/1.75 mA OFF
Power-On Effect	Realized in Amplifier
Reverse Polarity Protection	Incorporated
Wire-Break Protection	Realized in Amplifier
Transient Protection.	Realized in Amplifier
Shock.	30 g, 11 ms
Vibration	55 Hz, 1 mm Amplitude in all 3 Planes
Repeatability	≤2% of Rated Operating Distance

TURCK

Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
5.5 mm - Embeddable, Potted-In Cable 	BC 5-QF5.5-AN6X2/S250	S2620120	No Potentiometer	5	5	3-Wire DC NPN
	BC10-QF5.5-AN6X2	S2620121		10	10	
	BC10-QF5.5-AN6X2/S250	S2620119	No Potentiometer	10	10	
	BC 5-QF5.5-AP6X2/S250	S2620116	No Potentiometer	5	5	3-Wire DC PNP
	BC10-QF5.5-AP6X2	S2620117		10	10	
	BC10-QF5.5-AP6X2/S250	S2620115	No Potentiometer	10	10	
5.5 mm - Embeddable, Potted-In Cable, w/Potentiometer Cover 	BC10-QF5.5-AN6X2/S932	S2620137	Covered Pot.	10	10	3-Wire DC NPN
	BC10-QF5.5-AP6X2/S932	S2620109	Covered Pot.	10	10	3-Wire DC PNP
8 mm - Embeddable, Potted-In Cable 	BC 5-Q08-AN6X2	S2620100	No Potentiometer	5	5	3-Wire DC NPN
	BC 5-Q08-AP6X2	S2620000	No Potentiometer	5	5	3-Wire DC PNP
8 mm - Embeddable, picofast® Connector 	BC 5-Q08-AN6X2-V1131	S2621100	No Potentiometer	5	5	3-Wire DC NPN
	BC 5-Q08-AP6X2-V1131	S2621000	No Potentiometer	5	5	3-Wire DC PNP

"/S250" designates without potentiometer.

"/S932" designates Covered potentiometer.



Industrial Automation

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Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Mat.	Face/ Front Cap	Power LED	Output LED	Mating Cord/ Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-30 VDC	100	≤200	-25 to +70	IP 67	PP	PP	GN	YE	2M/PUR	1	Diagram 1
	100	≤200	-25 to +70	IP 67	PP	PP	GN	YE	2M/PUR	1	
	100	≤200	-25 to +70	IP 67	PP	PP	GN	YE	2M/PUR	1	
10-30 VDC	100	≤200	-25 to +70	IP 67	PP	PP	GN	Ye	2M/PUR	2	Diagram 2
	100	≤200	-25 to +70	IP 67	PP	PP	GN	YE	2M/PUR	2	
	100	≤200	-25 to +70	IP 67	PP	PP	GN	YE	2M/PUR	2	
5-30 VDC	100	Remote	-25 to +70	IP 67	PP	PP	N/A	YE	2M/PUR	5	Diagram 3
10-30 VDC	100	≤200	-25 to +70	IP 67	PP	PP	GN	YE	2M/PUR	1	
10-30 VDC	100	≤200	-25 to +70	IP 67	PP	PP	GN	YE	2M/PUR	2	
10-30 VDC	100	≤200	-25 to +70	IP 67	PP	PP	GN	YE	2M/PUR	2	Diagram 4
10-30 VDC	100	≤200	-25 to +70	IP 67	Zinc	PA 12	GN	YE	2M/PVC	1	
10-30 VDC	100	≤200	-25 to +70	IP 67	Zinc	PA 12	GN	YE	2M/PVC	2	
10-30 VDC	100	≤200	-25 to +70	IP 67	Zinc	PA 12	GN	YE	PKG 3Z-*	3	Diagram 5
10-30 VDC	100	≤200	-25 to +70	IP 67	Zinc	PA 12	GN	YE	PKG 3Z-*	4	

* Length in meters.

CAPACITIVE



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Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
10 mm - Embeddable, Potted-In Cable 	BC 8-Q10-AN6X2/S250	S2621203	No Potentiometer	8	8	3-Wire DC NPN
	BC 8-Q10-AP6X2/S250	S2621200	No Potentiometer	8	8	3-Wire DC PNP
10 mm - Embeddable, picofast® Connector 	BC 8-Q10-AN6X2-V1131/S250	S2621202	No Potentiometer	8	8	3-Wire DC NPN
	BC 8-Q10-AP6X2-V1131/S250	S2621201	No Potentiometer	8	8	3-Wire DC PNP
14 mm - Embeddable, Potted-In Cable 	BC10-Q14-AN4X2	M2530010		10	15	3-Wire DC NPN
	BC10-Q14-AN4X2/S400	M2530005	Rear LED	10	15	
	BC10-Q14-AP4X2	M2530001		10	15	3-Wire DC PNP
	BC10-Q14-AP4X2/S400	M2530003	Rear LED	10	15	
	BC10-Q14-VN4X2	M2530030	Comp. Outputs	10	15	4-Wire DC NPN
	BC10-Q14-VP4X2	M2530020	Comp. Outputs	10	15	4-Wire DC PNP
14 mm - Embeddable, picofast Connector 	BC10-Q14-AN4X2-V1131	M2530011		10	15	3-Wire DC NPN
	BC10-Q14-AN4X2-V1131/S400	M2530006	Rear LED	10	15	
	BC10-Q14-AP4X2-V1131	M2530002		10	15	3-Wire DC PNP
	BC10-Q14-AP4X2-V1131/S400	M2530004	Rear LED	10	15	

"/S250" in part number designates without potentiometer.

"/S400" in part number designates rear LED location on back of sensor opposite front face.



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Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Mat. Face/ Front Cap	Power LED	Output LED	Mating Cord Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-30 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	1	Diagram 1
10-30 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	2	Diagram 2
10-30 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	PKG 3M-*	3	Diagram 3
10-30 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	PKG 3M-*	4	Diagram 4
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	1	Diagram 5
	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	1	
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	2	Diagram 6
	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	2	
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	5	
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	6	
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	PKG 3M-*	3	
	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	PKG 3M-*	3	
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	PKG 3M-*	4	
	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	PKG 3M-*	4	

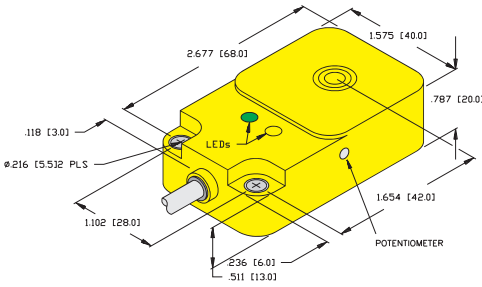
* Length in meters.

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Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
20 mm - Embeddable, Potted-In Cable 	BC20-Q20-AN4X2	M2530110		20	30	3-Wire DC NPN
	BC20-Q20-AN4X2/S400	M2530104	Rear LED	20	30	
	BC20-Q20-AP4X2	M2530100		20	30	3-Wire DC PNP
	BC20-Q20-AP4X2/S400	M2530102	Rear LED	20	30	
	BC20-Q20-VP4X2/S400	M2530122	Comp. Outputs	20	30	4-Wire DC PNP
	BC20-Q20-AZ3X2	M4352000		20	30	2-Wire AC
	BC20-Q20-AZ3X2/S400	M2310005	Rear LED	20	30	

"/S400" in part number designates rear LEDs, located on back of sensor opposite of sensing face.



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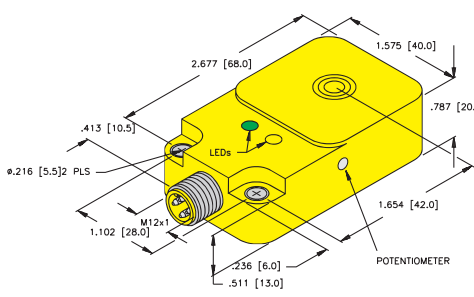
Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing	Face	Power LED	Output LED	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	1	1	Diagram 1
	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	1	1	
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	2	2	Diagram 2
	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	2	2	
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	3	3	Diagram 3
20-250 VAC	20	≤500	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	4	4	Diagram 4
	20	≤500	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	2M/PVC	4	4	

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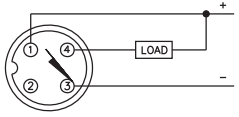
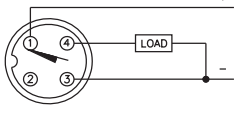
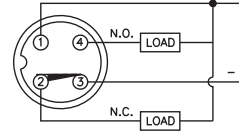
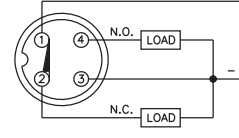

Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
20 mm - Embeddable, eurofast® Connector  Technical drawing dimensions (mm): Top: 2.677 [68.0], 1.575 [40.0] Side: 1.787 [20.0], 1.654 [42.0] Front: 1.102 [28.0], .511 [13.0] Bottom: .236 [6.0] Connector: .413 [10.5], .216 [5.5]2 PLS, M12x1 Features: LEDs, POTENTIOMETER	BC20-Q20-AN4X2-H1141	M2530111		20	30	3-Wire DC NPN
	BC20-Q20-AN4X2-H1141/S400	M2530105	Rear LED	20	30	
	BC20-Q20-AP4X2-H1141	M2530101		20	30	3-Wire DC PNP
	BC20-Q20-AP4X2-H1141/S400	M2530103	Rear LED	20	30	
	BC20-Q20-VN4X2-H1141	M2530131		20	30	4-Wire DC NPN
	BC20-Q20-VN4X2-H1141/S400	M2530124	Comp. Outputs	20	30	
	BC20-Q20-VP4X2-H1141	M2530121		20	30	4-Wire DC PNP
	BC20-Q20-VP4X2-H1141/S400	M2530123	Comp. Outputs	20	30	

"S400" in part number designates rear LEDs, located on back of sensor opposite of sensing face.

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Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing	Face	Power LED	Output LED	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	RK 4T-*	1	1	Diagram 1 
	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	RK 4T-*	1	1	
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	RK 4T-*	2	2	Diagram 2 
	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	RK 4T-*	2	2	
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	RK 4.4T-*	3	3	Diagram 3 
	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	RK 4.4T-*	3	3	
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	RK 4.4T-*	4	4	Diagram 4 
	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	RK 4.4T-*	4	4	

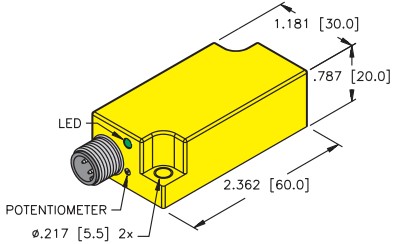
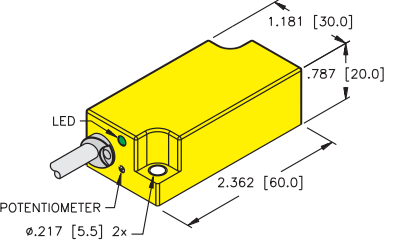
* Length in meters.

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
10 mm - Embeddable, <i>eurofast</i>® Connector 	BCF10-Q20L60-AP4X-H1141	M2504027	Noise Immune	10	20	3-Wire DC PNP
10 mm - Embeddable, Potted-In Cable 	BCF10-Q20L60-AP4X	M2504028	Noise Immune	10	20	3-Wire DC PNP



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Voltage	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Mat.	Face/ Front Cap	Power LED	Output LED	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-65 VDC	≤200	-25 to 70	IP 67	PBT-GF20-V0		None	YE	RK 4T-*	1	Diagram 1 Diagram 2
10-65 VDC	≤200	-25 to 70	IP 67	PBT-GF20-V0		None	YE	2M/PVC	2	

* Length in meters.

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Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
40 mm - Embeddable, Terminal Chamber	BC20-CP40-VN4X2	M2515700	Comp. Outputs	20	30	4-Wire DC NPN
	BC20-CP40-VP4X2	M2515600	Comp. Outputs	20	30	4-Wire DC PNP
	BC20-CP40-FZ3X2	M2311500	Prog. Outputs	20	30	2-Wire AC
80 mm - Nonembeddable, Terminal Chamber	NC50-CP80-VN4X2	M2580112	Comp. Outputs	NA	50	4-Wire DC NPN
	NC50-CP80-VP4X2	M2580212	Comp. Outputs	NA	50	4-Wire DC PNP
	NC50-CP80-FZ3X2	M2310610	Prog. Outputs	NA	50	2-Wire AC



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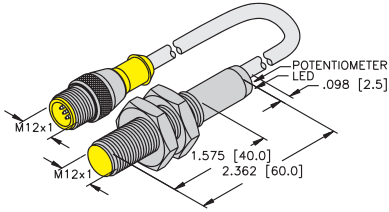
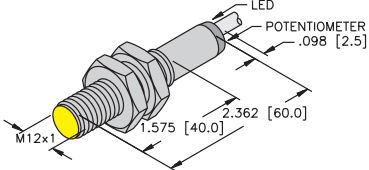
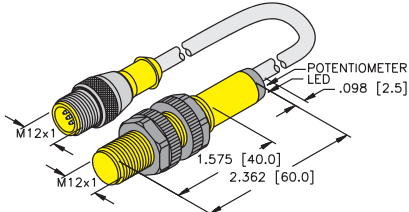
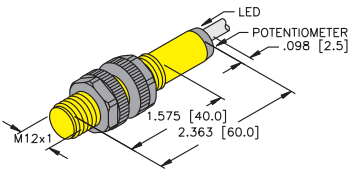
Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Mat.	Face	Power LED	Output LED	Mating Cord Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	- - - -		1	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	- - - -		2	Diagram 2
20-250 VAC	20	≤500	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	- - - -		3	Diagram 3
10-65 VDC	200	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	- - - -		1	
10-65 VDC	200	≤200	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	- - - -		2	
20-250 VAC	20	≤500	-25 to +70	IP 67	PBT-GF30-V0	GN	YE	- - - -		3	

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Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
12 mm - Embeddable, eurofast® Connector 	BC 3-M12-AN6X-0.2M-RS 4T	M2601190		3	3	3-Wire DC NPN
	BC 3-M12-AP6X-0.2M-RS 4T	M2601091		3	3	3-Wire DC PNP
12 mm - Embeddable, Potted-In Cable 	BC 3-M12-AN6X	M2601100		3	3	3-Wire DC NPN
	BC 3-M12-AP6X	M2601000		3	3	3-Wire DC PNP
12 mm - Embeddable, eurofast Connector 	BC 3-S12-AN6X-0.2M-RS 4T	M2601390		3	4.5	3-Wire DC NPN
	BC 3-S12-AP6X-0.2M-RS 4T	M2601291		3	4.5	3-Wire DC PNP
12 mm - Embeddable, Potted-In Cable 	BC 3-S12-AN6X	M2601300		3	4.5	3-Wire DC NPN
	BC 3-S12-AP6X	M2601200		3	4.5	3-Wire DC PNP
	BC 3-S12-AP6X/S100	M2601201	High Temp. 100°C	3	4.5	



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Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Mat.	Face	End Cap	Power LED	Output LED	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-30 VDC	100	≤200	-25 to +70	IP 67	CPB	ABS	PA	N/A	YE	RK 4T-*	1	Diagram 1
10-30 VDC	100	≤200	-25 to +70	IP 67	CPB	ABS	PA	N/A	YE	RK 4T-*	2	Diagram 2
10-30 VDC	100	≤200	-25 to +70	IP 67	CPB	ABS	PA	N/A	YE	2M/PVC	3	Diagram 3
10-30 VDC	100	≤200	-25 to +70	IP 67	CPB	ABS	PA	N/A	YE	2M/PVC	4	Diagram 4
10-30 VDC	100	≤200	-25 to +70	IP 67	PA 12-GF30		PA	N/A	YE	RK 4T-*	1	
10-30 VDC	100	≤200	-25 to +70	IP 67	PA 12-GF30		PA	N/A	YE	RK 4T-*	2	
10-30 VDC	200	≤200	-25 to +70	IP 67	PA 12-GF30		PA	N/A	YE	2M/PVC	3	
10-30 VDC	100	≤200	-25 to +70	IP 67	PA 12-GF30		PA	N/A	YE	2M/PVC	4	
	100	≤200	-25 to +100	IP 67	PA 12-GF30		PA	N/A	YE	2M/PVC	4	

* Length in meters..

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Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
18 mm - Embeddable, eurofast® Connector 	BC 5-M18-AN4X-0.2M-RS 4T	M2504091		5	5	3-Wire DC NPN
	BC 5-M18-AP4X-0.2M-RS 4T	M2504090		5	5	3-Wire DC PNP
18 mm - Embeddable, microfast® Connector 	BC 5-M18-AZ3X-0.2M-SB 3T	M2305090		5	5	2-Wire AC
18 mm - Embeddable, Potted-In Cable 	BC 5-M18-AN4X	M2504002		5	5	3-Wire DC NPN
	BC 5-M18-AP4X	M2504001		5	5	3-Wire DC PNP
	BC 5-M18-AZ3X	M2305000		5	5	2-Wire AC

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Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Mat.	Face	End Cap	Power LED	Output LED	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP 67	CPB	PBT-G30-V0	PUR	N/A	YE	RK 4T-*	1	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP 67	CPB	PBT-G30-V0	PUR	N/A	YE	RK 4T-*	2	Diagram 2
20-250 AC	20	≤500	-25 to +70	IP 67	CPB	PBT-G30-V0	PUR	N/A	YE	KB 3T-*	5	Diagram 3
10-65 VDC	100	≤200	-25 to +70	IP 67	CPB	PBT-G30-V0	PUR	N/A	YE	2M/PVC	3	Diagram 4
10-65 VDC	100	≤200	-25 to +70	IP 67	CPB	PBT-G30-V0	PUR	N/A	YE	2M/PVC	4	Diagram 5
10-65 VDC	100	≤200	-25 to +70	IP 67	CPB	PBT-G30-V0	PUR	N/A	YE	2M/PVC	4	Diagram 6
20-250 VAC	20	≤500	-25 to +70	IP 67	CPB	PBT-G30-V0	PUR	N/A	YE	2M/PVC	6	Diagram 6

* Length in meters.

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Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
18 mm - Embeddable, eurofast® Connector 	BC 5-S18-AN4X-0.2M-RS 4T	M2503192		5	7.5	3-Wire DC NPN
	BC 5-S18-AN4X-H1141/S250	M2503108		5	7.5	
	BCF 5-S18-AN4X-0.2M-RS 4T	M2503089	Noise Immune	5	7.5	
	BC 5-S18-AP4X-0.2M-RS 4T	M2503492		5	7.5	3-Wire DC PNP
	BC 5-S18-AP4X-H1141/S250	M2503602		5	7.5	
	BCF 5-S18-AP4X-0.2M-RS 4T	M2503099	Noise Immune	5	7.5	
18 mm - Embeddable, eurofast Connector 	BC 5-S185-AN4X-0.3M-RS 4T	M2503590	Chemical Resistant	5	7.5	3-Wire DC NPN
	BC 5-S185-AP4X-0.2M-RS 4T	M2503591	Chemical Resistant	5	7.5	3-Wire DC PNP
18 mm - Embeddable, microfast® Connector 	BC 5-S18-AZ3X-0.2M-SB 3T	M2305590		5	7.5	2-Wire AC

"/S250" in part number designates without potentiometer.



Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing	End Cap	Power LED	Output LED	Mating Cordset	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP 67	PA 12-GF30	PUR	N/A	YE	RK 4T-*	1	Diagram 1
	100	≤200	-25 to +70	IP 67	PA 12-GF30	PUR	N/A	YE	RK 4T-*	1	
	100	≤200	-25 to +70	IP 67	PA 12-GF30	PUR	N/A	YE	RK 4T-*	1	
10-65 VDC	100	≤200	-25 to +70	IP 67	PA 12-GF30	PUR	N/A	YE	RK 4T-*	2	Diagram 2
	100	≤200	-25 to +70	IP 67	PA 12-GF30	PUR	N/A	YE	RK 4T-*	2	
	100	≤200	-25 to +70	IP 67	PA 12-GF30	PUR	N/A	YE	RK 4T-*	2	
10-65 VDC	100	≤200	-25 to +70	IP 67	PVDF	PUR	N/A	YE	RK 4T-*	1	Diagram 3
10-65 VDC	100	≤200	-25 to +70	IP 67	PVDF	PUR	N/A	YE	RK 4T-*	2	
20-250 VAC	20	≤500	-25 to +70	IP 67	PA12-GF30	PUR	N/A	YE	KB 3T-*	3	

* Length in meters.

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Level Sensors - Capacitive



Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
18 mm - Embeddable, Potted-In Cable 	BC 5-S18-AN4X	M2503100		5	7.5	3-Wire DC NPN
	BCF 5-S18-AN4X	M2503012	Noise Immune	5	7.5	
	BC 5-S18-AP4X	M2503000		5	7.5	3-Wire DC PNP
	BCF 5-S18-AP4X	M2503011	Noise Immune	5	7.5	
	BCF 5-S18-AP4X/S90	M2503014	Noise Immune	5	7.5	
	BC 5-S18-AZ3X	M2305500		5	7.5	2-Wire AC
18 mm - Embeddable, Potted-In Cable 	BC 5-S185-AN4X	M2503550	Chemical Resistant	5	7.5	3-Wire DC NPN
	BC 5-S185-AN4X/S100	M2503551	High Temp. 100°C	5	7.5	
	BC 5-S185-AP4X	M2503500	Chemical Resistant	5	7.5	3-Wire DC PNP
	BC 5-S185-AP4X/S100	M2503502	High Temp. 100°C	5	7.5	
18 mm - Embeddable, Potted-In Cable 	BC 5-S18-Y1X	M2006000		5	7.5	2-Wire DC NAMUR

"/S100" in part number designates high temperature sensor.



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Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing	End Cap	Power LED	Output LED	Cable Length/ Material	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP 67	PA 12-GF30	PUR	N/A	YE	2M/PVC	1	Diagram 1 Diagram 2 Diagram 3 Diagram 4
	100	≤200	-25 to +70	IP 67	PA 12-GF30	PUR	N/A	YE	2M/PVC	1	
10-65 VDC	100	≤200	-25 to +70	IP 67	PA 12-GF30	PUR	N/A	YE	2M/PVC	2	
	100	≤200	-25 to +70	IP 67	PA 12-GF30	PUR	N/A	YE	2M/PVC	2	
	100	≤200	-25 to +70	IP 67	PA 12-GF30	PUR	N/A	YE	2M/PUR	2	
20-250 VAC	20	≤500	-25 to +70	IP 67	PA 12-GF30	PUR	N/A	YE	2M/PVC	3	
10-65 VDC	100	≤200	-25 to +70	IP 67	PVDF	PUR	N/A	YE	2M/PVC	1	
	100	≤200	-25 to +100	IP 67	PVDF	PUR	N/A	YE	2M/PVC	1	
10-65 VDC	100	≤200	-25 to +70	IP 67	PVDF	PUR	N/A	YE	2M/PVC	2	
	100	≤200	-25 to +100	IP 67	PVDF	PUR	N/A	YE	2M/PVC	2	
5-30 VDC	100	Remote	-25 to +70	IP 67	PA 12-GF30	PUR	N/A	YE	2M/PVC	4	

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Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
30 mm - Embeddable, eurofast[®] Connector 	BC10-M30K-AN4X-H1141	M2503030		10	10	3-Wire DC NPN
	BC10-M30K-AP4X-H1141	M2503026		10	10	3-Wire DC PNP
	BC10-M30K-VN4X-H1141	M2503033	Comp. Outputs	10	10	4-Wire DC NPN
	BC10-M30K-VP4X-H1141	M2503035	Comp. Outputs	10	10	4-Wire DC PNP
30 mm - Embeddable, microfast[™] Connector 	BC10-M30K-AZ3X-B3131	M2503034		10	10	2-Wire AC N.O.
	BC10-M30K-RZ3X-B3131	M2503023		10	10	2-Wire AC N.C.



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Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing Mat.	Face	End Cap	Power LED	Output LED	Mating Cord	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP 67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	RK 4T-*	1	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP 67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	RK 4T-*	2	Diagram 2
10-65 VDC	100	≤200	-25 to +70	IP 67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	RK 4.4T-*	3	Diagram 3
10-65 VDC	100	≤200	-25 to +70	IP 67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	RK 4.4T-*	4	Diagram 4
20-250 AC	20	≤500	-25 to +70	IP 67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	KB 3T-*	5	Diagram 5
20-250 AC	20	≤500	-25 to +70	IP 67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	KB 3T-*	6	Diagram 6

* Length in meters.

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Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
30 mm - Embeddable, Potted-In Cable 	BC10-M30K-VN4X	M2503024	Comp. Outputs	10	10	4-Wire DC NPN
	BC10-M30K-VP4X	M2503022	Comp. Outputs	10	10	4-Wire DC PNP
	BC10-M30K-AZ3X	M2503031		10	10	2-Wire AC N.O.
	BC10-M30K-RZ3X	M2503025		10	10	2-Wire AC N.C.



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Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing	Face	End Cap	Power LED	Output LED	Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP 67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	1	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP 67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	2	Diagram 2
20-250 VAC	20	≤500	-25 to +70	IP 67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	3	Diagram 3
20-250 VAC	20	≤500	-25 to +70	IP 67	CPB	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	4	Diagram 4

* Length in meters.

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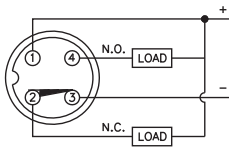
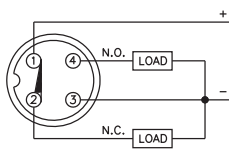
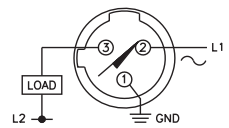
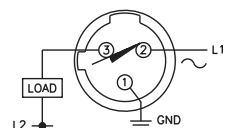
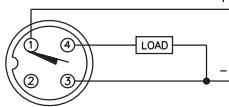
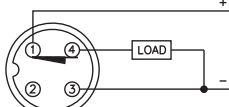


Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
30 mm - Embeddable, eurofast® Connector 	BC10-S30-VN4X-H1141	M2506010	Comp. Outputs	10	15	4-Wire DC NPN
	BC10-S30-VP4X-H1141	M2506100	Comp. Outputs	10	15	4-Wire DC PNP
30 mm - Embeddable, microfast® Connector 	BC10-S30-AZ3X-B3131	M2310710		10	15	2-Wire AC N.O.
	BCF10-S30-AZ3X-B3131	M2506012	Noise Immune	10	15	
	BC10-S30-RZ3X-B3131	M2310810		10	15	2-Wire AC N.C.
	BCF10-S30-RZ3X-B3131	M2506014	Noise Immune	10	15	
30 mm - Embeddable, eurofast® Connector 	BCC10-S30-AP4X-H1141	M2503038	Low dielectric targets	10	15	3-Wire DC PNP
	BCC10-S30-RP4X-H1143	M1542562	Low dielectric targets	10	15	3-Wire DC PNP N.C.
	BCC10-S30-VP4X-H1141	M2503043	Low dielectric targets	10	15	4-Wire DC PNP

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Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing	End Cap	Power LED	Output LED	Mating Cordset	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP 67	PA12-GF30	PA 66-GF25-V0	N/A	YE	RK 4.4T-*	1	Diagram 1 
10-65 VDC	100	≤200	-25 to +70	IP 67	PA12-GF30	PA 66-GF25-V0	N/A	YE	RK 4.4T-*	2	Diagram 2 
20-250 VAC	20	≤500	-25 to +70	IP 67	PA12-GF30	PA 66-GF25-V0	N/A	YE	KB 3T-*	3	Diagram 3 
	20	≤500	-25 to +70	IP 67	PA12-GF30	PA 66-GF25-V0	N/A	YE	KB 3T-*	3	
20-250 VAC	20	≤500	-25 to +70	IP 67	PA12-GF30	PA 66-GF25-V0	N/A	YE	KB 3T-*	4	Diagram 4 
	20	≤500	-25 to +70	IP 67	PA12-GF30	PA 66-GF25-V0	N/A	YE	KB 3T-*	4	
10-65 VDC	100	≤200	-25 to +70	IP 67	PA12-GF30	PA 66-GF25-V0	N/A	YE	RK 4T-*	5	Diagram 5 
	100	≤200	-25 to +70	IP 67	PA12-GF30	PA 66-GF25-V0	N/A	YE	RK 4T-*	6	
10-65 VDC	100	≤200	-25 to +70	IP 67	PA12-GF30	PA 66-GF25-V0	N/A	YE	RK 4.4T-*	2	Diagram 6 

* Length in meters.

