NOTICE:

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

Since 1952

Marlin MANUFACTURING CORPORATION

TEMPERATURE INSTRUMENTATION FOR RESEARCH AND INDUSTRY

Thank You,
for selecting Marlin to furnish your temperature instrumentation requirements.

We at Marlin recognize the importance of Customer Satisfaction to our success. Our knowledgeable and experienced staff of sales engineers, backed by an organization dedicated to temperature instrumentation, is available to assist you in your applications. Marlin will provide products and services which conform to requirements as stated in our quality policy.

MARLIN QUALITY POLICY

- QUALITY IS CONFORMANCE TO REQUIREMENTS
- NONCONFORMANCES ARE UNACCEPTABLE
- EVERY PROCESS MUST CONTINUOUSLY IMPROVE

Marlin's goal is to be a consistent, high quality and on-time producer of temperature instrumentation for research and industrial applications. We measure our success through total quality management that is integrated into our processes.

Sincerely,

The People of Marlin Manufacturing Corporation

Since 1952

Marlin

MANUFACTURING CORPORATION P.O. BOX 118000 CLEVELAND, OHIO 44111-8000 FAX: (216) 941-6207 (216) 941-6200

TYPICAL INSTRUMENTATION SYSTEM FOR TEMPERATURE MEASUREMENT

System Accuracy Verification – N I S T Traceable

The Hot Zone:

Where sensors are strategically placed so that process temperatures are meaningfully measured.

Thermocouples generate a small voltage signal that is relative to temperature. The hot junction is where the two thermo-elements are joined for tip sensitive measurements.

*RTDs (**R**esistance **T**emperature **D**evices) present an increasing resistance with increasing temperature at its wire wound bulb for end sensitive measurements.*

The Extension Region:

Where the signal is transported, without shorts or interference, from the sensor to the instrument that interprets it.

Thermocouples use the same compensating alloy type for connectors, wire, panels, and cable. Overall color codes are standardized for common thermocouple types (i.e. K - yellow, J - black, etc.) Internally the "Red" color code is negative throughout the thermocouple circuit.

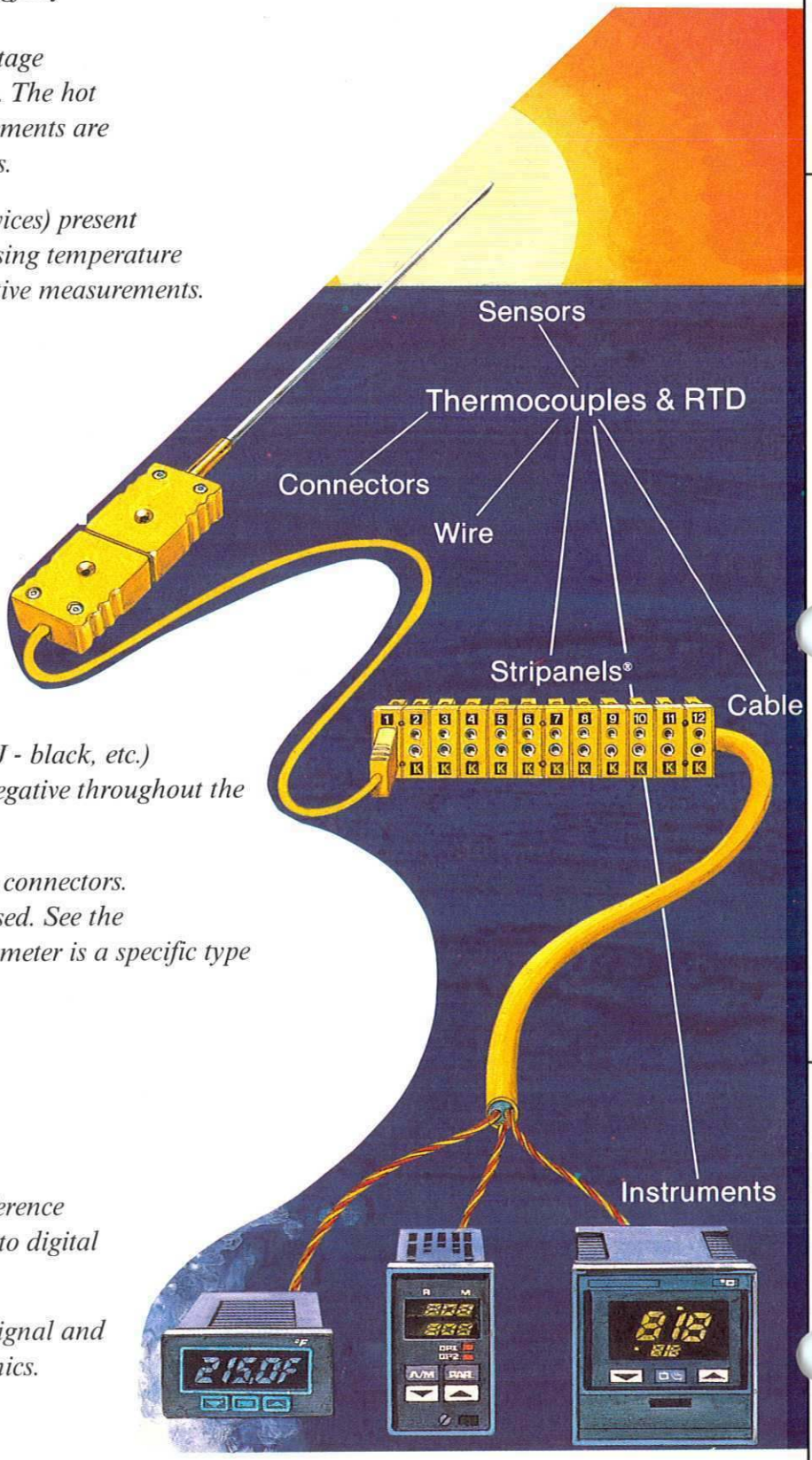
*RTDs use copper hook-up wire and connectors. Color codes depend on the circuit used. See the PRT (**P**latinum **R**esistance **T**hermometer is a specific type of RTD) section for details.*

The Instrument:

Where the signal is interpreted and used for indicating, controlling, and/or recording the process temperatures.

Thermocouple instruments have reference junction compensation and analog to digital conversion electronics.

RTD instruments provide the loop signal and analog to digital conversion electronics.



Since 1952 Marlin MANUFACTURING CORPORATION P.O. BOX 118000 CLEVELAND, OHIO 44111-8000 FAX: (216) 941-6207 (216) 941-6200

Marlin Manufacturing Corporation 12404 Triskett Road Cleveland, Ohio 44111 (216) 941-6200 Fax: (216) 941-6207

N I S T Traceable Calibration Services:	Thermocouples, Thermocouple Wire PRT's Calibrators Optical Pyrometers		**METROLOGY SERVICE**
Temperature Instrumentation Fabrications produced to your plans and specifications.		SENSORS	**CUSTOM FABRICATION**
Platinum Resistance Thermometers:	Stock PRT's Custom PRT's	SENSORS	**PT. RESISTANCE THERMOMETERS**
Metal Sheathed, MgO Insulated T/C's:	Stock Marlox® Custom Marlox® High-Temperature T/C's Random Length Cable	SENSORS	**MARLOX® THERMOCOUPLES**
Specialty Thermocouples: **Plastic Industry Thermocouples:**	Profiling, Foil, Surface Bayonet, Melt, Nozzle, Washer, Magnetic, Spade	SENSORS	**SPECIALTY & PLASTIC INDUSTRY THERMOCOUPLES**
Semiconductor Industry: **Non-Ferrous metals:** **Assemblies:**	3-Zone Profile T/C's Thermo-Dip® T/C's Platinum T/C's (R, S, B); Base Metal T/C's (J, K)	SENSORS	**INDUSTRIAL THERMOCOUPLES**
Protecting Tubes: **Thermowells:**	Ceramic, Silicon Carbide, Metal-Ceramic, Laminated, Metal, Cast Iron Threaded, Flanged, Socket Weld		**PROTECTING TUBES & THERMOWELLS**
Thermocouple Wire:	Plastic & Fibrous Insulated Bare Multipair Cable Retractable Cable		**THERMOCOUPLE WIRE**
Thermocouple Connectors & Stripanels:	Miniature Full Size Selector Switches Terminal Heads		**CONNECTORS & STRIPANELS®**
Hand Held Indicators / Calibrators **Panel Mount Indicators** **Transmitter**		INSTRUMENTS	**INDICATORS CALIBRATORS TRANSMITTER**
Temperature Controllers:	1/32 DIN, 1/8 DIN, 1/4 DIN	INSTRUMENTS	**CONTROLLERS**
Stripchart: **Circular:**	100mm; 180mm; Data Recorder 11"	INSTRUMENTS	**RECORDERS**
Thermocouple Information: **Pt. Resistance Thermometer Tables:** **Bibliography, T/C Systems Concept** **Units & Conversion Factors**	Glossary, Tolerance Tables, mV Tables "385" Alpha,		**REFERENCE DATA**

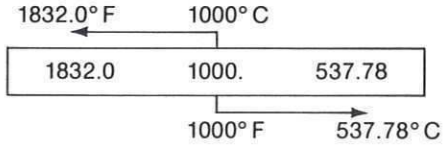
REFERENCE DATA
TEMPERATURE CONVERSION TABLE

$°C = \frac{5}{9}(°F - 32)$ $\qquad$ $°F = \frac{9}{5}°C + 32$

Kelvin = °C +273.15 $\qquad$ °Rankine = °F +459.67

TABLE EXAMPLE: To Convert 1000°C to °F look up 1000 read left

To Convert 1000°F to °C look up 1000 read right



F ← C / F → C			F ← C / F → C			F ← C / F → C			F ← C / F → C			F ← C / F → C		
	-458	-272.22		-308	-188.89	-252.4	-158	-105.56	+17.6	-8	-22.22	287.6	142	61.11
	-456	-271.11		-306	-187.78	-248.8	-156	-104.44	+21.2	-6	-21.11	291.2	144	62.22
	-454	-270.00		-304	-186.67	-245.2	-154	-103.33	+24.8	-4	-20.00	294.8	146	63.33
	-452	-268.89		-302	-185.56	-241.6	-152	-102.22	+28.4	-2	-18.89	298.4	148	64.44
	-450	-267.78		-300	-184.44	-238.0	-150	-101.11	+32.0	0	-17.78	302.0	150	65.56
	-448	-266.67		-298	-183.33	-234.4	-148	-100.00	+35.6	+2	-16.67	305.6	152	66.67
	-446	-265.56		-296	-182.22	-230.8	-146	-98.89	+39.2	+4	-15.56	309.2	154	67.78
	-444	-264.44		-294	-181.11	-227.2	-144	-97.78	+42.8	+6	-14.44	312.8	156	68.89
	-442	-263.33		-292	-180.00	-223.6	-142	-96.67	+46.4	+8	-13.33	316.4	158	70.00
	-440	-262.22		-290	-178.89	-220.0	-140	-95.56	+50.0	+10	-12.22	320.0	160	71.11
	-438	-261.11		-288	-177.78	-216.4	-138	-94.44	+53.6	+12	-11.11	323.6	162	72.22
	-436	-260.00		-286	-176.67	-212.8	-136	-93.33	+57.2	+14	-10.00	327.2	164	73.33
	-434	-258.89		-284	-175.56	-209.2	-134	-92.22	+60.8	+16	-8.89	330.8	166	74.44
	-432	-257.78		-282	-174.44	-205.6	-132	-91.11	+64.4	+18	-7.78	334.4	168	75.56
	-430	-256.67		-280	-173.33	-202.0	-130	-90.00	+68.0	+20	-6.67	338.0	170	76.67
	-428	-255.56		-278	-172.22	-198.4	-128	-88.89	+71.6	+22	-5.56	341.6	172	77.78
	-426	-254.44		-276	-171.11	-194.8	-126	-87.78	+75.2	+24	-4.44	345.2	174	78.89
	-424	-253.33		-274	-170.00	-191.2	-124	-86.67	+78.8	+26	-3.33	348.8	176	80.00
	-422	-252.22	-457.6	-272	-168.89	-187.6	-122	-85.56	+82.4	+28	-2.22	352.4	178	81.11
	-420	-251.11	-454.0	-270	-167.78	-184.0	-120	-84.44	+86.0	+30	-1.11	356.0	180	82.22
	-418	-250.00	-450.4	-268	-166.67	-180.4	-118	-83.33	+89.6	+32	0.00	359.6	182	83.33
	-416	-248.89	-446.8	-266	-165.56	-176.8	-116	-82.22	+93.2	+34	+1.11	363.2	184	84.44
	-414	-247.78	-443.2	-264	-164.44	-173.2	-114	-81.11	+96.8	+36	+2.22	366.8	186	85.56
	-412	-246.67	-439.6	-262	-163.33	-169.6	-112	-80.00	+100.4	+38	+3.33	370.4	188	86.67
	-410	-245.56	-436.0	-260	-162.22	-166.0	-110	-78.89	+104.0	+40	+4.44	374.0	190	87.78
	-408	-244.44	-432.4	-258	-161.11	-162.4	-108	-77.78	107.6	42	5.56	377.6	192	88.89
	-406	-243.33	-428.8	-256	-160.00	-158.8	-106	-76.67	111.2	44	6.67	381.2	194	90.00
	-404	-242.22	-425.2	-254	-158.89	-155.2	-104	-75.56	114.8	46	7.78	384.8	196	91.11
	-402	-241.11	-421.6	-252	-157.78	-151.6	-102	-74.44	118.4	48	8.89	388.4	198	92.22
	-400	-240.00	-418.0	-250	-156.67	-148.0	-100	-73.33	122.0	50	10.00	392.0	200	93.33
	-398	-238.89	-414.4	-248	-155.56	-144.4	-98	-72.22	125.6	52	11.11	395.6	202	94.44
	-396	-237.78	-410.8	-246	-154.44	-140.8	-96	-71.11	129.2	54	12.12	399.2	204	95.56
	-394	-236.67	-407.2	-244	-153.33	-137.2	-94	-70.00	132.8	56	13.33	402.8	206	96.67
	-392	-235.56	-403.6	-242	-152.22	-133.6	-92	-68.89	136.4	58	14.44	406.4	208	97.78
	-390	-234.44	-400.0	-240	-151.11	-130.0	-90	-67.78	140.0	60	15.56	410.0	210	98.89
	-388	-233.33	-396.4	-238	-150.00	-126.4	-88	-66.67	143.6	62	16.67	413.6	212	100.00
	-386	-232.22	-392.8	-236	-148.89	-122.8	-86	-65.56	147.2	64	17.78	417.2	214	101.11
	-384	-231.11	-389.2	-234	-147.78	-119.2	-84	-64.44	150.8	66	18.89	420.8	216	102.22
	-382	-230.00	-385.6	-232	-146.67	-115.6	-82	-63.33	154.4	68	20.00	424.4	218	103.33
	-380	-228.89	-382.0	-230	-145.56	-112.0	-80	-62.22	158.0	70	21.11	428.0	220	104.44
	-378	-227.78	-378.4	-228	-144.44	-108.4	-78	-61.11	161.6	72	22.22	431.6	222	105.56
	-376	-226.67	-374.8	-226	-143.33	-104.8	-76	-60.00	165.2	74	23.33	435.2	224	106.67
	-374	-225.56	-371.2	-224	-142.22	-101.2	-74	-58.89	168.8	76	24.44	438.8	226	107.78
	-372	-224.44	-367.6	-222	-141.11	-97.6	-72	-57.78	172.4	78	25.56	442.4	228	108.89
	-370	-223.33	-364.0	-220	-140.00	-94.0	-70	-56.67	176.0	80	26.67	446.0	230	110.00
	-368	-222.22	-360.4	-218	-138.89	-90.4	-68	-55.56	179.6	82	27.78	449.6	232	111.11
	-366	-221.11	-356.8	-216	-137.78	-86.8	-66	-54.44	183.2	84	28.89	453.2	234	112.22
	-364	-220.00	-353.2	-214	-136.67	-83.2	-64	-53.33	186.8	86	30.00	456.8	236	113.33
	-362	-218.89	-349.6	-212	-135.56	-79.6	-62	-52.22	190.4	88	31.11	460.4	238	114.44
	-360	-217.78	-346.0	-210	-134.44	-76.0	-60	-51.11	194.0	90	32.22	464.0	240	115.56
	-358	-216.67	-360.4	-208	-133.33	-72.4	-58	-50.00	197.6	92	33.33	467.6	242	116.67
	-356	-215.56	-356.8	-206	-132.22	-68.8	-56	-48.89	201.2	94	34.44	471.2	244	117.78
	-354	-214.44	-353.2	-204	-131.11	-65.2	-54	-47.78	204.8	96	35.56	474.8	246	118.89
	-352	-213.33	-349.6	-202	-130.00	-61.6	-52	-46.67	208.4	98	36.67	478.4	248	120.00
	-350	-212.22	-346.0	-200	-128.89	-58.0	-50	-45.56	212.0	100	37.78	482.0	250	121.11
	-348	-211.11	-324.4	-198	-127.78	-54.4	-48	-44.44	215.6	102	38.89	485.6	252	122.22
	-346	-210.00	-320.8	-196	-126.67	-50.8	-46	-43.33	219.2	104	40.00	489.2	254	123.33
	-344	-208.89	-317.2	-194	-125.56	-47.2	-44	-42.22	222.8	106	41.11	492.8	256	124.44
	-342	-207.78	-313.6	-192	-124.44	-43.6	-42	-41.11	226.4	108	42.22	496.4	258	125.56
	-340	-206.67	-310.0	-190	-123.33	-40.0	-40	-40.00	230.0	110	43.33	500.0	260	126.67
	-338	-205.56	-306.4	-188	-122.22	-36.4	-38	-38.89	233.6	112	44.44	503.6	262	127.78
	-336	-204.44	-302.8	-186	-121.11	-32.8	-36	-37.78	237.2	114	45.56	507.2	264	128.89
	-334	-203.33	-299.2	-184	-120.00	-29.2	-34	-36.67	240.8	116	46.67	510.8	266	130.00
	-332	-202.22	-295.6	-182	-118.89	-25.6	-32	-35.56	244.4	118	47.78	514.4	268	131.11
	-330	-201.11	-292.0	-180	-117.78	-22.0	-30	-34.44	248.0	120	48.89	518.0	270	132.22
	-328	-200.00	-288.4	-178	-116.67	-18.4	-28	-33.33	251.6	122	50.00	521.6	272	133.33
	-326	-198.89	-284.8	-176	-115.56	-14.8	-26	-32.22	255.2	124	51.11	525.2	274	134.44
	-324	-197.78	-281.2	-174	-114.44	-11.2	-24	-31.11	258.8	126	52.22	528.8	276	135.56
	-322	-196.67	-277.6	-172	-113.33	-7.6	-22	-30.00	262.4	128	53.33	532.4	278	136.67
	-320	-195.56	-274.0	-170	-112.22	-4.0	-20	-28.89	266.0	130	54.44	536.0	280	137.78
	-318	-194.44	-270.4	-168	-111.11	-0.4	-18	-27.78	269.6	132	55.56	539.6	282	138.89
	-316	-193.33	-266.8	-166	-110.00	+3.2	-16	-26.67	273.2	134	56.67	543.2	284	140.00
	-314	-192.22	-263.2	-164	-108.89	+6.8	-14	-25.56	276.8	136	57.78	546.8	286	141.11
	-312	-191.11	-259.6	-162	-107.78	+10.4	-12	-24.44	280.4	138	58.89	550.4	288	142.22
	-310	-190.00	-256.0	-160	-106.67	+14.0	-10	-23.33	284.0	140	60.00	554.0	290	143.33

Since 1952 Marlin

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

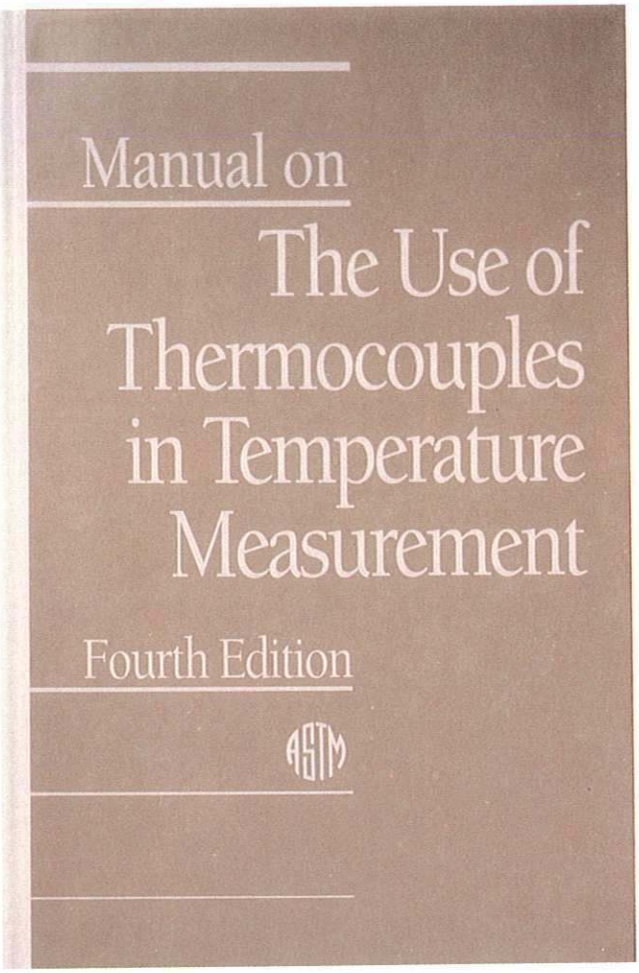
REFERENCE DATA
TEMPERATURE CONVERSION TABLE

F ← C / F → C			F ← C / F → C			F ← C / F → C			F ← C / F → C			F ← C / F → C		
557.6	**292**	144.44	870.8	**466**	241.11	1832.0	**1000**	537.78	3398.0	**1870**	1021.1	4964.0	**2740**	1504.4
561.2	**294**	145.56	874.4	**468**	242.22	1850.0	**1010**	543.33	3416.0	**1880**	1026.7	4982.0	**2750**	1510.0
564.8	**296**	146.67	878.0	**470**	243.33	1868.0	**1020**	548.89	3434.0	**1890**	1032.2	5000.0	**2760**	1515.6
568.4	**298**	147.78	881.6	**472**	244.44	1886.0	**1030**	554.44	3452.0	**1900**	1037.8	5018.0	**2770**	1521.1
572.0	**300**	148.89	885.2	**474**	245.56	1904.0	**1040**	560.00	3470.0	**1910**	1043.3	5036.0	**2780**	1526.7
575.6	**302**	150.00	888.8	**476**	246.67	1922.0	**1050**	565.56	3488.0	**1920**	1048.9	5054.0	**2790**	1532.2
579.2	**304**	151.11	892.4	**478**	247.78	1940.0	**1060**	571.11	3506.0	**1930**	1054.4	5072.0	**2800**	1537.8
582.8	**306**	152.22	896.0	**480**	248.89	1958.0	**1070**	576.67	3524.0	**1940**	1060.0	5090.0	**2810**	1543.3
586.4	**308**	153.33	899.6	**482**	250.00	1976.0	**1080**	582.22	3542.0	**1950**	1065.6	5108.0	**2820**	1548.9
590.0	**310**	154.44	903.2	**484**	251.11	1994.0	**1090**	587.78	3560.0	**1960**	1071.1	5126.0	**2830**	1554.4
593.6	**312**	155.56	906.8	**486**	252.22	2012.0	**1100**	593.33	3578.0	**1970**	1076.7	5144.0	**2840**	1560.0
597.2	**314**	156.67	910.4	**488**	253.33	2030.0	**1110**	598.89	3596.0	**1980**	1082.2	5162.0	**2850**	1565.6
600.8	**316**	157.78	914.0	**490**	254.44	2048.0	**1120**	604.44	3614.0	**1990**	1087.8	5180.0	**2860**	1571.1
604.4	**318**	158.89	917.6	**492**	255.56	2066.0	**1130**	610.00	3632.0	**2000**	1093.3	5198.0	**2870**	1576.7
608.0	**320**	160.00	921.2	**494**	256.67	2084.0	**1140**	615.56	3650.0	**2010**	1098.9	5216.0	**2880**	1582.2
611.6	**322**	161.11	924.8	**496**	257.78	2102.0	**1150**	621.11	3668.0	**2020**	1104.4	5234.0	**2890**	1587.8
615.2	**324**	162.22	928.4	**498**	258.89	2120.0	**1160**	626.67	3686.0	**2030**	1110.0	5252.0	**2900**	1593.3
618.8	**326**	163.33	932.0	**500**	260.00	2138.0	**1170**	632.22	3704.0	**2040**	1115.6	5270.0	**2910**	1598.9
622.4	**328**	164.44	935.6	**502**	261.11	2156.0	**1180**	637.78	3722.0	**2050**	1121.1	5288.0	**2920**	1604.4
626.0	**330**	165.56	939.2	**504**	262.22	2174.0	**1190**	643.33	3740.0	**2060**	1126.7	5306.0	**2930**	1610.0
629.6	**332**	166.67	942.8	**506**	263.33	2192.0	**1200**	648.89	3758.0	**2070**	1132.2	5324.0	**2940**	1615.6
633.2	**334**	167.78	946.4	**508**	264.44	2210.0	**1210**	654.44	3776.0	**2080**	1137.8	5342.0	**2950**	1621.1
636.8	**336**	168.89	950.0	**510**	265.56	2228.0	**1220**	660.00	3794.0	**2090**	1143.3	5360.0	**2960**	1626.7
640.4	**338**	170.00	953.6	**512**	266.67	2246.0	**1230**	665.56	3712.0	**2100**	1148.9	5378.0	**2970**	1632.2
644.0	**340**	171.11	957.2	**514**	267.78	2264.0	**1240**	671.11	3830.0	**2110**	1154.4	5396.0	**2980**	1637.8
647.6	**342**	172.22	960.8	**516**	268.89	2282.0	**1250**	676.67	3848.0	**2120**	1160.0	5414.0	**2990**	1643.3
651.2	**344**	173.33	964.4	**518**	270.00	2300.0	**1260**	682.22	3866.0	**2130**	1165.6	5432.0	**3000**	1648.9
654.8	**346**	174.44	968.0	**520**	271.11	2318.0	**1270**	687.78	3884.0	**2140**	1171.1	5450.0	**3010**	1654.4
658.4	**348**	175.56	971.6	**522**	272.22	2336.0	**1280**	693.33	3902.0	**2150**	1176.7	5468.0	**3020**	1660.0
662.0	**350**	176.67	975.2	**524**	273.33	2354.0	**1290**	698.89	3920.0	**2160**	1182.2	5486.0	**3030**	1665.6
665.6	**352**	177.78	978.8	**526**	274.44	2372.0	**1300**	704.44	3938.0	**2170**	1187.8	5504.0	**3040**	1671.1
669.2	**354**	178.89	982.4	**528**	275.56	2390.0	**1310**	710.00	3956.0	**2180**	1193.3	5522.0	**3050**	1676.7
672.8	**356**	180.00	986.0	**530**	276.67	2408.0	**1320**	715.56	3974.0	**2190**	1198.9	5540.0	**3060**	1682.2
676.4	**358**	181.11	989.6	**532**	277.78	2426.0	**1330**	721.11	3992.0	**2200**	1204.4	5558.0	**3070**	1687.3
680.0	**360**	182.22	993.2	**534**	278.89	2444.0	**1340**	726.67	4010.0	**2210**	1210.0	5576.0	**3080**	1693.3
683.6	**362**	183.33	996.8	**536**	280.00	2462.0	**1350**	732.22	4028.0	**2220**	1215.6	5594.0	**3090**	1698.9
687.2	**364**	184.44	1000.4	**538**	281.11	2480.0	**1360**	737.78	4046.0	**2230**	1221.1	5612.0	**3100**	1704.4
690.8	**366**	185.56	1004.0	**540**	282.22	2498.0	**1370**	743.33	4064.0	**2240**	1226.7	5702.0	**3150**	1732.2
694.4	**368**	186.67	1007.6	**542**	283.33	2516.0	**1380**	748.89	4082.0	**2250**	1232.2	5792.0	**3200**	1760.0
698.0	**370**	187.78	1011.2	**544**	284.44	2534.0	**1390**	754.44	4100.0	**2260**	1237.8	5882.0	**3250**	1787.8
701.6	**372**	188.89	1014.8	**546**	285.56	2552.0	**1400**	760.00	4118.0	**2270**	1243.3	5972.0	**3300**	1815.6
705.2	**374**	190.00	1018.4	**548**	286.67	2570.0	**1410**	765.56	4136.0	**2280**	1248.9	6062.0	**3350**	1843.3
708.8	**376**	191.11	1022.0	**550**	287.78	2588.0	**1420**	771.11	4154.0	**2290**	1254.4	6152.0	**3400**	1871.1
712.4	**378**	192.22	1040.0	**560**	293.33	2606.0	**1430**	776.67	4172.0	**2300**	1260.0	6242.0	**3450**	1898.9
716.0	**380**	193.33	1058.0	**570**	298.89	2624.0	**1440**	782.22	4190.0	**2310**	1265.6	6332.0	**3500**	1926.7
719.6	**382**	194.44	1076.0	**580**	304.44	2642.0	**1450**	787.78	4208.0	**2320**	1271.1	6422.0	**3550**	1954.4
723.2	**384**	195.56	1094.0	**590**	310.00	2660.0	**1460**	793.33	4226.0	**2330**	1276.7	6512.0	**3600**	1982.2
726.8	**386**	196.67	1112.0	**600**	315.56	2678.0	**1470**	798.89	4244.0	**2340**	1282.2	6602.0	**3650**	2010.0
730.4	**388**	197.78	1130.0	**610**	321.11	2696.0	**1480**	804.44	4262.0	**2350**	1287.8	6692.0	**3700**	2037.8
734.0	**390**	198.89	1148.0	**620**	326.67	2714.0	**1490**	810.00	4280.0	**2360**	1293.3	6782.0	**3750**	2065.6
737.6	**392**	200.00	1166.0	**630**	332.22	2732.0	**1500**	815.56	4298.0	**2370**	1298.9	6872.0	**3800**	2093.3
741.2	**394**	201.11	1184.0	**640**	337.78	2750.0	**1510**	821.11	4316.0	**2380**	1304.4	6962.0	**3850**	2121.1
744.8	**396**	202.22	1202.0	**650**	343.33	2768.0	**1520**	826.67	4334.0	**2390**	1310.0	7052.0	**3900**	2148.9
748.4	**398**	203.33	1220.0	**660**	348.89	2786.0	**1530**	832.22	4352.0	**2400**	1315.6	7142.0	**3950**	2176.7
752.0	**400**	204.44	1238.0	**670**	354.44	2804.0	**1540**	837.78	4370.0	**2410**	1321.1	7232.0	**4000**	2204.4
755.6	**402**	205.56	1256.0	**680**	360.00	2822.0	**1550**	843.33	4388.0	**2420**	1326.7	7322.0	**4050**	2232.2
759.2	**404**	206.67	1274.0	**690**	365.56	2840.0	**1560**	848.89	4406.0	**2430**	1332.2	7412.0	**4100**	2260.0
762.8	**406**	207.78	1292.0	**700**	371.11	2858.0	**1570**	854.44	4424.0	**2440**	1337.8	7502.0	**4150**	2287.8
766.4	**408**	208.89	1310.0	**710**	376.67	2876.0	**1580**	860.00	4442.0	**2450**	1343.3	7592.0	**4200**	2315.6
770.0	**410**	210.00	1328.0	**720**	382.22	2894.0	**1590**	865.56	4460.0	**2460**	1348.9	7682.0	**4250**	2343.3
773.6	**412**	211.11	1346.0	**730**	387.78	2912.0	**1600**	871.11	4478.0	**2470**	1354.4	7772.0	**4300**	2371.1
777.2	**414**	212.22	1364.0	**740**	393.33	2930.0	**1610**	876.67	4496.0	**2480**	1360.0	7862.0	**4350**	2398.9
780.8	**416**	213.33	1382.0	**750**	398.89	2948.0	**1620**	882.22	4514.0	**2490**	1365.6	7952.0	**4400**	2426.7
784.4	**418**	214.44	1400.0	**760**	404.44	2966.0	**1630**	887.78	4532.0	**2500**	1371.1	8042.0	**4450**	2454.4
788.0	**420**	215.56	1418.0	**770**	410.00	2984.0	**1640**	893.33	4550.0	**2510**	1376.7	8132.0	**4500**	2482.2
791.6	**422**	216.67	1436.0	**780**	415.56	3002.0	**1650**	898.89	4568.0	**2520**	1382.2	8222.0	**4550**	2510.0
795.2	**424**	217.78	1454.0	**790**	421.11	3020.0	**1660**	904.44	4586.0	**2530**	1387.8	8312.0	**4600**	2537.8
798.8	**426**	218.89	1472.0	**800**	426.67	3038.0	**1670**	910.00	4604.0	**2540**	1393.3	8402.0	**4650**	2565.6
802.4	**428**	220.00	1490.0	**810**	432.22	3056.0	**1680**	915.56	4622.0	**2550**	1398.9	8492.0	**4700**	2593.3
806.0	**430**	221.11	1508.0	**820**	437.76	3074.0	**1690**	921.11	4640.0	**2560**	1404.4	8582.0	**4750**	2621.1
809.6	**432**	222.22	1526.0	**830**	443.33	3092.0	**1700**	926.67	4658.0	**2570**	1410.0	8672.0	**4800**	2648.9
813.2	**434**	223.33	1544.0	**840**	448.89	3110.0	**1710**	932.22	4676.0	**2580**	1415.6	8762.0	**4850**	2676.7
816.8	**436**	224.44	1562.0	**850**	454.44	3128.0	**1720**	937.78	4694.0	**2590**	1421.1	8852.0	**4900**	2704.4
820.4	**438**	225.56	1580.0	**860**	460.00	3146.0	**1730**	943.33	4712.0	**2600**	1426.7	8942.0	**4950**	2732.2
824.0	**440**	226.67	1598.0	**870**	465.56	3164.0	**1740**	948.89	4730.0	**2610**	1432.2	9032.0	**5000**	2760.0
827.6	**442**	227.78	1616.0	**880**	471.11	3182.0	**1750**	954.44	4748.0	**2620**	1437.8	9122.0	**5050**	2787.8
831.2	**444**	228.89	1634.0	**890**	476.67	3200.0	**1760**	960.00	4766.0	**2630**	1443.3	9212.0	**5100**	2815.6
834.8	**446**	230.00	1652.0	**900**	482.22	3218.0	**1770**	965.56	4784.0	**2640**	1448.9	9302.0	**5150**	2843.3
838.4	**448**	231.11	1670.0	**910**	487.78	3236.0	**1780**	971.11	4802.0	**2650**	1454.4	9392.0	**5200**	2871.1
842.0	**450**	232.22	1688.0	**920**	493.33	3254.0	**1790**	976.67	4820.0	**2660**	1460.0	9482.0	**5250**	2898.9
845.6	**452**	233.33	1706.0	**930**	498.89	3272.0	**1800**	982.22	4838.0	**2670**	1465.6	9572.0	**5300**	2926.7
849.2	**454**	234.44	1724.0	**940**	504.44	3290.0	**1810**	987.78	4856.0	**2680**	1471.1	9662.0	**5350**	2954.4
852.8	**456**	235.56	1742.0	**950**	510.00	3308.0	**1820**	993.33	4874.0	**2690**	1476.7	9752.0	**5400**	2982.2
856.4	**458**	236.67	1760.0	**960**	515.56	3326.0	**1830**	998.89	4892.0	**2700**	1482.2	9842.0	**5450**	3010.0
860.0	**460**	237.78	1778.0	**970**	521.11	3344.0	**1840**	1004.4	4910.0	**2710**	1487.8	9932.0	**5500**	3037.8
863.6	**462**	238.89	1796.0	**980**	526.67	3362.0	**1850**	1010.0	4928.0	**2720**	1493.3	10,022.0	**5550**	3065.6
867.2	**464**	240.00	1814.0	**990**	532.22	3380.0	**1860**	1015.6	4946.0	**2730**	1498.9	10,112.0	**5600**	3093.3

IF YOU DO NOT HAVE A TABLE HANDY THIS MENTAL EXERCISE WILL GIVE YOU AN ACCURATE CONVERSION FOR °C TO °F WHEN °C IS ABOVE ZERO.

°C to °F	e. g. Convert 1000°C to °F		
	1. Double the °C value	1. 1000° × 2	2000
	2. Subtract 10%	2. 2000 −200	1800
	3. Add 32	3. 1800 + 32	1832° F

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



MANUAL ON THE USE OF THERMOCOUPLES IN TEMPERATURE MEASUREMENT

ASTM Manual Series: MNL-12, $49.00

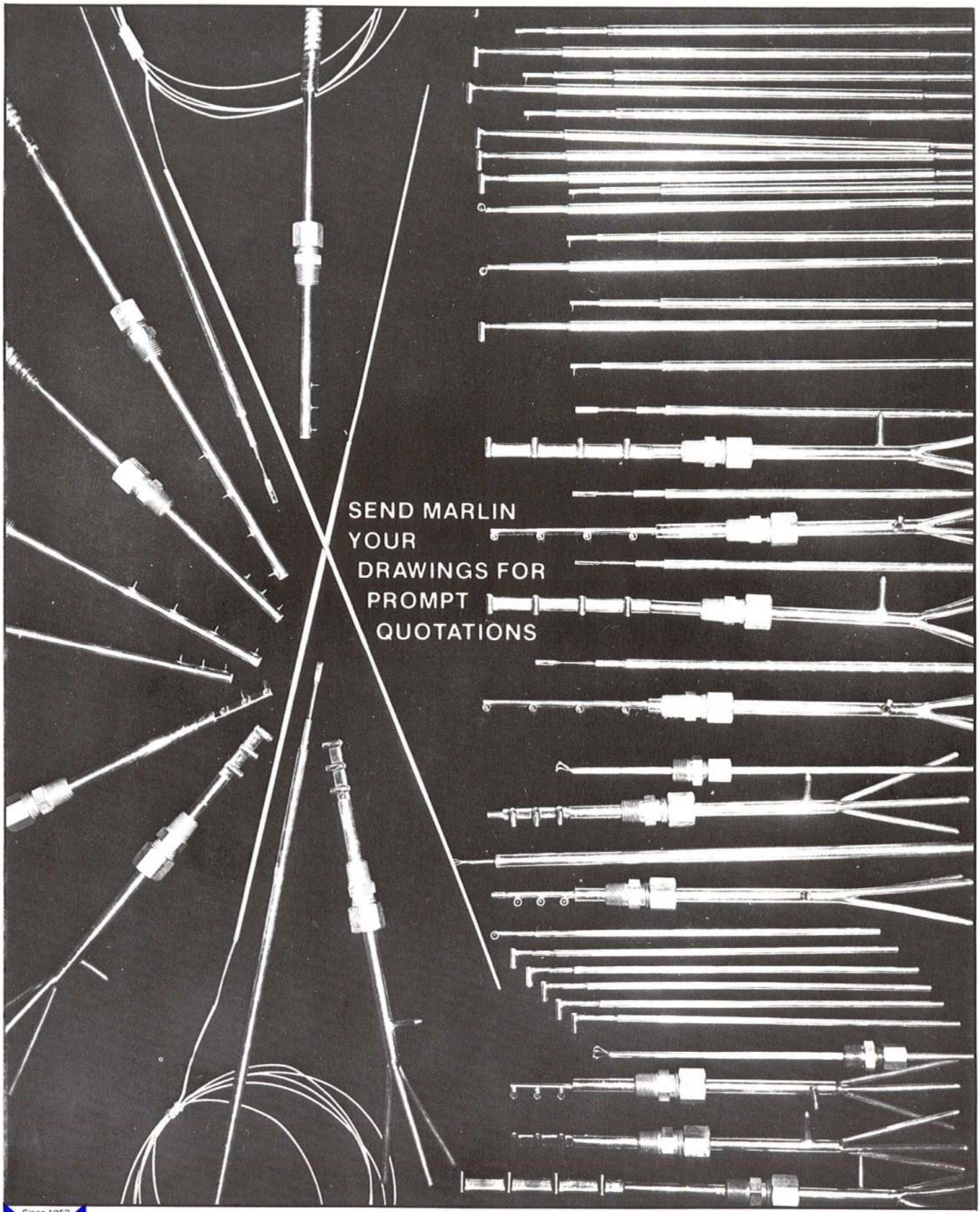
Edited by R.M. Park of Marlin Manufacturing Corp., and co-authored by experienced experts from a cross-section of American industry, this newly-revised Fourth Edition of a widely used and highly-regarded 311-page hard cover reference volume on thermocouple thermometry has been completely revised in accordance with latest ITS-90 requirements.

All text in this new edition has been completely reviewed and brought up to date. Whole chapters were completely rewritten, where necessary. The latest ITS-90 tables of EMF vs. Temperature, extracted from NIST Monograph 175 are included in a new easy to read format. Polynomial coefficients for the functions to generate the tables together with inverse polynomial functions, useful for determining temperature from a measured thermocouple emf, are presented. The calibration chapter was completely revised to reflect ITS-90 requirements. Manual 12 is the definitive reference work for the practical user of thermocouples.

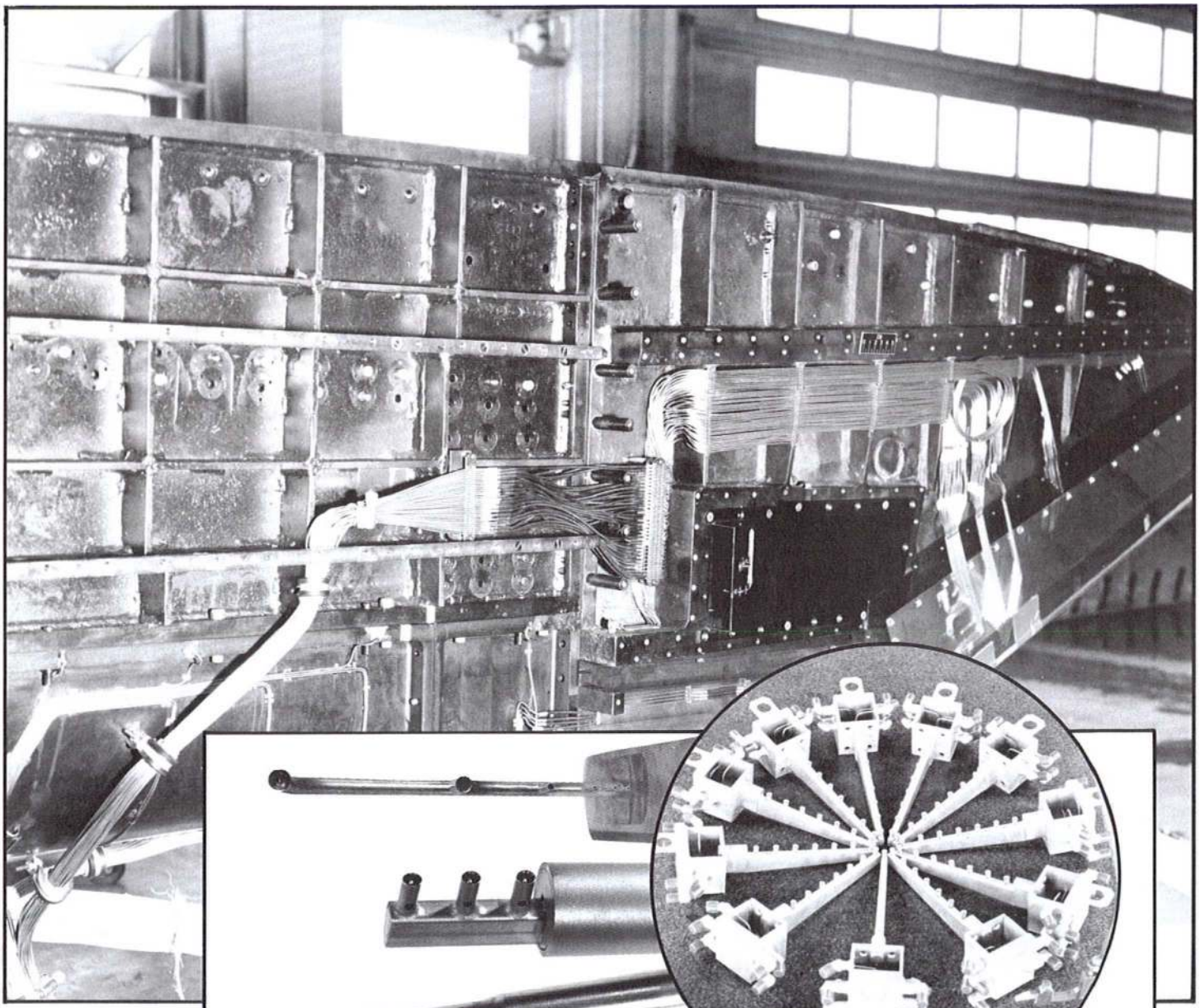
Since 1952 Marlin MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

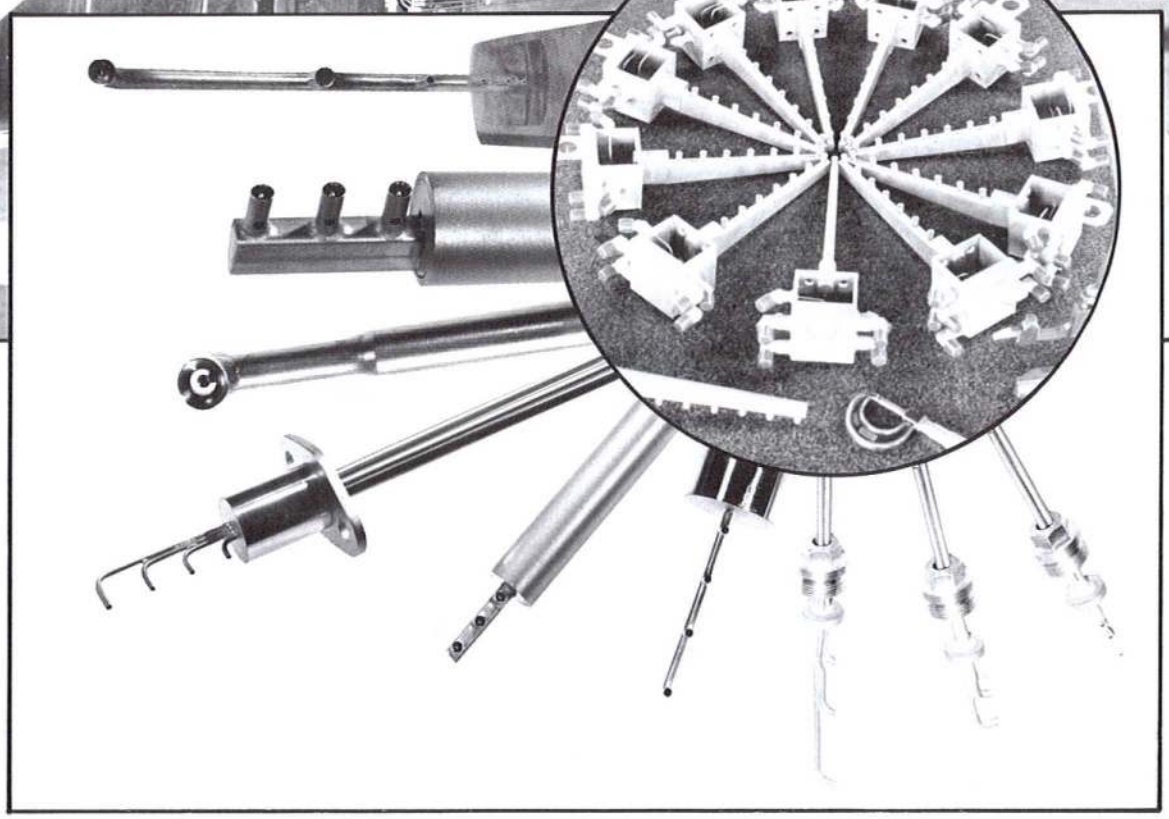
NOTICE:

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



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





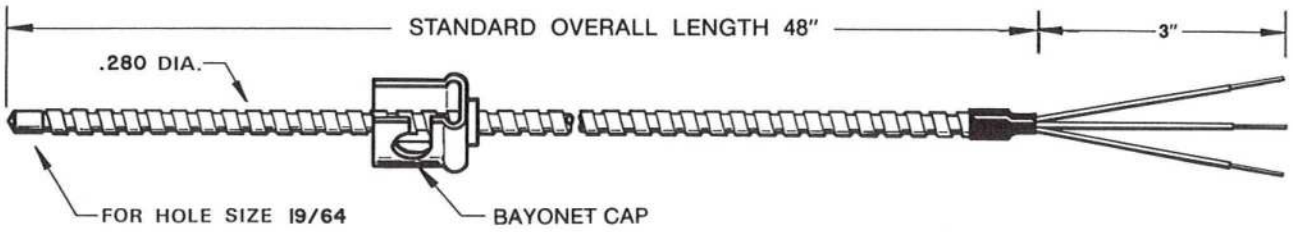
SEND MARLIN YOUR DRAWINGS FOR PROMPT QUOTATIONS

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

Platinum Resistance Thermometers

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

SENSORS
PRT's — PLATINUM RESISTANCE THERMOMETERS



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.

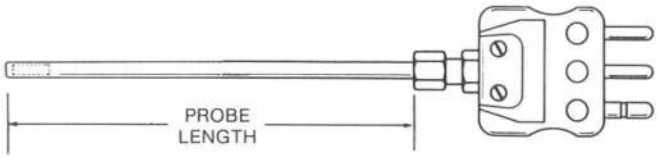
DISCOUNT SCHEDULE	
QUANTITY	FACTOR
1 - 9	Net
10 - 24	.95
25 - 49	.85
100 - 199	.80
200+	.75

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.

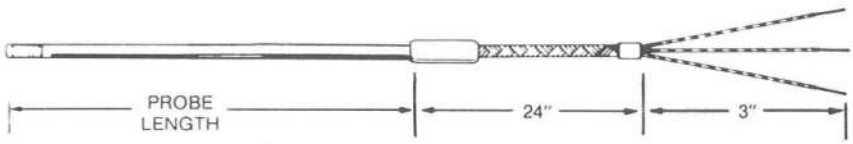
PRT Extension Wire
Color Code: White, Red, Red

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

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:

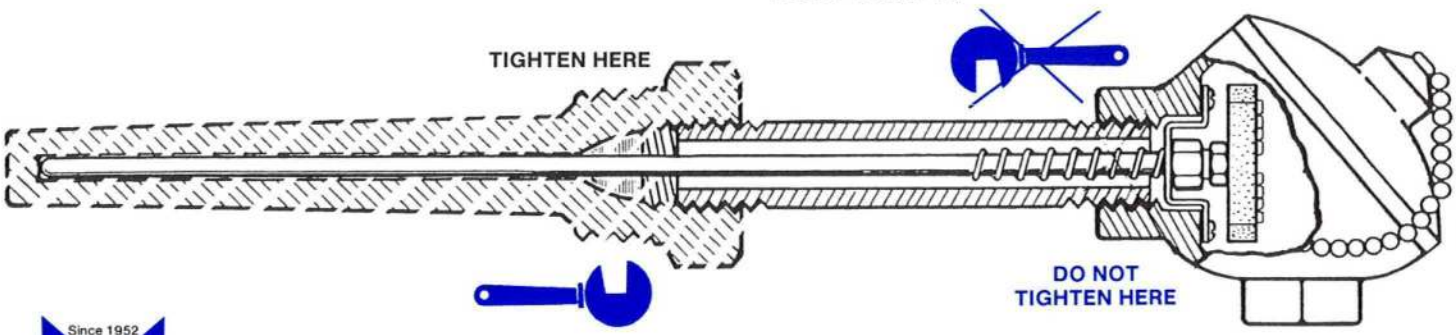
DO NOT ATTEMPT to mechanically connect the assembly into the process by tightening at the terminal or connecting head. USE ONLY THE PROCESS FITTING OR THE THERMOWELL FLATS FOR THIS PURPOSE. Terminals or connecting heads that are twisted can be damaged or cause shorts that can adversely affect the operation 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.

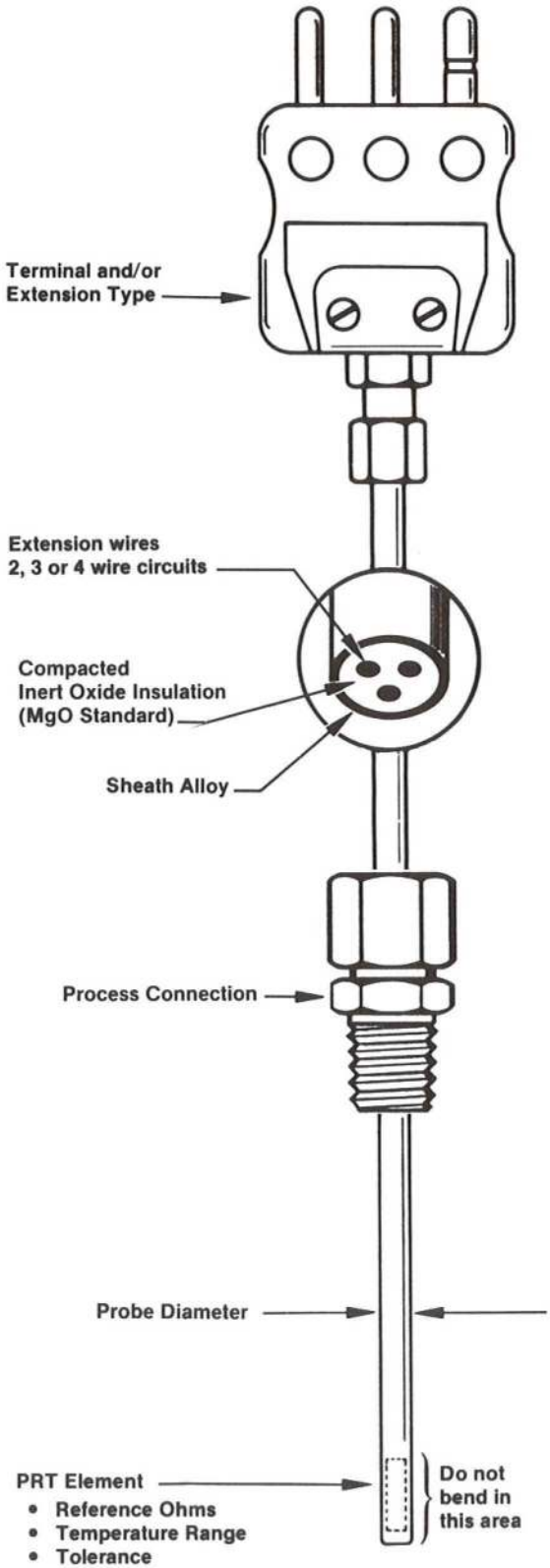
Tolerance of the PRT element:
A range of limits of error elements are available (0.1%-typical). See the tolerance section for definition. In general the better the tolerance the more expensive is the thermometer.

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

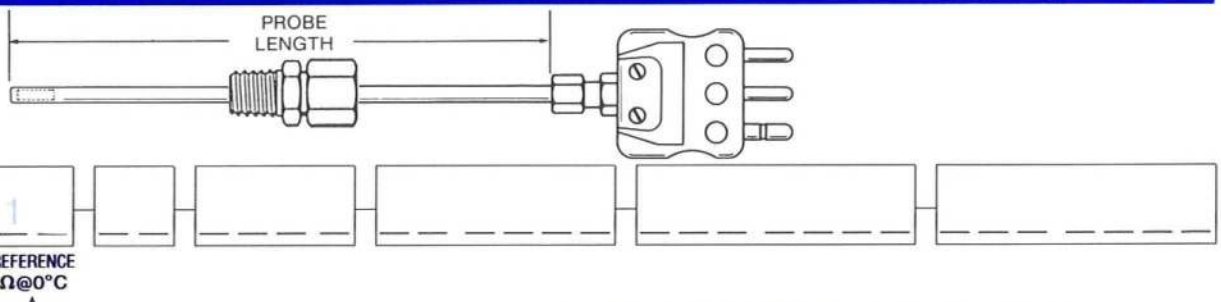
Probe Diameter:
Use the probe diameter that will withstand the rigors of your application but with minimal affect on it. Because the element can be broken if the sheath is bent in the element area, it is recommended that a minimum of 0.187" diameter thermometer be used. Smaller diameters are available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



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



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

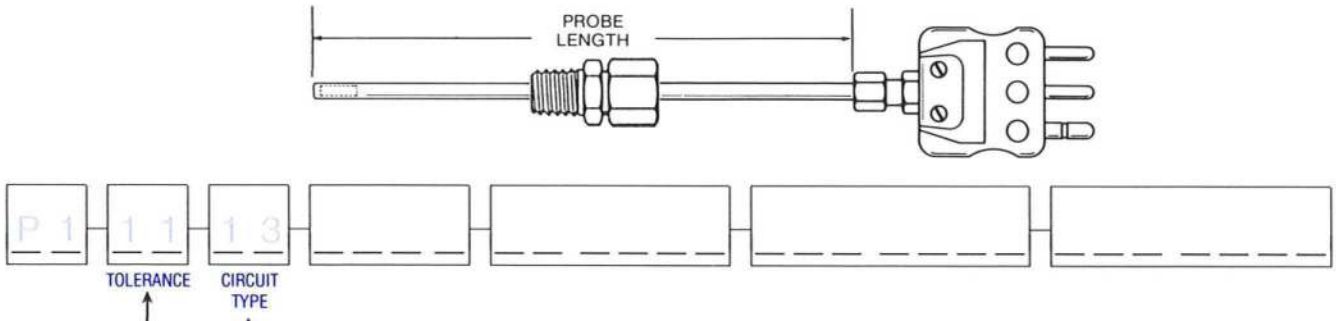
Over the temperature interval -200 to 600°C, the resistance of a platinum resistance thermometer is given by the relationship

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

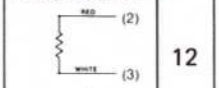
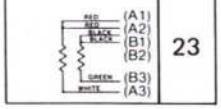
where R_t is the resistance in ohms at any temperature t (expressed in degrees Celsius), and R_0 is the resistance in ohms of the thermometer at 0°C. A, B, and C are constants whose values are

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

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.



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

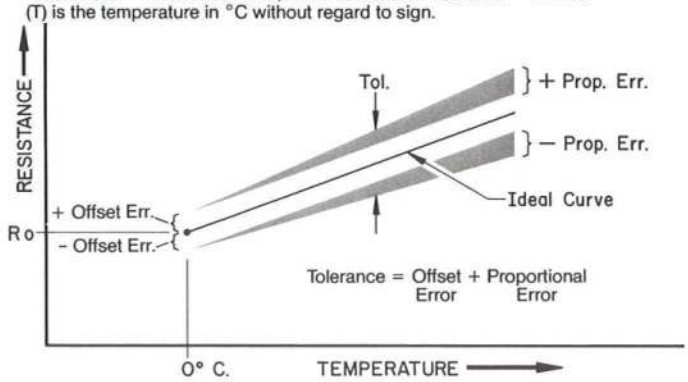
The accuracy of a platinum resistance thermometer is dependent upon two factors. The first is the offset of its actual resistance from the nominal value (typically 100 ohms) at some reference temperature (usually 0°C). The second factor is a variation from a nominal value of the effective resistance 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.

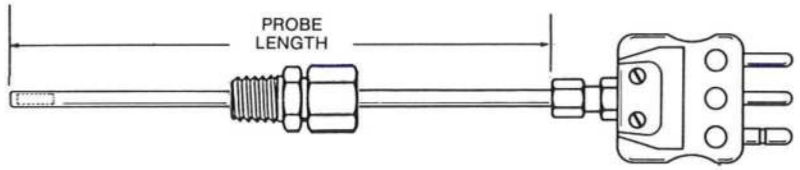


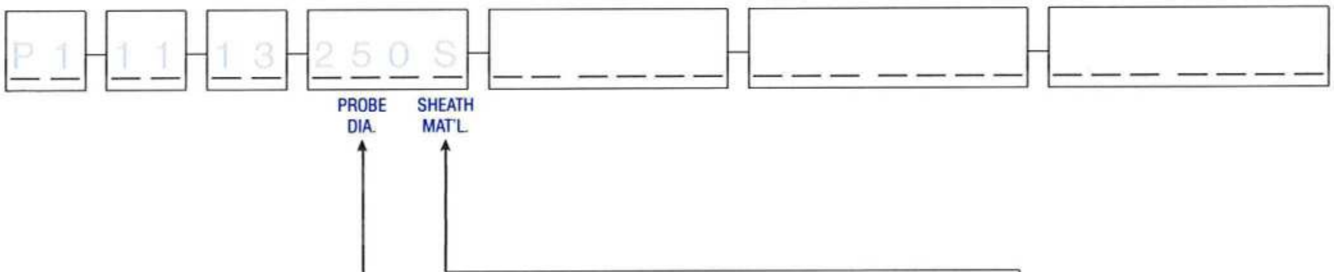
PRT Circuitry

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.





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

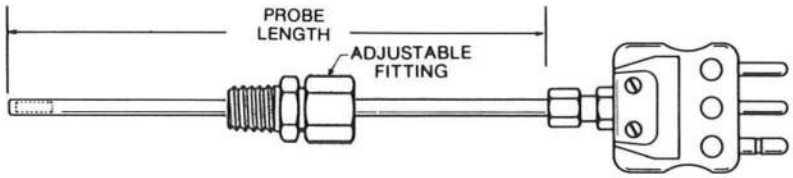
Your application dictates the size of the PRT Probe to be used. Generally the smaller the diameter the faster the thermal response time and the shorter the necessary immersion length for accurate instrumentation, but with less strength than a probe with a larger diameter. Use the sheath size that will 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.

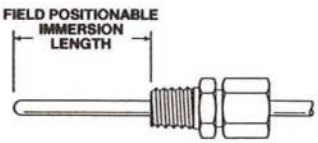
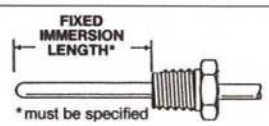
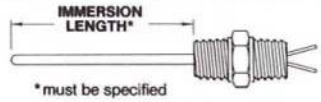


P 1 | 1 1 | 1 3 | 2 5 0 S | A 1 | 0 0 0 0 | | |

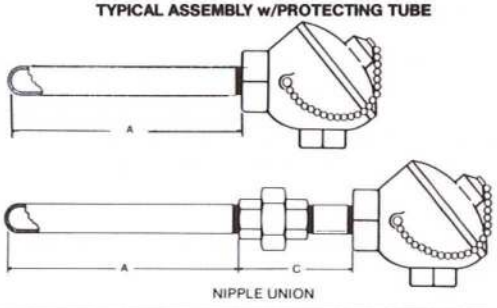
FITTING OR MOUNTING TYPE

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

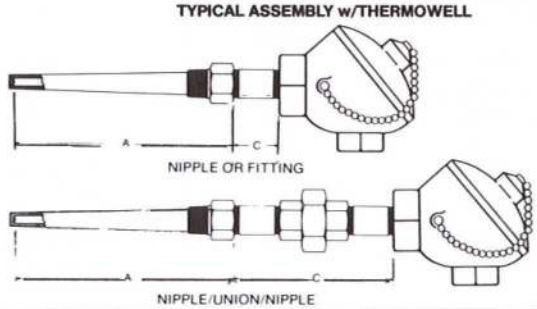
Mounting Fittings (SEE SELECTION SUMMARIES FOR DETAILS)

		CODE
NONE		XX
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		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	
Fixed Fittings are stainless steel, NPT thread sizes, and are brazed to the sheath. Additional sizes, materials and welded mountings are also available.		1/8 NPT 1/4 NPT 3/8 NPT 1/2 NPT 3/4 NPT 1 NPT	F1 F2 F3 F4 F6 F8
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.		1/4 x 1/4 NPT 1/2 x 1/2 NPT 3/4 x 3/4 NPT	D2 D4 D6

TYPICAL ASSEMBLY w/PROTECTING TUBE

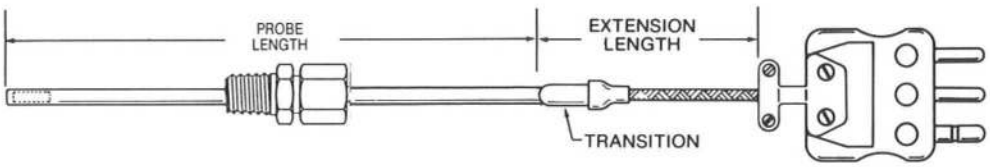


TYPICAL ASSEMBLY w/THERMOWELL



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

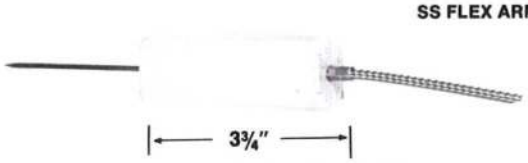
SS Armor Tubing Can be used over any wire extension for added mechanical damage and abrasion resistance.

SS FLEX ARMOR TUBING

GLASS/GLASS EXTENSION

0.187" SAME DIAMETER TRANSITION

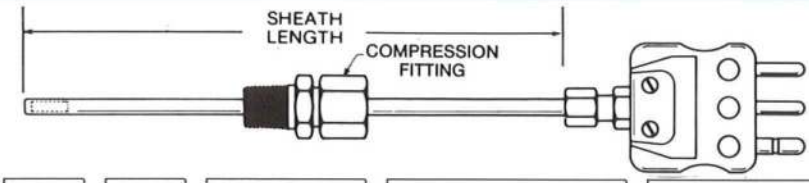
GLASS/GLASS EXTENSION



(See page F-0 for handle details)

PROBE HANDLE TRANSITION W/SS FLEX ARMOR

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



P1 11 13 250S A1 0000 XXX 0000 P31 0024

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

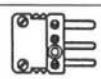
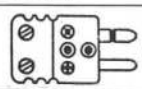
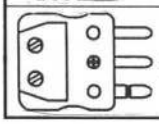
A1 — ⅛ NPT, SS compression fitting

0000 — Field positionable A1

XXX
0000 — No transition or wire extension

P31 — 3-pole full size plug

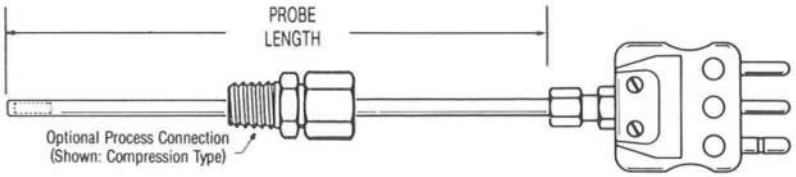
0024 — 24″ long probe length

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.

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

SENSORS — SELECTION SUMMARY
CUSTOM PRT'S



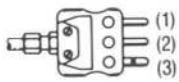
ELEMENT TYPE	REFERENCE Ω @ 0°C	TOLERANCE	CIRCUIT TYPE	PROBE DIA.	SHEATH MAT'L.	PROCESS CONNECTION	IMMERSION LENGTH (If Applicable)		TERMINAL TYPE	PROBE LENGTH IN INCHES
P 1							XXX	00	P31	

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

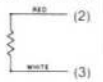
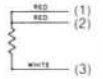
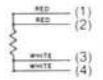
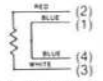
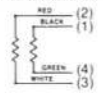
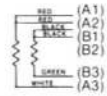
P1
α = 0.00385 -250°C to 600°C (-420°F to 1112°F)

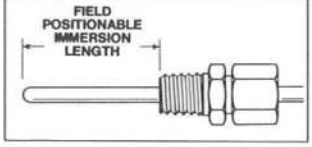
TOLERANCE	CODE
0.05%	0
0.1%	1
0.5%	2
NOTES: Other tolerances are available, consult Factory. "9" requires description.	

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.	

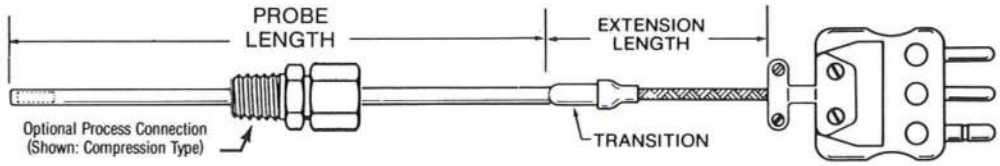
CIRCUIT	CODE
SINGLE ELEMENT	
	12
	13
	14
	15
DUAL ELEMENT	
	22
	23
NOTES: Dual element PRT's require .250 O.D. minimum sheath diameter.	

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.

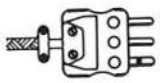
CODE	PROBE DIA.	SHEATH MATERIAL
187S	.187"	316SS
250S	.250"	
187I	.187"	INCONEL 600
250I	.250"	

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"

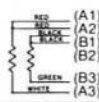
TRANSITIONS
3) Extension include transitions for use to 205°C (400°F)
4) For Hi-Temp transition 425°C (800°F) add "H" to code: e.g. "HG"
5) For transition "same size" as Sheath O.D. add "E" to code e.g. "EG"

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

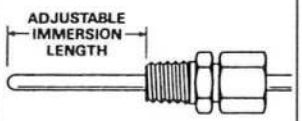
NOTES:
Other resistance value available. Please consult Factory.

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

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

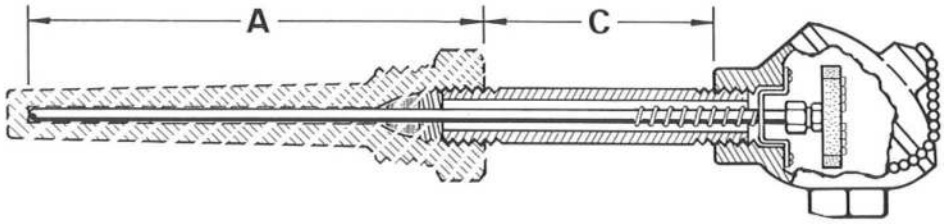
PROCESS CONNECTION	CODE
NONE	XX
***ADJUSTABLE IMMERSION**	
1/8 NPT	A1
1/4 NPT	A2

*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



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

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-3/4-4 1/2-304

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

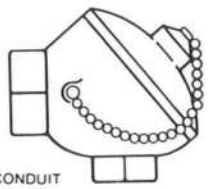
CODE	TOLERANCE
0	0.05%
1	0.1%
2	0.5%

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"	

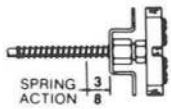
NOTES:
For special dia. or mat'l. consult Factory.

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



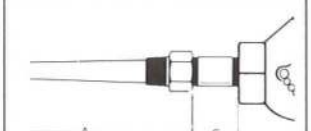
Ref. Ω PRT 1	
Ω @ 0°C	CODE
100	1
2 x 100 (DUAL)	2

NOTES:
Other resistance value available. Please consult Factory.

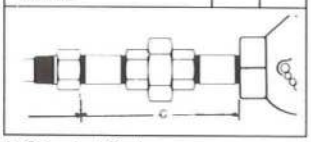
CIRCUIT	CODE
SINGLE ELEMENT	
	12
	13
	14
	15
DUAL ELEMENT	
	22
	23

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

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

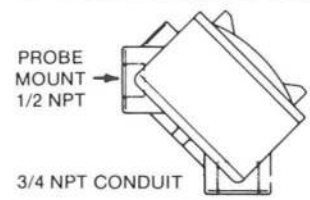


	"C" DIM.	Stl.(1)	SS
NIPPLE/ UNION/ NIPPLE	2⅜"	33	53
	5¾"	36	56



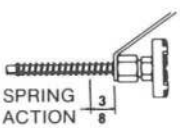
1.) Galvanized Steel

CODE	EXPLOSIONPROOF HEAD
124	



TERMINAL BLOCKS for Explosion Proof Heads

SPRING LOADED 4 WIRE

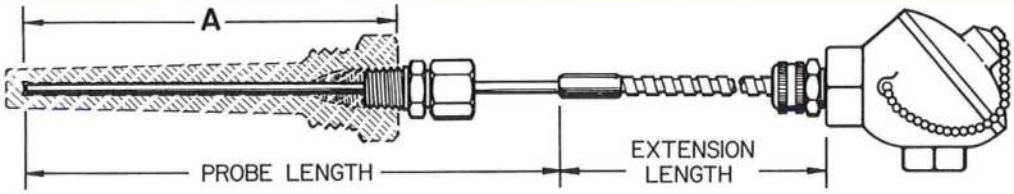


FOR / TITLE:		
DATE:	BY:	JOB NO.

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
P1				250	S	A4	0000	ME3		241	

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)

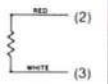
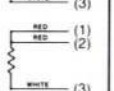
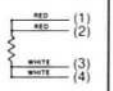
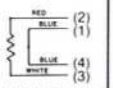
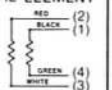
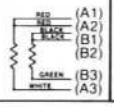
CODE	TOLERANCE
0	0.05%
1	0.1%
2	0.5%

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

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

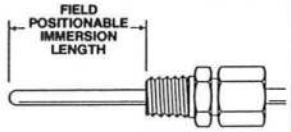
*EXTENSION LENGTH IN INCHES
NOTES:
1) For SS Armor Cable with PVC Coating over code ME8.

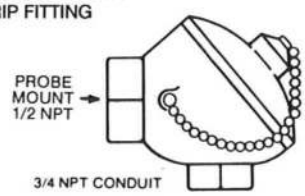
Ref. Ω PRT 1	
Ω @ 0°C	CODE
100	1
2 x 100 (DUAL)	2

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

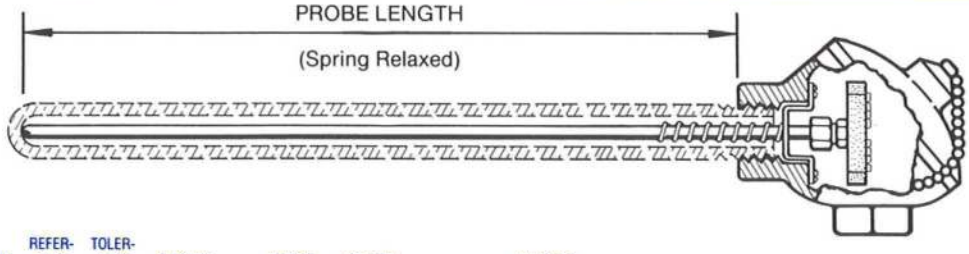


WEATHERPROOF HEAD	CODE
CAST ALUMINUM WITH WIRE GRIP FITTING 	241
TERMINAL BLOCKS for Weatherproof Heads	
RIGID 4 WIRE 	

FOR / TITLE:		
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 FOR PROTECTION TUBE



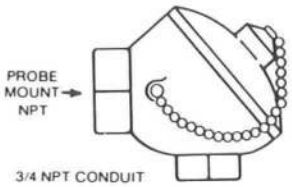
ELEMENT TYPE	REFERENCE Ω@0°C	TOLERANCE	CIRCUIT TYPE	PROBE DIA.	SHEATH MAT'L	SUPPORT FITTING		TERMINAL TYPE	PROBE LENGTH IN INCHES
P 1				2 5 0	S	X X 0 0 0 0	X X X 0 0 0 0		

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%

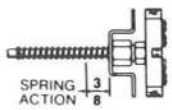
CODE	PROBE DIA. & SHEATH MATERIAL	
187S	.187"	316SS
250S	.250"	
187I	.187"	INCONEL 600
250I	.250"	

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

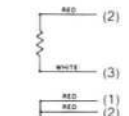
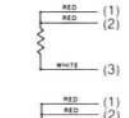
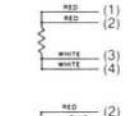
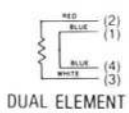
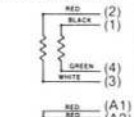
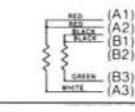


TERMINAL BLOCKS for Weatherproof Heads

SPRING LOADED 4 WIRE

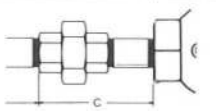


Ref. Ω PRT 1	
Ω @ 0°C	CODE
100	1
2 x 100 (DUAL)	2

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

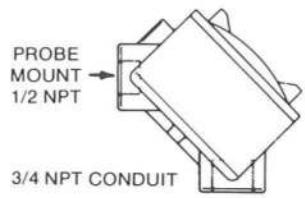
NOTES:
Dual element PRT's require .250 O.D. minimum sheath diameter.

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



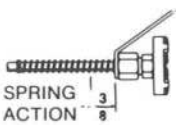
NOTES: 1) Steel Standard
2) Add S for Stainless Stl. e.g. 13S
3) NPT Size specified by Weatherproof Head Size

CODE	EXPLOSIONPROOF HEAD
124	1/2 NPT



TERMINAL BLOCKS for Explosion Proof Heads

SPRING LOADED 4 WIRE

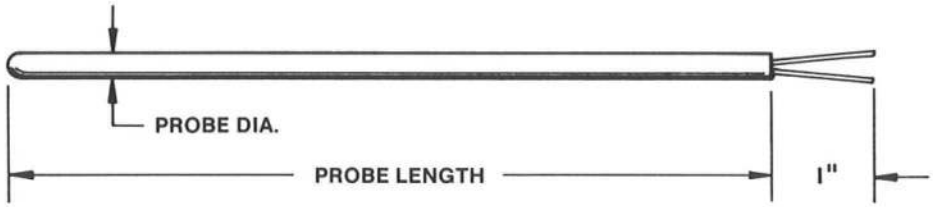


FOR / TITLE:		
DATE:	BY:	JOB NO.

