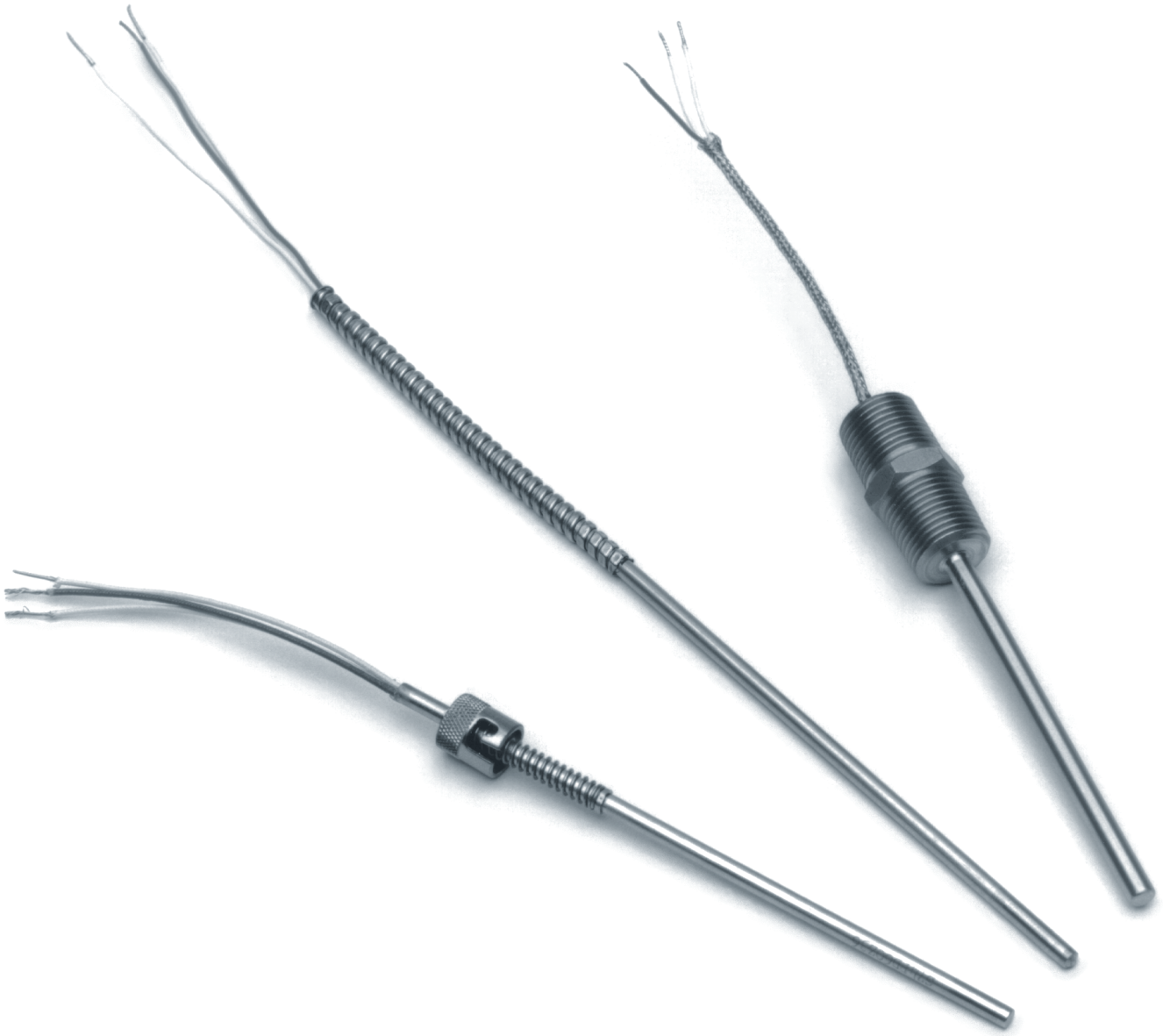
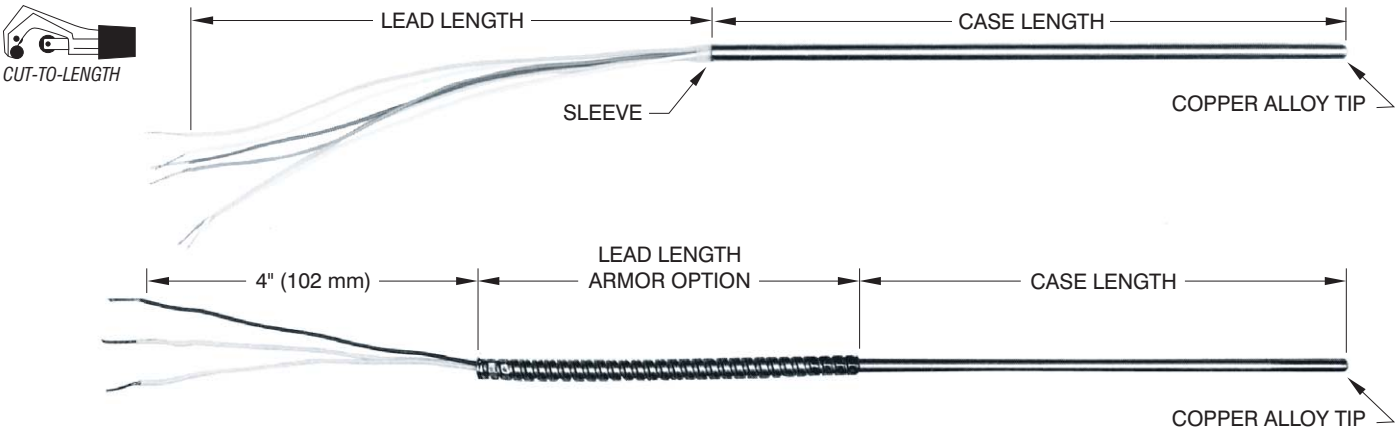


Section 3: RTD and Thermocouple Probes

- Tip-sensitive, high temperature, and fast response versions
- Single and dual elements
- Cut-to-length models are marked with  (see page 3-11 for instructions)



Tip-Sensitive RTDs

- Copper alloy tip for fast response
- Accurate sensing to 260°C (500°F)
- Non armor models can be user-shortened

The sensing tip of these probes is constructed of copper alloy, twenty times more conductive than stainless steel. Sensors react more quickly to changes and indicate tip temperature instead of stem temperature. The result: Better accuracy in thermowells, bearings, and other installations.

0.250" diameter is recommended for use in thermowells.