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Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
30 mm - Embeddable, Potted-In Cable 	BCC10-S30-AP4X	M2503037	Low dielectric targets	10		3-Wire DC PNP
	BC10-S30-VN4X	M2506000	Comp. Outputs	10	15	4-Wire DC NPN
	BCF10-S30-VN4X	M2506011	Noise Immune	10	15	4-Wire DC NPN
	BC10-S30-VP4X	M2506110	Comp. Outputs	10	15	4-Wire DC PNP
	BCF10-S30-VP4X	M2506111	Noise Immune	10	15	4-Wire DC PNP
	BC10-S30-AZ3X	M2310700		10	15	2-Wire AC
	BCF10-S30-AZ3X	M2506015	Noise Immune	10	15	2-Wire AC
30 mm - Embeddable, Potted-In Cable 	BC10-PT30-VN4X2	M2507020	Chemical Resistant	10	15	4-Wire DC NPN
	BC10-PT30-VP4X2	M2507010	Chemical Resistant	10	15	4-Wire DC PNP
	BC10-PT30-AZ3X	M2350001	Chemical Resistant	10	15	2-Wire AC
	BC10-PT30-Y0X	M2020000	Chemical Resistant	10	15	2-Wire DC NAMUR
30 mm - Embeddable, Terminal Chamber 	BC10-P30SR-VN4X2	M2505100	Comp. Outputs	10	15	4-Wire DC NPN
	BC10-P30SR-VP4X2	M2505000	Comp. Outputs	10	15	4-Wire DC PNP
	BC10-P30SR-VP4X2/S359-2M	M2505001	Comp. Outputs	10	15	

"/S359" designates Capacitive sensor with external potentiometer located on 2 meter cable.



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Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing	End Cap	Power LED	Output LED	Cable Length/ Material	Wiring Diagram #	Wiring Diagrams
10-30 VDC	100	≤200	-25 to +70	IP 67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	7	Diagram 1
	100	≤200	-25 to +70	IP 67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	1	
10-65 VDC	100	≤200	-25 to +70	IP 67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	1	
	100	≤200	-25 to +70	IP 67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	2	
10-65 VDC	100	≤200	-25 to +70	IP 67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	2	
	100	≤200	-25 to +70	IP 67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	3	
20-250 VAC	20	≤500	-25 to +70	IP 67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	3	
	20	≤500	-25 to +70	IP 67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	3	
5-30 VDC	100	N/A	-25 to +70	IP 67	PA 12-GF30	PA 66-GF25-V0	N/A	YE	2M/PVC	4	
10-65 VDC	100	≤200	-25 to +70	IP 67	PVDF	PVDF	GN	YE	2M/PVDF	1	
10-65 VDC	100	≤200	-25 to +70	IP 67	PVDF	PVDF	GN	YE	2M/PVDF	2	
20-250 VAC	20	≤500	-25 to +70	IP 67	PVDF	PVDF	N/A	YE	2M/PVDF	3	
5-30 VDC	100	Remote	-25 to +70	IP 67	PVDF	PVDF	N/A	YE	2M/PVDF	4	
10-65 VDC	100	≤200	-25 to +70	IP 67	ABS	ABS	GN	YE	- - - -	5	
10-65 VDC	100	≤200	-25 to +70	IP 67	ABS	ABS	GN	YE	- - - -	6	
	100	≤200	-25 to +70	IP 67	ABS	ABS	GN	YE	- - - -	6	
10-65 VDC											Diagram 7

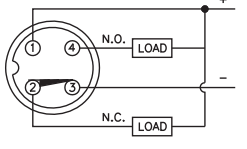
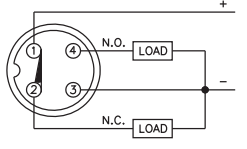
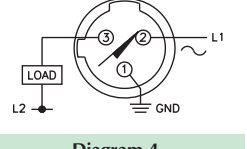
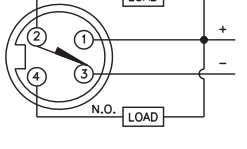
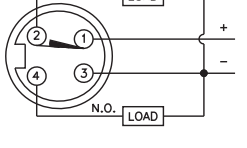
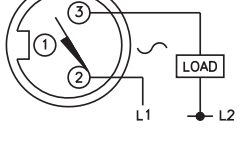
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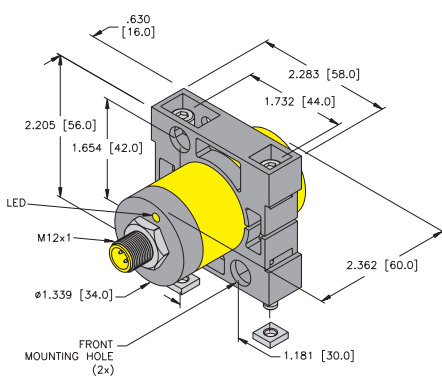
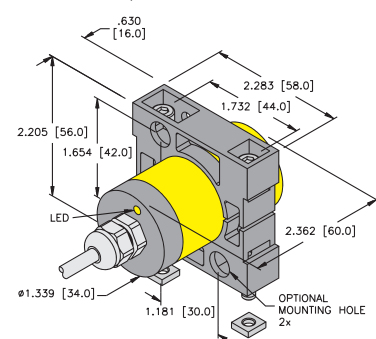
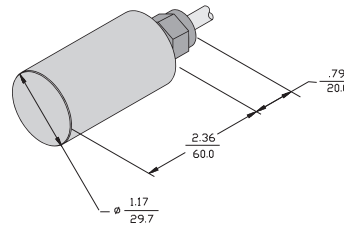

Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
30 mm - Embeddable, eurofast® Connector 	BC10-P30SR-VN4X2-H1141	M2505192	Comp. Outputs	10	15	4-Wire DC NPN
	BC10-P30SR-VP4X2-H1141	M2505094	Comp. Outputs	10	15	4-Wire DC PNP
30 mm - Embeddable, microfast® Connector 	BC10-P30SR-FZ3X2-B3131	M2310491	Comp. Outputs	10	15	2-Wire AC
30 mm - Embeddable, minifast® Connector 	BC10-P30SR-VN4X2-B1141	M2505191	Comp. Outputs	10	15	4-Wire DC NPN
	BC10-P30SR-VN4X2-B2141	M2505193	Comp. Outputs	10	15	
	BC10-P30SR-VP4X2-B1141	M2505092	Comp. Outputs	10	15	4-Wire DC PNP
	BC10-P30SR-VP4X2-B2141	M2505093	Comp. Outputs	10	15	
	BC10-P30SR-FZ3X2-B1131	M2310490	Comp. Outputs	10	15	2-Wire AC
	BC10-P30SR-FZ3X2-B2131	M2310493	Comp. Outputs	10	15	

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing	End Cap	Power LED	Output LED	Cable Length/ Material	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP 67	ABS	ABS	GN	YE	RK 4.4T-*	1	Diagram 1 
10-65 VDC	100	≤200	-25 to +70	IP 67	ABS	ABS	GN	YE	RK 4.4T-*	2	Diagram 2 
20-250 AC	200	≤500	-25 to +70	IP 67	ABS	ABS	GN	YE	KB 3T-*	3	Diagram 3 
10-65 VDC	100	≤200	-25 to +70	IP 67	ABS	ABS	GN	YE	RKM 40-*M	4	Diagram 4 
	100	≤200	-25 to +70	IP 67	ABS	ABS	GN	YE	RK 40-*M	4	
10-65 VDC	100	≤200	-25 to +70	IP 67	ABS	ABS	GN	YE	RKM 40-*M	5	Diagram 5 
	100	≤200	-25 to +70	IP 67	ABS	ABS	GN	YE	RK 40-*M	5	
20-250 AC	20	≤500	-25 to +70	IP 67	ABS	ABS	GN	YE	RKM 30-*M	6	Diagram 6 
	20	≤500	-25 to +70	IP 67	ABS	ABS	GN	YE	RK 30-*M	6	

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Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
34 mm - Embeddable, eurofast® Connector 	BC15-K34-AN4X-H1141	M2502125		15	23	3-Wire DC NPN
	BC15-K34-AP4X-H1141	M2502126		15	23	3-Wire DC PNP
34 mm - Embeddable, Potted-In Cable 	BC15-K34-VN4X	M2502127	Comp. Outputs	15	23	4-Wire DC NPN
	BC15-K34-VP4X	M2502124	Comp. Outputs	15	23	4-Wire DC PNP
	BC15-K34-AZ3X	M2310008		15	23	2-Wire AC
	BCF15-K34-AZ3X	M2502136	Noise Immune	15	23	
34 mm - Nonembeddable, Potted-In Cable 	NC20-KT34-VN4X2	M2550100	Chemical Resistant Comp. Output	N/A	20	4-Wire DC NPN
	NC20-KT34-VP4X2	M2550300	Chemical Resistant Comp. Output	N/A	20	4-Wire DC PNP

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing	End Cap	Power LED	Output LED	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	ABS	N/A	YE	RK 4T-*	1	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	ABS	N/A	YE	RK 4T-*	2	Diagram 2
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	ABS	N/A	YE	2M/PVC	3	Diagram 3
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	ABS	N/A	YE	2M/PVC	4	Diagram 4
20-250 VAC	20	≤500	-25 to +70	IP 67	PBT-GF30-V0	ABS	N/A	YE	2M/PVC	5	Diagram 5
	20	≤500	-25 to +70	IP 67	PBT-GF30-V0	ABS	N/A	YE	2M/PVC	5	
10-65 VDC	200	≤200	-25 to +70	IP 67	PVDF	PVDF	GN	YE	2M/PVDF	3	
10-65 VDC	200	≤200	-25 to +70	IP 67	PVDF	PVDF	GN	YE	2M/PVDF	4	

* Length in meters.

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Housing Style	Part Number	ID Number	Features	Embeddable Range (mm)	Nonembed. Range (mm)	Output
34 mm - Embeddable, Terminal Chamber Technical drawing of the 34 mm capacitive level sensor. Dimensions include: .630 [16.0], 2.205 [56.0], 1.654 [42.0], 2.283 [58.0], 1.732 [44.0], 1.969 [50.0], 4.173 [106.0], 1.181 [30.0], 1.575 [40.0], 1.339 [34.0], 2.165 [55.0], 3.543 [90.0], 1.870 [47.5], 2.559 [65.0], 1.969 [50.0], .630 [16.0], 1.654 [42.0], 2.205 [56.0], 2.283 [58.0], 1.732 [44.0], 1.969 [50.0], 4.173 [106.0], 1.181 [30.0], 1.575 [40.0], 1.339 [34.0], 2.165 [55.0], 3.543 [90.0], 1.870 [47.5], 2.559 [65.0], 1.969 [50.0], .630 [16.0], 1.654 [42.0], 2.205 [56.0], 2.283 [58.0], 1.732 [44.0], 1.969 [50.0], 4.173 [106.0], 1.181 [30.0], 1.575 [40.0], 1.339 [34.0], 2.165 [55.0], 3.543 [90.0], 1.870 [47.5], 2.559 [65.0], 1.969 [50.0]. Features include: LED (2x), M16x1.5, OPTIONAL MOUNTING HOLE (2x), POTENTIOMETER (SENSITIVITY ADJUSTMENT), M5x0.8x50 SOCKET HEAD CAP SCREW 2x.	BC15-K34SR-VN4X2	M2502128	Comp. Outputs	15	23	4-Wire DC NPN
	BC15-K34SR-VP4X2	M2502129	Comp. Outputs	15	23	4-Wire DC PNP
	BC15-K34SR-FZ3X2	M2310009	Prog. Outputs	15	23	2-Wire AC
40 mm - Embeddable, Terminal Chamber Technical drawing of the 40 mm capacitive level sensor. Dimensions include: .630 [16.0], 2.205 [56.0], 1.654 [42.0], 2.283 [58.0], 1.732 [44.0], 1.969 [50.0], 4.173 [106.0], 1.181 [30.0], 1.575 [40.0], 1.339 [34.0], 2.165 [55.0], 3.543 [90.0], 1.870 [47.5], 2.559 [65.0], 1.969 [50.0], .630 [16.0], 1.654 [42.0], 2.205 [56.0], 2.283 [58.0], 1.732 [44.0], 1.969 [50.0], 4.173 [106.0], 1.181 [30.0], 1.575 [40.0], 1.339 [34.0], 2.165 [55.0], 3.543 [90.0], 1.870 [47.5], 2.559 [65.0], 1.969 [50.0]. Features include: LED (2x), M16x1.5, OPTIONAL MOUNTING HOLE (2x), POTENTIOMETER (SENSITIVITY ADJUSTMENT), M5x0.8x50 SOCKET HEAD CAP SCREW 2x.	BC20-K40SR-VN4X2	M2510100	Comp. Outputs	20	30	4-Wire DC NPN
	BC20-K40SR-VP4X2	M2510000	Comp. Outputs	20	30	4-Wire DC PNP
	BC20-K40SR-FZ3X2	M2310300	Prog. Outputs	20	30	2-Wire AC



Industrial Automation

TURCK
works

 Industrial
 Automation

Voltage	Switching Freq. (Hz)	Operating Current (mA)	Operating Temp. (°C)	Protection Class	Housing	End Cap	Power LED	Output LED	Mating Cordset	Wiring Diagram #	Wiring Diagrams
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	ABS	GN	YE	- - - -	1	Diagram 1
10-65 VDC	100	≤200	-25 to +70	IP 67	PBT-GF30-V0	ABS	GN	YE	- - - -	2	Diagram 2
20-250 VAC	20	≤500	-25 to +70	IP 67	PBT-GF30-V0	ABS	GN	YE	- - - -	3	Diagram 3
10-65 VDC	100	≤200	-25 to +70	IP 67	ABS	ABS	GN	YE	- - - -	1	
10-65 VDC	100	≤200	-25 to +70	IP 67	ABS	ABS	GN	YE	- - - -	2	
20-250 VAC	20	≤500	-25 to +70	IP 67	ABS	ABS	GN	YE	- - - -	3	

CAPACITIVE



TURCK

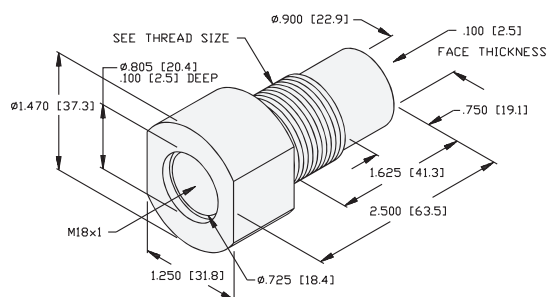
Level Sensors - Capacitive

Tank Wells

Part Number	ID Number	Material	Thread Size	Drill Size	Application
TWD-18S	A5055	Delrin	3/4-14 NPT	59/64	18 mm threaded capacitive sensors for liquid level sensing.
TWT-18S	A5050	Teflon	3/4-14 NPT	59/64	18 mm threaded capacitive sensors for liquid level sensing.
TWD-18S-1NPT	A5057	Delrin	1-11 1/2 NPT	1-5/32	18 mm threaded capacitive sensors for liquid level sensing.
TWT-18S-1NPT	A5056	Teflon	1-11 1/2 NPT	1-5/32	18 mm threaded capacitive sensors for liquid level sensing.

Pressure Rating: 150 psi
Inches [mm]

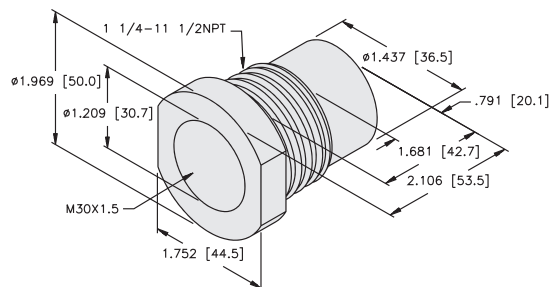
TWD-18..
TWT-18..



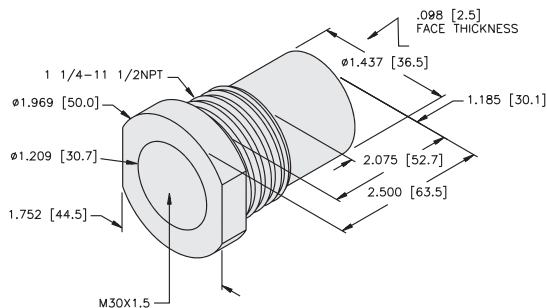
Part Number	ID Number	Material	Thread Size	Drill Size	Application
TWD-30S	A5065	Delrin	1 1/4-11 1/2 NPT	1 1/2	30 mm threaded capacitive sensors for liquid level sensing.
TWT-30S	A5060	Teflon	1 1/4-11 1/2 NPT	1 1/2	30 mm threaded capacitive sensors for liquid level sensing.
TWT-30S-SHORT	A5062	Teflon	1 1/4-11 1/2 NPT	1 1/2	30 mm threaded capacitive sensors for liquid level sensing.
TWD-30S-SHORT	A5063	Delrin	1 1/4-11 1/2 NPT	1 1/2	30 mm threaded capacitive sensors for liquid level sensing.

Pressure Rating: 150 psi
Inches [mm]

TWD-30S-SHORT
TWT-30S-SHORT



TWD-30S..
TWT-30S..





Sight Glass Mounts

Part Number	ID Number	Dimensions			
		A	B	C	D
TWTS-1.5-30	A5077	M30x1.5	1.500 [38.1]	1.984 [50.4]	1.000 [25.4]
TWTS-2-30	A5076	M30x2.0	2.008 [51.0]	2.520 [64.0]	1.000 [25.4]

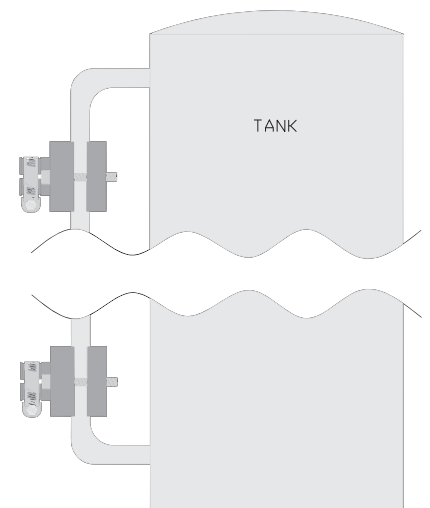
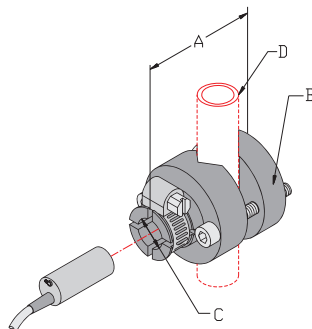
Material: Teflon
Inches [mm]

TWTS-1.5-30

CAPACITIVE

Part Number	ID Number	Dimensions			
		A	B	C	D
TSG-12	A2500	1.75 [44.5]	1.25 [31.8]	12 mm (threaded or non-threaded)	0.37-0.81 [9.40-20.6]
TSG-18	A2501	1.90 [48.3]	1.48 [37.5]	18 mm (threaded or non-threaded)	0.63-1.12 [16.0-28.4]
TSG-30	A2502	3.45 [87.6]	2.00 [50.8]	30 mm (threaded or non-threaded)	1.00-1.75 [25.4-44.5]

Material: Delrin
Inches [mm]





TURCK

Level Sensors - Capacitive

Dielectric Constants of Industrial Products

Material	Dielectric Constant
ABS resin, pellet	1.5 - 2.5
Acetic Acid	4.1
Acetone	19.5
Acetyl bromide	16.5
Acrylic resin	2.7 - 4.5
Air	1.0
Alcohol, industrial	16 - 31
Alcohol, isopropyl	18.3
Ammonia	15 - 25
Aniline	5.5 - 7.8
Aqueous solutions	50 - 80
Asbestos	3.0
Ash (fly)	1.7
Bakelite	3.6
Barley powder	3.0 - 4.0
Benzene	2.3
Benzyl acetate	5
Butane	1.4
Cable sealing compound	2.5
Calcium carbonate	9.1
Carbon Dioxide	1.6
Carbon tetrachloride	2.2
Celluloid	3.0
Cellulose	3.2 - 7.5
Cement	1.5 - 2.1
Cement powder	5 - 10
Cereal	3 - 5
Charcoal	1.2 - 1.8
Chlorine, liquid	2.0
Coke	1.1 - 2.2
Corn	5 - 10
Ebonite	2.7 - 2.9

Material	Dielectric Constant
Epoxy resin	2.5 - 6
Ethanol	24
Ethyl bromide	4.9
Ethylene Chloride	10.5
Ethylene Dichloride	11.0
Ethylene glycol	38.7
Ethylene Oxide	14.0
Ferrous Oxide	14.2
Fired Ash	1.5
Flour	2.5 - 3.0
Formic Acid	59.0
Freon® R22 & 502, liquid	6.1
Gasoline	2.2
Glass	3.1 - 10
Glass, raw material	2.0 - 2.5
Glycerine	47
Hexane	1.9
Hydrochloric Acid	4.6
Hydrogen cyanide	95.4
Hydrogen peroxide	84.2
Ice, -5C	2.85
Ice, -18C	3.16
Isobutylamine	4.5
Lime, shell	1.2
Marble	8.0 - 8.5
Melamine resin	4.7 - 10.2
Methane, liquid	1.7
Methanol	33.6
Mica, white	4.5 - 9.6
Milk, powdered	3.5 - 4
Nitrobenzene	36
Neoprene	6 - 9



Dielectric Constants of Industrial Products

Material	Dielectric Constant
Nylon	4 - 5
Oil, for transformer	2.2 - 2.4
Oil, paraffin	2.2 - 4.8
Oil, peanut	3.0
Oil, petroleum	2.1
Oil, soybean	2.9 - 3.5
Oil, turpentine	2.2
Paint	5 - 8
Paraffin	1.9 - 2.5
Paper	1.6 - 2.6
Paper, hard	4.5
Paper, oil saturated	4.0
Perspex	3.2 - 3.5
Petroleum	2.0 - 2.2
Phenol	9.9 - 15
Phenol resin	4.9
Polyacetal (Delrin®)	3.6
Polyamide (nylon)	2.5
Polycarbonate	2.9
Polyester resin	2.8 - 8.1
Polyethylene	2.3
Polypropylene	2.0 - 2.3
Polystyrene	3.0
Polyvinyl Chloride resin	2.8 - 3.1
Porcelain	4.4 - 7
Press board	2 - 5
Propane, liquid	1.6
Propylene, liquid	11.9
Quartz glass	3.7
Rice, dry	3.5

Material	Dielectric Constant
Rubber	2.5 - 35
Salt	6.0
Sand	3 - 5
Shellac	2.0 - 3.8
Silicon dioxide	4.5
Silicone rubber	3.2 - 9.8
Silicone varnish	2.8 - 3.3
Soybean	2.8
Styrene resin	2.3 - 3.4
Sugar	3.0
Sugar, granulated	1.5 - 2.2
Sulfur	3.4
Sulfuric acid	84
Teflon®, PCTFE	2.3 - 2.8
Teflon, PTFE	2.0
Toluene	2.3
Trichloroethylene	3.4
Urea resin	6.2 - 9.5
Urethane	3.2
Vaseline	2.2 - 2.9
Vinyl Chloride	2.8
Water	48 - 88
Wax	2.4 - 6.5
Wood, dry	2 - 7
Wood, pressed board	2.0 - 2.6
Wood, wet	10 - 30
Xylene	2.4
Zinc Oxide	1.7
Zirconium Oxide	12.5
Zirconium Silicate	5.0



Level Sensors - *levelprox*®

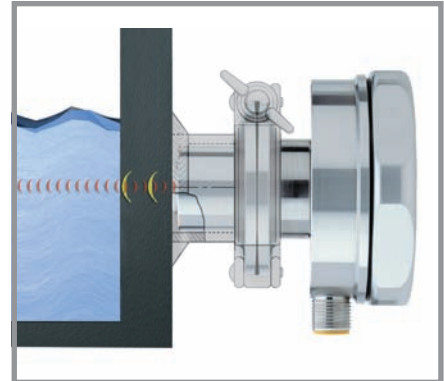
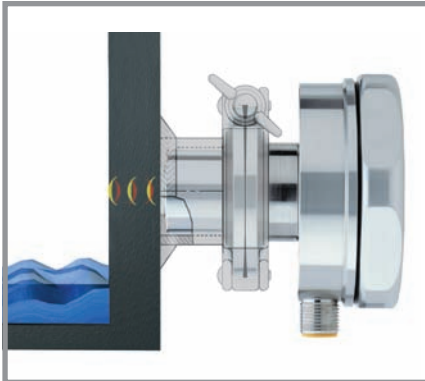


levelprox is a unique, non-invasive ultrasonic sensing solution that provides accurate media detection through metal container walls. *levelprox* mounts to the outside of a container with no compromise to structural integrity, and is ideal for high pressure, hazardous or sterile applications.

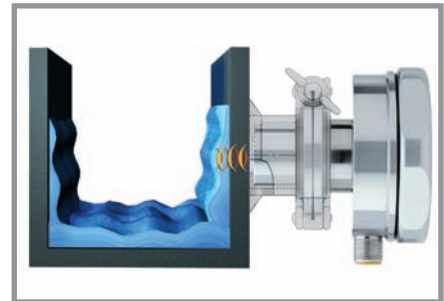
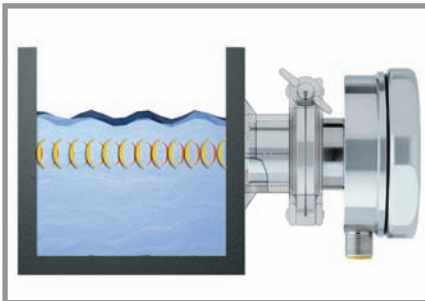
All it takes to reliably detect the presence of liquid through a metal container is to program the empty and full conditions into the *levelprox* using a simple teach button. The sensor generates a high frequency ultrasonic pulse that is transferred into the container wall through a coupling gel. As the pulse enters the container wall it is influenced by the containers contents. *levelprox* analyzes this pulse and compares it to the conditions that were programmed into the memory of the sensor.

With Dual Operating Modes, *levelprox* Provides Reliable Detection in Even the Toughest Applications:

Reverb Mode: Evaluates the ultrasonic pulse as it reverberates within the container wall. This pulse travels through the container wall until it reaches the inner wall. The reverb mode works well when the liquid to be detected has a low viscosity, leaving little or no coating on the container wall. The reverb mode should also be utilized when stirring devices are used inside the container.



Echo mode: Evaluates the ultrasonic pulse as it travels through the liquid and echoes off of the opposite container wall. Highly viscous liquids can be reliably detected with the echo mode. The mode looks past the layers of product that can coat the inside of a container to give the true level of the product.





levelprox®



Dual Mode T50



Dual Mode M30



Mounting Accessories

The T50 dual-mode *levelprox* features a robust 316L stainless steel housing with an integrated sanitary connection. The sensors construction and non-invasive operation make it the perfect choice for applications in food, beverage and pharmaceutical industries. The integrated Tri-Clamp mounting flange maintains proper orientation to the tank wall and also protects the coupling during washdown operations.

