Table of Contents – Fluid and Diagnostic Sensors

Temperature

Top five product features!

- *Simple setup with rotating adjustment dials that quickly establish setpoint and resetpoint*

- *Space-saving design with no moving parts that can wear or break*

- *Bright LEDs indicate switching status and power*

- *Fast response times (less than 3 seconds)*

- *One TK switch replaces two mechanical switches*

Compact temperature sensor with 316 stainless steel probe

The compact TK Series temperature switch and its integrated 316 stainless steel RTD probe measure only 4" long and can be directly mounted into a pipe.
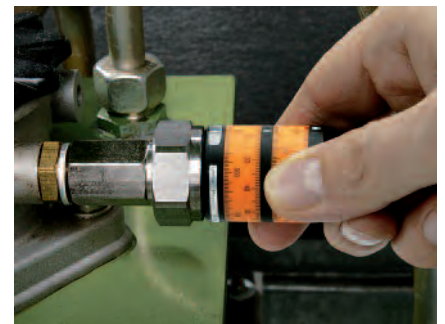
Two mechanical setup dials rotate to quickly establish the setpoint and resetpoint temperatures. The switch's high accuracy insures that the setpoint does not drift and calibration is not required. Two bright LEDs indicate switching and operating status.

With no moving parts to stick in the process or break, the ifm TK Series switch maintains high performance and long term stability. A locking device prevents unintentional setpoint changes.

NEW! Part No. TK7480 has been added to the offering. It features a 255 mm probe length, two switching outputs and a G 1/2 BSPP connection.

ifm's TK temperature sensor is a new benchmark for price / performance value.

Quick setup! Rotating setup dials establish parameters

TK temperature switches feature mechanical adjustment dials that rotate to quickly establish the setpoint and resetpoint.

Product + accessory selector

Output	RTD Length	Setpoint Range	Resetpoint Range	Process Connection	Response Time	Part No.	List Price (1-pc.)
PNP, N.O. and N.C. adjustable hysteresis	35 mm	3...284 °F (-16…140 °C)	-4...277 °F (-20...136 °C)	1/4 " NPT	< 3 sec.	**TK6330**	**$140.00**
PNP, 2X N.O. with fixed hysteresis (9 °F / 5 °C)	35 mm	-4...284 °F (-20...140 °C)	–	1/4 " NPT	< 3 sec.	**TK7330**	**$140.00**
PNP, N.O. and N.C. adjustable hysteresis	25 mm	3...284 °F (-16…140 °C)	-4...277 °F (-20...136 °C)	G1/4 BSPP	< 3 sec.	**TK6130**	**$144.00**
PNP, 2X N.O. with fixed hysteresis (9 °F / 5 °C)	25 mm	-4...284 °F (-20...140 °C)	–	G1/4 BSPP	< 3 sec.	**TK7130**	**$144.00**
PNP, N.O. and N.C. with fixed hysteresis (9 °F / 5 °C)	255 mm	-4...284 °F (-20...140 °C)	–	G1/2 BSPP	< 3 sec.	**TK7480**	**$160.00**

Optional Accessories

Type	Description	Part No.	List Price (1-pc.)
	Protective cover	**E30094**	**$9.00**

Cordsets

Type	Description	Part No.	List Price (1-pc.)
	M12 Micro DC (4-pin) 2 m, PUR	**EVC001**	**$9.95**
	M12 Micro DC (4-pin) 5 m, PUR	**EVC002**	**$13.50**
	M12 Micro DC (4-pin) 10 m, PUR	**EVC003**	**$18.00**
	M12 Micro DC (4-pin) 2 m, PUR	**EVC004**	**$9.95**
	M12 Micro DC (4-pin) 5 m, PUR	**EVC005**	**$13.50**
	M12 Micro DC (4-pin) 10 m, PUR	**EVC006**	**$18.00**

▶ Can't find the right sensor for your application, call 800-441-8246 or visit www.ifm.com/us

Technical Specs

Measuring element: Pt1000, class B
Supply voltage: 9.6…32 VDC
Maximum load current: 2x 500 mA
Accuracy of switch point: ± 5.4 °F (± 3 °C)
Pressure rating: 4350 psi (300 bar)
Ambient temperature: -13…158 °F (-25…70 °C)
Wetted parts: 316L stainless steel
Protection rating: IP67

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Process Sensors — Pressure (144 - 159), Flow (160 - 169), Level (170 - 185), Temperature (186 - 201) | Industrial Networks — AS-i network (204 - 217), Safety systems (218 - 229) | ID Systems — RF identification systems (232 - 235) | Machine Condition — Diagnostic systems (238 - 243) | Power Supplies — Power supplies (246 - 247) | Wiring Technology — Cordset solutions (250 - 261)

Top five product features!

- *Integrated solution: RTD, display and switching/transmitter output*

- *One-piece solution is ideal for small pipe mounting*

- *Stainless steel wetted parts and simple pushbutton setup*

- *Compatible with wide range of chemicals*

- *Very fast response on temperature changes (less than 3 seconds)*

Enclosure free, local mounting

ifm's compact TN Series process temperature sensors provide highly accurate temperature indication of fluids. The sensors are self-contained units that feature an integrated control monitor and probe. The sensor's robust stainless steel probe is resistant to aggressive media, withstands shock and vibration and features a rotatable display for system temperature.

These models simplify installation in small pipes where local indication is needed. The monitor's integrated display allows a user to view temperature directly at the process. The robust, stainless steel housing withstands harsh conditions and is mounted without the need for an enclosure or control box. With its flexible design, the temperature monitoring system adapts to most applications.

Pushbutton programming

Using the monitor's microprocessor-based pushbutton setup, users can toggle through a variety of menu items. Two output options are available: models with scaleable analog and switching outputs, and models with dual PNP / NPN outputs. The switching output has an independent setpoint and reset-point that can be programmed as normally open or normally closed.

Versatile mounting

A rotatable display allows the process temperature to be viewed from any angle.