Specifications

Temperature range:
-50 to 260°C (-58 to 500°F).
Case: Stainless steel with copper alloy tip.
Minimum case length:
Single element probes: 2.8" (71.1 mm).
Dual element probes: 4.0" (101.6 mm).
Maximum case length:
48" (1220 mm), longer on special order.
Leads: 2, 3, or 4 leadwires, stranded copper with PTFE insulation. AWG 22, except 0.188" diameter dual probes AWG 24. For 2-lead RTDs add 0.03 Ω per foot (0.05 Ω per foot for 0.188" diameter dual probes) of combined case and lead length to element tolerance. Copper (CA, CC) models must have 3 leads.
Time constant: 2.0 seconds typical in moving water. 3.0 seconds for dual element models.
Pressure rating: 100 psi (6.9 bar).
Insulation resistance:
Single element probes: 1000 megohms min. at 500 VDC, leads to case.
Dual element probes: 100 megohms min. at 100 VDC, between elements and leads to case.
Vibration: Withstands 10 to 2000 Hz at 20 G's min. per MIL-STD-202, Method 204, Test Condition D.
Shock: Withstands 100 G's min. sine wave shock of 8 milliseconds duration.

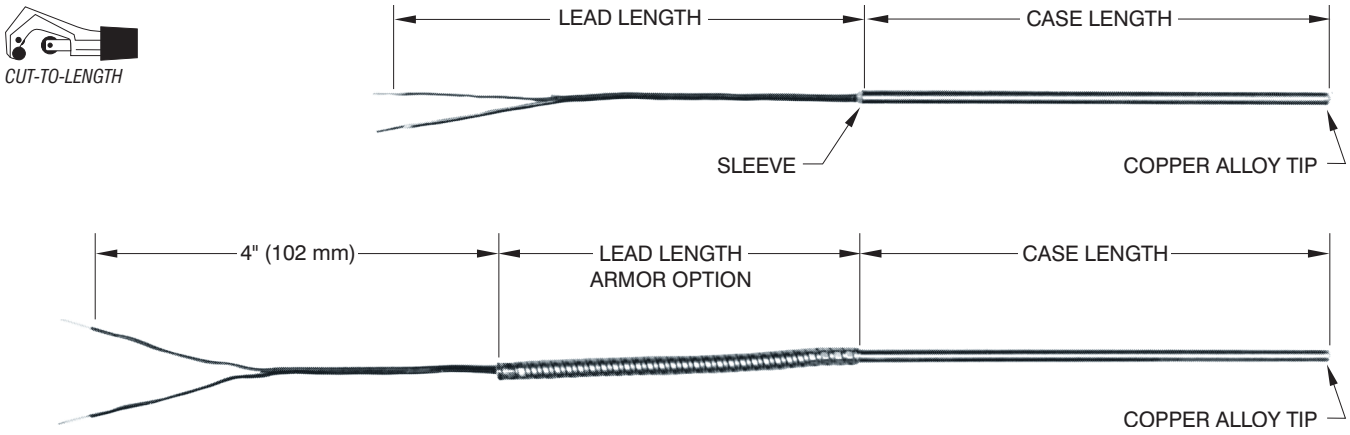
Element	TCR Ω/Ω/°C	Model number for probe diameter: 0.188" (4.8 mm)	0.215" (5.5 mm)	0.250" (6.4 mm)
Single element RTDs: No armor over leads				
Platinum, 100 Ω ±0.5% at 0°C	0.00392	S54PA	S51PA	S53PA
Platinum, 100 Ω ±0.1% at 0°C (meets EN60751, Class B)	0.00385	S854PD	S851PD	S853PD
Platinum, 100 Ω ±0.5% at 0°C	0.00385	S884PE	S881PE	S883PE
Copper, 10 Ω ±0.2% at 25°C	0.00427	S54CA	S51CA	S53CA
Nickel, 120 Ω ±0.5% at 0°C	0.00672	S54NA	S51NA	S53NA
Single element RTDs with armor over leads				
Add element code (Ex: S154NA, S153CA)		S154__	S151__	S153__
Dual element RTDs: No armor over leads				
Platinum, 100 Ω ±0.5% at 0°C	0.00392	S59PA	S56PA	S57PA
Platinum, 100 Ω ±0.1% at 0°C (meets EN60751, Class B)	0.00385	S859PD	S856PD	S857PD
Platinum, 100 Ω ±0.5% at 0°C	0.00385	S889PE	S886PE	S887PE
Copper, 10 Ω ±0.5% at 25°C	0.00427	N/A	S56CC	S57CC
Nickel, 120 Ω ±0.5% at 0°C	0.00672	S59NA	S56NA	S57NA
Dual element RTDs with armor over leads				
Add element code (Ex: S159NA, S157CC)		S159__	S156__	S157__

How to order

S56NA	**Model number from table**
125	**Case length:** Specify in 0.1" increments (Ex: 125 = 12.5 inches)
Y	**Number of leads per sensing element:** Y = 2 leads, Z = 3 leads, X = 4 leads (PD only)
36	**Lead length in inches**
S56NA125Y36 ← Sample P/N	

IN STOCK

Single element models (except PE), lengths from 4" to 24", without armor
Dual models: S859 to 18", S857 to 24"



Tip-Sensitive Thermocouples

- Copper alloy tip for fast response
- Accurate sensing to 260°C (500°F)
- Non armor models can be user-shortened

The sensing tip of these probes is constructed of copper alloy, twenty times more conductive than stainless steel. Sensors react more quickly to changes and indicate tip temperature instead of stem temperature. The result: Better accuracy in thermowells, bearings, and other installations.

0.250" diameter is recommended for use in thermowells.

Specifications

Temperature range:
-184 to 260°C (-300 to 500°F).
Case: Stainless steel with copper alloy tip.
Minimum case length: 2.5" (63.5 mm).
Maximum case length: 48" (1220 mm), longer on special order.
Leads: Solid thermocouple wire, AWG 20 (except AWG 24 on model TC355). Specify PTFE insulation, stainless steel overbraid, or stainless steel armor.
Time constant: Typical value in moving water:
Grounded junction: 1.5 seconds.
Ungrounded junction: 7 seconds.
Pressure rating: 100 psi (6.9 bar).
Insulation resistance: 10 megohms min. at 100 VDC, leads to case, ungrounded junctions only.
Vibration: Withstands 10 to 2000 Hz at 20 G's min. per MIL-STD-202, Method 204, Test Condition D.
Shock: Withstands 100 G's min. sine wave shock of 8 milliseconds duration.

