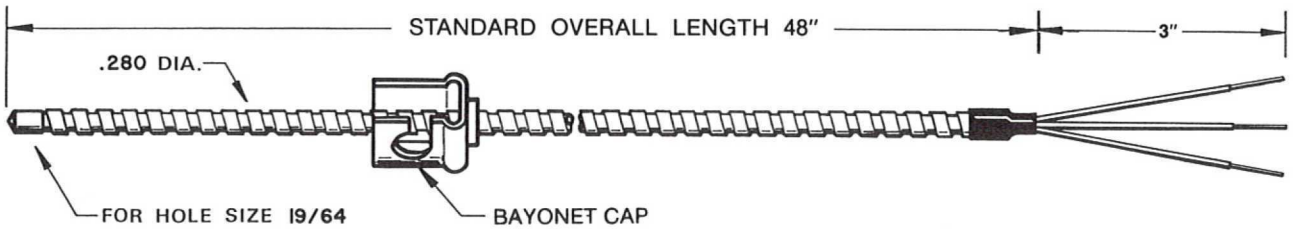
NOTICE:

Prices and availability are subject to change without notice. Please contact Marlin Manufacturing before ordering for updated pricing.

Platinum Resistance Thermometers

Since 1952
Marlin
(216) 941-6200
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 FAX: (216) 941-6207



DESCRIPTION					Marlin Part No.	Price $/Ea.
Probe Diameter	Sheath Mat'l.	Ref. Ohms @°C	Tolerance Class	Circuit Type		
0.280"	304SS	100	0.1%	3 WIRE	M649-48	$75.

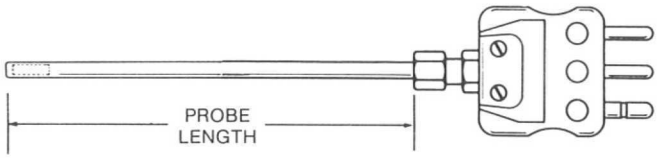
DISCOUNT SCHEDULE	
QUANTITY	FACTOR
1 - 9	Net
10 - 24	.95
25 - 49	.85
100 - 199	.80
200+	.75

Quantity (Feet)	Discount Factor
1 - 999	Net*
1M - 2999	.90
3M - 4999	.85
5M - 9999	.80
10M+	.75

*Respooling charge of $10. for less than 1000 ft.

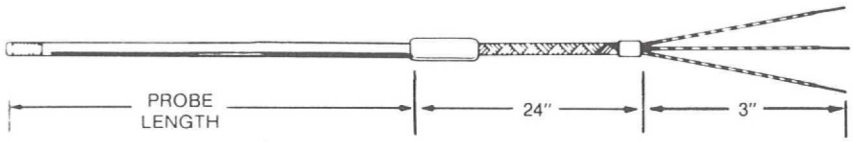
PRT Extension Wire
Color Code: White, Red, Red

Insulation	Ga.	Code	*Price per MFT	Solid/ Stranded	Nominal Size	Insulation Temp. Rating
(Tinned Copper 3 Conductor) Extruded Teflon FEP Triplex-Twisted Tinned Copper Overbraid Extruded Teflon Jacket	24	3CUF-24-E80E	$600.	Stranded	.130	400°F (204°C)
(Nickel/Copper 1 Conductors) Glass Wrap Single	22 22	1CUF-22-W010-RED 1CUF-22-W010-WHITE	200. 200.	Stranded Stranded	.040 .040	842°F (450°C)
(Nickel/Copper 3 Conductors) Glass Wrap Triplex-Twisted Braided Jacket	22	3CUF-22-WG80	650.	Stranded	.090	842°F (450°C)
W/SS Protective Overbraid	22	3CUF-22-WG81	945.	Stranded	.110	



3-Wire
PRT

DESCRIPTION					Marlin Part No.	Price $/Ea.
Probe Diameter	Sheath Mat'l.	Ref. Ohms @°C	Tolerance Class	Probe Length		
0.250″	316SS	100	0.1%	12″ 18″ 24″	M244-12 M244-18 M244-24	$75. 77. 79.



3-Wire
PRT

DESCRIPTION					Marlin Part No.	Price $/Ea.
Probe Diameter	Sheath Mat'l.	Ref. Ohms @°C	Tolerance Class	Probe Length		
0.250″	316SS	100	0.1%	12″ 18″ 24″	M445-12 M445-18 M445-24	$77. 79. 81.

DISCOUNT SCHEDULE	
QUANTITY	FACTOR
1 - 9	Net
10 - 24	.95
25 - 49	.85
100 - 199	.80
200+	.75

Since 1952 Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

GENERAL INSTALLATION PARAMETERS:

Handling:

There are many variations of PRT's and PRT assemblies. Even though some may appear to have heavy duty protecting tubes or thermowells, the internal parts can be delicate. Care in handling is a must to insure the sensor integrity. DO NOT DROP. PRT's are carefully packed at the factory. Inspect the package when receiving for indications of shipping damage. If shipping damage is noticed report it immediately to the shipping company and make the necessary reports. Marlin ships on a FOB factory basis therefore it is your responsibility to file any claims. Hidden shipping damage can also occur (no evident sign of mishandling). If after carefully opening the package, damage is discovered, save all product and shipping material then notify and file the proper claims with the shipping company immediately.

Storage:

Store in a dry, clean place. Avoid areas where dropping or stacking may occur.

Location:

The PRT should **SEE**, as close as possible, what the product in the process is experiencing in order to get meaningful temperature measurements. Locate the PRT as close to the product as possible. A rule of thumb is to have at least 10 tube diameters immersion in the hot zone. Avoid direct flame impingement or stagnant areas.

