# PYROSALES

# THERMOCOUPLE WIRE & CABLE


4 Wordie Place
Padstow NSW 2211
PO Box 309, Padstow, NSW 2211 Australia
Tel (02) 9790 1988 Fax (02) 9790 1040
sales@pyrosales.com.au

Factory 4, Enterprise Way,
Bayswater, Vic 3153
PO Box 553, Bayswater, Vic, 3153 Australia
Tel (03) 9729 2100 Fax (03) 9720 5559
vicsales@pyrosales.com.au

Unit 1,(Lot3), 70 Flanders Street
Salisbury QLD 4107
PO Box 182, Salisbury QLD 4107 Australia
Tel (07) 3277 9400 Fax (07) 3277 9495
qldsales@pyrosales.com.au

www.pyrosales.com.au

# SERV-RITE®
# Wire and Cable

## Thermocouple and Thermocouple Extension Wire

### Manufactured to Exacting Specifications

Since 1914, SERV-RITE® thermocouple wire and thermocouple extension wire have been known for premium performance and reliability. All stock and custom wire is manufactured in our plant where careful selection of materials, latest type of special machines and quality controls assure superior uniformity.

While this section presents available stock wire products, Watlow Gordon can custom manufacture wire using alloys and insulation types to meet your specific application demands.

All SERV-RITE thermocouple wire and thermocouple extension wire is manufactured under rigid quality controls. Watlow Gordon's wire products are manufactured following ISO 9001 standards. In addition, all EMF vs. temperature calibration procedures follow one or more of the following standards:

- ASTM E 207
- ASTM E 220
- AMS 2750

All testing has NIST (formerly NBS) traceability. Unless otherwise specified, all SERV-RITE thermocouple wire and extension wire are supplied to meet Standard Tolerances of ASTM E 230. Special Tolerances are also available.

***Performance Capabilities***

- Compliance with recognized agency tolerances
- Insulation temperature ranges from -328 to 2350°F (-200 to 1290°C)
- Tolerances from ±0.5°C or ±0.4%
- NIST calibration certificates

***Features and Benefits***

- **Type E, J, K, N and T thermocouple wire** for virtually all applications.
- **Type EX, JX, KX, NX, TX extension wire** to match thermocouple type.
- **Compensating extension wire for Type B, C*, R and S thermocouples** permit fine tuning of temperature measuring circuit.
- **Solid or stranded wire constructions** to meet specific application requirements.
- **Wide selection of insulation types** to meet temperature, chemical, moisture and abrasion resistance objectives.
- **Color coding** available to comply with United States, United Kingdom, German, Japanese and IEC standards.
- **Select metallic overbraids and wraps** to enhance abrasion resistance.
- **UL® listed PLTC wire and cable** for applications requiring agency compliance.
- **Stock RTD lead wire** to meet virtually all industrial RTD applications.

*Not an ASTM E 230 symbol.

# SERV-RITE Wire and Cable

## Thermocouple and Thermocouple Extension Wire

### Technical Data

The following pages contain SERV-RITE wire technical data. This information covers ASTM E 230 letter designations and tolerances, color coding, stranded and solid constructions, selection considerations, how to read SERV-RITE wire product code numbers, metallic overbraid and wrap options, insulation or “Series,” constructions and characteristics.

If you are unable to locate the stock product specifications required by your application, Watlow Gordon can custom manufacture a wire to meet your needs.

#### *Calibration and Certification*

SERV-RITE thermocouple wire and elements can be factory calibrated and certified at an extra charge. Each thermocouple, coil, reel or spool of wire is then tagged to show the individual departure from curve. Once calibrated, their exact departure from the standard curve at any specified temperature is known and can be taken into account. Thermocouples and wire samples sent to the factory for calibrating must be at least 36 inches long.

The standard calibrating temperature points range from 32 to 2300°F (0 to 1260°C), depending on calibration, gauge size and insulation. Subzero and cryogenic calibration is available at fixed points, such as boiling helium, nitrogen and sublimated carbon dioxide, including temperatures down to -110°F (-80°C).

A certificate of calibration is furnished for all calibrated items. Each item calibrated is also tagged with the results.

#### *Common Certifications for Wire*

The following standard certifications are available from Watlow Gordon. Requirements for these certifications must be stated on the order.

**Certificate #1 - Certificate of Compliance/Conformity**

This certification states that product is being supplied which meets the requirements of the purchase order.

**Certificate #2 - Certificate of Compliance to ASTM E 230 Tolerance**

This certification states that product is being supplied which meets the requirements of the purchase order, including the correct calibration type and tolerance. This certification is also used when conformance to ASTM E 230 must be documented.

**Certificate #3 - Certificate of Conformance to MIL Standard 45662A**

This certificate is used to certify that our calibration system is in accordance with MIL-STD 45662A.

**Certificate #4 - Certificate of Traceability to NIST**

This certification is used to certify that the materials they receive is traceable to NIST via calibration data of the thermoelements used to manufacture the product.

**Certificate #6 - Certificate of Calibration at Standard Calibration Points**

This is a calibration certification offering the preproduction calibration values of the insulated wire product at the standard calibration check points.

**Certificate #7A - Chemical and Physical Analysis of conductors in insulated wire products**

This certification offers the nominal chemical composition of the alloy used in the insulated wire products.

**Certificate #8 - Certificate of Calibration at Specified Temperatures**

This is a calibration certification when post-production calibration data is desired. Calibration is performed in the Watlow calibration laboratory with NIST traceable calibration standards. In addition to the calibration data, the test standard, equipment, NIST traceability, and reference to applicable calibration procedures are stated.

**Note: Custom certifications are available upon request.**

**SERV-RITE Wire Standard Calibration Temperatures**

| Calibration | Standard Calibration Points °F* |
|---|---|
| E | 300, 500, 1000, 1600 |
| J | 200, 500, 1000, 1400 |
| K | 300, 500, 1000, 1600, 2000 |
| N | 300, 500, 1000, 1600, 2000 |
| T | 200, 500 |
| BX | 212, 400 |
| CX | 200, 300, 400, 500 |
| EX | 200, 400 |
| JX | 200, 400 |
| KX | 200, 300, 400 |
| NX | 200, 300, 400 |
| RX | 400 |
| SX | 400 |
| TX | 200, 400 |

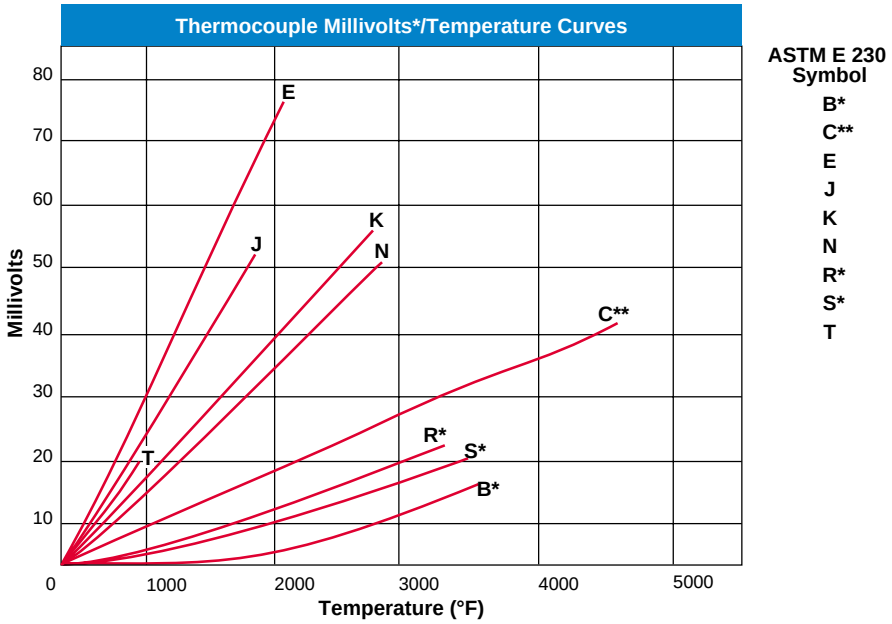
* Calibration not made when temperature exceeds wire insulation rating.

# SERV-RITE Wire and Cable

## Thermocouple and Thermocouple Extension Wire

### Technical Data

***Calibration and Certification***
Continued




*Millivolt values shown for C, R, S and B calibrations pertain to thermocouple calibrations only. RX, SX and BX constructions described in this catalog section are intended for use as **extension wire only** and will not exhibit the millivolt outputs shown.

**Not an ASTM E 230 Symbol- Tungsten 5% Rhenium/Tungsten 26% Rhenium.

### *ASTM E 230 Letter Designations*

Thermocouple and extension wires are generally ordered and specified by ASTM E 230 letter designations for wire type. Positive and negative legs are identified by the appropriate letter suffixes P and N, respectively.

| ASTM E 230 Letter | Description | Thermocouple Grade Alloys | Extension or Compensating Grade Alloys |
|---|---|---|---|
| B | BP<br>BN | Platinum 30% Rhodium<br>Platinum 6% Rhodium | BPX-PCLW-30-6<br>Copper |
| C* | CP<br>CN | W5Re (Tungsten 5% Rhenium)<br>W26Re (Tungsten 26% Rhenium) | Alloy 405<br>Alloy 426 |
| E | EP<br>EN | Chromel®<br>Constantan | Chromel®<br>Constantan |
| J | JP<br>JN | Iron<br>Constantan | Iron<br>Constantan |
| K | KP<br>KN | Chromel®<br>Alumel® | Chromel®<br>Alumel® |
| N | NP<br>NN | Nicrosil<br>Nisil | Nicrosil<br>Nisil |
| R | RP<br>RN | Platinum 13% Rhodium<br>Pure Platinum | Copper<br>#11 Alloy |
| S | SP<br>SN | Platinum 10% Rhodium<br>Pure Platinum | Copper<br>#11 Alloy |
| T | TP<br>TN | Copper<br>Constantan | Copper<br>Constantan |

*Not an ASTM E 230 symbol.

Note: Watlow Gordon reserves the right to substitute equivalent materials.

# SERV-RITE Wire and Cable

## Thermocouple and Thermocouple Extension Wire

### Technical Data
Continued

***ASTM E 230 Tolerances***

Unless otherwise specified, all SERV-RITE thermocouple wire and extension wire is supplied to meet Standard Tolerances of ASTM E 230. Special Tolerances are also available. The standard and special tolerances for thermocouple and extension wires are given in the accompanying tables. Where tolerances are given in percent, the percentage applies to the temperature being measured.

### Initial Calibration Tolerances for SERV-RITE Wire And Cable

Reference Junction 32°F (0°C)

| Calibration Type | Temperature Range °F | Temperature Range (°C) | Tolerances (whichever is greater) Standard °F | Standard (°C) | Special °F | Special (°C) |
|---|---|---|---|---|---|---|
| **Thermocouples** ① ③ | | | | | | |
| B | 1600 to 3100 | (870 to 1700) | ② | (±0.5%) | ② | (±0.25%) |
| E | 32 to 1600 | (0 to 870) | ② | (±1.7 or ±0.5%) | ② | (±1.0 or ±0.4%) |
| J | 32 to 1400 | (0 to 760) | ② | (±2.2 or ±0.75%) | ② | (±1.1 or ±0.4%) |
| K or N | 32 to 2300 | (0 to 1260) | ② | (±2.2 or ±0.75%) | ② | (±1.1 or ±0.4%) |
| R or S | 32 to 2700 | (0 to 1480) | ② | (±1.5 or ±0.25%) | ② | (±0.6 or ±0.1%) |
| T | 32 to 700 | (0 to 370) | ② | (±1.0 or ±0.75%) | ② | (±0.5 or ±0.4%) |
| E④ | -328 to 32 | (-200 to 0) | ② | (±1.7 or ±1%) | ② | ⑤ |
| K④ | -328 to 32 | (-200 to 0) | ② | (±2.2 or ±2%) | ② | ⑤ |
| T④ | -328 to 32 | (-200 to 0) | ② | (±1.0 or ±1.5%) | ② | ⑤ |
| **Extension Wires** ⑥ ⑦ | | | | | | |
| EX | 32 to 400 | (0 to 200) | ±3.0 | (±1.7) | ±1.8 | (±1.0) |
| JX | 32 to 400 | (0 to 200) | ±4.0 | (±2.2) | ±2.0 | (±1.1) |
| KX or NX | 32 to 400 | (0 to 200) | ±4.0 | (±2.2) | ±2.0 | (±1.1) |
| TX | 32 to 200 | (0 to 100) | ±1.8 | (±1.0) | ±0.9 | (±0.5) |
| **Compensating Extension Wires** ⑧ ⑨ | | | | | | |
| BX⑩ | 32 to 400 | (0 to 200) | ±7.6 | (±4.2) | * | * |
| CX | 32 to 500 | (0 to 260) | ±12.2 | (±6.8) | * | * |
| RX, SX | 32 to 400 | (0 to 200) | ±9.0 | (±5.0) | * | * |

① Tolerances in this table apply to new essentially homogeneous thermocouple wire, normally in the size range 0.25 to 3 mm in diameter (No. 30 to No. 8 AWG) and used at temperatures not exceeding the recommended limits on page 177. If used at higher temperatures these tolerances may not apply.

② At a given temperature that is expressed in °C, the tolerance expressed in °F is 1.8 times larger than the tolerance expressed in °C. Note: Wherever applicable, percentage-based tolerances must be computed from temperatures that are expressed in °C.

③ **Caution**: Users should be aware that certain characteristics of thermocouple materials, including the EMF vs. temperature relationship may change with time in use; consequently, test results and performance obtained at time of manufacture may not necessarily apply throughout an extended period of use. Tolerances given above apply only to new wire as delivered to the user *and do not allow for changes in characteristics with use*. The magnitude of such changes will depend on such factors as wire size, temperature, time of exposure and environment. It should be further noted that due to possible changes in homogeneity, attempting to recalibrate *used* thermocouples is likely to yield irrelevant results, and is not recommended. However, it may be appropriate to compare used thermocouples *in-situ* with new or known good ones to ascertain their suitability for further service under the conditions of the comparison.

④ Thermocouples and thermocouple materials are normally supplied to meet the tolerances specified in the table for temperatures above 0°C. The same materials, however, may not fall within the tolerances given for temperatures below °C in the second section of the table. If materials are required to meet the tolerances stated for temperatures below 0°C the purchase order must so state. Selection of materials usually will be required.

⑤ Special tolerances for temperatures below 0°C are difficult to justify due to limited available information. However, the following values for Types E and T thermocouples are suggested as a guide for discussion between purchaser and supplier: *Type E*: -200 to 0°C ±1.0°C or ±0.5% (whichever is greater); Type T: -200 to 0°C ±0.5 or±0.8% (whichever is greater).

Initial values of tolerance for Type J thermocouples at temperatures below 0°C and special tolerances for Type K thermocouples below 0°C are not given due to the characteristics of the materials.

⑥ Tolerances in the table represent the maximum error contribution allowable from new and essentially homogeneous thermocouple extension wire when exposed to the full temperature range given above. Extension grade materials are not intended for use outside the temperature range shown.

⑦ Thermocouple extension wire makes a contribution to the total thermoelectric signal that is dependent upon the temperature difference between the extreme ends of the extension wire length. The actual magnitude of any error introduced into a measuring circuit by homogeneous and correctly connected extension wires is equal to the algebraic difference of the deviations at its two end temperatures, as determined for that extension wire pair.

⑧ Tolerances in the table apply to new and essentially homogeneous thermocouple compensating extension wire when used at temperatures within the range given above.

⑨ Thermocouple compensating extension wire makes a contribution to the total thermoelectric signal that is dependent upon the temperature difference between the extreme ends of the compensating extension wire length.

⑩ Special compensating extension wires are not necessary with Type B over the limited temperature range 32 to 125°F (0 to 50°C), where the use of non-compensated (copper/copper) conductors introduces no significant error. For a somewhat larger temperature gradient of 32 to 210°F (0 to 100°C) across the extension portion of the circuit, the use of non-compensated (copper/copper) extension wires may result in small errors, the magnitude of which will not exceed the tolerance values given in the table above for measurements above 1800°F (1000°C). Proprietary alloy compensating extension wire is available for use over 32 to 400°F (0 to 200°C) temperature range.

* Special tolerance grade compensating extension wires are not available.

# SERV-RITE
# Wire and Cable

## Thermocouple and Thermocouple Extension Wire

### Technical Data
Continued

***International Standards***

SERV-RITE wire and cable complies with international standards and tolerances in both standard and special limits.

***United States and International Color Coding***

Standard ASTM E 230 color coding (United States) is used on all insulated thermocouple wire and extension wire when type of insulation permits. In color coding, the right is reserved to include a tracer to identify the ASTM E 230 type. Thermocouple grade wire normally has a brown overall jacket. For Types B, R and S the color codes relate to the compensating cable normally used. Additionally, various national and international standard agencies have adopted color codes for the identification of thermocouple wire and products. These generally differ from those used by ASTM E 230.

**Thermocouple and Extension Wire Color Codes**

Overall/Positive (+)/Negative (-)

| T/C Type | ASTM E 230 T/C | ASTM E 230 Extension | UK BS 1843 | Germany DIN 43710 | Japan JIS C1610-1981 | IEC 584-3 |
|---|---|---|---|---|---|---|
| B (overall) | - | Grey | - | Grey | Grey | - |
| BP | - | +Grey | - | +Red | +Red | - |
| BN | - | -Red | - | -Grey | -White | - |
| E (overall) | Brown | Purple | Brown | Black | Purple | Violet |
| EP | +Purple | +Purple | +Brown | +Red | +Red | +Violet |
| EN | Red- | -Red | -Blue | -Black | -White | -White |
| J (overall) | Brown | Black | Black | Blue | Yellow | Black |
| JP | +White | +White | +Yellow | +Red | +Red | +Black |
| JN | -Red | -Red | -Blue | -Blue | -White | -White |
| K (overall) | Brown | Yellow | Red | Green | Blue | Green |
| KP | +Yellow | +Yellow | +Brown | +Red | +Red | +Green |
| KN | -Red | -Red | -Blue | -Green | -White | -White |
| N (overall) | Brown | Orange | - | - | - | - |
| NP | +Orange | +Orange | - | - | - | - |
| NN | -Red | -Red | - | - | - | - |
| R (overall) | - | Green | Green | - | Black | Orange |
| RP | - | +Black | +White | - | +Red | +Orange |
| RN | - | -Red | -Blue | - | -White | -White |
| S (overall) | - | Green | Green | White | Black | Orange |
| SP | - | +Black | +White | +Red | +Red | +Orange |
| SN | - | -Red | -Blue | -White | -White | -White |
| T (overall) | Brown | Blue | Blue | Brown | Brown | Brown |
| TP | +Blue | +Blue | +White | +Red | +Red | +Brown |
| TN | -Red | -Red | -Blue | -Brown | -White | -White |

# SERV-RITE Wire and Cable

## Thermocouple and Thermocouple Extension Wire

### Technical Data
Continued

***Solid and Stranded Conductors***

Thermocouple wire and extension wire are usually solid conductors. When greater flexibility is required, either may be ordered in stranded construction.

Stranded wire is specified when flexibility is a major concern. It is manufactured by using several smaller gauge strands grouped together to form the desired gauge size. This is accomplished by twisting the smaller gauge wires together. The twisting also adds to the flexibility of the wire.

The most widely used stranding combination consists of seven small strands. This yields a fairly round construction and allows the use of various connection systems that are designed for round solid wires. SERV-RITE wire's standard items use this seven strand construction.

While most stranded wire is specified for its flexibility, there is another less common reason for its use. When a very specific resistance is required, the stranded conductors allow "fine tuning" the finished conductor's resistance. By replacing fine wires with slightly larger wires, the conductor's resistance can be adjusted to within a few percent of any given target resistance.

When flexibility or resistance are of prime concern, SERV-RITE wire or cable can be designed for your particular application.

**Conductor Sizes**

| Wire Size B & S Gauge | Solid Diameter inch | Solid Diameter (mm) | Stranded Diameter inch | Stranded Diameter (mm) | Stranded Number of Strands | Stranded Strand Gauge |
|---|---|---|---|---|---|---|
| 14 | 0.064 | (1.630) | 0.076 | (1.930) | 7 | 22 |
| 16 | 0.051 | (1.290) | 0.060 | (1.520) | 7 | 24 |
| 18 | 0.040 | (1.020) | 0.048 | (1.220) | 7 | 26 |
| 20 | 0.032 | (0.813) | 0.038 | (0.965) | 7 | 28 |
| 22 | 0.025 | (0.635) | 0.030 | (0.762) | 7 | 30 |
| 24 | 0.020 | (0.508) | 0.024 | (0.610) | 7 | 32 |
| 26 | 0.016 | (0.406) | | | | |
| 28 | 0.013 | (0.330) | | | | |
| 30 | 0.010 | (0.254) | | | | |
| 32 | 0.008 | (0.203) | | | | |
| 34 | 0.006 | (0.152) | | | | |
| 36 | 0.005 | (0.127) | | | | |

***Ohms per Double Feet***

The use of analog based instrumentation, make conductor resistance an important consideration in selecting the wire gauge best suited for your application. The table below lists the nominal ohms per double feet for thermocouple and thermocouple extension wire. Ohms per double feet is the total resistance, in ohms, for both conductors, per foot.

**Nominal Resistance for Thermocouple Alloys in Ohms per Double Feet at 20°C**

| B & S Gauge | Diameter inch | Diameter (mm) | BX | *CX* | E | J | K | N | RX,SX | T |
|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 0.258 | (6.543) | | | 0.011 | 0.006 | 0.009 | 0.012 | | |
| 4 | 0.204 | (5.189) | | | 0.017 | 0.009 | 0.014 | 0.019 | | |
| 6 | 0.162 | (4.115) | | | 0.028 | 0.014 | 0.023 | 0.030 | | |
| 8 | 0.129 | (3.264) | | | 0.044 | 0.023 | 0.036 | 0.048 | | |
| 10 | 0.102 | (2.588) | | | 0.070 | 0.036 | 0.058 | 0.077 | | |
| 12 | 0.081 | (2.053) | 0.015 | 0.058 | 0.111 | 0.057 | 0.092 | 0.123 | 0.006 | 0.048 |
| 14 | 0.064 | (1.630) | 0.024 | 0.093 | 0.177 | 0.091 | 0.147 | 0.195 | 0.010 | 0.076 |
| 16 | 0.051 | (1.290) | 0.039 | 0.147 | 0.281 | 0.145 | 0.233 | 0.310 | 0.016 | 0.120 |
| 18 | 0.040 | (1.020) | 0.063 | 0.238 | 0.453 | 0.234 | 0.376 | 0.500 | 0.025 | 0.194 |
| 20 | 0.032 | (0.813) | 0.098 | 0.372 | 0.709 | 0.367 | 0.589 | 0.783 | 0.040 | 0.304 |
| 22 | 0.025 | (0.645) | 0.156 | 0.592 | 1.129 | 0.584 | 0.937 | 1.245 | 0.063 | 0.483 |
| 24 | 0.020 | (0.508) | 0.248 | 0.941 | 1.795 | 0.928 | 1.490 | 1.980 | 0.100 | 0.768 |
| 26 | 0.016 | (0.406) | 0.395 | 1.495 | 2.853 | 1.476 | 2.369 | 3.148 | 0.159 | 1.221 |
| 28 | 0.013 | (0.320) | 0.628 | 2.378 | 4.537 | 2.347 | 3.767 | 5.006 | 0.253 | 1.942 |
| 30 | 0.010 | (0.254) | 0.999 | 3.781 | 7.214 | 3.731 | 5.990 | 7.960 | 0.402 | 3.088 |
| 32 | 0.008 | (0.203) | 1.588 | 6.012 | 11.470 | 5.933 | 9.524 | 12.656 | 0.639 | 4.910 |
| 34 | 0.006 | (0.152) | 2.525 | 9.560 | 18.239 | 9.434 | 15.145 | 20.126 | 1.016 | 7.808 |
| 36 | 0.005 | (0.127) | 4.015 | 15.200 | 29.000 | 15.000 | 24.080 | 32.000 | 1.615 | 12.415 |
| 14 Stranded | 0.076 | (1.930) | 0.022 | 0.085 | 0.161 | 0.083 | 0.134 | 0.178 | 0.009 | 0.069 |
| 16 Stranded | 0.060 | (1.520) | 0.035 | 0.134 | 0.256 | 0.133 | 0.213 | 0.283 | 0.014 | 0.110 |
| 18 Stranded | 0.048 | (1.220) | 0.056 | 0.214 | 0.408 | 0.211 | 0.338 | 0.450 | 0.023 | 0.174 |
| 20 Stranded | 0.038 | (0.965) | 0.090 | 0.340 | 0.648 | 0.335 | 0.538 | 0.715 | 0.036 | 0.277 |
| 22 Stranded | 0.030 | (0.762) | 0.143 | 0.540 | 1.031 | 0.533 | 0.856 | 1.137 | 0.057 | 0.441 |
| 24 Stranded | 0.024 | (0.610) | 0.227 | 0.859 | 1.639 | 0.848 | 1.361 | 1.808 | 0.091 | 0.701 |

*Not an ASTM E 230 symbol

# SERV-RITE Wire and Cable

## Thermocouple and Thermocouple Extension Wire

### Technical Data
Continued

***How to Select Wire to Suit Your Requirements***

The following information will acquaint you with some of the nomenclature involved with thermocouple wire and thermocouple extension wire. By spending a few minutes reading this information orders can be placed quickly and accurately.