The M30 dual-mode *levelprox* is ideal for level detection applications where stainless steel sanitary fittings are not required. The M30 delivers non-invasive detection without the additional expense of a sanitary housing. Its 30 mm barrel can be easily mounted using a welding adapter or a metal strap kit.

Mounting accessories are available for the T50 and M30 sensors for welding, bonding and strapping *levelprox* sensors to most common containers.

Recommended Operating Mode

Application	Reverb	Echo
Liquids contaminated with solids	Yes	No
Liquids that leave a film on container wall	No	Yes
Liquid with internal mixing devices	Yes	No
Containers with internal coating	No	Yes
Containers greater than 6 ft across	Yes	No
Aerated liquid	Yes	No

TURCK**Level Sensors - *levelprox*®**

Housing Style	Part Number	ID Number	Container Wall Thickness	Min/Max Container Diameter	Programming	Output
Smooth Cylindrical T50 Style 	LPRE-T50-UP6X3-H1151	M1606201	1-15 mm	100-2000 mm** Stainless Steel	Push button or external teach wire	5-Wire DC PNP
Standard M30 Style 	LPRE-M30-AP6X2-H1141	M1606203	1-15 mm	100-2000 mm** Stainless Steel	VB2-SP1	
	LPRE-EM30-RP6X2-H1143	M1606209	1-15 mm	100-2000 mm** Stainless Steel	VB2-SP1	4-Wire DC PNP

Additional specifications below.

Accessories on page D29.

** 2000 mm (echo mode), no limit (reverberation mode).

***levelprox*®**

Switching Delay	T50: 1-10 second (adjustable via DIP-switches) M30: None
Rated Operational Current (DC) I_e	≤200 mA
No-load Current I_o	≤60 mA
Overload Trip Point	>270 mA
Max. Voltage Drop at 200 mA	≤2.5 V
Switching Frequency	1 Hz
Time Delay Before Availability	≤2 s
Protection Class	IP 67
Housing Material	T50: 316L stainless steel (A41.4404) M30: Chrome plated brass M30: 316L stainless steel
Operation Temperature	-25°C to +70°C (-13°F to +158°F)
Supply Voltage Indication	Green LED
Switching status indication	Yellow LED
Error Indication	T50: Red LED; flashing and alarm output on M30: Yellow/Green; alternately flashing
Alarm Indication	T50: Red LED; flashing Green LED indicates alarm off M30: None
FM Approved.	Class I, Div 2

Voltage	Switching Current (mA)	Min. Repeat Accuracy (mm)	Operating Temp. (°C)	Protection Class	Housing	Short-circuit Protection	Rev. Polarity Protection	Wire Break Protection	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
15-30 VDC	≤200	≤±5 mm	-25 to +70	IP 67	SS	Yes	Yes	Yes	RK 4.5T-*	1	Diagram 1 Diagram 2
	≤200	≤±5 mm	-25 to +70	IP 67	CPB	Yes	Yes	Yes	RK 4.4T-*	2	
15-30 VDC	≤200	≤±5 mm	-25 to +70	IP 67	SS	Yes	Yes	Yes	RK 4.4T-*	2	
	≤200	≤±5 mm	-25 to +70	IP 67	SS	Yes	Yes	Yes	RK 4.4T-*	2	

* Length in meters.

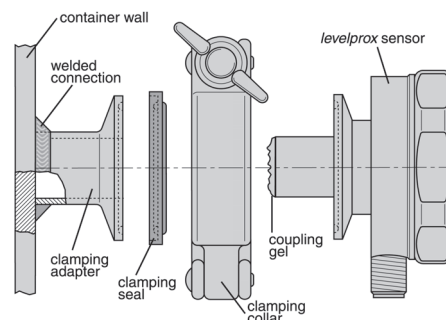
Mounting the T50 *levelprox*®

Mounting: Most critical procedures in any *levelprox* application is the mounting of the sensor. Reliable operation of the sensor requires a mount that is rigidly fixed and properly oriented to the container wall.

Surface Preparation: The structural integrity of the container wall need to be evaluated when selecting a mounting location for the sensor. The surface finish should be smooth and free of rust, paint, and coatings that could affect the sound transmission of the sensor. The area of the tank where the sensor will mount should be in good condition, i.e. no pitting, dents, welded joints, internal structures, etc. If you are using a weld-on mount, be aware that excessive heat from the welder can distort thin walled containers.

Mounting the Sensor: Make solid contact with the container wall for proper operation. Ideally, the clamping adapter should be mounted perpendicular to the container wall. In the case of a round container, the sensor should be mounted so that the transducer is pointing at the center axis. TURCK offers several mounting options designed to keep the sensor optimally coupled with the wall of the container.

Installation: Every TURCK *levelprox* is a small container of coupling gel. This gel is required for the sensor to efficiently pass the ultrasonic pulses into the container wall. Before installing the sensor on the container, remember to apply a generous amount of the gel to the sensor's transducer surface.





Level Sensors - *levelprox*®

Mounting Accessories for T50

Part Number	ID Number	T50 Weld Kit
LP-MS-T50-S	M6900253	 Designed to mount the T50 sensor to flat sided containers. Can also be used for mounting to large diameter round containers. Includes: Clamping Adapter, Clamp, and Gasket

Part Number	ID Number	T50 Epoxy Mounting Kit
LP-MS-T50-K	M6900255	 Designed for mounting the T50 sensor to flat sided containers. Kit is ideal for applications where welding is not possible. Includes: Clamping Adapter, General Purpose Epoxy, Clamp, Gasket, and Locator Buttons

Part Number	Clamping Adapter
LP-Clamping Adapter-*	 Custom machined weld-on clamping adapter to fit round containers. Note: Clamp and gasket need to be purchased separately, see table on right. * Indicates the container diameter in inches.

Individual Pieces		
Part Number	ID Number	Description
LP-OKS1110**	M6900296	Coupling Gel
LP-MZ-T50-SR**	A5316	Sanitary Clamp
LP-Clamping Adapter*		Clamping Adapter
LP-MZ-T50-D**	A5315	Gasket

Mounting Accessories for M30

Part Number	ID Number	Push Button
VB2-SP1	A3501-29	 The VB2-SP1 is used for programming and mode selection of the M30 <i>levelprox</i>®

Part Number	ID Number	M30 Bracket
LP-MZ-M30-SB	M6900377	 Mounting Bracket can be strapped or welded to container. Perfect for applications that don't require washdown.

Part Number	ID Number	M30 Sanitary Adapter
LP-MZ-M30-T50	A5317	 Allows the M30 to be mounted using T50 Accessories. Use with LP-Clamping Adapter-* in applications that are subjected to washdown. * Indicates the container diameter in meters.

Part Number	ID Number	M30 Straps
LP-MZ-M30-B250	M6900378	
LP-MZ-M30-B500	M6900379	
LP-MZ-M30-B1000	M6900380	
		Use with LP-MZ-M30-SB to mount the M30 using straps. Constructed of stainless steel with lengths of: 250 cm, 500 cm, and 1000 cm Includes: Two stainless steel straps

Part Number	ID Number	M30 Weld Kit
LP-M30-MOUNT-KIT	A9424	Includes the following: 

EZ-track[®] Liquid Level Probe

TURCK's **EZ-track** line of magnetostrictive linear displacement transducers detect the position of an external magnet along the active stroke of the sensor without causing any wear on the sensor parts. Because there are no parts to wear or break, the sensors can offer better performance over a longer time than competing technologies. They also offer an alternative when a continuous, absolute reading is necessary in the application.

The **EZ-track** R16 Liquid Level Sensor is a programmable, two-wire loop powered intrinsically safe probe that is ideal for continuous level monitoring in a variety of liquids and tank designs. The R16 sensor uses magnetostrictive technology to monitor the position of a magnetic float along the active stroke of the sensing tube, which is then converted into a configurable 4-20 mA output. The IP 68 rated R16 liquid level sensors are available in a rigid 316 stainless steel housing or a flexible PVDF design. The probe lengths vary between 18 and 288 inches. The stainless steel version is also available in an optional Food Grade or 3A Rated Sanitary finish probe for use in an array of food service, dairy and beverage applications. A variety of floats, fittings and accessories are available to fit virtually any application requirement.

All of the electronics for the R16 sensor are incorporated within the 5/8 inch sensing rod, which eliminates the need for an electronics enclosure at the top of the sensor. This feature, when ordered with the standard 4-pin (**minifast**[®]) 7/8-16UN quick disconnect, offers greater mounting options, and a faster, more reliable installation. The R16 liquid level sensor has a resolution of 0.02 inches of full scale, and an accuracy of 0.1% over the programmable monitoring span, making it the ideal sensor for applications where continuous level position is required.

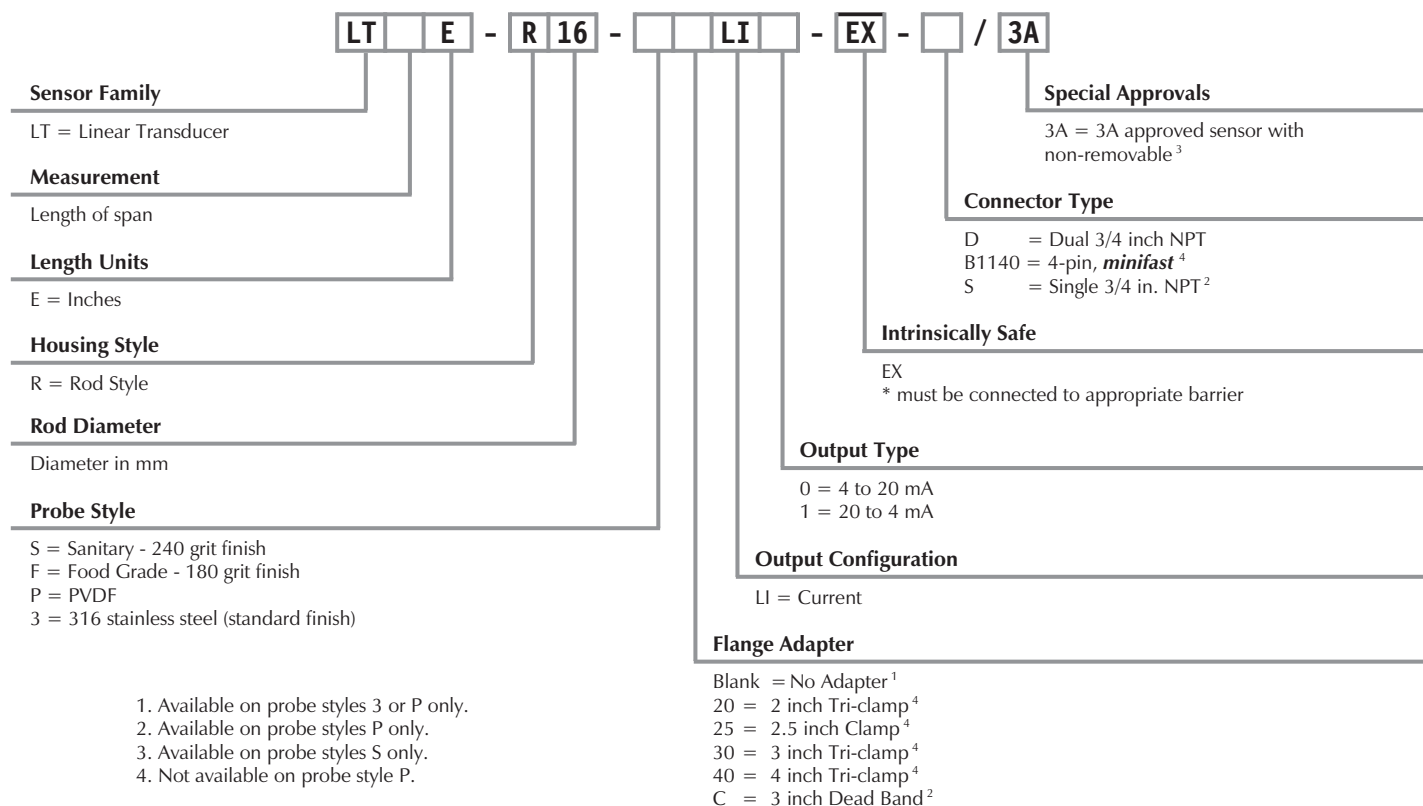
**R16 LEVEL**



TURCK

Level Sensors - R16 Probe

R16 Level Probe Part Number Key



1. Available on probe styles 3 or P only.
2. Available on probe styles P only.
3. Available on probe styles S only.
4. Not available on probe style P.



PVDF Probe

Output	4 to 20 mA, 20 to 4 mA
Span	7 to 288 in.
Repeatability	0.014 in. + 0.5% of programmable span typical; max 0.014 in. + 0.4% of programmable span
Resolution	0.25% of programmable span or 0.02 in., whichever is greater
Operating Temperature	-20°C to +70°C (-4°F to +158°F)
Null Zone	12 in.
Dead Zone	6 to 8 in. (span 7 in. to 126 in.: 6 in.; span 127 in. to 288 in.: 8 in.)
Operational Voltage	13.5-30 VDC
Current Consumption	Loop Powered
Enclosure Rating	IP 69
Non-linearity	0.1% of programmable span
Reading Rate	40 ms
Rod Diameter	0.625 in. (15.9 mm)
Pressure	145 psi
Electronics	PVDF
Rod	PVDF
Agency Approvals	FM
FM Approval	Class I, Div 1, Group C and D Class II, Div 1, Group E, F, and G Class I, Zone 0 or 1, Groups IIA or IIB

Stainless Steel Probe

Output	4 to 20 mA, 20 to 4 mA
Span	10 to 288 inches
Repeatability	0.014 in. + 0.5% of programmable span typical; max 0.014 in. + 0.4% of span
Resolution	0.25% of programmable span / 0.02 in., whichever is greater
Operating Temperature	-20°C to +70°C (-4°F to +158°F)
Null Zone	8 in.
Dead Zone	2 in.
Operational Voltage	13.5 to 30 VDC
Current Consumption	Loop Powered
Enclosure Rating	IP 69
Non-linearity	0.1% of programmable span
Reading Rate	40 ms
Rod Diameter	0.625 in. (15.9 mm)
Pressure	1015 psi
Electronics	Stainless Steel 316L
Rod	Stainless Steel 316L
Agency Approvals	FM
FM Approval	Class I, Div 1, Group C and D Class II, Div 1, Group E, F, and G Class I, Zone 0 or 1, Groups IIA or IIB



TURCK

Level Sensors - R16 Probe

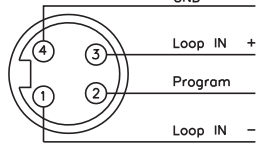
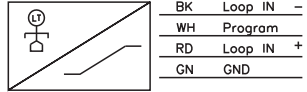


Housing Style	Part Number	Output Current
Stainless Steel Level Probe, minifast® Connection 	LT***E-R16-3LI0-EX-B1140 LT***E-R16-3LI1-EX-B1140	4-20 mA Loop Powered 20-4 mA Loop Powered
Stainless Steel Level Probe, Dual 3/4 NPT Connection 	LT***E-R16-3LI0-EX-D LT***E-R16-3LI1-EX-D	4-20 mA Loop Powered 20-4 mA Loop Powered
Stainless Steel Level Probe, minifast Connection, Tri-clamp Adapter 	LT***E-R16-3**LI0-EX-B1140 LT***E-R16-S**LI0-EX-B1140 LT***E-R16-F**LI0-EX-B1140 LT***E-R16-3**LI1-EX-B1140 LT***E-R16-S**LI1-EX-B1140 LT***E-R16-F**LI1-EX-B1140	4-20 mA Loop Powered 20-4 mA Loop Powered
Stainless Steel Level Probe, Dual 3/4 NPT Connection, Tri-clamp Adapter 	LT***E-R16-3**LI0-EX-D LT***E-R16-3**LI1-EX-D	4-20 mA Loop Powered 20-4 mA Loop Powered

* Float ordered separately, see page D64.

** For flange dimensions, see page D63.



Voltage	Probe Style (Finish)	Pressure Rating (psi)	Connection Type	Agency Approval	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
13.5-30 VDC	316 Stainless Steel	1015	4-pin <i>minifast</i>	FM	RKM 46-*M	1	Diagram 1 
	316 Stainless Steel	1015	4-pin <i>minifast</i>	FM	RKM 46-*M	1	
13.5-30 VDC	316 Stainless Steel	1015	Dual 3/4 NPT	FM	2M/PVC	2	Diagram 2 
	316 Stainless Steel	1015	Dual 3/4 NPT	FM	2M/PVC	2	
13.5-30 VDC	316 Stainless Steel	1015	4-pin <i>minifast</i>	FM	RKV 46-*M	1	
	Sanitary (316 SS w/240 grit)	1015	4-pin <i>minifast</i>	FM	RKV 46-*M	1	
	Food Grade (316 SS w/180 grit)	1015	4-pin <i>minifast</i>	FM	RKV 46-*M	1	
	316 Stainless Steel	1015	4-pin <i>minifast</i>	FM	RKV 46-*M	1	
	Sanitary (316 SS w/240 grit)	1015	4-pin <i>minifast</i>	FM	RKV 46-*M	1	
	Food Grade (316 SS w/180 grit)	1015	4-pin <i>minifast</i>	FM	RKV 46-*M	1	
13.5-30 VDC	316 Stainless Steel	1015	Dual 3/4 NPT	FM	2M/PVC	2	
	316 Stainless Steel	1015	Dual 3/4 NPT	FM	2M/PVC	2	

* Length in meters.

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Level Sensors - R16 Probe



Housing Style	Part Number	Output
Stainless Steel Level Probe, minifast® Connection, Tri-clamp Adapter, Non-removable Float 	LT***E-R16-S**LI0-EX-B1140/3A	4-20 mA Loop Powered
	LT***E-R16-S**LI1-EX-B1140/3A	20-4 mA Loop Powered
PVDF Level Probe, Dual 3/4 NPT Connection 	LT***E-R16-PLI0-EX-D	4-20 mA Loop Powered
	LT***E-R16-PLI1-EX-D	20-4 mA Loop Powered
PVDF Level Probe, Single 3/4 NPT Connection 	LT***E-R16-PLI0-EX-S LT***E-R16-PCLI0-EX-S	4-20 mA Loop Powered
	LT***E-R16-PLI1-EX-S LT***E-R16-PCLI1-EX-S	20-4 mA Loop Powered

- * Float ordered separately, see page D64.
 ** For flange dimensions, see page D63.



Industrial Automation

TURCK
works

 Industrial
 Automation

Voltage	Probe Style (Finish)	Pressure Rating (psi)	Connection Type	Agency Approval	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
13.5-30 VDC	Sanitary (316 SS w/240 grit)	1015	4-pin <i>minifast</i>	3A, FM	RKV 46-*M	1	Diagram 1 Diagram 2
	Sanitary (316 SS w/240 grit)	1015	4-pin <i>minifast</i>	3A, FM	RKV 46-*M	1	
13.5-30 VDC	PVDF	145	Dual 3/4 NPT	FM	2M/PVC	2	
	PVDF	145	Dual 3/4 NPT	FM	2M/PVC	2	
13.5-30 VDC	PVDF	145	Single 3/4 NPT	FM	2M/PVC	2	
	PVDF	145	Single 3/4 NPT	FM	2M/PVC	2	
	PVDF	145	Single 3/4 NPT	FM	2M/PVC	2	
	PVDF	145	Single 3/4 NPT	FM	2M/PVC	2	

* Length in meters.

R16 LEVEL

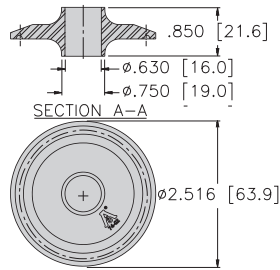


TURCK

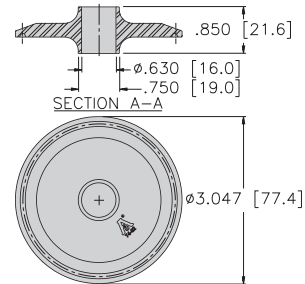
Level Sensors - R16 Probe

All dimensions shown as: Inches [mm]

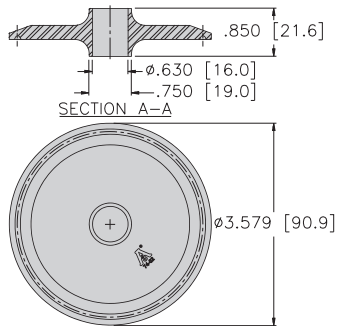
Flange Options



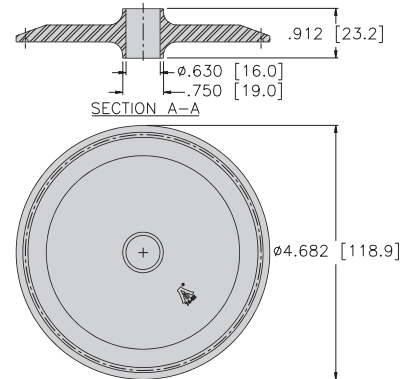
Flange, 2 inch Tri-clamp



Flange, 2.5 inch Tri-clamp



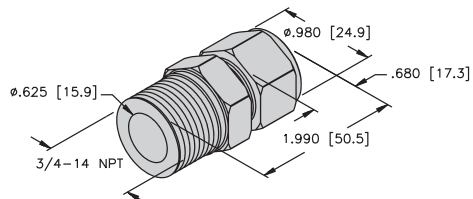
Flange, 3 inch Tri-clamp



Flange, 4 inch Tri-clamp

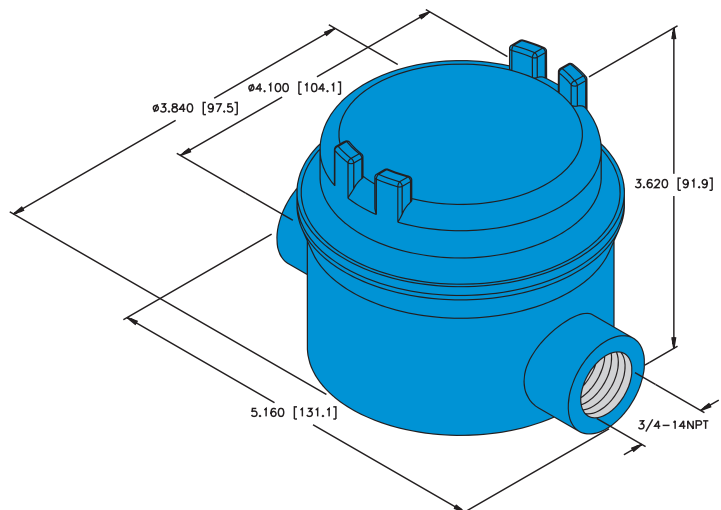
Level Probe Accessories

Tube Coupling



TC-R16-SS
(LT0305)

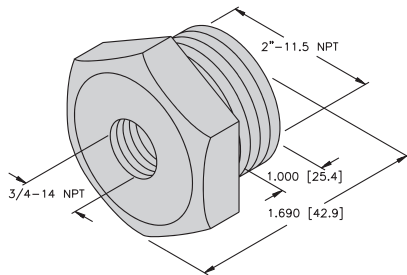
Junction Box



TB-R16S
(LT0294)

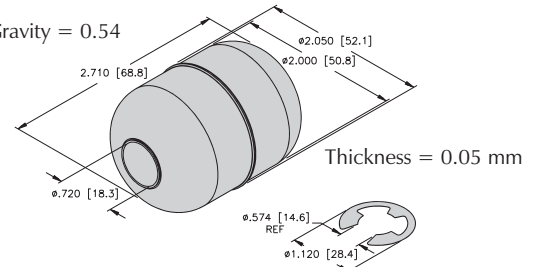


Level Probe Accessories

Bushing (316 Stainless Steel)

BU-R16-2x3/4 NPT-SS (LT0306)
Float Kit (316 Stainless Steel)

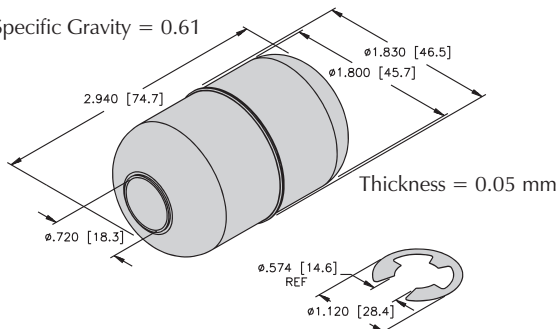
General Applications

Specific Gravity = 0.54


FK-R16-205-SSES (LT0299)
Float Kit (316 Stainless Steel)

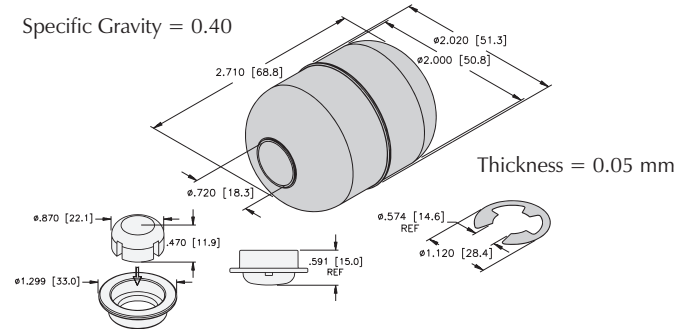
General Applications

Specific Gravity = 0.61


FK-R16-183-SSES (LT0296)
Float Kit (Nitrophyl)

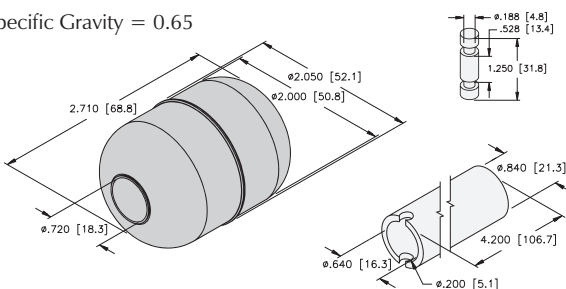
General Liquid Propane Applications

Specific Gravity = 0.40


FK-R16-202-NSH (LT0666)
Float Kit (Nickel Impregnated Teflon)

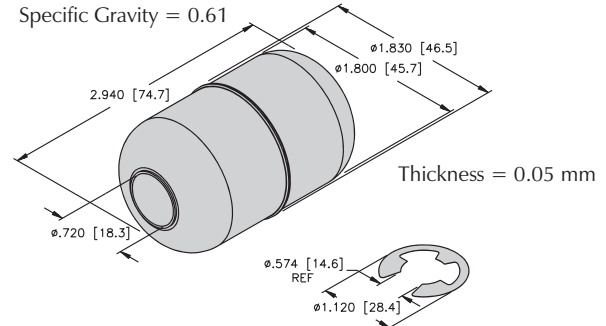
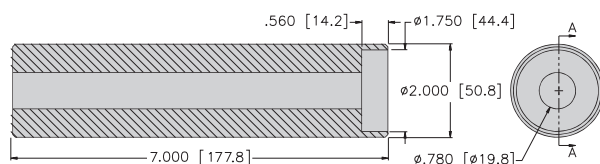
Acidic Applications - Consult Factory

Specific Gravity = 0.65

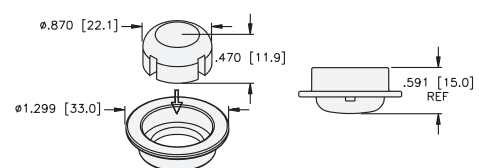

FK-R16-205-NCS-6 (LT0571)
Float Kit (316 Polished Stainless Steel)

Food Grade and Sanitary Applications

Specific Gravity = 0.61


FK-R16-183-SSFE (LT0302)
Weight Kit (316 Stainless Steel)


For use on PVDF probes 145-288 inches long.

