TPC Wire & Cable Corp.

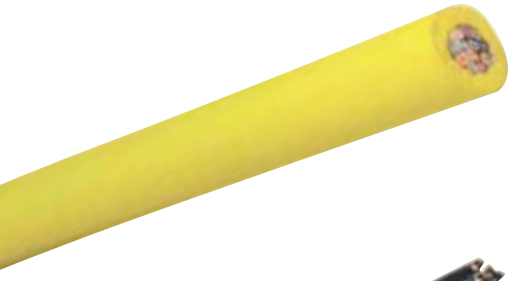
2013-2014 Product Catalog

Designed for your abusive environments

TPC WIRE & CABLE CORP.
EXPECT HIGH PERFORMANCE®

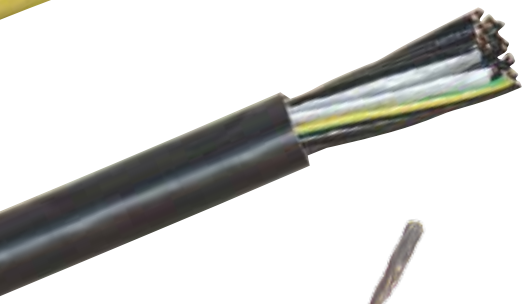
Designed For Abuse

Field analysis shows that TPC Wire & Cable Corp.'s products can last up to 10 times longer than standard commercially available products in abusive industrial environments where cables are exposed to flexing, heat, chemicals, cutting and abrasion.



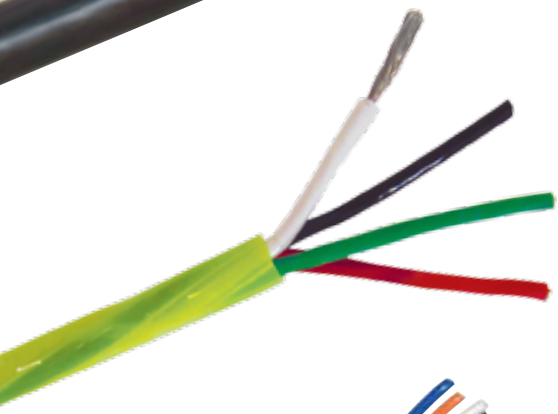
SUPER-TREX®

A very rugged line of cables which includes both single and multi-conductor configurations ranging from 600 volts to 2000 volts. These products are designed primarily for power and control applications where cables may be exposed to tension, reeling, flexing, cutting, abrasion, impact and heat.



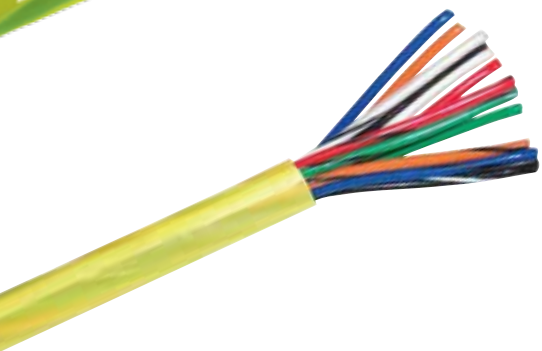
TREX-ONICS®

Designed for constant flexing applications such as cable carriers and robotics, this product line is designed to provide a high level of resistance to abrasion and cutting. Trex-Onics products include power cables and shielded multi-conductor cables for instrumentation, control and communications.



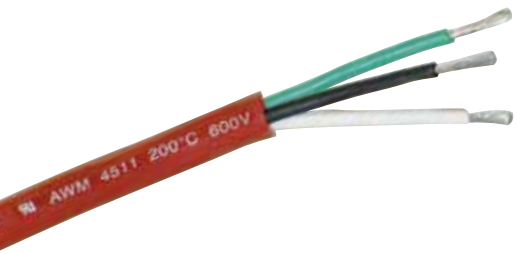
DEFENDER®

Antimicrobial cable designed to provide a solution to bacteria, fungus and mold growth on the cable jacket. A silver ion based antimicrobial additive provides built in lasting protection for the life of the cable while effectively eliminating greater than 99% of gram-negative and gram-positive bacteria, fungus and mold within 24 hours.



CHEM-GARD™

Designed for a broad range of applications where heat, cold or extreme chemical exposure can affect cable performance. Chem-Gard uses a fluoropolymer insulation and jacket that gives the cable a temperature performance range from -60°C to +200°C. The fluoropolymer jacket also allows the cable to survive in very acidic, alkali or solvent based environments. Chem-Gard's unique design makes it an excellent choice for flexing and high cycling applications.



THERMO-TREX®

High temperature cables and accessories designed for temperatures ranging from 400°F up to an extreme of 3000°F. This line includes power and control cables as well as a line of thermo-couple cables.

TPC WIRE & CABLE CORP.

EXPECT HIGH PERFORMANCE®

Cable, Connectors and Accessories for

THE TOTAL WIRE & CABLE SOLUTION

TPC WIRE & CABLE CORP.

EXPECT HIGH PERFORMANCE®

TPC Wire & Cable Corp. is a leading supplier of wire, cable and connectors used in harsh industrial environments. TPC's products are designed and engineered to withstand harsh conditions including abrasion, chemicals, constant flexing and extreme temperatures. TPC serves a variety of markets including the steel, utility, mining, automotive, food and beverage, government, oil and gas, transportation and wood, pulp and paper markets. The company's long-lasting, dependable wire and cable products solve the most difficult application problems in the harshest environments resulting in lower overall costs and increased production time. **TPC products outperform and outlast ordinary cable 10:1.**

1979

As part of Premier Industrial Corporation, TPC Wire & Cable started as a spin off of Cadillac Electric. The company started in a small office in Cleveland, OH with warehousing operations in Indianapolis, IN. At the time, the product line was limited to electrical cord and cable products selling to plant maintenance facilities on a regional basis.

1986

In response to rapid growth, TPC moves its warehouse and distribution operations to a much larger facility in Mentor, OH

QUALITY

TPC is committed to quality through its active participation in BSI's ISO 9001 Quality System, 5S (Five S) workplace organization methods and continuous improvement teams that engage over 10% of employees at any given time. TPC also has a Quality Program committed to 10CFR50 Appendix B/10CFR21. It follows the guidance of ASME NQA-1, 2008/09a.

SALES FORCE

TPC has a technical sales force that is committed to monthly training in products, systems and segment markets. They support their customers in showing cost value analysis reporting, application problem solving assistance, and wire and cable expertise. TPC's sales force consists of field representatives, inside representatives, segment market managers and international (bi-lingual) representatives. TPC also works closely with distributor partners in the U.S. and South America as well as having well-established OEM relationships in the U.S.

CUSTOM ENGINEERED PRODUCTS

TPC provides custom engineered products designed with application and environmental information supplied by the customer. These products are built specifically to solve a particular problem for an individual customer and represent a valuable service. The engineers who solve these problems are from the electrical, mechanical, chemical and industrial engineering disciplines.

RESEARCH AND DEVELOPMENT

Much of TPC's research and development process takes place at our customer's facility on their plant floor. Field sales representatives are frequently asked to look at a particular problem and work with internal TPC resources to develop a better solution. Other R&D processes take place in testing facilities, vendor meetings and the internal VOC (Voice of the Customer) program.

GOVERNMENT DEDICATED

TPC holds a GSA Multiple Award Schedule Contract through the U.S. General Services Administration (GSA). The contract is effective through December 14, 2017. It allows government agencies and organizations to purchase TPC products at pre-negotiated pricing and terms. TPC has approximately 1600 part numbers on its GSA contract. Those products can also be found on the GSA Advantage website.

FACILITIES

In 2012, TPC moved to its current location in Macedonia, OH. The newly renovated 120,000 square foot facility includes an onsite warehouse and distribution center, cable assembly center and engineering testing labs.

1996

Premier Industrial Corporation was purchased by British company, Farnell Electronics plc of Leeds, England. Premier Farnell plc is formed.

2011

In January of 2011 Premier Farnell sold TPC to Pfingsten Partners, a Chicago based private equity firm.

2012

TPC moves to current corporate headquarters in Macedonia, OH.

Table of Contents

TPC WIRE & CABLE CORP.
EXPECT HIGH PERFORMANCE®

SUPER-TREX®

ELECTRICAL CORD AND CABLE

Super-Trex®

Family of Electrical Cord and Cable

SUPER-TREX® CHEMICAL RESISTANCE *(CHART 1)*

The chart below shows typical fluid resistance properties of the Super-Trex® Jacket and Live-Flex™ inner conductor insulation material used in the Super-Trex Type SOO Ultra-Gard™ and Type SOO Triple-Gard™ Portable Cord.

CHEMICAL	SUPER-TREX® JACKET RATING	LIVE-FLEX™ INSULATION RATING
Acetylene	A	B
Aluminum Chloride Solutions	A	A
Aluminum Sulfate Solutions	A	A (250˚ F)
Ammonium Chloride Solutions	A	A
Ammonium Sulfate Solutions	A	A (200˚ F)
Amyl Alcohol	A	A (200˚ F)
Aniline	A	B
ASTM Oil #1	A	A
ASTM Oil #3	A	B (158˚ F)
ASTM Reference Fuel A	A	A
Asphalt	B	B
Barium Hydroxide Solutions	A	A (200˚ F)
Borax Solutions	B	A (200˚ F)
Boric Acid Solutions	A	A (200˚ F)
Butane	A	A
Calcium Bisulfite Solutions	A	A (200˚ F)
Calcium Chloride Solutions	A	A
Calcium Hydroxide Solutions	A	A (200˚ F)
Carbon Dioxide	A	A (200˚ F)
Castor Oil	A	A (158˚ F)
Citric Acid Solutions	B	A
Cottonseed Oil	A	A
Ethyl Alcohol	A	A (200˚ F)
Ethylene Glycol	A	A (200˚ F)
Ferric Chloride Solutions	A	A (200˚ F)
Floursilicic Acid	B	A (250˚ F)
Formic Acid	B	A
FREON-12	A	A (200˚ F)
FREON-22	A	A (200˚ F)
Gasoline	A	B
Glue	A	A (200˚ F)
Glycerin	A	A (200˚ F)

CHEMICAL	SUPER-TREX® JACKET RATING	LIVE-FLEX™ INSULATION RATING
n-Hexane	A	A
Hydrocyanic Acid	B	A
Hydrogen	A	A
Hydrogen Peroxide, 90%	A	A
Isopropyl Ether	A	B
Kerosene	A	B
Linseed Oil	A	A
Lubricating Oils	A	B (158˚ F)
Magnesium Chloride Solutions	A	A (220˚ F)
Magnesium Hydroxide Solutions	A	A (200˚ F)
Mercuric Chloride Solutions	A	A
Mercury	A	A
Methyl Alcohol	A	A
Methulethyl Keytone	C	D
Mineral Oil	A	A
Oleic Acid	A	B
Palmitic Acid	A	B
Phosphoric Acid, 20%	A	A (200˚ F)
Phosphoric Acid, 60%	A	A (200˚ F)
Phosphoric Acid, 70%	A	A (200˚ F)
Phosphoric Acid, 85%	A	A (200˚ F)
Picric Acid, 70%	A	A
Soap Solutions	A	A (200˚ F)
Sodium Chloride Solutions	A	A
Soybean Oil	A	A
Stannic Chloride	A	B
Stearic Acid	A	B (158˚ F)
Sulfuric Acid, up to 5%	A	A
Sulfuric Acid, up to 5-10%	A	A
Toluene	D	D
Triethanol Amine	A	A (158˚ F)
Tung Oil	A	A

SUPER-TREX® CHEMICAL AND SOLVENT RESISTANCE *(CHART 2)*

Super-Trex® Cord and Cable is jacketed with TSE, a specially compounded thermoset elastomer which has excellent resistance to most chemicals and solvents.

Resistance to solvents and chemicals is tested by immersing cable specimens in a solution for 28 days at room temperature.

Measurements of cable diameter are made before and after immersion. Resistance is rated as follows, depending upon the % of change in cable diameter:

(E) Excellent – less than 10%
(F) Fair – 30% to 50%
(G) Good – 10% to 30%
(P) Poor – More than 50%

Acetic Acid (60%)	G	Chromic Acid	G
Ammonium Hydroxide (60%)	E	Corn Oil	E
ASTM Fuel A	E	Distilled Water	E
ASTM Fuel B	G	Floor Polish	E
ASTM No. 1 Oil	E	Formaldehyde (40%)	E
ASTM No. 2 Oil	E	Gasoline	G
ASTM No. 3 Oil	E	Glycerine	E
Beef Blood	E	Hydrocarbon Hydraulic Fluid	E
Beer	E	Hydrochloric Acid (60%)	E
Boric Acid	E	Hydrogen Sulfide	E
Calcium Chloride	E	JP-4 (Jet Fuel)	G
Chlorinated Salt Brine	E	Kerosene	E
Linseed Oil	E	Silicone Oil	E
Lubricating Oil (3-in-1)	E	Sodium Bicarbonate	E
Methyl Butyl Ketone	P	Sodium Chloride	E
Milk	E	Sodium Cyanide (60%)	G
N-Butyl Alcohol	E	Sodium Hydroxide (60%)	G
Perchloroethylene	F	Sodium Nitrate	E
Phosphate Ester Hydraulic (Skydrol 500B)	P	Steel Mill Rolling Oil	E
Phosphoric Acid (85%)	E	Sulphuric Acid (10%)	E
Potassium Citrate	E	Toluene	P
Potassium Hydroxide (20%)	E	Turpentine	G
Rochelle Salts	E		

Ultra-Gard™ Portable Cord

LISTED

- SOO Rated
- 600 Volt
- MSHA Approved
- 90°C to -30°C
- UV Resistant
- FT-2
- RoHS Compliant
- Extra Hard Usage
- Suitable for Class 1, 2, 3 – Division 1 & 2*

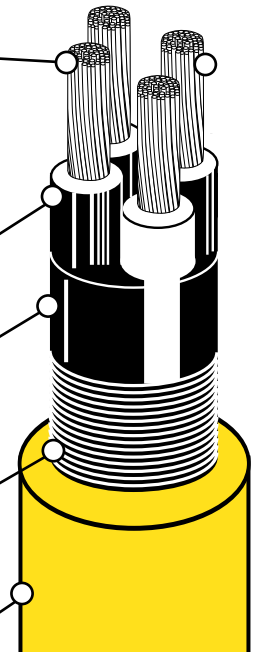
TINNED EXTRA-FLEX™ #34 AWG BUNCH STRANDED COPPER
Improves flexibility and reduces conductor fatigue and breakage. The tinned conductors resist corrosion making them easier to solder.

LIVE-FLEX™ OIL AND FLUID-RESISTANT THERMOSET INSULATION, WITH SEPARATOR
Resists effects of lubricating oils, coolants, cutting oils, acids, and most chemicals. Superior tensile strength.

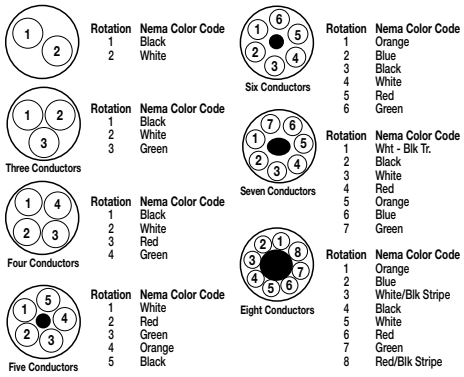
NO-WICK™ RAYON-REINFORCED SYNTHETIC FILLER
Adds tensile strength. Improves flexibility and won't wick up liquids. Acts like a shock absorber to reduce damage from impact.

100% FABRIC SERVE, JACKET IMPREGNATED
Increases tear resistance, provides greater protection from impact.

SPECIALLY COMPOUNDED, SECURITY YELLOW, *SUPER-TREX*® TSE JACKET
Superior first-line defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat-resistant. Extreme all-weather flexibility.



Portable Cord Color Code & Rotation



Two Conductors		
Rotation	Nema Color Code	
1	Black	
2	White	

Three Conductors		
Rotation	Nema Color Code	
1	Black	
2	White	
3	Green	

Four Conductors		
Rotation	Nema Color Code	
1	Black	
2	White	
3	Red	
4	Green	

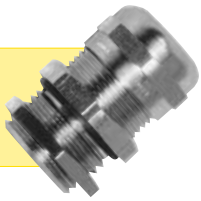
Five Conductors		
Rotation	Nema Color Code	
1	White	
2	Red	
3	Green	
4	Orange	
5	Black	

Six Conductors		
Rotation	Nema Color Code	
1	Orange	
2	Blue	
3	Black	
4	White	
5	Red	
6	Green	

Seven Conductors		
Rotation	Nema Color Code	
1	Wht - Blk Tr.	
2	Black	
3	White	
4	Red	
5	Orange	
6	Blue	
7	Green	

Eight Conductors		
Rotation	Nema Color Code	
1	Orange	
2	Blue	
3	White/Blk Stripe	
4	Black	
5	White	
6	Red	
7	Green	
8	Red/Blk Stripe	

ADD KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER! *See Pages 95-104.*



APPLICATIONS

- Cord Reels
- Conveyors
- Construction Sites
- Dockside Power
- Extension Cords
- Floor Polishers
- Foot Switches
- Heavy Duty Tools
- Hospital Equipment
- Industrial Heaters
- Limit Switches
- Man Cooling Fans
- Molds and Dies
- Motor Leads
- Pendant Pushbutton Stations
- Portable Machinery
- Proximity Switches
- Sanders
- Solenoid Valves
- Signaling Equipment
- Sound Equipment
- T-Stands
- Welding Primary

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CORD SIZE AWG/COND.	CONDUCTOR STRANDING	AMPACITY (1)	INSULATION THICKNESS (IN.)	JACKET THICKNESS (IN.)	MAX. O.D. (IN.)	WT. (LBS.) PER 1000'	MIN. BEND RADIUS (IN.)
87192	18/3	41 x 34	7	0.030	0.060	0.380	80	3.04
87197	18/4	41 x 34	7	0.030	0.060	0.408	100	3.26
87191	16/2	65 x 34	13	0.030	0.060	0.388	85	3.10
87193	16/3	65 x 34	10	0.030	0.060	0.408	105	3.26
87198	16/4	65 x 34	10	0.030	0.060	0.435	120	3.48
87202	16/5	65 x 34	8	0.030	0.080	0.520	175	4.16
87206	16/6	65 x 34	8	0.030	0.080	0.560	210	4.48
87207	16/7	65 x 34	7	0.030	0.080	0.630	240	5.04
87208	16/8	65 x 34	7	0.030	0.080	0.640	275	5.12
87194	14/3	104 x 34	15	0.045	0.080	0.548	180	4.38
87199	14/4	104 x 34	15	0.045	0.080	0.590	210	4.72
87195	12/3	165 x 34	20	0.045	0.095	0.623	235	4.98
87200	12/4	165 x 34	20	0.045	0.095	0.675	290	5.40
87196	10/3	259 x 34	25	0.045	0.095	0.685	310	5.48
87201	10/4	259 x 34	25	0.045	0.095	0.738	385	5.90

NOTES: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 400.5(A)(1).
**When installed in accordance with NEC guidelines sections, 501.140, 502.140, 503.140.*

Type TC Portable Cord

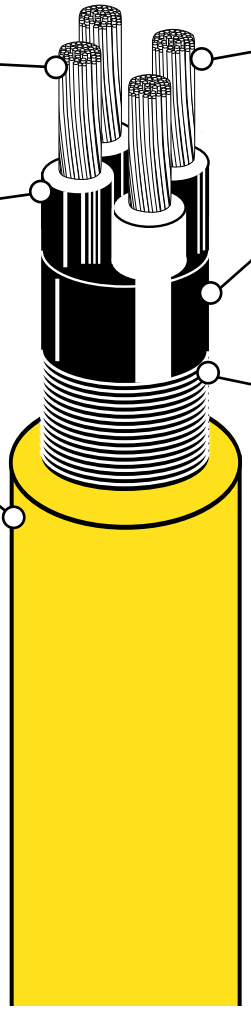
LISTED

- SOOW
- FT-4
- 90°C
- Oil Resistant
- Type TC - 600 Volt
- MSHA
- Suitable for Class 1, 2, 3 – Division 1 & 2*
- Sun Resistant

TINNED EXTRA-FLEX™ #34 AWG BUNCH STRANDED COPPER
Improves flexibility and reduces conductor fatigue and breakage.

LIVE-FLEX™ OIL AND FLUID-RESISTANT THERMOSET INSULATION WITH SEPARATOR
Resists effects of lubricating oils, coolants, cutting oils, acids, and most chemicals. Superior tensile strength.

SPECIALLY COMPOUNDED, SECURITY YELLOW, *SUPER-TREX*® TSE JACKET
Superior first-line defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat-resistant. Extreme all-weather flexibility.



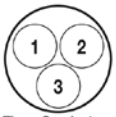
TINNED CONDUCTORS
Resists corrosion, easier to solder.

NO-WICK™ RAYON-REINFORCED SYNTHETIC FILLER
Adds tensile strength. Improves flexibility and won't wick up liquids. Acts like a shock absorber to reduce damage from impact.

100% FABRIC SERVE, JACKET IMPREGNATED
Increases tear resistance, provides greater protection from impact.

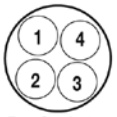
Recommended Minimum Bend Radius for Cable Applications
The Minimum Bend Radius for Dynamic Applications is 8 times the O.D. of the cable. Minimum Bend Radius for Static Applications is 6 times the O.D. of the cable.

Portable Cord and Color Rotation



Three Conductors

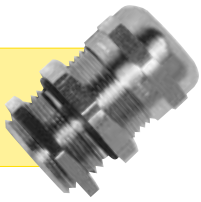
Rotation	Nema Color Code
1	Black
2	White
3	Green



Four Conductors

Rotation	Nema Color Code
1	Black
2	White
3	Red
4	Green

ADD KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER! *See Pages 95-104.*



APPLICATIONS

- Automated Equipment
- Cable Raceways
- Cable Trays – TC Rated
- Construction Sites
- Conveyors
- Electrical Fans
- Extension Cords
- Foot Switches
- Heavy Duty Tools
- Indoor and Outdoor Use
- Industrial Heaters
- Industrial Lighting
- Modular Power
- Molds and Dies
- Motor Leads
- Packaging Equipment
- Portable Machinery
- Signal Circuits
- Sound Equipment
- Wet or Dry Use

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND.	STRANDING NO. x AWG	AMPACITY (1)	INSULATION THICKNESS (IN.)	MIN. AVG. JACKET THICKNESS (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'	MIN. BEND RADIUS (IN.)
87193TC	16/3	65 x 34	10	0.030	0.060	0.408	105	3.26
87198TC	16/4	65 x 34	10	0.030	0.060	0.435	130	3.48
87194TC	14/3	104 x 34	15	0.045	0.080	0.548	185	4.38
87199TC	14/4	104 x 34	15	0.045	0.080	0.590	245	4.72
87200TC	12/4	165 x 34	20	0.045	0.095	0.675	320	5.40
87201TC	10/4	259 x 34	25	0.045	0.095	0.738	400	5.90

NOTES: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 400.5(A)(1).
**When installed in accordance with NEC guidelines sections, 501.140, 502.140, 503.140.*

Yellow Triple-Gard™ Portable Cord

LISTED

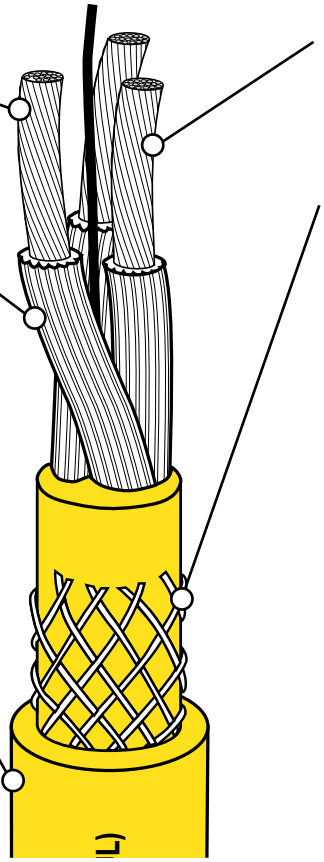
- SOOW Rated
- 90°C to -40°C
- FT-2
- 600 Volt
- UV Resistant
- Extra Hard Usage
- Suitable for Class 1, 2, 3 – Division 1 & 2*
- Triple Layered Construction
- RoHS Compliant

TINNED CONDUCTORS
Resists corrosion, easier to solder.

THIRD LAYER — SPECIALLY RIBBED OIL RESISTANT LIVE-FLEX™ CONDUCTOR INSULATION
Resists effects of lubricating oils, coolants, cutting oils, acids, and most chemicals. Superior tensile strength.

***SUPER-TREX*® TRIPLE-GARD CONSTRUCTION**
Extends life in torque, tension and flexing applications.

FIRST LAYER — SPECIALLY COMPOUNDED, SECURITY YELLOW *SUPER-TREX*® TSE JACKET
Superior first-line defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat-resistant. Extreme all-weather flexibility.



2-1/2 TIMES MORE STRANDING
Improves flexibility. Reduces conductor fatigue and breakage.

SECOND LAYER — RAYON REINFORCED BRAID AND INTEGRAL FILL DESIGN
Provides added strength. Improves cable resistance to tearing, abrasion, twisting and pulling. Locks the conductors into the jacket. Helps prevent cork-screwing and premature conductor failure.

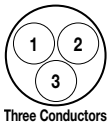
APPLICATIONS

- Cord Reels
- Construction Sites
- Conveyors
- Extension Cords
- Floor Polishers
- Foot Switches
- Heavy Duty Tools
- Hospital Equipment
- Industrial Heaters
- Limit Switches
- Man Cooling Fans
- Molds and Dies
- Motor Leads
- Pendant Pushbutton Stations
- Portable Machinery
- Proximity Switches
- Sanders
- Signaling Equipment
- Solenoid Valves
- T-Stands
- Welding Primary

Recommended Minimum Bend Radius for Cable Applications
The Minimum Bend Radius for Dynamic Applications is 8 times the O.D. of the cable. Minimum Bend Radius for Static Applications is 6 times the O.D. of the cable.

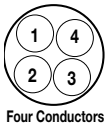
ADD KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER! *See Pages 95-104.*

Portable Cord and Color Rotation



Three Conductors

Rotation	Nema Color Code
1	Black
2	White
3	Green



Four Conductors

Rotation	Nema Color Code
1	Black
2	White
3	Red
4	Green

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CORD SIZE AWG/COND.	CONDUCTOR STRANDING	AMPACITY (1)	INSULATION THICKNESS (IN.)	JACKET THICKNESS (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'	MIN. BEND RADIUS (IN.)
85194	14/3	105 x 34	15	0.045	0.080	0.548	185	4.38
85199	14/4	105 x 34	15	0.045	0.080	0.590	245	4.72
85195	12/3	168 x 34	20	0.045	0.095	0.623	265	4.98
85200	12/4	168 x 34	20	0.045	0.095	0.675	320	5.40
85196	10/3	259 x 34	25	0.045	0.095	0.685	335	5.48
85201	10/4	259 x 34	25	0.045	0.095	0.745	400	5.96

NOTES: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 400.5(A)(1).
**When installed in accordance with NEC guidelines sections, 501.140, 502.140, 503.140.*

Black Triple-Gard™ Portable Cord

LISTED

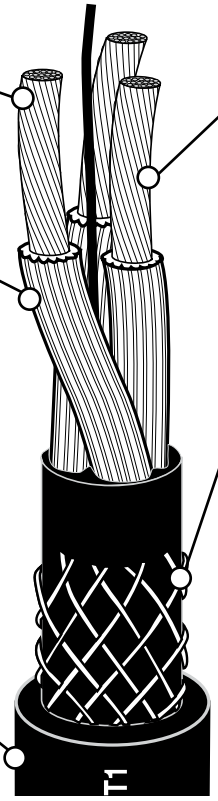
- SOOW Rated - UL Listed for Indoor/ Outdoor Use
- MSHA Approved
- UV Resistant
- 90°C to -40°C
- 600 Volt
- FT-1
- RoHS Compliant
- Weather Resistant
- Extra Hard Usage
- Suitable for Class 1, 2, 3 – Division 1 & 2*
- Triple Layered Construction

TINNED CONDUCTORS
Resists corrosion, easier to solder.

THIRD LAYER — SPECIALLY RIBBED OIL RESISTANT LIVE-FLEX™ CONDUCTOR INSULATION
Resists effects of lubricating oils, coolants, cutting oils, acids, and most chemicals. Superior tensile strength.

***SUPER-TREX*® TRIPLE-GARD CONSTRUCTION**
Extends life in torque, tension and flexing applications.

FIRST LAYER — SPECIALLY COMPOUNDED, *SUPER-TREX*® TSE JACKET
Superior first-line defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat-resistant. Extreme all-weather flexibility.

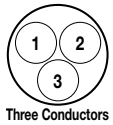


2-1/2 TIMES MORE STRANDING
Improves flexibility. Reduces conductor fatigue and breakage.

SECOND LAYER — RAYON REINFORCED BRAID AND INTEGRAL FILL DESIGN
Provides added strength. Improves cable resistance to tearing, abrasion, twisting and pulling. Locks the conductors into the jacket. Helps prevent cork-screwing and premature conductor failure.

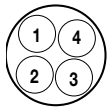
Recommended Minimum Bend Radius for Cable Applications
The Minimum Bend Radius for Dynamic Applications is 8 times the O.D. of the cable. Minimum Bend Radius for Static Applications is 6 times the O.D. of the cable.

Portable Cord and Color Rotation



Three Conductors

Rotation	Nema Color Code
1	Black
2	White
3	Green



Four Conductors

Rotation	Nema Color Code
1	Black
2	White
3	Red
4	Green

APPLICATIONS

- Cord Reels
- Construction Sites
- Conveyors
- Extension Cords
- Floor Polishers
- Foot Switches
- Heavy Duty Tools
- Hospital Equipment
- Industrial Heaters
- Limit Switches
- Man Cooling Fans
- Molds and Dies
- Motor Leads
- Pendant Pushbutton Stations
- Portable Machinery
- Proximity Switches
- Sanders
- Signaling Equipment
- Solenoid Valves
- T-Stands
- Welding Primary

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND.	STRANDING NO. x AWG	AMPACITY (1)	INSULATION THICKNESS (IN.)	MIN. AVG. JACKET THICKNESS (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'	MIN. BEND RADIUS (IN.)
85093**	16/3	65 x 34	10	0.030	0.060	0.408	105	3.26
85098**	16/4	65 x 34	10	0.030	0.060	0.435	130	3.48
85094	14/3	105 x 34	15	0.045	0.080	0.548	185	4.38
85099	14/4	105 x 34	15	0.045	0.080	0.590	245	4.72
85095	12/3	168 x 34	20	0.045	0.095	0.623	265	4.98
85000	12/4	168 x 34	20	0.045	0.095	0.675	320	5.40
85096	10/3	259 x 34	25	0.045	0.095	0.685	335	5.48
85001	10/4	259 x 34	25	0.045	0.095	0.745	400	5.96

NOTES: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 400.5(A)(1).
**When installed in accordance with NEC guidelines sections, 501.140, 502.140, 503.140.*
***16 AWG products are designed with reinforced single pass jacket.*

Extreme Temperature Cable *(-70°C to +150°C)*

• 1000V Rated • RoHS Compliant • FT1 Flame Rating • UV Resistant

Extreme Temperature Cable is designed to operate in temperature extremes ranging from -70°C to 150°C per ISO standards, (UL/cUL 105°C). The jacket is designed to withstand mechanical abuse and is resistant to UV light, water, oil and chemicals.

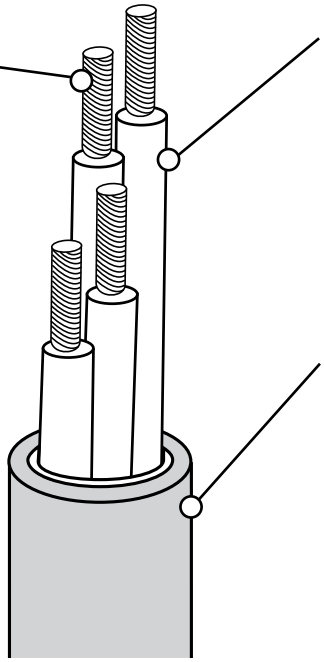
STRANDED TINNED COPPER CONDUCTORS

Stranded tinned copper conductors resist corrosion, improves flexibility and helps reduce conductor fatigue and breakage in flexing applications.

UL RECOGNIZED

Certified by UL to both Canadian and U.S. requirements.

COLOR CODE	
CONDUCTOR	**COLOR**
1	White
2	Black
3	Green
4	Red



CROSS-LINKED INSULATION ON INDIVIDUAL CONDUCTORS

The temperature rating of the insulation is matched to the jacket to provide maximum protection in high and low temperatures applications. The heavy duty design provides extra cut through protection.

HIGH TEMPERATURE CROSS-LINKED JACKET

The jacket protects the cable from high temperature operation and remains flexible at extreme cold temperatures. The heavy duty jacket provides protection from cutting, abrasion, water, oils, chemicals and is UV resistant.

APPLICATIONS

- Deep Freeze Food Processing
- Extreme Hot Applications
- Outdoor Applications
- Construction Sites
- Industrial Ovens
- Arctic Pipeline
- Steel Mills
- Foundries
- Oil Fields

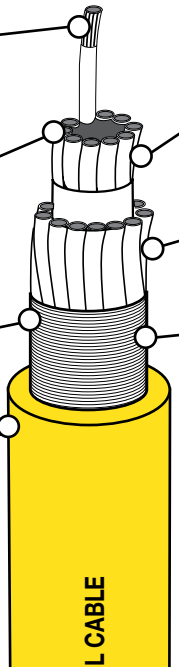
ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND	CONDUCTOR STRANDING	AMPACITY (1)	NOMINAL DIA. (IN.)	JACKET THICKNESS (IN.)	WT. (LBS.) PER 1000'
87840	14/3	41/30	34	0.426	0.065	106
87841	14/4	41/30	34	0.460	0.065	130
87835	12/3	65/30	43	0.465	0.065	141
87836	12/4	65/30	43	0.503	0.065	172
87830	10/3	105/30	55	0.492	0.065	192
87831	10/4	105/30	55	0.536	0.065	238
87825	8/3	168/30	76	0.685	0.060	306
87826	8/4	168/30	76	0.790	0.080	482
87820	6/3	259/30	96	0.814	0.080	448
87821	6/4	259/30	96	0.889	0.080	593
87815	4/3	413/30	120	0.933	0.080	653
87816	4/4	413/30	120	1.022	0.080	871
87810	2/3	665/30	160	1.074	0.080	991
87811	2/4	665/30	160	1.179	0.080	1328

NOTES: (1) Based on an ambient temperature of 40°C and conductor temperature of 90°C per NEC 2011, Table 3.10.15(B)(18).

20 AWG Reduced Diameter Control Cable

• FT-1 • 600 Volt • 90°C • RoHS Compliant



BUNCH STRANDED TINNED SOFT DRAWN COPPER
Longer flex life in flexing and twisting applications. Easier to solder.

POLYESTER TPE CONDUCTOR INSULATION
Oil resistant and has high dielectric, tensile and mechanical properties.

HIGH FLEX TAPE SEPARATOR AROUND INNER COMPONENTS
Provides easy movement of the conductor bundle for longer flex life.

SPECIALLY COMPOUNDED, SECURITY YELLOW, *SUPER-TREX*® TPE JACKET
Superior first-line defense against oil, ozone and UV exposure as well as most chemicals. Flame and heat resistant. Extreme all-weather flexibility.

CONDUCTORS ARE CODED WITH ALPHA-NUMERIC IDENTIFICATION
Provides fast identification of conductors. Easy to read and simplifies installation.

NYLON FILLERS
Low friction, non wicking fillers provide excellent flexibility.

UNI-LAY CONSTRUCTION ALTERNATING BUNDLES
Superior performance in flexing and torsional applications.

Chemical Resistance of Super-Trex Jacket in Oils and Fuels

Resistance to solvents and chemicals is tested by immersing cable specimens in a solution for 30 days at room temperature. Measurements of cable diameter are made before and after immersion. Resistance is rated as follows, depending upon the % of change in cable diameter:

(E) Excellent – less than 10% **(F) Fair** – 30% to 50%
(G) Good – 10% to 30% **(P) Poor** – More than 50%

REAGENT	SUPER-TREX TPE JACKET	PVC	NEOPRENE
Mobile Oil DTE 24	E	–	–
Mobile Oil DTE 26	E	–	–
Castor Oil	E	–	–
Simesol	E	–	–
Trimsol	E	–	–
ASTM Oil 1, 2 or 3	E	G	G
Transformer Oil	G	G	E
Diesel Fuel	G	P	G
Gasoline	G	P	G
Kerosene	E	E	G

20 MILLION Flex tested over 20,000,000 cycles in cat track testing without electrical failure

ADD SOME KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER!
See Pages 95-104.

NO. OF COND.	BASE COLOR	FIRST TRACER	NUMERIC ID.
1	Green	Yellow	–
2	Black	–	1
3	White	Black	–
4	Black	–	3

The first conductor in the outside layer is always Green with a Yellow Tracer. The third conductor in the outer layer is always White with a Black Tracer. All other conductors are Black with a white number. Color code repeats with black with unique numeric identification.

APPLICATIONS

- Automatic Welders
- Broach Machines
- Control Circuits
- Cranes
- Festoon Systems
- Machine Tools
- Power Track Systems
- Sensing Equipment
- Transfer Vehicles
- Positioning Equipment
- Remote Control of Electrical Equipment

Not for Reeling or Forced Directional (Pulling) Applications.

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CORD SIZE AWG/COND.	CONDUCTOR STRANDING	AMPACITY (1)	INSULATION THICKNESS (IN.)	JACKET THICKNESS (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'	MIN. BEND RADIUS (IN.)
88305	20/5	26 x 34	9	0.010	0.050	0.275	52	2.20
88312	20/12	26 x 34	8	0.010	0.050	0.362	94	2.90
88319	20/19	26 x 34	6	0.010	0.060	0.453	148	3.60
88325	20/25	26 x 34	6	0.010	0.060	0.507	175	4.00
88333	20/33	26 x 34	4	0.010	0.065	0.541	226	4.30
88347	20/47	26 x 34	4	0.010	0.070	0.663	335	5.30
88365	20/65	26 x 34	4	0.010	0.100	0.820	515	6.60

NOTES: (1) Maximum allowable current per conductor. Ampacities are based on an ambient temperature of 30°C with a conductor temperature of 90°C, not more than 3 current carrying conductors.

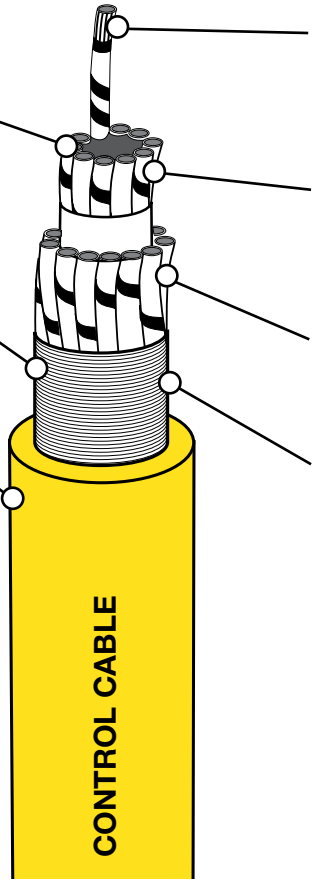
18 AWG Reduced Diameter Control Cable

• FT-4
• 90°C
• WTTC – 1000 Volt
• RoHS Compliant
• TC-ER – 600 Volt

POLYESTER TPE CONDUCTOR INSULATION
Oil resistant and has high dielectric, tensile and mechanical properties.

HIGH FLEX TAPE SEPARATOR AROUND INNER COMPONENTS
Provides easy movement of the conductor bundle for longer flex life.

SPECIALLY COMPOUNDED, SECURITY YELLOW, *SUPER-TREX*® TPE JACKET
Superior first-line defense against oil, ozone and UV exposure as well as most chemicals. Flame and heat resistant. Extreme all-weather flexibility.



BUNCH STRANDED TINNED SOFT DRAWN COPPER
Longer flex life in flexing and twisting applications. Easier to solder.

CONDUCTORS ARE CODED WITH ALPHA-NUMERIC IDENTIFICATION
Provides fast identification of conductors. Easy to read and simplifies installation.

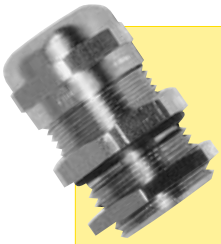
NYLON FILLERS
Low friction, non wicking fillers provide excellent flexibility.

UNI-LAY CONSTRUCTION ALTERNATING BUNDLES
Superior performance in flexing and torsional applications.

20 MILLION
Flex tested over 20,000,000 cycles in cat track testing without electrical failure

NO. OF COND.	BASE COLOR	FIRST TRACER	NUMERIC ID.
1	Green	Yellow	–
2	Black	–	1
3	White	Black	–
4	Black	–	3

The first conductor in the outside layer is always Green with a Yellow Tracer. The third conductor in the outer layer is always White with a Black Tracer. All other conductors are Black with a white number. Color code repeats with black with unique numeric identification.



ADD SOME KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER!
See Pages 95-104.

APPLICATIONS

- Automatic Welders
- Broach Machines
- Control Circuits
- Cranes
- Festoon Systems
- Machine Tools
- Power Track Systems
- Sensing Equipment
- Transfer Vehicles
- Positioning Equipment
- Remote Control of Electrical Equipment

Not for Reeling or Forced Directional (Pulling) Applications.

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CORD SIZE AWG/COND.	CONDUCTOR STRANDING	AMPACITY (1)	INSULATION THICKNESS (IN.)	JACKET THICKNESS (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'	MIN. BEND RADIUS (IN.)
88905	18/5	41 x 34	11	0.010	0.060	0.321	68	2.57
88912	18/12	41 x 34	7	0.010	0.070	0.444	137	3.55
88919	18/19	41 x 34	7	0.010	0.075	0.538	208	4.30
88925	18/25	41 x 34	6	0.010	0.080	0.613	273	4.90
88933	18/33	41 x 34	5	0.010	0.080	0.645	318	5.16
88949	18/49	41 x 34	5	0.010	0.090	0.787	473	6.29
88965	18/65	41 x 34	5	0.010	0.100	0.892	614	7.14

NOTES: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 3.10.15(B)(16).

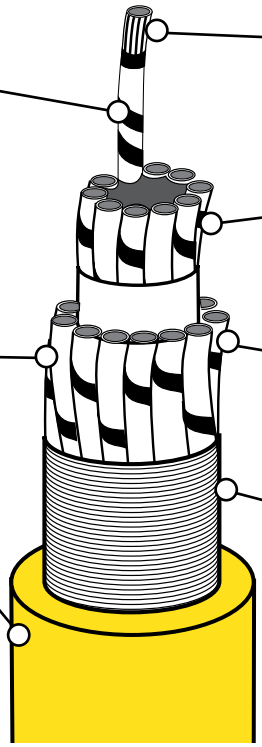
16 AWG Reduced Diameter Control Cable

• FT-4
• 90°C
• WTTC – 1000 Volt
• RoHS Compliant
• TC-ER – 600 Volt

CONDUCTORS ARE CODED WITH ALPHA-NUMERIC IDENTIFICATION
Provides fast identification of conductors. Easy to read and simplifies installation. **RED** conductors for AC applications and **BLUE** conductors for DC applications.

NYLON FILLERS
Low friction, non wicking fillers provide excellent flexibility.

SPECIALLY COMPOUNDED, SECURITY YELLOW, *SUPER-TREX*® TPE JACKET
Superior first-line defense against oil, ozone and UV exposure as well as most chemicals. Flame and heat resistant. Extreme all-weather flexibility.



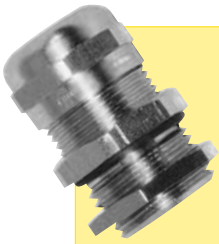
BUNCH STRANDED TINNED SOFT DRAWN COPPER
Longer flex life in flexing and twisting applications. Easier to solder.

POLYESTER TPE CONDUCTOR INSULATION
Oil resistant and has high dielectric, tensile and mechanical properties.

UNI-LAY CONSTRUCTION ALTERNATING BUNDLES
Superior performance in flexing and torsional applications.

HIGH FLEX TAPE SEPARATOR AROUND INNER COMPONENTS
Provides easy movement of the conductor bundle for longer flex life.

20 MILLION Flex tested over 20,000,000 cycles in cat track testing without electrical failure



ADD SOME KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER!
See Pages 95-104.

APPLICATIONS

- Automatic Welders
- Broach Machines
- Control Circuits
- Cranes
- Festoon Systems
- Machine Tools
- Positioning Equipment
- Power Track Systems
- Sensing Equipment
- Remote Control of Electrical Equipment
- Transfer Vehicles

Not for Reeling or Forced Directional (Pulling) Applications.

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO. (CONDUCTOR)			CORD SIZE	CONDUCTOR	AMPACITY	INSULATION	JACKET	NOMINAL	WT. (LBS.)	MIN. BEND
STD.	RED	BLUE	AWG/COND.	STRANDING	(1)	THICK. (IN.)	THICK. (IN.)	O.D. (IN.)	PER 1000'	RADIUS (IN.)
—	88505R	88505B	16/5	65 x 34	14	0.010	0.060	0.358	88	2.86
—	—	88507B	16/7	65 x 34	13	0.010	0.080	0.453	150	3.62
—	—	88508B	16/8	65 x 34	13	0.010	0.080	0.462	172	3.70
88512	88512R	88512B	16/12	65 x 34	9	0.010	0.070	0.510	191	3.96
88516	—	—	16/16	65 x 34	9	0.010	0.070	0.64	239	4.40
—	88519R	88519B	16/19	65 x 34	9	0.010	0.075	0.596	281	4.76
88522	—	—	16/22	65 x 34	8	0.010	0.080	0.725	327	5.20
88525	88525R	88525B	16/25	65 x 34	8	0.010	0.080	0.700	376	5.60
88531	—	—	16/31	65 x 34	7	0.010	0.080	0.835	425	5.80
—	88533R	88533B	16/33	65 x 34	7	0.010	0.080	0.745	448	5.96
88541	—	—	16/41	65 x 34	6	0.010	0.100	0.975	608	6.96
—	88547R	88547B	16/47	65 x 34	6	0.010	0.085	0.890	653	7.12
88549	—	—	16/49	65 x 34	6	0.010	0.100	0.900	714	7.20
88560	—	—	16/60	65 x 34	6	0.010	0.100	1.115	783	7.80

NOTES: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 3.10.15(B)(16).

(continued from previous page)

16 AWG Reduced Diameter Control Cable

COLOR CODE FOR PRODUCT WITH RED CONDUCTOR			
NO. OF COND.	BASE COLOR	FIRST TRACER	NUMERIC IDENTIFICATION
1	Green	Yellow	—
2	Red	—	1
3	White	Red	—
4	Red	—	3
5	Red	—	4

All remaining conductors will have RED base with BLACK numeric identification

- The first conductor in the outside layer is always GREEN with a YELLOW tracer.
- The third conductor in the outer layer is always WHITE with a RED tracer.
- All other conductors are RED with a BLACK number.

COLOR CODE FOR PRODUCT WITH BLUE CONDUCTOR			
NO. OF COND.	BASE COLOR	FIRST TRACER	NUMERIC IDENTIFICATION
1	Green	Yellow	—
2	Blue	—	1
3	White	Blue	—
4	Blue	—	3
5	Blue	—	4

All remaining conductors will have BLUE base with WHITE numeric identification

- The first conductor in the outside layer is always GREEN with a YELLOW tracer.
- The third conductor in the outer layer is always WHITE with a BLUE tracer.
- All other conductors are BLUE with a WHITE number.

Recommended Minimum Bend Radius for Cable Applications

The Minimum Bend Radius for Dynamic Applications is 8 times the O.D. of the cable. Minimum Bend Radius for Static Applications is 6 times the O.D. of the cable.

16 AWG REDUCED DIAMETER CONTROL CABLE				
NO. OF COND.	BASE COLOR	TRACER	SIDE ONE NUMERIC	SIDE TWO ALPHA-NUMERIC
1	Black	—	1	One
2	White	—	2	Two
3	Red	—	3	Three
4	Green	—	4	Four
5	Orange	—	5	Five
6	Blue	—	6	Six
7	White	Black	7	Seven
8	Red	Black	8	Eight
9	Green	Black	9	Nine
10	Orange	Black	10	Ten
11	Blue	Black	11	Eleven
12	Black	White	12	Twelve
13	Red	Black	13	Thirteen
14	Green	Black	14	Fourteen
15	Blue	Black	15	Fifteen
16	Black	White	16	Sixteen
17	White	Black	17	Seventeen
18	Orange	Black	18	Eighteen
19	Blue	Black	19	Nineteen
20	Red	Black	20	Twenty
21	Orange	Black	21	Twenty-One

Color code repeats after twenty-one conductors. Alpha-numeric identification is unique for all conductors one through sixty.

12 AWG Reduced Diameter Control Cable

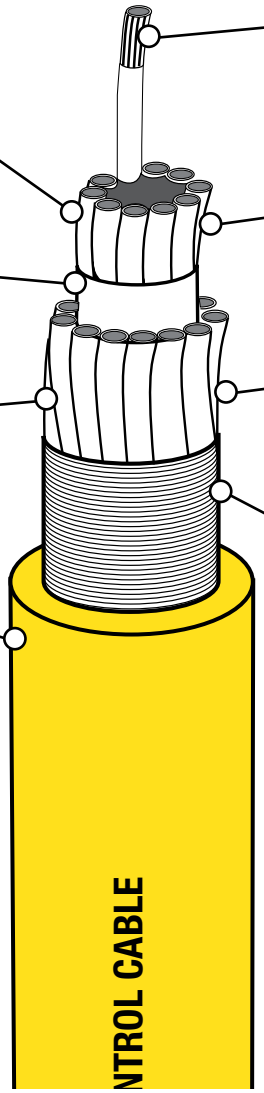
• 600 Volt • UV Resistant • 90°C • FT-1 • TC Rated • RoHS Compliant

CONDUCTORS ARE CODED WITH ALPHA-NUMERIC IDENTIFICATION
Provides fast identification of conductors. Easy to read and simplifies installation.