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

Marlox Thermocouples

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

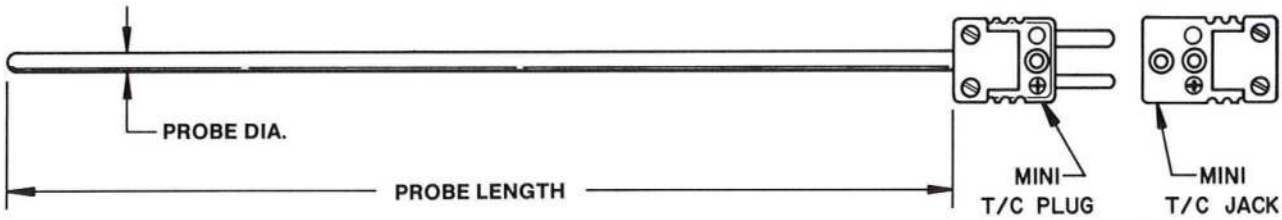


DESCRIPTION				PROBE LENGTH INCHES	MARLIN STOCK NO.	PRICE $/EA.
PROBE DIA.	SHEATH MATERIAL	ANSI TYPE	JUNCTION TYPE			
1/8	Inconel 600	K	Grounded	6″ 12″ 18″	M009 - 6 M009 -12 M009 -18	12 14 15
1/4	Inconel 600	K	Grounded	6″ 12″ 18″	M012 - 6 M012 -12 M012 -18	15 19 23
1/8	Inconel 600	K	Ungrounded	6″ 12″ 18″	M014 - 6 M014 -12 M014 -18	14 16 18
1/4	Inconel 600	K	Ungrounded	6″ 12″ 18″	M016 - 6 M016 -12 M016 -18	17 21 25

One Week Shipments for orders of stock Marlox Thermocouples.

- **Order by Stock Number or Part Number**
- **Quantity based on total stock Thermocouples per order**

DISCOUNT SCHEDULE	
QUANTITY	DISCOUNT FACTOR
1-9	NET
10-24	.95
25-49	.90
50-99	.85
100-199	.80
200 +	.75

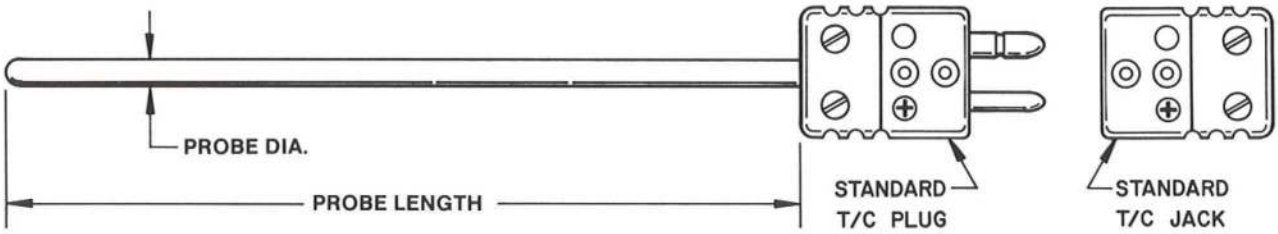


DESCRIPTION				PROBE LENGTH INCHES	MARLIN STOCK NO.	PRICE $/EA.
PROBE DIA.	SHEATH MATERIAL	ANSI TYPE	JUNCTION TYPE			
1/16	Inconel 600	K	Grounded	6″ 12″ 18″	M111 - 6 M111 -12 M111 -18	23 24 25
1/8	Inconel 600	K	Grounded	6″ 12″ 18″	M112 - 6 M112 -12 M112 -18	23 24 25
1/16	Inconel 600	K	Ungrounded	6″ 12″ 18″	M115 - 6 M115 -12 M115 -18	25 26 27
1/8	Inconel 600	K	Ungrounded	6″ 12″ 18″	M116 - 6 M116 -12 M116 -18	25 26 27

One Week Shipments for orders of stock Marlox Thermocouples.

- **Order by Stock Number or Part Number**
- **Quantity based on total stock Thermocouples per order**

DISCOUNT SCHEDULE	
QUANTITY	DISCOUNT FACTOR
1-9	NET
10-24	.95
25-49	.90
50-99	.85
100-199	.80
200 +	.75



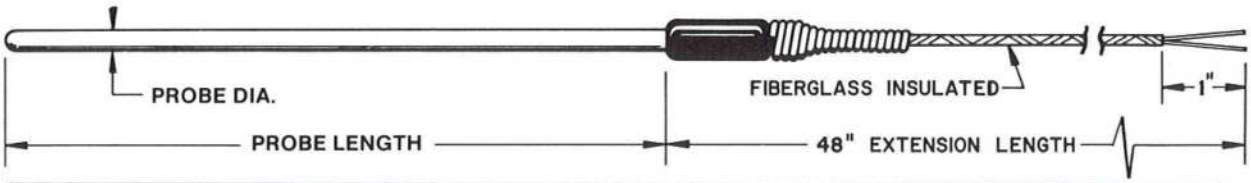
DESCRIPTION				PROBE LENGTH INCHES	MARLIN STOCK NO.		PRICE $/EA.
PROBE DIA.	SHEATH MATERIAL	ANSI TYPE	JUNCTION TYPE				
1/8	Inconel 600	K	Grounded	6″	M209	- 6	24
				12″		-12	26
				18″		-18	28
1/4				6″	M212	- 6	30
				12″		-12	34
				18″		-18	39
1/8	Inconel 600	K	Ungrounded	6″	M214	- 6	26
				12″		-12	28
				18″		-18	30
1/4				6″	M216	- 6	32
				12″		-12	36
				18″		-18	41

One Week Shipments for orders of stock Marlox Thermocouples.

- **Order by Stock Number or Part Number**
- **Quantity based on total stock Thermocouples per order**

DISCOUNT SCHEDULE	
QUANTITY	DISCOUNT FACTOR
1-9	NET
10-24	.95
25-49	.90
50-99	.85
100-199	.80
200 +	.75

SENSORS
STOCK MARLOX® THERMOCOUPLES



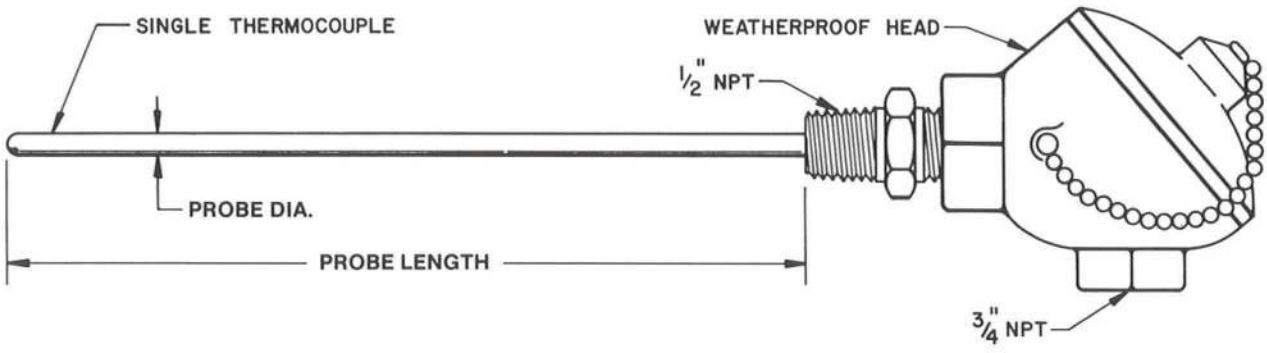
DESCRIPTION				PROBE LENGTH INCHES	MARLIN STOCK NO.		PRICE $/EA.
PROBE DIA.	SHEATH MATERIAL	ANSI TYPE	JUNCTION TYPE				
1/16	Inconel 600	K	Grounded	6″ 12″ 18″	M415	- 6 -12 -18	25 27 29
1/8				6″ 12″ 18″	M416	- 6 -12 -18	26 28 30
1/16	Inconel 600	K	Ungrounded	6″ 12″ 18″	M422	- 6 -12 -18	27 29 30
1/8				6″ 12″ 18″	M423	- 6 -12 -18	28 30 32

One Week Shipments for orders of stock Marlox Thermocouples.

- **Order by Stock Number or Part Number**
- **Quantity based on total stock Thermocouples per order**

DISCOUNT SCHEDULE	
QUANTITY	DISCOUNT FACTOR
1-9	NET
10-24	.95
25-49	.90
50-99	.85
100-199	.80
200 +	.75

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



DESCRIPTION				PROBE LENGTH INCHES	MARLIN STOCK NO.		PRICE $/EA.
PROBE DIA.	SHEATH MATERIAL	ANSI TYPE	JUNCTION TYPE				
1/4	Inconel 600	K	Grounded	6″ 12″ 18″	M708	- 6 -12 -18	46 50 54
1/4	Inconel 600	K	Ungrounded	6″ 12″ 18″	M712	- 6 -12 -18	50 54 58

DISCOUNT SCHEDULE	
QUANTITY	DISCOUNT FACTOR
1-9	NET
10-24	.95
25-49	.90
50-99	.85
100-199	.80
200 +	.75

One Week Shipments for orders of stock Marlox Thermocouples.

- **Order by Stock Number or Part Number**
- **Quantity based on total stock Thermocouples per order**

GENERAL INSTALLATION PARAMETERS:

Handling:

There are many variations of T/C's and T/C 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. T/C'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 T/C should "see", as closely as possible, what the product in the process is experiencing in order to get meaningful temperature measurements. Locate the T/C 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 T/C. If thermowell or protecting tube must be welded into the process, carefully remove T/C sensor before welding and be sure to handle carefully, keep clean and replace without forcing or stressing any components. Assemblies with ceramic tubes should be preheated before immersion into high heat in order to avoid any thermal shock.

Wire Extension:

Use wire extensions of the same thermocouple material type (i.e. "J", "K", "T", "E", "R", "S", "B", etc.) of the installed T/C throughout the circuit. The use of thermocouple grade or thermocouple extension grade wire and the selection of conductor insulation depends on what the environmental conditions dictate. "RED" color code is always negative in T/C circuits. Ideally run T/C circuit wires in separate conduits at least one foot away from power lines. Twisted and shielded constructions may be required to avoid noise in the T/C circuit. The overall impedance of the T/C circuit must be compatible with your instrumentation. If there is a reversal in the T/C circuit the indication will be down scale. A "double-reversal" in the circuit will give an upscale but erroneous reading. Keep the "RED" color coded leg negative throughout the circuit to avoid these reversals.

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.

T/C's often deteriorate with time, exhibiting a drift from actual temperatures. Deterioration usually is more rapid at higher temperatures and depends on the integrity of the protecting tube or sheath to isolate it from contaminates. T/C's should be checked at regular maintenance intervals based on recommendations or on experience.

THERMOCOUPLE DO's

- DO check in place.
- DO replace at established, proper intervals.
- DO have good connections throughout the circuit.

THERMOCOUPLE DO NOT's

- DON'T reinsert at different immersions. (Avoid decreasing the immersion.)
- DON'T use for accurate measurements at lower temperatures after being exposed to higher temperatures.
- DON'T use in defective protecting tubes.
- DON'T insulate with used insulators.
- DON'T use oils or solvents on or in T/C's or T/C assemblies.

Metal Sheathed — Inert Oxide Insulated THERMOCOUPLE ASSEMBLIES

Customized Thermocouples — Built to your design
Stock Thermocouples — Off-the-shelf availability

RANDOM LENGTH THERMOCOUPLE CABLE
HIGH TEMPERATURE THERMOCOUPLES

DESCRIPTION

Marlox is metal sheathed, inert oxide insulated thermocouple cable from Marlin Manufacturing Corporation. Available in ANSI calibrations with various types of sheath alloys, Marlox can be ordered as complete fabricated assemblies or in random lengths. Drawn to final size and fully annealed standard Marlox, single or dual thermocouple element, is moistureproof, pressure resistant, accurate, bendable and weldable. Quality control procedures insure that all thermocouple material is tested for adequate insulation resistance. All certified Marlox stock is checked for ANSI limits of error conformance by lot sampling in our quality control laboratory which is certified traceable to the NIST. Post assembly certified traceable calibration, is available upon request.

General Selection Parameters

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

Thermocouple Type:
Select the thermocouple type that will be capable of operating in your application temperature range.

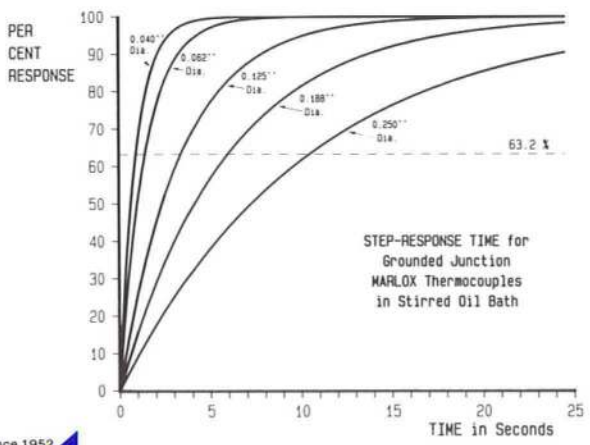
Sheath Alloy:
Select a sheath alloy that will withstand the temperature and possible corrosives of your application.

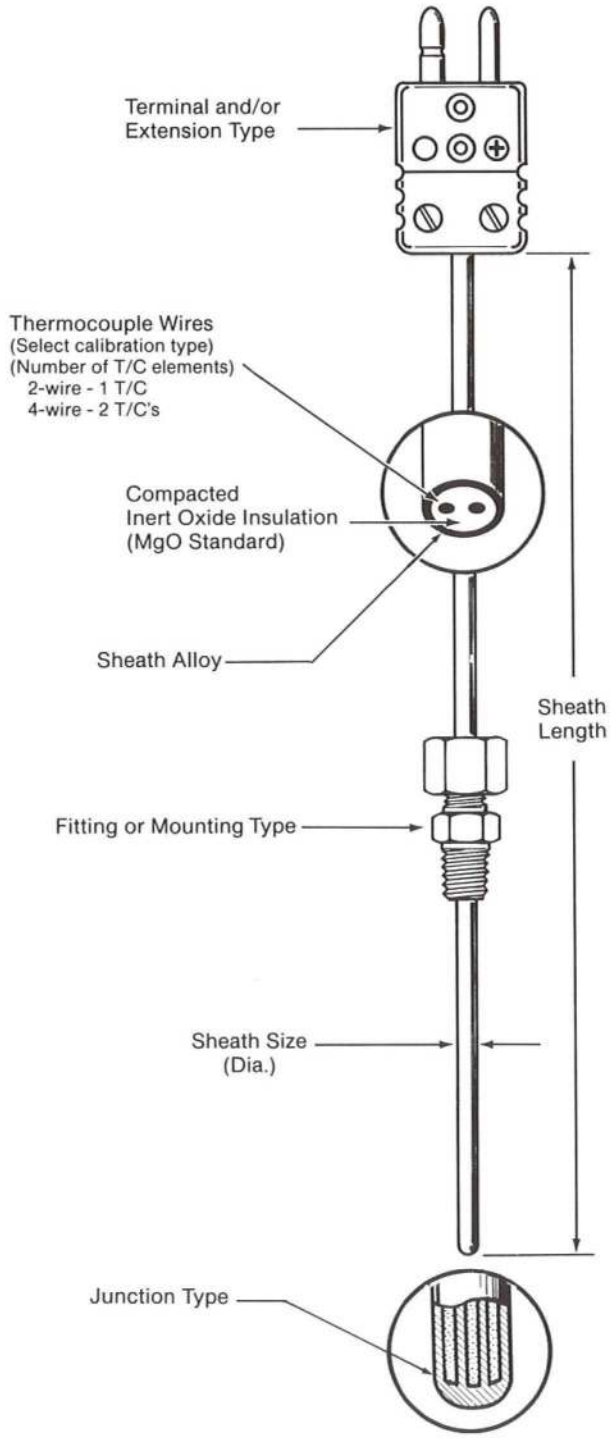
Sheath Size:
Use the thermocouple size that will withstand the rigors of your application but with minimal effect on it. See response chart below.

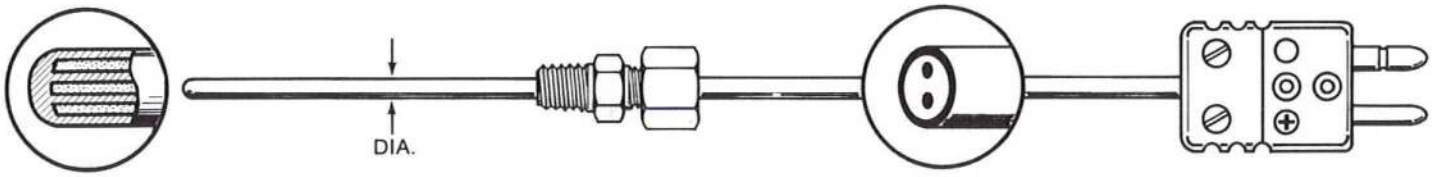
Junction Type:
Select the junction that will give the protection and response characteristics that you require.

Fitting or Mounting Type:
In order to attach and/or seal the thermocouple 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 and extensions are available.







CODE	SHEATH SIZE DIA. INCHES	CODE	SHEATH SIZE DIA. INCHES
010	.010	187	.187
020	.020	250	.250
032	.032	312	.312
040	.040	375	.375
062	.062	500	.500
125	.125		

CODE	SHEATH MAT'L.
304	304SS
310	310SS
316	316SS
600	INCONEL™ "600"
230	2300™

Temperature Recommendation

The temperature limits for continuous duty, grounded junction thermocouples are shown for available sheath sizes and thermocouple calibrations. Exposed junction thermocouples should be used at lower temperatures for equivalent service life.

LIMIT TEMPERATURE °F CONTINUOUS DUTY

SHEATH DIAMETER INCHES	NOMINAL TUBE WALL THICKNESS INCHES	WIRE GAUGE AWG.		ANSI THERMOCOUPLE TYPE			
		SINGLE TC ELEMENT	DUAL TC ELEMENT	J	T	K	E
.020	.003	38		700	400	1600	800
.032	.004	34		700	400	1600	800
.040	.006	33		700	400	1600	800
1/16	.009	28	30	700	400	1600	800
1/8	.017	22	24	700	400	1600	800
3/16	.025	20	21	900	500	2000	1000
1/4	.033	16	18	1000	600	2000	1100
5/16	.041	16		1000	600	2000	1100
3/8	.052	15		1100	700	2000	1200
1/2	.070	10					

DIM. TOLERANCE: Up to .062 ±.001; .125 to .500 ±.003"

Sheath Alloys

304 Stainless Steel (18% Chromium-8% Nickel) is a general purpose, economical, readily available sheath material that has good corrosion and oxidation resistance. Maximum operating temperature 1650° F.

310 Stainless Steel (24% Chromium-19% Nickel) is a material that has improved resistance to corrosion as compared to 304 SS and the best resistance to oxidation of the "300" series stainless steels. Maximum operating temperature 2100° F.

316 Stainless Steel (16% Chromium-10% Nickel) is a material that has superior corrosion resistance as compared to 304 SS or 310 SS with improved oxidation resistance and a higher hot strength than 304 SS. Maximum operating temperature 1700° F.

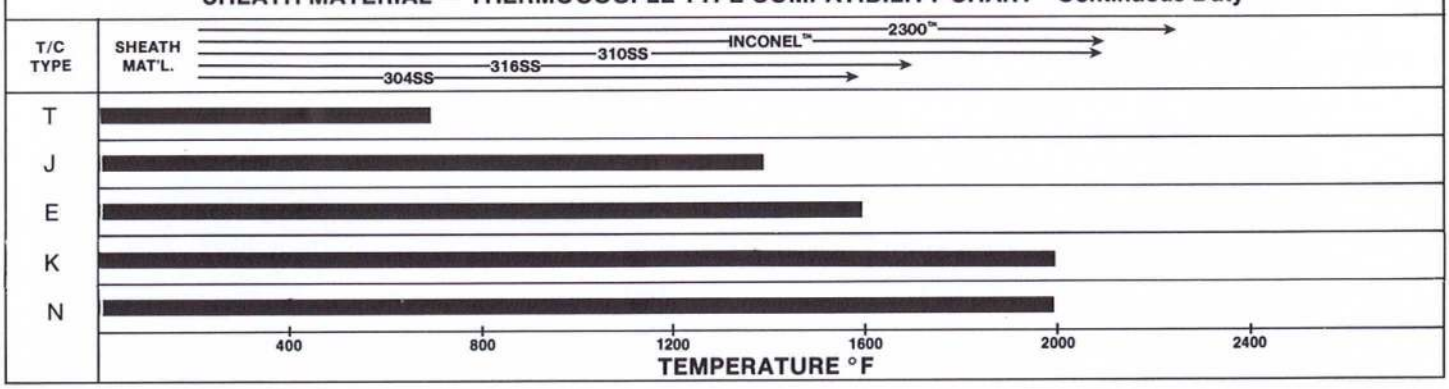
Inconel™600 (72% Nickel-17% Chromium) is a material that is readily available and has outstanding resistance to oxidation, corrosion and scaling. Should not be used in the presence of sulfur above 1600° F. Maximum operating temperature 2100° F.

™International Nickel Co.

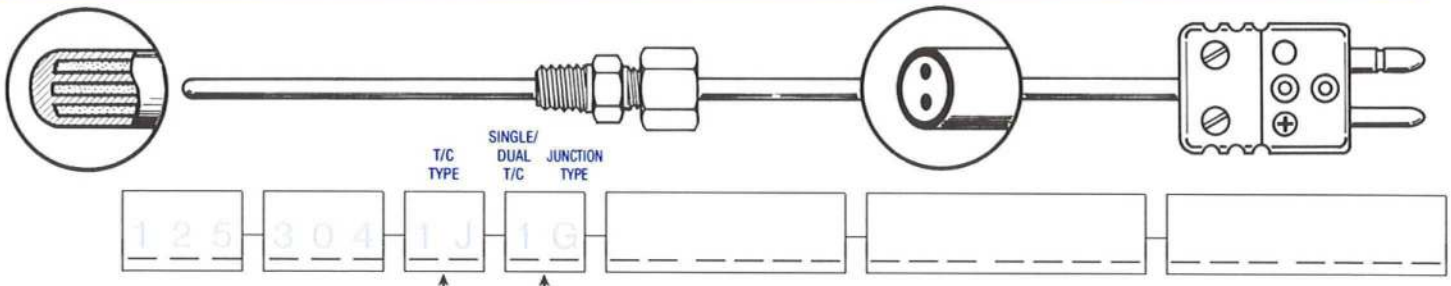
2300™ This nickel/chrome alloy is a superior alloy for sheathing applications. It is more effective in resisting oxidation at high temperatures than other available alloys as tested in air at 2300°F. Maximum operating temperature 2300°F.

™-Hoskins Mfg. Co.

SHEATH MATERIAL — THERMOCOUPLE TYPE COMPATIBILITY CHART - Continuous Duty



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



THERMOCOUPLE WIRE ALLOYS	TEMPERATURE RANGE (°F)	ORDER CODE STANDARD GRADE	INITIAL CALIBRATION TOLERANCE	
			STANDARD GRADE	SPECIAL* GRADE
Copper (+) vs. Constantan (-)	-32 to +270 +270 to +660	1J	±1.8°F ±.75%	±.9°F ±.4%
Iron (+) vs. Constantan (-)	32 to 530 530 to 1400	1J	±4°F ±.75%	±2°F ±.4%
Chromel™ (+) vs. Constantan (-)	32 to 600 600 to 1600	1E	±3°F ±.5%	±.4°F ±.4%
Chromel™ (+) vs. Alumel™ (-)	32 to 530 530 to 2300	1K	±4°F ±.75%	±2°F ±.4%
Nicrosil (+) vs. Nisil (-)	32 to 530 530 to 2300	1N	±4°F ±.75%	±2°F ±.4%

Calibration Type

Type T (COPPER vs CONSTANTAN) is used for service in oxidizing, inert or reducing atmospheres or in vacuum. It is highly resistant to corrosion from atmospheric moisture and condensation and exhibits high stability at low temperatures; it is the only type with limits of error guaranteed for cryogenic temperatures.

Type J (IRON vs CONSTANTAN) is used protected or unprotected in vacuum, oxidizing, inert or reducing atmospheres. Iron element oxidizes rapidly at temperatures exceeding 1000° F, and therefore heavier gauge wire is recommended for longer life at these temperatures.

Type E (CHROMEL™ vs CONSTANTAN) may be used protected or unprotected in oxidizing, inert or dry reducing atmospheres, or for short periods of time under vacuum. Must be protected from sulfurous and marginally oxidizing atmospheres. Produces the highest EMF per degree of any standardized metallic thermocouple.

Type K (CHROMEL™ vs ALUMEL™) is used protected or exposed to oxidizing, inert or dry reducing atmospheres. Exposure to vacuum limited to short time periods. Must be protected from sulfurous and marginally oxidizing atmospheres. Reliable and accurate at high temperatures. ™—HOSKINS MFG. CO.

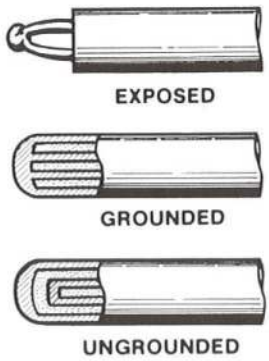
Type N (NICROSIL vs NISIL) is used protected or exposed to oxidizing, inert or dry reducing atmospheres. Exposure to vacuum limited to short time periods. Must be protected from sulfurous atmospheres.

*Accuracy of Marlox Thermocouples

Marlin products are manufactured to specifications in conformance with Initial Calibration Tolerance of the American National Standards Institute Standard Number MC96.1 as indicated in the tables. Standard grade wire is used in manufacturing all Marlin thermocouples for temperatures above 32°F; special grade, T/C's for use at sub-zero temperatures, and T/C's with certified traceable calibrations are available upon request. To order a special grade Initial Calibration Tolerance thermocouple use a designation; e.g., 2T, 2J, 2E, 2K, 2N.

JUNCTION TYPE	ORDER CODE
Single Thermocouple Element Marlox	
Exposed	1X
Grounded	1G
Ungrounded	1U
*Weld Pad, Grounded	
Perpendicular	1A
Parallel	1B
Tube Skin	1C
Dual Thermocouple Element Marlox	
Exposed	2X
Grounded	2G
Ungrounded	2U
*Weld Pad, Grounded	
Perpendicular	2A
Parallel	2B
Tube Skin	2C

Grounded designated
For ungrounded weld pad junction use "U" e.g. "1UL"



WELD PAD GROUNDED or UNGROUNDED JUNCTION

Junctions

All junctions are welded by the tungsten inert gas method to insure performance and to prevent contamination of Marlox thermocouples.

Exposed Junction Bare thermocouple wires are welded to form a junction that extends beyond the sheath for a distance equal to the sheath diameter. Used where fast response is required and contamination is not a factor.

Grounded Junction The thermocouple junction is welded directly to the sheath. Provides good thermocouple protection against pressure, moisture and mechanical damage yet retains good response characteristics.

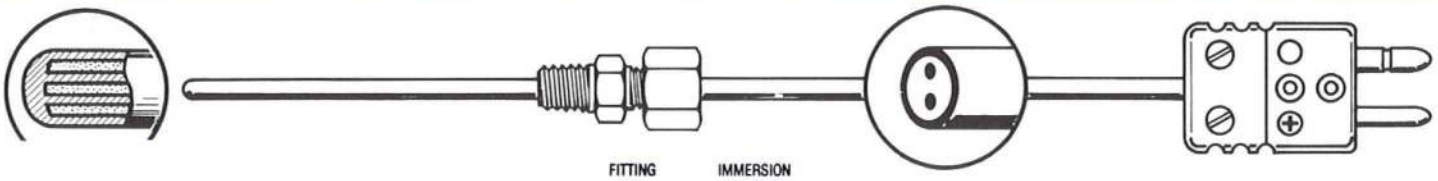
Ungrounded Junction The junction is electrically and mechanically insulated from the sheath for long life characteristics under maximum corrosion, thermal shock, and vibration conditions.

Dual Element Junction Dual element Marlox provides two circuits for simultaneous response from a single thermal point. Exposed, grounded or dual ungrounded are available. In Marlox 0.125 dia. and up the dual element ungrounded thermocouple junctions are insulated from the sheath and each other. Smaller dia. Marlox Dual ungrounded junctions are insulated from the sheath but not from each other.

Weld Pad Junction junction is used as a means of attaching Marlox to surfaces such as boiler tubes and pipes to provide efficient surface temperature measurement. Standard construction utilizes grounded or ungrounded junction Marlox welded to an alloy pad (1"×1"×1/8") of the same composition as the sheath. Tube skin Perpendicular and Parallel pad arrangements are available.

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

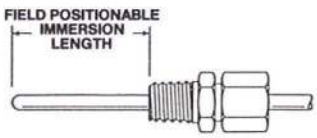
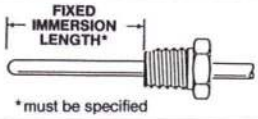
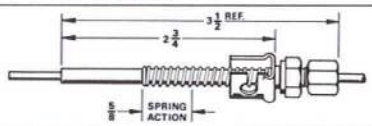
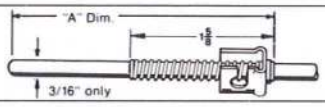
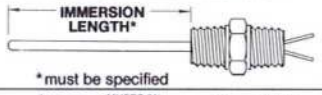
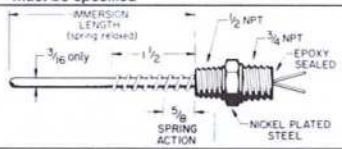
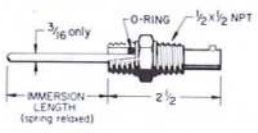
SENSORS
CUSTOM MARLOX® THERMOCOUPLES



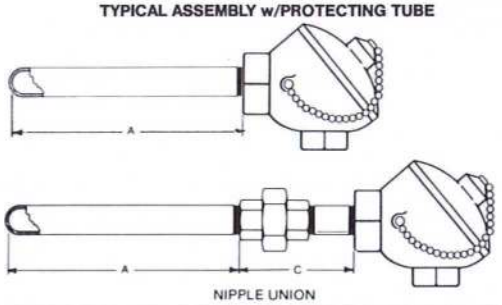
	FITTING OR MOUNTING TYPE	IMMERSION LENGTH IN INCHES (If Applicable)						
1 2 5	3 0 4	1 J	1 G	A 1	0 0 0 0			

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

Mounting Fittings — See Selection Summaries for Details

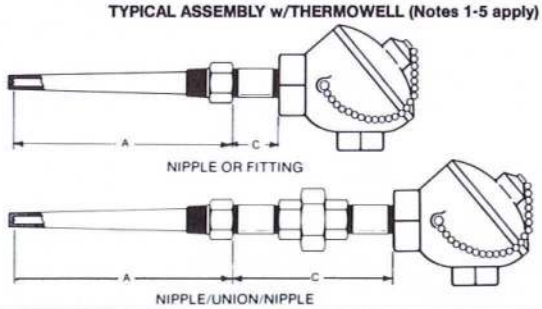
		NONE	XX
Compression Fittings allow a field positionable setting of the immersion length of the Marlox. Standard fittings are stainless steel, 1/8 NPT or 1/4 NPT thread size, and are supplied with metal ferrules that are not relocatable after compression. Teflon ferrules allow relocation after compression but have a limited temperature and pressure range. Lava ferrules are crushed with compression and must be replaced if Marlox is removed or readjusted.		S.S. Fitting 1/8 NPT 1/4 NPT	 A1 A2
		NOTES: C1=Stl. B1=Brass Ferrules: Metal Std. (Non-readjustable) "T" for Teflon, e.g. T1 "L" for Lava, e.g. L1	
Fixed Fittings are stainless steel, NPT thread sizes, and are brazed to the sheath. Additional sizes, materials and welded mountings are also available.	 *must be specified	1/8 NPT 1/4 NPT 3/8 NPT 1/2 NPT 3/4 NPT 1 NPT	F1 F2 F3 F4 F6 F8
Spring Loaded, Adjustable, Bayonet Type Fittings are compression type which allows a variable Marlox immersion length and also has bayonet mounting feature. Standard fittings are stainless steel and are supplied with metal ferrules for 1/8" or 1/16" Marlox sizes. Teflon ferrules are available which allow relocation after compression.		ADJUSTABLE BAYONET	AB
Fixed Spring Loaded Bayonet Mounting for 3/16" Dia. Marlox (See Plastic Industry Thermocouple section for bayonet adapters and dimension selection guide for immersion placement.)		FIXED BAYONET	FB( ) "A" Dim.
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.	 *must be specified	1/4 x 1/4 NPT 1/2 x 1/2 NPT 3/4 x 3/4 NPT	D2 D4 D6
Spring Loaded Epoxy Sealed Fitting provides NPT mounting for terminal head and process connection for bearing applications. For 3/16" Dia. Marlox only select immersion that allows at least a 1/4" interference for spring loading. Utilize a AWA3 or AWC3 weatherproof terminal head and terminal block.		**SPRING LOADED EPOXY SEALED FITTING**	W1
Spring Loaded O-Ring Sealed Fitting provides NPT mounting for terminal head and process connection for bearing applications. For 3/16" Dia. Marlox only select immersion that allows at least a 1/4" interference for spring loading. Marlox element may be easily removed from fitting by bayonet mounting. Utilizes a 6WA2 or 6WC2 weatherproof and terminal block.		**SPRING LOADED O-RING SEALED, SS FITTING**	S1

TYPICAL ASSEMBLY w/PROTECTING TUBE



NIPPLE UNION

TYPICAL ASSEMBLY w/THERMOWELL (Notes 1-5 apply)



NIPPLE OR FITTING

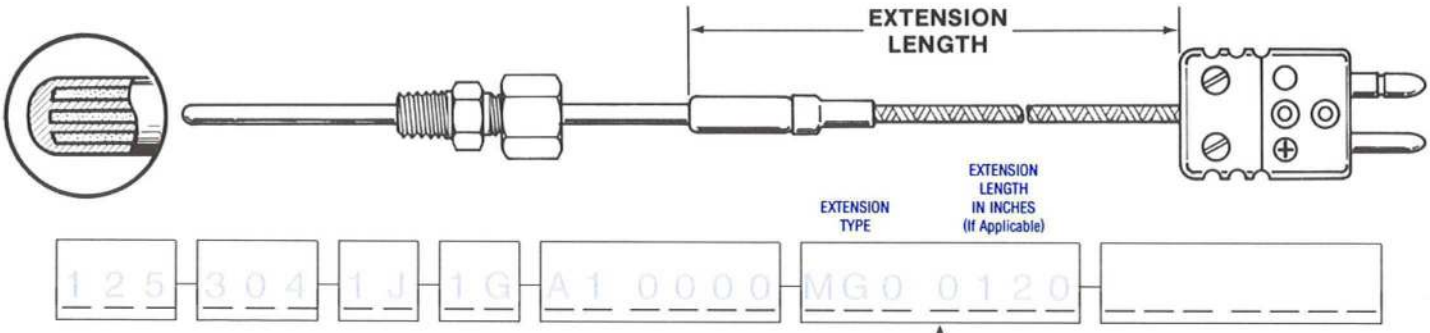
NIPPLE/UNION/NIPPLE

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

NOTES: 1) Galvanized Steel Standard

Since 1952 Marlin

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



The Marlox Transition

The Marlox transition is an exclusive development from Marlin Manufacturing Corporation. After the wire extension has been spliced to the sheathed thermocouple wire, the transition is molded with a thermoset compound. This transition exhibits the characteristics of high strength and resistivity and protects and 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 temperatures to 800°F (425°C).

MARLOX TRANSITION DIMENSIONS

MARLOX SIZE DIA. INCHES	TRANSITION* SIZE DIA. INCHES	TRANSITION LENGTH "L" DIMENSION INCHES	WIRE EXTENSION GAUGE (AWG.)	
			SINGLE	DUAL
.020	.190	.875	28	N/A
.032	.190	.875	28	N/A
.040	.190	.875	28	N/A
.062	.190	.875	24	28
.125	.250	1.000	20	24
.187	.312	1.000	20	24
.250	.437	1.000	16	20

* Same diameter transitions are available in .125" Dia. and larger Marlox.
* Dual element transitions are available in .062" Dia. and larger Marlox.

MOLDED SINGLE ELEMENT
GLASS INSULATED, STRANDED WIRE (MG4)

DUAL ELEMENT
MOLDED DUAL ELEMENT
GLASS INSULATED, SOLID WIRE (MG0)

.125° SAME DIAMETER TRANSITION (EG0)
1/8" MARLOX - GLASS/GLASS EXTENSION

EXTENSION TYPE

EXTENSION	CODE
NONE	XXX
TEFLON INSULATED 260°C (500°F)	ME0
FIBERGLASS INSULATED 482°C (900°F)	MG0

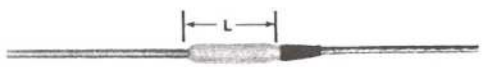
*Extension length in inches

NOTES:
1) For SS flex Armor Cable over Exten. add "3" to code: e.g. "MG3"
2) SS Overbraid over Exten. add "1" to code: e.g. "MG1"
TRANSITIONS
3) Extension includes transitions for use to 205°C (400°F)
4) For Hi-Temp transition 425°C (800°F) add "H" to code: e.g. "HG0"
5) For transition "same size" as Sheath O.D. add "E" to code e.g. "EG0"
6) For "Probe Handle" transition use code "P" e.g. "PT7" (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 (MG1)

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

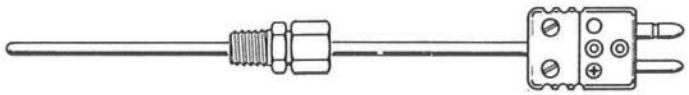
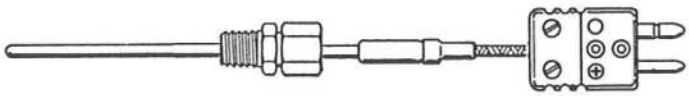
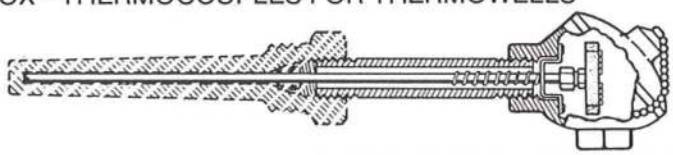
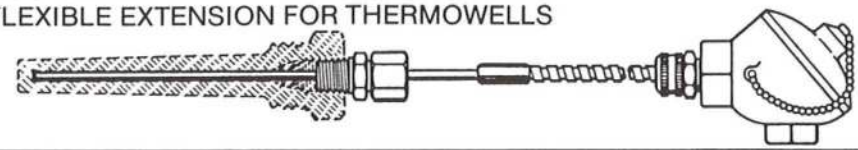
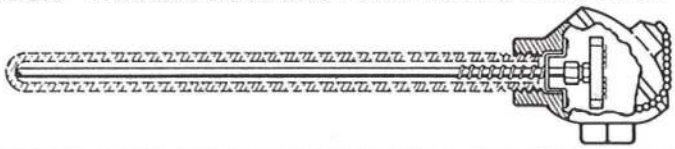
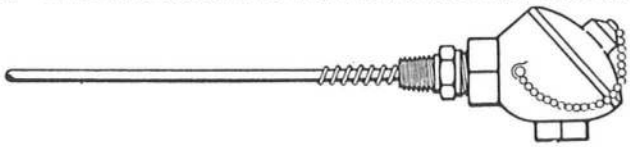
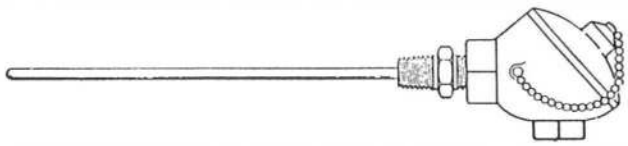
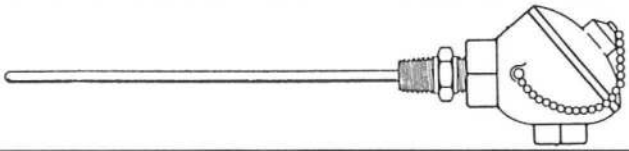
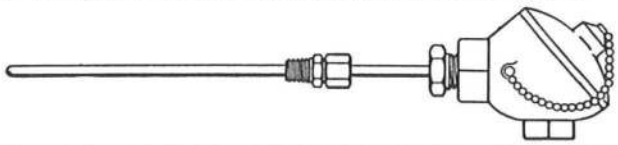
SS ARMOR TUBING (MG3)

(See page F-0 for handle details)

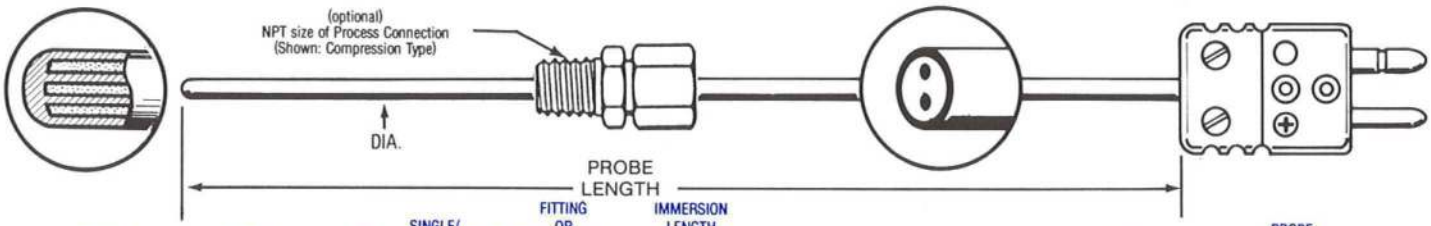
PROBE HANDLE TRANSITION W/SS FLEX ARMOR (PT7)

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

TABLE OF SUMMARY SELECTION — CUSTOM MARLOX THERMOCOUPLES

	DESCRIPTION	PAGE
See Pages C-20 to C-25 For Stock Marlox Thermo-couples	CUSTOM MARLOX® THERMOCOUPLES 	C-33
	CUSTOM MARLOX® THERMOCOUPLES WITH EXTENSION 	C-34
	CUSTOM MARLOX™ THERMOCOUPLES FOR THERMOWELLS 	C-35
	CUSTOM MARLOX™ THERMOCOUPLE WITH FLEXIBLE EXTENSION FOR THERMOWELLS 	C-36
	CUSTOM MARLOX™ THERMOCOUPLES FOR PROTECTING TUBE 	C-37
	CUSTOM MARLOX™ THERMOCOUPLES FOR BEARING APPLICATIONS 	C-38
	CUSTOM MARLOX™ THERMOCOUPLES FOR BEARING APPLICATIONS 	C-39
	CUSTOM MARLOX® THERMOCOUPLES WITH DOUBLE FITTING 	C-40
	CUSTOM MARLOX® THERMOCOUPLES WITH MOUNTED HEAD 	C-41

SENSORS — SELECTION SUMMARY
CUSTOM MARLOX® THERMOCOUPLES



PROBE DIA.	SHEATH MAT'L	T/C TYPE	SINGLE/ DUAL T/C	JUNCTION TYPE	FITTING OR MOUNTING TYPE	IMMERSION LENGTH IN INCHES (If Applicable)		TERMINAL TYPE	PROBE LENGTH IN INCHES
							XXX		

Last digit is 10ths of inches i.e. 0045 = .45"

PROBE DIA. CODE
010
020
032
040
062
125
187
250
312
375
500

SHEATH MAT'L. CODE
304
310
316
600
230

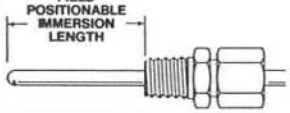
ANSI TYPE
1T
1J
1E
1K
1N

Special tolerance. Use "2" i.e. 2K

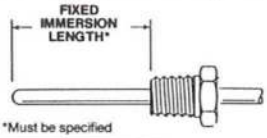
JUNCTION TYPE	ORDER CODE
Single Thermocouple Element Marlox	
Exposed	1X
Grounded	1G
Ungrounded	1U
*Weld Pad, Grounded	
Perpendicular	1A
Parallel	1B
Tube Skin	1C
Dual Thermocouple Element Marlox	
Exposed	2X
Grounded	2G
Ungrounded	2U
Weld Pad, Grounded	
Perpendicular	2A
Parallel	2B
Tube Skin	2C

MOUNTING FITTING	CODE
NONE	XX
*COMPRESSION FITTING	
SS Fittings 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



FIXED IMMERSION, SS	
1/8 NPT	F1
1/4 NPT	F2
3/8 NPT	F3
1/2 NPT	F4
3/4 NPT	F6
1 NPT	F8



*Must be specified

TERMINAL TYPE	ORDER CODE
BARE LEADS	B10
MINIATURE PLUG — Max Sheath DIA. .125"	M12
STANDARD 2-POLE PLUG — Max Sheath DIA. .250"	P51
STANDARD 2-POLE PLUG W/EXTERNAL STRAIN RELIEF — Max Sheath DIA. .375"	P11
DUAL-STD. 2-POLE PLUG W/EXTERNAL STRAIN RELIEF — Max Sheath DIA. .375"	P12
STANDARD 3-POLE PLUG W/EXTERNAL STRAIN RELIEF — Max Sheath DIA. .375"	P31
NOTES FOR ABOVE CONNECTORS a) Connectors for use to 205°C (400°F) For other option consult factory	
SINGLE ELEMENT MICRO CONNECTOR HEAD — Max Sheath DIA. .250"	500
DUAL ELEMENT MICRO CONNECTOR HEAD — Max Sheath DIA. .250"	504

EXPOSED

GROUNDED

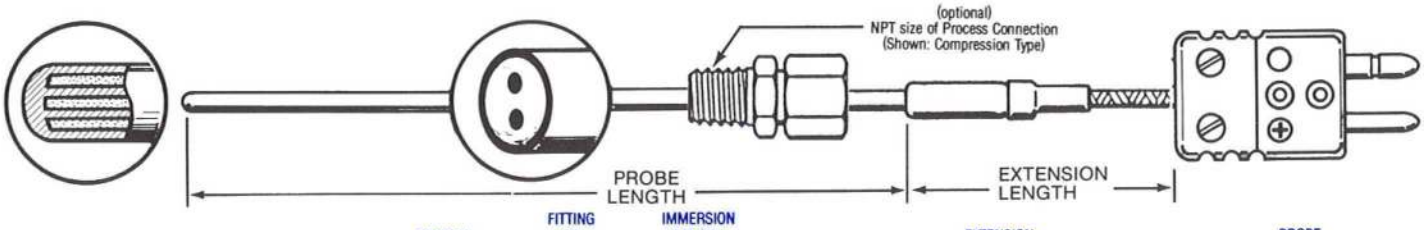
UNGROUNDED

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 MARLOX® THERMOCOUPLES WITH EXTENSION



PROBE DIA.	SHEATH MAT'L	T/C TYPE	SINGLE/ DUAL T/C	JUNCTION TYPE	FITTING OR MOUNTING TYPE	IMMERSION LENGTH IN INCHES (If Applicable)	EXTENSION TYPE	EXTENSION LENGTH IN INCHES	TERMINAL TYPE	PROBE LENGTH IN INCHES

Last digit is 10ths of inches i.e. 0045 = 4.5"

PROBE DIA. CODE
010
020
032
040
062
125
187
250
312
375
500

SHEATH MAT'L. CODE
304
310
316
600
230

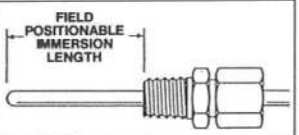
ANSI TYPE
1T
1J
1E
1K
1N

Special tolerance. Use "2" i.e. 2K

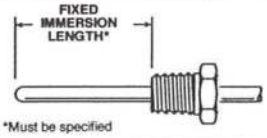
JUNCTION TYPE	ORDER CODE
Single Thermocouple Element Marlox	
Exposed	1X
Grounded	1G
Ungrounded	1U
*Weld Pad, Grounded	
Perpendicular	1A
Parallel	1B
Tube Skin	1C
Dual Thermocouple Element Marlox	
Exposed	2X
Grounded	2G
Ungrounded	2U
*Weld Pad, Grounded	
Perpendicular	2A
Parallel	2B
Tube Skin	2C

MOUNTING FITTING	CODE
NONE	XX
*COMPRESSION FITTING	
SS Fittings	
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



FIXED IMMERSION, SS	
1/8 NPT	F1
1/4 NPT	F2
3/8 NPT	F3
1/2 NPT	F4
3/4 NPT	F6
1 NPT	F8



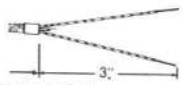
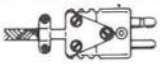
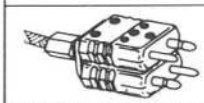
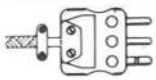
*Must be specified

EXTENSION TYPE	CODE
TEFLON INSULATED 260°C (500°F)	MEO
FIBERGLASS INSULATED 482°C (900°F)	MGO

*Extension length in inches

NOTES:
1) For SS flex Armor Cable over Exten. add "3" to code: e.g. "MG3"
2) SS Overbraid over Exten. add "1" to code: e.g. "MG1"

TRANSITIONS
3) Extension includes transitions for use to 205°C (400°F)
4) For Hi-Temp transition 425°C (800°F) add "H" to code: e.g. "HG0"
5) For transition "same size" as Sheath O.D. add "E" to code e.g. "EG0"
6) For "Probe Handle" transition use code "P" e.g. "PT7" (good for 350°F — not available in hi-temp).

TERMINAL TYPE	CODE
 BARE LEADS	B30
 MINIATURE PLUG	M15
 STANDARD 2-POLE PLUG W/EXTERNAL STRAIN RELIEF	P15
 DUAL-STD. 2-POLE PLUG W/EXTERNAL STRAIN RELIEF	P12
 STANDARD 3-POLE PLUG W/EXTERNAL STRAIN RELIEF	P32

NOTES FOR ABOVE TERMINAL CONNECTORS
a) Connectors for use to 205°C (400°F)
b) For other options see factory

EXPOSED

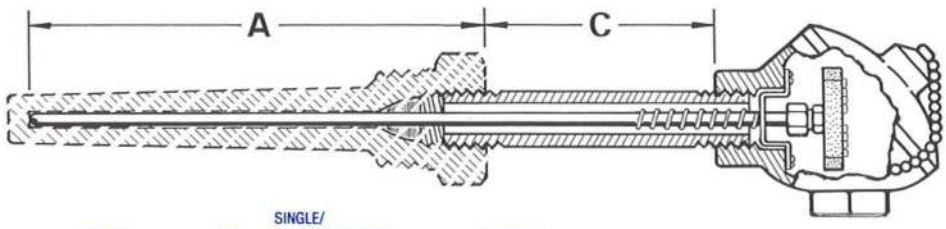
GROUNDED

UNGROUNDED

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 MARLOX™ THERMOCOUPLES



PROBE DIA.	SHEATH MAT'L	T/C TYPE	SINGLE/ DUAL T/C	JUNCTION TYPE	SUPPORT FITTING		TERMINAL TYPE	A DIM
					0000	XXX 0000		

SPECIFY "A" DIM. of Thermowell or give T'well P/N i.e. 260TR-¼-4½-304

PROBE DIA. CODE
187
250
312
375

SHEATH MAT'L. CODE
304
310
316
600
230

ANSI TYPE
1T
1J
1E
1K
1N

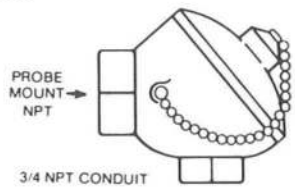
Special tolerance. Use "2" i.e. 2K

JUNCTION TYPE	ORDER CODE
Single Thermocouple Element Marlox	
Grounded Ungrounded	1G 1U
Dual Thermocouple Element Marlox	
Grounded Ungrounded	2G 2U

GROUNDED

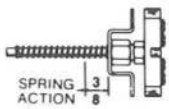
UNGROUNDED

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

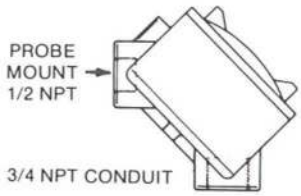


TERMINAL BLOCKS for Weatherproof Heads

SPRING LOADED 4 WIRE

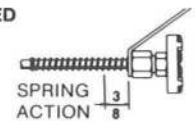


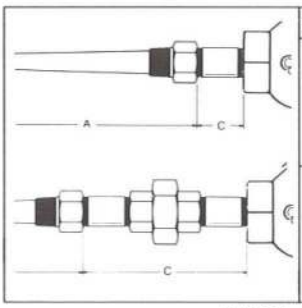
CODE	EXPLOSIONPROOF HEAD
124	1/2 NPT



TERMINAL BLOCKS for Explosion Proof Heads

SPRING LOADED 4 WIRE





SUPPORT FITTING		CODE	
	"C" DIM.	Stl(1)	SS
NIPPLE	2"	12	42
	5"	15	45
	6"	16	46
	"C" DIM.		
NIPPLE/ UNION/ NIPPLE	3"	33	63
	6"	36	69

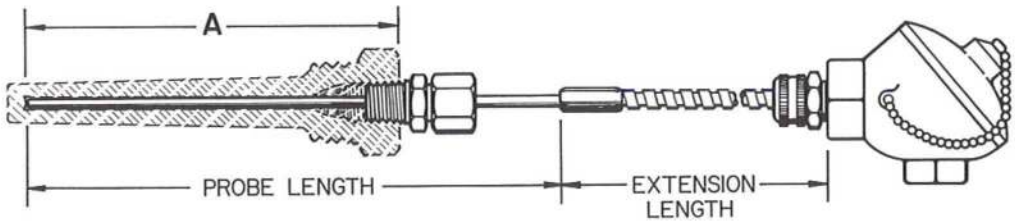
NOTES: 1) Galvanized Steel Standard
2) NPT Size specified by Weatherproof Head Size

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 MARLOX™ THERMOCOUPLE WITH FLEXIBLE EXTENSION FOR THERMOWELLS



PROBE DIA.	SHEATH MAT'L	T/C TYPE	SINGLE/ DUAL T/C	JUNCTION TYPE	SUPPORT FITTING	EXTENSION TYPE	EXTENSION LENGTH IN INCHES	TERMINAL TYPE	PROBE LENGTH IN INCHES
					A4 0000	ME3 0000		241	

PROBE DIA. CODE
187
250
312
375

SHEATH MAT'L. CODE
304
310
316
600
230

ANSI TYPE
1T
1J
1E
1K
1N

Special tolerance.
Use "2" i.e. 2K

EXTENSION TYPE	CODE
TEFLON INSULATED 260°C (500°F) with SS Armor Cable over Exten.	ME3

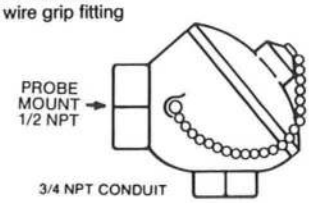
*EXTENSION LENGTH IN INCHES

NOTES
1) For SS Armor Cable with PVC coating. Code "ME8"

GROUNDED

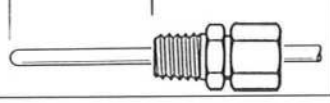
UNGROUNDED

JUNCTION TYPE	ORDER CODE
Single Thermocouple Element Marlox	
Grounded	1G
Ungrounded	1U
Dual Thermocouple Element Marlox	
Grounded	2G
Ungrounded	2U

WEATHERPROOF HEAD	CODE
CAST ALUMINUM with wire grip fitting 	241

TERMINAL BLOCKS for Weatherproof Heads

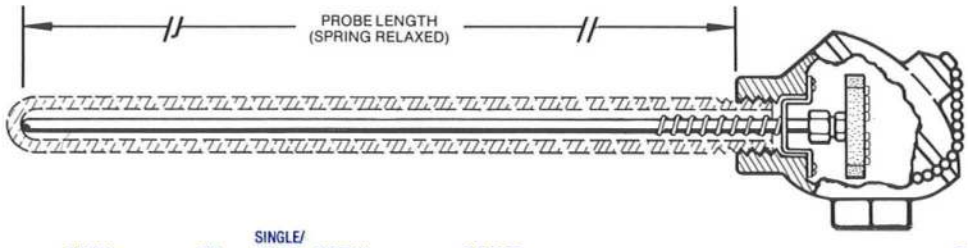
RIGID 4 WIRE 

MOUNTING FITTING		ORDER CODE
	NONE	XX
FIELD POSITIONABLE IMMERSION — COMPRESSION FITTING 	1/2 NPT	A4
NOTES Stainless Stl.		

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 MARLOX™ THERMOCOUPLES FOR PROTECTING TUBE



PROBE DIA.	SHEATH MAT'L	T/C TYPE	SINGLE/ DUAL T/C	JUNCTION TYPE	SUPPORT FITTING		TERMINAL TYPE	PROBE LENGTH IN INCHES
_ _ _	_ _ _	_ _ _	_	_ _ _	0 0 0 0	X X X 0 0 0 0	_ _ _	_ _ _ _

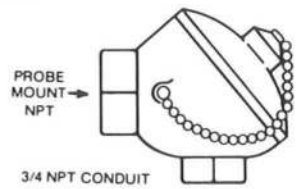
PROBE DIA. CODE
187
250
312
375

SHEATH MAT'L. CODE
304
310
316
600
230

ANSI TYPE
1T
1J
1E
1K
1N

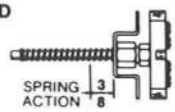
Special tolerance.
Use "2" i.e. 2K

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

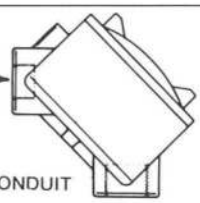


GROUNDED

UNGROUNDED

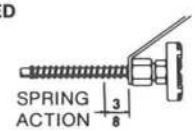
JUNCTION TYPE	ORDER CODE
Single Thermocouple Element Marlox	
Grounded Ungrounded	1G 1U
Dual Thermocouple Element Marlox	
Grounded Ungrounded	2G 2U

CODE	EXPLOSIONPROOF HEAD
124	1/2 NPT

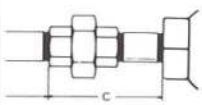


TERMINAL BLOCKS for Explosion Proof Heads

SPRING LOADED 4 WIRE



SUPPORT FITTING		CODE	
None		XX	
	"C" DIM.	Stl. (1)	SS
NIPPLE/ UNION	2-5/8"	23	53
	5-3/4"	26	56

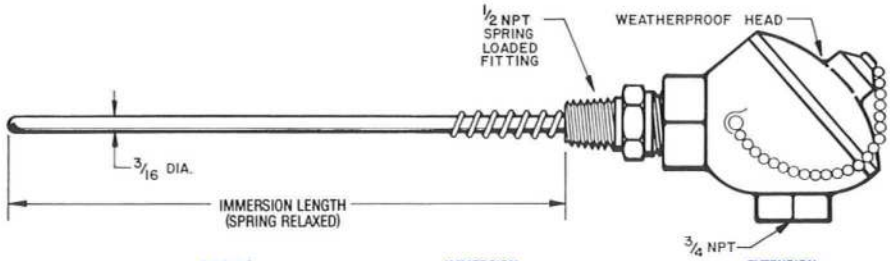


NOTES: 1) Galvanized Steel Standard
2) NPT Size specified by Weatherproof Head Size

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 MARLOX™ THERMOCOUPLES FOR BEARING APPLICATIONS



PROBE DIA.	SHEATH MAT'L	T/C TYPE	SINGLE/ DUAL T/C	JUNCTION TYPE	MOUNTING FITTING	IMMERSION LENGTH IN INCHES	EXTENSION TYPE	EXTENSION LENGTH IN INCHES	TERMINAL TYPE	PROBE LENGTH IN INCHES
187	304				W1		XXX	0000		XXXX

Last digit is 10ths of inches i.e. .0045 = 4.5"

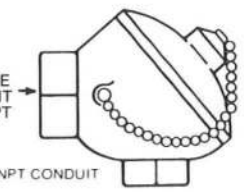
PROBE DIA. CODE
187

SHEATH MAT'L. CODE
304
310
316
600
230

ANSI TYPE
1T
1J
1E
1K
1N

Special tolerance. Use "2" i.e. 2K

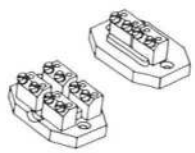
CODE	WEATHERPROOF HEAD
	CAST ALUMINUM
206	3/4 NPT w/single block
226	w/dual block



TERMINAL BLOCKS for Weatherproof Heads

RIGID 2 WIRE FOR SINGLE ELEMENT

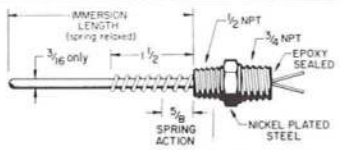
RIGID 4 WIRE FOR DUAL ELEMENT



GROUNDED

UNGROUNDED

JUNCTION TYPE	ORDER CODE
Single Thermocouple Element Marlox	
Grounded	1G
Ungrounded	1U
Dual Thermocouple Element Marlox	
Grounded	2G
Ungrounded	2U

MOUNTING FITTING	CODE
 SPRING LOADED EPOXY SEALED FITTING	W1

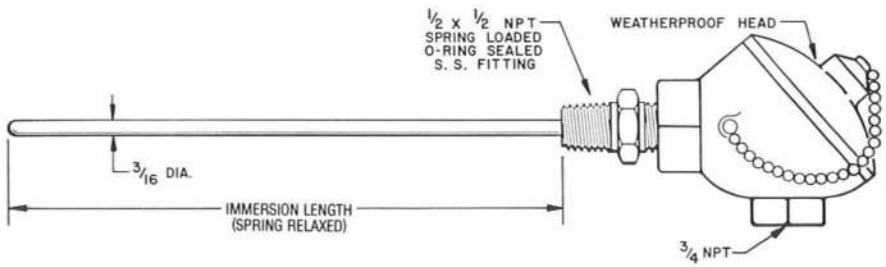
Spring Loaded Epoxy Sealed Fitting provides NPT mounting for terminal head and process connection for bearing applications. For 3/16" Dia. T/C's only select immersion that allows at least a 1/4" interference for spring loading.

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 MARLOX™ THERMOCOUPLES FOR BEARING APPLICATIONS



PROBE DIA.	SHEATH MAT'L	T/C TYPE	SINGLE/ DUAL T/C	JUNCTION TYPE	MOUNTING FITTING	IMMERSION LENGTH IN INCHES	EXTENSION TYPE	EXTENSION LENGTH IN INCHES	TERMINAL TYPE	PROBE LENGTH IN INCHES
187	304				S1		XXX	0000	294	XXXX

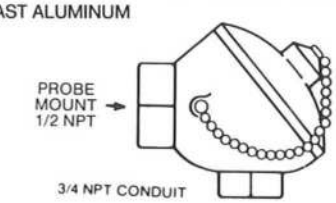
Last digit is 10ths of inches i.e. .0045 = 4.5"

PROBE DIA. CODE
187

SHEATH MAT'L. CODE
304

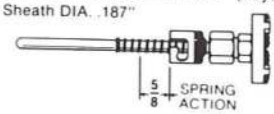
ANSI TYPE
1T
1J
1E
1K
1N

Special tolerance. Use "2" i.e. 2K

CODE	WEATHERPROOF HEAD
294	CAST ALUMINUM 

TERMINAL BLOCKS for Weatherproof Heads

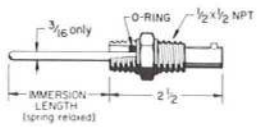
B12S SPRING LOADED 4 WIRE (Bayonet Mtg.)
Max Sheath DIA. .187"



GROUNDED

UNGROUNDED

JUNCTION TYPE	ORDER CODE
Single Thermocouple Element Marlox	
Grounded Ungrounded	1G 1U
Dual Thermocouple Element Marlox	
Grounded Ungrounded	2G 2U

MOUNTING FITTING		CODE
	**SPRING LOADED O-RING SEALED, SS FITTING**	S1

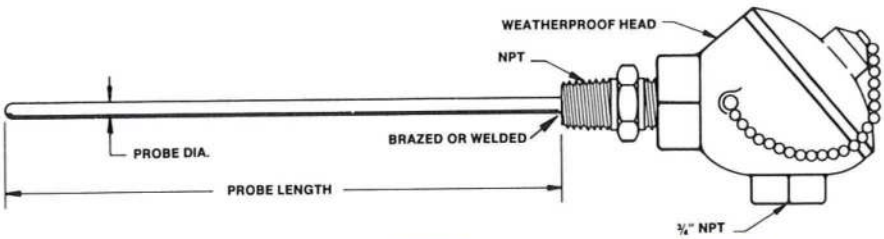
Spring Loaded O-Ring Sealed Fitting provides NPT mounting for terminal head and process connection for bearing applications. For 3/16" Dia. T/C's only select immersion that allows at least a 1/4" interference for spring loading. T/C element may be easily removed from fitting by bayonet mounting.

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 MARLOX™ THERMOCOUPLE WITH DOUBLE FITTING



PROBE DIA.	SHEATH MAT'L	T/C TYPE	SINGLE/ DUAL T/C	JUNCTION TYPE	MOUNTING FITTING	IMMERSION LENGTH IN INCHES	EXTENSION TYPE	EXTENSION LENGTH IN INCHES	TERMINAL TYPE	PROBE LENGTH IN INCHES
					D		XXX	0000		XXXX

Last digit is 10ths of inches i.e. .0045 = 4.5"

PROBE DIA. CODE
125
187
250
312
375
500

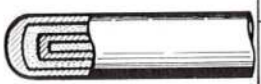
SHEATH MAT'L. CODE
304
310
316
600
230

ANSI TYPE
1T
1J
1E
1K
1N

Special tolerance. Use "2" i.e. 2K

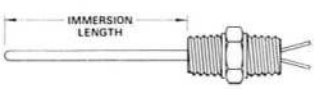
EXPOSED

GROUNDED

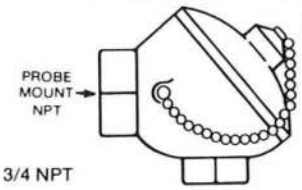
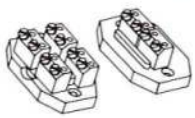
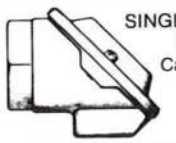


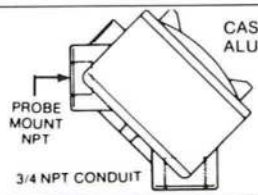
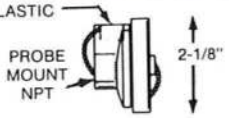
UNGROUNDED

JUNCTION TYPE	ORDER CODE
Single Thermocouple Element Marlox	
Exposed	1X
Grounded	1G
Ungrounded	1U
Dual Thermocouple Element Marlox	
Exposed	2X
Grounded	2G
Ungrounded	2U
*Weld Pad	

FITTING TYPE	SIZE	CODE
 IMMERSION LENGTH	1/4 x 1/4 NPT	D2
	1/2 x 1/2 NPT	D4
	3/4 x 3/4 NPT	D6

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.

TERMINAL TYPE WEATHERPROOF HEAD		CODE
 PROBE MOUNT NPT, 3/4 NPT	CAST ALUMINUM	
	SINGLE	
	1/2 NPT	204
	3/4 NPT	206
	DUAL	
	1/2 NPT	224
	3/4 NPT	226
TERMINAL BLOCKS for Weatherproof Heads		
RIGID 2 WIRE FOR SINGLE ELEMENT RIGID 4 WIRE FOR DUAL ELEMENT		
GENERAL PURPOSE HEAD w/block		
TERMINAL BLOCK 2-WIRE 	 SINGLE ELEMENT ONLY	
	Cast Aluminum	
	1/2 NPT	104
	3/4 NPT	106

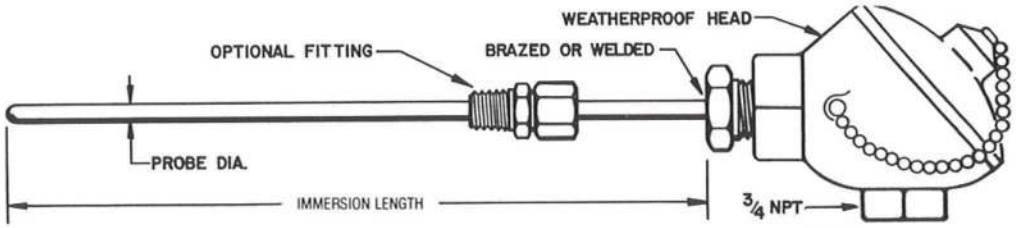
EXPLOSIONPROOF HEAD		CODE
RIGID 4 WIRE FOR SINGLE OR DUAL ELEMENT 	 PROBE MOUNT NPT, 3/4 NPT CONDUIT	CAST ALUMINUM 1/2 NPT
		120
MINI WEATHERPROOF HEAD		
THERMOSET PLASTIC  PROBE MOUNT NPT, 2-1/8"		400
— Does not require terminal block — For Hi-Temp Add "H" e/g. HM — 1/4 NPT Conduit — 1/4 X 1/4 NPT Double FT6 Only		

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 MARLOX™ THERMOCOUPLES WITH MOUNTED HEAD



PROBE DIA.	SHEATH MAT'L	T/C TYPE	SINGLE/ DUAL T/C	JUNCTION TYPE	MOUNTING FITTING	IMMERSION LENGTH IN INCHES	EXTENSION TYPE	EXTENSION LENGTH IN INCHES	TERMINAL TYPE	PROBE LENGTH IN INCHES
						0000	XXX	0000		

Last digit is 10ths of inches i.e. .0045 = 4.5"

PROBE DIA. CODE
187
250
312
375
500

SHEATH MAT'L. CODE
304
310
316
600
230

ANSI TYPE
1T
1J
1E
1K
1N

Special tolerance. Use "2" i.e. 2K

EXPOSED

GROUNDED

UNGROUNDED

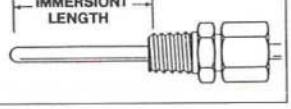
JUNCTION TYPE	ORDER CODE
Single Thermocouple Element Marlox	
Exposed Grounded Ungrounded	1X 1G 1U
Dual Thermocouple Element Marlox	
Exposed Grounded Ungrounded *Weld Pad	2X 2G 2U

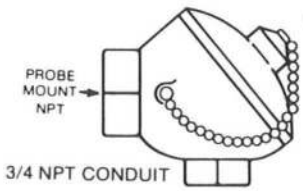
MOUNTING FITTING	CODE
NONE	XX
COMPRESSION IMMERSION	
SS Fitting 1/8 NPT 1/4 NPT	 A1 A2

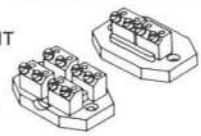
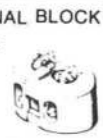
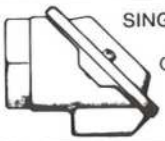
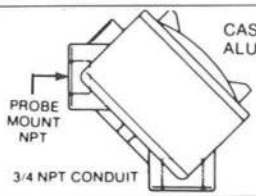
*Not readjustable with metal ferrule

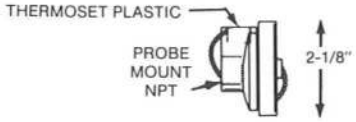
NOTES:
C1 = Stl. B1 = Brass

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



TERMINAL TYPE WEATHERPROOF HEAD	CODE
 CAST ALUMINUM SINGLE **1/2 NPT** DUAL **1/2 NPT**	 **214** **234**

TERMINAL BLOCKS for Weatherproof Heads	
RIGID 2 WIRE FOR SINGLE ELEMENT RIGID 4 WIRE FOR DUAL ELEMENT 	
GENERAL PURPOSE HEAD w/block	
TERMINAL BLOCK 2-WIRE   SINGLE ELEMENT ONLY Cast Aluminum 1/2 NPT 3/4 NPT	114
EXPLOSIONPROOF HEAD	**CODE**
RIGID 4 WIRE FOR SINGLE OR DUAL ELEMENT   CAST ALUMINUM **1/2 NPT**	122

MINI WEATHERPROOF HEAD	
	402

— Does not require terminal block
— 1/4 NPT Conduit

FOR / TITLE:		
DATE:	BY:	REFERENCE

Since 1952 Marlin

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

Specifications

MARLIN offers thermocouples utilizing noble metals and exotic materials for the sheath, thermocouple wires and insulation. These thermocouples are fabricated utilizing hard-fired refractory oxides and incorporate the highest manufacturing standards to insure performance and to prevent contamination.

Thermocouples

Platinum-Rhodium vs Platinum

Recommended for use in inert or oxidizing atmospheres or for short periods of time in vacuum. Easily contaminated, these elements must be protected from the effects of reducing atmospheres and contaminating vapors.

Tungsten vs Tungsten-Rhenium

Recommended for use in vacuum, high purity hydrogen and high purity inert atmospheres only.

Sheath Alloys

Platinum virtually non-oxidizable, soluable only in acids generating free chlorine. Halogens attack it at high temperatures. Malleable. Recommended for use in oxidizing or inert environments. Maximum operating temperature 3000° F.

Platinum 10% Rhodium has the character of platinum with increased resistance to corrosion and higher heat strength. Suitable for oxidizing or inert environments. Maximum operating temperature 3100° F.

Tantalum A reactive and refractory metal: reactive because it will oxidize above 550° F; refractory because of its extremely high melting point. Suitable for use in inert or vacuum environments. Hard and tough with good ductility, maximum operating temperature 4500° F.

Molybdenum Oxidizes at elevated temperatures. Relatively good hot strength. Suitable for inert, vacuum or reducing environments. Maximum operating temperature 4000° F.

Molybdenum 50%/Rhenium 50% Ductile with high hot strength. Suitable in vacuum, hydrogen, nitrogen, cracked ammonia and inert atmospheres. Maximum operating temperature 4000° F.

THERMOCOUPLES

CALIBRATION	MAXIMUM OPERATING TEMP.	MAXIMUM EXPOSURE TEMP.	RECOMMENDED ENVIRONMENT
Pt-10% Rh/Pt ANSI TYPE S	2700° F 1482° C	3100° F 1704° C	Oxidizing, Inert
Pt-13% Rh/Pt ANSI TYPE R	2700° F 1482° C	3100° F 1704° C	Oxidizing, Inert
Pt-30% Rh/Pt-6% Rh ANSI TYPE B	3100° F 1704° C	3220° F 1770° C	Oxidizing, Inert
W-5% Re/W-26% Re (C)	5000° F 2760° C	5430° F 3000° C	Vacuum, High Purity Hydrogen & Inert

Pt-Platinum, Rh-Rhodium, W-Tungsten, Re-Rhenium

SHEATH SIZE-WIRE GAUGE				
Sheath Dia. Inches	.062	.125	.187	.250
Wire Gauge B & S	30	30	24	24

REFRACTORY OXIDE INSULATORS

The resistivity of metal oxides decreases with increasing temperature. Above 3600° F only beryllia retains sufficient resistivity for most applications.

MATERIAL	APPROX. MELT TEMP.	MAXIMUM RECOMMENDED TEMP.	
		HARD-FIRED	SWAGED
Magnesia MgO	5070° F 2800° C	N/A	3400° F 1870° C
Alumina Al_2O_3	3650° F 2010° C	3200° F 1760° C	3000° F 1650° C
Beryllia* BeO	4620° F 2550° C	4200° F 2315° C	N/A

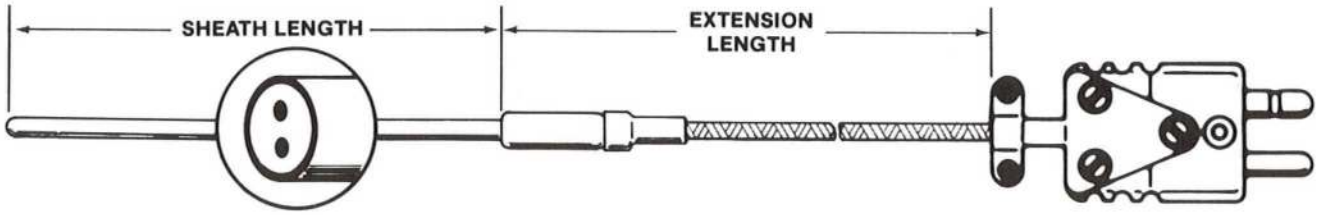
*Caution: Beryllia Dusts are Toxic.