Company	Position Sensors					Motion Control	Vision Sensors	Safety Technology
	Inductive	Capacitive	Cylinder position	Photoelectrics and lasers	Distance, color and contrast	Fiber optics	Speed monitors	2D / 3D inspection	Safety products
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Search Bar

Product + accessory selector

Output	Switchpoint Setting Range	In Steps of	Scaleable Analog Start Point	Scaleable Analog End Point	Process Connection	Part No.	List Price (1-pc.)
4-20 mA / 0-10 V and PNP / NPN N.O. / N.C.	-40…302 °F (-40…150 °C)	0.1 °F (0.1 °C)	-40…293 °F (-40…145 °C)	-31…302 °F (-35…150 °C)	See Required Accessories	**TN2531**	**$294.00**
2 X PNP / NPN N.O. / N.C.	-40…302 °F (-40…150 °C)	0.1 °F (0.1 °C)	–	–	See Required Accessories	**TN7531**	**$265.00**

Required Accessories (choose 1)

	Description	Part No.	List Price (1-pc.)
	1/4" NPT adapter	**E40106**	**$21.00**
	1/2" NPT adapter	**E40107**	**$23.00**
	3/4" NPT adapter	**U40085**	**$45.00**
	1" NPT adapter, 304 stainless steel and brass	**U40080**	**$72.00**
	G1/4 BSPP adapter	**E40099**	**$21.00**
	G1/2 BSPP adapter	**E40096**	**$26.00**
	Weldable adapter, carbon steel	**E40113**	**$19.00**
	Weldable adapter, 316 stainless steel	**E40124**	**$39.00**
	1/2" NPT thermowell, 27 mm (no other adapters required)	**UT0028**	**$45.00**

Cordsets and Optional Accessories

	Description	Part No.	List Price (1-pc.)
	M12 Micro DC (4-pin) 2 m, PUR	**EVC001**	**$9.95**
	M12 Micro DC (4-pin) 5 m, PUR	**EVC002**	**$13.50**
	M12 Micro DC (4-pin) 10 m, PUR	**EVC003**	**$18.00**
	M12 Micro DC (4-pin) 2 m, PUR	**EVC004**	**$9.95**
	M12 Micro DC (4-pin) 5 m, PUR	**EVC005**	**$13.50**
	M12 Micro DC (4-pin) 10 m, PUR	**EVC006**	**$18.00**
	Transparent protective cover	**E30006**	**$8.00**

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Technical Specs

Measuring element:	Pt1000, Class B
Response time T05/T09:	1/3 sec
Supply voltage:	18…32 VDC
Maximum load current:	TN2531: 250 mA , TN7531: 2 x 250 mA
Accuracy of analog signal:	TN 2531: ± 0.54 °F (± 0.3 °C)
Accuracy of switch point:	± 0.54 °F (± 0.3 °C)
Pressure rating:	4350 psi (300 bar)
Ambient temperature:	-13…158 °F (-25…70 °C)
Wetted parts:	316 stainless steel; FKM O-ring
Protection rating:	IP67

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Process Sensors				Industrial Networks		ID Systems	Machine Condition	Power Supplies	Wiring Technology
Pressure	*Flow*	*Level*	*Temperature*	*AS-i network*	*Safety systems*	*RF identification systems*	*Diagnostic systems*	*Power supplies*	*Cordset solutions*
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Top five product features!

- *2-wire loop power installation*

- *Fast response time: T05 / T09 = 1/3 sec*

- *LED indicates the operating status*

- *Installation lengths from 25...150 mm*

- *Popular pre-scaled ranges available or IO-Link programmable*

Compact one-piece design, fast response temperature transmitters

ifm's new line of transmitters offer an ideal combination of features, performance and value.

Compact and versatile

The TA2 temperature sensor is a compact transmitter with a 4...20 mA current output and a prescaled 0…300 °F measuring range. Scaling over the -58…302 °F range is done simply via the integrated IO-Link interface.

The bright LED indicator located in the M12 connector gives visible indication of operational status.

Ready to install

Pre-programmed and ready for use, the one-piece design with integrated electronics, 6 mm diameter probe and threaded process connectors makes ordering easy with a single part number.

Fast and precise

The TA2 transmitters use a high accuracy Pt1000 class A RTD with a low mass tip design for fast response.

Integrated electronics and factory calibration ensure a reliable ready-to-use transmitter for monitoring temperature in industrial automation applications.
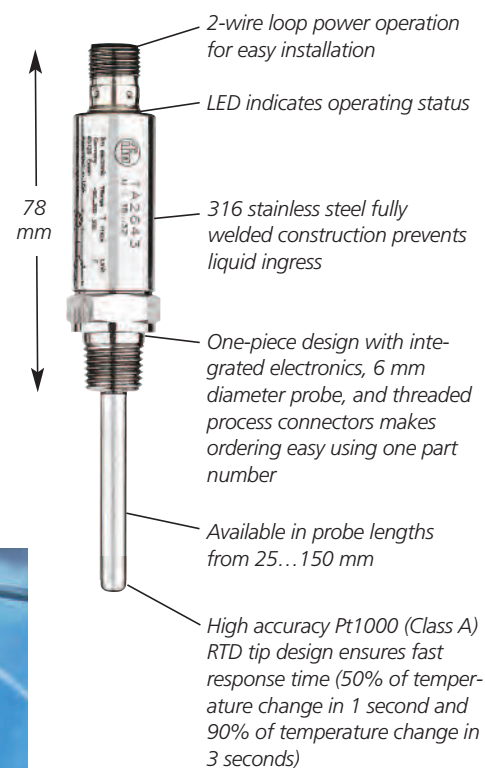
Fluid temperatures are critical measurements in process applications. The TA2 transmitter is ideal for monitoring their process fluids.

