

Temperature Probes



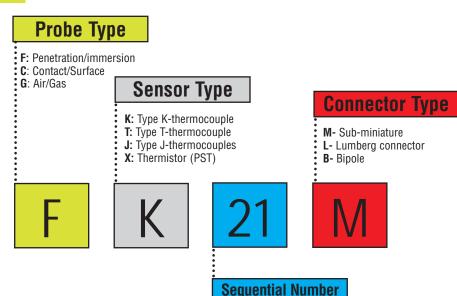
Probe Tips <u>Penetration / Immersion</u> <u>Type "F"</u> 20 Pointed penetration 21 Tapered penetration 22 Chisel penetration 24 Rounded Immersion 26 Corkscrew penetration to Carlinho 28 Alligator Immersion Surface/Contact Type "C" 30 Flat disk (Thermistor) 32 Ribbon 34 Between pack 36 Heavy duty spring Air/Gas Type "G' 40 Air (Thermistor) 42 Beaded thermocouple 44 Hooded 46 Caged 48 Caged with rack clip **Sub-Mini Connector Lumberg Connector Bipolar**

Temperature Probe Catalog V101

Connectors



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What is the difference between thermocouple and thermistor probes?

Thermocouple probes utilize the reaction between two dissimilar metals to produce a voltage that changes as temperature changes. A thermistor is a resistive with a change in temperature. In general, thermocouples offer a wider temperature range and quicker response time than thermistors. Thermistors are typically more accurate than thermocouples.

What are the differences between thermocouple types?

Each thermocouple uses different metals and there fore have different characteristics. Here are general guidelines:

<u>K-Type-</u> Wide temperature range used in many digital thermometers. Identified by a yellow connector. <u>T-Type-</u> Narrower temperature range than J-type but more accurate than K and J types, used in digital thermometers. Identified by a blue connector.

<u>J-Type-</u> Narrower temperature reange the K-Type used in analog and digital thermometers. Identified by a black connector.

Can different thermocouple types be interchanged?

No. Since each thermocouple type uses different metals in it's construction they have different output characteristics. Using a J-type thermocouple in a K-type thermometer will cause measurements to be very inaccurate.

What are the differences between the connector types TPI offers?

<u>Sub-Mini</u>- This is an industry standard connector type allowing TPI probes to be used in any thermocouple thermometer using this type of connector. Sub-mini connectors are quick and easy to use, simply push in and out. A wide variety of economical probes are available with sub-mini connectors, enhancing versatility and affordability of the temperature tester.

<u>Lumberg</u>- This connector uses a screw collar to attach to the thermometer and is the most secure connection available. Lumberg connectors are designed for the rigors of food processing environments. Advantages include:

- Strong connection stainless steel collar holds and protects connection. Probe will not pull out of instrument with out unscrewing the collar.
- Waterproof stainless steel will not rust and is ideal for wet, humid conditions
- Lumberg connectors are manufactured following ISO9000 quality control guidelines.

Bi-Polar- This connector is used in the TPI thermistor probe line.



_____ Lumbera

Connector



Bipolar Connectors

REFER TO THE TPI WEBSITE FOR ADDITIONAL OR OEM PROBE OPTIONS

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Contact/Surface Probe Applications (C)

- Measure grill temperature to assure correct cooking temperatures.
- Check frozen food to assure proper storage temperatures.
- Measure temperatures between package to ensure proper quality control.
- Check any surface for correct process control temperatures.
- Measure superheats on condensers.
- Measure griddle temperature.
- Measure mackinery or mold temperature with a surface probe.
- Measure pipe temperatures in any industrial application.

Penetration / Immersion Probe Applications (F)

- Check internal food temperatures to assure quality control.
- Measure deep fat fryers with a high temp immersion probe.
- Measure liquids and semi-solid temperatures in food processing applications.
- Use a reduced tip probe for quicker response times where time is crucial to the process.

Air/Gas Probe Applications. (G)

- Measure air temperatures in duct work.
- Measure air temperature coming from diffusers while Trouble-shooting heating and air conditioning systems.
- Measure flame temperatures to trouble-shoot industrial heating applications.
- Calibrate thermostats using an ambient air probe.