NYLON ARMORED INNER CONDUCTORS
Lower coefficient of friction. Longer life in flexing applications.

NYLON FILLERS
Low friction, non wicking fillers provide excellent flexibility.

SPECIALLY COMPOUNDED, SECURITY YELLOW, *SUPER-TREX*® TSE JACKET
Superior first-line defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat resistant. Extreme all-weather flexibility.



BUNCH STRANDED TINNED SOFT DRAWN COPPER
Longer flex life in flexing and twisting applications. Easier to solder.

XLPE CONDUCTOR INSULATION
Oil resistant and has high dielectric, tensile and mechanical properties.

REVERSE LAY OF ALTERNATING BUNDLES
Increases flexibility and relieves bending and twisting stress.

RUBBER BACKED FABRIC TAPE AROUND INNER COMPONENTS
Provides easy movement of the conductor bundle for longer flex life.

Recommended Minimum Bend Radius for Cable Applications
The Minimum Bend Radius for Dynamic Applications is 8 times the O.D. of the cable. Minimum Bend Radius for Static Applications is 6 times the O.D. of the cable.

ADD SOME KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER!
See Pages 95-104.

APPLICATIONS

- Automatic Welders
- Broach Machines
- Control Circuits
- Cranes
- Festoon Systems
- Machine Tools
- Positioning Equipment
- Power Track Systems
- Remote Control of Electrical Equipment
- Sensing Equipment
- Transfer Vehicles

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CORD SIZE AWG/COND.	CONDUCTOR STRANDING	AMPACITY (1)	INSULATION THICKNESS (IN.)	JACKET THICKNESS (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'	MIN. BEND RADIUS (IN.)
88708	12/8	65 x 30	21	0.015	0.060	0.640	306	5.12
88712	12/12	65 x 30	15	0.015	0.060	0.710	410	5.68
88722	12/22	65 x 30	13	0.015	0.085	0.945	750	7.56

NOTES: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 3.10.15(B)(16).

Multi-Conductor P&R Cable

LISTED

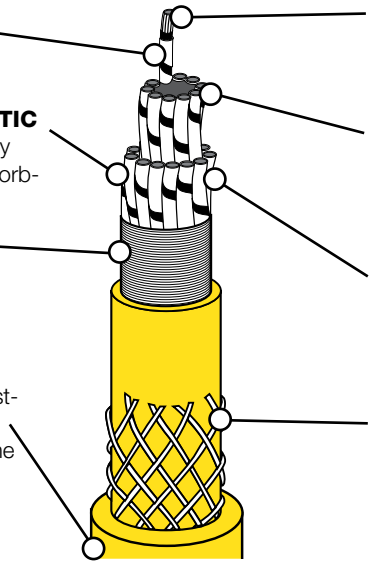
- FT-1
- 90°C Dry
- 75°C Wet
- TC-ER – 600 Volt
- Class 1 Division 2*
- UV Resistant
- WTTC – 1000 Volt
- RoHS Compliant
- 16 AWG MSHA Approved
- Payout & Retractile (P&R) Construction

LIVE-FLEX™ XLPE CONDUCTOR INSULATION Increases flexibility and has high dielectric, tensile and mechanical properties.

NO-WICK™ RAYON-REINFORCED SYNTHETIC FILLER Adds tensile strength, improves flexibility and won't wick up liquids. Acts like a shock absorber to reduce damage from impact.

POLYESTER TAPE AROUND INNER COMPONENTS Provides easy movement of the conductor bundle for longer flex life.

SPECIALLY COMPOUNDED, SECURITY YELLOW, *SUPER-TREX*® TSE JACKET A two layer reinforced jacket provides superior first-line defense against industrial and environmental abuse. Resists tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat resistant. Extreme all-weather flexibility.



BUNCH STRANDED TINNED SOFT DRAWN COPPER Longer flex life in reeling, flexing and twisting applications. Easier to solder.

CONDUCTORS – LOWER COEFFICIENT OF FRICTION Longer life in reeling and flexing applications. Fewer spares needed.

NYLON ARMORED INNER CONDUCTORS ARE CODED WITH ALPHA NUMERIC IDENTIFICATION Provides fast identification of conductors. Easy to read and simplifies installation.

NYLON REINFORCING BRAID EMBEDDED BETWEEN TWO-LAYER JACKET Provides added strength. Improves cable resistance to impact, abrasion, twisting and pulling.

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND	CONDUCTOR STRANDING	AMPACITY (1)	JACKET THICK. (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'	MIN. BEND RADIUS (IN.)
COLOR CODED CONDUCTORS							
88820	16/6	65/34	14	0.115	0.540	210	4.32
88822	16/8	65/34	12	0.115	0.605	247	4.84
88823	16/10	65/34	9	0.115	0.680	287	5.44
88824	16/12	65/34	9	0.135	0.695	326	5.56
88825	16/16	65/34	9	0.135	0.745	372	5.96
88826	16/20	65/34	9	0.135	0.805	450	6.44
88827	16/24	65/34	8	0.135	0.885	497	7.08
88828	16/33	65/34	7	0.155	0.980	708	7.84
88829	16/36	65/34	7	0.155	1.01	722	8.08
88830	16/41	65/34	6	0.155	1.07	833	8.56
88831	16/49	65/34	6	0.155	1.12	929	8.96
ALPHA NUMERIC BLACK CONDUCTORS							
88811	14/7	41/30	17	0.115	0.625	276	5.00
88812	14/8	41/30	17	0.115	0.660	305	5.28
88813	14/10	41/30	12	0.115	0.745	365	5.96
88814	14/12	41/30	12	0.135	0.760	411	6.08
88815	14/16	41/30	12	0.135	0.820	499	6.56
88816	14/20	41/30	12	0.135	0.890	586	7.12
88817	14/24	41/30	11	0.135	0.965	680	7.72
88800	12/6	65/30	24	0.115	0.640	334	5.12
88802	12/8	65/30	21	0.115	0.720	402	5.76
88804	12/12	65/30	15	0.135	0.830	549	6.64
88806	12/20	65/30	15	0.135	0.975	822	7.80
88808	12/30	65/30	13	0.155	1.155	1157	9.24
88832	10/6	105/30	32	0.115	0.760	439	6.08
88834	10/8	105/30	28	0.115	0.860	554	6.88
88836	10/12	105/30	20	0.135	0.990	768	7.92

NOTES: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 3.10.15(B)(16).
**When installed in accordance with NEC guidelines sections, 501.140, 502.140, 503.140.*

(continued from previous page)

Multi-Conductor P&R Cable

Recommended Minimum Bend Radius for Cable Applications

The Minimum Bend Radius for Dynamic Applications is 8 times the O.D. of the cable. Minimum Bend Radius for Static Applications is 6 times the O.D. of the cable.

APPLICATIONS

- Remote Control of Electrical Equipment
- Festoon Systems
- Cranes and Hoists
- Power Track Systems
- Cable Reels
- Automatic Welders
- Broach Machines
- Retractable Reels
- Machine Tools
- Control Circuits
- Positioning Equipment
- Transfer Vehicles

K-1/METHOD 1 WITH ALPHA NUMERIC IDENTIFICATION				
NO. OF COND.	BASE COLOR	TRACER	SIDE ONE NUMERIC	SIDE TWO ALPHA-NUMERIC
1	Black	—	1	One
2	White	—	2	Two
3	Red	—	3	Three
4	Green	—	4	Four
5	Orange	—	5	Five
6	Blue	—	6	Six
7	White	Black	7	Seven
8	Red	Black	8	Eight
9	Green	Black	9	Nine
10	Orange	Black	10	Ten
11	Blue	Black	11	Eleven
12	Black	White	12	Twelve
13	Red	White	13	Thirteen
14	Green	White	14	Fourteen
15	Blue	White	15	Fifteen
16	Black	Red	16	Sixteen
17	White	Red	17	Seventeen
18	Orange	Red	18	Eighteen
19	Blue	Red	19	Nineteen
20	Red	Green	20	Twenty
21	Orange	Green	21	Twenty-One

Color code repeats after twenty-one conductors. Alpha-numeric identification is unique for all conductor counts one through thirty-six.

ADD KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER! *See Pages 95-104.*

Extra Heavy Duty All Weather Reeling Cable

- **All Weather Usage**
- **Designed for Harsh Industrial Applications**
- **Extra Heavy Duty**
- **Aramid Reinforced**
- **600 Volt**
- **-40° to 90°C Dry**

FLEXIBLE HEAT AND MOISTURE RESISTANT EPR CONDUCTOR INSULATION RATED 90°C

Provides protection to the individual conductors while allowing them to remain flexible, provides long flex life in heavy duty reeling applications.

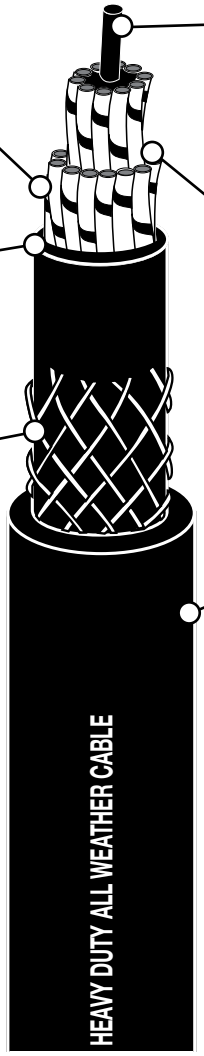
INTEGRAL FILL DESIGN

Inner jacket compound fills interstices of cable and locks conductors into place preventing corkscrewing and premature cable failure.

REINFORCED WITH ARAMID BRAID

EXTRA HEAVY DUTY ALL WEATHER CONSTRUCTION

This product is suitable for harsh industrial applications, indoor or outdoor use. The high quality compounds provide superior protection from sunlight, UV, oils, solvents, water, impact, heat and offer excellent all weather flexibility.



CENTRAL STRENGTH MEMBER RUBBER JACKETED ARAMID REINFORCEMENT

Rubber insulated aramid strength member provides additional overall strength to the cable, reduces stress on conductors.

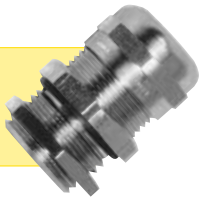
FINELY STRANDED FLEXIBLE TINNED COPPER CONDUCTORS

Provide longer flex life in reeling applications, tinned copper conductors resist corrosion and are easy to solder.

SPECIALLY COMPOUNDED *SUPER-TREX*® TSE™ JACKET

Double pass aramid reinforced jacket provides superior tensile strength in the most demanding reeling applications. The combination of a center aramid strength member with the reinforced aramid jacket provides 6,000 pounds of break strength.

ADD KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER! *See Pages 95-104.*



ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND.	CONDUCTOR STRANDING	AMPACITY (1)	JACKET THICKNESS (IN.)	INSULATION THICKNESS (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
88842	14/12	19 x 27	12	0.120	0.033	0.930	704
88847	14/24	19 x 27	11	0.120	0.030	1.135	836
88852	12/12	19 x 25	15	0.120	0.033	1.034	939
88857	12/24	19 x 25	13	0.120	0.030	1.278	1296
88879	12/30	19 x 25	13	0.260	0.030	1.75	2175
88862	10/12	37 x 26	20	0.120	0.033	1.114	704
88867	10/24	37 x 26	18	0.120	0.030	1.352	1503
88859	2.5mm^2 x 44	50 x 30	9	0.120	0.030	1.55	1849

NOTES: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 3.10.15(B)(16).

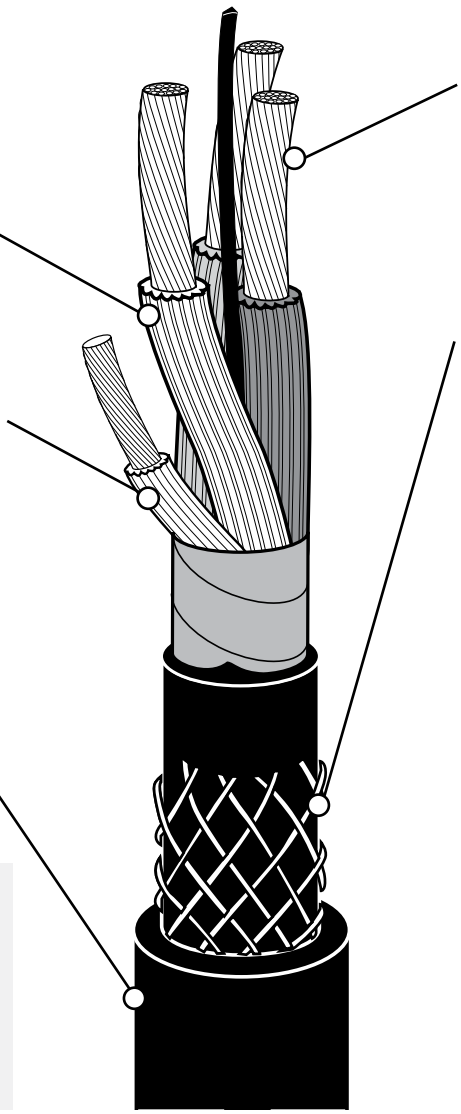
4/0 Type TC Power Cable

- Type TC – 600 Volt
- FT-4 Rated
- 90°C
- UV Resistant
- RoHS Compliant

CONDUCTORS ARE NUMBERED
Provides fast identification of conductors. Easy to read and simplifies installation.

LIVE-FLEX™ FREP CONDUCTOR INSULATION
Flame retardant EP insulation designed for Tray Cable applications. High dielectric, tensile and mechanical properties.

BLACK HEAVY-DUTY *SUPER-TREX*® TSE DOUBLE PASS JACKET
Provides superior first-line defense against industrial and environmental abuse. Resists tearing, abrasion, oil, impact, ozone and most chemicals. Flame and heat resistant. Extreme all-weather flexibility.



BUNCH STRANDED SOFT DRAWN COPPER
Longer flex life in flexing and twisting applications.

RAYON TIRE CORD REINFORCING BRAID
Embedded in jacket provides added strength. Improves cable resistance to impact, abrasion, twisting and pulling.

Recommended Minimum Bend Radius for Cable Applications
The Minimum Bend Radius for Dynamic Applications is 8 times the O.D. of the cable. Minimum Bend Radius for Static Applications is 6 times the O.D. of the cable.

COLOR CODE	
CONDUCTOR	**BASE COLOR**
3	Black – 1 Black – 2 Green
4	Black – 1 Black – 2 Black – 3 Green

Ampacity Changes Based on Temperature*

AMBIENT TEMPERATURE °C	°F	CORRECTION FACTOR MULTIPLY AMPACITY BY
21 - 25	70 - 77	1.04
26 - 30	78 - 86	1.00
31 - 35	87 - 95	0.96
36 - 40	96 - 104	0.91
41 - 45	105 - 113	0.87
46 - 50	114 - 122	0.82
51 - 55	123 - 131	0.76
56 - 60	132 - 140	0.71
61 - 65	141 - 149	0.65
66 - 70	150 - 158	0.58

**NEC 2011, Table 310.15(B)(2)(A).*

Ampacity Changes Based on Layers

NUMBER OF LAYERS	CORRECTION FACTORS
1	0.85
2	0.65
3	0.45
4	0.35

APPLICATIONS

- Automation Equipment
- Robot Power Supplies
- Mobile Equipment
- Tray Cable Applications
- Temporary and Emergency Power
- Pumps

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND.	CONDUCTOR STRANDING (Primary & Ground)	AMPACITY (1)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'	MIN. BEND RADIUS (IN.)
85412	4/0 - 2 Conductor with a 1/0 Ground	2090 x 30 & 1064 x 30	260	1.790	2958	14.32
85413	4/0 - 3 Conductor with a 1/0 Ground	2090 x 30 & 1064 x 30	260	1.995	3842	15.92
85422	4/0 - 2 Conductor with a 2 AWG Ground	2090 x 30 & 665 x 30	260	1.790	2792	14.32
85423	4/0 - 3 Conductor with a 2 AWG Ground	2090 x 30 & 665 x 30	260	1.925	3595	15.40

NOTES: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 3.10.15(B)(16).

Variable Frequency Drive Shielded Power Cable

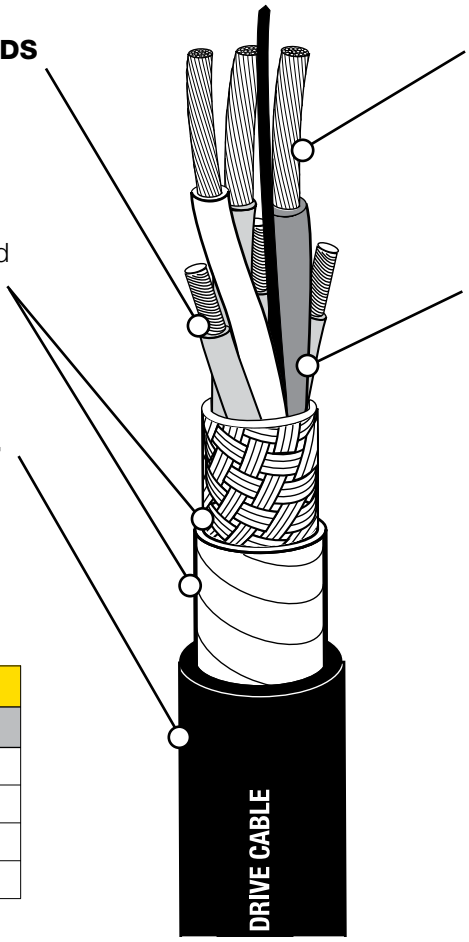
LISTED LISTED

- 600 Volt
- TC – ER
- 90˚C
- FT-4
- 2000 Volt Corona Resistant

THREE INSULATED GROUNDS
Reduces overall cable O.D.

ULTRA-SHIELD CONSTRUCTION
Combination tinned copper braid and foil shield for maximum RF and EM protection.

SPECIALLY COMPOUNDED SUPER-TREX® TSE JACKET
Superior protection against oil, ozone, sunlight, UV, chemicals, heat and flame. Excellent all weather flexibility.



FINELY STRANDED COPPER CONDUCTORS
Improves flexibility and extends conductor life in dynamic applications.

TSE INSULATION
Corona resistant insulation designed for VFD applications.

COLOR CODE	
CONDUCTOR	BASE COLOR
1	Black
2	White
3	Red
Ground	Green

ADD SOME KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER!

See Pages 95-104.

APPLICATIONS

- Variable Frequency Drive Systems
- Shielded Power Cable

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	POWER COND. SIZE AWG/COND.	POWER COND. STRANDING	GROUND SIZE COND./AWG*	AMPACITY (1)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
89103	#4 - 3 Cond	259 x 0.0127	3 x 12 AWG	114	1.19	1101
89104	#2 - 3 Cond	259 x 0.0160	3 x 10 AWG	152	1.34	1512
89106	1/0 - 3 Cond	266 x 0.0199	3 x 10 AWG	205	1.61	2174
89107	2/0 - 3 Cond	342 x 0.0199	3 x 10 AWG	237	1.70	2510
89109	4/0 - 3 Cond	532 x 0.0199	3 x 8 AWG	316	1.99	3727
89110	262Kcmil - 3 Cond	646 x 0.0199	3 x 6 AWG	362	2.21	4581
89111	373Kcmil - 3 Cond	925 x 0.0199	3 x 6 AWG	449	2.45	5968
89112	444Kcmil - 3 Cond	1110 x 0.0199	3 x 6 AWG	497	2.60	6922
89113	535Kcmil - 3 Cond	1332 x 0.0199	3 x 6 AWG	555	2.85	8246

NOTES: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table B310.15(B)(2)(3).
**Ground sized in accordance with NEC Table 250, 122 + UL1277 whichever is larger.*

Type W Portable Power & Automation Cable

UL LISTED c UL LISTED

- FT-5
- IEEE 1202 Flame Rating
- Type W – 2000 Volt
- -40°C – 90°C
- UV Resistant
- All Weather Design
- Extra Hard Usage
- Suitable for Class 1, 2, 3 – Division 1 & 2*

NO-WICK™ RAYON-REINFORCED SYNTHETIC CENTER FILLER

Adds tensile strength. Improves flexibility. Won't wick up liquids. Acts like a shock absorber to reduce damage from impact.

TINNED CONDUCTORS

Resists corrosion. Easier to solder.

LIVE-FLEX™ EPR CONDUCTOR INSULATION RATED 90ºC

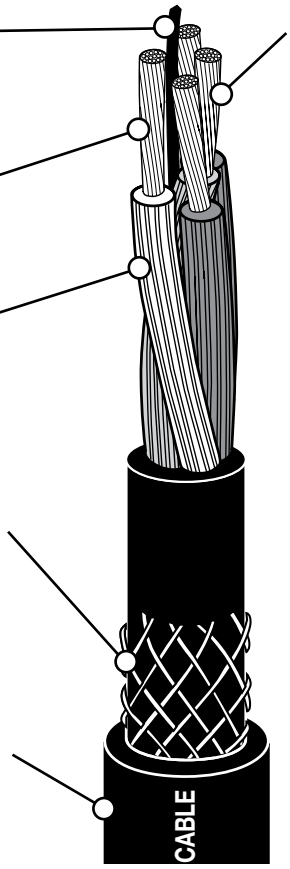
Resists dry rot. High dielectric, tensile and mechanical properties.

POLYESTER TIRE CORD REINFORCING BRAID EMBEDDED IN JACKET

Provides added strength. Improves cable resistance to impact, abrasion, twisting and pulling.

SPECIALLY COMPOUNDED, TSE *SUPER-TREX*® DOUBLE-PASS JACKET

Superior first-line defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat-resistant. Excellent all-weather flexibility.



FLEXIBLE CONCENTRIC ROPE LAY BUNCH STRANDED COPPER

Provides longer life in reeling, flexing and twisting applications.

COLOR CODE	
CONDUCTOR	**BASE COLOR**
2	Black, White
4	Black, White Red, Green

Ampacity Changes Based on Temperature*

AMBIENT TEMPERATURE °C	°F	CORRECTION FACTOR MULTIPLY AMPACITY BY
21 - 25	70 - 77	1.04
26 - 30	78 - 86	1.00
31 - 35	87 - 95	0.96
36 - 40	96 - 104	0.91
41 - 45	105 - 113	0.87
46 - 50	114 - 122	0.82
51 - 55	123 - 131	0.76
56 - 60	132 - 140	0.71
61 - 65	141 - 149	0.65
66 - 70	150 - 158	0.58

**NEC 2011, Table 310.15(B)(2)(A).*

Ampacity Changes Based on Layers

NUMBER OF LAYERS	CORRECTION FACTORS
1	0.85
2	0.65
3	0.45
4	0.35

APPLICATIONS

- Arc Welders
- Automated Equipment
- Robotic Welding
- Conveyors and Cranes
- Generator Power
- Lifting Magnets
- Mining Machines
- Mobile Equipment
- Movie Studio Power
- Pumps and Heaters
- Railroad Stand-by Power
- Retractable Reels
- Saws and Drills
- Shovels and Dredges
- Temporary and Emergency Power
- Transfer Cars and Loaders

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND	CONDUCTOR STRANDING	AMPACITY (1)	JACKET THICKNESS (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
87404	8/2	133 (7 x 19)	74	0.141	0.902	409
87304	8/4	133 (7 x 19)	65	0.141	1.027	643
87406	6/2	259 (7 x 37)	99	0.141	0.960	505
87306	6/4	259 (7 x 37)	87	0.141	1.100	818
87407	4/2	259 (7 x 37)	130	0.141	1.096	702
85108	4/4	259 (7 x 37)	114	0.141	1.270	1152
87408	2/2	259 (7 x 37)	174	0.141	1.220	1033
85110	2/4	259 (7 x 37)	152	0.141	1.380	1549
87411	1/0-2	266 (19 x 14)	234	0.156	1.520	1616
85224	2/0-4	323 (19 x 17)	237	0.156	1.880	2872

NOTE: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 400.5(A)(2).
**When installed in accordance with NEC guidelines sections, 501.140, 502.140, 503.140.*

Type W/Type TC Portable Power & Automation Cable (2 Conductor)

UL LISTED

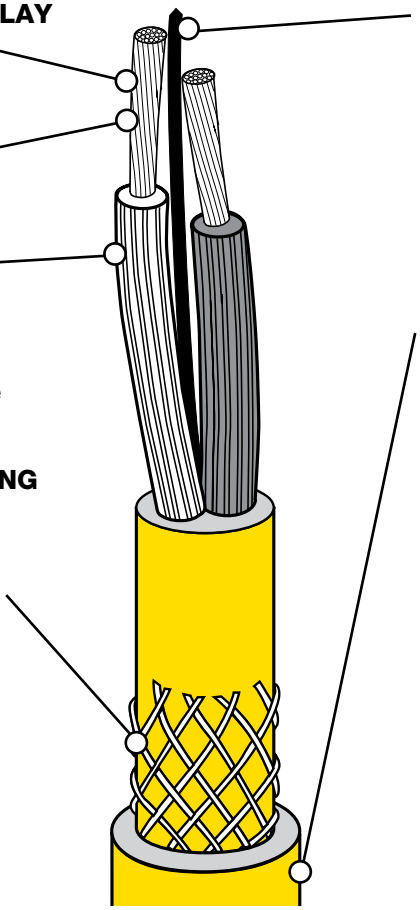
- **TC-ER – 2000 Volt**
- **Type W – 2000 Volt**
- **90°C**
- **UV Resistant**
- **Extra Hard Usage**
- **Suitable for Class 1, 2, 3 – Division 1 & 2***

FLEXIBLE CONCENTRIC ROPE LAY BUNCH STRANDED COPPER
Provides longer life in reeling, flexing and twisting applications.

TINNED CONDUCTORS
Resists corrosion. Easier to solder.

LIVE-FLEX™ RIBBED EPR RATED 90ºC
Ribbed to prevent kinking and breakage due to twisting and flexing. Resists dry rot. High dielectric, tensile and mechanical properties.

RAYON TIRE CORD REINFORCING BRAID EMBEDDED IN JACKET
Provides added strength. Improves cable resistance to impact, abrasion, twisting and pulling.



NO-WICK™ RAYON-REINFORCED SYNTHETIC FILLERS
Adds tensile strength. Improves flexibility. Won't wick up liquids. Acts like a shock absorber to reduce damage from impact.

SPECIALLY COMPOUNDED, SECURITY YELLOW *SUPER-TREX*® TSE DOUBLE-PASS INTEGRAL FILL JACKET
Superior first-line defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat-resistant. Excellent all-weather flexibility.

Recommended Minimum Bend Radius for Cable Applications
The Minimum Bend Radius for Dynamic Applications is 8 times the O.D. of the cable. Minimum Bend Radius for Static Applications is 6 times the O.D. of the cable.

COLOR CODE	
CONDUCTOR	**BASE COLOR**
2	Black, White

Ampacity Changes Based on Temperature*

AMBIENT TEMPERATURE °C	°F	CORRECTION FACTOR MULTIPLY AMPACITY BY
21 - 25	70 - 77	1.04
26 - 30	78 - 86	1.00
31 - 35	87 - 95	0.96
36 - 40	96 - 104	0.91
41 - 45	105 - 113	0.87
46 - 50	114 - 122	0.82
51 - 55	123 - 131	0.76
56 - 60	132 - 140	0.71
61 - 65	141 - 149	0.65
66 - 70	150 - 158	0.58

**NEC 2011, Table 310.15(B)(2)(A).*

Ampacity Changes Based on Layers

NUMBER OF LAYERS	CORRECTION FACTORS
1	0.85
2	0.65
3	0.45
4	0.35

APPLICATIONS

- Arc Welders
- Automated Equipment
- Robotic Welding
- Conveyors and Cranes
- Generator Power
- Lifting Magnets
- Mining Machines
- Mobile Equipment
- Movie Studio Power
- Pumps and Heaters
- Railroad Stand-by Power
- Retractable Reels
- Saws and Drills
- Shovels and Dredges
- Temporary and Emergency Power
- Transfer Cars and Loaders

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND	CONDUCTOR STRANDING	AMPACITY (1)	JACKET THICKNESS (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'	FLAME RATING	MIN. BEND RADIUS (IN.)
85404**†	8/2	133 (7 x 19)	74	0.141	0.950	512	FT-1	7.60
85406†	6/2	259 (7 x 37)	99	0.141	1.050	626	FT-4	8.40
85407†	4/2	259 (7 x 37)	130	0.141	1.150	823	FT-4	9.20
85408†	2/2	259 (7 x 37)	174	0.141	1.265	1094	FT-4	10.12
85411	1/0-2	1064 (19 x 56)	234	0.156	1.625	1766	FT-4	13.00

NOTE: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 400.5(A)(2).
**When installed in accordance with NEC guidelines sections, 501.140, 502.140, 503.140.*

****Not TC Rated***
†MSHA Approved

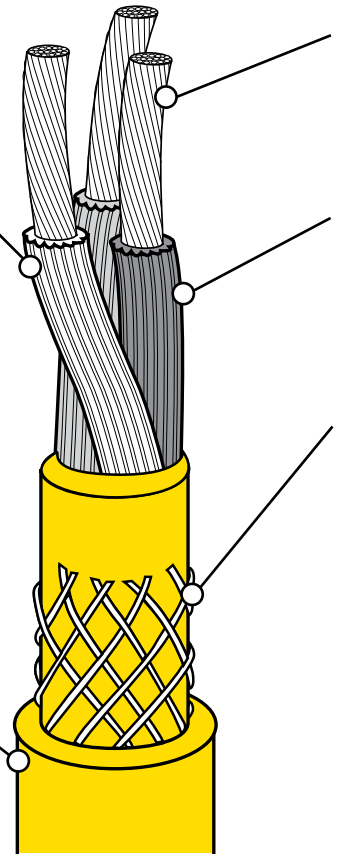
Type W/Type TC Portable Power & Automation Cable (3 Conductor)

LISTED LISTED

- **TC-ER – 2000 Volt**
- **Type W – 2000 Volt**
- **90°C**
- **UV Resistant**
- **Extra Hard Usage**
- **Suitable for Class 1, 2, 3 – Division 1 & 2***

LIVE-FLEX™ FREP CONDUCTOR INSULATION
Flame retardant EP insulation designed for Tray Cable applications. High dielectric, tensile and mechanical properties.

HEAVY-DUTY SECURITY YELLOW *SUPER-TREX*® TSE DOUBLE PASS JACKET
Provides superior first-line defense against industrial and environmental abuse. Resists tearing, abrasion, oil, impact, ozone and most chemicals. Flame and heat resistant. Extreme all-weather flexibility.



BUNCH STRANDED SOFT DRAWN COPPER
Longer flex life in flexing and twisting applications.

CONDUCTORS ARE COLOR CODED
Provides fast identification of conductors. Easy to read and simplifies installation.

RAYON TIRE CORD REINFORCING
Braid embedded in jacket provides added strength. Improves cable resistance to impact, abrasion, twisting and pulling.

COLOR CODE	
CONDUCTOR	**BASE COLOR**
1	Black
2	Red
3	Green

ADD SOME KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER!

See Pages 95-104.

APPLICATIONS

- Automation Equipment
- Robot Power Supplies
- Robot Welding
- Mobile Equipment
- Tray Cable Applications
- Temporary and Emergency Power
- Pumps and Heaters
- Conveyor
- Retractable Reels

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND	CONDUCTOR STRANDING (Primary & Ground)	AMPACITY (1)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'	FLAME RATING	MIN. BEND RADIUS (IN.)
85203**†	8/3	133 (7 x 19)	65	1.00	598	FT-1	8.00
85205†	6/3	259 (7 x 37)	87	1.080	742	FT-4	8.64
85257†	4/3	259/28	114	1.225	997	FT-4	9.80
85259†	2/3	259/26	152	1.34	1353	FT-4	10.72
85255	1/0-3	1050 x 30	205	1.70	2328	FT-4	13.60

NOTE: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 400.5(A)(2).
**When installed in accordance with NEC guidelines sections, 501.140, 502.140, 503.140.*

****Not TC Rated***
†MSHA Approved

Type W/Type TC Portable Power & Automation Cable (4 – 6 Conductor)

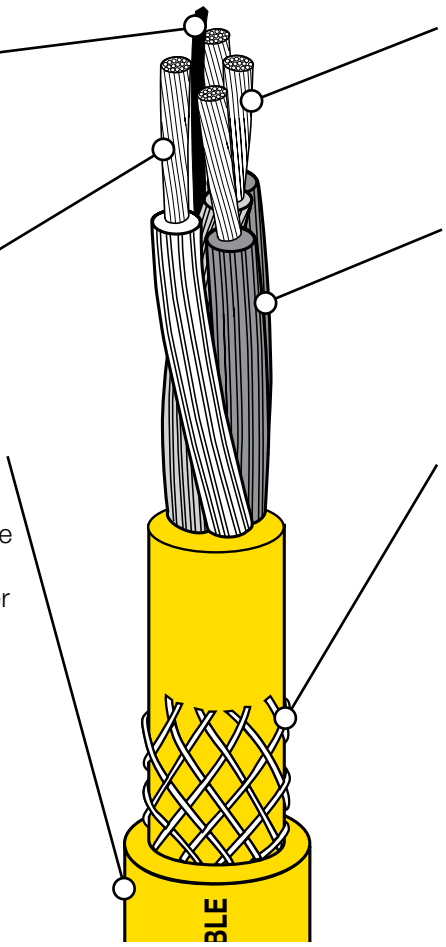
UL LISTED c UL LISTED

- 90°C
- MSHA Approved
- Type W – 2000 Volt
- TC-ER – 2000 Volt
- UV Resistant
- Extra Hard Usage
- Suitable for Class 1, 2, 3 – Division 1 & 2*

NO-WICK™ RAYON-REINFORCED SYNTHETIC CENTER FILLER
Adds tensile strength. Improves flexibility. Won't wick up liquids. Acts like a shock absorber to reduce damage from impact.

TINNED CONDUCTORS
Resists corrosion. Easier to solder.

SPECIALLY COMPOUNDED, TSE *SUPER-TREX*® DOUBLE-PASS JACKET
Superior first-line defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat-resistant. Excellent all-weather flexibility.



FLEXIBLE CONCENTRIC ROPE LAY BUNCH STRANDED COPPER
Provides longer life in reeling, flexing and twisting applications.

LIVE-FLEX™ EPR CONDUCTOR INSULATION RATED 90°C
Resists dry rot. High dielectric, tensile and mechanical properties.

POLYESTER TIRE CORD REINFORCING BRAID EMBEDDED IN JACKET
Provides added strength. Improves cable resistance to impact, abrasion, twisting and pulling.

COLOR CODE	
CONDUCTOR	BASE COLOR
4	Black, White Red, Green
6	Black, White, Red Green, Orange, Blue

ADD SOME KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER!

See Pages 95-104.

APPLICATIONS

- Arc Welders
- Automated Equipment
- Robotic Welding
- Conveyors and Cranes
- Generator Power
- Lifting Magnets
- Mining Machines
- Mobile Equipment
- Movie Studio Power
- Pumps and Heaters
- Railroad Stand-by Power
- Retractable Reels
- Saws and Drills
- Shovels and Dredges
- Temporary and Emergency Power
- Transfer Cars and Loaders

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND	CONDUCTOR STRANDING	AMPACITY (1)	JACKET THICKNESS (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'	FLAME RATING	MIN. BEND RADIUS (IN.)
85204	8/4	133 (7 x 19)	65	0.141	1.07	706	FT-1	8.56
85206	6/4	259 (7 x 37)	87	0.141	1.18	914	FT-4	9.44
85215	6/5	259 (7 x 37)	69	0.141	1.280	1077	FT-4	10.24
85606	6/6	259 (7 x 37)	69	0.141	1.39	1262	FT-4	11.04
85208	4/4	259 (7 x 37)	114	0.141	1.38	1229	FT-4	11.12
85210	2/4	259 (7 x 37)	152	0.141	1.46	1684	FT-4	11.68
85115	2/5	259 (7 x 37)	121	0.170	1.660	2135	FT-4	13.28

NOTE: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 400.5(A)(2).
**When installed in accordance with NEC guidelines sections, 501.140, 502.140, 503.140.*

Aramid Reinforced Orange Portable Power Reeling Cable (4 Conductor)

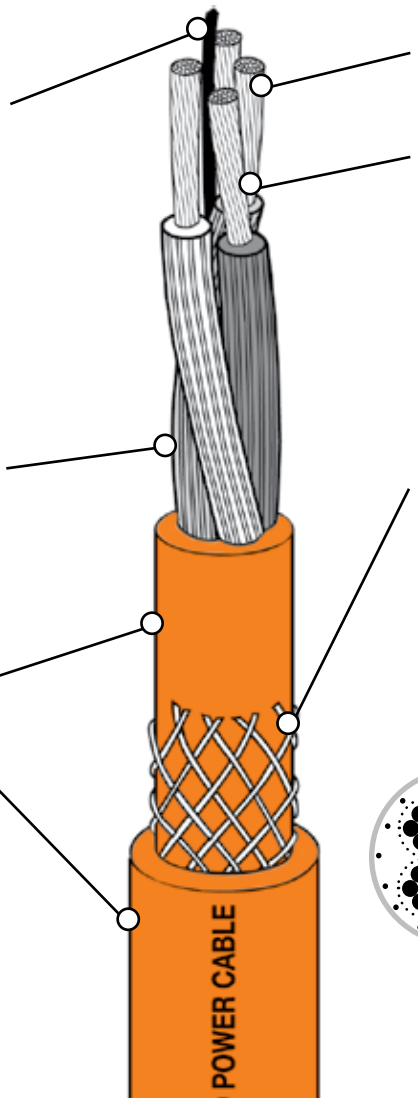
UL LISTED c UL LISTED

- 90°C, 200 Volt
- MSHA Approved
- FT-5
- Type W
- Extra Hard Usage
- Suitable for Class 1, 2, 3 – Division 1 & 2*

JACKETED ARAMID ROPE BRAID CENTER FILLER
Provides up to 6,000 lbs. of pull strength. Exceptional support in pulling, reeling or pendant applications. Dramatically improves overall tensile strength, reducing conductor fatigue and maximizing cable life.

LIVE-FLEX™ RIBBED EPR CONDUCTOR INSULATION RATED 90°C
Ribbed to prevent kinking and breakage due to twisting and flexing. High dielectric, tensile and mechanical properties. Resists dry rot.

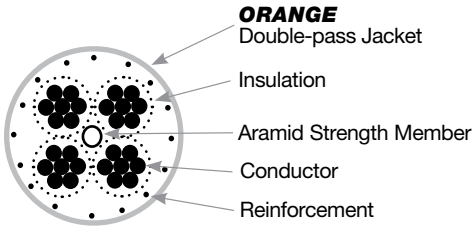
SPECIALLY COMPOUNDED ORANGE *SUPER-TREX*® TSE DOUBLE-PASS INTEGRAL FILL JACKET
Superior first-line defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat-resistant. Excellent all-weather flexibility.



TINNED CONDUCTORS
Resists corrosion. Easier to solder.

FLEXIBLE CONCENTRIC ROPE LAY BUNCH STRANDED COPPER
Has longer life in reeling, flexing and twisting applications.

POLYPROPYLENE CORD REINFORCING BRAID EMBEDDED IN JACKET
Provides added strength. Improves cable resistance to impact, abrasion, twisting and pulling.



COLOR CODE	
CONDUCTOR	COLOR
4	Black, White Red, Green

APPLICATIONS

- Automated Equipment
- Conveyors and Cranes
- Mobile Equipment
- Pendant Applications
- Railroad Stand-by Power
- Retractable Reels
- Robotic Welding
- Steel Transfer Cars and Loaders
- Temporary and Emergency Power

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND	CONDUCTOR STRANDING	AMPACITY (1)	JACKET THICKNESS (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
85288	4/4	259 (7 x 37)	114	0.125	1.29	1229
85248	2/4	259 (7 x 37)	152	0.180	1.50	1684

NOTE: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 400.5(A)(2).
**When installed in accordance with NEC guidelines sections, 501.140, 502.140, 503.140.*

Orange Type G Portable Power Cable

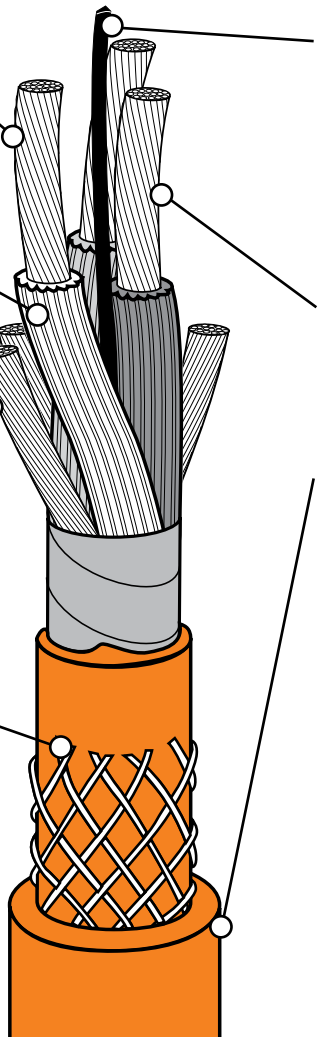
- ICEA Type G
- 90˚C
- 2000 Volt
- UV Resistant
- RoHS Compliant

FLEXIBLE CONCENTRIC ROPE LAY STRANDED COPPER
Longer life in reeling, flexing, twisting and tension applications.

RIBBED EPR CONDUCTOR INSULATION RATED 90ºC
Ribbed to prevent kinking and breakage due to twisting and flexing. Resists dry rot. High dielectric, tensile and mechanical properties.

THREE UNINSULATED TINNED COPPER GROUNDING CONDUCTORS
Provides circuit ground and Type G grounding protection.

REINFORCING BRAID EMBEDDED IN JACKET
Provides added tensile strength. Improves cable resistance to tension, impact, abrasion, twisting and pulling.

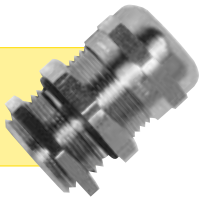


NO-WICK™ POLYESTER-REINFORCED SYNTHETIC CENTER FILLER
Improved flexibility. Won't wick up liquids. Acts like a shock absorber to reduce damage from impact.

TINNED CONDUCTORS
Resists corrosion. Provides longer flex life. Easier to solder.

SPECIALLY COMPOUNDED, ORANGE *SUPER-TREX*® TSE DOUBLE-PASS JACKET
Superior first line defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat resistant. Excellent all-weather flexibility.

ADD KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER! *See Pages 95-104.*



Color Code: Black, White, Red

Ampacity Changes Based on Temperature*

AMBIENT TEMPERATURE ºC	ºF	CORRECTION FACTOR MULTIPLY AMPACITY BY
21 - 25	70 - 77	1.04
26 - 30	78 - 86	1.00
31 - 35	87 - 95	0.96
36 - 40	96 - 104	0.91
41 - 45	105 - 113	0.87
46 - 50	114 - 122	0.82
51 - 55	123 - 131	0.76
56 - 60	132 - 140	0.71
61 - 70	141 - 158	0.58
71 - 80	159 - 176	0.41

**NEC 2011, Table 310.15(B)(2)(A).*

APPLICATIONS

- Automation Equipment
- Conveyors and Cranes
- Generator Power
- Mining Machines
- Mobile Equipment
- Motors
- Pumps and Heaters
- Railroad Stand-by Power
- Retractable Reels
- Shovels and Dredges
- Temporary and Emergency Power
- Transfer Cars and Loaders

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND.	COND. STRANDING	GROUND SIZE AWG	GROUND COND. # OF STRANDS	AMPACITY (1)	INSULATION THICK. (IN.)	JACKET THICK. (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'	MIN. BEND RADIUS (IN.)
85704	12/3	65/30	16	26/30	35	0.045	0.095	0.64	249	5.12
85703	10/3	105/30	14	41/30	49	0.045	0.095	0.69	291	5.52
85701	6/3	259/30	10	105/30	87	0.060	0.140	1.01	735	8.08

NOTE: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 400.5(A)(2).

Type W, RHH/RHW Single Conductor Power Cable

UL LISTED

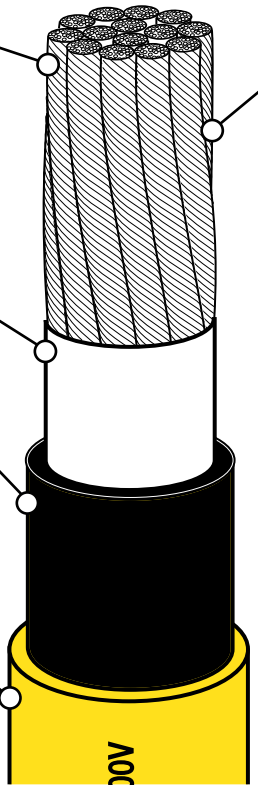
- TYPE W – 2000 Volt
- Type RHH/RHW – 600 Volt
- 90°C Dry
- -75°C Wet
- UV Resistant
- RoHS Compliant
- Extra Hard Usage
- Suitable for Class 1, 2, 3 – Division 1 & 2*

TINNED COPPER CONDUCTOR BUNCHEDIN A LEFT-HAND LAY
Resists corrosion, easy to solder, improved flex life.

MYLAR SEPARATOR
Easier to strip. Saves time.

LIVE-FLEX™ RIBBED EPR CONDUCTOR INSULATION RATED 90˚C
Ribbed to prevent kinking and breakage due to twisting and flexing. Resists dry rot. High dielectric, tensile and mechanical properties.

SPECIALLY COMPOUNDED, *SUPER-TREX*® TSE JACKET
First line defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat resistant. All-weather flexibility.



#30 AWG STRANDED COPPER CONDUCTOR
Provides for easy installation and longer life in vibration and flexing applications.

APPLICATIONS

- Automation Equipment
- Cat Track
- Crane Power
- Electroplating Equipment
- Induction Furnaces
- Motor Power Leads
- Metal Heat Treating Equipment
- Permanent Power
- Pumps
- Wet and Dry Environments

Recommended Minimum Bend Radius for Cable Applications

The Minimum Bend Radius for Dynamic Applications is 8 times the OD of the cable. Minimum Bend Radius for Static Applications is 6 times the OD of the cable.

PART NO.	SIZE AWG/ COND.	NOM. O.D. (IN.)	MIN. BEND RADIUS (IN.)
86324	#2	0.660	5.28
86325	2/0	0.820	6.56
86326	4/0	0.965	7.72
86319	250 MCM	1.035	8.28
86321	350 MCM	1.140	9.12
86323	500 MCM	1.325	10.60

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CONDUCTOR SIZE MCM	CONDUCTOR STRANDING	AMPACITY (1)		NSULATION THICK. (IN.)	JACKET THICK. (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
			WET** 75°C	DRY** 90°C				
86324	#2	665 x 30	170	190	0.060	0.095	0.660	440
86325	2/0	1330 x 30	265	300	0.080	0.095	0.820	750
86326	4/0	2107 x 30	360	405	0.080	0.095	0.965	1080
86319	250	2496 x 30	405	455	0.095	0.095	1.035	1310
86321	350	3458 x 30	505	570	0.095	0.095	1.140	1720
86323	500	5054 x 30	620	700	0.095	0.095	1.325	2320

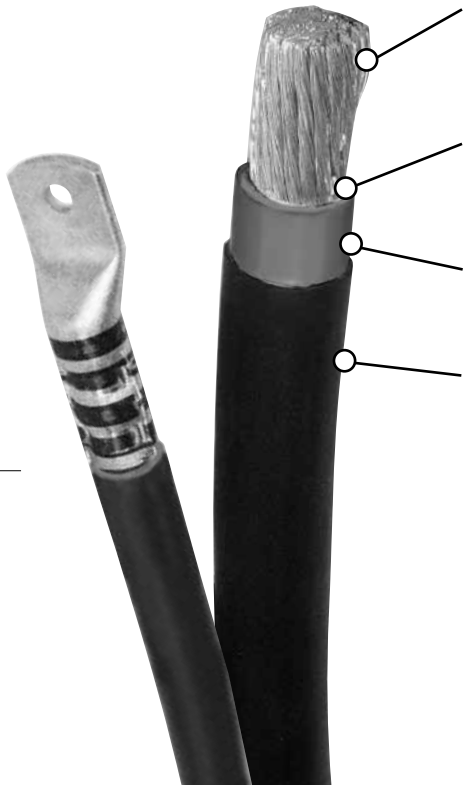
NOTES: (1) Based on an ambient temperature of 30°C per NEC 2011, Table 310.15(B)(17).
**When installed in accordance with NEC guidelines sections, 501.140, 502.140, 503.140.*
***Conductor Temperature*

Single Conductor Power Cable

- VW-1
- FT-4/IEEE 1202
- RHH, RHW-2
- For "CT" Use
- Sunlight Resistant
- RoHS Compliant
- Meets Smoke Release Test
- Rated 2000 Volt, 90°C

TPC 2000V single conductor Portable Power Cable is suitable for use in industrial applications needing flexibility, excellent weatherability and good flex life.

Ask about our custom assembly program. We will connectorize the cable and package it to your exact requirements.



CONDUCTORS
Flexible-stranded, tinned, annealed coated copper.

SEPARATOR
Suitable separator tape provides easy stripping of insulation.

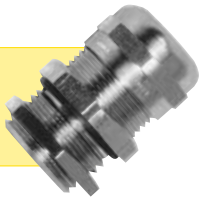
INSULATION
Ethylene-propylene rubber (EPR).