Installation:

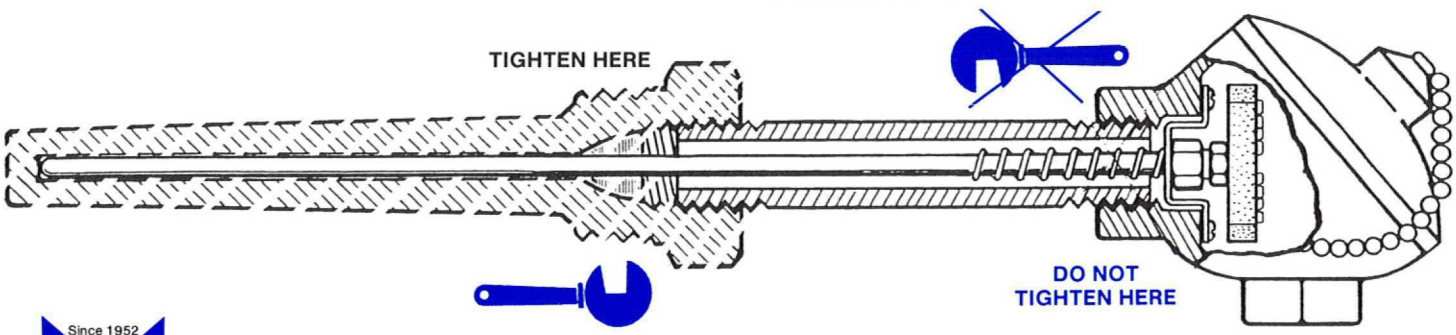
DO NOT ATTEMPT to mechanically connect the assembly into the process by tightening at the terminal or connecting head. USE ONLY THE PROCESS FITTING OR THE THERMOWELL FLATS FOR THIS PURPOSE. Terminals or connecting heads that are twisted can be damaged or cause shorts that can adversely affect the operation of the PRT. DO NOT BEND THE PRT IN THE ELEMENT AREA (within six inches of the end of the sheath). Bending will break the element that is in the metal sheath and the sensor will be rendered inoperative. If thermowell or protecting tube must be welded into the process, carefully remove PRT sensor before welding and be sure to handle carefully, keep clean and replace without forcing or stressing any components.

Wire Extension:

See general operation parameters and job wiring diagrams.

GENERAL MAINTENANCE PARAMETERS:

Regularly scheduled maintenance procedures should include inspection and calibration intervals so that life and reliability of the instrumentation is improved and the likelihood of sudden serious failure is reduced. These procedures should be set up by the responsible engineering department and performed by personnel that are familiar with the operating principles upon which the system is based. DO NOT LUBRICATE.



Since 1952
Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 FAX: (216) 941-6207
(216) 941-6200

Platinum Resistance thermometers

- **Customized PRT's — Built to your design**

Description:

Platinum Resistance Thermometers operate on the principle that the electrical resistance of a metal conductor changes as a function of temperature. PRT's provide an accurate, stable and repeatable means of absolute temperature measurement. The accuracy of a PRT may be independent of the distances between the sensor and the instrument whether it be an indicator, recorder, controller, data logger or computer. Copper hook-up wire is generally used between the sensor and instrument.

Marlin PRT probes consist of a platinum resistance element that is encapsulated and circuited in a mineral insulated, metal sheath construction and terminated by means of bare wire, quick connectors or terminal heads. This construction provides a rugged probe that is moisture, pressure, shock and vibration resistant and also is bendable up to the element area.

General Selection Parameters

The conditions of measurement determine the type of PRT used. Temperature, atmosphere, protection, response, and service life should be considered. The following descriptions serve as a guide to selection.

The Platinum Resistance Element:
Select the PRT element that will be capable of operating in your application range. The reference resistance (100 Ohms @ 0° C-typical) and temperature coefficient (Alpha of 0.00385 - typical) must match the instrumentation in your system.

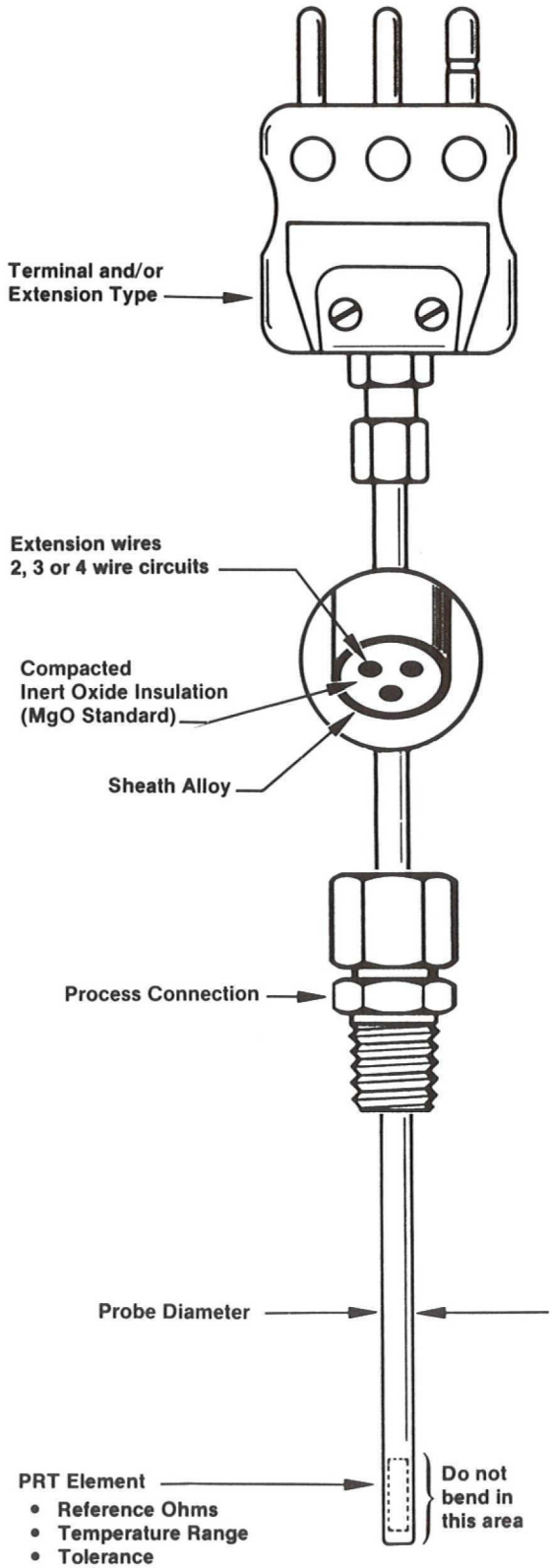
Tolerance of the PRT element:
A range of limits of error elements are available (0.1%-typical). See the tolerance section for definition. In general the better the tolerance the more expensive is the thermometer.

Sheath Alloy:
Select a sheath alloy that will withstand the temperature and possible corrosives of your application. 316 SS is standard.

Probe Diameter:
Use the probe diameter that will withstand the rigors of your application but with minimal affect on it. Because the element can be broken if the sheath is bent in the element area, it is recommended that a minimum of 0.187" diameter thermometer be used. Smaller diameters are available on request.

Process Connections:
In order to attach and/or seal the thermometer in your application you can use a fitting, braze, weld or solder it in place.