Probe	Penetration/Immersion (F)	Contact/ Immersion (C)	Air/Gas (G)
Tips	A	H	
	Use for penetation into solids and immersion into semi-solids & liquids.	Designed to measure surface temperatures	Measure air or gas temperatures
	Pointed: Can be used in air with slower response Chisel: Can be used in air and on surfaces with slower response Tapered: Heavy duty, large diameter shaft for bend resistant	Ribbon: Fast response. Spring: Heavy duty sensing element for higher surface temperatures	Beaded: Flexible, can be used in some liquid immersion applications Hooded: Rigid, hood provides protection for the sensing element. Caged: Rigid, cage provides maximum protec- tion for the sensing element.

What type of probe should I use?

The type of probe you use depends upon your application. Here are some general guidelines for different types of probes. <u>Penetration/Immersion (F)</u> General purpose probe used for penetration and immersion; can be used for air, but is much slower than an air probe. Need to select the tip type that best cuits the application.

<u>Contact/Surface (C)</u> Contact probes are used to measure surface temperatures. Penetration probes, with the exception of the chisel tip, can't measure surface temperatures. Need to select the tip type that best suits the application

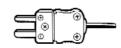
<u>Air/Gas (G)</u> Air probes measure the air or gas temperatures. They respond significantly faster than penetration or contact probes in air. Need to select the tip type that best fits the application.

K-Type Thermocouple with Sub-Mini Connector Probes

Model # Description	Application	Range°F°C	Probe tip	Dimensions	Insulation Material
CK11M Contact surface probe, water proof	Contact tempera- tures on flat and uneven surfaces	-58° to 500°F -50° to 250°C	32	Stem Length: 4" (102mm) Diameter: 0.13" (3.2mm) Lead Length: 39.4" (1M) IP Rating: N/A	Polyurethane
CK12M Contact surface probe, right angle, waterproof	Contact tempera- tures on flat and uneven surfaces	-58° to 500°F -50° to 250°C	32	Stem Length: 4" (102mm) w/90° bend Diameter: 0.3" (7.5mm) Lead Length: 39.4" (1M) IP Rating: N/A	Polyurethane
CK13M Heavy-duty contact surface probe	Contact tempera- tures on flat and uneven high tem- perature surfaces	-58° to 1202°F -50° to 650°C	36	Stem Length: 4" (102mm) Diameter: 0.6" (14mm) Lead Length: 39.4" (1M) IP Rating: N/A	Polyurethane
CK14M Right angle heavy- duty contact surface probe	Contact tempera- tures on flat and uneven high tem- perature surfaces	-58° to 1202°F -50° to 650°C	36	Stem Length: 6" (152mm) w/90° bend Diameter: 0.6" (14mm) Lead Length: 39.4" (1M) IP Rating: N/A	Polyurethane
CK15M Heavy-duty contact surface probe for HK11M handle	Contact tempera- tures on flat and uneven high tem- perature surfaces	-40° to 950°F -40° to 510°C	36	Stem Length: 8" (203mm) Diameter: 0.6" (14mm) Lead Length: N/A IP Rating: N/A	N/A