Thermocouple model numbers

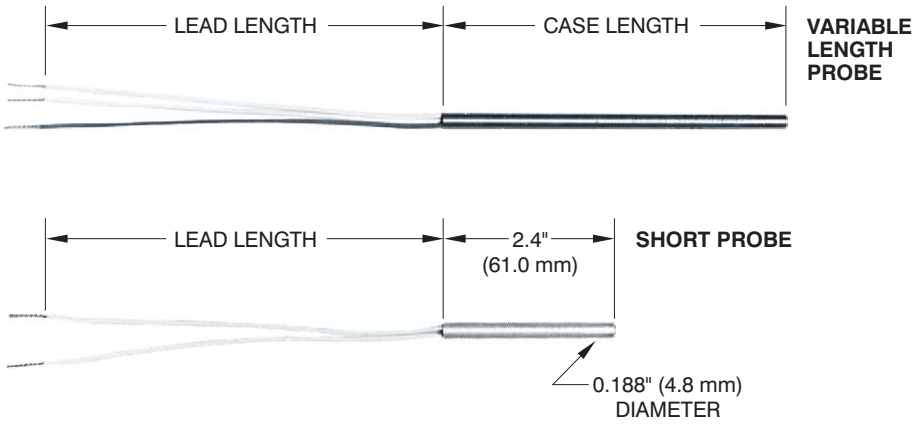
	Model		
	Ø 0.188" (4.8 mm)	Ø 0.215" (5.5 mm)	Ø 0.250" (6.4 mm)
Single junction	TC354	TC356	TC358
Dual junction	TC355	TC357	TC359

How to order

TC356	**Model number from table**
T	**Junction type:** E = Chromel-Constantan J = Iron-Constantan K = Chromel-Alumel T = Copper-Constantan
G	**Junction grounding:** G = Grounded U = Ungrounded
200	**Case length:** Specify in 0.1" increments: Ex: 200 = 20.0 inches
S	**Covering over leadwires:** T = PTFE only G = Glass braid only S = Stainless steel overbraid A = Stainless steel armor
24	**Lead length in inches**
TC356TG200S24 ← Sample P/N	

CUT-TO-LENGTH

S601: 0.215" (5.5 mm) Ø
S602: 0.125" (3.2 mm) Ø
S603: 0.250" (6.4 mm) Ø
S604: 0.188" (4.8 mm) Ø



Fast Response RTDs

- All-stainless steel probes for use to 260°C (500°F)
- Unique low mass element reacts quickly to temperature changes

These probes have rugged stainless steel cases for use in high pressures or corrosive fluids. Yet their time constants are comparable to copper-tipped probes at 2 to 4 seconds, compared to 8 to 10 seconds for other all-stainless probes.

Specifications

Temperature range:
-269 to 260°C (-452 to 500°F).
Case material:
S601, S602, S603, S604: 316 stainless steel.
S614: 304/305 stainless steel.
Case length:
Minimum case length:
S602, S604: 2.0" (50.8 mm) with PTFE insulated leads; 3.0" (76.2 mm) with SS braid over leads.
S601, S603: 3.0" (76.2 mm).
Maximum case length:
48" (1220 mm), longer on special order.
Time constant: Typical in moving water:
S602, S604, S614: 2 seconds.
S601: 3 seconds.
S603: 4 seconds.
Pressure rating: 1500 psi (103 bar).
Leads: 2, 3, or 4 leadwires, AWG 22, stranded copper with PTFE insulation, stainless steel braid, or stainless steel armor. For 2-lead RTDs add 0.03 Ω per foot of combined case and lead length to element tolerance (model S602 has AWG 26; add 0.08 Ω per foot for 2-lead).
Insulation resistance: 1000 megohms min. at 500 VDC, leads to case.
Vibration: Withstands 10 to 2000 Hz at 20 G's min. per MIL-STD-202, Method 204, Test Condition D.
Shock: Withstands 100 G's min. sine wave shock of 8 milliseconds duration.

Sensing elements:

Element	Code
Platinum 392, 100 Ω ±0.5% at 0°C	PA
Platinum 385, 100 Ω ±0.1% at 0°C (Meets EN60751, Class B)	PD
Platinum 385, 100 Ω ±0.5% at 0°C	PE
Platinum 385, 1000 Ω ±0.1% at 0°C (N/A for model S602)	PF
Copper, 10 Ω ±0.2% at 25°C	CA
Nickel, 120 Ω ±0.5% at 0°C	NA

How to order variable length probes

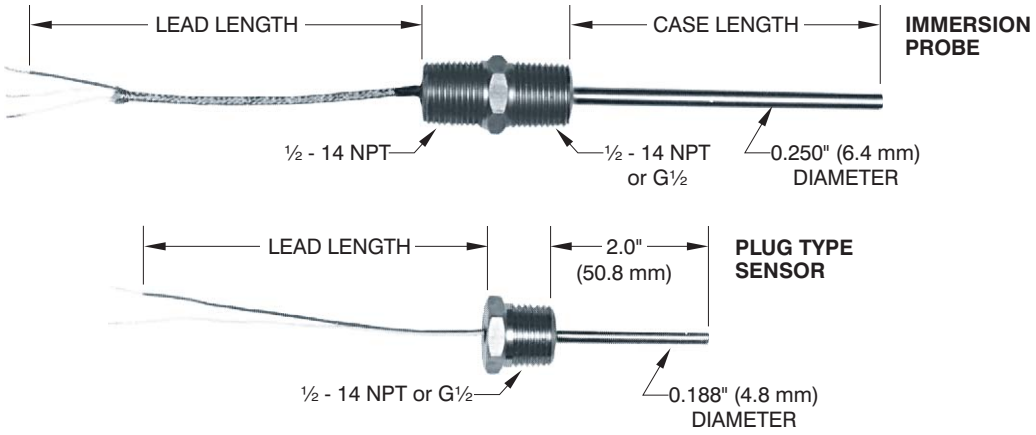
Specify 0.125" or 0.188" for fastest response, 0.250" or 0.215" for greater strength and cut-to-length capability (PTFE and SS braid models).

S604	**Model number:** S601: Ø 0.215" (5.5 mm) S602: Ø 0.125" (3.2 mm) S603: Ø 0.250" (6.4 mm) S604: Ø 0.188" (4.8 mm)
PD	**Sensing element from table**
140	**Case length:** Specify in 0.1" increments (Ex: 140 = 14.0 inches)
X	**Number of leadwires:** Y = 2 leads Z = 3 leads X = 4 leads (PD only)
36	**Lead length in inches**
T	**Covering over leadwires:** T = PTFE only S = Stainless steel braid A = Stainless steel armor (S, A not available on S602)
S604PD140X36T ← Sample P/N	

How to order short probes

This model has a case with fixed length of 2.4" (61 mm). Use it as an all-purpose sensing element.

S614	**Model number: S614**
PA	**Sensing element from table**
Z	**Number of leadwires:** Y = 2 leads Z = 3 leads X = 4 leads (PD only)
12	**Lead length in inches**
S	**Covering over leadwires:** T = PTFE only S = Stainless steel braid
S614PAZ12S ← Sample P/N	



Fast Response Immersion RTDs

- Stainless steel probes for use to 260°C (500°F)
- Pressure rating 1500 psi (103 bar)
- Quick reaction to changing fluid and gas temperatures
- NPT (U.S.) or metric threads

You can mount these probes directly in fluid streams for accurate, reliable sensing. Time constant is just 2 seconds, compared to 10 seconds for an ordinary stainless probe or up to 50 seconds for a thermowell. The result: More accurate monitoring of dynamic processes.