Terminal and/or Extension Type:
For connection to instruments various terminations extension are available. Select the circuit that is required to match your instrumentation.



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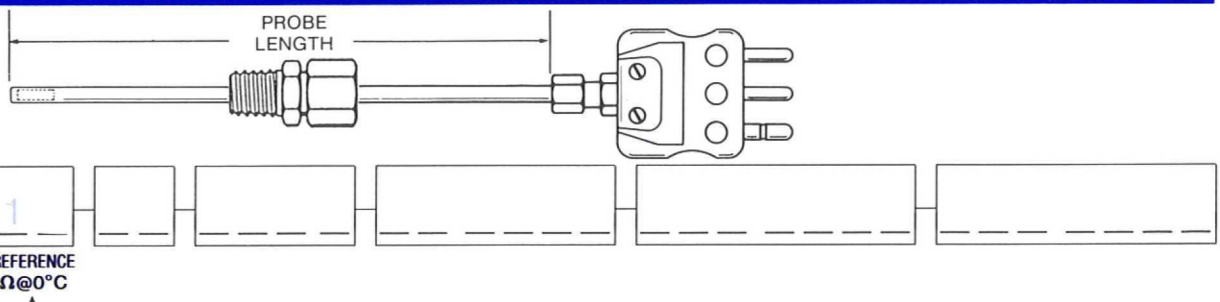


ELEMENT TYPE

P1
α = 0.00385 –250°C to 600°C (–420°F to 1112°F)

REFERENCE OHMS

P1	
Ω@0°C	CODE
100	1
2 x 100 (DUAL)	2

NOTES:
Other resistance value available. Please consult factory.

The Platinum Resistance Element

The Platinum Resistance Element of the standard Marlin PRT has a base or reference resistance of 100 Ohms @ 0°C, a temperature coefficient alpha of 0.00385, and a tolerance (limit of error) class of 0.1%. Other resistances, temperature coefficients and tolerances are available to fit your requirements. Marlin elements are of wire wound construction.

Type	Wire Wound Element Temperature Range	(Alpha) Temp. Coefficients
P1	-250°C to 600°C	.00385

Wire wound elements consist of fine, high purity platinum wire wound and imbedded in an insulation. The compacted MgO insulated construction of standard Marlin PRT's provides maximum durability and dependability for industrial PRT applications. All elements are carefully annealed and mounted so that the sensing wire remains strain free under severe, heavy-duty applications. Each element will have its own characteristics and therefore each PRT must be tested to insure it is within tolerance.

Single Element PRT's are most commonly used but dual units are available for simultaneous recording, controlling and indicating of a single thermal point. Also higher resistances are available but it should be noted that resistances above 100 Ohms and multiple elements require larger probe diameters (minimum 0.250") and are more expensive.

PRT Specifications

Amperage - Self Heating

The amperage is limited by self-heating. Currents in excess of 10 mA through the elements are not recommended. The error caused by self-heating is typically less than 0.1°C Temperature rise in water for a 5 mA current.

Inductance. Negligible for common AC use.

Insulation Resistance is greater than

100 MΩ @ 100 V DC and 25°C
10 MΩ @ 10 V DC and 100 to 300°C
2 MΩ @ 10 V DC and 301 to 650°C
0.5 MΩ @ 10 V DC and 651 to 850°C

Repeatability after 10 cycles to high temperature limits is less than the adjustment error for the corresponding tolerance class.

Alpha the Temperature Coefficient

is defined as:

$$\alpha = \frac{R100 - R_0}{100 \times R_0} \qquad \frac{\text{Ohms}}{\text{Ohms °C}}$$

and is related to A & B by the expression

$\alpha = A + 100B$

α = 0.00385 for P1

Temperature Resistance Relationship

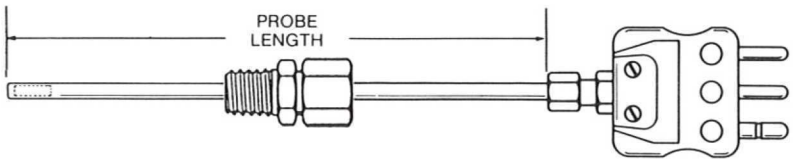
Over the temperature interval -200 to 600°C, the resistance of a platinum resistance thermometer is given by the relationship

$$R_t = R_0 [1 + At + Bt^2 + Ct^3 (t - 100)]$$

where R_t is the resistance in ohms at any temperature t (expressed in degrees Celsius), and R_0 is the resistance in ohms of the thermometer at 0°C. A, B, and C are constants whose values are

$$A = 3.9083 \times 10^{-3}$$
$$B = -5.775 \times 10^{-7}$$
$$C = -4.183 \times 10^{-12}$$

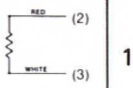
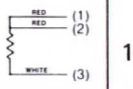
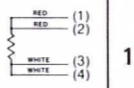
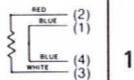
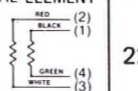
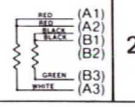
The C constant is used only for temperatures below 0°C. For all temperatures above 0°C, the C constant is set equal to zero, and the last term of the expression may be ignored.



P 1 | 1 1 | 1 3 | _ _ _ _ | _ _ _ _ _ | _ _ _ _ _ | _ _ _ _ _

TOLERANCE CIRCUIT TYPE

TOLERANCE	CODE
0.05%	0
0.1%	1
0.5%	2

CIRCUIT TYPE	
CIRCUIT	CODE
SINGLE ELEMENT	
	12
	13
	14
	15
DUAL ELEMENT	
	22
	23

NOTES:
Dual element PRT's require .250 O.D. minimum sheath diameter.

Calibration Tolerances for Platinum Resistance Thermometers

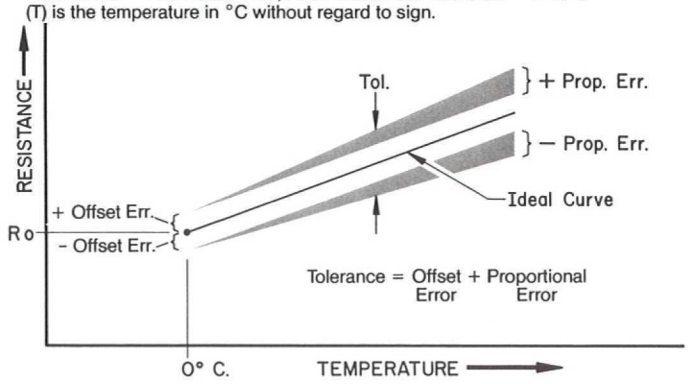
The accuracy of a platinum resistance thermometer is dependent upon two factors. The first is the offset of its actual resistance from the nominal value (typically 100 ohms) at some reference temperature (usually 0°C). The second factor is a variation from a nominal value of the effective resistance temperature coefficient over a given temperature interval, giving rise to an additional error component that is proportional to the temperature. Both of these factors are variable from sensor to sensor, but their magnitude limits are implicit for a given tolerance 'class.'