### Thermocouple Wire or Thermocouple Extension Wire

There are some significant differences between the wire used to actually measure temperature and the wire used to carry the millivoltage signal to an instrument.

The most obvious difference is the color-code used to identify the wire itself. In most cases, thermocouple grade wire is identified by its overall brown color. The exceptions in the SERV-RITE wire product line are the very high temperature yarns such as those used in the Series 301 and 350. Of course, the overall color code is not used when there is no overall covering as in SERV-RITE wire Series 505, 511 and 314.

The working differences between the two wires is that the thermocouple "extension" wire is not calibrated above 400°F (204°C). The temperature rating of the insulations used on some extension grade wire exceeds this 400°F temperature. This is to allow the wire to survive occasional contact with hot parts or furnace walls.

This catalog lists certain specific insulations for thermocouple and extension grade wire. However, virtually any of SERV-RITE wire insulation systems can be applied to either thermocouple or extension wire.

The following explains the meanings of the terms used in the tables of this section.

### Single Conductor Insulation

This item identifies the type of insulation used on the individual thermoelements. Certain part numbers use a combination of insulations. When there is a combination, the insulations are listed in their order of application.

### Duplex Conductor Insulation

This item lists the overall insulation when one is used. Some constructions which have no overall insulation use this area to describe the duplexing method- i.e. twisting, "ripcord", etc.

### Temperature Rating

Most constructions are rated for both continuous use and for single reading applications. The continuous use temperature is considered to be the highest temperature at which that particular construction will survive indefinitely. The single reading temperature has been determined by actual tests. Each insulation system will perform differently when exposed to this temperature. Generally, the construction will perform at this temperature and produce an accurate reading. However, after exposure to this temperature, the wire will exhibit less flexibility and/or abrasion resistance. Because of this, it is unlikely that the wire could be removed from the application and then replaced after exposure to the "single reading temperature."

**Recommended Upper Temperature Limit for Protected Thermocouple Wire**

| Thermocouple Type | No. 8 Gauge °F (°C) | No. 14 Gauge °F (°C) | No. 20 Gauge °F (°C) | No. 24 Gauge °F (°C) | No. 28 Gauge °F (°C) |
|---|---|---|---|---|---|
| E | 1600 (870) | 1200 (650) | 1005 (540) | 805 (430) | 805 (430) |
| J | 1400 (760) | 1095 (590) | 895 (480) | 700 (370) | 700 (370) |
| K and N | 2300 (1260) | 1995 (1090) | 1795 (980) | 1600 (870) | 1600 (870) |
| T | | 700 (370) | 500 (260) | 395 (200) | 395 (200) |

Table courtesy of ASTM.

# SERV-RITE Wire and Cable

## Thermocouple and Thermocouple Extension Wire

### Technical Data

***How to Select Wire to Suit Your Requirements***
Continued

#### ASTM E 230 Color Code

Generally, SERV-RITE wire has color codes wherever possible. The exceptions are the high temperature yarn constructions such as the 301 and 350 Series. Color coding of the 511 and 512 Series is accomplished by including a colored thread or "tracer" under the tape.

#### Physical Properties

**Abrasion Resistance** is rated fair, good, or excellent and is based on the wall thickness of the construction and how well it survives with other insulations of similar thicknesses. The 511 Series receives an excellent rating because the thin wall of polyimide tape will survive better than almost any other insulation applied in the same wall thickness.

The "absolute" abrasion resistance of a construction will depend not only on the type of insulation but on thickness at which it is applied.

**Moisture Resistance** ratings are given for the wire in the "as received" condition. In the case of fiberglass insulated wire, the moisture resistance is achieved by the use of impregnations or spirally applied tapes called moisture barriers. The impregnations and/or tapes will burn off at temperatures below the upper useful operating temperatures of the fiberglass. The thermoplastic insulations (PVC and the fluoroplastics) and the polyimide insulated constructions will maintain their moisture resistance up to their "continuous" temperature rating.

**Chemical Resistance** ratings are given as they relate to most common chemicals. These ratings apply to the insulation types and not necessarily to the type of impregnation used. Consult factory for specific applications.

#### UL® Listed PLTC Wire And Cable

Watlow Gordon offers UL® listed SERV-RITE thermocouple and extension wire and cable for PLTC (Power Limited Tray Cable) applications. The following insulation Series have these approvals:

- 502
- 507
- 509
- 510
- 900
- 1000

All these insulation Series have the following physical characteristics:

- UL® listed Type PLTC- 300 Volt
- Passes IEEE 383 70,000 BTU/Hr flame test
- Passes VW-1 flame test
- UL® listed under Subject 13
- Non-propagating
- Flame retardant
- UV light resistant

***How to Read SERV-RITE Wire Code Numbers***

Product code numbers for SERV-RITE wire are made up of three sets of figures separated by slashes. These figures convey the following data:

- The first set consists of a letter and two numerals. The letter is the ASTM E 230 Type designation for wire type. The numerals signify the wire B&S gauge.
- The second set consists of a single number. For thermocouple wire, 1 indicates solid, while 3 indicates stranded. For extension wire, 5 indicates solid, while 7 indicates stranded. The use of ODD numbers also indicates that the wire is manufactured to Standard Tolerances. If Special Tolerances are desired, this figure MUST be changed to the next higher EVEN digit when ordering.
- The third set consists of three numerals signifying SERV-RITE wire insulation type or "Series."

**Example:**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| K | 2 | 0 | / 1 | / 3 | 0 | 4 |

**1. ASTM E 230 Letter Designation (Calibration)**

**2-3. B & S Gauge**

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerance
2 = Thermocouple grade, solid wire, special tolerance
3 = Thermocouple grade,stranded wire, standard tolerance
4 = Thermocouple grade, stranded wire, special tolerance
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

**5-7. Insulation Type (Series)**

# Thermocouple and Thermocouple Extension Wire

## Technical Data

### *Metallic Overbraids and Wraps*

Continued

Although standard SERV-RITE wire products are designed to yield a high degree of abrasion resistance, it is sometimes necessary to add an additional metallic covering to further enhance this property. The following are the available overbraids and wraps.

### Stainless Steel Wire Braid (S)

This, the most popular of the overbraids, uses 300 series stainless steel and is available on virtually all standard SERV-RITE wire offerings. It is an economical method of extending the life of thermocouple and extension wire. Several of our standard wire items are available from stock with a stainless overbraid. Non-stock items are available on a special order basis.

### Alloy 600 Wire Braid (N)

Most commonly specified on high temperature SERV-RITE wire yarn insulations, the Inconel braid offers a higher operating temperature than the series 300 stainless steel overbraid. When this braid is specified on SERV-RITE's Series 350 the performance of the material is only surpassed by metal-sheathed cables. Consult factory for availability on specific wire items.

### Tinned Copper Wire Overbraid (C)

When there is a possibility of electrical interference in the area of the thermocouple installation, it may be necessary to shield the wire from electrical "noise." Several of our standard products use aluminized tapes as an intrinsic shield. However, when shielding is needed on other constructions, a tinned copper shield can be specified on special order.

### Half Oval Galvanized Wrap and Stainless Steel Spiral Wrap (G) or (W)

Certain constructions are available with a spirally applied galvanized or stainless steel wrap. The wrap yields a tough mechanical coating that survives well in most outdoor applications. Consult factory for the availability on specific catalog items. To add a metallic overbraid or wrap, insert the letter designator as follows:

**How to Select Wire Code Number**

| 1 | 2 | 3 | | 4 | | 5 | | 6 | 7 | 8 | | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | - | | - | | - | | | | - | | | |

**1. ASTM E 230 Calibration①**

| | | |
|---|---|---|
| B | J | S |
| C* | K | T |
| E | N | |

**2-3. B & S Gauge**
14 to 36

**4. Conductor Type/Tolerance ②**

| | | |
|---|---|---|
| 1 | = | Thermocouple grade, solid wire, standard tolerance |
| 2 | = | Thermocouple grade, solid wire, special tolerance |
| 3 | = | Thermocouple grade, stranded wire, standard tolerance |
| 4 | = | Thermocouple grade, stranded wire, special tolerance |
| 5 | = | Extension grade, solid wire, standard tolerance |
| 6 | = | Extension grade, solid wire, special tolerance |
| 7 | = | Extension grade, stranded wire, standard tolerance |
| 8 | = | Extension grade, stranded wire, special tolerance |

**5. Metallic Overbraids (optional)**

| | | |
|---|---|---|
| S | = | Stainless steel |
| N | = | Alloy 600 |
| C | = | Tinned copper |

**6-8. Insulation Series**
Refer to Insulation chart below.

**9-11. Color Code**

| | | |
|---|---|---|
| Blank | = | ASTM E 230 (formally ANSI MC96.1) |
| BSC | = | BS 1843 |
| DIN | = | DIN 43710 |
| JIS | = | JIS C 1610-1981 |
| IEC | = | IEC 584-3 |

*Not an ASTM E 230 symbol.

① Color coding will be to ASTM E 230 standards, unless specified.

② Stranded conductors will be seven strand constructions. Consult factory for other configurations.

**Note:** Product normally shipped in 1,000 foot spools. However, random lengths may be shipped, if not specified. Consult factory for special packaging.

### *Made-to-order*

If you are unable to locate the stock SERV-RITE wire product that meets your unique application, Watlow Gordon can manufacture the exact wire product that does. With short lead times, Watlow Gordon can make-to-order any combination of wire type and insulation with metallic overbraids, wraps or shielding, in designated standards. Simply review "How to Order," at the end of this section, define your requirements and call your Watlow representative to place your order and confirm specifications.

# SERV-RITE Wire and Cable

## Thermocouple and Thermocouple Extension Wire

### Technical Data

***Construction and Characteristics***

The following table lists the available SERV-RITE wire insulation series for thermocouple and extension wire. Further construction and characteristic explanations are contained in the pages referenced in the extreme right column of this table.

| Temperature Rating① | | Series | Single Conductor | | Duplex Conductors | | ASTM | Physical Properties | | | Notes | Page No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Continuous | Single Reading | | Insulation | Impregnation | Insulation | Impregnation | Color Coded | Abrasion Resistance | Moisture Resistance | Chemical Resistance | | |
| **Thermocouple and Thermocouple Extension Wire Constructions** | | | | | | | | | | | | |
| 190°F (88°C) | 190°F (80°C) | 308-002 | Double Cotton Wrap | - | Twisted, with Double Cotton Braid | Light Lacquer Coating | Yes | Fair | Fair | Poor | | NA |
| 220°F (105°C) | 220°F (105°C) | 502 or 502/UL | PVC | - | PVC | - | Yes | Good | Excellent | Good | | 25, 40 |
| 220°F (105°C) | 220°F (105°C) | 503 | PVC | - | PVC Twisted W/Cotton | - | Yes | Good | Excellent | Good | | NA |
| 220°F (105°C) | 220°F (105°C) | 505 | PVC | - | Ripcord | - | Yes | Good | Excellent | Good | | 27 |
| 220°F (105°C) | 220°F (105°C) | 510 or 510/UL | PVC | - | PVC Twisted | - | Yes | Good | Excellent | Good | Aluminum/ Polyester shield with Drain Wire | 32, 42 |
| 220°F (105°C) | 220°F (105°C) | 900 or 900/UL | PVC | - | PVC Twisted/ Cabled | - | Yes | Good | Excellent | Good | Aluminum/ Polyester shield with Drain Wire | 38, 43 |
| 220°F (105°C) | 220°F (105°C) | 1000 or 1000/UL | PVC | - | PVC Twisted/ Cabled | - | Yes | Good | Excellent | Good | Aluminum/ Polyester shield with Drain Wire② | 39, 44 |
| 300°F (150°C) | 300°F (150°C) | 504 | Nylon | - | Nylon | - | Yes | Excellent | Fair | Good | Overall Jacket is clear | 26 |
| 300°F (150°C) | 390°F (200°C) | 514 | Tefzel® | - | Tefzel® | - | Yes | Excellent | Excellent | Excellent | | 36 |
| 300°F (150°C) | 390°F (200°C) | 515 | Tefzel® | - | Tefzel® Twisted | - | Yes | Excellent | Excellent | Excellent | Aluminum/ Polyester shield with Drain Wire | NA |
| 400°F (204°C) | 500°F (260°C) | 506 | FEP Extr. | - | FEP Extr. | - | Yes | Excellent | Excellent | Excellent | | 28 |
| 400°F (204°C) | 500°F (260°C) | 507 or 507/UL | FEP Extr. | - | FEP Extr. | - | Yes | Excellent | Excellent | Excellent | | NA |

*CONTINUED*

Tefzel® is a registered trademark of E.I. du Pont de Nemours & Company.

# SERV-RITE Wire and Cable

## Thermocouple and Thermocouple Extension Wire

### Technical Data

***Construction and Characteristics***

Continued

| Temperature Rating[1] | | Series | Single Conductor | | Duplex Conductors | | ASTM | Physical Properties | | | Notes | Page No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Continuous | Single Reading | | Insulation | Impregnation | Insulation | Impregnation | Color Coded | Abrasion Resistance | Moisture Resistance | Chemical Resistance | | |
| **Thermocouple and Thermocouple Extension Wire Constructions** Continued | | | | | | | | | | | | |
| 400°F (204°C) | 500°F (260°C) | 509 or 509/UL | FEP Extr. | - | FEP Extr. Twisted | - | Yes | Excellent | Excellent | Excellent | Aluminum/ Polyester shield with Drain Wire | 31, 41 |
| 400°F (204°C) | 500°F (260°C) | 1900 | FEP Extr. | - | FEP Extr. Twisted/ Cabled | - | Yes | Excellent | Excellent | Excellent | Aluminum/ Polyester shield with Drain Wire | NA |
| 400°F (204°C) | 500°F (260°C) | 2000 | FEP Extr. | - | FEP Extr. Twisted/ Cabled | - | Yes | Excellent | Excellent | Excellent | Aluminum/ Polyester shield with Drain Wire[2] | NA |
| 500°F (260°C) | 600°F (315°C) | 508 | TFE Tape Fused | - | TFE Tape Fused | - | Yes | Good | Excellent | Excellent | | 30 |
| 500°F (260°C) | 550°F (290°C) | 516 | PFA | - | PFA | - | Yes | Good | Excellent | Excellent | | 37 |
| 500°F (260°C) | 550°F (290°C) | 517 | PFA | - | PFA Twisted | - | Yes | Good | Excellent | Excellent | Aluminum/ Polyester shield with Drain Wire | NA |
| 550°F (290°C) | 650°F (340°C) | 155 | Glass Braid | Modified Resin | SERVTEX® Braid | Modified Resin | Yes | Good | Good | Good | Impregnation retained to 400°F (204°C) | 14 |
| 550°F (290°C) | 650°F (340°C) | 157 | TFE Tape (not fused) Glass Braid | Modified Resin | SERVTEX Braid | Modified Resin | Yes | Good | Good | Good | Impregnation retained to 400°F (204°C); TFE good to 500°F (260°C) | 15 |
| 600°F (315°C) | 800°F (430°C) | 511 | Fused Polyimide Tape | - | None Twisted | - | Both legs have tracer | Excellent | Excellent | Excellent | FEP binder melts at approx. 500°F (260°C) | 33 |

*CONTINUED*

# SERV-RITE Wire and Cable

## Thermocouple and Thermocouple Extension Wire

### Technical Data

***Construction and Characteristics***
Continued

| Temperature Rating① | | Series | Single Conductor | | Duplex Conductors | | ASTM | Physical Properties | | | Notes | Page No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Continuous | Single Reading | | Insulation | Impregnation | Insulation | Impregnation | Color Coded | Abrasion Resistance | Moisture Resistance | Chemical Resistance | | |
| **Thermocouple and Thermocouple Extension Wire Constructions** Continued | | | | | | | | | | | | |
| 600°F (315°C) | 800°F (430°C) | 512 | Fused Polyimide Tape | - | Fused Polyimide Tape | - | Both legs have tracer | Excellent | Excellent | Excellent | FEP binder melts at approx. 500°F (260°C) | 34 |
| 600°F (315°C) | 800°F (430°C) | 513 | Fused Polyimide Tape | - | Fused Polyimide Tape | - | Yes | Excellent | Excellent | Excellent | FEP binder melts at approx. 500°F (260°C) | 35 |
| 900°F (480°C) | 1000°F (540°C) | 302 | Double Glass Braid | Modified Resin | Glass Braid | Modified Resin | Yes | Good | Good | Good | Impregnation retained to 400°F (204°C) | 17 |
| 900°F (480°C) | 1000°F (540°C) | 303 | Enameled Conductors/ Glass Braid | Modified Resin | Glass Braid | Modified Resin | Yes | Fair | Good | Good | Impregnation retained to 400°F (204°C) | NA |
| 900°F (480°C) | 1000°F (540°C) | 304 | Glass Braid | Modified Resin | Glass Braid | Modified Resin | Yes | Fair | Good | Good | Impregnation retained to 400°F (204°C) | 18 |
| 900°F (480°C) | 1000°F (540°C) | 305 | Double Glass Wrap | Modified Resin | Glass Braid | Modified Resin | Yes | Fair | Good | Good | Impregnation retained to 400°F (204°C) | 19 |
| 900°F (480°C) | 1000°F (540°C) | 306 | Glass Braid | - | Glass Braid | - | No | Fair | Fair | Good | | NA |
| 900°F (480°C) | 1000°F (540°C) | 307 | TFE Tape (not fused) TFE coated glass | - | TFE Coated Glass Braid | - | Yes | Good | Excellent | Excellent | TFE good to 500°F (260°C) | 20 |
| 900°F (480°C) | 1000°F (540°C) | 313 | Glass Braid | Modified Resin | Glass Braid | Modified Resin | Yes | Good | Good | Good | Impregnation retained to 400°F (204°C) | 21 |

CONTINUED

# SERV-RITE Wire and Cable

## Thermocouple and Thermocouple Extension Wire

### Technical Data

***Construction and Characteristics***

Continued

| Temperature Rating① | | Series | Single Conductor | | Duplex Conductors | | ASTM Color Coded | Physical Properties | | | Notes | Page No. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Continuous | Single Reading | | Insulation | Impregnation | Insulation | Impregnation | | Abrasion Resistance | Moisture Resistance | Chemical Resistance | | |
| **Thermocouple and Thermocouple Extension Wire Constructions** Continued | | | | | | | | | | | | |
| 900°F (480°C) | 1000°F (540°C) | 315 | Glass Braid | Modified Resin | Twisted | - | Yes | Good | Good | Good | Impregnation retained to 400°F (204°C) | NA |
| 1300°F (705°C) | 1600°F (870°C) | 309 | High Temp. Glass Braid | - | High Temp. Glass Braid | Modified Resin | Both legs have tracer | Good | Fair | Good | Impregnation retained to 400°F (204°C) | NA |
| 1300°F (705°C) | 1600°F (870°C) | 311 | High Temp. Glass Braid | - | High Temp. Glass Braid | Modified Resin | No | Fair | Fair | Good | Coating retained to 300°F (149°C) | NA |
| 1300°F (705°C) | 1600°F (870°C) | 314 | High Temp. Glass Braid | Modified Resin | Twisted | - | Yes | Good | Good | Good | Impregnation retained to 400°F (204°C) | 22 |
| 1300°F (705°C) | 1600°F (870°C) | 321 | High Temp. Glass Braid | Modified Resin | High Temp. Glass Braid | Modified Resin | Yes | Good | Good | Good | Impregnation retained to 400°F (204°C) | 23 |
| 1800°F (980°C ) | 2000°F (1095°C) | 301 | Vitreous Silica Fiber | - | Vitreous Silica Fiber | - | No | Fair | Fair | Good | | 16 |
| 1800°F (980°C) | 2000°F (1095°C) | 365 | Vitreous Silica Fiber | - | Vitreous Silica Fiber | | No | Fair | Fair | Good | | NA |
| 2200°F (1205°C) | 2600°F (1430°C) | 350 | Ceramic Fiber | - | Ceramic Fiber | - | No | Good | Fair | Good | | 24 |
| 2200°F (1205°C) | 2600°F (1430°C) | 355 | Ceramic Fiber | - | Ceramic Fiber | - | No | Good | Fair | Good | | NA |
| **RTD Leadwire Constructions** | | | | | | | | | | | | |
| 220°F (105°C) | 220°F (105°C) | 701 | PVC | - | PVC | - | Yes** | Good | Excellent | Good | RTD Leadwire | 45 |
| 400°F (204°C) | 500°F (260°C) | 704 | FEP Extr. | - | FEP Extr. Twisted | - | Yes** | Excellent | Excellent | Excellent | RTD Leadwire | 46 |
| 900°F (480°C) | 1000°F (540°C) | 705 | Glass Braid | Modified Resin | Glass Braid | Modified Resin | Yes** | Fair | Good | Good | RTD Leadwire | 47 |

①Thermocouple extension grade wire is only calibrated up to 400°F (204°C).
②Individual and overall
**Not an ASTM E 230 color code.

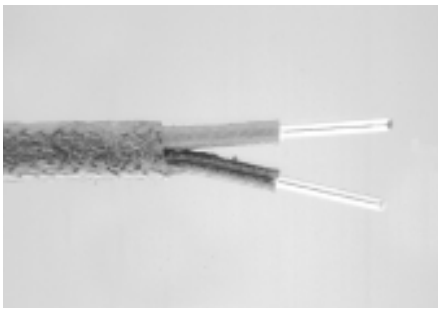
# SERV-RITE Wire and Cable

**PYROSALES P/N**

CA-PS012 - J16/5/155
CA-PS013 - K16/5/155
CA-PS014 - S16/5/155

## SERVTEX Insulated Extension Wire

### Series 155



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 550 F (290 C) | Good | Good | Good |

The Series 155 is a tough wire especially suited to applications involving momentary contact with molten metals.