Specifications

Temperature range:
-269 to 260°C (-452 to 500°F).
Case material:
S623, S628: 316 stainless steel.
S634, S639: 304/305 stainless steel.
Case length:
Minimum case length: 1.5" (38.1 mm).
Maximum case length: 48" (1220 mm), longer on special order.
Time constant: Typical value in moving water:
S623, S628: 4 seconds.
S634, S639: 2 seconds.
Pressure rating: 1500 psi (103 bar).
Leads: 2, 3, or 4 leadwires, AWG 22, stranded copper with PTFE insulation, stainless steel braid, or stainless steel armor. For 2-lead RTDs add 0.03 Ω per foot of combined case and lead length to element tolerance.
Insulation resistance: 1000 megohms min. at 500 VDC, leads to case.
Vibration: Withstands 10 to 2000 Hz at 20 G's min. per MIL-STD-202, Method 204, Test Condition D.
Shock: Withstands 100 G's min. sine wave shock of 8 milliseconds duration.

Sensing elements:

Element	Code
Platinum 392, 100 Ω ±0.5% at 0°C	PA
Platinum 385, 100 Ω ±0.1% at 0°C (Meets EN60751, Class B)	PD
Platinum 385, 100 Ω ±0.5% at 0°C	PE
Platinum 385, 1000 Ω ±0.1% at 0°C (N/A for model S602)	PF
Copper, 10 Ω ±0.2% at 25°C	CA
Nickel, 120 Ω ±0.5% at 0°C	NA

How to order immersion probes

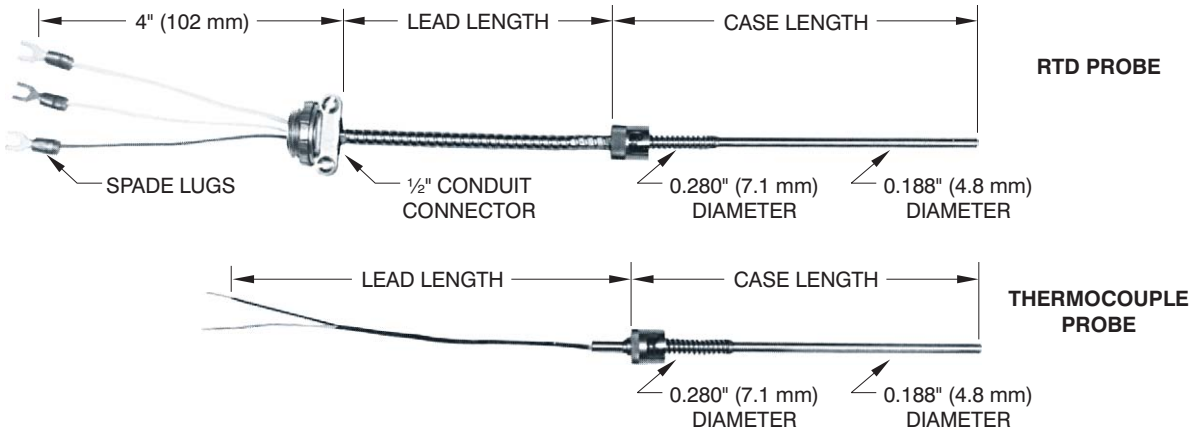
These probes have welded fittings to mount directly into fluid vessels. Add a connection head for termination of extension leads.

S623	**Model number:** S623: ½ - 14 NPT thread [2] S628: ISO 228/1-G½ process thread (½ - 14 NPT on leads end)
PF	**Sensing element from table**
60	**Case length:** Specify in 0.1" increments (Ex: 60 = 6.0 inches)
Y	**Number of leads:** Y = 2 leads Z = 3 leads X = 4 leads (PD only)
72	**Lead length in inches**
A	**Covering over leadwires:** T = PTFE only S = Stainless steel braid A = Stainless steel armor
S623PF60Y72A ← Sample P/N	

How to order plug type sensors

Save space and get accurate readings with this compact, easy-to-install probe.

S634	**Model number:** S634: ½ - 14 NPT thread S639: ISO 228/1-G½ thread
NA	**Sensing element from table**
Y	**Number of leads:** Y = 2 leads Z = 3 leads X = 4 leads (PD only)
24	**Lead length in inches**
T	**Covering over leadwires:** T = PTFE only S = Stainless steel braid
S634NAY24T ← Sample P/N	



Bayonet Mount Tip-Sensitive Probes

- Lockcap and spring for twist-and-release spring loading
- Accurate sensing to 260°C (500°F)

Bayonet mounting provides easy and inexpensive spring loaded installation of probes into solids. All models have a copper alloy tip for fast time response and increased tip sensitivity.

See page 4-9 for bayonet fittings.

Specifications

Temperature range:
-50 to 260°C (-58 to 500°F).
Case: Stainless steel with copper alloy tip.
Minimum case length: 3.0" (76.2 mm).
Maximum case length: 48" (1220 mm), longer on special order.
Vibration: Withstands 10 to 2000 Hz at 20 G's min. per MIL-STD-202, Method 204, Test Condition D.
Shock: Withstands 100 G's min. sine wave shock of 8 milliseconds duration.

⚠ See compatible fittings on pages 4-9 and 4-10.

RTDs

Element	Model
Platinum 392, 100 Ω ±0.5% at 0°C	S44PA
Platinum 385, 100 Ω ±0.1% at 0°C (Meets EN60751, Class B)	S844PD
Platinum 385, 100 Ω ±0.5% at 0°C	S874PE
Copper, 10 Ω ±0.2% at 25°C	S44CA
Nickel, 120 Ω ±0.5% at 0°C	S44NA

Leads: 2, 3, or 4 leadwires, AWG 22, stranded copper with PTFE insulation, stainless steel armor, and ½" conduit connector. For 2-lead RTDs add 0.03 Ω per foot of combined case and lead length to element tolerance.
Time constant: 2 seconds typical in moving water.
Insulation resistance: 1000 megohms min. at 500 VDC, leads to case.