The designation of a PRT tolerance class is based on the percent allowable variation, in ohms, of the nominal resistance value at the reference temperature. However, for convenience, this ohmic tolerance is often expressed as an equivalent °C temperature variation. To this base uncertainty must be added the allowable proportional error for the class, which is stated as a percentage of measured temperature. This percentage applies when temperatures are expressed in degrees Celsius. A tolerance in degrees Fahrenheit is obtained by multiplying the Celsius equivalent sum temperature tolerance by 9/5.

Tolerance = Offset Error + Proportional Error

Tolerance Class	Offset Error	Proportional Error (°C)	*Sum of Errors (°C)
0.05%	0.15°C	0.3% (T)	0.15 + 0.003 (T)
0.1%	0.3°C	0.5% (T)	0.3 + 0.005 (T)
0.5%	1.3°C	0.8% (T)	1.3 + 0.008 (T)

*See tables — Reference Data, Initial Calibration Tolerance — PRT's.
(T) is the temperature in °C without regard to sign.

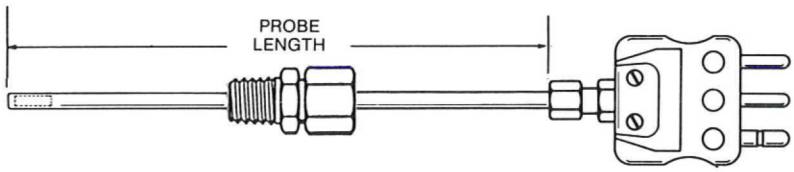


PRT Circuitry

Resistance bridge techniques are used with resistance thermometers for temperature measurement. In these techniques the resistance change with temperature of the PRT, which is the basis for a resistance thermometer, can be affected by the lead resistance. Marlin offers various circuits to fulfill the requirements of your instrumentation.

The accuracy of a PRT may be independent of the distances between the sensor and the instrument whether it be an indicator, recorder, controller, data logger or computer. The distance may vary from a few inches to many miles. Copper hook-up wire is generally used between the sensor and instrument.

The comparatively high signal level of the PRT eliminates the need for high gain amplifiers and generally reduces the susceptibility of the measuring system to noise and signal interference.



P 1 | 1 1 | 1 3 | 2 5 0 S | | | |

PROBE DIA. SHEATH MAT'L.

PROBE DIAMETER	CODE
3/16 IN	187
1/4 IN	250

NOTES: For special DIA. consult factory.

PROBE MATERIAL	CODE
316SS	S
INCONEL 600	I

NOTES: For special material consult factory.

PRT Probe Diameter

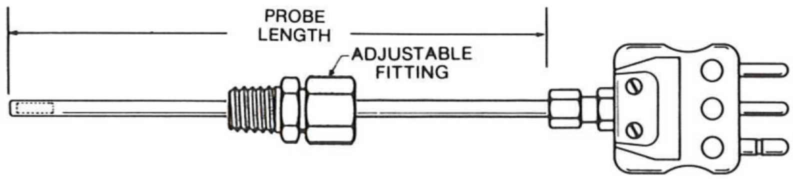
Your application dictates the size of the PRT Probe to be used. Generally the smaller the diameter the faster the thermal response time and the shorter the necessary immersion length for accurate instrumentation, but with less strength than a probe with a larger diameter. Use the sheath size that will withstand the rigors of your application but with minimal affect on it. Because the element can be broken if the sheath is bent in the element area it is recommended that a minimum of 0.187" diameter thermometer be used. Small diameters are available on request.

Sheath Materials

316 Stainless Steel (16% Chromium - 10% Nickel) is a material that has superior corrosion resistance as compared to 304SS with improved oxidation resistance and a higher hot strength. Maximum operation temperature 927°C (1700°F).

Inconel* 600 (72% Nickel - 17% Chromium) is a material that has outstanding resistance to oxidation, corrosion and scaling. Should not be used in the presence of sulfur above 1600°F. Maximum operating temperature 1149°C (2100°F).

*TM International Nickel Co.



P 1 – 1 1 – 1 3 – 2 5 0 S – A 1 0 0 0 0 – _ _ _ _ _ _ _ – _ _ _ _ _ _ _

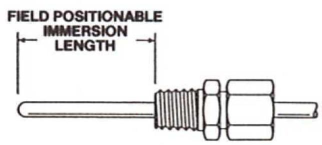
FITTING OR MOUNTING TYPE

Immersion Length
Last digit is 10th's of an inch
(i.e. 0045=4.5")

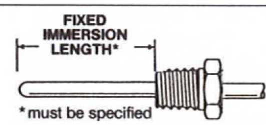
Mounting Fittings (SEE SELECTION SUMMARIES FOR DETAILS)

Compression Fittings field positionable setting of the immersion length of the PRT. Standard fittings are stainless steel, 1/8 NPT or 1/4 NPT thread size, and are supplied with metal ferrules that are not relocatable after compression. Teflon ferrules allow relocation after compression but have a limited temperature and pressure range. Lava ferrules are crushed with compression and must be replaced if PRT is removed or readjusted.

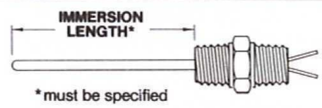
Teflon — 400°F practical use limit
Lava — 900°F practical use limit



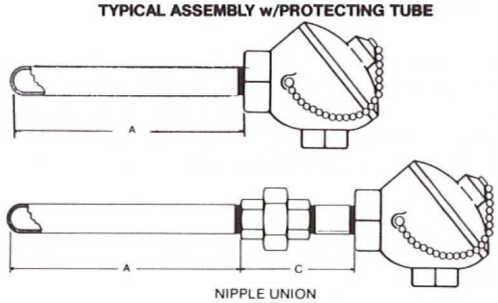
Fixed Fittings are stainless steel, NPT thread sizes, and are brazed to the sheath. Additional sizes, materials and welded mountings are also available.