78 mm

2-wire loop power operation for easy installation

LED indicates operating status

316 stainless steel fully welded construction prevents liquid ingress

One-piece design with integrated electronics, 6 mm diameter probe, and threaded process connectors makes ordering easy using one part number

Available in probe lengths from 25…150 mm

High accuracy Pt1000 (Class A) RTD tip design ensures fast response time (50% of temperature change in 1 second and 90% of temperature change in 3 seconds)

Company	Position Sensors					Motion Control	Vision Sensors	Safety Technology
	Inductive	Capacitive	Cylinder position	Photoelectrics and lasers	Distance, color and contrast	Fiber optics	Speed monitors	2D / 3D inspection	Safety products
1 - 7	10 - 47	48 - 53	54 - 59	60 - 91	92 - 97	98 - 103	106 - 109	112 - 125	128 - 141

Product + accessory selector

RTD Length (mm)	Pressure Rating (psi)	Process Connection	Factory Default Temperature Range (scaled 4…20 mA)	Part No.	List Price (1-pc.)
25	5800	1/4 NPT	0...300 °F (-18…149 °C)	**TA2603**	**$160.00**
50	5800	1/4 NPT	0...300 °F (-18…149 °C)	**TA2613**	**$160.00**
100	2320	1/4 NPT	0...300 °F (-18…149 °C)	**TA2633**	**$165.00**
150	2320	1/4 NPT	0...300 °F (-18…149 °C)	**TA2643**	**$165.00**
30	4350	1/2 NPT	0...300 °F (-18…149 °C)	**TA2303**	**$170.00**
50	4350	1/2 NPT	0...300 °F (-18…149 °C)	**TA2313**	**$170.00**
100	2320	1/2 NPT	0...300 °F (-18…149 °C)	**TA2333**	**$175.00**
150	2320	1/2 NPT	0...300 °F (-18…149 °C)	**TA2343**	**$175.00**
25	4350	G 1/4 BSPP	-58...302 °F (-50…150 °C)	**TA2105**	**$160.00**
50	4350	G 1/4 BSPP	-58...302 °F (-50…150 °C)	**TA2115**	**$160.00**
100	2320	G 1/4 BSPP	-58...302 °F (-50…150 °C)	**TA2135**	**$165.00**
150	2320	G 1/4 BSPP	-58...302 °F (-50…150 °C)	**TA2145**	**$165.00**
30	4350	G 1/2 BSPP	-58...302 °F (-50…150 °C)	**TA2405**	**$170.00**
50	4350	G 1/2 BSPP	-58...302 °F (-50…150 °C)	**TA2415**	**$170.00**
100	2320	G 1/2 BSPP	-58...302 °F (-50…150 °C)	**TA2435**	**$175.00**
150	2320	G 1/2 BSPP	-58...302 °F (-50…150 °C)	**TA2445**	**$175.00**

Optional Accessories

Type	Description	Part No.	List Price (1-pc.)
	USB IO-Link master cable connects PC to master	**E30396**	**$140.00**
	LineRecorder Sensor App, software for parameter setting	**ZGS210**	**$69.00**

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Cordsets

Description	Part No.	List Price (1-pc.)
M12 Micro DC (4-pin) 2 m, PUR	**EVC001**	**$9.95**
M12 Micro DC (4-pin) 5 m, PUR	**EVC002**	**$13.50**
M12 Micro DC (4-pin) 10 m, PUR	**EVC003**	**$18.00**
M12 Micro DC (4-pin) 2 m, PUR	**EVC004**	**$9.95**
M12 Micro DC (4-pin) 5 m, PUR	**EVC005**	**$13.50**
M12 Micro DC (4-pin) 10 m, PUR	**EVC006**	**$18.00**

Technical Specs

Measuring element: Pt1000, class A
Response time T05 / T09:   1/3 sec.
Supply voltage: 18...32 V DC
Maximum measuring range: -58…302 °F (-50…150 °C)
Accuracy: ± 0.54 + (± 0.1 % scaled range)
                           ± 0.3 + (± 0.1 % scaled range)
Ambient temperature: -13…176 °F (-25…80 °C)
Wetted parts: 316L stainless steel; FKM O-ring
Protection rating: IP 67 / IP 68 / IP 69K

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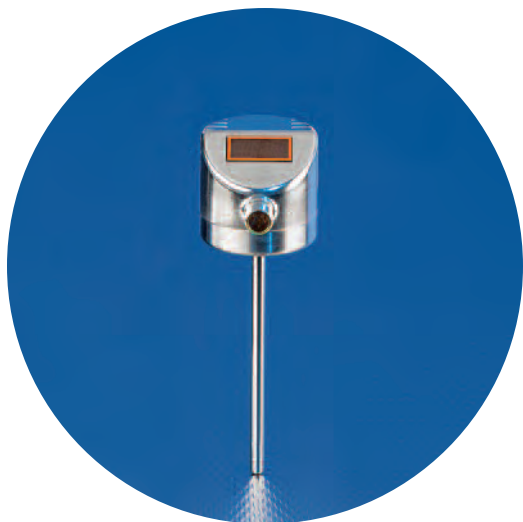
Top five product features!

- Transmitter provides long-term, highly accurate temperature indication in a variety of industrial automation applications

- The 2-wire loop powered transmitter is fully programmable and comes pre-scaled in a variety of ranges

- One-piece housing features integrated electronics, process connector and Class "A" RTD probe that are laser-welded and factory calibrated

- Bright, 4-digit LED display indicates measured temperature directly at the instrument for easy verification of proper operation

- 316 stainless steel housing is robust for harsh industrial applications

TD temperature transmitters are completely assembled, calibrated and ready to install

NEW! The TD Series temperature transmitters monitor the temperature of liquids in industrial automation applications. The one-piece housing is made of durable 316 stainless steel to withstand tough environments. The 2-wire loop powered programmable transmitter is pre-scaled for the most common ranges. A bright, 4-digit LED display is protected with a high performance polymer display window that is resistant to chemicals and high temperatures.

Temperature measurement uses high accuracy Pt1000 class A RTDs (resistive thermal detector). Evaluation electronics are optimized for accuracy over the full working range and calibrated to within 0.5 °F.

The highly engineered tip design reduces thermal mass and precisely locates the RTD element with a constant position and force. The benefit of the tip design is very fast reaction speeds of 1 second to 50% and 3 seconds to 90% of the temperature change. There is no calibration or matching of the RTD with the transmitter module.

The TD comes fully assembled and factory calibrated for the highest degree of reliability. This saves both installation and commissioning time.

Challenge

Traditional sensors require costly calibration and matching of the transmitter with the RTD probe. The assemblies do not have displays for local indication. The connection head and well assemblies are prone to damage from moisture ingress.

Solution

The Pt1000 sensor element, evaluation electronics and LED display are calibrated to operate as a system solution for your process monitoring.

The one-piece device eliminates wiring issues and moisture ingress.

One-piece solution mounts directly in process

The TD temperature transmitter reliably monitors the fluid temperature in many industrial applications.