Conductors are insulated with braided fiberglass and then impregnated with a resin. Insulated conductors are then laid parallel and a SERVTEX braid is woven over them and a final impregnation is applied.

### Construction Combinations

1 2 3 4 5 6 7
/ / 1 5 5

**1. ASTM E 230 Calibrations**

| | |
|---|---|
| E | N |
| J | S |
| K | T |

**2-3. B & S Gauge**

| | | |
|---|---|---|
| 20 | 16 | 14 |
| 20 stranded (7/28) | 16 stranded (7/24) | 14 stranded (7/22) |

**4. Conductor Type/Tolerance**

5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

### *Performance Capabilities*

- Continuous temperature rating: 550°F (290°C)
- Single reading: 650°F (340°C)

### *Features and Benefits*

- **Braided fiberglass single conductor insulation** impregnated for moisture resistance.
- **SERVTEX braid duplex insulation** for superior abrasion resistance.
- **Impregnation retained to 400°F (204°C).**
- **ASTM E 230 color code** for easy identification.
- **Good abrasion and chemical resistance, good moisture resistance.**
- **Additional abrasion resistance** with optional stainless steel, tinned copper and alloy 600 wire over-braids, or flat stainless steel spiral and half oval galvanized steel spiral wraps.
- **Custom constructions available, consult factory.**

### *Applications*

- Heat treating
- Steel and aluminum plants
- Glass, ceramic and brick manufacturing

### Wire Specifications

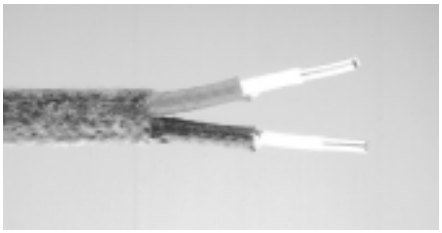
| B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.030 | (0.762) | 0.136 X 0.178 | (3.45 X 4.52) | 15 | (22.4) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.015 | (0.381) | 0.030 | (0.762) | 0.144 X 0.196 | (3.66 X 4.98) | 16 | (23.8) |
| 16 | 0.051 | (1.290) | 0.015 | (0.381) | 0.030 | (0.762) | 0.158 X 0.226 | (4.01 X 5.74) | 29 | (43.2) |
| 16 S* (7/24) | 0.060 | (1.524) | 0.015 | (0.381) | 0.030 | (0.762) | 0.170 X 0.244 | (4.32 X 6.20) | 31 | (46.2) |
| 14 | 0.064 | (1.628) | 0.015 | (0.381) | 0.030 | (0.762) | 0.180 X 0.252 | (4.57 X 6.40) | 40 | (59.6) |
| 14 S* (7/22) | 0.076 | (1.930) | 0.015 | (0.381) | 0.030 | (0.762) | 0.205 X 0.270 | (5.21 X 6.86) | 46 | (68.5) |

* "S" denotes stranded wire: e.g., "20 S (7/28)" is seven strands of 28 gauge wire to make a 20 gauge stranded conductor.

# SERV-RITE Wire and Cable

## SERVTEX and TFE Tape Extension Wire

### Series 157



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 550 F (290 C) | Good | Good | Good |

The Series 157 is an improved version of Series 155. The Series 157 uses tape over the conductors to improve moisture resistance.

The Series 157 conductors are first wrapped with a TFE tape, braided with fiberglass, and then impregnated with a resin. The insulated single conductors are then laid parallel and braided with SERVTEX yarn. The final coat is a resin impregnation.

The excellent abrasion resistance of the Series 157 can be further improved by the addition of metallic braids or wraps.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | | / | / 1 | 5 | 7 |

**1. ASTM E 230 Calibrations**

| | |
|---|---|
| E | N |
| J | S |
| K | T |

**2-3. B & S Gauge**

| | | |
|---|---|---|
| 20 | 16 | 14 |
| 20 stranded (7/28) | 16 stranded (7/24) | 14 stranded (7/22) |

**4. Conductor Type/Tolerance**

5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

### *Performance Capabilities*

- Continuous temperature rating: 550°F (290°C)
- Single reading: 650°F (340°C)

### *Features and Benefits*

- **Non-fused TFE tape and braided fiberglass single conductor insulation** impregnated with modified resin to provide moisture resistance.
- **SERVTEX braid duplex insulation** impregnated for additional moisture resistance.
- **Impregnation retained to 400°F (204°C), TFE good to 500°F (260°C).**
- **ASTM E 230 color code** for easy identification.
- **Good abrasion, moisture and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel, tinned copper and alloy 600 wire overbraids, or flat stainless steel spiral and half oval galvanized steel spiral wraps.
- **Custom constructions available, consult factory.**

### *Applications*

- Heat treating
- Steel and aluminum plants
- Glass, ceramic and brick manufacturing

### Wire Specifications

| B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 0.032 | (0.813) | 0.020 | (0.508) | 0.030 | (0.762) | 0.146 X 0.192 | (3.71 X 4.87) | 16 | (23.8) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.020 | (0.508) | 0.030 | (0.762) | 0.154 X 0.210 | (3.91 X 5.33) | 17 | (25.3) |
| 16 | 0.051 | (1.290) | 0.020 | (0.508) | 0.030 | (0.762) | 0.168 X 0.240 | (4.27 X 6.10) | 30 | (44.7) |
| 16 S* (7/24) | 0.060 | (1.524) | 0.020 | (0.508) | 0.030 | (0.762) | 0.180 X 0.258 | (4.57 X 6.55) | 32 | (47.7) |
| 14 | 0.064 | (1.628) | 0.020 | (0.508) | 0.030 | (0.762) | 0.019 X 0.266 | (4.83 X 6.76) | 42 | (62.6) |
| 14 S (7/22) | 0.076 | (1.930) | 0.025 | (0.508) | 0.030 | (0.762) | 0.225 X 0.302 | (5.72 X 7.67) | 48 | (71.5) |

* "S" denotes stranded wire: e.g., "20 S (7/28)" is seven strands of 28 gauge wire to make a 20 gauge stranded conductor.

**PYROSALES P/N**
WI-PWK720 - K20/2/301

# SERV-RITE Wire and Cable

## High Temperature Vitreous Silica Braided Thermocouple Wire

### Series 301

| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 1800 F (980 C) | Fair | Good | Fair |

Series 301 uses vitreous silica yarn as the insulation on both the conductors and duplex. This yarn retains its flexibility after exposure to high temperatures.

The vitreous silica yarn's greater purity performs better at high temperatures than other fibrous glass products. Testing has indicated that "contamination" will compromise this material's upper use temperature. For this reason, our standard offering is supplied without color coding or impregnations.

For higher temperatures consider Series 350.

### Construction Combinations

1 2 3 4 5 6 7
/ / 3 0 1

**1. ASTM E 230 Calibrations**
E K
J N

**2-3. B & S Gauge**
20 16
18

**4. Conductor Type/Tolerance**
1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances

***Performance Capabilities***

- Continuous temperature rating: 1800°F (980°C)
- Single reading: 2000°F (1095°C)

***Features and Benefits***

- **Braided vitreous silica yarn* single conductor and duplex insulation** provides high temperature performance.
- **Good chemical resistance, fair abrasion and moisture resistance.**
- **Additional abrasion resistance** with optional stainless steel and alloy 600 wire overbraids.
- **Custom constructions available, consult factory.**

***Applications***

- Furnace survey work
- Heat treating load thermocouples

### Wire Specifications

| B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness | | | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Conductor | | Overall | | | | | |
| | inches | (mm) | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 20 | 0.032 | (0.813) | 0.018 | (0.457) | 0.015 | (0.381) | 0.098 X 0.154 | (2.49 X 3.91) | 15 | (22.4) |
| 18 | 0.040 | (1.020) | 0.018 | (0.457) | 0.015 | (0.381) | 0.110 X 0.180 | (2.79 X 4.57) | 19 | (28.3) |
| 16 | 0.051 | (1.290) | 0.016 | (0.406) | 0.015 | (0.381) | 0.118 X 0.198 | (3.00 X 5.03) | 25 | (37.3) |

* Lack of binders or impregnations may cause insulation to "flower" when stripped.

# SERV-RITE
# Wire and Cable

## Fiberglass Double Braided Thermocouple and Extension Wire

### Series 302

| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 900 F (480 C) | Good | Good | Good |

Series 302 is a heavy duty version of the popular Series 304. The construction uses a double fibrous glass braid over each single conductor. These double insulated single conductors are then laid parallel and covered with a braided glass. Each braid is impregnated to add abrasion resistance and minimize fraying of the fibrous glass.

Due to additional layers of glass, this Series can be expected to survive longer and at higher temperatures than its single braided counterparts.

For higher temperature applications consider Series 321.

### Construction Combinations

1 2 3 4 5 6 7
/ / 3 0 2

**1. ASTM E 230 Calibrations**

| | |
|---|---|
| E | N |
| J | S |
| K | T |

**2-3. B & S Gauge**

| | |
|---|---|
| 24 | 20 |
| 24 stranded (7/32) | 20 stranded (7/28) |

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

***Performance Capabilities***

- Continuous temperature rating: 900°F (480°C)
- Single reading: 1000°F (540°C)

***Features and Benefits***

- **Double fiberglass braid single conductor insulation** impregnated with modified resin to provide abrasion resistance.
- **Fiberglass braid duplex insulation** impregnated with modified resin for added abrasion resistance.
- **Impregnation retained to 400°F (204°C).**
- **ASTM E 230 color code** for easy identification.
- **Good abrasion, moisture and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel, tinned copper and alloy 600 wire overbraids.
- **Custom constructions available, consult factory.**

***Applications***

- Steel and aluminum plants
- Heat treating
- Foundries
- Glass, ceramic and brick plants
- Plastic processing equipment

### Wire Specifications

| B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness | | | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Conductor | | Overall | | | | | |
| | inches | (mm) | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 24 | 0.020 | (0.508) | 0.008 | (0.203) | 0.006 | (0.152) | 0.048 X 0.084 | (1.22 X 2.13) | 7 | (10.4) |
| 24 S* (7/32) | 0.024 | (0.610) | 0.008 | (0.203) | 0.006 | (0.152) | 0.054 X 0.094 | (1.37 X 2.39) | 7 | (10.4) |
| 20 | 0.032 | (0.813) | 0.008 | (0.203) | 0.006 | (0.152) | 0.060 X 0.108 | (1.52 X 2.74) | 10 | (14.9) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.008 | (0.203) | 0.006 | (0.152) | 0.068 X 0.122 | (1.73 X 3.10) | 10 | (14.9) |

* "S" denotes stranded wire: e.g., "24 S (7/32)" is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

# SERV-RITE Wire and Cable

## Fiberglass Braided Thermocouple and Extension Wire

### Series 304

| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 900 F (480 C) | Good | Good | Fair |

The uniform quality and availability of the Series 304 make it the ideal wire for general applications requiring moderate abrasion and moisture resistance, wide temperature capabilities and economy.

Each conductor is covered with a color coded glass braid. This braid is impregnated to enhance abrasion resistance and reduce fraying. The insulated single conductors are laid parallel and covered with another layer of woven glass. A final impregnation is then applied to the glass.

For better moisture resistance, consider Series 307. For higher temperatures, consider Series 321. For better abrasion resistance, use Series 302 or choose an item with a stainless steel overbraid.

**PYROSALES P/N**

| | | | | | |
|---|---|---|---|---|---|
| CA-B20/5/304 | - | B20/5/304 | WI-PWN220 | - | N20/1/304 |
| WI-PWE220 | - | E20/1/304 | WI-PWN224/7 | - | N24/3/304 |
| WI-PWJ220 | - | J20/1/304 | WI-PWT220 | - | T20/1/304 |
| WI-PWJ224 | - | J24/1/304 | WI-PWT224 | - | T24/1/304 |
| WI-PWJ224SP | - | J24/2/304 | CA-PS540RM | - | S24/3/305 |
| WI-PWJ224/7 | - | J24/3/304 | | | |
| WI-PWK220 | - | K20/1/304 | | | |
| WI-PWK224SP | - | K24/2/304 | | | |
| WI-PWK224/7 | - | K24/3/304 | | | |

## Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | | / | / 3 | 0 | 4 |

**1. ASTM E 230 Calibrations**

B C E J K N S T

**2-3. B & S Gauge**

30 24 20

28 24 stranded (7/32) 20 stranded (7/28)

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

### *Performance Capabilities*

- Continuous temperature rating: 900°F (480°C)
- Single reading: 1000°F (540°C)

### *Features and Benefits*

- **Fiberglass braided single conductor and duplex insulation** impregnated with modified resin to enhance abrasion resistance.
- **Impregnation retained to 400°F (204°C).**
- **ASTM E 230 color code** for easy identification.
- **Good moisture and chemical resistance, fair abrasion resistance.**
- **Additional abrasion resistance** with optional stainless steel, tinned copper and alloy 600 wire over-braids, or flat stainless steel spiral wrap.
- **Custom constructions available, consult factory.**

### *Applications*

- Steel and aluminum plants
- Heat treating
- Foundries
- Glass, ceramic and brick plants

## Wire Specifications

| B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness | | | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Conductor | | Overall | | | | | |
| | inches | (mm) | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 30 | 0.010 | (0.254) | 0.007 | (0.178) | 0.008 | (0.203) | 0.043 X 0.064 | (1.09 X 1.63) | 3 | (4.5) |
| 28 | 0.013 | (0.320) | 0.007 | (0.178) | 0.008 | (0.203) | 0.043 X 0.070 | (1.09 X 1.78) | 3 | (4.5) |
| 24 | 0.020 | (0.508) | 0.005 | (0.127) | 0.006 | (0.152) | 0.045 X 0.072 | (1.14 X 1.83) | 7 | (10.4) |
| 24 S* (7/32) | 0.024 | (0.610) | 0.005 | (0.127) | 0.006 | (0.152) | 0.048 X 0.080 | (1.22 X 2.03) | 8 | (11.9) |
| 20 | 0.032 | (0.813) | 0.005 | (0.127) | 0.006 | (0.152) | 0.056 X 0.096 | (1.42 X 2.44) | 9 | (13.4) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.006 | (0.152) | 0.006 | (0.152) | 0.064 X 0.112 | (1.63 X 2.84) | 10 | (14.9) |

* "S" denotes stranded wire: e.g., "24 S (7/32)" is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

Pyrosales
Total Sensor Solutions

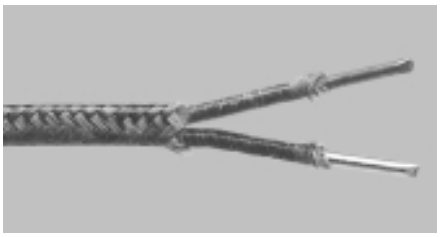
**PYROSALES P/N**

| | | |
|---|---|---|
| WI-PWJ230 | - | J30/1/305 |
| WI-PWJ230SP | - | J30/2/305 |
| WI-PWK230 | - | K30/1/305 |
| WI-PWK230SP | - | K30/2/305 |
| WI-PWT230 | - | T30/1/305 |

# SERV-RITE Wire and Cable

## Fiberglass Wrapped Thermocouple and Extension Wire

### Series 305



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 900 F (480 C) | Good | Good | Fair |

Series 305 is specifically constructed for light duty applications where size is a critical factor. The single conductors are insulated using a specialized yarn wrapped on the conductors in layers. This yarn is then impregnated to add abrasion resistance and enhance electrical properties. The insulated single conductors are then laid parallel and covered with a layer of braided glass. A final impregnation is applied to the braid.

For higher temperature applications, use Series 321.

For applications where resistance to abrasion is important, consider Series 302 or choose an item with a stainless steel overbraid.

## Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | | / | / 3 | 0 | 5 |

**1. ASTM E 230 Calibrations**

| | | |
|---|---|---|
| B | J | S |
| C | K | T |
| E | N | |

**2-3. B & S Gauge**

| | | |
|---|---|---|
| 30 | 24 | 20 |
| 28 | 24 stranded (7/32) | 20 stranded (7/28) |

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

### *Performance Capabilities*

- Continuous temperature rating: 900°F (480°C)
- Single reading: 1000°F (540°C)

### *Features and Benefits*

- **Double fiberglass wrap single conductor insulation,** impregnated with modified resin to add abrasion resistance and enhance electrical properties.
- **Fiberglass braided duplex insulation** impregnated with modified resin to enhance abrasion resistance.
- **Impregnation retained to 400°F (204°C).**
- **ASTM E 230 color code** for easy identification.
- **Good chemical and moisture resistance, fair abrasion resistance.**
- **Additional abrasion resistance** with optional stainless steel, tinned copper and alloy 600 wire overbraids, or flat stainless steel spiral wrap.
- **Custom constructions available, consult factory.**

### *Applications*

- Steel and aluminum plants
- Heat treating
- Foundries
- Glass, ceramic and brick plants

### Wire Specifications

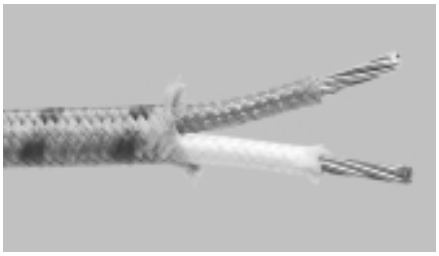
| B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Nominal Insulation Thickness Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 0.010 | (0.254) | 0.005 | (0.127) | 0.008 | (0.203) | 0.036 X 0.056 | (0.914 X 1.42) | 3 | (4.5) |
| 28 | 0.013 | (0.320) | 0.005 | (0.127) | 0.008 | (0.203) | 0.040 X 0.062 | (1.02 X 1.57) | 3 | (4.5) |
| 24 | 0.020 | (0.508) | 0.005 | (0.127) | 0.006 | (0.152) | 0.042 X 0.072 | (1.07 X 1.83) | 7 | (10.4) |
| 24 S* (7/32) | 0.024 | (0.610) | 0.005 | (0.127) | 0.006 | (0.152) | 0.048 X 0.080 | (1.22 X 2.03) | 8 | (11.9) |
| 20 | 0.032 | (0.813) | 0.005 | (0.127) | 0.006 | (0.152) | 0.054 X 0.096 | (1.37 X 2.44) | 9 | (13.4) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.005 | (0.127) | 0.006 | (0.152) | 0.060 X 0.108 | (1.52 X 2.74) | 10 | (14.9) |

* "S" denotes stranded wire: e.g., "24 S (7/32)" is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

# SERV-RITE
# Wire and Cable

## TFE Fiberglass with TFE Tape Thermocouple and Extension Wire

### Series 307



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 900 F (480 C) | Excellent | Excellent | Good |

Series 307 is designed for applications where a possibility of moisture along the unheated portion exists. While fiberglass has little moisture resistance, the use of TFE tape on the conductors provides moisture protection- even after short term exposure to temperatures of 600˚F (315˚C).

The Series 307 is constructed by first wrapping each conductor with TFE tape. Each taped conductor is then braided with TFE impregnated fiberglass. The two insulated conductors are then laid parallel and braided again with TFE impregnated fiberglass. The final operation involves heating the entire construction to fuse the insulations.

When your application involves higher temperatures, specify Series 314 or 321.

### Construction Combinations

1 2 3 4 5 6 7
/ / 3 0 7

**1. ASTM E 230 Calibrations**

E N
J S
K T

**2-3. B & S Gauge**

24 16
20

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

***Performance Capabilities***

- Continuous fiberglass temperature rating: 900˚F (480˚C)
- Continuous TFE temperature rating: 500˚F (260˚C)
- Single reading: 1000˚F (540˚C)

***Features and Benefits***

- **Non-fused TFE tape and TFE coated fiberglass single conductor insulation** provides excellent moisture and chemical resistance.
- **TFE coated fiberglass braid duplex insulation** adds to moisture and chemical resistance.
- **TFE retained to 600°F (315°C).**
- **ASTM E 230 color code** for easy identification.
- **Excellent moisture and chemical resistance, good abrasion resistance.**
- **Additional abrasion resistance with optional stainless steel,** tinned copper and alloy 600 wire overbraids, or flat stainless steel wrap.
- **Custom constructions available, consult factory.**

***Applications***

- Steel and aluminum plants
- Heat treating
- Foundries
- Glass, ceramic and brick plants

### Wire Specifications

| B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Nominal Insulation Thickness Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|
| 24 | 0.020 | (0.508) | 0.012 | (0.305) | 0.006 | (0.152) | 0.060 X 0.096 | (1.52 X 2.44) | 9 | (13.4) |
| 20 | 0.032 | (0.813) | 0.012 | (0.305) | 0.006 | (0.152) | 0.072 X 0.118 | (1.83 X 3.00) | 12 | (17.9) |
| 16 | 0.051 | (1.290) | 0.012 | (0.305) | 0.006 | (0.152) | 0.085 X 0.158 | (2.16 X 4.01) | 24 | (35.8) |

Pyrosales
Total Sensor Solutions

# SERV-RITE Wire and Cable

**PYROSALES P/N**

| | | |
|---|---|---|
| CA-B16/5/313 | - | B16/5/313 |
| CA-PS313 | - | S16/5/313 |
| WI-PWK216 | - | K16/5/313 |

## Heavy Duty Fiberglass Braided Thermocouple and Extension Wire

### Series 313

| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 900 F (480 C) | Good | Good | Good |

Series 313 is designed to replace the popular Series 304 in applications requiring a tougher construction. The Series 313 uses a heavier duty fiberglass yarn than the Series 304. The additional yarn enhances abrasion resistance and cut-through resistance.

Each thermoelement is insulated with braided fiberglass and impregnated to improve abrasion resistance. The insulated single conductors are laid parallel and again braided with fiberglass. Finally, another layer of abrasion resistant impregnation is applied to the construction.

For higher temperatures, consider Series 314 or 321.

For better abrasion resistance, specify Series 302 or consider a metallic overbraid.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | | / | / 3 | 1 | 3 |

**1. ASTM E 230 Calibrations**

| | |
|---|---|
| E | N |
| J | S |
| K | T |

**2-3. B & S Gauge**

| | | |
|---|---|---|
| 20 | 18 | 16 |
| 20 stranded (7/28) | 18 stranded (7/26) | 16 stranded (7/24) |

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

### *Performance Capabilities*

- Continuous temperature rating: 900°F (480°C)
- Single reading: 1000°F (540°C)

### *Features and Benefits*

- **Thick fiberglass braid single conductor and duplex insulation** impregnated with modified resin for added abrasion resistance.
- **Impregnation retained to 400°F (204°C).**
- **ASTM E 230 color code** for easy identification.
- **Good abrasion, moisture and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel, tinned copper and alloy 600 wire over-braids, or flat stainless steel spiral wrap.
- **Custom constructions available, consult factory.**

### *Applications*

- Steel and aluminum plants
- Heat treating
- Foundries
- Glass, ceramic and brick plants

### Wire Specifications

| B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness | | | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Conductor | | Overall | | | | | |
| | inches | (mm) | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 20 | 0.032 | (0.813) | 0.010 | (0.254) | 0.010 | (0.254) | 0.074 X 0.124 | (1.88 X 3.15) | 12 | (17.9) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.010 | (0.254) | 0.010 | (0.254) | 0.080 X 0.136 | (2.03 X 3.45) | 13 | (19.4) |
| 18 | 0.040 | (1.02) | 0.010 | (0.254) | 0.010 | (0.254) | 0.082 X 0.140 | (2.08 X 3.56) | 16 | (23.8) |
| 18 S* (7/26) | 0.048 | (1.22) | 0.010 | (0.254) | 0.010 | (0.254) | 0.090 X 0.156 | (2.29 X 3.96) | 17 | (25.3) |
| 16 | 0.051 | (1.29) | 0.010 | (0.254) | 0.010 | (0.254) | 0.093 X 0.162 | (2.36 X 4.11) | 22 | (32.8) |
| 16 S* (7/24) | 0.060 | (1.52) | 0.010 | (0.254) | 0.010 | (0.254) | 0.102 X 0.180 | (2.59 X 4.57) | 24 | (35.8) |

* “S” denotes stranded wire: e.g., “20 S (7/28)” is seven strands of 28 gauge wire to make a 20 gauge stranded conductor.