SHEATH ALLOYS

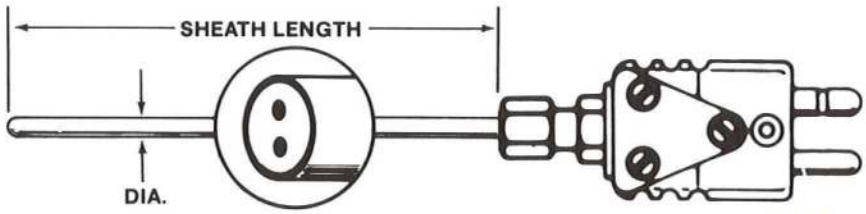
MATERIAL	APPROX. MELT TEMP.	MAXIMUM OPERATING TEMP.	RECOMMENDED ENVIRONMENT
Platinum	3217° F 1770° C	3000° F 1650° C	Oxidizing, Inert
Platinum 10% Rhodium	3362° F 1850° C	3100° F 1705° C	Oxidizing, Inert
Tantalum	5425° F 2996° C	4500° F 2482° C	Vacuum
*Molybdenum	4730° F 2610° C	4000° F 2205° C	Vacuum, Inert
*Moly 50% Rhenium 50%	4424° F 2440° C	4000° F 2205° C	Vacuum, Hydrogen, Nitrogen, Inert, Cracked Ammonia

*Not suitable for swaging

SENSORS
HIGH TEMPERATURE METAL SHEATHED THERMOCOUPLES



THERMOCOUPLE w/EXTENSION & CONNECTOR



THERMOCOUPLE w/CONNECTOR

HT	SHEATH DIA.	SHEATH MAT'L	INSULATOR MAT'L	T/C TYPE	JUNCTION TYPE	FITTING TYPE	EXTENSION TYPE	EXTENSION LENGTH IN INCHES (If applicable)	TERMINAL TYPE	SHEATH LENGTH IN INCHES

Last digit is 10ths of inches i.e. .0045 = 4.5"

SHEATH SIZE DIA. INCHES	CODE
0.125	125
0.187	187
0.250	250

INSULATOR MAT'L	CODE
MgO	M
Al_2O_3	A
BeO	E

ORDER CODE	JUNCTION TYPE
	Single Element Thermocouple
1X	Exposed
1G	Grounded
1U	Ungrounded
	Dual Element Thermocouple
2X	Exposed
2G	Grounded
2U	Ungrounded

CODE	EXTENSION TYPE
XXX	NONE
MGO	FIBERGLASS INSULATED 482°C (900°F)

*Extension length in inches

NOTES:
1) For SS Armor Cable over Exten. add "3" to code: e.g. "MG3"
2) For SS Overbraid over Exten. add "1" to code: e.g. "MG1"

TRANSITIONS:
3) Extension includes transitions for use to 205°C (400°F)
4) For Hi-Temp transition 425°C (800°F) add "H" to code e.g. "HGO"

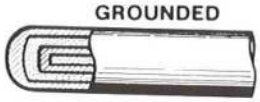
SHEATH MAT'L	CODE
Platinum	PPT
Platinum 10% Rhodium	P10
Tantalum	TAN
Molybdenum	MOL
Moly 50% Rehnium 50%	MR5
Inconel "600"	600

THERMOCOUPLE TYPE	CODE
Pt13Rh vs Pt	1R
Pt10Rh vs Pt	1S
Pt30Rh vs Pt6Rh	1B
W5Re vs W26Re	1C

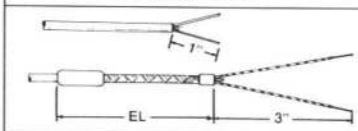
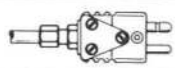
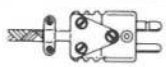
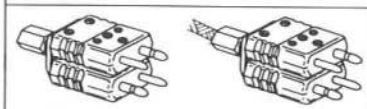
Special limits
Use "2" i.e. 2R

EXPOSED

GROUNDED



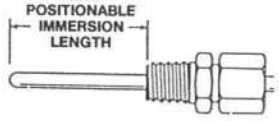
UNGROUNDED

TERMINAL TYPE	CODE
	B10 B30
	P11
	P15
	P12

NOTES FOR ABOVE TERMINAL CONNECTORS
1) Connectors for use to 205°C (400°F)
2) For other options consult factory

MOUNTING FITTING	CODE
NONE	XX
COMPRESSION IMMERSION	
SS Fitting	
1/8 NPT	A1
1/4 NPT	A2

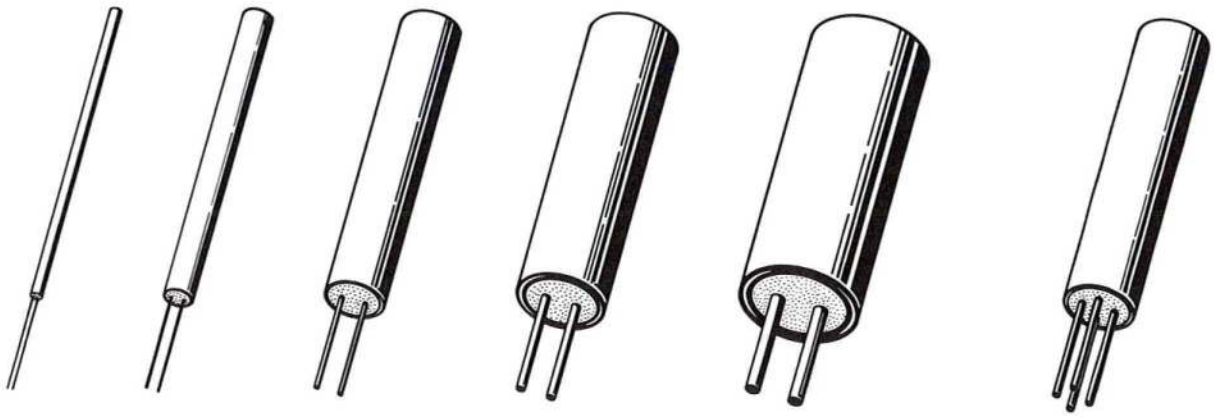
*Not readjustable with metal ferrule
NOTES:
C1 = Stl. B1 = Brass
Ferrules:
Metal Standard (Non-readjustable)
"T" for Teflon (Readjustable)
e.g. T1
"L" for Lava (Non-reusable)
e.g. L1



Note: Compession fitting is the only fitting available on this T/C arrangement.

EXAMPLE:
HT—187—MOL—A—1C—1U—XX—XXX000—P110012
3/16 O.D., Molybdenum Sheath, Alumina Insulator,
Tungsten 5 Rhenium vs Tungsten 26 Rhenium Thermocouple,
Ungrounded Junction, 2-Pole Connector,
12" Sheath Length
(Consult Factory for Prices)

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



MARLOX RANDOM LENGTHS

Marlox is available for your fabrication from our stock. Ends are cut square and moisture sealed.

Standard Marlox is single element (2 wire) or Dual Element (4 wire) thermocouple construction with magnesium oxide (MgO) insulation compacted into a metal sheath.

SHEATH SIZE DIA. INCHES	NOMINAL TUBE WALL THICKNESS INCHES	WIRE GAUGE B & S		MAX STOCK LENGTH (FT.)
		SINGLE T/C ELEMENT	DUAL T/C ELEMENT	
.010	.0015	44		50
.020	.003	38		100
.032	.004	34		150
.040	.006	33		200
.062	.009	28	30	500
.125	.017	22	24	375
.187	.025	20	21	175
.250	.033	16	18	100
.312	.041	16		60
.375	.052	15		45
.500	.070	10		30

DIM. TOLERANCE: Up to .062 ±.001; .125 to .500 ±.003"
Furnished in coils .010" to 0.312"
Furnished in straight lengths 0.375" to 0.500"

Example: 1/8" OD, 304SS, Iron-Constantan, Single Element, 50 feet
Order No. X-125-304-1J-1-50 Ft.

	SHEATH SIZE DIA. CODE	SHEATH MAT'L CODE	T/C TYPE	NO. OF T/C ELEMENTS
X	___	___	___	___

CODE	SHEATH SIZE DIA. INCHES
010	.010
020	.020
032	.032
040	.040
062	.062
125	.125
187	.187
250	.250
312	.312
375	.375
500	.500

CODE	SHEATH MAT'L
304	304SS
310	310SS
316	316SS
600	INCONEL 600

ORDER CODE* (ANSI) (TYPE)
1T
1J
1E
1K

For special limits use "2" i.e. "2K"

CODE	NO. OF ELEMENTS
1	Single (2 wire)
2	Dual (4 wire)

Dual Element Available .062 to .500

WHEN ORDERING SPECIFY:

1) Sheath Alloy and Size by code from table
2) ANSI Calibration Type by letter code
3) Length in feet

PRICE $/FT — RANDOM LENGTH MARLOX® THERMOCOUPLE CABLE												
CODE	SHEATH SIZE DIA. INCHES	SINGLE ELEMENT (−1)						DUAL ELEMENT (−2)					
		304SS				INCONEL		304				INCONEL	
		J	K	T	E	J	K	J	K	T	E	J	K
010	.010	$5	$5	—	—	—	—	—	—	—	—	—	—
020	.020	3	3	3	3	$3	$3	—	—	—	—	—	—
032	.032	3	3	3	3	3	3	—	—	—	—	—	—
040	.040	2	2	3	3	2	2	—	—	—	—	—	—
062	.062	2	2	3	3	3	3	$5	$5	$7	$7	$6	$6
125	.125	3	3	3	3	3	3	4	4	6	6	5	5
187	.187	4	4	4	4	4	4	6	6	8	8	8	8
250	.250	6	6	6	6	7	7	8	8	—	—	9	9
312	.312	9	9	—	—	9	9	—	—	—	—	—	—
375	.375	8	8	—	—	14	14	—	—	—	—	—	—
500	.500	—	—	—	—	—	—	—	—	—	—	—	—

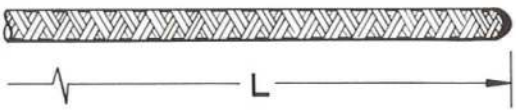
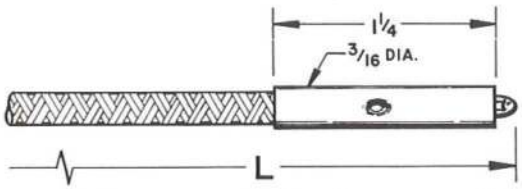
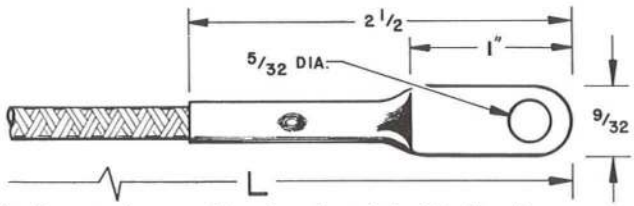
Other Sizes and Combinations available, consult factory.
Special Limit Marlox (i.e. JJ, KK) Add 10% to price.

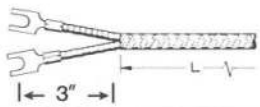
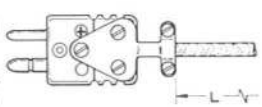
DISCOUNT SCHEDULE	
QUANTITY	FACTOR
0-99	NET
100-249	.90
250-499	.80
500-999	.70
1000+	.60

- Quantity is total feet per order.
- All items per order can be combined regardless of sizes or types.

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

TYPE K 20ga. — CERAMIC FIBER INSULATED — INCONEL OVERBRAID

Description	Part Number	Base Price L = 36 in.	$/Additional 12 in.
 The inconel overbraid is welded to the thermocouple wire to form a smooth tip.	K-20-CC42-1G-____-___ (Terminal Type; Length in inches)	$22.00	$3.00
 The thermocouple junction is exposed beyond the inconel overbraid	K-20-CC42-1X-____-___ (Terminal Type; Length in inches)	$22.00	$3.00
 An inconel sleeve is added to the exposed junction thermocouple as a mounting strain relief.	K-20-CC42-1X1-____-___ (Terminal Type; Length in inches)	$26.00	$3.00
 An inconel mounting lug is added to the thermocouple. Available grounded.	K-20-CC42-1G2-____-___ (Terminal Type; Length in inches)	$30.00	$3.00

Code	Terminal Type	Price
B10	1" Bare leads	N/C
L13	Compensated Spade Lugs 	$5.00
P16	2-Pole Connector Plug 	$6.00
P26	Hi-Temp. 2-Pole Connector Plug	$9.00

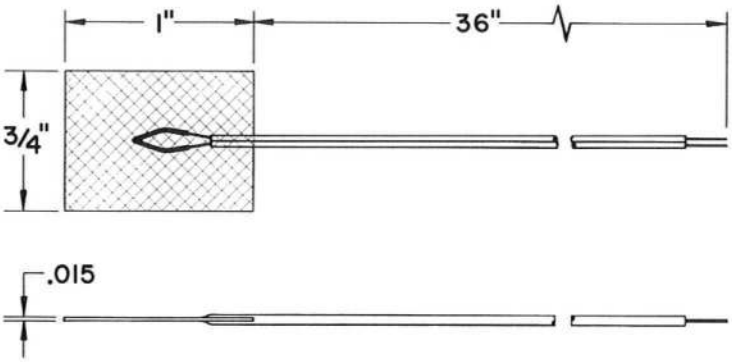
Discount Schedule	
Quantity	Discount Factor
1-9	NET
10-24	.95
25-49	.90
50-99	.85
100-199	.80
200 +	.75

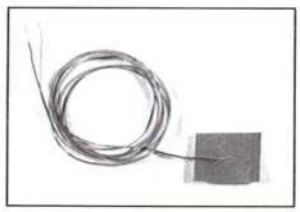
For fast response and accurate sensing of surface temperature these Marlin .005″ foil thermocouples (.015″ laminate) are easy to apply with their self adhesive laminate. For continuous duty temperature use of −50°F (−45°C)* to +400°F (205°C). The thermocouple leads are 30 gage, teflon insulated 36″ long (other lengths available on request). Stocked for immediate delivery in packages of 5 thermocouples.

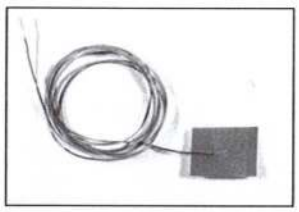
*Must be applied initially at above 40°F (4°C).

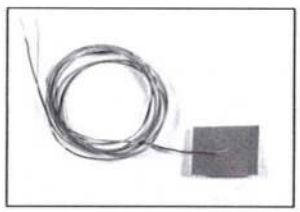
P/N	ANSI TYPE	LEAD LENGTH
M951-5	T J E K	36″

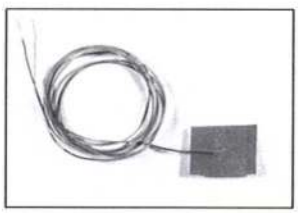
$60.00/Package of 5





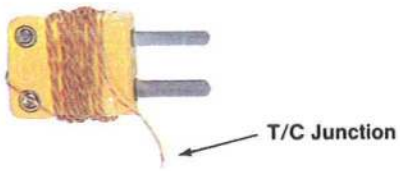






DISCOUNT SCHEDULE	
QUANTITY No. of Pkgs.	Factor
1-2	Ret.
3-5	.95
6-10	.90
11+	.85

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



M970 — Thermocouple Type K

$24.50 ea.

Very fine gage (40 ga.-.003") Type K thermocouple. This teflon insulated exposed junction thermocouple is 36" long and has a Marlin miniature plug (1260-K) attached. The junction can be cemented or taped in place. Temperature range to 400° F. Available only in Type K.

M990 — Thermocouple Type K

$28.00 ea.

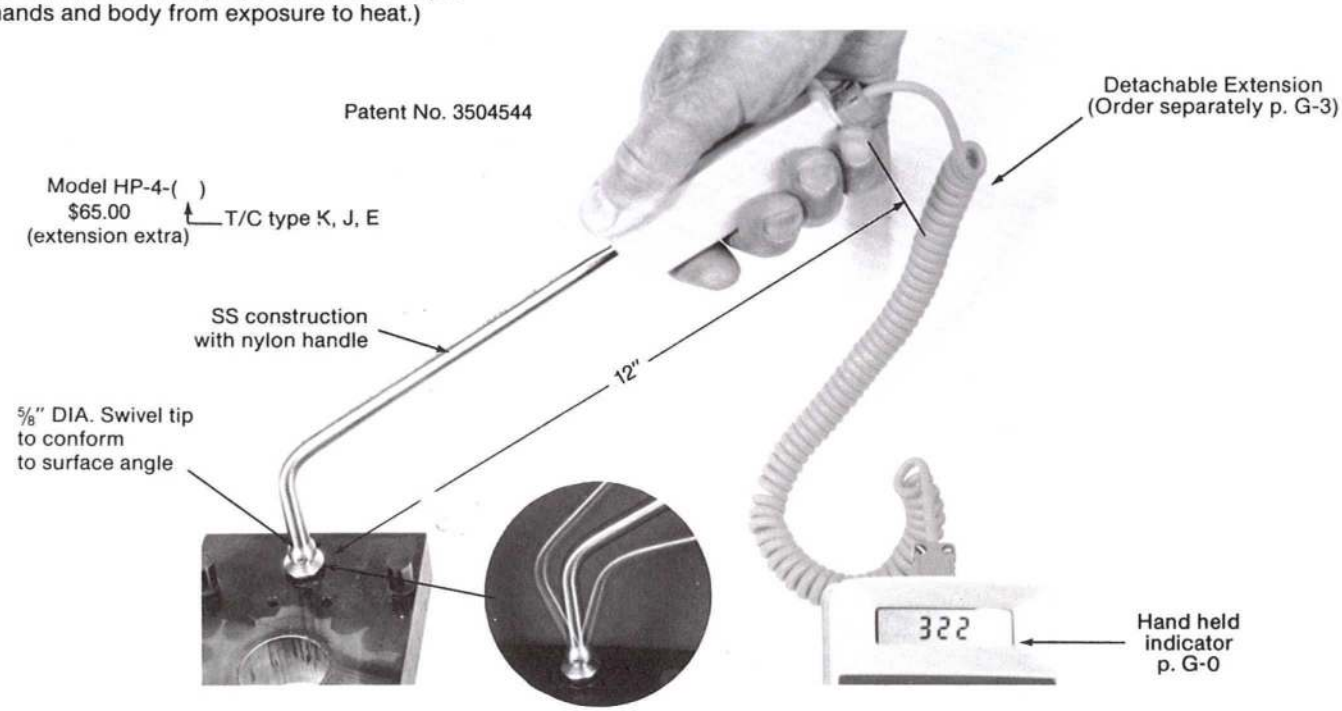
Totally teflon insulated Type K thermocouple of 24 ga. (.020) wire. For use in applications where acids or corrosives could otherwise attack exposed wire. For use to temperatures of 400° F. Available in Type K only 60" long.

DISCOUNT SCHEDULE	
QUANTITY No. of T/C's	Factor
1-9	Net
10-24	.95
25-49	.90
50+	.85

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

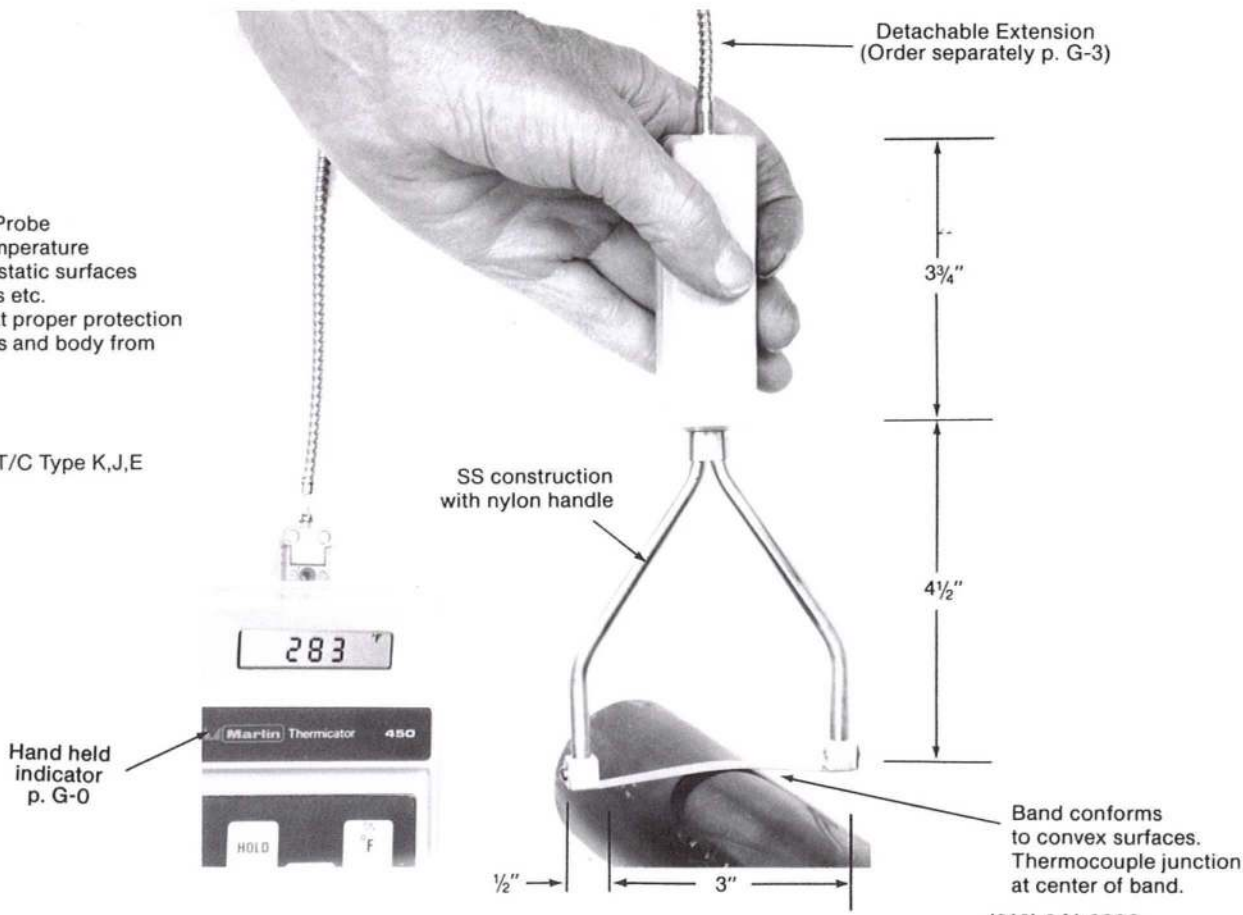
SENSORS
SURFACE TEMPERATURE MEASUREMENT — SWIVEL-TIP PROBE

Heavy duty, swivel-tip surface probe for accurate, fast temperature sensing of hot plates, molds, etc. to 500° F (not for liquids). (Insure that proper protection is provided for hands and body from exposure to heat.)



Band Type Surface Probe
for fast, accurate temperature readings of convex, static surfaces of cylinders and rolls etc. to 750° F. (Insure that proper protection is provided for hands and body from exposure to heat.)

Model HP-5-K
$95.00
(extension extra)
T/C Type K,J,E



Since 1952 Marlin

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

PLASTIC INDUSTRY THERMOCOUPLES

Fast Delivery on:

Adjustable Plastic Industry Thermocouples

Since 1952

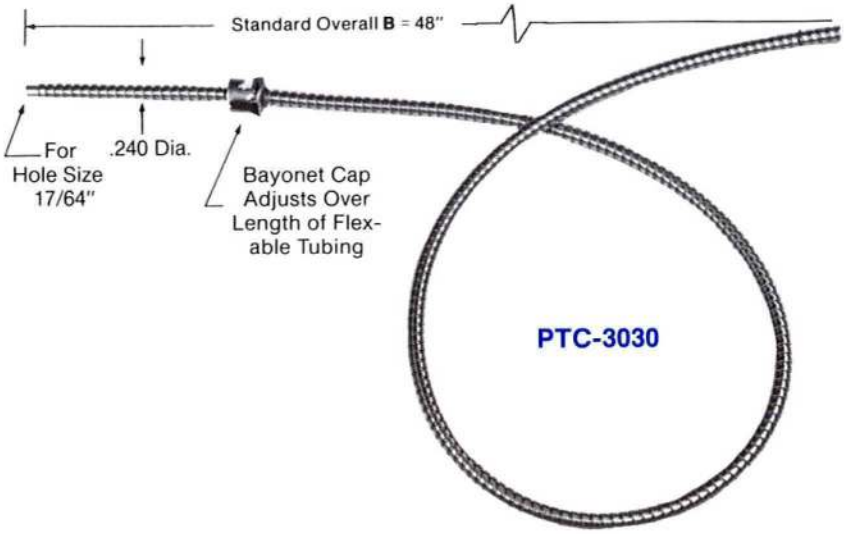
Marlin MANUFACTURING CORPORATION

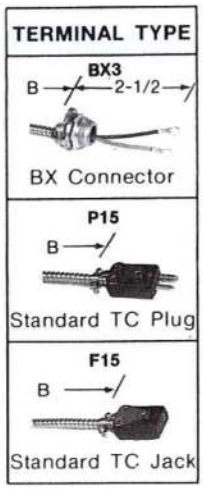
12404 TRISKETT ROAD CLEVELAND, OHIO 44111

216 941-6200 FAX 216 941-6207

TEMPERATURE INSTRUMENTATION for Research and Industry

Flex - Armored Adjustable Bayonet Thermocouple





STANDARD FEATURES

- Adjustable immersion
- Compression tension of Flex-Armor SS Tubing loads T/C Tip
- Type J thermocouple standard
- Grounded junction, Marlin's sensitive tip
- Single element 20 ga. stranded wire fiberglass insulated
- Dual element 24 ga. stranded wire fiberglass insulated
- Fits bayonet-type adapters
- Stainless steel cap
- For temperatures to 900°F (482°C)
- Other thermocouple types available i.e. K, T, E - use proper code and add 10% to price

CATALOG NUMBER	TERMINAL TYPE	BASE PRICE $ "B" TO 48 IN.	ADDITIONAL $ "B" LENGTH	DISCOUNT SCHEDULE
Single Element **PTC-3030**	BX3 P15 F15	$17.00 21.00 22.00	$1.75 per 12 in.	C
Dual Element **PTC-3030-D**	BX3 P12 F12	$27.00 35.00 37.00	$2.50 per 12 in.	C

To Order Give:

PTC-3030 - **J** - ____ - ____

Catalog No.	ANSI Type	Terminal Type	"B" Length

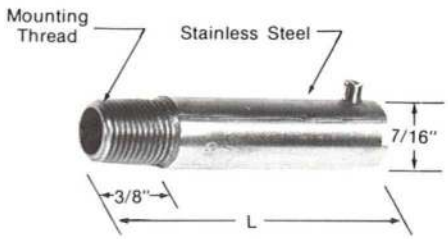
DISCOUNT SCHEDULE "C"	
QUANTITY	DISCOUNT FACTOR
1-4	Net
5-9	.95
10-49	.90
50-99	.85
100+	.80

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

Threaded Bayonet Adapter

ADAPTER CATALOG NUMBER	"T" THREAD	"L" INCHES	PRICE $ EACH	DISCOUNT SCHEDULE
PBA1	1/8 NPT	7/8	$1.75	C
		1-3/8	3.00	
		1-1/2	3.50	
		1-7/8	3.50	
PBA3	3/8 - 24	2	3.50	
		2-1/2	5.00	
		3	5.00	
		Specials (to 6")	8.00	
		(to 12")	12.00	

To Order Give: **PBA1** or **PBA3** - _____ IN.- ("L")



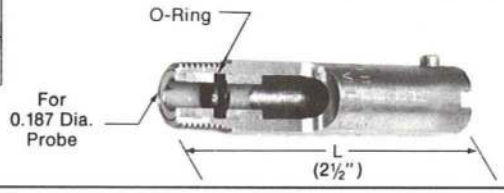
Oil Seal Bayonet Adapter

Similar to PBA series but with internal O-ring that seats against TC to prevent oil seepage.

Standard "L" length = 2½"
Available in 1/8 NPT only.

To Order Give: **PBAO- 2½"**

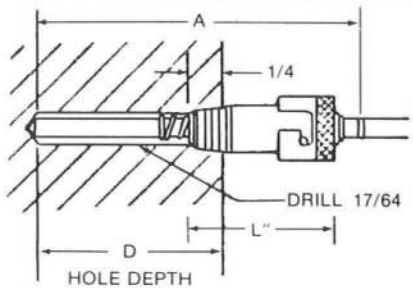
PRICE $ EACH	DISCOUNT SCHEDULE
$7.50	C



Dimension Selection Guide

"D" hole depth determines the required "A" dimension and threaded bayonet adapter Length "L".

A = D + L
round "A" up to next 1/2 in. if in between increments.
i.e.: for D = 1" And L = 2
A = D + L = 3"
i.e.: for D = 1" And L = 1-7/8
A = D + L = 2-7/8" round to 3"



Offset Pipe Clamp Bayonet Adapter

ADAPTER CATALOG NUMBER	"L" INCHES	PRICES* Includes Clamp
PBAC	1-3/4	$7.50
	2-1/4	7.50
	2-3/4	7.50
	3-1/4	8.00
	3-3/4	8.00
	4-1/4	8.00
	4-3/4	8.50
	6-3/4	8.50
	8-3/4	8.50

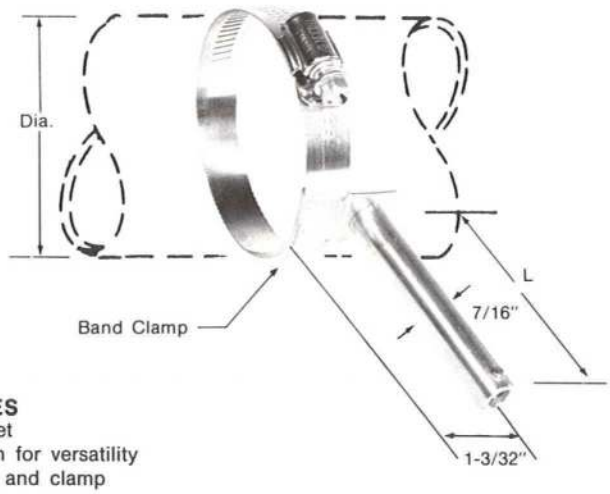
*Discount Schedule "C" Applies

BAND CLAMP NO.	DIAMETER (Inches) MIN.	MAX.	STANDARD PIPE SIZE
1	7/16	25/32	1/4 to 3/8
2	11/16	1-1/4	1/2 to 3/4
3	1-1/16	2	1 to 1-1/2
4	2-1/16	3	2 to 2-1/2
5	3-5/16	4-1/4	3 to 3-1/2
6	3-9/16	4-1/2	4
7	5-1/8	6	5
8	6-1/8	7	6

To Order Give: **PBAC -** _____ **IN.-** _____
("L") (Band Clamp No.)

Maximum insulation thickness = L - 3/4"

"A" (dimension of bayonet TC) = L + 3/4"

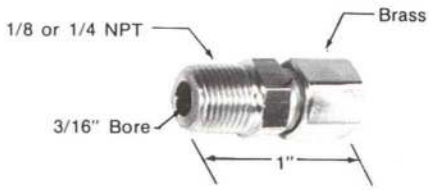


STANDARD FEATURES
- Offset mounting bracket
- Two piece construction for versatility
- Stainless steel adapter and clamp

Compression type mounting fitting

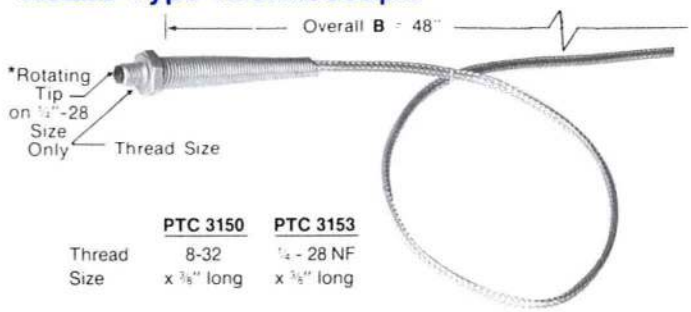
COMPRESSION FITTING CAT. #	NPT SIZE	PRICE EACH	DISCOUNT SCHEDULE
A18B 187	1/8 NPT	$3.00	C
A14B 187	1/4 NPT	3.50	

To Order Give: **A18B-187**
Bore Size

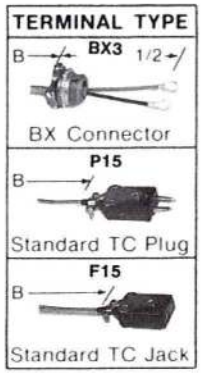


Since 1952 Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

Nozzle Type Thermocouple



	PTC 3150	PTC 3153
Thread Size	8-32 x 3/8" long	1/4 - 28 NF x 3/8" long



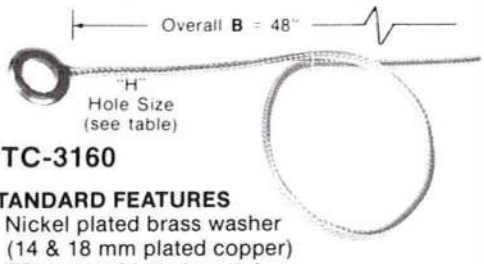
CATALOG NUMBER	"T" THREAD	TERMINAL TYPE	BASE* PRICE $ "B" PRICE 48 IN.	ADDITIONAL "B" LENGTH
PTC-3150	8-32	BX3 P15 F15	$14.50 19.00 20.00	$1.25 per 12 in.
PTC-3153	1/4-28NF	BX3 P15 F15	14.50 19.00 20.00	$1.25 per 12 in.

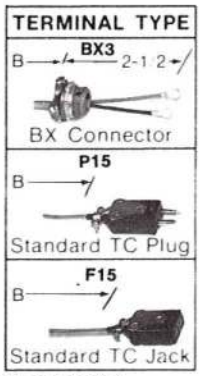
*Discount Schedule "C" Applies

Catalog No.	-	ANSI Type	-	Terminal Type	-B = "B" Length

STANDARD FEATURES
- *Rotating, quick, response, brass tip: PTC 3153 only
- Type J thermocouple grounded junction standard
- Single element 20 ga. stranded thermocouple wire fiberglass insulated with SS overbraid
- Stainless steel construction
- For temperatures to 900° F (482° C)
- Standard "B" length of 48 in.
- Other thermocouple types available i.e. K, T, E — use proper code and add 10% to price

Washer Type Thermocouple





PTC-3160

STANDARD FEATURES
- Nickel plated brass washer (14 & 18 mm plated copper)
- SS overbraid strain relief
- Type J single element thermocouple grounded junction standard
- Stranded thermocouple wire with stainless steel overbraid
- For temperatures to 900° F (482° C)
- Standard "B" length of 48 in.
- Other thermocouple types available i.e. K, T, E — use proper code and add 10% to price

CATALOG NUMBER	TERMINAL TYPE	*BASE PRICE $ "B" TO 48 IN. H TO ½ IN.	BASE PRICE $ "B" TO 48 IN. H-14mm or 18mm	ADDITIONAL $ "B" LENGTH
PTC-3160	BX3 P15 F15	$12.00 16.00 17.00	$21.50 26.00 27.00	$1.25 per 12 in.

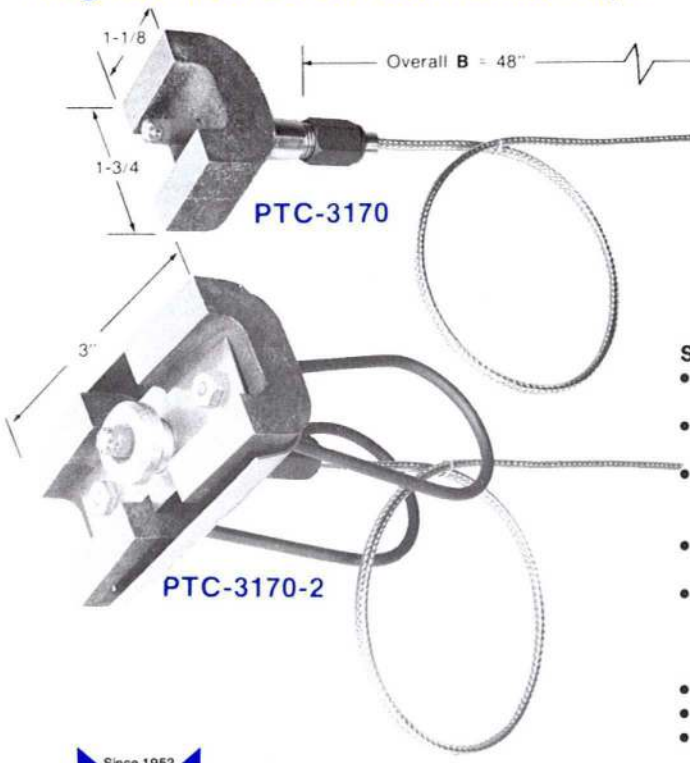
*Discount Schedule "C" Applies

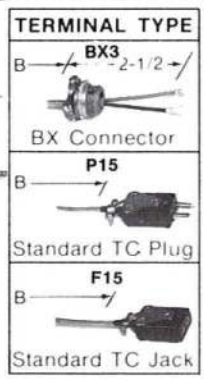
"H" HOLE SIZE	3/16 Bolt (also fits #8 & #10)	1/4 Bolt	3/8 Bolt	1/2 Bolt	14 mm Bolt	18 mm Bolt
Actual ID	0.193	0.255	0.380	0.510	0.560	0.730
Actual OD	0.425	0.545	0.815	1.060	0.810	1.060
Thickness "T"	.095-.120	.095-.120	.095-.12	0.095-.120	.156	.156
Wire Gauge	20	20	20	20	20	20

To Order Give: **PTC-3160** - - **H** =. **B** =

Catalog No.	ANSI Type	Terminal Type	Hole Size	"B" Length

Magnetic Mounted Surface Thermocouple





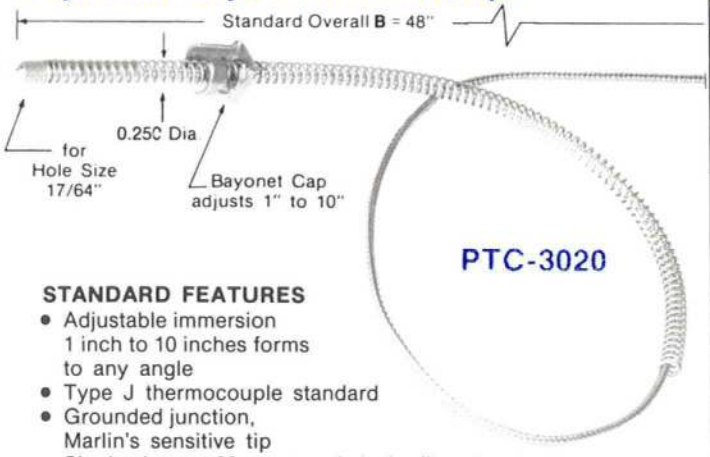
CATALOG NUMBER	TERMINAL TYPE	*BASE PRICE $ "B" TO 48 IN.	ADDITIONAL $ "B" LENGTH
(TC and Single Magnet) PTC-3170	BX3 P15 F15	$66.00 71.00 72.00	$1.25 per 12 in.
(TC and Dual Magnet) PTC-3170-2	BX3 P15 F15	$112.00 117.00 118.00	$1.25 per 12 in.
(TC Replacement) PTC-3171	BX3 P15 F15	$23.00 28.00 29.00	$1.25 per 12 in.
(Single Magnet Replacement) PTC-3172	—	$43.00	—
(Dual Magnet Replacement) PCT-3172-2	—	$89.00	—

*Discount Schedule "C" Applies

STANDARD FEATURES
- Single magnet with 20 lbs. holding force
- Dual magnet has 40 lbs. holding force
- Surface sensitive tip senses accurate surface temperatures
- Spring loaded Type J thermocouple standard
- Single element 20 ga. stranded thermocouple wire fiberglass insulated with SS overbraid
- For temperatures to 500° F (260° C)
- Standard "B" length of 48 in.
- Other thermocouple types available i.e. K, T, E — use proper code and add 10% to price

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

Adjustable Bayonet Thermocouple



STANDARD FEATURES

- Adjustable immersion 1 inch to 10 inches forms to any angle
- Type J thermocouple standard
- Grounded junction, Marlin's sensitive tip
- Single element 20 ga. stranded wire fiberglass insulated with stainless steel overbraid
- Dual element 24 ga. stranded wire fiberglass insulated with stainless steel overbraid
- Fits standard bayonet-type adapters

TERMINAL TYPE
BX3 — B — 2-1/2 — BX Connector
P15 — B — Standard TC Plug
F15 — B — Standard TC Jack

CODE NUMBER	TERMINAL TYPE	BASE PRICE $ "B" TO 48 IN.	ADDITIONAL $ "B" LENGTH
Single Element PTC-3020	BX3 P15 F15	$13.50 17.50 18.75	$1.25 per 12 in.
Dual Element PTC-3020-D	BX3 P15 F15	$24.50 32.00 34.00	$2.00 per 12 in.

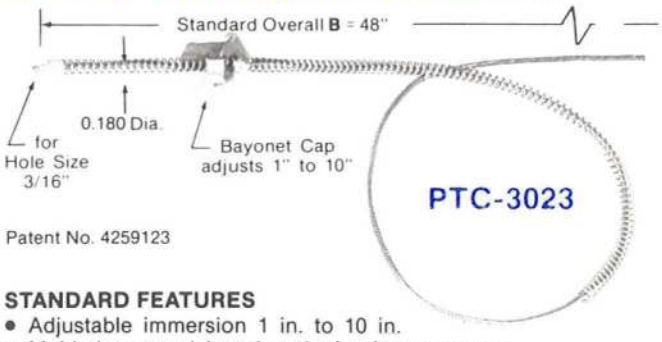
To Order Give:

PTC ____ - J - ____ - ____

Catalog No. | ANSI Type | Terminal Type | "B" Length

- Stainless steel spring and cap
- For temperatures to 900°F (482°C)
- Other thermocouple types available i.e. K,T,E - use proper code and add 10% to price

Mini Adjustable Bayonet Thermocouple



Patent No. 4259123

STANDARD FEATURES

- Adjustable immersion 1 in. to 10 in.
- Molded exposed junction tip for fast response
- Snakes into mold area for sensing "real" temperatures
- Single element, Type J, 24 ga. stranded thermocouple wire fiberglass insulated with stainless steel overbraid
- Fits standard bayonet-type adapters
- Stainless steel spring and cap
- For temperature to 600°F (316°C)

TERMINAL TYPE
BX3 — B — 2-1/2 — BX Connector
P15 — B — Standard TC Plug
F15 — B — Standard TC Jack

CODE NUMBER	TERMINAL TYPE	BASE PRICE $ "B" TO 48 IN.	ADDITIONAL $ "B" LENGTH
Single Element 180 Dia. PTC-3023	BX3 P15 F15	$15.00 19.00 20.00	$1.25 per 12 in.

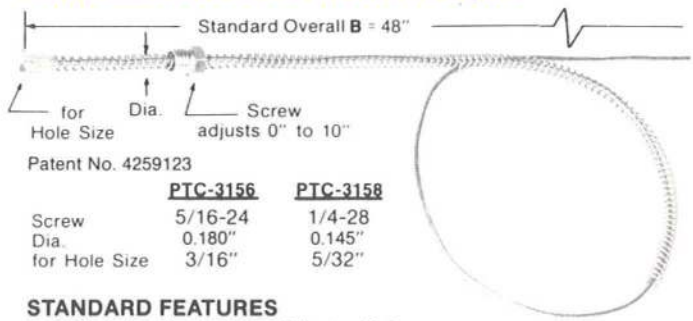
To Order Give:

PTC-3023 - J - ____ - ____

Catalog No. | ANSI Type | Terminal Type | "B" Length

- Other thermocouple types available i.e. K,T,E - use proper code and add 10% to price

Adjustable Nozzle Thermocouple



Patent No. 4259123

	PTC-3156	PTC-3158
Screw Dia. for Hole Size	5/16-24 0.180" 3/16"	1/4-28 0.145" 5/32"

STANDARD FEATURES

- Adjustable immersion 0 in. to 10 in.
- Molded exposed junction tip for fast response
- Snakes into mold area for sensing "real" temperatures
- Single element, Type J, 24 ga. stranded thermocouple wire fiberglass insulated with stainless steel overbraid
- Fits designated threaded hole 3/8" thread depth
- Stainless steel spring
- For temperature to 600°F (316°C)
- Other thermocouple types available i.e. K,T,E - use proper code and add 10% to price

TERMINAL TYPE
BX3 — B — 2-1/2 — BX Connector
P15 — B — Standard TC Plug
F15 — B — Standard TC Jack

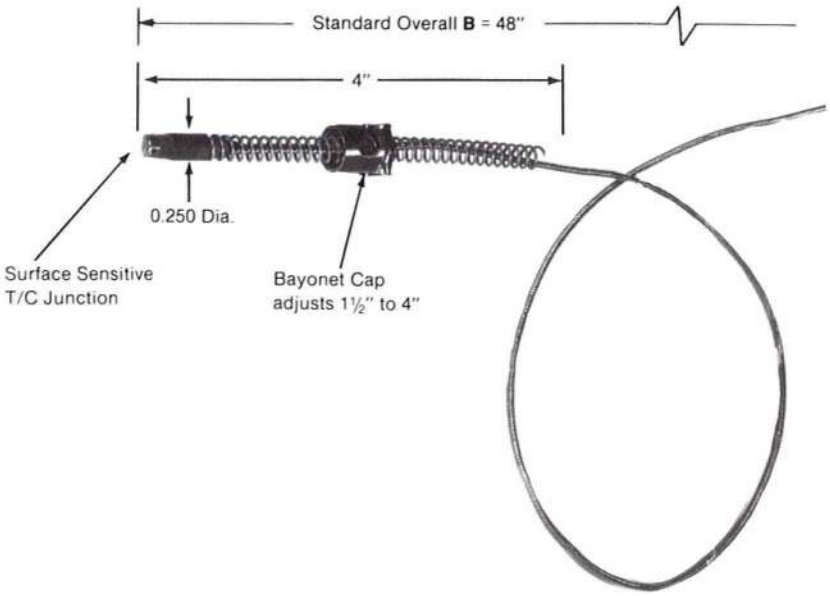
CODE NUMBER	TERMINAL TYPE	BASE PRICE $ "B" TO 48 IN.	ADDITIONAL $ "B" LENGTH
Single Element .180 Dia. 5/16 - 24 Brass Screw PTC-3156	BX3 P15 F15	$15.00 19.00 20.00	$1.25 per 12 in.
Single Element .145 Dia. 1/4 -28 SS Screw PTC-3158	BX3 P15 F15	$15.00 19.00 20.00	$1.25 per 12 in.

To Order Give: PTC ____ - J - ____ - ____

Catalog No. | ANSI Type | Terminal Type | "B" Length

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

Surface Temperature Measurement Thermocouple



TERMINAL TYPE
BX3 B — 2-1/2  BX Connector
P15 B  Standard TC Plug
F15 B  Standard TC Jack

This thermocouple gives accurate surface temperature measurement. Tests show that thermocouples that are not surface sensitive can give readings 20-30°F below actual temperature. Accessory bayonet adapter with a selection of bands is available for pipe application.

CODE NUMBER	TERMINAL TYPE	BASE PRICE $ "B" TO 48 IN.	ADDITIONAL $ "B" LENGTH
Single Element **PTC-3175**	BX3 P15 F15	$25.00 29.00 30.00	$1.25 per 12 in.

To Order Give: **PTC-3175** - **J** - _____ - _____

Catalog No. | ANSI Type | Terminal Type | "B" Length

BAND CLAMP NO.	DIAMETER (Inches) MIN.	MAX.	STANDARD PIPE SIZE
1	7/16	25/32	1/4 to 3/8
2	11/16	1-1/4	1/2 to 3/4
3	1-1/16	2	1 to 1-1/2
4	2-1/16	3	2 to 2-1/2
5	3-5/16	4-1/4	3 to 3-1/2
6	3-9/16	4-1/2	4
7	5-1/8	6	5
8	6-1/8	7	6

Pipe Clamp Bayonet Adapter Unit

ADAPTER CODE NUMBER	"L" INCHES	PRICE $ Includes Clamp
PCS	1-3/4	$7.50

To Order Give: **PCS** _____ _____

Band Clamp No.

STANDARD FEATURES

- Type J thermocouple standard
- Grounded junction, Marlin surface sensitive tip
- Single element 20 ga. stranded wire fiberglass insulated with stainless steel overbraid
- Fits standard bayonet-type adapters
- Stainless steel spring and cap
- For temperatures to 500°F (260°C)
- Other thermocouple types available i.e. K, T, E - use proper code and add 20% to price

SENSORS
PLASTIC INDUSTRY THERMOCOUPLES — MELT

ADJUSTABLE MELT ASSEMBLY		
CATALOG NUMBER	"L" DIMENSION	*PRICE
Single element **PTC-3110**	3"	$44.00
	4"	46.00
	5"	48.00
	6"	52.00
Dual Element **PTC-3110-D**	3"	64.00
	4"	66.00
	5"	68.00
	6"	72.00

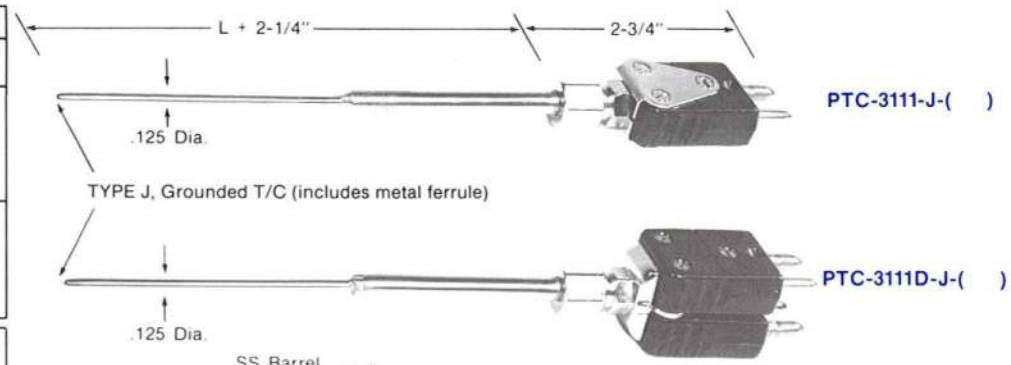
To Order Give: PTC ____ - J - ____
Catalog No. ANSI Type "L"

Adjustable Plastic Melt Thermocouple Also Available with Hastalloy Tip for Max. Abrasion Resistance

PTC-3110-J-( )

PTC-3110D-J-( )

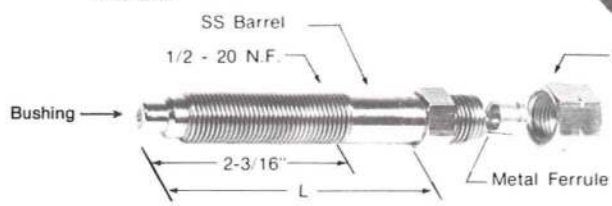
THERMOCOUPLE REPLACEMENT		
CATALOG NUMBER	FOR BARREL DIMENSION "L"	*PRICE
Single element **PTC-3111**	3"	$20.00
	4"	20.00
	5"	20.00
	6"	20.00
Dual element **PTC-3111-D**	3"	40.00
	4"	40.00
	5"	40.00
	6"	40.00



PTC-3111-J-( )

PTC-3111D-J-( )

BARREL REPLACEMENT (Includes Metal Ferrule and Hex Nut)		
CATALOG NUMBER	"L" DIMENSION	*PRICE
PTC-3112	3"	$25.00
	4"	27.00
	5"	29.00
	6"	33.00

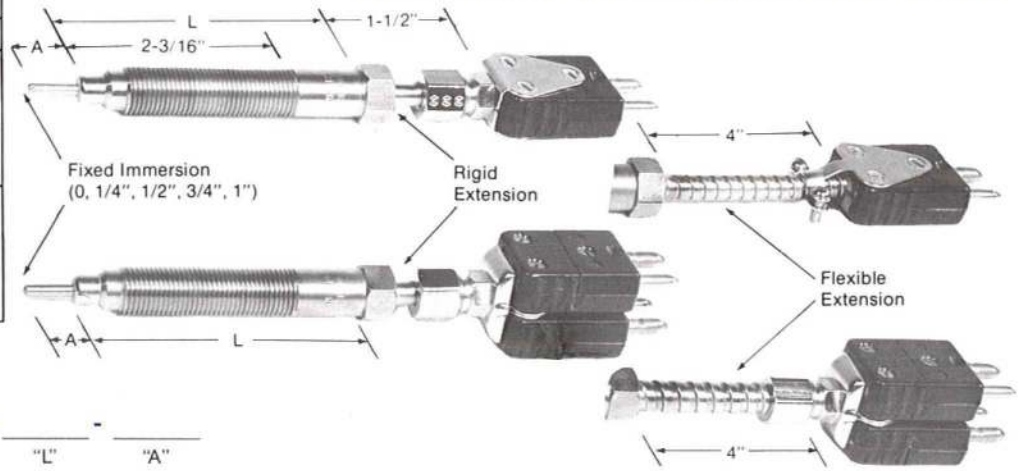


PTC-3112-J-( )

Fixed Immersion Plastic Melt Thermocouple

FIXED IMMERSION MELT TC ASSEMBLY			
CATALOG NO.	"L"	"A"	*PRICE
Single element			
Rigid Extension **PTC-3070** Flexible Exten. **PTC-3090**	3"	Specify (0, 1/4", 1/2", 3/4", or 1")	$46.00
	4"		48.00
	5"		50.00
	6"		52.00
Dual element			
Rigid Extension **PTC-3070-D** Flexible Exten. **PTC-3090-D**	3"	Specify (0, 1/4", 1/2", 3/4", or 1")	66.00
	4"		68.00
	5"		70.00
	6"		72.00

*Discount Schedule "C" Applies

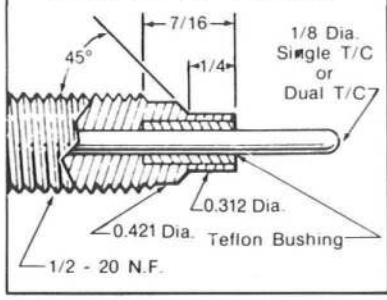


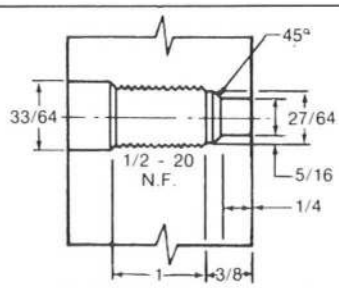
To Order Give: PTC ____ - ____ - ____ - ____
Catalog No. ANSI Type "L" "A"

STANDARD FEATURES & OPTIONS

- Stainless steel construction
- 1/8" Dia., Type J, grounded junction, Marlox Thermocouple standard
- Single or Dual Element Thermocouple
- Quick Connector Plug Termination
- Teflon Bushing Standard
- Ceramic Bushing available (add $4.00 to List Price) Add suffix C to catalog no., i.e. PTC-3113C-J-3"
- Other Thermocouple Types available e.g. K, T, E use proper ANSI code and add 10% to list price.
- For additional flexible extension add $1.25/ft.
- For additional Barrel Length "L" add $3.00/inch
- For Hastalloy Tip use suffix HST and add $10.00

Construction detail for plastic melt thermocouples

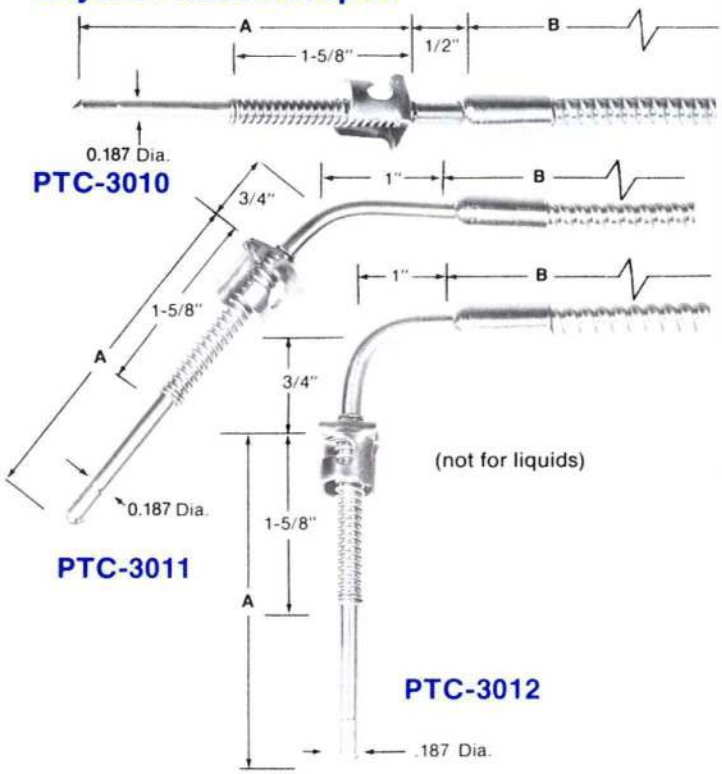




Recommended dimensions in plastic molding machine barrel for correct mounting of plastic melt extruder type thermocouple.

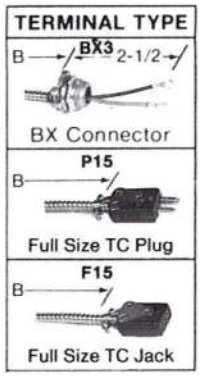
Since 1952 Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

Bayonet Thermocouples



Standard "A" Length = 3-1/2 in. (available to 8 in. in 1/2 in. increments)

Standard "B" Length = 48 in.



CATALOG NUMBER	BASE PRICE*		A TO 8" B TO 48"	ADDITIONAL "B" LENGTH
	BX3	P15	F15	
(Single Element) PTC-3010 PTC-3011 PTC-3012	$17.00	20.50	22.00	$1.75 per 12 in.
(Dual Element) PTC-3010-D PTC-3011-D PTC-3012-D	$23.50	36.50	38.50	$2.50 per 12 in.

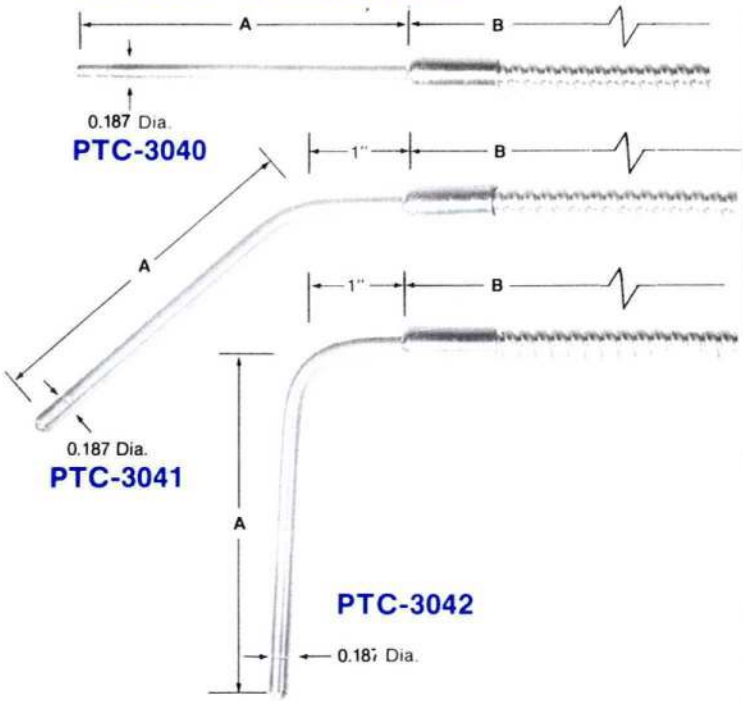
*Discount Schedule "C" Applies

NOTE: For stainless steel overbraid construction in lieu of SS armor tubing add S to catalog number (i.e. PTC-3010S-P15-3"-48") and deduct $1.00 from base price.

To Order Give: _____ - J - _____ A = _____ B = _____
Catalog No. | ANSI Type | Terminal Type

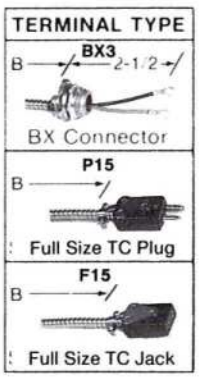
STANDARD FEATURES
- Sensitive tip 0.187 Dia. (not for use in liquids)
- Type J thermocouple with grounded junction standard
- Single element: 20 ga. stranded thermocouple wire with fiberglass insulation and SS armor tubing
- Dual element: 24 ga. stranded thermocouple wire with fiberglass insulation and SS armor tubing
- SS overbraid also available (add S to catalog no.)
- Fits standard bayonet type adapters
- For temperatures to 900°F (482°C)
- Rigid "B" length available (specify rigid "B" add $3.00 to base price)
- Stainless steel construction
- Other thermocouple types available i.e. K, T, E - use proper code and add 10% to price

Immersion Thermocouples



Standard "A" Length = 3-1/2 in. (available to 8 in. in 1/2 in. increments)

Standard "B" Length = 48 in.



CATALOG NUMBER	BASE PRICE*		A TO 8" B TO 48"	ADDITIONAL "B" LENGTH
	BX3	P15	F15	
(Single Element) PTC-3040 PTC-3041 PTC-3042	$15.00	18.50	19.50	$1.75 per 12 in.
(Dual Element) PTC-3040-D PTC-3041-D PTC-3042-D	$18.50	32.50	35.50	$2.50 per 12 in.

*Discount Schedule "C" Applies

NOTE: For stainless steel overbraid construction in lieu of SS armor tubing add S to catalog number (i.e. PTC-3040S-P15-3"-48") and deduct $1.00 from base price. For extra "A" Dim. add $0.50/inch.

To Order Give: _____ - J - _____ A = _____ B = _____
Catalog No. | ANSI Type | Terminal Type

STANDARD FEATURES
- Sensitive tip 0.187 Dia.
- Type J thermocouple with grounded junction standard
- Single element: 20 ga. stranded thermocouple wire with fiberglass insulation and SS armor tubing
- Dual element: 24 ga. stranded thermocouple wire with fiberglass insulation and SS armor tubing
- SS overbraid also available (add S to catalog no.)
- Fits 3/16" bore compression fitting (order separately
- For temperatures to 900°F (482°C)
- Rigid "B" length available (specify rigid "B" add $3.00 to base price)
- Stainless steel construction
- Other thermocouple types available i.e. K, T, E — use proper code and add 10% to price

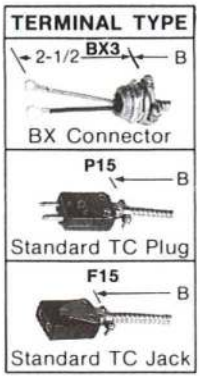
Since 1952 Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

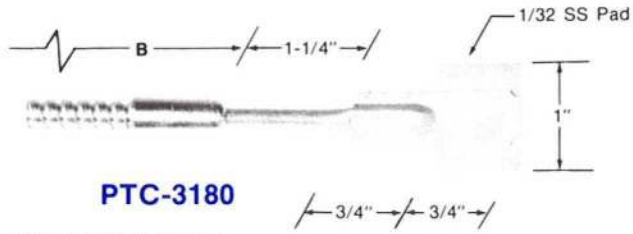
SENSORS
PLASTIC INDUSTRY THERMOCOUPLES

Spade Type Thermocouple

CATALOG NUMBER	TERMINAL TYPE	BASE PRICE $ "B" TO 48 IN.	ADDITIONAL $ "B" LENGTH
PTC-3180	BX3	$22.00	$1.75 per 12 in.
	P15	26.50	
	F15	27.50	

*Discount Schedule "C" Applies





PTC-3180

STANDARD FEATURES

- For use under heater bands or where no thermocouple hole can be drilled
- Type J thermocouple grounded junction standard
- Very sensitive, quick responding
- 20 ga. stranded thermocouple wire fiberglass insulated with SS armor tubing
- Stainless steel construction with 1/32 SS pad
- For temperatures to 900°F (482°C)
- Other thermocouple types available e.g. K,T,E—use proper code and add 10% to price

To Order Give: **PTC-3180** - **J** - _____ **B =**

Catalog No. | Ansi Type | Terminal Type | "B" Length

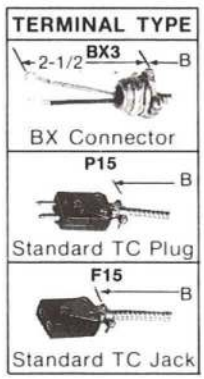
Extension Cable

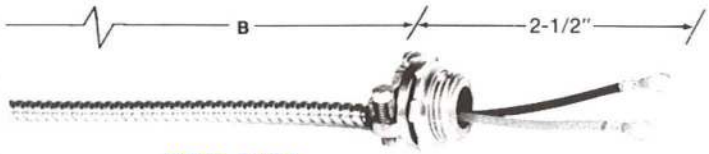
CATALOG NUMBER SINGLE T/C	TERMINAL TYPE	BASE PRICE $ "B" TO 48 IN.	ADDITIONAL $ "B" LENGTH
PTC-3191	BX3	$12.00	$1.75 per 12 in.
	P15	16.00	
	F15	17.00	
PTC-3192	BX3	$16.00	$1.75 per 12 in.
	P15	20.00	
	F15	21.00	
PTC-3193	BX3	$17.00	$1.75 per 12 in.
	P15	21.00	
	F15	22.00	

- For SS overbraid construction deduct 10% from base and increment prices and add suffix S (i.e. PTC-3191S-J-P15) to catalog number.

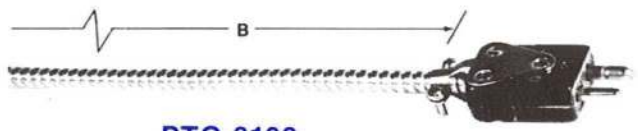
CATALOG NUMBER DUAL TR	TERMINAL TYPE DUAL T/C	BASE PRICE $ "B" TO 48 IN.	ADDITIONAL $ "B" LENGTH
PTC-3191D	BX3	$20.00	$3.00 per 12 in.
	P12	30.00	
	F12	32.00	
PTC-3192D	BX3	$30.00	$3.00 per 12 in.
	P12	40.00	
	F12	42.00	
PTC-3193D	BX3	$32.00	$3.00 per 12 in.
	P12	42.00	
	F12	44.00	

*Discount Schedule "C" Applies

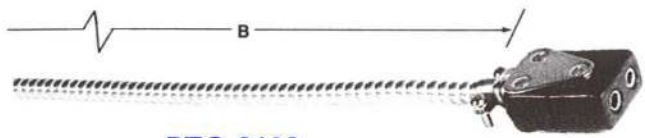




PTC-3191



PTC-3192



PTC-3193

STANDARD FEATURES

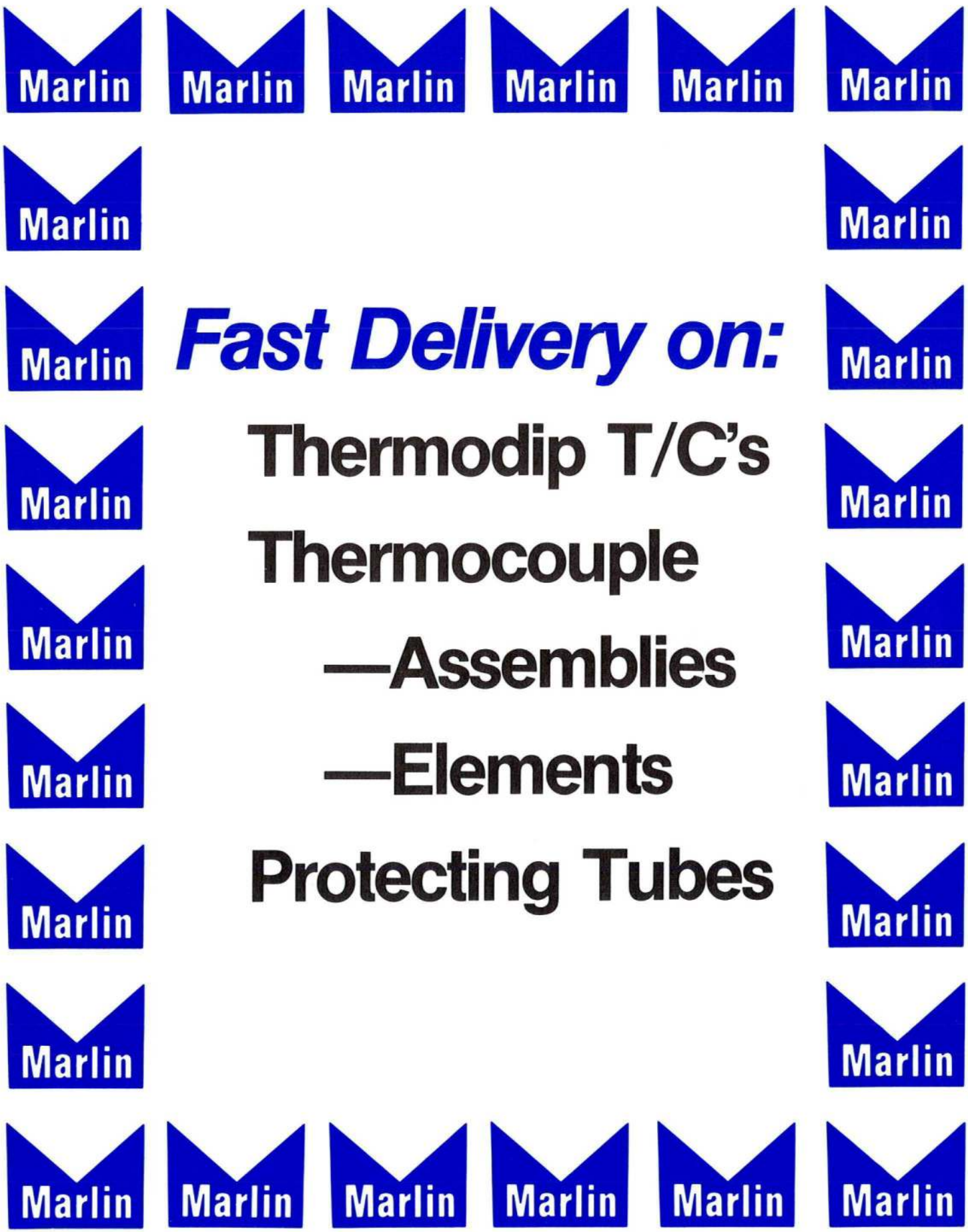
- Single element Type J stranded thermocouple extension wire standard
- SS armor tubing construction
- Standard connectors for 500°F ambient
- SS overbraid construction available
- Dual element available
- Other thermocouple types available e.g. K, T, E — use proper code and add 10% to price

To Order Give: **PTC-** _____ - **J** - _____ **B =**

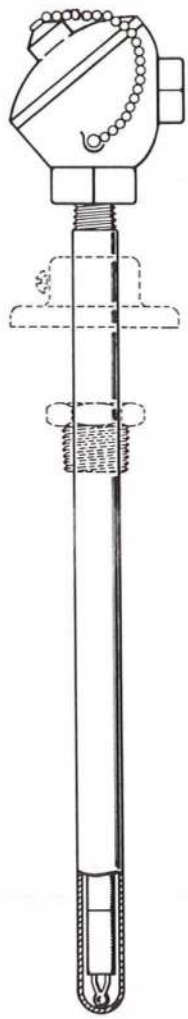
Catalog No. | Ansi Type | Terminal Type | "B" Length

DISCOUNT SCHEDULE "C"	
QUANTITY	FACTOR
1-4	Net
5-9	.95
10-49	.90
50-99	.85
100+	.80

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


Marlin
Fast Delivery on:
Thermodip T/C's
Thermocouple
—Assemblies
—Elements
Protecting Tubes

MARLIN
INDUSTRIAL THERMOCOUPLES



Marlin MANUFACTURING CORPORATION

12404 TRISKETT ROAD CLEVELAND, OHIO 44111

216 941-6200 FAX 216 941-6207

GENERAL SELECTION PARAMETERS

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

Thermocouple Type:
Select the thermocouple type that will be capable of operating in your application temperature range and be compatible with your instrumentation.

Protecting Tube:
Select a material that will withstand the temperature and possible corrosives of your application. (see table below for T/C - Tube Compatibility and pages D-0, D-1, D-8 for tube information)

Tube Size:
Use the tube size that will withstand the rigors of your application but with minimal effect on it.

Fitting or Mounting Type:
To attach and/or seal the assembly in your application use a flange or fixed fitting.

Terminal and/or Extension Type:
For connection to instruments various terminations are available.

GENERAL INSTALLATION PARAMETERS:

The thermocouple should "see", as closely as possible, what the product in the process is experiencing in order to get meaningful measurements.

Location:
Locate the thermocouple junction 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.

Wire Extension:
Pages E-1, E-2 and E-3 give general wire insulation characteristics, select the insulation that environmental conditions dictate. Use the correct thermocouple type through the circuit. "Red" color code is always negative in thermocouple circuits. Ideally, run thermocouple circuit wires in separate conduits at least one foot away from power lines. Twisted and shielded constructions may be required to avoid noise in the thermocouple circuit. The overall impedance of the thermocouple circuit must be compatible with your instrumentation.

GENERAL MAINTENANCE PARAMETERS:

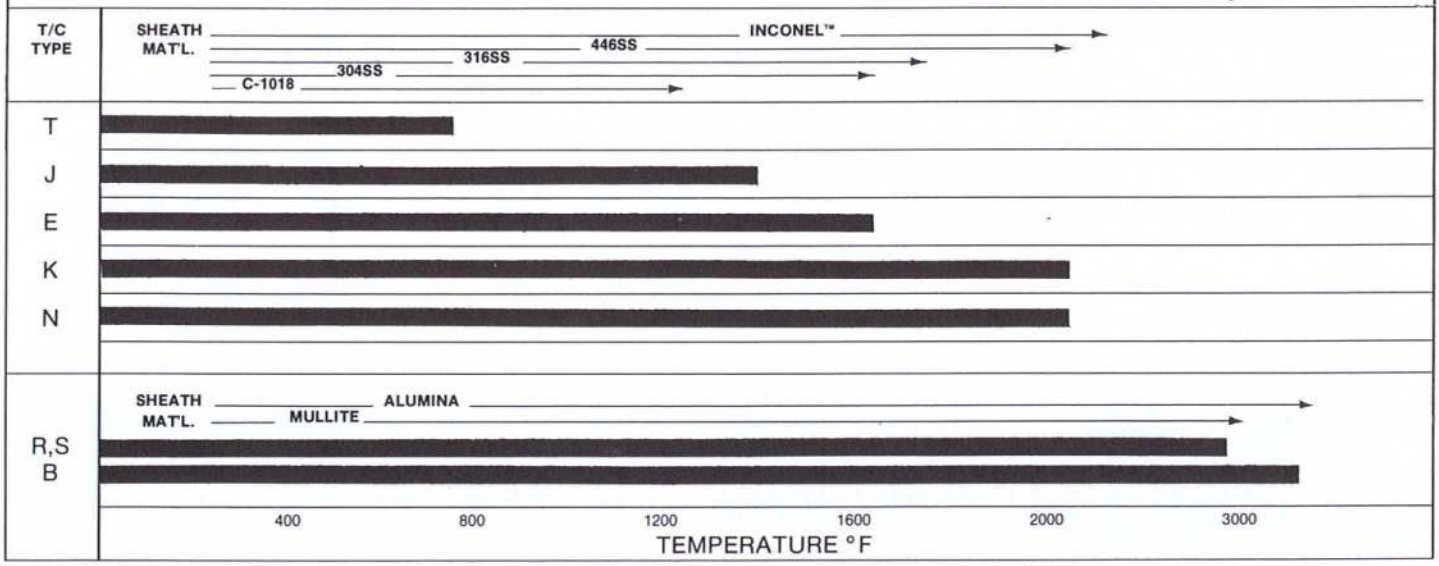
Thermocouples often deteriorate with time, exhibiting a drift from actual temperatures. Deterioration usually is more rapid at higher temperatures and depends upon the integrity of the protecting tube to isolate it from contaminates. Thermocouples should be checked at regular maintenance intervals based on recommendations or on experience.

Thermocouple DO's
- DO check in place.
- DO replace at established, proper intervals.
- DO have good connections throughout the circuit.

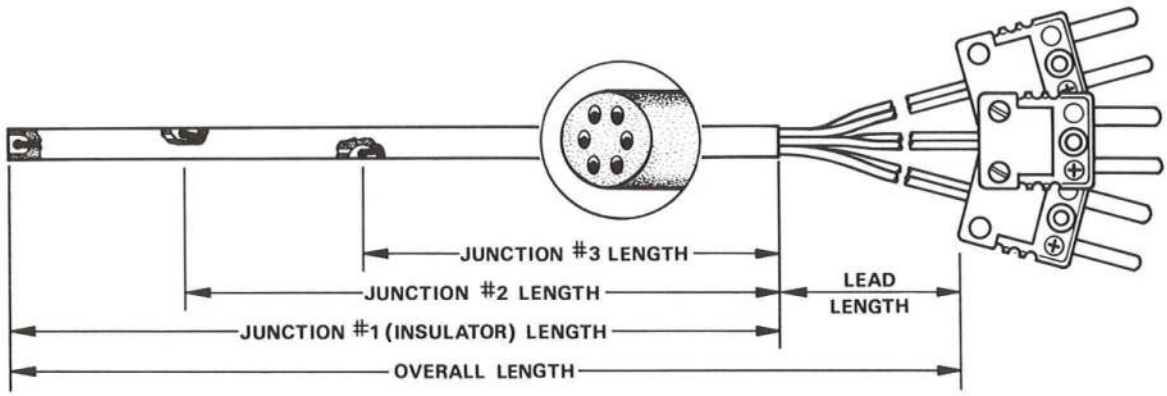
Thermocouple DO NOT's
- DON'T reinsert at different immersions. (Avoid decreasing the immersion.)
- DON'T use for accurate measurements at lower temperatures after being exposed to higher temperatures.
- DON'T use in defective protecting tubes.
- DON'T insulate with used insulators.

If there is a reversal in the thermocouple circuit the indication will be down scale. A "double-reversal" in the circuit will give an upscale but erroneous reading. Keep the "Red" color coded leg negative throughout the circuit to avoid these reversals.

PROTECTING TUBE — THERMOCOUPLE TYPE COMPATIBILITY CHART - Continuous Duty



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



SPECIFICATIONS:

3-Zone Profile Thermocouple

- 24 ga. (.020″) Type R, S, or B Thermocouple Wire
- 997 Alumina Insulator .250″ Dia. — Max Length 84″
- All Junctions Recessed in Insulator
- Teflon Insulated Color Coded Leads.
  Standard Color Code:
  #1 T/C - Black/Red
  #2 T/C - Yellow/Red
  #3 T/C - Green/Red
  (Specify your Color Code requirements if not Marlin standard)
- Terminations:

Mini T/C Connector Plugs 1260-( )	Use Code M14
Mini T/C Connector Jack 1210-( )	Use Code F14
For No terminals	Use Code 0

TO ORDER: 97-250V—3 □ — □ — □ — □ — □ — □

T/C Type	T/C #1	T/C #2	T/C #3	Lead Length	Termination 0 None 2MP-Mini Plug
	[Junction Lengths In Inches]				

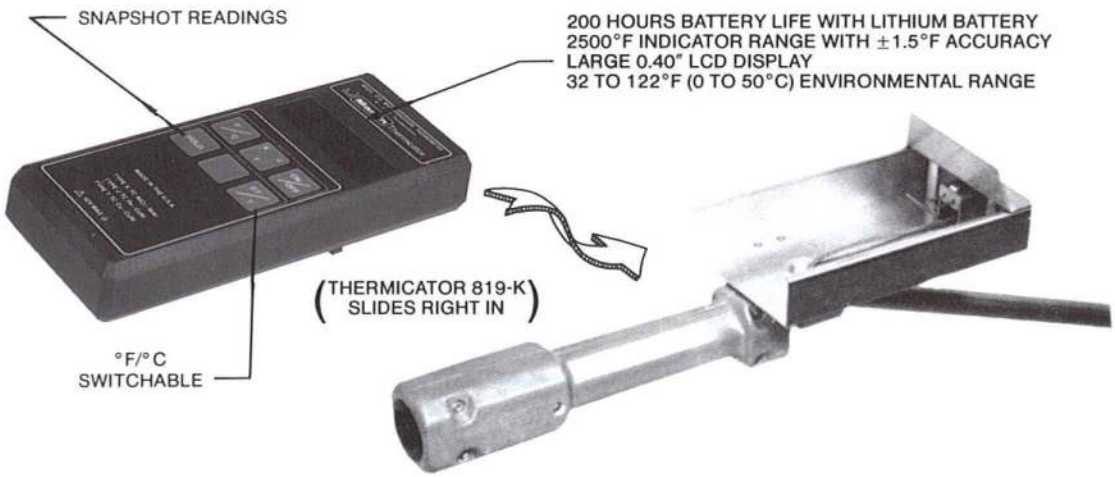
e.g. 97—250—3S—60—50—40—12—M14

Description
- 3-Zone Type "S" ITS-90 24 ga. (.020) Thermocouples
- Insulator length 60″
- Recessed Junctions @ 60″, 50″, 40″.
- 12″ leads w/Mini T/C Connector Plugs

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

FAST DEPENDABLE READINGS AT LOW COST
$250. for Holder with Indicator

(Thermocouple not included)



Thermo-Dip® Holder for Digital Foundry Thermicator
Thermo-Dip holder is constructed of a stainless steel tube and box with reinforced thermoset molded grip. Thermocouple installs in stainless steel sleeve with two stainless set screws. Removing one half of grip exposes terminals for easy thermocouple replacement. Thermicator 819-K indicator slides into holder for fast dependable connections.