K-Type Thermocouple with Sub-Mini Connector Probes



Model #	Application	Range°F°C		Probe	Dimensions	Insulation Meterial
Description CK16M Heavy-duty contact surface probe	Contact tempera- tures on flat and uneven high tem- perature surfaces	-40° to 950°F -40° to 510°C		tip 36	Stem Length: 8" (203mm) Diameter: 0.6" (14mm) Lead Length: 39.4" (1M) IP Rating: N/A	Material Polyurethane
CK17M Contact surface probe, 45 degree angle	Contact tempera- tures on flat and uneven surfaces	-40° to 500°F -50° to 250°C		32	Stem Length: 4" (102mm) w/45° bend Diameter: 0.3" (7.5mm) Lead Length: 39.4" (1M) IP Rating: N/A	Polyurethane
CK18M Contact surface probe	Contact temper- atures on flat surfaces	-58° to 500°F -50° to 250°C		32	Stem Length: N/A Nomin: 2.36" (60mm) Lead Length: 39.4" (1M) IP Rating: N/A	Polyurethane
CK20M Pipe clamp probe	Clamp probe for pipe tempera- tures	-58° to 212°F -50° to 100°C		N/A	Max jaw opening: 0.79" Nominal jaw opening: 0.25" Lead Length: 39.4" (1M) IP Rating: N/A	Polyurethane
CK21M Pipe clamp probe	Clamp probe for pipe tempera- tures	-58° to 212°F -50° to 100°C		N/A	Max jaw opening: 1.2" Nominal jaw opening: 0.75" Lead Length: 39.4" (1M) IP Rating: N/A	Polyurethane
CK22M Fast response contact surface probe, 45 degree angle swivel head sensor	Contact temper- atures on flat and uneven sur- faces	-58° to 500°F -50° to 250°C		32	Stem Length: 4.5" (114mm) w/45° bend Diameter: 0.5" (12.7mm) Lead Length: 39.4" (1M) IP Rating: N/A	Polyurethane
CK23M Fast response contact surface probe, 90 degree angle swivel head sensor	Contact temper- atures on flat and uneven sur- faces	-58° to 500°F -50° to 260°C		32	Stem Length: 4.9" (125mm) w/90° bend Diameter: 0.5" (12.7mm) Lead Length: 39.4" (1M) IP Rating:	Polyurethane
FK11M Chisel tip penetra- tion probe	General purpose penetration into semi-solids and liquids	-58° to 500°F -50° to 250°C		20	Stem Length: 4" (102mm) Diameter: 0.13" (3.2mm) Lead Length: 39.4" (1M) IP Rating: 67	Polyurethane
FK12M Pointed tip tapered penetration probe	Heavy duty penetra- tion into semi-solids and liquids tapered shaft resist bending	-58° to 500°F -50° to 250°C		21	Stem Length: 11.8" (300mm) Diameter: 0.25 / 0.10" (6.4 / 2.5mm) Lead Length: 39.4" (1M) IP Rating: 67	Polyurethane
FK13M Pointed tip penetra- tion probe for HK11M handle	General purpose penetration into semi-solids and liquids	-40° to 1562°F -40° to 850°C		20	Stem Length: 8" (203mm) Diameter: 0.15" (3.75mm) Lead Length: N/A IP Rating: 67	N/A
FK14M Chisel tip penetra- tion probe	General purpose penetration into semi-solids and liquids	-40° to 1562°F -40° to 850°C		20	Stem Length: 8" (203mm) Diameter: 0.15" (3.75mm) Lead Length: 39.4" (1M) IP Rating: 67	Polyurethane
FK15M Tapered tip low mass quick response pene- tration probe	Food temperature measurements and other light duty applications	-58° to 500°F -50° to 250°C		20	Stem Length: 3.75" (80mm) Diameter: 0.06 (1.6mm) Lead Length: 39.4" (1M) IP Rating: N/A	Teflon
FK21M Tapered chisel tip penetration probe	General purpose light duty penetration applications requiring fast response	-58° to 500°F -50° to 250°C		21	Stem Length: 4." (101.6mm) Diameter: 0.13"/.06" (3.2/1.6mm) Lead Length: 39.4" (1M) IP Rating: 67	Polyurethane
FK22M Pointed tip penetra- tion probe	General purpose light duty penetration applications requiring fast response	-58° to 500°F -50° to 250°C		21	Stem Length: 4" (101.6mm) Diameter: 0.09/0.06" (3.2/2.5mm) Lead Length: 39.4" (1M) IP Rating: N/A	Teflon
FK23M Rack clamp probe	General purpose air / liquid probe with clip	-40° to 950°F -40° to 510°C	R	28	Stem Length: N/A Diameter: N/A Lead Length: 177" (4.5M) IP Rating: 67	Teflon
FK24M Heavy duty T-handle long stem penetra- tion probe	General purpose penetration into semi-solids and liquids	-40° to 500°F -40° to 250°C		21	Stem Length: 24" (610mm) Diameter: 0.37"/0.15" (9.5mm/3.76mm) Lead Length: 39.4" (1M) IP Rating: 67	Polyurethane

REFER TO THE TPI WEBSITE FOR ADDITIONAL OR OEM PROBE OPTIONS

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K-Type Thermocouple with Sub-Mini Connector Probes