# SERV-RITE Wire and Cable

## High Temperature Fiberglass Twisted Thermocouple and Extension Wire

### Series 314

| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 1300 F (705 C) | Good | Good | Good |

The Series 314 is an economical construction for general, high temperature applications. The braided high temperature yarn is applied in a unique manner that allows Series 314 to be competitively priced with other fiberglass constructions. It produces a finished wire that performs at temperatures to 1600°F (870°C).

The conductors are insulated with braided high strength fiberglass and impregnated to improve abrasion resistance. The impregnation is tinted to impart color coding to primary insulations. The insulated single conductors are then twisted together to yield a construction flexible enough for most any application.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | | / | / 3 | 1 | 4 |

**1. ASTM E 230 Calibrations**

E K T
J N

**2-3. B & S Gauge**

24 18 14
20 16

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

For better abrasion resistance, consider Series 321 or a metallic overbraid.

Consider Series 301 or 350 for higher temperatures.

***Performance Capabilities***

- Continuous temperature rating: 1300°F (705°C)
- Single reading: 1600°F (870°C)

***Features and Benefits***

- **High temperature fiberglass braid single conductor insulation** impregnated with modified resin for added abrasion resistance.
- **Impregnation retained to 400°F (204°C).**
- **Duplex construction via twisting single conductors.**
- **ASTM E 230 color code** for easy identification.
- **Good abrasion, moisture and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel, tinned copper and alloy 600 wire overbraids.
- **Custom constructions available, consult factory.**

***Applications***

- Heat treating load thermocouples
- Aluminum stress relieving
- Steel annealing

### Wire Specifications

| B & S Gauge | Nominal Conductor Size | | Nominal Conductor Insulation Thickness | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|
| | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 24 | 0.020 | (0.508) | 0.015 | (0.381) | 0.100 | (2.54) | 6 | (8.9) |
| 20 | 0.032 | (0.965) | 0.015 | (0.381) | 0.124 | (3.15) | 10 | (14.9) |
| 18 | 0.040 | (1.02) | 0.018 | (0.457) | 0.152 | (3.86) | 16 | (23.8) |
| 16 | 0.051 | (1.29) | 0.018 | (0.457) | 0.174 | (4.42) | 21 | (31.3) |
| 14 | 0.064 | (1.63) | 0.018 | (0.457) | 0.200 | (5.08) | 32 | (47.7) |

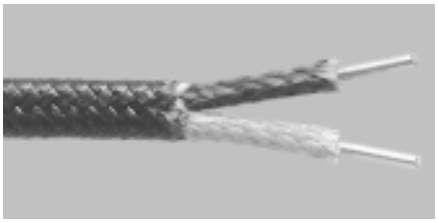
# SERV-RITE Wire and Cable

**PYROSALES P/N**

| | | |
|---|---|---|
| WI-PWJ820 | - | J20/1/321 |
| WI-PWK820 | - | J20/2/321 |
| WI-PWK824 | - | J24/2/321 |

## High Temperature Braided Fiberglass Thermocouple Wire

### Series 321



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 1300 F (705 C) | Good | Good | Good |

The addition of color coding and impregnation to the high temperature fiberglass make this the logical next step for systems which have exceeded the temperature capabilities of standard glass insulated series.

Each conductor is covered with a color coded high temperature fiberglass braid. This braid is then impregnated to enhance abrasion resistance and reduce fraying. The insulated conductors are laid parallel and covered with another braid of high temperature fiberglass and impregnation.

The Series 321 is available with a full range of metallic coverings for improved abrasion resistance.

When the temperature of the application exceeds the rating of the Series 321, specify Series 301.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | | / | / 3 | 2 | 1 |

**1. ASTM E 230 Calibrations**

E K T
J N

**2-3. B & S Gauge**

24 18 14
20 16

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

***Performance Capabilities***

- Continuous temperature rating: 1300°F (705°C)
- Single reading: 1600°F (870°C)

***Features and Benefits***

- **High temperature fiberglass braid single conductor and duplex insulation** impregnated with modified resin for added abrasion resistance.
- **Impregnation retained to 400°F (204°C).**
- **ASTM E 230 color code** for easy identification.
- **Good abrasion, moisture and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel, tinned copper and alloy 600 wire overbraids, or flat stainless steel spiral and half oval galvanized steel spiral wraps.
- **Custom constructions available, consult factory.**

***Applications***

- Steel and aluminum plants
- Heat treating

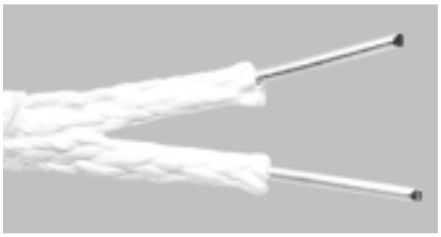
### Wire Specifications

| B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness | | | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Conductor | | Overall | | | | | |
| | inches | (mm) | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 24 | 0.020 | (0.508) | 0.015 | (0.381) | 0.010 | (0.254) | 0.072 X 0.120 | (1.83 X 3.05) | 10 | (14.9) |
| 20 | 0.032 | (0.965) | 0.015 | (0.381) | 0.010 | (0.254) | 0.082 X 0.140 | (2.08 X 3.56) | 13 | (19.4) |
| 18 | 0.040 | (1.02) | 0.015 | (0.381) | 0.010 | (0.254) | 0.090 X 0.156 | (2.29 X 3.96) | 18 | (26.8) |
| 16 | 0.051 | (1.29) | 0.015 | (0.381) | 0.010 | (0.254) | 0.100 X 0.174 | (2.54 X 4.42) | 25 | (37.3) |
| 14 | 0.064 | (1.63) | 0.015 | (0.381) | 0.010 | (0.254) | 0.114 X 0.200 | (2.90 X 5.08) | 34 | (50.7) |

# SERV-RITE Wire and Cable

## High Temperature Ceramic Fiber Thermocouple Wire

### Series 350



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 2200 F (1205 C) | Fair | Good | Good |

The Series 350 uses the ultimate high-temperature flexible insulating system. The ceramic fiber yarn's upper temperature limit often exceeds the melting point of the material it's insulating. When an application requires flexible insulation, while pushing Type K or Type N to their extreme limits, ceramic fiber insulation is the only choice.

While Series 350 can be manufactured to your specification, Watlow Gordon supplies standard Series 350 without color coding or impregnations.* This minimizes contaminating the pure ceramic fiber yarn. Laboratory testing indicates the introduction of even small amounts of impregnation can decrease the upper use temperature by as much as 1000°F (540°C). Watlow Gordon's processing assures the ceramic fiber yarn has the longest life and maximum operating temperature.

If application temperatures exceed Series 350 construction, specify XACTPAK® mineral-insulated, metal-sheathed cable.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | | / | / 3 | 5 | 0 |

**1. ASTM E 230 Calibrations**

E K
J N

**2-3. B & S Gauge**

24 18 14
20 16

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances

### *Performance Capabilities*

- Continuous temperature rating: 2200°F (1205°C)
- Single reading: 2600°F (1430°C)

### *Features and Benefits*

- **Ceramic fiber braid single conductor and duplex insulation;** no impregnation for contamination-free operation.
- **Good abrasion and chemical resistance, fair moisture resistance.**
- **Additional abrasion resistance** with optional stainless steel and alloy 600 wire overbraids.
- **Custom constructions available, consult factory.**

### *Applications*

- Steel and aluminum plants
- Heat treating

### Wire Specifications

| B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|
| 24 | 0.020 | (0.508) | 0.016 | (0.406) | 0.016 | (0.406) | 0.088 X 0.132 | (2.24 X 3.35) | 13 | (19.4) |
| 20 | 0.032 | (0.965) | 0.016 | (0.406) | 0.016 | (0.406) | 0.100 X 0.154 | (2.54 X 3.91) | 16 | (23.8) |
| 18 | 0.040 | (1.02) | 0.016 | (0.406) | 0.016 | (0.406) | 0.108 X 0.170 | (2.74 X 4.32) | 21 | (31.3) |
| 16 | 0.051 | (1.29) | 0.016 | (0.406) | 0.016 | (0.406) | 0.119 X 0.192 | (3.02 X 4.88) | 32 | (47.7) |
| 14 | 0.064 | (1.63) | 0.016 | (0.406) | 0.016 | (0.406) | 0.132 X 0.218 | (3.35 X 5.54) | 44 | (65.6) |

*Because this insulation has no binders or impregnations, it may "flower" when stripped.

Pyrosales
Total Sensor Solutions

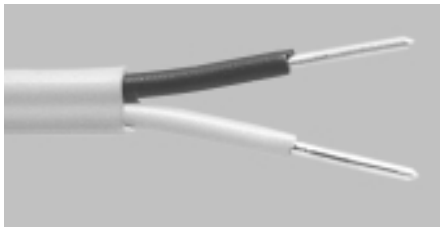
**PYROSALES P/N**

| | | | | | |
|---|---|---|---|---|---|
| CA-PS02620 | - | S20/5/502 | WI-PWN420 | - | N20/5/502 |
| CA-S24/7/502 | - | S24/7/502 | WI-PWN420/7 | - | N20/7/502 |
| CA-PS050 | - | T20/5/502 | WI-PWN424/7 | - | N24/7/502 |
| WI-PWE420 | - | E20/5/502 | WI-PWT420/7 | - | N20/7/502 |
| WI-PWJ420 | - | J20/5/502 | WI-PWT424/7 | - | T24/7/502 |
| WI-PWJ424/7 | - | J24/7/502 | | | |
| WI-PWK420 | - | K20/5/502 | | | |
| WI-PWK420/7 | - | K20/7/502 | | | |
| WI-PWK424/7 | - | K24/7/502 | | | |

# SERV-RITE Wire and Cable

## PVC Insulated Thermocouple and Extension Wire

### Series 502



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 220 F (105 C) | Excellent | Excellent | Excellent |

Series 502 is an economical wire that's also available in UL® listings for PLTC (Power Limited Tray Cable) applications.

The primary and duplex insulation is PVC. It yields a construction that's inexpensive while performing continuously at temperatures to 220°F (105°C).

Series 502 is often used in conduit and wiring trays where its flexibility allows for easy installation. The Series 502 can be easily stripped using hand tools or mechanical methods.

***Performance Capabilities***

- Continuous temperature rating: 220°F (105°C)

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | / | / | 5 | 0 | 2 |

**1. ASTM E 230 Calibrations**

| | | |
|---|---|---|
| B | J | S |
| C | K | T |
| E | N | |

**2-3. B & S Gauge**

| | | |
|---|---|---|
| 24 | 18 | 14 |
| 24 stranded (7/32) | 18 stranded (7/26) | 14 stranded (7/22) |
| 20 | 16 | |
| 20 stranded (7/28) | 16 stranded (7/24) | |

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

***Features and Benefits***

- **Extruded PVC single conductor and duplex insulation** for excellent moisture resistance.
- **Available as UL® Listed PLTC Wire and Cable.**
- **ASTM E 230 color code** for easy identification.
- **Excellent moisture resistance, good abrasion and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

***Applications***

- Laboratories
- Industrial equipment testing
- Automotive

### Wire Specifications

| B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|
| 24 | 0.020 | (0.508) | 0.015 | (0.381) | 0.015 | (0.381) | 0.080 X 0.130 | (2.03 X 3.30) | 10 | (14.9) |
| 24 S* (7/32) | 0.024 | (0.610) | 0.015 | (0.381) | 0.015 | (0.381) | 0.084 X 0.138 | (2.13 X 3.51) | 11 | (16.4) |
| 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.015 | (0.381) | 0.092 X 0.154 | (2.34 X 3.91) | 14 | (20.9) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.015 | (0.381) | 0.015 | (0.381) | 0.098 X 0.166 | (2.49 X 4.22) | 16 | (23.8) |
| 18 | 0.040 | (1.02) | 0.020 | (0.508) | 0.020 | (0.508) | 0.120 X 0.200 | (3.05 X 5.08) | 21 | (31.3) |
| 18 S* (7/26) | 0.048 | (1.22) | 0.020 | (0.508) | 0.020 | (0.508) | 0.128 X 0.216 | (3.25 X 5.49) | 23 | (34.3) |
| 16 | 0.051 | (1.29) | 0.020 | (0.508) | 0.020 | (0.508) | 0.131 X 0.222 | (3.33 X 5.64) | 28 | (41.7) |
| 16 S* (7/24) | 0.060 | (1.52) | 0.020 | (0.508) | 0.020 | (0.508) | 0.140 X 0.240 | (3.56 X 6.10) | 30 | (44.7) |
| 14 | 0.064 | (1.628) | 0.020 | (0.508) | 0.025 | (0.635) | 0.144 X 0.248 | (3.66 X 6.30) | 44 | (65.6) |
| 14 S* (7/22) | 0.076 | (1.930) | 0.020 | (0.508) | 0.025 | (0.635) | 0.166 X 0.282 | (4.22 X 7.16) | 48 | (71.5) |

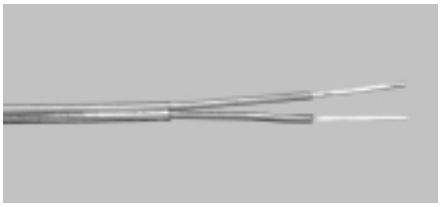
* "S" denotes stranded wire: e.g., "24 S (7/32)" is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

**PYROSALES P/N**
WI-TT-N/N 051 - T/24/1/504

# SERV-RITE Wire and Cable

## Nylon Insulated Thermocouple Wire

### Series 504



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 300˚F (150˚C) | Fair | Good | Excellent |

The Series 504 is a construction that permits reduced amounts of insulation material to produce a rugged, compact wire.

Primary and duplex insulation is extruded nylon that performs continuously at 300°F (150°C). Single conductors are color coded for easy installation.

Series 504 can be easily stripped using hand tools or mechanical methods.

### Construction Combinations

1 2 3 4 5 6 7
_ _ _ / _ / 5 0 4

**1. ASTM E 230 Calibrations**
E K
J T

**2-3. B & S Gauge**
24
20

**4. Conductor Type/Tolerance**
1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances

***Performance Capabilities***

- Continuous temperature rating: 300°F (150°C)

***Features and Benefits***

- **Extruded nylon single conductor and duplex insulation** for exceptional protection.
- **Resistant to chemicals and hydrocarbons**
- **Overall insulation jacket is clear** to ease identification.
- **ASTM E 230 color code** for easy identification.
- **Excellent abrasion resistance, good chemical resistance and fair moisture resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

***Applications***

- Laboratories
- Test stands
- Food processing

### Wire Specifications

| B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness | | | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Conductor | | Overall | | | | | |
| | inches | (mm) | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 24 | 0.020 | (0.508) | 0.008 | (0.203) | 0.004 | (0.102) | 0.044 X 0.080 | (1.12 X 2.03) | 6 | (8.9) |
| 20 | 0.032 | (0.813) | 0.008 | (0.203) | 0.008 | (0.203) | 0.064 X 0.112 | (1.63 X 2.84) | 11 | (16.4) |

# SERV-RITE Wire and Cable

## PVC Insulated "RIPCORD" Thermocouple and Extension Wire

### Series 505

| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 220˚F (105˚C) | Excellent | Good | Good |

The Series 505 is the most economical wire produced. Unlike some competitive “ripcord” type constructions which use only a stripe to establish polarity, Series 505 single conductors are fully color coded. The conductors are individually insulated with the proper colored PVC and fused into “ripcord” using a proprietary process.

The insulated conductors can be easily separated by hand once the bond between conductors has been slit. As with other PVC insulated products, Series 505 lends itself well to both manual and mechanical stripping methods.

**PYROSALES P/N**

| | | |
|---|---|---|
| WI-PWJ524 | - | J24/1/505 |
| WI-PWK524 | - | K24/1/505 |
| WI-PWN524 | - | N24/1/505 |

## Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | | / | / 5 | 0 | 5 |

**1. ASTM E 230 Calibrations**

| | | |
|---|---|---|
| B | J | S |
| C | K | T |
| E | N | |

**2-3. B & S Gauge**

| | | |
|---|---|---|
| 26 | 24 | 20 |
| | 24 stranded (7/32) | 20 stranded (7/28) |

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

For higher temperature applications or enhanced abrasion resistance, consider a fluoroplastic insulated construction such as the Series 507 or 508.

### *Performance Capabilities*

- Continuous temperature rating: 220°F (105°C)

### *Features and Benefits*

- **Extruded PVC single conductor insulation** with fused (ripcord) duplex construction for easy separa-tion and stripping.
- **ASTM E 230 color code** for easy identification.
- **Excellent moisture resistance, good abrasion and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

### *Applications*

- Laboratories
- Test stands
- Automotive

### Wire Specifications

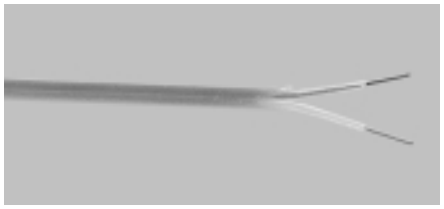
| B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Conductor Insulation Thickness inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|
| 26 | 0.016 | (0.406) | 0.015 | (0.381) | 0.046 X 0.088 | (1.17 X 2.24) | 4 | (6.0) |
| 24 | 0.020 | (0.508) | 0.015 | (0.381) | 0.050 X 0.096 | (1.27 X 2.44) | 5 | (7.5) |
| 24 S* (7/32) | 0.024 | (0.610) | 0.015 | (0.381) | 0.054 X 0.104 | (1.37 X 2.64) | 6 | (8.9) |
| 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.062 X 0.120 | (1.57 X 3.05) | 10 | (14.9) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.015 | (0.381) | 0.068 X 0.132 | (1.73 X 3.35) | 11 | (16.4) |

* “S” denotes stranded wire: e.g., “24 S (7/32)” is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

# SERV-RITE
# Wire and Cable

## Small Gauge FEP Insulated Thermocouple and Extension Wire

### Series 506



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 400˚F (204˚C) | Excellent | Excellent | Excellent |

Series 506 is the smallest standard insulated wire construction. The thin FEP wall on both primary and duplex insulation yields a construction that can operate safely at temperatures far beyond common PVC and nylon insulations.

The Series 506 is fully color coded for ease of installation. Its small size allows use in high density circuits. Response time is minimized by small diameter conductors. Series 506 is available only in gauge sizes of #26 and smaller. For gauge sizes larger than #26 specify Series 507.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | | / | / 5 | 0 | 6 |

**1. ASTM E 230 Calibrations**

| | |
|---|---|
| E | N |
| J | S |
| K | T |

**2-3. B & S Gauge**

| | |
|---|---|
| 36 | 30 |
| 32 | 28 |

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

### *Performance Capabilities*

- Continuous temperature rating: 400°F (204°C)
- Single reading: 500°F (260°C)

### *Features and Benefits*

- **Extruded FEP single conductor and duplex insulation** for excellent protection.
- **ASTM E 230 color code** for easy identification.
- **Excellent abrasion, moisture and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

### *Applications*

- Industrial equipment testing

### Wire Specifications

| B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|
| 36 | 0.005 | (0.127) | 0.005 | (0.127) | 0.005 | (0.127) | 0.025 X 0.040 | (0.635 X 1.02) | 2 | (3.0) |
| 32 | 0.008 | (0.203) | 0.005 | (0.127) | 0.005 | (0.127) | 0.028 X 0.046 | (0.711 X 1.17) | 2 | (3.0) |
| 30 | 0.010 | (0.254) | 0.005 | (0.127) | 0.005 | (0.127) | 0.030 X 0.050 | (0.762 X 1.27) | 3 | (4.5) |
| 28 | 0.013 | (0.330) | 0.005 | (0.127) | 0.005 | (0.127) | 0.033 X 0.056 | (0.838 X 1.42) | 3 | (4.5) |

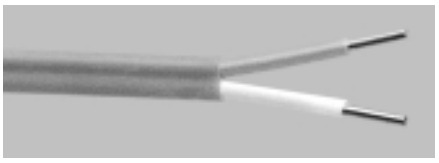
**PYROSALES P/N**

| | | |
|---|---|---|
| WI-PWJ620 | - | J20/1/507 |
| WI-PWJ620/7 | - | J20/3/507 |
| WI-PWJ624/7 | - | J24/3/507 |
| WI-PWK620 | - | K20/1/507 |
| WI-PWK620/7 | - | K20/3/507 |
| WI-PWK624/7 | - | K24/3/507 |
| WI-PWT620 | - | T20/1/507 |
| WI-PWT624/7 | - | T24/3/507 |

# SERV-RITE Wire and Cable

## FEP Insulated Thermocouple and Extension Wire

### Series 507



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 400˚F (204˚C) | Excellent | Excellent | Excellent |

The Series 507 is the most economical fluoroplastic insulated wire. Series 507 is also available as UL® listed PLTC. Individual conductors are coated with a layer of color coded FEP. The insulated conductors are then parallel duplexed with an additional layer of color coded FEP. The finished construction has a temperature rating of 500°F (260°C). Abrasion, moisture and chemical resistance are far in excess of most other insulations.

This construction is widely used when pulling long lengths of wire through conduit. FEP's low friction coefficient and abrasion resistance make it ideally suited for these applications.

## Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | / | / | 5 | 0 | 7 |

**1. ASTM E 230 Calibrations**

B C E J K N S T

**2-3. B & S Gauge**

| | | |
|---|---|---|
| 24 | 20 | 16 |
| 24 stranded (7/32) | 20 stranded (7/28) | 16 stranded (7/24) |
| 22 | 18 | |
| 22 stranded (7/30) | 18 stranded (7/26) | |

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

For higher abrasion resistance consider Tefzel® insulated constructions, the Series 514.

For higher temperatures specify Series 508 or 516.