WK-R16 Weight Kit (LT0295)
Probe Foot (ECTFE)

PF-R16 (LT0292)

R16 LEVEL

**TURCK****Level Sensors - R16 Probe****R16 Level Probe Worksheet**

Liquid to be measured _____

Fluid Properties (check all that apply)

___ Turbulent

___ Foam

___ Solids

Product Build-Up Yes ___ No ___

Temperature Range _____ °F to _____ °F

Pressure Range _____ to _____

Viscosity Range _____ to _____

Specific Gravity _____

4 mA Starting Point Top___ Bottom ___

Approvals Required

UL___ CSA___ FM___ 3A___ Food Grade___

Tank Location Indoors___ Outdoors___

Tank Material _____

Additional Comments _____

Allow overhead clearance for installation and removal of sensor.*Customer**

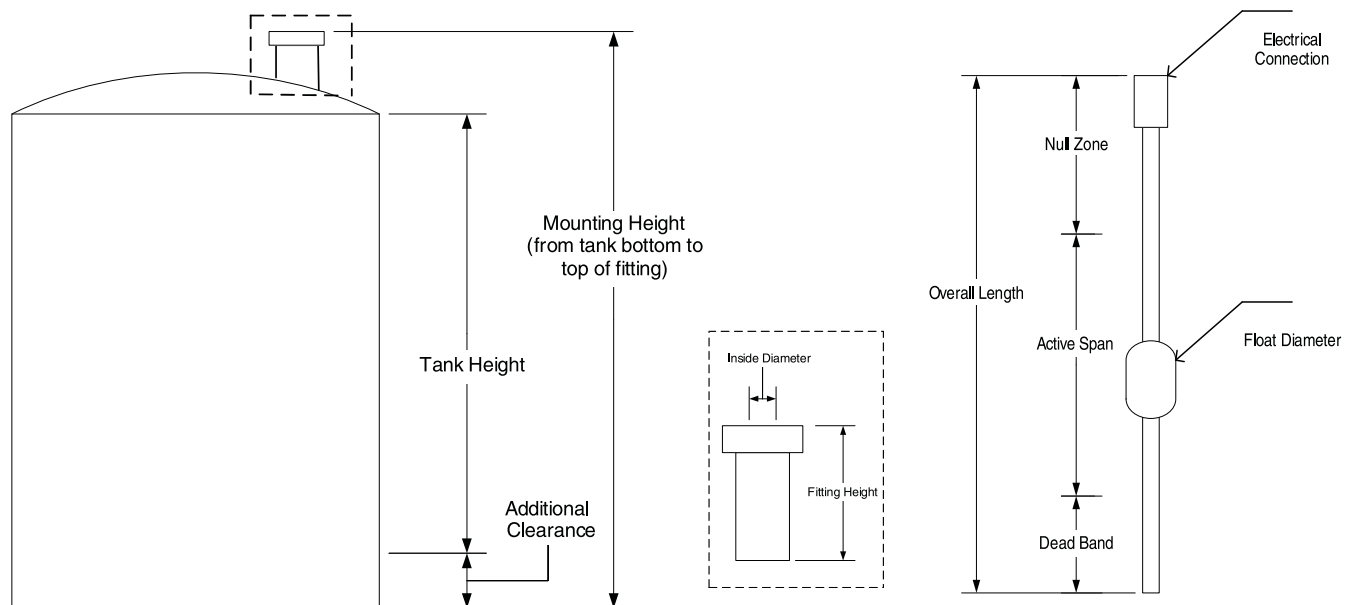
Phone Number

Date

Project

Quantity

R16 Level Probe Worksheet



TURCK

Interface Technology

IM33-11Ex-Hi/24 VDC



Pin#	Terminal Function
1	(+) 2-Wire or 3-Wire Field Power
2	(+) 2-Wire or 3-Wire Field Power
3	(-) Field Power for 2, 3 Wire Device
4	N/C
5	N/C
6	N/C
7	(+) 4-20 mA Non-Hazardous Area Output
8	N/C
9	N/C
10	Module Power (+) or AC
11	Module Power (-) or AC

Functional Description:

This 1 channel intrinsically non-hazardous interface will power a 2 or 3-wire HART transmitter or a separately powered field device. It will then retransmit the 0-20 mA or 4-20 mA signal from a hazardous area, and repeat the signal in the non-hazardous area as a 0-20 mA or 4-20 mA signal reflecting the hazardous area input. The device will also accept a sourced 0-20 mA or 4-20 mA signal from a separately powered field device and repeat this signal in the non-hazardous area. It will drive a non-hazardous area load of up to 500 Ω .

Due to the 1:1 transmission characteristic, open circuit or short circuit conditions can be indicated by a 0 mA or 22.5 mA reading indicating the condition for alarm implementation.

HART or conventional transmitters can be accommodated by this device with bi-directional communications of digital information with HART field devices.

Features:

- 1 Channel HART or conventional compatible analog input
- 2, 3 or 4-wire configurations for sinking or sourcing field devices
- Constant field voltage
- Short-circuit protected field circuit
- Over/Under current indication of 0 or 22.5 mA
- SIL 2 rated

Electrical Parameters:

Inputs: Hazardous Area

Supply Voltage - Universal Input

Input Resistance 250 Ω

Operating Characteristics

Voltage 17 V @ 20 mA

Current 0-22 mA

Short-Circuit Current (short-term) 60 mA (for 50 ms)

For entity parameters see control drawings.

Outputs: Non-Hazardous Area

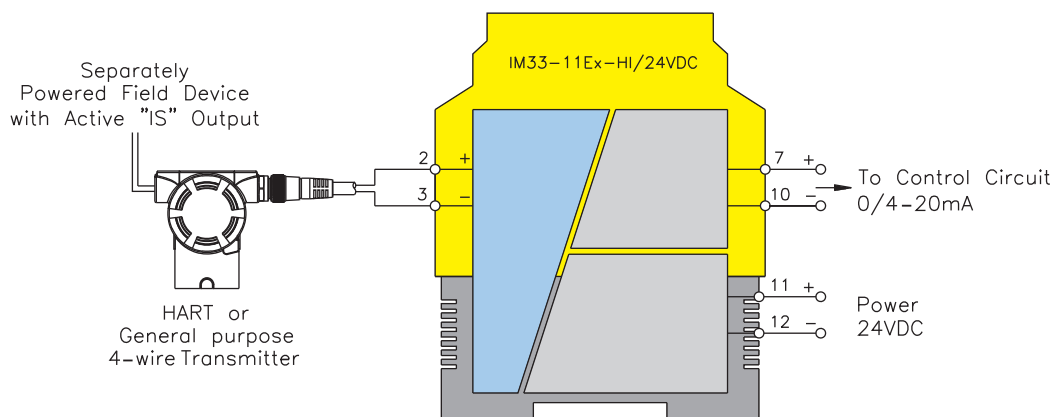
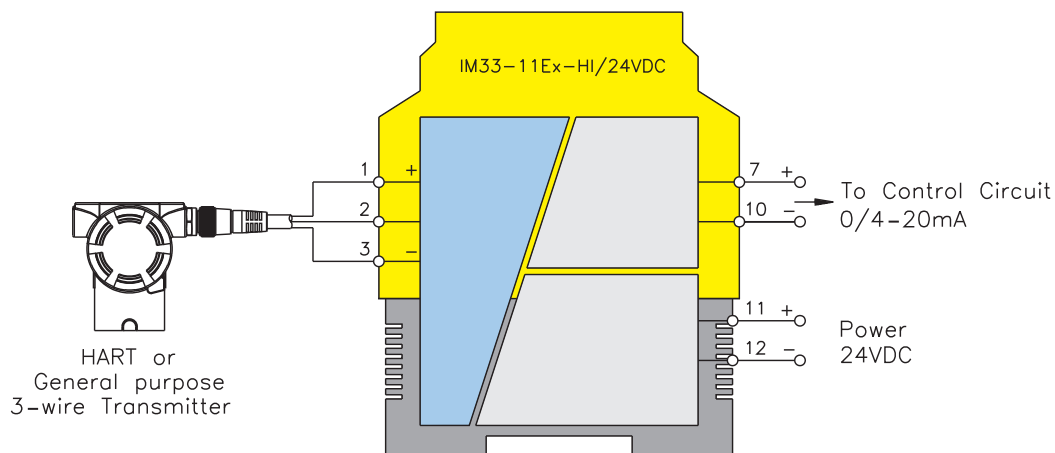
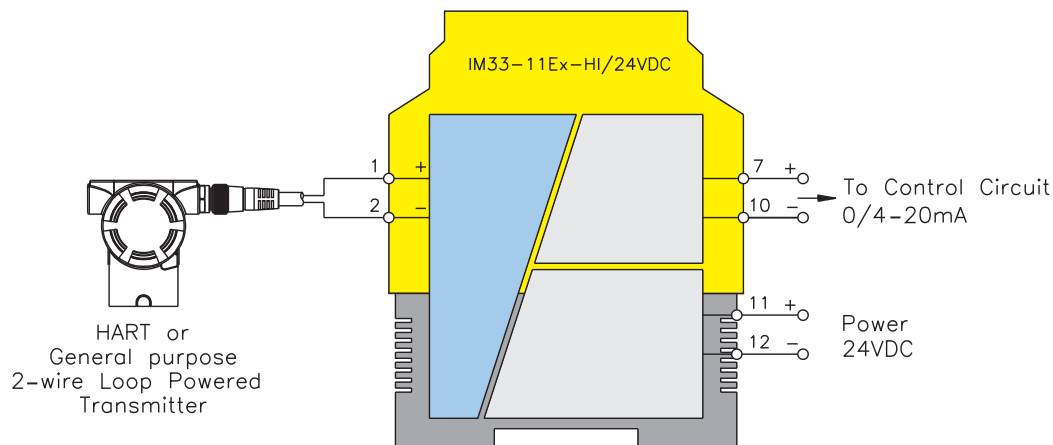
0/4-20 mA

Load $\leq$ 500 Ω

Open Circuit Indication 0 mA

Closed Circuit Indication $\geq$ 22.5 mA

IM33-11Ex-Hi/24 VDC



R16 LEVEL

TURCK

Interface Technology

IM33-12Ex-Hi/24 VDC



Pin#	Terminal Function
1	(+) 2-Wire or 3-Wire Field Power
2	4-20 mA Input from Field Device
3	(-) Field Power for 2, 3 Wire Device
4	N/C
5	N/C
6	N/C
7	(+) 4-20 mA Non-Hazardous Area Output
8	(+) 4-20 mA Non-Hazardous Area Output
9	(-) 4-20 mA Non-Hazardous Area Output
10	(-) 4-20 mA Non-Hazardous Area Output
11	Module Power (-) or AC

Functional Description:

This 1 channel intrinsically non-hazardous interface will power a 2 or 3-wire HART transmitter or a separately powered field device. It will retransmit the 0-20 mA or 4-20 mA signal from a hazardous area, and repeat the signal in the non-hazardous area as two 0-20 mA or 4-20 mA signals reflecting the hazardous area input. The device will also accept a sourced 0-20 mA or 4-20 mA signal from a separately powered field device and repeat this signal as two non-hazardous area signals. It will drive two separate non-hazardous area loads of up to 500 Ω each.

Due to the 1:1 transmission characteristic, open circuit or short circuit conditions can be indicated by a 0 mA or 22.5 mA reading indicating the condition for alarm implementation.

Features:

- 1 Channel HART or conventional compatible analog inputs
- 2, 3 or 4-wire configurations for sinking or sourcing field devices in any combination
- 2 independent 0/4-20 mA outputs reflecting a single hazardous area input
- Constant field voltage
- Short-circuit protected field circuits
- Over/Under current indication of 0 or 22.5 mA
- SIL 2 rated

Electrical Parameters:

Inputs: Hazardous Area

Supply Voltage - Universal Input

Input Resistance 250 Ω

Operating Characteristics

Voltage 17 V @ 20 mA

Current 0-22 mA

Short-Circuit Current (short-term) 60 mA (for 50 ms)

For entity parameters see control drawings.

Outputs: Non-Hazardous Area

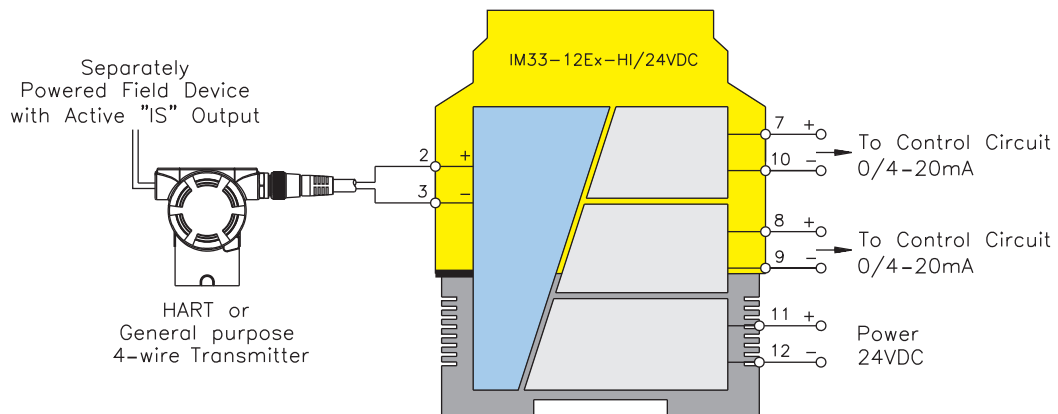
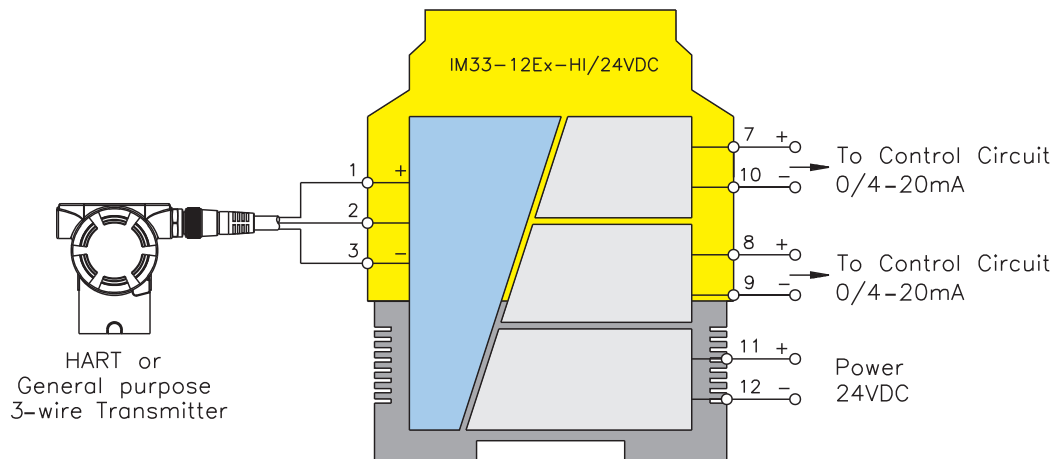
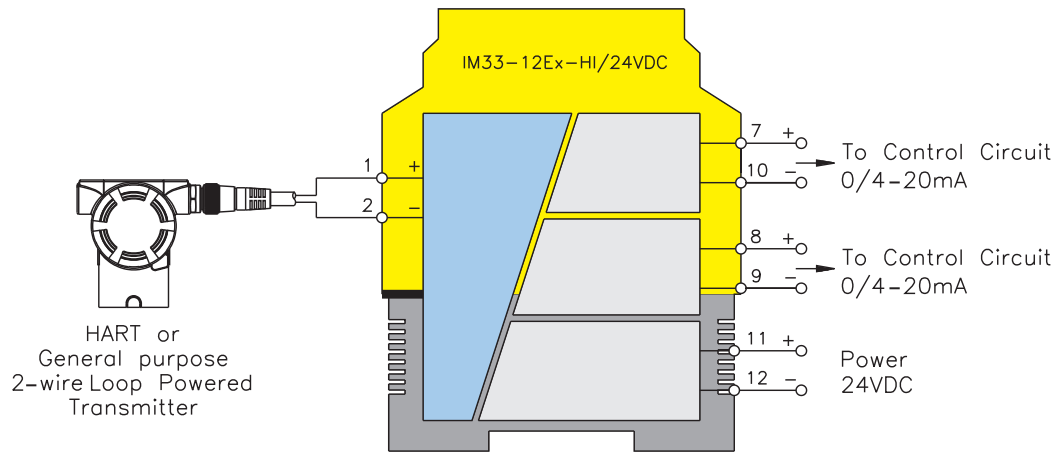
0/4-20 mA

Load $\leq$ 500 Ω

Open Circuit Indication 0 mA

Closed Circuit Indication $\geq$ 22.5 mA

IM33-12Ex-Hi/24 VDC



R16 LEVEL

TURCK

Interface Technology

IM33-22Ex-Hi/24 VDC



Pin#	Terminal Function
1	(+) 2-Wire or 3-Wire Field Power
2	4-20 mA Input from Field Device
3	(-) Field Power for 2, 3 Wire Device
4	(+) 2-Wire or 3-Wire Field Power
5	4-20 mA Input from Field Device
6	(-) Field Power for 2, 3 Wire Device
7	(+) 4-20 mA Non-Hazardous Area Output
8	(+) 4-20 mA Non-Hazardous Area Output
9	(-) 4-20 mA Non-Hazardous Area Output
10	(-) 4-20 mA Non-Hazardous Area Output
11	Module Power (-) or AC

Functional Description:

This 2 channel intrinsically non-hazardous interface will power two separate 2 or 3-wire HART transmitters, or separately powered field devices, or any combination of these devices. It will retransmit the 0-20 mA or 4-20 mA from a hazardous area, and repeat the signal in the non-hazardous area as two separate 0-20 mA or 4-20 mA signals reflecting the hazardous area input. The device will also accept two separate source 0-20 mA or 4-20 mA signals from separately powered field devices, and repeat these signal as two non-hazardous area signals. It will drive two separate non-hazardous area loads of up to 500 Ω each.

Due to the 1:1 transmission characteristic, open circuit or short circuit conditions can be indicated by a 0 mA or 22.5 mA reading indicating the condition for alarm implementation.

Features:

- 2 independent channel HART or conventional compatible analog inputs
- 2, 3, or 4-wire configurations for sinking or sourcing field devices in any combination
- Constant field voltage for each channel
- Short-circuit protected field circuits
- Over/Under current indication of 0 or 22.5 mA
- SIL 2 rated

Electrical Parameters:

Inputs: Hazardous Area

Supply Voltage - Universal Input

Input Resistance 250 Ω

Operating Characteristics

Voltage 17 V @ 20 mA

Current 0-22 mA

Short-Circuit Current (short-term) 60 mA (for 50 ms)

For entity parameters see control drawings.

Outputs: Non-Hazardous Area

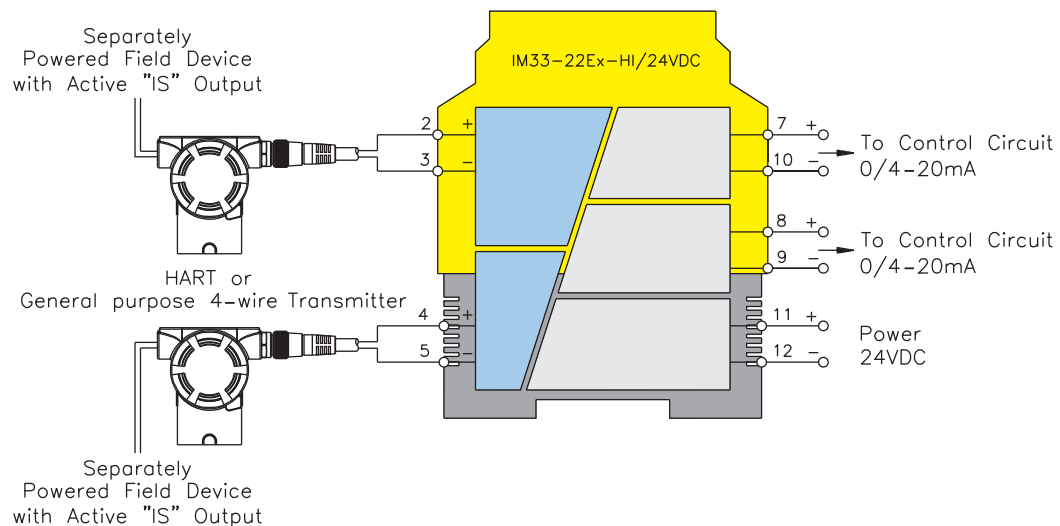
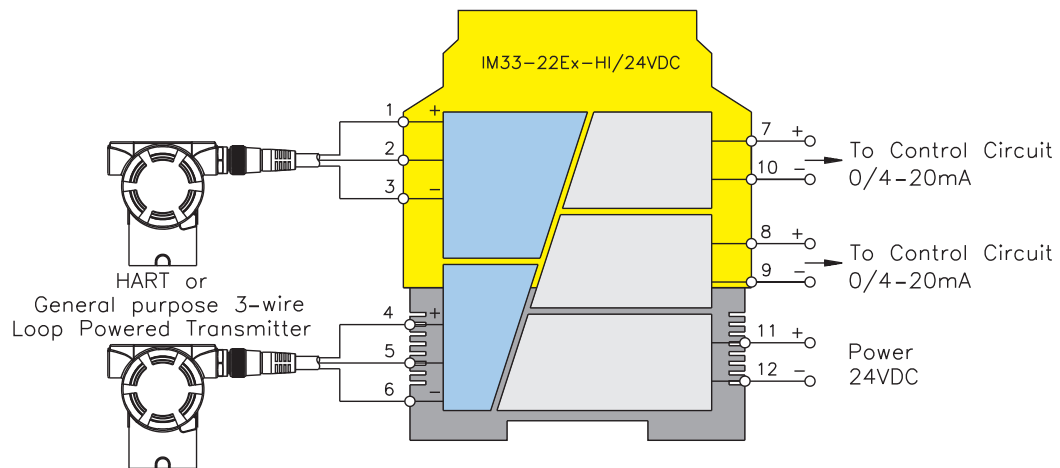
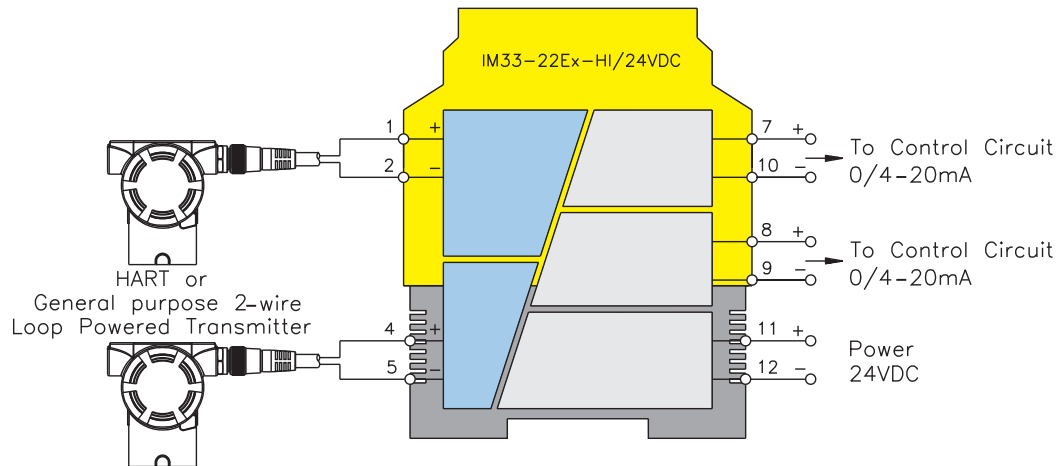
0/4-20 mA

Load $\leq$ 500 Ω

Open Circuit Indication 0 mA

Closed Circuit Indication $\geq$ 22.5 mA

IM33-22Ex-Hi/24 VDC



R16 LEVEL



TURCK

Interface Technology

IM43-13-SR / IM43-14-SRi



Pin#	Terminal Function
1	(+) 18 VDC Sensor Supply
2	(+) Current Input
3	(+) Voltage Input
4	(-) 0 V Sensor Common
5	(-) Common for 0/4 mA Minimum Selection
9	Input for 0/4 mA Minimum Selection
12	Relay Output 1
13	Relay Output 1
14	Relay Output 2
15	Relay Output 2
11	SRi - 0/4-20 mA Output
16	SRi - 0/4-20 mA Output
17	Relay Output 3
18	Relay Output 2
19	20-250 VUC Supply Power
20	20-250 VUC Supply Power

Functional Description:

The limit value monitors IM43-13-SR and IM43-14-SRi are single-channel devices and alternately monitor measuring current of 0/4-20 mA or measuring voltages of 0/2-10 V. The three limit values are set via the front panel teach button. In addition, a voltage of approx. 18 V (at 35 mA max.) is provided, which can be used to power transmitters or sensors. The output mode is jumper programmable at terminals 5-8.

Features:

- 1-channel limit value monitor with removable terminal blocks
- Input either via current input 0/4-20 mA or voltage input 0/2-10 V
- Supply of a 2-wire or 3-wire transmitter/sensor
- Limit value adjustment via teach button
- Three relay outputs, each with one normally open output
- Current output of 0/4-20 mA. (IM43-14-SRi only)
- Universal operating voltage (20-250 VUC)

Electrical Parameters:

Inputs: Hazardous Area

Supply Voltage - Universal Input

Input Resistance < 50 Ω

Operating Characteristics:

Voltage 0/2-10 VDC

Current 0/4-20 mA

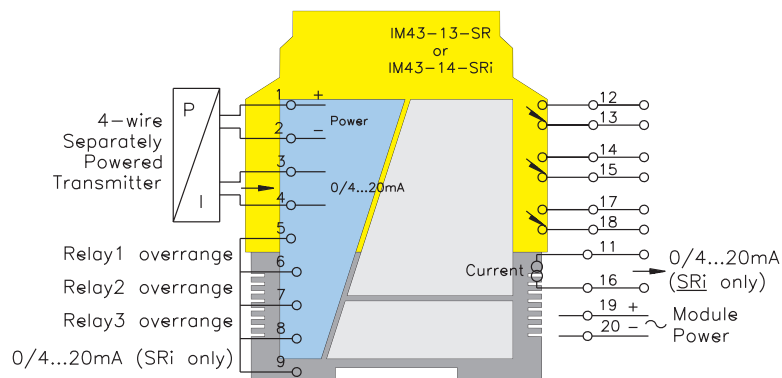
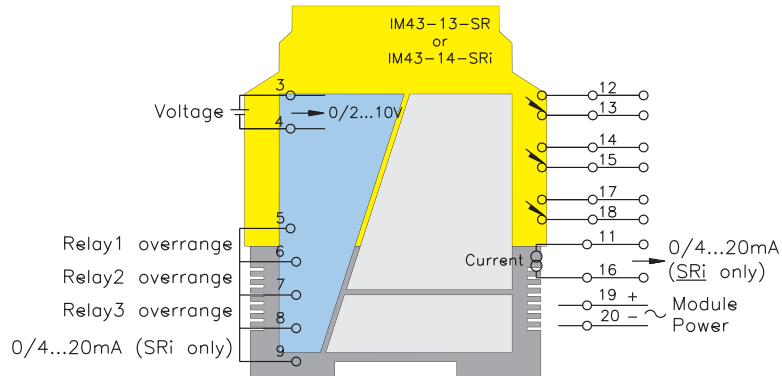
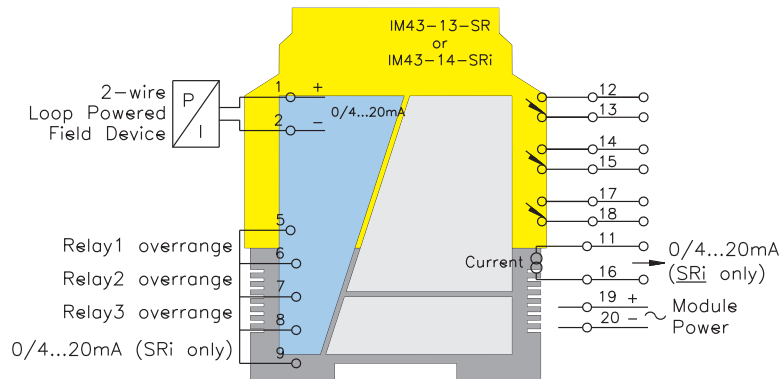
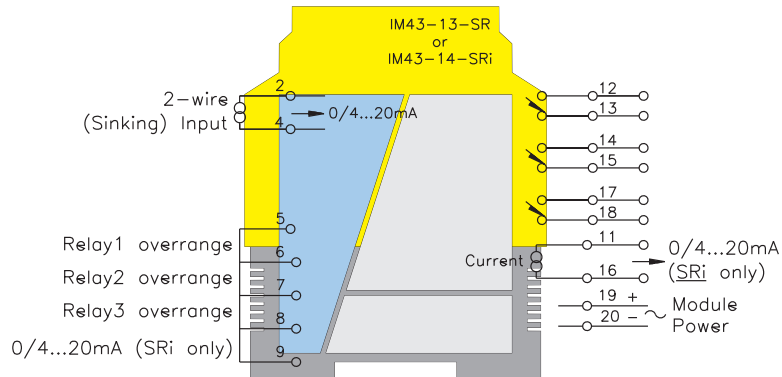
Outputs: Non-Hazardous Area

Relay Outputs 3 normally open contacts

Current Output (SRi Version) 0/4-20 mA

For entity parameters see control drawings.