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Model # Description	Application	Range°F°C		Probe tip		Dimensions	Insulation Material
FK25M Flat sensor pack probe	Between pack temperatures	-40° to 400°F -40° to 204°C		34	Lead Length: IP Rating:	N/A 39.4" (1.2M) 67	Polyurethane
FK26M Petes plug probe	Petes plug temperatures	-40° to 400°F -40° to 204°C		24	Stem Length: Diameter: Lead Length: IP Rating:	0.12" (3mm)	Polyurethane
FK27M Waterproof long stem heavy duty penetration probe	General purpose penetration into semi-solids and liquids	-58° to 500°F -50° to 250°C		21	Diameter: Lead Length: IP Rating:	67	Polyurethane
FK28M Heavy duty penetration probe	Heavy duty penetra- tion into semi-solids and liquids tapered shaft resist bending	-58° to 500°F -50° to 250°C		22	Stem Length: Diameter: Lead Length: IP Rating:	0.13" (3.2mm) 39.4" (1M) N/A	Polyurethane
FK29M Long stem pointed tip penetration probe	General purpose penetration into semi-solids and liquids	-58° to 500°F -50° to 250°C		22	Diameter: Lead Length: IP Rating:	6.3" (160mm) 0.13" (3.2mm) 39.4" (1M) N/A	Polyurethane
FK30M Long stem heavy duty T-handle pene- tration probe	Heavy duty penetra- tion into semi-solids and liquids tapered shaft resist bending	-58° to 500°F -50° to 250°C		22	Stem Length: Diameter: Lead Length: IP Rating:	24" (609.60mm) 0.38" (9.5mm) 39.4" (1M) 67	Polyurethane
FK31M T-handle corkscrew insertion probe	General purpose penetration into semi-solids	-58° to 500°F -50° to 250°C	Must be used with EXT31M extension (included)	26	Stem Length: Diameter: Lead Length: IP Rating:	0.20" (5mm)	Polyurethane
FK32M Long stem heavy duty T-handle pene- tration probe	Heavy duty penetra- tion into semi-solids and liquids tapered shaft resist bending	-58° to 500°F -50° to 250°C		24	Stem Length: Diameter: Lead Length: IP Rating:	0.37 [°] /0.15 [°] (9.5mm/3.76mm)	Polyurethane
GK11M General purpose beaded tip probe	Exposed junction for fast response in non- food liquid, air and surface applications	-40° to 950°F -40° to 510°C		42	Stem Length: Diameter: Lead Length: IP Rating:	28 gauge	Fiberglass
GK12M General purpose beaded tip probe with rack clip	Exposed junc- tion for fast response in air applications.	-40° to 950°F -40° to 510°C		42		N/A 20 gauge 48" (1.2M) N/A	Fiberglass
GK13M General purpose beaded tip probe	Exposed junction for fast response in food and non-food liquid, air and sur- face applications	-40° to 400°F -40° to 204°C		42	Stem Length: Diameter: Lead Length: IP Rating:	24 gauge	Teflon
GK14M Rigid stem hooded exposed tip probe	Exposed junc- tion for fast response in air applications.	-58° to 910°F -40° to 510°C		44	Stem Length: Diameter: Lead Length: IP Rating:	0.13" (3.75mm)	Polyurethane
GK16M General purpose caged air probe for use with HK11M handle	Caged exposed junction for fast response in air	-40° to 500°F -40° to 260°C		46	Stem Length: Diameter: Lead Length: IP Rating:	0.26" (6.5mm)	N/A
GK17M General purpose caged air probe	Caged exposed junction for fast response in air	-40° to 500°F -40° to 260°C		46	Stem Length: Diameter: Lead Length: IP Rating:	0.26" (6.5mm)	Polyurethane
GK18M General purpose caged air probe with rack clip and armored cable	Caged exposed junction for fast response in air	-40° to 586°F -40° to 308°C		48	Stem Length: Diameter: Lead Length: IP Rating:	N/A	Braided stainless steel
GK19M General purpose beaded tip probe with armored cable	Exposed junction for fast response in non-food liquid, air and surface appli- cations	-40° to 950°F -40° to 510°C		42	Stem Length: Diameter: Lead Length: IP Rating:	28 gauge	Braided stainless steel