### *Performance Capabilities*

- Continuous temperature rating: 400°F (204°C)
- Single reading: 500°F (260°C)

### *Features and Benefits*

- **Extruded FEP single conductor and duplex insulation** for excellent protection.
- **Available as UL® listed PLTC wire and cable.**
- **ASTM E 230 color code** for easy identification.
- **Excellent abrasion, moisture and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

### *Applications*

- Aerospace
- Industrial equipment testing

### Wire Specifications

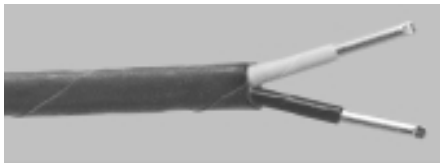
| B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|
| 24 | 0.020 | (0.508) | 0.008 | (0.203) | 0.010 | (0.254) | 0.056 X 0.096 | (1.42 X 2.44) | 8 | (11.9) |
| 24 S* (7/32) | 0.024 | (0.610) | 0.008 | (0.203) | 0.010 | (0.254) | 0.060 X 0.104 | (1.52 X 2.64) | 9 | (13.4) |
| 22 | 0.025 | (0.635) | 0.008 | (0.203) | 0.010 | (0.254) | 0.061 X 0.106 | (1.55 X 2.69) | 10 | (14.9) |
| 22 S* (7/30) | 0.030 | (0.762) | 0.008 | (0.203) | 0.010 | (0.254) | 0.066 X 0.116 | (1.68 X 2.95) | 11 | (16.4) |
| 20 | 0.032 | (0.813) | 0.008 | (0.203) | 0.010 | (0.254) | 0.068 X 0.120 | (1.73 X 3.05) | 12 | (17.9) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.008 | (0.203) | 0.010 | (0.254) | 0.074 X 0.132 | (1.88 X 3.35) | 14 | (20.9) |
| 18 | 0.040 | (1.02) | 0.008 | (0.203) | 0.010 | (0.254) | 0.076 X 0.136 | (1.93 X 3.45) | 18 | (26.8) |
| 18 S* (7/26) | 0.048 | (1.22) | 0.008 | (0.203) | 0.010 | (0.254) | 0.084 X 0.152 | (2.13 X 3.86) | 20 | (29.8) |
| 16 | 0.051 | (1.29) | 0.008 | (0.203) | 0.012 | (0.305) | 0.091 X 0.162 | (2.31 X 4.11) | 28 | (41.7) |
| 16 S* (7/24) | 0.060 | (1.52) | 0.008 | (0.203) | 0.012 | (0.305) | 0.100 X 0.186 | (2.54 X 4.72) | 30 | (44.7) |

* "S" denotes stranded wire: e.g., "24 S (7/32)" is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

# SERV-RITE Wire and Cable

## TFE Tape Insulated Thermocouple and Extension Wire

### Series 508



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 500˚F (260˚C) | Excellent | Excellent | Good |

The primary and duplex insulation of Series 508 is fused TFE tape. The tape is spirally applied to the conductor and heated. This process, called sintering, forms the tape into a homogeneous layer. When sintered, the tape exhibits all of the advantages of extruded TFE insulation, while eliminating the concentricity problems associated with TFE extrusions.

The Series 508 is fully color coded and capable of continuous operation in excess of 500°F (260°C). Because the fusing process causes the duplex tape to fuse with the primary insulation, Series 508 is not recommended for applications where it's necessary to remove the outer tape while leaving the primary insulation intact.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | | / | / 5 | 0 | 8 |

**1. ASTM E 230 Calibrations**

B C E J K N S T

**2-3. B & S Gauge**

| | | |
|---|---|---|
| 26 | 20 | 16 |
| | 20 stranded (7/28) | 16 stranded (7/24) |
| 24 | 18 | |
| 24 stranded (7/32) | 18 stranded (7/26) | |

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

When higher temperature capabilities are required, specify polyimide insulated constructions: Series 511, 512 or 513.

For improved abrasion resistance, consider Series 514 or a stainless steel overbraid.

#### *Performance Capabilities*

- Continuous temperature rating: 500°F (260°C)
- Single reading: 600°F (315°C)

#### *Features and Benefits*

- **Fused TFE tape single conductor and duplex insulation** to eliminate concentricity problems.
- **ASTM E 230 color code** for easy identification.
- **Excellent moisture and chemical resistance, good abrasion resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

#### *Applications*

- Aircraft composite bonding
- Petroleum plants

### Wire Specifications

| B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Nominal Insulation Thickness Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|
| 26 | 0.016 | (0.406) | 0.006 | (0.152) | 0.008 | (0.203) | 0.044 X 0.072 | (1.12 X 1.83) | 4 | (6.0) |
| 24 | 0.020 | (0.508) | 0.006 | (0.152) | 0.008 | (0.203) | 0.047 X 0.077 | (1.19 X 1.95) | 5 | (7.5) |
| 24 S* (7/32) | 0.024 | (0.610) | 0.006 | (0.152) | 0.008 | (0.203) | 0.049 X 0.084 | (1.24 X 2.13) | 6 | (8.9) |
| 20 | 0.032 | (0.813) | 0.006 | (0.152) | 0.008 | (0.203) | 0.061 X 0.106 | (1.55 X 2.69) | 11 | (16.4) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.006 | (0.152) | 0.008 | (0.203) | 0.064 X 0.112 | (1.63 X 2.84) | 12 | (17.9) |
| 18 | 0.040 | (1.02) | 0.006 | (0.152) | 0.008 | (0.203) | 0.068 X 0.120 | (1.73 X 3.05) | 16 | (23.8) |
| 18 S* (7/26) | 0.048 | (1.22) | 0.006 | (0.152) | 0.008 | (0.203) | 0.076 X 0.136 | (1.93 X 3.45) | 18 | (26.8) |
| 16 | 0.051 | (1.29) | 0.010 | (0.254) | 0.008 | (0.203) | 0.087 X 0.158 | (2.21 X 4.01) | 25 | (37.3) |
| 16 S* (7/24) | 0.060 | (1.52) | 0.010 | (0.254) | 0.008 | (0.203) | 0.096 X 0.176 | (2.44 X 4.47) | 27 | (40.2) |

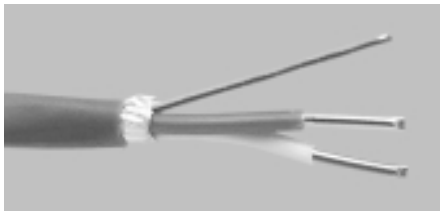
* "S" denotes stranded wire: e.g., "24 S (7/32) is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

Pyrosales
Total Sensor Solutions

# SERV-RITE Wire and Cable

## FEP Insulated and Shielded Thermocouple and Extension Wire

### Series 509



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 400˚F (204˚C) | Excellent | Excellent | Excellent |

The Series 509 was developed especially for use with microprocessor based systems. Series 509 is also available as UL® listed PLTC.

The conductors are insulated with color coded FEP. They're then twisted with a copper drain wire. An aluminized polyester tape is wrapped around the conductors and drain wire. Finally, FEP is applied.

The finished construction can withstand temperatures in excess of 400°F (204°C). Twisted conductors minimize EMI and the taped shield eliminates most problems associated with AC "noise."

When better abrasion resistance is required, specify an overall metallic braid.

**PYROSALES P/N**

| | | |
|---|---|---|
| CA-PS700K | - | K16/5/509 |
| CA-PS700RM | - | S16/5/509 |
| CA-PS720RM | - | S24/7/509 |
| WI-PWK620SC | - | K20/1/509 |

## Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | | / | / 5 | 0 | 9 |

**1. ASTM E 230 Calibrations**

B C E J K N S T

**2-3. B & S Gauge**

| | | | |
|---|---|---|---|
| 24 | 20 | 18 | 16 |
| 24 stranded (7/32) | 20 stranded (7/28) | 18 stranded (7/26) | 16 stranded (7/24) |

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

### *Performance Capabilities*

- Continuous temperature rating: 400°F (204°C)
- Single reading: 500°F (260°C)

### *Features and Benefits*

- **Extruded FEP single conductor insulation** for excellent protection.
- **Twisted; extruded FEP overall duplex insulation** to minimize electrical interference.
- **Available as UL® listed PLTC wire and cable.**
- **Aluminum/polyester shield with drain wire** reduces electrical noise.
- **ASTM E 230 color code** for easy identification.
- **Excellent abrasion, moisture and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

### *Applications*

- Aerospace
- Industrial equipment testing
- Glass manufacture

### Wire Specifications

| B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness | | | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Conductor | | Overall | | | | | |
| | inches | (mm) | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 24 | 0.020 | (0.508) | 0.008 | (0.203) | 0.012 | (0.305) | 0.104 | (2.64) | 12 | (17.9) |
| 24 S* (7/32) | 0.024 | (0.610) | 0.008 | (0.203) | 0.012 | (0.305) | 0.112 | (2.84) | 13 | (19.4) |
| 20 | 0.032 | (0.813) | 0.008 | (0.203) | 0.012 | (0.305) | 0.128 | (3.25) | 18 | (26.8) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.008 | (0.203) | 0.012 | (0.305) | 0.140 | (3.56) | 20 | (29.8) |
| 18 | 0.040 | (1.02) | 0.008 | (0.203) | 0.015 | (0.381) | 0.152 | (3.86) | 25 | (37.3) |
| 18 S* (7/26) | 0.048 | (1.22) | 0.008 | (0.203) | 0.015 | (0.381) | 0.168 | (4.27) | 27 | (40.2) |
| 16 | 0.051 | (1.29) | 0.008 | (0.203) | 0.015 | (0.381) | 0.174 | (4.42) | 33 | (49.2) |
| 16 S* (7/24) | 0.060 | (1.52) | 0.008 | (0.203) | 0.015 | (0.381) | 0.192 | (4.88) | 35 | (52.2) |

* "S" denotes stranded wire: e.g., "24 S (7/32)" is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

Pyrosales
Total Sensor Solutions

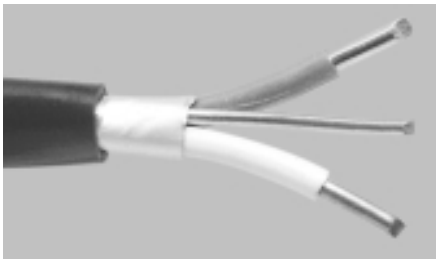
**PYROSALES P/N**

| | | |
|---|---|---|
| CA-PS024SC | - | J16/5/510 |
| CA-PS02420SC | - | J20/5/510 |
| CA-PS026SC | - | S16/5/510 |
| CA-PS02620SC | - | S20/5/510 |
| CA-PS028SC | - | K16/5/510 |
| CA-PS02820SC | - | K20/5/510 |
| CA-PS02824SC | - | K24/5/510 |
| CA-PS050SC | - | T20/5/510 |
| CA-PS410SC | - | N20/5/510 |

# SERV-RITE Wire and Cable

## PVC Insulated and Shielded Thermocouple and Extension Wire

### Series 510



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 220˚F (105˚C) | Excellent | Good | Good |

The Series 510 is a PVC insulated, twisted and shielded construction for systems sensitive to induced voltages and “noise.” Series 510 is also available as UL® listed PLTC.

The conductors are insulated with color coded PVC. The next operation twists the two insulated conductors with a copper drain wire. An aluminized polyester tape is wrapped around the wires to impart 100 percent shielding. Lastly, another layer of PVC is applied.

## Construction Combinations

1 2 3 4 5 6 7
/ / 5 1 0

**1. ASTM E 230 Calibrations**

| | | | |
|---|---|---|---|
| B | E | K | S |
| C | J | N | T |

**2-3. B & S Gauge**

| | | |
|---|---|---|
| 24 | 20 | 18 |
| 24 stranded (7/32) | 20 stranded (7/28) | 18 stranded (7/26) |
| 16 | 14 | |
| 16 stranded (7/24) | 14 stranded (7/22) | |

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

The twisting eliminates most EMI while the shield tape minimizes AC “noise.”

For higher temperatures specify Series 509. For improved abrasion resistance consider a metallic overbraid.

***Performance Capabilities***

- Continuous temperature rating: 220°F (105°C)

***Features and Benefits***

- **Extruded PVC single conductor insulation** for excellent protection.
- **Twisted; extruded PVC overall duplex insulation.**
- **Available in UL® PLTC.**
- **Aluminum/polyester shield with drain wire.**
- **ASTM E 230 color code.**
- **Excellent moisture resistance, good abrasion and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

### Wire Specifications

| B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|
| 24 | 0.020 | (0.508) | 0.015 | (0.381) | 0.020 | (0.508) | 0.140 | (3.56) | 13 | (19.4) |
| 24 S* (7/32) | 0.024 | (0.610) | 0.015 | (0.381) | 0.020 | (0.508) | 0.148 | (3.76) | 14 | (20.9) |
| 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.020 | (0.508) | 0.164 | (4.17) | 22 | (32.8) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.015 | (0.381) | 0.020 | (0.508) | 0.176 | (4.47) | 24 | (35.8) |
| 18 | 0.040 | (1.02) | 0.020 | (0.508) | 0.020 | (0.508) | 0.200 | (5.08) | 30 | (44.7) |
| 18 S* (7/26) | 0.048 | (1.22) | 0.020 | (0.508) | 0.020 | (0.508) | 0.216 | (5.49) | 32 | (47.7) |
| 16 | 0.051 | (1.29) | 0.020 | (0.508) | 0.020 | (0.508) | 0.222 | (5.64) | 39 | (58.1) |
| 16 S* (7/24) | 0.060 | (1.52) | 0.020 | (0.508) | 0.020 | (0.508) | 0.240 | (6.10) | 41 | (61.1) |
| 14 | 0.064 | (1.63) | 0.020 | (0.508) | 0.025 | (0.635) | 0.258 | (6.55) | 55 | (82.0) |
| 14 S* (7/22) | 0.076 | (1.93) | 0.020 | (0.508) | 0.025 | (0.635) | 0.282 | (7.16) | 58 | (86.4) |

* “S” denotes stranded wire: e.g., “24 S (7/32)” is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

# SERV-RITE
# Wire and Cable

## Polyimide Insulated and Twisted Thermocouple and Extension Wire

### Series 511

| | Resistance Properties | | |
|---|---|---|---|
| Temp. | Moisture | Chemical | Abrasion |
| 600˚F (315˚C) | Excellent | Excellent | Excellent |

Series 511 is the most economical polyimide taped construction. The polyimide film applied to the conductors is considered to be the ultimate "soft" insulation. The tape maintains its strength at temperatures to 600°F (315°C). The FEP laminate serves as a moisture barrier and allows the tape to fused with itself. The finished construction will not unravel when cut.

The Series 511 conductors are wrapped with the polyimide tape which is fused to itself. Each conductor is color coded with a colored thread under the tape. The final operation is twisting the insulated conductors into a duplex construction, thereby eliminating the overall duplex insulation and minimizing cost.

### Construction Combinations

1 2 3 4 5 6 7
_ _ _ / _ / 5 1 1

**1. ASTM E 230 Calibrations**

E K T
J N

**2-3. B & S Gauge**

30 24 20 16
24 stranded (7/32) 20 stranded (7/28)

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

The Series 512 and 513 use additional polyimide insulation and should be specified when better abrasion resistance is required.

For higher temperatures, consider our fiberglass insulated constructions.

If heavier insulation is needed, refer to Series 512.

***Performance Capabilities***

- Continuous temperature rating: 600°F (315°C)
- Single reading: 800°F (430°C)

***Features and Benefits***

- **Fused polyimide tape*** single conductor insulation for excellent protection.
- **Duplex construction via twisted single conductors.**
- **Both legs have ASTM E 230 color coded tracers** for easy identification.
- **Excellent abrasion, moisture and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

***Applications***

- Petrochemical plants
- Glass, ceramic and brick manufacturing
- Electric power plants
- Cryogenic applications
- Aerospace industry

### Wire Specifications

| B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness Conductor | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|
| | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 30 | 0.010 | (0.254) | 0.004 | (0.102) | 0.040 | (1.02) | 3 | (4.5) |
| 24 | 0.020 | (0.508) | 0.005 | (0.127) | 0.060 | (1.52) | 4 | (6.0) |
| 24 S** (7/32) | 0.024 | (0.610) | 0.005 | (0.127) | 0.068 | (1.73) | 5 | (7.5) |
| 20 | 0.032 | (0.813) | 0.005 | (0.127) | 0.084 | (2.13) | 8 | (11.9) |
| 20 S** (7/28) | 0.038 | (0.965) | 0.005 | (0.127) | 0.094 | (2.39) | 9 | (13.4) |
| 16 | 0.051 | (1.29) | 0.005 | (0.127) | 0.122 | (3.10) | 19 | (28.3) |

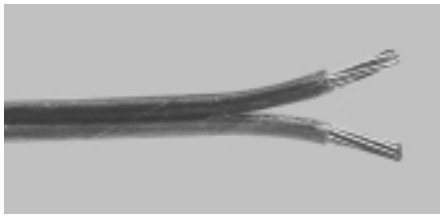
* FEP laminate melts at approximately 500°F (260°C). Polyimide tape film may be either Kapton® from E.I. du Pont de Nemours & Company, or Apical® from Allied.

** "S" denotes stranded wire: e.g., "24 S (7/32)" is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

# SERV-RITE Wire and Cable

## Polyimide Insulated Thermocouple and Extension Wire

### Series 512



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 600˚F (315˚C) | Excellent | Excellent | Excellent |

The Series 512 is a heavier duty version of Series 511 construction, using the same polyimide insulation. Color coding is accomplished using the same colored thread “tracers”. However, the Series 512 has a duplex insulation of polyimide tape. The extra wall of tape yields a construction with increased abrasion resistance.

For higher temperature requirements, choose one of our fiberglass insulated wires.

For improved abrasion resistance, and easier color identification of conductors, specify Series 513.

### Construction Combinations

1 2 3 4 5 6 7
/ / 5 1 2

**1. ASTM E 230 Calibrations**

E K T
J N

**2-3. B & S Gauge**

30 24 20 16
24 stranded (7/32) 20 stranded (7/28) 16 stranded (7/24)

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

***Performance Capabilities***

- Continuous temperature rating: 600°F (315°C)
- Single reading: 800°F (430°C)

***Features and Benefits***

- **Fused polyimide tape* single conductor and duplex insulation** for excellent protection.
- **Both legs have ASTM E 230 color coded tracers** for easy identification.
- **Excellent abrasion, moisture and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

***Applications***

- Petrochemical plants
- Glass, ceramic and brick manufacturing
- Electric power plants
- Cryogenic applications
- Aerospace industry

### Wire Specifications

| B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness | | | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Conductor | | Overall | | | | | |
| | inches | (mm) | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 30 | 0.010 | (0.254) | 0.004 | (0.102) | 0.005 | (0.127) | 0.026 X 0.044 | (0.660 X 1.18) | 3 | (4.5) |
| 24 | 0.020 | (0.508) | 0.005 | (0.127) | 0.005 | (0.127) | 0.036 X 0.064 | (0.914 X 1.626) | 5 | (7.5) |
| 24 S** (7/32) | 0.024 | (0.610) | 0.005 | (0.127) | 0.005 | (0.127) | 0.043 X 0.066 | (1.092 X 1.676) | 6 | (8.9) |
| 20 | 0.032 | (0.813) | 0.005 | (0.127) | 0.005 | (0.127) | 0.048 X 0.088 | (1.219 X 2.235) | 8 | (11.9) |
| 20 S** (7/28) | 0.038 | (0.965) | 0.005 | (0.127) | 0.005 | (0.127) | 0.056 X 0.098 | (1.42 X 2.490) | 9 | (13.4) |
| 16 | 0.051 | (1.29) | 0.005 | (0.127) | 0.005 | (0.127) | 0.071 X 0.132 | (1.80 X 3.35) | 19 | (28.3) |
| 16 S** (7/24) | 0.060 | (1.52) | 0.005 | (0.127) | 0.005 | (0.127) | 0.084 X 0.148 | (2.134 X 3.760) | 21 | (31.3) |

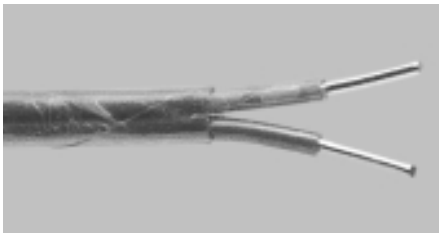
* FEP laminate melts at approximately 500°F (260°C). Polyimide tape film may be either Kapton® from E.I. du Pont de Nemours & Company, or Apical® from Allied.

** “S” denotes stranded wire: e.g., “24 S (7/32)” is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

# SERV-RITE Wire and Cable

## Double Polyimide Insulated Thermocouple and Extension Wire

### Series 513



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 600˚F (315˚C) | Excellent | Excellent | Excellent |

The Series 513 is the ultimate polyimide insulated wire. The toughness of multiple polyimide tape layers along with fully color coded conductors make this insulation system the choice for high reliability circuits. Abrasion, moisture and chemical resistance are all enhanced by additional layers of tape and application of polyimide varnish.

The actual construction consists of a double polyimide tape layer applied to each conductor. The tape is fused by heating. Each insulated single conductor is then coated to impart the proper color code. Finally, the insulated conductors are laid parallel and covered by a double, heat fused layer of polyimide tape.

### Construction Combinations

1 2 3 4 5 6 7
/ / 5 1 3

**1. ASTM E 230 Calibrations**
E K T
J N

**2-3. B & S Gauge**
30 24 20
24 stranded (7/32) 20 stranded (7/28)

**4. Conductor Type/Tolerance**
1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

When applications require higher heat resistance, it is necessary to specify fiberglass insulation.

For applications requiring better abrasion resistance, specify a metallic overbraid.

### *Performance Capabilities*

- Continuous temperature rating: 600°F (315°C)
- Single reading: 800°F (430°C)

### *Features and Benefits*

- **Fused polyimide tape* single conductor insulation** color coded with polyimide enamel for excellent protection.
- **Fused polyimide tape* duplex insulation** for additional protection.
- **Both conductors have ASTM E 230 color code** for easy identification.
- **Excellent abrasion, moisture and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available consult factory.**

### *Applications*

- Petrochemical plants
- Glass, ceramic and brick manufacturing
- Electric power plants
- Cryogenic applications
- Aerospace industry

### Wire Specifications

| B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness | | | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Conductor | | Overall | | | | | |
| | inches | (mm) | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 30 | 0.010 | (0.254) | 0.006 | (0.152) | 0.006 | (0.152) | 0.038 X 0.058 | (0.97 X 1.47) | 3 | (4.5) |
| 24 | 0.020 | (0.508) | 0.006 | (0.152) | 0.006 | (0.152) | 0.054 X 0.076 | (1.37 X 1.93) | 5 | (7.5) |
| 24 S** (7/32) | 0.024 | (0.610) | 0.006 | (0.152) | 0.006 | (0.152) | 0.056 X 0.084 | (1.42 X 2.13) | 6 | (8.9) |
| 20 | 0.032 | (0.813) | 0.006 | (0.152) | 0.006 | (0.152) | 0.065 X 0.100 | (1.65 X 2.54) | 10 | (14.9) |
| 20S** (7/28) | 0.038 | (0.965) | 0.006 | (0.152) | 0.006 | (0.152) | 0.070 X 0.112 | (1.78 X 2.84) | 11 | (16.4) |

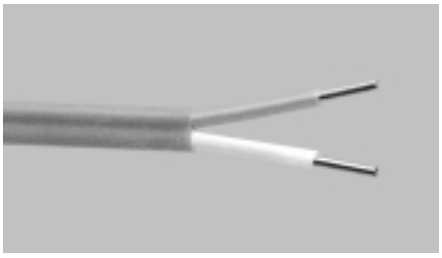
* FEP laminate melts at approximately 500°F (260°C). Polyimide tape film may be either Kapton® from E.I. du Pont de Nemours & Company, or Apical® from Allied.

** "S" denotes stranded wire: e.g., "24 S (7/32)" is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

# SERV-RITE
# Wire and Cable

## Tefzel® Insulated Thermocouple and Extension Wire

### Series 514



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 300˚F (150˚C) | Excellent | Excellent | Excellent |

The Series 514 for applications requiring a higher cut-through resistance than is typically available with the other fluoroplastics. The Tefzel® insulation retains the chemical resistance associated with fluoroplastics but has enhanced physical properties. Its temperature rating, while not as high as the other fluoroplastics, is far higher than nylon or PVC.