How to order

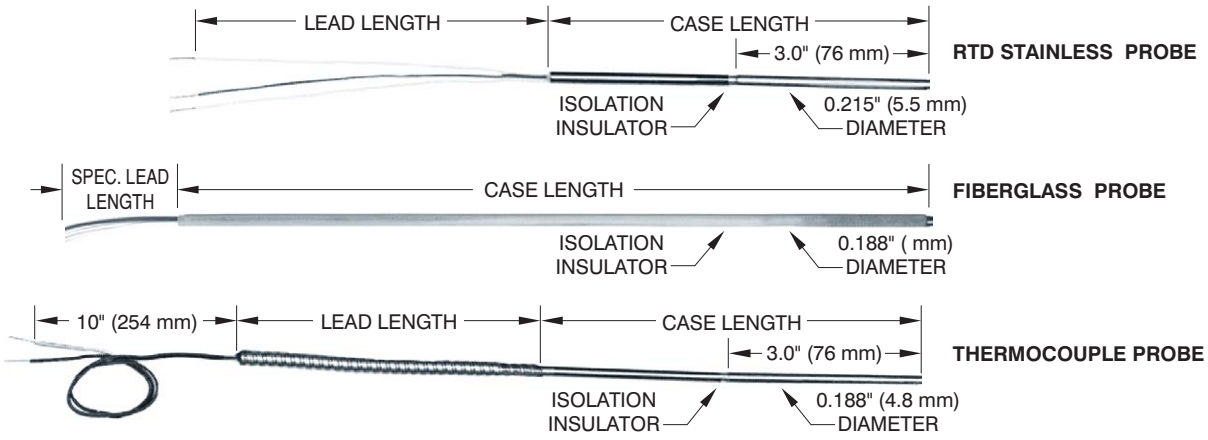
S874PE	**Model number from table**
110	**Case length:** Specify in 0.1" increments (Ex: 110 = 11.0 inches)
Y	**Number of leads:** Y = 2 leads, Z = 3 leads, X = 4 leads (PD only)
36	**Lead length in inches**
S874PE110Y36 ← Sample P/N	

Thermocouples

Leads: Solid thermocouple wire, AWG 20 (single) or AWG 24 (dual). Specify PTFE insulation, glass braid insulation, stainless steel braid over glass braid, or stainless steel armor over PTFE.
Time constant: Typical value in moving water:
Grounded junction: 1.5 seconds.
Ungrounded junction: 7 seconds.
Insulation resistance: 10 megohms min. at 100 VDC, leads to case, ungrounded junctions only.

How to order

TC360	**Model number:** TC360 = Single junction, TC361 = Dual junction
E	**Junction type:** E = Chromel-Constantan, J = Iron-Constantan, K = Chromel-Alumel, T = Copper-Constantan
G	**Junction grounding:** G = Grounded, U = Ungrounded
95	**Case length:** Specify in 0.1" increments (Ex: 95 = 9.5 inches)
A	**Covering over leadwires:** T = PTFE only, G = Glass braid, A = Stainless steel armor, S = Stainless steel overbraid
12	**Lead length in inches**
TC360EG95A12 ← Sample P/N	



Electrically Isolated Probes

- Electrically isolated sensing tip for "hot" bearings
- Accurate sensing to 260°C (500°F), 155°C (311°F) for fiberglass probes.
- Copper alloy tip for fast time response and increased tip sensitivity.

Specifications

Dielectric strength of isolation insulator: 1000 volts RMS at 60 Hz for 30 seconds, between case sections, 1 mA max. leakage current.
Pressure rating: 30 psi (2.1 bar).
Vibration: Withstands 10 to 2000 Hz at 20 G's min. per MIL-STD-202, Method 204, Test Condition D.
Shock: Withstands 100 G's min. sine wave shock of 8 milliseconds duration.

Fiberglass sheath RTDs

Element	Model
Platinum 392, 100 Ω ±0.5% at 0°C	S101659PA
Platinum 385, 100 Ω ±0.12% at 0°C (Meets EN60751, Class B)	S101659PD
Platinum 385, 100 Ω ±0.5% at 0°C	S101659PE
Copper, 10 Ω ±0.2% at 25°C	S101659CA
Nickel, 120 Ω ±0.5% at 0°C	S101659NA

Temp. Range: -50 to 155°C (-58 to 311°F).
Case: Filament braided glass/epoxy tubing with copper alloy tip.
Minimum case length: 3.0" (101.6 mm).
Maximum case length: 40" (1220 mm).
Leads: 2 (not available with CA element models), 3, or 4 leadwires, AWG 22, stranded copper with PTFE insulation. For 2-lead RTDs add 0.03Ω per foot of combined case and lead length to element tolerance.
Time constant: 2.5 seconds typical in moving water.
Insulation resistance: 1000 megohms min. at 500 VDC, leads to tip.

Isolated tip RTDs

Element	Model
Platinum 392, 100 Ω ±0.5% at 0°C	S52PA
Platinum 385, 100 Ω ±0.1% at 0°C (Meets EN60751, Class B)	S852PD
Platinum 385, 100 Ω ±0.5% at 0°C	S882PE
Copper, 10 Ω ±0.2% at 25°C	S52CA
Nickel, 120 Ω ±0.5% at 0°C	S52NA

Temp. Range: -50 to 260°C (-58 to 500°F).
Case: Stainless steel with copper alloy tip.
Minimum case length: 4.0" (101.6 mm).
Maximum case length: 48" (1220 mm), longer on special order.
Leads: 2, 3, or 4 leadwires, AWG 22, stranded copper with PTFE insulation. For 2-lead RTDs add 0.03 Ω per foot of combined case and lead length to element tolerance.
Time constant: 2 seconds typical in moving water.
Insulation resistance: 1000 megohms min. at 500 VDC, leads to case.

How to order

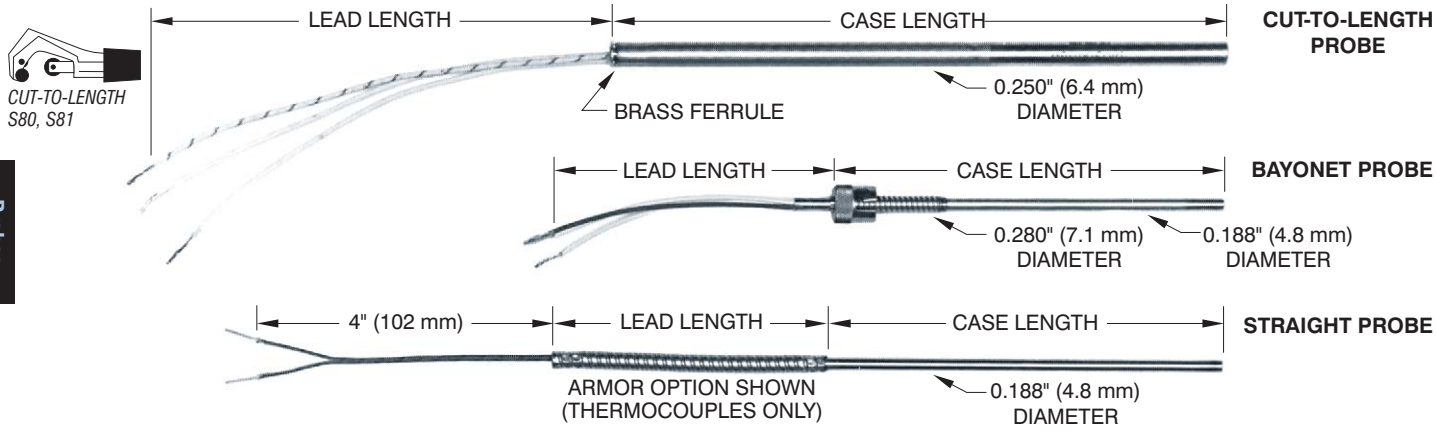
S52CA	**Model number from isolated tip or fiberglass sheath table**
355	**Case length:** Specify in 0.1" increments (Ex: 355 = 35.5 inches)
Z	**Number of leads:** Y = 2 leads, Z = 3 leads, X = 4 leads (PD only)
36	**Lead length in inches**
S52CA355Z36 ← Sample P/N	