Process and compression fittings attach to the RTD probe to provide a secure connection in the process.

Optional thermowell mounting allows the sensor to be removed without stopping process.

A compression fitting and nylon ferrule are required for thermowell mounting.

Company	Position Sensors						Motion Control	Vision Sensors	Safety Technology
	Inductive	Capacitive	Cylinder position	Photoelectrics and lasers	Distance, color and contrast	Fiber optics	Speed monitors	2D / 3D inspection	Safety products
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Product + accessory selector

Maximum Temperature Range	RTD Length [mm]	Optional Thermowell 1/2" NPT	Part No. Factory Default Temperature Range (scaled 4…20 mA)			List Price (1-pc.)
			-10…150 °C	0…300 °F	0…100 °C	
-58…302 °F (-50…150 °C)	50	–	**TD2211**	**TD2213**	**TD2217**	**$190.00**
-58…302 °F (-50…150 °C)	100	–	**TD2231**	**TD2233**	**TD2237**	**$195.00**
-58…302 °F (-50…150 °C)	150	E37210	**TD2241**	**TD2243**	**TD2247**	**$200.00**
-58…302 °F (-50…150 °C)	200	E37220	**TD2251**	**TD2253**	**TD2257**	**$205.00**
-58…302 °F (-50…150 °C)	250	–	**TD2261**	**TD2263**	**TD2267**	**$210.00**
-58…302 °F (-50…150 °C)	300	E37230 / E37430	**TD2271**	**TD2273**	**TD2277**	**$215.00**
-58…302 °F (-50…150 °C)	350	E37250 / E37450	**TD2291**	**TD2293**	**TD2297**	**$220.00**

Thermowell Mounting (Requires UT0042 compression fitting)

Description	Part No.	List Price (1-pc.)	Description	Part No.	List Price (1-pc.)
1/2" NPT thermowell, 63.5 mm insertion length	**E37210**	**$23.00**	1/2" NPT compression fitting with nylon ferrules for removable installation in thermowell	**UT0042**	**$30.00**
1/2" NPT thermowell, 114 mm insertion length	**E37220**	**$35.00**			
1/2" NPT thermowell, 190 mm insertion length	**E37230**	**$50.00**			
1/2" NPT thermowell, 267 mm insertion length	**E37250**	**$65.00**			
Weld-in thermowell, 190 mm insertion length	**E37430**	**$83.00**			
Weld-in thermowell, 267 mm insertion length	**E37450**	**$116.00**			

Direct Mounting (Select one of the fittings below)

Description	Part No.	List Price (1-pc.)
1/4" NPT, 316 SS compression fitting	**E30049**	**$34.00**
1/2" NPT, 316 SS compression fitting	**UT0038**	**$34.00**

Accessories

Description	Part No.	List Price (1-pc.)
USB IO-Link master cable connects PC to sensor	**E30396**	**$140.00**
LineRecorder Sensor App Software for parameter setting	**ZGS210**	**$69.00**

Cordsets

Description	Part No.	List Price (1-pc.)
M12 Micro DC (4-pin) 2 m, PUR	**EVC001**	**$9.95**
M12 Micro DC (4-pin) 5 m, PUR	**EVC002**	**$13.50**
M12 Micro DC (4-pin) 10 m, PUR	**EVC003**	**$18.00**
M12 Micro DC (4-pin) 2 m, PUR	**EVC004**	**$9.95**
M12 Micro DC (4-pin) 5 m, PUR	**EVC005**	**$13.50**
M12 Micro DC (4-pin) 10 m, PUR	**EVC006**	**$18.00**

Technical Specs

Measuring element	Pt 1000, Class A
Response time T05 / T09	1/3 sec.
Supply voltage	18…32 V DC
Accuracy of analog signal	± 0.54 + (0.1 % of measuring span) °F
	± 0.3 + (0.19 % of measuring span) °C
Pressure rating	-14.5…2321 psi
Ambient temperature	-13…176 °F (-25…80 °C)
Wetted parts	316L stainless steel
Protection rating	IP67 / IP68 / IP69K

Top five product features!

- *Compact size with "Lock in Place" M12 connectors*

- *Plug-and-play connection eliminates wiring errors*

- *Scaleable and offsetable Pt100 / Pt1000 evaluation with temperature ranges from -58… 572 °F (-50… 300 °C)*

- *Integrated LED confirms operating status*

- *Over-molding technology guarantees integrity in harsh environments*

Turns any RTD into a programmable 4…20 mA temperature transmitter

The innovative TP transmitter module with "plug and play" M12 connectors solves the common installation and environmental problems associated with conventional terminal chamber-head transmitters.

Error sources from screw terminals, wiring mistakes, and fluid ingress are eliminated. An integrated LED gives local indication that the transmitter is powered and transmitting.

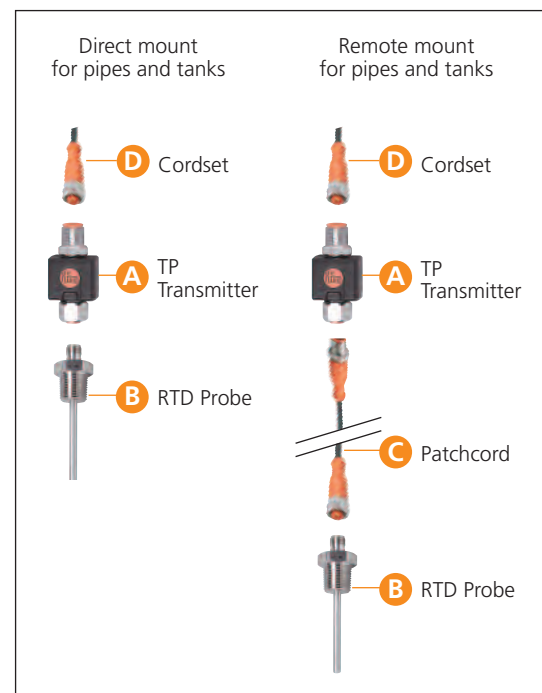| **Challenge**	**Solution**
Bulky traditional head transmitters are costly and are subject to moisture ingress.	*ifm's compact TP transmitter is rated to withstand liquid ingress and provide reliable temperature indication*

Completely configurable

Compatible with any Pt100 or Pt1000 probe, the TP temperature module verifies the type of RTD and automatically makes the correct settings. Usable with 2, 3, or 4-wire RTDs, the TP can be scaled and offset using ifm's USB interface. With it's "overmolded" construction, the TP is suitable for harsh environments allowing for use in almost any application.