IM43-13-SR / IM43-14-SRi



R16 LEVEL



TURCK

Level Sensors - Conductive Rods

Conductive Level Probes and Controllers

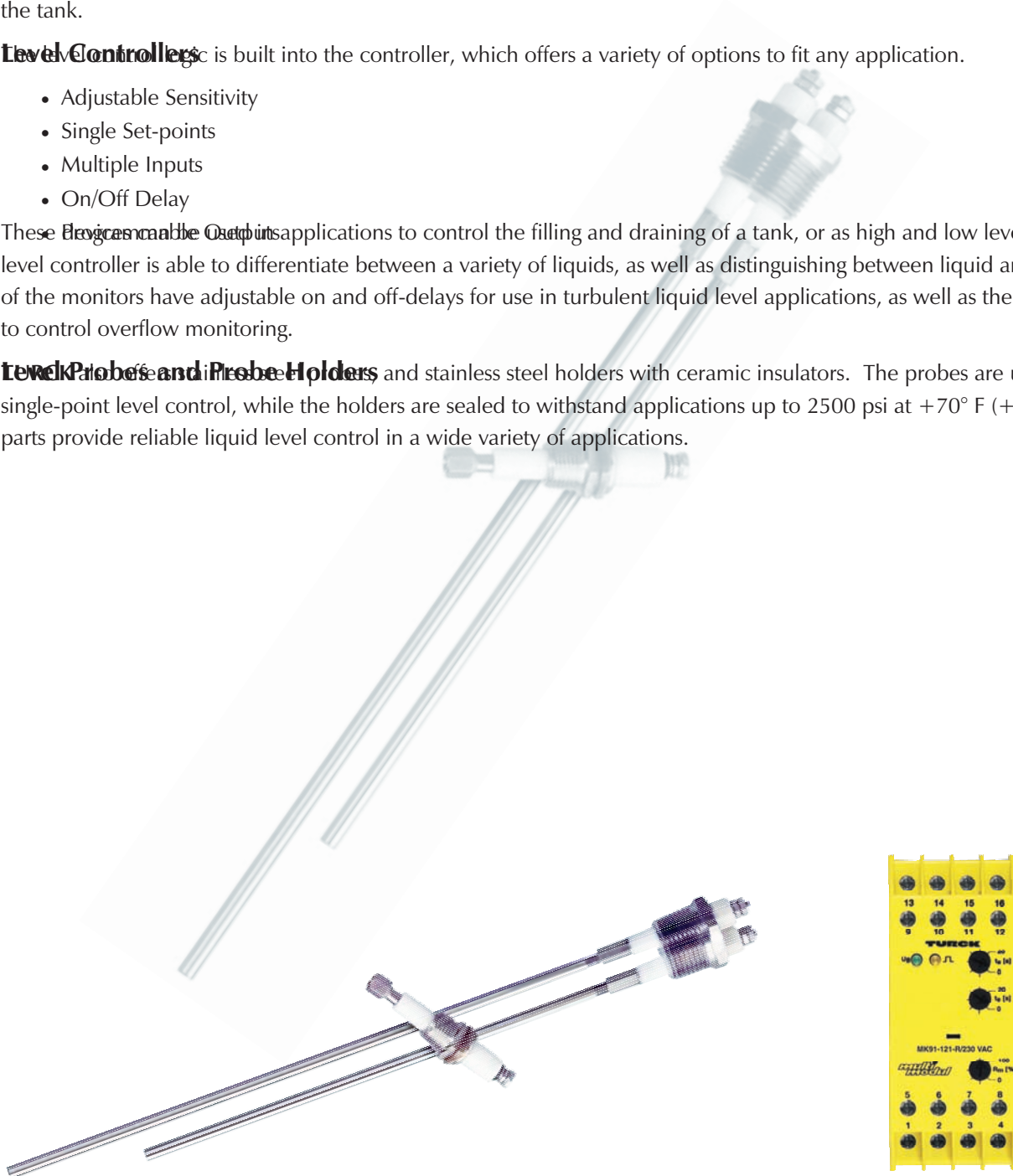
TURCK offers liquid level probes for use in conjunction with our level control monitors, to provide a simple solution for liquid level applications. The resistance between the terminals is measured to determine the level of the medium in the tank.

Level Controllers The logic is built into the controller, which offers a variety of options to fit any application.

- Adjustable Sensitivity
- Single Set-points
- Multiple Inputs
- On/Off Delay

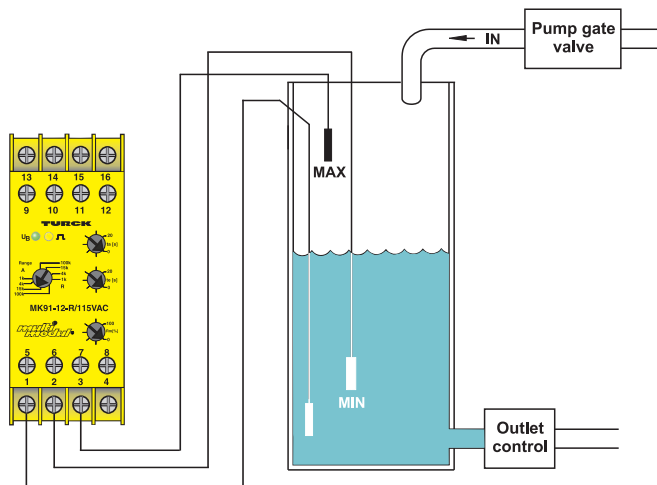
These devices can be used in applications to control the filling and draining of a tank, or as high and low level alarms. The level controller is able to differentiate between a variety of liquids, as well as distinguishing between liquid and foam. Many of the monitors have adjustable on and off-delays for use in turbulent liquid level applications, as well as the necessary logic to control overflow monitoring.

Level Probes and Probe Holders These probes are made of Inconel and stainless steel holders with ceramic insulators. The probes are used to provide single-point level control, while the holders are sealed to withstand applications up to 2500 psi at +70° F (+21°C). These parts provide reliable liquid level control in a wide variety of applications.



Level Detection Application Examples

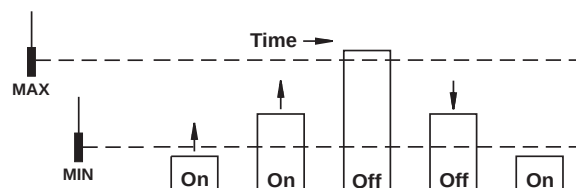
Control for Pump-in "Filling" a Tank



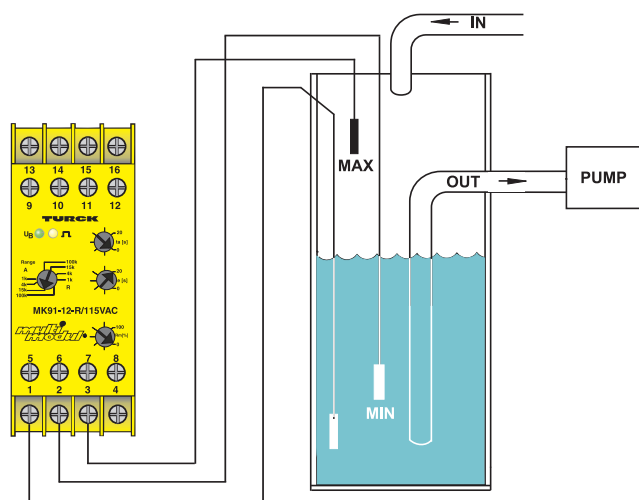
Example Application using MK91-12-R/...

The MK91-12-R will start a pump or open a fill valve when the liquid drops below the MIN level probe and will remain on until the MAX level probe is reached.

The relay then de-energizes and stays off until the MIN level is reached. The pump or valve does not cycle constantly, as would be the case if only one sensor were used.



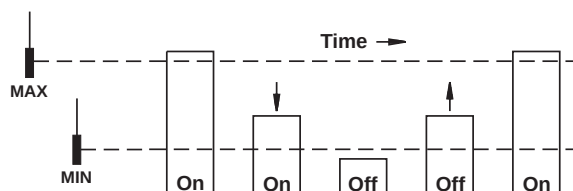
Control for Pump-out "Draining" a Tank



Example Application using MK91-12-R/...

The MK91-12-R will start a pump when the liquid reaches the MAX level probe and remain on until the MIN level probe is reached.

The relay then de-energizes and stays off until the MAX level is reached. The pump or valve does not cycle constantly, as would be the case if only one sensor were used.



TURCK**Level Sensors - Conductive Rods****MK91-121-R.. and MK91-12-R..**

Galvanic Isolation	between input, output and supply circuits, test voltage 2.5 kVrms
Probe Voltage	0.02-5 V _{pp} /150 Hz (delta)
Sensitivity Ranges (Switching Thresholds)	
- Range 1	0.2-1 kΩ
- Range 2	0.8-4 kΩ
- Range 3	2.5-15 kΩ
- Range 4	10-100 kΩ
Hysteresis	approx. 10%
Switch-on Delay	0-20 s (adj.)
Switch-off Delay	0-20 s (adj.)
Contact Material	silver alloy + 3 μ Au
Switching Capacity	≤500 VA / 60 W
Protection	IP 20
Mounting	DIN 50022 or pull-out tabs
Operating Temperature	-25°C to +60°C (-13°F to +140°F)
Line Frequency (AC)	48-62 Hz
Ripple (DC)	≤10%

MS91-12-R..

Galvanic Isolation	between input, output and supply circuits
Probe Voltage	typ. 5 V _{pp} /100 Hz (delta)
Sensitivity Ranges (Switching Thresholds)	
- Range 1	0.1-1 kΩ
- Range 2	0.5-5 kΩ
- Range 3	2-20 kΩ
- Range 4	10-100 kΩ
Hysteresis	10%
Switch-on /Switch-off Delay	0.1-15 s (adj.)
Contact Material	AgCdO
Switching Capacity	≤500 Va/60 W
Protection	IP 20
Mounting	DIN 50022 or pull-out tabs
Operating Temperature	-25°C to +60°C (-13°F to +140°F)
Line Frequency (AC)	48-62 Hz
Ripple (DC)	≤10%

Galvanic Isolation	between input and output circuit, insulation test voltage 4 kV/8 mm input circuit and supply voltage galvanically connected
Switching Point Deviation in	
Supply Voltage Range	≤1%
Operating Characteristics at:	V = 24 V, R _M = 40 k
- Rectangular Signal	f = 1 Hz
- Amplitude of Electrode Voltage	±2 V
- Amplitude of electrode current.	±50 µA
Contact Material	silver alloy + 3µ Au
Switching Capacity.	≤500 VA / 60 W
Protection	IP 20
Mounting.	DIN 50022 or pull-out tabs
Operating Temperature	-25°C to +60°C (-13°F to +140°F)
Line Frequency (AC)	48-62 Hz
Ripple (DC)	≤10%

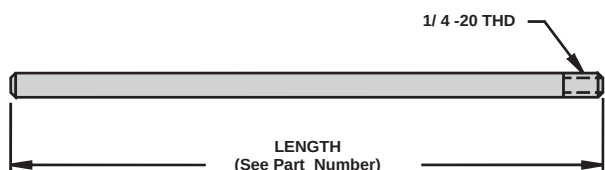

TURCK
Level Sensors - Conductive Rods


Housing Style	Part Number	ID Number	Number of Probes	Maximum Pressure (psi)	Fluid Connection
Probe Holder	WCC-1138	A3365	1	2500	3/8 NPT
Probe Holder	WCT-2	A3375	2	2500	1 in. NPT

Material

Probe Holders	303/304 Stainless Steel
Insulators	Ceramic
Probes	304 Stainless Steel

Industrial Automation

Housing Style	Part Number	ID Number	Material
Stainless Steel Probes 	91-SSP 01 Ft	A3000	304 Stainless Steel
	91-SSP 02 Ft	A3002	304 Stainless Steel
	91-SSP 03 Ft	A3004	304 Stainless Steel
	91-SSP 04 Ft	A3006	304 Stainless Steel
	91-SSP 05 Ft	A3008	304 Stainless Steel
	91-SSP 06 Ft	A3010	304 Stainless Steel
	91-SSP 07 Ft	A3014	304 Stainless Steel
	91-SSP 08 Ft	A3016	304 Stainless Steel
	91-SSP 09 Ft	A3018	304 Stainless Steel
	91-SSP 10 Ft	A3020	304 Stainless Steel

For use with Amplifiers on pages D55.

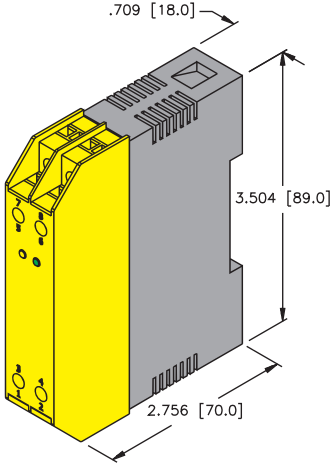
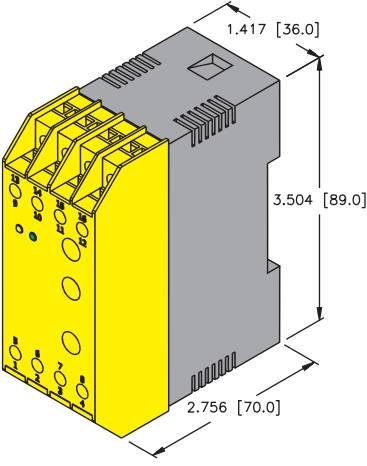
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Level Sensors - Conductive Rods



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Housing Style	Part Number	ID Number	Features	Output
Level Control Monitor with Fixed Switch Point 	MK 91-R11/24VDC	M7525202	Single Level Controller 10 second delay	(1) SPDT Relay
Level Control Monitor, Potentiometer/Jumper Programmable 	MK 91-121-R/24VDC	M7545087	Dual Level Controller, Adjustable Delay	(2) SPDT Relays/Parallel
	MK 91-121-R/230VAC	M7545080	Dual Level Controller, Adjustable Delay	

Additional specifications on pages D51-D52.

Material

Housing

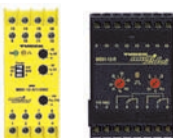
PC/ABS



Voltage	Switching Current	Switch Point	Current Consumption	Hysteresis	Power LED	Output LED	Wiring Diagram #	Wiring Diagrams
19-29 VDC	3 A at 250 VUC	40 kΩ Fixed	≤20 mA at 24 VDC	Approx. 5%	GN	YE	1	Diagram 1 Diagram 2
20-28 VDC	3 A at 250 VUC	0.2-100 kΩ	≤1.5 W	Approx. 10%	GN	YE	2	
184-264 VAC	3 A at 250 VUC	0.2-100 kΩ	3 VA/<15 mARMS	Approx. 10%	GN	YE	2	

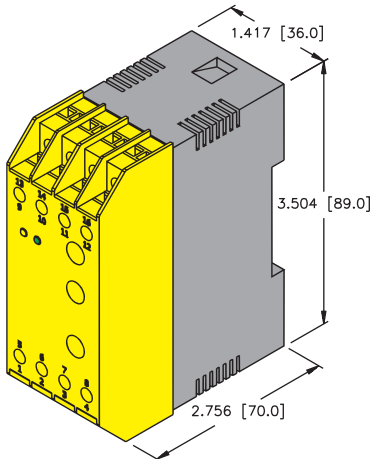
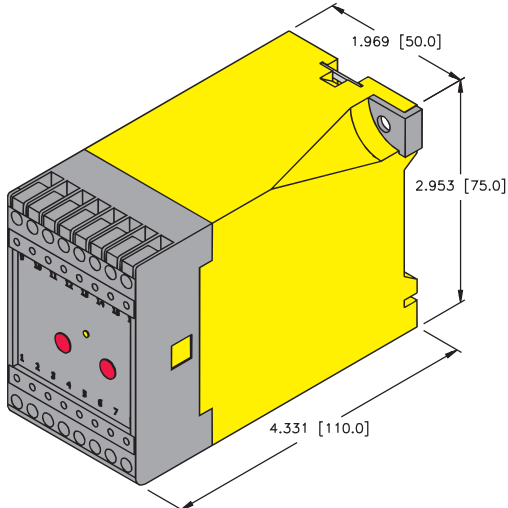
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Level Sensors - Conductive Rods



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Housing Style	Part Number	ID Number	Features	Output
Level Control Monitor 24 VDC, Dip-Switch Programmable 	MK 91-12-R/024VDC	M7545077	Dual Level Controller, Adjustable Time Delay	(2) SPDT Relays/Parallel
	MK 91-12-R/115VAC	M7545072		
	MK 91-12-R/230VAC	M7545070		
Level Control Monitor, Potentiometer/Jumper Programmable 	MS91-12-R	M5220110	Dual Level Controller, Adjustable Time Delay	(2) SPDT Relays

Additional specifications on page D51-D52.

Material

Housing

PC/ABS



Voltage	Switching Current	Switch Point	Current Consumption	Hysteresis	Power LED	Output LED	Wiring Diagram #	Wiring Diagrams
20-28 VDC	3 A at 250 VUC	0.2-100 kΩ	≤1.5 W	Approx. 10%	GN	YE	1	Diagram 1 Diagram 2
98-126 VAC	3 A at 250 VUC	0.2-100 kΩ	3 VA/<15 mARMS	Approx. 10%	GN	YE	1	
184-264 VAC	3 A at 250 VUC	0.2-100 kΩ	3 VA/<15 mARMS	Approx. 10%	GN	YE	1	
20-250 VUC	4 A at 250 VUC	0.1-100 kΩ	≤3 W	Approx. 10%	GN	YE	2	

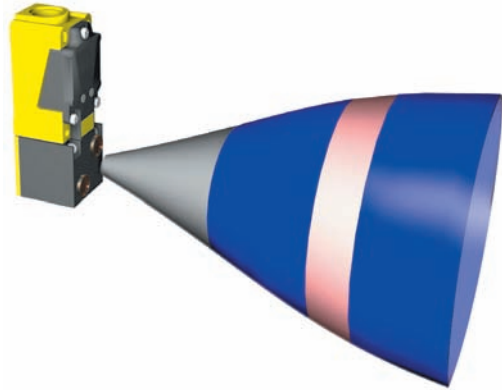


TURCK

Ultrasonic Sensors

Principle of Operation

The sensor emits an ultrasonic pulse that reflects back from any object entering the sonic cone. Because sound has a constant velocity at a given temperature and humidity, the time taken for this echo to return to the sensor is directly proportional to the distance of the object. The sensor's output status is dependent on the comparison of this time with the setting of the detection zone.



Medium

TURCK ultrasonic transducers are calibrated for use in air. The sensors can also be used in other gaseous media with a corresponding change in sensing range.

Targets

Solid, fluid, granular and powdery targets can be detected by TURCK ultrasonic sensors.

The **variations** of an "ideal" target should not exceed 0.15 mm (.006 in). Larger surface variations allow for larger alignment variations but may reduce sensing range.

Target **temperature** affects the sensing range in that hot surfaces reflect sonic waves less than cold ones.

The ultrasonic reflectivity of **liquid surfaces** is the same as that of solid, flat objects. Correct alignment should be observed.

Textiles, foams, wool, etc. absorb sonic waves, thereby reducing the sensing range.

Air pressure

Normal atmospheric pressure changes of $\pm 5\%$ (at a fixed reference point) can cause a $\pm 6\%$ deviation in sensing range.

Air temperature and humidity

Both air temperature and humidity influence the sonic pulse duration. An air temperature increase of 20°C (68°F) results in a +3.5% change in sensing distance for M18, M30 or Q30 styles and +8% for CP40s.

An increase in humidity results in an increased sound speed (max. 2%) compared with dry air.

Air streams

Air streams affect the echo propagation time, but the effects of air flow speeds of up to 10 m/s are negligible. The use of ultrasonic sensors is not recommended in turbulent areas such as above glowing metal because the sonic waves become distorted, making the echos difficult to evaluate.

Dewing

Normal concentrations of rain or snow falling in front of the sensor do not affect sensor operation.

CP40 transducers are not protected against wetting. All other ultrasonic sensors are not damaged by water, but correct functionality may be impaired when wet. Therefore, the transducers should not be subjected to direct wetting during use.



Sensor styles

M18, M30 & Q30: These sensor styles have one transducer that functions both as emitter and receiver, which results in a larger blind zone. They have a narrow sonic cone (6°) and are especially suited for detection of small objects in a small area at a long distance.

CP40: These sensor styles have two transducers - one emitter and one receiver - which results in a smaller blind zone. They have a wide sonic cone (60°). The wide cone angle allows for a greater angle of inclination for the target. CP40 style sensors are especially suited for detecting objects in a large area.



Simultaneous operation of several sensors

When several ultrasonic sensors are used, mutual interference of the sonic cones may arise. To eliminate this problem, some of the sensors have synchronization and multiplexing features. For those sensors without these features maintaining a minimum distance between sensors will also solve this problem.

Synchronization

Synchronization of ultrasonic sensors causes the sensors to emit their sonic pulses simultaneously. Using RUC...M30, RU...Q30 or RU...M18 sensors, up to six sensors may be synchronized by tying their X1 lines.

Multiplexing

Multiplexing the sensors causes them to emit their pulses at pre-defined intervals, independent of one another. This eliminates the possibility of mutual interference and of sensors seeing targets that are actually in front of other sensors. The more sensors that are operated alternately, the lower the switching frequency.

The X1 line of sensors RUC...M30, RU...Q30 and RU...M18 can be used as an enable input for multiplexing purposes. An X1 input of +24 V enables the sensor while an X1 input of 0 V disables it. Multiplexing via the X1 line instead of by powering down the sensors has the advantage that only the response time has to be considered and not the time delay before availability.



TURCK

Ultrasonic Sensors

Range adjustments

M30 and CP40 style sensors have two potentiometers to enable both foreground and background suppression. Q30 and discrete M18 style sensors have one potentiometer to enable background suppression only.

Analog M18 sensors have a fixed range.

Sensing ranges given are at nominal conditions, i.e. $T_u = +20^{\circ}\text{C}$ (68°F) using a standard target, vertically aligned, with reflective surface (metal, 1 mm thick).

Sensors with two switch points

RUC...2AP8X - the potentiometers on these sensors set the far limits of each detection zone. Potentiometer S1 sets the far limit of Zone 1, which begins at the end of the blind zone.

Potentiometer S2 sets the far limit of Zone 2, which begins at the far limit of Zone 1 (Figure 1).

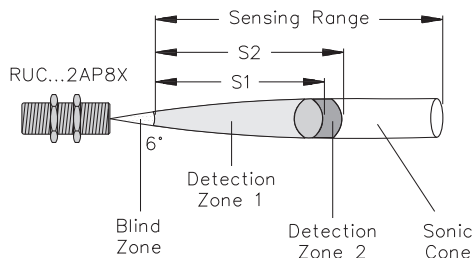


Figure 1

Sensors with one switch point

CP40 - potentiometer S1 sets the near limit while potentiometer S2 sets the depth of the detection zone. This allows both foreground and background suppression. Changes to S1 will cause the far limit to follow (Figure 2).

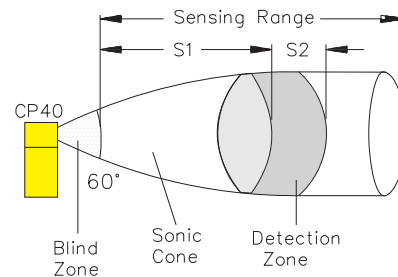


Figure 2

Q30 and discrete M18 - one potentiometer sets the far limit of the detection zone. The near limit is not adjustable, and is determined by the blind zone. This allows for background suppression only (Figure 3).

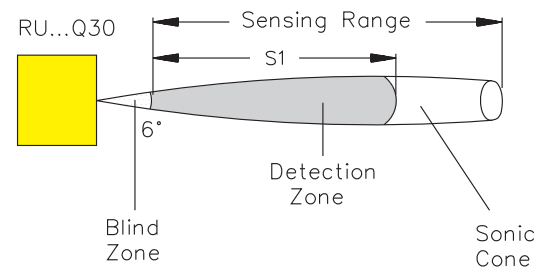


Figure 3

M30 - potentiometers S1 and S2 set the near and far limits of the detection zone. This allows for foreground and background suppression. The pots are independent of each other (Figure 4).

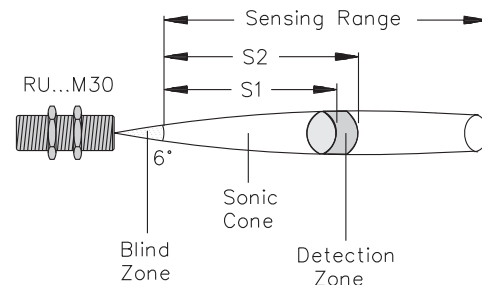
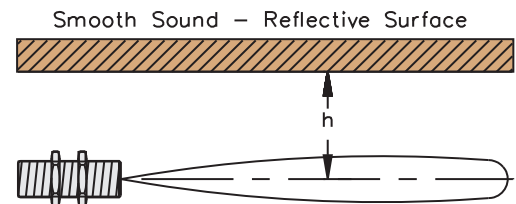
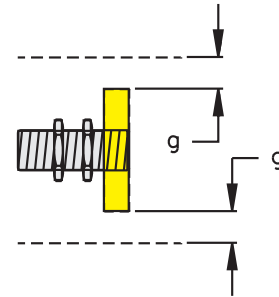
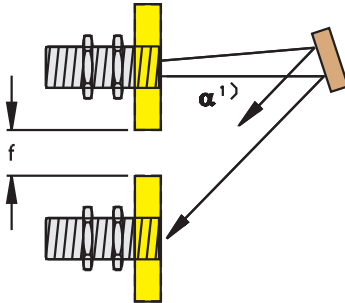
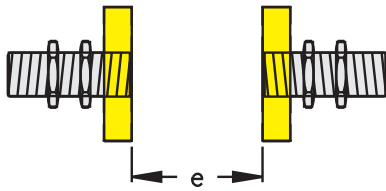


Figure 4

Mounting Considerations



Sensor Type	e (cm)	f (cm)	g (cm)	h (cm)
RU20-M18K-	80	6	3	1.5
RU70-M18K-	280	18	10	5.0
RUN20-M18K	80	6	3	1.5
RUN70-M18K-	280	18	10	5.0
RUR20-M18K-	80	6	3	1.5
RUR70-M18K-	280	18	10	5.0
RU20-M18KS-	80	6	3	1.5
RU70-M18KS-	280	18	10	5.0
RUN20-M18KS-	80	6	3	1.5
RUN70-M18KS-	280	18	10	5.0
RUR20-M18KS-	80	6	3	1.5
RUR70-M18KS-	280	18	10	5.0
RU 30-M18-	≥120	≥15	≥6	≥3
RU100-M18-	≥400	≥60	≥30	≥15
RU 30-M30-	≥120	≥15	≥6	≥3
RU100-M30-	≥400	≥60	≥30	≥15
RU600-M3065-	≥2500	≥250	≥80	≥40
RUC 30-M30-	≥120	≥15	≥6	≥3
RUC130-M30-	≥400	≥60	≥30	≥15
RUC300-M3047-	≥1200	≥150	≥60	≥30
RUC600-M3065-	≥2500	≥250	≥80	≥40
RU 30-Q30	≥120	≥15	≥6	≥3
RU100-Q30	≥400	≥60	≥30	≥15
RU100-CP40-AP6X2	≥600	≥100	≥120	≥60
RU100-CP40-LIUX	≥600	≥100	≥120	≥60

¹⁾ The greater the angle α , the larger the distance f. The minimum f values in the table refer to $\alpha = 0^\circ$.