***SUPER-TREX*® TSE JACKET**
Flame retardant, oil and sunlight resistant, meets low smoke requirements of UL 1685.

FEATURES

Two layer composite of flame retardant, oil and sunlight resistant TSE outer layer and an EPR inner layer.

ADD KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER! *See Pages 95-104.*



APPLICATIONS

- Locomotive and car equipment
- Motor and generator leads
- Battery leads
- Shipyards
- Telecommunications power
- Heavy earth moving equipment
- Wind turbines
- Other heavy duty flexing applications

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	SIZE AWG/ kcmil	MIN. WIRES PER COND	AMPACITY (1) (90°C)	NOM. INSUL. THICKNESS (IN.)	NOM. JACKET THICKNESS (IN.)	NOMINAL O.D. (IN.)	APPROX. WT. (LBS.) PER 1000'
76020	2/0	342	300	0.065	0.045	0.69	562
76030	3/0	418	350	0.065	0.045	0.77	757
76040	4/0	532	405	0.065	0.052	0.82	894
76262	262	646	467	0.075	0.052	0.96	1091
76313	313	777	522	0.075	0.052	1.01	1245
76373	373	925	591	0.075	0.052	1.07	1486
76444	444	1110	652	0.075	0.052	1.14	1749
76323	535	1332	728	0.090	0.052	1.26	2099
76646	646	1591	815	0.090	0.052	1.36	2464
76777	777	1924	904	0.090	0.052	1.44	2899

NOTE: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 3.10.15(B)(17).

600V Welding Cable

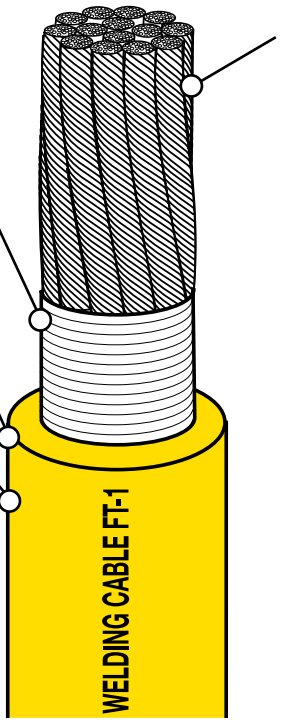
- Rated 90°C
- Extreme Usage
- UV Resistant
- 600 Volt
- FT-1
- RoHS Compliant
- Type SC

100% FABRIC SERVE Improves tear resistance and reduces jacket shrink-back.

FOOTAGE INDICATORS MARKED ON THE JACKET Easy, precise measuring reduces waste and improves productivity.

SPECIALLY COMPOUNDED, SECURITY YELLOW, *SUPER-TREX*® TSE JACKET RATED 600 VOLT Superior first-line defense against all types of industrial and environmental abuse. Flame and heat resistant. Extreme all-weather flexibility.

JACKET IS 25% THICKER THAN ORDINARY CABLE Withstands tearing, abrasion, impact and chunking.



EXTRA-FLEX™ #34 AWG BUNCH STRANDED ROPE LAY COPPER 2-1/2 times more stranding than conventional welding cables. Reduces copper conductor fatigue and breakage. Easier to work with. High impact resistance.

APPLICATIONS

- Battery Charger Lead Wires
- Bus Welding Boxes or Transformers
- Electrode Holder and Ground Connections to Arc Welders
- Portable Lighting
- Power Supply Applications

Recommended Minimum Bend Radius for Cable Applications

The Minimum Bend Radius for Dynamic Applications is 8 times the OD of the cable. Minimum Bend Radius for Static Applications is 6 times the OD of the cable.

PART NO.	SIZE AWG/ COND.	NOM. O.D. (IN.)	MIN. BEND RADIUS (IN.)
86317	4/0	0.900	7.20
86315	2/0	0.700	5.60
86314	1/0	0.660	5.44
86312	#2	0.540	4.32
86311	#4	0.450	3.60
86310	#6	0.370	2.96

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO. YELLOW	PART NO. BLACK	CABLE SIZE AWG	CONDUCTOR STRANDING	JACKET THICK. (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'	SUGGESTED APPLICATION AMPACITIES FOR:	
							**600 VOLT IN-LINE	***INTERMITTENT WELDING
86310	–	6	660 x 34	0.080	0.370	132	105	130
86311	–	4	1045 x 34	0.093	0.450	202	140	195
86312*	**86312BK***	2	1650 x 34	0.103	0.540	305	190	260
86314*	**86314BK***	1/0	2640 x 34	0.115	0.620	416	260	300
86315*	**86315BK***	2/0	3300 x 34	0.115	0.700	558	300	450
86317*	**86317BK***	4/0	5225 x 34	0.158	0.900	906	405	600

**MSHA Approved*

***Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 3.10.15(B)(17).*

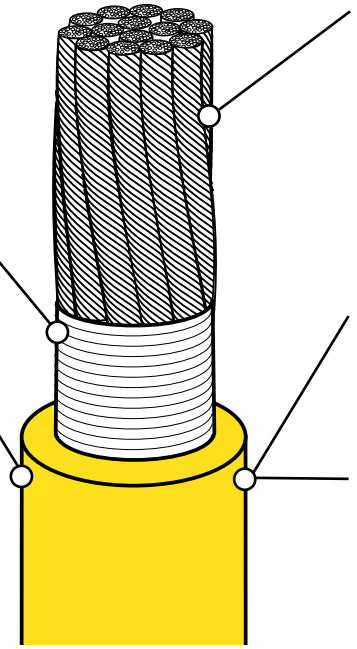
****These values for current carrying capacity are based on a conductor temperature of 90˚C (194˚F), an ambient temperature of 30˚C (86˚F). In actual service, the load factor may be much higher than indicated without overheating the cable as the ambient temperature will generally be substantially lower than 40˚C (Based on 100 feet length for total circuit for secondary voltages only with 4 volt drop and 60% duty cycle).*

DC Welding Cable

- 90°C
- Extreme Usage
- Extra Flexible
- UV Resistant
- FT-1
- RoHS Compliant
- 90 Volts Max.

100% FABRIC SERVE
Improves tear resistance and reduces jacket shrinkage.

SPECIALLY COMPOUNDED, SECURITY YELLOW *SUPER-TREX*® TSE JACKET
The best first-line defense against all types of industrial and environmental abuse. Resists oil, ozone, most chemicals and weld spatter. Flame and heat resistant. Extreme all-weather flexibility. See chart below for sizes available with red or black jacket.



EXTRA-FLEX™ #34 AWG SOFT DRAWN BUNCH STRANDED ROPE LAY COPPER
2-1/2 times more stranding than conventional welding cables. Reduces copper conductor fatigue and breakage. Easier to work with. High impact resistance.

JACKET IS 25% THICKER THAN ORDINARY WELDING CABLE
Superior resistance to tearing, abrasion and impact.

FOOTAGE INDICATORS MARKED ON THE JACKET
Easy, precise measuring reduces waste, improves productivity.

ADD KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER! *See Pages 95-104.*

Suggested Cable Size Based on Ampacity and Cable Length

IMPORTANT NOTE: *Total circuit length includes both the welding (electrode) and ground lead.*

REQUIRED AMPS	TOTAL CIRCUIT LENGTH								
	100'	150'	200'	250'	300'	350'	400'	500'	600'
100	4	4	2	1	1/0	1/0	2/0	3/0	4/0
150	4	2	1	1/0	2/0	3/0	3/0		
200	2	1	1/0	2/0	3/0	4/0	4/0		
250	1	1/0	2/0	3/0	4/0				
300	1/0	2/0	3/0	4/0					
350	1/0	3/0	4/0						
400	2/0	3/0							
450	2/0	4/0							
500	3/0	4/0							
550	3/0	4/0							

For welding applications only. Do not use this table for 600 volt applications. The total circuit length includes both the welding and ground cable (based on 4 volt drop) 60% duty-cycle. Current carrying values are based on copper temperature of 60°C and ambient temperature of 40°C.

APPLICATIONS

- Battery Charger Lines
- Lift Truck Cables
- Electro-Plating Leads
- Electro-Plating Danglers
- Ground Cables
- Jumper Cables
- Battery Cables
- Welding Stingers
- Welding Ground Leads
- Welding Electrode Leads

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.			CABLE SIZE	CONDUCTOR	AMPACITY	JACKET	NOMINAL	WT. (LBS.)	MIN. BEND
YELLOW	RED	BLACK	AWG	STRANDING	(1)	THICK. (IN.)	O.D. (IN.)	PER 1000'	RADIUS (IN.)
86301	—	—	4	1045 x 34	150	0.093	0.450	209	3.60
86302	86302R	86302BK	2	1650 x 34	200	0.103	0.540	318	4.32
86303	—	—	1	2090 x 34	250	0.103	0.580	379	4.64
86304	—	—	1/0	2640 x 34	350	0.120	0.660	484	5.28
86305	86305R	86305BK	2/0	3300 x 34	450	0.115	0.700	579	5.60
86306	—	—	3/0	4256 x 34	550	0.140	0.800	709	6.40
86307	—	—	4/0	5225 x 34	600	0.158	0.900	935	7.20

NOTE: (1) Ampacity is for a low voltage intermittent welding lead. Based on 30ºC ambient 90ºC insulation.

Flexible Medium Voltage Power Cable — Single Conductor

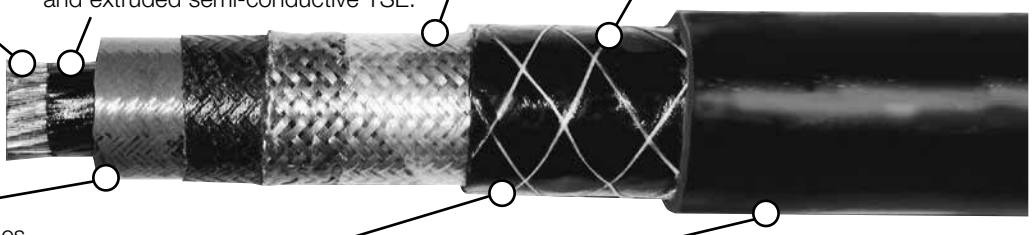
- **ASTM B-33: Standard specification for tinned soft or annealed copper wire for electrical purposes**
- **ICEA S-75-381/NEMA WC-58: Portable and power feeder cables for use in mines and similar applications**

CONDUCTOR
High flex tin coated bunch stranded copper conductors, for long life in harsh environments.

CONDUCTOR SHIELD
Combination of semi-conducting tape and extruded semi-conductive TSE.

INSULATION SHIELD
Tin coated braid shield placed over semi-conductive tape.

REINFORCEMENT †
Rayon tire cord reinforcing, improves cable resistance to pulling and twisting.



INSULATION
EPR insulation provides protection from moisture, heat and ozone.

INNER JACKET
Heavy duty TSE provides added strength.

OUTER JACKET
Extra heavy duty TSE jacket provides excellent protection against industrial and environmental abuse. Resists tearing, abrasion, oil, impact, ozone and most chemicals.

ORDERING INFORMATION *(Call for pricing & availability)*

VOLTAGE/ JACKET COLOR	PART NO.	CABLE SIZE AWG/COND	CONDUCTOR STRANDING	AMPACITY (IN.)	INSULATION THICK (IN.)	JACKET THICK (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
5kV YELLOW	70502	2	259	190	0.110	1.125	0.975	674
	70510	1/0	266	260	0.110	0.140	1.060	825
	70520	2/0	323	300	0.110	0.140	1.170	1039
	70540	4/0	532	400	0.110	0.155	1.300	1393
	70525	250	627	445	0.120	0.155	1.300	1477
	70535	350	888	550	0.120	0.170	1.490	1926
	70550	500	1221	695	0.120	0.190	1.700	2662
15kV ORANGE	70102	2	259	195	0.210	0.155	1.203	881
	70110*	1/0	266	260	0.210	0.155	1.325	1147
	70120*	2/0	323	300	0.210	0.155	1.350	1226
	70140*	4/0	532	400	0.210	0.170	1.497	1594
	70125*	250	608	445	0.210	0.170	1.550	1760
	70135* †	350	888	550	0.210	0.190	1.765	2364
	70150* †	500	1221	685	0.210	0.190	1.900	2937
25kV RED	70201*	1	259	225	0.260	0.170	1.450	1170
	70210*	1/0	266	260	0.295	0.170	1.500	1350
	70220*	2/0	323	300	0.295	0.170	1.560	1507
	70240* †	4/0	532	395	0.295	0.190	1.713	1909
	70225*	250	627	440	0.295	0.190	1.765	2085
	70235* †	350	888	545	0.295	0.190	1.886	2517
	70250* †	500	1221	680	0.295	0.205	2.048	3168
	70275 †	750	1850	870	0.295	0.205	2.253	4253
35kV BLACK	70310	1	259	225	0.340	0.170	1.623	1465
	70316	1/0	266	260	0.340	0.170	1.725	1632
	70320	2/0	342	300	0.340	0.205	1.840	1898
	70340 †	4/0	532	395	0.340	0.205	1.895	2235
	70325 †	250	608	440	0.340	0.205	1.960	2429
	70335 †	350	888	545	0.340	0.205	2.100	2901
	70350 †	500	1221	680	0.340	0.205	2.280	3396

*NOTES: (1) Allowable ampacity per conductor of insulated single conductor in air based on conductor temperature of 90°C and ambient air temperature of 40°C. NEC 2011 Table 310.60(C)(69). *CSA Approved.* ***†These cables include rayon reinforcement.***

Flexible Medium Voltage Power Assemblies

- **ASTM B-33: Standard specification for tinned soft or annealed copper wire for electrical purposes**
- **ICEA S-75-381/NEMA WC-58: Portable and power feeder cables for use in mines and similar applications**
- **90°C and CSA Approved**

WE STOCK THE PRODUCT SO YOU DON'T HAVE TO!

TPC Wire & Cable carries deep inventories of medium voltage power cables and allows you to buy just the amount you need for your specific application.

CUSTOM CUTTING AND PACKAGING SERVICE

TPC will cut the cable to length for you and pack the product to your specific requirements. You will receive the product in the lengths you require ready to be installed.

BUY IT CONNECTORIZED

- Factory installed medium voltage terminations – standard or customized to meet your specific requirements.
- Factory installed load break elbows.
- Cut, packaged and shipped ready for installation.

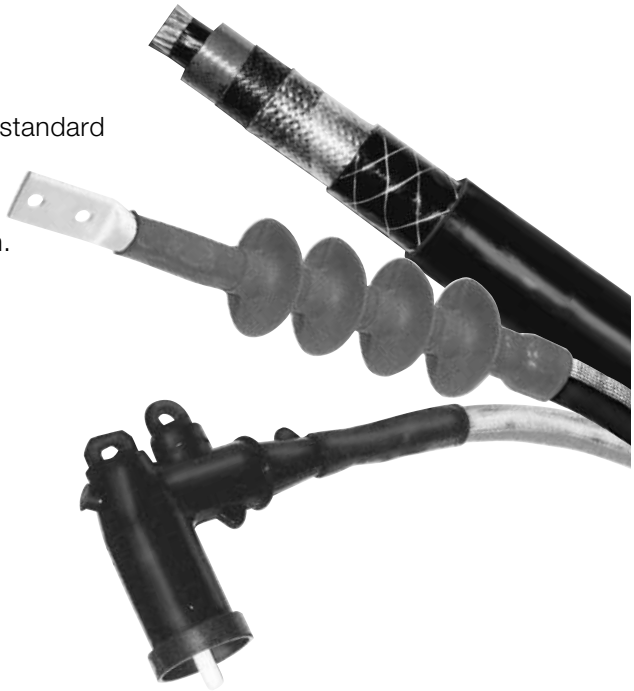
AVAILABLE 2 AWG TO 750 MCM

5kV	15kV	25kV	35kV
YELLOW	ORANGE	RED	BLACK

**35kv is NOT CSA approved*

APPLICATIONS

- Mobile substation equipment.
- Anywhere a flexible medium voltage cable is needed.
- Other series and colors available through our Engineered Products Department.

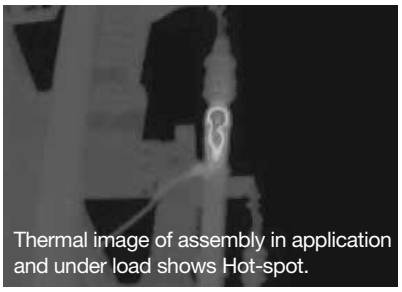


MEDIUM VOLTAGE CABLE ASSEMBLY TESTING

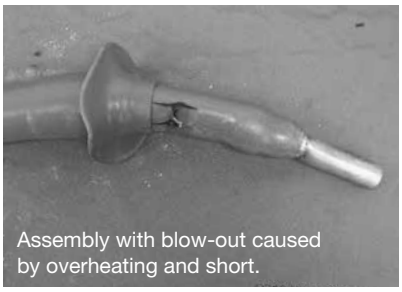
TPC Wire & Cable Corp. tests all Medium and High Voltage assemblies prior to leaving our facility. All assemblies are tested in accordance with the ANSI/NEMA WC 58-2008, 6.17 electrical test requirements. A full testing report is provided to certify the testing and to ensure the highest quality workmanship and traceability of the ready to install assembly.

Damaging an assembly is easy to do but hard to detect until it is too late. ***TPC provides 100% AC or DC Hi-pot testing on all assemblies before they leave our facility – giving you 100% peace of mind.***

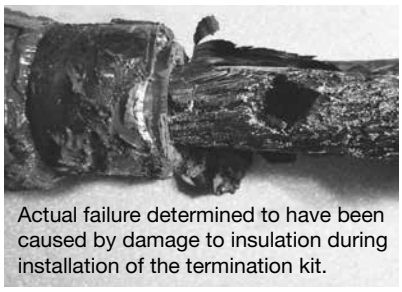
AVOID UNTESTED CABLE ASSEMBLIES



Thermal image of assembly in application and under load shows Hot-spot.



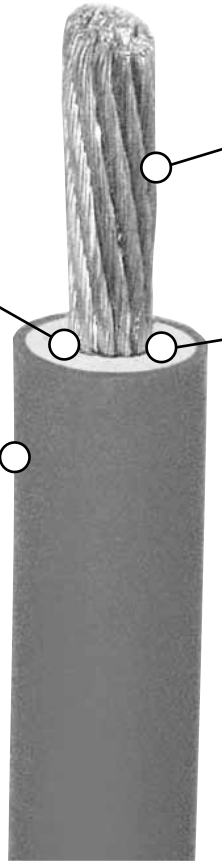
Assembly with blow-out caused by overheating and short.



Actual failure determined to have been caused by damage to insulation during installation of the termination kit.

Unshielded Jumper Cable

• 90°C • 5,000/15,000 Volts



EXTRUDED SEMI-CONDUCTIVE EPR INSULATION
Heat resistant, 90°C EPR insulation provides excellent dielectric properties and resists moisture and ozone.

THERMOSET JACKET
Rated to 90°C and provides excellent protection from abrasion, tearing, impact and most chemicals.

EXTRA FLEXIBLE TINNED COPPER CONDUCTORS
Extends the flex life of this cable in abusive applications. Tinned copper resists corrosion.

SEMI-CONDUCTIVE TAPE
Placed directly over the tinned copper conductor the semi-conductive tape prevents the insulation compound from bonding to the conductor, this makes the product easier to strip and terminate.

Jumper cables should only be used on equipment and in applications where an unshielded flexible medium voltage cable is required. Caution should be taken to limit access to these areas and cables to authorized properly trained personnel. Since these cables are not shielded, they must be positioned away from contact with grounds, transformer cases, etc., to avoid possible high stress and capacitance leakage. Jumper cables are intended for temporary use and should not be used in place of shielded medium voltage cables.

ORDERING INFORMATION *(Call for pricing & availability)*

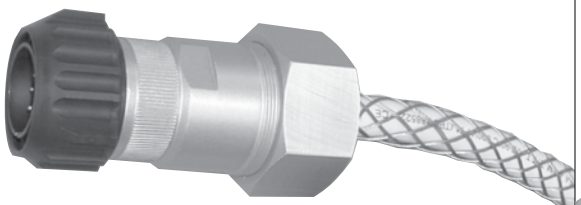
PART NO.	CONDUCTOR SIZE	CONDUCTOR STRANDING	AMPACITY (1)	INSULATION THICKNESS (IN.)	JACKET THICKNESS (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
78006	6	133	110	0.210	0.065	0.820	360
78004	4	259	145	0.210	0.065	0.880	449
78002	2	259	190	0.210	0.065	0.940	563
78010	1/0	266	260	0.210	0.065	1.05	742
78020	2/0	323	300	0.210	0.065	1.08	869
78040	4/0	532	400	0.210	0.065	1.22	1181
78350	350	888	550	0.210	0.065	1.34	1692
78500	500	1221	685	0.210	0.065	1.46	2192

Add a Connector to Any Cable Order!

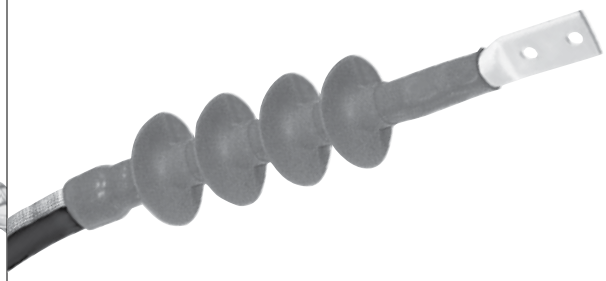
MOLDED CIRCULAR CONNECTORS

MOLDED SINGLE POLE CAM-TYPE

HDLC ASSEMBLIES



TYPE SH TERMINATION



MILITARY ASSEMBLIES

HEAVY DUTY LUG TERMINATION

RECTANGULAR ASSEMBLIES

CUSTOM DESIGNED

See Pages 180 – 220 for Additional Details.

TREX-ONICS®

ELECTRONIC AND ELECTRICAL CABLE

Trex-Onics®

Family of Electronic and Electrical Cable

TREX-ONICS JACKET CHEMICAL RESISTANCE

ACIDS

Acetic, 5% ..... Good
Formic, 20% ..... Variable
Hydrochloric, 10% ..... Fair
Olcic..... Fair-Good
Sulfuric, 20% ..... Fair

ALCOHOLS

Ethanol..... Variable
Isopropanol.....Fair-Poor
Isopropanol, 50% .....Fair-Poor
Methanol..... Variable

ALKALI

Sodium Hydroxide, 20%..... Fair

ORGANICS

Acetone .....Poor
ASTM Fuel A..... Good
ASTM Fuel B..... Fair
ASTM Fuel C.....Fair-Variable
ASTM Fuel #1 ..... Good
ASTM Fuel #2 ..... Good
ASTM Fuel #3 .....Good-Fair

ORGANICS (continued)

Benzene..... Variable
Brake Fluid Type A..... Variable
Brake Fluid (H.D.)..... Fair-Good
Butane ..... Good
Carbon Tetrachloride..... Variable
Cyclohexanone..... NR
Dimenthyl Formamid..... NR
Dimethyl Sulfoxide ..... NR
I, 4-Dioxane ..... NR
Dioctyl Phthalate..... Fair
Ethyl Ether..... Fair-Good
Ethylene Glycol ..... Good
Ethylene Glycol 50% Water ..... Good
Gasoline, 100 Octane..... Fair
HexaneFair-Good
Kerosene ..... Good
Methylene Chloride..... Variable
Methyl Ethyl Keytone ..... Variable
N-Methyl-2-Pyrrolidene ..... NR
Oil, Texas Crude ..... Fair-Good
Oil, Detergent 20W ..... Good
Oil, Non-Detergent 20W ..... Good
Oil, Skydrol Type B ..... NR

ORGANICS (continued)

Oil, Skydrol Type 500A .....Fair-Variable
Oil, Skydrol Type 500B.....Fair-Variable
Oil, Transmission Type A ..... Good
Perchlorethylene..... Variable
Pyridine..... NR
Tertrahydrofuran ..... NR
Toluene ..... Variable
Trichlorothylene..... Variable
Turpentine..... Good

MISCELLANEOUS

Chlorox (5%) ..... Good
Calcium Chloride Saturated Solution..... Good
FREON-113 ..... Variable
FREON-11B..... Variable
FREON-112 ..... Good
Hydrogen Disulfide (5%) .....Excellent
Sodium Chloride Saturated Solution ..... Good
Synthetic Perspiration..... Good
Tide (1%) ..... Good
Water ..... Good

CODING

EXCELLENT — Little or no change in constant exposure — application is recommended.
GOOD — Only slight loss in properties on constant exposure — application is recommended.
FAIR — Some swelling could occur in constant exposure but recommended for infrequent contact.
VARIABLE — In constant exposure not recommended. Infrequent contact recommended.
NR — Not recommended, product could deteriorate in moderate exposure.

CHEMICAL RESISTANCE OF COMMON INSULATING MATERIALS

CHEMICAL	RUBBER	SILICON	FLUOROPOLYMER
OXIDATION RESISTANCE	F	E	O
OIL RESISTANCE	P	F-G	O
UV RESISTANCE	F	O	O
WATER RESISTANCE	G	G-E	E
ACID RESISTANCE	F-G	F-G	E
ALKALI RESISTANCE	F-G	F-G	E
GASOLINE KEROSENE	P	P-F	E
BENZOL TOLUENE	P	P	E
DEGREASER SOLVENT	P	P-G	E
ALCOHOL RESISTANCE	G	G	E

O = OUTSTANDING E = EXCELLENT G = GOOD F = FAIR P = POOR

Reduced Diameter Extra Heavy-Duty Reeling Cable

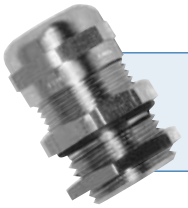
- **UL Registered**
- **cUL**
- **VW-1 Flame Rating**
- **600 V**
- **Max Conductor Temperature 90°C**
- **Cold Temperature Rating -50°C**
- **AWM**

TPE CONDUCTOR INSULATION

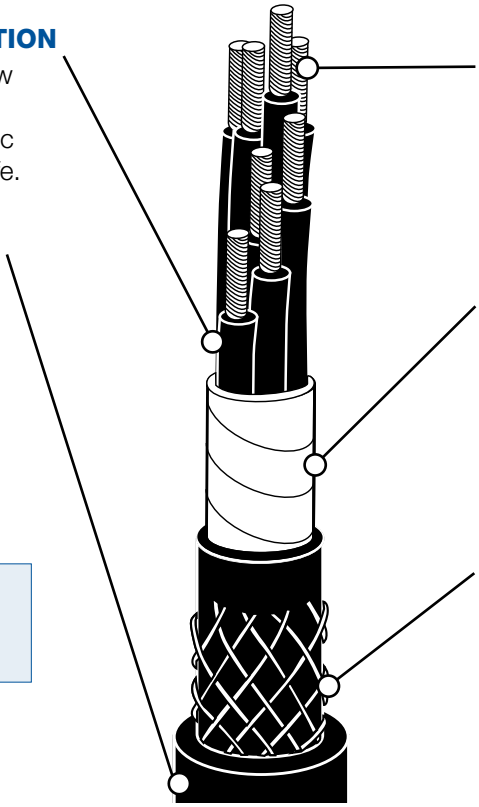
Superior dielectrics and very low coefficient of friction improves overall performance in dynamic reeling applications for longer life.

HEAVY-DUTY TPE JACKET

Superior first line defense against tearing, abrasion, oil, ozone, UV Exposure, as well as most chemicals. Flame and heat resistant. All weather flexibility.



ADD KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER! *See Pages 95-104.*



BUNCH STRANDED TINNED SOFT DRAWN COPPER CONDUCTORS

Longer flex life in flexing and twisting applications, Resist corrosion, easier to solder.

HIGH FLEX TAPE SEPARATOR

Fluoropolymer tape applied over the conductor layers improves the lubricity between the conductors, improving overall flexibility and performance in flexing applications.

REINFORCING ARAMID BRAID EMBEDDED IN JACKET

Reinforced with an aramid fiber braid for an additional 1800 lbs of tensile strength for tensile reeling applications.

APPLICATIONS

- Automatic Welders
- Broach Machines
- Control Circuits
- Cranes
- Festoon Systems
- Machine Tools
- Positioning Equipment
- Power Track Systems
- Remote Control of Electrical Equipment
- Sensing Equipment
- Transfer Vehicles

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND.	STRANDING NO. X AWG	AMPACITY (1)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
621606	16/6	65 x 34	14	0.496	140
621616	16/16	65 x 34	9	0.741	319
621620	16/20	65 x 34	9	0.808	389
621624	16/24	65 x 34	8	0.899	475
621408	14/8	41 x 30	17	0.678	270
621412	14/12	41 x 30	12	0.744	334
621416	14/16	41 x 30	12	0.812	420
621424	14/24	41 x 30	11	1.048	673
621437	14/37	41 x 30	9	1.235	959
621206	12/6	65 x 30	24	0.655	277
621208	12/8	65 x 30	21	0.743	363
621212	12/12	65 x 30	15	0.818	459
621214	12/14	65 x 30	15	0.855	521
621230	12/30	65 x 30	13	1.239	1104

NOTE: (1) Ampacity based on NEC Table 310.16, 90°C Rated Conductors.

Variable Frequency Drive Shielded Power Cable

In cat track testing VFD cable completed over **5** million cycles without electrical failure!

- **CSA – 1000 Volt**
- **CSA – FT-4**
- **TC-ER – 600 Volt**
- **Corona Resistant to 2000 VAC**
- **RoHS Compliant**
- **Sunlight & Oil Resistant**
- **90°C**

FINELY STRANDED COPPER CONDUCTORS

Improves flexibility and extends conductor life in dynamic applications. Conductors are alpha-numerically marked for ease of identification.

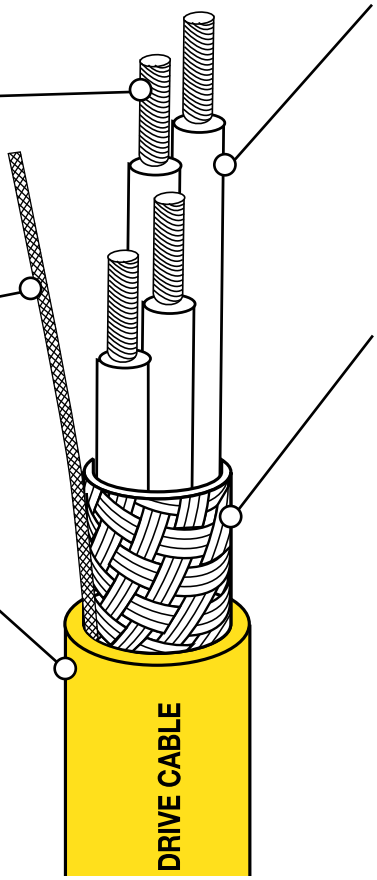
FLAT BRAID DRAIN WIRE

FILLERS

Low friction, non-wicking fillers provide increased flexibility in dynamic applications.

SPECIALLY COMPOUNDED SECURITY YELLOW *TREX-ONICS*® TPE JACKET

Superior first line defense against oil, ozone, UV exposure, as well as most chemicals. Flame and heat resistant. All-weather flexibility.



OIL RESISTANT COMPOSITE INSULATION SYSTEM

High dielectric, tensile and mechanical properties. Designed with a semi-conductive layer to protect against Corona discharge build up from voltage spikes during operation. Prevents damage to motor and controllers.

HEAVY DUTY 95% COVERAGE OF TINNED COPPER BRAID

Provides a shield against EM and RF noise and interference, and a low impedance path to ground. Protects equipment and motor damage from electrical noise and "stray voltage". Designed for superior performance in moving applications.

COLOR CODE	
CONDUCTOR	**BASE COLOR**
1	Black
2	Black
3	Black
4	Green/Yellow

APPLICATIONS

AC Variable Frequency Drives are more prevalent today as the advantages of this technology have become better understood. The most common method of controlling VFD motors is the use of Pulse Width Modulation (PWM), a method where the frequency or pulse width of the drive signal is controlled to vary the motor speed. The issues associated with VFD systems are high switching speeds (10 KHz and higher) which generate electrical noise, corona discharge and "stray voltages". The generation of electrical noise, corona and "stray voltages" are potentially damaging to the motor and equipment if a non VFD or "drive rated" cable is installed. For this reason, TPC has designed a high performance VFD cable for dynamic industrial applications that reduces the effects of electrical noise and corona discharge, while providing a low impedance path to ground to eliminate the potential damage caused by "stray voltages".

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG	STRANDING	AMPACITY (1)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'	DRAIN WIRE AWG
60040	16/4	65 x 34	18	0.465	145	18
60041	14/4	105 x 34	25	0.509	158	16
60042	12/4	165 x 34	30	0.606	247	14
60043	10/4	105 x 30	40	0.683	308	14
60044	8/4	168 x 30	55	0.887	528	14
60045	6/4	266 x 30	75	1.020	753	14
60046	4/4	413 x 30	95	1.190	1083	14

NOTE: (1) Ambient temperature of 30°C, conductor temperature of 90°C, not more than three current-carrying conductors. Based on NEC 2011, Table 310.15(B)(16).

Variable Frequency Drive
Shielded Power Cable with Brake & Signal Pairs

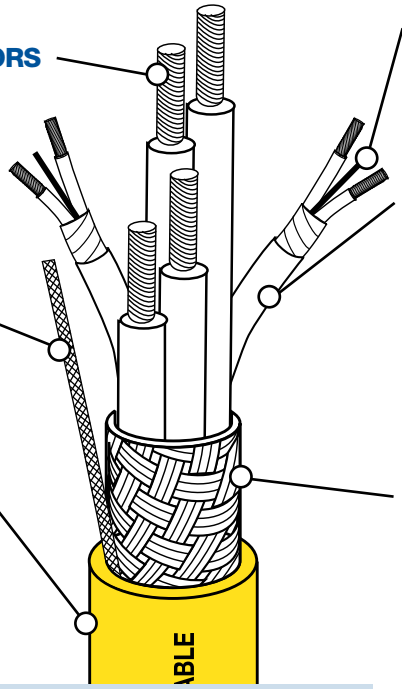
In cat track testing VFD cable completed over **5** million cycles without electrical failure!

- CSA – 1000 Volt
- CSA – FT-4
- TC-ER – 600 Volt
- Corona Resistant to 2000 VAC
- RoHS Compliant
- Sunlight & Oil Resistant
- 90°C

FINELY STRANDED COPPER CONDUCTORS
Improves flexibility and extends conductor life in dynamic applications. Conductors are alpha-numerically marked for ease of identification.

FLAT BRAID DRAIN WIRE

SPECIALLY COMPOUNDED SECURITY YELLOW *TREX-ONICS*® TPE JACKET
Superior first line defense against oil, ozone, UV exposure, as well as most chemicals. Flame and heat resistant. All-weather flexibility.



BRAKE AND SIGNAL PAIRS
Aluminum/Mylar foil shielded pairs provide 100% shielding.

OIL RESISTANT COMPOSITE INSULATION SYSTEM
High dielectric, tensile and mechanical properties. Designed with a semi-conductive layer to protect against Corona discharge build up from voltage spikes during operation. Prevents damage to motor and controllers.

HEAVY DUTY 95% COVERAGE OF TINNED COPPER BRAID
Provides a shield against EM and RF noise and interference, and a low impedance path to ground. Protects equipment and motor damage from electrical noise and "stray voltage". Designed for superior performance in moving applications.

FILLERS
Low friction, non-wicking fillers provide increased flexibility in dynamic applications.

COLOR CODE	
CONDUCTOR	**BASE COLOR**
1	Black
2	Black
3	Black
4	Green/Yellow

Pairs Identified Alpha Numerically
BLACK with **WHITE** print
PAIR #1 = 5+6
PAIR #2 = 7+8

ORDERING INFORMATION *(Call for pricing & availability)*

SINGLE PAIR

PART NO.	POWER CONDUCTOR				BRAKE & SIGNAL PAIRS			JACKET THICKNESS (IN.)	NOMINAL O.D.	WT. (LBS.) PER 1000'
	AWG/ COND.	STRANDING	AMPACITY (1)	OVERALL DRAIN	AWG/ NO. PAIRS	STRANDING	DRAIN WIRES			
60021	14/4	105x34	25	16	16/1	65x34	18	0.070	0.620	215
60023	12/4	165x34	30	14	16/1	65x34	18	0.070	0.670	310
60025	10/4	105x30	40	14	16/1	65x34	18	0.070	0.760	420
60026	8/4	168x30	55	14	16/1	65x34	18	0.090	0.940	617
60027	6/4	266x30	75	14	16/1	65x34	18	0.090	1.050	825
60096	4/4	1050x34	67	18	14/1	105x30	16	0.115	1.390	1450

TWO PAIR

PART NO.	POWER CONDUCTOR				BRAKE & SIGNAL PAIRS			JACKET THICKNESS (IN.)	NOMINAL O.D.	WT. (LBS.) PER 1000'
	AWG/ COND.	STRANDING	AMPACITY (1)	OVERALL DRAIN	AWG/ NO. PAIRS	STRANDING	DRAIN WIRES			
60028	14/4	105x34	25	16	16/2	65x34	18	0.070	0.695	280
60029	12/4	165x34	30	14	16/2	65x34	18	0.070	0.745	370
60030	10/4	105x30	40	14	16/2	65x34	18	0.070	0.860	505
60031	8/4	168x30	55	14	16/2	65x34	18	0.090	1.000	800
60032	6/4	266x30	75	14	16/2	65x34	18	0.090	1.110	1175

NOTE: (1) Ambient temperature of 30°C, conductor temperature of 90°C, not more than three current-carrying conductors. Based on NEC 2011, Table 310.15(B)(16).

Communication/Instrumentation Low Capacitance Cable

- 300 Volt
- UL Recognized 80˚C
- RoHS Compliant
- EIA RS-232/422/485
- Digital Communications
- VW-1
- 13pF/ft

FINELY STRANDED BARE COPPER CONDUCTORS

Finely stranded copper conductors improve flexibility. The bare copper conductor offers maximum conductivity.

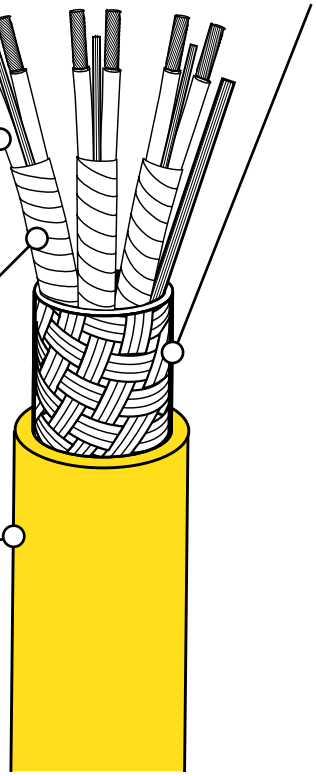
FOAM INSULATION ON INDIVIDUAL CONDUCTORS

Foam polyethylene insulation on individual conductors provides a low dielectric constant to maintain a low capacitance value between conductors.

INDIVIDUALLY TWISTED SHIELDED PAIRS

SECURITY YELLOW HEAVY-DUTY POLYURETHANE JACKET

Security yellow heavy-duty polyurethane jacket provides excellent protection against cutting, abrasion, oil and chemicals.



HEAVY DUTY COMBINATION OF TINNED COPPER BRAID AND ALUMINUM/POLYESTER FOIL SHIELD

Combination of tinned copper braid and aluminum/polyester foil shield provides 100% shielding protection from EM and RF interference. Finely stranded braid provides superior flexibility and mechanical strength.

COLOR CODE	
PAIR NO.	**COLOR**
1	Black - Red
2	Black - White
3	Black - Green
4	Black - Blue
5	Black - Yellow
6	Black - Brown
7	Black - Orange
8	Red - White
9	Red - Green
10	Red - Blue
11	Red - Yellow
12	Red - Brown

Trex-Onics Low Capacitance Cable has been designed for use in Heavy Duty Industrial environments where a superior Low Capacitance Cable design is required. TPC's Low Capacitance Cable has been designed to provide superior protection against abrasion, oil and chemicals. The cable is also designed to limit capacitance to 13pF/ft and provide 100% shielding protection from EMI and RF interference.

Electrical Characteristics

Voltage	300 Volts
Capacitance	13.0 pF/Ft @ 1 MHz – between conductors
DC Resistance	25.38 Ohms/1000 Ft @ 20° C Nominal
Characteristic Impedance	115 Ohms ± 16 Ohms
Propagation Delay	2.03 nsec/Ft (Max)

APPLICATIONS

- Tachometers
- Computers
- Control Circuits
- Instrumentation
- High Speed Digital/Analog Communications
- Encoders/Resolvers

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE AWG/ NO. PAIRS	CONDUCTOR STRANDING	AMPACITY (1)	INSULATION THICK. (IN.)	IND. PAIRS DRAIN WIRE	OVERALL DRAIN WIRE	JACKET THICK. (IN.)	NOMINAL DIA. (IN.)	WT. (LBS.) PER 1000'
68902	24/2	19/36	1.6	0.028	26 AWG	26 AWG	0.035	0.364	64
68903	24/3	19/36	1.4	0.028	26 AWG	26 AWG	0.035	0.386	72
68904	24/4	19/36	1.4	0.028	26 AWG	26 AWG	0.035	0.428	91
68906	24/6	19/36	1.4	0.028	26 AWG	26 AWG	0.035	0.509	118
68909	24/9	19/36	1.0	0.028	26 AWG	26 AWG	0.035	0.639	164
68910	24/10	19/36	1.0	0.028	26 AWG	26 AWG	0.035	0.639	170
68912	24/12	19/36	1.0	0.028	26 AWG	26 AWG	0.035	0.639	175

NOTE: (1) Based on 20°C ambient, 80°C Conductor Temperature, single cable in open air.

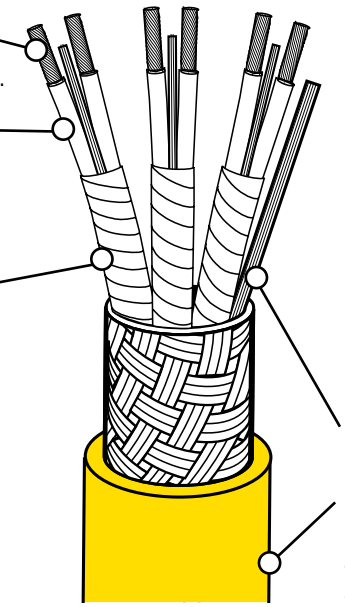
300 Volt Individually Shielded Encoder/ Resolver & Intrinsically Safe Cable

- UL Recognized 90°C
- CSA Certified 80°C
- VW-1
- FT-2
- 300 Volt
- RoHS Compliant

FINELY STRANDED TINNED COPPER CONDUCTORS
Improves flexibility and extends conductor life.

FLUOROPOLYMER INSULATION ON INDIVIDUAL CONDUCTORS
Offers superior resistance to oil, solvents and chemicals. Provides high dielectric capability, mechanical strength and cut resistance.

HEAVY DUTY COMBINATION OF TINNED COPPER BRAID AND ALUMINUM/POLYESTER FOIL SHIELD
Shielding combination provides 100% protection from EM and RF interference. Finely stranded braid provides superior flexibility and mechanical strength.



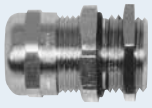
DRAIN WIRE

HEAVY-DUTY POLYURETHANE JACKET
Provides excellent protection against cutting, abrasion, oil and chemicals. Available in Security Yellow or Intrinsically Safe Blue.

APPLICATIONS

- Encoders/Resolvers
- Bar Code Readers
- Control Circuits
- Heat, Pressure, Flow Meters
- Instrumentation
- Load Cell Monitors
- Programmable Controllers
- Programmable Limit Switches
- Proximity Switches
- Servo Motors
- Tachometers
- Variable Speed Motors
- General Analog Applications

ADD AN EMI SHIELDED GRIP-SEAL™ TO COMPLETE YOUR ORDER!
See Page 100.



COLOR CODE	
PAIR NO.	COLOR
1	Black - Red
2	Black - White
3	Black - Green
4	Black - Blue
5	Black - Brown
6	Black - Yellow
7	Black - Orange
8	Red - Green
9	Red - White

ELECTRICAL CHARACTERISTICS

AWG	NOM. IMPEDANCE (OHMS)	NOM. CAPACITANCE pF/FT. (COND-COND)	NOM. CAPACITANCE pF/FT. (COND-SHLD)	NOM. INDUCTANCE (MH/FT.)
24	55	36.5	65.7	0.188
22	40	41.2	74.2	0.180
20	35	45.5	81.4	0.172

ORDERING INFORMATION *(Call for pricing & availability)*

Intrinsically safe circuits are designed to limit electrical and thermal energy to levels below what is necessary to ignite a flammable atmosphere. Reference NEC 2011, Article 504 when wiring Intrinsically Safe circuits.

PART NO.		COND. SIZE	CONDUCTOR	AMPACITY	INSULATION	IND. PAIRS	OVERALL	JACKET	NOMINAL	WT. (LBS.)
YELLOW	BLUE	AWG/PAIRS	STRANDING	(1)	THICK (IN.)	DRAIN WIRE	DRAIN WIRE	THICK (IN.)	DIA. (IN.)	PER 1000'
68809	68809B	24/9	19/36	4	0.006	26 AWG	26 AWG	0.045	0.400	97
68807	68807B	24/7	19/36	4	0.006	26 AWG	26 AWG	0.045	0.330	68
68806	68806B	24/6	19/36	6	0.006	26 AWG	26 AWG	0.045	0.330	64
68804	68804B	24/4	19/36	7	0.006	26 AWG	26 AWG	0.045	0.300	48
68803	68803B	24/3	19/36	7	0.006	26 AWG	26 AWG	0.045	0.265	42
68802	68802B	24/2	19/36	8	0.006	26 AWG	26 AWG	0.045	0.275	33
68709	68709B	22/9	19/34	6	0.006	24 AWG	24 AWG	0.045	0.450	138
68707	68707B	22/7	19/34	6	0.006	24 AWG	24 AWG	0.045	0.370	92
68706	68706B	22/6	19/34	8	0.006	24 AWG	24 AWG	0.045	0.370	86
68704	68704B	22/4	19/34	9	0.006	24 AWG	24 AWG	0.045	0.315	62
68703	68703B	22/3	19/34	9	0.006	24 AWG	24 AWG	0.045	0.300	52
68702	68702B	22/2	19/34	11	0.006	24 AWG	24 AWG	0.045	0.275	43
68609	68609B	20/9	19/32	6	0.006	22 AWG	22 AWG	0.045	0.500	189
68607	68607B	20/7	19/32	7	0.006	22 AWG	22 AWG	0.045	0.410	125
68606	68606B	20/6	19/32	7	0.006	22 AWG	22 AWG	0.045	0.410	117
68604	68604B	20/4	19/32	10	0.006	22 AWG	22 AWG	0.045	0.350	83
68603	68603B	20/3	19/32	10	0.006	22 AWG	22 AWG	0.045	0.315	66
68602	68602B	20/2	19/32	13	0.006	22 AWG	22 AWG	0.045	0.305	53

NOTE: (1) Ampacities are based on 30°C ambient and 90°C conductor temperature. These values are to be used as a guideline and may vary according to the actual cable application.

TPC WIRE & CABLE CORP. • USA 800-521-7935 • CANADA 800-545-0122 • MEXICO 001-877-283-1696

Overall Shielded Continuous Flex Multi-Conductor Cable

- 90°C UL
- 80°C CSA
- MSHA Approved
- RoHS Compliant
- Designed for Continuous Flex Applications
- 600 Volt

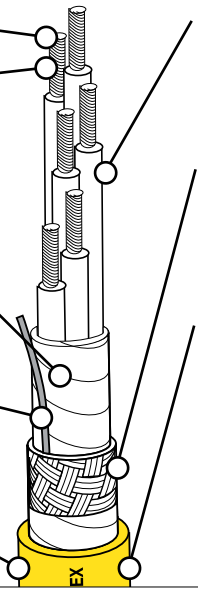
BUNCH STRANDED SOFT DRAWN COPPER
Longer flex life in flexing and twisting applications.

FINELY STRANDED TINNED COPPER CONDUCTORS
Improves flexibility and extends flex life.

FLUOROPOLYMER OVER-WRAP
Acts as a flex-facilitator, allowing the conductors to slide smoothly under the braid shield in dynamic applications. Protects the conductors from abrasion, improving flex life.

FLAT TINNED DRAIN WIRE

SECURITY YELLOW HEAVY-DUTY POLYURETHANE TPE JACKET
Provides superior first-line defense against industrial and environmental abuse. Resists tearing, abrasion, oil, ozone and most chemicals. UV resistant.



FLUOROPOLYMER INSULATION
Offers superior resistance to oil, solvents and chemicals. Provides high dielectric capability, mechanical strength and cut resistance.

ULTRA-SHIELD™ CONSTRUCTION, A HEAVY-DUTY TINNED COPPER BRAID
Shielding provides a minimum of 85% protection from EM and RF interference in addition to superior mechanical strength in industrial applications.

WOVEN NYLON TAPE
Improves flexibility, allows the conductor bundle to move easily within the jacket for longer flex life.