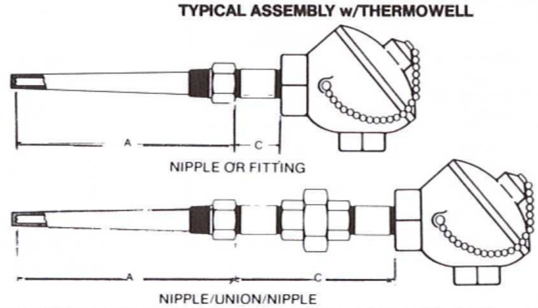
Fixed Double Fittings (Back to Back Threads) are stainless steel, NPT thread sizes, and are brazed to the sheath. Generally used with terminal heads this arrangement provides a process connection.



TYPICAL ASSEMBLY w/PROTECTING TUBE



TYPICAL ASSEMBLY w/THERMOWELL



	CODE
NONE	XX
S.S. Fitting 1/8 NPT 1/4 NPT	 A1 A2

*Not readjustable with metal ferrule

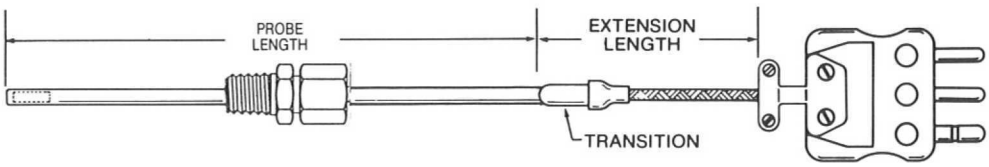
NOTES:
C1=Stl. B1=Brass

Ferrules:
Metal Standard (Non-readjustable)
"T" for Teflon (Readjustable)
e.g. T1
"L" for Lava (Non-reusable)
e.g. L1

	CODE
1/8 NPT	F1
1/4 NPT	F2
3/8 NPT	F3
1/2 NPT	F4
3/4 NPT	F6
1 NPT	F8
1/4 x 1/4 NPT	D2
1/2 x 1/2 NPT	D4
3/4 x 3/4 NPT	D6

	"C" DIM.	Gal. Stl. (1)	SS
NIPPLE	2"	12	42
	5"	15	45
	6"	16	46
NIPPLE/ UNION	2¾"	23	53
	3¾"	26	56
NIPPLE/ UNION/ NIPPLE	3"	33	63
	6"	36	66

NOTES: 1) Galvanized Steel
2) NPT Size specified by Weatherproof Head Size



P 1 | 1 1 | 1 3 | 2 5 0 S | A 1 0 0 0 0 | M T 0 0 1 2 0 | _ _ _ _ _ _ _ _

EXTENSION TYPE

EXTENSION LENGTH IN INCHES (If Applicable)

EXTENSION TYPE	
EXTENSION	**CODE**
NONE	XXX
TEFLON INSULATED 260°C (500°F)	MTO
FIBERGLASS INSULATED 482°C (900°F)	MGO

Molded Transition and Extension

This transition is an exclusive development from Marlin Manufacturing Corporation. After the wire extension has been spliced to the sheathed wire, the transition is molded with a thermoset compound. This transition exhibits the characteristics of high strength and resistivity and protects the splice against moisture, vibration and mechanical damage and also incorporates a strain relief for the wires that obsoletes springs and adapters. Standard transitions can be used in ambient temperatures to 400° F (205° C). High temperature transitions are available for use in ambient temperature to 800° F (425° C).

TRANSITION DIMENSIONS			
SHEATH SIZE DIA. INCHES	TRANSITION* SIZE DIA. INCHES	TRANSITION LENGTH "L" DIMENSION INCHES	STRANDED WIRE EXTENSION GAUGE B & S
.187	.312	1.000	24
.250	.437	1.000	24
.375	.625	1.000	24

*Same diameter transitions are available in 0.187" Dia. and larger sheath sizes.

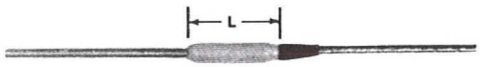
NOTES:
1) For SS flex Armor Cable over Exten. add "3" to code: e.g. "MT3"
2) For SS Overbraid over Exten. add "1" to code. e.g. "MT1"

TRANSITIONS
3) Extension include transitions for use to 205°C (400°F)
4) For Hi-Temp transition 425°C (800°F) use "H" to code: e.g. "HT0"
5) For transition "same size" as Sheath O.D. use "E" to code e.g. "ET0"
6) For "Probe Handle" transition use code "P" e.g. "PT0" (good for 350°F — not available in hi-temp).

Teflon-Teflon Teflon insulates individual conductors followed by an overall teflon jacket. Superior abrasion and moisture resistance. Resists most acids and vapors. Recommended operating temperature −90° F to 500° F.

Glass-Glass Glass yarn is applied over each conductor then impregnated with silicone varnish plus both conductors are covered with a braid of glass yarn also with silicone varnish. Fair resistance to abrasion and moisture. Recommended operating temperature to 900° F. Varnish is destroyed above 400° F.

Glass-Glass with SS Overbraid Same as Glass-Glass With added abrasion resistance.



SS OVERBRAID

GLASS/GLASS EXTENSION

SS Armor Tubing Can be used over any wire extension for added mechanical damage and abrasion resistance.

SS FLEX ARMOR TUBING

0.187" SAME DIAMETER TRANSITION
GLASS/GLASS EXTENSION

(See page F-0 for handle details)

PROBE HANDLE TRANSITION W/SS FLEX ARMOR

Since 1952 Marlin
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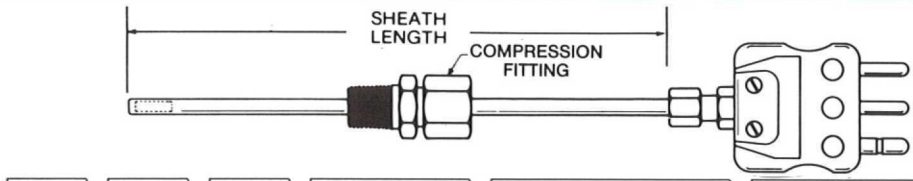


P 1 | 1 1 | 1 3 | 2 5 0 S | A 1 | 0 0 0 0 | X X X | 0 0 0 0 | P 3 1 | 0 0 2 4

TERMINAL TYPE — PROBE LENGTH IN INCHES

This Platinum Resistance Thermometer (PRT) is now fully specified.