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Ultrasonic Sensors

Ultrasonic Sensor Part Number Key

RUC	130	-	M	30	-	2	A	P	8	X	Wiring Options
Mounting			Rated Operating Distance (cm)			Housing Style			Number of LEDs		
RU(C) = Ultrasonic Sensor RUN = Ultrasonic Sensor RUR = Ultrasonic Sensor			M = Partial Threading, Chrome Plated Brass Q = Metal or Plastic, Various Rectangular Styles			LI(LU) = Linear Analog Output Current (LI) or Voltage (LU) LIU = Linear Analog Output (Current and Voltage) LFX = Analog Frequency Output			Examples: Blank = No LEDs X2 = 2 LEDs		
Rated Operating Distance (cm)			Housing Style			Output Function			Output		
RU(C) = Ultrasonic Sensor RUN = Ultrasonic Sensor RUR = Ultrasonic Sensor			M = Partial Threading, Chrome Plated Brass Q = Metal or Plastic, Various Rectangular Styles			A = Normally Open (N.O.) LI(LU) = Linear Analog Output Current (LI) or Voltage (LU) LIU = Linear Analog Output (Current and Voltage) LFX = Analog Frequency Output			N = NPN Transistor (Current Sinking) P = PNP Transistor (Current Sourcing)		
Rated Operating Distance (cm)			Housing Style			Number of Switch Points			Secondary Barrel Modifier		
RU(C) = Ultrasonic Sensor RUN = Ultrasonic Sensor RUR = Ultrasonic Sensor			M = Partial Threading, Chrome Plated Brass Q = Metal or Plastic, Various Rectangular Styles			K = Short Barrel Length S = Side Sensing			DC: 6 = 10-30 VDC, Polarity Protected, Pulsed SCP 8 = 20-30 VDC, Polarity Protected, Pulsed SCP LI = 20-30 VDC LIU = 15-30 VDC LU = 18-30 VDC		
Rated Operating Distance (cm)			Housing Style			Housing Diameter/Height (mm)			Wiring Options		
RU(C) = Ultrasonic Sensor RUN = Ultrasonic Sensor RUR = Ultrasonic Sensor			M = Partial Threading, Chrome Plated Brass Q = Metal or Plastic, Various Rectangular Styles			K = Short Barrel Length S = Side Sensing			Examples: Blank = No LEDs X2 = 2 LEDs		

More Ultrasonic Sensors can be found in the Sensors catalog B1006.

Wiring Options

A) Connectorized Sensor

RUC 130-M30-2AP8X-**H1 1 5 1**

Connector Family

H1 = *eurofast*®, Metal or Plastic, Male

Number of LEDs

Example:
1 = Standard

Number of Pins

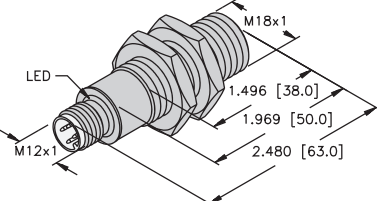
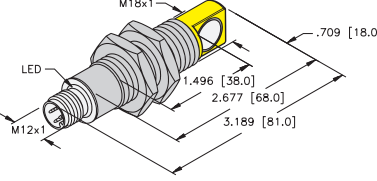
Connector / Sensor Transition

1 = Straight

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Ultrasonic Sensors


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Housing Style	Part Number	ID Number	Sensor Operating Mode	Rated Oper. Distance (cm)	Adjustment Method	Sonic Cone Angle	Output
18 mm - Embeddable, Barrel Style eurofast® Connection 	RUN20-M18K-AP8X-H1141	M1830034	D	5-20	<i>Teach Input</i>	6°	4-Wire DC PNP
	RUN70-M18K-AP8X-H1141	M1830035	D	15-70	<i>Teach Input</i>	6°	
	RUR20-M18K-AP8X-H1141	M1830036	R	7-20	<i>Teach Input</i>	6°	
	RUR70-M18K-AP8X-H1141	M1830037	R	20-70	<i>Teach Input</i>	6°	
	RU20-M18K-LFX-H1141	M1830030	D	5-20	<i>Teach Input</i>	6°	4-Wire DC 200-800 Hz 400-1600 Hz Frequency Output
	RU70-M18K-LFX-H1141	M1830031	D	15-70	<i>Teach Input</i>	6°	4-Wire DC 150-700 Hz 300-1400 Hz Frequency Output
18 mm - Embeddable, Side Sensing, Barrel Style eurofast connection 	RUN20-M18KS-AP8X-H1141	M1830038	D	5-20	<i>Teach Input</i>	6°	4-Wire DC PNP
	RUN70-M18KS-AP8X-H1141	M1830039	D	15-70	<i>Teach Input</i>	6°	
	RUR20-M18KS-AP8X-H1141	M1830040	R	7-20	<i>Teach Input</i>	6°	
	RUR70-M18KS-AP8X-H1141	M1830041	R	20-70	<i>Teach Input</i>	6°	
	RU20-M18KS-LFX-H1141	M1830032	D	5-20	<i>Teach Input</i>	6°	4-Wire DC 200-800 Hz 400-1600 Hz Frequency Output
	RU70-M18KS-LFX-H1141	M1830033	D	15-70	<i>Teach Input</i>	6°	4-Wire DC 150-700 Hz 300-1400 Hz Frequency Output

Sensor operating mode:

D = Diffused

R = Retro-reflective

Adjustment method:

Pot. = Potentiometer

* 4-wire DC sensors can be programmed with a VB2-SP2 programming kit.



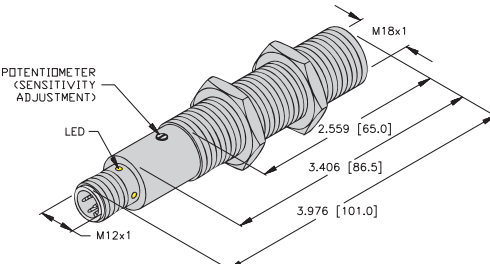
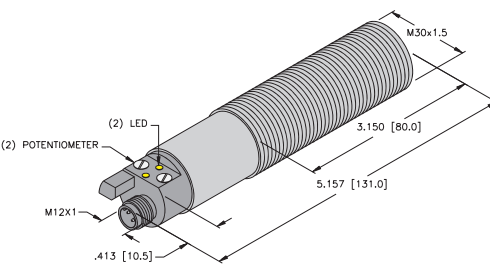
Voltage	Switching Freq. (Hz)	Continuous Load Current (mA)	Operating Temp. (°C)	Protection	Housing	Transducer	Power LED	Output LED	Mating Cordset	Wiring Diagram #	Wiring Diagrams
20-30 VDC	10	≤150	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	1	Diagram 1 Teach Input Diagram 2 Frequency Input
	5	≤150	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	1	
	10	≤150	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	1	
	5	≤150	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	1	
20-30 VDC	N/A	≤150	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	2	
20-30 VDC	N/A	≤150	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	2	
20-30 VDC	10	≤150	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	1	
	5	≤150	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	1	
	10	≤150	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	1	
	5	≤150	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	1	
20-30 VDC	N/A	≤150	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	2	
20-30 VDC	N/A	≤150	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	2	

* Length in meters.

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Ultrasonic Sensors


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Housing Style	Part Number	ID Number	Sensor Operating Mode	Rated Oper. Distance(cm)	Adjustment Method	Sonic Cone Angle	Output
18 mm - Embeddable, eurofast® Connection 	RU100-M18-AP8X-H1141	M1810200	D	15-100	Pot.	6°	4-Wire DC PNP
	RU30-M18-AP8X-H1141	M1810000	D	5-30	Pot.	6°	
	RU100-M18-LIX-H1141	M1810205	D	15-100	Pot.	6°	4-Wire DC PNP Analog 4-20 mA
	RU30-M18-LIX-H1141	M1810005	D	5-30	Pot.	6°	
30 mm - Embeddable, eurofast Connection 	RU100-M30-AP8X-H1141	M1830200	D	15-100	Pot.	6°	3-Wire DC PNP
	RU30-M30-AP8X-H1141	M1830000	D	6-30	Pot.	6°	
	RUC130-M30-LIAP8X-H1151	M1840230	D	20-130	Pot.	6°	5-Wire DC PNP Analog 4-20 mA
	RUC130-M30-2AP8X-H1151	M1840220	D	20-130	Pot.	6°	5-Wire DC PNP
	RUC30-M30-2AP8X-H1151	M1840020	D	6-30	Pot.	6°	

Sensor operating mode:

D = Diffused

R = Retro-reflective

Adjustment method:

Pot. = Potentiometer

4-wire DC sensors can be programmed with a RU-PDI programming kit.



Industrial Automation

TURCK mold-on connectors available on all cable sensors.



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Voltage	Switching Freq. (Hz)	Continuous Load Current (mA)	Operating Temp. (°C)	Protection	Housing	Transducer	Power LED	Output LED	Mating Cordset	Wiring Diagram #	Wiring Diagrams
20-30 VDC	4	≤150	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	1	Diagram 1
	5	≤150	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	1	
20-30 VDC	N/A	≤300	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	2	Diagram 2
	N/A	≤300	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RK 4.4T-*	2	
20-30 VDC	4	≤300	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RKK 4.4T-*	1	Diagram 3
	8	≤300	-25 to +70	IP 67	NPB	E/PU/PBT	N/A	YE	RKK 4.4T-*	1	
20-30 VDC	4	≤300	-25 to +70	IP 65	NPB	E/PU/PBT	GN	YE	RKK 4.5T-*	4	Diagram 4
20-30 VDC	4	≤300	-25 to +70	IP 65	NPB	E/PU/PBT	N/A	YE	RKK 4.5T-*	3	Diagram 4
	8	≤300	-25 to +70	IP 65	NPB	E/PU/PBT	N/A	YE	RKK 4.5T-*	3	

* Length in meters.

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Ultrasonic Sensors



Housing Style	Part Number	ID Number	Sensor Operating Mode	Rated Oper. Distance(cm)	Adjustment Method	Sonic Cone Angle	Output
47 mm - Embeddable, eurofast® Connection 	RUC300-M3047-AP8X-H1141	M1840400	D	40-300	Pot.	6°	4-Wire DC PNP
	RUC300-M3047-2AP8X-H1151	M1840420	D	40-300	Pot.	6°	5-Wire DC PNP
65 mm - Embeddable, eurofast Connection 	RU600-M3065-AP8X-H1141	M1830400	D	60-600	Pot.	6°	3-Wire DC PNP
	RUC600-M3065-AP8X-H1141	M1840600	D	60-600	Pot.	6°	4-Wire DC PNP
	RUC600-M3065-2AP8X-H1151	M1840620	D	60-600	Pot.	6°	5-Wire DC PNP

Sensor operating mode:

D = Diffused

R = Retro-reflective

Adjustment method:

Pot. = Potentiometer

4-wire DC sensors can be programmed with a RU-PDI programming kit.

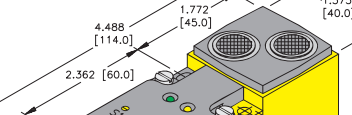


TURCK mold-on connectors available on all cable sensors.



Voltage	Switching Freq. (Hz)	Continuous Load Current (mA)	Operating Temp. (°C)	Protection	Housing	Transducer	Power LED	Output LED	Mating Cordset	Wiring Diagram #	Wiring Diagrams
20-30 VDC	2	≤300	-25 to +70	IP 65	CPB	E/PU/PBT	N/A	YE	RKK 4.4T-*	2	Diagram 1
20-30 VDC	2	≤300	-25 to +70	IP 65	CPB	E/PU/PBT	N/A	YE	RKK 4.5T-*	3	Diagram 2
20-30 VDC	1	≤300	-25 to +70	IP 67	CPB	E/PU/PBT	N/A	YE	RKK 4T-*	4	Diagram 3
20-30 VDC	1	≤300	-25 to +70	IP 65	CPB	E/PU/PBT	N/A	YE	RKK 4.4T-*	2	Diagram 4
20-30 VDC	1	≤300	-25 to +70	IP 65	CPB	E/PU/PBT	N/A	YE	RKK 4.5T-*	5	Diagram 5

* Length in meters.



Technical drawing of the 1000 Series 1/2" valve, showing dimensions in inches and millimeters. The valve is yellow with a grey top and bottom. Dimensions include:

- Top width: 1.575 [40.0]
- Top width: 1.772 [45.0]
- Top width: 4.488 [114.0]
- Top width: 2.362 [60.0]
- Top width: 1.181 [30.0]
- Top width: 1.575 [40.0]
- Top width: .209 [5.3]
- Top width: .287 [7.3] x 2
- Bottom width: 1/2-14NPT

R = Retro-reflective



TURCK mold-on connectors available on all cable sensors.



Voltage	Switching Freq. (Hz)	Continuous Load Current (mA)	Operating Temp. (°C)	Protection	Housing	Transducer	Power LED	Output LED	Mating Cordset/Cable	Wiring Diagram #	Wiring Diagrams
18-35 VDC	5	≤100	-25 to +70	IP 65	Crastin	EPR	N/A	YE	RKK 4.4T-*	1	Diagram 1
18-35 VDC	N/A	≤100	-25 to +70	IP 65	Crastin	EPR	N/A	YE	RKK 4.4T-*	2	Diagram 2
10-30 VDC	3	≤200	-25 to +70	IP 67	PBT	EPR	GN	YE	- - - -	3	Diagram 3
15-30 VDC	N/A	≤100	-25 to +70	IP 67	PBT	EPR	N/A	YE	- - - -	4	Diagram 4

* Length in meters.

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Ultrasonic Sensors


[Return to Main Selection Guide](#)

Housing Style	Part Number	ID Number	Sensor Operating Mode	Rated Oper. Distance(cm)	Adjustment Method	Sonic Cone Angle	Output
40 mm - Embeddable, Rectangular, <i>picofast</i>® Quick Disconnect 	RUR40-Q12-AP8X-V1141	M1830049	R	0-40	External Teach	6°	4-Wire DC PNP
	RU40-Q12-LFX-V1141	M1830048	D	4-40	Choose 80-800 Hz or 40-400 Hz	6°	4-Wire DC Analog Frequency
	RUN40-Q12-AP8X-V1141	M1830050	D	2.5-40	External Teach	6°	4-Wire DC PNP

Sensor operating mode:

D = Diffused

R = Retro-reflective



Industrial Automation

TURCK mold-on connectors available on all cable sensors.



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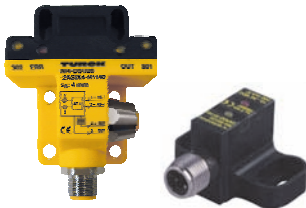
Industrial Automation

Voltage	Switching Freq. (Hz)	Load Current (mA)	Operating Temp. (°C)	Protection	Housing	Transducer	Power LED	Output LED	Mating Cordset/ Cable	Wiring Diagram #	Wiring Diagrams
20-30 VDC	≤10	≤20	-25 to +70	IP 67	ABS	ABS	N/A	YE	PKG 4Z-*	1	Diagram 1
20-30 VDC	N/A	≤20	-25 to +70	IP 67	ABS	ABS	N/A	YE	PKG 4Z-*	2	Diagram 2
20-30 VDC	≤10	≤20	-25 to +70	IP 67	ABS	ABS	N/A	YE	PKG 4Z-*	1	

* Length in meters.



Valve Sensors Selection Guide

Description/Housing	Features	Applications	Page
DSU35 Valve Sensors 	- Outputs: PNP, NPN, ASi, DeviceNet, NAMUR, AC/DC - Solenoid power pass through 35 mm contoured housing - Terminal chamber	- Quarter Turn Valves - Food and Beverage - Semiconductor - Pharmaceutical	E7
DSU26 and DSC26 Valve Sensors 	- Outputs: AC/DC, PNP, ASi, NAMUR 26 mm housing - Solenoid power pass through	- Quarter Turn Valves - Large Stem Valves - Food and Beverage - Semiconductor - Pharmaceutical	E11
DS20 Valve Sensors 	- Outputs: PNP, NAMUR, AC/DC 20 mm Housing	- Quarter Turn Valves - Food and Beverage - Semiconductor - Pharmaceutical	E13
Vprox 	- Stainless Steel housing - Green Power LED - Red Switching LEDs 2 wire AC/DC	Rising stem Valves	E15
Pucks 	- Adjustable or Non-Adjustable - Varying heights for 20 or 30 mm stems - NAMUR puck (EU1)	- DSU35 Sensors - DSU26 Sensors - DSC26 Sensors - DS20 Sensors	E17
Mounting Kits 	- Variety of sizes - Works with DSU35 pucks	- Large Valve Stems - Valve Stems with collars	E20
Guards 	- Stainless Steel Guards - Fits over sensor	Class I, Div 2 applications	E21

Valve Position Sensors

Position control in actuators and drives is essential in most chemical, petrochemical, and food industry applications. **TURCK** valve position sensors provide a quality solution to valve position feedback in a variety of applications. Each industry has different needs, and while the DS20 series works well in most general applications, **TURCK** has created a variety of styles that were designed with specific industries in mind.

Chemical and Petrochemical Industries

The DSU35 provides superior protection against environmental influences, and is highly resistant to harsh chemicals, making it the ideal choice for chemical and petrochemical applications. This sensor and target puck can be mounted to several different actuator sizes without the need for adapters or spacer plates. The DSU35 is available with numerous outputs circuits such as a 2-wire DC, 2-wire NAMUR, 2-wire AC/DC, as well as with DeviceNet™ and AS-I bus protocols. We also offer the DSU35 with a terminal chamber, which is often a requirement in chemical process applications where conduit must be used.



Rising stem valve shown with
TURCK Vprox® 773 sensors.



Food & Beverage Industries

TURCK uses injection-molding technology to make the compact DSC26 sensor, ensuring that it is fully sealed and well suited in wet surroundings. These features make the DSC26 ideal for use in a number of food or beverage applications. The DSC26 has a smooth housing which makes it easy to clean, yet it also has a high degree of protection against high pressure cleaning, and is highly resistant to aggressive cleaning agents.

Overview

TURCK has met with market demand to create an extensive line of valve position sensors. With a variety of standard **eurofast**®, **microfast**®, and **minifast**® connections available, **TURCK's** dual sensors reduce installation costs and minimize the cost of maintenance. These robust and impact resistant sensors are ideal when valve position information must be provided.



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Valve Sensors

Valve Position Sensor Part Number Key

Part Number Keys are to assist in IDENTIFICATION ONLY. Consult factory for catalog items not identified.

N	I	4	-	DSU	35	-	2	A	P	4	X2	-	H1	1	4	1	-	F	K	E	-	4.5	
Mounting																					Number of Pins		
B = Embeddable N = Nonembeddable																					4.3 = 3 4.5 = 5		
Principle of Operation																					Material		
I = Inductive																					E = Stainless Steel		
Rated Operating Distance (mm)																					Solenoid Connection Type		
																					K = Female		
Housing Style																					Solenoid Connection Style		
EG16CA = Stainless Steel 5/8 -18 UNF; 1/2-14 NPT DSU = Dual Sensor Universal DS = Dual Sensor																					F = Receptacle		
Housing Height																					Factory Code		
20 = 20 mm 26 = 26 mm 35 = 35 mm																					0 = Non Standard Wiring		
Housing Modifier																					Number of Pins		
TC = Terminal Chamber Blank = Connector																					1 = Straight 3 = Straight with Adapter		
Number of Outputs																					Connector / Sensor Transition		
2 = Dual Output Blank = Single Output																					B1 = <i>minifast</i> ®, Metal, Male H1 = <i>eurofast</i> ®, Metal, Male		
Output Function																					Connector Family		
A = Normally Open F = Connection Programmable Y1 = NAMUR Output, Requires Remote Amplifier																					Blank = No LEDs X2 = 2 LEDs		
																					Number of LEDs		
																					Blank = No LEDs X2 = 2 LEDs		
																					Voltage Range		
																					4 = 10-65 VDC (SCP)* 6 = 10-30 VDC (SCP)* 30 = 20-250 VAC; 10-300 VDC (SCP)* 31 = 20-250 VAC; 10-300 VDC (No SCP) 32 = 20-250 VAC; 10-300 VDC (SCP)* * Short-Circuit Protection		
																					Output		
																					ASI = AS-I Protocol DZ = 2-Wire AC/DC DNET = DeviceNet™ Protocol N = NPN (Current Sinking) P = PNP (Current Sourcing)		



Dual DC NAMUR – Y1

Temperature Drift	≤±10%
Differential Travel (Hysteresis)	1-10% (5% typical)
Nominal Voltage	8.2 VDC (EN60947-5-6)
Resistance Change from Nonactivated to Activated Condition	Typical <1.0 to >8.0 kΩ
Rated Insulation Voltage	≤1.5 kV
Resulting Current Change	≥2.2 mA to ≤1.0 mA
Recommended Switching Point for Remote Amplifier	>1.2 to <2.1 mA, typ. 1.55 mA ON/1.75 mA OFF
Power-On Effect	Realized in Amplifier
Reverse Polarity Protection	Yes, up to 10 VDC
Wire-Break Protection	Realized in Amplifier
Transient Protection	Realized in Amplifier
Shock	30 g, 11 ms
Vibration	55 Hz, 1 mm Amplitude in all 3 Planes
Repeatability	≤2% of Rated Operating Distance
Short-Circuit Protection	Yes, when connected to NAMUR amplifier up to 15 VDC

Dual AC/DC without Short-Circuit Protection – ADZ31, ADZ35

Temperature Drift	≤±10%
Line Frequency	40-60 Hz
Differential Travel (Hysteresis)	3-15% (5% typical)
Voltage Drop Across Conducting Sensor	≤6.0 V at 400 mA
Off-State (Leakage) Current	≤1.7 mA
Minimum Load Current	≥5.0 mA
Inrush Current	≤8.0 A (≤10 ms, 5% Duty Cycle)
Power-On Effect	Per IEC 947-5-2
Transient Protection	Per EN 60947-5-2
Shock	30 g, 11 ms
Vibration	55 Hz, 1 mm Amplitude in all 3 Planes
Repeatability	≤2% of Rated Operating Distance
Short-Circuit Protection	No



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Valve Sensors

Dual AC/DC with Short-Circuit Protection – ADZ30, ADZ32, FDZ32

Temperature Drift	≤±10%
Line Frequency	40-60 Hz
Differential Travel (Hysteresis)	3-15% (5% typical)
Voltage Drop Across Conducting Sensor	≤6.0 V at 400 mA; 8 & 12 mm ≤6.0 V at 100 mA
Trigger Current for Overload Protection	AC: ≥440 mA; DC: ≥330 mA
Rated Insulation Voltage	≤1.5 kV
Off-State (Leakage) Current	≤1.7 mA (AC) ≤1.5 mA (DC)
Minimum Load Current	≥3.0 mA
Inrush Current	4.0 A (≤20 ms, 10% Duty Cycle)
Power-On Effect	Per IEC 947-5-2
Transient Protection	Per EN 60947-5-2
Shock	30 g, 11 ms
Vibration	55 Hz, 1 mm Amplitude in all 3 Planes
Repeatability	≤2% of Rated Operating Distance
Short-Circuit Protection	Yes

Dual DC or Discrete Output – 2AP4X2, 2AP6X2, 2AN4X2, 2AN6X2

Temperature Drift	≤±10%
Ripple	≤10%
Differential Travel (Hysteresis)	3-15% (5% typical)
Voltage Drop Across Conducting Sensor	≤1.8 V
Rated Insulation Voltage	≤0.5 kV
Trigger Current for Overload Protection	≥220 mA on 200 mA Load Current ≥170 mA on 150 mA Load Current ≥120 mA on 100 mA Load Current
Off-State (Leakage) Current	<100 µA
No-Load Current	<10 mA
Time Delay Before Availability	≤8 ms
Power-On Effect	Per IEC 947-5-2
Reverse Polarity Protection	Incorporated
Wire-Break Protection	Incorporated
Transient Protection	Per EN 60947-5-2
Shock	30 g, 11 ms
Vibration	55 Hz, 1 mm Amplitude in all 3 Planes
Repeatability	≤2% of Rated Operating Distance
Short-Circuit Protection	Yes



Dual DC – AS-interface®

Temperature Drift	≤±10%
Differential Travel (Hysteresis)	3-15% (5% typical)
No-Load Current	≤35 ma
Rated Insulation Voltage	≤0.5 kV
E/A Configuration (HEX) / ID-Code (HEX)	7 / F
I/O Matrix Input	0 = upper sensor S01 1 = lower sensor S02 2 = wire-break at output 3 = not used
I/O Matrix Output	0 = output "ON" 1-3 = not used
Short-Circuit Protection / Output Watchdog	Yes / Yes
Wire-Break Protection I _{out}	≤0.1 mA
Shock	30 g, 11 ms
Vibration	55 Hz, 1 mm Amplitude in all 3 Planes
Repeatability	≤2% of Rated Operating Distance
AS-I Version	AS-I V2.1

Dual DC – DeviceNet™

Temperature Drift	≤±10%
Differential Travel (Hysteresis)	3-15% (5% typical)
No-Load Current	≤60 ma
Rated Insulation Voltage	≤0.5 kV
Address (MacID)	0-63, via EDS file
Baud Rate	via EDS Date
Input Data DeviceNet	Bit 0 S01 input / Bit 1 S02 input / Bit 2 output error / Bit 7 input error / Bit 3-6, not used
Output Data DeviceNet	Bit 0 valve output / Bit 1-7, not used
Output Voltage	V+ - 3 V, PNP
Short-Circuit Protection / Output Watchdog	Yes / No
Wire-Break Protection I _{out}	≤0.1 mA
Shock	30 g, 11 ms
Vibration	55 Hz, 1 mm Amplitude in all 3 Planes
Repeatability	≤2% of Rated Operating Distance

LED	Color	State	Status
S01	YE	On	Target detected
S02	YE	On	Target detected
Out	YE	Off	Output Off
		On	Output On
ERR	RD	On	Output On/Off wirebreak detected
Status	RD/GN	Off	Sensor not powered
		GN On Steady	Sensor active and allocated by master
		GN Flashing	Sensor active and not allocated by master
		RD Flashing	Recoverable fault (open output, invalid input state, low bus voltage, I/O timeout)
		RD On Steady	Major fault (duplicate address, baud rate, bus off comm.)
		GN+RD On	Autobaud detect
		GN+RD Flashing	Power-up test

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Valve Sensors



[Return to Main Selection Guide](#)

Housing Style	Part Number	ID Number	Features	Sensing Range (mm)	Output
35 mm - Nonembeddable, Dual Valve Sensor, eurofast® Connector 	Ni 4-DSU35-2AN4X2-H1141	M1569920	Short-Circuit Protection	4	Dual NPN
	Ni 4-DSU35-2AP4X2-H1141	M1569901	Short-Circuit Protection	4	Dual PNP
	Ni 4-DSU35-2Y1X2-H1140	M1051003	Short-Circuit Protection up to 15 VDC	4	Dual NAMUR
35 mm - Nonembeddable, Dual Valve Sensor, minifast® Connector 	Ni 4-DSU35-2ADZ30X2-B1151	M4290001	Short-Circuit Protection	4	Dual AC/DC
	Ni 4-DSU35-2ADZ35X2-B1151	M4290009		4	Dual AC/DC
35 mm - Nonembeddable, Dual Valve Sensor, eurofast Connector 	Ni 4-DSU35-2ASIX4-B1140-FKE4.3	M1902009	Short-Circuit Protection	4	Dual ASI-BUS
	Ni 4-DSU35-2DNETX5-B1150-FKE4.3	M1569924	Short-Circuit Protection	4	Dual DeviceNet™
35 mm - Nonembeddable, Dual Valve Sensor, minifast Connector 	Ni 4-DSU35-2AP4X2-B1160-FKE4.5	M1569923	Short-Circuit Protection	4	Dual PNP

Additional specifications on pages E4-E6.
Target Pucks on pages E17-E21.