38 MILLION
In cat track testing TPC Continuous Flex products exceeded 38,000,000 cycles without electrical failure

ORDERING INFORMATION

PART NO.	CABLE AWG/COND	STRANDING NO./AWG	AMPACITY (1)	DRAIN WIRE	NOMINAL O.D. (IN.)	INSULATION THICKNESS (IN.)	WT. (LBS.) PER 1000'
61609	24/9	19/36	4.9	24 AWG	0.300	0.010	51
61606	24/6	19/36	5.6	24 AWG	0.255	0.010	41
61604	24/4	19/36	5.6	24 AWG	0.225	0.010	32
61602	24/2	19/36	7.0	24 AWG	0.210	0.010	28
61526	20/26	26/34	4.9	22 AWG	0.500	0.010	196
61524	20/24	26/34	4.9	22 AWG	0.495	0.010	192
61518	20/18	26/34	5.5	22 AWG	0.430	0.010	148
61512	20/12	26/34	5.5	22 AWG	0.375	0.010	110
61509	20/9	26/34	7.7	22 AWG	0.360	0.010	89
61506	20/6	26/34	8.8	22 AWG	0.290	0.010	68
61502	20/2	26/34	11.0	22 AWG	0.235	0.010	40
61465	18/65	41/34	4.9	20 AWG	0.980	0.010	628
61449	18/49	41/34	4.9	20 AWG	0.875	0.010	496
61433	18/33	41/34	5.6	20 AWG	0.615	0.010	322
61424	18/24	41/34	6.3	20 AWG	0.560	0.010	265
61418	18/18	41/34	7.0	20 AWG	0.485	0.010	210
61412	18/12	41/34	7.0	20 AWG	0.415	0.010	145
61409	18/9	41/34	9.8	20 AWG	0.400	0.010	110
61406	18/6	41/34	11.2	20 AWG	0.320	0.010	88
61404	18/4	41/34	11.2	20 AWG	0.280	0.010	58
61403	18/3	41/34	14.0	20 AWG	0.265	0.010	54
61402	18/2	41/34	14.0	20 AWG	0.250	0.010	50
61731	16/31	65/34	7.2	20 AWG	0.655	0.010	412
61725	16/25	65/34	8.0	20 AWG	0.640	0.010	360
61719	16/19	65/34	9.0	20 AWG	0.575	0.010	286
61712	16/12	65/34	9.0	20 AWG	0.465	0.010	185
61709	16/9	65/34	12.6	20 AWG	0.435	0.010	158
61705	16/5	65/34	14.4	20 AWG	0.385	0.010	110
61703	16/3	65/34	18.0	20 AWG	0.290	0.010	85
61340	14/10	105/34	12.5	20 AWG	0.515	0.010	260

NOTE: (1) Ampacities are based on 30°C ambient and 90°C conductor temperature. These values are to be used as a guideline and may vary according to the actual cable application.

(continued from previous page)

Overall Shielded Continuous Flex Multi-Conductor Cable

APPLICATIONS

- Cat Tracks
- Computer Interface
- Digital Remote Control
- Heat, Pressure and Flow Meters
- Instrumentation
- Load Cell Monitors
- Programmable Controllers
- Proximity Switches
- Programmable Limit Switches
- Robotic Applications
- Servo Motors
- Tachometers
- Telecommunications
- Torque-Tool Monitoring Equipment
- Variable Speed Motors

SPECIFICATIONS

TREX-ONICS MULTI-CONDUCTOR	
1. Black	34. Black/White/Orange
2. White	35. White/Red/Orange
3. Red	36. Orange/White/Blue
4. Green	37. White/Red/Blue
5. Orange	38. Black/White/Green
6. Blue	39. White/Black/Green
7. White/Black	40. Red/White/Green
8. Red/Black	41. Green/White/Blue
9. Green/Black	42. Orange/Red/Green
10. Orange/Black	43. Blue/Red/Green
11. Blue/Black	44. Black/White/Blue
12. Black/White	45. White/Black/Blue
13. Red/White	46. Red/White/Blue
14. Green/White	47. Green/Orange/Red
15. Blue/White	48. Orange/Red/Blue
16. Black/Red	49. Blue/Red/Orange
17. White/Red	50. Black/Orange/Red
18. Orange/Red	51. White/Black/Orange
19. Blue/Red	52. Red/Orange/Black
20. Red/Green	53. Green/Red/Blue
21. Orange/Green	54. Orange/Black/Blue
22. Black/White/Red	55. Blue/Black/Orange
23. White/Black/Red	56. Black/Orange/Green
24. Red/Black/White	57. White/Orange/Green
25. Green/Black/White	58. Red/Orange/Green
26. Orange/Black/White	59. Green/Black/Blue
27. Blue/Black/White	60. Orange/Green/Blue
28. Black/Red/Green	61. Blue/Green/Orange
29. White/Red/Green	62. Black/Red/Blue
30. Red/Black/Green	63. White/Orange/Blue
31. Green/Black/Orange	64. Red/Black/Blue
32. Orange/Black/Green	65. Green/Orange/Blue
33. Blue/White/Orange	

ADD AN EMI SHIELDED GRIP-SEAL™ TO COMPLETE YOUR ORDER!

See Page 100.

CHEMICAL RESISTANCE OF COMMON INSULATING MATERIALS

CHEMICAL	RUBBER	SILICON	FLUOROPOLYMER
OXIDATION RESISTANCE	F	E	O
OIL RESISTANCE	P	F-G	O
UV RESISTANCE	F	O	O
WATER RESISTANCE	G	G-E	E
ACID RESISTANCE	F-G	F-G	E
ALKALI RESISTANCE	F-G	F-G	E
GASOLINE KEROSENE	P	P-F	E
BENZOL TOLUENE	P	P	E
DEGREASER SOLVENT	P	P-G	E
ALCOHOL RESISTANCE	G	G	E

O = OUTSTANDING E = EXCELLENT G = GOOD F = FAIR P = POOR

ELECTRICAL CHARACTERISTICS

PART NO.	NOM. IMPEDANCE (PER 1,000 FT.)	NOM. CAPACITANCE (COND-COND)	NOM. CAPACITANCE (COND-SHLD)
61609	69	24	42.5
61606	69	24	42.5
61604	69	24	42.5
61602	69	24	42.5
61524	53	31.5	56
61518	53	31.5	56
61512	53	31.5	56
61509	53	31.5	56
61506	53	31.5	56
61502	53	31.5	56
61424	47	35	62
61418	47	35	62
61412	47	35	62
61409	47	35	62
61406	47	35	62
61404	47	35	62
61402	47	35	62
61731	37.5	44	79.2
61725	37.5	44	79.2
61719	37.5	44	79.2
61712	37.5	44	79.2
61709	37.5	44	79.2
61705	37.5	44	79.2

These values are to be used as a guideline and may vary according to the actual cable application.

Individually Shielded, Multi-Pair Control Cable

- 90°C UL
- 80°C CSA
- MSHA Approved
- 600 Volt
- RoHS Compliant
- -40°C Jacket

FLUOROPOLYMER INSULATION ON INDIVIDUAL CONDUCTORS

Offers superior resistance to oil, solvents and chemicals. Provides high dielectric capability, mechanical strength and cut resistance.

UNIQUE COLOR CODE FOR EACH PAIR

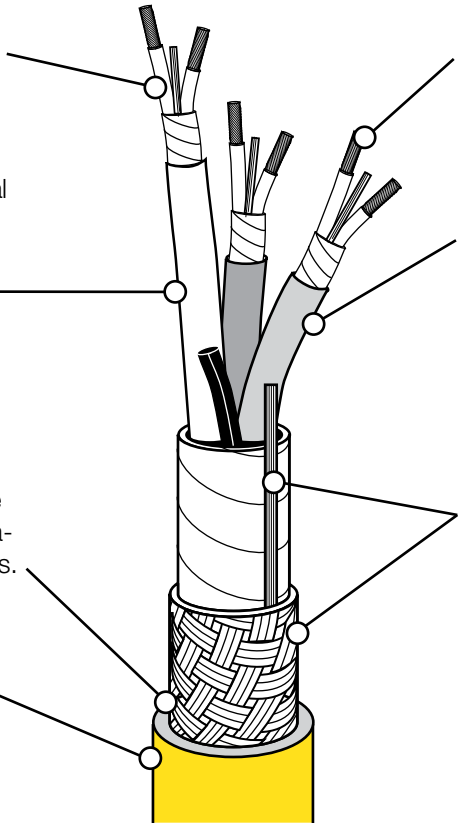
FEP coated pairs are color coded for ease of identification.

CABLE BONDED DESIGN

Jacket adheres to braid to reduce conductor movement and elongation in flexing or reeling applications.

SECURITY YELLOW HEAVY-DUTY POLYURETHANE TPE JACKET

Excellent defense against cutting, abrasion, oil and chemicals.



FINELY STRANDED TINNED COPPER CONDUCTORS

Improves flexibility and extends conductor life.

INDIVIDUALLY TWISTED SHIELDED PAIRS PROTECTED WITH FEP "OVERCOAT"

Unique "overcoat" design helps maintain shield integrity on the pairs in flexing applications.

ULTRA-SHIELD™ CONSTRUCTION, A HEAVY-DUTY COMBINATION OF TINNED COPPER BRAID, ALUMINUM/POLYESTER FOIL SHIELD AND TINNED DRAIN WIRE

100% shielding provides protection from EM and RF interference. Finely stranded braid provides superior mechanical strength.

18 MILLION — Tested to over 18,000,000 cycles without electrical failure

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	COND. SIZE AWG	NO. OF PAIRS	CONDUCTOR STRANDING	AMPACITY (1)	INSULATION THICK. (IN.)	IND. PAIRS DRAIN WIRE	OVERALL DRAIN WIRE	JACKET THICK. (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
68412	24	12	19/36	5.0	0.010	26 AWG	26 AWG	0.070	0.60	215
68409	24	9	19/36	5.0	0.010	26 AWG	26 AWG	0.065	0.57	160
68406	24	6	19/36	7.0	0.010	26 AWG	26 AWG	0.060	0.47	126
68404	24	4	19/36	7.0	0.010	26 AWG	26 AWG	0.055	0.39	86
68403	24	3	19/36	7.0	0.010	26 AWG	26 AWG	0.050	0.36	79
68402	24	2	19/36	8.0	0.010	26 AWG	26 AWG	0.045	0.33	62
68518	20	18	19/32	6.0	0.010	22 AWG	22 AWG	0.080	0.85	275
68512	20	12	19/32	6.0	0.010	22 AWG	22 AWG	0.075	0.73	264
68509	20	9	19/32	7.0	0.010	22 AWG	22 AWG	0.070	0.72	247
68506	20	6	19/32	7.0	0.010	22 AWG	22 AWG	0.060	0.57	161
68504	20	4	19/32	9.0	0.010	22 AWG	22 AWG	0.055	0.48	118
68503	20	3	19/32	11.0	0.010	22 AWG	22 AWG	0.050	0.43	92
68502	20	2	19/32	13.0	0.010	22 AWG	22 AWG	0.050	0.41	74
68312	18	12	19/30	12.0	0.010	20 AWG	20 AWG	0.080	0.84	405
68309	18	9	19/30	12.0	0.010	20 AWG	20 AWG	0.080	0.79	320
68306	18	6	19/30	16.0	0.010	20 AWG	20 AWG	0.075	0.65	245
68304	18	4	19/30	16.0	0.010	20 AWG	20 AWG	0.065	0.54	163
68303	18	3	19/30	16.0	0.010	20 AWG	20 AWG	0.060	0.49	142
68302	18	2	19/30	19.0	0.010	20 AWG	20 AWG	0.060	0.44	110

NOTE: (1) Ampacities are based on 30°C ambient and 90°C conductor temperature. These values are to be used as a guideline and may vary according to the actual cable application.

(continued from previous page)

Individually Shielded, Multi-Pair Control Cable

APPLICATIONS

- Computer Inter-Connections
- Bar Code Readers
- Computer Interfaces
- Control Circuits
- Data Transmissions
- Digital Remote Controls
- Heat Pressure and Flow Meters
- Programmable Limit Switches
- Programmable Controllers
- Encoders or Resolvers
- Instrumentation
- Load Cell Monitors
- Pendants
- Torque-Tool Monitoring Equipment
- Proximity Switches
- Servo Motors
- Tachometers
- Telecommunications
- Variable Speed Motors
- X-Ray Monitors

SPECIFICATIONS

ELECTRICAL CHARACTERISTICS

PART NO.	NOMINAL IMPEDANCE (PER 1,000 FT.)	NOMINAL CAPACITANCE (COND-COND)	NOMINAL CAPACITANCE (COND-SHLD)
68412	59	30	53
68409	59	30	53
68406	59	30	53
68404	69	24	42.5
68403	69	24	42.5
68402	69	24	42.5
68512	45	35	33
68509	45	35	33
68506	45	35	33
68504	45	35	33
68503	45	35	33
68502	45	35	33
68312	47	35	62
68309	47	35	62
68306	47	35	62
68304	47	35	62
68303	47	35	62
68302	47	35	62

These values are to be used as a guideline and may vary according to the actual cable application.

Trex-Onics Individually Shielded Paired Cables

This cable has been specifically designed for these types of applications:

1 Cat Track applications
2 Reeling applications
3 Drop Pendant applications
4 Robotic applications

Trex-Onics Individually Shielded Paired Products

The FEP pair overcoat colors for the individually shielded pairs are listed below and shall be made of 10 mils of FEP.

Pair No.	Color Code	FEP Overcoat Color
1	Black – Red	Black
2	Black – White	White
3	Black – Green	Red
4	Black – Blue	Green
5	Black – Brown	Orange
6	Black – Yellow	Blue
7	Black – Orange	Yellow
8	Red – Green	Brown
9	Red – White	Violet
10	Red – Blue	Gray
11	Red – Yellow	Pink
12	Red – Brown	Tan/Beige

Multi-Pair Control Cables

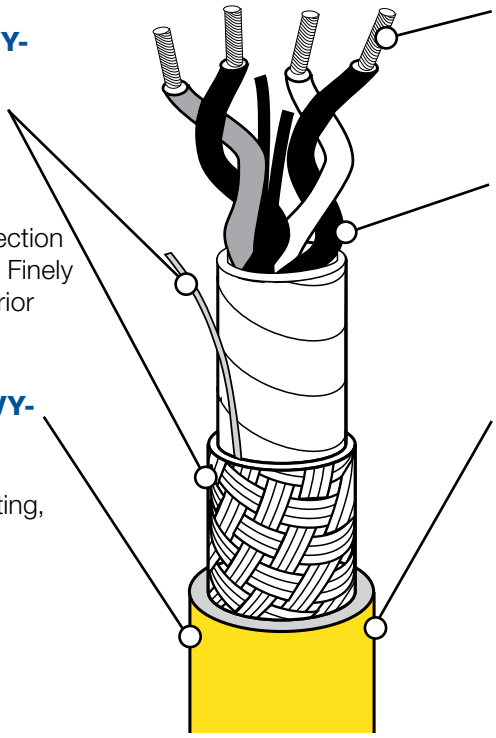
- 90°C UL
- 80°C CSA
- 600 Volt
- RoHS Compliant

ULTRA-SHIELD™ CONSTRUCTION, A HEAVY-DUTY COMBINATION OF TINNED COPPER BRAID, ALUMINUM/POLYESTER FOIL SHIELD AND TINNED DRAIN WIRE

100% shielding provides protection from EM and RF Interference. Finely stranded braid provides superior mechanical strength.

SECURITY YELLOW HEAVY-DUTY POLYURETHANE TPE JACKET

Excellent defense against cutting, abrasion, oil and chemicals.



FINELY STRANDED TINNED COPPER CONDUCTORS

Improves flexibility and extends conductor life.

FLUOROPOLYMER INSULATION

Offers superior resistance to oil, solvents and chemicals. Provides high dielectric capability, mechanical strength and cut resistance.

CABLE BONDED DESIGN

Jacket adheres to braid to reduce conductor movement and elongation in flexing or reeling applications.

Trex-Onics Multi-Paired Cables

This cable is recommended for static, non-moving applications.

APPLICATIONS

- Digital Remote Controls
- Bar Code Readers
- Computer Interfaces
- Pendants
- Instrumentation
- Programmable Controllers
- Load Cell Monitors
- Telecommunications
- Tachometers
- Proximity Switches
- Servo Motors
- Torque-Tool Monitoring Equipment
- Heat Pressure and Flow Meters
- Programmable Limit Switches
- Variable Speed Motors
- X-Ray Monitors

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	COND. SIZE AWG	NO. OF PAIRS	CONDUCTOR STRANDING	AMPACITY (1)	INSULATION THICK. (IN.)	OVERALL DRAIN WIRE	JACKET THICK. (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
66424	24	4	19/36	7.0	0.010	26 AWG	0.045	0.305	53
66312	20	12	19/32	8.0	0.010	22 AWG	0.070	0.600	225
66309	20	9	19/32	8.0	0.010	22 AWG	0.060	0.530	172
66306	20	6	19/32	11.0	0.010	22 AWG	0.060	0.450	130
66303	20	3	19/32	11.0	0.010	22 AWG	0.045	0.335	70
66302	20	2	19/32	13.0	0.010	22 AWG	0.045	0.335	66
66212	18	12	19/30	12.0	0.010	22 AWG	0.080	0.670	298
66209	18	9	19/30	12.0	0.010	22 AWG	0.070	0.610	240
66206	18	6	19/30	16.0	0.010	22 AWG	0.060	0.510	175
66204	18	4	19/30	16.0	0.010	22 AWG	0.055	0.420	110
66203	18	3	19/30	16.0	0.010	22 AWG	0.050	0.380	93
66202	18	2	19/30	19.0	0.010	22 AWG	0.050	0.380	88

NOTE: (1) Ampacities are based on 30˚C ambient and 90˚C conductor temperature. These values are to be used as a guideline and may vary according to the actual cable application.

(continued from previous page)

Multi-Pair Control Cables

SPECIFICATIONS

ELECTRICAL CHARACTERISTICS			
PART NO.	**NOMINAL IMPEDANCE** (PER 1,000 FT.)	**NOMINAL CAPACITANCE** (COND-COND)	**NOMINAL CAPACITANCE** (COND-SHLD)
66424	69	24	42.5
66312	53	31.5	56
66309	53	31.5	56
66306	53	31.5	56
66303	53	31.5	56
66302	53	31.5	56
66212	47	35	62
66209	47	35	62
66206	47	35	62
66204	47	35	62
66203	47	35	62
66202	47	35	62

These values are to be used as a guideline and may vary according to the actual cable application.

Trex-Onics Paired Conductor Colors

PAIR NO.	COLOR
1	Black - Red
2	Black - White
3	Black - Green
4	Black - Blue
5	Black - Yellow
6	Black - Brown
7	Black - Orange
8	Red - White
9	Red - Green
10	Red - Blue
11	Red - Yellow
12	Red - Brown

CHEMICAL RESISTANCE OF COMMON INSULATING MATERIALS			
CHEMICAL	**RUBBER**	**SILICON**	**FLUOROPOLYMER**
OXIDATION RESISTANCE	F	E	O
OIL RESISTANCE	P	F-G	O
UV RESISTANCE	F	O	O
WATER RESISTANCE	G	G-E	E
ACID RESISTANCE	F-G	F-G	E
ALKALI RESISTANCE	F-G	F-G	E
GASOLINE KEROSENE	P	P-F	E
BENZOL TOLUENE	P	P	E
DEGREASER SOLVENT	P	P-G	E
ALCOHOL RESISTANCE	G	G	E

O = OUTSTANDING E = EXCELLENT G = GOOD F = FAIR P = POOR

ADD KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER! *See Pages 95-104.*

High-Flex Ultra-Coil Retractiles

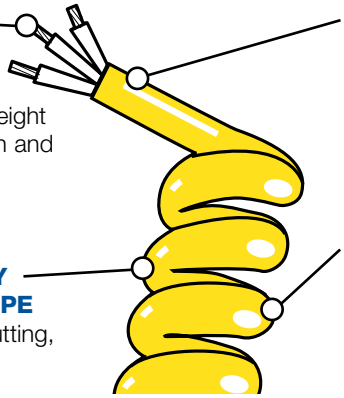
- UL Recognized 90°C
- 600 Volt
- 80°C
- RoHS Compliant

TINNED CONDUCTORS
Resists corrosion. Easier to solder.

UNIQUE CONSTRUCTION
Provides for a very durable but light weight retractile design. Superior coil retention and "snappiness".

PERFORMANCE DESIGNED
For continuous cycle applications.

SECURITY YELLOW HEAVY-DUTY TREX-ONICS® POLYURETHANE TPE JACKET Excellent defense against cutting, abrasion, oil and chemicals. Designed for long term coil retention.

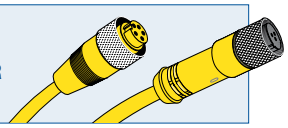


12" OR 24" PIGTAIL LEADS ON BOTH ENDS
Provides for easy termination without disrupting coil integrity.

QUICK-CONNECT™ COMPATIBLE DESIGN
Uniquely designed to allow the addition of TPC Molded Micro or Mini Quick-Connects in either 3 or 4 conductor configurations.

OIL AND FLUID RESISTANT INSULATION
Offers superior resistance to oil, solvents and chemicals. Provides high dielectric capability, mechanical strength and cut resistance.

ADD A TREX-ONICS® QUICK-CONNECT™ TO COMPLETE YOUR ORDER! *See Page 173.*



ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CORD SIZE AWG/COND	COIL LENGTH (FT.)	CONDUCTOR STRANDING	AMPACITY (1)	JACKET THICK. (IN.)	INSULATION THICK. (IN.)	NOMINAL O.D. (IN.)	COIL INNER DIA. (IN.)	COIL OUTTER DIA. (IN.)	LEAD LENGTH (IN.)
60831	18/3	1'-5'	41 x 34	10	0.050	0.012	0.270	0.60	1.10	12
60832	18/3	2'-10'	41 x 34	10	0.050	0.012	0.270	0.60	1.10	12
60833	18/3	3'-15'	41 x 34	10	0.050	0.012	0.270	0.60	1.10	12
60834	18/3	4'-20'	41 x 34	10	0.050	0.012	0.270	0.60	1.10	12
60841	18/4	1'-5'	41 x 34	10	0.050	0.012	0.290	0.60	1.10	12
60842	18/4	2'-10'	41 x 34	10	0.050	0.012	0.290	0.60	1.10	12
60843	18/4	3'-15'	41 x 34	10	0.050	0.012	0.290	0.60	1.10	12
60844	18/4	4'-20'	41 x 34	10	0.050	0.012	0.290	0.60	1.10	12
60871	18/12	1'-5'	41 x 34	5	0.065	0.016	0.475	0.75	1.60	12
60872	18/12	2'-10'	41 x 34	5	0.065	0.016	0.475	0.75	1.60	12
60873	18/12	3'-15'	41 x 34	5	0.065	0.016	0.475	0.75	1.60	12
60874	18/12	4'-20'	41 x 34	5	0.065	0.016	0.475	0.75	1.60	12
60631	16/3	1'-5'	65 x 34	16	0.050	0.016	0.330	0.60	1.20	12
60632	16/3	2'-10'	65 x 34	16	0.050	0.016	0.330	0.60	1.20	12
60633	16/3	3'-15'	65 x 34	16	0.050	0.016	0.330	0.60	1.20	12
60634	16/3	4'-20'	65 x 34	16	0.050	0.016	0.330	0.60	1.20	12
60641	16/4	1'-5'	65 x 34	16	0.050	0.016	0.360	0.60	1.20	12
60642	16/4	2'-10'	65 x 34	16	0.050	0.016	0.360	0.60	1.20	12
60643	16/4	3'-15'	65 x 34	16	0.050	0.016	0.360	0.60	1.20	12
60644	16/4	4'-20'	65 x 34	16	0.050	0.016	0.360	0.60	1.20	12
60681	16/8	1'-5'	65 x 34	11	0.069	0.016	0.460	0.75	1.60	24
60682	16/8	2'-10'	65 x 34	11	0.069	0.016	0.460	0.75	1.60	24
60683	16/8	3'-15'	65 x 34	11	0.069	0.016	0.460	0.75	1.60	24
60684	16/8	4'-20'	65 x 34	11	0.069	0.016	0.460	0.75	1.60	24
60441	14/4	1'-5'	105 x 34	19	0.059	0.018	0.375	0.60	1.40	24
60442	14/4	2'-10'	105 x 34	19	0.059	0.018	0.375	0.60	1.40	24
60443	14/4	3'-15'	105 x 34	19	0.059	0.018	0.375	0.60	1.40	24
60444	14/4	4'-20'	105 x 34	19	0.059	0.018	0.375	0.60	1.40	24
60241	12/4	1'-5'	165 x 34	25	0.070	0.018	0.470	0.75	1.70	24
60242	12/4	2'-10'	165 x 34	25	0.070	0.018	0.470	0.75	1.70	24
60243	12/4	3'-15'	165 x 34	25	0.070	0.018	0.470	075	1.70	24
60244	12/4	4'-20'	165 x 34	25	0.070	0.018	0.470	0.75	1.70	24

NOTE: (1) Per IEEE Standard 835, based on a conductor temperature of 80°C, ambient temperature of 40°C, not more than three current carrying conductors. NEC 2011 Table 310.15(B)(3)(a) used as adjustment for more than three current carrying conductors.

Trex-Onics High-Flex Ultra-Coil Retractiles Specially Designed for Industrial Environments

(continued from previous page)

High-Flex Ultra-Coil Retractiles

APPLICATIONS

- Fork Lifts
- Overhead Doors
- Portable Tools
- Packaging Equipment
- Portable Conveyors
- Presses
- Robots
- Slide Tables

SPECIFICATIONS

Trex-Onics Color Code

PAIR NO.	COLOR
1	Black
2.	White
3.	Green
4.	Red
5.	Orange
6.	Yellow
7.	Blue
8.	Brown
9.	Violet
10.	Gray
11.	White/Black
12	White/Red

CHEMICAL RESISTANCE OF COMMON INSULATING MATERIALS

CHEMICAL	RUBBER	SILICON	FLUOROPOLYMER
OXIDATION RESISTANCE	F	E	O
OIL RESISTANCE	P	F-G	O
UV RESISTANCE	F	O	O
WATER RESISTANCE	G	G-E	E
ACID RESISTANCE	F-G	F-G	E
ALKALI RESISTANCE	F-G	F-G	E
GASOLINE KEROSENE	P	P-F	E
BENZOL TOLUENE	P	P	E
DEGREASER SOLVENT	P	P-G	E
ALCOHOL RESISTANCE	G	G	E

O = OUTSTANDING E = EXCELLENT G = GOOD F = FAIR P = POOR

TREX-ONICS JACKET CHEMICAL RESISTANCE

ACIDS

Acetic, 5% ..... Good
Formic, 20% ..... Variable
Hydrochloric, 10% ..... Fair
Olcic..... Fair-Good
Sulfuric, 20% ..... Fair

ALCOHOLS

Ethanol..... Variable
Isopropanol.....Fair-Poor
Isopropanol, 50% .....Fair-Poor
Methanol..... Variable

ALKALI

Sodium Hydroxide, 20%..... Fair

ORGANICS

Acetone .....Poor
ASTM Fuel A..... Good
ASTM Fuel B..... Fair
ASTM Fuel C.....Fair-Variable
ASTM Fuel #1 ..... Good
ASTM Fuel #2 ..... Good
ASTM Fuel #3 .....Good-Fair

ORGANICS (continued)

Benzene..... Variable
Brake Fluid Type A..... Variable
Brake Fluid (H.D.)..... Fair-Good
Butane ..... Good
Carbon Tetrachloride..... Variable
Cyclohexanone..... NR
Dimenthyl Formamid..... NR
Dimethyl Sulfoxide ..... NR
I, 4-Dioxane ..... NR
Dioctyl Phthalate..... Fair
Ethyl Ether..... Fair-Good
Ethylene Glycol ..... Good
Ethylene Glycol 50% Water ..... Good
Gasoline, 100 Octane..... Fair
HexaneFair-Good
Kerosene ..... Good
Methylene Chloride..... Variable
Methyl Ethyl Keytone ..... Variable
N-Methyl-2-Pyrrolidene ..... NR
Oil, Texas Crude ..... Fair-Good
Oil, Detergent 20W ..... Good
Oil, Non-Detergent 20W ..... Good
Oil, Skydrol Type B ..... NR

ORGANICS (continued)

Oil, Skydrol Type 500A .....Fair-Variable
Oil, Skydrol Type 500B.....Fair-Variable
Oil, Transmission Type A ..... Good
Perchlorethylene..... Variable
Pyridine..... NR
Tertrahydrofuran ..... NR
Toluene ..... Variable
Trichlorothylene..... Variable
Turpentine..... Good

MISCELLANEOUS

Chlorox (5%) ..... Good
Calcium Chloride Saturated Solution..... Good
FREON-113 ..... Variable
FREON-11B..... Variable
FREON-112 ..... Good
Hydrogen Disulfide (5%) .....Excellent
Sodium Chloride Saturated Solution ..... Good
Synthetic Perspiration..... Good
Tide (1%) ..... Good
Water ..... Good

CODING

EXCELLENT — Little or no change in constant exposure — application is recommended.
GOOD — Only slight loss in properties on constant exposure — application is recommended.
FAIR — Some swelling could occur in constant exposure but recommended for infrequent contact.
VARIABLE — In constant exposure not recommended. Infrequent contact recommended.
NR — Not recommended, product could deteriorate in moderate exposure.

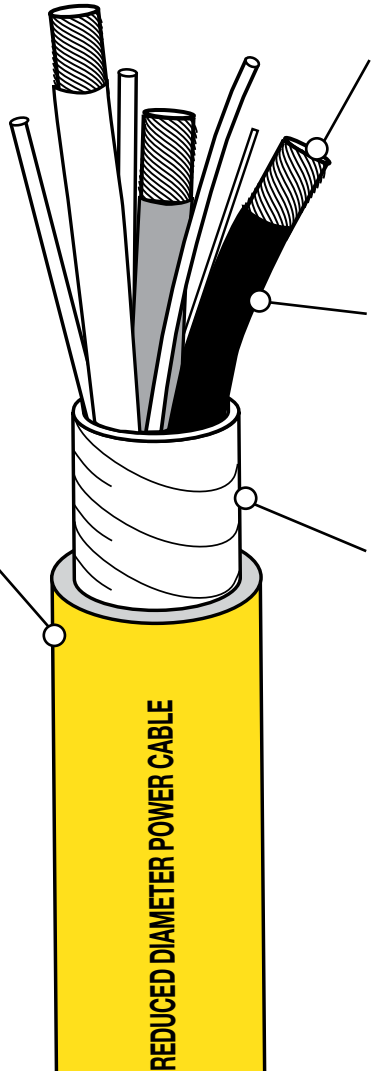
TPC WIRE & CABLE CORP. • USA 800-521-7935 • CANADA 800-545-0122 • MEXICO 001-877-283-1696

Reduced Diameter Power Cable

- 600 Volt
- 90°C
- RoHS Compliant
- FT-1
- Designed for Continuous Flex Applications

UNIQUE TUBED CONSTRUCTION
Designed to allow the conductors to move freely within the jacket without binding.

SPECIALLY COMPOUNDED, SECURITY YELLOW TPE JACKET
Superior first line defense against tearing, abrasion, impact, oil, ozone and most chemicals.



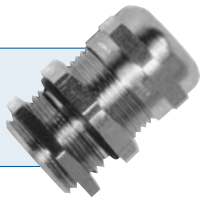
EXTRA FINE STRANDING
34 AWG stranding for improved flexibility in robotic and cat-track applications. Four times the stranding of standard power cable designs.

FLEXIBLE CONCENTRIC ROPE LAY COPPER CONSTRUCTION
Provides longer life in flexing and twisting applications.

HIGH FLEX NYLON WOVEN WRAP
Improves performance in continuous movement applications. Allows the conductors to move freely within the jacket, reducing conductor failure due to work hardening.

6.5 MILLION — *Tested to over 6.5 million cycles with a bend radius of 10 x OD*

ADD KORD-GARDS™ OR GRIP-SEALS™ TO COMPLETE YOUR ORDER! *See Pages 95-104.*



APPLICATIONS

- Cat Tracks
- Automated Equipment
- Mobile Equipment
- Robotics
- Conveyors
- Pumps and Heaters
- Material Handling
- Temporary Power
- Electric Motors

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND	STRANDING	AMPACITY (1)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
61843	4/3	1,050 x 34	95	0.945"	672
61823	2/3	1,666 x34	130	1.160"	1,007

NOTE: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 3.10.15(B)(16).

Flat Festoon Cable

• 600 Volt **• 90°C** **• RoHS Compliant**

SECURITY YELLOW HEAVY-DUTY *TREX-ONICS*® POLYURETHANE TPE JACKET
Excellent defense against cutting, abrasion, oil and chemicals.

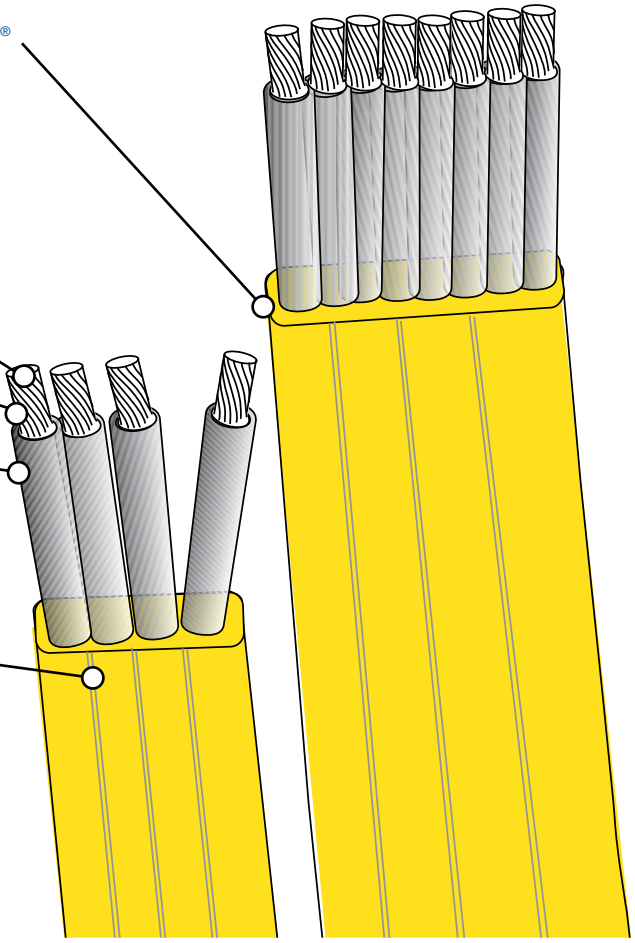
TINNED CONDUCTORS
Resists corrosion. Easier to solder.

FINELY STRANDED TINNED CONDUCTORS
Improves flexibility and extends conductor life.

FLUOROPOLYMER INSULATION
Offers superior resistance to oil, solvents and chemicals. Provides high dielectric capability, mechanical strength and cut resistance.

CUT GROOVES
Easier to strip and terminate.

UNIQUE CONSTRUCTION
Provides for a very durable long life flat cable.



ADD SPECIALLY DESIGNED GRIP-SEALS™ FOR FLAT FESTOON CABLE TO COMPLETE YOUR ORDER! *See Page 103.*

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CORD SIZE AWG/COND	CONDUCTOR STRANDING	INSULATION THICK. (IN.)	AMPACITY (1)	DIMENSIONAL DATA	COLOR CODE	WT. (LBS.) PER 1000'
61114	16/4	65/34	0.015"	18	0.19" x 0.485"	Black, Red, Blue, Orange	94
61118	16/8	65/34	0.015"	12	0.19" x 0.87"	Black, Red, Blue, Orange, Yellow, Brown, Red/Black, Blue/Black	130
61112	16/12	65/34	0.015"	9	0.19" x 1.255"	Black, Red, Blue, Orange, Yellow, Brown, Red/Black, Blue/Black, Orange/Black, Yellow/Black, Brown/Black, Black/Red	198
61148	14/8	105/34	0.015"	17	0.204" x 0.982"	Black, Red, Blue, Orange, Yellow, Brown, Red/Black, Blue/Black	206
61142	14/12	105/34	0.015"	12	0.204" x 1.423"	Black, Red, Blue, Orange, Yellow, Brown, Red/Black, Blue/Black, Orange/Black, Yellow/Black, Brown/Black, Black/Red	287
61124	12/4	65/30	0.015"	30	0.22" x 0.60"	Black, Red, Blue, Orange	112
61104	10/4	105/30	0.018"	40	0.246" x 0.709"	Black, Red, Blue, Orange	210
61164	6/4	266/30	0.022"	75	0.350" x 1.13"	Black, Red, Blue, Orange	462

NOTE: (1) Based on an ambient temperature of 30°C and conductor temperature of 90°C per NEC 2011, Table 3.10.15(B)(16).

TREX-ONICS® BUS CABLES

PROFIBUS®

CONTROLNET

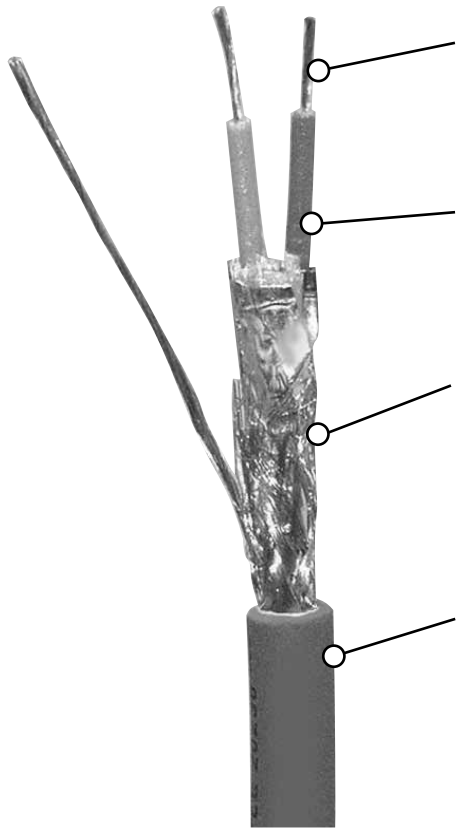
ETHERNET

DEVICENET™

PROFIBUS® Festoon/Trailing Cable

• -40°C to +80°C • RoHS Compliant

Trex-Onics Festoon/Trailing PROFIBUS Cable is designed for use in industrial festoon applications where a superior cable is required. TPC's PROFIBUS Festoon/Trailing cable is designed for applications requiring flexibility and portability and resisting exposure to oils and chemicals. The polyurethane jacket provides superior protection against cuts and abrasion.



FINELY STRANDED TINNED COPPER CONDUCTORS

Finely stranded tinned copper conductors resist corrosion, improves flexibility and helps reduce conductor fatigue and breakage in flexing applications.

FOAM INSULATION

Conductors are insulated with foamed High-Density Polyethylene (HDPE). Foamed HDPE insulation provides a low dielectric constant, excellent electrical characteristics and improved signal integrity.

HEAVY DUTY COMBINATION OF TINNED COPPER BRAID AND ALUMINUM/POLYESTER FOIL SHIELD

Combination of tinned copper braid and aluminum/polyester foil shield provides 100% shielding protection from EM and RF interference. The finely stranded braid provides superior flexibility and mechanical strength.

HEAVY DUTY POLYURETHANE JACKET

A heavy-duty polyurethane jacket provides excellent protection against cutting, abrasion, oil and chemicals, extending the overall cable life.

APPLICATIONS

- Process Automation Systems
- Crane Festoons Systems

SPECIFICATIONS

TEMPERATURE RANGE
-40°C to +80°C

VOLTAGE
30 Volts

VELOCITY OF PROPAGATION
78% Nominal

IMPEDANCE
122.1 Ohms Differential
78.8 Ohms Single-Ended

CAPACITANCE
10.7 pF/ft Mutual
16.5 pF/ft Single-Ended

ATTENUATION

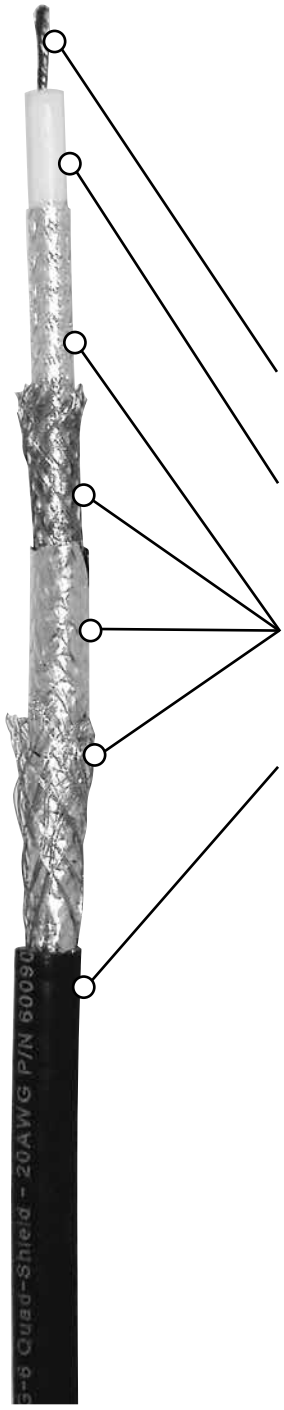
Frequency (MHz)	**dB/100 Feet** (Nominal)
4	0.95
16	1.92
100	4.94
300	8.87
500	11.73

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CONDUCTOR SIZE	COND. STRANDING	NOM. INSUL. THICKNESS (IN.)	NOM. JACKET THICKNESS (IN.)	NOMINAL DIA. (IN.)
60092	23 AWG	21/36	0.082	0.05	0.29

ControlNet RG-6U Quad-Shield Coaxial Cable

• ODVA Conformity • FT-2 • RoHS Compliant



Trex-Onics ControlNet RG-6U Quad-Shield coaxial cable is designed for use in heavy duty industrial ControlNet applications where a superior cable is required. TPC's RG-6U ControlNet cable is designed for applications requiring flexibility and portability and resisting exposure to oils and chemicals. The Quad-Shield provides protection against RF and EMI noise, and a Polyurethane jacket provides superior protection against cuts and abrasion.

FINELY STRANDED BARE COPPER CONDUCTORS

Improve flexibility and offers maximum conductivity. Tin for "f" connectors.

FOAM INSULATION

Conductors are insulated with a foamed HDPE to provide a low dielectric constant and maintain low cable capacitance.

QUAD-SHIELD

Provides excellent protection against RF and EMI noise. Uses RG-6 style connectors.

HEAVY DUTY POLYURETHANE JACKET

Provides excellent protection against cutting, abrasion, oil and chemicals extending cable life.

APPLICATIONS

- Human Machine Interfaces
- PC Based Controllers
- Video Monitors
- PLC's
- Closed Circuit Systems
- Satellite Systems

SPECIFICATIONS

TEMPERATURE RANGE	-40°C to 80°C
VOLTAGE	30 Volts
IMPEDANCE	75 ± 5 Ohms
CAPACITANCE	17 pF/ft Nominal
VELOCITY OF PROPAGATION	79% Nominal

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CONDUCTOR SIZE	CONDUCTOR STRANDING	NOM. INSUL. THICKNESS (IN.)	NOM. JACKET THICKNESS (IN.)	NOMINAL DIA.	WT. (LBS.) PER 1000'
60090	20 AWG	105/40	0.182	0.027	0.300	29.5

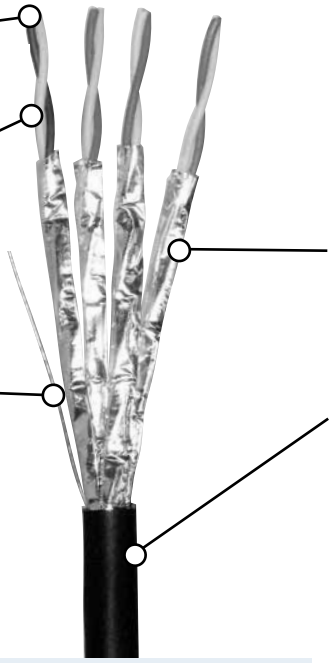
Industrial Ethernet CAT6$_A$ Cable

- **ISO/IEC 11801**
- **IEC 60332-1**
- **IEC 61156**
- **500 MHz**
- **300 Volt**
- **Halogen-Free**
- **RoHS Compliant**

STRANDED BARE COPPER CONDUCTORS
Improve flexibility and offer longer flex life.

CELLULAR POLYOLEFIN INSULATION
Provides excellent dielectric and insulation properties.

DRAIN WIRE



COMBINATION OF CELLULAR INSULATION AND SHIELDED PAIRS
Provides superior electrical performance to meet CAT6$_A$ and ethernet/IP requirements.

ALUMINUM/POLYESTER FOIL SHIELD
Around each pair reduces electrical noise interference.

HALOGEN-FREE AND FLAME RETARDANT POLYURETHANE JACKET
Provides protection from environmental abuse and offers resistance to UV light, cutting, abrasion, oil and chemicals.

APPLICATIONS

- Data processing & information systems
- High bandwidth digital applications
- High data rate applications

Voltage Rating: **300 Volts**
Frequency Range: **500 MHz**
Input Impedance: **100 Ω ± 15 Ω**
DC Resistance: **44.2 Ω/1000 ft**
DCR Unbalanced: **2% Max**
Capacitance Unbalanced: **0.36Pf/ft Max**
Delay (Skew): **30 nsec/100 m Max**
Velocity of Propagation: **78% Nominal**
Temperature Range: **- 30ºC to +65ºC**
Tensile Strength (Short Term): **22 Lbs Max**

COLOR CODE (PER TIA/EIA 568B)	
PAIR NO.	**COLOR**
1	Blue - White
2	Orange - White
3	Green - White
4	Brown - White

ELECTRICAL SPECIFICATIONS

FREQ (MHz)	**ATTENUATION** (dB/100m)	**PS NEXT LOSS** (dB)	**NEXT LOSS** (dB)	**PS ANEXT** (dB)	**ELFEXT** (dB)	**PS ELFEXT** (dB)	**RL** (dB)
1	3.1	72.3	75.3	67.0	68.0	65.0	20.0
4	5.8	63.3	66.3	67.0	56.0	53.0	23.0
10	9.0	57.3	60.3	67.0	48.0	45.0	25.0
20	12.8	52.8	55.8	67.0	42.0	39.0	25.0
30	15.8	50.1	53.1	67.0	38.4	35.4	23.8
100	29.9	42.3	45.3	62.5	28.0	25.0	21.1
150	37.4	39.7	42.7	59.8	24.5	21.5	18.8
200	43.8	37.8	40.8	58.0	22.0	19.0	18.0
250	49.7	36.3	39.3	56.5	20.0	17.0	17.3
300	55.1	35.1	38.1	55.3	18.5	15.5	17.3
400	65.1	33.3	36.3	53.4	16.0	13.0	17.3
500	74.0	31.8	34.8	52.0	14.0	11.0	17.3

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	**CONDUCTOR SIZE**	**NOM. INSUL. WALL** (IN.)	**OVERALL SHIELD**	**JACKET WALL** (IN.)	**NOMINAL O.D.** (IN.)	**WT.** (LBS.) **PER 1000'**
60062	26 AWG (7 x 0.0067")	0.010	NO	0.039	0.275	27

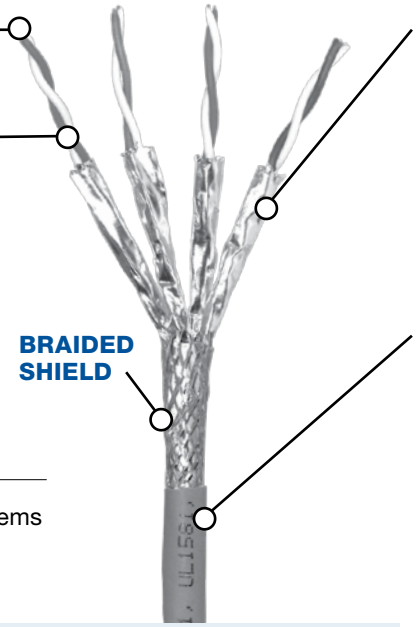
Industrial Ethernet CAT7$_A$ Cable

- **1,000 MHz**
- **IEC 61156-6**
- **ANSI/TIA/EIA 568-B**
- **-40°C to +70°C**
- **ISO/IEC 11801**
- **IEC 60332-1**
- **Abrasion Resistant**
- **Halogen-Free Flame Retardent**
- **RoHS Compliant 2002/95/EC**

STRANDED BARE COPPER CONDUCTORS
Improve flexibility and offer longer flex life.

POLYOLEFIN (PO) INSULATION SYSTEM
Provides excellent dielectric and insulation properties.

COMBINATION OF CELLULAR INSULATION AND SHIELDED PAIRS
Provides superior electrical performance to meet CAT7$_A$ and Ethernet/IP requirements.



ULTRA-SHIELD® CONFIGURATION AND ALUMINUM/POLYESTER FOIL SHIELD CONSTRUCTION
Placed around each pair reduces radiated and conducted electrical noise interference.

BACKWARD COMPATIBILITY
Fully interchangeable with CAT6$_A$ and CAT5e shielded cables.

HALOGEN-FREE FLAME RETARDANT POLYURETHANE JACKET
Provides protection from environmental abuse and offers resistance to cutting, abrasion, oil and chemicals.