Description:

P1 — Element Type
Alpha = 0.00385
for use to 600°C

11 — 100 ohms at 0°C
0.1% tolerance

13 — Single element
Three wire circuit

250S — ¼″ Dia. sheath size
316SS sheath material

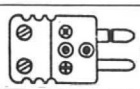
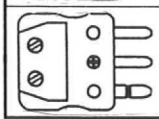
A1 — ⅛ NPT, SS compression fitting

0000 — Field positionable A1

XXX
0000 — No transition or wire extension

P31 — 3-pole full size plug

0024 — 24″ long probe length

TERMINAL TYPES		ORDER CODE
	Bare Leads	B10
	Lugs, Uncompensated	L03
	Lugs, Compensated for thermocouple type	L13
	2-Pole Mini Plug Max sheath .125″ OD, Max wire 20 ga.	M12
	3-Pole Mini Plug Max sheath .125″ OD, Max wire 20 ga.	M32
	2-Pole Full Size Plug	P11
	3-Pole Full Size Plug	P31

Notes: Above specifications are for
1.) Connectors for use to 205°C (400°F)
2.) Other terminal types are available. Please consult factory for terminal type code.

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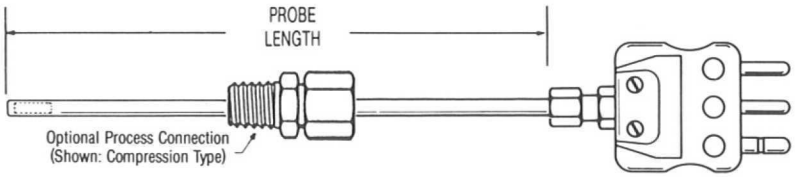
SENSORS — SELECTION SUMMARY
CUSTOM PRT'S



ELEMENT TYPE	REFERENCE Ω @ 0°C	TOLERANCE	CIRCUIT TYPE	PROBE DIA.	SHEATH MAT'L.	PROCESS CONNECTION	IMMERSION LENGTH (If Applicable)		TERMINAL TYPE	PROBE LENGTH IN INCHES
P 1							X X X	0 0	P 3 1	

Last digit is 10th's of an inch (i.e. 0045 = 4.5")

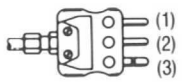
P1
α = 0.00385
-250°C to 600°C
(-420°F to 1112°F)

TOLERANCE	CODE
0.05%	0
0.1%	1
0.5%	2

NOTES:
Other tolerances are available, consult Factory. "9" requires description.

PROBE DIA. & SHEATH MATERIAL		CODE
.187"	316SS	187S
.250"		250S
.187"	INCONEL 600	187I
.250"		250I

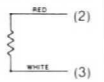
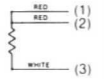
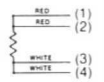
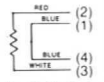
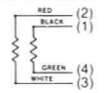
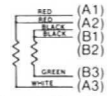
NOTES:
For special dia. or mat'l. consult Factory.

TERMINAL TYPE		CODE
 (1) (2) (3)	**STANDARD 3-POLE PLUG W/EXTERNAL STRAIN RELIEF** – Max. Probe Dia. .375" – For Circuits (12, 13)	P31

NOTES FOR ABOVE CONNECTORS
( ) Circuit hook up.
a) Connectors for use to 205°C (400°F)
b) For Hi-Temp connectors to 425°C (800°F) use code P41

Ref. Ω PRT 1	
Ω@0°C	CODE
100	1
2 x 100 (DUAL)	2

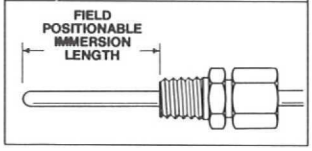
NOTES:
Other resistance value available. Please consult Factory.

CIRCUIT	CODE
SINGLE ELEMENT	
	12
	13
	14
	15
DUAL ELEMENT	
	22
	23

NOTES:
Dual element PRT's require .250 O.D. minimum sheath diameter.

PROCESS CONNECTION	CODE
NONE	XX
COMPRESSION FITTING	
1/8 NPT	A1
1/4 NPT	A2

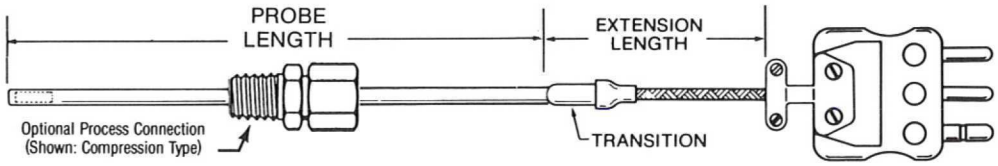
Not readjustable with metal ferrule
NOTES:
C1 = Stl. B1 = Brass
Ferrules:
Metal Standard (Non-readjustable)
"T" for Teflon (Readjustable)
e.g. T1
"L" for Lava (Non-reusable)
e.g. L1



FOR / TITLE:		
DATE:	BY:	REFERENCE

Since 1952
Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

SENSORS — SELECTION SUMMARY
CUSTOM PRT'S WITH EXTENSION



ELEMENT TYPE	REFERENCE Ω@0°C	TOLERANCE	CIRCUIT TYPE	PROBE DIA.	SHEATH MAT'L	FITTING OR MOUNTING TYPE	IMMERSION LENGTH IN INCHES (If Applicable)	EXTENSION TYPE	EXTENSION LENGTH IN INCHES	TERMINAL TYPE	PROBE LENGTH IN INCHES
P 1										P 3 3	

Last digit is 10th's of an inch (i.e. 0045 = 4.5")

P1
α = 0.00385
-250°C to 600°C
(-420°F to 1112°F)

CODE	TOLERANCE
0	0.05%
1	0.1%
2	0.5%

NOTES:
Other tolerances are available, consult Factory. "9" requires description.

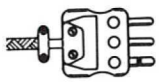
CODE	PROBE DIA.	SHEATH MATERIAL
187S	.187"	316SS
250S	.250"	
187I	.187"	INCONEL 600
250I	.250"	

NOTES:
For special dia. or mat'l. consult Factory.