The construction consists of bare conductors insulated with a color coded layer of extruded Tefzel®. The insulated conductors are then laid parallel and covered with another layer of Tefzel®.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| | | | / | / 5 | 1 | 4 |

**1. ASTM E 230 Calibrations**

| | | | |
|---|---|---|---|
| B | E | K | S |
| C | J | N | T |

**2-3. B & S Gauge**

| | | |
|---|---|---|
| 24 | 20 | 16 |
| 24 stranded (7/32) | 20 stranded (7/28) | 16 stranded (7/24) |

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

***Performance Capabilities***

- Continuous temperature rating: 300°F (150°C)
- Single reading: 390°F (200°C)

***Features and Benefits***

- **Extruded Tefzel® (ETFE) single conductor and duplex insulation** for excellent protection.
- **ASTM E 230 color code** for easy identification.
- **Excellent abrasion, moisture and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

***Applications***

- Petrochemical plants
- Power generating plants

### Wire Specifications

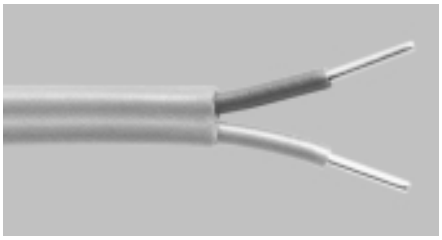
| B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|
| 24 | 0.020 | (0.508) | 0.010 | (0.254) | 0.010 | (0.254) | 0.060 X 0.100 | (1.52 X 2.54) | 9 | (13.4) |
| 24 S* (7/32) | 0.024 | (0.610) | 0.010 | (0.254) | 0.010 | (0.254) | 0.064 X 0.108 | (1.63 X 2.74) | 10 | (14.9) |
| 20 | 0.032 | (0.813) | 0.010 | (0.254) | 0.012 | (0.305) | 0.076 X 0.128 | (1.93 X 3.25) | 12 | (17.9) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.010 | (0.254) | 0.012 | (0.305) | 0.082 X 0.140 | (2.08 X 3.56) | 13 | (19.4) |
| 16 | 0.051 | (1.29) | 0.010 | (0.254) | 0.012 | (0.305) | 0.095 X 0.166 | (2.41 X 4.22) | 26 | (38.7) |
| 16 S* (7/24) | 0.060 | (1.52) | 0.010 | (0.254) | 0.012 | (0.305) | 0.104 X 0.184 | (2.64 X 4.67) | 28 | (41.7) |

* “S” denotes stranded wire: e.g., “24 S (7/32)” is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

# SERV-RITE Wire and Cable

## PFA Insulated Thermocouple and Extension Wire

### Series 516



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 500˚F (260˚C) | Excellent | Excellent | Good |

A relatively new fluoroplastic, PFA, is the insulation on Series 516. PFA's temperature rating is only slightly less than TFE. However, PFA can be applied using conventional extrusion techniques. This produces a smooth finish, as opposed to the spiral usually associated with TFE tape constructions. This is important in the food industry where taped constructions present cleaning problems. The smooth surface also allows this construction to be pulled through conduits and cut-outs more easily.

Once each conductor has been coated with a color coded PFA layer, they are laid parallel and again coated with PFA.

### Construction Combinations

1 2 3 4 5 6 7
/ / 5 1 6

**1. ASTM E 230 Calibrations**

B E K S
C J N T

**2-3. B & S Gauge**

| 36 | 30 | 24 | 20 | 16 |
|---|---|---|---|---|
| | | 24 stranded (7/32) | 20 stranded (7/28) | 16 stranded (7/24) |

**4. Conductor Type/Tolerance**

1 = Thermocouple grade, solid wire, standard tolerances
2 = Thermocouple grade, solid wire, special tolerances
3 = Thermocouple grade, stranded wire, standard tolerances
4 = Thermocouple grade, stranded wire, special tolerances
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

For improved abrasion resistance, the Series 516 can be supplied with a metallic braid or wrap.

For higher temperature applications, specify polyimide insulated wire constructions, Series 511, 512, or 513.

***Performance Capabilities***

- Continuous temperature rating: 500°F (260°C)
- Single reading: 550°F (290°C)

***Features and Benefits***

- **Extruded PFA single conductor and duplex insulation** for added protection.
- **ASTM E 230 color code** for easy identification.
- **Excellent, moisture and chemical resistance, good abrasion resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

***Applications***

- Food processing facilities
- Petrochemical plants

**Wire Specifications**

| B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|
| 36 | 0.005 | (0.127) | 0.003 | (0.076) | 0.003 | (0.076) | 0.017 X 0.028 | (0.432 X 0.711) | 2 | (3.0) |
| 30 | 0.010 | (0.254) | 0.003 | (0.076) | 0.003 | (0.076) | 0.022 X 0.038 | (0.559 X 0.965) | 3 | (4.5) |
| 24 | 0.020 | (0.508) | 0.008 | (0.203) | 0.010 | (0.254) | 0.056 X 0.092 | (1.42 X 2.34) | 8 | (11.9) |
| 24 S* (7/32) | 0.024 | (0.610) | 0.008 | (0.203) | 0.010 | (0.254) | 0.060 X 0.100 | (1.52 X 2.54) | 9 | (13.4) |
| 20 | 0.032 | (0.813) | 0.008 | (0.203) | 0.010 | (0.254) | 0.068 X 0.116 | (1.73 X 2.95) | 12 | (17.9) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.008 | (0.203) | 0.010 | (0.254) | 0.074 X 0.128 | (1.88 X 3.25) | 14 | (20.9) |
| 16 | 0.051 | (1.29) | 0.010 | (0.254) | 0.012 | (0.305) | 0.095 X 0.166 | (2.41 X 4.22) | 27 | (40.2) |
| 16 S* (7/24) | 0.060 | (1.52) | 0.010 | (0.254) | 0.012 | (0.305) | 0.104 X 0.184 | (2.64 X 4.67) | 29 | (43.2) |

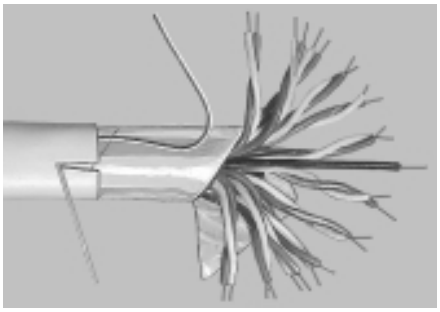
* "S" denotes stranded wire: e.g., "24 S (7/32)" is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

SERV-RITE
Wire and Cable

**PYROSALES P/N**
CA-PS22820SC - K20/5/902
CA-PS42820SC - K20/5/904

# PVC Insulated Multi-Pair Extension Wire with Overall Shield

## Series 900



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 220˚F (105˚C) | Excellent | Good | Good |

Series 900 is the classification for our family of overall shielded multipair cables. Series 900 is also available in UL® listings for PLTC (Power Limited Tray Cable) applications.

Series 900 cable starts by insulating conductors with 220°F (105°C) PVC. For identification, one conductor of each pair is numbered and twisted with its counterpart. These “twisted pairs” are cabled with an additional insulated copper wire for communication use. The entire cable is wrapped with clear polyester tape to minimize the chance of short circuits to the cable’s shield. An aluminized polyester tape shield is then spirally applied. A copper drain wire and heavy ripcord are longitudinally applied under the final jacket of color coded PVC.

For higher temperatures, contact our factory. Multipair constructions, using FEP, Tefzel®, polyimide and fiberglass can be made to meet specific requirements in quantities of not less than 1000 feet (305 m). Specifications should accompany any request for quotation.

## Construction Combinations

1 2 3 4 5 6 7
/ / 9

**1. ASTM E 230 Calibrations**
E K T
J S

**2-3. B & S Gauge**
24 20 18 16

**4. Conductor Type/Tolerance**
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

**5. Series 900**

**6-7. Pair Counts**
02 04 06 08 10 12 16 20 24

### *Performance Capabilities*

- Continuous temperature rating: 220°F (105°C)

### *Features and Benefits*

- **Extruded PVC single conductor and overall insulation.**
- **Available in UL® PLTC.**
- **Aluminum/polyester shield with drain wire** provides “noise” protection.
- **ASTM E 230 color code.**
- **Excellent moisture resistance, good abrasion and chemical resistance.**

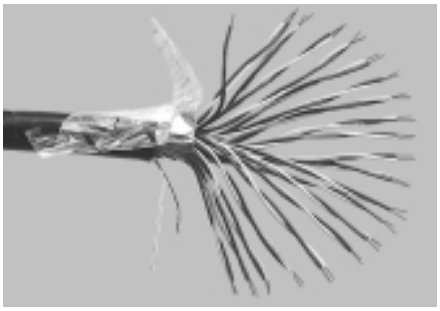
### Wire Specifications

| No. of Pairs | B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness | | | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Conductor | | Overall | | | | | |
| | | inches | (mm) | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 2 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.290 | (7.37) | 72 | (107.3) |
| 4 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.350 | (8.89) | 94 | (140.1) |
| 6 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.405 | (10.29) | 116 | (172.8) |
| 8 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.440 | (11.18) | 140 | (208.6) |
| 10 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.490 | (12.45) | 164 | (244.4) |
| 12 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.060 | (1.52) | 0.535 | (13.59) | 188 | (280.1) |
| 16 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.060 | (1.52) | 0.610 | (15.49) | 240 | (357.6) |
| 20 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.060 | (1.52) | 0.650 | (16.51) | 292 | (435.1) |
| 24 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.060 | (1.52) | 0.710 | (18.03) | 344 | (512.6) |

# SERV-RITE Wire and Cable

## PVC Insulated Multi-Pair Extension Wire with Individual and Overall Shield

### Series 1000



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 220˚F (105˚C) | Excellent | Good | Good |

Series 1000 is the classification for our extensive family of individually shielded and isolated multipair cables. Series 1000 is also available in UL® listings for PLTC (Power Limited Tray Cable) applications. Series 1000 cables are manufactured the same as Series 900 cables except each pair is spirally wrapped with an aluminized polyester tape and a drain wire. This isolates each pair of conductors in the cable. This eliminates both internal and external "noise" that can exist in a circuit.

### Construction Combinations

1 2 3 4 5 6 7 8
/ / 1 0

**1. ASTM E 230 Calibrations**
E J K S T

**2-3. B & S Gauge**
24 20 18 16

**4. Conductor Type/Tolerance**
5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

**5-6. Series 1000**

**7-8. Pair Counts**
02 04 06 08 10 12 16 20 24

These individual pairs are then cabled together and finished the same way as the Series 900 cables. These cables are ideal for computerized data communications.

For higher temperature versions of Series 1000, please contact our factory. Special multipair constructions, using FEP, Tefzel®, polyimide and fiberglass can be manufactured to meet specific requirements or specifications in quantities of not less than 1000 feet (305 m). Specifications should accompany any request for quotation.

***Performance Capabilities***

- Continuous temperature rating: 220°F (105°C)

***Features and Benefits***

- **Extruded PVC single conductor and overall insulation** for excellent protection.
- **Available as UL® listed PLTC wire and cable.**
- **Aluminum/polyester shield with drain wire** provides "noise" protection.
- **ASTM E 230 color code** for easy identification.
- **Excellent moisture resistance, good abrasion and chemical resistance.**

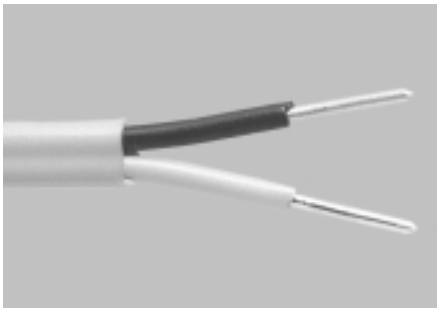
### Wire Specifications

| No. of Pairs | B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness | | | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Conductor | | Overall | | | | | |
| | | inches | (mm) | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 2 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.305 | (7.75) | 77 | (114.7) |
| 4 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.385 | (9.78) | 104 | (155.0) |
| 6 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.445 | (11.30) | 131 | (195.2) |
| 8 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.490 | (12.45) | 160 | (238.4) |
| 10 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.52) | 0.560 | (14.22) | 189 | (281.6) |
| 12 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.52) | 0.610 | (15.49) | 218 | (324.8) |
| 16 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.52) | 0.640 | (16.26) | 280 | (417.2) |
| 20 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.52) | 0.710 | (18.03) | 342 | (509.6) |
| 24 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.52) | 0.805 | (20.45) | 404 | (602.0) |

# SERV-RITE Wire and Cable

## PVC Insulated 300V UL® Listed PLTC Extension Wire

### UL® Series 502



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 220˚F (105˚C) | Excellent | Good | Good |

UL® Series 502 is an economical wire available in UL® listings for PLTC (Power Limited Tray Cable) applications.

The primary and duplex insulation is PVC. It yields a construction that's inexpensive while performing continuously at temperatures to 220°F (105°C).

UL® Series 502 is often used in conduit and wiring trays where its flexibility allows for easy installation. The UL® Series 502 can be easily stripped using hand tools or mechanical methods.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| | | | / | / 5 | 0 | 2 | / U | L |

**1. ASTM E 230 Calibrations**

| | |
|---|---|
| E | N |
| J | S |
| K | T |

**2-3. B & S Gauge**

| | | |
|---|---|---|
| 20 | 18 | 16 |
| 20 stranded (7/28) | 18 stranded (7/28) | 16 stranded (7/24) |

**4. Conductor Type/Tolerance**

5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

### *Performance Capabilities*

- Continuous temperature rating: 220°F (105°C)

### *Features and Benefits*

- **UL® listed Type PLTC—300 volt.**
- **Listed under UL® Subject 13, File Number E116321.**
- **Extruded PVC single conductor and duplex insulation** for excellent moisture resistance.
- **Passes IEEE 383 70,000 BTU/hour flame test.**
- **Passes VW-1 flame test.**
- **Non-propagating.**
- **UV light resistant.**
- **ASTM E 230 color code** for easy identification.
- **Excellent moisture resistance, good abrasion and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

### *Applications*

- Laboratories
- Industrial equipment
- Hydrocarbon processing plants
- Automotive

### Wire Specifications

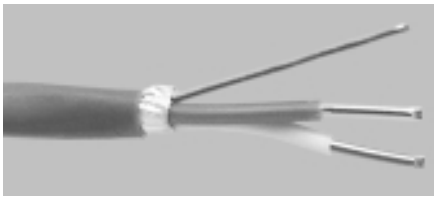
| B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness | | | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Conductor | | Overall | | | | | |
| | inches | (mm) | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.035 | (0.889) | 0.132 X 0.194 | (3.35 X 4.93) | 23 | (34.3) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.015 | (0.381) | 0.035 | (0.889) | 0.138 X 0.206 | (3.50 X 5.23) | 25 | (37.3) |
| 18 | 0.040 | (1.02) | 0.020 | (0.508) | 0.035 | (0.889) | 0.158 X 0.230 | (3.81 X 5.48) | 31 | (46.2) |
| 18 S* (7/26) | 0.048 | (1.22) | 0.020 | (0.508) | 0.035 | (0.889) | 0.158 X 0.246 | (4.01 X 6.25) | 32 | (47.7) |
| 16 | 0.051 | (1.29) | 0.020 | (0.508) | 0.035 | (0.889) | 0.161 X 0.252 | (4.09 X 6.40) | 38 | (56.6) |
| 16 S* (7/24) | 0.060 | (1.52) | 0.020 | (0.508) | 0.035 | (0.889) | 0.170 X 0.270 | (4.32 X 6.86) | 40 | (59.6) |

* "S" denotes stranded wire: e.g., "20 S (7/28)" is seven strands of 28 gauge wire to make a 20 gauge stranded conductor.

# SERV-RITE Wire and Cable

## FEP Insulated with Shield and Drain 300V UL® Listed PLTC Extension Cable

### UL® Series 509



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 400˚F (204˚C) | Excellent | Excellent | Excellent |

The Series 509 UL® is one of a family of constructions developed especially for use with microprocessor based systems. Series 509 UL® has UL® listings for PLTC (Power Limited Tray Cable) applications.

The conductors are first insulated with color coded FEP. The conductors are then twisted with a copper drain wire. An aluminized polyester tape is wrapped around the two conductors and drain wire. Finally, an FEP layer is applied over the taped conductors.

The finished construction can withstand temperatures in excess of 400°F (204°C). The twisted conductors minimizes electromagnetic interference and the taped shield eliminates most problems associated with AC "noise" in the sensing circuit.

When better abrasion resistance is required, specify an overall metallic braid.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| | | | / | / 5 | 0 | 9 | / U | L |

**1. ASTM E 230 Calibrations**

| | |
|---|---|
| E | N |
| J | S |
| K | T |

**2-3. B & S Gauge**

| | |
|---|---|
| 20 | 16 |
| 20 stranded (7/28) | 16 stranded (7/24) |

**4. Conductor Type/Tolerance**

5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

### *Performance Capabilities*

- Continuous temperature rating: 400°F (204°C)
- Single reading: 500°F (260°C)

### *Features and Benefits*

- **Extruded FEP single conductor insulation** for excellent protection.
- **Twisted; extruded FEP overall duplex insulation** to minimize electrical interference.
- **UL® listed Type PLTC—300 volt.**
- **Listed under UL® Subject 13, File Number E116321.**
- **Passes IEEE 383 70,000 BTU/hour flame test.**
- **Passes VW-1 flame test.**
- **Non-propagating.**
- **UV light resistant.**
- **Aluminum/polyester shield with drain wire** reduces electrical noise.
- **ASTM E 230 color code** for easy identification.
- **Excellent abrasion, moisture and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

### *Applications*

- Aerospace
- Industrial equipment
- Glass manufacture
- Chemical plants

### Wire Specifications

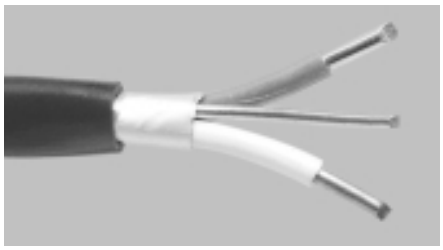
| B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 0.032 | (0.813) | 0.008 | (0.203) | 0.018 | (0.457) | 0.142 | (3.61) | 22 | (32.8) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.008 | (0.203) | 0.018 | (0.457) | 0.158 | (3.91) | 24 | (35.8) |
| 16 | 0.051 | (1.29) | 0.008 | (0.203) | 0.018 | (0.457) | 0.180 | (4.57) | 38 | (56.6) |
| 16 S* (7/24) | 0.060 | (1.52) | 0.008 | (0.203) | 0.018 | (0.457) | 0.198 | (5.03) | 41 | (61.1) |

* "S" denotes stranded wire: e.g., "20 S (7/28)" is seven strands of 28 gauge wire to make a 20 gauge stranded conductor.

# SERV-RITE Wire and Cable

## PVC Insulated and Shielded 300V UL® Listed PLTC Extension Cable

### UL® Series 510



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 220˚F (105˚C) | Excellent | Good | Good |

The UL® Series 510 is UL® listed for PLTC (Power Limited Tray Cable) applications. It's an economical PVC insulated, twisted and shielded construction for microprocessor based systems and others that are sensitive to induced voltages and "noise."

The conductors are first insulated with color coded PVC. The next operation consists of twisting the two insulated conductors with a copper drain wire. An aluminized polyester tape is then wrapped around the wires to impart 100 percent shielding. Lastly, another layer of PVC is applied.

The twisting eliminates most electromagnetic interference while the shield tape minimizes AC "noise" interference.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| | | | / | / 5 | 1 | 0 | / U | L |

**1. ASTM E 230 Calibrations**

| | |
|---|---|
| E | N |
| J | S |
| K | T |

**2-3. B & S Gauge**

| | | |
|---|---|---|
| 20 | 18 | 16 |
| 20 stranded (7/28) | 18 stranded (7/28) | 16 stranded (7/24) |

**4. Conductor Type/Tolerance**

5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

For improved abrasion resistance consider a metallic overbraid.

***Performance Capabilities***

- Continuous temperature rating: 220°F (105°C)

***Features and Benefits***

- **UL® listed Type PLTC—300 volt.**
- **Listed under UL® Subject 13, File Number E116321.**
- **Extruded PVC single conductor insulation** for excellent protection.
- **Twisted; extruded PVC overall duplex insulation** to minimize electrical interference.
- **Passes IEEE 383 70,000 BTU/hour flame test.**
- **Passes VW-1 flame test.**
- **Non-propagating.**
- **UV light resistant.**
- **Aluminum/polyester shield with drain wire** reduces electrical noise.
- **ASTM E 230 color code** for easy identification.
- **Excellent moisture resistance, good abrasion and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

***Applications***

- Industrial equipment
- Automotive
- Laboratories
- Hydrocarbon processing plants

### Wire Specifications

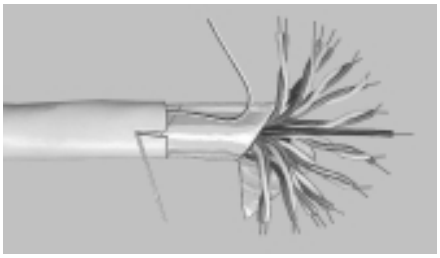
| B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness | | | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Conductor | | Overall | | | | | |
| | inches | (mm) | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.035 | (0.889) | 0.198 | (5.03) | 27 | (40.2) |
| 20 S* (7/28) | 0.038 | (0.965) | 0.015 | (0.381) | 0.035 | (0.889) | 0.210 | (5.33) | 29 | (43.2) |
| 18 | 0.040 | (1.02) | 0.020 | (0.508) | 0.035 | (0.889) | 0.234 | (5.94) | 35 | (52.2) |
| 18 S* (7/26) | 0.048 | (1.22) | 0.020 | (0.508) | 0.035 | (0.889) | 0.250 | (6.35) | 37 | (55.1) |
| 16 | 0.051 | (1.29) | 0.020 | (0.508) | 0.035 | (0.889) | 0.256 | (6.50) | 48 | (71.5) |
| 16 S* (7/24) | 0.060 | (1.52) | 0.020 | (0.508) | 0.035 | (0.889) | 0.274 | (6.96) | 51 | (76.0) |

* "S" denotes stranded wire: e.g., "20 S (7/28)" is seven strands of 28 gauge wire to make a 20 gauge stranded conductor.

# SERV-RITE Wire and Cable

## PVC Insulated Multi-Pair 300V UL® Listed PLTC Extension Cable

### UL® Series 900



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 220˚F (105˚C) | Excellent | Good | Good |

UL® Series 900 is our family of multi-pair cables* for UL® PLTC applications. Standard UL® Series 900 cables of different pair counts in most calibrations can be shipped quickly.

UL® Series 900 cable starts by insulating conductors with 220°F (105°C) PVC. For identification, one conductor of each pair is numbered and twisted with its counterpart. These “twisted pairs” are cabled with an additional insulated copper wire for communication use. The entire cable is wrapped with clear polyester tape to minimize the chance of short circuits to the cable’s shield. An aluminized polyester tape shield is then spirally applied. A copper drain wire and heavy ripcord are longitudinally applied under the final jacket of color coded PVC.