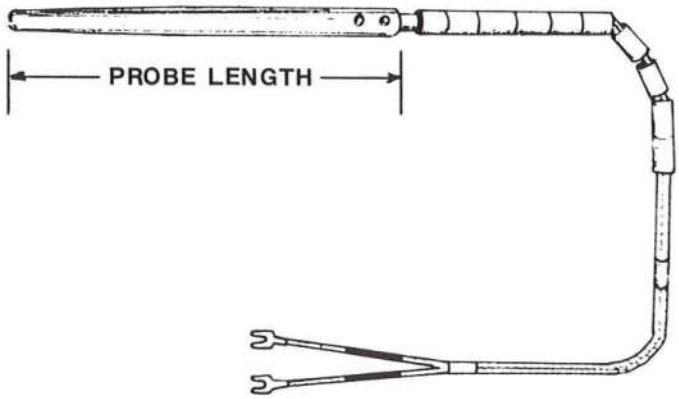
PART NO.	LENGTH	PRICE*
119-006	43"	$100.
	55"	106.
	72"	112.
	96"	122.

*–Order 819-K separately @ $150.00
—Order Thermo-Dip Thermocouples separately (next page)

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

Thermo-Dip® Thermocouples

Thermo-Dip thermocouples are designed for intermittent temperature sensing below 2300°F (1255°C), for use in molten brass, copper, aluminum, lead and other non-ferrous metals. The 446 SS sheath (.500" OD) protects a 16 gage ANSI Type K thermocouple. Insulated at the hot end with double bore ceramic insulators and fiberglass sleeving at the cold end. Interchangeable with other makes.

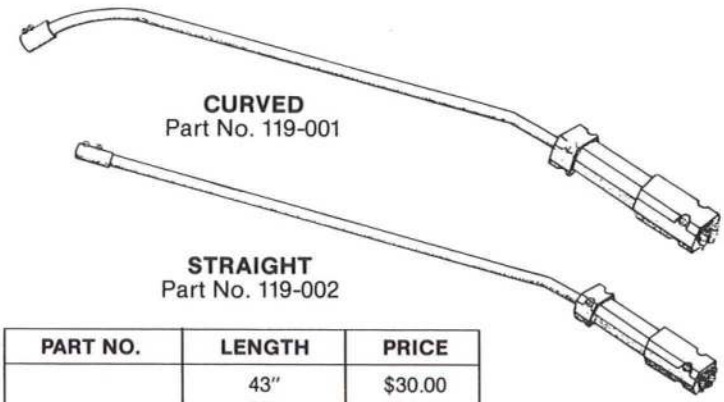


PROBE LENGTHS	FOR HOLDER LENGTHS							
	43"		55"		72"		96"	
	PART NO.	PRICE	PART NO.	PRICE	PART NO.	PRICE	PART NO.	PRICE
8"	119-084	$12.00	119-085	$15.00	119-087	$17.00	119-089	$24.00
12"	119-124	17.00	119-125	18.50	119-127	21.00	119-129	28.00
15"	119-154	19.00	119-155	21.00	119-157	24.00	119-159	32.00
20"	119-204	31.50	119-205	34.00	119-207	36.00	119-209	38.00
24"	119-244	37.00	119-245	40.00	119-247	45.00	119-249	49.00
30"	119-304	44.00	119-305	48.00	119-307	52.00	119-309	57.00

Thermo-Dip® Holder

Thermo-Dip holder is constructed of a stainless steel tube with reinforced thermoset molded grip. Thermocouple installs in stainless steel sleeve with two stainless set screws. Removing one half of grip exposes terminals for easy thermocouple replacement. Interchangeable with other makes.

Curved holder available in lengths of 43", 55", 72" and 96". Straight holder available in 31" length only.



CURVED
Part No. 119-001

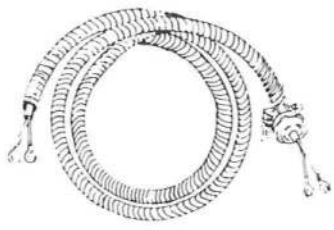
STRAIGHT
Part No. 119-002

PART NO.	LENGTH	PRICE
119-001	43"	$30.00
	55"	36.00
	72"	42.00
	96"	52.00
119-002	31"	$30.00

Armored Extension Cable

Connects Thermo-Dip holder to wall mounted instrument. Flexible armor protects 16 ga Type KX extension wire; strain relief springs provide extra protection at each end.

Available in lengths from 5 feet.
119-005 — (↑)
cable length in feet.



PART NO.	LENGTH	PRICE
119-005	5 Ft.	$17.00
Each additional foot		1.75

QUANTITY	DISCOUNT FACTOR
1-4	Net
5-9	.950
10-24	.900
25-49	.850
50-99	.800
100+	.750

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

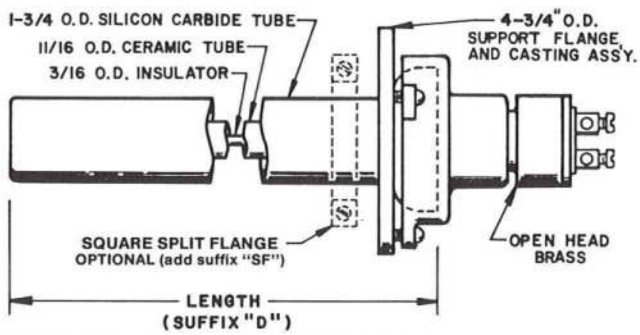
GENERAL NOTES

There are many arrangements of industrial platinum thermocouple assemblies that utilize combinations of protecting tubes, thermocouple elements, terminals and mounting options. They are catagorized into SINGLE, DOUBLE and TRIPLE tube assemblies which, depending on their application and design, give various degrees of protection to the platinum thermocouple element. Platinum thermocouples are relatively expensive units that are easily contaminated so proper protection from harmful atmospheres is required in order to get suitable service life from the assembly.

Please refer to the "PROTECTING TUBES — GENERAL" section for material selection parameters.

The part numbers shown are for "commonly used" assemblies.

SENSORS
INDUSTRIAL DOUBLE TUBE PLATINUM THERMOCOUPLE ASSEMBLIES

Part No.	Double Tube Assembly Type	Replacement Components
(see tables) ABB C D D176C—□—□ T C Type ↑ Length ↑		A C D T/C Element 97-187-3-□ — □ — X Protecting Tube B No. 1 60-687-3 — □ No. 2 SIC — □ — X Terminal Open Head MTI-01-□

Assembly Example: **D 1 7 6 C — S — 24"**

- D — Assembly Designation (Double Tube Type 1)
- 7 — Insulator Material (Alumina 997)
- 6 C — Protecting Tube Material (No. 1 Tube-Mullite 60) (No. 2 Tube-Silicon Carbide)
- S — Thermocouple Type
- 24" — Assembly Length

In each assembly designation the INSULATOR and/or PROTECTING TUBE MATERIAL can be changed from the "commonly used" combination to fit your particular requirements. For example, if the above assembly was required with Alumina 997 for the No. 1 protecting tube the part number would change from:

D 1 7 6 C — S — 24"

to:

D 1 7 7 C — S — 24"

Of course, the thermocouple type and length must reflect the proper requirements of your application.

For each assembly designation, a parts list for replacement components is given opposite the assembly sketch. If the material of the insulator and/or tube is changed from the "commonly used" combination, the material code must be changed in the replacement components when ordering or specifying these replacement components.

Example:

D 1 7 6 C — S — 24"

REPLACEMENT T/C Element:	97—187—3—S—24"
Protecting Tube No. 1:	60—687—3 — 24"
No. 2:	SIC - 24"

WHEN CHANGED TO:

D 1 7 7 C — S — 24"

REPLACEMENT T/C Element:	97—187—3—S—24"
Protecting Tube No. 1:	97—687—3 — 24"
No. 2:	SIC - 24"

If you need any additional information please contact the Factory.

TABLE A — INSULATOR MATERIAL

MATERIAL	CODE
MULLITE 60	6
ALUMINA 997	7
ALUMINA 998	8

INSULATOR MAT'L.

Note:
Insulator material can be changed from "commonly used" combination to fit your particular requirements.

ASSEMBLY DESIGNATION

EXAMPLE: D 1 7 6 C — S — 24"

No. 1. No. 2

TABLE B — PROTECTING TUBE MATERIAL

TUBE MATERIAL	CODE
MULLITE 60	6
ALUMINA 997	7
ALUMINA 998	8
SA SILICON CARBIDE	A
SILICON CARBIDE	C
METAL CERAMIC	L
INCONEL	I

PROTECTING TUBE MAT'L.

Note: Protecting Tube materials can be changed from "commonly used" combination to fit your particular requirements.

TABLE C — SINGLE/DUAL THERMOCOUPLE & T/C TYPE

THERMOCOUPLE TYPE	SINGLE ELEMENT	DUAL ELEMENT
ITS-90/IPTS 1968		
Pt13%Rh vs Pt	R	R2
Pt10%Rh vs Pt	S	S2
Pt30%Rh vs Pt6%Rh	B	B2
IPTS 1948		
Pt13%Rh vs Pt	4R	4R2
Pt10%Rh vs Pt	4S	4S2

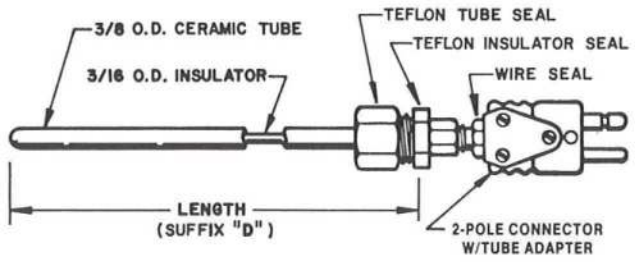
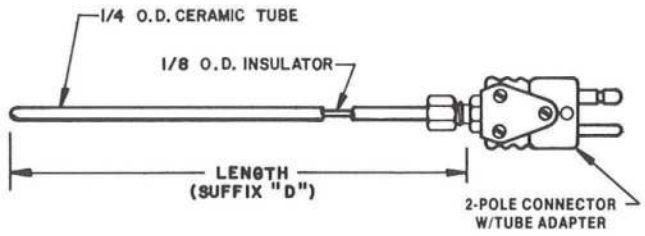
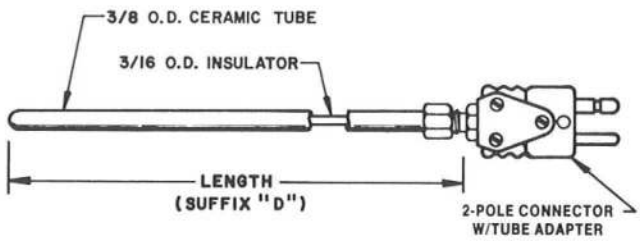
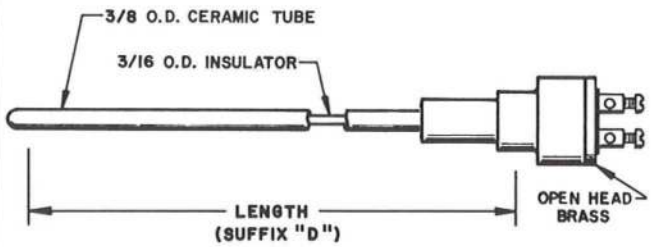
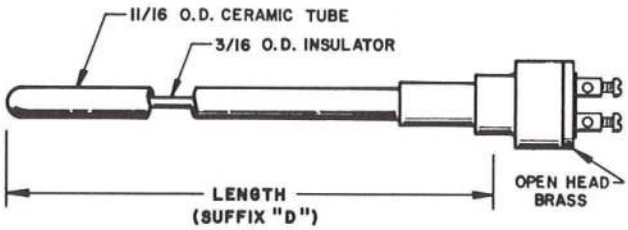
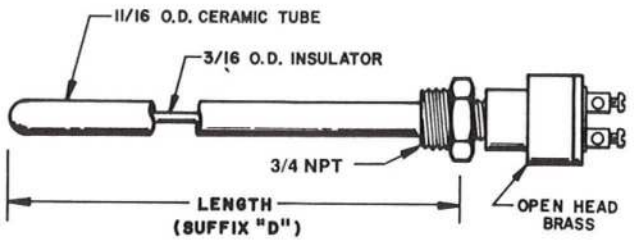
THERMOCOUPLE TYPE

TABLE D — ASSEMBLY TUBE LENGTH

Length from 12" to 48" in 6" increments.
For special Lengths consult Factory.

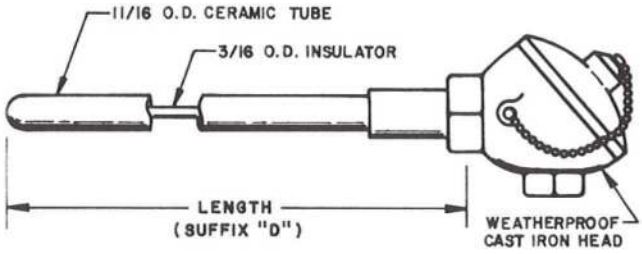
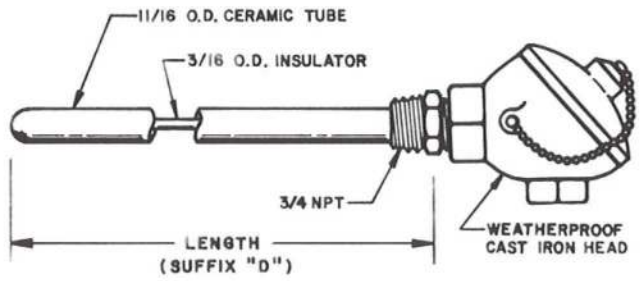
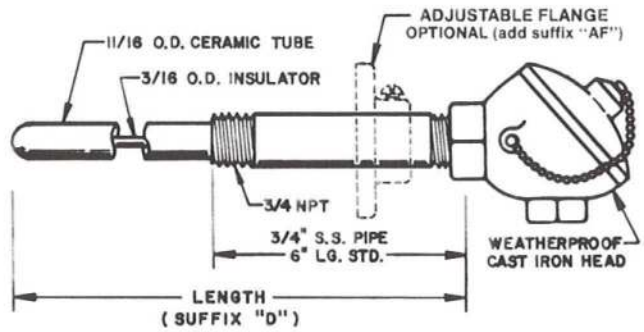
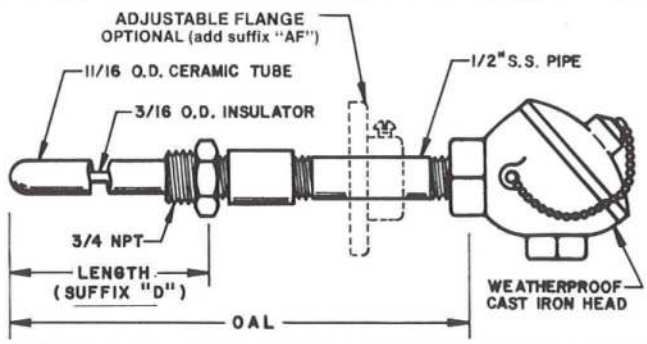
ASSEMBLY LENGTH

SENSORS
INDUSTRIAL SINGLE TUBE PLATINUM THERMOCOUPLE ASSEMBLIES

Part No.	Single Tube Assembly Type	Replacement Components
(see tables) AB C D F088 — □ — □ T/C Type, Length		A C D T/C Element 98-187-1-□ — □ — X Protecting Tube B 98-375-0 — □ Terminal 2-Pole Connector 1060- □ Ftg. & Adapter 1089- 3/8
(see tables) AB C D F177 — □ — □		A C D T/C Element 97-125-1-□ — □ — X Protecting Tube B 97-250-0 — □ Terminal 2-Pole Connector 1060- □ Ftg. & Adapter 1070- 1/4-T
(see tables) AB C D F277 — □ — □ T/C Type, Length		A C D T/C Element 97-187-1-□ — □ — X Protecting Tube B 97-375-0 — □ Terminal 2-Pole Connector 1060- □ Ftg. & Adapter 1070- 3/8-T
(see tables) AB C D F977 — □ — □ T/C Type, Length		A C D T/C Element 97-187-1-□ — □ — X Protecting Tube B 97-375-0 — □ Terminal Open Head MTI-01-□
(see tables) AB C D F377 — □ — □ T/C Type, Length		A C D T/C Element 97-187-3-□ — □ — X Protecting Tube B 97-687-3 — □ Terminal Open Head MTI-01-□
(see tables) AB C D F477 — □ — □ T/C Type, Length		A C D T/C Element 97-187-3-□ — □ — X Protecting Tube B 97-687-2 — □ Terminal Open Head MTI-02-□

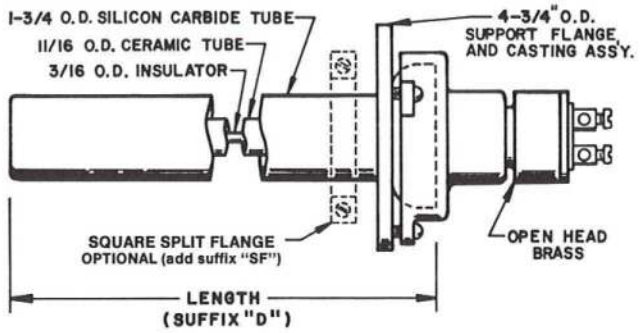
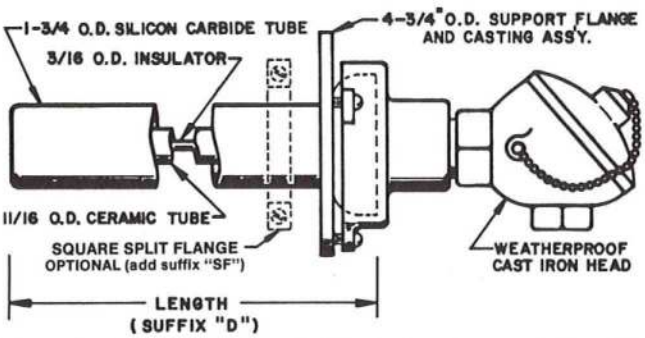
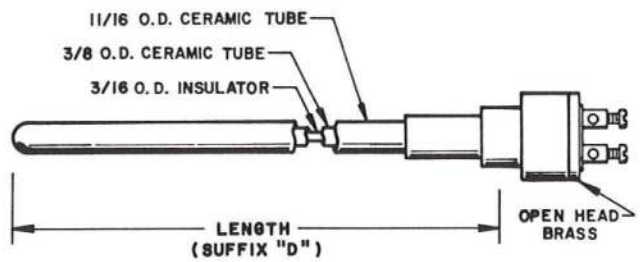
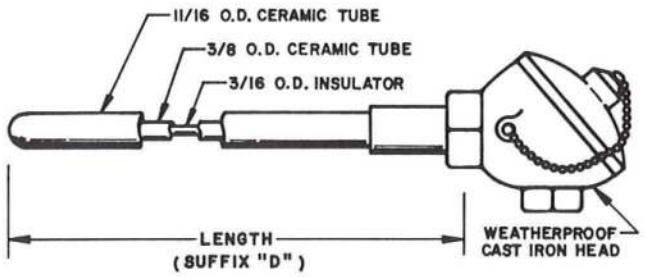
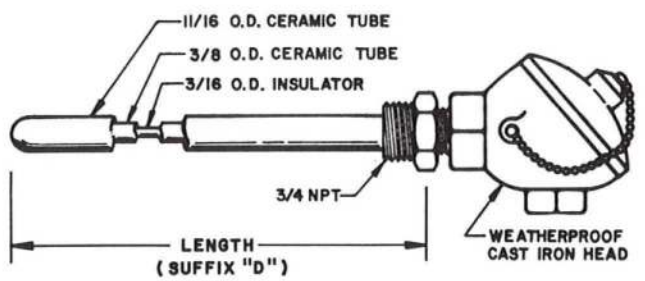
Since 1952 Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

SENSORS
INDUSTRIAL SINGLE TUBE PLATINUM THERMOCOUPLE ASSEMBLIES

Replacement Components	Single Tube Assembly Type	Part No.
A C D T/C Element 97-187-5-☐ — ☐ — X Protecting Tube B 97-687-3 — ☐ Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-⅞ Aluminum (*optional*) WA-⅞ (*add suffix "WA" e.g.F566-R-18-WA*) General Purpose Aluminum (*optional*) GP-⅞ (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a		(see tables) AB C D F577 — ☐ — ☐ T/C Type — Length
A C D T/C Element 97-187-5-☐ — ☐ — X Protecting Tube B 97-687-2 — ☐ Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-2 Aluminum (*optional*) WA-2 (*add suffix "WA" e.g.F666-R-18-WA*) General Purpose Aluminum (*optional*) GP-2 (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a		(see tables) AB C D F677 — ☐ — ☐ T/C Type — Length
A C D T/C Element 97-187-5-☐ — ☐ — X Protecting Tube B 97-687-7(6")- ☐ Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-3 Aluminum (*optional*) WA-3 (*add suffix "WA" e.g.F766-R-18-WA*) General Purpose Aluminum (*optional*) GP-3 (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a		(see tables) AB C D F777 — ☐ — ☐ T/C Type — Length
A C D OAL T/C Element 97-187-5-☐ — ☐ — ☐ — X Protecting Tube B 97-687-2 — ☐ Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-2 Aluminum (*optional*) WA-2 (*add suffix "WA" e.g.F866-R-18-30-WA*) General Purpose Aluminum (*optional*) GP-2 (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a		(see tables) AB C D F877 — ☐ — ☐ — ☐ T/C Type — Length — Overall Length

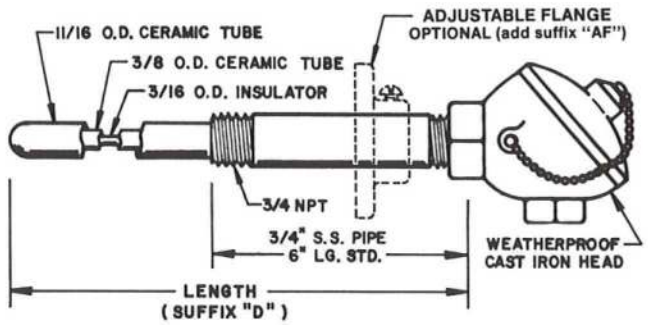
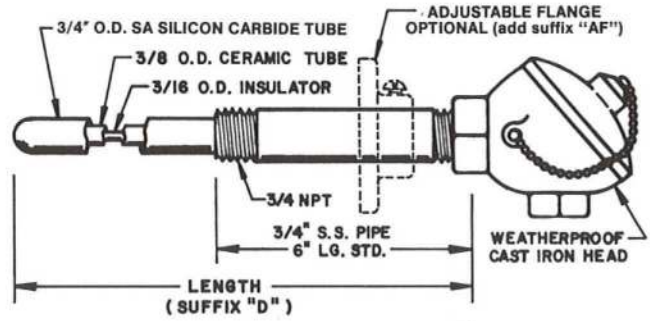
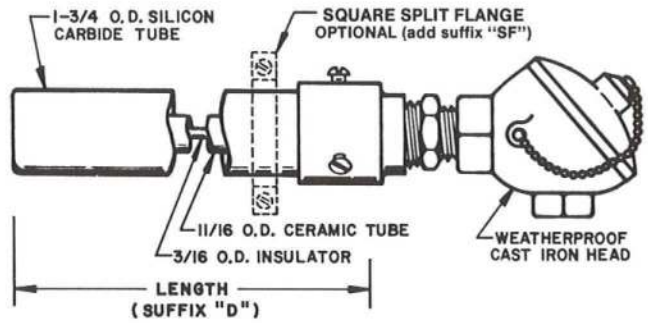
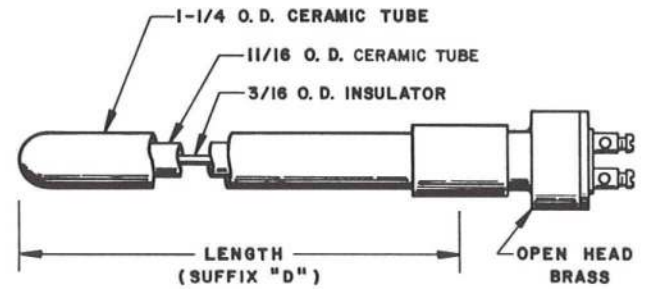
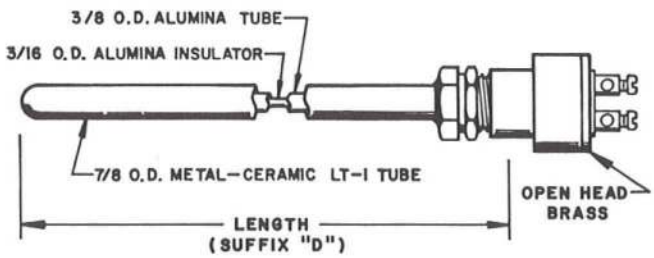
Since 1952 Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

SENSORS
INDUSTRIAL DOUBLE TUBE PLATINUM THERMOCOUPLE ASSEMBLIES

Part No.	Double Tube Assembly Type	Replacement Components
ABB C D **D177C** – □ – □ (see tables) T/C Type, Length		A C D T/C Element 97-187-3-□ – □ – X Protecting Tube B No. 1 97-687-3 – □ No. 2 SIC – □ – X Terminal Open Head MTI-01-□
ABB C D **D277C** – □ – □ (see tables) T/C Type, Length		A C D T/C Element 97-187-5-□ – □ – X Protecting Tube B No. 1 97-687-2 – □ No. 2 SIC – □ – X Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-⅞ Aluminum (*optional*) WA-⅞ (*add suffix "WA" e.g.D266C-R-18-WA*) General Purpose Aluminum (*optional*) GP-⅞ (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a
ABB C D **D3777** – □ – □ (see tables) T/C Type, Length		A C D T/C Element 97-187-3-□ – □ – X Protecting Tube B No. 1 97-375-0 – □ No. 2 97-687-3 – □ Terminal Open Head MTI-01-□
ABB C D **D4777** – □ – □ (see tables) T/C Type, Length		A C D T/C Element 97-187-5-□ – □ – X Protecting Tube B No. 1 97-375-0 – □ No. 2 97-687-3 – □ Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-⅞ Aluminum (*optional*) WA-⅞ (*add suffix "WA" e.g.D4666-R-18-WA*) General Purpose Aluminum (*optional*) GP-⅞ (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a
ABB C D **D5777** – □ – □ (see tables) T/C Type, Length		A C D T/C Element 97-187-5-□ – □ – X Protecting Tube B No. 1 97-375-0 – □ No. 2 97-687-3 – □ Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-2 Aluminum (*optional*) WA-2 (*add suffix "WA" e.g.D5666-R-18-WA*) General Purpose Aluminum (*optional*) GP-2 (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a

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

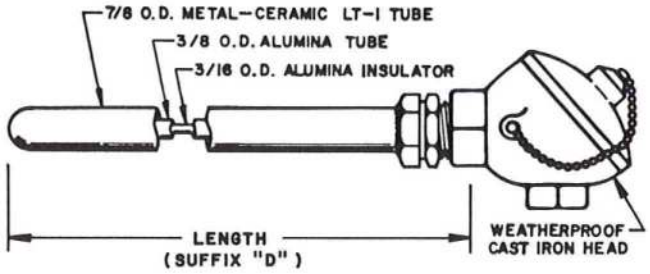
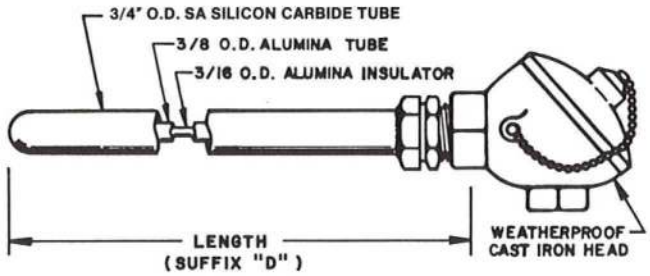
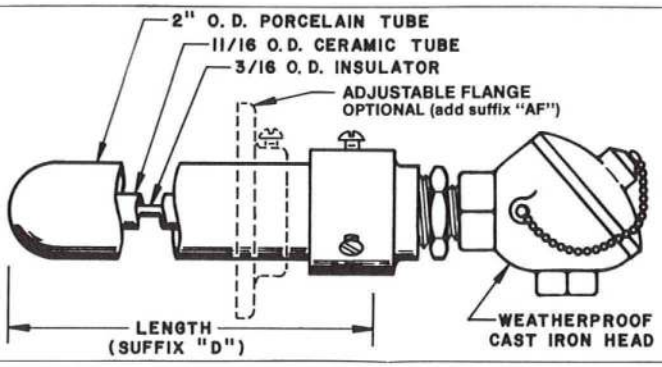
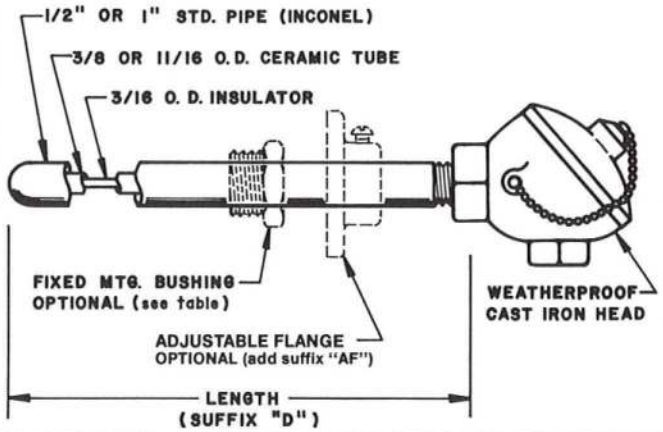
SENSORS
INDUSTRIAL DOUBLE TUBE PLATINUM THERMOCOUPLE ASSEMBLIES

Replacement Components	Double Tube Assembly Type	Part No.
A C D T/C Element 97-187-5-□ — □ — X Protecting Tube B No. 1 97-375-0 — □ No. 2- 97-687-7(6") — □ Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-3 Aluminum (*optional*) WA-3 (*add suffix "WA" e.g.D6666-R-18-WA*) General Purpose Aluminum (*optional*) GP-3 (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a		(see tables) ABB C D D6777 — □ — □ T/C Type — Length
A C D OAL T/C Element 97-187-5-□ — □ — □ — X Protecting Tube B No. 1 97-375-0 — □ No. 2 SA-750 — □ Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-2 Aluminum (*optional*) WA-2 (*add suffix "WA" e.g.D7666-R-18-30-WA*) General Purpose Aluminum (*optional*) GP-2 (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a		NEW (see tables) ABB C D D777A — □ — □ T/C Type — Length
A C D T/C Element 97-187-5-□ — □ — X Protecting Tube B No. 1 97-687-2 — □ No. 2 SIC — □ — O Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-2 Aluminum (*optional*) WA-2 (*add suffix "WA" e.g.D866C-R-18-WA*) General Purpose Aluminum (*optional*) GP-2 (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a		(see tables) ABB C D D877C — □ — □ T/C Type — Length
A C D T/C Element 97-187-3-□ — □ — X Protecting Tube B No. 1 97-687-3 — □ (No. 1 with WA or WC option 60-687-8 (1")—) No. 2 60-1250-4 — □ Terminal Open Head (*standard*) MTI-41-□ Weatherproof (*optional*) Cast Iron (*optional*) WC-4 Aluminum (*optional*) WA-4 (*add suffix "WA" e.g.D9666-R-18-WA*) General Purpose Aluminum (*optional*) GP-4 (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a		(see tables) ABB C D D9776 — □ — □ T/C Type — Length
A C D T/C Element 97-187-3-□ — □ — X Protecting Tube B No. 1 97-375-0 — □ No. 2 LT-1 — □ Terminal Open Head MTI-03-□		(see tables) ABB C D DA77L — □ — □ T/C Type — Length

Since 1952 Marlin

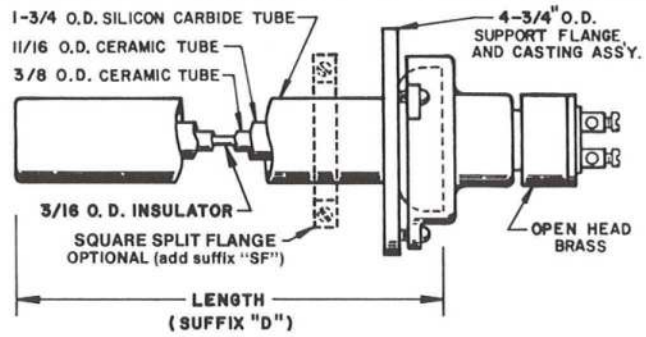
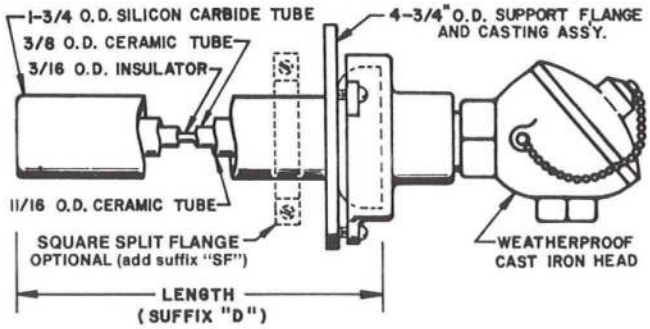
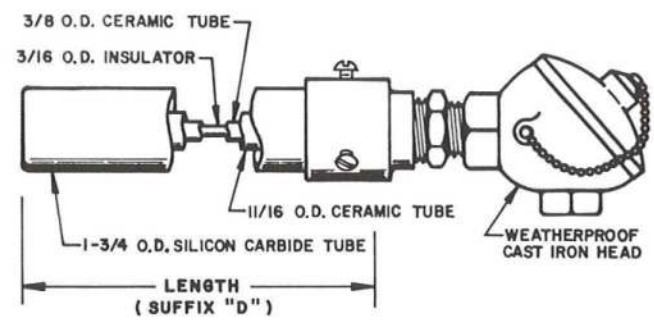
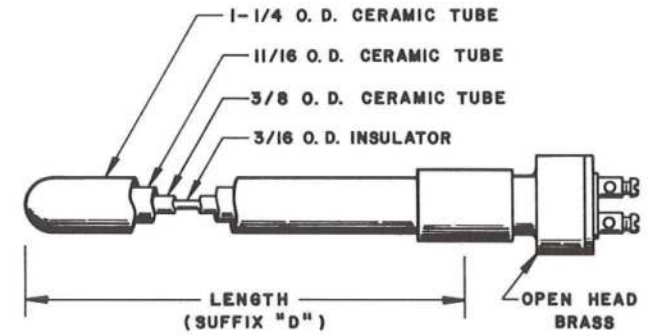
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

SENSORS
INDUSTRIAL DOUBLE TUBE PLATINUM THERMOCOUPLE ASSEMBLIES

Part No.	Double Tube Assembly Type	Replacement Components
(see tables) ABB C D **DB77L** — □ — □ T/C Type, Length		A C D T/C Element 97-187-5 □ — □ — X Protecting Tube B No. 1 97-375-0 — □ No. 2 LT-1 — □ Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-3 Aluminum (*optional*) WA-3 (*add suffix "WA" e.g.DB77L-R-18-WA*) General Purpose Aluminum (*optional*) GP-3 (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a
(see tables) ABB C D **DC77A** — □ — □ T/C Type, Length		A C D OAL T/C Element 97-187-5 □ — □ — □ — X Protecting Tube B No. 1 97-375-0 — □ No. 2 SA-750 — □ **NEW** Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-3 Aluminum (*optional*) WA-3 (*add suffix "WA" e.g.DC77L-R-18-30-WA*) General Purpose Aluminum (*optional*) GP-3 (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a
(see tables) ABB C D **DD766** — □ — □ T/C Type, Length		A C D T/C Element 97-187-5 □ — □ — X Protecting Tube B No. 1 60- 687-2 — □ No. 2 60-2000-0 — □ Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-2 Aluminum (*optional*) WA-2 (*add suffix "WA"e.g.DD666-R-18-WA*) General Purpose Aluminum (*optional*) GP-2 (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a
(1/2" INC. PIPE) (see tables) ABB C D **DE76I** — □ — □ T/C Type, Length (1" INC. PIPE) ABB C D **DF76I** — □ — □ T/C Type, Length		A C D T/C Element 97-187-5 □ — □ — X Protecting Tube B (*DE type assembly*) No. 1 60-375-0- — □ No. 2 12-600 — □ (*DF type assembly*) No. 1 60-687-0- — □ No. 2 44-600 — □ Terminal Weatherproof for Ass,y — DE — DF Cast Iron (*standard*) WC-2 WC-4 Aluminum (*optional*) WA-2 WA-4 (*add suffix "WA" e.g.DE66I-R-18-WA*) General Purpose Aluminum (*optional*) GP-2 GP-4 (*add suffix "GP"*) Terminal Blocks — Single El. — Dual El. WC or WA — TB-A — TB-D GP — TB-1 — n/a

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

SENSORS
INDUSTRIAL TRIPLE TUBE PLATINUM THERMOCOUPLE ASSEMBLIES

Replacement Components	Triple Tube Assembly Type	Part No.
A C D T/C Element Protecting Tube 97-187-3- □ — □ — X B No. 1 97-375-0 — □ No. 2 97-687-3 — □ No. 3 SIC — □ — X Terminal Open Head MTI-01- □		(see tables) ABBB C D T1777C – □ – □ T/C Type Length
A C D T/C Element Protecting Tube 97-187-5- □ — □ — X B No. 1 97-375-0 — □ No. 2 97-687-2 — □ No. 3 SIC — □ — X Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-4 Aluminum (*optional*) WA-4 (*add suffix "WA" e.g. T2666C-R-18-WA*) *General Purpose* *Aluminum (optional)* GP-4 (*add suffix "GP"*) Terminal Blocks Single El. Dual El. WC or WA TB-A TB-D GP TB-1 n/a		(see tables) ABBB C D T2777C – □ – □ T/C Type Length
A C D T/C Element Protecting Tube 97-187-5- □ — □ — X B No. 1 97-375-0 — □ No. 2 97-687-2 (1")— □ No. 3 SIC — □ — O Terminal Weatherproof (*standard*) Cast Iron (*standard*) WC-2 Aluminum (*optional*) WA-2 (*add suffix "WA" e.g. T8666C-R-18-WA*) *General Purpose* *Aluminum (optional)* GP-2 (*add suffix "GP"*) Terminal Blocks Single El. Dual El. WC or WA TB-A TB-D GP TB-1 n/a		(see tables) ABBB C D T8777C – □ – □ T/C Type Length
A C D T/C Element Protecting Tube 97-187-3- □ — □ — X B No. 1 97-375-0 — □ No. 2 97-687-3- □ (No. 2 with WA or WC option 60-687-8(1"-) No. 3 60-1250-4 — □ Terminal Open Head (*standard*) MTI-41- □ Weatherproof (*optional*) Cast Iron (*optional*) WC-4 Aluminum (*optional*) WA-4 (*add suffix "WA" e.g. T9666C-R-18-WA*) *General Purpose* *Aluminum (optional)* GP-4 (*add suffix "GP"*) Terminal Blocks Single El. Dual El. WC or WA TB-A TB-D GP TB-1 n/a		(see tables) ABBB C D T97776 – □ – □ T/C Type Length

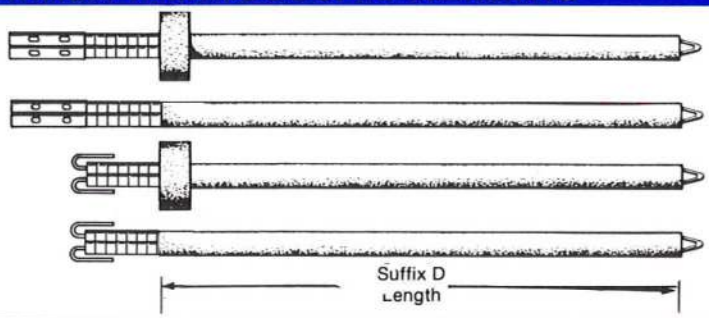
Since 1952 Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

SENSORS
INDUSTRIAL — PLATINUM THERMOCOUPLE ELEMENTS

Platinum 24 ga. (.020") thermocouple elements have welded junctions, Insulators are round double bore alumina or mullite. Alumina is the recommended material for use with Platinum thermocouples. Available in lengths from 12", in 6" increments.

Example: R-97-187-3-24"-X

Type R 24 GA. (.020) Thermocouple
997 Aluminum Insulator, 3/16 O.D. with
Collar,Exposed Junction



INSULATOR TYPE		PART NUMBER	PRICE	
MATERIAL	SIZE O.D.		$/12" T.C	$/1" ADDITION
MULLITE 60	1/8 3/16 1/4	A (see tables) B C D □ – 60 — 125 — □ — □ — X □ – 60 — 187 — □ — □ — □ □ – 60 — 250 — □ — □ — □ T/C Type; Term Option; Length; Junction Option	Consult Factory	
ALUMINA 997	1/8 3/16 1/4	A (see tables) B C D □ – 97 — 125 — □ — □ — X □ – 97 — 187 — □ — □ — □ □ – 97 — 250 — □ — □ — □ T/C Type; Term Option; Length; Junction Option	Consult Factory	
ALUMINA 998	1/8 3/16 1/4	A (see tables) B C D □ – 98 — 125 — □ — □ — X □ – 98 — 187 — □ — □ — □ □ – 98 — 250 — □ — □ — □ T/C Type; Term Option; Length; Junction Option	Consult Factory	
NONE (Bare Element)		A □ — 00 — 24(020) — 1 — □ — X T/C Type	Consult Factory	

NOTES: All platinum thermocouples utilize 24ga. (.020") wire unless otherwise specified.

TABLE B TERMINATION OPTIONS

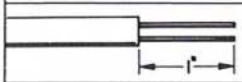
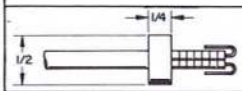
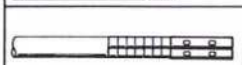
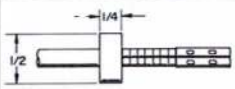
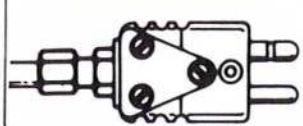
DESCRIPTION	ORDER CODE	PRICE ADDITION
 1" BARE LEADS	1	n/c
 Ball & Socket Insulators	2	$2.00
 Ball & Socket Insulators w/Collar	3	$3.00
 Ball & Socket Insulators w/Sleeves	4	$3.00
 Ball & Socket Insulators w/Collar and Sleeves	5	$3.00
 2-Pole-Plug and Tube Adapter	2SPC	$7.50

TABLE A THERMOCOUPLE TYPE

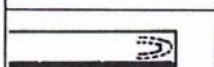
T/C TYPE	ORDER CODE: SINGLE ELEMENT	ORDER CODE: DUAL[1] ELEMENT
ITS-90/IPTS 1968		
PT13%RH vs PT	R	R2
PT10%RH vs PT	S	S2
PT30%RH vs PT6%RH	B	B2
IPTS 1948		
PT13%RH vs PT	4R	4R2
PT10%RH vs PT	4S	4S2

Notes: 1) Dual Element
— Not available in 1/8 O.D.
— Does not apply to bare elements

TABLE C ELEMENT LENGTH

Available from 12" to 48" in 1" increments
for longer lengths consult Factory.

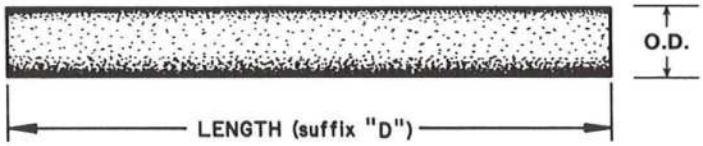
TABLE D JUNCTION OPTIONS

	DESCRIPTION	ORDER CODE
	EXPOSED	X
	RECESSED[1]	U

Notes: 1) Recessed available in
3/16 and 1/4 O.D. only

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

Example:
2-60-187-3-24"-X
TWO HOLE, Mullite 60 Insulator
3/16 O.D. with Collar,
24" long with plain Junction End



ONE HOLE TWO HOLE FOUR HOLE

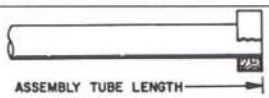
INSULATOR TYPE		PART NUMBER	BASE PRICE	
MATERIAL	SIZE O.D.		12" INSULATOR	6" ADDITION
MULLITE 60	1/8 3/16 1/4	A (see tables) B C D □ – 60 — 125 — □ — □ — X □ – 60 — 187 — □ — □ — □ □ – 60 — 250 — □ — □ — □ Hole Type; O.D. Code; End Option; Length; Junction End Option	$3.50	$1.75
ALUMINA 997	1/8 3/16 1/4	A (see tables) B C D □ – 97 — 125 — □ — □ — X □ – 97 — 187 — □ — □ — □ □ – 97 — 250 — □ — □ — □ O.D. Code; End Option; Length; Junction End Option	6.50	3.25
ALUMINA 998	1/8 3/16 1/4	A (see tables) B C D □ – 98 — 125 — □ — □ — X □ – 98 — 187 — □ — □ — □ □ – 98 — 250 — □ — □ — □ Hole Type; O.D. Code; End Option; Length; Junction End Option	9.00	4.50

Tolerances: Diameter ±3%; Length ±.062"; Camber .062" Max. Per Ft.
For material specifications see general data section.

TABLE A HOLE TYPE

HOLE TYPE			INSULATOR	
CODE	DESCRIPTION	HOLE SIZE	O.D.	O.D. CODE
1	ONE	0.062"	1/8"	125
		0.093"	3/16"	187
		0.125"	1/4"	250
2	TWO	0.031"	1/8"	125
		0.040"	3/16"	187
		0.062"	1/4"	250
4	FOUR	0.020"	1/8"	125
		0.040"	3/16"	187
		0.062"	1/4"	250

TABLE B TERMINATION END OPTIONS

DESCRIPTION		ORDER CODE	PRICE ADD.
	PLAIN END	1	N/C
 ASSEMBLY TUBE LENGTH	WITH COLLAR	3	$3.00

DISCOUNT SCHEDULE	
QUANTITY	FACTOR
1-9	NET
10-49	.90
50-74	.85
75-99	.80
100+	.75

TABLE C INSULATOR LENGTH

Available from 12" to 48" in 6" increments for longer lengths consult Factory.

TABLE D JUNCTION END OPTIONS

DESCRIPTION		CODE	PRICE ADD.
	PLAIN END	X	N/C
	RECESSED	U	$5.00

Notes: 1) Recessed available in 3/16 and 1/4 O.D. only

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

FOR WIRE GAUGE	OD (INCHES)	HOLE SIZE (INCHES)	CODE FOR ELEMENT	LENGTH	PART NO.	PRICE $/1000
8	0.562 × 0.312	0.190	V0	1″	2V081-0	$41.
8	0.500 × 0.250	0.156	V1	1″	2V081-1	41.
8	0.435 × 0.250	0.156	V2	1″	2V081-2	26.
8	0.562 × 0.312	0.190	V3	3″	2V083	110.
14	0.375 × 0.217	0.109	V1	1″	2V141-1	23.
14	0.312 × 0.187	0.085	V2	1″	2V141-2	23.
14	0.375 × 0.217	0.093	V3	3″	2V143	96.

TWO HOLE OVAL

FOR WIRE GAUGE	OD (INCHES)	HOLE SIZE (INCHES)	CODE FOR ELEMENT	LENGTH	PART NO.	PRICE $/1000
8	0.468	0.156	R1	1″	2R081	$41.
8	0.500	0.187	R3	3″	2R083	144.
14	0.250	0.085	R1	1″	2R141	23.
14	0.250	0.080	R2	2″	2R142	41.
14	0.281	0.085	R3	3″	2R143	73.
20	0.156	0.045	R1	1″	2R201	26.
20	0.187	0.065	R2	1″	2R201-1	26.
20	0.225	0.078	R3	3″	2R203	73.

TWO HOLE ROUND

14	0.312	0.075	R4	1″	4R141	$64.

FOUR HOLE ROUND

FOR WIRE GAUGE	OD (INCHES)	HOLE SIZE (INCHES)	CODE FOR ELEMENT	LENGTH	PART NO.	PRICE $/1000
6	0.312	0.187	O1	1″	1R061	$41.
8	0.250	0.156	O1	1″	1R081	41.
8	0.250	0.156	O3	3″	1R083	73.
14	0.187	0.093	O1	1″	1R141	41.

ONE HOLE ROUND

FOR WIRE GAUGE	OD (INCHES)	HOLE SIZE (INCHES)	CODE FOR ELEMENT	LENGTH	PART NO.	PRICE $/1000
8	0.260	0.156	S1	0.260	1B08	$18.
14	0.200	0.092	S2	0.200	1B14	18.
20	0.170	0.068	S3	0.170	1B20	18.
24	0.110	0.056	S4	0.110	1B24	18.

BALL AND SOCKET

All insulators on this page are:
- Composition Ceramics
- Operating Temperatures to 2000° F
- Not suitable for use with Platinum Type Thermocouples

BALL AND SOCKET PREPACKED IN 12″ SLEEVES					PRICE* $/EACH
8	0.260	0.156	12″ Sleeve (Approx 54 pcs of 0.260 long Insulators)	1B08-12	$1.75
14	0.200	0.092	12″ Sleeve (Approx 70 pcs of 0.200 long Insulators)	1B14-12	1.75
20	0.170	0.068	12″ Sleeve (Approx 82 pcs of 0.170 long Insulators)	1B20-12	2.00

*Use quantity discount on next page (this table only)

DISCOUNT SCHEDULE	
QUANTITY	FACTOR
1M-5M	NET
6M-9M	.95
10M-24M	.90
25M-49M	.85
50M-74M	.80
75M+	.75

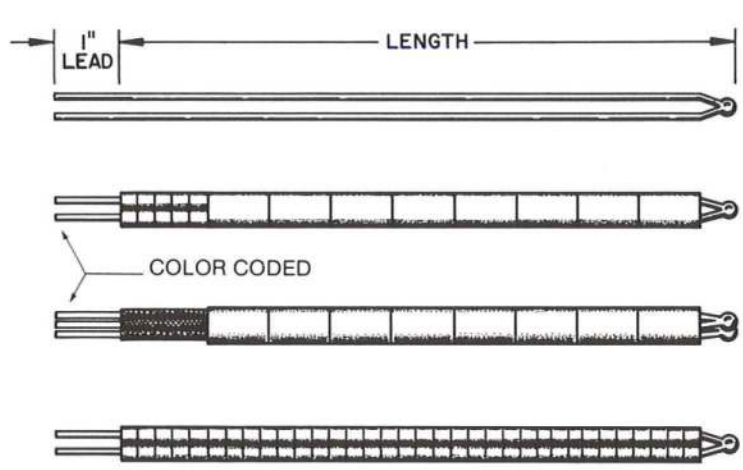
M signifies 1000's

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

SENSORS
INDUSTRIAL — BASE METAL THERMOCOUPLE ELEMENTS

DISCOUNT SCHEDULE	
QUANTITY	FACTOR
1-9	NET
10-49	.90
50-74	.85
75-99	.80
100+	.75

Element Type:



Example:
08—K—V0—18" @ $13.00
8 ga., Type K Thermocouple Element,
2-Hole Ceramic Insulated, 18" long
with welded junction

BASE METAL THERMOCOUPLE ELEMENTS[3]

WIRE GAGE	STANDARD[1] INSULATOR TYPE	ELEMENT TYPE	TYPE J THERMOCOUPLE PART NUMBER (T/C Length)	TYPE J PRICE 12" ELEMENT	TYPE J PRICE 6" ADDITION	TYPE K THERMOCOUPLE PART NUMBER (T/C Length)	TYPE K PRICE 12" ELEMENT	TYPE K PRICE 6" ADDITION
8	NONE	BARE	08 — J — 00 — □	$7.00	$1.10	08 — K — 00 — □	$9.00	$1.50
14			14 — J — 00 — □	5.75	0.60	14 — K — 00 — □	6.50	0.80
20			20 — J — 00 — □	5.45	0.40	20 — K — 00 — □	5.60	0.50
8	2V081-0	2-HOLE CERAMIC INSULATED	08 — J — V0 — □	$9.00	$1.85	08 — K — V0 — □	$11.00	$2.00
14	2V141-1		14 — J — V1 — □	7.25	1.00	14 — K — V1 — □	8.50	1.60
20	2R201-1		20 — J — R1 — □	7.45	0.80	20 — K — R1 — □	7.60	1.00
14	4R141	4-HOLE CERAMIC INSULATED	14 — J2 — R4 — □ (DUAL THERMOCOUPLE)	$10.00	$2.75	14 — K2 — R4 — □	$11.00	$3.25
8	IB08	BALL & SOCKET CERAMIC INSULATED	08 — J — S1 — □	$12.50	$4.20	08 — K — S1 — □	$17.00	$4.60
14	IB14		14 — J — S2 — □	10.25	3.10	14 — K — S2 — □	12.50	3.60
20	IB20		20 — J — S3 — □	8.25	2.60	20 — K — S3 — □	10.60	3.10
8	2V081-0/1B08	ANGLE[2]	08 — JA — V0 — □	$14.50	$1.85	08 — KA — V0 — □	$18.00	$2.50
14	2V141-1/1B14		14 — JA — V1 — □	10.75	1.10	14 — KA — V1 — □	13.50	1.55
20	2R201-1/1B20		20 — JA — R1 — □	9.00	0.80	20 — KA — R1 — □	11.60	1.10

NOTES: 1) Part numbers reflect Marlin standard construction. For different insulator other than shown substitute insulator code for element shown in insulator table at no change in price.
e.g. for element with small 2-hole oval ceramics 08 — K — V2 — 18"
2) Angle type elements include 18" of cold leg. For other than 18" insert length after "A" code and add incremental additional cost.
e.g. 08 — KA (24") — V0 — 18"
3) Welded junctions are standard. For twisted and welded junction add suffix "W" and add $1.00 to list price
e.g. 08 — K — V0 —18" — W

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

SENSORS
INDUSTRIAL — BASE METAL THERMOCOUPLE ASSEMBLIES

T/C Type	NPT Size	Tube Mat'l.	Length	Mounting Option	See Notes Table B
A	B	C	D	E	F

Assembly Example: K — 12 — 600 — 24"

TABLE A THERMOCOUPLE TYPE

THERMOCOUPLE TYPE	ORDER CODE "A"	
	SINGLE ELEMENT	DUAL ELEMENT
CHROMEL vs ALUMEL	K	K2
IRON vs CONSTANTAN	J	J2

Notes: 1) All assemblies are plain junction unless otherwise specified.
2) For insulated junction insert "U"
e.g. KU—12—600—24":
3) For angle type assembly insert "A" code: Prices add $14 to list.
e.g. KA—12—600—24"
For other than 18" cold leg specify cold leg length: Price per 6"
e.g. KA (24")—12—600—24" $4.00
∠ Cold leg length

JUNCTION OPTIONS

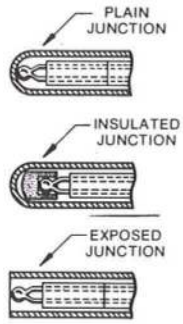


TABLE B PROTECTING TUBE SIZE

PROTECTING TUBE SIZE		ORDER CODE	T/C ELEMENT REPLACEMENT		HEAD & BLOCK REPLACEMENT	
NPT	I.D. × O.D.		SINGLE ELEMENT	DUAL ELEMENT	SINGLE ELEMENT	DUAL ELEMENT
			A D	A D		
1/4	0.364 × 0.540	14	14 — □ — R1 — □	14 — □ 2 — R4 — □	AWC-1/4	DWC-1/4
3/8	0.493 × 0.675	38	14 — □ — V1 — □	14 — □ 2 — R4 — □	AWC-3/8	DWC-3/8
1/2	0.622 × 0.840	12	08 — □ — V0 — □	14 — □ — V1 — □ (2 Pcs)	AWC-2	DWC-2
3/4	0.824 × 1.050	34	08 — □ — V0 — □	08 — □ — V0 — □ (2 Pcs)	AWC-3	DWC-3
1	1.049 × 1.315	44	08 — □ — V0 — □	08 — □ — V0 — □ (2 Pcs)	AWC-4	DWC-4

Notes: 1) Schedule 40 protecting tubes standard, for extra-heavy schedule 80 use suffix "H" e.g. K — 12 — 600 — 24" — 0 — H. Consultant Factory for price.
2) For open end tube (for exposed T/C junction) construction add suffix "X" e.g. 12 — 304 — 12" — 0 — X with no increase in price.
3) Weatherproof cast iron head standard for WP aluminum head use suffix "WA" e.g. K — 12 — 600 — 24" — WA; Price add $2.50 to list price.
4) For general purpose aluminum head suffix GP, e.g. K — 13 — 600 GP, price deduct $1.50 from list price (not available in dual element).
5) 1/4 NPT & 3/8 NPT heads utilize reducer bushings.

TABLE C — PROTECTING TUBE MATERIAL

MATERIAL	ORDER CODE	MAX. WORKING TEMPERATURE	APPROX. MELTING TEMPERATURE	REPLACEMENT PROTECTING TUBE CODE
				B D E
CARBON STEEL	118	1300°F	2500°F	□ — 118 — □ — □
304SS	304	1650°F	2560°F	□ — 304 — □ — □
316SS	316	1700°F	2500°F	□ — 316 — □ — □
446SS	446	2000°F	2700°F	□ — 446 — □ — □
INCONEL 600	600	2100°F	2550°F	□ — 600 — □ — □

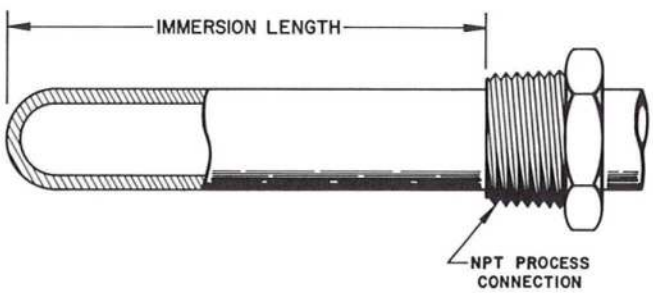
TABLE D — ASSEMBLY LENGTH from 12" in 6" increments

TABLE E — MOUNTING BUSHING

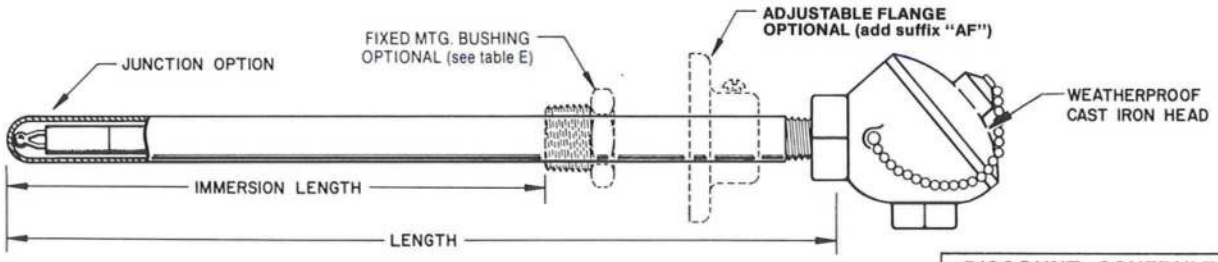
FIXED BUSHING SIZE	PART NO. (Steel)	PRICE $ add	PART. NO. (SS)	PRICE $ add
1/2 NPT	F12C	$ 8.00	F12S	$10.00
3/4 NPT	F34C	9.00	F34S	11.00
1 NPT	F44C	9.00	F44S	13.00
1-1/4 NPT	F54C	11.00	F54S	27.00
1-1/2 NPT	F64C	11.00	F64S	32.00

Notes: Bushings are welded to tubes.
1/2 NPT Bushing fits up to 3/8 pipe
3/4 NPT Bushing fits up to 1/2 pipe
1 NPT Bushing fits up to 3/4 pipe
1-1/4 NPT Bushing fits up to 1 pipe
1-1/2 NPT Bushing fits up to 1-1/4 pipe
GIVE IMMERSION LENGTH WHEN ORDERING BUSHING
e.g. 12 — 304 — 24" — F34C — 18" and add bushing price to baselist price.

Fixed Steel Mounting Bushing
For Metal Protecting Tubes



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



DISCOUNT SCHEDULE	
QUANTITY	FACTOR
1-9	NET
10-49	.90
50-74	.85
75-99	.80
100+	.75

Example: K-12-600-24"

Type K Thermocouple, 1/2 NPT, Inconel 600 Tube, 24" long

PROTECTING TUBE		PART NUMBER	BASE PRICE	
MATERIAL	SIZE NPT		$/12" ASSEMBLY	$/6" ADDITION
CARBON STEEL	1/4 NPT	(see tables) A B C D E F □ — 14 — 118 — □ — □ — □	$40.00	4.50
	1/2 NPT	□ — 12 — 118 — □ — □ — □	41.00	4.75
	3/4 NPT	□ — 34 — 118 — □ — □ — □	42.00	5.00
	1 NPT	□ — 44 — 118 — □ — □ — □ (See Note 1, 2)	43.00	5.50
		T/C Type J or K; Length; Mounting Accessories (if Applicable)		
304 SS	1/4 NPT	(see tables) A B C D E F □ — 14 — 304 — □ — □ — □	44.00	6.00
	1/2 NPT	□ — 12 — 304 — □ — □ — □	46.00	6.75
	3/4 NPT	□ — 34 — 304 — □ — □ — □	47.00	7.00
	1 NPT	□ — 44 — 304 — □ — □ — □ (See Note 1, 2)	48.00	8.00
		T/C Type J or K; Length; Mounting Accessories (if Applicable)		
316 SS	1/4 NPT	(see tables) A B C D E F □ — 14 — 316 — □ — □ — □	46.00	7.00
	1/2 NPT	□ — 12 — 316 — □ — □ — □	48.00	8.00
	3/4 NPT	□ — 34 — 316 — □ — □ — □	49.00	9.00
	1 NPT	□ — 44 — 316 — □ — □ — □ (See Note 1, 2)	52.00	11.00
		T/C Type J or K; Length; Mounting Accessories (if Applicable)		
446 SS	1/4 NPT	(see tables) A B C D E F □ — 14 — 446 — □ — □ — □	58.00	12.00
	1/2 NPT	□ — 12 — 446 — □ — □ — □	62.00	15.00
	3/4 NPT	□ — 34 — 446 — □ — □ — □	68.00	18.00
	1 NPT	□ — 44 — 446 — □ — □ — □ (See Note 1, 2)	75.00	22.00
		T/C Type J or K; Length; Mounting Accessories (if Applicable)		
INCONEL 600	1/4 NPT	(see tables) A B C D E F □ — 14 — 600 — □ — □ — □	61.00	16.00
	1/2 NPT	□ — 12 — 600 — □ — □ — □	67.00	18.00
	3/4 NPT	□ — 34 — 600 — □ — □ — □	70.00	21.00
	1 NPT	□ — 44 — 600 — □ — □ — □ (See Note 1, 2)	77.00	24.00
		T/C Type J or K; Length; Mounting Accessories (if Applicable)		

Note: 1) Schedule 40 protecting tubes standard, for extra-heavy schedule 80 use code "H" e.g. K-12-600-24-0-H, consult factory for price.
2) For open end tube (for exposed T/C junction) construction add suffix "X" e.g. 12-304-12"-0-X with no increase in price.

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

DISCOUNT SCHEDULE	
QUANTITY	FACTOR
1-9	NET
10-49	.90
50-74	.85
75-99	.80
100+	.75

ASSEMBLY DESIGNATION

EXAMPLE: C16 — K — 24″

TABLE B — PROTECTING TUBE MATERIAL

TUBE MATERIAL	CODE
MULLITE 60	6
ALUMINA 997	7
ALUMINA 998	8
CAST IRON	T
INCONEL	I

PROTECTING TUBE MAT'L

Note: Protecting Tube materials can be changed from "commonly used" combination to fit your particular requirements. (Applies to assemblies C1, C2, C3)

TABLE C — SINGLE/DUAL THERMOCOUPLE & T/C TYPE

THERMOCOUPLE TYPE	SINGLE ELEMENT	DUAL ELEMENT
CHROMEL™ vs ALUMEL™	K	K2
IRON vs CONSTANTAN	J	J2

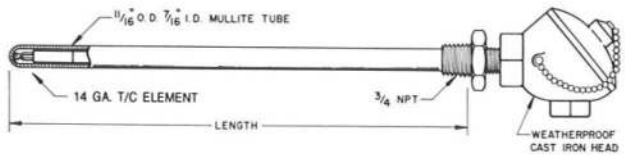
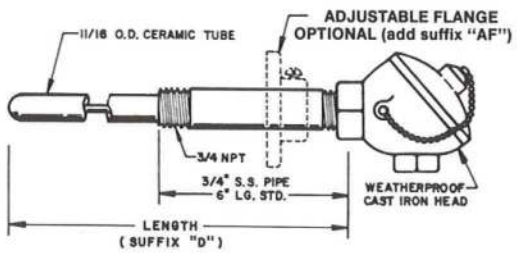
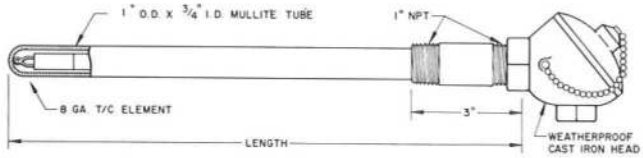
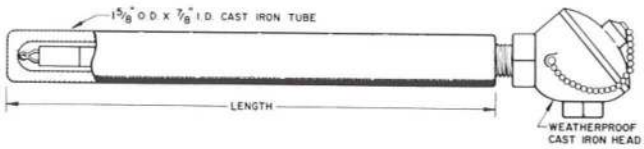
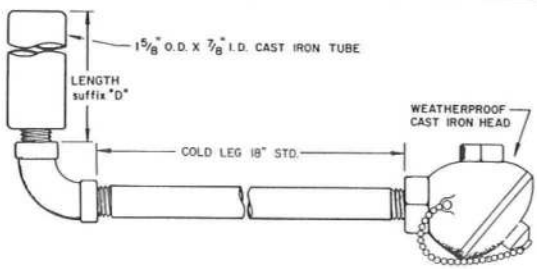
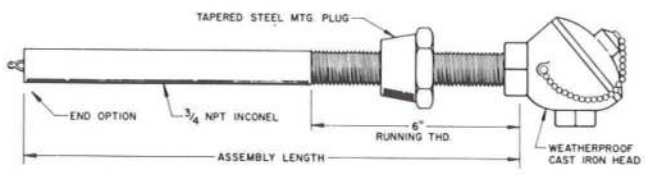
THERMOCOUPLE TYPE

TABLE D — ASSEMBLY TUBE LENGTH

Length from 12″ to 48″ in 6″ increments.
For special Lengths consult Factory.

ASSEMBLY LENGTH

SENSORS
INDUSTRIAL — BASE METAL THERMOCOUPLE ASSEMBLIES

Replacement Components	Assembly Type	Part No.
C D T/C Element 14- □ — V1 — □ Protecting Tube B 60-687-2 — □ Terminal Weatherproof *(standard)* Cast Iron *(standard)* WC-2 Aluminum *(optional)* WA-2 *add suffix "WA" e.g.* C16—K—24"—WA General Purpose Aluminum *(optional)* GP-2 *(add suffix "GP")* Terminal Blocks: WC or WA — Single El. TB-A — Dual El. TB-D; GP — Single El. TB-1 — Dual El. n/a		*(see tables)* B C D C16 — □ — □ T/C Type — Length **PRICE** 12" Ass'y: $40. — 6" Add.: $5.50
C D T/C Element 14- □ — V1 — □ Protecting Tube B 60-687-7(6") — □ Terminal Weatherproof *(standard)* Cast Iron *(standard)* WC-3 Aluminum *(optional)* WA-3 *add suffix "WA" e.g.* C26—K—12"—WA General Purpose Aluminum *(optional)* GP-3 *(add suffix "GP")* Terminal Blocks: WC or WA — Single El. TB-A — Dual El. TB-D; GP — Single El. TB-1 — Dual El. n/a		*(see tables)* B C D C26 — □ — □ T/C Type — Length **PRICE** 12" Ass'y: $42. — 6" Add.: $5.50
C D T/C Element 08- □ — V0 — □ Protecting Tube 60-1000-8(3") — □ Terminal Weatherproof *(standard)* Cast Iron *(standard)* WC-4 Aluminum *(optional)* WA-4 *add suffix "WA" e.g.* C36—K—24"—WA General Purpose Aluminum *(optional)* GP-4 *(add suffix "GP")* Terminal Blocks: WC or WA — Single El. TB-A — Dual El. TB-D; GP — Single El. TB-1 — Dual El. n/a		*(see tables)* B C D C36 — □ — □ T/C Type — Length **PRICE** 12" Ass'y: $55. — 6" Add.: $7.
T/C Type — Length T/C Element 08- □ — □ Protecting Tube 34-CIR — □ Terminal Weatherproof *(standard)* Cast Iron *(standard)* WC-3 Aluminum *(optional)* WA-3 *add suffix "WA" e.g.* C4A—K—18"—WA General Purpose Aluminum *(optional)* GP-3 *(add suffix "GP")* Terminal Blocks: WC or WA — Single El. TB-A — Dual El. TB-D; GP — Single El. TB-1 — Dual El. n/a		*(see tables)* B C D C4T — □ — □ T/C Type — Length **PRICE** 12" Ass'y: $40. — 6" Add.: $6.
T/C Type — Length T/C Element 08- □A — □ Protecting Tube 34-CIR — □ Terminal Weatherproof *(standard)* Cast Iron *(standard)* WC-3 Aluminum *(optional)* WA-3 *add suffix "WA" e.g.* C5A—K—24"—WA General Purpose Aluminum *(optional)* GP-3 *(add suffix "GP")* Terminal Blocks: WC or WA — Single El. TB-A — Dual El. TB-D; GP — Single El. TB-1 — Dual El. n/a		*(see tables)* B C D C5T — □ — □ T/C Type — Length **PRICE** 12" Ass'y: $54. — 6" Add.: $6.
Blast furnace, open end, T/C assembly standard assembly consists of a weatherproof head, refractory terminal block and tapered plug on 6" running thread on 3/4 NPS Inconel Pipe. Type K, 8 ga. T/C is cemented in tube. Replacement T/C's are not available.		*(see tables)* B D End Option C6I — K — □ — □ Length — O-Flush X-Expose **PRICE** 18" Ass'y: $115. — 6" Add.: $21.

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

NOTICE:

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

Protecting tubes, as their name implies, are used to protect sensors, usually thermocouples, from contaminating atmospheres and/or mechanical damage. Closed on one end and open on the termination end they usually incorporate some means by which the tube, sensor, and terminal are assembled and mounted into the process.

Ceramic Protecting Tubes are dense, fine grained, nonporous compositions that remain gas tight even at temperatures near their melting point. Ceramic tubes are generally used at high temperatures with platinum type thermocouples although use with base metal thermocouples is prevalent in atmospheres harmful to metal tubes but not subjected to mechanical damage. Ceramic tubes will sag at temperatures below their maximum working temperatures so if they are installed horizontally and used above their sagging temperatures they should be fully supported. Sag temperature is temperature at which the tube will sag 1/4" in one hour. Ceramics will retain moisture at room temperature. This moisture may become trapped in the ceramic and cause the destruction of the tube when the tube is thermally shocked. It is recommended that preheating or slow heating of ceramic tubes to 400 to 800° F be done in order to drive off this moisture before high heat is introduced.

Alumina (Al_2O_3) tubes in their purest forms have very good thermal shock and strength characteristics and are virtually chemical resistant. For long term use Alumina 998 is very compatible for use with platinum type thermocouples. Its use is evaluated by examination of these features versus its relatively high cost.

Mullite ($3Al_2O_3 \cdot 2SiO_2$) has good thermal shock and strength characteristics and is chemically resistant. This low cost ceramic is also used with platinum type thermocouples usually for shorter term applications in which mechanical damage is more likely to be encountered rather than the long term detrimental effects of the silica in the mullite on the platinum type thermocouple.

TYPICAL CHEMICAL ANALYSIS

	Al_2O_3	SiO_2	MgO	Na_2O	CaO	Fe_2O_3	Cr_2O_3	TiO_2	B_2O_3	K_2O
998	99.8	.060	.035	.008	.040	.025	<.003	.004	<.001	<.001
997	99.7	.1	.05	.06	.04	.05	—	—	—	—
Mullite 60	60.0	38.0	.2	.2	.1	.5	—	.5	—	.7

TYPICAL PHYSICAL PROPERTIES

Material	998	997	Mullite 60
Constitution	99.8% Al_2O_3	99.7% Al_2O_3	85% Mullite 15% SiO_2
Bulk Specific Gravity	3.85	3.65	2.8
Impenetrability	gas tight	gas tight	gas tight
Max. Working Temp.	1950°C (3542°F)	1800°C (3270°F)	1600°C (2912°F)
Sag. Temp. (Unsupported)	1600°C (2912°F)	1500°C (2730°F)	1400°C (2552°F)
Thermal Conductivity (BTU/ft²/hr/°F/in) @ 24°C (75°F) @ 800°C (1472°F)	230 60	125 30	40 25
Dielectric Strength (V/Mil) @ 24°C (75°F)	230	250	250
Thermal Expansion (per °C X 10^{-6}) (24 to 1000°C)	8.5	7.7	5.0

Silicon Carbide (SiC) tubes are porous and highly refractory. They are used to temperatures of 1650°C (3000°F) as secondary protection against extreme temperature, abrasive atmospheres and direct flame impingement. Silicon Carbide tubes are moderate in cost. Primary mullite or alumina tubes are recommended with these tubes.

Single-Phase Silicon Carbide (SA SiC) is a pressureless, sintered form of alpha silicon carbide with a density greater than 98% theoretical. Having a very fine grain structure and being 50% harder than tungsten carbide makes it resistant to erosion. It contains no free silicone, which makes it highly chemical resistant in both oxidizing and reducing environments. For use in air to 1650°C (3000°F). SA SiC tubes are high in cost.

Metal Ceramic tubes are a high cost combination of chromium and alumina for use to temperatures of 1205°C (2200°F) that provides excellent oxidation resistance, thermal conductivity comparable to that of stainless steel, good resistance to wetting by most molten metals. A primary alumina tube is recommended when this tube is used in conjunction with platinum thermocouples.

Refractory Laminated, Metal tubes offer the mechanical protection of metal tubes and the corrosion resistance of ceramics. For molten aluminum and zinc applications, they resist erosion, will not contaminate metal melts, and may outlast iron tubes by many times depending on the application.

Metal tubes offer good mechanical protection for base metal thermocouples up to 1150°C (2100°F) in oxidizing atmospheres. All metals are porous after about 870°C (1600°F) so it may be necessary to provide a ceramic primary tube to protect the thermocouple from detrimental vapors.

Mild Steel provides good protection at lower temperatures against oxidizing and reducing atmospheres and non-corrosive liquids and vapors. Maximum working temperature 700°C (1300°F).

304 SS (18% Chrome/8% Nickel) is a general purpose material that has good resistance to corrosion and oxidation. Maximum working temperature 875°C (1600°F).

316 SS (16% Chrome/10% Nickel) is a material that has superior corrosion resistance as compared to 304 SS with improved oxidation resistance and a higher hot strength. Maximum working temperature 925°C (1700°F).

446 SS (28% Chrome) has excellent resistance to corrosion and oxidation. It is highly resistant to sulphur atmospheres, salt baths and molten non-ferrous metals. Maximum working temperature 1100°C (2000°F).

Inconel 600™ (75% Nickel/15% Chrome) combines good mechanical strength at elevated temperatures with high resistance to oxidation, corrosion and scaling. Not suitable for use in sulfurous atmospheres above 875°C (1600°F). Maximum working temperature 1150°C (2100°F).

Inconel 601™ (60% Nickel/23% Chrome) has similar properties of Inconel 600 and offers improved resistance to sulfur attack at elevated temperatures.

Cast Iron is a low cost material used in molten aluminum and aluminum alloy applications and also has good resistance to acid and caustic solutions. Maximum working temperatures 875°C (1600°F) reducing; 700°C (1300°F) Oxidizing.

™- International Nickel Co., Inc.