APPLICATIONS

- Data processing & information systems
- High bandwidth digital applications
- High data rate applications

Frequency Range: **1,000 MHz**
Input Impedance: **100 Ω ± 15 Ω**
DC Resistance: **44.2 Ω/1000 ft**
DCR Unbalanced: **2% Max**
Capacitance Unbalanced: **0.36pF/ft Max**
Dielectric Strength: **500 V / Minute**
Dielectric Strength to Shield: **500 V / Minute**
Delay (Skew): **20 nsec/100 m Max**
Velocity of Propagation: **78% Nominal**
Temperature Range: **- 40°C to +70°C**
Tensile Strength (Short Term): **33.7 Lbs Max**
Min. Insulation Resistance: **5 G Ω • Km**
Min. Bend Radius: **1.4 Inches**

COLOR CODE (PER TIA/EIA 568B)	
PAIR NO.	**COLOR**
1	Blue - White
2	Orange - White
3	Green - White
4	Brown - White

ELECTRICAL SPECIFICATIONS

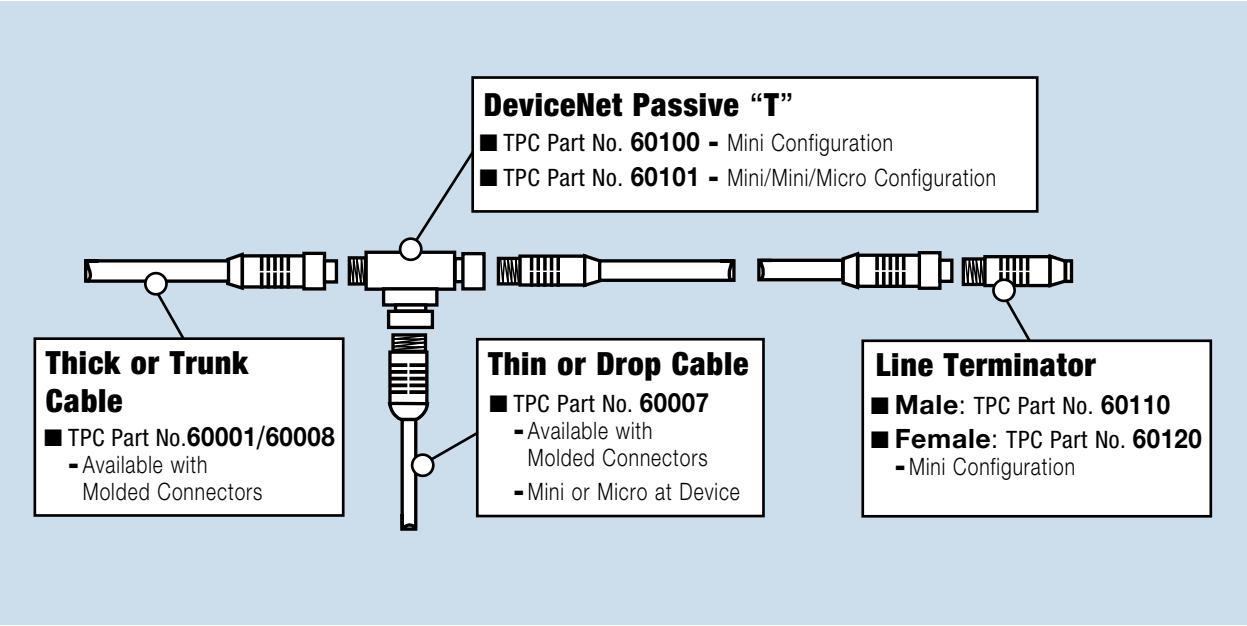
FREQ (MHz)	**ATTENUATION** (dB/100m)	**PS NEXT LOSS** (dB)	**NEXT LOSS** (dB)	**PS ANEXT** (dB)	**PS ACR-F** (dB)	**RL** (dB)
1	3.0	75.0	78.0	67.0	75.0	20.0
4	5.6	75.0	78.0	67.0	75.0	23.0
10	8.7	75.0	78.0	67.0	75.0	25.0
20	12.3	75.0	78.0	67.0	65.0	25.0
30	15.0	75.0	78.0	67.0	61.5	23.8
100	27.8	75.0	78.0	67.0	51.0	21.1
200	39.7	71.0	74.0	67.0	45.0	18.0
300	49.0	68.2	71.2	67.0	41.5	15.6
600	70.6	63.7	66.7	64.0	35.5	15.6
700	76.7	62.7	65.4	63.0	34.0	15.6
900	87.7	61.1	64.1	61.0	32.0	15.6
1000	92.9	60.4	63.4	60.0	31.0	15.6

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	**CONDUCTOR SIZE**	**NOM. INSUL. WALL** (IN.)	**SHIELDED PAIRS**	**JACKET WALL** (IN.)	**NOMINAL O.D.** (IN.)	**WT.** (LBS.) **PER 1000'**
60067	26 AWG (7 x 0.0063")	0.010	YES	0.039	0.260	27

DeviceNet™

DeviceNet is a standardized open communication network for the inter-connection of field devices such as sensors, switches and actuators. The basic technology of the physical layer of DeviceNet is based on the CANbus. CAN is an acronym for “Controller Area Network” which is a communication system in compliance with the international standard ISO 11 898.



As a bus arbitration method a CSMA/NBA (Carrier Sense Multiple Access/Non-Destructive Bit Arbitration) scheme is used which allows communication on the network. The Controller Area Network communication system allows the transmission of data messages of up to 8 bytes in length. For the physical signal transmission on the bus line a differential voltage signal is used which is similar to the RS-485 standard, which offers the best interference immunity.

The DeviceNet specification supports a variety of different network services for support of up to 64 addressable bus nodes. TPC Wire & Cable supplies a full line of DeviceNet Cable, Connectors and Accessories specifically designed for industrial applications. In addition to being UL and CSA rated, these products have been tested to meet all electrical requirements of the ODVA (Open DeviceNet Vendor Association). Physical testing of these products has included extensive MIL-C-13777 testing on our Thin Cable to insure superior performance in continuous flex/torsional Robotic applications. The design of our Flex-Net™ line of products was based on the proven performance of our Trex-Onics® line of Electronic Cable, offering superior cut-through, abrasion and chemical resistance.

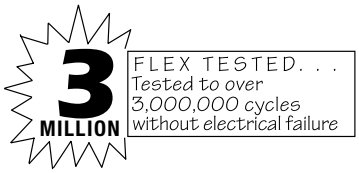
Flex-Net™ Cable
"Thin" High Performance Design

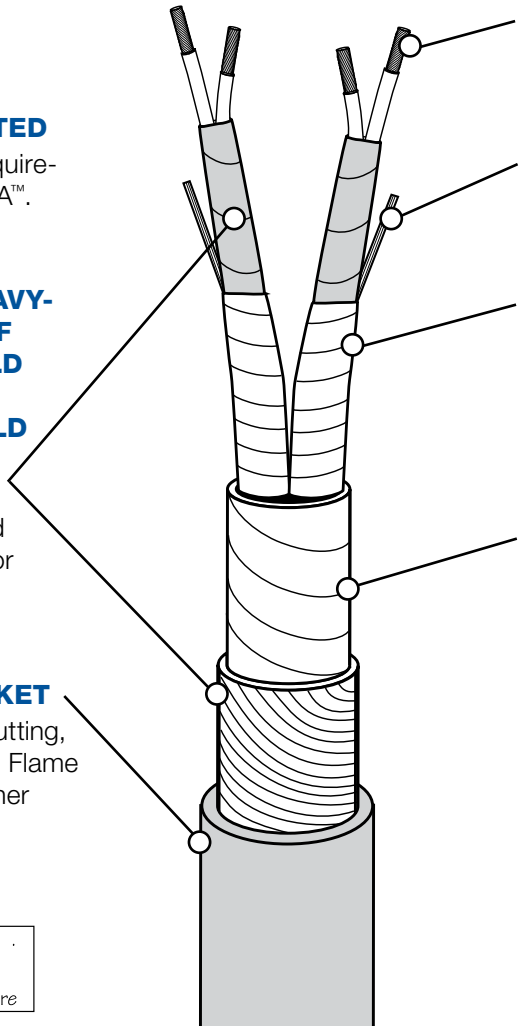
- PLTC Rated
- 300 Volt
- 80°C
- FT-4
- CSA Approved
- RoHS Compliant

ELECTRONICALLY TESTED
Meets the performance requirements as specified by ODVA™.

ULTRA-SHIELD™ CONSTRUCTION, A HEAVY-DUTY COMBINATION OF TINNED COPPER SHIELD AND AN ALUMINUM/ POLYESTER FOIL SHIELD
100% shielding provides protection from EM and RF interference. Finely stranded spiral braid provides superior mechanical strength.

HEAVY-DUTY GRAY *TREX-ONICS*® TPE JACKET
Excellent defense against cutting, abrasion, oil and chemicals. Flame and heat resistant. All-weather flexibility.





TINNED COPPER CONDUCTORS
Resist corrosion. Easier to solder.

DRAIN WIRES
Drain wire with each pair to protect against interference.

FLUOROPOLYMER TAPE WRAP
Allows the braid and conductors to move more freely within the jacket. Improves performance in high flex torsional applications.

WOVEN NYLON TAPE
Improves flexibility allowing conductor bundle to move easily within the jacket. Protects inner conductor bundle from spiral braid.

ADD AN EMI SHIELDED GRIP-SEAL™ TO COMPLETE YOUR ORDER!

See Page 100.

COLOR CODE *POWER PAIR* - **Red** & **Black** *DATA PAIR* - **Blue** & **White**

ELECTRONIC SPECIFICATIONS

- The electrical requirement of the DeviceNet Cable shall be in accordance with those identified by the ODVA (Open DeviceNet Association) for the Thin Cable.
- Capacitance between Conductors – 12 pF/ft. at 1 MHz (nominal).
- Impedance – 120 Ohms +/- 12 Ohms.
- Capacitance between one conductor and other conductor connected to shield – 24 pF/ft. at 1 MHz (nominal).
- Propagation Delay – 1.36 nSec/ft. (maximum).

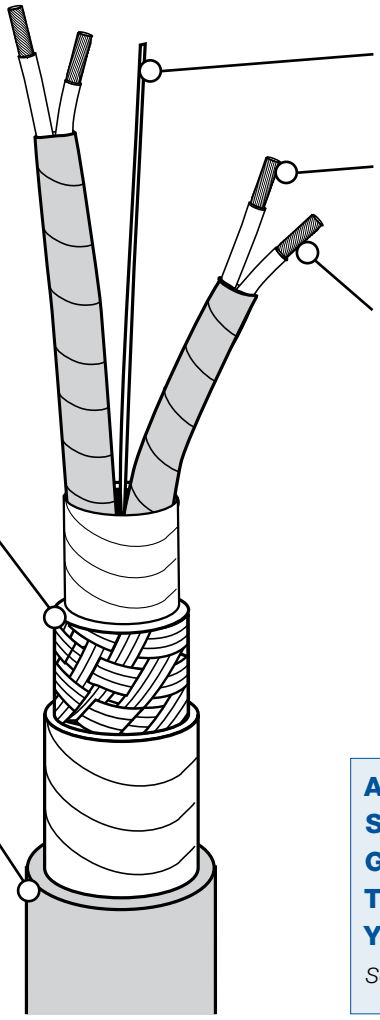
ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
60007	0.340	55

ODVA™ is a trademark of the Open DeviceNet Vendors Association, Inc. — 22 AWG Power Pair — 24 AWG Communication Pair

Flex-Net™ Cable "Thick" Cable Design

- **PLTC Rated**
- **300 Volt**
- **80°C**
- **FT-4**
- **RoHS Compliant**



18 AWG DRAIN WIRE

TINNED COPPER
Resists corrosion. Easier to solder.

FINE STRANDED COPPER CONDUCTORS
Improves flex life in abusive applications.

COMMON AXIS DESIGN
Equal stresses are placed on all conductors. Provides superior performance in Torsional and Bending applications.

ULTRA-SHIELD™ CONSTRUCTION, A HEAVY-DUTY COMBINATION OF TINNED COPPER SHIELD AND AN ALUMINUM/POLYESTER FOIL SHIELD
100% shielding provides protection from EM and RF interference. Finely stranded braid provides superior mechanical strength.

HEAVY-DUTY GRAY *TREX-ONICS*® TPE JACKET
Excellent defense against cutting, abrasion, oil and chemicals.

ELECTRONICALLY TESTED
Meets the performance requirements as specified by ODVA™.

ADD AN EMI SHIELDED GRIP-SEAL™ TO COMPLETE YOUR ORDER!
See Page 100.

COLOR CODE *POWER PAIR* - **Red** & **Black** *DATA PAIR* - **Blue** & **White**

ELECTRONIC SPECIFICATIONS

- The electrical requirement of the DeviceNet Cable shall be in accordance with those identified by the ODVA (Open DeviceNet Association) for the Thin Cable.
- Capacitance between Conductors – 12 pF/ft. at 1 MHz (nominal).
- Impedance - 120 Ohms +/- 10% (at 1 MHz).
- Capacitance between one conductor and other conductor connected to shield – 24 pF/ft. at 1 MHz (nominal).
- Propagation Delay – 1.36 nSec/ft. (maximum).

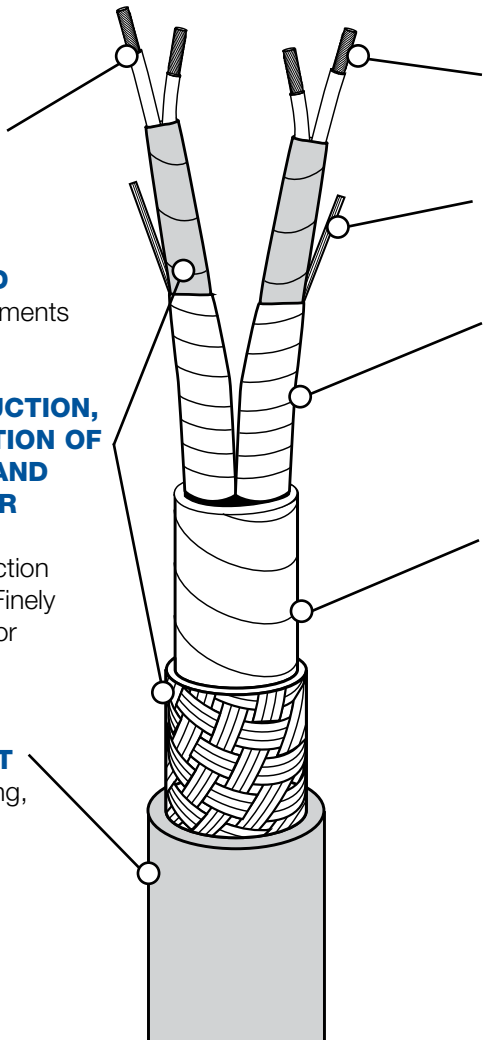
ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
60001	0.475	100

ODVA™ is a trademark of the Open DeviceNet Vendors Association, Inc. — 15 AWG Power Pair — 18 AWG Communication Pair

Flex-Net™ Cable
"Thick" High Performance Design

- **PLTC Rated**
- **300 Volt**
- **80°C**
- **FT-4**
- **RoHS Compliant**



FINE STRANDED COPPER CONDUCTORS
Improves flex life in abusive applications.

ELECTRONICALLY TESTED
Meets the performance requirements as specified by ODVA™.

ULTRA-SHIELD™ CONSTRUCTION, A HEAVY-DUTY COMBINATION OF TINNED COPPER SHIELD AND AN ALUMINUM/POLYESTER FOIL SHIELD
100% shielding provides protection from EM and RF interference. Finely stranded braid provides superior mechanical strength.

HEAVY-DUTY GRAY *TREX-ONICS*® TPE JACKET
Excellent defense against cutting, abrasion, oil and chemicals

TINNED COPPER
Resists corrosion. Easier to solder.

DRAIN WIRES
Drain wire with each pair to protect against interference.

FLUOROPOLYMER TAPE WRAP
Allows the braid and conductors to move more freely within the jacket. Improves performance in high flex torsional applications.

WOVEN NYLON TAPE
Improves flexibility allowing conductor bundle to move easily within the jacket. Protects inner conductor bundle from spiral braid.

1 MILLION
FLEX TESTED. . .
Tested to over 1,000,000 cycles without electrical failure

ADD AN EMI SHIELDED GRIP-SEAL™ TO COMPLETE YOUR ORDER!
See Page 100.

COLOR CODE *POWER PAIR* - **Red** & **Black** *DATA PAIR* - **Blue** & **White**

ELECTRONIC SPECIFICATIONS

- The electrical requirement of the DeviceNet Cable shall be in accordance with those identified by the ODVA (Open DeviceNet Association) for the Thin Cable.
- Capacitance between Conductors – 12 pF/ft. at 1 MHz (nominal).
- Impedance - 120 Ohms +/- 10% (at 1 MHz).
- Capacitance between one conductor and other conductor connected to shield – 24 pF/ft. at 1 MHz (nominal).
- Propagation Delay – 1.36 nSec/ft. (maximum).

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
60008	0.540	100

ODVA™ is a trademark of the Open DeviceNet Vendors Association, Inc. — 16 AWG Power Pair — 18 AWG Communication Pair

Flex-Net™ Cable Micro Assemblies

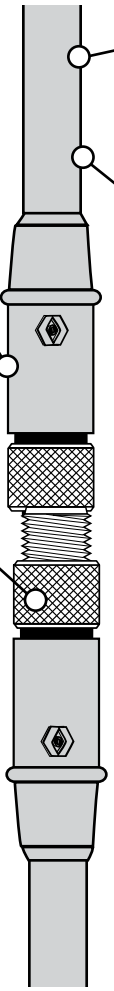
• RoHS Compliant

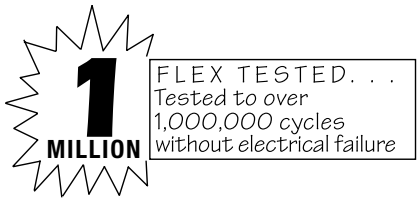
POLYURETHANE MOLDED PLUG BODY
Permanently bonded to cable providing a superior water and chemical resistant seal.

GRAY HEAVY-DUTY *TREX-ONICS*® JACKET
Excellent defense against cutting, abrasion, oil and chemicals. High flex cable designed to withstand harsh industrial applications.

A HEAVY-DUTY COMBINATION OF TINNED COPPER SHIELD AND AN ALUMINUM/MYLAR SHIELD
100% shielding provides protection from EM and RF interference. Finely stranded braid provides superior mechanical strength.

CONTACT PINS AND SLEEVES
Gold plating over nickel insures electronic and electrical integrity over repeated insertions and extractions.





ROLE OF PRODUCT

This product is intended for use in the DeviceNet Bus System in applications requiring "Micro" style Male, Female or Male/Female connectors. Applications for this product are industrial in nature and will be connected to devices such as proximity, photo electric and limit switches. This cable may be used in harsh industrial environments where oils, coolants, water, chemicals or grease are present.

COLOR CODE *POWER PAIR* - **Red** & **Black** *DATA PAIR* - **Blue** & **White**

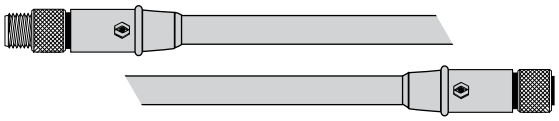
ELECTRONIC SPECIFICATIONS

- The electrical requirement of the DeviceNet Cable shall be in accordance with those identified by the ODVA (Open DeviceNet Association) for the Thin Cable.
- Capacitance between Conductors – 12 pF/ft. at 1 MHz (nominal).
- Impedance – 120 Ohms +/- 12 Ohms.
- Capacitance between one conductor and other conductor connected to shield – 24 pF/ft. at 1 MHz (nominal).
- Propagation Delay – 1.36 nSec/ft. (maximum).

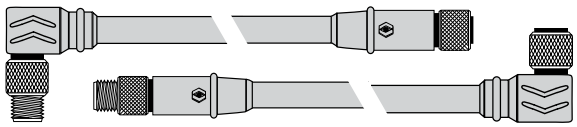
(continued from previous page)

Flex-Net™ Cable Micro Assemblies

ORDERING INFORMATION *(Call for pricing & availability)*



MICRO STRAIGHT DEVICENET CONNECTOR CORD SETS – THIN			
TPC ITEM NO.	M.	FT.	DESCRIPTION
CT15A43M001	1.0	3.3	Male
CT15A43M002	2.0	6.6	Male
CT15A43M003	3.0	9.8	Male
CT15A43M004	4.0	13.1	Male
CT15A43M006	6.0	19.7	Male
CT15A43M012	12.0	39.3	Male
CT15A43M018	18.0	59.0	Male
CT15A43M024	24.0	78.7	Male
CT15A43M030	30.0	98.4	Male
CT15C43M001	1.0	3.3	Female
CT15C43M002	2.0	6.6	Female
CT15C43M003	3.0	9.8	Female
CT15C43M004	4.0	13.1	Female
CT15C43M006	6.0	19.7	Female
CT15C43M012	12.0	39.3	Female
CT15C43M018	18.0	59.0	Female
CT15C43M024	24.0	78.7	Female
CT15C43M030	30.0	98.4	Female
CT25E43M001	1.0	3.3	Male/Female
CT25E43M002	2.0	6.6	Male/Female
CT25E43M003	3.0	9.8	Male/Female
CT25E43M004	4.0	13.1	Male/Female
CT25E43M006	6.0	19.7	Male/Female
CT25E43M012	12.0	39.3	Male/Female
CT25E43M018	18.0	59.0	Male/Female
CT25E43M024	24.0	78.7	Male/Female
CT25E43M030	30.0	98.4	Male/Female

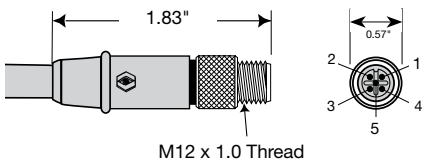


MICRO 90°/STRAIGHT DEVICENET CONNECTOR CORD SETS – THIN			
TPC ITEM NO.	M.	FT.	DESCRIPTION
CT25G43M001	1.0	3.3	Male 90°/Female
CT25G43M002	2.0	6.6	Male 90°/Female
CT25G43M003	3.0	9.8	Male 90°/Female
CT25G43M004	4.0	13.1	Male 90°/Female
CT25G43M006	6.0	19.7	Male 90°/Female
CT25G43M012	12.0	39.3	Male 90°/Female
CT25G43M018	18.0	59.0	Male 90°/Female
CT25G43M024	24.0	78.7	Male 90°/Female
CT25G43M030	30.0	98.4	Male 90°/Female
CT25F43M001	1.0	3.3	Male/Female 90°
CT25F43M002	2.0	6.6	Male/Female 90°
CT25F43M003	3.0	9.8	Male/Female 90°
CT25F43M004	4.0	13.1	Male/Female 90°
CT25F43M006	6.0	19.7	Male/Female 90°
CT25F43M012	12.0	39.3	Male/Female 90°
CT25F43M018	18.0	59.0	Male/Female 90°
CT25F43M024	24.0	78.7	Male/Female 90°
CT25F43M030	30.0	98.4	Male/Female 90°
CT25H43M001	1.0	3.3	Male 90°/Female 90°
CT25H43M002	2.0	6.6	Male 90°/Female 90°
CT25H43M003	3.0	9.8	Male 90°/Female 90°
CT25H43M004	4.0	13.1	Male 90°/Female 90°
CT25H43M006	6.0	19.7	Male 90°/Female 90°
CT25H43M012	12.0	39.3	Male 90°/Female 90°
CT25H43M018	18.0	59.0	Male 90°/Female 90°
CT25H43M024	24.0	78.7	Male 90°/Female 90°
CT25H43M030	30.0	98.4	Male 90°/Female 90°

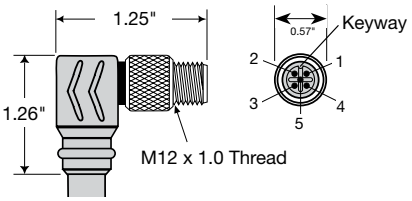
***TREX-ONICS**® Flex-Net™ Cable Assemblies are designed and manufactured in accordance with your length requirements. Please contact our Engineered Products Department to review your specific needs.*

PRODUCT SPECIFICATIONS

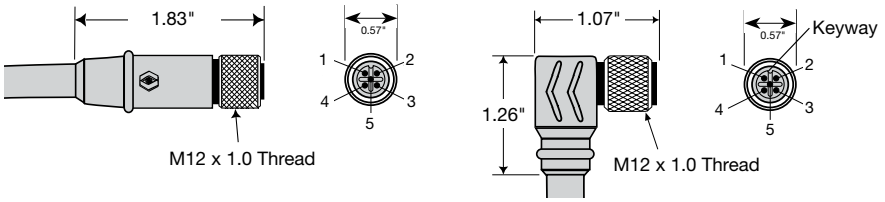
STRAIGHT MALE PLUG



90° MALE PLUG



90° FEMALE PLUG



FACE VIEW OF FEMALE PLUG

5 POLE
1. Drain
2. Red (V+)
3. Black (V-)
4. White (Can-H)
5. Blue (Can-L)

Flex-Net™ Cable Mini Assemblies

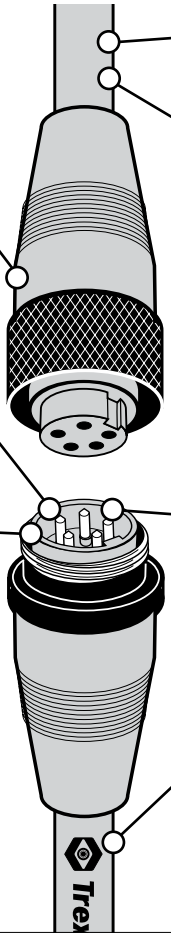
• RoHS Compliant

POLYURETHANE MOLDED PLUG BODY
Permanently bonded to cable providing a superior water and chemical resistant seal.

UNIQUE STAINLESS STEEL REINFORCED FEMALE PIN DESIGN
Prevents pin deformation resulting in loss of signal and electrical continuity. Superior performance in high vibration and continuous motion environments. Probe proof.

CONTACT PINS AND SLEEVES
Gold plating over nickel insures electronic and electrical integrity over repeated insertions and extractions.

COMMON AXIS DESIGN



GRAY HEAVY-DUTY *TREX-ONICS*® JACKET
Excellent defense against cutting, abrasion, oil and chemicals.

ULTRA-SHIELD™ CONSTRUCTION, A HEAVY-DUTY COMBINATION OF COPPER BRAID AND AN ALUMINUM/MYLAR SHIELD
100% shielding provides protection from EM and RF interference. Finely stranded braid provides superior mechanical strength.

EXTRA LONG GROUNDING PIN
Ensures first-in, last-out contact for safety.

FLEX-NET THIN CABLE — PERFORMANCE TESTED
In accordance with MIL 13777G standards for flexing and torsional applications. Meets ODVA™ electrical performance requirements.

ROLE OF PRODUCT

This product is intended for use in the DeviceNet Bus System in applications requiring “Mini” style Male, Female or Male/Female connectors. Applications for this product are industrial in nature and will be connected to devices such as proximity, photo electric and limit switches. This cable may be exposed to oils, coolants, water, chemicals and grease. Temperature exposures for the assemblies are not to exceed 80˚C (176˚F) and not below -25˚C (-13˚F).

PHYSICAL TESTING SPECIFICATIONS

- ***TREX-ONICS*** Flex-Net Thin cable was independently lab tested using the Mil Standard 13777 Torsional and Bend testing guidelines.
- Thin cable torsional performance exceeded 1,000,000 cycles with a bend radius of 10x.
- Thin cable assemblies were vibration tested to over 2 million cycles in accordance with SAE standards for connector assemblies.

ELECTRONIC SPECIFICATIONS

- The electrical requirement of the DeviceNet Cable shall be in accordance with those identified by the ODVA (Open DeviceNet Association) for the Thin Cable.
- Capacitance between Conductors – 12 pF/ft. at 1 MHz (nominal).
- Impedance – 120 Ohms +/- 12 Ohms.
- Capacitance between one conductor and other conductor connected to shield – 24 pF/ft. at 1 MHz (nominal).
- Propagation Delay – 1.36 nSec/ft. (maximum).

(continued from previous page)

Flex-Net™ Cable Mini Assemblies

ORDERING INFORMATION *(Call for pricing & availability)*

MINI DEVICENET CONNECTOR CORD SETS – THICK

STANDARD PRODUCT (#60001)	HIGH PERF. PRODUCT (Thick Cable #60008)	M.	FT.	DESCRIPTION
60933	CP25E44M001	1.0	3.3	Male/Female
60936	CP25E44M002	2.0	6.6	Male/Female
60939	CP25E44M003	3.0	9.8	Male/Female
60932	CP25E44M004	4.0	13.1	Male/Female
60930	CP25E44M006	6.0	19.7	Male/Female
60934	CP25E44M012	12.0	39.3	Male/Female
60937	CP25E44M018	18.0	59.0	Male/Female
60938	CP25E44M024	24.0	78.7	Male/Female
60931	CP25E44M030	30.0	98.4	Male/Female
60503	CP15A44M001	1.0	3.3	Male
60506	CP15A44M002	2.0	6.6	Male
60509	CP15A44M003	3.0	9.8	Male
60512	CP15A44M004	4.0	13.1	Male
60520	CP15A44M006	6.0	19.7	Male
60540	CP15A44M012	12.0	39.3	Male
60550	CP15A44M015	15.0	49.2	Male
60560	CP15A44M018	18.0	59.0	Male
60580	CP15A44M024	24.0	78.7	Male
60510	CP15A44M030	30.0	98.4	Male
60303	CP15C44M001	1.0	3.3	Female
60306	CP15C44M002	2.0	6.6	Female
60309	CP15C44M003	3.0	9.8	Female
60312	CP15C44M004	4.0	13.1	Female
60320	CP15C44M006	6.0	19.7	Female
60340	CP15C44M012	12.0	39.3	Female
60350	CP15C44M018	18.0	59.0	Female
60360	CP15C44M024	24.0	78.7	Female
60310	CP15C44M030	30.0	98.4	Female

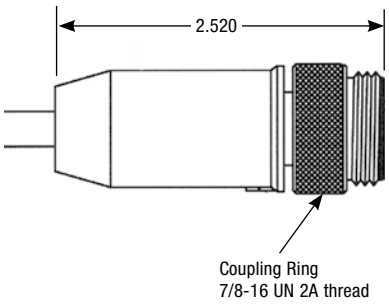
MINI DEVICENET CONNECTOR CORD SETS – THIN

STANDARD PRODUCT (#60001)	HIGH PERF. PRODUCT (Thick Cable #60008)	M.	FT.	DESCRIPTION
60923	CP25E43M001	1.0	3.3	Male/Female
60926	CP25E43M002	2.0	6.6	Male/Female
60929	CP25E43M003	3.0	9.8	Male/Female
60922	CP25E43M004	4.0	13.1	Male/Female
60920	CP25E43M006	6.0	19.7	Male/Female
60940	CP25E43M012	12.0	39.4	Male/Female
60052	CP25E43M015	15.0	50.0	Male/Female
60060	CP25E43M018	18.0	59.0	Male/Female
60080	CP25E43M024	24.0	78.7	Male/Female
60012	CP25E43M030	30.0	98.4	Male/Female
60703	CP15A43M001	1.0	3.3	Male
60706	CP15A43M002	2.0	6.6	Male
60709	CP15A43M003	3.0	9.8	Male
60712	CP15A43M004	4.0	13.1	Male
60720	CP15A43M006	6.0	19.7	Male
60740	CP15A43M012	12.0	39.4	Male
60750	CP15A43M015	15.0	49.2	Male
60760	CP15A43M018	18.0	59.0	Male
60780	CP15A43M024	24.0	78.7	Male
60710	CP15A43M030	30.0	98.4	Male
60203	CP15C43M001	1.0	3.3	Female
60206	CP15C43M002	2.0	6.6	Female
60209	CP15C43M003	3.0	9.8	Female
60212	CP15C43M004	4.0	13.1	Female
60220	CP15C43M006	6.0	19.7	Female
60240	CP15C43M012	12.0	39.4	Female
60250	CP15C43M015	15.0	49.2	Female
60260	CP15C43M018	18.0	59.0	Female
60280	CP15C43M024	24.0	78.7	Female
60210	CP15C43M030	30.0	98.4	Female

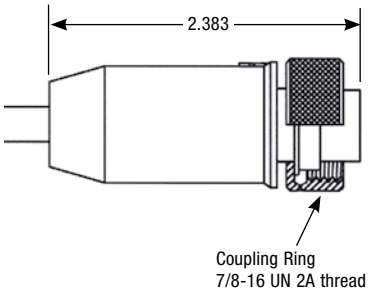
TREX-ONICS® Flex-Net™ Cable Assemblies are designed and manufactured in accordance with your length requirements. Please contact our Engineered Products Department to review your specific needs.

PRODUCT SPECIFICATIONS

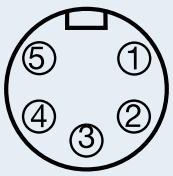
STRAIGHT MALE PLUG



STRAIGHT FEMALE PLUG



FACE VIEW OF FEMALE MINI



5 POLE
1. Drain
2. Red (V+)
3. Black (V-)
4. White (Can-H)
5. Blue (Can-L)

Quick-Connect™ Wiring System Accessories

• RoHS Compliant

DEVICENET PASSIVE "T" MINI

DeviceNet Compatible "T".

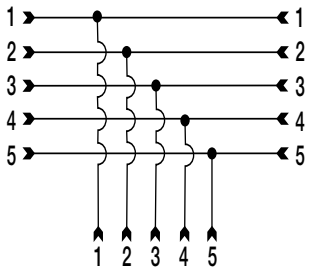
Meets all electrical requirements of Open DeviceNet Vendor Association (ODVA™).

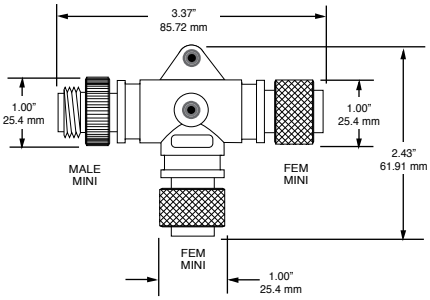
Oil and shock resistant.

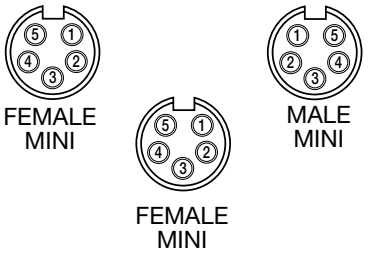
All molded construction.

Designed to simplify the addition of a sensor to an existing system.

WIRING SCHEME







DEVICENET PASSIVE "T" MINI TO MICRO

DeviceNet Compatible "T".

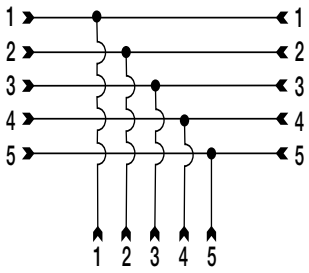
Meets all electrical requirements of Open DeviceNet Vendor Association (ODVA™).

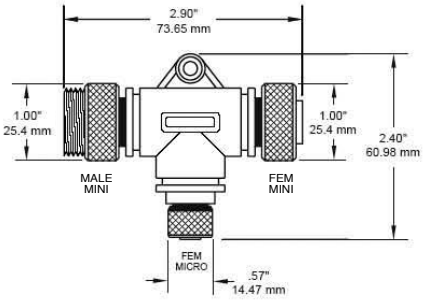
Oil and shock resistant.

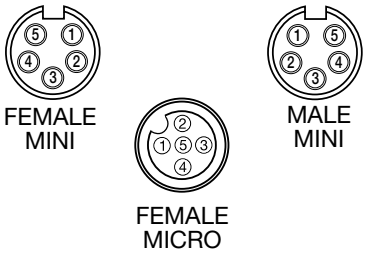
All molded construction.

Designed to simplify the addition of a sensor to an existing system.

WIRING SCHEME







ORDERING INFORMATION *(Call for pricing & availability)*

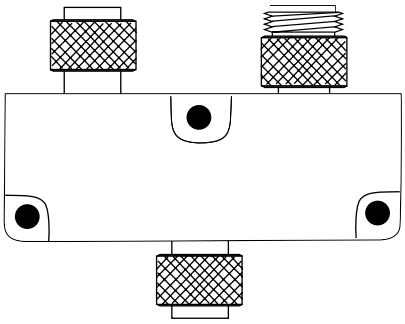
PART NO.	DESCRIPTION
60100	DeviceNet Passive "T" – Mini
60101	DeviceNet Passive "T" Micro Type – Mini to Micro

(continued from previous page)

Quick-Connect™ Wiring System Accessories

• **RoHS Compliant**

DEVICENET "Y"



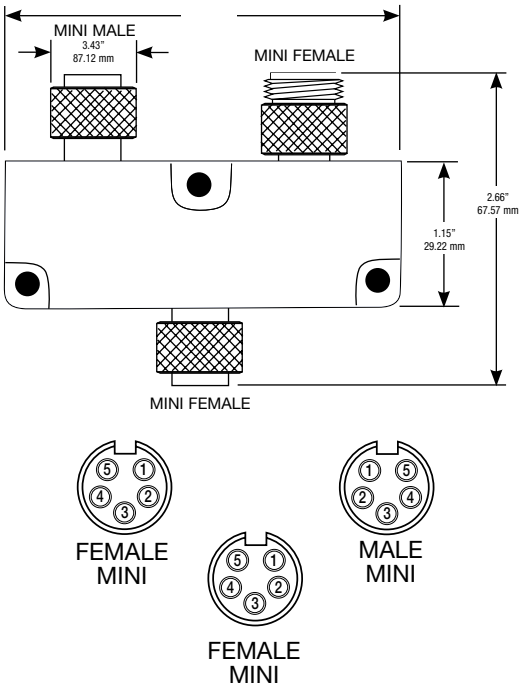
DeviceNet Compatible "Y".

Meets all electrical requirements of Open DeviceNet Vendor Association (ODVA™).

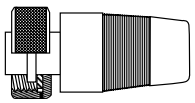
Oil and shock resistant.

All molded construction.

Designed to simplify the addition of a sensor to an existing system.



DEVICENET LINE TERMINATORS



DeviceNet Compatible.

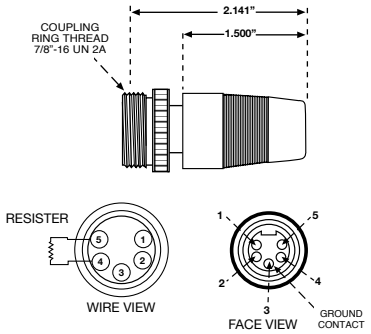
Meets all electrical requirements of Open DeviceNet Vendor Association (ODVA™).

Oil and shock resistant.

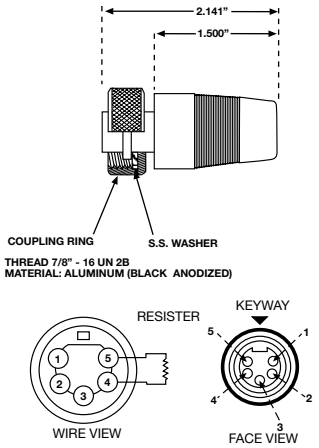
All molded construction.

Designed to be used with Quick-Connect DeviceNet assemblies at a termination plug.

MALE TERMINATOR



FEMALE TERMINATOR



ORDERING INFORMATION *(Call for pricing & availability)*

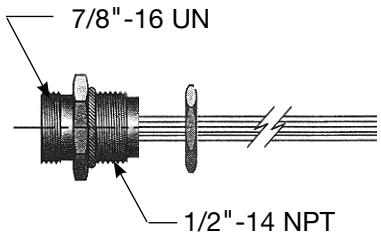
PART NO.	DESCRIPTION
60200	DeviceNet Passive "Y" – Mini
60110	DeviceNet Male Terminator
60120	DeviceNet Female Terminator

Flex-Net™ Receptacles for DeviceNet™ Applications

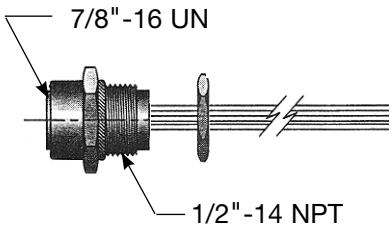
• RoHS Compliant

5 POLE MINI RECEPTACLES

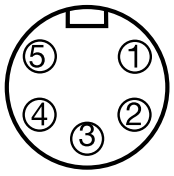
MINI MALE



MINI FEMALE



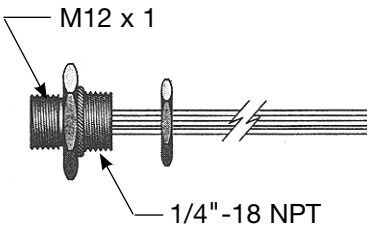
FACE VIEW OF FEMALE MINI RECEPTACLE



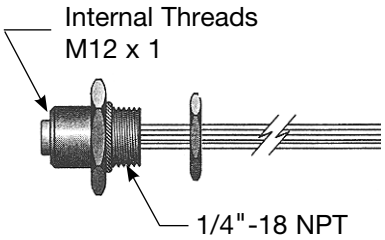
1 Drain
2 Red (V+)
3 Black (V-)
4 White (Can-H)
5 Blue (Can-L)

5 POLE MICRO RECEPTACLES

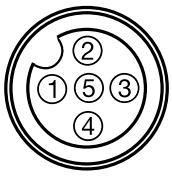
MICRO MALE



MICRO FEMALE



FACE VIEW OF FEMALE MICRO RECEPTACLE



1 Drain
2 Red (V+)
3 Black (V-)
4 White (Can-H)
5 Blue (Can-L)

ORDERING INFORMATION *(Call for pricing & availability)*

MINI			
PART NO.	**DESCRIPTION**	**METERS**	**FEET**
RP15A43F004	Male Mini Receptacle	1.22	4.0
RP15C43F004	Female Mini Receptacle	1.22	4.0

MICRO			
PART NO.	**DESCRIPTION**	**METERS**	**FEET**
RT15R43F004	Male Micro Receptacle	1.22	4.0
RT15T43F004	Female Micro Receptacle	1.22	4.0

Build Your Own DeviceNet™ Cord Sets

Type	Style	Ends	Poles	Head configuration	Cable	UOM	Length	Coupling
C	P	2	5	E	44	F	020	

Part No.

Coupling: Blank=Regular
S = Stainless Steel
P = Plastic

Cable Length
(3 characters) example:
5 = **"005"**
50 = **"050"**
500 = **"500"**

Unit of Measure
F = Feet
M = Meters
A = Inches

Cable Type – must be two digits
DeviceNet™
41 = DeviceNet Thick - 60001
42 = DeviceNet Thin - 60002 (sub 60007)
43 = DeviceNet Thin HP - 60007
44 = DeviceNet Thick HP - 60008

Other Cable Options
54 = 16/4 Cenelec

Head Configuration
A = Male Straight
B = Male 90°
C = Female Straight
D = Female 90°

E = Male Straight to Female Straight
F = Male Straight to Female 90°
G = Male 90° to Female Straight
H = Male 90° to Female 90°

J = Male Straight to Male Straight
K = Male Straight to Male 90°
L = Male 90° to Male 90°

M = Female Straight to Female Straight
N = Female Straight to Female 90°
P = Female 90° to Female 90°

# of Poles
4 = Cenelec
5 = DeviceNet

Single or Double Ended
1 = Single End (or receptacle)
2 = Double End

Style
P = DeviceNet - Mini
T = DeviceNet - Micro

Type
C = Cordset
R = Receptacle

In the sample part number above, **CP25E44F020** is a mini cordset, double ended, 5 pole, male srtaight to female straight, using DeviceNet Thick HP cable (60008) and is 20 feet long.

DEFENDER®

ANTIMICROBIAL CABLE

DEFENDER®

Family of Antimicrobial Cable

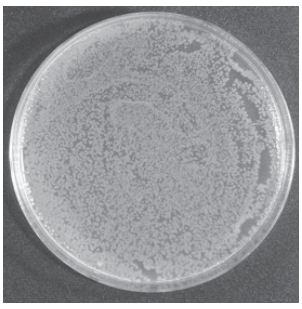
Eliminates Greater than 99% of Bacteria, Fungus and Mold

TPC designs and supplies high quality, high performance cord, cable and accessories that increase uptime and solve difficult problems in harsh industrial environments. ***DEFENDER®*** antimicrobial cable is the first product in this antimicrobial line to provide a solution to bacteria, fungus and mold growth on the cable jacket. A silver ion based antimicrobial additive provides built in lasting protection for the life of the cable while effectively eliminating greater than 99% of gram-negative and gram-positive bacteria, fungus and mold within 24 hours.

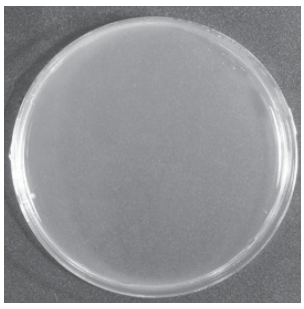
The presence of heat, moisture and organic materials in food processing plants create an ideal environment for bacteria, fungus and mold to grow on equipment. Stringent cleaning requirements are daily rituals in the food and beverage industry. *DEFENDER* antimicrobial cable adds another level of protection with its built in antimicrobial jacket. If a cable fails a visual inspection, the down time can cost a facility thousands of dollars in lost production. *DEFENDER* antimicrobial cable will increase the cable life in this harsh industrial environment while inhibiting bacteria, fungus and mold growth on the cable jacket.

TESTING METHODS

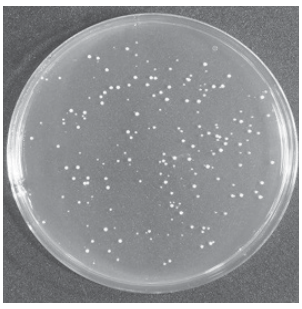
Highly effective ***DEFENDER®* Antimicrobial Cable** efficacy has been confirmed by independent lab test results. Photos below show the amount of E.Coli and Staph bacteria cultivated for 14 days after 24 hours of exposure to the *DEFENDER* antimicrobial cable jacket versus a cable jacket without antimicrobial agents. The photos have not been altered in any way.



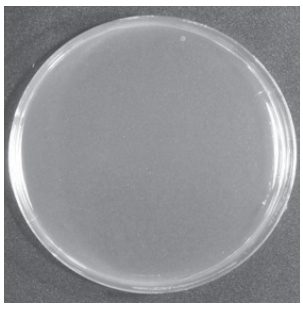
E. COLI GROWTH
No Antimicrobial Additive



E. COLI NO GROWTH
With Antimicrobial Additive



STAPH GROWTH
No Antimicrobial Additive



STAPH NO GROWTH
With Antimicrobial Additive

APPLICATIONS

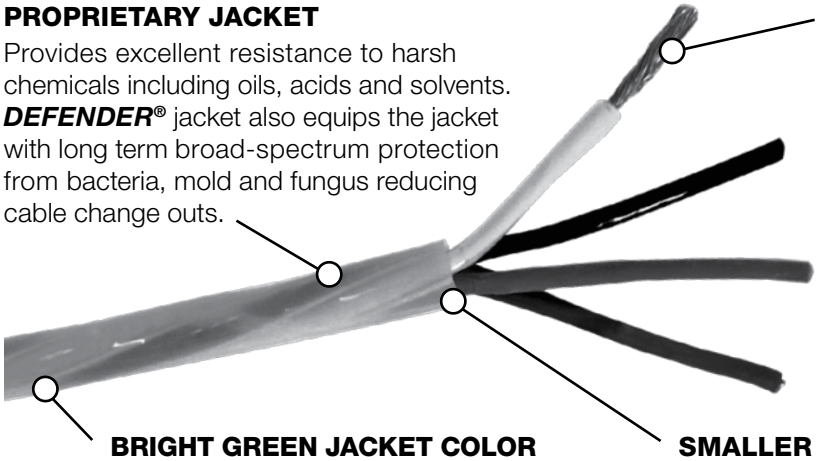
- Wash Down Areas
- Automated Packaging/ Bagging Equipment
- Electronic Control Systems
- Cable Carriers
- Power Supply for Fans, Pumps, Motors, Hand Tools
- Conveyor Systems
- Coolers, Freezers, Ovens, Fryers
- Pasta Drying Machinery
- Canning and Bottling Process Lines
- Any application where fungus, bacteria or mold growth need to be controlled

DEFENDER® Antimicrobial Cable

- **Antimicrobial**
- **Superior Chemical Resistance**
- **VW1-UL Flame Test**
- **FT-1 CSA Flame Test**
- **600 Volt**
- **-60°C to +150°C**
- **RoHS Compliant**

PROPRIETARY JACKET

Provides excellent resistance to harsh chemicals including oils, acids and solvents. ***DEFENDER***® jacket also equips the jacket with long term broad-spectrum protection from bacteria, mold and fungus reducing cable change outs.



FINELY STRANDED TINNED CONDUCTORS

Provides greater flex life in dynamic conditions and protects from corrosion and oxidation in chemical and high temperature environments.

HAS A LOW COEFFICIENT OF FRICTION

Provides superior resistance to cutting and abrasion.

BRIGHT GREEN JACKET COLOR

Allows for easy visual inspection.

SMALLER DIAMETER

Easily fits through conduit or around tight spaces.

ORDERING INFORMATION *(Call for pricing & availability)*

UNSHIELDED					
PART NO.	**CONFIGURATION** (AWG/COND)	**STRANDING** (STRANDS/AWG)	**NOMINAL O.D.** (IN.)	**AMPACITY** (1)	**WT.** (LBS.) **PER 1000'**
52128	12/4	65/30	0.335	48	133
52124	14/4	105/34	0.270	37	86
52127	14/8	105/34	0.354	24	165
52125	14/12	105/34	0.383	23	210
52126	16/4	65/34	0.225	21	59
52129	16/8	65/34	0.295	18	115
52130	16/12	65/34	0.365	13	152
52122	18/4	41/34	0.200	16	41
52123	18/12	41/34	0.315	10	98

SHIELDED					
PART NO.	**CONFIGURATION** (AWG/COND)	**STRANDING** (STRANDS/AWG)	**NOMINAL O.D.** (IN.)	**AMPACITY** (1)	**WT.** (LBS.) **PER 1000'**
52118	12/4	65/30	0.370	48	154
52117	14/4	105/34	0.290	37	104
52116	16/4	65/34	0.245	21	77
52120	16/12	65/34	0.385	13	176
52114	18/3	65/36	0.205	16	46
52115	18/4	41/34	0.220	16	56
52119	18/12	41/34	0.345	10	123

NOTE: (1) Ampacities are based on conductors in free air, 40°C (104°F) ambient, 150°C (302°F) conductor temperature.

TPC CAN PROVIDE CUSTOM CONFIGURATIONS.