For higher temperatures, UL® Series 900 can be made with FEP insulation. Multipair constructions are also available to meet specific requirements in quantities of not less than 1000 feet (305 m). Specifications should accompany any request for quotation.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| | | | / | / 9 | | | /U | L |

**1. ASTM E 230 Calibrations**

E N
J S
K T

**2-3. B & S Gauge**

24 20 18 16

**4. Conductor Type/Tolerance**

5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

**5. Series 900**

**6-7. Pair Counts**

02 04 06 08 10 12 16 20 24

### *Performance Capabilities*

- Continuous temperature rating: 220°F (105°C)

### *Features and Benefits*

- **UL® listed Type PLTC—300 volt.**
- **Listed under UL® Subject 13.**
- **Extruded PVC single conductor and overall insulation.**
- **Passes IEEE 383 70,000 BTU/hour flame test.**
- **Passes VW-1 flame test.**
- **Non-propagating.**
- **UV light resistant.**
- **Aluminum/polyester shield with drain wire.**
- **ASTM E 230 color code.**
- **Excellent moisture resistance, good abrasion and chemical resistance.**

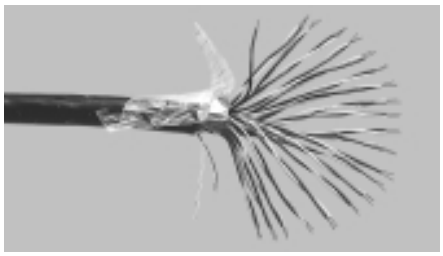
### Wire Specifications

| No. of Pairs | B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.290 | (7.37) | 72 | (107.3) |
| 4 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.350 | (8.89) | 94 | (140.1) |
| 6 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.405 | (10.29) | 116 | (172.8) |
| 8 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.440 | (11.18) | 140 | (208.6) |
| 10 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.490 | (12.45) | 164 | (244.4) |
| 12 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.060 | (1.52) | 0.535 | (13.59) | 188 | (280.1) |
| 16 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.060 | (1.52) | 0.610 | (15.49) | 240 | (357.6) |
| 20 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.060 | (1.52) | 0.650 | (16.51) | 292 | (435.1) |
| 24 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.060 | (1.52) | 0.710 | (18.03) | 344 | (512.6) |

# SERV-RITE Wire and Cable

## PVC Insulated Multi-Pair 300V UL® Listed PLTC Extension Cable with Individual and Overall Shield

### UL® Series 1000



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 220˚F (105˚C) | Excellent | Good | Good |

UL® Series 1000 is our family of individually shielded and isolated multipair cables* for UL® PLTC applications. UL® Series 1000 cables are made by insulating conductors with 220°F (105°C) PVC. For identification, one conductor of each pair is numbered and twisted with its counterpart. The pairs are then spirally wrapped with an aluminized polyester tape and drain wire to isolate them in the cable. This eliminates "noise" that can exist in a circuit.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| | | | / | /1 | 0 | | | /U | L |

**1. ASTM E 230 Calibrations**

| | |
|---|---|
| E | N |
| J | S |
| K | T |

**2-3. B & S Gauge**

24 20 18 16

**4. Conductor Type/Tolerance**

5 = Extension grade, solid wire, standard tolerance
6 = Extension grade, solid wire, special tolerance
7 = Extension grade, stranded wire, standard tolerance
8 = Extension grade, stranded wire, special tolerance

**5-6. Series 1000**

**7-8. Pair Counts**

02 04 06 08 10 12 16 20 24

Individual pairs are then cabled with an additional insulated copper wire for communication use. These cables are ideal for data signals.

For higher temperature applications, UL® Series 1000 can be made with FEP insulation. Special multipair constructions are also available to meet specific requirements in quantities of not less than 1000 feet (305 m). Specifications should accompany any request for quotation.

***Performance Capabilities***

- Continuous temperature rating: 220°F (105°C)

***Features and Benefits***

- **UL® listed Type PLTC—300 volt.**
- **Listed under UL® Subject 13.**
- **Extruded PVC single conductor and overall insulation.**
- **Passes IEEE 383 70,000 BTU/hour flame test.**
- **Passes VW-1 flame test.**
- **Non-propagating.**
- **UV light resistant.**
- **Aluminum/polyester shield with drain wire.**
- **ASTM E 230 color code.**
- **Excellent moisture resistance, good abrasion and chemical resistance.**

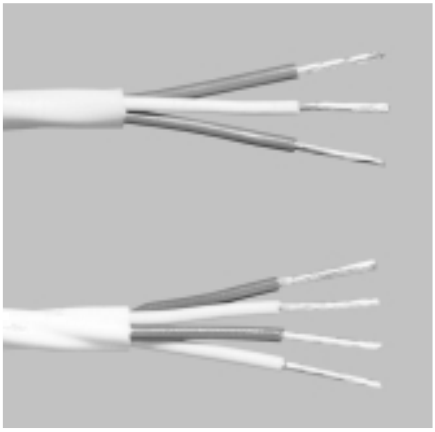
### Wire Specifications

| No. of Pairs | B & S Gauge | Nominal Conductor Size | | Nominal Insulation Thickness | | | | Nominal Overall Size | | Approximate Shipping Weight | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Conductor | | Overall | | | | | |
| | | inches | (mm) | inches | (mm) | inches | (mm) | inches | (mm) | lbs/1000 ft | (kg/km) |
| 2 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.305 | (7.75) | 77 | (114.7) |
| 4 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.385 | (9.78) | 104 | (155.0) |
| 6 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.445 | (11.30) | 131 | (195.2) |
| 8 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.050 | (1.27) | 0.490 | (12.45) | 160 | (238.4) |
| 10 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.060 | (1.52) | 0.560 | (14.22) | 189 | (281.6) |
| 12 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.060 | (1.52) | 0.610 | (15.49) | 218 | (324.8) |
| 16 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.060 | (1.52) | 0.640 | (16.26) | 280 | (417.2) |
| 20 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.060 | (1.52) | 0.710 | (18.03) | 342 | (509.6) |
| 24 | 20 | 0.032 | (0.813) | 0.015 | (0.381) | 0.060 | (1.52) | 0.805 | (20.45) | 404 | (602.0) |

# SERV-RITE Wire and Cable

## PVC Insulated RTD Leadwire

### Series 701



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 220˚F (105˚C) | Excellent | Good | Good |

Watlow Gordon's quality, experience and versatility carry over from insulated thermocouple and extension wire to RTD leadwire. Series 701 is offered in three- and four-wire constructions, and available from stock to cover many industrial RTD applications.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| R | T | / | | | / | /7 | 0 | 1 |

**3. Number of Conductors**
2 3 4

**4-5. B & S Gauge**
24 22 20
18 16

**6. Conductor Type/Tolerance**
4 = Stranded tinned copper

Each conductor is insulated and color coded with extruded PVC insulation. The conductors are then twisted for added flexibility and covered with an overall PVC insulation.

***Performance Capabilities***

- Continuous temperature rating: 220°F (105°C)

***Features and Benefits***

- **Extruded PVC single conductor and overall insulation** for protection.
- **Twisted conductors for reduced electrical interference.**
- **Color coded conductors** for easy installation.
- **Excellent moisture resistance, good abrasion and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

### Wire Specifications

| Number of Conductors | B & S Gauge* | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 22 S** (7/30) | 0.030 | (0.762) | 0.015 | (0.381) | 0.020 | (0.508) | 0.160 | (4.06) | 17 | (25.3) |
| 2 | 20 S** (7/28) | 0.038 | (0.965) | 0.015 | (0.381) | 0.020 | (0.508) | 0.176 | (4.47) | 19 | (28.3) |
| 2 | 18 S** (7/26) | 0.048 | (1.22) | 0.020 | (0.508) | 0.025 | (0.635) | 0.226 | (5.74) | 22 | (32.8) |
| 3 | 22 S** (7/30) | 0.030 | (0.762) | 0.015 | (0.381) | 0.020 | (0.508) | 0.172 | (4.37) | 20 | (29.8) |
| 3 | 20 S** (7/28) | 0.038 | (0.965) | 0.015 | (0.381) | 0.020 | (0.508) | 0.190 | (4.83) | 25 | (37.3) |
| 3 | 18 S** (7/26) | 0.048 | (1.22) | 0.020 | (0.508) | 0.025 | (0.635) | 0.244 | (6.20) | 30 | (44.7) |
| 4 | 22 S** (7/30) | 0.030 | (0.762) | 0.015 | (0.381) | 0.020 | (0.508) | 0.184 | (4.67) | 23 | (34.3) |
| 4 | 20 S** (7/28) | 0.038 | (0.965) | 0.015 | (0.381) | 0.020 | (0.508) | 0.204 | (5.18) | 30 | (44.7) |
| 4 | 18 S** (7/26) | 0.048 | (1.22) | 0.020 | (0.508) | 0.025 | (0.635) | 0.262 | (6.65) | 37 | (55.1) |

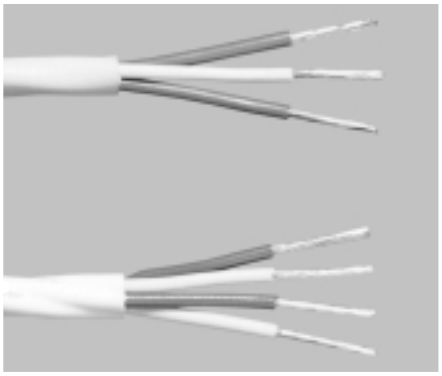
* 24 and 16 gauge constructions also available, consult factory for details.

** "S" denotes stranded wire: e.g., "22 S (7/30)" is seven strands of 30 gauge wire to make a 22 gauge stranded conductor.

# SERV-RITE Wire and Cable

## FEP Insulated RTD Leadwire

### Series 704



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 400˚F (204˚C) | Excellent | Excellent | Excellent |

Watlow Gordon's quality, experience and versatility carry over from insulated thermocouple and extension wire to RTD leadwire. Series 704 is offered in two-, three- and four-wire constructions, and available from stock to cover many industrial RTD applications.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| R | T | | / | | / | /7 | 0 | 4 |

**3. Number of Conductors**
2 3 4

**4-5. B & S Gauge**
24 22 20

**6. Conductor Type/Tolerance**
6 = Stranded silver plated copper
8 = Stranded nickel plated copper

Each conductor is insulated and color coded with extruded FEP insulation. The conductors are then twisted for added flexibility and covered with an overall FEP insulation.

***Performance Capabilities***

- Continuous temperature rating: 400°F (204°C)
- Single reading: 500°F (260°C)

***Features and Benefits***

- **Extruded FEP single conductor and overall insulation** for protection.
- **Twisted conductors for reduced electrical interference.**
- **Color coded conductors** for easy installation.
- **Excellent moisture, abrasion and chemical resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.
- **Custom constructions available, consult factory.**

### Wire Specifications

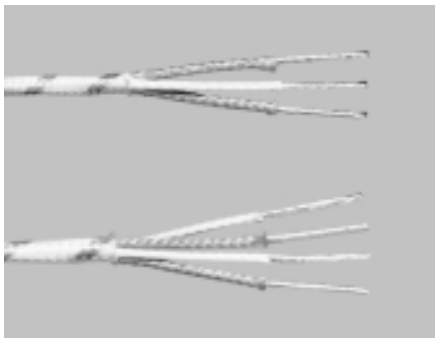
| Number of Conductors | B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Nominal Insulation Thickness Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 24 S* (7/32) | 0.024 | (0.610) | 0.008 | (0.203) | 0.012 | (0.305) | 0.118 | (3.00) | 12 | (17.9) |
| 2 | 22 S* (7/30) | 0.030 | (0.762) | 0.008 | (0.203) | 0.012 | (0.305) | 0.130 | (3.30) | 14 | (20.9) |
| 2 | 20 S* (7/28) | 0.038 | (0.965) | 0.008 | (0.203) | 0.012 | (0.305) | 0.146 | (3.71) | 17 | (25.3) |
| 3 | 24 S* (7/32) | 0.024 | (0.610) | 0.008 | (0.203) | 0.012 | (0.305) | 0.126 | (3.20) | 16 | (23.8) |
| 3 | 22 S* (7/30) | 0.030 | (0.762) | 0.008 | (0.203) | 0.012 | (0.305) | 0.140 | (3.56) | 20 | (29.8) |
| 3 | 20 S* (7/28) | 0.038 | (0.965) | 0.008 | (0.203) | 0.012 | (0.305) | 0.158 | (4.01) | 24 | (35.8) |
| 4 | 24 S* (7/32) | 0.024 | (0.610) | 0.008 | (0.203) | 0.012 | (0.305) | 0.136 | (3.46) | 19 | (28.3) |
| 4 | 22 S* (7/30) | 0.030 | (0.762) | 0.008 | (0.203) | 0.012 | (0.305) | 0.150 | (3.81) | 23 | (34.3) |
| 4 | 20 S* (7/28) | 0.038 | (0.965) | 0.008 | (0.203) | 0.012 | (0.305) | 0.170 | (4.32) | 27 | (40.2) |

* "S" denotes stranded wire: e.g., "24 S (7/32)" is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

# SERV-RITE Wire and Cable

## Fiberglass Braided RTD Leadwire

### Series 705



| Temp. | Resistance Properties | | |
|---|---|---|---|
| | Moisture | Chemical | Abrasion |
| 900˚F (480˚C) | Good | Good | Fair |

Watlow Gordon's quality, experience and versatility carry over from insulated thermocouple and extension wire to RTD leadwire. Series 705 is offered in three- and four-wire constructions, and available from stock to cover many industrial RTD applications.

### Construction Combinations

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|
| R | T | __ | / | __ | / | __ / | 7 | 0 | 5 |

**3. Number of Conductors**
2 3 4

**4-5. B & S Gauge**
24 22 20

**6. Conductor Type/Tolerance**
6 = Stranded silver plated copper
8 = Stranded nickel plated copper

Each conductor is covered with a color coded fiberglass braid insulation that's impregnated with a modified resin. The conductors are then twisted for added flexibility and covered with a fiberglass braid impregnated with a modified resin.

***Performance Capabilities***

- Continuous temperature rating: 900°F (480°C)
- Single reading: 1000°F (540°C)

***Features and Benefits***

- **Fiberglass braid single conductor and overall insulation** impregnated with modified resin for protection.
- **Twisted conductors** for reduced electrical interference.
- **Color coded conductors** for easy installation.
- **Good moisture and chemical resistance, fair abrasion resistance.**
- **Additional abrasion resistance** with optional stainless steel and tinned copper wire overbraids.

### Wire Specifications

| Number of Conductors | B & S Gauge | Nominal Conductor Size inches | (mm) | Nominal Insulation Thickness Conductor inches | (mm) | Overall inches | (mm) | Nominal Overall Size inches | (mm) | Approximate Shipping Weight lbs/1000 ft | (kg/km) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | 24 S* (7/32) | 0.024 | (0.610) | 0.005 | (0.127) | 0.006 | (0.152) | 0.080 | (2.03) | 6 | (8.9) |
| 2 | 22 S* (7/30) | 0.030 | (0.762) | 0.005 | (0.127) | 0.006 | (0.152) | 0.092 | (2.34) | 7 | (10.4) |
| 2 | 20 S* (7/28) | 0.038 | (0.965) | 0.006 | (0.152) | 0.006 | (0.152) | 0.112 | (2.84) | 9 | (13.4) |
| 3 | 24 S* (7/32) | 0.024 | (0.610) | 0.005 | (0.127) | 0.006 | (0.152) | 0.086 | (2.18) | 8 | (11.9) |
| 3 | 22 S* (7/30) | 0.030 | (0.762) | 0.005 | (0.127) | 0.006 | (0.152) | 0.098 | (2.49) | 9 | (13.4) |
| 3 | 20 S* (7/28) | 0.038 | (0.965) | 0.006 | (0.152) | 0.006 | (0.152) | 0.120 | (3.05) | 12 | (17.9) |
| 4 | 24 S* (7/32) | 0.024 | (0.610) | 0.005 | (0.127) | 0.006 | (0.152) | 0.092 | (2.34) | 10 | (14.9) |
| 4 | 22 S* (7/30) | 0.030 | (0.762) | 0.005 | (0.127) | 0.006 | (0.152) | 0.106 | (2.69) | 12 | (17.9) |
| 4 | 20 S* (7/28) | 0.038 | (0.965) | 0.006 | (0.152) | 0.006 | (0.152) | 0.130 | (3.30) | 16 | (23.8) |

* "S" denotes stranded wire: e.g., "24 S (7/32)" is seven strands of 32 gauge wire to make a 24 gauge stranded conductor.

# Accessories

## Connector Systems

Many varieties of thermocouple connectors and jack panels are available from Watlow. Whether you're looking for high impact strength, fast installation, or high temperature capabilities, you'll find the right connector system for your application at Watlow.

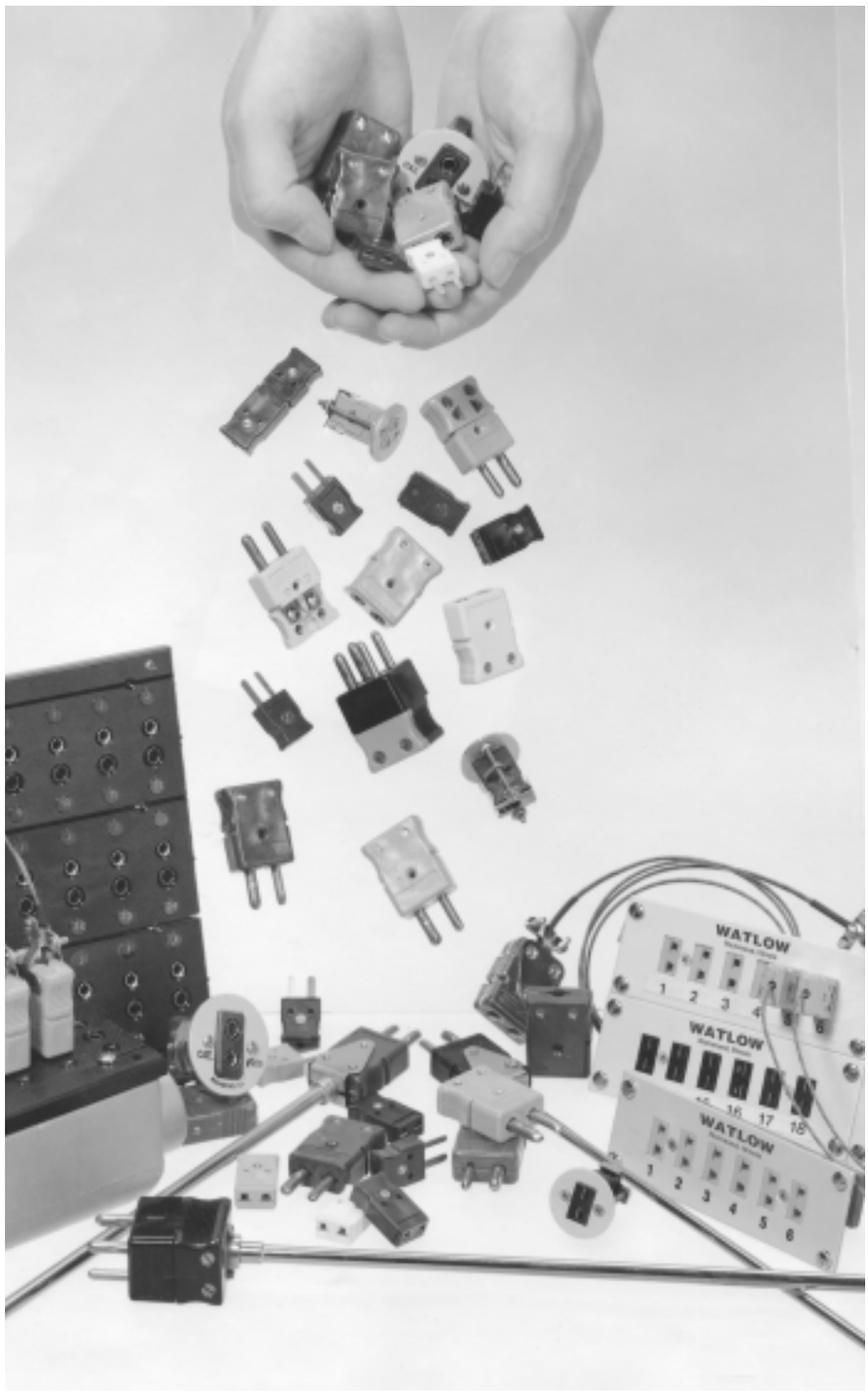
Listed below are the various connectors and systems from which to choose:

- Standard thermocouple connectors
- Quick-attach thermocouple connectors
- High temperature connectors
- Three-pole connectors for RTD applications
- Dual thermocouple connectors
- Miniature thermocouple connectors
- Jack panels: multi-circuit, multi-circuit for FS box mounting, and miniature multiple jack panels

### Applications and Technical Data

To eliminate measuring errors, all Watlow connectors are made exclusively of matching metal alloys. If the connector material had different thermal EMF characteristics from the thermocouple or lead wire, a uniform temperature would have to be maintained across the connector. This is not always easily obtainable, nor is it practical.

If a temperature gradient did exist across the connector made of a third metal, unwanted EMFs generated between the thermoelectric materials and the extremities of the connectors would cause an error appearing at the thermocouple output. The larger the gradient the larger the error. In some cases and depending on the calibration, net errors may occur that are even larger than the gradient.



# Accessories

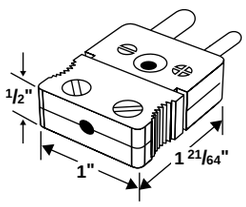
## Connector Systems

### Standard Thermocouple Connectors

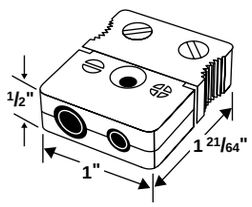
Lightweight, rugged, and accurate, the standard connectors also feature quick positive wiring hookup. The exclusive channel design isolates all wire for clean, strong signals.

***Additional Features and Benefits***

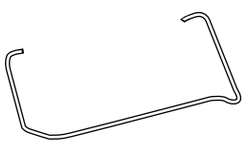
- **Matching thermocouple materials** throughout (except Types R/S, which are compensated).
- **Hollow pins** minimize weight.
- **Standard 7⁄16 inch** pin spacing.
- **Positive pin diameter** 5⁄32 inch, negative pin diameter 3⁄16 inch.
- **Glass-filled thermoplastic** provides high impact strength.
- **Fully visible connections.**
- **ASTM color coded** for easy identification.
- **Handles high temperature** thermocouple applications; 400°F (200°C) ambient temperature rating.
- **Molded-in** threaded inserts.
- **Captive cap screws** won't fall out.



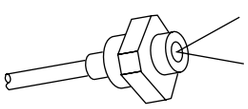

| Code Number | Description |
|---|---|
| **900** | Connector plug with Watlow name (specify calibration*) |
| **910**** | Connector plug without Watlow name** (specify calibration*) |




| Code Number | Description |
|---|---|
| **901** | Connector jack (specify calibration*) |
| **911**** | Connector jack without Watlow name** (specify calibration*) |



| Code Number | Description |
|---|---|
| **924** | Connector lock |



| Code Number | Description |
|---|---|
| **923-020** | Small XACTPAK® brazing adapter for plug or jack (0.020 inch sheath O.D.) |
| **923-032** | Small XACTPAK® brazing adapter for plug or jack (0.032 inch sheath O.D.) |
| **923-040** | Small XACTPAK® brazing adapter for plug or jack (0.040 inch sheath O.D.) |
| **923-063** | Small XACTPAK® brazing adapter for plug or jack (0.063 inch sheath O.D.) |
| **923-125** | Small XACTPAK® brazing adapter for plug or jack (0.125 inch sheath O.D.) |
| **923-188** | Small XACTPAK® brazing adapter for plug or jack (0.188 inch sheath O.D.) |

**Note:** Nominal dimensions of plug or jack 1 ⅜ X 1 X ½ inch

*Available in ASTM E 230 calibration Types J, K, T, R/S, E, Cu/Cu and N.

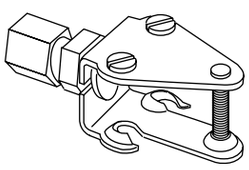
**Can be imprinted with customer's own logo (minimum order and tooling charge applies).