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

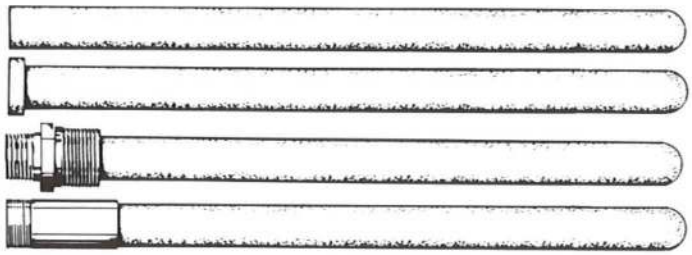
PROTECTING TUBES
CERAMIC

TUBE w/Plain End

TUBE w/Collar

TUBE w/Bushing

TUBE w/Brass Sleeve



Example: 60-687-0-24"
Mullite 60, 7/16 X/11/16, Plain End Protecting Tube

DISCOUNT SCHEDULE	
QUANTITY	FACTOR
1-9	NET
10-49	.90
50-74	.85
75-99	.80
100+	.75

PROTECTING TUBE		PART NUMBER	BASE PRICE*	
MATERIAL	SIZE I.D. X. O.D.		12" TUBE	6" ADDITION
		(see tables) A D		
MULLITE 60	3/16 × 1/4	60 — 250 — □ — □	$ 8.00	$ 3.25
	1/4 × 3/8	60 — 375 — □ — □	8.00	3.25
	3/8 × 1/2	60 — 500 — □ — □	8.50	3.25
	7/16 × 11/16	60 — 687 — □ — □	10.00	3.75
	3/4 × 1	60 — 1000 — □ — □	13.00	4.50
	1 × 1-1/4	60 — 1250 — □ — □	15.00	5.00
	1¼ × 2	60 — 2000 — □ — □ (End Option, Length)	20.00	10.00
		(see tables) A D		
ALUMINA 997	3/16 × 1/4	97 — 250 — □ — □	20.00	9.00
	1/4 × 3/8	97 — 375 — □ — □	20.00	9.00
	3/8 × 1/2	97 — 500 — □ — □	20.00	9.00
	7/16 × 11/16	97 — 687 — □ — □	20.00	9.00
	3/4 × 1	97 — 1000 — □ — □	30.00	13.50
	1 × 1-1/4	97 — 1250 — □ — □ (End Option, Length)	38.00	18.00
		(see tables) A D		
ALUMINA 998	3/16 × 1/4	98 — 250 — □ — □	33.00	16.50
	1/4 × 3/8	98 — 375 — □ — □	37.00	17.00
	3/8 × 1/2	98 — 500 — □ — □	40.00	20.00
	7/16 × 11/16	98 — 687 — □ — □	40.00	20.00
	3/4 × 1	98 — 1000 — □ — □	50.00	25.00
	1 × 1-1/4	98 — 1250 — □ — □ (End Option, Length)	52.00	35.00

*Price for tube to 48" long — for tubes to 60" add 30% to base price.
Notes: 1) Standard diameter tolerance for size variation and out-of-roundness is ±5% or 0.025" min.
2) Camber tolerance is 1/16" max. per foot.

DESCRIPTION		ORDER CODE	Suffix "A" PRICE ADDITION
	PLAIN END	0	N/C
ASSEMBLY TUBE LENGTH	CERAMIC COLLAR TUBE O.D. / COLLAR O.D. .250 / .500 .375 / .687 .500 / .875 .687 / 1.000 1.000 / 1.250 1.250 / 1.750	1	$3.50
ASSEMBLY TUBE LENGTH	Steel Bushing* 1/2 NPT X 3/4 NPT	2	3.50

*Max. tube size 11/16" O.D.

DESCRIPTION		ORDER CODE	Suffix "A" PRICE ADDITION
ASSEMBLY TUBE LENGTH	Brass Sleeve* 7/8 — 27 thread	3	3.50
ASSEMBLY TUBE LENGTH	Coupling 1 NPT (internal)	4	5.00
ASSEMBLY TUBE LENGTH	Steel Bushing 1 NPT X 1 NPT	5	6.00

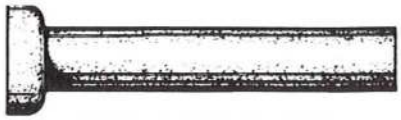
SS Support Tube		Length	6" Tube	6" Addition
Max. Tube O.D.	Tube Size			
0.500	1/2 NPT	6—□	$10.00	$4.00
0.687	3/4 NPT	7—□	11.00	4.25
1.000	1 NPT	8—□	12.00	5.00

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

PROTECTING TUBES
SILICON CARBIDE

SILICON CARBIDE is a porous high refractory material used for protection against extreme temperature, abrasive atmospheres and direct flame impingement. "SIC" tubes can also be used for direct immersion into molton aluminum or brass.

PART NO.	OVERALL LENGTH	STOCK	PRICE PER TUBE
SIC A-B (A = Length, B = Collar: Yes-C, No-O)	12"	CO	$52.
	18"	CO	61.
	24"	CO	65.
	30"	CO	85.
	36"	CO	91.
	42"	C—	113.
	48"	C—	137.



WITH COLLAR "C"

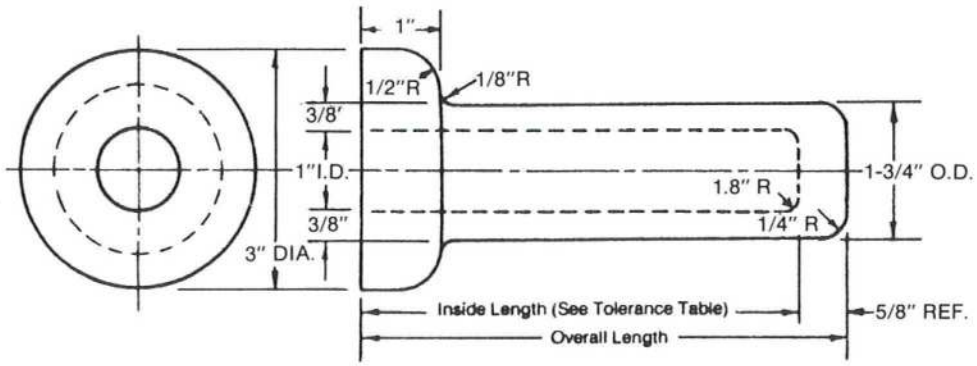
WITHOUT COLLAR "O"

DISCOUNT	
QUANTITY PER ORDER	FACTOR
1-9	NET
10-49	.90
50-74	.85
75-99	.80
100+	.75

TABLE A
Tube Length in Inches

TABLE B
Collar Designation (with collar Yes-C); i.e. SIC-24"-C
(without collar No-O); i.e. SIC-24"-O

STOCK
C = Stocked with collar. O = Stocked, no collar.



TOLERANCE TABLE	
Overall Length	**Inside Length**
Less than 24"	±1/8"
24" to 45"	±3/16"
Over 45"	±1/4"

PHYSICAL PROPERTIES

Major Constituent:	Silicon Carbide (SiC)		**Thermal Conductivity:** @ 1204°C (2200°F):	15.7 W/m °C (109 Btu in/hr ft² °F)
Dry Abrasion Resistance Index:	1.0		**Coefficient of Linear Expansion:** 20-1538°C (68-2800°F)	4.68×10^{-6} mm/mm °C (2.6×10^{-6} in/in °F)
Maximum Usable Hot Face Temperature			**Thermal Shock Resistance:**	very good
In Oxidizing Atmosphere:	1650°C	(3000°F)	**Acid Resistance** (except hydroflouric):	good
In Inert Atmosphere:	1650°C	(3000°F)	**Permeability:**	nil
Bulk Density:	2.58 g/cm³	(3800 lb/in²)	**Apparent Porosity:**	14%
Modulus of Rupture:	267 kg/cm²	(>20,000 lb/in²)	**Electrical Characteristics:**	semi-conductor
Compressive Strength:	>1406 kg/cm²			

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

SA SiC is produced by pressureless sintering sub micron silicon carbide powder. The sintering process results in a self-bonded, fine grain SiC product which is highly resistant to corrosion, erosion, high temperature and thermal shock.

CORROSION RESISTANCE

SA SiC has superior corrosion resistance than alumina and other refractory materials in environments of hot gases and liquids, including strong acids and bases.

EROSION RESISTANCE

SA SiC is 50% harder than tungsten carbide. This extreme hardness combined with high purity and fine micro structure makes SA SiC resistant to erosion under abrasive conditions.

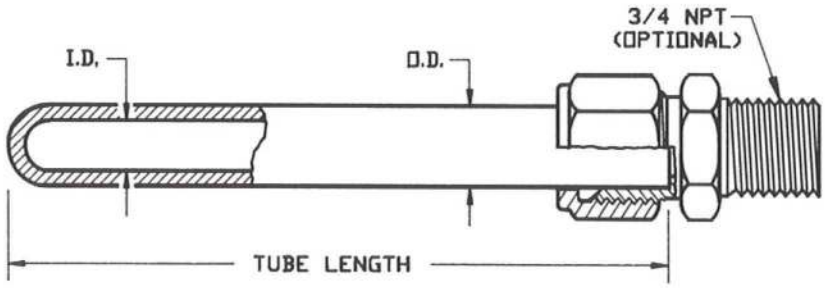
HIGH TEMPERATURE PROPERTIES

The single phase composition of SA SiC enables it to reliably perform in air up to temperatures of 1650°C (3000°F). It contains no free silicon which makes it highly chemical resistant in both oxidizing and reducing environments.

THERMAL SHOCK RESISTANCE

Because of its high thermal conductivity and low coefficient of thermal expansion, SA SiC is very resistant to thermal shock and thermal cycling as compared to other refractory materials.

Physical Properties	Units	Typical Values SA
Composition (phases)		SIC
Density	G/cm^3	3.10
Grain Size	microns	4-6
Hardness (Knoop)		2800
Flexural Strength 4pt @ RT	MPa $x10^3 lb/in^2$	460 60
Compressive Strength @ RT	MPa $x10^3 lb/in^2$	3900 560
Modulus of Elasticity @ RT	GPa $x10^6 lb/in^2$	410 59
Weibull Modulus (2 parameters)		10
Poisson Ratio		0.14
Fracture Toughness @ RT Double Torsion & SENB	 MPa/m $x10^3 lb/in^2/\sqrt{in}$	 4.60 4.20
Coefficient of Thermal Expansion RT to 700°C	$x10^{-6}$mm/mm°K $x10^{-6}$in/in°F	4.02 2.20
Max. Service Temp (air)	°C °F	1650 3000
Mean Specific Heat @ RT	J/gm°K	0.67
Thermal Conductivity @ RT @ 200°C @ 400°C	 W/mK Btu/ft h°F 	 125.6 72.6 102.6 59.3 77.5 44.8
Permeability, RT to 1000°C	Impervious to gases over 31 MPa	
Electrical Resistivity @ RT @ 1000°C	ohm-cm	10^2-10^6 0.01-0.2
Emissivity		0.9



Discount Schedule	
Quantity	Factor
1-5	Net
6-25	.95
26+	.90

Material	Tube Size I.D. x O.D.	Part Number (A B)	Price to 24"	Price to 48"
SA SiC	¼" x ⅜"	SA - 375 - □ - □	$210.	$395.
	½" x ¾"	SA - 750 - □ - □	295.	395.
	½" x 1"	SA - 1000 - □ - □	385.	590.

(length; end option (note A))

Notes: 1) Standard diameter to tolerance for size variation and out-of-roundness is ±5%.
2) Camber tolerance is 1/16" per foot.
A) Plain end "A" is 0: i.e. SA-750-0-12"
Optional ¾" NPT steel Ftg. "A" is 1: i.e. SA-750-1-12" - Add $40 to list

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

PROTECTING TUBES
LT-1 METAL-CERAMIC

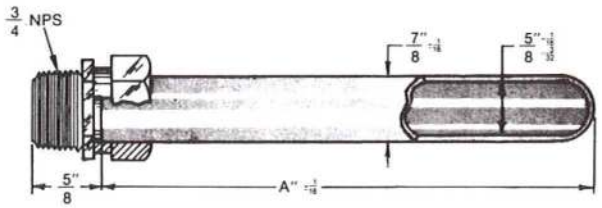
* Superior oxidation resistance to 2200° F
* Thermal conductivity comparable to that of stainless steel
* Good resistance to wetting by most molten metals

LT-1 is hard, abrasion-resistant and dense—is a slip-cast composite of two compatible high temperature materials, chromium and aluminum oxide. LT-1 has excellent oxidation resistance and also resists wetting by many metals and alloys, as well as basic furnace slags. The chromium-metal phase takes on a very tightly bonded layer of chromium oxide which, together with the naturally inert nature of the alumina, provides this material with its remarkable resistance to oxidizing atmospheres over 2200° F, good corrosion resistance, and the ability to resist wetting by molten metals. High thermal conductivity and the resultant excellent sensitivity to temperature changes accounts in part for its demand in the high temperature pyrometry field as a thermocouple protection tube.

LT-1 has good strength at temperatures where many high-temperature metals melt. Above about 2800°F, it begins to soften and becomes plastic. LT-1 thermocouple protection tubes have, however, been used successfully for dip immersion at a temperature of 3000° F. In use or service care must be taken to avoid conditions of extreme thermal shock, extreme thermal gradients, mechanical shock, and impact. Although LT-1 is superior to ceramics in all of these properties, it is less resistant to shock and impact than the metallic alloys. Therefore, a standard thermocouple protection tube should be preheated to about 900°F before immersion in molten metal at 2000°F or higher. Whenever practical the following preheat procedure can also be used: Hold the tube immediately above the molten metal for approximately one minute before immersing. In tests conducted this procedure proved to be adequate to prevent thermal shock failure.

LT-1 exhibits good resistance to wear under conditions of sliding friction as well as resistance to abrasion at high temperatures. The hardness of this material (Rockwell C 37) is more indicative of the crushing strength of the material than its true hardness because the individual particles have a greater hardness than the combined body.

LT-1 is less porous than most compacts. There is no significant passage of gases through the body at high temperature, except under high vacuum. For the usual industrial application, it is sufficiently impermeable.



Part Number	TUBE LENGTH (Dimension "A") Inches	Price Per Tube
LT-1	9	$82.
	12	94.
	18	141.
	24	187.
	30	249.
	36	293.
	48	583.

DISCOUNT SCHEDULE	
Quantity	Factor
1-9	NET
10-49	.90
50-74	.85
75-99	.80
100+	.75

TOLERANCES AND SPECIFICATIONS:

I.D. Size - Will pass a 33/64 inch diameter × 2 inch long probe through the full length of the tube.
Straightness - Tube to be straight within 3/16 inch per foot of length as measured chord to arc.
Note - For use with B & S Wire Gage 8 or smaller. A ceramic primary tube is required when noble metal thermocouple is used.

CONNECTING FITTINGS:

Standard 3/4" conduit fitting, malleable iron with 3/4" N.P.S. thread. Thermocouple Protecting Tubes can be supplied without fitting. Specify with suffix "0" eg. LT-1-12-0 and add $5.00 to tube cost.

TYPICAL PHYSICAL PROPERTIES

PROPERTY	UNITS	VALUE	LENGTH (INCHES)	WEIGHT PER TUBE (POUNDS)
Thermal Conductivity	BTU-ft/ft²-hr° F	17	9	.56
Coefficient of Thermal Expansion	in/in/° F	5 × 10_⁶	12	.75
Density	gm/cc	5.8	18	1.20
Flexural Strength	psi	45,000	24	1.75
Compressive Strength	psi	110,000	30	2.00
Hardness	Rc	34	36	2.60
Chemical Composition	Weight %	Cr-77 Al_2O_3—23	48	3.50

RECOMMENDED APPLICATIONS

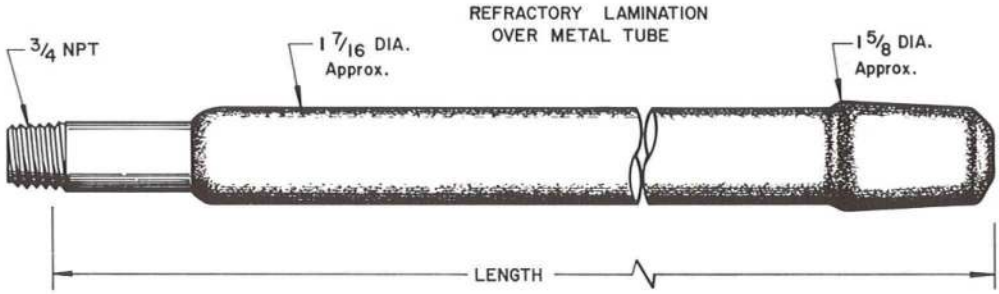
1. Molten copper and brass to 2100° F intermittent and continuous immersions.
2. Corrosive SO_2 and SO_3 gas (to 2200° F) and SO_3 and HF gas (to 2000° F).
3. Open hearth furnace checker chambers to 2200° F.
4. Steel mill soaking pits to 2200° F.
5. Pelletizing chamber of Taconite refining operation to 2100° F.
6. Molten zinc to 1600° F.
7. Molten lead to 650° F.
8. Basic steels and slags to 3000° F (intermittent) and 2200° F (continuous in open hearth and general foundry practices.
9. Calcining kilns to 2200° F.
10. Barium titanate (barium oxide service) to 2200° F.
11. Magnesium oxide calcining kilns.
12. Fluid bed cement process with severe corrosion and temperature to 2200° F (fluid method of producing builders cement).
13. Gas and ethylene cracking atmosphere.
14. Atmosphere directly upon burning sodium (1800-2200° F).
15. Oil fired furnace chambers.
16. Atmosphere directly above molten glass in an open hearth glass furnace.
17. Molten silver solder.
18. Molten tin.
19. Borax flux.
20. Copper matte.
21. Boiling sulphuric acid — 97%.
22. Blast furnace stove dome and bustle pipes.

NON-RECOMMENDED APPLICATIONS

1. Molten aluminum.
2. Cryolite.
3. Tin (stannous) chloride (750° F).
4. Acid slag.
5. Carbide slag.
6. Molten glass.
7. Boiling sulphuric acid — 10%.
8. Carburizing atmospheres.
9. Nitriding atmospheres.
10. Barium chloride salt bath.
11. Sodium Nitrate — nitrate salt bath.

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

PROTECTING TUBES
REFRACTORY-LAMINATED METAL

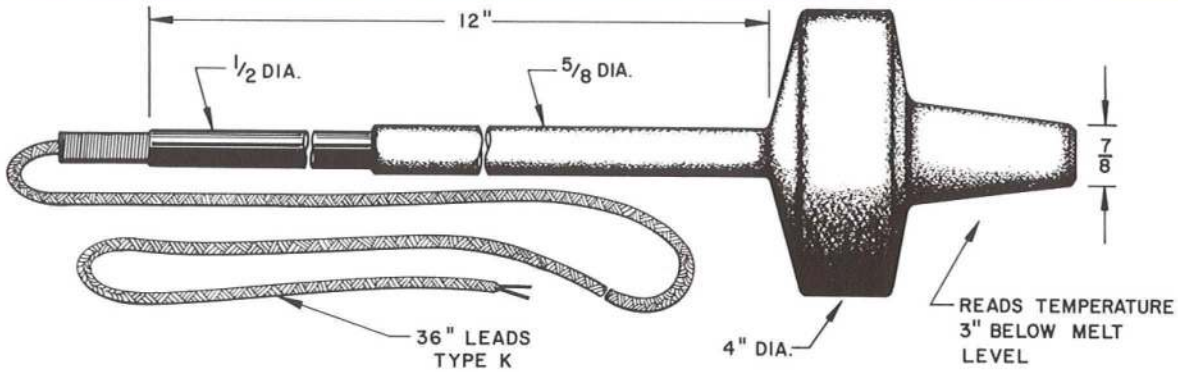


Refractory-Laminated Metal Tube offers the mechanical protection of metal tubes and the corrosion resistance of ceramics. For molten aluminum or zinc applications, they resist erosion, will not contaminate metal melts and will out last iron tubes by many times.

PART NUMBER	LENGTH INCHES	PRICE $ / ea.
RL-	12	$29.
	18	31.
	21	32.
	24	33.
	30	36.
	36	38.

DISCOUNT SCHEDULE	
Quantity	Factor
1-9	Net
10-49	.90
50-74	.85
75-99	.80
100+	.75

PROTECTING TUBES
FLOATING REFRACTORY-LAMINATED METAL WITH THERMOCOUPLE

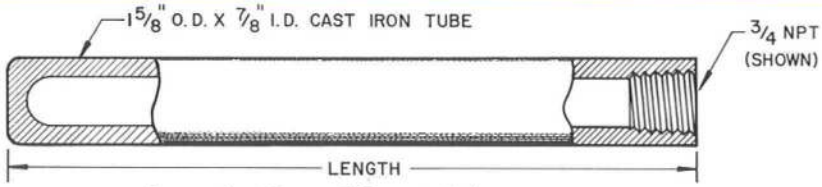


Floating, refractory-laminated, metal protecting tube with thermocouple for accurate temperature indication approximately 3" below the melt level. Laminated silicon carbide tip provides good heat transfer to SS sheathed, Type K, .125 O.D., thermocouple with 36" fiberglass insulated and SS overbraided leads. Floatation may require support spring or holder.

PART NUMBER	PRICE $ / each
FL-K-12	$49.00

Discount Schedule above applies.

PROTECTING TUBES
CAST IRON

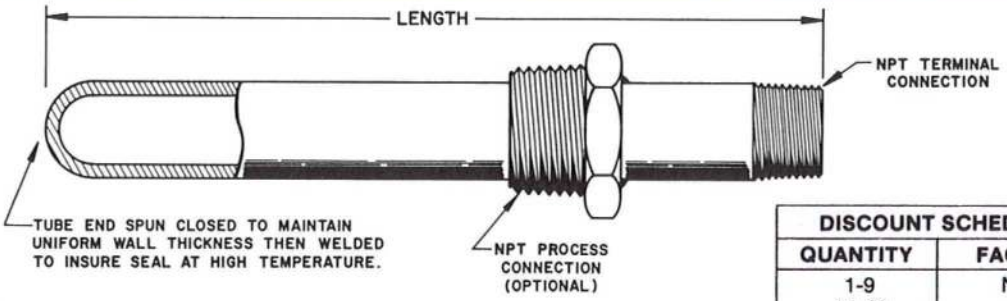


Example : 34 — CIR — 18" $13.50

	INDUSTRIAL — CAST IRON PROTECTING TUBES				
MATERIAL	PROTECTING TUBE SIZE		PART NUMBER	12" TUBE PRICES	6" ADDITION
	NPT	I.D. × O.D.			
CAST IRON	3/4 (INTERNAL) 1" NPT (EXTERNAL)	7/8 × 1-5/8	34 — CIR — ☐	$10.00	$3.50
			44 — CIR — ☐	14.00	3.50

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

PROTECTING TUBES
METAL — PIPE SIZES



DISCOUNT SCHEDULE	
QUANTITY	**FACTOR**
1-9	NET
10-49	.90
50-74	.85
75-99	.80
100+	.75

Example: 12-600-24"
1/2 NPT, Inconel 600 Tube, 24" long

PROTECTING TUBE			PART NUMBER	BASE PRICE	
MATERIAL	**SIZE NPT**	**I.D. × O.D.**		**12" TUBE**	**6" ADDITION**
CARBON STEEL	1/4 NPT	0.364 × 0.540	*(see tables)* **14 — 118 —** □ **D** — □ **E** — □ **F**	$12.50	$ 2.25
	1/2 NPT	0.622 × 0.840	**12 — 118 —** □ — □ — □	12.50	2.25
	3/4 NPT	0.824 × 1.050	**34 — 118 —** □ — □ — □	13.00	2.50
	1 NPT	1.049 × 1.315	**44 — 118 —** □ — □ — □	13.50	3.00
			Length · Mounting Accessories (if Applicable) · See notes 2, 3		
304 SS	1/4 NPT	0.364 × 0.540	*(see tables)* **14 — 304 —** □ **D** — □ **E** — □ **F**	16.50	3.25
	1/2 NPT	0.622 × 0.840	**12 — 304 —** □ — □ — □	17.50	4.50
	3/4 NPT	0.824 × 1.050	**34 — 304 —** □ — □ — □	19.00	4.75
	1 NPT	1.049 × 1.315	**44 — 304 —** □ — □ — □	21.00	5.50
			Length · Mounting Accessories (if Applicable) · See notes 2, 3		
316 SS	1/4 NPT	0.364 × 0.540	*(see tables)* **14 — 316 —** □ **D** — □ **E** — □ **F**	19.50	4.25
	1/2 NPT	0.622 × 0.840	**12 — 316 —** □ — □ — □	20.00	5.75
	3/4 NPT	0.824 × 1.050	**34 — 316 —** □ — □ — □	21.50	6.00
	1 NPT	1.049 × 1.315	**44 — 316 —** □ — □ — □	24.00	7.50
			Length · Mounting Accessories (if Applicable) · See notes 2, 3		
446 SS	1/4 NPT	0.364 × 0.540	*(see tables)* **14 — 446 —** □ **D** — □ **E** — □ **F**	28.50	9.00
	1/2 NPT	0.622 × 0.840	**12 — 446 —** □ — □ — □	33.00	12.00
	3/4 NPT	0.824 × 1.050	**34 — 446 —** □ — □ — □	40.50	15.00
	1 NPT	1.049 × 1.315	**44 — 446 —** □ — □ — □	54.00	23.50
			Length · Mounting Accessories (if Applicable) · See notes 2, 3		
INCONEL 600	1/4 NPT	0.364 × 0.540	*(see tables)* **14 — 600 —** □ **D** — □ **E** — □ **F**	31.00	12.00
	1/2 NPT	0.622 × 0.840	**12 — 600 —** □ — □ — □	36.00	14.00
	3/4 NPT	0.824 × 1.050	**34 — 600 —** □ — □ — □	44.00	18.00
	1 NPT	1.049 × 1.315	**44 — 600 —** □ — □ — □	51.00	21.00
			Length · Mounting Accessories (if Applicable) · See notes 2, 3		

NOTES: Schedule 40 pipe standard
1) For EXTRA heavy, schedule 80, pipe add suffix "H" e.g. 12-304-12"-0-H and consult Factory for prices.
2) For open end tube (for exposed T/C junction) construction add suffix "X" e.g. 12-304-12"-0-X with no increase in price.

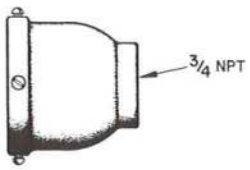
TABLE "D" Protecting Tube Length In Inches from 12".
TABLE "E" Fixed Mounting Bushing (if applicable) (see mounting accessories)

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

FIXED BUSHING SIZE	PART NO. (steel)	PRICE $ add	PART NO. (SS)	PRICE $ add
1/2 NPT	F12C	8.00	F12S	10.00
3/4 NPT	F34C	9.00	F34S	11.00
1 NPT	F44C	9.00	F44S	13.00
1¼ NPT	F54C	11.00	F54S	27.00
1½ NPT	F64C	11.00	F64S	32.00

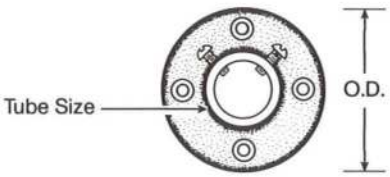
NOTES:
1) Bushings are welded to tubes.
2) 1/2 NPT Bushing fits up to 3/8 pipe
   3/4 NPT Bushing fits up to 1/2 pipe
   1 NPT Bushing fits up to 3/4 pipe
   1¼ NPT Bushing fits up to 1 pipe
   1½ NPT Bushing fits up to 1¼ pipe
3) GIVE IMMERSION LENGTH WHEN ORDERING BUSHING e.g. 12-304-24"-F34C-18" and add bushing price to base list price

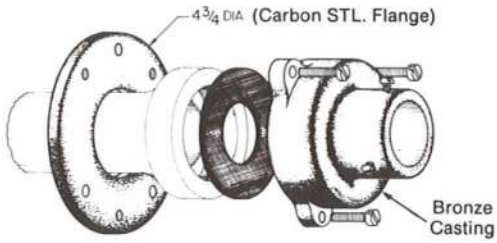
Fixed Steel Mounting Bushing
For Metal Protecting Tubes



PART NO.	PRICE
WP	12.00

Weatherproof cover for SIC





Adjustable Flange
For Metal Protecting Tubes

PROTECTING TUBE SIZE	FLANGE O.D.*	PART NO.	PRICE $/ea.
1/4" NPT	2⅜"	AF-14	6.00
3/8" NPT	2⅞"	AF-38	6.00
1/2" NPT	3"	AF-12	6.00
3/4" NPT	3¼"	AF-34	6.00
1" NPT	3¾"	AF-44	7.50
1-1/2" NPT	4½"	AF-64	9.00

*Approx. Dim.

Support Flange and Casting Assembly
For 1-3/4" O.D. Silicon Carbide Protecting Tube w/Collar

DESCRIPTION	PRICE $/ea.
Support Casting MF-0	10.50
Gasket MF-1	1.25
CS Support Flange MF-2	10.00

When ordering complete assembly, order all three part numbers.

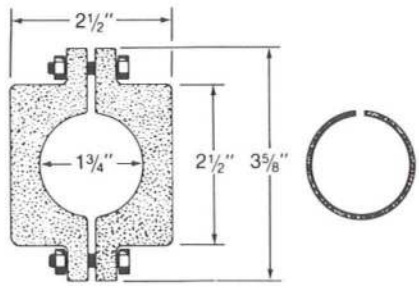
Split Flange
For Ceramic Protecting Tubes

FOR PROTECTING TUBE	PART NO.	PRICE $/ea.
1¾ O.D. SILICON CARBIDE	SF	11.

*Includes gasket

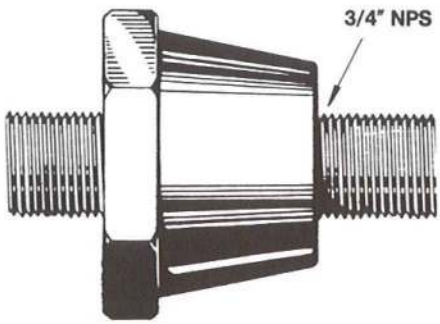
Tapered Steel Mtg. Plug
For Blast Furnace Assembly

PART NO.	PRICE
TP	18.00



(thickness, ½")

DISCOUNT SCHEDULE	
QUANTITY	FACTOR
1-9	NET
10-49	.90
50-74	.85
75-99	.80
100+	.75



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

NOTICE:

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

PROTECTING TUBES
THERMOWELLS

CORRODENT	TEMP. °F.	CONC. %	RECOM. MATERIAL
Acetic Acid	212	ALL	Monel
Acetic Anhydride	300		Nickel
Acetone	212	ALL	304 SS
Acetylene	400		304 SS
Alcohols	212	ALL	304 SS
Alum. (Potassium or Sodium)	300	ALL	Hast. C
Aluminum Chloride	212	ALL	Hast. B
Aluminum Sulfate	212	ALL	316 SS
Ammonia, Dry	212	ALL	304, 316 SS
Ammonium Hydroxide (Ammonia, Aqua)	212	ALL	304, 316 SS
Ammonium Chloride	300	50%	Monel
Ammonium Nitrate	300	ALL	304 SS
Ammonium Sulfate	212	ALL	316 SS
Amyl Acetate	300	ALL	304 SS
Aniline	75		Monel
Asphalt	250		304 SS
Atmosphere, (Industrial and Marine)			304 SS
Barium Compounds	SEE CALCIUM		
Beer	70		304 SS
Benzene (Benzol)	212		Steel
Benzoic Acid	212	ALL	316 SS
Bleaching Powder	70	15%	Monel
Borax	212	ALL	Brass
Bordeaux Mixture	200		304 SS
Boric Acid	400	ALL	316 SS
Bromine	125	DRY	Monel
Butane	400	ALL	Steel
Butyl Alcohol	SEE ALCOHOLS		
Butyric Acid	212		Hast. C
Calcium Bisulphite	75	ALL	Hast. C
Calcium Chloride	212	ALL	Hast. C
Calcium Hydroxide	300	20%	Hast. C
Calcium Hypochlorite	SEE BLEACHING POWDER		
Carbolic Acid	SEE PHENOL		
Carbon Dioxide, Dry	800	ALL	Brass
Carbonated Water	212	ALL	304 SS
Carbonated Beverages	212		304 SS
Carbon Disulfide	200		304 SS
Carbon Tetrachloride	125	ALL	Monel
Chlorine, Dry	100		Monel
Chlorine, Moist	100	ALL	Monel
Chloracetic Acid	212	ALL	Monel
Chloroform, Dry	212		Monel
Chromic Acid	300	ALL	Hast. C
Cider	300	ALL	304 SS
Citric Acid	212	ALL	Hast. C
Copper (10) Chloride	212	ALL	Hast. C
Copper (10) Nitrate	300	ALL	316 SS
Copper (10) Sulfate	300	ALL	316 SS
Copper Plating Solution (Cyanide)	180		304 SS
Copper Plating Solution (Acid)	75		304 SS
Corn Oil	200		304 SS
Creosote	200	ALL	304 SS
Crude Oil	300		Monel
Ethyl Acetate	SEE LACQUER THINNER		
Ethyl Chloride, Dry	500		Steel
Ethanol	SEE ALCOHOLS		
Ethylene Glycol (Uninhibited)	212	ALL	304 SS
Ethylene Oxide	75		Steel
Fatty Acids	500	ALL	316 SS
Ferric Chloride	75	ALL	Hast. C
Ferric Sulfate	300	ALL	304 SS
Formaldehyde	212	40%	316 SS
Formic Acid	300	ALL	316 SS
Freon	300		Steel
Fluorine, Anhydrous	100		304 SS
Furfural	450		316 SS
Gasoline	300		Steel
Glucose	300		304 SS
Glue ph 6-8	300	ALL	304 SS
Glycerine	212	ALL	Brass
Hydrobromic Acid	212	ALL	Hast. C
Hydrochloric Acid (37-38%)	225	ALL	Hast. B
Hydrogen Chloride, Dry	500		304 SS
Hydrocyanic Acid	212	ALL	304 SS
Hydrofluoric Acid	212	60%	Monel
Hydrogen Fluoride, Dry	175		Steel
Hydrofluogilicic Acid	212	40%	Monel
Hydrogen Peroxide	125	10-100%	304 SS
Kerosene	300	ALL	Steel
Lacquers & Thinners	300	ALL	304 SS
Lactic Acid	300	ALL	316 SS
Lime	212	ALL	316 SS
Linseed Oil	75		Steel
Magnesium Chloride	212	50%	Nickel
Magnesium Hydroxide (or Oxide)	75	ALL	304 SS
Magnesium Sulfate	212	40%	304 SS
Mercuric Chloride	75	10%	Hast. C
Mercury	700	100%	Steel
Methylene Chloride	212	ALL	304 SS
Methyl Chloride, Dry	75		Steel
Milk, fresh or sour	180		304 SS
Molasses	SEE GLUCOSE		
Natural Gas	70		304 SS
Nitric Acid	75	ALL	304 SS
Nitric Acid	300	ALL	316 SS
Oxygen	75	ALL	Steel
Oleic Acid	SEE FATTY ACIDS		
Oxalic Acid	212	ALL	Monel
Photographic Bleaching	100	ALL	304 SS
Palmitic Acid	SEE FATTY ACIDS		
Phosphoric Acid	212	ALL	316 SS
Phenol	212	ALL	316 SS
Potassium Compounds	SEE SODIUM COMPOUNDS		
Propane	300		Steel
Rosin	700	100%	316 SS
Sea Water	75		Monel
Soap & Detergents	212	ALL	304 SS
Sodium Bicarbonate	212	20%	316 SS
Sodium Bisulphite	212	20%	304 SS
Sodium Bisulphate	212	20%	304 SS
Sodium Carbinate	212	40%	316 SS
Sodium Chloride	300	30%	Monel
Sodium Chromate	212	ALL	316 SS
Salt or Brine	SEE SODIUM CHLORIDE		
Sodium Cyanide	212	ALL	304 SS
Sodium Hydroxide	212	30%	316 SS
Sodium Hypochlorite	75	10%	Hast. C
Sodium Nitrate	212	40%	304 SS
Sodium Nitrite	75	20%	316 SS
Sodium Phosphate	212	10%	Steel
Sodium Silicate	212	10%	Steel
Sodium Sulfate	212	30%	316 SS
Sodium Sulfide	212	10%	316 SS
Sodium Sulfite	212	30%	304 SS
Sodium Thiosulfate	212	ALL	304 SS
Steam			304 SS
Stearic Acid	SEE FATTY ACIDS		
Sugar Solutions	SEE GLUCOSE		
Sulfur	500		304 SS
Sulfur Chloride	75	DRY	316 SS
Sulfur Dioxide	500	DRY	316 SS
Sulfur Trioxide	500	DRY	316 SS
Sulfuric Acid	212	10%	316 SS
Sulfuric Acid	212	10-90%	Hast. B
Sulfuric Acid, Fuming	175		Hast. C
Sulfurous Acid	75	20%	316 SS
Titanium Tetrachloride	75	ALL	316 SS
Tannic Acid	75	40%	Hast. B
Toluene	75		Steel
Trichloracetic Acid	75	ALL	Hast. B
Trichlorethylene	300	DRY	Monel
Turpentine	75		316 SS
Varnish	150		Steel
Zinc Chloride	212	ALL	Hast. B
Zinc Sulfate	212	ALL	316 SS

In recommending the above materials, consideration has been given to providing good service life without undue cost. Where two or more materials are satisfactory, the least expensive is listed. Consult the factory for information on materials or services not given. Other factors which will influence corrosion rates include: degree and frequency of temperature fluctuation, concentration, ...rations of fluids, high velocities or abrasives in the fluid stream, flashing or cavitating conditions, etc. Therefore the data presented should be interpreted as one basis for material selection and not as a complete recommendation.

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

Thermowells

Thermowells provide maximum protection for thermal sensors from corrosion, pressure and flow induced stresses. When selecting thermowells these parameters determine the type and material that should be used. In general, thermowells are machined from solid bar stock for "A" dimensions to 24" but for longer lengths a built-up design is used.

General Application Considerations

Select sensor location for representative temperature measurement.

Provide sufficient depth of immersion so that heat transfer along the instrument does not influence temperature measurement.

Select materials that are compatible with corrosive media elements.

Select thermowell with sufficient stiffness to resist destruction from flow induced stresses.

Thermowell Materials

Strength at operating temperature and resistance to corrosion are the primary considerations in material selection. A corrosion guide is supplied in the general Data Section.

General Material Considerations

Carbon Steels can be used to 1300° F (700° C) usually in oxidizing atmospheres.

Austenitic Stainless Steels (300 series) can be used to 1600° F (870° C) mostly in oxidizing atmospheres although type 316 can be used in some reducing environments.

Ferritic Stainless Steels (400 series) can be used to the 1800° F (982° C) — 2100° F (1149° C) range in both oxidizing and reducing atmospheres.

High Nickel Alloys can be used to 2100° F (1149° C) in oxidizing atmospheres.

Material Code	MATERIAL	Melting Point	Recommended Operating Atmosphere	Maximum Operating Temp. in Atmosphere
	STAINLESS STEELS			
304	304	2560	ORNV	1650
310	310	2560	ORNV	2100
316	316	2500	ORNV	1700
321	321	2550	ORNV	1600
347	347	2600	ORNV	1600
446	446	2700	ORNV	2000
CS	Carbon Steel	2500	ON	1300
INC	Inconel™	2550	ONV	2100
INX	Inconel X™	2620	ONV	1500
INY	Incoloy™	2500	ON	1600
HTX	Hastelloy X™	2300	O	2200
HTC	Hastelloy C™	2310	O	1800
HTB	Hastelloy B™	2375	OR	1400
MON	Monel™	2460	OR	1000
BR	Brass	1850	O	650
AL	Aluminum	1220	O	700
NCK	Nickel	2647	O	1400
TRN	Tantalum	5425	V	5000
TIT	Titanium	3035	VN	2000

O = Oxidizing R = Reducing N = Neutral V = Vacuum

Velocity Rating

Once the selection of material is made attention should be given to the parameter of flow induced stresses. Fluids flowing by a well form a turbulent wake called the Von Karman Trail. This wake has a definite frequency based on the diameter of the well and the fluid velocity. It is important to provide a well with sufficient stiffness so that the wake frequency will never exceed the natural frequency of the well itself. Should the natural frequency of the well coincide with the wake frequency the well would vibrate to destruction. Tapered shank wells provide greater stiffness for the same sensitivity than a straight shank well. The higher strength to weight ratio gives these wells a higher natural frequency and therefore are able to operate at higher fluid velocities. Recommended maximum velocity rating can be found for every standard well length and material catalogued. Ratings are based on operating temperatures as shown in the table below.

Material	Velocity Rating Operating Temperature
Carbon Steel (C1018) 304 SS 316 SS	1000° F (538° C)
Monel	900° F (482° C)
Brass	350° F (177° C)

Single values that appear in the velocity tables may be considered safe for water, steam, air or gas. Double values distinguish between water (parenthesized) and steam, air and gases. These values are intended as general guides to selection. If you have operating conditions requiring special well designs our engineering staff is available to assist you.

Pressure Rating

The limit pressure versus temperature ratings are tabulated for various materials for each thermowell series.

Here is a typical table.

LIMIT PRESSURE vs TEMPERATURE
(lbs/in²) (°F)

MATERIAL	CODE	TEMPERATURE – °F						
		70°	200°	400°	600°	800°	1000°	1200°
Brass	BR	5000	4200	1000	—	—	—	—
Carbon Steel	CS	5200	5000	4800	4600	3500	1500	—
A.I.S.I. 304	304	7000	6200	5600	5400	5200	4500	1650
A.I.S.I. 316	316	7000	7000	6400	6200	6100	5100	2500
Monel	MON	6500	6000	5400	5300	5200	1500	—

Selection of material and/or equipment is at the sole risk of the user of this publication. The data presented does not and should not preclude professional engineering design and consulting for your particular application. Marlin Manufacturing Corporation, its distributors, representatives, and the contributors to this publication specifically deny any warranty expressed or implied.

THERMOWELLS
MECHANICAL APPLICATION CONSIDERATION

Process Connection supports and/or seals the thermowell into the process system.

Types:

Threaded	one piece well with NPT threads (may require welding or brazing for seal).
Flanged Welded	a primary J groove weld and a bevel groove secondary weld join the flange to the well. Flanges are made to specification.
Lap Joint	flanges are made to specification.
Socket Weld	fits A.S.A. standard socket weld couplings for field installation.

Bore Size is the inside diameter of the thermowell in which the temperature sensor will be located. Standard sizes are .260" or .385" with a ± .002" tolerance.

Instrument Connection supports and/or seals the temperature sensor into the thermowell bore. Standard connection is a ½" NPS thread. An optional brass or stainless steel captive cap is available for keeping the well bore clean when not in use.

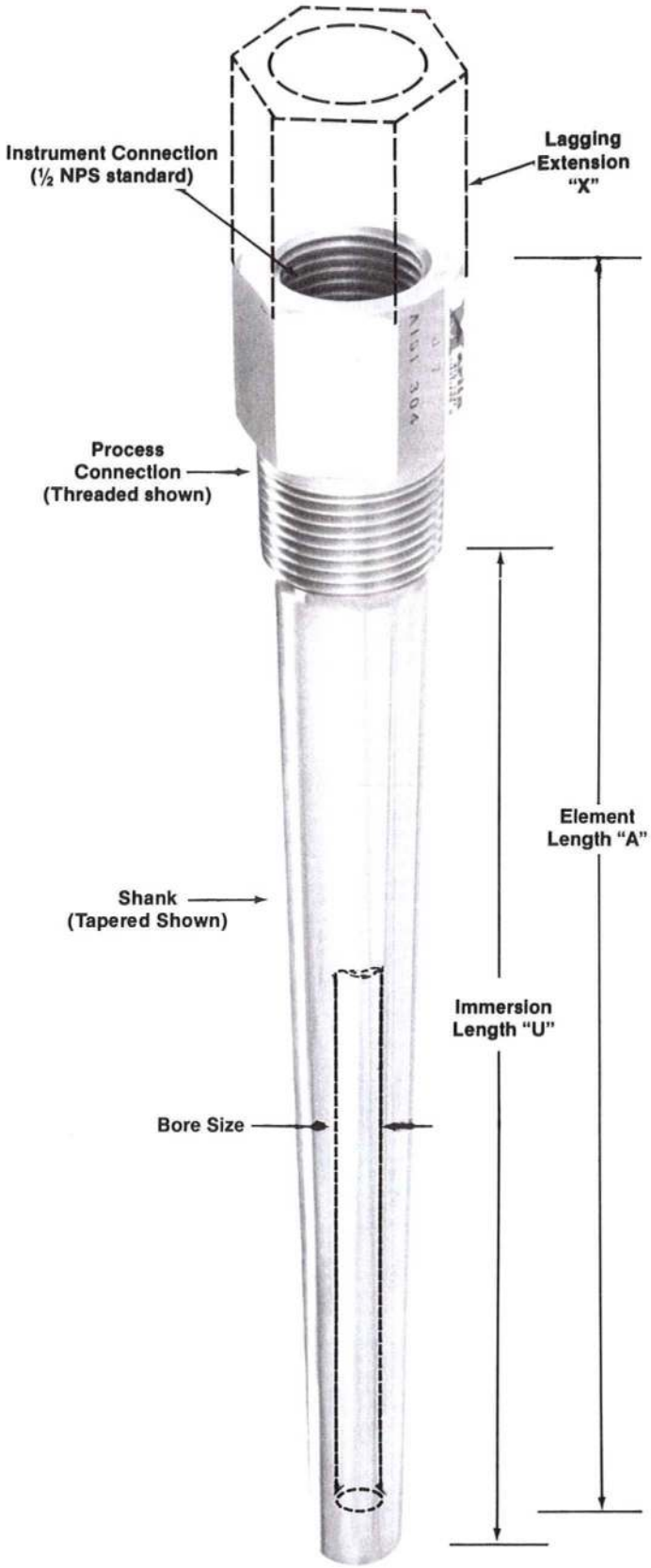
Shank Constructions

Straight	the outside diameter of the well is consistent over its immersion length.
Reduced Diameter	the outside diameter at the end of well is reduced for greater sensor sensitivity.
Tapered	the outside diameter of the well decreases along the immersion length for greater stiffness. (see Velocity Ratings)

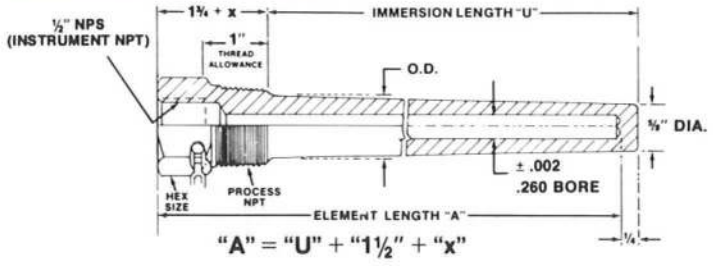
Immersion Length is the distance along the shank from the end of the well to the underside of the process connection. Immersion length implies that this is the portion of the well that sees the fluid or gas that is being monitored. Care must be taken so that dead lengths (required lengths to pass through walls, pipe fittings, etc.) and proper sensitivity lengths (lengths required for proper temperature measurement of the sensor) are taken into account.

Lagging Extension Length is the distance along the shank from the top side of the process connection to the termination connection of the well. If needed dead lengths (i.e.-that required to pass through walls, pipe fittings etc.) should be taken into account.

Note: For special thermowells please send your prints and/or specifications — Marlin will promptly quote price and delivery.



THERMOWELLS
0.260" BORE, THREADED



"A" = "U" + "1½" + "x"

260 TT - ___ - ___ - ___ - ___ - ___

"U" | "X" (if req.) | Mat'l. Code

Bore Size .260"
Threaded Thermowell (T)
Tapered Shank (T)
Process Sizes 3/4" or 1" NPT
Instrument Size 1/2" NPS (Standard)
Cap and Chain (if req.) Brass "BC" add $4.00 extra
SSTL. "SC" add $8.50 extra

Process Size	¾" NPT	1" NPT
Shank OD	⅞"	1 1/16"
Hex Size	1⅛"	1⅜"

STANDARD LENGTHS (inches)

Without Extension X

U	2½	4½	7½	10½	13½	16½	22½
A	4	6	9	12	15	18	24

With Extension X

Ux		2½	4½	7½	10½	13½	19½
X		2	3	3	3	3	3
Ax		6	9	12	15	18	24

Process Size	Price $/Thermowell 304 SS						
3/4" NPT	33.00	38.00	56.00	70.00	93.00	114.00	158.00
1" NPT	37.00	47.00	62.00	76.00	105.00	122.00	164.00

To price other materials see multiplier table.

LIMIT PRESSURE (lbs/in²) **vs TEMPERATURE** (°F)

MATERIAL	CODE	TEMPERATURE – °F						
		70°	200°	400°	600°	800°	1000°	1200°
Brass	BR	5300	4750	1100	—	—	—	—
Carbon Steel	CS	5900	5750	5450	5250	4000	1750	—
A.I.S.I. 304	304	7800	7050	6400	6150	6000	5190	1875
A.I.S.I. 316	316	7800	7800	7250	7100	6950	5200	2720
Monel	MON	7450	6850	6150	6100	5940	1750	—

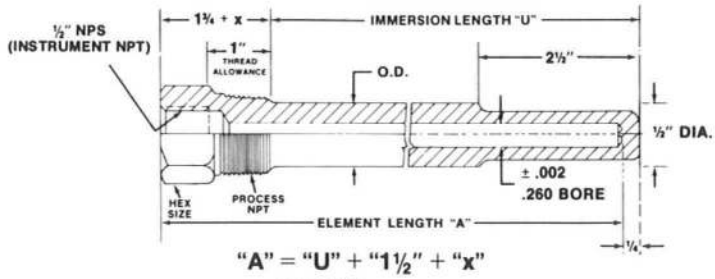
LIMIT FLUID VELOCITY (ft/sec) **vs LENGTH** (inches)

PROCESS SIZE	MATERIAL	CODE	IMMERSION LENGTH "L"							
			2½	4½	7½	10½	13½	16½	19½	22½
¾ NPT	Brass	BR	305 (97.5)	93.8 (54.1)	33.9	17.1	10.5	7.0	5.0	3.7
	Carbon Steel	CS	386 (175)	180 (97.2)	65.3 (58.3)	33.0	20.1	13.4	9.6	7.1
	A.I.S.I.-304 & 316	304 316	440 (243)	197 (135)	71.2	36.0	22.0	14.7	10.5	7.8
	Monel	MON	354 (195)	155 (108)	56.1	28.4	17.3	11.6	7.5	5.6
1 NPT	Brass	BR	354 (161)	108 (89.5)	39.4	19.8	12.2	8.1	5.8	4.3
	Carbon Steel	CS	448 (289)	209 (161)	75.7	38.4	23.3	15.5	11.1	8.2
	A.I.S.I.-304 & 316	304 316	490 (403)	228 (225)	82.5	41.8	25.5	17.1	12.2	9.1
	Monel	MON	410 (322)	179 (178)	65.1	33.0	20.1	13.5	8.7	6.5

Total Quantity	Discount Factor
1 - 9*	Net
10 - 24	.95
25 - 49	.90
50 - 99	.85
100 - 199	.80
200+	.75

*1 to 4 pcs add $24.00 set up

Material	X 304SS Price Multiplier
C-1018, Brass	0.85
304 ECL (Low carbon)	1.15
316 SS, 347 SS, 321 SS	1.35
316 ELC (Low carbon)	1.45
309 SS, s10 SS	3.0
Carp 20, Incoloy 800	3.5
Inc 600, Nickel, Monel	3.75
Titanium, Hast C	8.0
Hast B	10.0



"A" = "U" + "1½" + "x"

260 TR - ___ - ___ - ___ - ___ - ___

"U" | "X" (if req.) | Mat'l. Code

Bore Size .260"
Threaded Thermowell (T)
Reduced Diameter (R)
Process Sizes 1/2", 3/4" or 1" NPT
Instrument Size 1/2" NPS (Standard)
Cap and Chain (if req.) Brass "BC" add $4.00 extra
SSTL. "SC" add $8.50 extra

Process Size	½" NPT	¾" NPT	1" NPT
Shank OD	⅝"	¾"	⅞"
Hex Size	1⅛"	1⅛"	1⅜"

STANDARD LENGTHS (inches)

Without Extension X

U	2½	4½	7½	10½	13½	16½	22½
A	4	6	9	12	15	18	24

With Extension X

Ux		2½	4½	7½	10½	13½	19½
X		2	3	3	3	3	3
Ax		6	9	12	15	18	24

Process Size	Price $/Thermowell 304 SS						
1/2" NPT	25.00	30.00	42.00	52.00	75.00	90.00	116.00
3/4" NPT	27.00	33.00	44.00	54.00	77.00	92.00	120.00
1" NPT	32.00	42.00	54.00	66.00	91.00	106.00	146.00

To price other materials see multiplier table.

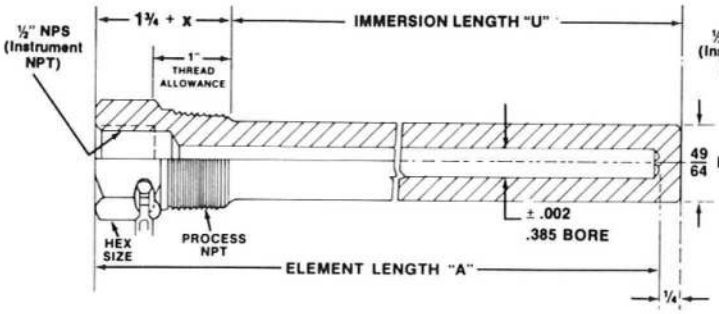
LIMIT PRESSURE (lbs/in²) **vs TEMPERATURE** (°F)

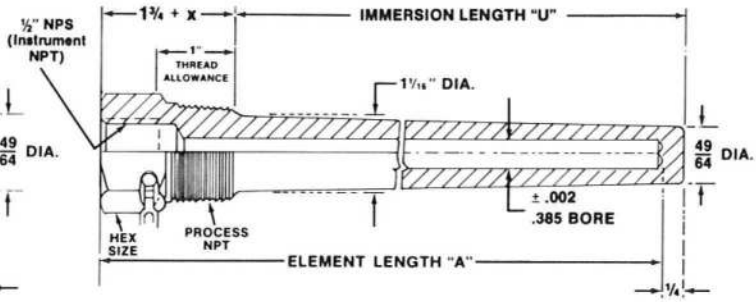
MATERIAL	CODE	TEMPERATURE – °F						
		70°	200°	400°	600°	800°	1000°	1200°
Brass	BR	5000	4200	1000	—	—	—	—
Carbon Steel	CS	5200	5000	4800	4600	3500	1500	—
A.I.S.I. 304	304	7000	6200	5600	5400	5200	4500	1650
A.I.S.I. 316	316	7000	7000	6400	6200	6100	5100	2500
Monel	MON	6500	6000	5400	5300	5200	1500	—

LIMIT FLUID VELOCITY (ft/sec) **vs LENGTH** (inches)

PROCESS SIZE	MATERIAL	CODE	IMMERSION LENGTH "L"							
			2½	4½	7½	10½	13½	16½	19½	22½
½ NPT	Brass	BR	207 (59.3)	75.5 (32.2)	27.3 (19.7)	13.9	8.4	5.6	4.1	3.0
	Carbon Steel	CS	290 (106)	105 (59)	38.2 (36.3)	19.4	11.8	7.8	5.7	4.2
	A.I.S.I.-304 & 316	304 316	300 (148)	109 (82.2)	39.5	20.1	12.2	8.1	5.9	4.4
	Monel	MON	261 (118)	95 (65.5)	24.4	17.5	10.5	7.1	5.2	3.8
¾ NPT	Brass	BR	207 (59.3)	89.1 (39.8)	32.2 (23.9)	16.4	9.9	6.6	4.8	3.6
	Carbon Steel	CS	290 (106)	123 (71.2)	44.9 (42.7)	2.84	13.8	9.3	6.7	4.9
	A.I.S.I.-304 & 316	304 316	300 (148)	128 (99.3)	46.4	23.6	14.3	9.6	6.9	5.1
	Monel	MON	261 (118)	112 79.88)	40.6	20.7	12.4	8.3	6.1	4.5
1 NPT	Brass	BR	207 (59.3)	102 (47.6)	37.0 (28)	18.8	11.4	7.6	5.5	4.1
	Carbon Steel	CS	290 (106)	143 (84.3)	51.6 (50.6)	26.2	15.9	10.6	7.6	5.7
	A.I.S.I.-304 & 316	304 316	300 (148)	148 (117)	53.5	27.2	16.5	11.0	7.9	5.9
	Monel	MON	216 (118)	128 (93.3)	46.7	23.7	14.4	9.5	6.9	5.1

THERMOWELLS
0.385" BORE, THREADED





385 TS - ___ - ___ - ___ - ___ - ___ - ___

"U" | "X" (if req.) | Mat'l. Code

Bore Size 0.385
Threaded Thermowell (T)
Straight Shank (S)
Process Sizes 3/4" or 1" NPT
Instrument Size 1/2" NPS (Standard)
Cap and Chain (if req.) Brass "BC" add $4.00 extra
SSTL. "SC" add $8.50 extra

"A" = "U" + "1½" + "x"

Process NPT	¾"	1"
Hex Size	1⅛"	1⅜"

STANDARD LENGTHS (inches)							
Without Extension X							
U	2½	4½	7½	10½	13½	16½	22½
A	4	6	9	12	15	18	24
With Extension X							
Ux		2½	4½	7½	10½	13½	19½
X		2	3	3	3	3	3
Ax		6	9	12	15	18	24

Process Size	Price $/Thermowell 304 SS						
3/4" NPT	27.00	33.00	44.00	54.00	77.00	92.00	120.00
1" NPT	32.00	42.00	54.00	66.00	91.00	106.00	146.00

To price other materials see multiplier table

LIMIT PRESSURE vs TEMPERATURE
(lbs/in²) (°F)

MATERIAL	CODE	TEMPERATURE – °F						
		70°	200°	400°	600°	800°	1000°	1200°
Brass	BR	5000	4200	1000	—	—	—	—
Carbon Steel	CS	5200	5000	4800	4600	3500	1500	—
A.I.S.I. 304	304	7000	6200	5600	5400	5200	4500	1650
A.I.S.I. 316	316	7000	7000	6400	6200	6100	5100	2500
Monel	MON	6500	6000	5400	5300	5200	1500	—

LIMIT FLUID VELOCITY vs LENGTH
(ft/sec) (inches)

MATERIAL	CODE	IMMERSION LENGTH "L"							
		2½	4½	7½	10½	13½	16½	19½	22½
Brass	BR	290 (145)	150 (80)	54.1 (48)	27.6	16.7	11.1	8.0	6.0
Carbon Steel	CS	326 (260)	192 (144)	69.5	35.4	20.5	14.3	10.3	7.7
A.I.S.I.-304 & 316	304 316	349 (360)	199	71.9	36.6	21.2	14.8	10.7	8.0
Monel	MON	316 (320)	189 (178)	68.1	34.8	20.8	14.0	10.0	7.5

385 TT - ___ - ___ - ___ - ___ - ___ - ___

"U" | "X" (if req.) | Mat'l. Code

Bore Size 0.385
Threaded Thermowell (T)
Tapered Shank (T)
Process Sizes 1" NPT
Instrument Size 1/2" NPS (Standard)
Cap and Chain (if req.) Brass "BC" add $4.00 extra
SSTL. "SC" add $8.50 extra

"A" = "U" + "1½" + "x"

Process NPT	1"
Hex Size	1⅜"

STANDARD LENGTHS (inches)							
Without Extension X							
U	2½	4½	7½	10½	13½	16½	22½
A	4	6	9	12	15	18	24
With Extension X							
Ux		2½	4½	7½	10½	13½	19½
X		2	3	3	3	3	3
Ax		6	9	12	15	18	24

Process Size	Price $/Thermowell 304 SS						
1" NPT	37.00	46.00	62.00	76.00	104.00	122.00	164.00

To price other materials see multiplier table

LIMIT PRESSURE vs TEMPERATURE
(lbs/in²) (°F)

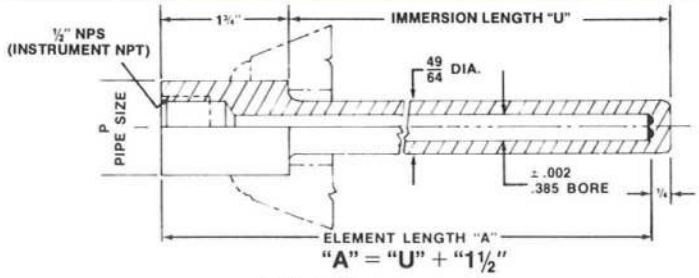
MATERIAL	CODE	TEMPERATURE – °F						
		70°	200°	400°	600°	800°	1000°	1200°
Brass	BR	5000	4200	1000	—	—	—	—
Carbon Steel	CS	5200	5000	4800	4600	3500	1500	—
A.I.S.I. 304	304	7000	6200	5600	5400	5200	4500	1650
A.I.S.I. 316	316	7000	7000	6400	6200	6100	5100	2500
Monel	MON	6500	6000	5400	5300	5200	1500	—

LIMIT FLUID VELOCITY vs LENGTH
(ft/sec) (inches)

MATERIAL	CODE	IMMERSION LENGTH "L"							
		2½	4½	7½	10½	13½	16½	19½	22½
Brass	BR	321 (150)	129 (83.5)	46.8	23.6	14.5	9.6	6.9	5.1
Carbon Steel	CS	410 (270)	249 (150)	90.3	45.6	27.8	18.5	13.2	9.8
A.I.S.I.-304 & 316	304 316	483 (350)	272 (208)	97.3	49.7	30.4	20.3	14.5	10.7
Monel	MON	396 (300)	214 (167)	77.5	39.2	23.8	16.0	10.3	7.7

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

THERMOWELLS
SOCKET WELD, FLANGED

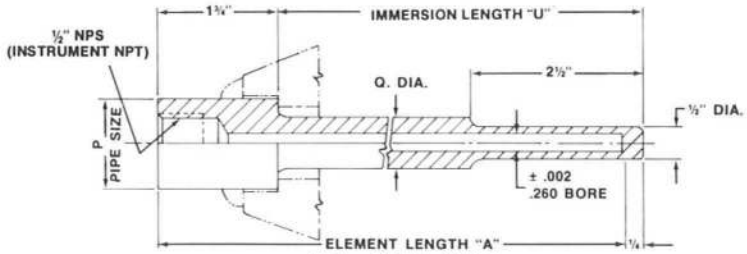


"A" = "U" + "1½"

385 WS - ___ - ___ - ___ - ___ - ___

"U" | "X" (if req.) | Mat'l. Code

Bore Size 0.385
Socket Weld Thermowell (W)
Straight Shank (S)
Process Sizes 3/4" or 1" Pipe
Instrument Size 1/2" NPT (Standard)
Cap and Chain (if req.) Brass "BC" add $4.00 extra
SSTL. "SC" add $8.50 extra



"A" = "U" + "1½"

260 WR - ___ - ___ - ___ - ___

"U" | Mat'l. Code

Bore Size 0.260
Socket Weld Thermowell (W)
Reduced Diameter (R)
Process Size 3/4" or 1" Pipe
Instrument Size 1/2" NPT (Standard)
Cap and Chain (if req.) Brass "BC"
SSTL. "SC"

Pipe Size	¾"	1"
"P" O.D.	1.050	1.315
"Q" 260WR	¾"	⅞"

STANDARD LENGTHS (inches)							
U	2½	4½	7½	10½	13½	16½	22½
A	4	6	9	12	15	18	24
Process Size	**Price $/Thermowell 304 SS**						
3/4" Pipe	27.00	33.00	44.00	54.00	77.00	92.00	120.00
1" Pipe	32.00	42.00	54.00	66.00	91.00	106.00	146.00

To price other materials see multiplier table.

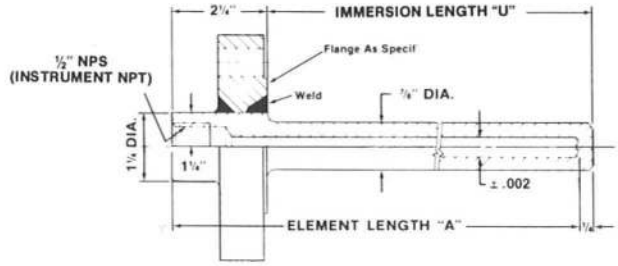
LIMIT PRESSURE vs TEMPERATURE
(lbs/in²) (°F)

MATERIAL	CODE	TEMPERATURE – °F						
		70°	200°	400°	600°	800°	1000°	1200°
Brass	BR	5000	4200	1000	—	—	—	—
Carbon Steel	CS	5200	5000	4800	4600	3500	1500	—
A.I.S.I. 304	304	7000	6200	5600	5400	5200	4500	1650
A.I.S.I. 316	316	7000	7000	6400	6200	6100	5100	2500
Monel	MON	6500	6000	5400	5300	5200	1500	—

LIMIT FLUID VELOCITY vs LENGTH (385WS)*
(ft/sec) (inches)

MATERIAL	CODE	IMMERSION LENGTH "L"						
		2½	4½	7½	10½	13½	16½	22½
Carbon Steel	CS	426 (260)	192 (144)	35.4	20.5	14.3	7.7	
A.I.S.I.-304&316	304 360	449	199	71.9	36.6	21.2	14.8	8.0

*FOR 260WR REDUCE LIMIT FLUID VELOCITY BY 35%.



"A" = "U" + "2"

385 or 260 FS - ___ - ___ - ___ - ___ - ___

"U" | Mat'l Code | Flange Size | Flange Mat'l. Code

Bore Size
Welded Flanged
Thermowell (F)
Straight Shank (S)
(For tapered shank use code T add 15% to thermowell price)
Instrument Size 1/2" NPT (Standard)
Cap and Chain (if req.) Brass "BC" add $4.00 extra
SSTL. "SC" add $8.50 extra

STANDARD LENGTHS (inches)							
U	2	4	7	10	13	16	22
A	4	6	9	12	15	18	24
Price $/Thermowell 304 SS							
Add 15% for Tapered Shank	27.00	33.00	44.00	54.00	77.00	92.00	120.00

*Add Thermowell price to flange price for total price.
To price other materials see multiplier table.

Flange Rating	Flange Size	Price* 304SS $/Flange
150# RF or FF	1"	74.00
	1½	90.00
	2"	120.00
150# RTJ	1"	120.00
	1½"	144.00
	2"	178.00
300# RF or FF	1"	120.00
	1½"	132.00
	2"	160.00
300# RTJ	1"	166.00
	1½"	208.00
	2"	260.00

To price other materials see multiplier table.

LIMIT PRESSURE vs TEMPERATURE
(lbs/in²) (°F)

MATERIAL	CODE	TEMPERATURE – °F						
		0°	200°	400°	600°	800°	1000°	1125°
Carbon Steel	CS	___	___	- TO -	___	2500#		
A.I.S.I. 304	304	___	___	- TO -	___	___	2500#	
A.I.S.I. 316	316	___	___	- TO -	___	___	___	2500#
Monel	MON	___	___	- TO -	___	2500#		

LIMIT FLUID VELOCITY vs LENGTH (385FS)*
(ft/sec) (inches)

MATERIAL	CODE	IMMERSION LENGTH "L"						
		2	4	7	10	13	16	22
Carbon Steel	CS	410 (152)	248 (84.3)	91.3 (50.6)	45.7	27.6	18.5	10.0
A.I.S.I. 304 & 316	304 316	444 (117)	258 (70.3)	95.2	47.6	28.8	19.3	10.4
Monel	MON	338 (168)	226 (93.3)	83.3 (56.0)	41.6	25.2	16.9	9.1

*FOR 260FS REDUCE LIMIT FLUID VELOCITY BY 25%.

NOTICE:

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

Accuracy of Marlin Wire

Marlin insulated and bare thermocouple wire is matched to meet standard initial calibration tolerances for temperatures above 0°C as given in ANSI MC96.1 and shown in the table below without regard for wire size (see page E-0 for wire size upper temperature limits).

Wire conforming to special initial calibration tolerances, wire for use at sub-zero temperatures, and wire with certified traceable calibration is available on request. Designate special limit grade wire using a double ANSI symbol (e.g. KK,JJ). Sub-zero and calibration requirements should be spelled out on the Purchase Order.

INITIAL CALIBRATION TOLERANCES FOR THERMOCOUPLE WIRE

THERMOCOUPLE TYPE		°C.			°F.		
WIRE ALLOYS	ANSI TYPE SYMBOL	TEMPERATURE RANGE	STANDARD LIMITS	SPECIAL LIMITS	TEMPERATURE RANGE	STANDARD LIMITS	SPECIAL LIMITS
Copper (+) vs. Constantan (−)	T	−200° to −65° −65° to +130° +130° to +350°	±1.5% ±1° ±.75%	±.8% ±.5° ±.4%	−330° to −85° −85° to +270° +270° to +660°	±1.5% ±1.8° ±.75%	±.8% ±.9° ±.4%
*Iron (+) vs. Constantan (−)	J	0° to +285° +285° to +750°	±2.2° ±.75%	±1.1° ±.4%	+32° to +545° +545° to +1400°	±4° ±.75%	±2° ±.4%
Chromel™ (+) vs. Constantan (−)	E	−200° to −170° −170° to +250° +250° to +340° +340° to +900°	±1% ±1.7° ±1.7° ±.5%	±1° ±1° ±.4% ±.4%	−330° to −270° −270° to +480° +480° to +640° +640° to +1600°	±1% ±3° ±3° ±.5%	±1.8° ±1.8° ±.4% ±.4%
Chromel™ (+) vs. *Alumel™ (−)	K	−200° to −110° −110° to 0° 0° to +285° +285° to +1250°	±2% ±2.2° +2.2° ±.75%	±1.1° ±.4%	−330° to −165° −165° to +32° +32° to +545° +545° to +2300°	±2% ±4° ±4° ±.75%	±2° ±.4%
Nicrosil (+) vs. Nisil (−)	N	0° to +285° +285° to +1250°	±2.2° ±.75%	±1.1° ±.4%	+32° to +545° +545° to 2300°	±4° ±.75%	±2° ±.4%
Platinum −10% Rhodium (+) vs. Platinum (−)	S	0° to +600° +600° to +1450°	±1.5° ±.25%	±.6° ±.1%	+32° to +1110° +1110° to 2650°	±2.7° ±.25%	±1.1° ±.1%
Platinum −13% Rhodium (+) vs. Platinum (−)	R	0° to +600° +600° to +1450°	±1.5° ±.25%	±.6° ±.1%	+32° to +1110° +1110° to +2650°	±2.7° ±.25%	±1.1° ±.1%
Platinum −30% Rhodium (+) vs. Platinum −6% Rhodium (−)	B	+870° to +1700°	±.5%	±.25%	+1600° to +3100°	±.5%	±.25%
Tungsten −5% Rhenium (+) vs. Tungsten −26% Rhenium (−)	C†	+400° to +2300°	±1%		+800° to +4200°	±1%	

*Magnetic
™TradeMark, Hoskins Mfg. Co.
†NOT ANSI Type Symbol

NOTE — Per cent limits apply directly to temperatures in °C units, but for °F equivalents are applied to the number of °F above or below the ice point (+32°F.).
[i.e., Limit (°F) = (Temp. °F −32°F) × Percentage]

Thermocouple Extension Wire

Thermocouple extension wire has approximately the same thermoelectric characteristic as thermocouple wire but its accuracy is guaranteed over a more limited range of temperatures. Thermocouple extension wire can offer advantages in cost or mechanical properties when used for connections between thermocouples and instruments. For base metal types of thermocouples, extension wire is of substantially the same composition as the corresponding thermocouple type. For noble metal types, however, an entirely different alloy is formulated to match the noble metal characteristics over a specified temperature range. This is necessary due to the high cost of the noble metals which could otherwise be necessary for the interconnection. The "X" in the ANSI code denotes extension grade wire.

INITIAL CALIBRATION TOLERANCES FOR THERMOCOUPLE EXTENSION WIRE

THERMOCOUPLE TYPE		°C.			°F.		
EXTENSION WIRE ALLOY	ANSI TYPE SYMBOL	TEMPERATURE RANGE	STANDARD LIMITS	SPECIAL LIMITS	TEMPERATURE RANGE	STANDARD LIMITS	SPECIAL LIMITS
Copper vs. Constantan	TX	−60° to +100°	±1°	±5°	−75° to +210°	±2°	±1°
*Iron vs. Constantan	JX	0° to +200°	±2.2°	±1.1°	+32° to +400°	±4°	±2°
Chromel™ vs. Constantan	EX	0° to +200°	±1.7°	±1.1°	+32° to +400°	±3°	±2°
Chromel™ vs. *Alumel™	KX	0° to +200°	±2.2°	±1.1°	+32° to +400°	±4°	±2°
Nicrosil vs. Nisil	NX	0° to +200°	±2.2°	±1.1°	+32° to +400°	±4°	±2°
Copper vs. Copper Alloy	SX RX	+25° to +200°	±7°		+75° to +400°	±12°	
PCLW630 vs. Copper	BX	0° to +200°	±2.2°		+32° to +400°	±4°	
Copper vs. Copper	BX	0° to 65°	±1°		+32° to +150°	±2°	
Alloy 405 vs Alloy 426	CX†	0° to 870°	±7°		+32° to +1600°	±12°	

*Magnetic
™Trade Mark Hoskins Mfg. Co.
†NOT ANSI Symbol

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

Calibration Type Characteristics

Type T (COPPER vs CONSTANTAN) is used for service in oxidizing, inert or reducing atmospheres or in vacuum. It is highly resistant to corrosion from atmospheric moisture and condensation and exhibits high stability at low temperatures; it is the only type with limits of error guaranteed for cryogenic temperatures.

Type J (IRON vs CONSTANTAN) is used protected or unprotected in vacuum, oxidizing, inert or reducing atmospheres. Iron element oxidizes rapidly at temperatures exceeding 1000°F, and therefore heavier gauge wire is recommended for longer life at these temperatures.

Type E (CHROMEL vs CONSTANTAN) May be used protected or unprotected in oxidizing, inert or dry reducing atmospheres, or for short periods of time under vacuum. Must be protected from sulfurous and marginally oxidizing atmospheres. Produces the highest EMF per degree of any standardized thermocouple.

Type K (CHROMEL™ vs ALUMEL™) is used protected or exposed in oxidizing, inert or dry reducing atmospheres. Exposure to vacuum limited to short time periods. Must be protected from sulfurous and marginally oxidizing atmospheres. Reliable and accurate at high temperatures.

™Hoskins Mfg. Co.

Type N (NICROSIL vs NISIL) is used protected or exposed in oxidizing, inert or dry reducing atmospheres. Must be protected from sulfurous atmospheres. Very reliable and accurate at high temperatures.

Type S (PLATINUM - 10%, RHODIUM vs PLATINUM)

Type R (PLATINUM - 13%, RHODIUM vs PLATINUM)

Type B (PLATINUM-30% RHODIUM vs PLATINUM-6% RHODIUM)

Platinum alloy thermocouples are all recommended for use in inert or oxidizing atmospheres, or for short periods of time in a vacuum. Easily contaminated, these elements must be protected from the effects of reducing atmospheres and contaminating vapors. Alumina protecting tubes are recommended for directly containing platinum element.

Type C† (TUNGSTEN 5% RHENIUM vs TUNGSTEN 26% RHENIUM)

Tungsten Alloy thermocouples are recommended for use in vacuum, high purity hydrogen, or high purity inert atmospheres. Very poor oxidation resistance.

† — Not ANSI symbols

Thermocouple Insulation provides electrical insulation for thermocouple and thermocouple extension wire. If the insulation breaks down for any reason, the indicated temperature may be in error. When selecting insulation moisture, abrasion, flexing, chemical attack, temperature extremes and any other adverse environmental considerations must be evaluated. Insulations are rated for a maximum continuous use temperature and also a maximum single exposure temperature because after excessive temperatures have been encountered the insulation may become conductive or conductive residues may form even though the insulation remains physically intact. Also do not assume the temperature rating as the temperature at the sensing junction of the thermocouple without evaluating the thermocouple system.

Fibrous Insulation is either braided or wrapped on the conductors. In general, fibrous insulations are used for applications where extreme moisture and abrasion resistance requirements are not prevalent. Available at moderate cost for upper utilization temperatures of 900°F (482°C) for fiberglass, 1600°F (780°C) for high temperature silica fiber, and 2400°F (1315°C) for ceramic fiber.

Plastic Insulation is used on comparatively lower temperature applications and provides good moisture and abrasion resistance. Available at low to moderate cost with typical upper utilization temperatures of 220°F (104°C) for PVC and 500°F (260°C) for teflon and silicone rubber.

Wiring Electronic Instruments to conform to national and local codes does not address the "noise" problems of electronic instruments. Shielding of thermocouple and thermocouple extension wire may be necessary but not the only requirement of reducing noise. Ever since the introduction of electronics into instruments, noise generated by external relays, switches, motors, phase fired thyristors, etc. have caused problems that interfere with the instrument's operation. Now that microprocessors are being increasingly incorporated into many more varied instruments, external sources that generate noise pulses that, in some cases, may render the instrument completely inoperative, have become crucial to instrument applications. While much can be done within the instrument to reduce its sensitivity to external noise, the solution in many cases can only be resolved by supressing the noise generation at its source.

THERMOCOUPLE WIRE
GENERAL

ANSI COLOR CODE FOR THERMOCOUPLE AND THERMOCOUPLE EXTENSION WIRE

ANSI TYPE	WIRE ALLOYS	POLARITY	THERMOCOUPLE WIRE COLOR		ANSI TYPE	T/C EXTENSION WIRE COLOR	
			INDIVIDUAL	OVERALL		INDIVIDUAL	OVERALL
T	COPPER CONSTANTAN	+TP -TN	BLUE RED	BROWN	TX	BLUE RED	BLUE
J	IRON CONSTANTAN	+JP -JN	WHITE RED	BROWN	JX	WHITE RED	BLACK
E	CHROMEL™ CONSTANTAN	+EP -EN	PURPLE RED	BROWN	EX	PURPLE RED	PURPLE
K	CHROMEL™ ALUMEL™	+KP -KN	YELLOW RED	BROWN	KX	YELLOW RED	YELLOW
N	NICROSIL NISIL	+NP -NN	ORANGE RED	BROWN	NX	ORANGE RED	ORANGE
R	PLATINUM 13% RHODIUM PLATINUM	+RP -RN			RX	BLACK RED	GREEN
S	PLATINUM 10% RHODIUM PLATINUM	+SP -SN			SX	BLACK RED	GREEN
B	PLATINUM 30% RHODIUM PLATINUM 6% RHODIUM	+BP -BN			BX	GREY RED	GREY

NOMINAL THERMOCOUPLE RESISTANCE Ohms per Double Foot @ 68°F (20°C)

Wire Ga B & S	Wire Size DIA.	ANSI TYPES						
		J	K	T	E	S	R	B
6	.162	.014	.023	.012	.027	.007	.007	.008
*7	.144	.021						
8	.128	.022	.036	.019	.044	.010	.010	.013
14	.064	.089	.147	.074	.176	.044	.044	.054
16	.050	.141	.232	.117	.277	.069	.069	.086
18	.040	.229	.377	.190	.450	.112	.113	.139
20	.032	.357	.588	.297	.702	.175	.178	.218
24	.020	.905	1.488	.745	1.778	.449	.453	.550
26	.015	1.441	2.45	1.20	2.84	.701	.708	.875
28	.012	2.297	3.59	1.92	4.33	1.062	1.073	1.392
30	.010	3.65	6.02	2.94	7.19	1.794	1.813	2.213
36	.005	14.66	24.08	12.22	28.80	7.150	7.226	8.897

*Double feet 7 Ga Type J=7 Ga Iron/8 Ga Constantan

BARE THERMOCOUPLE WIRE APPROXIMATE WEIGHT FEET/LB.