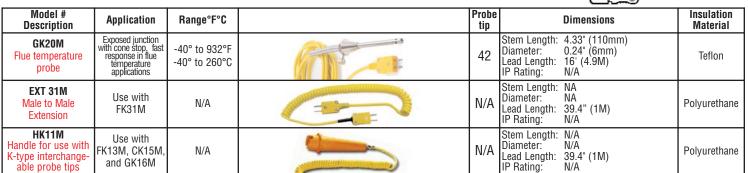


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K-Type Thermocouple with Sub-Mini Connector Probes



J-Type Thermocouple with Sub-Mini Connector Probes 🗧

Model # Description	Application	Range°F°C	Probe tip	Dimensions	Insulation Material
GJ11M Standard fiberglass insulation, 4 foot, bead- ed end (disposable)	Exposed junc- tion for fast response	-40° to 950°F -40° to 500°C		Stem Length: N/A Diameter: 24 Gauge Lead Length: 1.2 IP Rating: N/A	Fiberglass
GJ12M GJ11M with oven clip	Oven clip to shield sensor from direct radiated heat	-40° to 950°F -40° to 500°C		Stem Length: N/A Diameter: 24 Gauge Lead Length: 1.2 IP Rating: N/A	Fiberglass

K-Type Thermocouple with Lumberg Connector Probes 😳 🚺 💽

Model # Description	Application	Range°F°C	Probe tip	Dimensions	Insulation Material
FK21L Contact surface probe with ribbon sensor. Water proof	Food Penetration	-58° to 500°F -50° to 250°C	21	Stem Length: 4" (101.6mm) Diameter: 0.13/.06" (3.2/1.6mm) Lead Length: 39.4" (1M) IP Rating: 67	Polyurethane
FK22L Oven food probe	Testing food temperatures during cooking	-58° to 500°F -50° to 250°C	20	Stem Length: 4"(101.6mm) Diameter: 0.09/.06" (3.2/1.6mm) Lead Length: 47.2" (1.2M) IP Rating:	Teflon
FK23L Immersion / Penetration probe no handle or lead	Food Penetration	-58° to 500°F -50° to 250°C	21	Stem Length: 3.9"(100mm) Diameter: 0.15" (3.75mm) Lead Length: NA IP Rating: 67	NA
FK25L Flat sensor pack probe	Between pack	-40° to 400°F -40° to 204°C	34	Stem Length: NA Diameter: NA Lead Length: 47.2" (1.2M) IP Rating: 67	Teflon
FK26L Immersion / Penetration probe	Food Penetration	-58° to 500°F -50° to 250°C	20	Stem Length: 4"(101.6mm) Diameter: .09/.06" (2.4/1.6mm) Lead Length: 39.4" (1M) IP Rating: 67	Polyurethane

T-Type Thermocouple with Lumberg Connector Probes 💮 🚺 🚺

Model # Description	Application	Range°F°C	Probe tip	Dimensions	Insulation Material
CT11L Surface probe with ribbon sensor	Surface Temperatures Grills	-58° to 500°F -50° to 250°C	22	Stem Length: 4"(102mm) Diameter: 0.13" (3.2mm) Lead Length: 39.4" (1M) IP Rating: N/A	PVC
FT11L Chisel tip penetra- tion probe	General purpose penetation into semi-solids and liquids	-148° to 500°F	 22	Stem Length: 4"(101.6mm) Diameter: 0.13/.15" (3.2mm/2.2mm Lead Length: 39.4" (1M) IP Rating: 67) Polyurethane