Component guide

Direct mount for pipes and tanks

Remote mount for pipes and tanks

D Cordset
A TP Transmitter
B RTD Probe

D Cordset
A TP Transmitter
C Patchcord
B RTD Probe

Company	Position Sensors					Motion Control	Vision Sensors	Safety Technology
	Inductive	Capacitive	Cylinder position	Photoelectrics and lasers	Distance, color and contrast	Fiber optics	Speed monitors	2D / 3D inspection	Safety products
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Product + accessory selector

A **Transmitter Module**

Type	Output	Factory Default Range	Scaleable Analog Start Point	Scaleable Analog End Point	In steps of	Part No.	List Price (1-pc.)
	4…20 mA	-58…302 °F (-50…150 °C)	-58…563 °F (-50…295 °C)	-49…572 °F (-45…300 °C)	0.1 °F (0.1 °C)	**TP3231**	**$84.00**
		-58…572 °F (-50…300 °C)	-58…563 °F (-50…295 °C)	-49…572 °F (-45…300 °C)	0.1 °F (0.1 °C)	**TP3232**	**$84.00**
		0…300 °F (-18…149 °C)	-58…563 °F (-50…295 °C)	-49…572 °F (-45…300 °C)	0.1 °F (0.1 °C)	**TP3233**	**$84.00**
		32…212 °F (0…100 °C)	-58…563 °F (-50…295 °C)	-49…572 °F (-45…300 °C)	0.1 °F (0.1 °C)	**TP3237**	**$84.00**
	0…10 V	32…212 °F (0…100 °C)	-58…563 °F (-50…295 °C)	-49…572 °F (-45…300 °C)	0.1 °F (0.1 °C)	**TP9237**	**$84.00**

B **Pt 100 RTD Probes, 316L Stainless Steel***

Process Connection	Insertion Depth	RTD Diameter	Temperature Range	Response Time	Part No.	List Price (1-pc.)
1/2″ NPT	50 mm	6 mm	-40…302 °F (-40…150 °C)	1/3 sec.	**TM4311**	**$92.00**
1/2″ NPT	100 mm	6 mm	-40…302 °F (-40…150 °C)	1/3 sec.	**TM4331**	**$95.00**
1/2″ NPT	150 mm	6 mm	-40…302 °F (-40…150 °C)	1/3 sec.	**TM4341**	**$97.00**
1/2″ NPT	250 mm	6 mm	-40…302 °F (-40…150 °C)	1/3 sec.	**TM4361**	**$104.00**

* For other RTD probes and accessories, please see pages 198 - 199.

Accessories

Description	Part No.	List Price (1-pc.)
USB IO-Link master cable connects PC to sensor	**E30396**	**$140.00**
LineRecorder Sensor App Software for parameter setting	**ZGS210**	**$69.00**

Technical Specs

Supply voltage: 20…32 VDC
Ambient Temperature: -13…158 °F (-25…70 °C)
Accuracy of analog output: ±0.54 °F + (± 0.1%) of the scaled span
     ±0.3 °C + (± 0.1%) of the scaled span
Housing material: TPU with Viton™ seal
Material coupling nut: 316L stainless steel
Protection rating: IP67

D Cordsets

Type	Description	Part No.	List Price (1-pc.)
	M12 Micro DC (4-pin) 2 m, PUR	**EVC001**	**$9.95**
	M12 Micro DC (4-pin) 5 m, PUR	**EVC002**	**$13.50**
	M12 Micro DC (4-pin) 10 m, PUR	**EVC003**	**$18.00**
	M12 Micro DC (4-pin) 2 m, PUR	**EVC004**	**$9.95**
	M12 Micro DC (4-pin) 5 m, PUR	**EVC005**	**$13.50**
	M12 Micro DC (4-pin) 10 m, PUR	**EVC006**	**$18.00**

C Patchcords for remote mount

Type	Description	Part No.	List Price (1-pc.)
	M12, straight to straight, 2 m, PUR	**EVC013**	**$20.00**
	M12, straight to straight, 5 m, PUR	**EVC014**	**$21.00**
	M12, straight to straight, 10 m, PUR	**EVC108**	**$26.00**

▶ Can't find the right sensor for your application, call 800-441-8246 or visit www.ifm.com/us
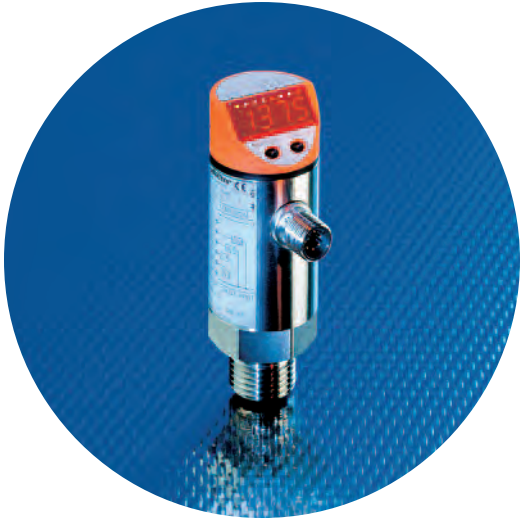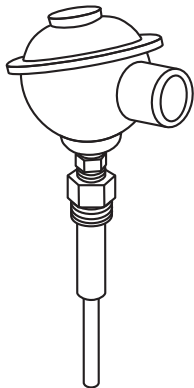
Top five product features!

- *Integrated display with switching and transmitter outputs*

- *Easy direct mounting in tanks*

- *Display can be remotely mounted with simple 4-wire patchcord*

- *Enclosure-free housing eliminates problems with moisture ingress*

- *Directly interfaces with any 2, 3, and 4 wire RTDs*

## More compact and easier to install than head-and-well assemblies

The TR Series process temperature monitors provide highly accurate temperature indication of fluids. The monitor's integrated display allows a user to view temperature directly at the process. The robust, stainless steel housing withstands harsh conditions. Programmable in either °F or °C, the highly-visible display can be viewed from a distance which is advantageous in low-lit areas.