Thermocouples

Temp. Range: -50 to 260°C (-58 to 500°F).
Case: Stainless steel with copper alloy tip.
Minimum case length: 4.0" (101.6 mm).
Maximum case length: 48" (1220 mm), longer on special order.
Leads: Solid thermocouple wire, AWG 20 (AWG 24 for stainless steel braid option). Specify PTFE insulation or PTFE with stainless steel armor and shrink tubing over all.
Time constant: Typical value in moving water:
Grounded junction: 1.5 seconds.
Ungrounded junction: 7 seconds.
Insulation resistance: 10 megohms min. at 100 VDC, leads to case, ungrounded junctions only.

How to order

TC2198	**Model number: TC2198**
E	**Junction type:** E = Chromel-Constantan, J = Iron-Constantan, K = Chromel-Alumel, T = Copper-Constantan
U	**Junction grounding:** G = Grounded, U = Ungrounded
225	**Case length:** Specify in 0.1" increments (Ex: 225 = 22.5 inches)
T	**Covering over leadwires:** T = PTFE only, A = Stainless steel armor plus shrink tubing, S = SS braid over PTFE (5" min. case length)
48	**Lead length in inches**
TC2198EU225T48 ← Sample P/N	



550°C RTD and Thermocouple Probes

- 0.250" diameter cut-to-length RTDs
- 0.188" diameter straight and bayonet RTDs and thermocouples.

Install these probes in steam lines, exhaust gases, wherever you need precise readings of elevated temperatures. RTD probes feature high temperature ceramic elements, assembled into stainless steel cases in a configuration that provides long-term reliable service.

Models S80 and S81 are user shortenable. You can stock standard lengths and cut them to the size required with an ordinary tubing cutter.

Bayonet style probes have a lockcap and spring for spring-loaded installation. See page 4-9 for bayonet fittings.

Specifications

Temperature range:
-100 to 550°C (-148 to 1022°F).
Leadwires: 500°C (932°F) max.
Case: 316 stainless steel.
Minimum case length:
0.250" diameter: 4.0" (101.6 mm).
0.188" diameter:
S71, S72: 2.0" (50.8 mm)
S73, S74: 3.0" (76.2 mm).
Maximum case length: 48" (1220 mm), longer on special order.
Pressure rating: 1500 psi (103 bar).
Vibration: Withstands 10 to 2000 Hz at 20 G's min. per MIL-STD-202, Method 204, Test Condition D.
Shock: Withstands 100 G's min. sine wave shock of 8 milliseconds duration.

IN STOCK

S80 and S81, lengths from 4" to 24"

RTDs

Element 100 Ω ±0.1% at 0°C	Ø 0.188" (4.8 mm) Straight probe	Ø 0.188" (4.8 mm) Bayonet probe	Ø 0.250" (6.4 mm) Cut-to-length
Platinum 391	S71PB	S73PB	S80PB
Platinum 385, (Meets EN60751, Class B)	S72PD	S74PD	S81PD

Leads: 2 or 3 leadwires, AWG 22, stranded copper with mica/glass insulation. For 2-lead RTDs add 0.04 Ω per foot of combined case and lead length to element tolerance.
Time constant: 10 seconds typical in moving water.
Insulation resistance: 10 megohms min. at 100 VDC, leads to case.

How to order

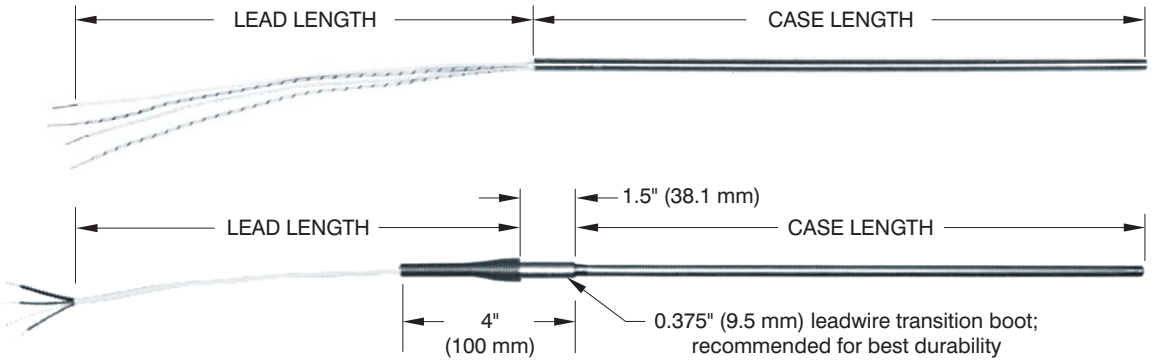
S74PD	**Model number from table**
145	**Case length:** Specify in 0.1" increments (Ex: 145 = 14.5 inches)
Z	**Number of leads:** Y = 2 leads Z = 3 leads
6	**Lead length in inches**
S74PD145Z6 ← Sample P/N	

Thermocouples

Leads: Solid thermocouple wire, AWG 20. Specify glass braid insulation, stainless steel overbraid, or stainless steel armor.
Time constant: 7 seconds typical in moving water.
Insulation resistance: 10 megohms min. at 100 VDC, leads to case, ungrounded junctions only.

How to order

TC173	**Model number:** TC173: Straight probe TC171: Bayonet mount
J	**Junction type:** E = Chromel-Constantan J = Iron-Constantan K = Chromel-Alumel
U	**Junction grounding:** G = Grounded U = Ungrounded
45	**Case length:** Specify in 0.1" increments (Ex: 45 = 4.5 inches)
G	**Covering over leadwires:** G = Glass braid only S = Stainless steel overbraid A = Stainless steel armor
24	**Lead length in inches**
TC173JU45G24 ← Sample P/N	



600°C and 850°C RTDs

- Accurate sensing of extreme high and low temperatures
- Platinum elements to EN60751, Class A or B
- English and metric diameters

These RTDs cover the full temperature scale of the international standard EN60751. Precision sensing elements and nickel alloy sheaths are capable of measurements from -200 to 850°C with typical ice point drift less than ±0.05°C.