Most Ni 4-DSU35... dual valve sensors are FM approved for installation in Class I, Division 2 hazardous locations. See **TURCK** control drawing Ni-1.002 (www.turck.com/fmcd) for specific models and installation requirements. Ni 4-DSU35-2Y1X2-... dual valve sensors are FM approved as intrinsically safe for installation in Class I, II or III, Division 1 hazardous locations per **TURCK** control drawing IS-1.000 (www.turck.com/fmcd).



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Voltage	Switching Freq. (Hz)	Switching Current (mA) VAC/VDC	Operating Temp. (°C)	Protection	Housing	Face	Power LED	Output LED	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-65 VDC	50	≤200	-25 to +70	IP 67	PP	PP	No	YE/RD	RK 4.4T-*	1	Diagram 1
10-65 VDC	50	≤200	-25 to +70	IP 67	PP	PP	No	YE/RD	RK 4.4T-*	2	Diagram 2
5-30 VDC	50	Remote	-25 to +70	IP 67	PP	PP	No	YE/RD	RK 4.41T-*	3	Diagram 3
20-250 VAC 10-300 VDC	30	≤400/300	-25 to +70	IP 67	PP	PP	No	YE/RD	RKM 50-*M	4	Diagram 4
20-150 VAC 10-150 VDC	50	≤400/300	-25 to +70	IP 67	PP	PP	No	YE/RD	RKM 50-*M	4	Diagram 4
18-33 VDC	30	≤80	-25 to +70	IP 67	PP	PP	No	YE/RD	RKM 254-*M RS 4.4T-*	5	Diagram 5
11-25 VDC	50	≤80	-25 to +70	IP 67	PP	PP	No	YE/RD	RKM 572-*M RS 4.4T-*	6	Diagram 5
10-65 VDC	50	≤200	-25 to +70	IP 67	PP	PP	No	YE/RD	RKM 60-*M RK 4.5T-*	7	Diagram 6
											Diagram 7

* Length in meters.

VALVE

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Valve Sensors

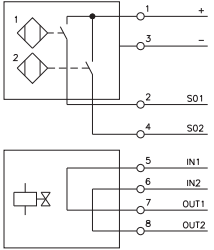
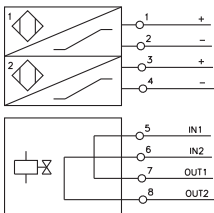
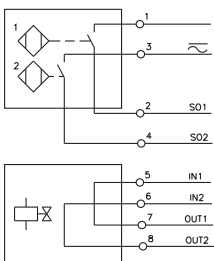
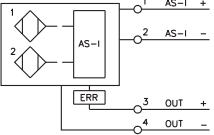


Housing Style	Part Number	ID Number	Features	Sensing Range (mm)	Output
35 mm - Nonembeddable, Dual Valve Sensor, Terminal Chamber 	Ni 4-DSU35TC-2AP4X2	M1569902	Short-Circuit Protection	4	Dual PNP
	Ni 4-DSU35TC-2Y1X2	M1051004	Short-Circuit Protection up to 15 VDC	4	Dual NAMUR
	Ni 4-DSU35TC-2ADZ30X2	M4290002	Short-Circuit Protection	4	Dual AC/DC
	Ni 4-DSU35TC-2ASIX4	M1902005	Short-Circuit Protection	4	Dual ASI-BUS

Additional specifications on pages E4-E6.
Target Pucks on pages E17-E21.



Most Ni 4-DSU35... dual valve sensors are FM approved for installation in Class I, Division 2 hazardous locations. See **TURCK** control drawing Ni-1.002 (www.turck.com/fmcd) for specific models and installation requirements. Ni 4-DSU35TC-2Y1X2 dual valve sensors are FM approved as intrinsically safe for installation in Class I, II or III, Division 1 hazardous locations per **TURCK** control drawing IS-1.000 (www.turck.com/fmcd).

Voltage	Switching Freq. (Hz)	Switching Current (mA) VAC/VDC	Operating Temp. (°C)	Protection	Housing	Face	End Cap	Power LED	Output LED	Mating Cord Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-65 VDC	50	≤200	-25 to +70	IP 67	PP	PP	N/A	N/A	YE/RD	N/A	1	Diagram 1 
5-30 VDC	50	Remote	-25 to +70	IP 67	PP	PP	N/A	N/A	YE/RD	N/A	2	Diagram 2 
20-250 VAC 10-300 VDC	30	≤400/300	-25 to +70	IP 67	PP	PP	N/A	N/A	YE/RD	N/A	3	Diagram 3 
18-33 VDC	30	≤80	-25 to +70	IP 67	PP	PP	N/A	N/A	YE/RD	N/A	4	Diagram 4 

TURCK

Valve Sensors



Housing Style	Part Number	ID Number	Features	Sensing Range (mm)	Output
26 mm - Nonembeddable, Dual Valve Sensor, eurofast® Connector 	Ni 4-DSC26-2AP6X2-H1141	M1650087	Short-Circuit Protection	4	Dual PNP
26 mm - Nonembeddable, Dual Valve Sensor, eurofast Connector 	Ni 4-DSU26-2AP4X2-H1141	M1569904	Short-Circuit Protection	4	Dual PNP
	Ni 4-DSU26-2Y1X2-H1140	M1051007	Short-Circuit Protection up to 15 VDC	4	Dual NAMUR
26 mm - Nonembeddable, Dual Valve Sensor, eurofast Connector 	Ni 4-DSU26-2ASIX4-H1140-FKE4.3	M1902010	Short-Circuit Protection	4	Dual ASI-BUS

Additional specifications on pages E4-E6.
Target Pucks on pages E17-E21.



Most Ni 4-DSU26-Y1X2-... dual valve sensors are FM approved as intrinsically safe for installation in Class I, Division 1 hazardous locations per TURCK control drawing IS-1.000 (www.turck.com/fmcd).



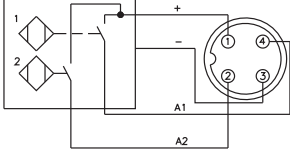
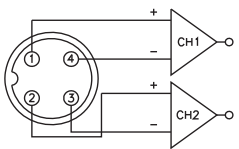
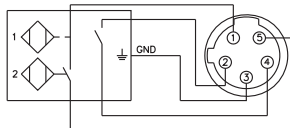
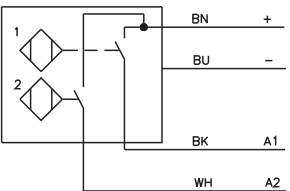
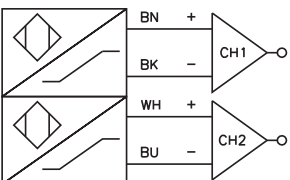
Voltage	Switching Freq. (Hz)	Switching Current (mA) VAC/VDC	Operating Temp. (°C)	Protection	Housing	Face	Power LED	Output LED	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-30 VDC	50	≤200	-25 to +70	IP 67	PP	PP	No	YE/RD	RK 4.4T-*	1	Diagram 1 Diagram 2 Diagram 3
10-65 VDC	50	≤200	-25 to +70	IP 67	PP	PP	No	YE/RD	RK 4.4T-*	1	
5-30 VDC	50	Remote	-25 to +70	IP 67	PP	PP	No	YE/RD	RK 4.41T-*	2	
18-33 VDC	30	≤80	-25 to +70	IP 67	PP	PP	No	YE/RD	RKC 254-* RS 4.4T-*	3	

* Length in meters.

Additional specifications on pages E4-E6.
Target Pucks on pages E17-E21.



E13

Voltage	Switching Freq. (Hz)	Switching Current (mA) VAC/VDC	Operating Temp. (°C)	Protection	Housing	Face	Power LED	Output LED	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
10-30 VDC	50	≤200	-25 to +70	IP 67	PBT	PBT	No	YE/YE	RK 4.41T-*	1	Diagram 1 
5-30 VDC	50	Remote	-25 to +70	IP 67	PBT	PBT	No	RD/RD	RK 4.41T-*	2	Diagram 2 
20-250 VAC 10-300 VDC	20	≤100/300	-25 to +70	IP 67	PBT	PBT	No	RD/RD	KB 5T-*	3	Diagram 3 
10-30 VDC	50	≤200	-25 to +70	IP 67	PBT	PBT	No	YE/YE	2M/PVC	4	Diagram 4 
5-30 VDC	50	Remote	-25 to +70	IP 67	PBT	PBT	No	RD/RD	2M/PVC	5	Diagram 5 

* Length in meters.

TURCK

Valve Sensors



Housing Style	Part Number	ID Number	Features	Sensing Range (mm)	Output
16 mm - Embeddable, Vprox 773™, Potted-In Cable 	Bi 2.5-EG16CA-FDZ32X2	T4205100-1	Prog. Outputs Low Temp. -40°C Short-Circuit Protection	2.5	2-Wire AC/DC
16 mm - Embeddable, Vprox 773, minifast® Connector 	Bi 2.5-EG16CA-FDZ32X2-B1151	T4205190	Prog. Outputs Low Temp. -40°C Short-Circuit Protection	2.5	2-Wire AC/DC

Additional specifications on pages E4-E6.



TURCK Vprox sensors are FM approved for installation in Class I, Division 2 hazardous locations when installed per **TURCK** control drawing Ni-1.002 (www.turck.com/fmcd).



Voltage	Switching Freq. (Hz)	Switching Current (mA) VAC/VDC	Operating Temp. (°C)	Protection	Housing	Face	Power LED	Output LED	Mating Cord, Cable Length/Jacket	Wiring Diagram #	Wiring Diagrams
20-250 VAC 10-300 VDC	50	≤100	-40 to +70	IP 67	SS	PA 12	GN	RD	2M/PVC	1	Diagram 1 Diagram 2
20-250 VAC 10-300 VDC	50	≤100	-40 to +70	IP 67	SS	PA 12	GN	RD	RKM 50-*M	2	

* Length in meters.



TURCK

Valve Sensors

BTS | Valve Sensor Pucks and Accessories

TURCK's valve sensors monitor the position of a valve via rotary actuators. The BTS-DSU35-EBE3, is fully adjustable with interlocking teeth for accurate positioning and feature wide targets for easier adjustments.

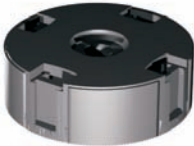
TURCK offers traditional low profile pucks with black and yellow clips for visual indication.

BTS-DSU35 Clip
Black (2x)



BTS-DSU35 Clip
Yellow (2x)

BTS-DSU35-EBE3
Top



BTS-DSU35-EBE3
Bottom



BTS-DSU35-EBE3
Insert



TURCK also offers domes for easy visual indication, and a cover to protect the puck from debris or spills. The domes are available in two colors: red/green and yellow/black.

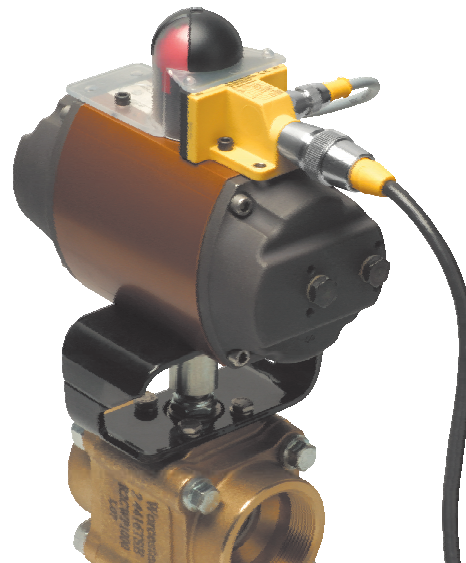
Puck is not included with Dome. Domes are only compatible with BTS-DSU35-EBE3 pucks.

Dome Cover



Technical Data

Part Number	ID Number	Notes
BTS-DSU35-DOME YE/BK	M6901072	Yellow/Black indicators
BTS-DSU35-DOME RD/GN	M6901073	Red/Green indicators
BTS-DSU35-DOME COVER-US	M6901075	Includes 10-32 screws
BTS-DSU35-DOME COVER	M6901074	Includes M5 screws
BTS-DSU35-EBE3-US	M6901071	Includes 10-32 screws for sensor
BTS-DSU35-EBE3-US2	M6901079	Includes 10-24 screws for sensor
BTS-DSU35-EBE3	M6901070	Includes M5 screws for sensor



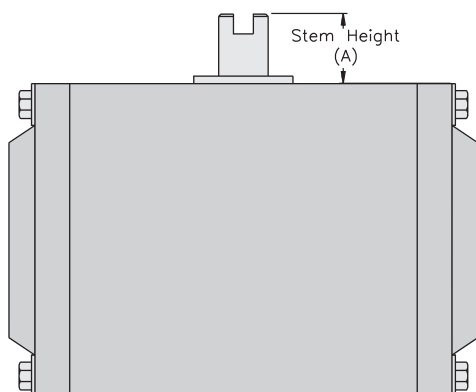


Valve Sensor Puck Selection Guide

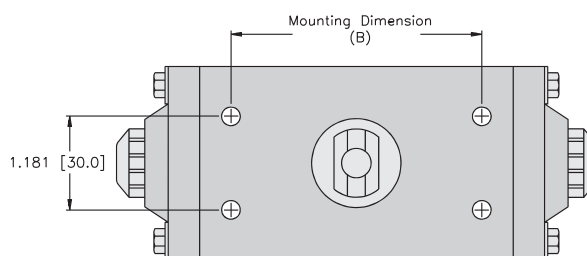
Stem Height (A)		20 mm		30 mm		50 mm	
Mounting Dimension (B)		80 mm	130 mm	80 mm	130 mm	80 mm	130 mm
Part Number	Output Function						
DS20	End Position Indication- On	BTS-DS20-TP1 (M6900155)	Consult Factory	BTS-DS20-TK1 (M6900156)	BTS-DS20-TP1 (M6900155)	N/A	N/A
	Adjustable/End Position- On	BTS-DS20-KEY (M6900136)	BTS-DS20-KEY (M6900136)	Consult Factory	Consult Factory	N/A	N/A
DSC26	End Position Indication- On	BTS-DSC26-EB1 (M6900222)	Consult Factory	BTS-DSC26-EB2 (M6900223)	BTS-DSC26-EB3 (M6900224)	Consult Factory	Consult Factory
DSU35	End Position Indication- On	BTS-DSU35-EB1 (M6900225)	BTS-DSU35-EB1 (M6900225)	BTS-DSU35-EB1 (M6900225)	BTS-DSU35-EB1 (M6900225)	BTS-DSU35-EB1 (M6900225) and BTS-DSU35-Z07 (M6900403)	BTS-DSU35-EB1 (M6900225) and BTS-DSU35-Z07 (M6900403)
	Adjustable/End Position- On	BTS-DSU35-EBE3 (M6901070)	BTS-DSU35-EBE3 (M6901070)	BTS-DSU35-EBE2 (M6900228)	BTS-DSU35-EBE2 (M6900228)	BTS-DSU35-EBE3 (M6901070) and BTS-DSU35-Z07 (M6900403)	BTS-DSU35-EBE3 (M6901070) and BTS-DSU35-Z07 (M6900403)
	End Position Indication- Off (NAMUR)	BTS-DSU35-EU1 (M6900227)	BTS-DSU35-EU1 (M6900227)	BTS-DSU35-EU1 (M6900227)	BTS-DSU35-EU1 (M6900227)	BTS-DSU35-EU1 (M6900227) and BTS-DSU35-Z07 (M6900403)	BTS-DSU35-EU1 (M6900227) and BTS-DSU35-Z07 (M6900403)

For stems that exceed 40 mm in diameter, consult drawings for appropriate shim package.

Actuator Side View



Actuator Top View

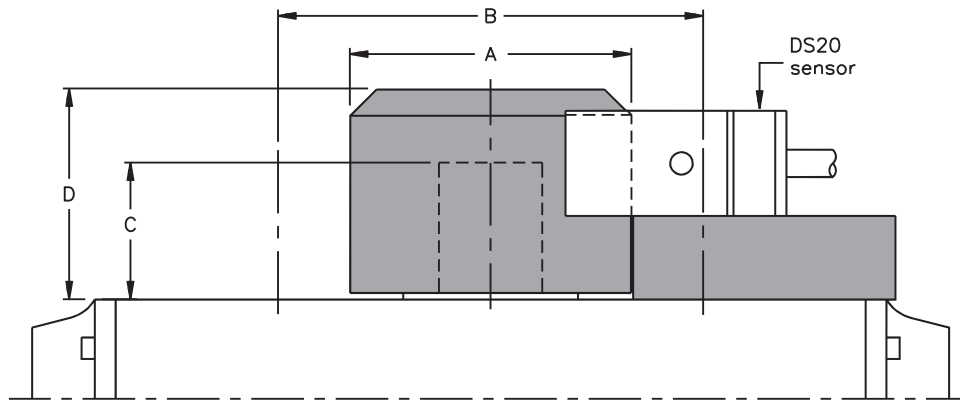




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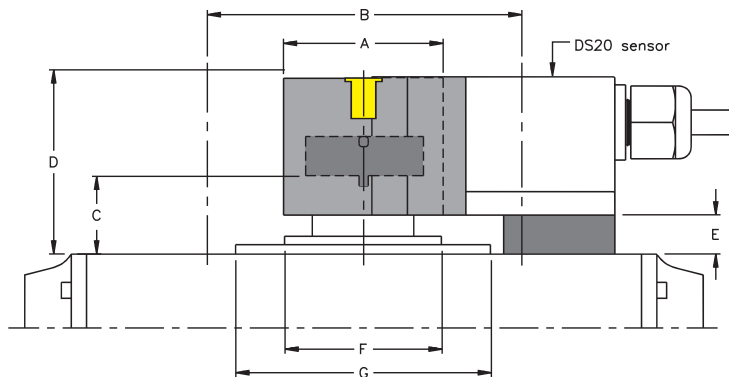
Valve Sensors

DS20 Valve Sensor Kits



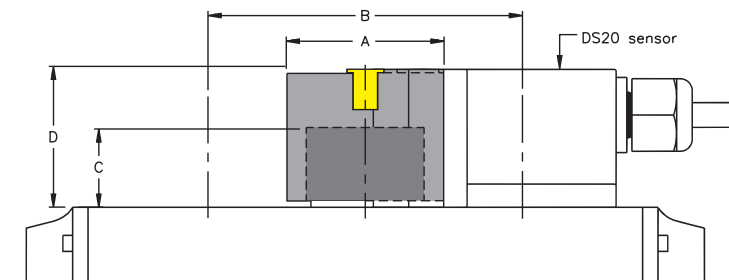
Part Number	Dimensions (mm)				Adjustable	End Position Indication
	A	B	C	D		
BTS-DS20-KEY	40	80x130	20	37	Yes	On

Puck included in package.



Part Number	Dimensions (mm)						
	A	B	C	D	E	F	G
BTS-DS20-TK1	40	80x130	30	46	10	50	50

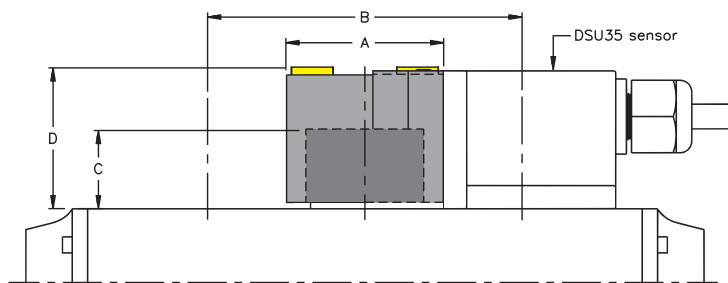
Puck included in package.



Part Number	Dimensions (mm)				Adjustable	End Position Indication
	A	B	C	D		
BTS-DS20-TP1	40	80	20	36	No	On

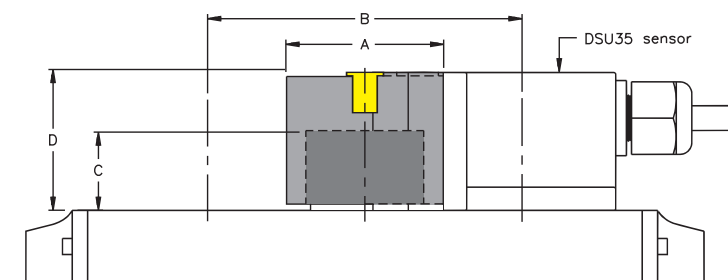
Puck included in package.

Valve Sensor Puck Information - DSU35



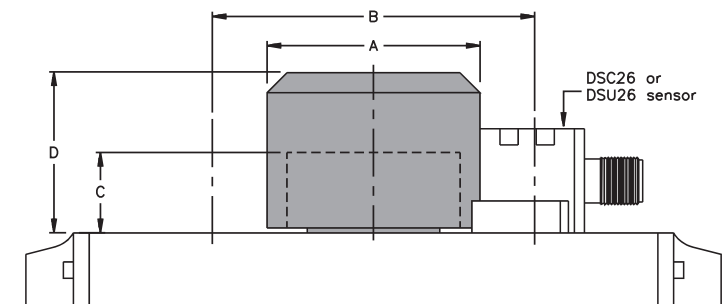
Part Number	Dimensions (mm)				Adjustable	End Position Indication
	A	B	C	D		
BTS-DSU35-EU1	40	80x130	20	36	No	Off

For use with NAMUR Sensors (Y1 output)



Part Number	Dimensions (mm)				Adjustable	End Position Indication
	A	B	C	D		
BTS-DSU35-EB1	40	80x130	20	36	No	On
BTS-DSU35-EBE1	40	80x130	20	36	Yes	On
BTS-DSU35-EBE2	40	80x130	30	47	Yes	On
BTS-DSU35-EBE3	40	80x130	20	36	Yes	On

Valve Sensor Puck Information - DSU26 or DSC26

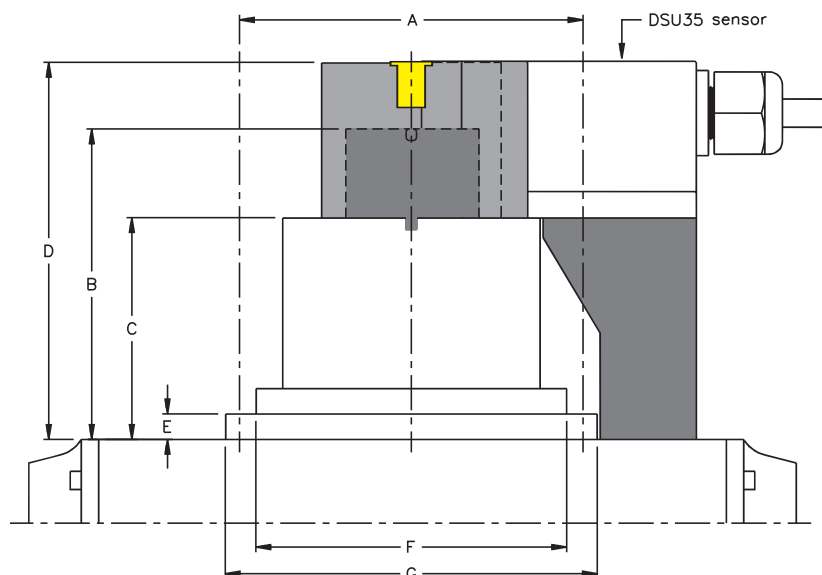


Part Number	Dimensions (mm)			
	A	B	C	D
BTS-DSC26-EB1-2	53	80	20	40
BTS-DSC26-EB2	65	80	30	50
BTS-DSC26-EB3	102	130	30	50

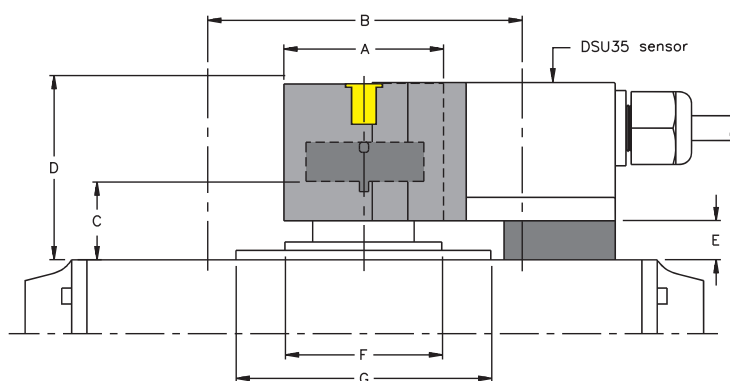
TURCK

Valve Sensors

DSU35 - Mounting Kits



Part Number	Dimensions (mm)						
	A	B	C	D	E	F	G
BTS-DSU35-Z03	130	50	30	65	19 (max)	70	110
BTS-DSU35-Z07	130	70	50	85	19 (max)	10	110

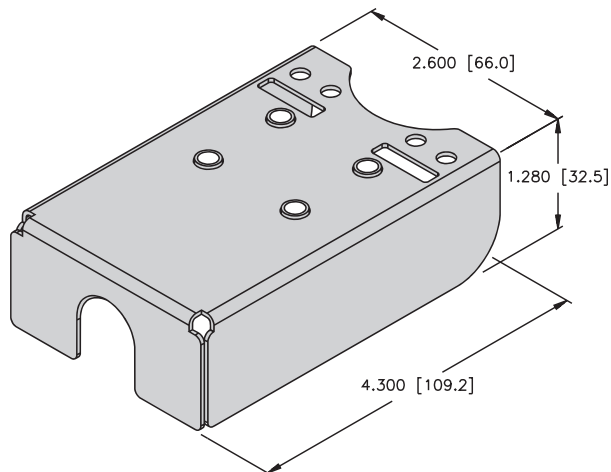


Part Number	Dimensions (mm)						
	A	B	C	D	E	F	G
BTS-DSU35-Z01	40	80x130	20	45	10	40	65
BTS-DSU35-Z02	40	80x130	20	55	20	40	65
BTS-DSU35-Z04	40	80x130	30	45	10	40	65
BTS-DSU35-Z05	40	80x130	30	55	20	30	65
BTS-DSU35-Z06	40	80x130	30	65	30	40	65

"Z" mounting packages include shims to increase height of sensor and do not include pucks. Target pucks must be ordered separately.