PRODUCT DISCLAIMER: *Antimicrobial properties are built in to inhibit the growth of bacteria that may affect this product. The additives can not leach out of this product. The antimicrobial properties do not protect users or others against bacteria, viruses, germs or other disease organisms. Always clean and wash this product in accordance with required cleaning procedures.*

TPC WIRE & CABLE CORP. • USA 800-521-7935 • CANADA 800-545-0122 • MEXICO 001-877-283-1696

CHEM-GARD™

CABLE FOR EXTREME TEMPERATURE AND CHEMICALS

Chem-Gard™

Cable for Extreme Temperature and Chemicals

CHEM-GARD™ CHEMICAL RESISTANCE *(CHART 1)*			
CHEMICAL	**FLUOROPOLYMER**	**ETFE**	**FEP**
Oxidation Resistance	Excellent	Excellent	Excellent
Oil	Excellent	Excellent	Excellent
UV Rays	Excellent	Excellent	Excellent
Water	Excellent	Excellent	Excellent
Acid	Excellent	Excellent	Excellent
Alkali	Excellent	Excellent	Excellent
Gasoline/Kerosene	Excellent	Excellent	Excellent
Benzol Toluene	Excellent	Excellent	Excellent
Degreaser Solvent	Excellent	Excellent	Excellent
Alcohol	Excellent	Excellent	Excellent

CHEM-GARD™ COLOR CODES *(CHART 2)*

1	**BLACK**
2	**WHITE**
3	**RED**
4	**GREEN**
5	**ORANGE**
6	**BLUE**
7	**WHITE/BLACK**
8	**RED/BLACK**
9	**GREEN/BLACK**
10	**ORANGE/BLACK**
11	**BLUE/BLACK**
12	**BLACK/WHITE**

CHEM-GARD™ COMPLIANCE

- Passes Boeing Test Method BSS 7239 for Toxic Gas, Flaming and Non-Flaming Mode.
- Passes Bombardier Specification SMP 800C Toxic Gas Generation, Flaming and Non-Flaming Mode.
- ASTM E 662 — Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials (NFPA Designation No. 258.)

Chem-Gard™ 200 Encoder/Resolver Cable

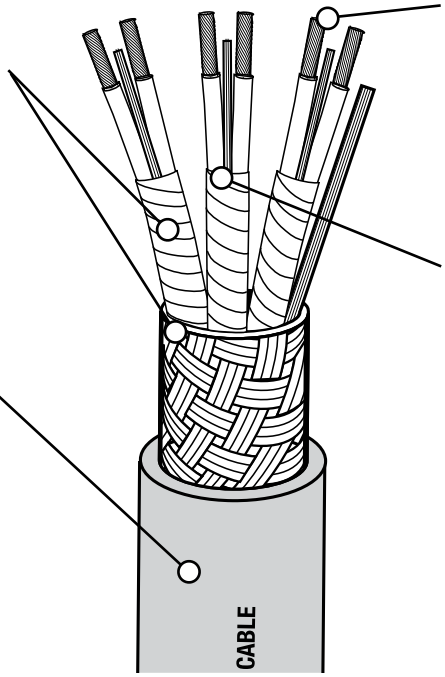
- 600 Volt
- RoHS Compliant
- Rated to 200°C (392°F)
- Rated to -60°C
- FT-1
- VW-1

HEAVY DUTY COMBINATION OF NICKEL-PLATED COPPER BRAID AND ALUMINUM/ MYLAR FOIL SHIELD

The combination of nickel-copper braid and aluminum/foil shield provides 100% shielding protection from EM and RF interference. Finely stranded braid is ideal for flexing applications.

FLUOROPOLYMER JACKET

Ideal for environments with harsh chemicals including oils, acids and solvents. Excellent protection against cutting and abrasion. Excellent performance in temperatures up to 200°C and down to -60°C.



FINELY STRANDED NICKEL-PLATED COPPER CONDUCTORS

For improved flexibility in dynamic applications and protection from corrosion and oxidation in chemical and high temperature environments.

FLUOROPOLYMER INSULATION ON INDIVIDUAL CONDUCTORS

Offers superior resistance to oils, solvents and chemicals. Provides high dielectric capability, mechanical strength and cut resistance.

ADD CHEM-GARD™ QUICK-CONNECTS™ TO COMPLETE YOUR ORDER! *See Pages 174-176.*

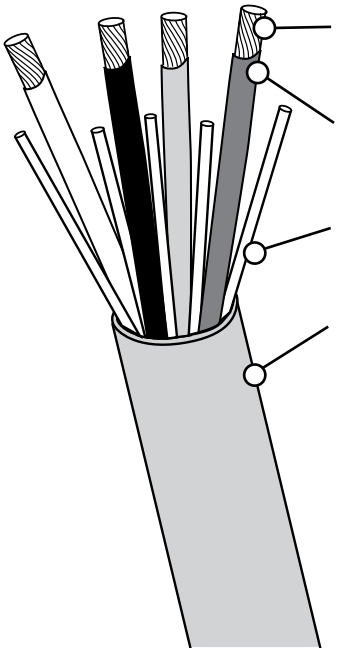
ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	COND SIZE (AWG/# PAIRS)	STRANDING (STRANDS/AWG)	NOMINAL O.D. (IN.)	AMPACITY (1)	WT. (LBS.) PER 1000'	CAPACITANCE COND-COND (pF/ft)	CAPACITANCE COND-SHLD (pF/ft)	INDUCTANCE (mHh/ft)
45502	18/2 PR	19/30	0.292	19	85	32.5	58.5	0.16
45503	18/3 PR	19/30	0.325	16	98	32.5	58.5	0.16
45504	18/4 PR	19/30	0.360	16	116	32.5	58.5	0.16
45506	18/6 PR	19/30	0.460	16	201	32.5	58.5	0.16
45507	18/7 PR	19/30	0.460	16	209	32.5	58.5	0.16
45509	18/9 PR	19/30	0.535	12	295	32.5	58.5	0.16
45602	20/2 PR	19/32	0.262	13	65	28.8	51.8	0.17
45603	20/3 PR	19/32	0.290	11	75	28.8	51.8	0.17
45604	20/4 PR	19/32	0.330	11	96	28.8	51.8	0.17
45606	20/6 PR	19/32	0.380	11	136	28.8	51.8	0.17
45607	20/7 PR	19/32	0.380	11	140	28.8	51.8	0.17
45609	20/9 PR	19/32	0.480	8	230	28.8	51.8	0.17
45702	22/2 PR	19/34	0.225	10	52	25.3	45.5	0.17
45703	22/3 PR	19/34	0.270	9	60	25.3	45.5	0.17
45704	22/4 PR	19/34	0.300	9	76	25.3	45.5	0.17
45706	22/6 PR	19/34	0.340	9	108	25.3	45.5	0.17
45707	22/7 PR	19/34	0.340	9	110	25.3	45.5	0.17
45709	22/9 PR	19/34	0.430	6	145	25.3	45.5	0.17
45802	24/2 PR	19/36	0.215	8	42	22.4	40.3	0.19
45803	24/3 PR	19/36	0.250	7	52	22.4	40.3	0.19
45804	24/4 PR	19/36	0.275	7	62	22.4	40.3	0.19
45806	24/6 PR	19/36	0.326	7	85	22.4	40.3	0.19
45807	24/7 PR	19/36	0.326	7	123	22.4	40.3	0.19
45809	24/9 PR	19/36	0.379	5	150	22.4	40.3	0.19

Chem-Gard™ 200

• Rated to 200°C (392°F) • FT-1 • VW-1

In cat track testing Chem-Gard 16/12 completed over **1.7** million cycles without failure!



FINELY STRANDED NICKEL PLATED COPPER CONDUCTORS
For improved flexibility in dynamic applications and protection from corrosion and oxidation in chemical and high temperature environments.

FLUOROPOLYMER CONDUCTOR INSULATION
Extremely chemical resistant and mechanically durable for additional protection against cutting, abrasion and chemicals. Conductors slide easily within jacket for maximum flex life.

HIGH TEMPERATURE FLUOROPOLYMER FILLERS
Will not wick up contaminants into cable. Allows conductors to move freely within jacket for improved flexibility in dynamic applications.

FLUOROPOLYMER JACKET
Ideal for harsh chemical environments. Excellent defense against cutting and abrasion. Resistant to oils, acids, solvents and chemicals. Designed for continuous temperature environments up to 200°C (392°F).

OPTIONAL ULTRA-SHIELD™ CONSTRUCTION
90% coverage heavy duty tinned copper braid shielding provides protection from EM and RF interference in addition to superior mechanical strength in abusive environments.

SMALL DIAMETER
Fluoropolymer offers excellent electrical properties and the product is much smaller than most cables of the same AWG size and conductor count. This allows the product to be used in areas that require a tighter bend radius.

APPLICATIONS

- Conveyors
- Pumps
- Motor Operated Valves
- Emergency Isolation Valves
- Kiln Fans
- Furnaces

ADD CHEM-GARD™ QUICK-CONNECTS™ TO COMPLETE YOUR ORDER! *See Pages 174-176.*

ORDERING INFORMATION *(Call for pricing & availability)*

UNSHIELDED MULTI-CONDUCTOR
High Temp Non-Shielded Braid – 200°C *(Additional configurations available)*

PART NO.	CONFIGURATION (AWG/COND)	STRANDING (STRANDS/AWG)	NOMINAL O.D. (IN.)	AMPACITY (1)	WT. (LBS.) PER 1000'
42804	18/4	41/34	0.200	19.0	42
42812	18/12	41/34	0.305	12.0	105
42604	16/4	65/34	0.230	26.0	59
42612	16/12	65/34	0.370	16.0	152
42404	14/4	105/34	0.270	43.0	86.5
42412	14/12	105/34	0.425	26.0	210
42204	12/4	65/30	0.345	54.0	133.5

UNSHIELDED SINGLE CONDUCTOR *(CONTINUED ON NEXT PAGE)*
High Temp Non-Shielded Braid – 200°C *(Additional configurations available)*

PART NO.	CONFIGURATION (AWG/COND)	STRANDING (STRANDS/AWG)	NOMINAL O.D. (IN.)	AMPACITY (1)	WT. (LBS.) PER 1000'
42901	1	817/30	0.437	344	340
42902	2	665/30	0.401	293	277
42904	4	133/25	0.305	220	170
42906	6	133/27	0.252	165	111
42908	8	133/29	0.211	124	73

NOTE: (1) Ampacities are based on conductors in free air, 40°C (104°F) ambient, 200°C (392°F) conductor temperature.

(continued from previous page)

UNSHIELDED SINGLE CONDUCTOR
High Temp Non-Shielded Braid – 200°C *(Additional configurations available)*

PART NO.	CONFIGURATION (AWG/COND)	STRANDING (STRANDS/AWG)	NOMINAL O.D. (IN.)	AMPACITY (1)	WT. (LBS.) PER 1000'
42881	18 BLACK	41/34	0.068	24.0	6.8
42882	18 WHITE	41/34	0.068	24.0	6.8
42883	18 RED	41/34	0.068	24.0	6.8
42884	18 GREEN	41/34	0.068	24.0	6.8
42885	18 BROWN	41/34	0.068	24.0	6.8
42886	18 ORANGE	41/34	0.068	24.0	6.8
42887	18 YELLOW	41/34	0.068	24.0	6.8
42888	18 BLUE	41/34	0.068	24.0	6.8
42661	16 BLACK	65/34	0.078	32.0	10.4
42662	16 WHITE	65/34	0.078	32.0	10.4
42663	16 RED	65/34	0.078	32.0	10.4
42664	16 GREEN	65/34	0.078	32.0	10.4
42665	16 BROWN	65/34	0.078	32.0	10.4
42666	16 ORANGE	65/34	0.078	32.0	10.4
42667	16 YELLOW	65/34	0.078	32.0	10.4
42668	16 BLUE	65/34	0.078	32.0	10.4
42441	14 BLACK	105/34	0.094	54.0	15.5
42442	14 WHITE	105/34	0.094	54.0	15.5
42443	14 RED	105/34	0.094	54.0	15.5
42444	14 GREEN	105/34	0.094	54.0	15.5
42445	14 BROWN	105/34	0.094	54.0	15.5
42446	14 ORANGE	105/34	0.094	54.0	15.5
42447	14 YELLOW	105/34	0.094	54.0	15.5
42448	14 BLUE	105/34	0.094	54.0	15.5
42221	12 BLACK	65/30	0.124	68.0	24.6
42222	12 WHITE	65/30	0.124	68.0	24.6
42223	12 RED	65/30	0.124	68.0	24.6
42224	12 GREEN	65/30	0.124	68.0	24.6
42225	12 BROWN	65/30	0.124	68.0	24.6
42226	12 ORANGE	65/30	0.124	68.0	24.6
42227	12 YELLOW	65/30	0.124	68.0	24.6
42228	12 BLUE	65/30	0.124	68.0	24.6
42301	10 BLACK	105/30	0.134	90.0	38.5
42302	10 WHITE	105/30	0.134	90.0	38.5
42303	10 RED	105/30	0.134	90.0	38.5
42304	10 GREEN	105/30	0.134	90.0	38.5
42305	10 BROWN	105/30	0.134	90.0	38.5
42306	10 ORANGE	105/30	0.134	90.0	38.5
42307	10 YELLOW	105/30	0.134	90.0	38.5
42308	10 BLUE	105/30	0.134	90.0	38.5

SHIELDED MULTI-CONDUCTOR
High Temp Shielded Braid – 200°C *(Additional configurations available)*

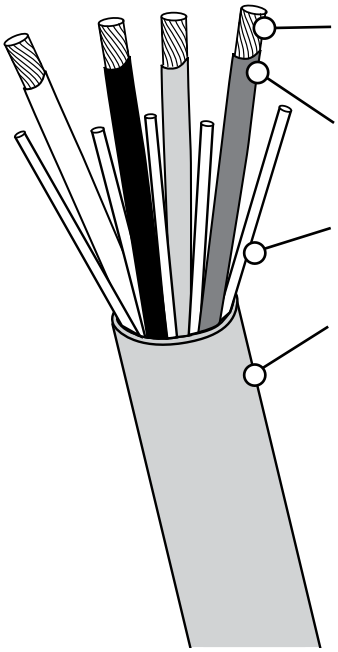
PART NO.	CONFIGURATION (AWG/COND)	STRANDING (STRANDS/AWG)	NOMINAL O.D. (IN.)	AMPACITY (1)	WT. (LBS.) PER 1000'
42066	18/3	41/34	0.208	19.0	46
42060	18/4	41/34	0.220	19.0	56
42064	18/12	41/34	0.345	12.0	123
42061	16/4	65/34	0.245	26.0	77
42065	16/12	65/34	0.385	16.0	176
42062	14/4	105/34	0.290	43.0	104
42063	12/4	65/30	0.370	54.0	154

NOTE: (1) Ampacities are based on conductors in free air, 40°C (104°F) ambient, 200°C (392°F) conductor temperature.

Chem-Gard™ 150

- 600 Volt
- RoHS Compliant
- Rated to 150°C (302°F)
- Rated to -60°C
- FT-1
- VW-1

In cat track testing Chem-Gard 16/12 completed over **1.7** million cycles without failure!



FINELY STRANDED NICKEL PLATED COPPER CONDUCTORS
For improved flexibility in dynamic applications and protection from corrosion and oxidation in chemical and high temperature environments.

FLUOROPOLYMER CONDUCTOR INSULATION
Extremely chemical resistant and mechanically durable for additional protection against cutting, abrasion and chemicals. Conductors slide easily within jacket for maximum flex life.

HIGH TEMPERATURE FLUOROPOLYMER FILLERS
Will not wick up contaminants into cable. Allows conductors to move freely within jacket for improved flexibility in dynamic applications.

FLUOROPOLYMER JACKET
Ideal for harsh chemical environments. Excellent defense against cutting and abrasion. Resistant to oils, acids, solvents and chemicals. Designed for continuous temperature environments up to 150°C (302°F).

OPTIONAL ULTRA-SHIELD™ CONSTRUCTION
90% coverage heavy duty tinned copper braid shielding provides protection from EM and RF interference in addition to superior mechanical strength in abusive environments.

SMALL DIAMETER
Fluoropolymer offers excellent electrical properties and the product is much smaller than most cables of the same AWG size and conductor count. This allows the product to be used in areas that require a tighter bend radius.

APPLICATIONS

- Conveyors
- Pumps
- Motor Operated Valves
- Emergency Isolation Valves
- Kiln Fans
- Furnaces

ADD CHEM-GARD™ QUICK-CONNECTS™ TO COMPLETE YOUR ORDER! *See Pages 174-176.*

ORDERING INFORMATION *(Call for pricing & availability)*

UNSHIELDED MULTI-CONDUCTOR
Non-Shielded Configurations – 150°C *(Additional configurations available)*

PART NO.	CONFIGURATION (AWG/COND)	STRANDING (STRANDS/AWG)	NOMINAL O.D. (IN.)	AMPACITY (1)	WT. (LBS.) PER 1000'
42122	18/4	41/34	0.200	16.0	41
42123	18/12	41/34	0.315	10.0	98
42126	16/4	65/34	0.225	21.0	59
42130	16/12	65/34	0.365	13.0	152
42124	14/4	105/34	0.270	37.0	86
42125	14/12	105/34	0.423	23.0	210
42128	12/4	65/30	0.335	48.0	133

UNSHIELDED SINGLE CONDUCTOR *(CONTINUED ON NEXT PAGE)*
Non-Shielded Configurations – 150°C *(Additional configurations available)*

PART NO.	CONFIGURATION (AWG/COND)	STRANDING (STRANDS/AWG)	NOMINAL O.D. (IN.)	AMPACITY (1)	WT. (LBS.) PER 1000'
42197	1	817/30	0.437	293	340
42190	2	665/30	0.401	255	277
42185	4	133/25	0.305	190	170
42180	6	133/27	0.252	155	111
42170	8	133/29	0.211	106	73

NOTE: (1) Ampacities are based on conductors in free air, 40°C (104°F) ambient, 200°C (392°F) conductor temperature.

(continued from previous page)

UNSHIELDED SINGLE CONDUCTOR
Non-Shielded Configurations – 150°C *(Additional configurations available)*

PART NO.	CONFIGURATION (AWG/COND)	STRANDING (STRANDS/AWG)	NOMINAL O.D. (IN.)	AMPACITY (1)	WT. (LBS.) PER 1000'
42161	18 BLACK	41/34	0.066	20.0	6.8
42162	18 WHITE	41/34	0.066	20.0	6.8
42163	18 RED	41/34	0.066	20.0	6.8
42164	18 GREEN	41/34	0.066	20.0	6.8
42165	18 BROWN	41/34	0.066	20.0	6.8
42166	18 ORANGE	41/34	0.066	20.0	6.8
42167	18 YELLOW	41/34	0.066	20.0	6.8
42168	18 BLUE	41/34	0.066	20.0	6.8
42151	16 BLACK	65/34	0.076	26.0	10.4
42152	16 WHITE	65/34	0.076	26.0	10.4
42153	16 RED	65/34	0.076	26.0	10.4
42154	16 GREEN	65/34	0.076	26.0	10.4
42155	16 BROWN	65/34	0.076	26.0	10.4
42156	16 ORANGE	65/34	0.076	26.0	10.4
42157	16 YELLOW	65/34	0.076	26.0	10.4
42158	16 BLUE	65/34	0.076	26.0	10.4
42141	14 BLACK	105/34	0.092	46.0	15.5
42142	14 WHITE	105/34	0.092	46.0	15.5
42143	14 RED	105/34	0.092	46.0	15.5
42144	14 GREEN	105/34	0.092	46.0	15.5
42145	14 BROWN	105/34	0.092	46.0	15.5
42146	14 ORANGE	105/34	0.092	46.0	15.5
42147	14 YELLOW	105/34	0.092	46.0	15.5
42148	14 BLUE	105/34	0.092	46.0	15.5
42131	12 BLACK	65/30	0.124	60.0	24.6
42132	12 WHITE	65/30	0.124	60.0	24.6
42133	12 RED	65/30	0.124	60.0	24.6
42134	12 GREEN	65/30	0.124	60.0	24.6
42135	12 BROWN	65/30	0.124	60.0	24.6
42136	12 ORANGE	65/30	0.124	60.0	24.6
42137	12 YELLOW	65/30	0.124	60.0	24.6
42138	12 BLUE	65/30	0.124	60.0	24.6
42101	10 Black	105/30	0.142	80.0	38.5
42102	10 White	105/30	0.142	80.0	38.5
42103	10 Red	105/30	0.142	80.0	38.5
42104	10 Green	105/30	0.142	80.0	38.5
42105	10 BROWN	105/30	0.142	80.0	38.5
42106	10 ORANGE	105/30	0.142	80.0	38.5
42107	10 YELLOW	105/30	0.142	80.0	38.5
42108	10 BLUE	105/30	0.142	80.0	38.5

SHIELDED MULTI-CONDUCTOR
Shielded Configurations – 150°C *(Additional configurations available)*

PART NO.	CONFIGURATION (AWG/COND)	STRANDING (STRANDS/AWG)	NOMINAL O.D. (IN.)	AMPACITY (1)	WT. (LBS.) PER 1000'
42114	18/3	65/36	0.205	16.0	46
42115	18/4	41/34	0.220	16.0	56
42119	18/12	41/34	0.345	10.0	123
42116	16/4	65/34	0.245	21.0	77
42120	16/12	65/34	0.385	13.0	176
42117	14/4	105/34	0.290	37.0	104
42118	12/4	65/30	0.370	48.0	154

NOTE: (1) Ampacities are based on conductors in free air, 40°C (104°F) ambient, 150°C (302°F) conductor temperature.

THERMO-TREX®

HIGH TEMPERATURE WIRE & CABLE

HIGH TEMPERATURE SLEEVING

HIGH TEMPERATURE SILICA TAPE

Thermo-Trex®

Family of High Temperature Wire and Cable

Thermo-Trex 2800:	Maximum Continuous Temperature of 1,000°F Extreme Temperature up to 3,000°F
Thermo-Trex 2000:	Maximum Continuous Temperature of 850°F Extreme Temperature up to 2,000°F
Thermo-Trex 850:	Maximum Continuous Temperature of 500°F Extreme Temperature up to 850°F
Thermo-Trex 500-K:	Maximum Continuous Temperature of 392°F Extreme Temperature up to 775°F
Thermo-Trex 500:	Maximum Continuous Temperature of 392°F Extreme Temperature up to 775°F
Thermo-Trex 500-Plus:	Maximum Continuous Temperature of 392°F Extreme Temperature up to 775°F

Family of High Temperature Sleeving

THERMO-TREX® SLEEVING SELECTION CHART

CONDITION	CERAMIC	FIBERGLASS	SILICONE	REFLECTIVE	ABRASION RESISTANT
TEMPERATURE 250°F – 500°F	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT	EXCELLENT
TEMPERATURE 501°F – 1000°F	EXCELLENT	EXCELLENT	POOR	EXCELLENT (up to 750°F)	POOR
TEMPERATURE 1001°F – 2600°F	EXCELLENT	EXCELLENT	POOR	POOR	POOR
FLAME SHORT TERM	EXCELLENT	GOOD	POOR	GOOD	GOOD
FLAME LONG TERM	EXCELLENT	POOR	POOR	POOR	POOR
MOISTURE	POOR	POOR	EXCELLENT	EXCELLENT	POOR
CHEMICAL	POOR	POOR	EXCELLENT	EXCELLENT	POOR
TEARING	POOR	POOR	EXCELLENT	EXCELLENT	EXCELLENT
ABRASION	GOOD	GOOD	POOR	GOOD	EXCELLENT

**This selection chart is meant to be used only as a guide in selecting the proper sleeving. The selection of individual sleeving products is based on their performance in conjunction with a high temperature cord or cable product.*

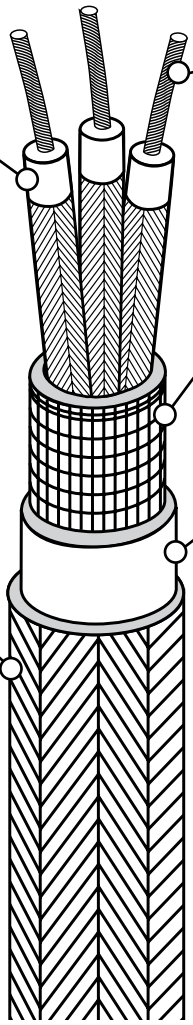
Thermo-Trex® 2800

- 600 Volt
- RoHS Compliant
- Extreme Temperatures up to 3000ºF
- Continuous Temperatures up to 1000ºF

FLUOROPOLYMER COLOR SATURATED INSULATION
Easier to identify. Reduced chance of miswiring. Maintain their color for ease of identification up to 450ºC.

AVAILABLE IN SINGLE AND MULTIPLE CONDUCTOR CONFIGURATIONS
The right product for the job.

SPECIALLY WOVEN GLASS-BRAID JACKET, IMPREGNATED WITH FLUOROPOLYMER FINISHING COMPOUNDS
Provides first-line defense against abrasion and high heat.



27% NICKEL-PLATED COPPER, #30 AWG STRANDING
Increases flexibility, provides longer cable life.

SPECIAL FLUOROPOLYMER/ MICA/GLASS MULTIPLE-LAYERED CONSTRUCTION
Highly resistant to heat, chemicals, and corrosives. Long-term durability in the harshest industrial environments.

HEAT-SEALED FLUOROPOLYMER VAPOR BARRIER PERMANENTLY BONDED TO THE JACKET
Provides improved electrical safety in wet environments.

Independently lab tested to ANSI/ IEEE 383-1974 Standard. Passed 2-hour 3000˚F vertical flame test.

CONDUCTOR COLOR CODE	
1	Red
2	White
3	Blue
4	Green

APPLICATIONS

- Conveyors
- Pumps
- Furnaces
- Motor Operated Valves
- Emergency Isolation Valves
- Kiln Fans
- Flare Stacks
- Control Panels
- Crane Hoist

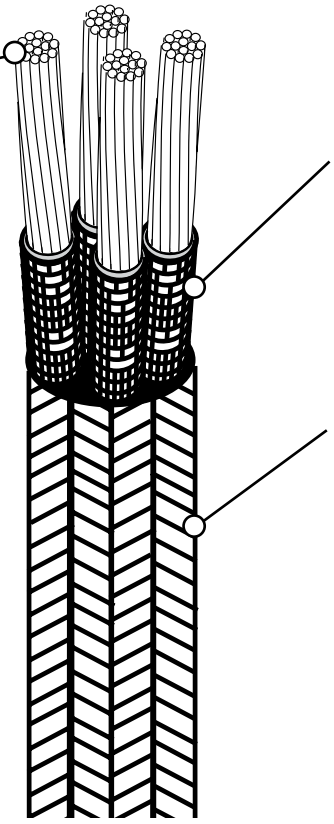
ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CONDUCTOR SIZE (AWG)	CONDUCTOR STRANDING	AMPACITY (1)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
41213	16/3	26/30	25	0.347	93
41215	12/4	65/30	42	0.430	166
41204	14	41/30	51	0.190	30
41205	12	65/30	70	0.208	42
41206	10	105/30	95	0.254	63

NOTE: (1) Ampacity is based on a single conductor in free air, 40ºC (104ºF) ambient, 450ºC (842ºF) conductor temperature. Ampacity ratings for Thermo-Trex high-temperature wire are significantly higher than normally insulated wire because the insulating materials used in Thermo-Trex can withstand much higher conductor temperatures without breaking down.

Thermo-Trex® 2000

- **600 Volt**
- **RoHS Compliant**
- **Extreme Temperatures up to 2000ºF**
- **Continuous Temperatures up to 850ºF**



27% NICKEL-PLATED COPPER STRANDING

Long life in high-heat, improved signal quality. Increases flexibility, provides longer cable life.

SPECIAL MICA/GLASS MULTIPLE LAYERED INSULATION

Provides long-term durability in the harshest industrial environments. Highly resistant to heat.

SPECIALLY WOVEN GLASS-BRAID JACKET, IMPREGNATED WITH FLUOROPOLYMER FINISHING COMPOUNDS

Provides first-line defense against abrasion and high heat.

APPLICATIONS

- Conveyors
- Pumps
- Furnaces
- Motor Operated Valves
- Emergency Isolation Valves
- Kiln Fans
- Flare Stacks
- Control Panels
- Crane Hoist

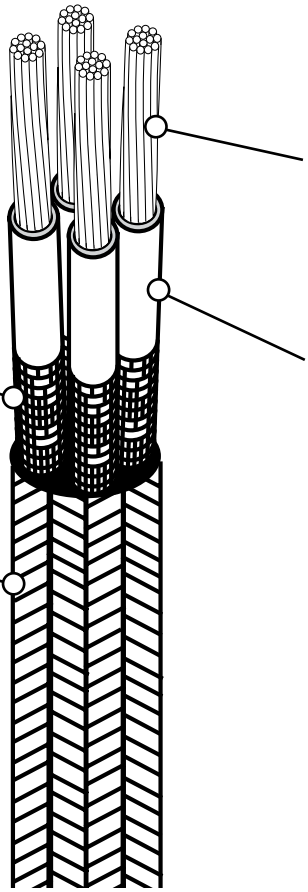
ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CONDUCTOR SIZE (AWG)	CONDUCTOR STRANDING	AMPACITY (1)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
41103	22	7/30	11	0.950	4.62
41106	20	10/30	21	0.105	7.52
41109	18	16/30	28	0.115	9.77
41112	16	26/30	38	0.125	11.87
41115	14	41/30	51	0.140	17.12
41118	12	65/30	70	0.160	25.94
41121	10	105/30	95	0.210	41.58
41124	8	133/29	130	0.265	69.30
41127	6	133/27	177	0.310	102.90
41134	16/4	19/0.0117	13	0.317	77
41139	12/4	37/0.0133	23	0.388	14

NOTE: (1) Ampacities are based on a single conductor in free air, 40°C (104°F) ambient, 450°C (842°F) conductor temperature. Ampacity ratings for Thermo-Trex high temperature wire are significantly higher than normal insulated wire because the insulating materials used in Thermo-Trex can withstand much higher conductor temperatures without breaking down.

Thermo-Trex® 850

- 600 Volt
- RoHS Compliant
- Extreme Temperatures up to 850ºF
- Continuous Temperatures up to 500ºF



2% NICKEL-PLATED COPPER, #30 AWG FLEXIBLE STRANDING
Increased flexibility, improved signal quality.

FLUOROPOLYMER VAPOR BARRIER INSULATION
Provides high resistance to chemicals and corrosives.

VAPOR BARRIER
Insulation provides improved electrical safety in wet environments.

CERAMIC WRAP
Acts as a heat barrier to protect the insulation and provide optimum performance.

SPECIALLY WOVEN GLASS-BRAID JACKET, IMPREGNATED WITH FLUOROPOLYMER FINISHING COMPOUNDS
Provides first-line defense against abrasion and high heat.

APPLICATIONS

- Conveyors
- Pumps
- Furnaces
- Motor Operated Valves
- Emergency Isolation Valves
- Kiln Fans
- Flare Stacks
- Control Panels
- Crane Hoist

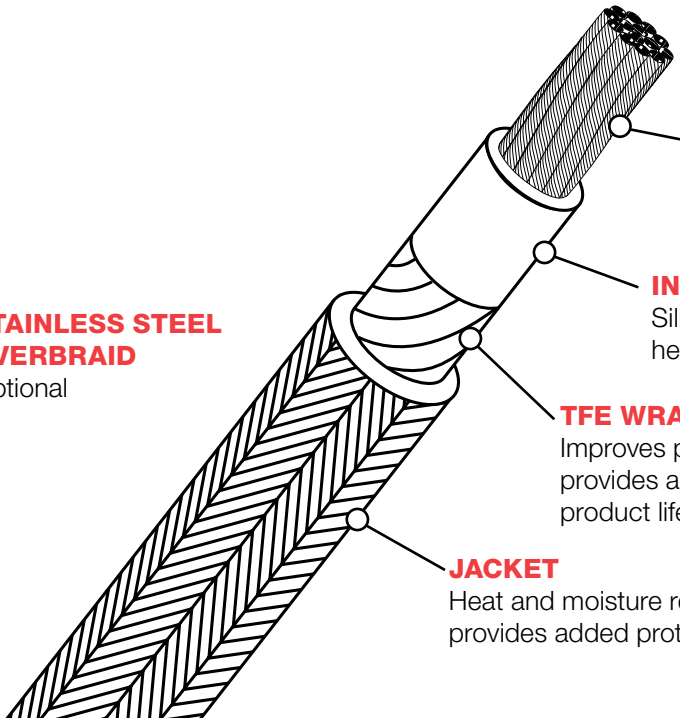
ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CONDUCTOR SIZE (AWG)	CONDUCTOR STRANDING	AMPACITY (1)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
41062	18	16/30	27	0.110	13
41065	16	26/30	37	0.120	18
41068	14	41/30	51	0.140	24
41071	12	65/30	66	0.160	34
41074	10	105/30	90	0.185	51
41084	16/4	26/30	16	0.332	84
41087	16/12	26/30	10	0.566	224
41089	12/4	65/30	22	0.423	158

NOTE: (1) Ampacity is based on a single conductor in free air, 40ºC (104ºF) ambient, 200ºC (392ºF) conductor temperature. Ampacity ratings for Thermo-Trex high-temperature wire are significantly higher than normally insulated wire because the insulating materials used in Thermo-Trex can withstand much higher conductor temperatures without breaking down.

500-K Single Conductor Cable

- 600 Volt
- RoHS Compliant
- Extreme Temperatures up to 775ºF
- Continuous Temperatures up to 392ºF



CONDUCTORS
Flexible tinned copper strands for improved flexibility.

INSULATION
Silicone rubber provides resistance to heat, moisture and chemicals.

STAINLESS STEEL OVERBRAID
Optional

TFE WRAP
Improves performance in flexing applications and provides an additional thermal barrier to extend product life in extreme temperature environments.

JACKET
Heat and moisture resistant Aramid fiber braid jacket provides added protection against abrasion.

APPLICATIONS

- Conveyors
- Pumps
- Furnaces
- Motor Operated Valves
- Emergency Isolation Valves
- Kiln Fans
- Flare Stacks
- Control Panels
- Crane Hoist

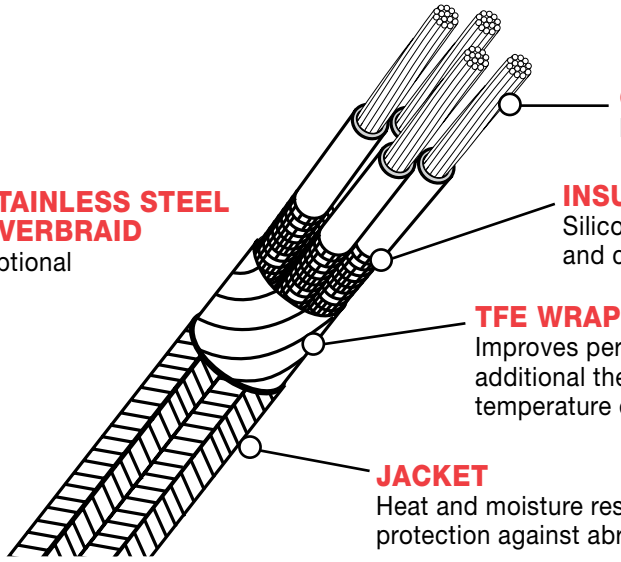
ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CONDUCTOR SIZE	CONDUCTOR STRANDING	SILICONE THICKNESS (IN.)	ARAMID BRAID THICKNESS (IN.)	AMPACITY (1)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
44002	16	7/24	0.045	0.025	37	0.200	24
44003	14	7/22	0.045	0.025	51	0.220	30
44004	12	19/25	0.045	0.025	66	0.240	40
44005	10	19/23	0.045	0.025	90	0.270	50
44006	8	54/25	0.060	0.040	125	0.375	90
44007	6	84/25	0.060	0.040	167	0.415	125
44008	4	133/25	0.060	0.040	226	0.475	185
44009	2	133/23	0.060	0.040	305	0.540	270
44010	1	259/25	0.080	0.040	362	0.625	360
44011	1/0	259/24	0.080	0.040	422	0.670	435
44012	2/0	259/23	0.080	0.040	492	0.725	530
44013	3/0	259/22	0.080	0.040	574	0.785	650
44014	4/0	259/21	0.080	0.040	671	0.850	810
44015	250	427/22	0.100	0.040	756	0.945	960
44016	350	427/21	0.100	0.040	947	1.06	1310
44017	500	427/19	0.100	0.040	1202	1.215	1830

NOTE: (1) Based on single conductor in free air, 200ºC conductor temperature, 40ºC ambient temperature per IEEE STD 835.

500-K Multi-Conductor Cable

- **600 Volt**
- **RoHS Compliant**
- **Extreme Temperatures up to 775ºF**
- **Continuous Temperatures up to 392ºF**



CONDUCTORS
Flexible tinned copper strands for improved flexibility.

STAINLESS STEEL OVERBRAID
Optional

INSULATION
Silicone rubber provides resistance to heat, moisture and chemicals with a glass fiber braid over the insulation.

TFE WRAP
Improves performance in flexing applications and provides an additional thermal barrier to extend product life in extreme temperature environments.

JACKET
Heat and moisture resistant Aramid fiber braid jacket provides added protection against abrasion.

APPLICATIONS

- Conveyors
- Pumps
- Furnaces
- Motor Operated Valves
- Emergency Isolation Valves
- Kiln Fans
- Flare Stacks
- Control Panels
- Crane Hoist

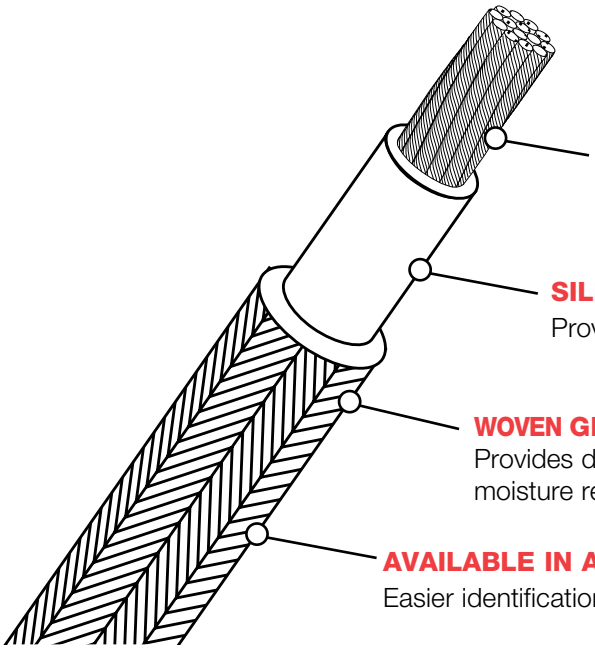
ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CONDUCTOR SIZE	CONDUCTOR STRANDING	SILICONE THICKNESS (IN.)	ARAMID BRAID THICKNESS (IN.)	AMPACITY (1)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
44027	14/2	7/22	0.045	0.030	36	0.375	55
44028	14/3	7/22	0.045	0.030	36	0.400	75
44029	14/4	7/22	0.045	0.030	36	0.435	100
44030	14/5	7/22	0.045	0.030	29	0.480	125
44031	14/7	7/22	0.045	0.030	29	0.520	170
44032	14/9	7/22	0.045	0.030	25	0.610	210
44033	14/12	7/22	0.045	0.030	18	0.690	280
44034	12/2	19/25	0.045	0.030	45	0.410	75
44035	12/3	19/25	0.045	0.030	45	0.430	110
44036	12/4	19/25	0.045	0.030	45	0.475	145
44037	12/5	19/25	0.045	0.030	36	0.520	175
44038	12/7	19/25	0.045	0.030	36	0.570	240
44039	12/9	19/25	0.045	0.030	32	0.670	300
44040	12/12	19/25	0.045	0.030	23	0.755	410
44041	10/2	19/23	0.045	0.045	60	0.525	125
44042	10/3	19/23	0.045	0.045	60	0.555	180
44043	10/4	19/23	0.045	0.045	60	0.615	235
44044	10/5	19/23	0.045	0.045	48	0.675	300
44045	10/7	19/23	0.045	0.045	48	0.740	385
44046	10/9	19/23	0.045	0.045	42	0.875	500
44047	10/12	19/23	0.045	0.045	30	0.990	665

NOTE: (1) Based on an ambient temperature of 40°C and conductor temperature of 90°C per NEC 2011, Table 3.10.15(B)(18).

Thermo-Trex® 500

- 600 Volt
- RoHS Compliant
- Extreme Temperatures up to 775ºF
- Continuous Temperatures up to 392ºF



FLEXIBLE, TINNED COPPER STRANDING
Increased flexibility for easier installation.

SILICONE RUBBER INSULATION
Provides resistance to heat, moisture and chemicals.

WOVEN GLASS-BRAID JACKET
Provides defense, provides increased heat, abrasion and moisture resistance.

AVAILABLE IN A VARIETY OF COLORS
Easier identification, less chance for miswiring.

APPLICATIONS

- Conveyors
- Pumps
- Furnaces
- Motor Operated Valves
- Emergency Isolation Valves
- Kiln Fans
- Flare Stacks
- Control Panels
- Crane Hoist

ORDERING INFORMATION *(Call for pricing & availability)*

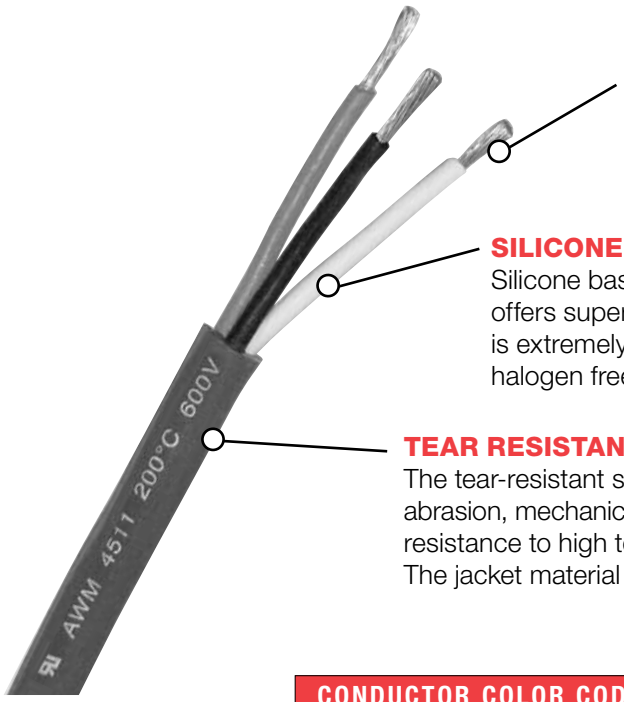
PART NO.			CONDUCTOR SIZE	CONDUCTOR STRANDING	AMPACITY (1)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
BLACK	WHITE	RED					
41001	41002	41003	18	7/26	27	0.121	12.5
41004	41005	41006	16	7/24	37	0.130	17
41007	41008	41009	14	7/22	51	0.145	23
41010	41011	41012	12	19/25	66	0.160	31.5
41013	41014	41015	10	19/23	90	0.220	53
41016	41017	41018	8	54/25	125	0.300	92
41019	41020*	41021*	6	84/25	167	0.340	133
41022	41023*	41024*	4	133/25	226	0.411	190
41025	41026*	41027*	2	133/23	305	0.500	280
41028	41029*	41030*	1	259/25	362	0.585	362
41031	41032*	41033*	1/0	259/24	422	0.645	440
41034	41035*	41036*	2/0	259/23	492	0.700	538
41037	41038*	41039*	3/0	259/22	574	0.755	659
41040	41041*	41042*	4/0	259/21	671	0.820	812

*NOTE: (1) Ampacity is based on a single conductor in free air, 40ºC (104ºF) ambient, 200ºC (392ºF) conductor temperature. Ampacity ratings for Thermo-Trex high-temperature wire are significantly higher than normally insulated wire because the insulating materials used in Thermo-Trex can withstand much higher conductor temperatures without breaking down. *Call for availability.*

500-Plus Silicone Cable

- 200°C UL/cUL
- 600V Rated UL/cUL
- Low Smoke Zero Halogen
- RoHS Compliant
- FT-1/FT-2

Thermo-Trex 500-Plus is designed with a tear-resistant silicone jacket. It is an ideal choice for applications exposed to high temperatures, UV light and mechanical abuse.



FINELY STRANDED TINNED COPPER CONDUCTORS

Finely stranded tinned copper conductors improve flexibility and extends conductor life.

SILICONE INSULATION ON INDIVIDUAL CONDUCTORS

Silicone based elastomer insulation on individual conductors offers superior resistance to oil and abrasion. This insulation is extremely flexible and offers low smoke density and is halogen free.

TEAR RESISTANT SILICONE JACKET

The tear-resistant silicone jacket provides excellent protection against abrasion, mechanical abuse and is resistant to oils. It offers outstanding resistance to high temperatures, and remains flexible down to -40ºC. The jacket material is low smoke/halogen-free.

CONDUCTOR COLOR CODE	
1	White
2	Black
3	Green
4	Red
5	Orange

ADD 500 PLUS SILICONE QUICK-CONNECTS™ TO COMPLETE YOUR ORDER! *See Page 178.*

APPLICATIONS

- Conveyors
- Pumps
- Furnaces
- Motor Operated Valves
- Emergency Isolation Valves
- Kiln Fans
- Flare Stacks
- Control Panels
- Crane Hoist

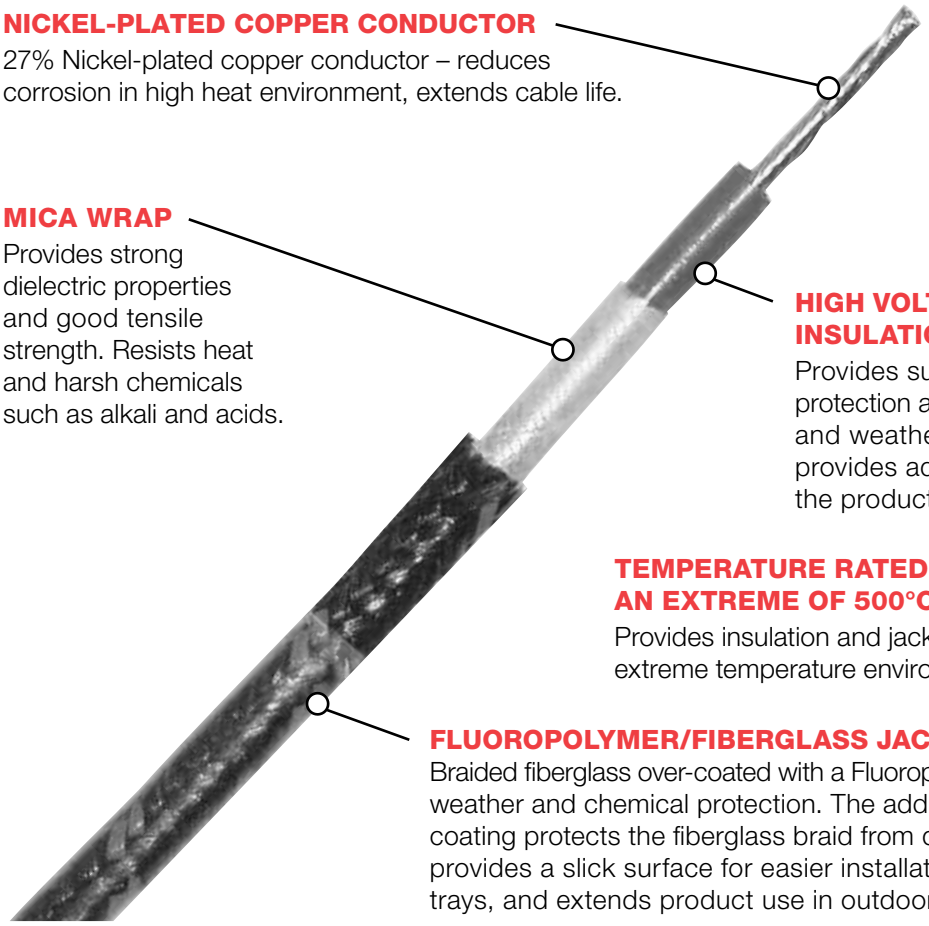
ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND	CONDUCTOR STRANDING	AMPACITY (1)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
41462*	16/2	19/29	30	0.272	46
41463	16/3	19/29	26	0.287	56
41464	16/4	19/29	24	0.295	70
41465	16/5	19/29	23	0.342	89

NOTE: (1) Calculations are based on 40°C ambient temperature, 200°C conductor temperature, single cable installed in free air.
**Call for availability*

Flare Stack Cable

• Rated to 250°C • 25kV • RoHS Compliant



NICKEL-PLATED COPPER CONDUCTOR
27% Nickel-plated copper conductor – reduces corrosion in high heat environment, extends cable life.

MICA WRAP
Provides strong dielectric properties and good tensile strength. Resists heat and harsh chemicals such as alkali and acids.

VOLTAGE RATED FOR UP TO 25kV
Suitable for virtually all Flare Stack Igniter applications.

HIGH VOLTAGE SILICONE MICA INSULATION SYSTEM
Provides superior heat and voltage protection and resistance to chemicals and weather. High voltage Silicone provides additional flexibility, making the product easier to install.

TEMPERATURE RATED FROM 250°C UP TO AN EXTREME OF 500°C
Provides insulation and jacketing protection in the most extreme temperature environments.

FLUOROPOLYMER/FIBERGLASS JACKETING SYSTEM
Braided fiberglass over-coated with a Fluoropolymer to provide additional weather and chemical protection. The addition of the Fluoropolymer coating protects the fiberglass braid from damage during installation, provides a slick surface for easier installation in conduit or cable trays, and extends product use in outdoor environments.