600°C models have stainless steel sheaths for reduced cost. They use the same element structure as 850°C models for excellent accuracy and stability.

Specifications

Element: Platinum, 100 Ω at 0°C, TCR = 0.00385 Ω/Ω/°C.
Tolerance: EN60751 Class A or B.
Class A: ± 0.06%
Class B: ± 0.12%
Repeatability: Meet IEC requirements. Typical shift less than 0.05°C (0.02 Ω) at 0°C after ten cycles over range.
Stability: Meet IEC stability specifications after 250 hours exposure to extremes of temperature range. Typical drift is less than 0.05°C (0.02 Ω) at 0°C.
Vibration: Will withstand 10 to 5000 Hz at 2 G's minimum per EN60751.
Shock: Will withstand 250 mm drop onto 8 mm thick steel plate (approximately 1400 G's for 0.08 ms).
Time constant: 10 seconds typical in moving water.
Pressure rating: 1000 psi (69 bar) at 25°C.
Insulation resistance: 10 megohms min. at 100 VDC, leads to case.

600°C probes

Probe diameter	Model number
0.188" (4.8 mm)	S914
0.236" (6.0 mm)	S912
0.250" (6.4 mm)	S913

Temperature range: -200 to 600°C (-328 to 1112°F). Reduced temperature rating for leads and last 2" (50 mm) of case; see leadwire chart.
Case: 316 stainless steel.
Minimum case length: 2.0" (50.8 mm).
Maximum case length: 48.0" (1220 mm), longer on special order.

850°C probes

Probe diameter	Model number
0.157" (4.0 mm)	S926
0.236" (6.0 mm)	S922
0.250" (6.4 mm)	S923

Temperature range: -200 to 850°C (-328 to 1582°F). Reduced temperature rating for leads and last 2" (50 mm) of case; see leadwire chart.
Case: Nickel alloy.
Minimum case length: 6.0" (150 mm).
Maximum case length: 18.0" (460 mm), longer on special order.

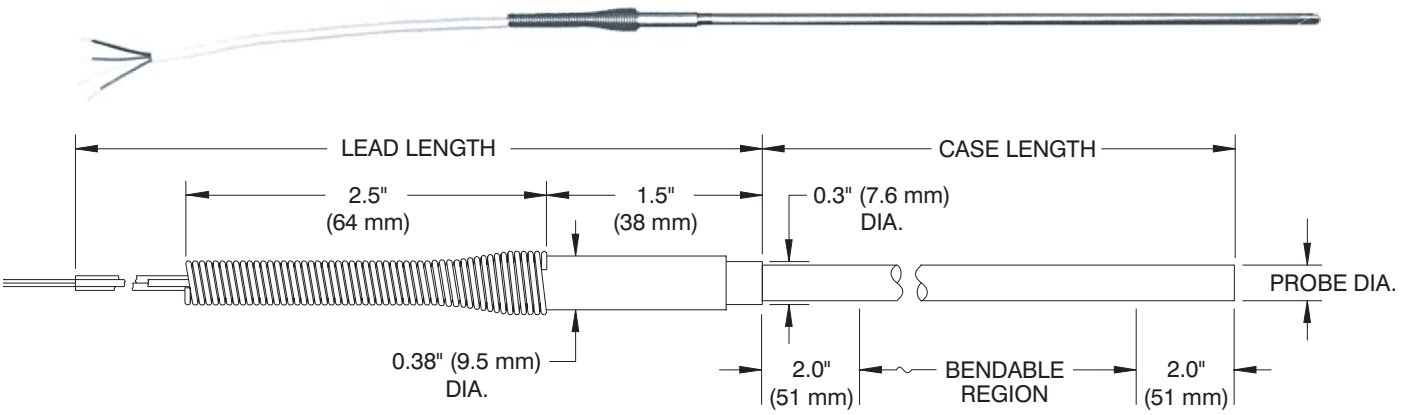
Leadwire options:

Code	Description	Max. temp*
G	Mica/glass insulated stranded copper, AWG 22.	600°C 1112°F
T	PTFE insulated stranded copper, AWG 22.	260°C 500°F
C	AWG 24, PTFE insulated, stranded copper wires with silver-plated copper braid and PTFE over all (4 leads only).	260°C 500°F

* Temp. rating for leads and last 2" of case.

How to order

S914	**Model number from table**
PD	**100 Ω Platinum, 0.00385 TCR**
06	**Tolerance at 0°C:** 06 = ±0.06%, EN60751 Class A 12 = ±0.12%, EN60751 Class B
G	**Leadwire code from table**
120	**Case length:** Specify in 0.1" increments (Ex: 120 = 12.0 inches)
X	**Number of leads:** Z = 3 leads X = 4 leads
24	**Lead length in inches**
BS	**Probe termination:** BS = Boot and spring B = Boot only (Boot required on S926) N = No boot or spring
S914PD06G120X24BS ← Sample P/N	



Mineral-Insulated RTDs

- Mineral MgO packing protects element from shock and contamination
- Field bendable
- Inconel or stainless steel sheath
- High precision RTD elements for stable, repeatable measurements

Mineral-insulated RTDs provide excellent performance, even when exposed to high levels of shock and vibration in tough industrial environments. Typical applications include process control and steam turbine efficiency measurement.

Probes can be bent around a mandrel diameter at least 3 times the probe diameter without kinking.

Custom designed RTDs and thermocouples are available.

Probe diameter	Max. temperature	Case material	Model
0.236" (6.0 mm)	550°C (1022°F)	316 stainless steel	S942
0.236" (6.0 mm)	650°C (1202°F)	Inconel 600	S932
0.250" (6.4 mm)	550°C (1022°F)	316 stainless steel	S943
0.250" (6.4 mm)	650°C (1202°F)	Inconel 600	S933
0.188" (4.8 mm)	550°C (1022°F)	316 stainless steel	S944

Specifications

Element: Platinum, 100 Ω at 0°C, TCR=0.00385 Ω/Ω/°C.
Temperature range:
Inconel case: -200 to 650°C (-328 to 1202°F).
Stainless steel case: -200 to 550°C (-328 to 1022°F). Reduced to 260°C (500°F) for leadwires and potting.
Tolerance: EN60751 Class B (±0.12 Ω = ±0.3°C) or Class A (±0.06 Ω = ±0.15°C)
Repeatability: Meets EN60751 requirements. Typical shift less than 0.05°C (0.1°F) when cycled over temperature range.
Stability: Meets EN60751 specifications after 250 hours exposure to extremes of temperature range. Typical drift of less than 0.05°C (0.1°F) at 0°C.
Vibration: Withstands 10 to 5000 Hz at 2 G's per EN60751. Also withstands 50 to 250 Hz at 50 G's at 500°C.
Shock: Withstands a 1 meter drop onto an 8 mm steel plate (1 meter is 4 times the EN60751 height requirement of 250 mm).
Time constant: 10 seconds typical in moving water.
Pressure rating: 69 bar (1000 psi) at 25°C.
Insulation resistance: 10 megohms min. at 100 VDC.