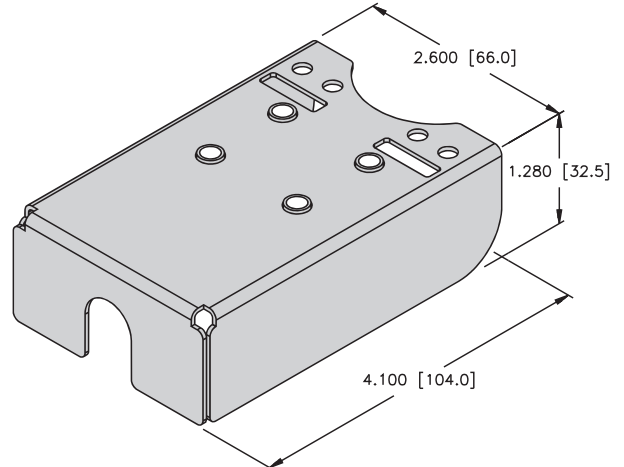
Valve Sensor Accessories for Class I, Division 2 Applications

GUARD-DSU35-AD
(A9235)



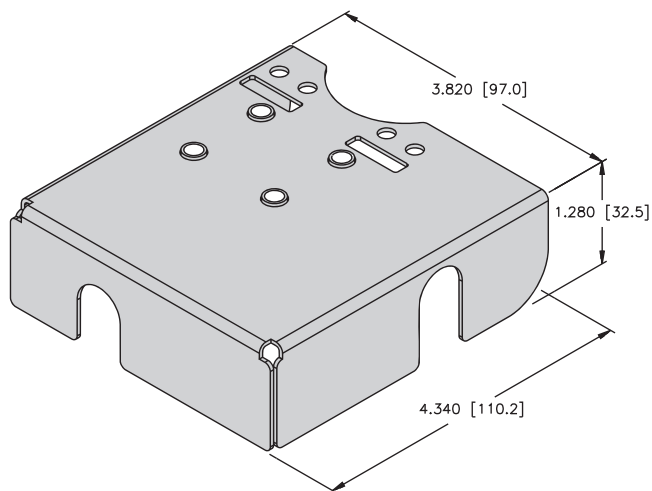
For use with: Ni 4-DSU35-ADZ35X2-B1151

GUARD-DSU35-DC
(A9234)



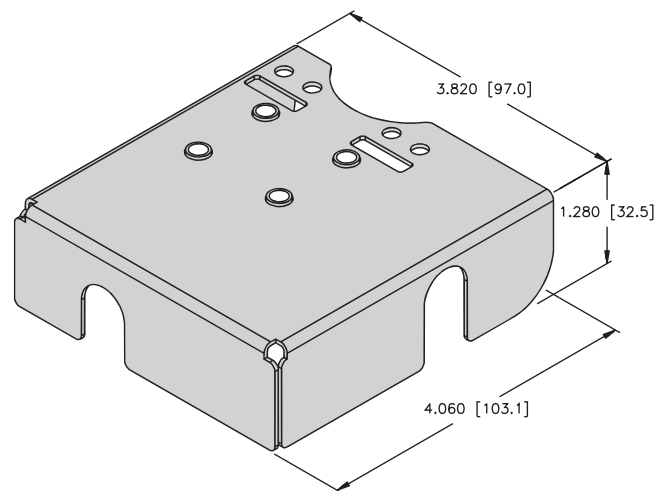
For use with: Ni 4-DSU35-2AP4X2-H1140
Ni 4-DSU35-2AN4X2
Ni 4-DSU35-2ADZ35X2
Ni 4-DSU35-2AP4X2

GUARD-DSU35-DCS
(A9287)



For use with: Ni 4-DSU35-2AP4X2-B1160-FKE4.5

GUARD-DSU35
(A9150)



For use with: Ni 4-DSU35-2ASIX4
Ni 4-DSU35-2DNETX5

VALVE



Instrumentation Connectivity

Housing Style	Photo	Page
M12X1 <i>euro fast</i>		F3 - F4
7/8-16UN <i>mini fast</i>		F4 - F5
1/2-20UNF <i>micro fast</i>		F6
M8X1 <i>pico fast®</i>		F7

TURCK Cable Material Options

Standard PVC Insulation

Standard PVC has a standard temperature rating of +105°C (+221°F), a high dielectric strength and insulation resistance. It also has an outstanding resistance to ozone, acids, alkalis, alcohols, most solvents, oils, gasoline, greases and waxes. All **TURCK** PVC is weather and atmosphere rated to UL 62 for ultraviolet radiation resistance. It is inherently tough and flame, abrasion, and moisture resistant. Oil resistant varieties used on **TURCK** cordsets will not soften or swell in the presence of oil. The plasticizer used in PVC may, however, migrate. Continuous exposure to hot oil and cutting fluids may cause embrittlement and cracking.

Our standard cable construction is PVC insulated inner conductors of high-flex stranding with extruded outer jacket. A separator is utilized to ensure easy machine and hand stripping. Extruded construction is inherently non-wicking because of the absence or minimal use of fillers. Extrusion also minimizes convolutions and provides a near-perfect circular cross section. Standard PVC is used in **euromast**®, **minimast**®, **microfast**®, **picofast**®, and **V*fast**®, valve connector cordsets and carries CSA and UL approvals. Some PVC cables also have MSHA approval - consult factory for specifics.



/S90 Polyurethane cable is over-jacketed and bonded to a PVC inner core. The extruded construction is inherently non-wicking. The PUR over-jacket provides superior resistance to oils and lubricants, including cutting oils, transmission fluids (ATF), and gasoline. The abrasion resistance is comparable to Neoprene or other rubber including thermoset rubbers. **TURCK** "/S90" cable is UL listed and flame resistant to UL 94 VO. PUR is not degraded by exposure to Ozone, making it excellent for outdoor use.

TURCK "/S90" cable carries CSA and UL approvals and is used in **euromast**, **minimast**, **microfast**, **picofast**, and **multifast** and **V*fast** valve connector cordsets. With an "/S90" indicator some PUR cables also have MSHA approval - consult factory for specifics.

/S101 flexlife®-20 is a unique construction of high-flex, low stress cable using custom compounded TPE, and stranded conductors with PVC or PUR extruded jackets. It is designed for robotic and other continuous motion applications. **flexlife-20** guarantees increased performance to provide 20 million cycles of continuous flexing, bending, and twisting motion found in C-track, robotic and other motion systems.

/XOR Radiated PVC has a steady state temperature rated at -25°C to +80°C (-13°F to +176°F) and a short-term rating of +250°C (+482°F). The conductors and jacket are resistant to melting under conditions such as weld-flash, contact with hot objects, (e.g. soldering iron), or under short circuit condition (to VDE 0298). It has superior performance in the presence of oils and organic solvents with no swelling. It has no reduction of physical properties when soaked 168 hours at +90°C (+194°F) in ASTM #2 oil (re: VDE 0472 part 802), nor does it exhibit signs of aging in presence of hot oil, as standard PVC exhibits. The fine litz-wire stranded construction, provides superior performance in flex applications.



TURCK

Industrial Connectivity Products

**euro
fast**

2, 3, 4 and 5-Wire eurofast® Cordsets, Standard and 6-Wire "C" Style Medium Plug Body

- Straight Female and Male Connectors
- NEMA 1, 3, 4, 6P and IEC IP 68 Protection
- 250 VAC/300 VDC, 4 A



Housing Style	Part Number	Cable	Features	Pinouts
RK ..** RKK ..** RKV ..**	RK 4.22T-*	AWM PVC Grey 2x20 AWG 105°C 5.2 mm OD Cable #RF50529-*M	<i>flexlife</i> ®	1. BN 2. N/C 3. BU 4. N/C
	RK 4T-*	AWM PVC Grey 3x20 AWG 105°C 5.2 mm OD Cable #RF50528-*M	<i>flexlife</i>	1. BN 2. N/C 3. BU 4. BK
	RK 4T-*/S618	AWM PVC Grey 3x20 AWG Foil/Drain 105°C 5.7 mm OD Cable #RF50611-*M	<i>RF/EMI Protection</i>	
	RK 4.41T-*	AWM PVC Namur Blue 4x22 AWG 105°C 5.2 mm OD Cable #RF50598-*M	<i>flexlife</i>	
	RK 4.4T-*	AWM PVC Grey 4x22 AWG 105°C 5.2 mm OD Cable #RF50516-*M	<i>flexlife</i>	1. BN 2. WH 3. BU 4. BK
	RK 4.4T-*/S90	AWM PUR Grey 4x22 AWG 105°C, 5.2 mm OD Cable #RF50532-*M	<i>Cut/Abrasion Immune</i>	
	RK 4.5T-*	AWM PVC Grey 5x22 AWG 105°C 5.7 mm OD Cable #RF50543-*M	<i>flexlife</i>	1. BN 2. WH 3. BU 4. BK 5. GY
RS ..	RS 4.4T-*	AWM PVC Grey 4x22 AWG 105°C 5.2 mm OD Cable #RF50516-*M	<i>flexlife</i>	1. BN 2. WH 3. BU 4. BK
RKC ..	RKC 6T-*	AWM PVC Grey 6x24 AWG 105°C 5.7 mm OD Cable #RF50608-*M†	<i>flexlife</i> ®	1. BN 2. WH 3. BU 4. BK 5. GY 6. PK

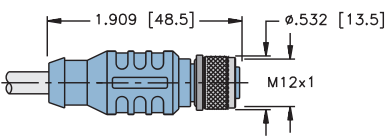
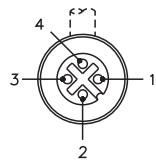
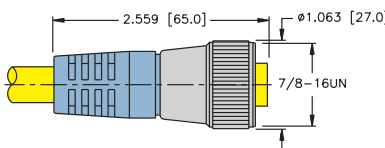
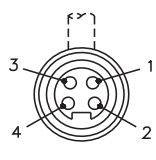
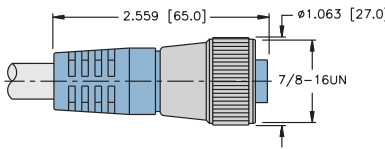
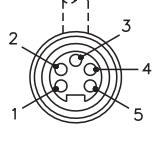
* Length in meters.

Standard cable lengths are 2, 4, 6, 8 and 10 meters. Consult factory for other lengths.

2 and 5-Wire *eurofast*® and *minifast*® Network Cordsets

- Straight Female Connectors
- NEMA 1, 3, 4, 6P and IEC IP 68 Protection



Housing Style	Part Number	Cable	Features	Pinouts
RKC ..** 	RKC 254-*M	CMG PVC Yellow 2x16 AWG 105°C 250 V, 4 A 7.2 mm OD Cable #RB50852-*M	<i>AS-I Communication</i>	
RKM ..** 	RKM 254-*M	CMG PVC Yellow 2x16 AWG 105°C 300 V, 9 A 7.2 mm OD Cable #RB50852-*M	<i>AS-I Communication</i>	
RKM ..** 	RKM 572-*M	AWM PVC Grey 4x22 AWG, 22 AWG Shield 75°C 300 V, 9 A 7.2 mm OD Cable #RB50603-*M	<i>DeviceNet® Communication</i>	

* Length in meters.

Standard cable lengths are 2, 4, 6, 8 and 10 meters. Consult factory for other lengths.

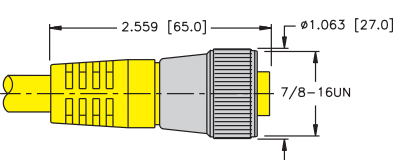
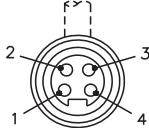
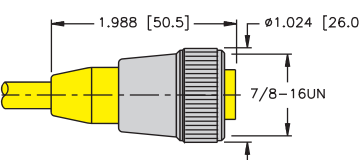
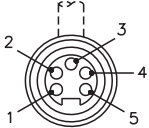
** Standard coupling nut material is nickel plated brass "RKC/RKM .."; "RKCV/RKV" indicates 316 stainless steel.

TURCK
Industrial Connectivity Products
**mini
fast**

4 and 5-Wire *minifast*® Connectors, Standard Plug Body

- Straight Female Connectors
- NEMA 1, 3, 4, 6P and IEC IP 67 Protection



Housing Style	Part Number	Cable Specs.	Features	Pinouts
RKM ..** 	RKM 46-*M	STOW PVC Yellow 4x16 AWG 105°C 600 V, 9 A 11 mm OD Cable #RF50538-*M	<i>flexlife</i> ®	1. BK 2. WH 3. RD 4. GN 
RKM ..** 	RKM 50-*M	AWM PVC Yellow 5x18 AWG 105°C 300 V, 9 A 7.3 mm OD Cable #RF50549-*M	<i>flexlife</i>	1. BK 2. BU 3. GN/YE 4. BN 5. WH 

* Length in meters.

Standard cable lengths are 2, 4, 6, 8 and 10 meters. Consult factory for other lengths.

** Standard coupling nut material is nickel plated brass "RKM .."; "RK .." indicates nylon and "RKV .." indicates 316 stainless steel.

3, 4 and 5-Wire *microfast*® Cordsets, Standard Duty

- Straight Female Connectors
- NEMA 1, 3, 4, 6P and IEC IP 67 Protection
- 250 V, 4.0 A



Housing Style	Part Number	Cable Specs.	Features	Pinouts
KB ..**	KB 3T-*	AWM PVC Yellow 3x22 AWG 105°C 5.2 mm OD Cable #RF50531-*M	<i>flexlife</i> ®	1. GN 2. RD/BK 3. RD/WH
	KB 4T-*/S727	AWM PUR Grey 4x22 AWG 105°C 5.2 mm OD Cable #RF50532-*M	<i>Special conductor color code</i>	1. BN 2. BU 3. BK 4. WH
	KB 5T-*	AWM PVC Yellow 5x22 AWG 105°C 5.7 mm OD Cable #RF50556-*M	<i>flexlife</i>	1. RD/WH 2. RD 3. GN 4. RD/YE 5. RD/BK

* Length in meters.

Standard cable lengths are 2, 4, 6, 8 and 10 meters. Consult factory for other lengths.

** Standard coupling nut material is nickel plated brass "KB .."; "KBK .." indicates nylon and "KBV .." indicates 316 stainless steel.

3-Wire *picofast*® Cordsets, Snap Lock (Locking Sleeve) and Threaded Coupling Nut

- Straight Female Connectors
- NEMA 1, 3, 4, 6P and IEC IP 67 Protection
- 125 VAC/VDC, 4 A



Housing Style	Part Number	Cable Specs.	Features	Pinouts
PKG ..Z** 	PKG 3Z-*	AWM PVC Yellow 3x24 AWG 105°C 4.4 mm OD Cable #RF50642-*M	<i>flexlife</i> ®	1. BN 2. BU 3. BK
PKG ..M** 	PKG 3M-*	AWM PVC Yellow 3x24 AWG 105°C 4.4 mm OD Cable #RF50642-*M	<i>flexlife</i>	1. BN 2. BU 3. BK
PKG ..M** 	PKG 4M-*	AWM PVC Yellow 4x26 AWG 105°C 4.4 mm OD Cable #RF50697-*M	<i>flexlife</i>	1. BN 2. WH 3. BU 4. BK

* Length in meters. Standard cable lengths are 2, 4, 6, 8 and 10 meters.

** Standard coupling nut material is POM.. "PKG..Z".

** Standard coupling material is nickel plated brass.. "PKG..M"; "PKG..M" indicates 316 stainless steel.

Notes:



Enclosure Ratings

IEC 529

- IP 40** Protection against solid bodies larger than 1 mm. No protection against liquids.
- IP 65** Dust tight. Protection against water spray from all directions at 14.2 PSI through a 12.5 mm nozzle.
- IP 67** Dust tight. Protection against the effects of immersion in water for 30 minutes at 1 meter.
- IP 68** Dust tight. Protection against the effects of indefinite immersion in water at a pressure specified by the manufacturer. Ex. **TURCK's** IP 68 definitions is IP 67 plus.

- 24 hours at 70°C
- 24 hours at -25°C
- 7 days at 1 meter under water at a constant temperature

IP 69K

- 10 cycles +70°C and -25°C, minimum of 1 hour @ each temperature

Hot steam jet cleaning per EN 60529 (IP enclosure ratings) and DIN 40050-9



Material Descriptions

Plastics

ABS - Acrylonitrile-Butadiene-Styrene	Impact resistant, rigid. Resistant to aqueous acids, alkalis, salts, alcohols, oils, concentrated hydrochloric acid; disintegrated by concentrated sulfuric or nitric acids, esters, ketones.
CPE, Thermoset (rubber cables)	Excellent resistance to oils, acids, chemicals, ozone, extreme temperatures, cuts, abrasions; flame retardant in welding applications.
PA - Polyamide (nylon)	Good mechanical strength, temperature resistant.
PA, Amorphous (Trogamid T)	Similar properties to nylon, but transparent. Hard, rigid, good chemical resistance.
PA 12-GF30	Nylon 12, 30% glass filled.
PA 66-GF25-V0	Nylon 66, 25% glass filled, self-extinguishing.
PBT - Polybutylene Terephthalate (when glass reinforced, Crastin®)	Good mechanical strength; resistant to abrasion; resistant to alcohols, oils, some acids, trichloroethylene.
PBT-GF30-V0	PBT, 30% glass filled, self-extinguishing.
PEI - Polyetherimide (Ultem®)	Excellent resistance to most commercial automotive fluids, fully hydrogenated hydrocarbons, alcohols, weak aqueous solutions. Withstands higher temperatures.
POM - Polyoxymethylene / Polyacetal (Delrin®)	High impact resistance; good mechanical strength; good resistance to oils, alcohols, alkalis, gasoline, xylene, toluene. Dielectric constant 3.7.
PP - Polypropylene	Excellent resistance against chemicals including acids, solvents and solutions. High temperature resistance and good mechanical strength.
PTFE - Polytetrafluoroethylene (Teflon®)*	Optimum resistance against high temperature and chemicals; low dielectric constant (2.0).
PUR - Polyurethane	Elastic, resistant to abrasion, impact-resistant, oil- and grease-tolerant.
PVC - Polyvinylchloride	Good mechanical strength, viscosity to impact; resistant to acids, alkalis.
PVC, irradiated	Heat and chemical resistant, withstands short-term temperatures to 482° F.
PVDF - Polyvinylidene fluoride (Kynar®)	Resistant to high and low temperatures, good resistance to chemicals (similar to PTFE), high mechanical strength.
Silicon	For use at high or low ambient temperatures (-50...+180 °C), moderate mechanical strength, average resistance against alkalis, acids, oils, and solvents.
IRPA12 - Irradiated Polyamide (nylon)	Good mechanical strength, temp. resistant.
EPTR - Elastomer, Polymer Thermal Plastic	Good fluid resistance.
TROG - Trogamid T	Hard, rigid, good chemical resistance.

Metals

AG	armorguard®
SS - 306 Stainless Steel	Excellent atmospheric resistance.
CPB	Chrome Plated Brass
CuZn - Brass	Generally good resistance to industrial atmospheres.
GD - AlSi12 - Aluminum, die-cast	Low specific weight, long-life characteristics.
GD - ZnAl4Cu1 (Z410) - Zinc, die-cast	Long-life characteristics.
TC	Teflon Coated
WG	weldguard®
AL - Anodized Aluminum	Long-life characteristics
NPB	Nickel Plated Brass



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Notes:



TURCK

Instrumentation Warranty

Warranty Terms and Conditions

RISK OF LOSS

Delivery of the equipment to a common carrier shall constitute delivery to the Purchaser and the risk of loss shall transfer at that time to Purchaser. Should delivery be delayed due to an act or omission on the part of the Purchaser, risk of loss shall transfer to the Purchaser upon notification by **TURCK Inc.** that the order is complete and ready for shipment.

WARRANTIES

TURCK INC. (hereinafter “**TURCK**”) offers five (5) WARRANTIES to cover all products sold. They are as follows:

- 1) The **12-MONTH WARRANTY** is available for the products listed - generally those not covered by **LIFETIME, 5-YEAR, 24-MONTH** or **18-MONTH** warranty. No registration required.
- 2) The **18-MONTH WARRANTY** is available for the products listed - generally those not covered by **LIFETIME** or **5-YEAR WARRANTY**. No registration is required.
- 3) The **24-MONTH WARRANTY** is available for the products listed - generally those not covered by **LIFETIME, 5-YEAR** or **18-MONTH**. No registration is required.
- 4) The **5-YEAR WARRANTY** is available generally for the products listed. No registration is required.
- 5) A **LIFETIME WARRANTY** is available for the products listed. It becomes effective when the accompanying **TURCK LIFETIME WARRANTY REGISTRATION** is completed and returned to **TURCK**.

GENERAL TERMS AND CONDITIONS FOR ALL WARRANTIES

- **12-MONTH STANDARD WARRANTY**
- **18-MONTH STANDARD WARRANTY**
- **24-MONTH STANDARD WARRANTY**
- **5-YEAR WARRANTY**
- **LIFETIME WARRANTY**

TURCK warrants the Products covered by the respective WARRANTY AGREEMENTS to be free from defects in material and workmanship under normal and proper usage for the respective time periods listed above from the date of shipment from **TURCK**. In addition, certain specific terms apply to the various WARRANTIES.

THESE EXPRESS WARRANTIES ARE IN LIEU OF AND EXCLUDE ALL OTHER REPRESENTATIONS MADE - BOTH EXPRESSED AND IMPLIED. THERE ARE NO WARRANTIES OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE FOR PRODUCTS COVERED BY THESE TERMS AND CONDITIONS.

TURCK warrants that the goods sold are as described, but no promise, description, affirmation of fact, sample model or representation, oral or written shall be part of an order, unless set forth in these terms and conditions, or are in writing and signed by an authorized representative of **TURCK**. These WARRANTIES do not apply to any Product which has been subject to misuse, negligence, or accident - or to any Product which has been modified or repaired, improperly installed, altered, or disassembled -except according to **TURCK's** written instructions.

These WARRANTIES are subject to the following conditions:

- 1) These WARRANTIES are limited to the electronic and mechanical performance only, as expressly detailed in the Product specifications and NOT to cosmetic performance.
- 2) These WARRANTIES shall not apply to any cables attached to, or integrated with the Product. However, the **18-MONTH WARRANTY** shall apply to cables sold separately by **TURCK**.
- 3) These WARRANTIES shall not apply to any Products which are stored, or utilized, in harsh environmental or electrical conditions outside **TURCK's** written specifications.
- 4) The WARRANTIES are applicable only to Products shipped from **TURCK** subsequent to January 1, 1988.

ADDITIONAL SPECIFIC TERMS FOR -

(12-MONTH STANDARD WARRANTY) for Linear Displacement Transducers and RFID products.

(18-MONTH STANDARD WARRANTY) FOR ULTRASONIC SENSORS, CABLES AND ALL NON-SENSING PRODUCTS SOLD BY TURCK INC. INCLUDING MULTI-SAFE, MULTI-MODUL, MULTI-CART AND RELATED AMPLIFIER PRODUCTS, RELAYS AND TIMERS.

(24-MONTH STANDARD WARRANTY) FOR ENCODERS.

5-YEAR WARRANTY FOR INDUCTIVE AND CAPACITIVE PROXIMITY SENSORS: The periods covered for the above WARRANTIES and Products shall be 12 MONTHS, 18-MONTHS, 24-MONTHS and 5-YEARS, respectively, from the date of shipment from **TURCK**.



Warranty Terms and Conditions

ADDITIONAL SPECIFIC TERMS FOR - (continued)

LIFETIME WARRANTY (OPTIONAL - REGISTRATION REQUIRED) FOR INDUCTIVE, INDUCTIVE MAGNET OPERATED AND CAPACITIVE PROXIMITY SENSORS SOLD TO THE ORIGINAL PURCHASER FOR THE LIFETIME OF THE ORIGINAL APPLICATION.

The following terms apply to the LIFETIME WARRANTY in addition to the General Terms:

- 1) This WARRANTY shall be effective only when the LIFETIME WARRANTY REGISTRATION has been completed, signed by the End User and an authorized **TURCK** Representative or Distributor and has been received by **TURCK** no later than six (6) months after installation in the End User's Plant, or two (2) years from the date product was shipped from **TURCK**, whichever is sooner.
- 2) This warranty is available only to **TURCK's** authorized Representatives, Distributors and to the Original User. (The term "Original User" means that person, firm, or corporation which first uses the Product on a continuous basis in connection with the operation of a production line, piece of machinery, equipment, or similar device.) In the event the ownership of the product is transferred to a person, firm or corporation other than the Original User, this WARRANTY shall terminate.
- 3) This WARRANTY is applicable only to the Original Application. In the event the machinery, equipment, or production line to which the Product is connected, or on which it is installed, is substituted, changed, moved or replaced, the WARRANTY shall terminate.
- 4) This WARRANTY shall be valid only if the Product was purchased by the Original User from **TURCK**, or from an authorized **TURCK** Distributor, or was an integral part of a piece of machinery and equipment obtained by the Original user from an Original Equipment Manufacturer, which itself, was purchased directly from **TURCK** or from an authorized Distributor.

PURCHASER'S REMEDIES

This Remedy shall apply to all WARRANTIES. If a **TURCK** Distributor desires to make a WARRANTY Claim, the Distributor shall, if requested by **TURCK**, ship the Product to **TURCK's** factory in Minneapolis, Minnesota, postage or freight prepaid. If the User desires to make a WARRANTY Claim, they shall notify the authorized **TURCK** Distributor from whom it was purchased or, if such Distributor is unknown, shall notify **TURCK**. **TURCK** shall, at its option, take any of the following two courses of action for any products which **TURCK** determines are defective in materials or workmanship.

- 1) Repair or replace the Product and ship the Product to the Original Purchaser or to the authorized **TURCK** Distributor, postage or freight prepaid; or
- 2) Repay to the Original Purchaser that price paid by the Original Purchaser; provided that if the claim is made under the LIFETIME WARRANTY, and such Product is not then being manufactured by **TURCK**, then the amount to be repaid by **TURCK** to the Original Purchaser shall be reduced according to the following schedule:

<u>Number of Years Since Date of Purchase by Original Purchaser</u>	<u>Percent of Original Purchase Price To Be Paid by TURCK</u>
10	50%
15	25%
20	10%
More than 20	5%

PURCHASER'S REMEDIES SHALL BE LIMITED EXCLUSIVELY TO THE RIGHT OF REPLACEMENT, REPAIR OR REPAYMENT AS PROVIDED AND DOES NOT INCLUDE ANY LABOR COST OR REPLACEMENT AT ORIGINAL PURCHASER'S SITE. TURCK SHALL NOT BE LIABLE FOR ANY CONSEQUENTIAL DAMAGES RESULTING FROM ANY BREACH OF ANY WARRANTY, EXPRESSED OR IMPLIED, APPLICABLE TO THE PRODUCT, INCLUDING WITHOUT LIMITATION, ANY DAMAGES RESULTING FROM PROPERTY DAMAGE, PERSONAL INJURY OR BUSINESS INTERRUPTION.

CONSIDER SAFETY AND PROTECTION PRECAUTIONS

TURCK takes great care to design and build reliable and dependable products, however, some products can fail eventually. You must take precautions to design your equipment to prevent property damage and personal injury in the unlikely event of failure. As a matter of policy, **TURCK** does NOT recommend the installation of electronic controls as the sole device FOR THE PROTECTION OF PERSONNEL in connection with power driven presses, brakes, shears and similar equipment and, therefore, the customer should build in redundancy or dual control using approved safety devices for these applications.

GOVERNING LAW

The sale and purchase of Products covered hereby and all terms and conditions hereof shall be governed by the law of the State of Minnesota.



TURCK

Instrumentation Warranty

TURCK Inc. sells its products through Authorized Distributors. These distributors provide our customers with technical support, service and local stock. **TURCK** distributors are located nationwide - including all major metropolitan marketing areas.

For Application Assistance or for the location of your nearest **TURCK** distributor, call:

1-800-544-7769

Specifications in this manual are subject to change without notice. **TURCK** also reserves the right to make modifications and makes no guarantee of the accuracy of the information contained herein.

Literature and Media questions or concerns?

Contact Marketing Communications TURCK USA - media@turck.com