EXTENSION	CODE
TEFLON INSULATED 260°C (500°F)	MT0
FIBERGLASS INSULATED 482°C (900°F)	MG0

NOTES:
1) For SS Armor Cable over Exten. add "A" to code: e.g. "GA"
2) For SS Overbraid over Exten. add "S" to code: e.g. "GS"

TRANSITIONS
3) Extension include transitions for use to 205°C (400°F)
4) For Hi-Temp transition 425°C (800°F) add "H" to code: e.g. "HG"
5) For transition "same size" as Sheath O.D. add "E" to code e.g. "EG"

TERMINAL TYPE		CODE
 (1) (2) (3)	STANDARD 3-POLE PLUG W/EXTERNAL STRAIN RELIEF – For Circuits (12, 13)	P33

NOTES FOR ABOVE CONNECTORS
( ) Circuit hook up.
a) Connectors for use to 205°C (400°F)
b) For Hi-Temp connectors to 425°C (800°F) use code P43

Ref. Ω PRT 1	
Ω@0°C	CODE
100	1
2 x 100 (DUAL)	2

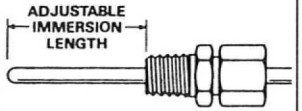
NOTES:
Other resistance value available. Please consult Factory.

CIRCUIT	CODE
SINGLE ELEMENT	
	12
	13
	14
	15
DUAL ELEMENT	
	22
	23

NOTES:
Dual element PRT's require .250 O.D. minimum sheath diameter.

PROCESS CONNECTION	CODE
NONE	XX
*ADJUSTABLE IMMERSION	
1/8 NPT	A1
1/4 NPT	A2

*Not readjustable with metal ferrule
NOTES:
C1=Stl. B1=Brass
Ferrules:
Metal Standard (Non-readjustable)
"T" for Teflon (Readjustable)
e.g. T1
"L" for Lava (Non-reusable)
e.g. L1



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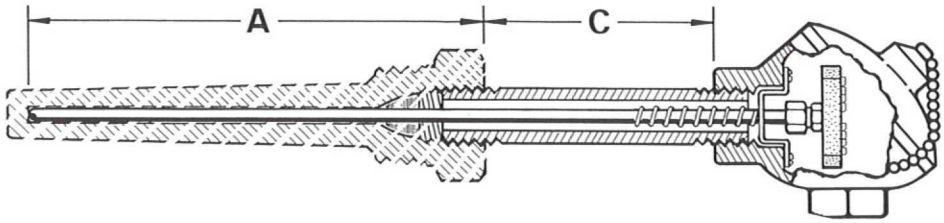
SENSORS — SELECTION SUMMARY
CUSTOM PRT'S FOR PROTECTION TUBE



ELEMENT TYPE	REFERENCE Ω@0°C	TOLERANCE	CIRCUIT TYPE	PROBE DIA.	SHEATH MAT'L	SUPPORT FITTING		TERMINAL TYPE	A DIM.
P 1				2 5 0	S	0 0 0 0	X X X 0 0 0 0		

SPECIFY "A" DIM. of Thermowell or give T'well P/N i.e. 260TR-¾-4½-304

P1
α = 0.00385
-250°C to 600°C
(-420°F to 1112°F)

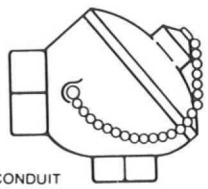
CODE	TOLERANCE
0	0.05%
1	0.1%
2	0.5%

NOTES:
Other tolerances are available, consult Factory. "9" requires description.

CODE	PROBE DIA. & SHEATH MATERIAL	
187S	.187"	316SS
250S	.250"	
187I	.187"	INCONEL 600
250I	.250"	

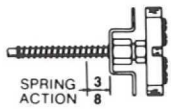
NOTES:
For special dia. or mat'l. consult Factory.

CODE	WEATHERPROOF HEAD
	CAST ALUMINUM
274	1/2 NPT
276	3/4 NPT
278	1 NPT
	CAST IRON
374	1/2 NPT
376	3/4 NPT
378	1 NPT



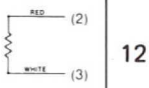
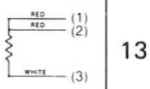
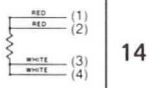
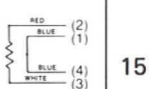
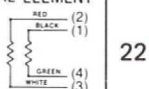
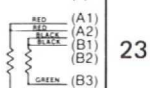
TERMINAL BLOCKS for Weatherproof Heads

SPRING LOADED 4 WIRE



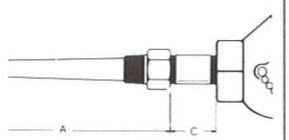
Ref. Ω PRT 1	
Ω @ 0°C	CODE
100	1
2 x 100 (DUAL)	2

NOTES:
Other resistance value available. Please consult Factory.

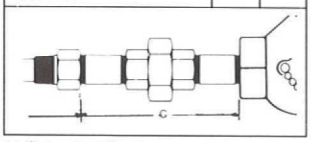
CIRCUIT	CODE
SINGLE ELEMENT	
	12
	13
	14
	15
DUAL ELEMENT	
	22
	23

NOTES:
Dual element PRT's require .250 O.D. minimum sheath diameter.

SUPPORT FITTING	"C" DIM.	Stl.(1)	SS
NIPPLE	2"	12	42
	5"	15	45
	6"	16	46

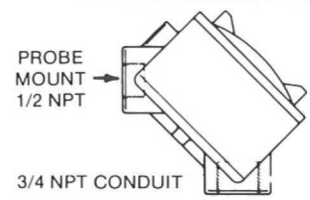


NIPPLE/ UNION/ NIPPLE	"C" DIM.	Stl.(1)	SS
	2⅜"	33	53
	5¾"	36	56



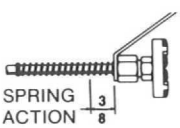
1.) Galvanized Steel

CODE	EXPLOSIONPROOF HEAD
124	



TERMINAL BLOCKS for Explosion Proof Heads

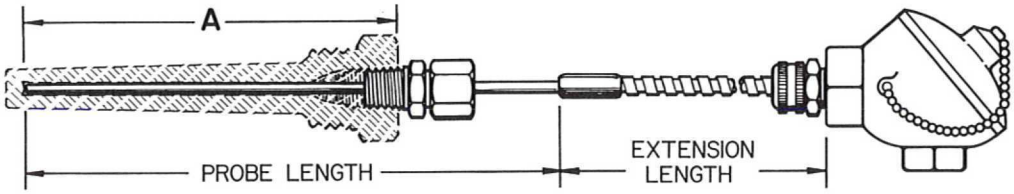
SPRING LOADED 4 WIRE



FOR / TITLE:		
DATE:	BY:	JOB NO.