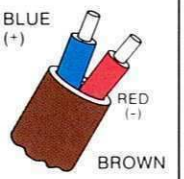
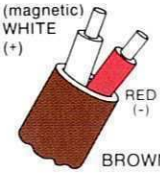
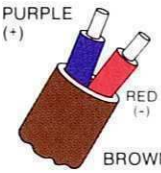
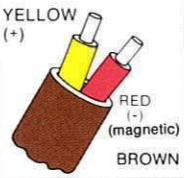
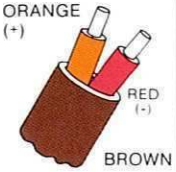
Wire Ga B & S	Wire Size DIA.	TYPE J		TYPE K		TYPE T		TYPE E	
		Iron + JP	Constantan— JN	Chromel + KP	Alumel— KN	Copper + TP	Constantan— TN	Chromel + EP	Constantan— EN
6	.162	14.2	12.6	13	13	12.6	12.6	13	12.6
7	.144	18.0							
8	.128	22.8	20.2	21	21	19.8	20.2	21	20.2
14	.064	91.2	80.9	83	83	80.5	80.9	83	80.9
16	.050	144	127	130	130	128	127	130	127
18	.040	233	207	212	212	203	207	212	207
20	.032	365	324	331	331	324	324	331	324
24	.020	925	821	838	838	820	821	838	821
26	.015	1478	1312	1340	1340	1299	1312	1340	1312
28	.012	2353	2089	2130	2130	2062	2089	2130	2089
30	.010	3736	3316	3370	3370	3294	3316	3370	3316
36	.005	14940	13260	13500	13500	13250	13260	13500	13260

American Wire Gauge (AWG)	Size DIA. Inches
7/0	—
6/0	0.5800
5/0	0.5165
4/0	0.4600
3/0	0.4096
2/0	0.3648
1/0	0.3249
1	0.2893
2	0.2576
3	0.2294
4	0.2043
5	0.1819
6	0.1620
7	0.1443
8	0.1285
9	0.1144
10	0.1019
11	0.0907
12	0.0808
13	0.0720
14	0.0641
15	0.0571
16	0.0508
17	0.0453
18	0.0403
19	0.0359
20	0.0320
21	0.0285
22	0.0253
23	0.0226
24	0.0201
25	0.0179
26	0.0159
27	0.0142
28	0.0126
29	0.0113
30	0.0100
31	0.00893
32	0.00795
33	0.00708
34	0.00630
35	0.00561
36	0.00500
37	0.00445
38	0.00396
39	0.00353
40	0.00314
41	0.00280
42	0.00249
43	0.00222
44	0.00198
45	0.00176
46	0.00157
47	0.00140
48	0.00124
49	0.00111
50	0.00099

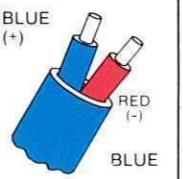
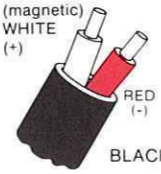
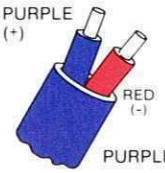
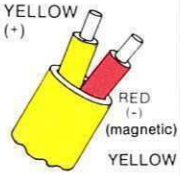
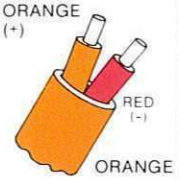
Since 1952 Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

THERMOCOUPLE AND THERMOCOUPLE EXTENSION WIRE COLOR CODES

MARLIN THERMOCOUPLE WIRE

Thermocouple wire Letter Designator	T	J	E	K	N
Alloy Combination & Polarity	(+) Copper (-) Constantan	(+) Iron (magnetic) (-) Constantan	(+) Chromel™ (-) Constantan	(+) Chromel™ (-) Alumel™ (magnetic)	(+) Nicrosil (-) Nisil
Insulated Thermocouple wire Color Code **Note:** Some insulations cannot be color coded					
Bare Wire Temperature Range **Note:** Smaller wire sizes have shorter T/C life at higher temperatures	660°F (350°C) -330°F (-200°C)	1400°F (750°C) 32°F (0°C)	1600°F (900°C) 32°F (0°C)	2300°F (1250°C) 32°F (0°C)	2300°F (1250°C) 32°F (0°C)

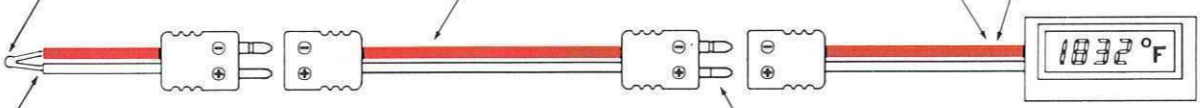
MARLIN T/C EXTENSION WIRE

T/C Extension wire Letter Designator	TX	JX	EX	KX	NX
Alloy Combination & Polarity	(+) Copper (-) Constantan	(+) Iron (magnetic) (-) Constantan	(+) Chromel™ (-) Constantan	(+) Chromel™ (-) Alumel™ (magnetic)	(+) Nicrosil (-) Nisil
Insulated T/C Extension Wire Color Code					
Bare Extension Wire Temperature Range	210°F (100°C) -75°F (-60°C)	400°F (200°C) 32°F (0°C)	400°F (200°C) 32°F (0°C)	400°F (200°C) 32°F (0°C)	400°F (200°C) 32°F (0°C)

Thermocouple wire can be fabricated into accurate and dependable thermocouples by joining the thermoelements at the sensing end.

Thermocouple wire or T/C extension wire of the same type must be used to extend T/C's to indicating or control instrumentation. RED color code is negative throughout circuit.

Hook-up Red Color-Coded wire to **negative** terminal of instrument.



Temperature limit of T/C depends on the T/C wire; wire size; wire insulation; and environmental factors.

Use T/C connectors if required, they are made of the same alloys and have the same color codes of T/C extension wire. (Except Hi-Temp connectors are all colored red regardless of T/C Type). Marlin's T/C connectors are molded from strong, non-melting, glass filled thermo-set compounds.

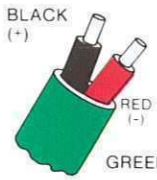
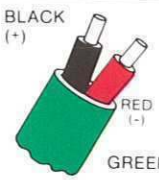
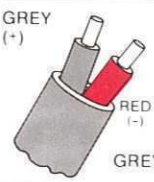
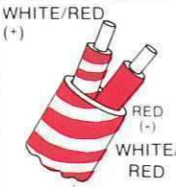
Since 1952 Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111
(216) 941-6200
FAX: (216) 941-6207

THERMOCOUPLE AND THERMOCOUPLE EXTENSION WIRE COLOR CODES

MARLIN THERMOCOUPLE WIRE

R	S	B	C	Thermocouple wire Letter Designator
(+) Platinum 13% Rhodium (-) Platinum	(+) Platinum 10% Rhodium (-) Platinum	(+) Platinum 30% Rhodium (-) Platinum 6% Rhodium	(+) Tungsten 5% Rhenium (-) Tungsten 26% Rhenium	Alloy Combination & Polarity
NOT AVAILABLE INSULATED	NOT AVAILABLE INSULATED	NOT AVAILABLE INSULATED	NOT AVAILABLE INSULATED	Insulated Thermocouple Wire Color Code **Note:** Some insulations cannot be color coded
			4200°F (2300°C) (for vacuum or inert atmospheres)	Bare Wire Temperature Range **Note:** Smaller wire sizes have shorter T/C life at higher temperatures
		3100°F (1700°C)		
2650°F (1450°C)	2650°F (1450°C)			
		1600°F (870°C)		
			800°F (400°C)	
32°F (0°C)	32°F (0°C)			

MARLIN T/C EXTENSION WIRE

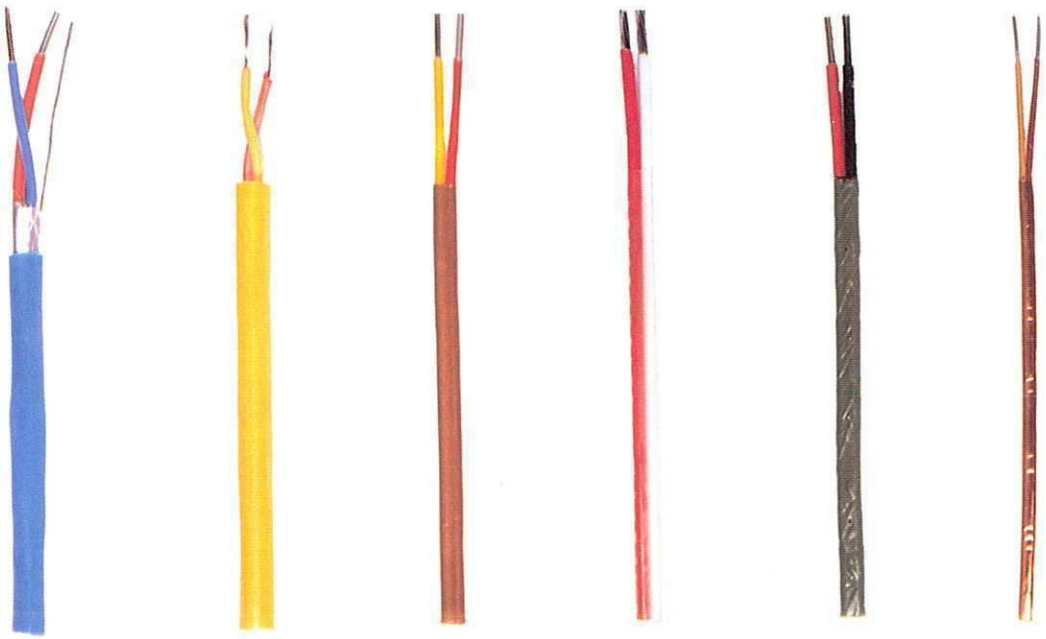
RX	SX	BX	CX	T/C Extension wire Letter Designator
(+) Copper (-) Copper Alloy II	(+) Copper (-) Copper Alloy II	(+) Copper Alloy 630 (-) Copper	(+) Copper Alloy 405 (-) Copper Alloy 426	Alloy Combination & Polarity
				Insulated T/C Extension wire Color Code
			1600°F (870°C)	Bare Extension Wire Temperature Range
400°F (200°C)	400°F (200°C)	400°F (200°C)		
75°F (25°C)	75°F (25°C)			
		32°F (0°C)	32°F (0°C)	

Insulation Temperature Range	PVC	221°F (105°C)
	Silicone Rubber	500°F (260°C)
	FEP Teflon	400°F (204°C)
	PFA Teflon	500°F (260°C)
	TFE Teflon (tape)	500°F (260°C)
	Kapton (tape)	600°F (316°C)
	Glass (braid)	900°F (482°C)
	*High-Temp. Glass	1300°F (704°C)
	*Refrasil®	1600°F (871°C)
	*Ceramic (braid)	2400°F (1315°C)
	*(Not available color coded)	

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

THERMOCOUPLE AND THERMOCOUPLE EXTENSION WIRE INSULATIONS — PLASTIC

Notes: Trade Names Teflon, Kapton, E.I. Dupont de Nemours & Co., Refrasil, Hitco.	PVC is the lowest cost of all the insulations. Mostly used with extension grade wire with the exception of ripcorp, code 3, construction which is T/C grade. Very easy to strip.	Silicone Rubber is a soft, flexible and tough insulation. Moderate in cost, it retains flexibility at lower temperatures and has higher upper utilization temperature than PVC. Outstanding fuel and solvent resistance.	Teflon FEP is not affected by most corrosives, lubricants or weather. Moderate in cost, FEP will not crack or embrittle with heat aging. Good for cryogenic use if not flexed.	Teflon PFA is higher in cost than FEP but has higher upper utilization temperature. Resistant to most corrosives, lubricants and weather. Good for cryogenic use if not flexed.	Teflon TFE is higher in cost than FEP but has higher upper utilization temperature. Tape is helically applied and cured. Difficult to strip.	Kapton is a high cost insulation. It is resistant to radiation. The tape is helically applied and cured with FEP binder. Difficult to strip.
Flexibility	Very Good	Excellent	Good	Good	Good	Good
Moisture Resistance	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
Abrasion Resistance	Very Good	Excellent	Excellent	Excellent	Very Good	Very Good
ANSI Color Coded	Yes	Yes	Yes	Yes	Yes	Yes
Temperature Rating Continuous	−15 to +221°F −26 to +105°C	−75 to +500°F −100 to +260°C	−90 to +400°F −67 to +204°C	−90 to +500°F −67 to +260°C	−90 to +500°F −67 to +260°C	−90 to +500°F −67 to +260°C
Single Reading	N/A	N/A	600°F (316°C)	550°F (288°C)	600°F (316°C)	800°F (427°C)
Mfg. Method	Extruded	Extruded	Extruded	Extruded	Fused Tape	Fused Tape
Description	Polyvinyl Chloride (PVC)	Silicone Rubber	Teflon FEP	Teflon PFA	Teflon TFE	Kapton
Insulation Code	P	L	E	F	T	K



THERMOCOUPLE AND THERMOCOUPLE EXTENSION WIRE INSULATIONS — FIBEROUS

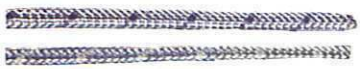
Synthetic Fiber insulation is bulky because of the heavy application of the fiber. Used for extension grade wire, it can take rough handling. Not for use in conduits. Binder burn-off above 400°F (204°C)	Wrapped glass is used only on the single conductors. Usually used on the smaller gage wires because it is easier to strip without fraying. For thermocouple grade wire only. Binder burn-off above 400°F (204°C)	Braided glass is used on singles and for all jackets. Glass will not burn at any temperature but will melt if over-temperatured. Any burn-off is due to binders and colorings. Has very high tensil strength. Binder burn-off above 400°F (204°C)	High-Temp glass extends the upper utilization temperature of fiberglass. Although higher in cost it is better suited for the aluminum industry than glass. Used with jacket or as twisted singles. Binder burn-off above 400°F (204°C)	Refrasil is a vitreous silica fiber that is higher in cost than High-Temp glass. Not as strong as glass but is utilized at higher temperatures. The FEP sizing can leave a residue when burned off under vacuum or restrictive atmospheres.	Ceramic fiber is designed for extreme temperature applications. Extremely high in cost. Should not be used in closed tubes. Has an abrasive feel when handling. Use appropriate protection when handling.	Notes: Trade Names Teflon, Kapton, Dupont de Nemours & Co. Refrasil, Hitco.
Good	Good	Good	Good	Good	Good	Flexibility
Fair	Fair	Fair	Fair	Fair	Fair	Moisture Resistance
Good	Fair	Fair	Fair	Fair	Fair	Abrasion Resistance
Yes	Yes	Yes	Yes by Tracer	No	No	ANSI Color Coded
500°F (260°C)	900°F (482°C)	900°F (482°C)	1300°F (704°C)	1600°F (871°C)	2200°F (1205°C)	Temperature Rating Continuous
650°F (343°C)	1000°F (538°C)	1000°F (538°C)	1600°F (871°C)	2000°F (1093°C)	2400°F (1315°C)	Single Reading
Braided Silicone Binder	Wrapped Silicone Binder	Braided Silicone Binder	Braided Silicone Binder	Braided FEP Sizing	Braided	Mfg. Method
Synthetic Fiber	Fiberglass	Fiberglass	High-Temp Fiberglass	Refrasil Silica Fiber	Ceramic Fiber	Description
S	W	G	H	R	C	Insulation Code

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

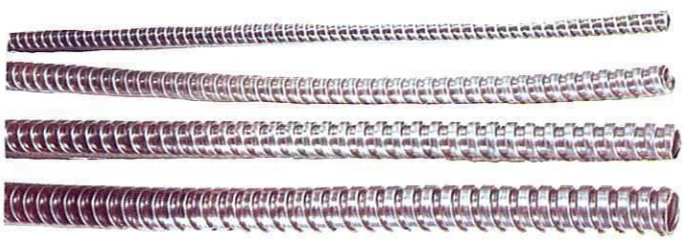
Constructions are arrangements of the conductor and insulation that suit the application. For instance, singles can be used to wire panels more easily than a jacketed construction. And duplex constructions can be more easily used in conduits. And Twisted duplex constructions are more flexible than paralleled ones and counteract flux induced noises. Twisted and shielded constructions provide the best noise reduction.

	CONSTRUCTIONS	
	Code	**Description**
	1	Insulated Single Conductor
	3	Insulated Duplex Conductors — Ripcord
	4	Insulated Duplex Conductors — Paralleled with Overall Insulation Jacket
	7	Insulated Duplex Conductors — Twisted
	8	Insulated Duplex Conductors — Twisted with Overall Insulation Jacket
	9	Insulated Duplex Conductors — Twisted with Mylar backed Aluminum Shield, Drain Wire, and Overall Insulation Jacket

Protective metal overbraids are used to enhance abraision and cut-through resistance. With an approximately 85% coverage they also provide a noise shield although not as effective as the aluminized mylar tape full coverage shields.

	Protective Overbraid	
	Code	**Description**
None	0	No Attendant
	1	Stainless Steel 1400°F (760°C) Wire Braided over Insulated Construction
	2	Inconel wire 1800°F (982°C) Braided over Insulated Construction

[Sold Separately]



SS Flex Tubing			
Code	***Price $/Ft.**	**I.D.**	**Approx. O.D.**
FT-125	1.30	0.125"	0.200"
FT-187	0.90	0.187"	0.280"
FT-250	1.00	0.250"	0.340"
FT-312	1.10	0.310"	0.420"

*No Discounts.

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

Example: J-20-GG40
Type J, T/C Grade, Standard Tolerance, Solid, 20 GA., Glass/Glass Insulation, Parallel, No Overbraid

CONDUCTOR:
T/C Type/
Grade – T/C or Extension
Tolerance
Solid or Standard

WIRE GA.:

INSULATION: CONDUCTOR / OVERALL

CONSTRUCTION:

PROTECTIVE OVERBRAID

J - 20 - G G 4 0

CODE
T
J
E
K
N
TX
JX
EX
NX
RX
SX
BX
CX

NOTES:

K - TYPE K,
Standard Tolerance
T/C Grade,
Solid Conductors

KK - Special Tolerance

KX - Extension Grade

KF - Stranded Conductors (Flexible)

For Single Conductor:
KPF - Type K - Positive leg
Standard Tolerance
T/C Grade
Stranded Conductor

KNF - TYPE K -Negative leg

CODE
14
16
18
20
24
30
36
40

INSULATION	CODE	CODE
NONE	—	0
PVC	P	P
Silicone Rubber	L	L
Extruded Teflon FEP	E	E
Extruded Teflon PFA	F	F
Taped Teflon TFE	T	T
Kapton	K	K
Synthetic Fiber	S	S
Wrapped Glass	W	—
Glass Braid	G	G
Hi-Temp Glass	H	H
Refrasil	R	R
Ceramic	C	C

"—" designates not available.

CONSTRUCTION	CODE
Insulated Single	1
Insulated Duplex - Ripcord	3
Insulated Duplex - Paralleled with Overall Jacket	4
Insulated Duplex - Twisted	7
Insulated Duplex - Twisted with Overall Jacket	8
Insulated Duplex - Twisted with Mylar backed Al. Shield and Overall Jacket	9

CODE	OVERBRAID
0	NONE
1	SS
2	INCONEL

(SEE PRICE LISTS FOR AVAILABLE CONSTRUCTIONS)

Type "J" Thermocouple Wire
ANSI Color Code: Positive - White, Negative - Red, Overall - Brown

INSULATION	GA.	CODE	*PRICE/1000 FT.	SOLID/ STRANDED	NOMINAL SIZE	INSULATION TEMP. RATING
PVC - Ripcord	24	J-24-P030	$140.	Solid	.048 x .094	221°F (105°C)
Teflon FEP Ripcord	24	J-24-E030	315.	Solid	.035 x .070	400°F (209°C)
Extruded Teflon FEP Singles	20 20	JPF-20-E010 JNF-20-E010	145. 280.	Stranded Stranded	.062	400°F (209°C)
Extruded Teflon FEP Duplex-Parallel Extruded Jacket	20 24 24 30	J-20-EE40 J-24-EE40 JF-24-EE40 J-30-EE40	515. 400. 450. 350.	Solid Solid Stranded Solid	.070 x .120 .050 x .080 .050 x .080 .035 x .055	400°F (204°C)
Extruded Teflon PFA Duplex-Parallel Extruded Clear Jacket	30 36	J-30-FF40 J-36-FF40	370. 420.	Solid Solid	.022 x .042 .018 x .028	500°F (260°C)
Teflon TFE Fused Tape Duplex-Parallel Fused Tape Jacket	16 20 24	J-16-TT40 J-20-TT40 J-24-TT40	800. 550. 435.	Solid Solid Solid	.115 x .165 .065 x .110 .050 x .080	500°F (260°C)
Kapton Fused Tape Duplex-Twisted	20 24	J-20-K070 J-24-K070	605. 375.	Solid Solid	.085 .063	600°F (316°C)
Kapton Fused Tape Duplex-Parallel Fused Tape Jacket	20 20 24 30	J-20-KK40 JF-20-KK40 J-24-KK40 J-30-KK40	990. 900. 760. 840.	Solid Stranded Solid Solid	.057 x .103 .057 x .103 .045 x .079 .038 x .063	600°F (316°C)
Glass Wrap Duplex-Parallel Braided Jacket	20 20 24 24 30 36	J-20-WG40 JF-20-WG40 J-24-WG40 JF-24-WG40 J-30-WG40 J-36-WG40	435. 670. 350. 370. 290. 300.	Solid Stranded Solid Stranded Solid Solid	.051 x .090 .065 x .110 .041 x .069 .045 x .078 .032 x .051 .030 x .040	900°F (482°C)
Glass Braid Duplex-Parallel Braided Jacket	16 20 20 24	J-16-GG40 J-20-GG40 JF-20-GG40 J-24-GG40	700. 415. 700. 295.	Solid Solid Stranded Solid	.110 x .160 .060 x .100 .070 x .120 .045 x .080	900°F (482°C)
Glass Braid Duplex-Parallel Braided Jacket SS Protective Overbraid	20 20 24 24	J-20-GG41 JF-20-GG41 J-24-GG41 JF-24-GG41	680. 735. 630. 580.	Solid Stranded Solid Stranded	.090 x .130 .100 x .150 .075 x .120 .080 x .160	900°F (482°C)
Hi-Temp Glass Duplex-Twisted	20	J-20-H070	315.	Solid	.125	1300°F (704°C)
Hi-Temp Glass Duplex-Parallel Braided Jacket	20	J-20-HH40	420.	Solid	.110 x .150	1300°F (704°C)

*See Discounts and Notes Page E-11.

Type "JX" Thermocouple Extension Wire
ANSI Color Code: Positive - White, Negative - Red, Overall - Black

INSULATION	GA.	CODE	*PRICE/1000 FT.	SOLID/ STRANDED	NOMINAL SIZE	INSULATION TEMP. RATING
PVC Duplex-Parallel Extruded Jacket	14	JX-14-PP40	$580.	Solid	.130 x .226	221°F (105°C)
	16	JX-16-PP40	360.	Solid	.115 x .190	
	20	JX-20-PP40	185.	Solid	.095 x .158	
	20	JXF-20-PP40	410.	Stranded	.113 x .182	
PVC Duplex Twisted Shield w/Drain Extruded Jacket	16	JX-16-PP90	450.	Solid	.220	221°F (105°C)
	20	JX-20-PP90	290.	Solid	.184	
Extruded Teflon FEP Duplex-Parallel Extruded Jacket	20	JXF-20-EE40	560.	Stranded	.075 x .122	400°F (204°C)
Extruded Teflon FEP Duplex-Twisted Shield w/Drain Extruded Jacket	16	JX-16-EE90	800.	Solid	.220	400°F (204°C)
	20	JX-20-EE90	550.	Solid	.131	
	20	JXF-20-EE90	650.	Stranded	.135	
Synthetic Fiber Braid Duplex-Parallel Braided Jacket	14	JX-14-SS40	945.	Solid	.190 x .290	500°F (260°C)
	16	JX-16-SS40	880.	Solid	.170 x .240	
	16	JXF-16-SS40	740.	Stranded	.175 x .250	

*See Discounts and Notes below.

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

M = 1000

ORDER NOTES	
Code	Description
KK, JJ	Double ANSI symbol for special tolerance wire. Consult Factory for availability. Add $30. per MFT to list price.
Length	For calibration services see page B-5. Standard packages are 1000 ft. or 2000 ft. reels. Shipping variance is plus or minus 10% of total amount ordered.
‡Respooling charge of $10.00 for orders less than 1000 continuous feet.	

Approx. Shipping Wt. Per 1000 ft. Covered Wire	Wire Gage AWG	14	16	20	24	28	30
	Approx. lbs. per 1000 ft.	40-48	30-35	15-20	5	4	3

Type "K" Thermocouple Wire
ANSI Color Code: Positive - Yellow, Negative - Red, Overall - Brown

INSULATION	GA.	CODE	*PRICE/1000 FT.	SOLID/ STRANDED	NOMINAL SIZE	INSULATION TEMP. RATING
PVC - Ripcord	24	K-24-P030	$265.	Solid	.048 x .094	221°F (105°C)
Teflon FEP Ripcord	24	K-24-E030	370.	Solid	.035 x .070	400°F (209°C)
Extruded Teflon FEP Singles	20 20	KPF-20-E010 KNF-20-E010	315. 315.	Stranded Stranded	.062	400°F (204°C)
Extruded Teflon FEP Duplex-Parallel Extruded Jacket	20 24 24 30	K-20-EE40 K-24-EE40 KF-24-EE40 K-30-EE40	615. 400. 550. 370.	Solid Solid Stranded Solid	.070 x .120 .050 x .080 .050 x .080 .035 x .055	400°F (204°C)
Extruded Teflon PFA Duplex-Parallel Extruded Clear Jacket	30 36 40	K-30-FF40 K-36-FF40 K-40-FF40	360. 395. 525.	Solid Solid Solid	.022 x .042 .018 x .028 .015 x .024	500°F (260°C)
Teflon TFE Fused Tape Duplex-Parallel Fused Tape Jacket	16 20 24	K-16-TT40 K-20-TT40 K-24-TT40	1200. 685. 535.	Solid Solid Solid	.085 x .155 .065 x .110 .050 x .080	500°F (260°C)
Kapton Fused Tape Duplex-Twisted	20	K-20-K070	800.	Solid	.085	600°F (316°C)
Kapton Fused Tape Duplex-Parallel Fused Tape Jacket	20 20 24 30	K-20-KK40 KF-20-KK40 K-24-KK40 K-30-KK40	1300. 1365. 840. 890.	Solid Stranded Solid Solid	.057 x .103 .057 x .103 .045 x .079 .038 x .063	600°F (316°C)
Glass Wrap Duplex-Parallel Braided Jacket	20 20 24 24 30 36	K-20-WG40 KF-20-WG40 K-24-WG40 KF-24-WG40 K-30-WG40 K-36-WG40	550. 1040. 435. 630. 375. 420.	Solid Stranded Solid Stranded Solid Solid	.051 x .090 .065 x .110 .041 x .069 .045 x .078 .032 x .051 .030 x .040	900°F (482°C)
Glass Braid Duplex-Parallel Braided Jacket	16 20 20 24	K-16-GG40 K-20-GG40 KF-20-GG40 K-24-GG40	950. 500. 1070. 350.	Solid Solid Stranded Solid	.110 x .160 .060 x .100 .070 x .120 .045 x .080	900°F (482°C)
Glass Braid Duplex-Parallel Braided Jacket SS Protective Overbraid	20 20 24	K-20-GG41 KF-20-GG41 K-24-GG41	830. 1500. 675.	Solid Stranded Solid	.090 x .130 .100 x .150 .075 x .120	900°F (482°C)
Hi-Temp Glass Duplex-Twisted	20	K-20-H070	500.	Solid	.125	1300°F (704°C)
Hi-Temp Glass Duplex-Parallel Braided Jacket	20	K-20-HH40	690.	Solid	.110 x .150	1300°F (704°C)
Refrasil Braid Duplex-Parallel Braided Jacket	20	K-20-RR40	1200.	Solid	.100 x .174	1600°F (871°C)
w/SS Protective Overbraid	20	K-20-RR41	1470.	Solid	.130 x .200	1400°F (760°C)
Ceramic Braid Duplex-Parallel Braided Jacket	20	K-20-CC40	1630.	Solid	.090 x .130	2200°F (1205°C)
w/INC. Protective Overbraid	20	K-20-CC42	2250.	Solid	.115 x .160	1800°F (982°C)

*See Discounts and Notes on next page.

Type "KX" Thermocouple Extension Wire
ANSI Color Code: Positive - Yellow, Negative - Red, Overall - Yellow

INSULATION	GA.	CODE	*PRICE/1000 FT.	SOLID/ STRANDED	NOMINAL SIZE	INSULATION TEMP. RATING
PVC Duplex-Parallel Extruded Jacket	14 16 20 20	KX-14-PP40 KX-16-PP40 KX-20-PP40 KXF-20-PP40	$1160. 590. 295. 580.	Solid Solid Solid Stranded	.130 x .226 .115 x .190 .095 x .158 .113 x .182	221°F (105°C)
PVC Duplex Twisted Extruded Jacket	20	KXF-20-PP80	680.	Stranded	.160	221°F (105°C)
PVC Duplex Twisted Shield w/Drain Extruded Jacket	16 20	KX-16-PP90 KX-20-PP90	710. 380.	Solid Solid	.220 .184	221°F (105°C)
Extruded Teflon FEP Duplex-Parallel Extruded Jacket	16 20	KX-16-EE40 KXF-20-EE40	915. 760.	Solid Stranded	.085 x .155 .075 x .122	400°F (204°C)
Extruded Teflon FEP Duplex-Twisted Shield w/Drain Extruded Jacket	16 20 20	KX-16-EE90 KX-20-EE90 KXF-20-EE90	1400. 700. 895.	Solid Solid Stranded	.220 .131 .135	400°F (204°C)
Silicone Rubber Duplex-Twisted Extruded Jacket	24 20	KXF-24-LL80 KXF-20-LL80	525. 840.	Stranded Stranded	.225 .400	500°F (260°C)
Synthetic Fiber Braid Duplex-Parallel Braided Jacket	14 16 16	KX-14-SS40 KX-16-SS40 KXF-16-SS40	1260. 1090. 1160.	Solid Solid Stranded	.190 x .290 .170 x .240 .175 x .250	500°F (260°C)

*See Discounts and Notes below.

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

M = 1000

ORDER NOTES	
Code	**Description**
KK, JJ	Double ANSI symbol for special tolerance wire. Consult Factory for availability. Add $30. per MFT to list price. For calibration services see page B-5.
Length	Standard packages are 1000 ft. or 2000 ft. reels. Shipping variance is plus or minus 10% of total amount ordered.
‡Respooling charge of $10.00 for orders less than 1000 continuous feet.	

Approx. Shipping Wt. Per 1000 ft. Covered Wire	Wire Gage AWG	14	16	20	24	28	30
	Approx. lbs. per 1000 ft.	40-48	30-35	15-20	5	4	3

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

THERMOCOUPLE WIRE INSULATED

Type "T" Thermocouple Wire
ANSI Color Code: Positive - Blue, Negative - Red, Overall - Brown

INSULATION	GA.	CODE	*PRICE/1000 FT.	SOLID/ STRANDED	NOMINAL SIZE	INSULATION TEMP. RATING
PVC - Ripcord	24	T-24-P030	$140.	Solid	.048 x .094	221°F (105°C)
Extruded Teflon FEP Singles	20 20	TPF-20-E010 TNF-20-E010	125. 230.	Stranded Stranded	.062	400°F (209°C)
Extruded Teflon FEP Duplex-Parallel Extruded Jacket	20 24	T-20-EE40 T-24-EE40	475. 420.	Solid Solid	.070 x .120 .050 x .080	400°F (204°C)
Extruded Teflon PFA Duplex-Parallel Extruded Clear Jacket	30 36	T-30-FF40 T-36-FF40	420. 475.	Solid Solid	.022 x .042 .018 x .028	500°F (260°C)
Teflon TFE Fused Tape Duplex-Parallel Extruded Jacket	20 24	T-20-TT40 T-24-TT40	485. 430.	Solid Solid	.065 x .110 .050 x .080	500°F (260°C)
Kapton Fused Tape Duplex-Parallel Fused Tape Jacket	20 24 30	T-20-KK40 T-24-KK40 T-30-KK40	1100. 780. 840.	Solid Solid Solid	.057 x .103 .045 x .079 .038 x .063	600°F (316°C)
Glass Wrap Duplex-Parallel Braided Jacket	20 24 30	T-20-WG40 T-24-WG40 T-30-WG40	415. 341. 315.	Solid Solid Solid	.051 x .090 .041 x .069 .032 x .051	900°F (482°C)
Glass Braid Duplex-Parallel Braided Jacket	20 20 24	T-20-GG40 TF-20-GG40 T-24-GG40	415. 630. 310.	Solid Stranded Solid	.060 x .100 .070 x .120 .045 x .080	900°F (482°C)
w/SS Protective Overbraid	20	T-20-GG41	685.	Solid	.090 x .130	

Type "E" Thermocouple Wire
ANSI Color Code: Positive - Purple, Negative - Red, Overall - Brown

PVC-Ripcord	24	E-24-P030	$285.	Solid	.048 x .094	221°F (105°C)
Extruded Teflon FEP Duplex-Parallel Extruded Jacket	20 24	E-20-EE40 E-24-EE40	645. 420.	Solid Solid	.070 x .120 .050 x .080	400°F (204°C)
Extruded Teflon PFA Duplex-Parallel Extruded Clear Jacket	30 36	E-30-FF40 E-36-FF40	420. 475.	Solid Solid	.022 x .042 .018 x .028	500°F (260°C)
Glass Braid Duplex-Parallel Braided Jacket	20	E-20-GG40	570.	Solid	.060 x .100	900°F (482°C)

Type "N" Thermocouple Wire
ANSI Color Code: Positive - Orange, Negative - Red, Overall - Brown

PVC-Ripcord	24	N-24-P030	$275.	Solid	.048 x .094	221°F (105°C)
Extruded Teflon FEP Duplex-Parallel Extruded Jacket	20	N-20-EE40	685.	Solid	.070 x .120	400°F (204°C)
Glass Braid Duplex-Parallel Braided Jacket	20	N-20-GG40	550.	Solid	.060 x .100	900°F (482°C)

*See Discounts and Notes.

THERMOCOUPLE EXTENSION WIRE INSULATED

Type "TX" Thermocouple Extension Wire
ANSI Color Code: Positive - Blue, Negative - Red, Overall - Blue

INSULATION	GA.	CODE	*PRICE/1000 FT.	SOLID/ STRANDED	NOMINAL SIZE	INSULATION TEMP. RATING
PVC Duplex-Parallel Extruded Jacket	16 20 20	TX-16-PP40 TX-20-PP40 TXF-20-PP40	$400. 175. 410.	Solid Solid Stranded	.115 x .190 .095 x .158 .113 x .182	221°F (105°C)
PVC Duplex-Twisted Shield w/Drain Extruded Jacket	16 20	TX-16-PP90 TX-20-PP90	490. 270.	Solid Solid	.220 .184	221°F (105°C)
Extruded Teflon FEP Duplex-Twisted Shield w/Drain Extruded Jacket	16 20	TX-16-EE90 TX-20-EE90	630. 560.	Solid Solid	.220 .131	400°F (204°C)

*See Discounts & Notes on page E-11

Type "EX" Thermocouple Extension Wire
ANSI Color Code: Positive - Purple, Negative - Red, Overall - Purple

PVC Duplex-Parallel Extruded Jacket	20	EX-20-PP40	$375.	Solid	.095 x .158	221°F (105°C)
PVC Duplex-Twisted Extruded Jacket	20	EXF-20-PP80	580.	Stranded	.180	221°F (105°C)
PVC Duplex-Twisted Shield w/Drain Extruded Jacket	16 20	EX-16-PP90 EX-20-PP90	725. 500.	Solid Solid	.220 .184	221°F (105°C)

Type "NX" Thermocouple Extension Wire
ANSI Color Code: Positive - Orange, Negative - Red, Overall - Orange

PVC Duplex-Parallel Extruded Jacket	20	NX-20-PP40	$295.	Solid	.095 x .158	221°F (105°C)

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

THERMOCOUPLE EXTENSION WIRE
INSULATED

Type "RX" or "SX" Thermocouple Extension Wire
ANSI Color Code: Positive - Black, Negative - Red, Overall - Green

INSULATION	GA.	CODE	*PRICE/1000 FT.	SOLID/ STRANDED	NOMINAL SIZE	INSULATION TEMP. RATING
PVC Duplex-Parallel Extruded Jacket	 16 20	 R,SX-16-PP40 R,SX-20-PP40	 $580. 250.	 Solid Solid	 .115 x .190 .095 x .158	221°F (105°C)
PVC Duplex-Twisted Shield w/Drain Extruded Jacket	16 20	R,SX-16-PP90 R,SX-20-PP90	630. 275.	Solid Solid	.220 .184	221°F (105°C)
Extruded Teflon FEP Duplex-Parallel Extruded Jacket	 16 20	 R,SX-16-EE40 R,SX-20-EE40	 700. 460.	 Solid Solid	 .085 x .155 .065 x .110	400°F (204°C)
Teflon TFE Fused Tape Duplex-Parallel Fused Tape Jacket	16	R,SX-16-TT40	890.	Solid	.085 x .155	†500°F (260°C)
Extruded Teflon FEP Duplex-Twisted Shield w/Drain Extruded Jacket	 16 20	 R,SX-16-EE90 R,SX-20-EE90	 840. 500.	 Solid Solid	 .220 .131	400°F (204°C)
Synthetic Fiber Braid Duplex-Parallel Braided Jacket	 16 16	 R,SX-16-SS40 R,SXF-16-SS40	 890. 790.	 Solid Stranded	 .170 x .240 .175 x .250	†500°F (260°C)
Glass Braid Duplex Parallel Braided Jacket	16 20 24	R,SX-16-GG40 R,SX-20-GG40 R,SX-24-GG40	590. 440. 315.	Solid Solid Solid	.110 x .160 .060 x .100 .045 x .080	†900°F (482°C)

† Extension Wire limit 400°F (204°C)

Type "BX" Thermocouple Extension Wire (Alloy PCLW630 vs Copper)
ANSI Color Code: Positive - Gray, Negative - Red, Overall - Gray

Glass Braid Duplex-Parallel Braided Jacket	20	BX-20-GG40	$660.	Solid	.060 x .100	900°F (482°C)

Type "CX" Thermocouple Extension Wire (Alloy 405 vs Alloy 426)
ANSI Color Code: Positive - Orange, Negative - Red, Overall - Orange/Black Tracer

Glass Braid Duplex-Parallel Braided Jacket	24	CX-24-GG40	$830.	Solid	.050 x .090	900°F (482°C)

*See Discounts and Notes Page E-11

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

THERMOCOUPLE WIRE
INSULATED — FINE GAGE

INSULATION	ANSI TYPE	GA.	CODE	*PRICE/1000 FT.	SOLID/ STRANDED	NOMINAL SIZE	INSULATION TEMP. RATING
Extruded Teflon PFA Duplex-Parallel Extruded Clear Jacket	T	30	T-30-FF40	420.	Solid	.022 x .042	500° F (260° C)
		36	T-36-FF40	475.	Solid	.018 x .028	
	J	30	J-30-FF40	370.	Solid	.022 x .042	
		36	J-36-FF40	420.	Solid	.018 x .028	
	E	30	E-30-FF40	420.	Solid	.022 x .042	
		36	E-36-FF40	475.	Solid	.018 x .028	
	K	30	K-30-FF40	360.	Solid	.022 x .042	
		36	K-36-FF40	395.	Solid	.018 x .028	
		40	K-40-FF40	525.	Solid	.015 x .024	

*See Discounts and Notes below.

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

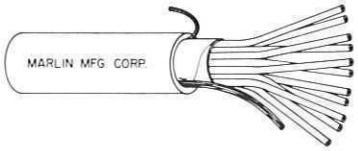
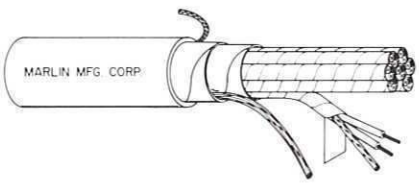
M = 1000

ORDER NOTES	
Code	**Description**
KK, JJ	Double ANSI symbol for special tolerance wire. Consult Factory for availability. Add $30. per MFT to list price. For calibration services see page B-5.
Length	Standard packages are 1000 ft. spools. Shipping variance is plus or minus 10% of total amount ordered.
‡Respooling charge of $10.00 for orders less than 1000 continuous feet.	

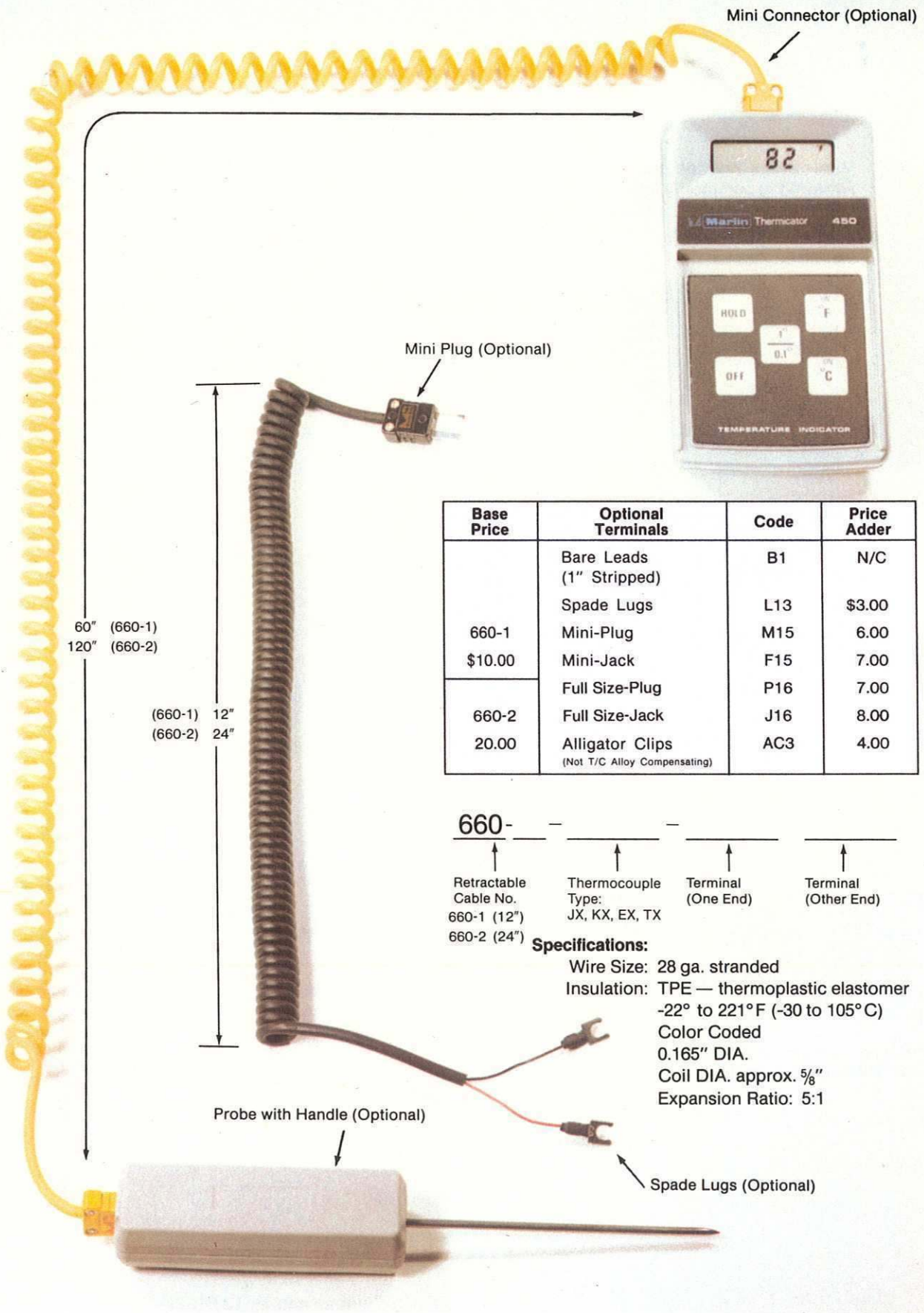
Fine Gage Thermocouple Wire
Teflon PFA insulated
3 mil on each conductor
3 mil jacket
500° F (260° C) Temperature rating

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

THERMOCOUPLE WIRE
MULTIPAIR THERMOCOUPLE EXTENSION CABLE

DESCRIPTION	PVC JACKET THICK-NESS	APPROX. O.D. INCHES	WEIGHT (lbs.) PER 1000 FT	ORDER CODE	PRICE $/FT
				ANSI CODE J,K,T ↓ / B.&S. WIRE GAGE ↓ / NO. OF PAIRS ↓ / LENGTH IN FEET ↓	JX KX TX
	0.045	0.390	75	662-___ X-20 - 4P- _____	
	0.045	0.440	100	- 6P-	
	0.045	0.480	120	- 8P-	
	0.060	0.595	185	-12P-	
	0.060	0.660	225	-16P-	
	0.060	0.685	270	-20P-	
	0.060	0.790	300	-24P-	
	0.080	0.920	425	-36P-	
Twisted Pair Cable • 20 ga. solid thermocouple extension wire • Primary insulation - 15 mils of 105° C PVC • Paired construction - duplex twisted pairs • Each pair numbered for ready identification • ANSI color coded • Shielding of cabled pairs - clear mylar bedding tape 2 mil, 20 ga. stranded copper drain wire and 100% coverage of aluminum mylar tape 2 mil. • Communications wire - 20 ga. PVC insulated, solid, copper • Overall jacket 90° C PVC with easy-strip thread					**CONSULT FACTORY** **Minimum Order Quantity 250 ft.**
				ANSI CODE J,K,T ↓ / B.&S. WIRE GAGE ↓ / NO. OF PAIRS ↓ / LENGTH IN FEET ↓	
	0.045	0.460	90	665-___ X-20 - 4P- _____	
	0.045	0.575	140	- 6P-	
	0.045	0.625	175	- 8P-	
	0.060	0.750	250	-12P-	
	0.060	0.825	300	-16P-	
	0.060	0.975	400	-20P-	
	0.060	1.050	450	-24P-	
	0.080	1.200	640	-36P-	
Twisted Shielded Pair Cable • 20 ga. solid thermocouple extension wire • Primary insulation - 15 mils of 105° C PVC • Paired construction - duplex twisted shielded pairs - isolation of pairs • Shielding of each pair - 100% coverage of aluminum mylar tape - 1 mil 22 ga. stranded copper drain wire • Each pair numbered for ready identification • ANSI color coded • Shielding of cabled pairs - clear mylar bedding tape 2 mil, 20 ga. stranded copper drain wire and 100° C coverage of aluminum mylar tape 2 mil. • Communications wire - 20 ga., PVC insulated, solid, copper • Overall jacket 90°C PVC with easy-strip thread					**CONSULT FACTORY** **Minimum Order Quantity 250 ft.**

THERMOCOUPLE WIRE
RETRACTABLE EXTENSION CABLE



Base Price	Optional Terminals	Code	Price Adder
	Bare Leads (1″ Stripped)	B1	N/C
	Spade Lugs	L13	$3.00
660-1	Mini-Plug	M15	6.00
$10.00	Mini-Jack	F15	7.00
	Full Size-Plug	P16	7.00
660-2	Full Size-Jack	J16	8.00
20.00	Alligator Clips (Not T/C Alloy Compensating)	AC3	4.00

660- ___ – _____ – _____ _____

- ___ — Retractable Cable No. 660-1 (12″) 660-2 (24″)
- _____ — Thermocouple Type: JX, KX, EX, TX
- _____ — Terminal (One End)
- _____ — Terminal (Other End)

Specifications:

Wire Size: 28 ga. stranded
Insulation: TPE — thermoplastic elastomer
-22° to 221°F (-30 to 105°C)
Color Coded
0.165″ DIA.
Coil DIA. approx. 5/8″
Expansion Ratio: 5:1

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

THERMOCOUPLE WIRE
BARE, BASE METAL

Marlin offers thermocouple wire in popular ANSI calibrations and in commonly used sizes. 8 Ga. and larger sizes are shipped in coils; 14 Ga. and smaller are shipped on non-returnable spools.

BASE METAL THERMOCOUPLE WIRE					Price $ per Lb.	Standard Package C-Coil S-Spool	Finish Availability 1-Bright 2-Oxidized 3-Rust Veto
Wire Type	Element Polarity	Wire Ft./Lb.	Type Code	AWG			
Iron	Positive (+)	22.8	JP	8	12.00	60lb - C	3
		91.2		14	15.00	25lb - S	3
		365		20	17.00	25lb - S	1
Constantan	Negative (-)	20.2	JN	8	29.00	60lb - C	1
		80.9		14	30.00	25lb - S	1
		324		20	32.00	25lb - S	1
Chromel	Positive (+)	21	KP	8	35.50	60lb - C	1, 2
		83		14	37.00	25lb - S	1, 2
		130		16	38.00	25lb - S	1, 2
		331		20	42.00	25lb - S	1
		838		24	48.00	5lb - S	1
Alumel	Negative (-)	21	KN	8	35.50	60lb - C	1, 2
		83		14	36.50	25lb - S	1, 2
		130		16	37.00	25lb - S	1, 2
		331		20	41.00	25lb - S	1
		838		24	46.00	5lb - S	1

Quality In lbs.	Discount Factor
1 - 24 lbs.	Net *
25 - 99 lbs.	.95
100 - 499 lbs.	.90
500 - 1999 lbs.	.85
2000 lbs. +	.80

*Respooling charge of $10 for less than Standard Pkg. Quantity.

Order Code:

KN	-	8	-	2	-	60 lbs.
KP	-	8	-	2	-	60 lbs.
Type Code		Wire Ga.		Finish 1 - Bright 2 - Oxidized 3 - Rust Veto		Quantity

(Bare wire coils or spools may vary significantly due to production melt sizes, e.g. If you order 40 lbs. and receive 47 lbs. on a spool, we reserve the right to overship.)

Bare wire is sold in matched pairs. Please order equal amounts of each element.

THERMOCOUPLE WIRE
BARE, HIGH TEMPERATURE

Code Type	Element Polarity	Wire In/TOz	Type Code	Wire Diameter	AWG	Price
PT- 10% Rh	Positive (+)	46.4 118.0 302.2 715.2	SP	0.050 0.032 0.020 0.012 0.010	16 20 24 28 30	Consult Factory
PT-	Negative (-)	43.3 110.0 281.6 666.6	SN	0.050 0.032 0.020 0.012 0.010	16 20 24 28 30	Consult Factory
PT- 13% Rh	Positive (+)	47.4 120.4 308.3 729.8	RP	0.050 0.032 0.020 0.012 0.010	16 20 24 28 30	Consult Factory
PT-	Negative (-)	43.3 110.0 281.6 666.6	RN	0.050 0.032 0.020 0.012 0.010	16 20 24 28 30	Consult Factory
PT- 30% Rh	Positive (+)	52.7 134.0 343.1 812.3	BP	0.050 0.032 0.020 0.012 0.010	16 20 24 28 30	Consult Factory
PT- 6% Rh	Negative (-)	45.2 114.8 294.0 695.8	BN	0.050 0.032 0.020 0.012 0.010	16 20 24 28 30	Consult Factory
Tungsten 5% Rhenium vs Tungsten 26% Rhenium		—	C	0.020 0.010	24 30	Consult Factory

Pt = Platinum
Rh = Rhodium

Bare wire is sold in matched pairs. Please order equal amounts of each element.

Order Code:

SP	-	**24**	-	**120 inches**
SN	-	**24**	-	**120 inches**
Type Code		Wire Ga.		Length

NOTICE:

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

TEMPERATURE INSTRUMENATION
for
Research and Industry

MARLIN MANUFACTURING CORPORATION

12404 Triskett Road Cleveland, Ohio 44111
216 941-6200 (216-941-6207) FAX

NOTES

THERMOCOUPLE CONNECTORS—STRIPANELS

- 2-POLE MINIATURE/FULL SIZE
- 3-POLE MINIATURE/FULL SIZE

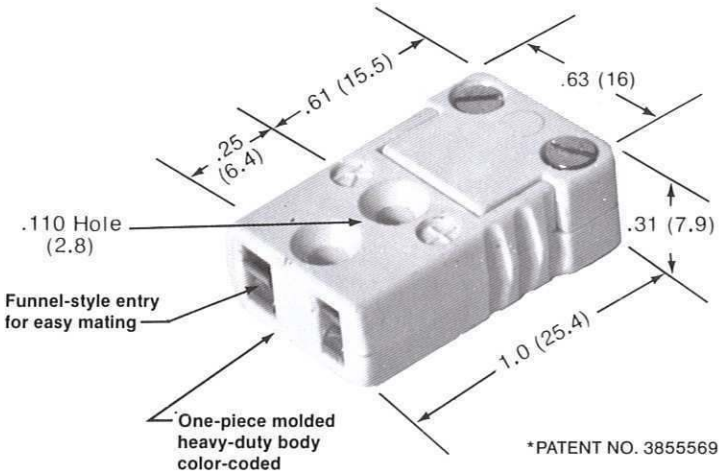
SELECTOR SWITCHES
TERMINAL HEADS/LUGS/HANDLE

Since 1952

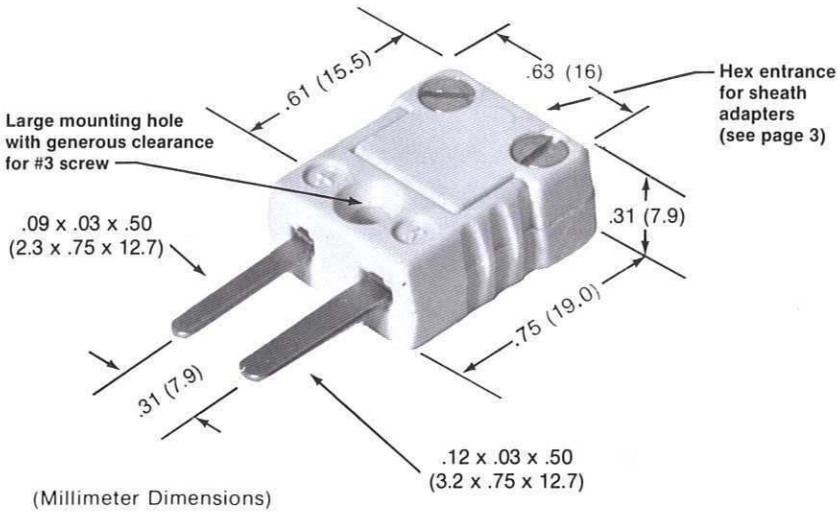
Marlin MANUFACTURING CORPORATION

12404 TRISKETT ROAD CLEVELAND, OHIO 44111
216-941-6200 (FAX 216-941-6207)

ACTUAL SIZE



JACK



(Millimeter Dimensions)

PLUG

MINI PLUG AND JACKS

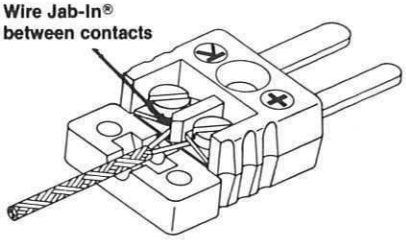
Miniature plugs and jacks provide dependable, quick connections and easy installation of fine thermocouple wire and sheath. Accepts wire from .001″ diameter to 24 gauge.

Polarized pins make it virtually impossible to mismate. Large double wipe jack inserts assure tight grip and low signal loss. Due to exclusive isolated screw design, contact is all thermocouple alloy from wire entrance to wire exit. ANSI calibration symbol and polarity symbol are molded on connector face. Surface mounting and stacking made easy by molded-in clearance holes.

Mini-connectors are molded from glass filled, high strength, thermoset compounds that will not melt. Mini-connectors are color coded and can be used in ambient temperatures to 400°F (205°C) continuous and 500°F (260°C) intermittent. Hi-Temp Mini connectors are colored red and can be used to 800°F (425°C) continuous and 1000°F (540°C) intermittent.

Exclusive Jab-In® terminals require only ¼″ of insulation removed. Wire is sandwiched between contacts of thermocouple alloy without damage. Looped wire ends are eliminated. Simple two-piece construction. Removable cap with semi-captive screws exposes terminals without loose parts falling out. Elastomer bushing provides wire strain relief. Braze-on sheath adapters are brazed or soldered to sheath. Crimp-on adapters are crimped on sheath using crimp tool. Bushings and adapters are locked into connector by cap.

For corrosive applications, gold plated contacts are available. Caution — system errors can result from use of plated contacts if significant thermal gradient exist at connector.



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

CONNECTORS
MINI PLUGS AND JACKS

MINI PLUGS AND JACKS		400°F Continuous Ambient				800°F Continuous Ambient			
THERMOCOUPLE TYPE	TYPE CODE	COLOR	PLUG CODE NO.	JACK CODE NO.	DISCOUNT SCHEDULE	COLOR	HI TEMP PLUG CODE NO.	HI TEMP JACK CODE NO.	DISCOUNT SCHEDULE
Iron Constantan	J	Black				Red			
Copper Constantan	T	Blue				Red			
Chromel™ Alumel™	K	Yellow				Red			
Nicrosil Nisil	N	Orange	1260-( )	1210-( )	A	Red	1360-( )	1310-( )	B
Chromel™ Constantan	E	Violet	TYPE Code ↑	TYPE Code ↑		Red	TYPE Code ↑	TYPE Code ↑	
Platinum 10% Rhodium	S	Green	$2.65	$3.30		Red	$4.25	$5.25	
Platinum 13% Rhodium	R	Green				Red			
Uncompensated (CU)	U	White				Red			
Tungsten 5% Re/W26% Re	C	Brown	$3.65	$4.30	B	Red	$5.25	$6.25	B

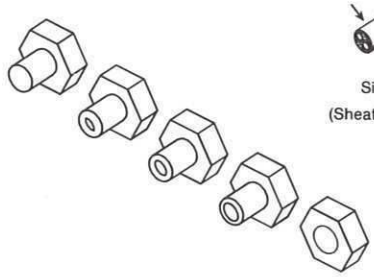
1.) Gold plated contacts are available at $1.00 added to list price. Use suffix "G" (i.e. 1260-K-G)

Grommet Wire Grip			
Code No.	Size	$/Each	Discount Schedule
1279-030	.030″	0.15	A
1279-062	.062″	0.15	
1279-090	.090″	0.15	

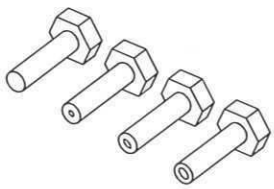
Option 1: Grommet is furnished with each connector at no cost. Give part number of desired size otherwise 1279-062 is furnished as the standard package.

Mini Braze-on Adapter			
Code No.	Size	$/Each	Discount Schedule
1277-000	blank	0.30	A
1277-040	.040″	0.30	
1277-062	.062″	0.30	
1277-090	.090″	0.30	
1277-125	.125″	0.30	

Option 2: Braze-on Adapter is furnished with each connector at no cost instead of grommets specified. Give part number of desired size.

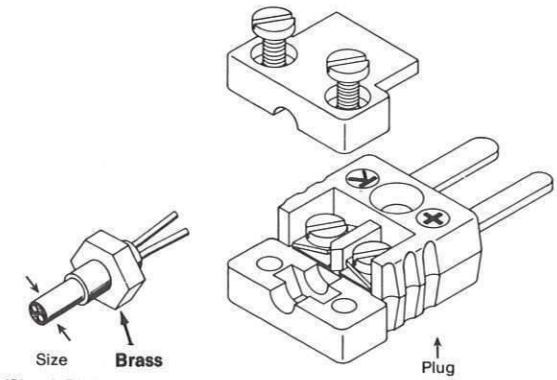


Mini Hex Crimp Adapter			
Code No.	Size	$/Each	Discount Schedule
1275-000	blank	0.40	A
1275-020	.020″	1.30	
1275-040	.040″	0.40	
1275-062	.062″	0.40	



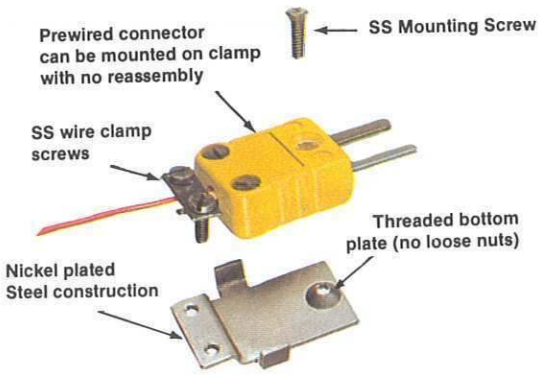
Mini 2-Pole Crimp Adapter			
Code No.	Size	$/Each	Discount Schedule
1274-040	.040″	1.75	B
1274-062	.062″	1.75	
1274-125	.125″	1.75	

Mini Wire Clamp		
Code No.	$/Each	Discount Schedule
1280	1.25	B



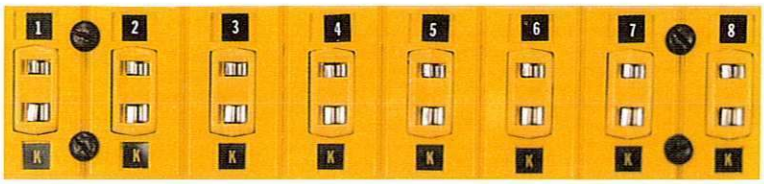
DISCOUNT SCHEDULE "A"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

DISCOUNT SCHEDULE "B"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75



MINI WIRE CLAMP
Strain relieves fine wire as well as heavy insulated wire.

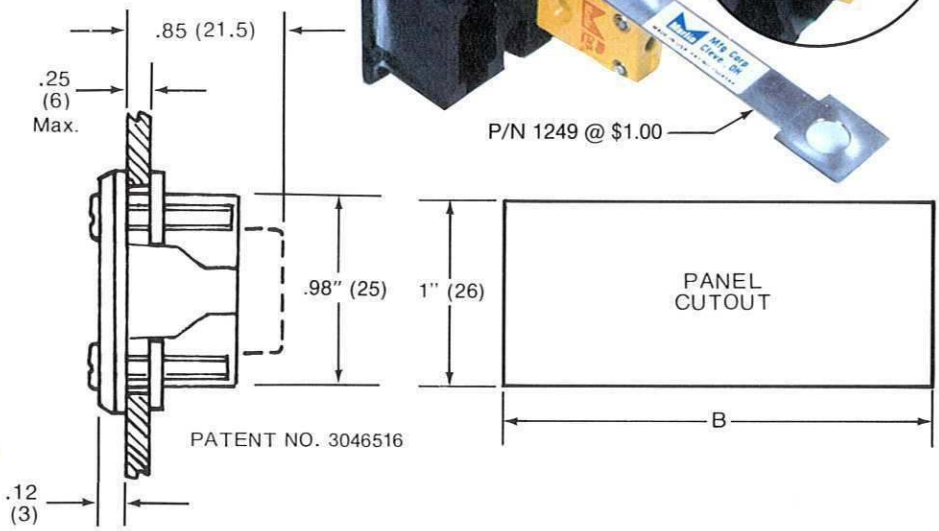
Since 1952 Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207



To remove connector from panel insert release key in slot above connector.

Slide out connector.

To install simply push connector into panel until spring locks.



No. 1237 Miniature Stripanels are molded panels designed to mount No. 1210 miniature Jacks. Connectors are installed from the rear and snap in place with spring clips. They are easily removed by releasing spring clip with a release key. No loose connector mounting hardware. Circuit identification is distinct as each circuit is numbered, lettered and color coded to ANSI standards. Self contained hardware provides front mounting in panels to ¼" thick. Stripanel is molded of color coded thermoset compound that withstands ambient temperatures to 400°F (205°C) continuous and 500°F (260°C) intermittent. High temperature panels that will withstand ambient temperatures to 800°F (425°C) continuous and 1000°F (540°C) intermittent are molded of a red thermoset compound.

For corrosive application, gold plated contacts are available. Caution — system errors can result from use of plated contacts if significant thermal gradients exist at connection.

Available in modules from 2 circuits to 8 circuits. Standard stripanels are provided with Mini Jacks for horizontal mounting, as shown.

NUMBER OF CIRCUITS	"A" DIMENSION PANEL OAL		"B" DIMENSION CUTOUT LENGTH	
2	1.38"	32mm	1.25"	32mm
3	2.06"	52mm	1.94"	50mm
4	2.75"	70mm	2.63"	67mm
5	3.44"	87mm	3.31"	84mm
6	4.13"	105mm	4.00"	102mm
7	4.81"	122mm	4.69"	120mm
8	5.50"	140mm	5.38"	137mm

TO ORDER:

1. Give Stripanel No. 1237 - 6 - J
2. Specify Number of circuits
3. Specify Thermocouple Type
4. For Hi-Temp Stripanel: 1337 - 6 - J
5. For vertical rows add suffix "V" e.g. 1237 - 6 - J - V

MINI STRIPANEL (400°F Continuous Ambient)			
No. of Circuits	Mini Panel Part No.	Price $/Panel	Discount Schedule
2	1237-2-*	$10.00	
3	1237-3-*	15.00	
4	1237-4-*	20.00	
5	1237-5-*	25.00	A
6	1237-6-*	30.00	
7	1237-7-*	35.00	
8	1237-8-*	40.00	

MINI STRIPANEL (800°F Continuous Ambient)			
No. of Circuits	Hi-Temp Mini Panel Part No.	Price $/Panel	Discount Schedule
2	1337-2-*	$16.00	
3	1337-3-*	24.00	
4	1337-4-*	32.00	
5	1337-5-*	40.00	B
6	1337-6-*	48.00	
7	1337-7-*	56.00	
8	1337-8-*	64.00	

*Thermocouple Type Code: J, K, T, N, E, R, S, U
1.) For "Type C" add $1.00/Circuit. Use discount schedule "B"
2.) Gold plated contacts add $1.00 to list and use suffix "G" (i.e. 1237-2-K-G)

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

CONNECTORS
MINI STRIPANEL® WITH MOUNTING FRAME

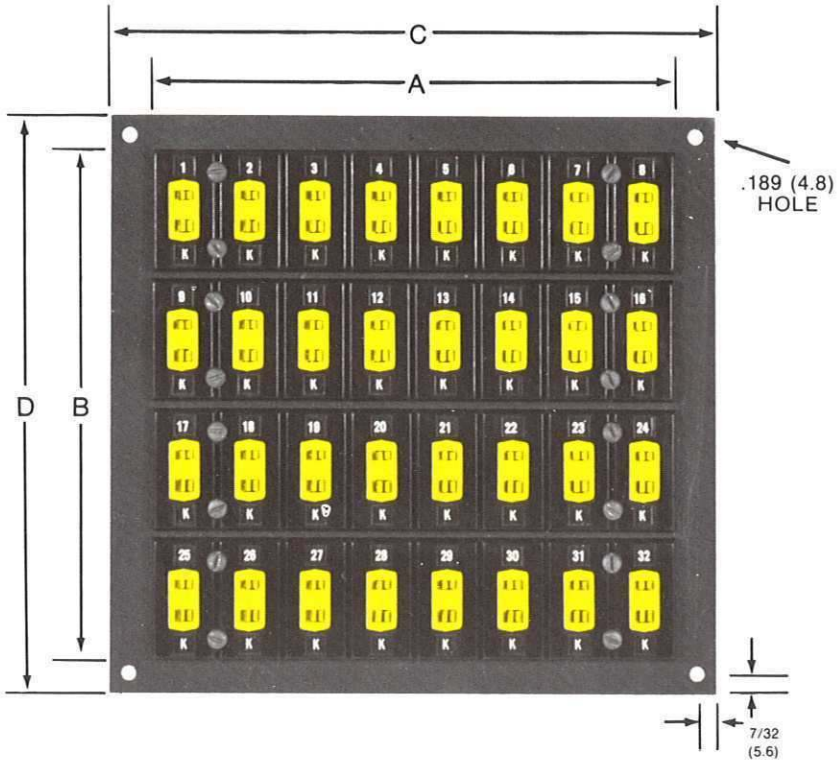
Mini Stripanel with mounting frame is a pre-assembled unit, ready for quick installation. Stripanel modules are mounted to a metal frame (3/32″ thick). Each circuit is numbered, color coded and lettered with type code. (Hi-Temp Panels are color coded red.)

Available in any combination of rows and circuits per row. Standard sizes shown to table below. Standard Stripanels are provided with jacks loose packed for plug-in installation after wire hook-up. Horizontal mounting shown.

Stripanels with vertical mounting, mixed calibration or plugs instead of jacks are available upon request.

To order:

1. Give Code No. → 1238 - 4 X 10 - 40 - K
2. Specify no. of horizontal rows
3. Specify no. of circuits per row
4. Give total number of circuits
5. Give ANSI Thermocouple Code
6. For vertical rows use suffix "V"
   e.g. 1238 - 4 X 10 - 40 - K - V



TOTAL CIRCUITS

NUMBER OF ROWS	NUMBER OF CIRCUITS PER ROW 2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	D FRAME HEIGHT	B CUTOUT HEIGHT	PRICE 1238-	HI-TEMP PRICE 1338-
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	2″ (51mm)	1 3/8″ (35mm)		
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	3 5/16″ (85mm)	2 11/16″ (69mm)		
3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	4 5/8″ (118mm)	4″ (102mm)	$6.50 per circuit Discount Schedule "A"	$9.50 per circuit Discount Schedule "B"
4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	5 15/16″ (151mm)	5 5/16″ (135mm)		
5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	7 1/4″ (185mm)	6 5/8″ (169mm)		
6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	8 9/16″ (218mm)	7 15/16″ (202mm)		
7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	9 7/8″ (251mm)	9 1/4″ (235mm)		
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	11 3/16″ (285mm)	10 9/16″ (269mm)		
9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	12 1/2″ (318mm)	11 7/8″ (302mm)		
10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	13 13/16″ (351mm)	13 3/16″ (335mm)		
C FRAME WIDTH	2 1/4″ (58mm)	2 15/16″ (75mm)	3 5/8″ (92mm)	4 5/16″ (110mm)	5″ (127mm)	5 11/16″ (145mm)	6 3/8″ (162mm)	7 1/16″ (180mm)	7 3/4″ (197mm)	8 7/16″ (215mm)	9 1/8″ (232mm)	9 13/16″ (250mm)	10 1/2″ (267mm)	11 3/16″ (285mm)	11 7/8″ (302mm)	Other arrangements available—Consult Factory			
A CUTOUT WIDTH	1 3/8″ (35mm)	2 1/16″ (53mm)	2 3/4″ (70mm)	3 7/16″ (88mm)	4 1/8″ (105mm)	4 13/16″ (123mm)	5 1/2″ (140mm)	6 3/16″ (158mm)	6 7/8″ (175mm)	7 9/16″ (192mm)	8 1/4″ (210mm)	8 15/16″ (227mm)	9 5/8″ (245mm)	10 5/16″ (262mm)	11″ (280mm)				

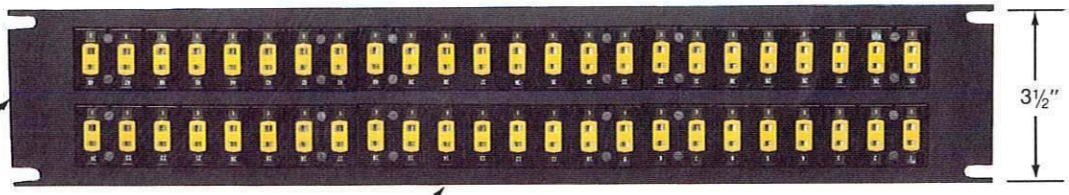
1. Hi-temp panels available.
   e.g. 1338-4 x 10-40-K
   (Hi-Temp Panels and connectors are color coded red.)
2. Availability: J,K,T,N,E,R,S,U; also "C" EXCEPT ADD $1.00 to circuit price with maximum .75 discount factor for regular or hi-temp.
3. Gold plated contacts are available at $1.00 per circuit. Add to list price. Use suffix "G" (i.e. 1338-4x10-40-K-G)

DISCOUNT SCHEDULE "A"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

DISCOUNT SCHEDULE "B"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75

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

CONNECTORS
19" RACK - MOUNTED MINI STRIPANEL® 2-POLE



Heavy Duty Steel Frame is sturdy, will not flex in use.

Universal 19" Rack Frame No. 1241
2-24 circuits supplied in single row.
25-48 circuits supplied in double row.

- Universal 19" Racks accept 2 to 48 Circuits of No. 1237 Mini Stripanels. Up to 24 circuits in a single row or up to 48 in a double row may be supplied.
- Circuits can be added in the field without changing frame.
- Thermocouple types can be mixed within panel with each type color coded.
- 19" Rack Frame is made of sturdy 10 ga. steel that will not flex in use. Standard frame is flat black. High-Temp frame is bright silver finish.
- Thermocouple type and circuit numbers are marked on face of Stripanel. Stripanels are numbered starting from "1" unless specified otherwise.
- Stripanels are molded of glass filled thermoset compounds (will not melt) for high strength and dependability. The color coded panels will withstand ambient temperatures to 400° F (205° C) continuous and 500° F (260° C) intermittent. High-temperature panels (All Hi-Temp panels are color coded red) will withstand ambient temperatures to 800° F (425° C) continuous and 1000° F (540° C) intermittent.
- Inserts are spring loaded to assure positive contact with the negative insert larger to make it virtually impossible to mismate.
- For corrosive applications, gold plated inserts are available. Caution — system errors can result from use of plated contacts if significant thermal gradients exist at connector.

CALIB. MARK	INSERT MAT'L. ALLOY		COLOR CODE	HI-TEMP COLOR CODE
	POSITIVE	NEGATIVE		
J	IRON	CONSTANTAN	BLACK	
T	COPPER	CONSTANTAN	BLUE	
K	CHROMEL™	ALUMEL™	YELLOW	
N	NICROSIL	NISIL	ORANGE	
R	COPPER	#11 ALLOY	GREEN	RED
S	COPPER	#11 ALLOY	GREEN	
E	CHROMEL™	CONSTANTAN	VIOLET	
U	COPPER	COPPER	WHITE	
C*	#405 ALLOY	#426 ALLOY	BROWN	

*For type "C" add $1.50 per circuit to list price and discount schedule "B" applies for regular or hi-temp.

Gold plated inserts are available at $1.00 per circuit. Add to list price. Use suffix "G" (i.e. 1241-48-K-G)

TO ORDER:

1. Give Code No. 1241 - 48 - K
2. Specify number of circuits
3. Designate Thermocouple Type by Code
4. For Hi-Temp Stripanel: 1341 - 48 - K

Price:

Standard 1241 Frame & Stripanel
1241 Std. Frame @ $50.
Std. Circuits @ $5.00/circuit
Discount Schedule "A" applies

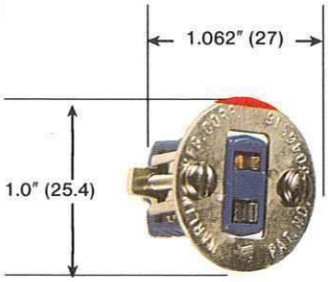
Hi-Temp Frame & Stripanel
1341 Hi-Temp Frame @ $60.
Hi-Temp Circuits @ $8.00/circuit
Discount Schedule "B" applies

Example:

1241-48 Frame	$50
(48) Std. Circuits @ $5.00	240
Total Price (1241 - 48 - K)	$290

DISCOUNT SCHEDULE "A"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

DISCOUNT SCHEDULE "B"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75



3/4" KNOCKOUT
ADAPTER PLATE

MINI RSC PANEL JACK

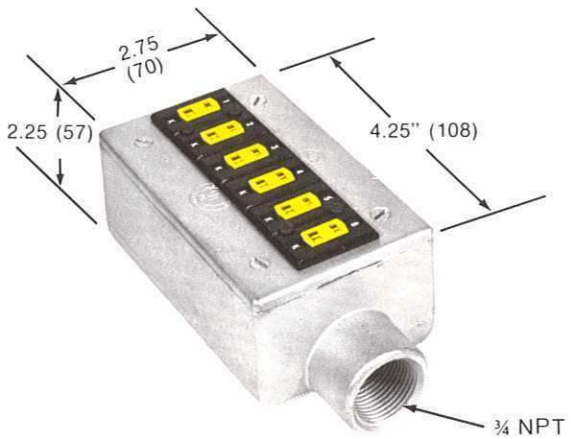
Mini round single circuit (RSC) module is assembled in bracket, for direct mounting in standard 1/2" electrical box knockout. Self-contained hardware provides front mounting in panels to 1/4" thick. ANSI calibration symbol and color code easily visible from the front. Adaptor available for 3/4" knockout.

DESCRIPTION	CODE NO.	PRICE	DISC. SCHED.
Mini RSC Panel	1231-*	$6.00	B
Adapter Plate for 3/4" knockout	APD-34	1.00	

*with Adapter Plate back side of mounting must be accessable.

When ordering, specify part number, adding ANSI calibration code * as a suffix.

MINI RSC MOUNTING HARDWARE (if ordered separately)			DISCOUNT SCHEDULE
Mini RSC Hardware	1295	$3.00	B



MINI PANEL IN CONDUIT BOX

Mini Stripanel modules are mounted in conduit box, cast aluminum construction. Circuits are color coded, numbered and lettered with ANSI calibration code. Available with 2 thru 6 circuits. Standard panels are provided with Mini Jacks.

NUMBER OF CIRCUITS	CODE NO.	PRICE	DISCOUNT SCHEDULE
2	1239-2-*	$34.00	B
3	1239-3-*	39.00	
4	1239-4-*	44.00	
5	1239-5-*	49.00	
6	1239-6-*	54.00	

When ordering, specify part number,
adding ANSI calibration code * as a suffix.