Component Guide

A	Control monitor and power cable
B	RTD mounting set
C	TT RTD probe
D	Compression fitting
E	Optional thermowell

Challenge	Solution

Bulky head-and-well assemblies with open cavities are subject to liquid ingress and do not have localized displays.
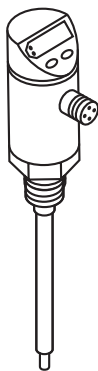
ifm's zero-leak, compact temperature monitor connects to a variety of RTDs and features local numeric display.

Two monitors available:

- Model TR2432 provides a scaleable analog and switching output.

- Model TR7432 features a dual switching output.

- Both monitors have a temperature range of -40 to 572 °F and interface with 2-, 3- and 4-wire RTDs (Pt 100 or Pt 1000). The compact monitors feature a 4-digit numeric LED display that indicates temperature in 0.1 °F resolution.
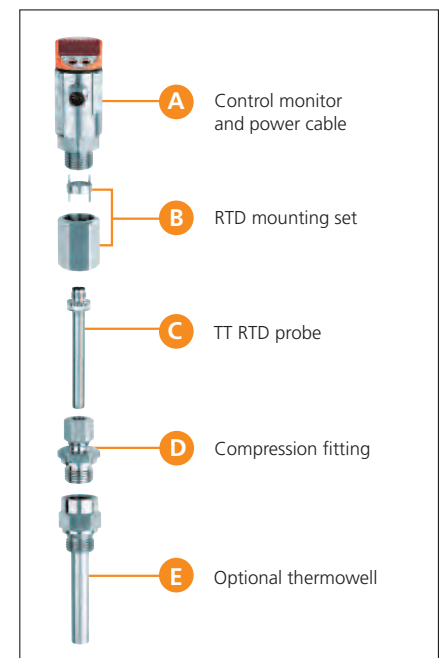
	Position Sensors						Motion Control	Vision Sensors	Safety Technology
Company	Inductive	Capacitive	Cylinder position	Photoelectrics and lasers	Distance, color and contrast	Fiber optics	Speed monitors	2D / 3D inspection	Safety products
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Search Bar

Product + accessory selector

A Control Monitor

Output	Switchpoint Setting Range	In steps of	Scaleable Analog Start Point	Scaleable Analog End Point	Part No.	List Price (1-pc.)
4-20mA / 0-10V and PNP / NPN N.O. / N.C.	-40…572 °F (-40…300 °C)	0.1 °F (0.1 °C)	-40.0…482 °F (-40.0…250 °C)	50…572.0 °F (10…300.0 °C)	**TR2432**	**$270.00**
Dual PNP / NPN N.O. / N.C.	-40…572 °F (-40…300 °C)	0.1 °F (0.1 °C)	–	–	**TR7432**	**$228.00**

C Pt 100 RTD Probes, 316L Stainless Steel*

Usable RTD Length	Total RTD Length	RTD Diameter	Temperature Range	Part No.	List Price (1-pc.)
100 mm	160 mm	10 mm	-40…302 °F (-40…150 °C)	**TT1081**	**$75.00**
200 mm	260 mm	10 mm	-40…302 °F (-40…150 °C)	**TT2081**	**$82.00**
300 mm	360 mm	10 mm	-40…302 °F (-40…150 °C)	**TT3081**	**$88.00**
500 mm	560 mm	10 mm	-40…302 °F (-40…150 °C)	**TT5081**	**$97.00**

* For other RTD probes and accessories, please see pages 198 - 199.

Accessories

Type	Description	Part No.	List Price (1-pc.)
B	RTD mounting set	**E30017**	**$34.00**
D	1/2" NPT Compression fitting, 316 stainless steel	**E30024**	**$26.00**
E	1/2" NPT Thermowell, 100 mm, 316 stainless steel	**UT0009**	**$32.00**
	1/2" NPT Thermowell, 200 mm, 316 stainless steel	**UT0010**	**$38.00**
	1/2" NPT Thermowell, 300 mm, 316 stainless steel	**UT0011**	**$45.00**
	1/2" NPT Thermowell, 500 mm, 316 stainless steel	**UT0012**	**$52.00**
	Thermal grease for thermowells	**700692**	**$2.50**

Cordsets

Type	Description	Part No.	List Price (1-pc.)
	M12 Micro DC (4-pin) 2 m, PUR	**EVC001**	**$9.95**
	M12 Micro DC (4-pin) 5 m, PUR	**EVC002**	**$13.50**
	M12 Micro DC (4-pin) 10 m, PUR	**EVC003**	**$18.00**
	M12 Micro DC (4-pin) 2 m, PUR	**EVC004**	**$9.95**
	M12 Micro DC (4-pin) 5 m, PUR	**EVC005**	**$13.50**
	M12 Micro DC (4-pin) 10 m, PUR	**EVC006**	**$18.00**

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Technical Specs

Supply voltage:	18…32 VDC
Maximum load current:	TR2432: 250 mA, TR7432: 2 x 250 mA
Accuracy of switch point:	±0.54 °F (±0.3 °C)
Accuracy of analog signal:	TR2432: ± 0.54 °F (±0.3 °C)
Ambient temperature:	-13…158 °F (-25…70 °C)
Protection rating:	IP67

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Process Sensors				Industrial Networks		ID Systems	Machine Condition	Power Supplies	Wiring Technology
Pressure	*Flow*	*Level*	*Temperature*	*AS-i network*	*Safety systems*	*RF identification systems*	*Diagnostic systems*	*Power supplies*	*Cordset solutions*
144 - 159	160 - 169	170 - 185	186 - 201	204 - 217	218 - 229	232 - 235	238 - 243	246 - 247	250 - 261

Top five product features!

- *A variety of RTD probe lengths offer a wide range of insertion depths*
- *Various thermowells are available that allow the probe to be removed without shutting down the process*
- *316 stainless steel design detect rapid temperature changes and is compatible with a wide range of chemicals*
- *For a custom temperature monitoring system, RTDs can be used with or without ifm's TR control monitor or TP transmitter module*
- *Standard M12 connectors allow for a multitude of mounting options*

ifm's modular temperature components allow flexibility in any application

Select an RTD probe and process fitting that will suit your application. Optional thermowells allow the RTD probe to be removed without stopping the process.