Since 1952 Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

SENSORS — SELECTION SUMMARY
CUSTOM PRT'S WITH FLEXIBLE EXTENSION FOR THERMOWELLS



ELEMENT TYPE	REFERENCE Ω@0°C	TOLERANCE	CIRCUIT TYPE	PROBE DIA.	SHEATH MAT'L	FITTING OR MOUNTING TYPE	IMMERSION LENGTH IN INCHES (If Applicable)	EXTENSION TYPE	EXTENSION LENGTH IN INCHES	TERMINAL TYPE	PROBE LENGTH IN INCHES
P 1				2 5 0	S	A 4	0 0 0 0	M E 3		2 4 1	

Last digit is 10th's of an inch (i.e. 0045 = 4.5")

P1
α = 0.00385 -250°C to 600°C (-420°F to 1112°F)

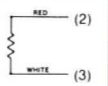
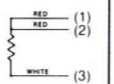
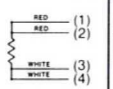
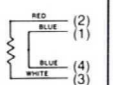
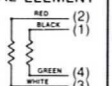
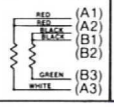
CODE	TOLERANCE
0	0.05%
1	0.1%
2	0.5%

CODE	PROBE DIA. & SHEATH MATERIAL	
187S	.187"	316SS
250S	.250"	
187I	.187"	INCONEL 600
250I	.250"	

EXTENSION	CODE
MOLDED TRANSITION/ TEFLON INSULATED WIRE 260°C (500°F) S.S. FLEX ARMOR	ME3

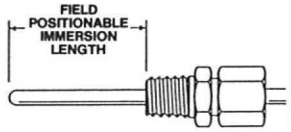
*EXTENSION LENGTH IN INCHES
NOTES:
1) For SS Armor Cable with PVC Coating over code ME8.

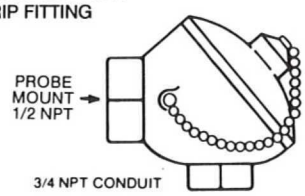
Ref. Ω PRT 1	
Ω @ 0°C	CODE
100	1
2 x 100 (DUAL)	2

CIRCUIT	CODE
SINGLE ELEMENT	
	12
	13
	14
	15
DUAL ELEMENT	
	22
	23

NOTES:
Dual element PRT's require .250 O.D. minimum sheath diameter.

FITTING TYPE	CODE
NONE	XX
COMPRESSION FITTING	
1/2 NPT	A4



WEATHERPROOF HEAD	CODE
CAST ALUMINUM WITH WIRE GRIP FITTING 	241
TERMINAL BLOCKS for Weatherproof Heads	
RIGID 4 WIRE 	

FOR / TITLE:		
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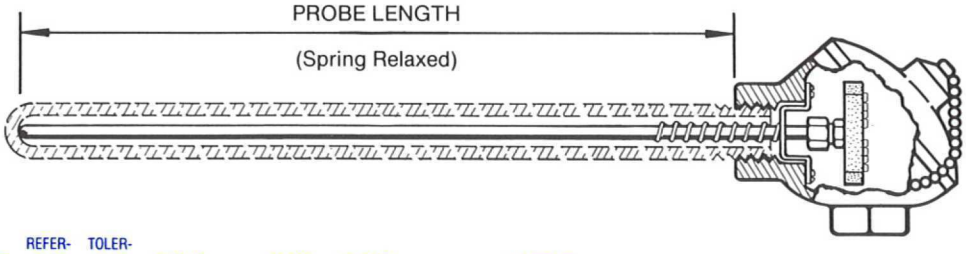
SENSORS — SELECTION SUMMARY
CUSTOM PRT'S FOR PROTECTION TUBE



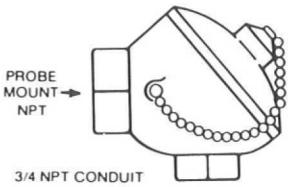
ELEMENT TYPE	REFERENCE Ω@0°C	TOLERANCE	CIRCUIT TYPE	PROBE DIA.	SHEATH MAT'L	SUPPORT FITTING		TERMINAL TYPE	PROBE LENGTH IN INCHES
P1				250	S	XX	0000	XXX 0000	

P1
α = 0.00385
-250°C to 600°C
(-420°F to 1112°F)

CODE	TOLERANCE
0	0.05%
1	0.1%
2	0.5%

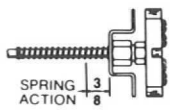
CODE	PROBE DIA.	SHEATH MATERIAL
187S	.187″	316SS
250S	.250″	316SS
187I	.187″	INCONEL 600
250I	.250″	INCONEL 600

CODE	WEATHERPROOF HEAD
	CAST ALUMINUM
274	1/2 NPT
276	3/4 NPT
278	1 NPT
	CAST IRON
374	1/2 NPT
376	3/4 NPT
378	1 NPT

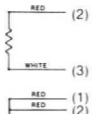
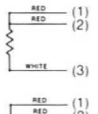
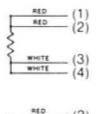
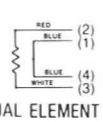
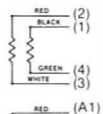
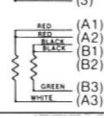


TERMINAL BLOCKS for Weatherproof Heads

SPRING LOADED 4 WIRE

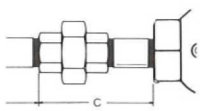


Ref. Ω PRT 1	
Ω @ 0°C	CODE
100	1
2 x 100 (DUAL)	2

CIRCUIT	CODE
SINGLE ELEMENT	
	12
	13
	14
	15
DUAL ELEMENT	
	22
	23

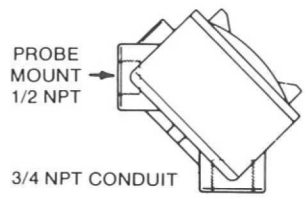
NOTES:
Dual element PRT's require .250 O.D. minimum sheath diameter.

SUPPORT FITTING	CODE		
None	XX		
	"C" DIM.	Stl.	SS
NIPPLE/ UNION	2-5/8"	23	53
	5-3/4"	26	56



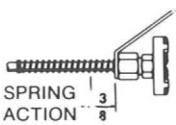
NOTES: 1) Steel Standard
2) Add S for Stainless Stl. e.g. 13S
3) NPT Size specified by Weatherproof Head Size

CODE	EXPLOSIONPROOF HEAD
124	1/2 NPT



TERMINAL BLOCKS for Explosion Proof Heads

SPRING LOADED 4 WIRE



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