STANDARD TO MINI ADAPTER

Provides a reliable connection between a standard two pole plug and a mini jack. Available in J or K only.

DESCRIPTION	CODE NO.	PRICE	DISC. SCHED.
STANDARD TO MINI ADAPTER	1044-J 1044-K	$5.00	B

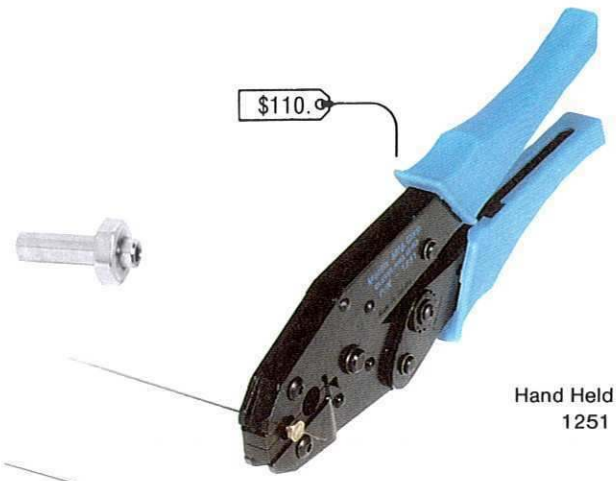
Adapter Crimping Tools provide fast and easy installation of Plugs and Jacks to metal sheathed thermocouple wire. The hand held tool crimps the brass adapter for miniature connectors onto the metal sheath and eliminates the need to braze or solder. The tool is engineered to insure a positive crimp. Jaws cannot be reopened until the full crimp stroke has been made.

To install, strip sheath from cable to expose wires. Place crimp-on sheath adapter over sheath, hex end toward stripped wires. Position tool jaws over adapter and crimp.

DISCOUNT SCHEDULE "A"	
QUANTITY	**FACTOR**
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

DESCRIPTION	CODE NO.	*PRICE
Hand-Crimping Tool	1251	$110.00

*No Discounts

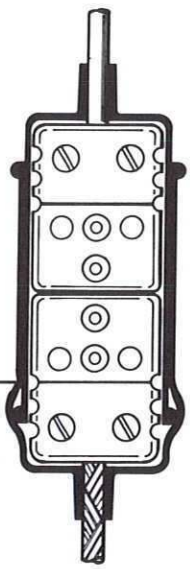


Hand Held Tool
1251

MINI HEX CRIMP-ON ADAPTERS

SHEATH OD	CODE NO.	PRICE	DISC. SCHED.
Blank	1275-Blank	$0.40	A
.020"	1275-020	1.20	
.040"	1275-040	0.40	
1/16	1275-062	0.40	

DESCRIPTION	CODE NO.	PRICE	DISC. SCHED.
Elastomer Grommet Wire grip	1279	$0.15	A



MINI WATER SEAL BOOTS

DESCRIPTION	CODE NO.	PRICE	DISC. SCHED.
Miniature Water Seal Boot	1291	$1.10	A

Two Required for Connector Pair.
For use to 212°F (100°C), stiffens at −37°F (−35°C).

FULL SIZE WATER SEAL BOOTS

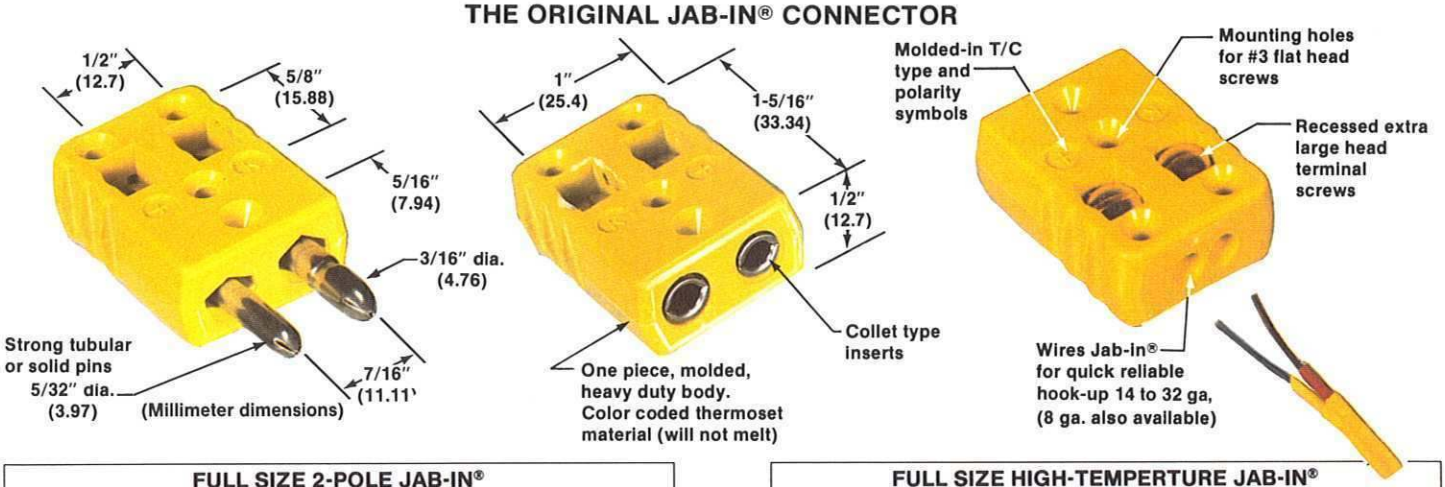
DESCRIPTION	CODE NO.	PRICE	DISC. SCHED.
Standard Water Seal Boot	1091	$1.40	A

Two Required for Connector Pair.
Neoprene for use to 212°F (100°C), stiffens at −37°F (−35°C)

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

CONNECTORS
FULL SIZE — 2-POLE — JAB-IN®

THE ORIGINAL JAB-IN® CONNECTOR



FULL SIZE 2-POLE JAB-IN®			
CODE NO.	PRICE EACH	DESCRIPTION	DISC. SCHED.
1064 - *	$2.85	Jab-in® Plug	A
1054 - †	4.85	Solid Pin Plug	
1014 - *	4.50	Jab-in® Jack	

* - Tubular Pin Availability: J,K,T,N,E,R,S,U also "C" EXCEPT ADD $1.50 to price of plug or jack with maximum .75 discount factor for regular or hi-temp.

† - Solid Pin Availability: J,K,T,E,R,S,U.

1 - For connectors that will accept 8 ga. add suffix "8" e.g. 1064-K-8 (8 ga. units will not accept smaller ga.; not avail. in solid pin or Hi-Temp.) add $1.00 to list price.

ONE-PIECE CONSTRUCTION

- Molded completely in one piece, Jab-In® connectors eliminate terminal cap and fasteners. There are no loose parts to fumble or lose.
- Twin molded-in channels allow user to jab in wires for quick, reliable hook-up. Wires can be installed or removed in seconds.
- Prongs and inserts are permanently mounted; provide dependable screw connection to extension wires.

RECESSED TERMINAL SCREWS

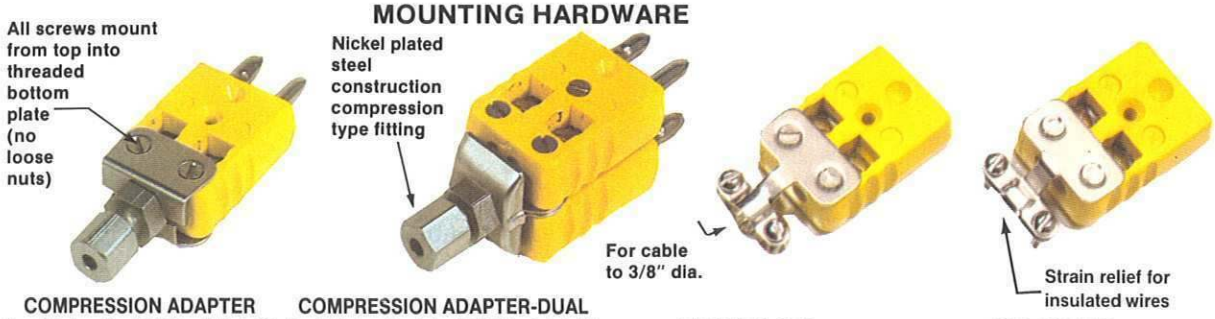
- Terminal screws are exposed for fastest, easiest access to connections. Deeply recessed in terminal body, screws are out of the way and protected from mechanical damage.
- Large head brass screws hold connections tight on stranded or solid wire without damaging the wire, exclusive jab-In® construction eliminates the need to turn down ends.
- Accommodate wire sizes from 14 gauge stranded to 32 gauge inclusive. 8 ga. also available see note 1.
- Alloys of prongs and inserts match ANSI calibrations to maintain sensing accuracy. Alloy and polarity are identified by symbols molded into body.

FULL SIZE HIGH-TEMPERTURE JAB-IN®			
CODE NO.	PRICE EACH	DESCRIPTION	DISC. SCHED.
1164 - *	$6.60	HT Jab-in® Plug	B
1154 - †	8.30	HT Solid Pin Plug	
1114 - *	9.00	HT Jab-in® Jack	

- Connector bodies molded of glass filled thermoset compounds (will not melt) for high strength and dependability. The color coded connectors will withstand ambient temperatures to 400°F (205°C) continuous and 500°F (260°C) intermittent. High-Temperature (All Hi-Temp are color coded red) will withstand ambient temperatures to 800°F (425°C) continuous and 1000°F (540°C) intermittent.
- Inserts are spring loaded collet type to assure positive full contact with the negative insert larger making it virtually impossible to mismate.

TYPE CODE	INSERT MAT'L. ALLOY		COLOR CODE
	POSITIVE	NEGATIVE	
J	IRON	CONSTANTAN	BLACK
T	COPPER	CONSTANTAN	BLUE
K	CHROMEL™	ALUMEL™	YELLOW
N	NICROSIL	NISIL	ORANGE
R	COPPER	#11 ALLOY	GREEN
S	COPPER	#11 ALLOY	GREEN
E	CHROMEL™	CONSTANTAN	VIOLET
U	COPPER	COPPER	WHITE
C	#405 ALLOY	#426 ALLOY	BROWN
(ALL HI-TEMP CONNECTORS)			RED

MOUNTING HARDWARE



COMPRESSION ADAPTER (metal sheathed T/C to Jab-In®)

CODE NO.	PRICE
1072-*	$2.10

COMPRESSION ADAPTER-DUAL (metal sheathed dual T/C to Jab-In®)

CODE NO.	PRICE
1071-*	$4.50

CABLE CLAMP

CODE NO.	PRICE
1082	$1.35

WIRE CLAMP

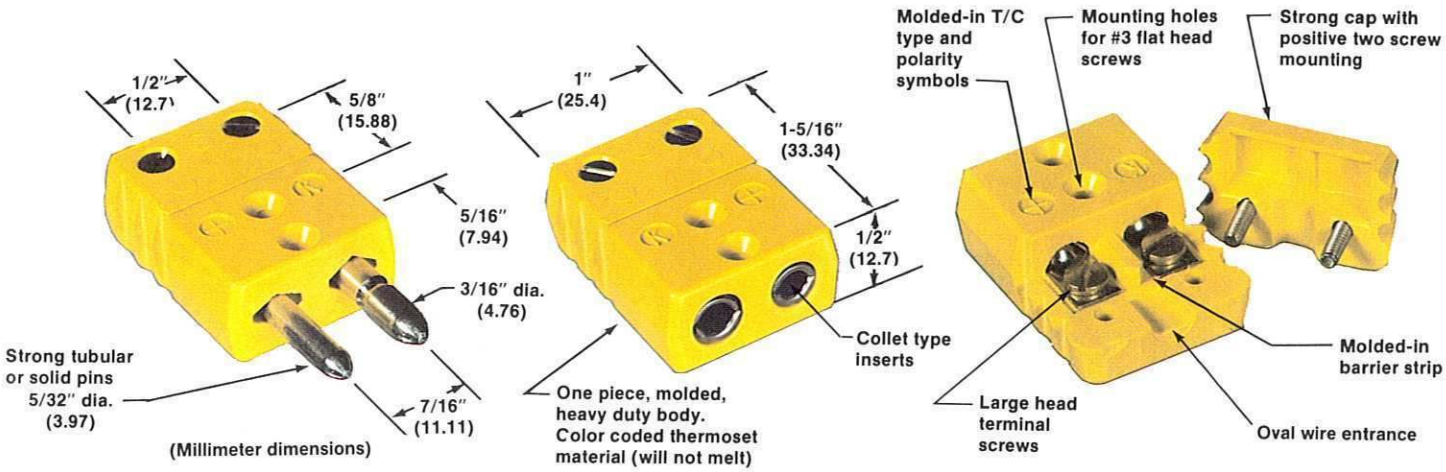
CODE NO.	PRICE
1086	$1.35

DISC. SCHED.
B

Specify Size: Blank, .040", .062", .125", .187", .250", .312", .375"
*Code: 000, 040, 062, 125, 187, 250, 312, 375

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

CONNECTORS
FULL SIZE — 2-POLE



FULL SIZE 2-POLE			
CODE NO.	PRICE EACH	DESCRIPTION	DISC. SCHED.
1060 - *	$2.85	Plug	A
1050 - †	4.85	Solid Pin Plug	
1010 - *	4.50	Jack	

- 2-Pole Connector plugs and jacks are made to exacting specifications to provide rapid, dependable connections between thermocouples and extension wires.
- Alloys of prongs and inserts match ANSI calibrations to maintain sensing accuracy. Alloy and polarity are identified by symbols molded into body.
- Connector bodies molded of glass filled thermoset compounds (will not melt) for high strength and dependability. The color coded Connectors will withstand ambient temperatures to 400° F (205° C) continuous and 500° F (260° C) intermittent. High-Temperature Connectors (All Hi-Temp Connectors are color coded red) will withstand ambient temperatures to 800° F (425° C) continuous and 1000° F (540° C) intermittent.
- Inserts are spring loaded collet type to assure positive full contact with the negative insert larger making it virtually impossible to mismate.
- For corrosive applications, gold or nickel plated prongs and inserts are available. Caution — system errors can result from use of plated contacts if significant thermal gradients exist at connector.

For gold plating use suffix "G" (i.e. 1060-K-G) @ $1.00 add to list.
For nickel plating use suffix "P" (i.e. 1060-K-P) @ $0.50 add to list.

DISCOUNT SCHEDULE "A"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

DISCOUNT SCHEDULE "B"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75

FULL SIZE HIGH-TEMPERATURE 2-POLE				
CODE NO.	PRICE EA.	DESCRIPTION	COLOR CODE	DISC. SCH.
1160 - *	$6.60	Hi-Temp Plug	RED	B
1150 - †	8.30	Solid Pin Plug		
1110 - *	9.00	Hi-Temp Jack		

* - Tubular Pin Availability: J,K,T,N,E,R,S,U, also "C" EXCEPT ADD $1.50 price of plug or jack with maximum .75 discount factor for regular or hi-temp.
† - Solid Pin Availability: J,K,T,E,R,S,U.

MOUNTING HARDWARE FOR 2-POLE CONNECTOR

- Nickel Plated Construction.
- All screws mount from top into threaded bottom plate. (no loose nuts)

CABLE CLAMP		
CODE NO.	PRICE EA.	DISCOUNT SCHEDULE
1080	$1.35	B
1088 w/mtg. stud	$2.00	

WIRE CLAMP		
CODE NO.	PRICE EA.	DISCOUNT SCHEDULE
1084	$1.35	B
1085 w/mtg. stud	$2.00	

CRIMP ADAPTER		
CODE NO.	PRICE EA.	DISCOUNT SCHEDULE
1074-125 1074-187	$2.00	B

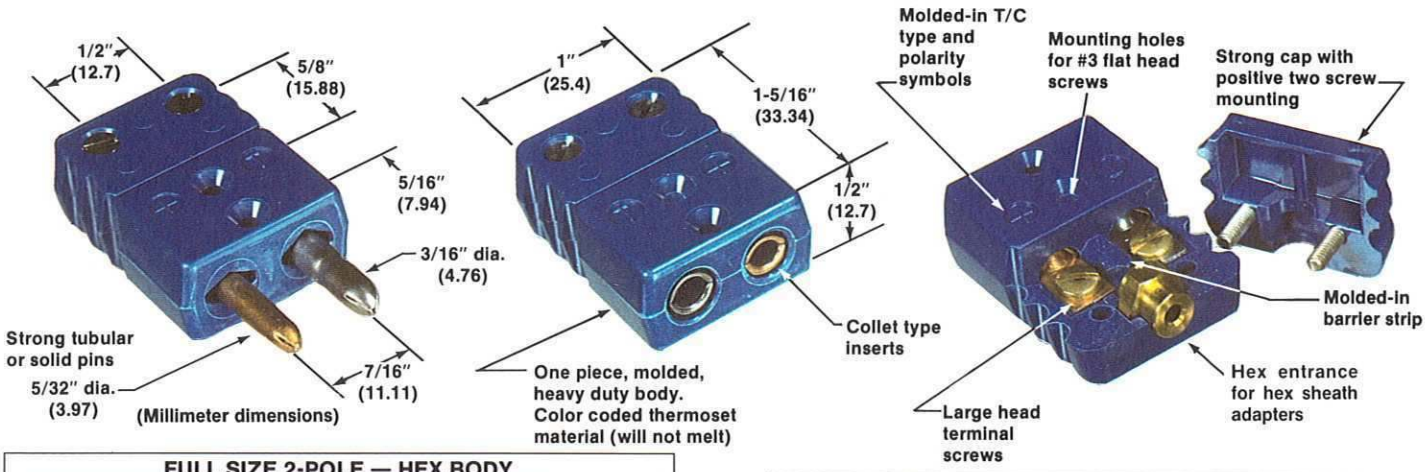
COMPRESSION ADAPTER (metal sheathed T/C to connector)		
CODE NO.	PRICE EA.	DISCOUNT SCHEDULE
1070-*	$2.10	B
1078-* w/mtg. stud	$2.75	

COMPRESSION ADAPTER-DUAL (metal sheathed dual T/C to connector)		
CODE NO.	PRICE EA.	DISCOUNT SCHEDULE
1071-*	$4.50	B

Specify Size: Blank, .040", .062", .125", .187", .250", .312", .375"
*Code: 000, 040, 062, 125, 187, 250, 312, 375
No nut or ferrule

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

CONNECTORS
FULL SIZE — 2-POLE — HEX BODY



FULL SIZE 2-POLE — HEX BODY			
CODE NO.	PRICE EACH	DESCRIPTION	DISC. SCHED.
1065 - * 1055 - † 1015 - *	$2.85 4.85 4.50	Plug Solid Pin Plug Jack	A

- 2-Pole Connector plugs and jacks are made to exacting specifications to provide rapid, dependable connections between thermocouples and extension wires.
- Alloys of prongs and inserts match ANSI calibrations to maintain sensing accuracy. Alloy and polarity are identified by symbols molded into body.
- Connector bodies molded of glass filled thermoset compounds (will not melt) for high strength and dependability. The color coded Connectors will withstand ambient temperatures of 400°F (205°C) continuous and 500°F (260°C) intermittent.
- Inserts are spring loaded collet type to assure positive full contact with the negative insert larger making it virtually impossible to mismate.
- For corrosive applications, gold or nickel plated prongs and inserts are available. Caution — system errors can result from use of plated contacts if significant thermal gradients exist at connector.

For gold plating use suffix "G" (i.e. 1065-K-G) @ $1.00 add to list.
For nickel plating use suffix "P" (i.e. 1065-K-P) @ $0.50 add to list.

HIGH-TEMPERATURE 2 POLE — HEX BODY		
CODE NO.	PRICE EACH	DESCRIPTION
Hex Body Connectors are not available in high temperature use regular connectors for this application		

* - Tubular Pin Availability: J,K,T,N,E,R,S,U also "C" EXCEPT ADD $1.50 to price of plug or jack with maximum .75 discount factor for regular or hi-temp.
† - Solid Pin Availability: J,K,T,E,R,S,U.
1 - Braze-on adapters can be ordered with connector at no extra charge - Specify sheath size
2 - Crimp-on adapters must be ordered separately

TYPE CODE	INSERT MAT'L. ALLOY		COLOR CODE
	POSITIVE	NEGATIVE	
J	IRON	CONSTANTAN	BLACK
T	COPPER	CONSTANTAN	BLUE
K	CHROMEL™	ALUMEL™	YELLOW
N	NICROSIL	NISIL	ORANGE
R	COPPER	#11 ALLOY	GREEN
S	COPPER	#11 ALLOY	GREEN
E	CHROMEL™	CONSTANTAN	VIOLET
U	COPPER	COPPER	WHITE
C	#405 ALLOY	#426 ALLOY	BROWN

MOUNTING HARDWARE

BRAZE ADAPTER		
CODE NO.	PRICE EACH	DISCOUNT SCHEDULE
1077-*	$0.30	A

Specify Size: Blank, .040", .062", .090", .125", .187", .250"
*Code: 000, 040, 062, 090, 125, 187, 250
Can be included w/Connector at no extra charge

HEX-CRIMP ADAPTER		
CODE NO.	PRICE EACH	DISCOUNT SCHEDULE
1075-*	$0.40	A

Specify Size: .040", .062", .125", .187"
*Code: 040, 062, 125, 187
Cannot be included w/Connector price

(Power crimping equipment recommended.)

NEOPRENE WIRE GRIP BUSHING		
CODE NO.	PRICE EACH	DISCOUNT SCHEDULE
1079	$0.15	A

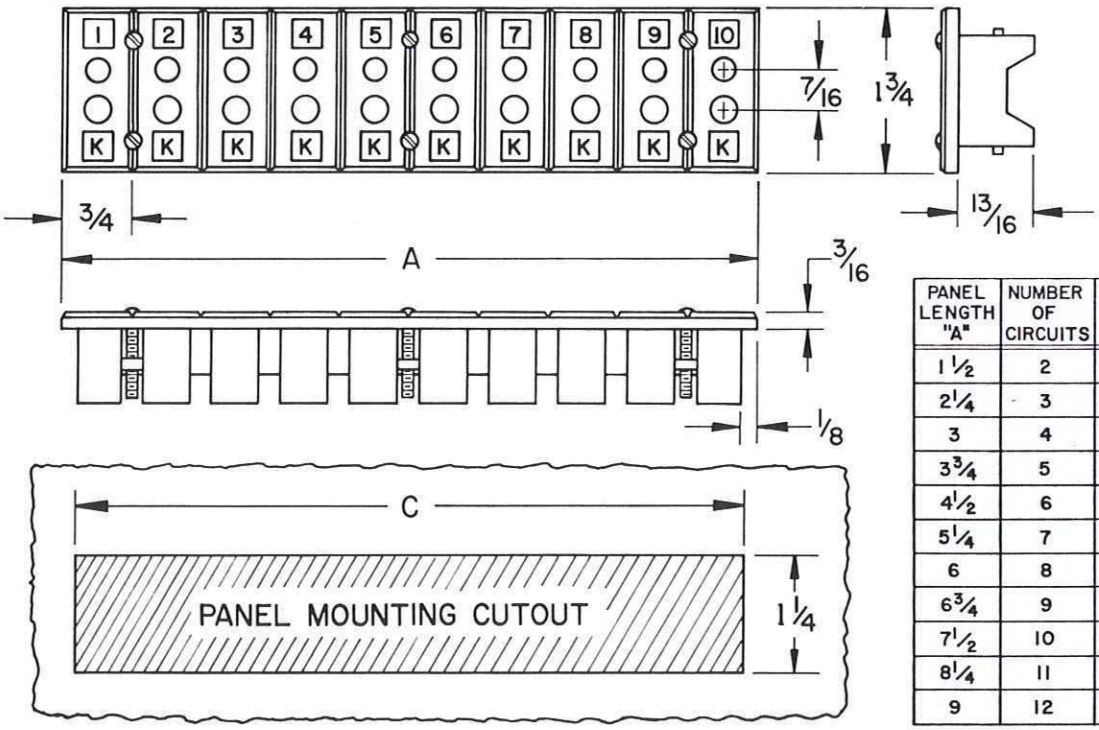
One included with each connector at no extra charge

DISCOUNT SCHEDULE "A"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

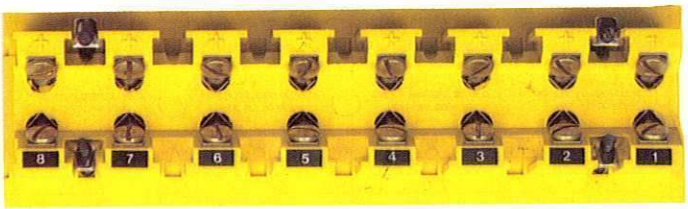
Since 1952 Marlin MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

CONNECTORS
FULL SIZE — 2-POLE STRIPANEL®

CATALOG NUMBER 1032



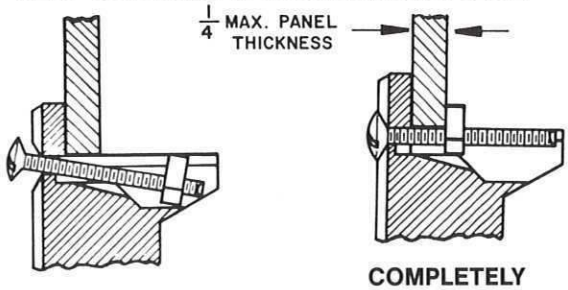
PANEL LENGTH "A"	NUMBER OF CIRCUITS	CUTOUT DIMEN. "C"
1 1/2	2	1 5/16
2 1/4	3	2 1/16
3	4	2 13/16
3 3/4	5	3 9/16
4 1/2	6	4 5/16
5 1/4	7	5 1/16
6	8	5 13/16
6 3/4	9	6 9/16
7 1/2	10	7 5/16
8 1/4	11	8 1/16
9	12	8 13/16



(BACK VIEW)

- Stripanels available 2 to 12 circuits - Color coded.
- For cutouts — Does not require mounting frame or mounting holes.
- Stripanels can be wired and installed completely from front. Patented self-contained fastening devise, "T Nut", is permanently attached, simplifies mounting, holds tight. Patent No. 3046516.
- Thermocouple type and circuit numbers are marked on face of Stripanel with corresponding circuit numbers and polarity identification on the back. Stripanels are numbered starting from "1" unless specified otherwise.
- Stripanels are molded of glass filled thermoset compounds (will not melt) for high strength and dependability. The color coded panels will withstand ambient temperatures to 400° F (205° C) continuous and 500° F (260° C) intermittent. High-Temperature panels (All Hi-Temp panels are color coded red) will withstand ambient temperatures to 800° F (425° C) continuous and 1000° F (540° C) intermittent.
- Inserts are spring loaded collet type to assure positive full contact with the negative insert larger making it virtually impossible to mismate.
- For corrosive application, gold plated contacts are available. Caution — system errors can result from use of plated contacts if significant thermal gradients exist.

SELF-CONTAINED FASTENING DEVICE



Ready for installation, T-nuts are out of the way at bottom of track.

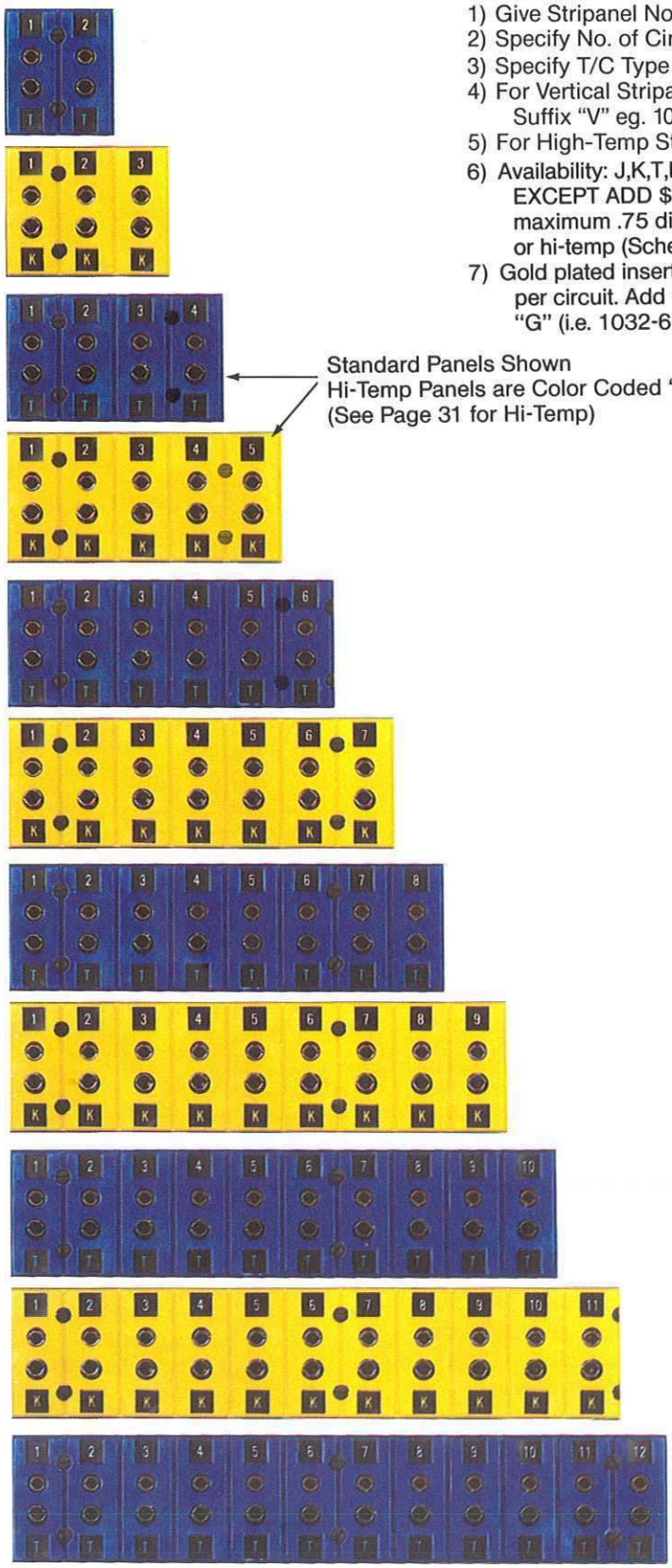
COMPLETELY FRONT FASTENING
Screws accessible from the front draw T-nuts up molded track and hold them tight against back wall.

TYPE CODE	INSERT MAT'L. ALLOY		COLOR CODE
	POSITIVE	NEGATIVE	
J	IRON	CONSTANTAN	BLACK
T	COPPER	CONSTANTAN	BLUE
K	CHROMEL™	ALUMEL™	YELLOW
N	NICROSIL	NISIL	ORANGE
R	COPPER	#11 ALLOY	GREEN
S	COPPER	#11 ALLOY	GREEN
E	CHROMEL™	CONSTANTAN	VIOLET
U	COPPER	COPPER	WHITE
C	#405 ALLOY	#426 ALLOY	BROWN
(ALL HI-TEMP STRIPANELS)			RED

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

STANDARD 2-POLE/ HI-TEMP 2-POLE		
CODE NUMBER	**PRICE**	**DISCOUNT SCHEDULE**
1032-2-(*)	**$11.00**	**A**
1132-2-(*)	18.00	B
1032-3-(*)	**$16.50**	**A**
1132-3-(*)	27.00	B
1032-4-(*)	**$22.00**	**A**
1132-4-(*)	36.00	B
1032-5-(*)	**$27.50**	**A**
1132-5-(*)	45.00	B
1032-6-(*)	**$33.00**	**A**
1132-6-(*)	54.00	B
1032-7-(*)	**$38.50**	**A**
1132-7-(*)	63.00	B
1032-8-(*)	**$44.00**	**A**
1132-8-(*)	72.00	B
1032-9-(*)	**$49.50**	**A**
1132-9-(*)	81.00	B
1032-10-(*)	**$55.00**	**A**
1132-10-(*)	90.00	B
1032-11-(*)	**$60.50**	**A**
1132-11-(*)	99.00	B
1032-12-(*)	**$66.00**	**A**
1132-12-(*)	108.00	B

*TYPE CODE



Standard Panels Shown
Hi-Temp Panels are Color Coded "RED"
(See Page 31 for Hi-Temp)

TO ORDER:
1) Give Stripanel No. 1032 - 6 - K @ $30.00
2) Specify No. of Circuits
3) Specify T/C Type by Code
4) For Vertical Stripanels Add Suffix "V" eg. 1032 - 6 - K - V
5) For High-Temp Stripanels: 1132 - 6 - K
6) Availability: J,K,T,N,E,R,S,U, also "C" EXCEPT ADD $1.50 to circuit price with maximum .75 discount factor for regular or hi-temp (Schedule "B") for type "C".
7) Gold plated inserts are available at $1.00 per circuit. Add to list price. Use suffix "G" (i.e. 1032-6-K-G).

DISCOUNT SCHEDULE "A"	
QUANTITY*	**FACTOR**
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

*No. of circuits

DISCOUNT SCHEDULE "B"	
QUANTITY*	**FACTOR**
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75

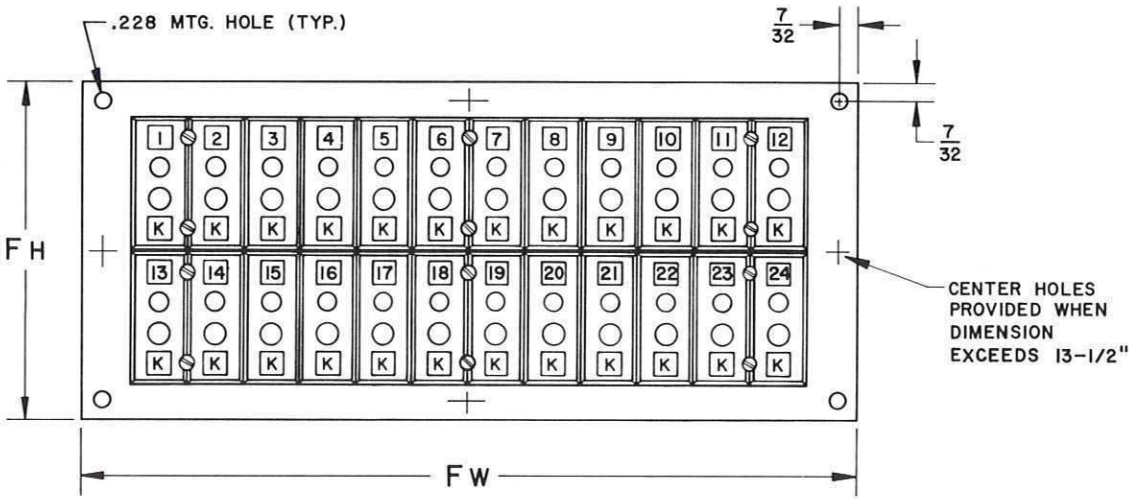
*No. of circuits

THERMOCOUPLE TYPE	COLOR CODE
T	BLUE
J	BLACK
E	VIOLET
K	YELLOW
N	ORANGE
S	GREEN
R	GREEN
C	BROWN
U	WHITE
ALL HI-TEMP	RED

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

CONNECTORS
FULL SIZE — 2-POLE STRIPANEL® WITH MOUNTING FRAME

CATALOG NUMBER 1033



Dimension for Panel Assembly
C_H AND C_W ARE MOUNTING CUTOUT DIMENSIONS

TOTAL CIRCUITS

NUMBER OF ROWS		CIRCUITS PER ROW																							
		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
		F_W=2¾" C_W=1½"	F_W=3½" C_W=2¼"	F_W=4¼" C_W=3"	F_W=5" C_W=3¾"	F_W=5¾" C_W=4½"	F_W=6½" C_W=5¼"	F_W=7¼" C_W=6"	F_W=8" C_W=6¾"	F_W=8¾" C_W=7½"	F_W=9½" C_W=8¼"	F_W=10¼" C_W=9"	F_W=11" C_W=9¾"	F_W=11¾" C_W=10½"	F_W=12½" C_W=11¼"	F_W=13¼" C_W=12"	F_W=14" C_W=12¾"	F_W=14¾" C_W=13½"	F_W=15½" C_W=14¼"	F_W=16¼" C_W=15"	F_W=17" C_W=15¾"	F_W=17¾" C_W=16½"	F_W=18½" C_W=17¼"	F_W=19¼" C_W=18"	PRICE	DISC. SCHED.
1	F_H = 2⅝" C_H = 1½"	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	1033 Standard $7.00 Per Circuit	A
2	F_H = 4⅜" C_H = 3¼"	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48		
3	F_H = 6⅛" C_H = 5"	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72		
4	F_H = 7⅞" C_H = 6¾"	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96		
5	F_H = 9⅝" C_H = 8½"	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105	110	115	120		
6	F_H = 11⅜" C_H = 10¼"	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126	132	138	144		
7	F_H = 13⅛" C_H = 12"	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147	154	161	168	1133 Hi-Temp $10.50 Per Circuit	B
8	F_H = 14⅞" C_H = 13¾"	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128	136	144	152	160	168	176	184	192		
9	F_H = 16⅝" C_H = 15½"	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144	153	162	171	180	189	198	207	216		
10	F_H = 18⅜" C_H = 17¼"	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240		

- Stripanels with mounting frames can accommodate virtually any number of circuits.
- One-piece mounting frame is made of 3/32" thick rigid steel with flat black finish.
- For specifications see Stripanel 1032 section.
- For frame sizes other than those in table consult Factory.
- Horizontal rows are assumed unless specified vertical by the suffix "V" which are numbered from top to bottom: e.g. 1033 - 4 X 12 - 48 - K - V.
- Stripanels with mounting frames will withstand ambient temperatures of 400°F (205°C) continuous and 500°F (260°C) intermittant. Hi-Temp panels will withstand ambient temperatures to 800°F (425°C) continuous and 1000°F (540°C) intermittant.
- For corrosive applications, gold plated inserts are available. Caution — system errors can result from use of plated contacts if significant thermal gradients exist at connector.

TO ORDER:

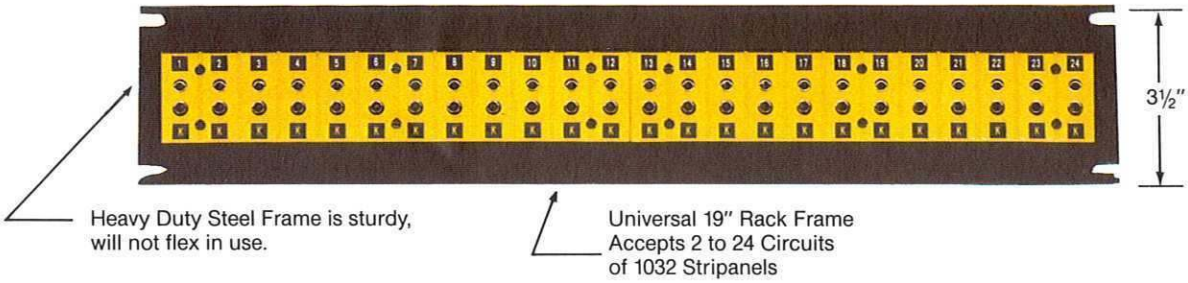
1. Give Stripanel No. → 1033 - 4 X 12 - 48 - K
2. Specify No. of Horizontal Rows
3. Specify No. of Circuits per Row
4. Give Total Number of Circuits
5. Specify Thermocouple Type Code
6. For Vertical Rows Add Suffix "V"
   e.g. 1033 - 4 x 12 - 48 - K - V
7. For Hi-Temp Stripanel In Frame:
   e.g. 1133 - 4 x 12 - 48 - K
8. Availability: J,K,T,N,E,R,S,U, also "C" EXCEPT ADD $1.50 to circuit price with maximum .75 discount factor for regular or Hi-Temp.
9. Gold plated inserts are available at $1.00 per circuit. Add to list price. Use suffix "G" (i.e. 1033-4x12-48-K-G).

Since 1952 Marlin

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

CONNECTORS
FULL SIZE — 2-POLE — 19" RACK — MOUNTED STRIPANEL®

CATALOG NUMBER 1041



- Universal 19" Rack accepts 2 to 24 circuits of 1032 Stripanels, less than 24 circuits are supplied with filler sections.
- Circuits can be added in the field without changing frame.
- 19" Rack Frame is made of sturdy 10 ga. steel that will not flex in use. Standard frame is flat black. High-Temp frame is bright silver finish.
- Thermocouple type and circuit numbers are marked on face of Stripanel with corresponding circuit numbers and polarity identification on the back. Stripanels are numbered starting from "1" unless specified otherwise.
- Stripanels are molded of glass filled thermoset compounds (will not melt) for high strength and dependability. The color coded panels will withstand ambient temperatures to 400°F (205°C) continuous and 500°F (260°C) intermittent. High-Temperature panels (All Hi-Temp panels are color coded red) will withstand ambient temperatures to 800°F (425°C) continuous and 1000°F (540°C) intermittent.
- Inserts are spring loaded collet type to assure positive full contact with the negative insert larger making it virtually impossible to mismate.
- For corrosive application, gold plated contacts are available. Caution — system errors can result from use of plated contacts if significant thermal gradients exist at connection.

TYPE CODE	INSERT MAT'L. ALLOY		COLOR CODE
	POSITIVE	NEGATIVE	
J	IRON	CONSTANTAN	BLACK
T	COPPER	CONSTANTAN	BLUE
K	CHROMEL™	ALUMEL™	YELLOW
N	NICROSIL	NISIL	ORANGE
R	COPPER	#11 ALLOY	GREEN
S	COPPER	#11 ALLOY	GREEN
E	CHROMEL™	CONSTANTAN	VIOLET
U	COPPER	COPPER	WHITE
C	#405 ALLOY	#426 ALLOY	BROWN
(ALL HI-TEMP STRIPANELS)			RED

*For type "C" add $1.50 per circuit to list price. Schedule "B" discount applies for regular or high-temp.

Gold plated contacts available at $1.00. Add to list price. Use suffix "G" (i.e. 1041-24-K-G).

TO ORDER:

1. Give Code No. 1041 - 24 - K
2. Specify number of circuits
3. Designate Thermocouple Type by Code
4. For Hi-Temp Stripanel: 1141 - 24 - K

Price:

Standard 1041 Frame & Stripanel
1041 Std. Frame @ $50.
Std. Circuits @ $5.50/circuit
Discount Schedule "A" applies

Hi-Temp Frame & Stripanel
1141 @ $60.
Hi-Temp Circuits @ $9.00/circuit
Discount Schedule "B" applies

Example:

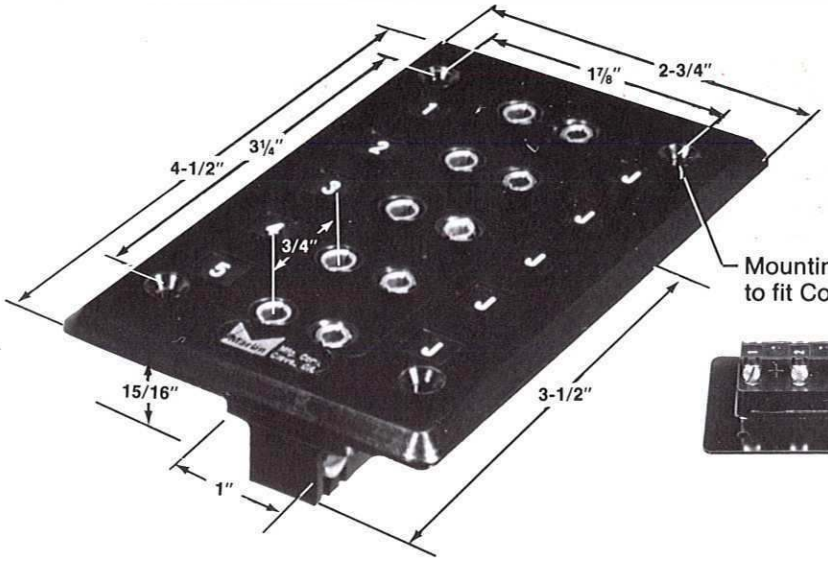
1041-24 Frame	$50
(24) Std. Circuits @ $5.50	132
Total Price (1041-24-K)	$182

DISCOUNT SCHEDULE "A"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

DISCOUNT SCHEDULE "B"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75*

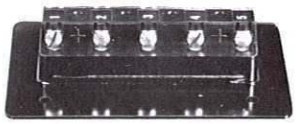
Since 1952 Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

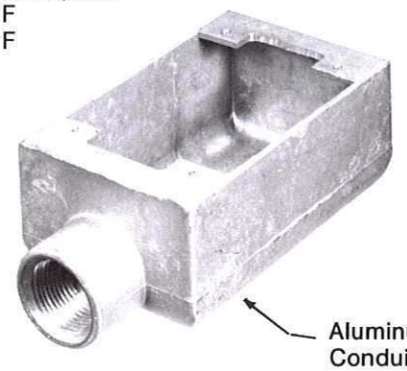
CONNECTORS
CONDUIT BOX PANEL



- 1 to 5 circuits
- Color Coded
- Molded Channels guide wires for quick, easy connections.
- Molded of Thermoset Compounds
- See 1032 for basic specs.
- Standard 400° F
- Hi-Temp. 800° F

Mounting Screws to fit Conduit Box





Aluminum Conduit Box

2-POLE JACK PANEL FOR CONDUIT BOX		
CODE NO.	PRICE EACH	DISCOUNT SCHEDULE
1030-5-(*)	$28.	B
1030-4-(*)	26.	
1030-3-(*)	24.	
1030-2-(*)	22.	
1030-1-(*)	20.	

*Specify Calibration J,K,T,N,E,R,S,U

2-POLE HI-TEMP JACK PANEL FOR CONDUIT BOX		
CODE NO.	PRICE EACH	DISCOUNT SCHEDULE
1130-5-(*)	$38.	B
1130-4-(*)	36.	
1130-3-(*)	34.	
1130-2-(*)	32.	
1130-1-(*)	30.	

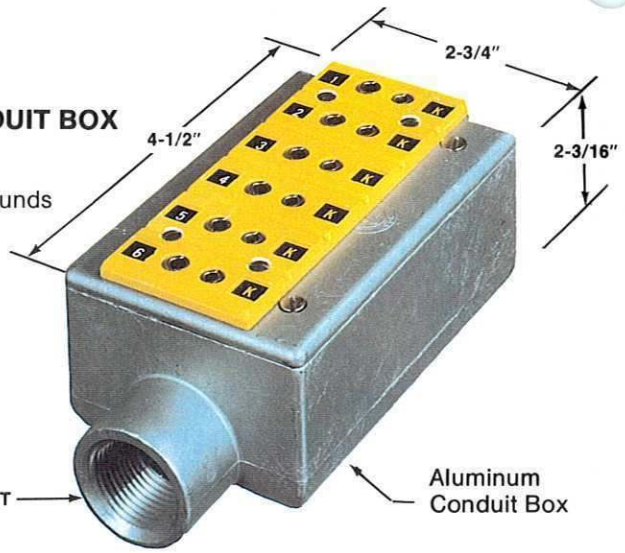
*Specify Calibration J,K,T,N,E,R,S,U

CONDUIT BOX FOR PANEL		
CODE NO.	PRICE EACH	DESCRIPTION
1040	$20.00	Conduit Box for 1030 Panels

DISCOUNT SCHEDULE "B"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75

6 CIRCUIT PANEL w/CONDUIT BOX

- Color Coded
- Molded of Thermoset Compounds
- See 1032 for basic specs.
- Standard to 400° F
- Hi-Temp. to 800° F



2-POLE 6-CIRCUIT PANEL w/CONDUIT BOX		
CODE NO.	PRICE	DISCOUNT SCHEDULE
1036-6-(*) (with FS Box)	$57.00	B

*Specify Calibration J,K,T,N,E,R,S,U

HI-TEMP 2-POLE 6-CIRCUIT PANEL w/CONDUIT BOX		
CODE NO.	PRICE	DISCOUNT SCHEDULE
1136-6-(*) (with FS Box)	$81.00	B

*Specify Calibration J,K,T,N,E,R,S,U

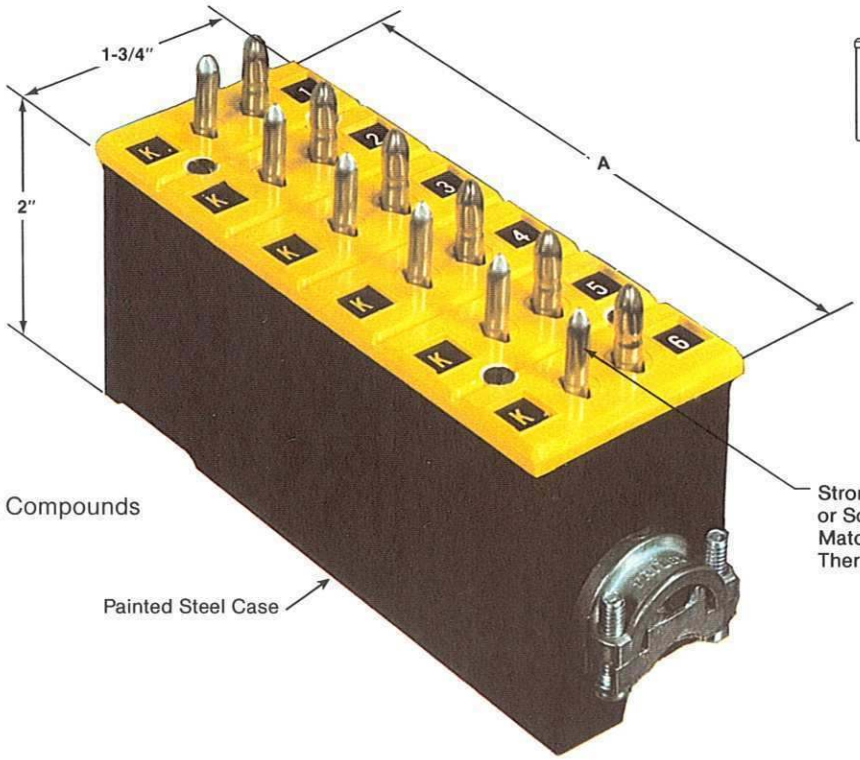
CONDUIT BOX FOR 1036-6 PANEL IF ORDERED SEPARATELY		
CODE NO.	PRICE	DISCOUNT SCHEDULE
1040-6	$24.00	B

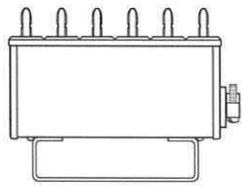
*Includes cover plate.

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

CONNECTORS
MULTIPLUG AND RSC (Round Single Circuit) PANEL

NO. OF CIRCUITS	"A"
2	1½"
3	2¼"
4	3"
5	3¾"
6	4½"




SIDE VIEW

- 2 to 6 circuits
- Color Coded
- Molded of Thermoset Compounds
- See 1032 Stripanel® for specifications
- Standard 400° F
- Hi-Temp. 800° F

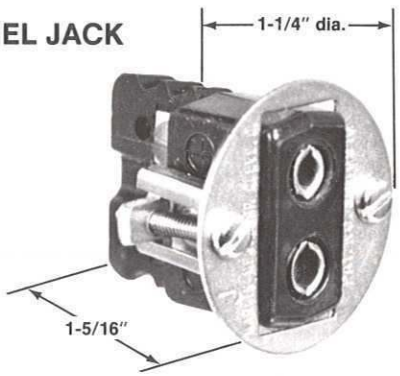
2-POLE MULTIPLUG		
CODE NO.	PRICE EACH[1]	DISCOUNT SCHEDULE
1062-2-(*)	$22.	B
1062-3-(*)	25.	
1062-4-(*)	28.	
1062-5-(*)	31.	
1062-6-(*)	36.	

* - Specify calibration J,K,T,N,E,R,S,U,C
1 - For solid pins use No. 1052-( )-( ) and add $2.00 per circuit

HI-TEMPERATURE 2-POLE MULTIPLUG		
CODE NO.	PRICE EACH	DISCOUNT SCHEDULE
1162-2-(*)	$28.	B
1162-3-(*)	36.	
1162-4-(*)	44.	
1162-5-(*)	51.	
1162-6-(*)	60.	

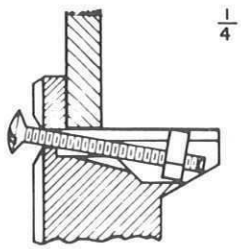
1) For hi-temp with solid pins, use No. 1152-( )-( ) and add $2.00 per circuit

RSC PANEL JACK



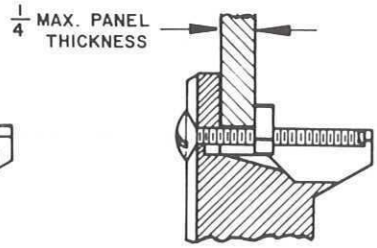
Single circuit jack designed for mounting into control panel or instrument case can be wired and installed completely from the front. **Fits** in standard ¾" knockout (1⅛" diameter). **Permanently attached self-fastening device** simplifies mounting, holds tight.

Patent No. 3046516



ON RSC PANEL JACK OR STRIPANEL

Ready for installation, T-nuts are out of the way at bottom of track.



COMPLETELY FRONT FASTENING

Screws accessible from the front draw T-nuts up metal track and hold them tight against back wall.

RSC 2-POLE JACK PANEL		
CODE NO.	PRICE EACH[1]	DISCOUNT SCHEDULE
1031-*	$7.25	B

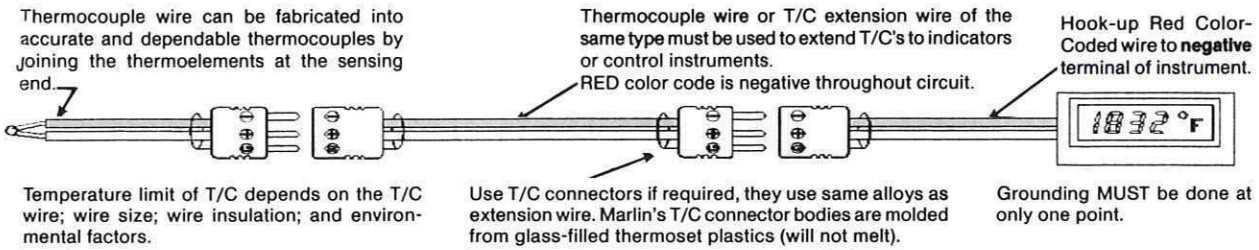
HIGH TEMPERATURE RSC 2-POLE JACK PANEL		
CODE NO.	PRICE EACH[1]	DISCOUNT SCHEDULE
1131-*	$11.00	B

NOTES: *Specify Calibration J,K,T,N,E,R,S,U,C

RSC MOUNTING HARDWARE (If ordered separately)		
CODE NO.	PRICE EACH[1]	DISCOUNT SCHEDULE
1095	$3.00	B

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

THERMOCOUPLE CONNECTORS
3-POLE APPLICATION



A thermocouple is a pair of dissimilar wires so joined as to produce a thermally generated emf when its ends are at different temperatures. Several combinations of dissimilar pairs have become standardized and used in temperature instrumentation. T,J,E,K,N,R,S,B are letter codes designating some popular thermocouples that are readily available. Each combination has its own unique emf output and its own properties that make them more applicable for a particular use. Thermocouple theory allows the extension of the thermocouple without affecting its emf output when the extension wire and connectors have the same thermoelectric characteristics. For example, when a type "K" thermocouple is being used the wires and connectors used to extend it should be also type "K." The different types have color codes, for instance "K" type is yellow, assigned to them for easy identification so as to help prevent mismatching of extension wire connectors, and thermocouples. For example in the yellow color code of the type "K" circuit a blue type "T" connector would be an obvious improper component.

The generalized thermocouple system may be divided into five basic areas: Hot Zone/Gradient Area/Extension Region/Reference Junction/and Readout. The extension region is generally where thermocouple connectors are used to facilitate thermocouple-to-readout hook-up. In a simplistic and isolated system the thermocouple will perform to specifications. Unfortunately, these low voltage thermocouple signals can be interfered with from power lines, relays, motors, transformers and all other power associated appliances. This electrical noise can be reduced by the correct application of shields and grounding techniques.

3-pole thermocouple connectors provide a shield terminal that maintains the shield circuit from metal sheathed thermocouples to extension wires or from wire to wire hook-ups. Grounding must be done at one point and only one point.

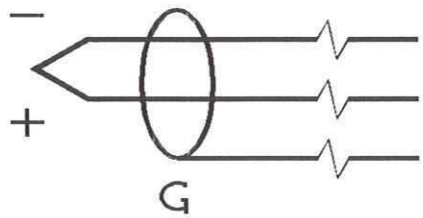
Thermocouple connectors and panels are polarized making them virtually impossible to mismate. Marlin's connectors and panels are molded from glass filled thermoset compounds for high strength. They will not melt and are rated for continuous use to 400°F (205°C) continuous duty and 500°F (260°C) intermittently. They are color coded and letter coded for type and polarization identification. Current carrying metal parts are made of alloys matching the characteristics of the thermocouple type with which they are intended to be used. Contact springs are non-magnetic, non-corrosive, and are specially selected and processed to withstand the rated operating conditions.

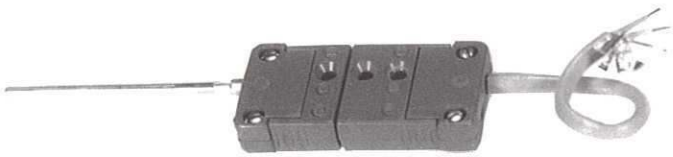
An exception to the color code is the red colored high temperature version of these connectors and panels which are rated for use to 800°F (425°C) continuous duty and 1000°F (540°C) intermittently. They are molded from a highly stable and inert silicone-based thermoset compound filled with glass fibers for strength. These high temperature units are colored red for all thermocouple types but do retain the letter and polarization identification. The premium materials of which Marlin's high-temperature products are made make them unusually suitable for harsh environments, even where extreme temperature tolerance may not be a factor. In particular, these high temperature units have proven durable in the presence of radiation, and their low-outgassing properties also make them highly satisfactory for use under vacuum. Marlin's high temperature connectors are fully compatible, mechanically and electrically, with normal-temperature connectors, and share the same accessories and hardware. Regular and high-temperature connectors of like kind will fully intermate.

Mini 3-Pole (Patent Pending)

Miniature Thermocouple Connectors for easy mating of small diameter sheathed thermocouple to extension wires where an electrical interference noise shield is required.

Featuring reliable, easy hook-up Jab-in® thermocouple terminals with built-in shield wire connection.



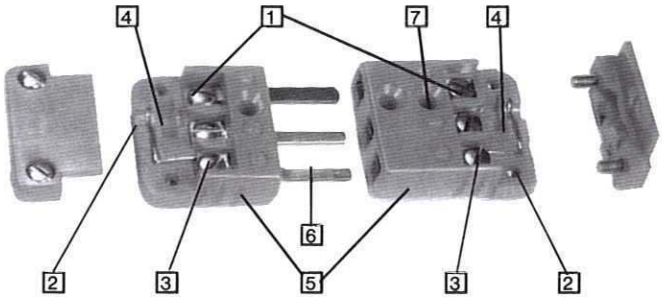


These 3-pole miniature thermocouple connectors are the most functional terminations available. Developed by temperature instrumentation experts in response to user requirements, these connectors achieve dependable connections between small diameter metal sheathed thermocouples and shield extension wires. Fine wires found in these units are easily handled and an automatically terminated shield wire circuit is provided.

The premium materials of which these connectors are made make them unusually suitable for harsh environments even where extreme temperature tolerance is a factor.

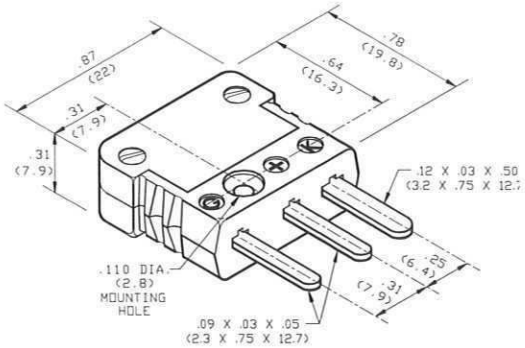
The real cost of a connector includes the time required for installation and reliability in service. The mini 3-pole connectors give you the best performance at the lowest cost.

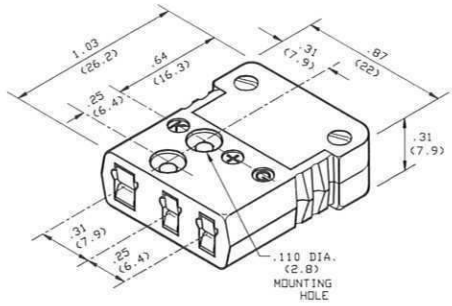
THERMOCOUPLE CONNECTORS
MINI 3-POLE PLUGS AND JACKS



Feature/Function	Benefit
1. Jab-in® terminals/ Wire is sandwiched between contacts of alloy material without damage.	Even the very fine wires (.003″) of .020″ diameter sheathed thermocouples can be installed quickly and reliably without special tools or set-ups. Jab-in® terminals require only ¼″ of insulation to be removed. Looped wire ends are eliminated.
2. Built-in Shield wire connection/ Shield circuit is connected to 3rd-pole of connector via ground link.	The need for a special shield circuit wire to connect the sheath or the extension wire is eliminated resulting in a dependable, time-saving installation.
3. Removable shield wire connection/ Built-in shield wire connection can be eliminated when not required.	After the built-in shield link is removed the shield from the extension wire or a 3-wire RTD can be easily and quickly installed using the Jab-in® terminal which accepts up to 24 gauge (.020″) wire.
4. Offset hex entrance/ Accepts braze-on or crimp-on hex sheath adapters, external sheath adaptors, and wire clamps.	The fine wires of the small diameter sheathed thermocouples are not strained. Technicians work with same-length wires for ease of installation.
5. Molded body/ Connector body and cap are molded of thermo-set, glass-reinforced compounds that are color coded.	Thermoset molded connectors will withstand severe temperature environments without melting or deforming. Color codes allow easy thermocouple type identification which helps prevent mis-applications of connectors.
6. Polarized pins and double-wipe inserts/ Connectors are virtually impossible to mismate. Inserts are spring loaded with funnel type entrances.	Elimination of mismated connectors saves time in trouble-shooting instrumentation. Tight grip assures low signal loss. The entrance provides easy mating.
7. Mounting Hole/ Through hole provides clearance for #3 screw.	Surface mounting and stacking, if required can be made without special fixtures or secondary operations to the connector.

THERMOCOUPLE CONNECTORS
MINI 3-POLE PLUGS AND JACKS





Specifications (Patent Pending):

- Mini 3-Pole Thermocouple Connector plugs and jacks provide rapid, dependable connections between small diameter sheathed thermocouples and extension wires with shield terminals an integral part of the system. In its all-copper version the 3-pole mini is ideal for 3-wire RTD applications.

- The thermocouple alloys of the prongs and inserts match ANSI standards to maintain thermocouple integrity. The thermocouple alloy-type letter code, polarity and shield terminal are identified by symbols that are molded into the connector body.

T/C Type Code	Connector Positive (+) T/C Alloy	Connector Negative (-) T/C Alloy	Shield Terminal Alloy	Body Color Code
T	Copper	Constantan	Copper	Blue
J	Iron	Constantan	Copper	Black
E	Chromel	Constantan	Copper	Violet
K	Chromel	Alumel	Copper	Yellow
N	Nicrosil	Nisil	Copper	Orange
R	Copper	#11 Alloy	Copper	Green
S	Copper	#11 Alloy	Copper	Green
U	Copper	Copper	Copper	White
C	#405 Alloy	#426 Alloy	Copper	Brown
1,2,3	Copper	Copper	Copper	White
ALL HI-TEMP CONNECTORS				Red

- Polarized pins are virtually impossible to mismate.

- Large double-wipe jack inserts assure tight grip and low signal loss. With an isolated screw design, contact is all thermocouple alloy from wire entrance to wire exit.

- Jab-In® terminals require only ¼″ of insulation to be removed. Wire is sandwiched between contacts of thermocouple alloy without damage.

- For use in corrosive environments, gold or nickel plated prongs and inserts are available. Caution — system errors can result from use of plated contacts if significant thermal gradients exist at the connector.

- Connector bodies are molded from glass-filled thermoset compounds (will not melt) for high strength and dependability. The color coded connector bodies will withstand ambient temperatures to 400°F (205°C) continuous duty and 500°F (260°C) intermittent use.

- High temperature connector bodies (All high temperature connector bodies are color coded RED) are made of a highly stable and inert silicone-based thermoset compound that will withstand ambient temperatures to 800°F (425°C) continuous duty and 1000°F (540°C) intermittent use. These units have proven durable in the presence of radiation, and their low-outgassing properties also make them highly satisfactory for use under vacuum.

- Surface mounting and stacking, if required, can be made by use of molded-in clearance holes.

- Shield terminals provide isolated connections of the shield circuit via the built-in sheath-to-shield link.

THERMOCOUPLE CONNECTORS
MINI 3-POLE PLUGS AND JACKS

Mini 3-Pole Plugs & Jacks

Code No.	$/Each	Description	Discount Schedule
1261-*	3.80	Mini 3-pole Plug	A
1211-*	4.75	Mini 3-pole Jack	

*-Thermocouple Type Code
T,J,E,K,N,R,S,U,123

Please note accessory options

Hi-Temp Mini 3-Pole Plugs & Jacks

Code No.	$/Each	Description	Discount Schedule
1361-*	6.50	H/T Mini 3-Pole Plug	B
1311-*	8.00	H/T Mini 3-Pole Jack	

*-Thermocouple Type Code
T,J,E,K,N,R,S,U,123

Please note accessory options

"C" Mini 3-Pole Plugs & Jacks
(Tungsten 5% Re/Tungsten 26% Re)

Code No.	$/Each	Description	Discount Schedule
1261-C	4.80	Mini 3-pole Plug	B
1211-C	5.75	Mini 3-pole Jack	

"C" Hi-Temp Mini 3-Pole Plugs & Jacks
(Tungsten 5% Re/Tungsten 26% Re)

Code No.	$/Each	Description	Discount Schedule
1361-C	7.50	H/T Mini 3-Pole Plug	B
1311-C	9.00	H/T Mini 3-Pole Jack	

Discount Schedule A	
Quantity	Factor
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

Discount Schedule B	
Quantity	Factor
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75

T/C Type Code	Connector Positive (+) T/C Alloy	Connector Negative (-) T/C Alloy	Shield Terminal Alloy	Body Color Code
T	Copper	Constantan	Copper	Blue
J	Iron	Constantan	Copper	Black
E	Chromel	Constantan	Copper	Violet
K	Chromel	Alumel	Copper	Yellow
N	Nicrosil	Nisil	Copper	Orange
R	Copper	#11 Alloy	Copper	Green
S	Copper	#11 Alloy	Copper	Green
U	Copper	Copper	Copper	White
C	#405 Alloy	#426 Alloy	Copper	Brown
1,2,3	Copper	Copper	Copper	White
ALL HI-TEMP CONNECTORS				Red

Gold plated contacts available at $1.50 per circuit. Add to list price.
Use suffix "G" (i.e. 1261-K-G).

Plug
Mini 3-Pole

Jack
Mini 3-Pole

THERMOCOUPLE CONNECTORS
MINI 3-POLE PLUG AND JACK ACCESSORIES

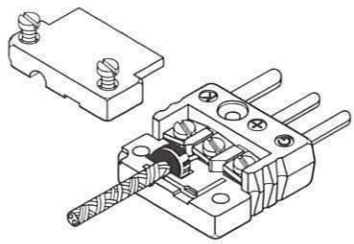
Accessory

Grommet Wire Grip			
Part No.	Size	$/Each	Discount Schedule
1279-030	.030″	0.15	A
1279-062	.062″	0.15	
1279-090	.090″	0.15	

Option 1: Grommet is furnished with each connector at no cost. Give part number of desired size otherwise 1279-062 is furnished as the standard package.

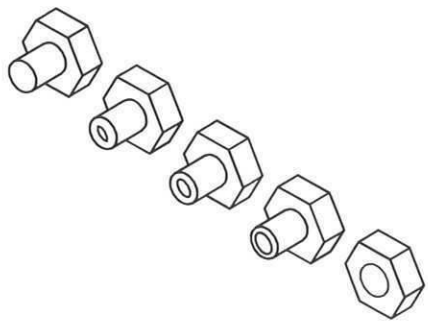
Description

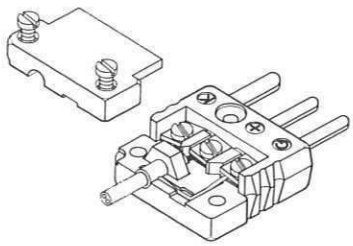
Typical Installation



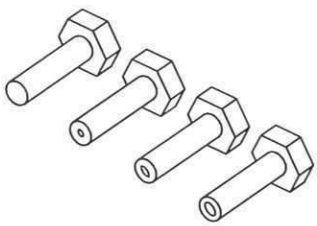
Mini Braze-on Adapter			
Part No.	Size	$/Each	Discount Schedule
1277-000	blank	0.30	A
1277-040	.040″	0.30	
1277-062	.062″	0.30	
1277-090	.090″	0.30	
1277-125	.125″	0.30	

Option 2: Braze-on Adapter is furnished with each connector at no cost instead of grommets specified. Give part number of desired size.

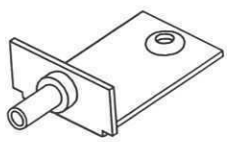


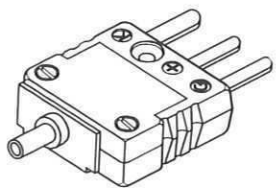


Mini Hex Crimp Adapter			
Part No.	Size	$/Each	Discount Schedule
1275-000	blank	0.40	A
1275-020	.020″	1.30	
1275-040	.040″	0.40	
1275-062	.062″	0.40	

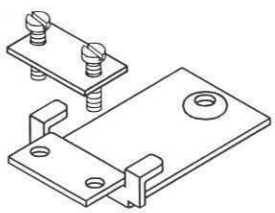


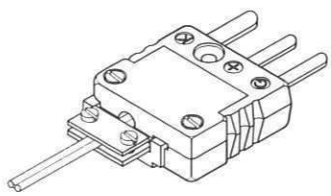
Mini 3-Pole Crimp Adapter			
Part No.	Size	$/Each	Discount Schedule
1272-062	.062″	1.75	B
1272-125	.125″	1.75	





Mini 3-Pole Wire Clamp		
Part No.	$/Each	Discount Schedule
1282	1.25	B

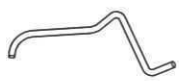




Replacement Shield Link			
Part No.	$/Each	Notes	Discount Schedule
1261-006	0.50	for Plug	B
1211-006	0.50	for Jack	

Shield Links are supplied installed at no cost when a mini 3-pole plug or jack is ordered.

for Plug

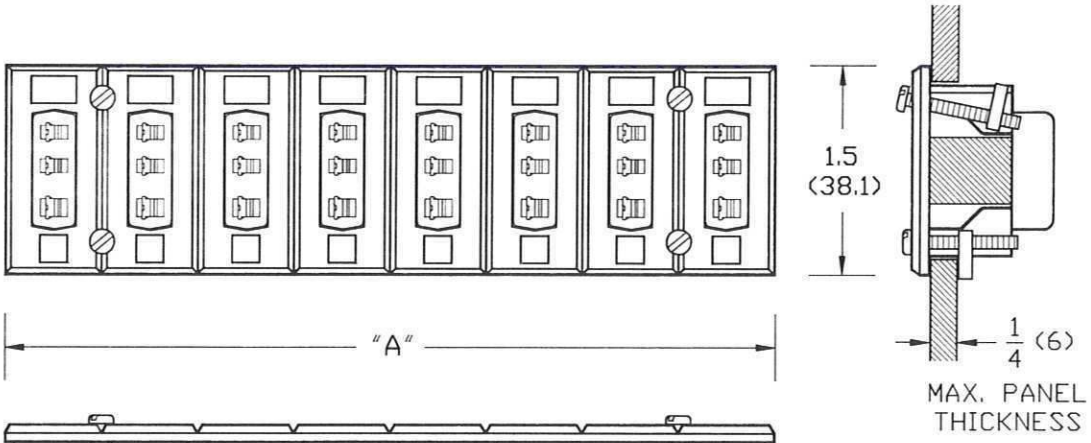


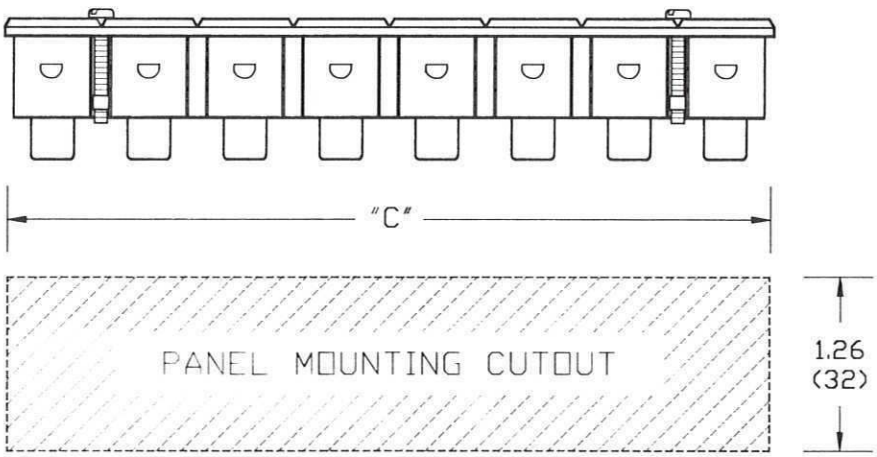
for Jack

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

THERMOCOUPLE CONNECTORS
MINI 3-POLE STRIPANEL®

Catalog Number 1437





COMPLETELY FRONT FASTENING

Ready for installation, T-nuts are out of the way at bottom of track.

Screws accessible from the front draw T-nuts up metal track and hold them tight against back wall.

PANEL LENGTH "A"	NUMBER OF CIRCUITS	CUTOUT DIMEN. "C"
1⅜	2	1¼
2 1/16	3	1 15/16
2¾	4	2⅝
3 7/16	5	3 5/16
4⅛	6	4
4 13/16	7	4 11/16
5½	8	5⅜

- Stripanels available 2 to 8 circuits.
- Color Coded.
- For cutouts - does not require additional mounting frame or holes.
- Stripanels can be wired and installed completely from front. Patented self-contained fastening devise, "T-Nut", is permanently attached, simplifies mounting, holds tight. Patent No. 3046516.
- Thermocouple type and circuit numbers are marked on face of Stripanel. Stripanels are numbered starting from "1" unless specified otherwise.
- Stripanels are molded of glass filled thermoset compounds (will not melt) for high strength and dependability. The color coded panels will withstand ambient temperatures to 400°F (205°C) continuous and 500°F (260°C) intermittent. High-Temperature panels (All Hi-Temp panels are color coded red) will withstand ambient temperatures to 800°F (425°C) continuous and 1000°F (540°C) intermittent.
- 1211/1311 Mini 3-Pole Jacks slide and lock in stripanel frame.

CALIB. MARK	INSERT MAT'L. ALLOY			COLOR CODE
	POSITIVE	NEGATIVE	GROUND	
J	IRON	CONSTANTAN	COPPER	BLACK
T	COPPER	CONSTANTAN	COPPER	BLUE
K	CHROMEL™	ALUMEL™	COPPER	YELLOW
N	NICROSIL	NISIL	COPPER	ORANGE
R	COPPER	#11 ALLOY	COPPER	GREEN
S	COPPER	#11 ALLOY	COPPER	GREEN
E	CHROMEL™	CONSTANTAN	COPPER	VIOLET
U	COPPER	COPPER	COPPER	WHITE
C	#405 ALLOY	#426 ALLOY	COPPER	BROWN
1,2,3*	(2) COPPER	(3) COPPER	(1) COPPER	WHITE
(ALL HI-TEMP CONNECTORS)				RED

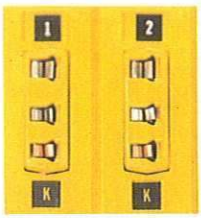
*for RTD 3-wire applications

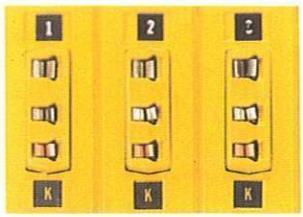
Since 1952 Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

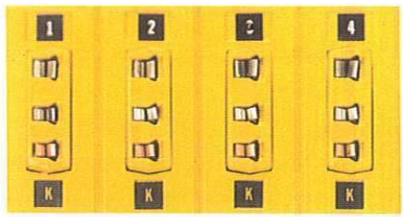
THERMOCOUPLE CONNECTORS
MINI 3-POLE STRIPANEL®

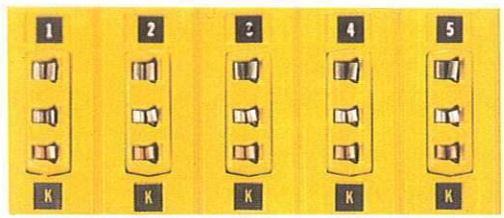
MINI 3-POLE HI-TEMP 3-POLE		
PART NUMBER	$/EACH	DISCOUNT SCHEDULE
1437-2-(X)	$13.00	A
1537-2-(X)	20.00	B
1437-3-(X)	19.50	A
1537-3-(X)	30.00	B
1437-4-(X)	26.00	A
1537-4-(X)	40.00	B
1437-5-(X)	32.50	A
1537-5-(X)	50.00	B
1437-6-(X)	39.00	A
1537-6-(X)	60.00	B
1437-7-(X)	45.50	A
1537-7-(X)	70.00	B
1437-8-(X)	52.00	A
1537-8-(X)	80.00	B

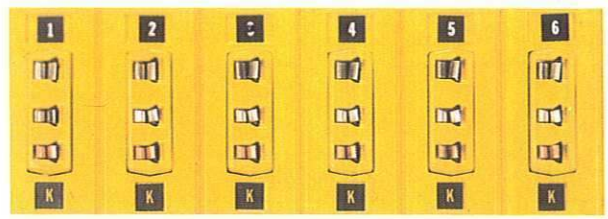
(X) - TYPE DESIGNATION

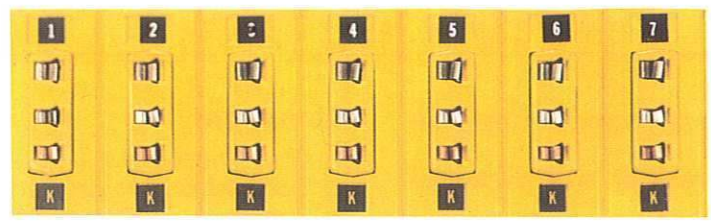


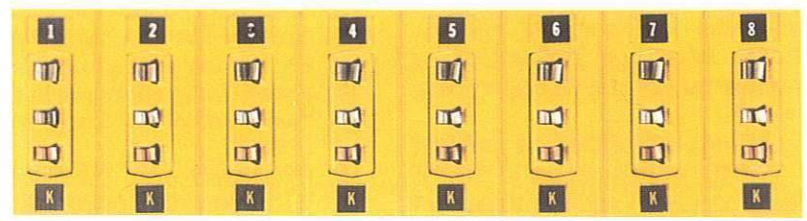












TO ORDER:

1) Give Stripanel No. 1437 - 8 - K
2) Specify No. of Circuits
3) Specify T/C Type by Code
4) For Vertical Stripanels Add Suffix "V" eg. 1437 - 8 - K - V
5) For High-Temp Stripanels: 1537 - 8 - K
6) Availability: J,K,T,N,E,R,S,U,RTD; also "C" EXCEPT ADD $1.50 to circuit price with maximum .75 discount factor for regular or hi-temp.