A Select an RTD probe

ifm stainless steel temperature probes are available in 6 mm, 8.2 mm and 10 mm diameters.

Probes are available in varying lengths to suit a wide range of installation depths.

B Select a process / compression fitting

Process and compression fittings attach to the probe to provide a secure connection in the process.

Models are available in 1/4", 1/2", .3/4" and 1" NPT, G 1/4 and G 1/2 BSPP and weldable adapters.

C If needed, select a thermowell

Optional thermowell mounting allows the RTD probe to be removed without stopping process.

Thermowells are available in various diameter options and lengths.

Selection Guide for RTD Probes, Fittings and Thermowells

A 6 mm diameter · Pt 100 · M12 connector Integrated 1/2" process connection

Type	Usable Length (after fitting)	Temperature Range	Part No.	List Price (1-pc.)
	50 mm	-40…302 °F (-40… 150 °C)	TM4311	$92.00
	100 mm	-40…302 °F (-40… 150 °C)	TM4331	$95.00
	150 mm	-40…302 °F (-40… 150 °C)	TM4341	$97.00
	250 mm	-40…302 °F (-40… 150 °C)	TM4361	$104.00

Selection Guide for RTD Probes, Fittings and Thermowells

A 8.2 mm diameter · Pt 100 · M12 quick disconnect for small pipes

Type	Usable Length (after fitting)	Temperature Range	Part No.	List Price (1-pc.)
	23 mm	-40…257 °F (-40… 125 °C)	TM9950	$109.00

B Process Fitting	Part No.	List Price (1-pc.)
1/4" NPT adapter	E40106	$21.00
1/2" NPT adapter	E40107	$23.00
3/4" NPT adapter	U40085	$45.00
1" NPT adapter, 304 stainless steel and brass	U40080	$72.00
G1/4 BSPP adapter	E40099	$21.00
G1/2 BSPP adapter	E40096	$26.00
Weldable adapter, carbon steel	E40113	$19.00
Weldable adapter, 316 ss	E40124	$39.00

C Optional Thermowell, 1/2" NPT	Part No.	List Price (1-pc.)
1/2" NPT thermowell, 27 mm (no other adapters required)	UT0028	$45.00

Company	Inductive	Capacitive	Cylinder position	Photoelectrics and lasers	Distance, color and contrast	Fiber optics	Speed monitors	2D / 3D inspection	Safety products
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Selection Guide for RTD Probes, Fittings and Thermowells (continued)

A · 6 mm diameter · Pt 100 · M12 quick disconnect

Usable Length (after fitting)	Temperature Range	Part No.	List Price (1-pc.)
12 mm	-40…302 °F (-40…150 °C)	TT9291	$86.00
62 mm	-40…302 °F (-40…150 °C)	TT0291	$95.00
100 mm	-40…302 °F (-40…150 °C)	TT1291	$97.00
200 mm	-40…302 °F (-40…150 °C)	TT2291	$95.00
300 mm	-40…302 °F (-40…150 °C)	TT3291	$103.00

B · Compression Fitting

Part No.	List Price (1-pc.)
E30049 1/4" NPT	$34.00

C · Optional Thermowell, 1/2" NPT (requires E30049)*

Length	Part No.	List Price (1-pc.)
N/A	N/A	N/A
N/A	N/A	N/A
100 mm	UT0022	$34.00
200 mm	UT0023	$39.00
300 mm	UT0024	$45.00

A · 10 mm diameter · Pt 100 · M12 quick disconnect

Usable Length	Temperature Range	Part No.	List Price (1-pc.)
100 mm	-40…302 °F (-40…150 °C)	TT1081	$75.00
200 mm	-40…302 °F (-40…150 °C)	TT2081	$82.00
300 mm	-40…302 °F (-40…150 °C)	TT3081	$88.00
500 mm	-40…302 °F (-40…150 °C)	TT5081	$97.00

B · Compression Fitting

Part No.	List Price (1-pc.)
E30024 1/2" NPT	$26.00

C · Optional Thermowell, 1/2" NPT (requires E30024)*

Length	Part No.	List Price (1-pc.)
100 mm	UT0009	$32.00
200 mm	UT0010	$38.00
300 mm	UT0011	$45.00
500 mm	UT0012	$52.00

A · 10 mm diameter Pt 100 · Prewired with M12 quick disconnect

Cable Length	Temperature Range	Part No.	List Price (1-pc.)
2 m, PUR	-40…194 °F (-40…90 °C)	TS2089	$55.00
5 m, PUR	-40…194 °F (-40…90 °C)	TS5089	$60.00
2 m, PTFE	-58…482 °F (-50…250 °C)	TS2056	$107.00

B · Compression Fitting

Part No.	List Price (1-pc.)
E30025 1/2" NPT	$26.00

C · Optional Thermowell, 1/2" NPT (requires E30025)*

Length	Part No.	List Price (1-pc.)
100 mm	UT0009	$32.00
200 mm	UT0010	$38.00
300 mm	UT0011	$45.00
500 mm	UT0012	$52.00

*Thermal grease for thermowells (order separately), Part No. 700692, List price: $2.50

A · Bolt-on · Pt 100 · Prewired with M12 quick disconnect

Cable Length	RTD Element	Temperature Range	Part No.	List Price (1-pc.)
2 m	Pt 100	-13…194 °F (-25…90 °C)	TS2229	$68.00

Technical Specs

Wetted parts:	316 stainless steel
Response time T05/T09:	TTxxxx: 1/3 sec; TSx051: 6/25 sec; TS2056: 12/39 sec TM9950: 1/3 sec
Ambient temperature:	-13…176 °F (-25…80 °C)
Protection rating:	TTxxxx: IP68 / IP69K; TSxxxx: IP67; TM9950: IP68 / IP69K

Cordsets

Type	Description	Part No.	List Price (1-pc.)
	M12 Micro DC (4-pin) 2 m, PUR	EVC001	$9.95
	M12 Micro DC (4-pin) 5 m, PUR	EVC002	$13.50
	M12 Micro DC (4-pin) 10 m, PUR	EVC003	$18.00
	M12 Micro DC (4-pin) 2 m, PUR	EVC004	$9.95
	M12 Micro DC (4-pin) 5 m, PUR	EVC005	$13.50
	M12 Micro DC (4-pin) 10 m, PUR	EVC006	$18.00

Process Sensors

Pressure	Flow	Level	Temperature	**Industrial Networks** AS-i network	Safety systems	**ID Systems** RF identification systems	**Machine Condition** Diagnostic systems	**Power Supplies** Power supplies	**Wiring Technology** Cordset solutions
144 - 159	160 - 169	170 - 185	186 - 201	204 - 217	218 - 229	232 - 235	238 - 243	246 - 247	250 - 261

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**Infrared temp-
erature switches**

**Non-contact detection
of hot objects**

DC

Switching and analog outputs
Detects objects up to 2900 °F

Top five product features!