T-Type Thermocouple with Lumberg Connector Probes 😳 🚺 💿

Model # Description	Application	Range°F°C		Probe tip		Dimensions	Insulation Material
FT12L Needle probe	Weiner probe for food processing	-148° to 500°F -100° to 250°C		22	Stem Length: Diameter: Lead Length: IP Rating:	4"(101.6mm) 0.13"(3.2mm) 39.4" (1.0M) 67	PVC
FT15L Needle probe	Weiner probe for food pro- cessing	-148° to 500°F -100° to 250°C		22	Stem Length: Diameter: Lead Length: IP Rating:	3.15"(80mm) 0.06"(1.6mm) 39.4" (1.2M) N/A	Teflon
FT21L Tapered end for food penetration Waterproof	Food penetration	-148° to 500°F -100° to 250°C		21	Stem Length: Diameter: Lead Length: IP Rating:	3.2/1.6mm ′	PVC
FT22L Oven food probe	Testing food temperature during cooking	-40° to 500°F -50° to 250°C		22	Stem Length: Diameter: Lead Length: IP Rating:	0.13" `(3.2mm)	Teflon
FT23L Oven food probe	Testing food temperature during cooking	-40° to 950°F -40° to 510°C	and the second sec	28	Stem Length: Diameter: Lead Length: IP Rating:	NA NA 177.2" (4.5M) N/A	Teflon
FT24L Heavy duty T-handle long stem penetra- tion probe	General purpose penetration into semi-solids and liquids	-40° to 500°F -40° to 250°C		21	Stem Length: Diameter: Lead Length: IP Rating:	24" (610mm) 0.37"/0.15" (9.5mm/3.76mm) 39.4" (1M) 67	Polyurethane
GT13L Beaded probe with FDA approved insulation	General Purpose. Air	-148° to 500°F -100° to 250°C		42	Stem Length: Diameter: Lead Length: IP Rating:	NA NA 47.2" (1.2M) 67	Teflon
GT19L Oven clamp probe	Special hangingClip for ovens. Air.	-40° to 500°F -40° to 510°C		48	Stem Length: Diameter: Lead Length: IP Rating:	NA	SS

Thermistor Probe with Lumberg Connectors



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Model # Description	Application	Range°F°C	Probe tip	Dimensions	Insulation Material
FX11L Liquid immersion probe	General Purpose, Liquid	-40° to 300°F -40° to 150°C	24	Stem Length: 4"(102mm) Diameter: 0.13" (3.2mm) Lead Length: 39.4" (1M) IP Rating: 67	PVC

Thermistor Probe with Bipolar Connectors

Model # Description	Application	Range°F°C		Probe tip	Dimensions	Insulation Material
CX13B Surface flat disk probe	Surface	-40° to 300°F -40° to 150°C	NUT	30	Stem Length: 3.15"(80mm) Diameter: 0.3" (7.5mm) Lead Length: 15.7" (0.4M) IP Rating: N/A	PVC
FX12B Liquid immersion probe	General Purpose	-40° to 300°F -40° to 150°C		24	Stem Length: 3.15"(80mm) Diameter: 0.13" (3.2mm) Lead Length: 15.7" (0.4M) IP Rating: N/A	PVC
FX13B Liquid immersion probe	General Purpose	-40° to 300°F -40° to 150°C		24	Stem Length: 8"(203mm) Diameter: 0.13" (3.2mm) Lead Length: 15.7" (0.4M) IP Rating: 67	PVC
GX15B Shielded air probe	Air	-40° to 300°F -40° to 150°C	No.	44	Stem Length: 3.15"(80mm) Diameter: 0.13" (3.2mm) Lead Length: 15.7" (0.4M) IP Rating: N/A	PVC
EX11B extension lead	Thermistor probes	N/A		NA	Stem Length: N/A Diameter: N/A Lead Length: 36" (0.9M) IP Rating: N/A	PVC



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The

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Probe selection

TPI has three basic types of temperature probes: Penetration/Immersion (F), Contact/Surface (C), and Air/Gas (G).

- Penetration/Immersion (F) probes are used for liquids, semi-solids, and solids.
- Contact/Surface (C) probes are designed for surface temperatures.
- Air/Gas (G) probes are designed to measure air or gas temperatures.

Select your type of application and probe tip first. Then match the connector type of the probe to your instrument.

OEM/specialty temperature probes

Whatever your OEM temperature probe needs are, let TPI help you. Just let us have the following information, along with your company and contact information.

- 1. Application, environment, and operating temperature
- 2. New or existing product
- 3. Annual usage and release quantities
- 4. Connector type or bare wire details
- 5. Length of lead wire and straight or coiled wire
- 6. Probe tip type and dimensions
- 7. Any other special requirements, materials, etc.

Cost of ownership temperature probe

Ask us about a customized cost of ownership temperature probe program.

Three Year Limited Warranty on TPI Products

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