DISCOUNT SCHEDULE "A"	
QUANTITY*	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

*No. of circuits

DISCOUNT SCHEDULE "B"	
QUANTITY*	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75

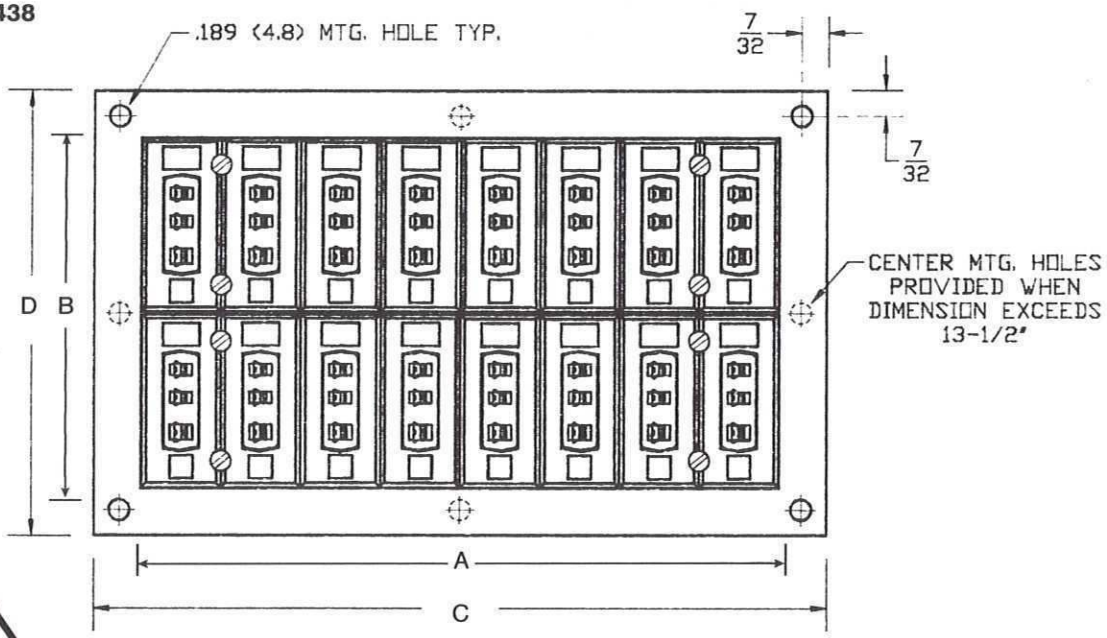
*No. of circuits

THERMOCOUPLE TYPE	COLOR CODE
T	BLUE
J	BLACK
E	VIOLET
K	YELLOW
N	ORANGE
S	GREEN
R	GREEN
C	BROWN
U	WHITE
ALL HI-TEMP	RED

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

CONNECTORS
MINI 3-POLE STRIPANEL® WITH MOUNTING FRAME

Code Number 1438



TOTAL CIRCUITS

NUMBER OF ROWS	NUMBER OF CIRCUITS PER ROW																D FRAME HEIGHT	B CUTOUT HEIGHT	PRICE 1438	HI-TEMP PRICE 1538
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16		2¼" (57mm)	1⅝" (41mm)		
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32		3 13/16" (97mm)	3³⁄₁₆" (81mm)	$8.00	$11.50
3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48		5⅜" (137mm)	4¾" (121mm)	per	per
4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64		6 15/16" (176mm)	6⅜" (160mm)	circuit	circuit
5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80		8½" (216mm)	7⅞" (200mm)	Disc.	Disc.
6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96		10 1/16" (256mm)	9⅞" (240mm)	Sched.	Sched.
7	14	21	28	35	42	49	56	63	70	77	84	91	98	105	112		11⅝" (295mm)	11" (280mm)	A	B
8	16	24	32	40	48	56	64	72	80	88	96	104	112	120	128		13⅜" (335mm)	12⅝" (319mm)		
9	18	27	36	45	54	63	72	81	90	99	108	117	126	135	144		14¾" (375mm)	14⅛" (359mm)		
10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160		16 7/16" (418mm)	15 13/16" (402mm)		

C FRAME WIDTH	2 ¼" (58mm)	2 15/16" (75mm)	3 5/8" (92mm)	4 5/16" (110mm)	5" (127mm)	5 11/16" (145mm)	6 3/8" (162mm)	7 1/16" (180mm)	7 ¾" (197mm)	8 7/16" (215mm)	9 ⅛" (232mm)	9 13/16" (250mm)	10 ½" (267mm)	11 3/16" (285mm)	11 7/8" (302mm)
A CUTOUT WIDTH	1 3/8" (35mm)	2 1/16" (53mm)	2 ¾" (70mm)	3 7/16" (86mm)	4 ⅛" (105mm)	4 13/16" (123mm)	5 ½" (140mm)	6 3/16" (158mm)	6 7/8" (175mm)	7 9/16" (192mm)	8 ¼" (210mm)	8 15/16" (227mm)	9 5/8" (245mm)	10 5/16" (262mm)	11" (280mm)

Other arrangements available—Consult Factory

- Stripanels with mounting frames can accommodate virtually any number of circuits.
- One-piece mounting frame is made of 3/32" thick rigid steel with flat black finish.
- For specifications see Stripanel 1437 section.
- For frame sizes other than those in table consult Factory.
- Horizontal rows are assumed unless specified vertical by the suffix "V" which are numbered from top to bottom: e.g. 1438 - 4 x 12 - 48 - K - V.
- Stripanels with mounting frames will withstand ambient temperatures of 400°F (205°C) continuous and 500°F (260°C) intermittent. Hi-Temp panels will withstand ambient temperatures to 800°F (425°C) continuous and 1000°F (540°C) intermittent.

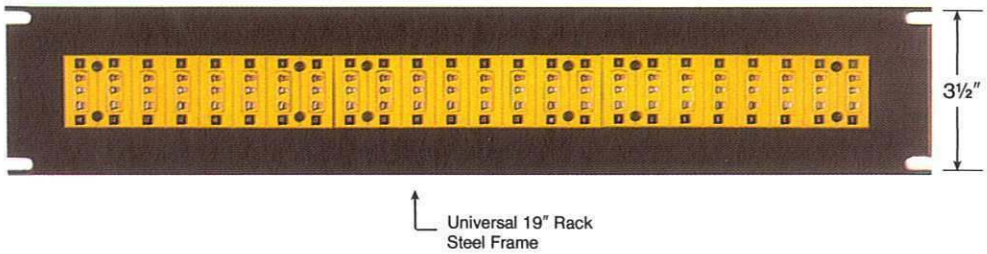
TO ORDER:

1) Give Stripanel No. → 1438 - 4 x 12 - 48 - K
2) Specify No. of Horizontal Rows
3) Specify No. of Circuits per Row
4) Give Total Number of Circuits
5) Specify Thermocouple Type Code
6) For Vertical Rows Add Suffix "V", e.g. 1438-4x12-48-K-V
7) For Hi-Temp Stripanel In Frame: 1538-4x12-48-K
   *(Use discount schedule on next page for stripanels with mounting frames.)
8) Availability: J,K,T,N,E,R,S,U,RTD; also "C" EXCEPT ADD $1.50 to circuit price with maximum .75 discount factor for regular or hi-temp.

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

CONNECTORS
MINI 3-POLE — 19″ RACK-MOUNTED STRIPANEL®

Code Number 1441



- Universal 19″ Rack accepts 2 to 24 circuits of 1437 Stripanels.
- Circuits can be added in the field without changing frame.
- 19″ Rack Frame is made of sturdy 10 ga. steel that will not flex in use. Standard frame is flat black, High-Temp frame is bright silver finish.
- Thermocouple type and circuit numbers are marked on face of Stripanel and polarity identification on the back. Stripanels are numbered starting from "1" unless specified otherwise.
- Stripanels are molded of glass filled thermoset compounds (will not melt) for high strength and dependability. The color coded panels will withstand ambient temperatures to 400°F (205°C) continuous and 500°F (260°C) intermittent. High-Temperature panels (All Hi-Temp panels are color coded red) will withstand ambient temperatures to 800°F (425°C) continuous and 1000°F (540°C) intermittent.
- For corrosive applications, gold plated inserts are available. Caution — system errors can result from use of plated contacts if significant thermal gradients exist at connector.

TYPE CODE	INSERT MAT'L. ALLOY			COLOR CODE
	POSITIVE	NEGATIVE	GROUND	
J	IRON	CONSTANTAN	COPPER	BLACK
T	COPPER	CONSTANTAN	COPPER	BLUE
K	CHROMEL™	ALUMEL™	COPPER	YELLOW
N	NICROSIL	NISIL	COPPER	ORANGE
R	COPPER	#11 ALLOY	COPPER	GREEN
S	COPPER	#11 ALLOY	COPPER	GREEN
E	CHROMEL™	CONSTANTAN	COPPER	VIOLET
U	COPPER	COPPER	COPPER	WHITE
C†	#405 ALLOY	#426 ALLOY	COPPER	BROWN
1,2,3*	(2) COPPER	(3) COPPER	(1) COPPER	WHITE
(ALL HI-TEMP CONNECTORS)				RED

*for RTD 3-wire applications
† For type "C" add $1.50 per circuit to list price. Schedule "B" discount applies for regular or high temp.
Gold plated inserts are available at $1.50 per circuit added to list price. Use suffix"G" (i.e. 1441-24-K-G).

TO ORDER:

1) Give Stripanel No. → 1441 - 24 - K
2) Specify No. of circuits
3) Specify Thermocouple Type by Code
4) For Hi-Temp Stripanel: 1441 - 24 - K

Price

Standard 1441 Frame & Stripanel
1441 Std. Frame @ $50.
Std. Circuits @ $6.50/circuit, discount sched. "A" applies
Hi-Temp Frame & Stripanel
1541 @ $60.
Hi-Temp Circuits @ $10./circuit, discount sched. "B" applies

Example:

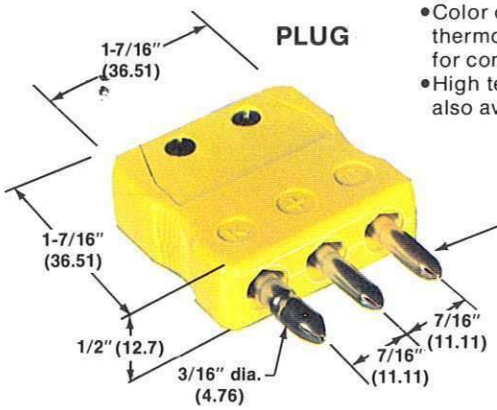
1441 - 24 Frame	$50.
(24) Std. Circuits @ $6.50	156.
Total Price (1437 - 24)	$206.

DISCOUNT SCHEDULE "A"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

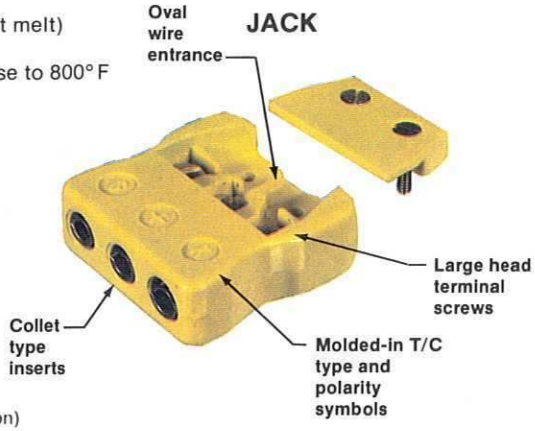
DISCOUNT SCHEDULE "B"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75

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

CONNECTORS
FULL SIZE — 3-POLE



- Color coded body molded of thermoset compounds (will not melt) for continuous 400° F use.
- High temperature bodies for use to 800° F also available



(Millimeter dimension)

FULL SIZE 3-POLE			
CODE NO.	PRICE EA.	DESCRIPTION	DISCOUNT SCHEDULE
1061 - *	$4.40	3 Pole Plug	A
1051 - †	7.20	Solid Pin Plug	
1011 - *	7.00	3 Pole Jack	

*-Tubular Pin Availability: J,K,T,N,E,R,S,U,RTD; also "C" EXCEPT ADD $1.50 to price of plug or jack with maximum .75 discount factor for regular or hi-temp.
†-Solid Pin Availability: J,K,T,E,R,S,U,RTD.

FULL SIZE HIGH-TEMPERATURE 3-POLE				
CODE NO.	PRICE EA.	DESCRIPTION	COLOR CODE	DISCOUNT SCHEDULE
1161 - *	$8.20	HT 3 Pole Plug	RED	B
1151 - †	10.20	HT Solid Pin Plug		
1111 - *	10.50	HT 3 Pole Jack		

- 3-Pole Connector plugs and jacks are made to exacting specifications to provide rapid, dependable connections between thermocouples and extension wires, with ground wires an integral part of the system. Also ideal for 3-wire RTD applications.
- Alloys of prongs and inserts match ANSI calibrations to maintain sensing accuracy. Alloy, polarity and ground are identified by symbols molded into body.
- Connector bodies molded of glass filled thermoset compounds (will not melt) for high strength and dependability. The color coded Connectors will withstand ambient temperatures to 400° F (205° C) continuous and 500° F (260° C) intermittent. High-temperature Connectors (All Hi-Temp Connectors are color coded red) will withstand ambient temperatures to 800° F (425°) continuous and 1000° F (540° C) intermittent.
- Inserts are spring loaded collet type to assure positive full contact with the negative insert larger making it virtually impossible to mismate.

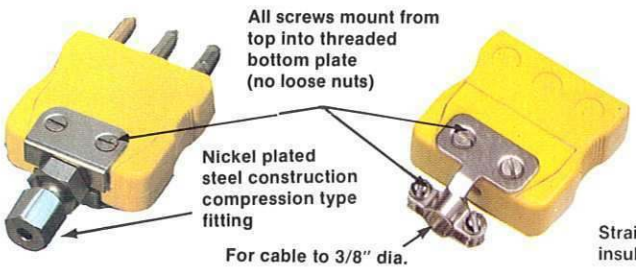
- For corrosive applications, gold or nickel plated prongs and inserts are available. Caution — system errors can result from use of plated contacts if significant thermal gradients exist at connector.

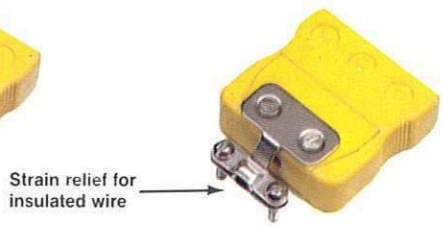
  For gold plating use suffix "G" (i.e. 1061-K-G) @ $1.50 add to list.
  For nickel plating use suffix "P" (i.e. 1061-K-P) @ $0.75 add to list.

TYPE CODE	INSERT MAT'L. ALLOY			COLOR CODE
	POSITIVE	NEGATIVE	GROUND	
J	IRON	CONSTANTAN	COPPER	BLACK
T	COPPER	CONSTANTAN	COPPER	BLUE
K	CHROMEL™	ALUMEL™	COPPER	YELLOW
N	NICROSIL	NISIL	COPPER	ORANGE
R	COPPER	#11 ALLOY	COPPER	GREEN
S	COPPER	#11 ALLOY	COPPER	GREEN
E	CHROMEL™	CONSTANTAN	COPPER	VIOLET
U	COPPER	COPPER	COPPER	WHITE
C	#405 ALLOY	#426 ALLOY	COPPER	BROWN
1,2,3*	(2) COPPER	(3) COPPER	(1) COPPER	WHITE
(ALL HI-TEMP CONNECTORS)				RED

*for RTD 3-wire applications

MOUNTING HARDWARE





COMPRESSION ADAPTER (metal sheathed T/C to 3-Pole)

CODE NO.	PRICE EA.	DISC. SCH.
1072-*	$2.10	B

CABLE CLAMP

CODE NO.	PRICE EA.	DISC. SCH.
1082	$1.35	B

WIRE CLAMP

CODE NO.	PRICE EA.	DISC. SCH.
1086	$1.35	B

Specify T/C Sheath Dia: Blank, .040", .062", .125", .187", .250", .312", .375"
*Code: 000, 040, 062, 125, 187, 250, 312, 375
No nut or ferrule

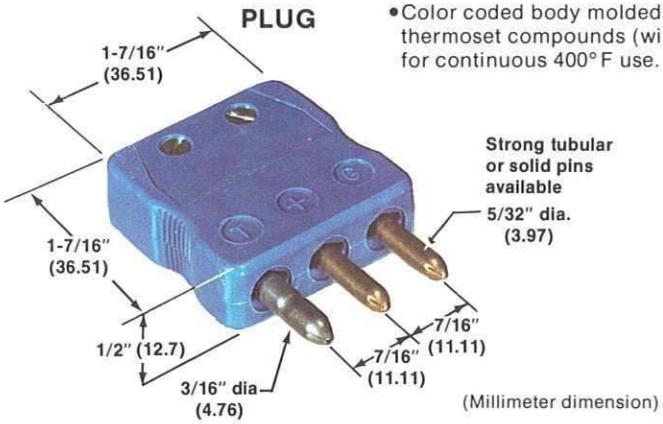
DISCOUNT SCHEDULE "A"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

DISCOUNT SCHEDULE "B"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75

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

CONNECTORS
FULL SIZE — 3-POLE — HEX BODY

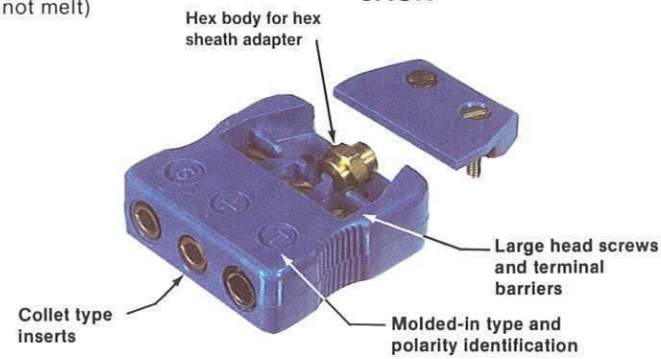
PLUG



(Millimeter dimension)

- Color coded body molded of thermoset compounds (will not melt) for continuous 400° F use.

JACK



FULL SIZE 3-POLE — HEX BODY			
CODE NO.	PRICE EACH	DESCRIPTION	DISC. SCHED.
1067 - *	$4.40	3 Pole Plug	A
1057 - †	7.20	Solid Pin Plug	
1017 - *	7.00	3 Pole Jack	

- 3-Pole Connector plugs and jacks are made to exacting specifications to provide rapid, dependable connections between thermocouples and extension wires, with ground wires an integral part of the system. Also ideal for 3-wire RTD applications.
- Alloys of prongs and inserts match ANSI calibrations to maintain sensing accuracy. Alloy, polarity and ground are identified by symbols molded into body.
- Connector bodies molded of glass filled thermoset compounds (will not melt) for high strength and dependability. The color coded Connectors will withstand ambient temperatures to 400° F (205° C) continuous and 500° F (260° C) intermittent.
- Inserts are spring loaded collet type to assure positive full contact with the negative insert larger making it virtually impossible to mismate.
- For corrosive applications, gold or nickel plated prongs and inserts are available. Caution — system errors can result from use of plated contacts if significant thermal gradients exist at connector.

  For gold plating use suffix "G" (i.e. 1061-K-G) @ $1.50 add to list.
  For nickel plating use suffix "P" (i.e. 1061-K-P) @ $0.75 add to list.

HIGH-TEMPERATURE 3 POLE — HEX BODY		
CODE NO.	PRICE EACH	DESCRIPTION
Hex Body Connectors are not available in high temperature use regular connectors for this application		

* - Tubular Pin Availability: J,K,T,N,E,R,S,U, RTD; for "C" type add $1.50 to price of plug or jack with maximum .75 discount factor for regular or hi-temp. Discount schedule "B" applies.
† - Solid Pin Availability: J,K,T,E,R,S,U,RTD.
1 - Braze-on adapters can be ordered with connector at no extra charge - Specify sheath size
2 - Crimp-on adapters must be ordered separately

TYPE CODE	INSERT MAT'L. ALLOY			COLOR CODE
	POSITIVE	NEGATIVE	GROUND	
J	IRON	CONSTANTAN	COPPER	BLACK
T	COPPER	CONSTANTAN	COPPER	BLUE
K	CHROMEL™	ALUMEL™	COPPER	YELLOW
N	NICROSIL	NISIL	COPPER	ORANGE
R	COPPER	#11 ALLOY	COPPER	GREEN
S	COPPER	#11 ALLOY	COPPER	GREEN
E	CHROMEL™	CONSTANTAN	COPPER	VIOLET
U	COPPER	COPPER	COPPER	WHITE
C	#405 ALLOY	#426 ALLOY	COPPER	BROWN
1,2,3*	(2) COPPER	(3) COPPER	(1) COPPER	WHITE

*for RTD 3-wire applications

BRAZE ADAPTER		
CODE NO.	PRICE EACH	DISC. SCHED.
1077-*	$0.30	A

Specify Size: Blank, .040", .062", .090", .125", .187", .250"
*Code: 000, 040, 062, 090, 125, 187, 250,
Can be included w/Connector at no extra charge

HEX-CRIMP ADAPTER		
CODE NO.	PRICE EACH	DISC. SCHED.
1075-*	$0.40	A

Specify Size: Blank, .040", .062", .125", .187"
*Code: 000, 040, 062, 125, 187
Cannot be included w/Connector price

NEOPRENE WIRE GRIP BUSHING		
CODE NO.	PRICE EACH	DISC. SCHED.
1079	$0.15	A

One included with each connector at no extra charge

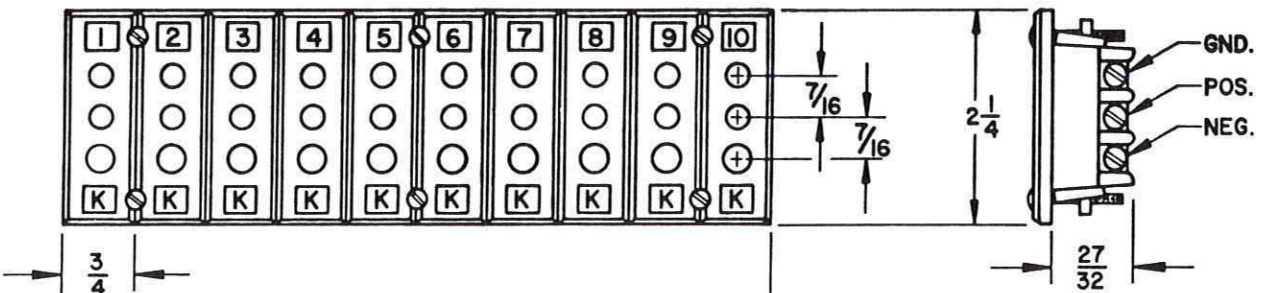
MOUNTING HARDWARE

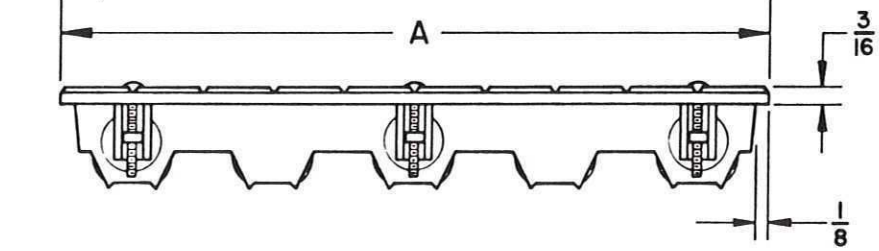
(Power crimping equipment recommended.)

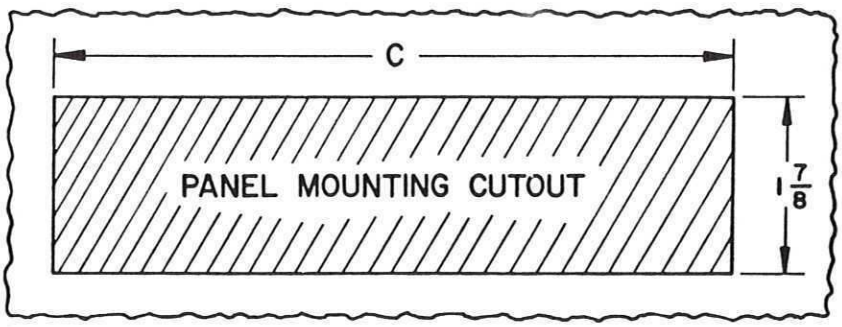
DISCOUNT SCHEDULE "A"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

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

Catalog Number 1034

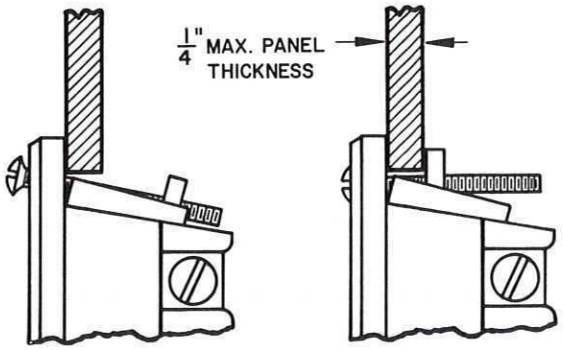






PANEL LENGTH "A"	NUMBER OF CIRCUITS	CUTOUT DIMEN. "C"
1 1/2	2	1 5/16
3	4	2 13/16
4 1/2	6	4 5/16
6	8	5 13/16
7 1/2	10	7 5/16
9	12	8 13/16

SELF-CONTAINED FASTENING DEVICE



Ready for installation, T-nuts are out of the way at bottom of track.

COMPLETELY FRONT FASTENING
Screws accessible from the front draw T-nuts up metal track and hold them tight against back wall.

- Stripanels available 2 to 12 circuits in even number of circuits.
- Color Coded.
- For cutouts - does not require mounting frame or holes.
- Stripanels can be wired and installed completely from front. Patented self-contained fastening devise, "T-Nut", is permanently attached, simplifies mounting, holds tight. Patent No. 3046516.
- Thermocouple type and circuit numbers are marked on face of Stripanel and polarity identification on the back. Stripanels are numbered starting from "1" unless specified otherwise.
- Stripanels are molded of glass filled thermoset compounds (will not melt) for high strength and dependability. The color coded panels will withstand ambient temperatures to 400°F (205°C) continuous and 500°F (260°C) intermittent. High-Temperature panels (All Hi-Temp panels are color coded red) will withstand ambient temperatures to 800°F (425°C) continuous and 1000°F (540°C) intermittent.
- Inserts are spring loaded collet type to assure positive full contact with the negative insert larger making it virtually impossible to mismate.
- For corrosive applications, gold plated inserts are available. Caution — system errors can result from use of plated contacts if significant thermal gradients exist at connector.

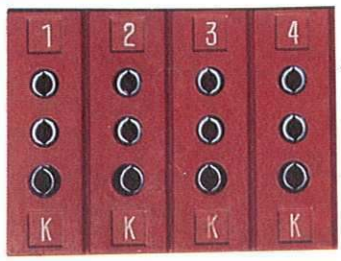
TYPE CODE	INSERT MAT'L. ALLOY			COLOR CODE
	POSITIVE	NEGATIVE	GROUND	
J	IRON	CONSTANTAN	COPPER	BLACK
T	COPPER	CONSTANTAN	COPPER	BLUE
K	CHROMEL™	ALUMEL™	COPPER	YELLOW
N	NICROSIL	NISIL	COPPER	ORANGE
R	COPPER	#11 ALLOY	COPPER	GREEN
S	COPPER	#11 ALLOY	COPPER	GREEN
E	CHROMEL™	CONSTANTAN	COPPER	VIOLET
U	COPPER	COPPER	COPPER	WHITE
C	#405 ALLOY	#426 ALLOY	COPPER	BROWN
(ALL HI-TEMP CONNECTORS)				RED

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

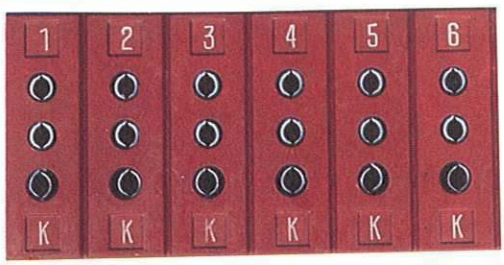
CONNECTORS
FULL SIZE — 3-POLE STRIPANEL®

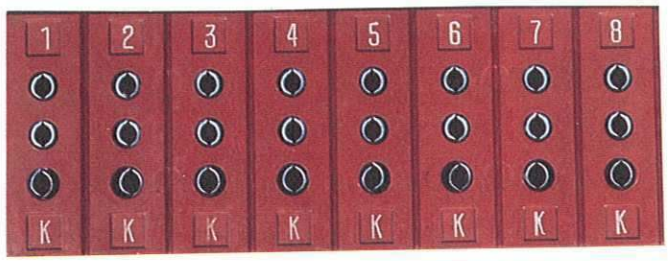
STANDARD 3-POLE/ HI-TEMP 3-POLE		
CODE NUMBER	**PRICE**	**DISCOUNT SCHEDULE**
1034-2-(*)	**$15.00**	**A**
1134-2-(*)	24.00	B
1034-4-(*)	**$30.00**	**A**
1134-4-(*)	48.00	B
1034-6-(*)	**$45.00**	**A**
1134-6-(*)	72.00	B
1034-8-(*)	**$60.00**	**A**
1134-8-(*)	96.00	B
1034-10-(*)	**$75.00**	**A**
1134-10-(*)	120.00	B
1034-12-(*)	**$90.00**	**A**
1134-12-(*)	144.00	B

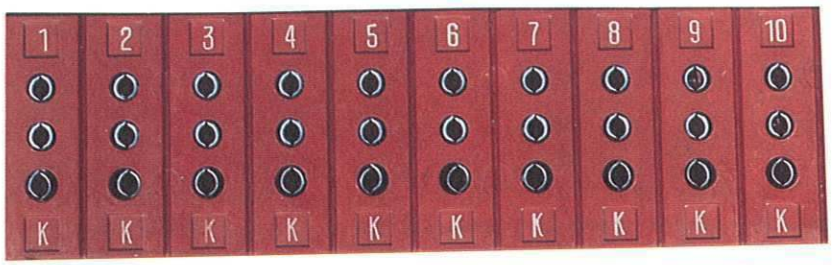
*TYPE CODE

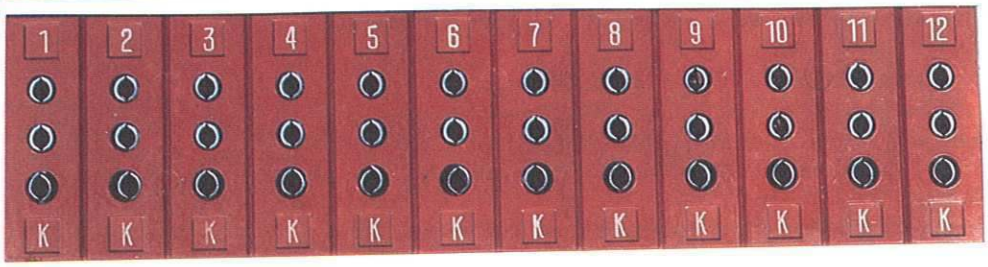


Hi-Temp Stripanels are as shown color coded "RED"
Standard 3-Pole Panels are color coded (See Page 13)









TO ORDER:

1) Give Stripanel No. 1034 - 8 - K
2) Specify No. of Circuits
3) Specify T/C Type by Code
4) For Vertical Stripanels Add Suffix "V" eg. 1034 - 8 - K - V
5) For High-Temp Stripanels: 1134 - 8 - K
6) Availability: J,K,T,N,E,R,S,U, also "C" EXCEPT ADD $1.50 to circuit price with maximum .75 discount factor for regular or hi-temp.
7) Gold plated inserts are available at $1.50 per circuit added to list price. Use suffix "G" (i.e. 1034-6-K-G).

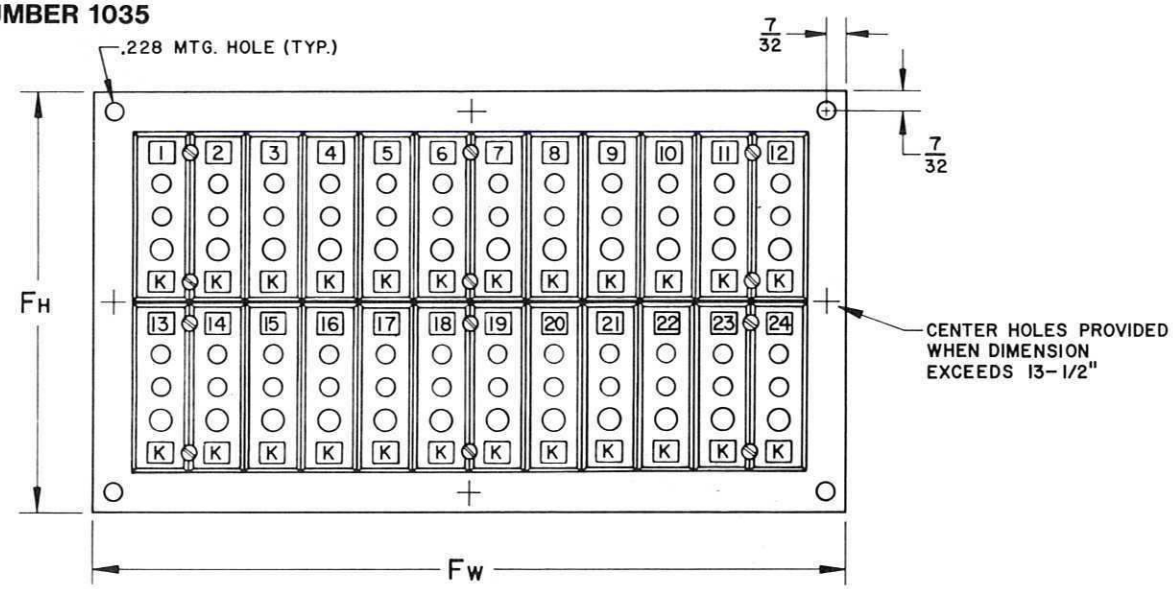
DISCOUNT SCHEDULE "A"	
QUANTITY	**FACTOR**
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

DISCOUNT SCHEDULE "B"	
QUANTITY	**FACTOR**
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75

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

CONNECTORS
FULL SIZE — 3-POLE STRIPANEL® WITH MOUNTING FRAME

CODE NUMBER 1035



Dimension for Panel Assembly
C_H AND C_W ARE MOUNTING CUTOUT DIMENSIONS

NUMBER OF ROWS	TOTAL CIRCUITS		CIRCUITS PER ROW: 2	4	6	8	10	12	14	16	18	20	22	24	PRICE (3-Pole) Standard	PRICE (3-Pole) Hi-Temp
			F_W = 2¾" C_W = 1½"	F_W = 4¼" C_W = 3"	F_W = 5¾" C_W = 4½"	F_W = 7¼" C_W = 6"	F_W = 8¾" C_W = 7½"	F_W = 10¼" C_W = 9"	F_W = 11¾" C_W = 10½"	F_W = 13¼" C_W = 12"	F_W = 14¾" C_W = 13½"	F_W = 16¼" C_W = 15"	F_W = 17¾" C_W = 16½"	F_W = 19¼" C_W = 18"		
1	F_H = 3¼" C_H = 2¼"	2	4	6	8	10	12	14	16	18	20	22	24	1035 $9.00 per Circuit Disc. Sched. "A"	1135 $13.50 per Circuit Disc. Sched. "B"
2	F_H = 5½" C_H = 4½"	4	8	12	16	20	24	28	32	36	40	44	48		
3	F_H = 7¾" C_H = 6¾"	6	12	18	24	30	36	42	48	54	60	66	72		
4	F_H = 10" C_H = 9"	8	16	24	32	40	48	56	64	72	80	88	96		
5	F_H = 12¼" C_H = 11¼"	10	20	30	40	50	60	70	80	90	100	110	120		
6	F_H = 14½" C_H = 13½"	12	24	36	48	60	72	84	96	108	120	132	144		
7	F_H = 16¾" C_H = 15¾"	14	28	42	56	70	84	98	112	126	140	154	168		
8	F_H = 19" C_H = 18"	16	32	48	64	80	96	112	128	144	160	176	192		
9	F_H = 21¼" C_H = 20¼"	18	36	54	72	90	108	126	144	162	180	198	216		
10	F_H = 23½" C_H = 22½"	20	40	60	80	100	120	140	160	180	200	220	240		

- Stripanels with mounting frames can accommodate virtually any number of circuits.
- One-piece mounting frame is made of 3/32" thick rigid steel with flat black finish.
- For specifications see Stripanel 1034 section.
- For frame sizes other than those in table consult Factory.
- Horizontal rows are assumed unless specified vertical by the suffix "V" which are numbered from top to bottom: e.g. 1035 – 4 X 12 – 48 – K – V.
- Stripanels with mounting frames will withstand ambient temperatures of 400°F (205°C) continuous and 500°F (260°C) intermittent. Hi-Temp panels will withstand ambient temperatures to 800°F (425°C) continuous and 1000°F (540°C) intermittent.

TO ORDER:

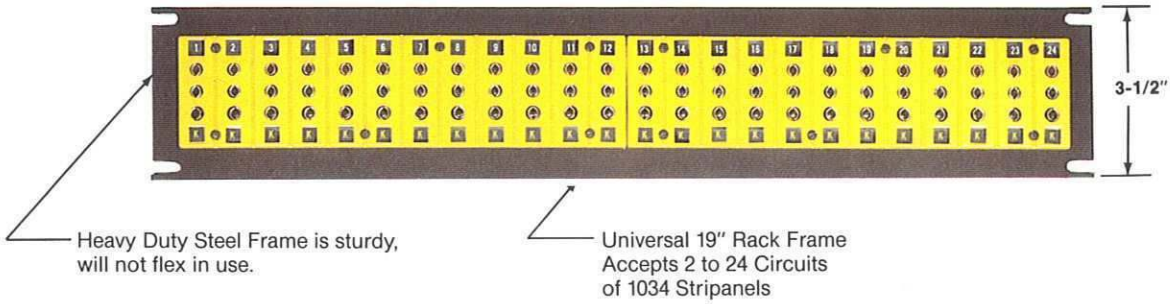
1. Give Stripanel No. → 1035 – 4 X 12 – 48 – K
2. Specify No. of Horizontal Rows
3. Specify No. of Circuits per Row
4. Give Total Number of Circuits
5. Specify Thermocouple Type Code
6. For Vertical Rows Add Suffix "V" e.g. 1035 - 4 x 12 - 48 - K - V
7. For Hi-Temp Stripanel In Frame: e.g. 1135 - 4 x 12 - 48 - K
8. Availability: J,K,T,N,E,R,S,U, also "C" EXCEPT ADD $1.50 to circuit price with maximum .75 discount factor for regular or Hi-Temp.
9. Gold plated inserts are available at $1.00 per circuit added to list price. Use suffix "G" (i.e. 1035-4x12-48-K-G).

Since 1952 Marlin

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

CONNECTORS
FULL SIZE — 3-POLE — 19" RACK — MOUNTED STRIPANEL®

CODE NUMBER 1042



- Universal 19" Rack accepts 2 to 24 circuits of 1034 Stripanels, less than 24 circuits are supplied with filler sections.
- Circuits can be added in the field without changing frame.
- 19" Rack Frame is made of sturdy 10 ga. steel that will not flex in use. Standard frame is flat black. High-Temp frame is bright silver finish.
- Thermocouple type and circuit numbers are marked on face of Stripanel and polarity identification on the back. Stripanels are numbered starting from "1" unless specified otherwise.
- Stripanels are molded of glass filled thermoset compounds (will not melt) for high strength and dependability. The color coded panels will withstand ambient temperatures to 400°F (205°C) continuous and 500°F (260°C) intermittent. High-Temperature panels (All Hi-Temp panels are color coded red) will withstand ambient temperatures to 800°F (425°C) continuous and 1000°F (540°C) intermittent.
- Inserts are spring loaded collet type to assure positive full contact with the negative insert larger making it virtually impossible to mismate.
- For corrosive applications, gold plated inserts are available. Caution — system errors can result from use of plated contacts if significant thermal gradients exist at connector.

TO ORDER:

1. Give Stripanel No. 1042 - 24 - K
2. Specify number of circuits
3. Specify Thermocouple Type by Code
4. For Hi-Temp Stripanel: 1142 - 24 - K

Price:

Standard 1042 Frame & Stripanel
1042 Std. Frame @ $50.
Std. Circuits @ $7.50/circuit
Discount Schedule "A" applies

Hi-Temp Frame & Stripanel
1142 @ $60.
Hi-Temp Circuits @ $12.00/circuit
Discount Schedule "B" applies

Example:

1042-24 Frame	$50
(24) Std. Circuits @ $7.50	180
Total Price (1041-24)	$230

TYPE CODE	INSERT MAT'L. ALLOY			COLOR CODE
	POSITIVE	NEGATIVE	GROUND	
J	IRON	CONSTANTAN	COPPER	BLACK
T	COPPER	CONSTANTAN	COPPER	BLUE
K	CHROMEL™	ALUMEL™	COPPER	YELLOW
N	NICROSIL	NISIL	COPPER	ORANGE
R	COPPER	#11 ALLOY	COPPER	GREEN
S	COPPER	#11 ALLOY	COPPER	GREEN
E	CHROMEL™	CONSTANTAN	COPPER	VIOLET
U	COPPER	COPPER	COPPER	WHITE
C*	#405 ALLOY	#426 ALLOY	COPPER	BROWN
(ALL HI-TEMP STRIPANELS)				RED

*For type "C" add $1.50 per circuit. Schedule B applies for regular or hi-temp.
Gold plated inserts are available at $1.50 per circuit added to list price. Use suffix "G" (i.e. 1042-24-K-G).

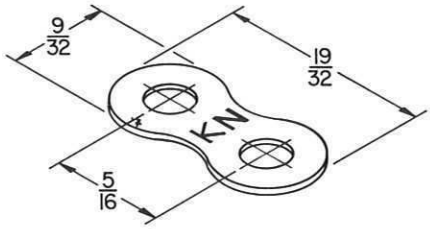
DISCOUNT SCHEDULE "A"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250-499	.75
500-999	.70
1000-1999	.65
2000+	.60

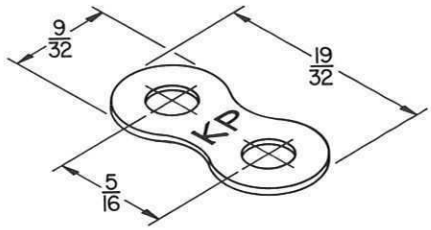
DISCOUNT SCHEDULE "B"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75

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

CONNECTORS
TERMINAL LUGS

Each lug has stamped-in designation of thermocouple type and polarity
e.g. JP = Type J positive
JN = Type J negative
(Exception "CU" uncompensated is not designated)

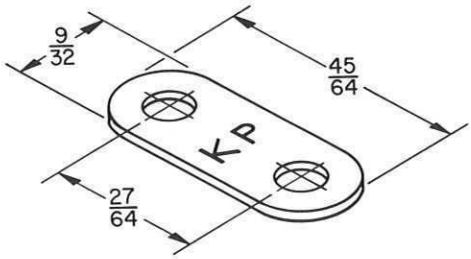


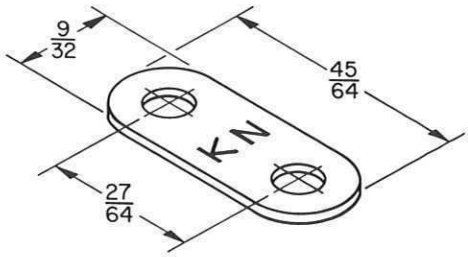


PART NO.	PRICE-SET	HOLE SPACING	FITS CINCH NO.	DISCOUNT SCHEDULE
2140 - (*)	$1.20	5/16	140	B

(*) Specify type J,K,T,E,R,S,CU,N

Each lug has stamped-in designation of thermocouple type and polarity
e.g. JP = Type J positive
JN = Type J negative
(Exception "CU" uncompensated is not designated)



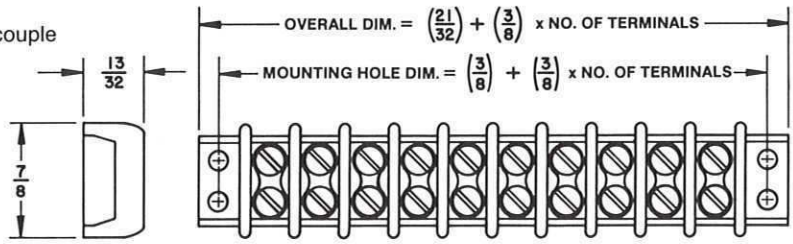


PART NO.	PRICE-SET	HOLE SPACING	FITS CINCH NO.	DISCOUNT SCHEDULE
2141 - (*)	$1.20	27/64	141	B

(*) Specify type J,K,T,E,R,S,CU,N

TERMINAL LUGS WITH BARRIER STRIP

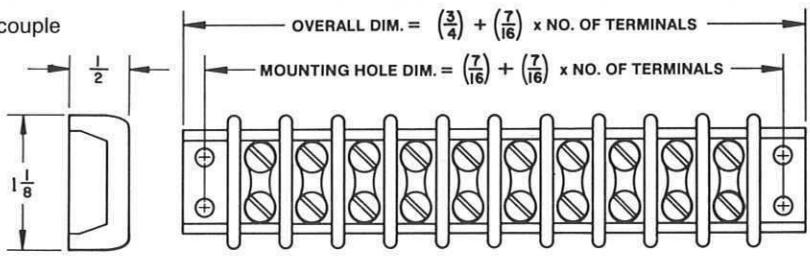
- 20 Terminals/10 Thermocouple Circuits max per strip
- Molded of bakelite
- Strips are shipped fully assembled with terminal lugs mounted
- 5-40 B.HD. Screws
- Cinch No. 140
- Hole Spacing 5/16"



PART NO.	PRICE-CIRCUIT
BS-2140-(*)-( )	$3.00

(*) Specify type J,K,T,E,R,S,CU,N
( ) Specify number of thermocouple circuits
Discount Schedule "B" applies

- 20 Terminals/10 Thermocouple Circuits max per strip
- Molded of bakelite
- Strips are shipped fully assembled with terminal lugs mounted
- 6-32 B.HD. Screws
- Cinch No. 141
- Hole Spacing 27/64"



PART NO.	PRICE-CIRCUIT
BS-2141-(*)-( )	$3.00

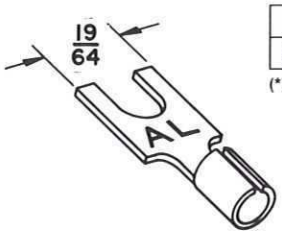
(*) Specify type J,K,T,E,R,S,CU,N
( ) Specify number of thermocouple circuits
Discount Schedule "B" applies

TERMINAL SPADE LUGS

Each spade lug has stamped-in designation of thermocouple alloy type.

e.g. CH = CHROMEL
AL = ALUMEL
IR = IRON
CO = CONSTANTAN
CP = COPPER
II = ALLOY II
NP = NICROSIL
NN = NISIL

Fits 6-32 (CINCH-141) Terminal Screws. Accepts up to 18 ga. wire for crimp connection.



PART NO.	PRICE - EACH	DISC. SCHED.
SL-2141-(*)	$0.45	B

(*) Specify thermocouple alloy

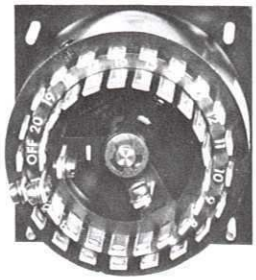
DISCOUNT SCHEDULE "B"	
QUANTITY**	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75

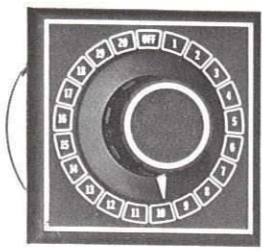
**Quantity based on total number of circuits per order of terminal lugs or lugs with barrier strip. Total no. of pieces of terminal spade lugs.

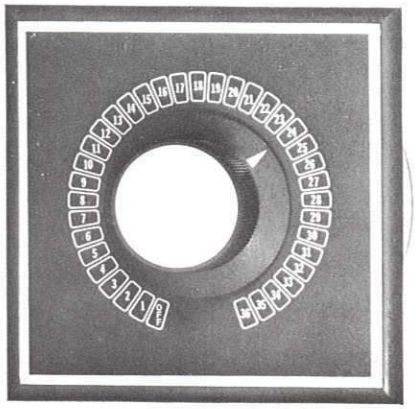
Since 1952 Marlin
MANUFACTURING CORPORATION 12404 TRISKETT ROAD CLEVELAND, OHIO 44111 (216) 941-6200 FAX: (216) 941-6207

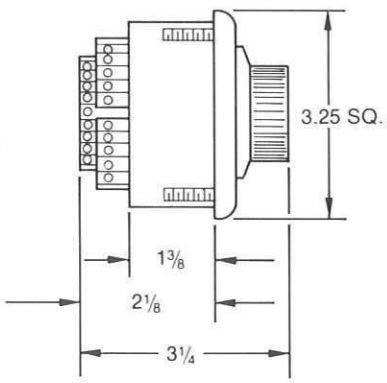
CONNECTORS
SELECTOR SWITCHES

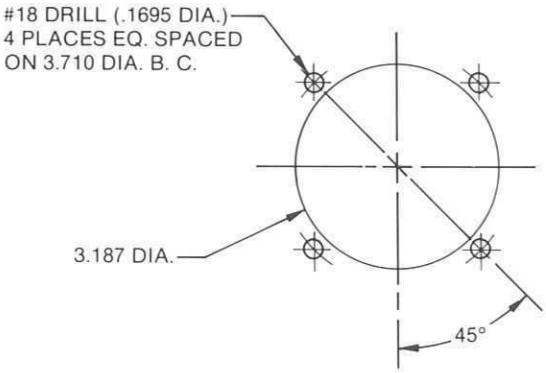
—Available in 2 to 40 positions
—2 Pole and 3 Pole circuits with "OFF" position
—Silver plated blades and contacts with self-cleaning wiper action and low contact resistance
—Terminals are silver plated brass numbered circuits with polarity identification
—"OFF" position has terminals available for shorting input circuit when using it with a digital meter (Not available on 3-Pole)
—High impact GE Noryl™ case
—Break before make SW3-2 through SW3-10
—Make before break SW3-12 through SW5-40 and SWT-6 through SWT-36
—Pistol grip knob is available @ $10. (suffix PG) i.e. SW3-10-PG @ 113.+10 = $123.





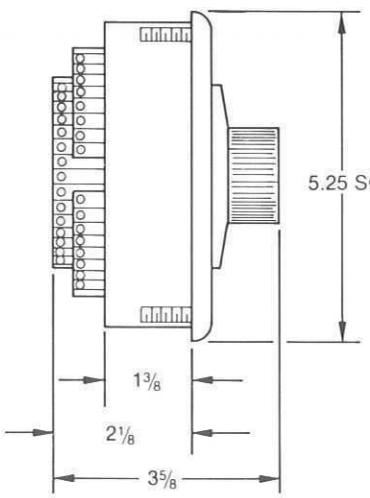


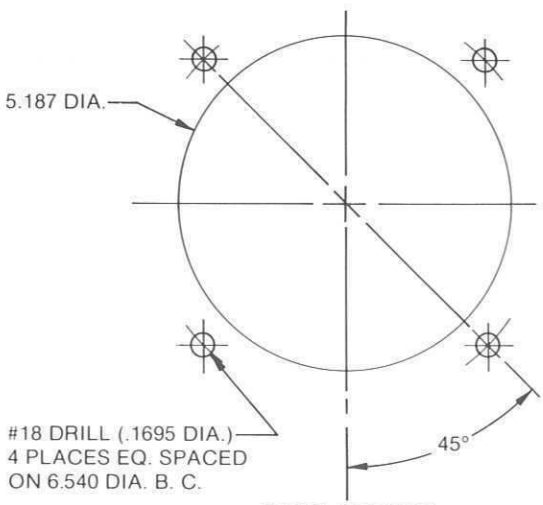




PANEL CUTOUT

NO. POS.		CODE NO.	PRICE
2	2 Pole	SW3-2	$ 95.
3		SW3-3	97.
4		SW3-4	103.
5		SW3-5	105.
6		SW3-6	108.
8		SW3-8	110
10		SW3-10	113.
12		SW3-12	119.
14		SW3-14	124.
16		SW3-16	128.
18		SW3-18	133.
20		SW3-20	136.



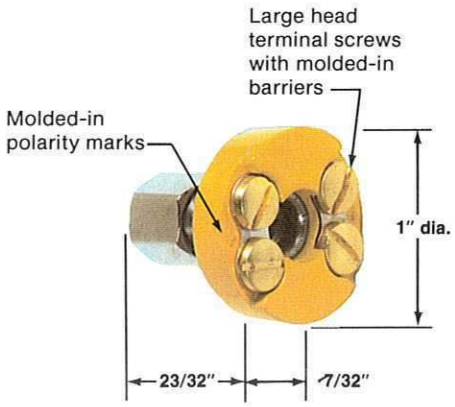


PANEL CUTOUT

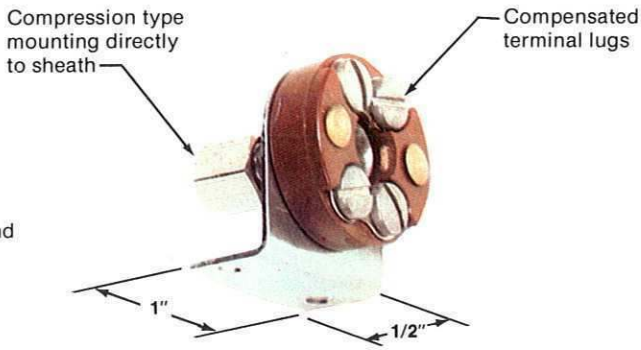
NO. POS.		CODE NO.	PRICE
24		SW5-24	$145.
28		SW5-28	154.
30		SW5-30	158.
32		SW5-32	162.
36		SW5-36	171.
40		SW5-40	185.
6		SWT-6	111.
12		SWT-12	131.
18		SWT-18	151.
24		SWT-24	168.
28		SWT-28	181.
32		SWT-32	195.
36		SWT-36	208.

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

CONNECTORS
MICRO CONNECTOR HEAD



- Body of molded thermo-set compound (will not melt)
- Color coded
- Hi-Temp available to 800° F



SINGLE CIRCUIT

MICRO HEAD	
CODE NO.	PRICE EACH
2010-(*)-( )[1]	$4.50

HI-TEMP MICRO HEAD	
CODE NO.	PRICE EACH
2110-(*)-( )[1]	$8.25

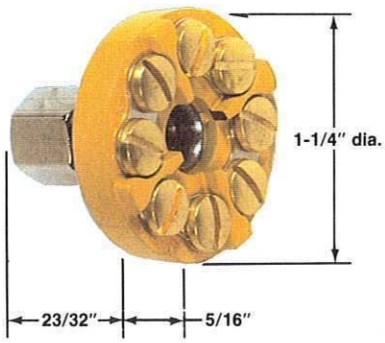
*Specify type J,K,T,E,R,S,CU,N
1-Specify sheath size 1/16, 1/8, 3/16, 1/4

SINGLE CIRCUIT WITH BRACKET

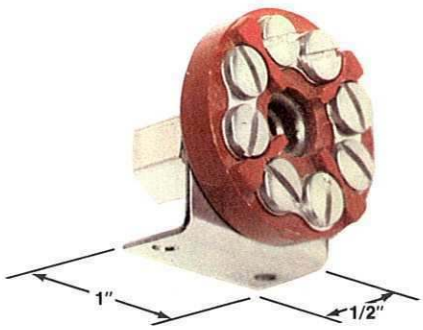
MICRO HEAD w/MTG. BKT.	
CODE NO.	PRICE EACH
2011-(*)-( )[1]	$5.00

HI-TEMP MICRO HEAD w/MTG. BKT.	
CODE NO.	PRICE EACH
2111-(*)-( )[1]	$9.00

*Specify type J,K,T,E,R,S,CU,N
1-Specify sheath size 1/16, 1/8, 3/16, 1/4



Same features as the single circuit with molded-in circuit designators A+, A–, B+, B–



DUAL CIRCUIT

DUAL CIRCUIT MICRO HEAD	
CODE NO.	PRICE EACH[1]
2210-(*)-( )[1]	$6.00

HI-TEMP DUAL MICRO HEAD	
CODE NO.	PRICE EACH
2310-(*)-( )[1]	$9.50

*Specify type J,K,T,E,R,S,CU,N
1-Specify sheath size 1/16, 1/8, 3/16, 1/4

DUAL CIRCUIT WITH BRACKET

DUAL CIRCUIT MICRO HEAD w/MTG. BKT.	
CODE NO.	PRICE EACH
2211-(*)-( )[1]	$6.50

HI-TEMP DUAL MICRO HEAD w/MTG. BKT.	
CODE NO.	PRICE EACH
2311-(*)-( )[1]	$10.00

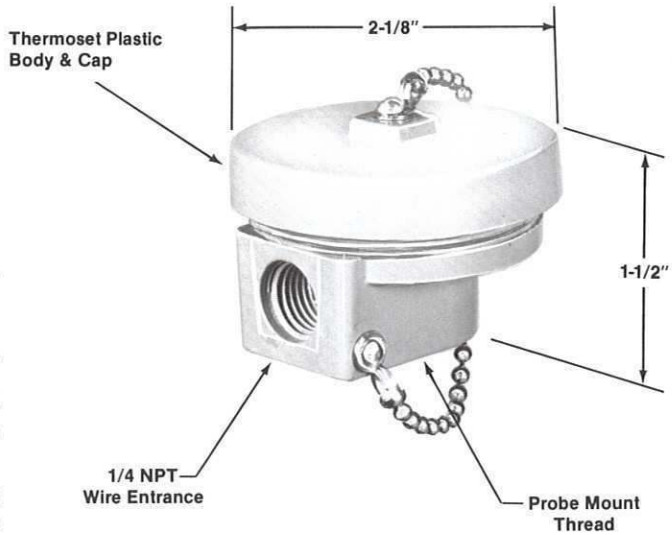
*Specify type J,K,T,E,R,S,CU,N
1-Specify sheath size 1/16, 1/8, 3/16, 1/4

For Mounting directly on thermocouple sheath stem by compression fitting. **Large head brass terminal screws** facilitate tight connections. **Bodies are molded** of high performance thermoset compounds (will not melt) for high strength and dependability. The color coded micro heads will withstand ambient temperatures to 400° F (205° C) continuous 500° F (260° C) intermittent. High-Temperature micro heads (All Hi-Temp micro heads are color coded red) will withstand ambient temperatures to 800° F (425° C) continuous and 1000° F (540° C) intermittent.

Angle bracket made of nickel plated steel provides means for firm surface mounting; can be spot welded for permanent mounting or screw mounted through holes provided.

DISCOUNT SCHEDULE "B"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75

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



Miniature Weatherproof Connecting Head is designed for termination of single or dual thermocouples, RTD's and strain gauges. Pipe threads are provided for probe mounting and extension wire fittings. Probe mount thread accomodates 1/4 NPT or 3/8 NPT. Cover includes gasket to seal against moisture, and chain to prevent loss. Molded of reinforced thermoset compounds, standard head can be used in ambient temperatures to 350° F (175° C); Hi-Temp head to 800° F (425° C).

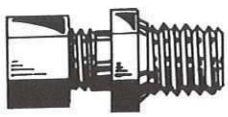
Four separate connections are provided with individual circuit and polarity markings. Jab-In® terminals eliminate looped wire ends and make wiring easy and positive. Molded channels guide wire between large-head brass screws and copper terminal inserts. Accepts wire from 32 ga to 14 ga.

DISCOUNT SCHEDULE "B"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75

DESCRIPTION	PROBE MOUNT THREAD	PART NO.	PRICE	DISCOUNT SCHEDULE
Standard 350°F	1/4 NPT	2002	$11.00	B
	3/8 NPT	2003	$11.00	
Hi-Temp 800°F	1/4 NPT	2102	$17.00	B
	3/8 NPT	2103	$17.00	

Mounting Accessories

Brass Compression Fitting includes body, nut and ferrule for mounting probe tubing.



TUBE SIZE OD	THREAD SIZE	PART NO.	PRICE	DISCOUNT SCHEDULE
1/8"	1/4 NPT	A 14B 125	$4.00	B
3/16"	1/4 NPT	A 14B 187	4.50	
1/4"	1/4 NPT	A 14B 250	4.50	
3/8"	3/8 NPT	A 38B 375	7.00	

Stainless Steel Fixed Fitting for brazing to probe.

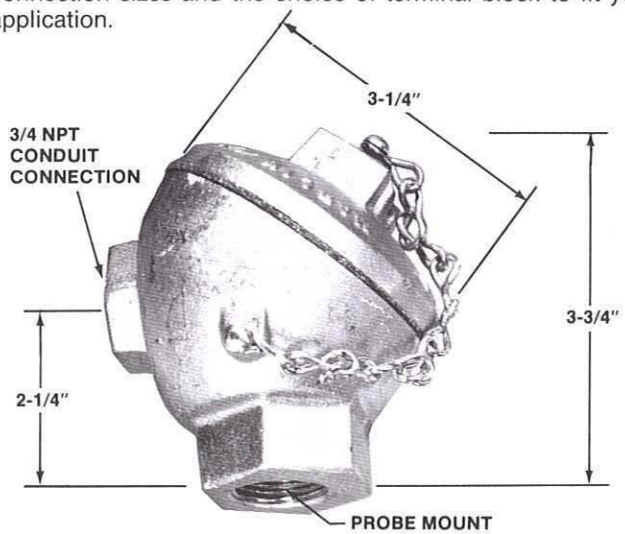
1/8"	1/4 NPT	F 14S 125	$5.00	B
3/16"	1/4 NPT	F 14S 187		
1/4"	1/4 NPT	F 14S 250		
3/8"	3/8 NPT	F 38S 375		

Wire Grip Fitting provides strain relief and moisture-proof protection for extension wires from 1/8" OD to 3/8" OD. Contains 1/4 NPT brass body, nut, two sizes of back up washers and four assorted sizes of elastomer grommets.

1/4 NPT	2080	$5.00	B

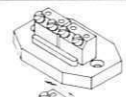
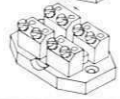
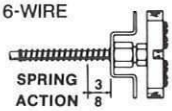
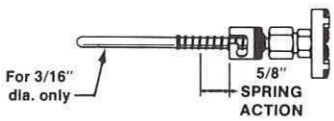
Weatherproof Terminal Head

Weatherproof heads are rugged cast aluminum or cast iron screw cover units that are available in various NPT probe connection sizes and the choice of terminal block to fit your application.



	PROBE NPT	CODE	PRICE EACH	DISCOUNT SCHEDULE
Cast Aluminum Weatherproof Head	1/2 NPT 3/4 NPT 1 NPT	WA 2 WA 3 WA 4	$17.00	B
Cast Iron Weatherproof Head	1/2 NPT 3/4 NPT 1 NPT	WC 2 WC 3 WC 4	$16.00	B

1. To order terminal head/block assembly use block code as prefix e.g. 2WA2 and combine prices.

TERMINAL BLOCKS for Weatherproof Heads	T'BLOCK CODE	PRICE EACH	DISCOUNT SCHEDULE
2-WIRE Accepts to 8 ga. wire 	A	$4.00	B
4-WIRE Accepts to 8 ga. wire 	D	5.50	
RIGID 4-WIRE 	2	9.00	
RIGID 4-WIRE W/Sheath Adapter -max sheath O.D. .250" 	3 *	12.00	
SPRING LOADED 4-WIRE (¼" sheath size)	4 *	13.50	
SPRING LOADED 6-WIRE (¼" sheath size) 	5 *	14.50	
	6	15.00	

* Specify sheath size with these blocks. e.g. TB-3-250 or TB-3-375

ORDER CODE: TB ☐ (T'BLOCK CODE)

EXPLOSION PROOF TERMINAL HEAD

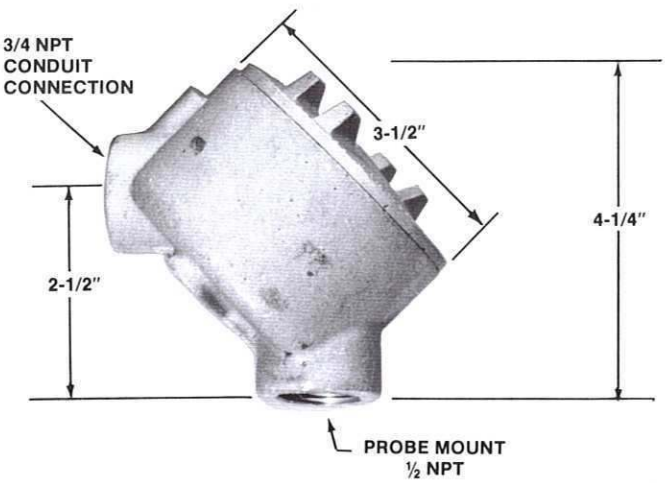
Explosion proof heads are cast aluminum screw cover units that comply with: NEC

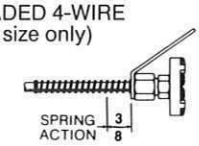
Class I, Group C, D — Class III
Class II, Groups E, F, G — UL Standard 866

They are designed for use in hazardous environments where extreme caution must be observed.

	PROBE NPT	CODE	PRICE EACH	DISCOUNT SCHEDULE
Explosion proof head Cast Aluminum	1/2 NPT	EX A	$50.00	B

1. To order terminal head/block assembly use block code as prefix e.g. 2EXA and combine prices.



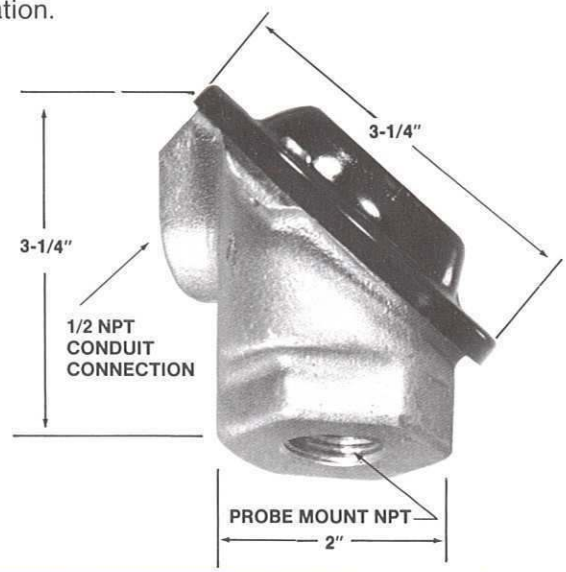
TERMINAL BLOCKS for Explosion Proof Heads	T'BLOCK CODE	PRICE EACH	DISCOUNT SCHEDULE
RIGID 4-WIRE 	3	$9.00	B
SPRING LOADED 4-WIRE (1/4" sheath size only) 	8 *	15.00	

* Specify sheath size: e.g. TB-8-250

ORDER CODE: TB ☐ (T'BLOCK CODE)

CONNECTORS
GENERAL PURPOSE HEAD

General purpose heads are rugged cast aluminum units with stamped steel covers that are available in various NPT probe connection sizes and terminal block to fit your application.



	PROBE NPT	CODE	PRICE EACH	DISCOUNT SCHEDULE
Cast Aluminum General Purpose Head	1/2 NPT 3/4 NPT 1 NPT	GP 2 GP 3 GP 4	$18.00	B

1. To order terminal head/block assembly use block code as prefix e.g. 1GP2 and combine prices.

Terminal Blocks for General Purpose Heads	T'Block CODE	PRICE EACH	DISCOUNT SCHEDULE
2-WIRE Accepts to 8 ga. wire 	1	$8.00	B

ORDER CODE: TB-1

DISCOUNT SCHEDULE "B"	
QUANTITY	FACTOR
1-14	NET
15-49	.90
50-99	.85
100-249	.80
250+	.75

MARLIN OPEN HEAD

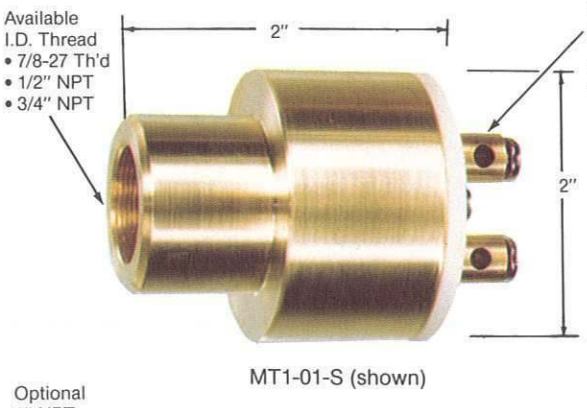
The open head is a brass body head with post terminals, T/C male plugs, or T/C female jacks. Dual thermocouple open heads are also available in post, plug, or jack styles. Designed primarily for use with platinum/rhodium type thermocouples. No terminal block is used with this head.

CATALOG NO.: MT1—01—S @ $23.50

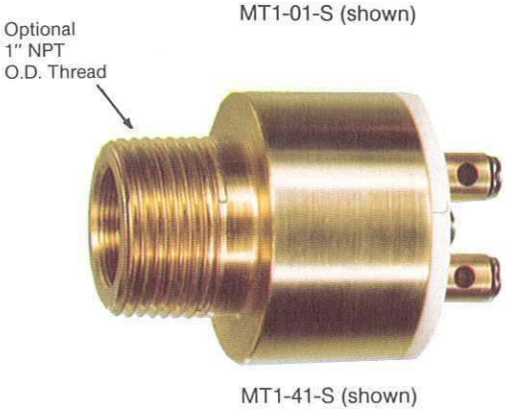
Marlin Open Head, Post Terminal, Single Types T/C

M ___ ___ — ___ — ___

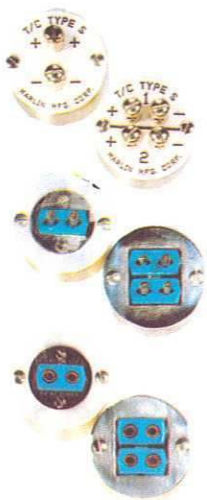
			I.D. Thread Only	T/C Type
(Terminal)	T	01	7/8-27" thread	R
(Plug(s))	P	02	1/2" NPT } Price add	S
(Jack(s))	F	03	3/4" NPT } $5.00	
			O.D. X I.D. Thread	
(single T/C)	1	41	1" NPT × 7/8-27" thread } Price add $12.00	
(dual T/C's)	2	42	1" NPT × 1/2" NPT }	
		43	1" NPT × 3/4" NPT }	



MT1-01-S (shown)



MT1-41-S (shown)

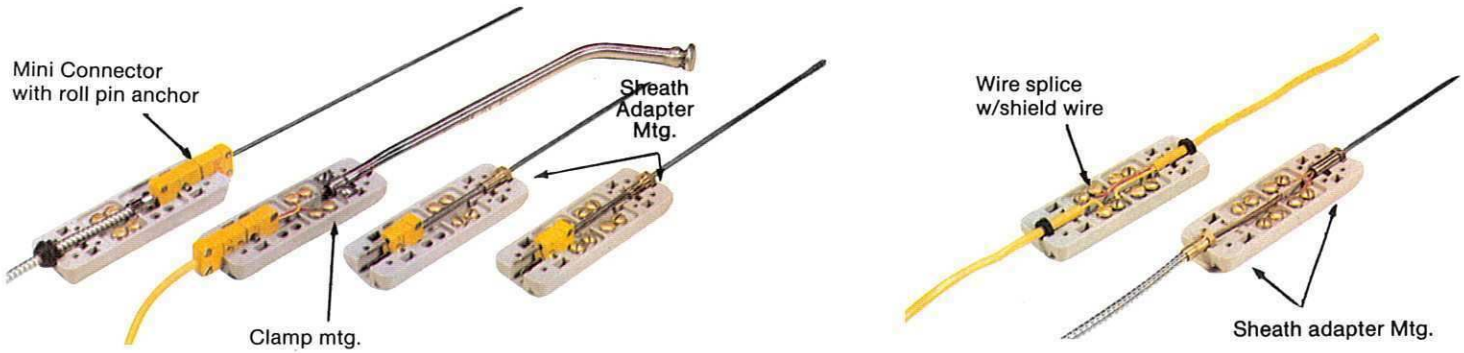


Terminal Type	Prefix Code	Price* Each	Discount Schedule
Post:			B
Single	MT1-	$23.50	
Dual	MT2-	28.00	
T/C Plug:			
Single	MP1-	$25.00	
Dual	MP2-	34.00	
T/C Jack:			
Single	MF1-	$32.00	
Dual	MF2-	37.00	

$5.00 extra charge for thread codes 02, 03
$12.00 extra for 1" NPT external thread codes 41, 42, 43

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

TYPICAL PROBE HANDLE CONFIGURATION

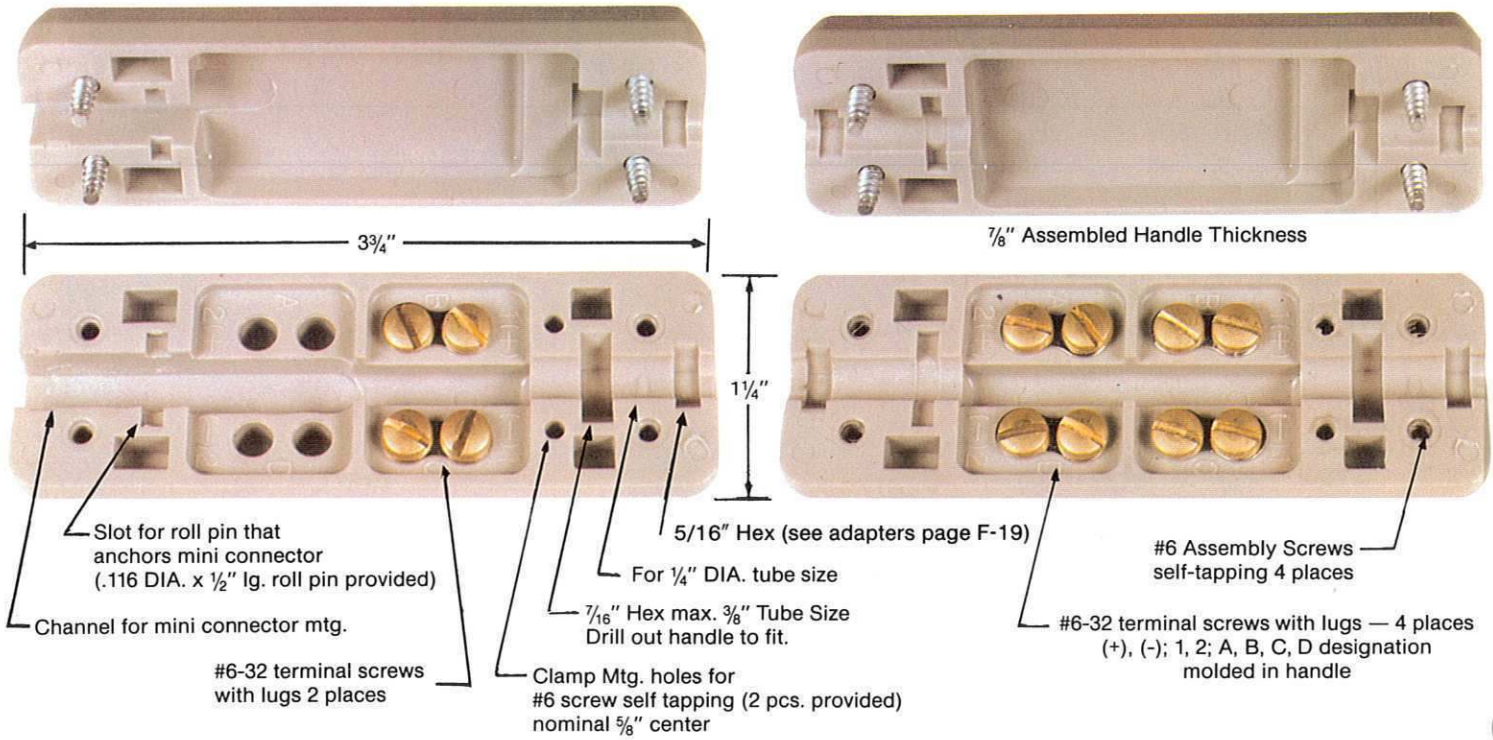


TYPICAL PROBE HANDLE HOOK-UP

This universal probe handle has been designed to accommodate a variety of mounting arrangements. Mini connectors, hex sheath adapters and rigid clamping provide dependable probe assemblies that properly strain-relieves both the sheath and the wire. Molded of reinforced nylon the handle can be used to temperatures of 260°F (127°C) (not available in high-temperature).

FOR MINI CONNECTORS

FOR DIRECT WIRES



Part Number	Price	Disc. Sched.
UPH-1	$7.50	A

Part Number	Price	Disc. Sched.
UPH-2	$7.50	A

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