- *Reliable part-presence detection of hot objects up to 2900 °F (1600 °C) using non-contact long-distance sensing technology*

- *30 mm threaded stainless steel housing designed for harsh environments*

- *Scratch-resistant, optically coated precision lens for minimum sensitivity to scattered light ensures reliability*

- *Easy setup via pushbutton and display on the sensor*

- *Analog / switching or dual switching outputs are available*

Compact infrared temperature sensor for detecting objects with temperatures up to 2900 °F

NEW!   Many industries involve detection of objects that are too hot for the use of standard position sensors, such as in the manufacturing of asphalt, steel, glass, or ceramic products. ifm's TW Series non-contact infrared temperature switch is designed to detect objects ranging in temperature from 32 to 2900 °F (0 to 1600 °C).

The TW sensor solves these applications by detecting the infrared radiation emitted by the object and converting it into an output signal. The TW2 sensor provides an accurate temperature measurement based on the target emissivity.

High precision in a robust housing

ifm's TW temperature series features a compact robust housing. The integrated scratch-resistant precision quartz lens with anti-reflective coating provides minimum sensitivity to scattered light for reliability in extremely harsh environments.

The TW is available with an M12 Micro quick disconnect connector. For mounting restrictions with limited space, fiber optic units are available. A special lens attachment is required in this case.

Easy setup

Outputs can easily be set using the pushbuttons and digital display of the sensor.
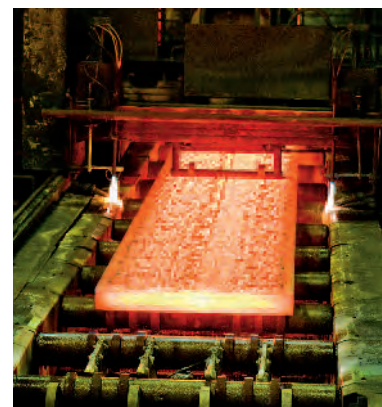
The TW Series temperature sensor can be used to detect a hot steel slab by measuring the infrared radiation intensity emitted from the hot slab.

The TW2 transmitter displays actual temperature of the hot slab and provides a corresponding analog signal.

The TW7 switch displays a percentage of the infrared radiation intensity and provides a switchpoint set by the user.

Company	Position Sensors						Motion Control	Vision Sensors	Safety Technology
	Inductive	Capacitive	Cylinder position	Photoelectrics and lasers	Distance, color and contrast	Fiber optics	Speed monitors	2D / 3D inspection	Safety products
1 - 7	10 - 47	48 - 53	54 - 59	60 - 91	92 - 97	98 - 103	106 - 109	112 - 125	128 - 141

Product + accessory selector

Type	Output	Temperature Range	Accuracy (∈=1)	Wave Length	Part No.	List Price (1-pc.)
Self-contained	Scaleable 4…20 mA and PNP N.O. / N.C.	32…1831 °F (0…995.5 °C)	< ±1% of measured value	8…14 µm	**TW2000**	**$1,060.00**
Self-contained	Scaleable 4…20 mA and PNP N.O. / N.C.	482…2912 °F (250…1600 °C)	< ±0.5% of measured value	1.0…1.7 µm	**TW2001**	**$1,325.00**
Self-contained	Scaleable 4…20 mA and PNP N.O. / N.C.	932…4532 °F (500…2500°C)	< ±0.3% of measured value	0.78…106 µm	**TW2002**	**$1,340.00**
Fiber Optic	Scaleable 4…20 mA and PNP N.O. / N.C.	572…2912 °F (300…1600 °C)	< ±0.5% of measured value	1.0…1.7 µm	**TW2011**	**$1,925.00**
Self-contained	2 x PNP N.O. / N.C.	122…932 °F (50…500 °C)	< ±1% of measured value	8…14 µm	**TW7000**	**$778.00**
Self-contained	2 x PNP N.O. / N.C.	482…2282 °F (250…1250 °C)	< ±1% of measured value	1.0…1.7 µm	**TW7001**	**$1,100.00**
Fiber Optic	2 x PNP N.O. / N.C.	662…2462 °F (350…1350 °C)	< ±1% of measured value	1.0…1.7 µm	**TW7011**	**$1,050.00**

Accessories

Type	Description	Part No.	List Price (1-pc.)
	Air purge	**E35063**	**$119.00**
	Cooling jacket	**E35064**	**$270.00**
	Mounting bracket	**E35065**	**$55.00**
	Protective tube	**E35066**	**$82.00**
	Heat isolator	**E35067**	**$45.00**

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Required Accessories TW2011/TW7011

Description	Part No.	List Price (1-pc.)
Fiber optic cable, 2 m	**E35061**	**$265.00**
Fiber optic cable, 5 m	**E35062**	**$320.00**
Sensor head, lens attachment for IR temperature sensors	**E35060**	**$275.00**

Cordsets

Type	Description	Part No.	List Price (1-pc.)
	M12 Micro DC (5 pin) 10 m, PUR, shielded	**EVC546**	**$45.00**
	M12 Micro DC (5 pin) 10 m, PUR, shielded	**EVC549**	**$45.00**

Technical Specs

Supply voltage: TW2: 18…32 V DC; TW7: 10…34 V DC
Current rating: 150 mA per switching output
Ambient temperature: TW: 32…140 °F (0…60 °C)
      E35060: -4…480 °F (-20…250 °C)
Protection rating: IP65

Reliable service center

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