# Accessories

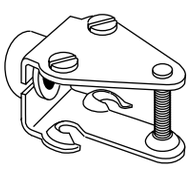
## Connector Systems

### Standard Thermocouple Connectors

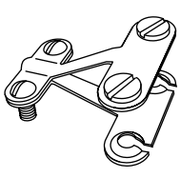
Continued



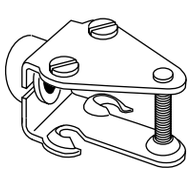
| Code Number | Description |
|---|---|
| **933-063** | Compression type adapter for plug or jack (0.063 inch sheath O.D.) |
| **933-125** | Compression type adapter for plug or jack (0.125 inch sheath O.D.) |
| **933-188** | Compression type adapter for plug or jack (0.188 inch sheath O.D.) |
| **933-250** | Compression type adapter for plug or jack (0.250 inch sheath O.D.) |
| **933-313** | Compression type adapter for plug or jack (0.313 inch sheath O.D.) |



| Code Number | Description |
|---|---|
| **934-125** | Large XACTPAK brazing adapter for plug or jack (0.125 inch sheath O.D.) |
| **934-188** | Large XACTPAK brazing adapter for plug or jack (0.188 inch sheath O.D.) |
| **934-250** | Large XACTPAK brazing adapter for plug or jack (0.250 inch sheath O.D.) |



| Code Number | Description |
|---|---|
| **921** | Cable clamp for plug or jack |



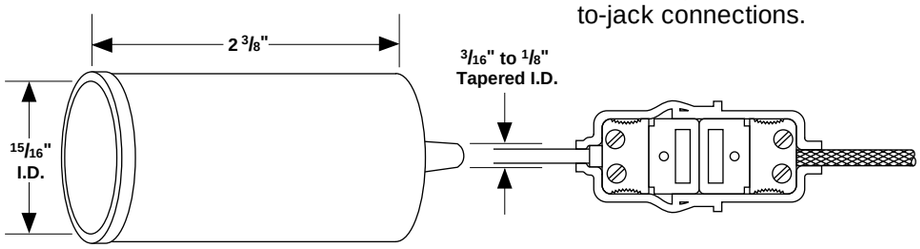
| Code Number | Description |
|---|---|
| **934-265** | Large brazing adapter for flexible stainless steel tubing (0.265 inch O.D.) |



***Weatherproof Boots***

**Code No. 943**

Used in pairs as illustrated, these flexible neoprene rubber boots add moisture protection to standard plug-to-jack connections.



# Accessories

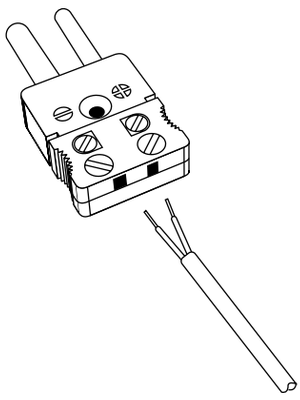
## Connector Systems

### Quick-Attach Thermocouple Connectors

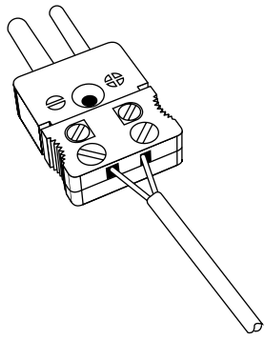
Watlow's time-saving thermocouple connectors are fast and convenient to use. No loose parts, no cap removal, no need to wrap wires around terminal screws. Simply insert stripped wire ends into plug or jack, tighten down two terminal screws, and you're finished. There is no need to remove Watlow cable clamp, either.

Accepts solid or stranded wires to 16 gauge. Available in J, K and T calibrations, ASTM E 230 color-coded. The connector is made of a high impact strength, 400°F (200°C) rated glass filled thermocouplastic with matching thermocouple materials throughout. Other features and specifications are identical to standard Watlow 900 Series quick-disconnect connectors.

**Step 1.**
**Simply insert stripped wires into connector.**



**Step 2.**
**Tighten down two terminal screws, and you're finished.**



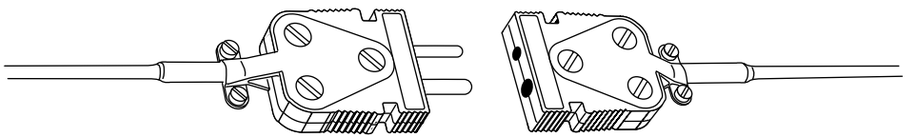
| Code Number | Description |
|---|---|
| **916** | Connector plug with Watlow name (specify J, K or T calibration) |
| **917** | Connector jack with Watlow name (specify J, K or T calibration) |
| **918** | Connector plug without Watlow name* (specify J, K or T calibration) |
| **919** | Connector jack without Watlow name* (specify J, K or T calibration) |

*Can be imprinted with customer's own logo (minimum order and tooling charge applies).

### High Temperature Connectors

The ASTM E 230 color-coded bodies of these high temperature ceramic connectors are practical for temperatures up to 1000°F (540°C). Colors are permanent and will not fade even after exposure to temperature. The positive-locking screw type terminals are captive for easy assembly. Solid plug pins and collet inserts are made of thermocouple alloys (except Types R/S which are compensated).

Calibration must be specified when ordering. Both plug and jack are marked for polarity. Standard 7⁄16 inch pin spacing.



| Code Number | Description |
|---|---|
| **912** | Ceramic plug (specify calibration J, K, R/S or E) |
| **913** | Ceramic jack (specify calibration J, K, R/S or E) |
| **925-125** | XACTPAK adapter for plug or jack (0.125 inch sheath O.D.) |
| **925-188** | XACTPAK adapter for plug or jack (0.188 inch sheath O.D.) |
| **925-250** | XACTPAK adapter for plug or jack (0.250 inch sheath O.D.) |
| **926** | Cable clamp for ceramic plug or jack |

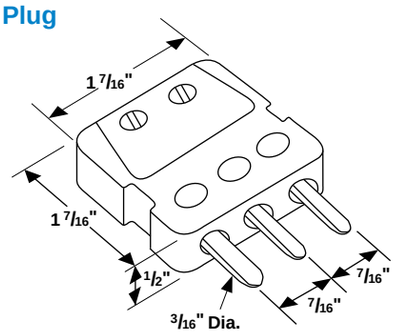
# Accessories

## Connector Systems

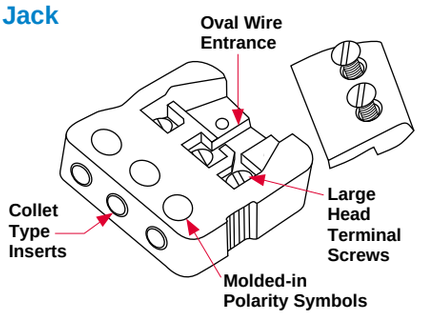
### Three-Pole Connectors for RTD Applications

- Three pins to accommodate most RTD sensor applications
- Rated to 400°F (200°C) continuous
- Jacks have spring-loaded inserts for positive contact
- Larger diameter negative pin prevents user from reversing polarity

**Plug**



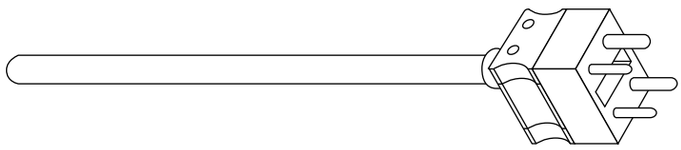

**Jack**




| Code Number | Description |
|---|---|
| **TH-335** | 3-pole connector plug with copper pins |
| **TH-336** | 3-pole connector jack with copper inserts |
| **TH-337-125** | Compression-type adapter for 0.125 inch tube |
| **TH-337-188** | Compression-type adapter for 0.188 inch tube |
| **TH-337-250** | Compression-type adapter for 0.250 inch tube |
| **80701201** | Cable clamp for 3-pole connector |

### Dual Thermocouple Connectors

- High impact molded plugs and jacks
- Mate with standard jack panels or two single connectors
- ASTM E 230 color-coded caps
- Matching thermocouple materials throughout (except Types R/S, which are compensated)
- Firm, positive connections—fast!
- Captive screws for efficient assembly
- Full line of hardware fittings
- Exclusive internal channel design isolates all conductors for clean, strong signals
- Ambient temperature rating 300°F (150°C)
- Standard 7/16 inch pin spacing with ¾ inch between circuits
- Positive pin diameter 5/32 inch, negative pin diameter 3/16 inch.



| Code Number | Description |
|---|---|
| **914** | Connector plug (specify calibration*) |
| **915** | Connector jack (specify calibration*) |
| **927-125** | Compression type adapter for plug or jack (0.125 inch sheath O.D.) |
| **927-188** | Compression type adapter for plug or jack (0.188 inch sheath O.D.) |
| **927-250** | Compression type adapter for plug or jack (0.250 inch sheath O.D.) |
| **928-063** | Brazing adapter for plug or jack (0.063 inch sheath O.D.) |
| **928-125** | Brazing adapter for plug or jack (0.125 inch sheath O.D.) |
| **928-188** | Brazing adapter for plug or jack (0.188 inch sheath O.D.) |
| **928-250** | Brazing adapter for plug or jack (0.250 inch sheath O.D.) |
| **928-265** | Adapter for Watlow's TH-195 stainless flex armor (0.265 inch sheath O.D.) |

*Available in ASTM E 230 calibration Types J, K, T, R/S, E, Cu/Cu and N.

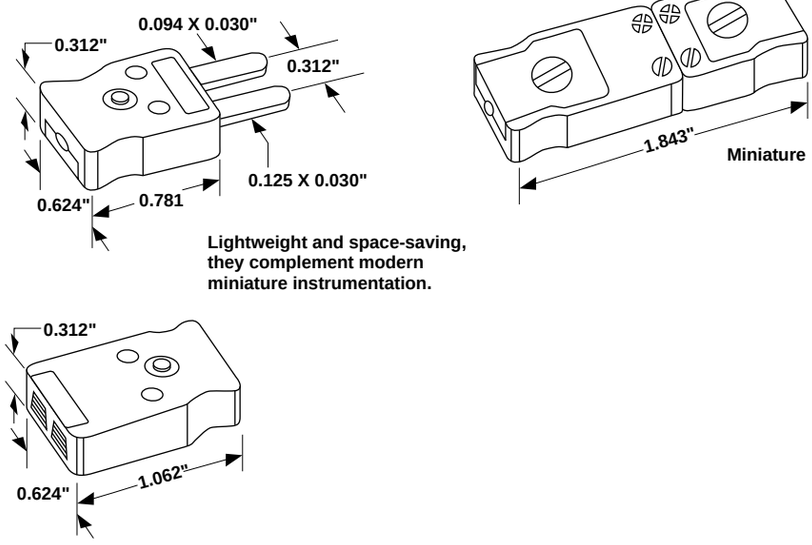
# Accessories

## Connector Systems

### Miniature Thermocouple Connector System

- Miniature design—mates with other miniature size thermocouple connectors
- Molded-in pin contacts assure precise alignment (no loose, wobbly parts)
- Rugged, high quality, high performance connectors
- Employ matching thermocouple alloy materials
- Available in all standard calibrations and copper-copper, ASTM E 230 color-coded
- Exclusive channel design isolates the wires for clean, strong signals.

### Miniature Connectors Compared with Standard Connectors

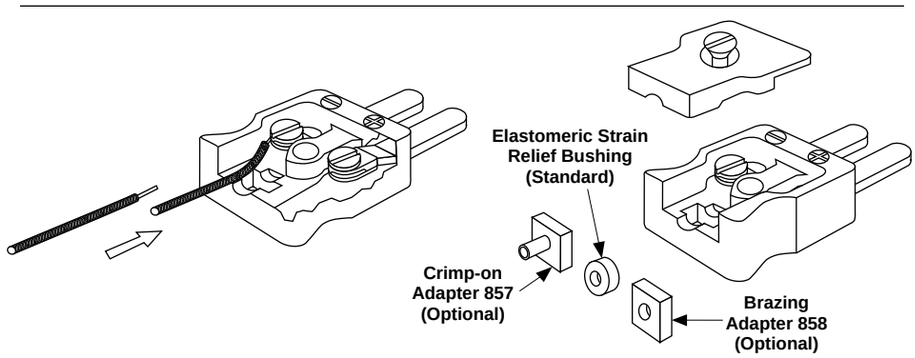



***Connection Method***

Simply insert the stripped ends of your thermocouple wire between contact base and washer, tighten down the two terminal screws and you're finished. There are no loose parts to contend with. Do not wrap conductors around the terminal screws.

Watlow miniature connectors can accommodate wire sizes up to 20 AWG, 20 ga. solid, 22 ga. stranded. The connector is made of high impact strength, 400°F (200°C) rated, glass-filled thermoplastic. To maintain the highest measurement accuracy, matching thermocouple alloy materials are employed throughout. The same fine features and high quality performance characteristics found in Watlow's standard connectors also apply with the miniature connectors.

To order, simply indicate the code number, calibration and specify the quantity. Elastomeric strain relief bushings are standard, but brazing and crimp-on accessories are also available as options.




| Code Number | Description |
|---|---|
| **850-Specify calibration letter** | Plug with Watlow name |
| **851-Specify calibration letter** | Jack with Watlow name |
| **852-Specify calibration letter** | Plug without Watlow name* |
| **853-Specify calibration letter** | Jack without Watlow name* |
| **857-000** | Crimp-on adapter - undrilled |
| **857-040** | Crimp-on adapter - 0.040 inch sheath diameter |
| **857-063** | Crimp-on adapter - 0.063 inch sheath diameter |
| **858-000** | Brazing adapter - undrilled |
| **858-040** | Brazing adapter - 0.040 inch sheath diameter |
| **858-063** | Brazing adapter - 0.063 inch sheath diameter |
| **858-125** | Brazing adapter - 0.125 inch sheath diameter |

**Note:** Available in ASTM E 230 calibration Types J, K, T, R/S, E, Cu/cu.

*Can be imprinted with customer's own logo (minimum order and tooling charge applies.)

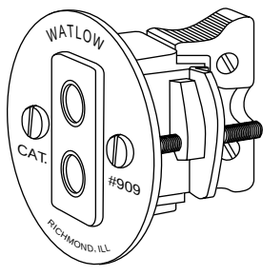
## Connector Systems

### Panel Mount Hardware

***Single Panel Mount Hardware***

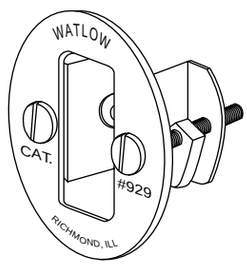
Designed for use with Watlow's standard thermocouple connectors, these units fit panels up to 7/16 inch thick. Panel cutout: 1 1/8 inch to 1 5/32 inch hole. Units fit into standard 3/4 inch knockouts.

**Code No. 909**



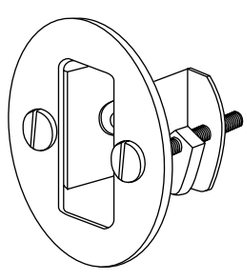

**Single circuit panel mount with quick-disconnect jack included. Available calibrations J, K, N, T, R/S & Cu/cu.**

**Code No. 929**




**Panel mount hardware only.**

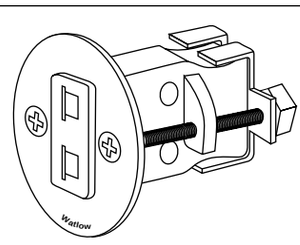
**Code No. 930**



**Panel mount hardware only without Watlow name.***

***Miniature Single Jack Panel Mount***

- Easy 3/4 inch diameter "knock-out" installation
- Attractive frosted aluminum finish
- Rear clearance 1 1/2 inch
- All installation can be accomplished from the front of the panel




**Jack not included.**
**(See page 148 for code number 851 or 853)**

| Code Number | Description |
|---|---|
| **861** | Single jack panel mount less jack; with Watlow name. |
| **863** | Single jack panel mount less jack; without Watlow name.* |

*Can be imprinted with customer's own logo (minimum order and tooling charge applies).

# Accessories

## Connector Systems

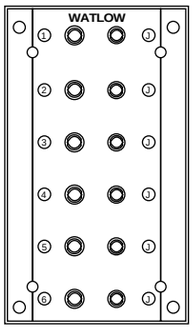
### Jack Panels

***Multi-Circuit Thermocouple Jack Panels***

Continued

| Code No. | Calibration* | Single Module Mounting Position | No. of Circuits | Numbering Sequence** | No. of Modules Left to Right | X | No. of Modules Top to Bottom |
|---|---|---|---|---|---|---|---|
| **941** | J, K, T | H-Horizontal<br>V-Vertical | 4, 5, 6 | R-Row<br>C-Column | 1 | X | 1 |

*All circuits in any given module must be the same calibration.




***Ordering Information*—To order, complete the code number on the right with the information below:**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| **9** | **4** | **1** | | | | | **1** | **X** | **1** |

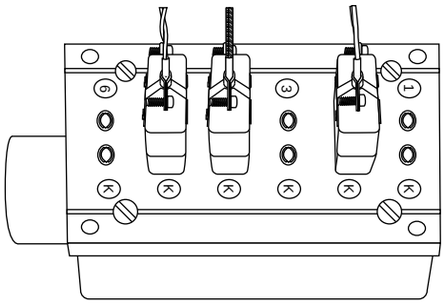
**4. Calibration**
J = Type J
K = Type K
T = Type T

**5. Mounting position**
H = Horizontal
V = Vertical

**6. Number of circuits**
4 = 4 circuits
5 = 5 circuits
6 = 6 circuits

**7. Numbering sequence**
R = Row (horizontal)
C = Column (vertical)

***Multi-Circuit Thermocouple Jack Panels for FS Box Mounting***



**940 multi-circuit jack panel mounted in 942 FS box. Nominal dimensions: 940 panel 4 ¾ in X 2 ¾ in X 1 in, 942 box 4 ⅝ in X 2 ¹³⁄₁₆ in X 2 ⅛ in.**

These multi-circuit thermocouple jack panels are lightweight, yet sturdy. Their many outstanding features include:

- Thermocouple alloy contacts (except Types R/S which are compensated)
- Standard 7⁄16 inch pin spacing with ¾ inch between circuits
- 250°F (120°C) ambient temperature rating
- Choice of four, five or six circuits per panel

Code number 940 jack panels are designed for mounting in special Watlow FS boxes (Code no. 942), which can accommodate panels with four, five or six circuits.

***To order:*** Specify 940—ASTM E 230 calibration—Number of circuits, i.e., 940-K-6.

| Code No. | Description | Calibration | No. of Circuits |
|---|---|---|---|
| **940** | Jack Panel | J, K, T, N, R/S, E and Cu/Cu | 4, 5 or 6 |
| **942** | FS Box | — | — |

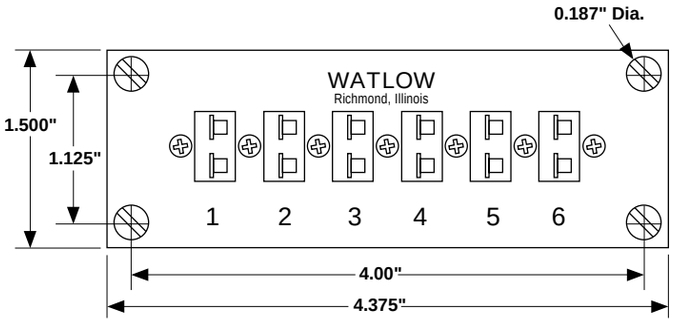
# Accessories

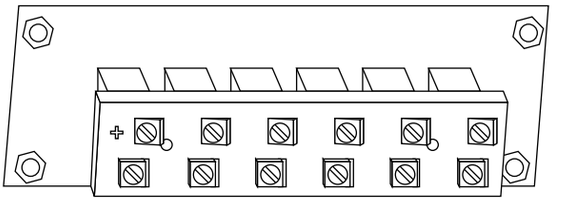
## Connector Systems

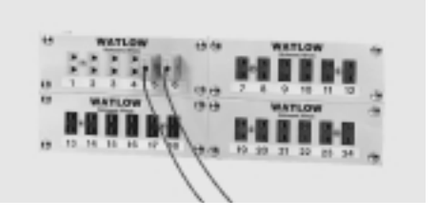
### Jack Panels

***Miniature Multiple Jack Panels***

- For use with Watlow miniature connectors
- Each multiple jack panel compactly holds six jacks
- Color-coding of connectors is clearly visible for easy identification of calibration
- Modular building blocks in multiples of six circuits
- Panel has attractive frosted aluminum finish
- Cutout dimensions 3 ½ X 1 inch
- Rear clearance 1 ½ inch
- Comes fully assembled
- Specially modified jacks with terminal screw extenders are used for easy rear terminal connections
- Thermocouple alloys are used throughout jacks, including extenders
- Polarity is clearly indicated on the insulating back plate
- Connections are easy to make with exposed screw terminals





### Miniature Multiple Jack Panel Connectors

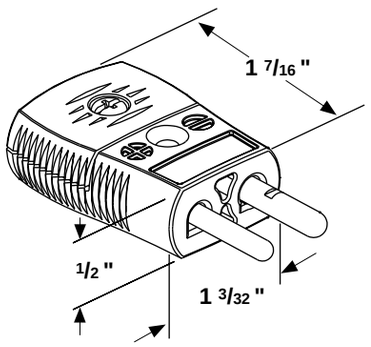
| Code No. | Description |
|---|---|
| **871**<br>**Specify calibration letter** | Panel with mounting hardware and jacks,<br>with Watlow name (J, K, T, E, Cu/Cu) |
| **873**<br>**Specify calibration letter** | Panel with mounting hardware and jacks,<br>without Watlow name* (J, K, T, E, Cu/Cu) |
| **874** | Back strap and four screws (only necessary when four panels are used in rectangular configuration) |
| **871-SPL-6, -12, etc.**<br>**Specify calibration letter** | Special panel with mounting hardware and jacks, with Watlow name, using decal numbering |
| **873-SPL-6, -12, etc.**<br>**Specify calibration letter** | Special panel with mounting hardware and jacks, without Watlow name, using decal numbering |
| **9-136**<br>**Specify calibration letter** | Replacement jack for use with miniature multiple jack panels only.<br>Calibration numeral code: **1**-K; **2**-J; **3**-T; **4**-R/S; **5**-E; **6**-Cu/Cu. |

*Can be imprinted with customer's own logo (minimum order and tooling charge applies).

# Accessories

## Connector Systems

### "S" Series Standard Connectors




***Ordering Information*—To order, complete the code number on the right with the information below:**

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| S | C | | - | - | | |

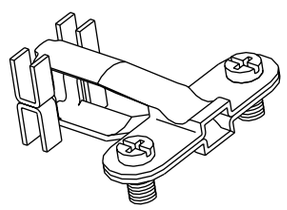
**1-2. "S" Series Standard Connector, 425°F**

**3. Style**
M = Male (plug)
F = Female (jack)

**4. Calibration**
E = Type E
J = Type J
K = Type K
S = Type S/Type R
T = Type T
U = Uncompensated

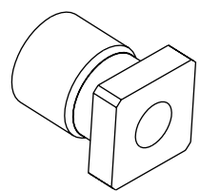
**5. Name Plate**
W = With Watlow name
N = Without name label

**6. Color Code**
AT = ASTM E 230 color code/uncompensated-white



### Cable Clamp Style

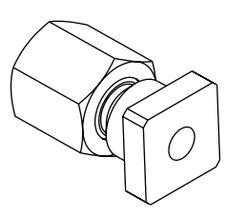
**Ordering Information:**
**Specify SAC-300**



### Crimp/Braze Style

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| S | A | B | - | | |

**4-6. Sheath size**
040 = 0.040 inches
063 = 0.063 inches
090 = 0.090 inches
125 = 0.125 inches
188 = 0.188 inches
250 = 0.250 inches
30M = 3.0 mm
60M = 6.0 mm



### Compression Style

| 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|
| S | A | P | - | | |

**4-6. Sheath size**
063 = 0.063 inches
125 = 0.125 inches
188 = 0.188 inches
250 = 0.250 inches
30M = 3.0 mm
60M = 6.0 mm