APPLICATIONS

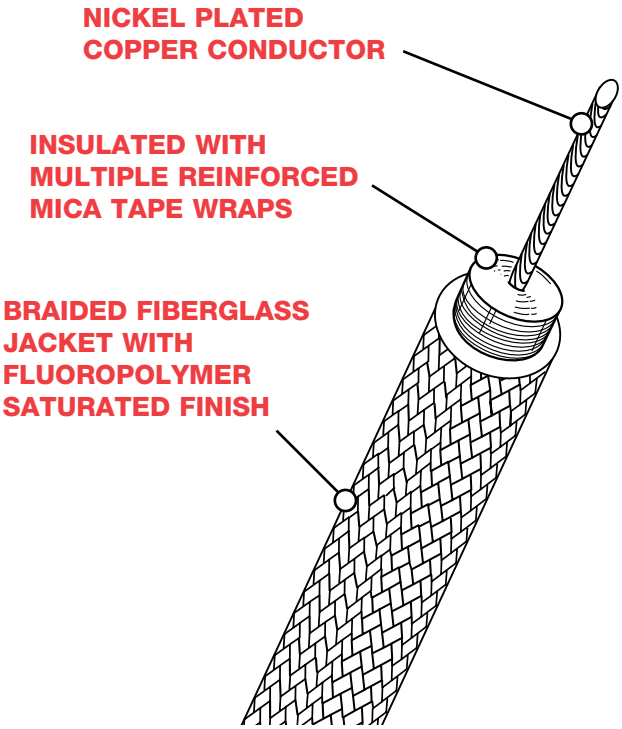
- Conveyors
- Pumps
- Furnaces
- Motor Operated Valves
- Emergency Isolation Valves
- Kiln Fans
- Flare Stacks
- Control Panels
- Crane Hoist

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	AWG SIZE	JACKET	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
40518	18	Glass-Fiber/Fluoropolymer	0.236	36
40516	16	Glass-Fiber/Fluoropolymer	0.242	42
40514	14	Glass-Fiber/Fluoropolymer	0.281	53
40512	12	Glass-Fiber/Fluoropolymer	0.306	65
40510	10	Glass-Fiber/Fluoropolymer	0.340	85

Igniter Wire (40100)

• RoHS Compliant

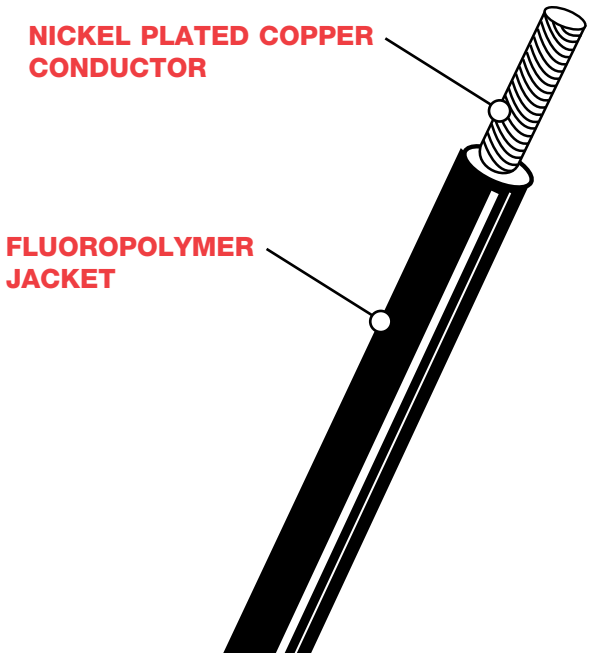


40100 SPECIFICATIONS

An 18 AWG single conductor igniter wire with a mica tape-wrap insulation system. The product is made with nickel plated copper conductors with voltage ratings of 25KVDC/17KVAC peak pulse and temperatures to 1000°F/538°C.

Igniter Wire (40200)

UL LISTED • RoHS Compliant



40200 SPECIFICATIONS

An 18 AWG single conductor igniter wire with a fluoropolymer jacket. The product also has nickel plated copper conductors and is UL rated to 250°C/482°F, and 25KVDC. It has also been used in non-UL rated applications up to 260°C/50KVDC/15KVAC.

APPLICATIONS

- Conveyors
- Pumps
- Furnaces
- Motor Operated Valves
- Emergency Isolation Valves
- Kiln Fans
- Flare Stacks
- Control Panels
- Crane Hoist

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	AWG SIZE	VOLTAGE	JACKET	TEMPERATURE	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
40100	18	25KVDC/17KVAC Peak Pulse	Black (Fiberglass Braid)	1000°F/538°C	0.339	50.13
40200	18	25KVDC	Black (Fluoropolymer)	482°F/250°C	0.098	41.00

Circuit Integrity Cable

- 600 Volt
- Rated to 200°C
- IEEE – 383 Flame Test
- RoHS Compliant
- FT-4

NICKEL PLATED STRANDED COPPER CONDUCTORS

Withstands continuous operation in temperatures up to 392°F (200°C). Stranded construction make the product flexible and easy to install reducing installation time and saving money.

HIGH PERFORMANCE FLEXIBLE CONSTRUCTION

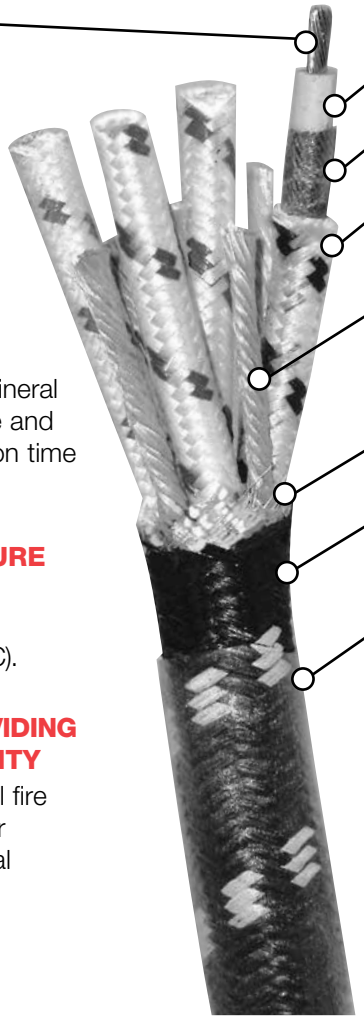
Product is engineered to replace Mineral Insulated cables which are inflexible and difficult to install. Reduces installation time and costs.

EXCELLENT LOW TEMPERATURE PROPERTIES

Product remains flexible in cold temperatures down to -320°F (-190°C).

MEETS UL FLAME TESTS PROVIDING 2 HOURS OF CIRCUIT INTEGRITY

Passes simulated hydrocarbon pool fire test 2 hours at 2,000°F. Suitable for Critical Circuits that require electrical integrity in the event of fire.



SILICONE INSULATION

MICA TAPE

HEAT RESISTANT FIBERGLASS WRAP

HEAT RESISTANT FILLERS

MICA TAPE WRAP

FLAME RETARDANT FIBERGLASS JACKET

CHEMICAL RESISTANT FLUOROPOLYMER OUTER JACKET

Excellent protection against chemicals, oils, grease, direct sunlight and UV exposure. Overall cable is virtually impervious to moisture.

COLOR CODE	
Base Color	**Tracer Color**
White	Black
White	Blue
White	Green
White	Red

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND	CONDUCTOR STRANDING	AMPACITY (1)	JACKET THICKNESS (IN.)	NOMINAL O.D. (IN.)	WT. (LBS.) PER 1000'
43403	14/3	19	36	0.015	0.545	172
43404	14/4	19	36	0.015	0.597	242
43405	14/5	19	28	0.015	0.660	248
43410	14/10	19	18	0.015	0.952	463
43412	14/12	19	18	0.015	0.985	536
43203	12/3	37	45	0.015	0.583	205
43204	12/4	37	45	0.015	0.640	265
43207	12/7	37	31	0.015	0.779	414
43212	12/12	37	22	0.015	1.060	665
43003	10/3	37	60	0.015	0.666	276
43004	10/4	37	60	0.015	0.740	367

NOTE: (1) Based on an ambient temperature of 40°C and conductor temperature of 90°C per NEC 2011, Table 3.10.15(B)(18).

(continued from previous page)

Circuit Integrity Cable

Thermo-Trex® CIC cable is used where critical circuits need to function to keep safety equipment running even when exposed to extreme heat or fire. ***Thermo-Trex*** CIC cables are designed specifically to maintain electrical integrity in applications such as Electrically Operated Valves (EOVs) and Motor Operated Valves (MOVs). In these critical applications loss of power due to fire or extreme temperature could result in catastrophic loss or devastating damage.

COMPLIANCE

- Passes IEEE-1202 / FT4 Flame Test
- Meets Low Smoke requirements per UL-1685
- Passes Simulated Hydrocarbon Pool Fire Test 2 hours @ 2,000°F
- Passes IEEE-383 Flame Test
- Passes MIL-W-25038 Test - 2 hours with Insulation Resistance Constant > 10,000
- Passes IEEE - 383 Modified 210,000 BTU Vertical Tray Flame Test with circuit integrity for 2 hours minimum

APPLICATIONS

Circuit integrity for power and control circuits of critical equipment, such as:

- Critical process valves used in the petrochemical plants and refineries
- Motor operated valves - “MOVs”
- Electrically operated valves “EOVs”
- Areas where flammable or corrosive chemicals may be present e.g. oil refineries, petrol stations, industrial factories
- Air pressurization systems for stairwells to enable building egress during a fire
- Hospital operating rooms
- Fire alarm systems
- Emergency power systems
- Emergency lighting systems
- Public buildings e.g. theatres, cinemas, hotels
- Transport hubs (railway stations, airports etc.)
- Tunnels and mines
- Hot areas e.g. power stations, foundries, and close to or even inside industrial furnaces, kilns and ovens

Thermocouple Extension Wire (Types JX, KX and RSX)

• RoHS Compliant • High Chemical Resistance Offered By FEP & PFA Jacket

ANSI COLOR CODED CONDUCTORS & JACKET

FINELY STRANDED CONDUCTORS
Improve flexibility.

APPLICATIONS

- Remotely located controller or temperature indicator
- Food processing equipment
- Plastic molding equipment
- Medical equipment
- Heat treating & metals processing
- Engine & turbine exhaust gas
- Aerospace industries
- Glass processing

ORDERING INFORMATION *(Call for pricing & availability)*

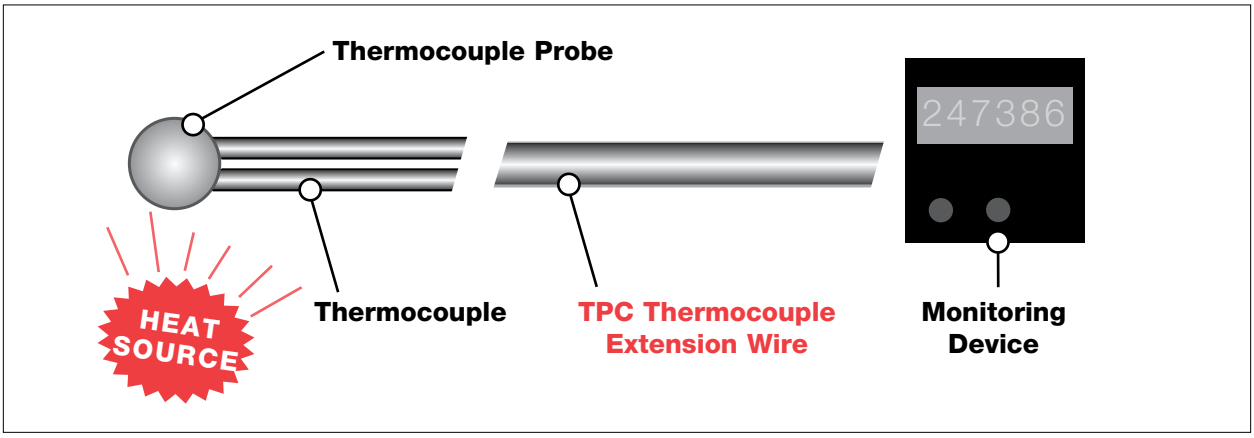
TYPE JX		TYPE KX		TYPE RSX		CONFIG.	JACKET	WT. (LBS.) PER 1000'	AMBIENT TEMP. RATING
PART NO.	CABLE O.D.	PART NO.	CABLE O.D.	PART NO.	CABLE O.D.				
46500	0.165	**46530**	0.165	**–**	–	22/1 PR	PUR	21	
46501	0.227	**46531**	0.227	**–**	–	22/2 PR	PUR	31	
46502	0.200	**46532**	0.200	**46602**	0.219	18/1 PR	PUR	33	**90°C (194°F)**
46503	0.285	**46533**	0.285	**–**	–	18/2 PR	PUR	51	
46504	0.220	**46534**	0.220	**–**	–	16/1 PR	PUR	41	
46505	0.320	**46535**	0.320	**–**	–	16/2 PR	PUR	62	
46506	0.130	**46536**	0.130	**–**	–	22/1 PR	FEP	15	
46507	0.195	**46537**	0.195	**–**	–	22/2 PR	FEP	21	
46508	0.170	**46538**	0.170	**–**	–	18/1 PR	FEP	26	**150°C (302°F)**
46509	0.255	**46539**	0.255	**–**	–	18/2 PR	FEP	39	
46510	0.196	**46540**	0.196	**–**	–	16/1 PR	FEP	34	
46511	0.290	**46541**	0.290	**–**	–	16/2 PR	FEP	54	
46512	0.130	**46542**	0.130	**–**	–	22/1 PR	PFA	16	
46513	0.195	**46543**	0.195	**–**	–	22/2 PR	PFA	21	
46514	0.170	**46544**	0.170	**46614**	0.250	18/1 PR	PFA	27	**250°C (482°F)**
46515	0.255	**46545**	0.255	**–**	–	18/2 PR	PFA	40	
46516	0.196	**46546**	0.196	**–**	–	16/1 PR	PFA	35	
46517	0.290	**46547**	0.290	**–**	–	16/2 PR	PFA	54	
46518	0.230	**46548**	0.230	**–**	–	22/1 PR	TT2000	29.1	
46519	0.344	**46549**	0.344	**–**	–	22/2 PR	TT2000	54.4	
46520	0.259	**46550**	0.259	**–**	–	18/1 PR	TT2000	39.1	**450°C (842°F)**
46521	0.389	**46551**	0.389	**–**	–	18/2 PR	TT2000	75.9	
46522	0.277	**46552**	0.277	**46622**	0.279	16/1 PR	TT2000	47.4	
46523	0.422	**46553**	0.422	**–**	–	16/2 PR	TT2000	89.8	
46524	0.273	**46554**	0.273	**–**	–	22/1 PR	TT2800	38.2	
46525	0.417	**46555**	0.417	**–**	–	22/2 PR	TT2800	76.5	
46526	0.310	**46556**	0.310	**–**	–	18/1 PR	TT2800	51.4	**530°C (986°F)**
46527	0.460	**46557**	0.460	**–**	–	18/2 PR	TT2800	100.7	
46528	0.340	**46558**	0.340	**–**	–	16/1 PR	TT2800	59.1	
46529	0.500	**46559**	0.500	**–**	–	16/2 PR	TT2800	116.4	

Additional thermocouple types and paired configurations available. Shielding also available.
Call your Sales Representative for price and delivery.

(continued from previous page)

Thermocouple Extension Wire (Types JX, KX and RSX)

A Thermocouple is a device that produces a signal for measuring temperature. The signal is created when two dissimilar metals have heat applied to them. Thermocouple Extension Cables allow the signal created by the Thermocouple to reach the controller or monitoring device. The Thermocouple Extension Cable must match the Thermocouple "type" (J, K, R, S and T) of the system to assure accurate measurements.



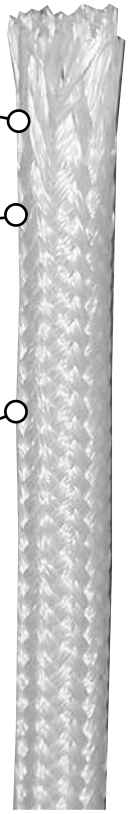
STANDARD CONFIGURATIONS

ANSI TYPE	METALS		COLOR CODE		
	+	–	JACKET	+	–
JX	Iron	Constantan	Black	White	Red
KX	Chromel	Alumel	Yellow	Yellow	Red
RSX	Copper	Copper Alloy	Green	Black	Red
TX	Copper	Constantan	Blue	Blue	Red

For RTD Extension Cable, any standard cable in a 3 or 4 conductor configuration may be used; be sure to match the cable for the environment.

Ceramic Ultra-Sleeve™

- **Continuous Temperature Rating 2200˚F**
- **Intermittent Temperature Rating 2600˚F**
- **RoHS Compliant**



EXTRA THICK BRAID
Superior resistance to ultra high temperatures.

FINELY STRANDED SPUN CERAMIC FIBERS
Finer strands mean more flexibility. Higher density of ceramic fibers per square inch increases protection of cable.

SPECIAL FINISHING COMPOUNDS
Reduces friction for easier installation.

AVAILABLE IN VARYING O.D.'S
Allows you to buy the right size for the job. Protects most cable sizes.

Fiberglass Ultra-Sleeve™

- **Continuous Temperature Rating 1000˚F**
- **Fits Cable Sizes from 0.25" to 2.25"**
- **Abrasion and Cutting Resistance**
- **RoHS Compliant**

EXTRA THICK BRAID
Superior high temperature resistance.

FINELY STRANDED SPUN GLASS FIBERS
Finer strands mean more flexibility. Higher density of fibers per square inch increases protection of cable.

SPECIAL FINISHING COMPOUNDS
Adds stiffness and reduces friction for easier installation.

ORDERING INFORMATION *(Call for pricing & availability)*

CERAMIC ULTRA-SLEEVE™	
PART NO.	**SLEEVING INNER DIAMETER** (IN.)
49300	0.25
49301	0.50
49302	1.00
49303	1.50

FIBERGLASS ULTRA-SLEEVE™	
PART NO.	**SLEEVING INNER DIAMETER** (IN.)
49200	0.25
49201	0.75
49202	1.00
49203	1.50
49204	2.50

SEE PAGE 94 TO LEARN ABOUT OUR HIGH TEMPERATURE SILICA TAPE

Reflective Fiberglass Ultra-Sleeve™

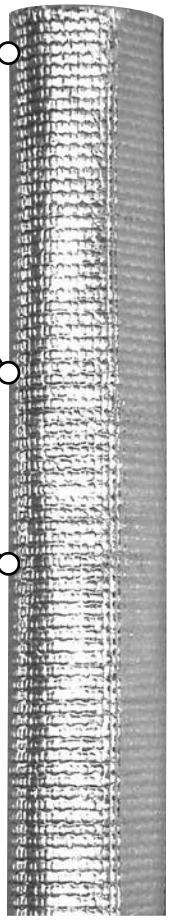
- **Continuous Temperature Rating 752˚F**
- **Intermittent Temperature Rating 1000˚F**
- **RoHS Compliant**

FRAY RESISTANT DESIGN
Will not unravel or fray when exposed to constant flexing or movement.

FINELY STRANDED AND WOVEN FIBERGLASS SLEEVE
Superior high temperature resistance. Fine stranding means greater flexibility.

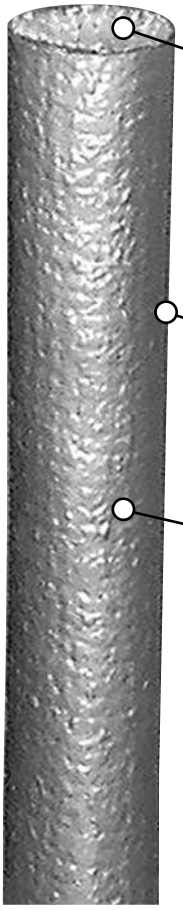
ALUMINIZED HEAT SEAL FILM
Protects cables by providing a barrier to radiant heat.
Fluid and chemical resistant.
Extremely flexible.

AVAILABLE IN VARYING O.D.'S
Allows you to buy the right size for the job. Larger sizes available through our Engineered Products Department.



Silicone Fiberglass Ultra-Sleeve™

- **Continuous Temperature Range of -65˚F + 500˚F**
- **Extreme Temperature Range of up to 2000˚F**
- **Excellent Chemical Resistance**
- **RoHS Compliant**



FINELY STRANDED SPUN GLASS FIBERS
Finer strands mean more flexibility. Higher density of glass fibers per square inch increases protection of cable.

EXTRA THICK SILICONE BARRIER
Provides a first line defense against heat, abrasion and moisture.

ALUMINIZED JACKET
Reflects radiant heat energy. Helps to reduce heat build up within the sleeve.

AVAILABLE IN VARYING O.D.'S
Allows you to buy the right size for the job. Protects most cable sizes.

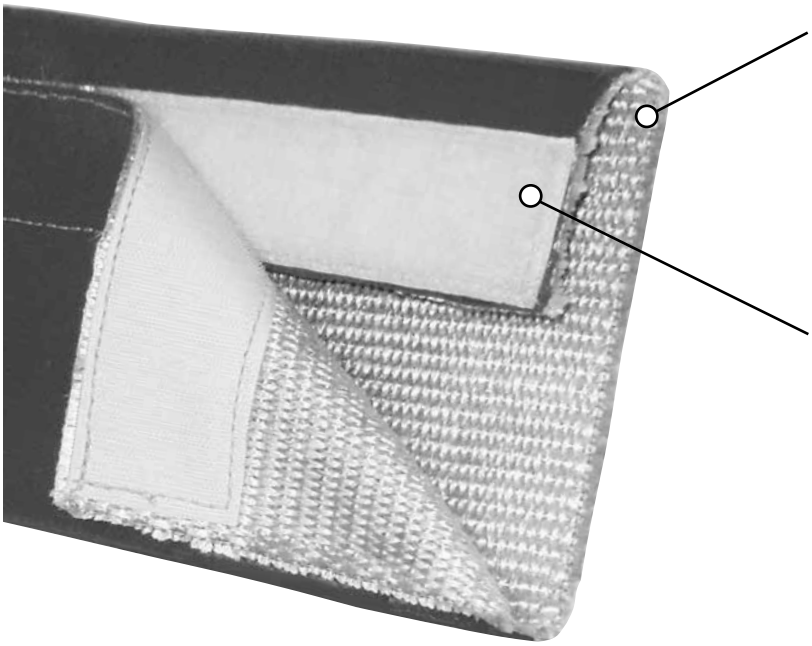
ORDERING INFORMATION *(Call for pricing & availability)*

REFLECTIVE FIBERGLASS ULTRA-SLEEVE™	
PART NO.	**SLEEVING INNER DIAMETER** (IN.)
49402	0.75
49403	1.00
49404	1.50

SILICONE FIBERGLASS ULTRA-SLEEVE™	
PART NO.	**SLEEVING INNER DIAMETER** (IN.)
49100	0.25
49105	0.50
49101	0.75
49102	1.00
49103	1.50
49104	2.00

SEE PAGE 94 TO LEARN ABOUT OUR HIGH TEMPERATURE SILICA TAPE

High Temperature Fiberglass/Silicone Sleeve with Closure



ULTRA-HEAVY GRADE FIBERGLASS BASE FABRIC

Coated with a heavy layer of specially compounded silicone rubber to resist severe temperatures. The sleeve can extend the life of cables that are exposed to extreme heat and molten splash.

NOMEX HOOK & LOOP CLOSURE SYSTEMS

Allows for easy access to cables for inspection or maintenance, while also protecting them from extreme heat and molten splash. The Nomex Hook & Loop material will withstand continuous temperatures from -50°C (-58°F) to 176°C (350°F).

*Short term exposure defined as 20 – 30 seconds

EASY INSTALLATION

Product can be installed without having to disconnect existing cables or cable assemblies.

IN THE EVENT OF EXTREME TEMPERATURES

The sleeve will withstand maximum short term exposure* of temperatures up to 1650°C (3000°F).

APPLICATIONS/PRODUCT CAPABILITIES

- Cable covers
- Cable tray protection
- Welding cable protection
- Protection from abrasion
- Hose protection
- Protects from water, grease and hydraulic oils
- Sheds heat from molten splash almost instantly, before heat transfer can occur

Custom lengths and widths available upon request

MARKETS/INDUSTRIES

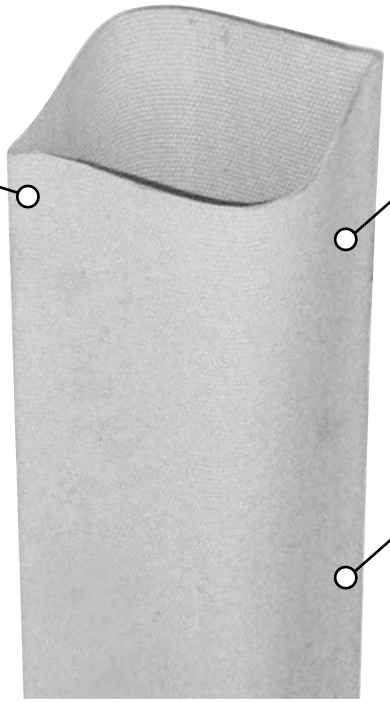
- Primary metals
- Refineries
- Blast furnaces
- Casting furnaces
- Electric arc furnaces
- Robotic weld cells
- Utility power stations
- Plastic molding plants
- Fire protection equipment
- Food industry
- Auto plants

PRODUCT SPECIFICATIONS

- Flame resistant
- Abrasion resistant
- Nominal thickness 0.145"
- White 96 oz. heavy duty fiberglass
- Temperature rating -50°C (-58°F) to 176°C (350°F)
- Extreme temperature to 1650°C (3000°F)
- Coated on one side with specially compounded silicone rubber

Abrasion Resistant Ultra-Sleeve™

- **Rated to -40°C**
- **RoHS Compliant**
- **Continuous Temperatures to 500°F (260°C)**
- **Fits Cable Sizes 2.0" up to 5.25"**
- **Excellent Abrasion Resistance**



PROTECTS CABLES AND EQUIPMENT

Protect cables from wear due to abrasion. Decrease downtime due to cable failure. Prevents equipment being marred by chains or cables.

AVAILABLE IN VARYING ODs

Allows you to buy the right size for the job. Protects most cable sizes.

ABRASION RESISTANT FINISHING COMPOUNDS

Specially designed with heavy duty nylon/polyester fibers and impregnated with abrasion resistant polymers to provide abrasion protection in harsh applications.

EXTRA THICK BRAID

Offers superior protection in abusive environments.

Abrasion Resistant Ultra-Sleeve™ is constructed with an extra thick nylon/polyester blend fiber. Ultra-Sleeve offers superior protection against tearing and abrasion adding greater protection to your electrical cables, water lines, hydraulic hoses, air lines, and other critical areas.

Available in a wide range of sizes and closure options.

APPLICATIONS/PRODUCT CAPABILITIES

- Cable covers
- Cable tray protection
- Welding cable protection
- Protection from abrasion
- Hose protection
- Sheds heat from molten splash almost instantly, before heat transfer can occur
- Protects from water, grease and hydraulic oils

ORDERING INFORMATION *(Call for pricing & availability)*

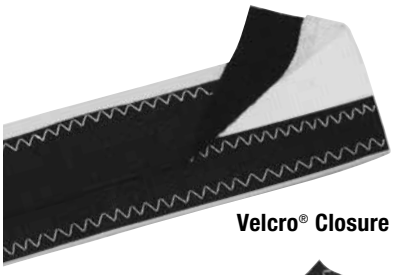
PART NO.	SLEEVING INNER DIAMETER (IN.)
49502Y	2.00
49503Y	3.50

Color may vary.

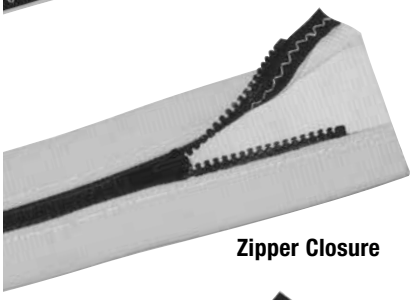
SEE PAGE 94 TO LEARN ABOUT OUR HIGH TEMPERATURE SILICA TAPE

Abrasion Resistant Ultra-Sleeve™ with Closures

- **Multiple Closure Options**
- **Excellent Abrasion Resistance**
- **Heavy Duty Construction**
- **Quick and Easy Installation**
- **Multiple Lengths and ODs**
- **RoHS Compliant**



Velcro® Closure



Zipper Closure

Velcro & Zipper Closure

UNIQUE CLOSURE DESIGNS FOR QUICK INSTALLATION

Select Velcro®, Zipper or combination Velcro & Zipper closure design. Provides quick field installation and removal of sleeving.

ABRASION RESISTANT FINISHING COMPOUNDS

Specially designed with heavy duty nylon/polyester fibers and impregnated with abrasion resistant polymers to provide abrasion protection in harsh applications.

EXTRA THICK BRAID

Offers superior protection in abusive environments.

PROTECTS CABLES AND EQUIPMENT

Protect cables from wear due to abrasion. Decrease downtime due to cable failure. Prevents equipment being marred by chains or cables.

AVAILABLE IN VARYING O.D.s

Allows you to buy the right size for the job. Protects most cable sizes.

APPLICATIONS

- Electrical cables
- Water lines
- Hydraulic hoses
- Air lines
- And other critical areas

ORDERING INFORMATION *(Call for pricing & availability)*

SLEEVING INNER DIAMETER (IN.)	LENGTH (FT.)	VELCRO® CLOSURE	ZIPPER CLOSURE	VELCRO & ZIPPER CLOSURE
1.50"	2'	49652Y	49752Y	49852Y
	3'	49632Y	49732Y	49832Y
	4'	49642Y	49742Y	49842Y
	6'	49602Y	49702Y	49802Y
	8'	49612Y	49712Y	49812Y
	10'	49622Y	49722Y	49822Y
3.00"	2'	49653Y	49753Y	49853Y
	3'	49633Y	49733Y	49833Y
	4'	49643Y	49743Y	49843Y
	6'	49603Y	49703Y	49803Y
	8'	49613Y	49713Y	49813Y
	10'	49623Y	49723Y	49823Y

Color may vary. Velcro is a registered trademark of Velcro Industries.

High Temperature Silica Tape

- **Continuous Temperature Rating 1800°F (982°C)**
- **Maximum Short Term Exposure 3000°F (1650°C)**

UNIQUE SILICA BASED TAPE

Designed using 96% pure SiO2 silica fiber offers superior resistance to radiant heat and flame.

EASE OF INSTALLATION

Adhesive backed tape provides for ease of installation, no need to disconnect hoses or cables. Simply remove backing tape and wrap around object to be protected.

EXTREME TEMPERATURE PROPERTIES

Suitable for continuous use at 1800°F and able to withstand short term exposure up to 3000°F. Offers superior protection for cables, assemblies or hoses exposed to extreme heat or flame.

SUPERIOR ABRASION AND CUT RESISTANCE

Proprietary hydrocarbon coatings enhance abrasion resistance, cut through and tensile strength.

SELF SEALING DESIGN

The wrap will not unravel or pull back from extreme heat. Adhesive backing decomposes when heated, leaving a perfectly wrapped hose, cable or assembly.

APPLICATIONS

- Protect your hydraulic and pneumatic lines, and electrical cables from exposure to high and extreme heat conditions. Use our High Temperature Silica Tape to fastened our Ultra-Sleeves™ to your lines, pipes, and cables.

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	**NOMINAL WIDTH** (IN.)	**NOMINAL LENGTH/ROLL** (FT.)	**NOM. THICKNESS** (INCL. BACKING)
91111	2.00"	25'	0.030"

WIRE AND CABLE ACCESSORIES

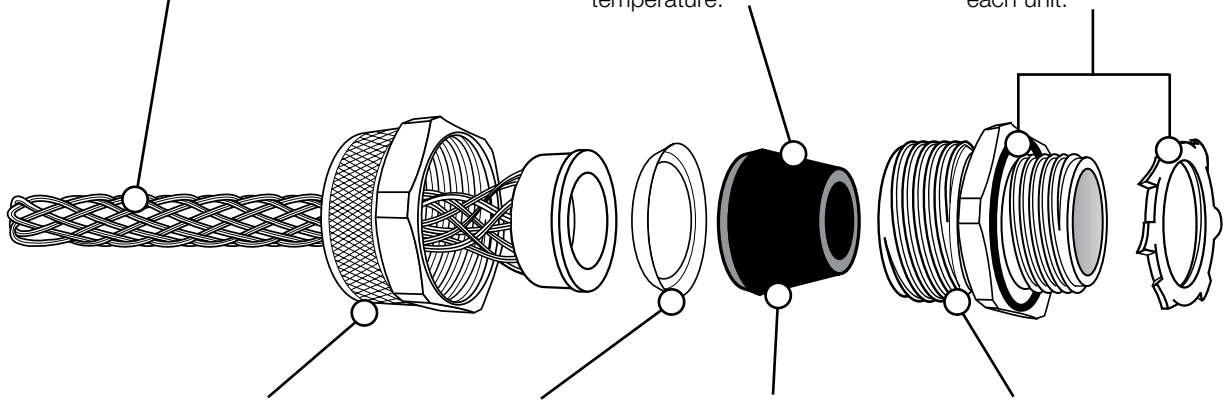
Kord-Gard™ Mesh Cord Grips

• RoHS Compliant • Extra Hard Duty Strain Relief • Straight and 90° Configurations

FULL DOUBLE-WOVEN STAINLESS STEEL MESH
Provides exceptional gripping strength, longer life. Resists corrosion.

SYNTHETIC SEALING BUSHING
Seals out water, oil, and other contaminants. 250°F maximum operating temperature.

SEALING O-RING AND LOCKNUT
Seals out oil, chemicals and other contaminants. Locknut included with each unit.



UNIQUE DROP-IN BASKET DESIGN
Easier assembly.

NICKEL-PLATED FRICTION RING
Provides uniform compression for a proper seal. Prevents bushing damage.

MULTIPLE BUSHING SIZES
Covers a broad range of cord and cable sizes.

ALUMINUM COMPRESSION BUSHING AND THREADED BODY
Resistant to corrosion and weathering. Easy attachment to pendants and electrical enclosures. Available in both a 90° and straight configuration.

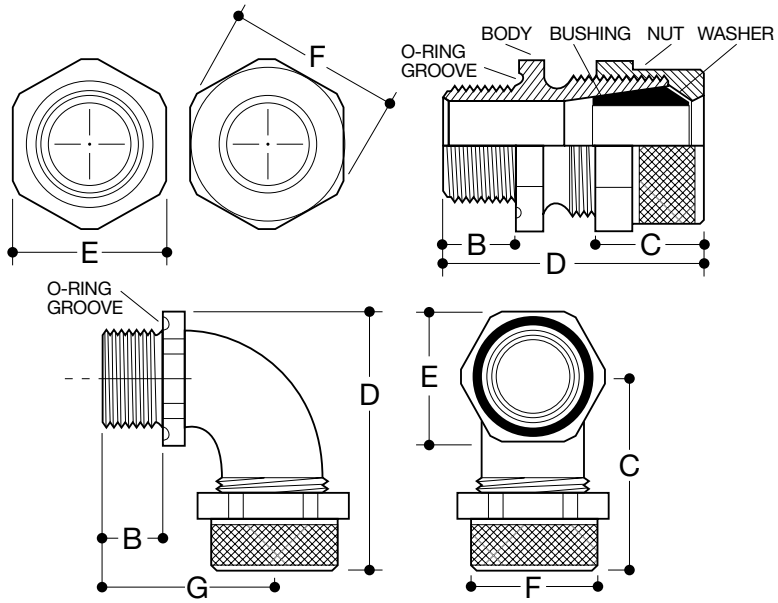
ORDERING INFORMATION *(Call for pricing & availability)*

STRAIGHT KORD-GARD PART NO.	90° KORD-GARD PART NO.	CORD O.D. RANGE (IN.)	KNOCK-OUT OR FITTING SIZE	NUMBER OF BUSHINGS	KNOCK-OUT DRILL SIZE
55405	**59405**	0.124 – 0.312	3/8" NPT	3	11/16"
55410	**59410**	0.250 – 0.438	3/8" NPT	3	11/16"
55415	**59415**	0.312 – 0.500	1/2" NPT	3	7/8"
55420	**59420**	0.437 – 0.625	1/2" NPT	3	7/8"
55430	**59430**	0.562 – 0.750	3/4" NPT	2	1-1/8"
55440	**59440**	0.687 – 0.875	3/4" NPT	1	1-1/8"
55445	**59445**	0.745 – 1.000	1" NPT	2	1-3/8"
55450	**59450**	0.870 – 1.125	1-1/4" NPT	2	1-3/4"
55455	**59455**	1.105 – 1.375	1-1/4" NPT	2	1-3/4"
55460	**59460**	1.320 – 1.562	2" NPT	2	2-3/8"
55465	**59465**	1.413 – 1.655	2" NPT	2	2-3/8"

(continued from previous page)

Kord-Gard™ Mesh Cord Grips

SPECIFICATIONS



STRAIGHT KORD-GARD™ DIMENSION TABLE

PART NO.	CONDUIT SIZE	A BODY BORE	B	C	D	E BODY HEX.	F NUT DIA.
55405	3/8"	0.46	0.44	0.59	1.50	0.88	0.99
55410	3/8"	0.46	0.44	0.59	1.50	0.88	0.99
55415	1/2"	0.62	0.53	0.72	1.81	1.09	1.33
55420	1/2"	0.62	0.53	0.72	1.81	1.09	1.33
55430	3/4"	0.81	0.56	0.86	2.06	1.38	1.52
55440	3/4"	0.81	0.62	0.97	2.31	1.56	1.70
55445	1"	1.00	0.69	1.25	2.78	2.16	2.50
55450	1-1/4"	1.31	0.69	1.25	2.78	2.16	2.50
55455	1-1/4"	1.31	0.69	1.25	2.78	2.16	2.50
55460	2"	1.84	0.84	1.72	3.75	2.83	3.25
55465	2"	1.84	0.84	1.72	3.75	2.83	3.25

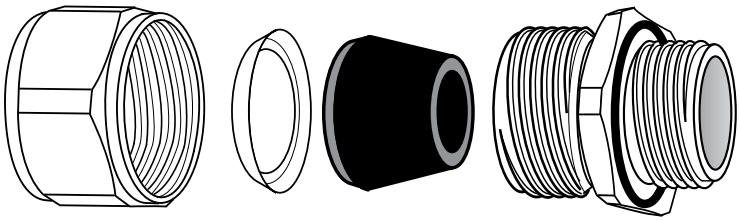
90° KORD-GARD™ DIMENSION TABLE

PART NO.	CONDUIT SIZE	A BODY BORE	B	C	D	E BODY HEX.	F NUT DIA.	G
59405	3/8"	0.45	0.44	1.51	2.00	0.98	0.99	1.31
59410	3/8"	0.45	0.44	1.51	2.00	0.98	0.99	1.31
59415	1/2"	0.58	0.56	1.88	2.39	1.03	1.33	1.50
59420	1/2"	0.58	0.56	1.88	2.39	1.03	1.33	1.50
59430	3/4"	0.76	0.63	2.25	2.88	1.25	1.52	1.94
59440	3/4"	0.76	0.63	2.25	2.88	1.25	1.52	1.94
59445	1"	0.99	0.63	2.41	3.13	1.44	1.70	2.00
59450	1-1/4"	1.28	0.69	3.19	4.41	2.13	2.55	2.69
59455	1-1/4"	1.28	0.69	3.19	4.41	2.13	2.55	2.69
59460	2"	1.90	0.81	4.03	5.56	2.81	3.25	3.19
59465	2"	1.90	0.81	4.03	5.56	2.81	3.25	3.19

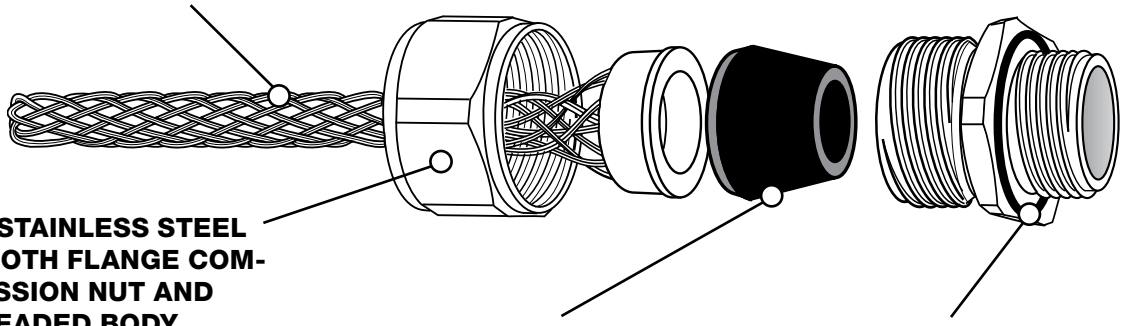
Stainless Steel Grip-Seals™ and Kord-Gards™

- IP68/NEMA 4x
- Liquid Tight Seal
- Corrosion Resistant
- 304 Stainless Steel
- Sealing O-Ring
- RoHS Compliant

GRIP-SEAL™



KORD-GARD™



FULL DOUBLE WOVEN STAINLESS STEEL MESH

(Kord-Gards only) Provides exceptional gripping strength, extends cable life and resists corrosion.

304 STAINLESS STEEL SMOOTH FLANGE COMPRESSION NUT AND THREADED BODY

Smooth flange compression nut eliminates crevices where bacteria can grow. Ideal for wash down areas. 304 Stainless Steel design resists impact and corrosion. Provides exceptional gripping strength. Easy to install.

MULTIPLE SYNTHETIC BUSHINGS INCLUDED WITH EACH PRODUCT

One part number covers a variety of cord diameters. Seals out water, oil, metal particles and other contaminants.

SEALING "O" RING

Designed to fit tightly against panel surface to keep moisture and other contaminants out of panel. Protects connections from corrosion.

ORDERING INFORMATION *(Call for pricing & availability)*

STAINLESS STEEL GRIP-SEALS™

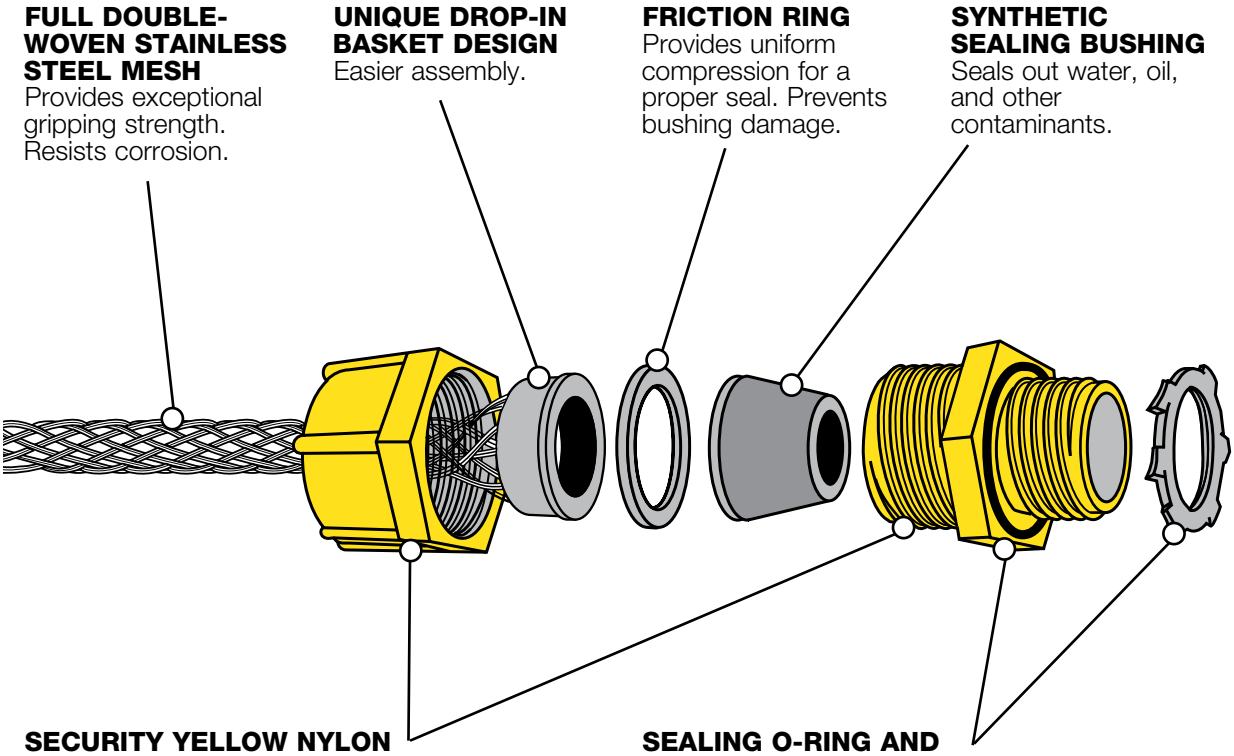
PART NO.	CORD DIAMETER RANGE	KNOCK-OUT OR FITTING SIZE	NUMBER OF BUSHINGS	KNOCK-OUT DRILL SIZE
55505SS	0.180" – 0.430"	3/8"	4	11/16"
55513SS	0.188" – 0.500"	1/2"	5	7/8"
55515SS	0.312" – 0.625"	1/2"	5	7/8"
55516SS	0.188" – 0.625"	1/2"	7	7/8"
55530SS	0.560" – 0.750"	3/4"	2	1-1/8"

STAINLESS STEEL KORD-GARDS™

PART NO.	CORD DIAMETER RANGE	KNOCK-OUT OR FITTING SIZE	NUMBER OF BUSHINGS	KNOCK-OUT DRILL SIZE
55310SS	0.180" – 0.310"	3/8"	2	11/16"
55311SS	0.310" – 0.440"	3/8"	2	11/16"
55320SS	0.370" – 0.500"	1/2"	2	7/8"
55321SS	0.500" – 0.570"	1/2"	2	7/8"
55330SS	0.560" – 0.690"	3/4"	1	1-1/8"

Nylon Kord-Gard™ Mesh Cord Grips

• RoHS Compliant • Extra Hard Duty Strain Relief • Corrosion Resistant



ORDERING INFORMATION *(Call for pricing & availability)*

NYLON KORD-GARD PART NO.	CORD O.D. RANGE (IN.)	KNOCK-OUT OR FITTING SIZE	NUMBER OF GROMMETS	KNOCK-OUT DRILL SIZE
55310	0.18" – 0.31"	3/8" NPT	2	11/16"
55311	0.31" – 0.44"	3/8" NPT	2	11/16"
55320	0.37" – 0.50"	1/2" NPT	2	7/8"
55321	0.50" – 0.57"	1/2" NPT	2	7/8"
55330	0.56" – 0.69"	3/4" NPT	1	1-1/8"

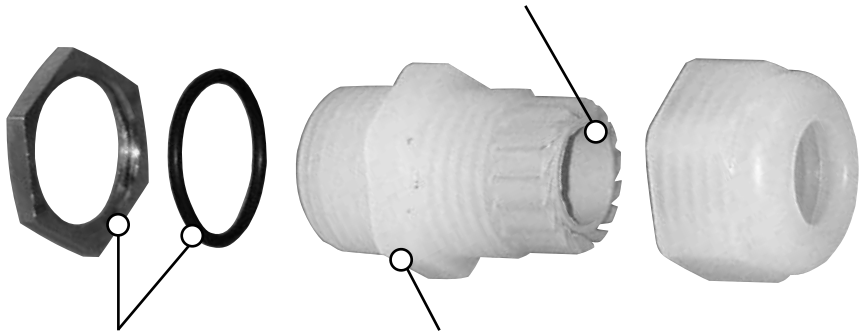
Heat & Chemical Resistant Straight Grip-Seal™

- UL Listed
- CSA Certified
- Corrosion Resistant
- High Temperature (150°C)
- RoHS Compliant
- Strain Relief
- Liquid Tight Seal
- Temperature Rating: -35°C to 150°C operation (-31°F to 302°F)

EXTREME TEMPERATURE

FLUOROELASTOMER FORM SEAL

Ensures a strong, uniform seal around the cord surface and will withstand high temperature conditions.



FLUOROELASTOMER O-RING AND NICKEL-PLATED BRASS LOCKING NUT

Provides uniform compression for a proper seal and withstands high temperature conditions. The nickel-plated brass locking nut included with each Grip-Seal will resist corrosion.

HEAT & CHEMICAL RESISTANT

Grip-Seals are made of PVDF (Polyvinylidene Difluoride) which provides outstanding temperature and chemical resistance. These Grip-Seals operate up to 150ºC, resists impact and corrosion, and provide exceptional gripping strength. It is an ideal accessory for use with our Chem-Gard™ product line. Each Grip-Seal package includes the grip-seal body, O-ring and locking nut.