How to order

S933	**Model number from table**
PD	**100 Ω platinum, 0.00385 TCR**
06	**Tolerance at 0°C:** 06 = ±0.06%, EN60751 Class A 12 = ±0.12%, EN60751 Class B
T	**Leadwire insulation:** T = PTFE leadwires C = PTFE cable (4 lead only)
120	**Case length:** Specify in 0.1" increments (Ex: 120 = 12.0 inches)
X	**Number of leadwires:** Z = 3 leads X = 4 leads
36	**Lead length in inches**
BS	**Lead exit configuration:** (B or BS option recommended for best lead exit strength) BS = Potting boot and strain relief spring B = Potting boot N = No potting boot or spring
S933PD06T120X36BS ← Sample P/N	

Cut-to-length probes

Many probe models in section 3 can be cut to the required length using an ordinary tubing cutter. Cut-to-length models are marked with 

Benefits are:

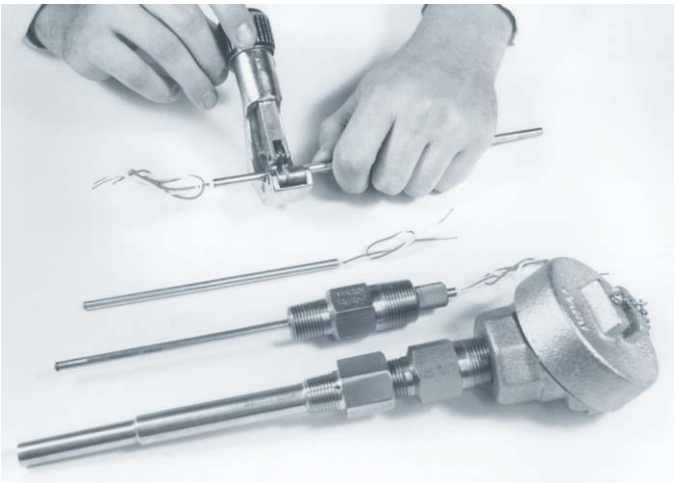
- You can keep standard lengths in inventory, and shorten them as needed for urgent requirements
- Stocking and shortening probes, instead of ordering a few pieces at a time, may let you take advantage of quantity discounts
- Minco stocks most cut-to-length probes and can trim and ship them within 24 hours of your call

How to shorten probes

Remove the PTFE or brass ferrule from the lead exit end of the probe. Mark the proper length, then cut, going slowly to avoid crimping the case or damaging the leads. Use a good quality tubing cutter that is intended to cut stainless steel tubing or conduit. The cutter must have a sharp blade to prevent “rolling in” during cutting of the tubing. Suitable models are available from Imperial Eastman and Sears Industrial.

After cutting, discard the hollow tube section, carefully deburr the cut end, and replace the ferrule. You can slit the PTFE ferrule for easier installation.

If you use many cut-to-length probes consider the AC101248 probe cutting system. It includes an electric Dremel™ tool, flexible shaft and accessories to allow clean, precise cuts. The system includes a convenient carrying case and comes with easy to follow instructions.



Shorten probes easily with a tubing cutter.

The AC101248 probe cutting system makes clean, precise cuts.

Protect probes from chemical attack

AC100375 PFA or FEP encapsulation tubing

The tube is sealed at one end and can be easily shrunk onto any probe. Supplied separately.

Temperature range:
PFA = -70 to 260°C (-94 tp 500°F).
FEP = -70 to 200°C (-94 to 392°F).

IN STOCK

6" and 12" lengths

How to order

AC100375	**Model number**
L60	**Length in 0.1" increments**
P	**Encapsulation type:** P = clear PFA F = clear FEP
188	**Probe diameter:** 125 = 0.125" (3.2 mm) 188 = 0.188" (4.8 mm) 215 = 0.215" (5.5 mm) 250 = 0.250" (6.4 mm)

AC100375L60P188 ← Sample P/N

Specifying Custom Assemblies

The standard assemblies in Section 2 will fit a wide variety of installations. For more versatility you can create new assemblies from the probes, accessories, and transmitters in the pages listed.

Follow these steps:

1. Choose a probe

Select an RTD or thermocouple from Section 3. The section includes tip-sensitive, high temperature, and fast response models. Some have integral fittings or bayonet lockcaps.

Factors to consider are:

- Temperature rating
- Compatibility with receiving instruments
- Probe style and diameter
- Accuracy vs. cost

2. Add a fitting

See Section 4 for probe mounting fittings. Adjustable fittings, combined with cut-to-length probes, allow instant fabrication of assemblies to any length required. Included are spring-loaded holders, pressure fittings, and bayonet-style fittings.

Factors to consider are:

- Temperature rating
- Probe diameter
- Correct NPT threads
- Pressure ratings
- Compatibility with environment

3. Select a thermowell

Thermowells isolate sensors from the effects of fluid flow and pressure. See Section 4 for a variety of well styles and materials.

Factors to consider are:

- Pressure rating
- Compatibility with fluid media
- Insertion depth
- Correct NPT thread

4. Attach a connection head

Finish off your assembly with a connection head for termination to remote extension wires. See pages 4-2 to 5-14.

Factors to consider are:

- Connection head size
- Temperature rating
- Correct pipe threads for fitting and conduit
- Number of terminals or wire nuts
- Hazardous area requirements

5. Install a transmitter

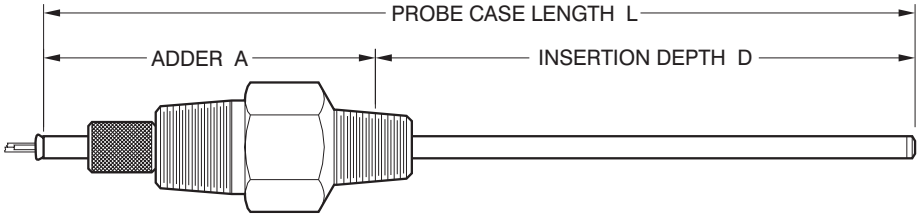
Transmitters convert sensor output to a 4 to 20 mA current signal, immune to leadwire resistance. See Section 5 for RTD and thermocouple transmitters.

Factors to consider are:

- Transmitter accepts sensor input
- Transmitter fits connection head
- Ambient temperature range acceptable

6. How to calculate probe length

All fittings listed in this catalog have probe length adders to help you determine total probe length. Total length L is the insertion depth D plus the adder A.



Thermowell drawings show an adder to convert thermowell length U to insertion depth D. Then use D plus the fitting adder A to find total probe length L.