CHEMICAL RESISTANCE

Acetic Acid, 5% ... R	Gasoline ... R	Pentane ... R	Ethers ... L
Acetonitrile ... R	Glycerol ... R	Perchloric Acid ... R	Methyl Ethyl Ketone (MEK) ... L
Amyl Acetate ... R	Hexane ... R	Petroleum Base Oils ... R	Methyl Isobutyl Ketone ... L
Amyl Alcohol ... R	Hydrobromic Acid (50%) ... R	Phenol (0.5%) ... R	Nitrobenzene ... L
Benzaldehyde ... R	Hydrochloric Acid ... R	Phosphoric Acid (95%) ... R	Perchloroethylene ... L
Benzyl Alcohol ... R	Hydrogen Peroxide, 30% ... R	Propane ... R	Tetrahydrofuran ... L
Boric Acid ... R	Hydrogen Sulphide ... R	Silicone Oils ... R	Acetone ... N
Bromine ... R	Hypochlorites ... R	Sodium Hydroxide ... R	Ammonia ... N
Butyl Alcohol ... R	Isobutyl Alcohol ... R	Sodium Peroxide ... R	Ammonium Hydroxide ... N
Calcium Chloride ... R	Isopropyl Acetate ... R	Sodium Silicate ... R	Diethyl Acetamide ... N
Carbon Tetrachloride ... R	Isopropyl Alcohol ... R	Sulphates (Na, K, Mg, Ca) ... R	Dioxane ... N
Cyclohezanone ... R	Kerosene ... R	Sulphur ... R	Ethyl Acetate ... N
Ethyl Alcohol ... R	Methanol ... R	Trichlorethylene ... R	Hydrofluric Acid ... N
Ethylene Glycol ... R	Nitric acid (50%) ... R	Trichloroethane ... R	Methylene Chloride ... N
Formaldehyde ... R	Oils, Diesel ... R	Water ... R	Sulfuric Acid ... N
Formic Acid ... R	Oils, Lubricating ... R	Benzene ... L	Toluene ... N
Freon TF ... R	Ozone ... R	Chloroform ... L	Xylene ... N

R = *Resistant* L = *Limited Resistance (testing before use recommended)* N = *Not Recommended*

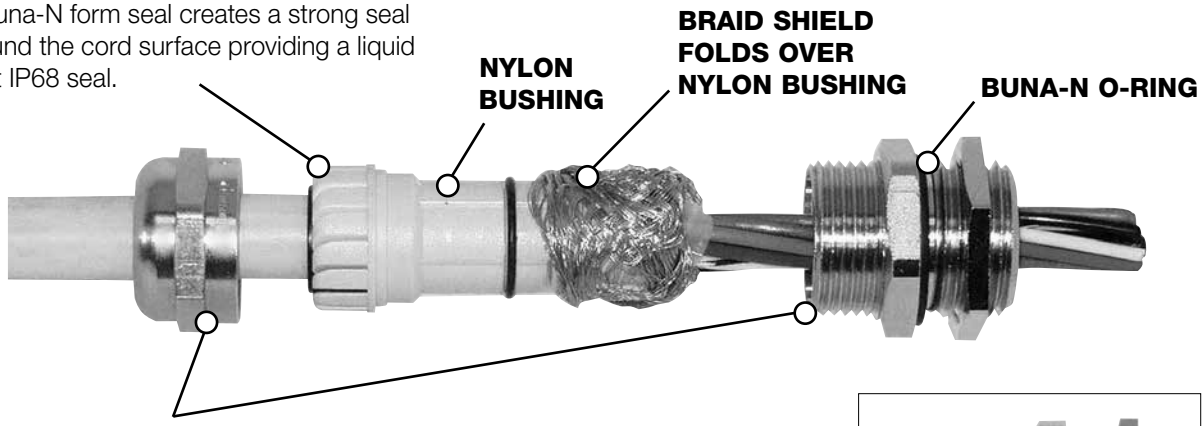
ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	THREAD SIZE (IN.)	CORD DIAMETER RANGE (IN.)	KNOCK OUT DRILL SIZE (IN.)
55725	1/4" NPT	0.08" – 0.20"	1/2"
55738	3/8" NPT	0.08" – 0.24"	11/16"
55739	3/8" NPT	0.16" – 0.31"	11/16"
55750	1/2" NPT	0.24" – 0.47"	7/8"

EMI Shielded Grip-Seal™

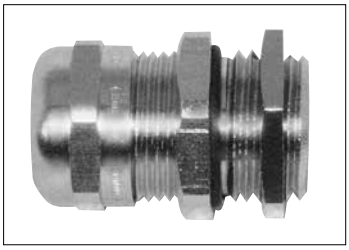
- Strain Relief
- EMI Protection
- -40°C to 100°C (-40°F to 212°F)
- Liquid Tight Seal
- RoHS Compliant
- For Cables with Braid Shields

BUNA-N FORM SEAL
A Buna-N form seal creates a strong seal around the cord surface providing a liquid tight IP68 seal.



NICKEL-PLATED BODY AND LOCKING NUT
Provides corrosion resistance.

MATERIALS
Body & Locking Nut: Nickel-Plated Brass
Bushing: Nylon
Form Seal & O-Ring: Buna-N



ROLE OF PRODUCT

EMI Shielded Grip-Seals are designed to provide a reliable electrical ground, and protection from electromagnetic interference (EMI). An integral O-ring presses the braid shield against the inside wall of the body to ensure solid contact between the cable braid and grip-seal wall. Each EMI Shielded Grip-Seal package includes the grip-seal body, bushing, form seal, O-ring and locking nut.

ORDERING INFORMATION *(Call for pricing & availability)*

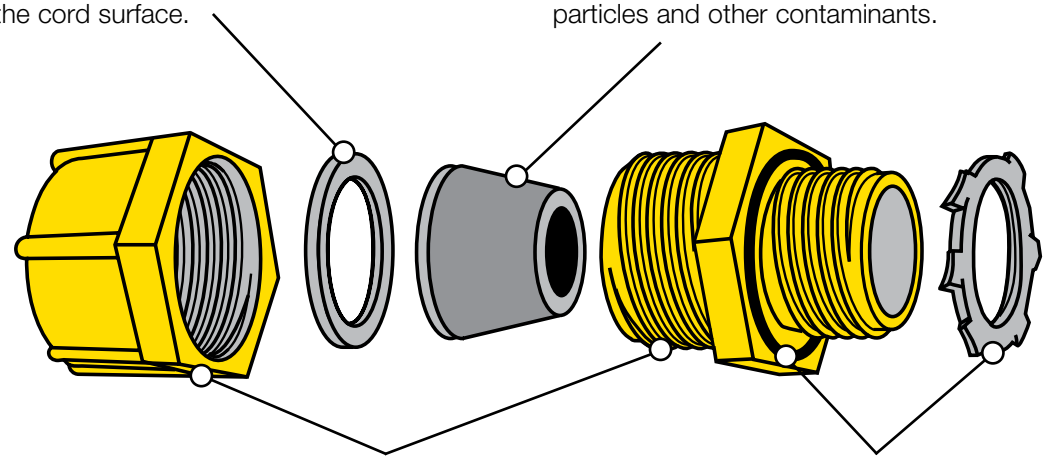
PART NO.	THREAD SIZE (IN.)	CORD DIAMETER RANGE (IN.)	KNOCK OUT DRILL SIZE (IN.)
55051	3/8" NPT	0.16" – 0.31"	0.68"
55052	1/2" NPT	0.24" – 0.47"	0.83"
55053	3/4" NPT	0.51" – 0.71"	1.05"
55054	PG 29	0.70" – 0.98"	1.47"
55055	PG 36	0.86" – 1.26"	1.85"
55056	PG 42	1.26" – 1.50"	2.13"
55058	PG 48	1.77" – 2.01"	2.34"

Nylon Straight and 90° Grip-Seals™

- Strain Relief
- Liquid Tight Seal
- Corrosion Resistant
- RoHS Compliant

NYLON FRICTION RING
Provides uniform compression for a proper seal. Prevents bushing damage and results in a tight, uniform seal on the cord surface.

MULTIPLE SYNTHETIC SEALING BUSHINGS INCLUDED WITH EACH PRODUCT
One part number covers a variety of cord diameters. Seals out water, oil, metal particles and other contaminants.



SECURITY YELLOW NYLON COMPRESSION NUT AND THREADED BODY
Resists impact and corrosion. Provides exceptional gripping strength. Easy to remove and reuse.

SEALING O-RING AND ZINC-PLATED LOCKNUT
Seals out oil, chemicals and other contaminants. Zinc-plated locknut included with each unit is rustproof.

ORDERING INFORMATION *(Call for pricing & availability)*

STRAIGHT CORD & CABLE GRIP-SEALS™				
PART NO.	CORD DIAMETER RANGE	KNOCK-OUT OR FITTING SIZE	NUMBER OF BUSHINGS	KNOCK-OUT DRILL SIZE
55505	0.180" – 0.430"	3/8" NPT	4	11/16"
55513	0.188" – 0.500"	1/2" NPT	5	7/8"
55515	0.312" – 0.625"	1/2" NPT	5	7/8"
55516	0.188" – 0.625"	1/2" NPT	7	7/8"
55530	0.560" – 0.750"	3/4" NPT	2	1-1/8"

90° NYLON CORD & CABLE GRIP-SEALS™				
PART NO.	CORD DIAMETER RANGE	KNOCK-OUT OR FITTING SIZE	NUMBER OF BUSHINGS	KNOCK-OUT DRILL SIZE
55592	0.188" – 0.625"	1/2" NPT	7	7/8"
55593	0.562" – 0.750"	3/4" NPT	2	1-1/8"

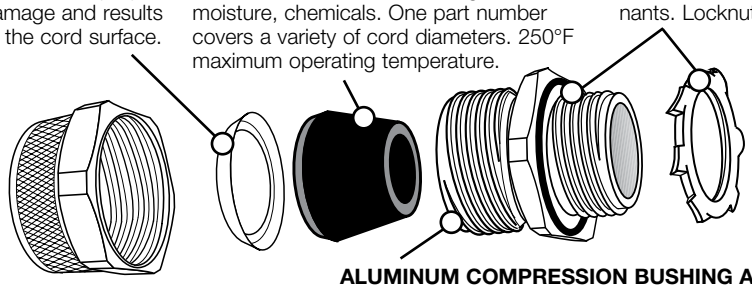
Aluminum Straight and 90° Grip-Seals™

- **NEMA Standard FBI-1983**
- **Straight and 90° Configurations**
- **Liquid Tight Seal**
- **RoHS Compliant**

NICKEL-PLATED FRICTION RING
Provides uniform compression for a proper seal. Prevents bushing damage and results in a tight, uniform seal on the cord surface.

MULTIPLE SEALING BUSHINGS
Provides environmental seal against dust, moisture, chemicals. One part number covers a variety of cord diameters. 250°F maximum operating temperature.

SEALING O-RING
Seals out oil, chemicals and other contaminants. Locknut included with each unit.



ALUMINUM COMPRESSION BUSHING AND THREADED BODY
Resistant to corrosion and weathering. Easy attachment to pendants and electrical enclosures. Available in both a 90° and straight configuration.

ORDERING INFORMATION *(Call for pricing & availability)*

STRAIGHT ALUMINUM GRIP-SEALS™

PART NO.	CONFIGURATION	CONDUIT SIZE	CORD O.D. RANGE (IN.)	NUMBER OF BUSHINGS
55001	Straight	3/8"	0.188 – 0.312	2
55002	Straight	3/8"	0.312 – 0.438	2
55003	Straight	1/2"	0.250 – 0.375	2
55004	Straight	1/2"	0.375 – 0.500	2
55005	Straight	1/2"	0.500 – 0.625	2
55006	Straight	3/4"	0.500 – 0.688	2
55007	Straight	3/4"	0.625 – 0.812	2
55008	Straight	1"	0.688 – 0.875	2
55009	Straight	1"	0.812 – 1.000	2
55010	Straight	1-1/4"	0.875 – 1.125	2
55011	Straight	1-1/4"	1.125 – 1.375	2
55012	Straight	1-1/2"	0.875 – 1.125	2
55013	Straight	1-1/2"	1.125 – 1.375	2
55014	Straight	2"	1.250 – 1.562	2
55015	Straight	2"	1.562 – 1.812	2
55016	Straight	2-1/2"	1.812 – 2.062	2
55017	Straight	2-1/2"	2.062 – 2.312	2

90° ALUMINUM GRIP-SEALS™

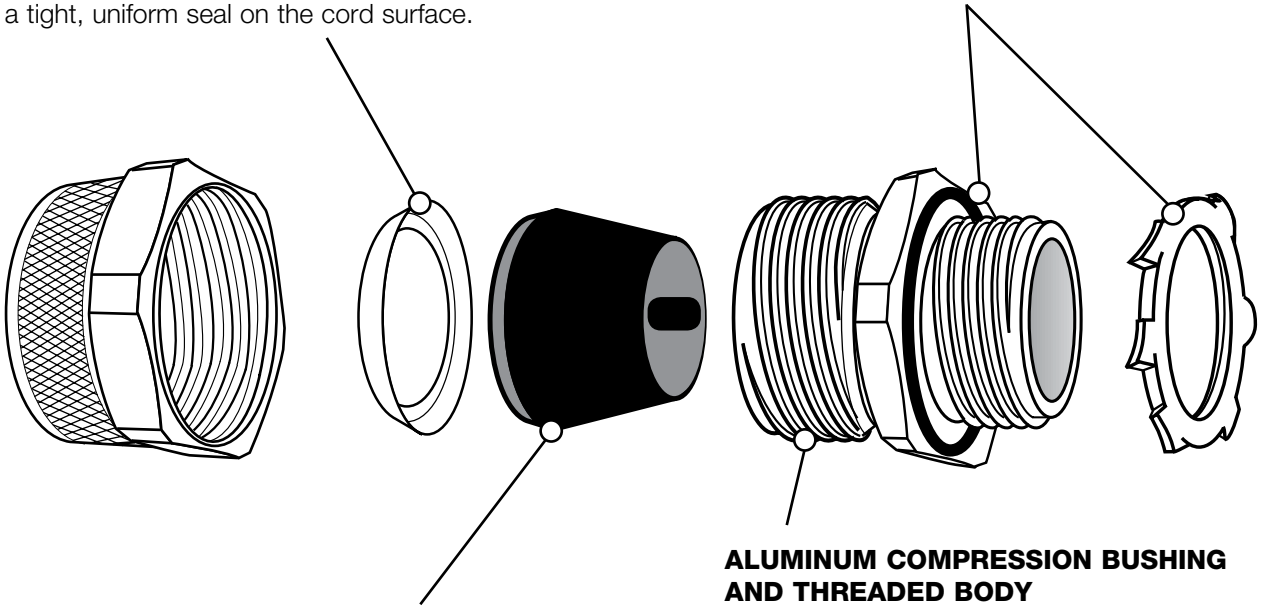
PART NO.	CONFIGURATION	CONDUIT SIZE	CORD O.D. RANGE (IN.)	NUMBER OF BUSHINGS
55901	90°	3/8"	0.188 – 0.312	2
55902	90°	3/8"	0.312 – 0.438	2
55903	90°	1/2"	0.250 – 0.375	2
55904	90°	1/2"	0.375 – 0.500	2
55905	90°	1/2"	0.500 – 0.625	2
55906	90°	3/4"	0.500 – 0.688	2
55907	90°	3/4"	0.625 – 0.812	2
55908	90°	1"	0.688 – 0.875	2
55909	90°	1"	0.812 – 1.00	2
55910	90°	1-1/4"	0.875 – 1.125	2
55911	90°	1-1/4"	1.125 – 1.375	2
55912	90°	2"	1.250 – 1.562	2
55913	90°	2"	1.562 – 1.812	2

Aluminum Grip-Seals™ for Flat Festoon Cable

- **NEMA Standard FBI-1983**
- **Straight and 90° Configurations**
- **Liquid Tight Seal**
- **RoHS Compliant**

NICKEL-PLATED FRICTION RING
Provides uniform compression for a proper seal. Prevents bushing damage and results in a tight, uniform seal on the cord surface.

SEALING O-RING
Seals out oil, chemicals and other contaminants. Locknut included with each unit.



SEALING BUSHINGS FOR FLAT FESTOON CABLE
Specially designed bushing provides environmental seal against dust, moisture, chemicals. 250°F maximum operating temperature.

ALUMINUM COMPRESSION BUSHING AND THREADED BODY
Resistant to corrosion and weathering. Easy attachment to pendants and electrical enclosures. Available in both a 90° and straight configuration.

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CONFIGURATION	CONDUIT SIZE	CABLE (IN.)	SIZE/COND	NUMBER OF BUSHINGS
55038	Straight	1"	0.190 – 0.870	16/8	1
55032	Straight	1-1/2"	0.204 – 1.420	14/12	1
55034	Straight	1"	0.220 – 0.600	12/4	1
55036	Straight	1-1/2"	0.350 – 1.130	6/4	1

SEE PAGE 50 FOR FLAT FESTOON CABLE FOR USE WITH GRIP-SEAL™ CONNECTORS

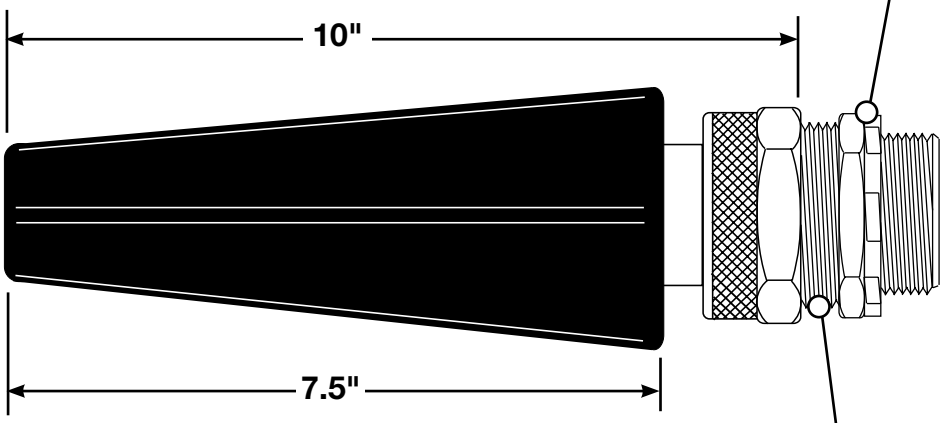
Kord-Gard™ Rubber Boot Strain Relief

• RoHS Compliant • Extra Hard Duty Strain Relief • Corrosion Resistant

STRAIGHT, 45°, 90° AND SWIVEL CONFIGURATIONS AVAILABLE

SYNTHETIC SEALING BUSHING
Seals out water, oil, and other contaminants. 250°F maximum operating temperature.

SEALING O-RING AND LOCKNUT
Seals out oil, chemicals and other contaminants. Locknut included with each unit.



ALL NATURAL RUBBER BOOT
Extremely resistant to heat, sparks, oils and most chemicals.

MULTIPLE BUSHING SIZES
Covers a broad range of cord and cable sizes.

ALUMINUM COMPRESSION BUSHING AND THREADED BODY
Easy attachment to pendants and electrical enclosures.

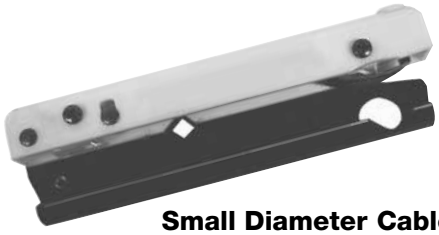
ORDERING INFORMATION *(Call for pricing & availability)*

NON-SWIVEL				
		PART NO.		
CONDUIT SIZE	CABLE RANGE	STRAIGHT	45°	90°
1"	0.945 – 1.00	51101	—	—
1-1/4"	0.945 – 1.00 1.13 – 1.35	51102 51103	51402 51403	51902 51903
1-1/2"	0.945 – 1.00 1.13 – 1.35	51104 51105	51404 51405	51904 51905

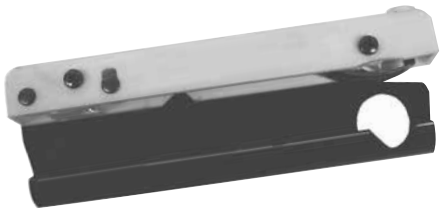
SWIVEL				
		PART NO.		
CONDUIT SIZE	CABLE RANGE	STRAIGHT	45°	90°
1"	0.945 – 1.00	51121	—	—
1-1/4"	0.945 – 1.00 1.13 – 1.35	51122 51123	51422 51423	51922 51923
1-1/2"	0.945 – 1.00 1.13 – 1.35	51124 51125	51424 51425	51924 51925

Cord and Cable Tools

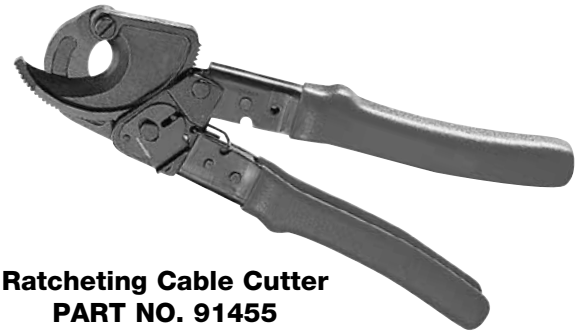
• All Tools Are RoHS Compliant



Small Diameter Cable Stripper
PART NO. 91400
CORD O.D. RANGE (IN.)
0.25 to 0.675



Large Diameter Cable Stripper
PART NO. 91450
CORD O.D. RANGE (IN.)
0.375 to 0.875



Ratcheting Cable Cutter
PART NO. 91455
FOR CABLE O.D.
UP TO 1.25

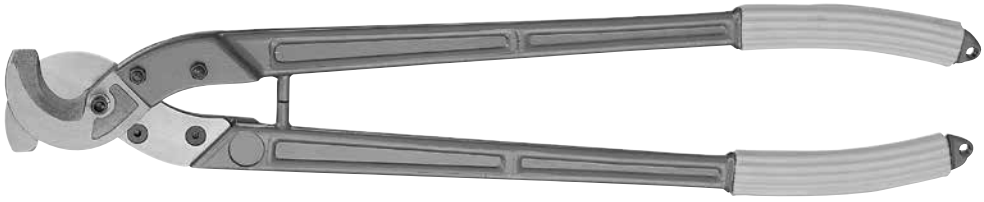
Wire Stripper
PART NO. Y510B
CORD O.D. RANGE (IN.)
0.0395 to 0.1260

Heavy Duty Cable Stripper
PART NO. 91470
CORD O.D. RANGE (IN.)
0.25 to 2.25

Replacement Blade for
Heavy Duty Cable Stripper
PART NO. 11470

Cable Cutter
PART NO. PVC100
CORD O.D. RANGE (IN.)
0.25 to 0.75

Super-Trex® Cable Cutter
PART NO. 91457
FOR CABLE O.D.
UP TO 1.50



Vulko-Wrap™ Insulating Material (Yellow, Black and Blue)

- **Self-Vulcanizing Wrap**
- **High Dielectric Strength**
- **RoHS Compliant**

HIGH DIELECTRIC STRENGTH
Can be used for all electrical connections.

SPECIALLY COMPOUNDED, SYNTHETIC SILICONE ELASTOMER
Resistant to oil, water, ozone, and many chemicals. Wide temperature range from -60° F to +400° F.

VULCANIZES IMMEDIATELY
Requires no heat – becomes fully bonded in 24 hours at room temperature. Remains pliable over time.

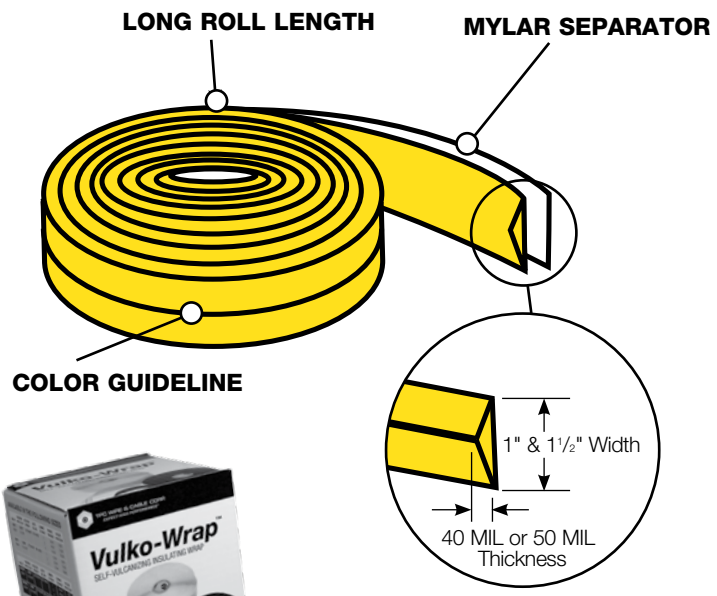
NO ADHESIVES – ADHERES ONLY TO ITSELF
Easy to remove – leaves no residue. Covered fittings are immediately reusable.

TRIANGULAR SHAPE WITH COLOR GUIDELINE
Allows even thickness for uniform high dielectric strength.

STRETCHES TO APPROXIMATELY 2-1/2 TIMES ITS LENGTH
Conforms to irregular shapes and uneven surfaces. Can be used on parts which move or vibrate.

WIDTH 1" TO 1-1/2"
Covers more surface than ordinary tape with a single wrap.

AVAILABLE IN 40 MIL OR 50 MIL THICKNESS
Extra thick design allows wrapping over sharp and irregular surfaces without tearing or puncturing.



Storage/Dispenser Box Available
Keep rolls protected and organized in sturdy, reusable, compact box

SPECIFICATIONS Meets U.S. Military Spec. MIL-I-46852, superseded by CID A-A-59163.

DIELECTRIC STRENGTH (Per ASTM D-149): 300 volts per mil of finished wrap thickness for 40 mil and 275 volts per mil of finished wrap thickness for 50 mil.

TENSILE/BREAK STRENGTH (Per ASTM D-412): 700 PSI Min.; 17 lbs. for 40 mil; 42 lbs. for 50 mil.

ELONGATION (Per ASTMD-412): 300% minimum.

SHELF LIFE Product should be stored at 70°F or less for maximum shelf life. Store in original packaging in clean dry environment when not in use.

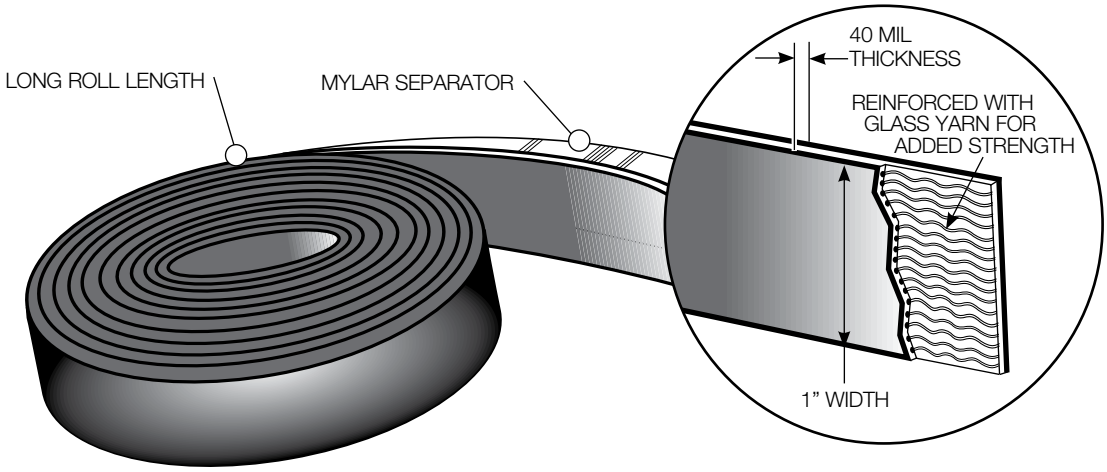
PRODUCT LIMITATION Vulko-Wrap has a low abrasion and cut resistance. A protective overwrap is recommended for applications exposed to dragging or impact.

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	5 ROLL PACK PART NO.	NOMINAL THICKNESS	NOMINAL WIDTH	NOMINAL LENGTH	WRAP COLOR	GUIDE LINE COLOR	DIELECTRIC STRENGTH PER MIL
98412	**98412D**	40 Mils	1 In. (2.54 cm)	36 Ft. (1100 cm)	**Yellow**	Red	300 Volts
98512	**98512D**	50 Mils	1-1/2 In. (3.81 cm)	36 Ft. (1100 cm)	**Yellow**	Black	275 Volts
98412BK	**98412BKD**	40 Mils	1 In. (2.54 cm)	36 Ft. (1100 cm)	**Black**	Green	300 Volts
98512BK	**98512BKD**	50 Mils	1-1/2 In. (3.81 cm)	36 Ft. (1100 cm)	**Black**	Yellow	275 Volts
98412B	**–**	40 Mils	1 In. (2.54 cm)	12 Yds.	**Blue**	White	300 Volts

Reinforced Vulko-Wrap™ Insulating Material

- **Self-Vulcanizing Wrap**
- **High Dielectric Strength**
- **Temperature Rating (-60°F to +400°F)**
- **Reinforced with Glass Yarn Fiber**
- **RoHS Compliant**



APPLICATIONS AND SPECIFICATIONS

- Bus Bar Insulation
- Cable Insulation Splices
- Corrosive Areas
- Electroplating Danglers
- Food Related Equipment
- High Heat
- High Voltage
- HVAC Equipment
- Lift Truck Battery Cable Terminals
- Motor Leads
- Outdoor Terminations
- Temporary Repair of Low Pressure Air and Hydraulic Lines
- Terminal Splicing
- Transformer Tap Lead Insulation
- Washdown Areas

SPECIFICATIONS Meets U.S. Military Spec. MIL-I-22444C.

DIELECTRIC STRENGTH (Per ASTM D-149) 500 volts per mil of finished wrap thickness for 40 mil.

ELONGATION (Per ASTMD-412) 15% minimum.

SHELF LIFE Product should be stored at 70°F or less for maximum shelf life. Store in original packaging in clean dry environment when not in use.

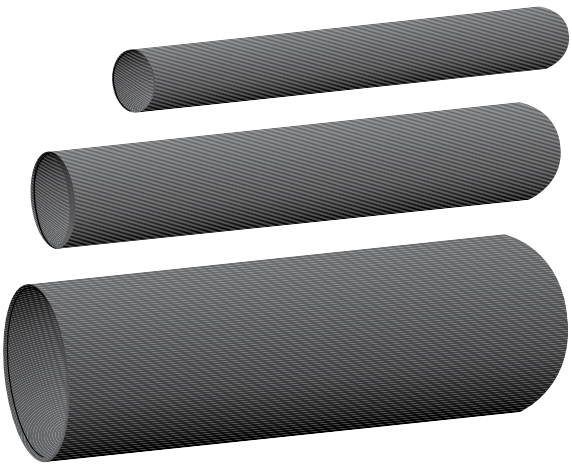
REINFORCEMENT Reinforcing braid embedded in center of material provides enhanced mechanical strength while still allowing the product to cover irregular shapes.

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	5 ROLL PACK PART NO.	NOMINAL THICKNESS	NOMINAL WIDTH	NOMINAL LENGTH	WRAP COLOR	GUIDE LINE COLOR	DIELECTRIC STRENGTH PER MIL
18412	**—**	40 Mils	1 In. (2.54 cm)	36 Ft. (1100 cm)	**Black**	None	500 Volts

Hy-Trex™ High Ratio 6 to 1 Adhesive Shrink Tubing

- **Continuous Operating Temperature 55˚C to 110˚C**
- **Shrink Temperature 120˚C**
- **Fluid Resistance MIL-DTL-23053**
- **RoHS Compliant**



SELF-SEALING
Inner adhesive provides a watertight seal, ideal for wet and corrosive locations and underground applications.

WIDE APPLICATION RANGE
Only three sizes needed to cover wire from #16 AWG through 2000 MCM cable.

DIELECTRIC STRENGTH UP TO 24,000 VOLTS
Ideal for high voltage applications.

GREATER STRENGTH
The inner adhesive provides excellent strain relief and tensile strength.

VERSATILE
Designed to adhere to cable jackets and other non-oily surfaces.

UNIVERSAL
Adhesive 6 to 1 easily fits over and seals large, bulky connections saving time and added expense.

APPLICATIONS & SPECIFICATIONS

Abrasion Protection For:
- Exposed sensors
- Cables
- Cords
- Flexible conduit
- Hydraulic hoses & fittings

Strain Relief For:
- Plugs
- Connectors
- Flexible conduit
- Portable cords

Dielectric Protection For:
- Tools
- Crimp connections
- Pliers

Corrosion Protection For:
- Hydraulic cylinders
- Conduit
- Exposed sensors

PROPERTY	VALUE	ASTM TEST METHOD
Electrical		
Dielectric Strength	500 Volts/Mil	ASTM D149
Physical		
Tensile Strength (min)	2100 psi	ASTM D412
Elongation	600%	ASTM D412
Cut-Through Resistance	Excellent	ASTM D2240
Chemical		
Water Absorption (max)	0.1%	ASTM D570
Fungus Resistance	No Growth	ASTM DG21
Fluid Resistance (24 hrs @ 25°C) of the following fluids: *a) Turbine fuel, JP-4, MIL-T-5624 b) Hydraulic fluid MIL-H-5606 c) Diesel fuel, V V-F-800 d) Lubricating oil, MIL-L-7808 e) Lubricating oil, MIL-L-23699 f) 5% NaCL, O-S-1926 g) De-icing fluid, MIL-A-8243*	Passes	ASTM D4R

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	LENGTH	UNIT OF MEASURE	BEFORE SHRINKAGE		AFTER SHRINKAGE	
			I.D.	WALL THICKNESS	I.D.	WALL THICKNESS
75001	24"	Each	0.75"	0.040"	0.125"	0.103"
75002	24"	Each	2.00"	0.045"	0.330"	0.132"
75003	24"	Each	3.50"	0.048"	0.673"	0.145"

Adjustable Cable Strap

- **200°F to -70°F (93°C to -55°C)**
- **Fits Various Bundle Sizes**
- **Easy to Install**
- **Reusable**
- **RoHS Compliant**

RUGGED NYLON BUCKLE
Industrial strength nylon buckle is lightweight, yet stands up to tough use. Allows easy securing of strap.

BOX STITCHED CONSTRUCTION
Buckle is attached to strap with a strong box stitch to prevent twisting or breaking.

NON-ABRASIVE 1.5" WIDE STRAP
Will not cut into cable jackets or adversely affect cable performance.

REUSABLE
Strap can be installed quickly or, when necessary, loosened and reinstalled with minimum downtime.

DOUBLE SIDED LOOP DESIGN
Double sided design doubles strength and allows strap to be used on a variety of bundle sizes.

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	WIDTH	TOTAL LENGTH	CABLE BUNDLE MAXIMUM NOMINAL O.D.	DOUBLE SIDED LOOP LENGTH	SINGLE SIDED HOOK LENGTH
12507	1.5"	17"	0.25" to 4"	12"	5"
12530	1.5"	30"	0.25" to 8"	25"	5"

Large Cord and Cable Reel Rack

• Heavy Duty • Easy to Assemble • Holds Up to 10,000 lbs • Keeps Area Organized

Ask Your Sales Representative How to Earn a Free Reel Rack!

HIGH CAPACITY REEL RACK
Adjustable for up to 60" diameter reels. Brackets support up to 2,000 lbs per level, Max capacity 10,000 lbs.

RACKS CAN BE BOLTED TOGETHER TO EXPAND CAPACITY

SAFETY PINS LOCK AXLE BRACKETS AND CROSS BEAMS TO UPRIGHT FRAMES
Cross beams and brackets adjust on 3" centers.

HEAVY DUTY 12 GAUGE STEEL UPRIGHT FRAME
Measures 3-1/2" wide x 3" deep. 10 gauge steel axle brackets. Lapped and welded beams have three hooks for positive connection.

REEL RACK INCLUDES
2 upright frames with built in brace set, 2 pairs of cross beams, 4 pairs of axle brackets. Rack should be secured to the floor.

EASY TO ASSEMBLE

SPECIFICATIONS

- Measures 120" high x 48" wide x 36" deep
- Adjustable for up to 60" diameter reels
- Axle brackets accommodate up to 2" diameter
- Axles for 2,000 lb capacity per level
- Rack should be secured to the floor
- Safety pins lock axle brackets and cross beams to upright frames
- Gray powder coat finish
- Durable 12 gauge steel upright frames measure 3½" wide x 3" deep

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	DESCRIPTION	SHIPPING BOX	WEIGHT (LBS.)
12006	High Capacity Reel Rack	Ships in four boxes	260

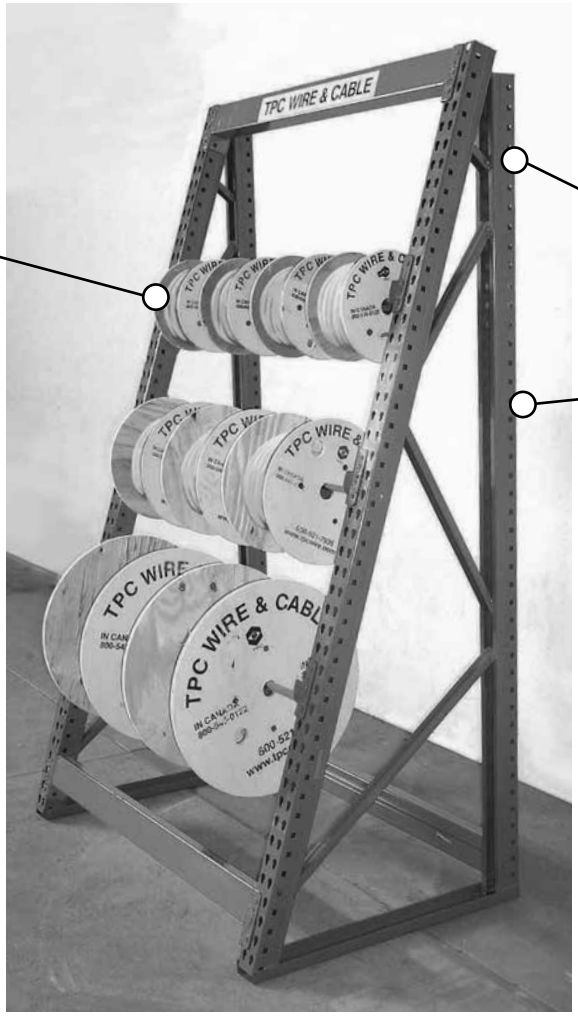
Small Cord and Cable Reel Rack

- **Organize Inventory**
- **Easy to Dispense**
- **Efficient Product Handling**

Ask Your Sales Representative How to Earn a Free Reel Rack!

HOLDS FULL REELS OF TPC CORD AND CABLE
Full reels reduce waste – only one end piece. Reduces the improper storage of unusable lengths.

EASILY DISPENSE CABLE NEEDED
Allows you to take just the right amount of "Kink Free – Twist Free" TPC Product for the job at hand, therefore reducing waste.



STURDY WELDED CONSTRUCTION
Built to last.

TAKES UP VERY LITTLE SPACE
Can be located in stores, crib, construction or high maintenance areas. Organizes inventory and makes visual inspection easy.

SPECIFICATIONS

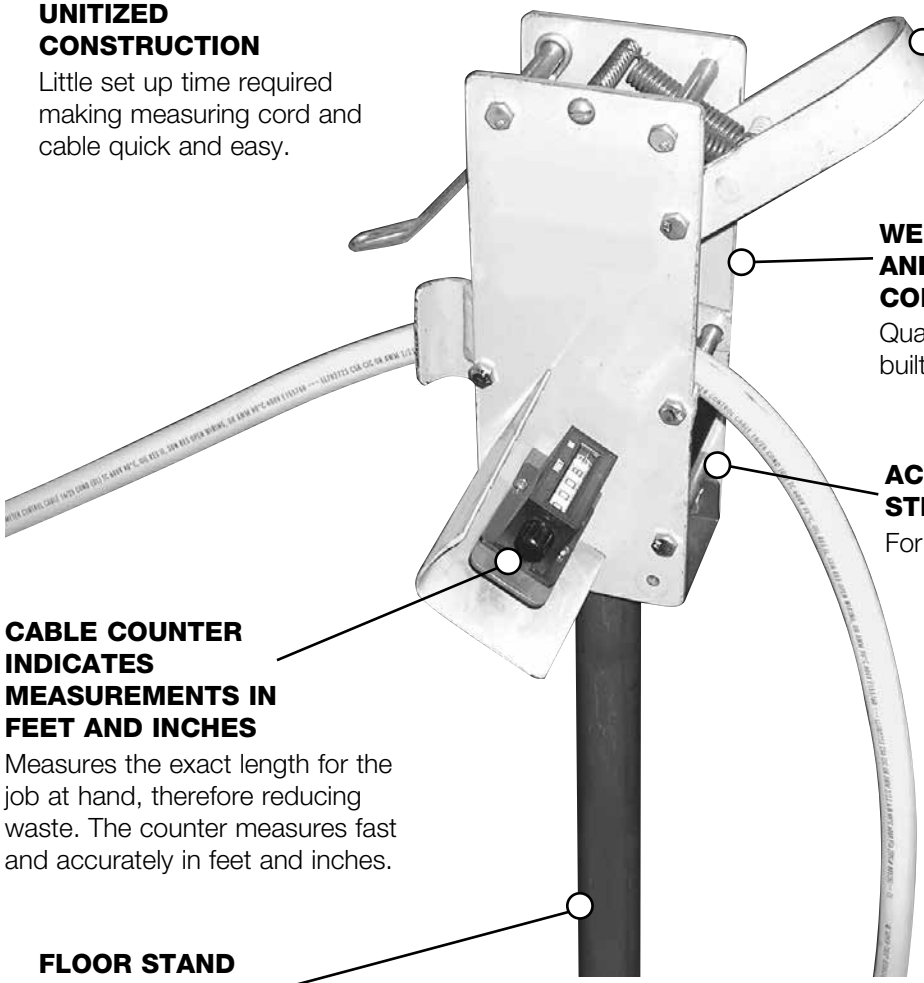
- Accommodates various TPC cord and cable reels
- Measures 96" high x 48" wide x 36" deep
- Holds reel sizes up to 30" in diameter x 20" wide
- Heavy steel construction
- 3000 lb. capacity – 1000 lbs. per level
- Includes 4 steel bars to hold assorted reels

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	DESCRIPTION	SHIPPING BOX DIMENSIONS	WEIGHT (LBS.)
12005	Small Reel Rack	12" x 38" x 97"	250

Cord and Cable Meter

- **Exact Measurements**
- **Measures from 0 to 1,000 ft.**
- **Measures up to 2" Diameter Cord and Cable**
- **Heavy Duty**
- **Reduces Waste**



CONVENIENT HANDLE

UNITIZED CONSTRUCTION
Little set up time required making measuring cord and cable quick and easy.

WELDED STEEL PIPE AND ANGLE IRON CONSTRUCTION
Quality construction, built to last.

ACCURATELY MACHINED STEEL ROLLERS
For smooth operation.

CABLE COUNTER INDICATES MEASUREMENTS IN FEET AND INCHES
Measures the exact length for the job at hand, therefore reducing waste. The counter measures fast and accurately in feet and inches.

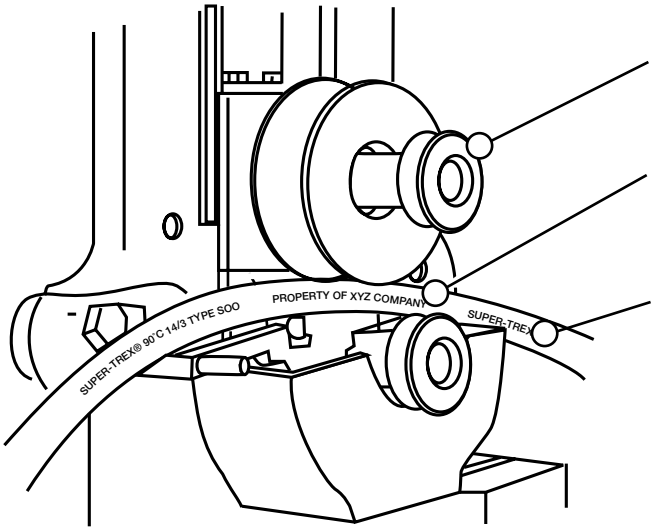
FLOOR STAND ADJUSTS FROM 30" TO 48"
Easier to use and setup.

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	DESCRIPTION	SHIPPING WEIGHT (LBS.)
12003	Cable Meter and Adjustable Floor Stand	31

Custom Cable Printing

Making a Great Impression Every Time!



FEATURES & BENEFITS

PERSONALIZED PRINTING OF CUSTOMER SELECTED LEGENDS, INCLUDING TRADE NAMES AND LOGOS
Provides company identification, advertises corporate identity, is an excellent deterrent to theft and will eliminate ownership confusion such as with subcontractors on the job.

DOT-ETCHED MARKING WHEEL
Makes a great impression.

ONE TIME MARKING WHEEL PURCHASE FOR MANY CABLE SIZES
Reduces cost and saves time.

UP TO 100 CHARACTERS PER MARKING WHEEL
High degree of flexibility in legend design.

BLACK INK ON YELLOW CABLE PROVIDES HIGH CONTRAST
High visibility, easy to read and identify.

MARKING WHEEL IS RETAINED BY TPC WIRE & CABLE
One time charge. Fast service on repeat print orders.

SPECIFICATIONS

- Actual type size is 1/8"
- Legend repeat is approximately every foot
- Up to 100 single spaced characters per standard marking wheel*

** The print is random and could overprint the Super-Trex® Legend*

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	DESCRIPTION
12050	Marking Wheel** 1/8" x 0.437"

***One time purchase per legend for the life of the wheel. The wheel is the property of the customer but will be retained by TPC Wire & Cable for printing on future orders. To obtain marking wheel a written request must be made.*

PART NO.	DESCRIPTION
12051	Custom Printing

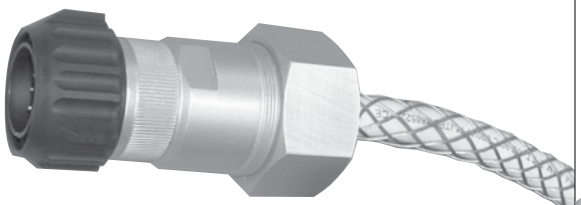
Custom printed cord and cable is non-returnable.

Add a Connector to Any Cable Order!

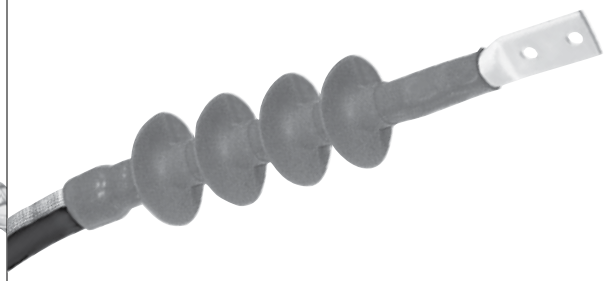
MOLDED CIRCULAR CONNECTORS

MOLDED SINGLE POLE CAM-TYPE

HDLC ASSEMBLIES



TYPE SH TERMINATION



MILITARY ASSEMBLIES

HEAVY DUTY LUG TERMINATION

RECTANGULAR ASSEMBLIES

CUSTOM DESIGNED

See Pages 180 – 220 for Additional Details.

SUPER-TREX®

QUICK-CONNECT™ ASSEMBLIES

SJOO MICRO QUICK-CONNECT™

TREX-ONICS®

MICRO QUICK-CONNECT™

NANO QUICK-CONNECT™

SPECIALTY

QUICK-CONNECTS™

16 AWG Quick-Connect™ 2-8 Pole Cord Sets

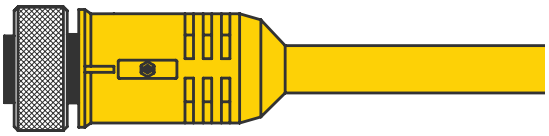
• Meets IP68 & IP69K Requirements for Dust and Water • 600 Volt • RoHS Compliant

Quick-Connects make replacement of electrical and electronic control devices quick and simple

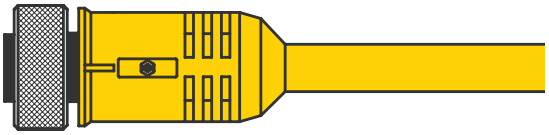
CONSTRUCTION FEATURES & BENEFITS

PLUG SETS MADE WITH SUPER-TREX® TYPE S00 ULTRA-GARD™ PORTABLE CORD, RATED 90°C

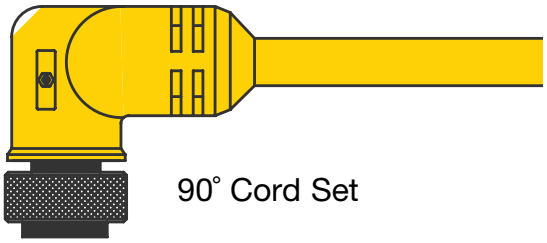
Superior first-line defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat resistant. Extreme all-weather flexibility.



Female Cord Set



Male Cord Set



90˚ Cord Set

EXTRA LONG PLUG BODY IS SPECIALLY COMPOUNDED, THERMOSET ELASTOMER

Provides long flex life, resists heat and oil deterioration.

MOLDED AND KEYED, VULCANIZED THERMOSET ASSEMBLY

Provides rapid and secure connect and disconnect. Ensures a water, oil, and dust tight seal.

SOLID BRASS CONTACT PINS ARE NICKEL COATED AND GOLD PLATED, MACHINE CRIMPED TO CONDUCTORS

Provides long life, resists corrosion, easy positive engagement. Excellent for high/low voltage and low level signal applications.

UNIQUE STAINLESS STEEL SLEEVE OVER THE GOLD PLATED FEMALE PINS

Prevents pin deformation resulting in loss of signal and electrical continuity. Superior performance in high vibration and continuous motion environments. Probe proof.

HARD COATED MIL SPEC. ANODIZED ALUMINUM KNURLED COUPLING RING

Resists corrosion, provides quick and secure assembly.

STAINLESS STEEL FRICTION RING BETWEEN COUPLER AND PLUG BODY

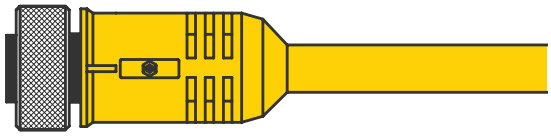
Increases pull-out strength, ensures uniform tightness.

EXTRA LONG GROUNDING PIN

Ensures first-in, last-out contact for safety.

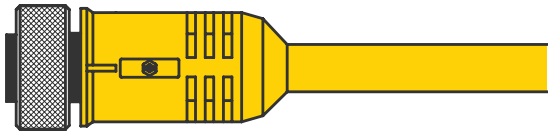
16 AWG Quick-Connect™ 2-6 Pole Cord Sets

ORDERING INFORMATION *(Call for pricing & availability)*



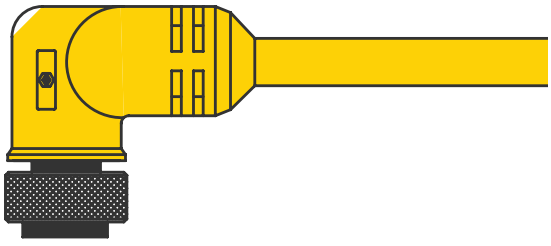
FEMALE PLUGS

PART NO.					FEET	METERS	DESCRIPTION
2 POLE	3 POLE	4 POLE	5 POLE	6 POLE			
84203	84303	84403	84503	—	3	0.91	F Plug
84206	84306	84406	84506	84166	6	1.83	F Plug
84212	84312	84412	84512	84172	12	3.66	F Plug
84220	84320	84420	84520	84190	20	6.10	F Plug



MALE PLUGS

PART NO.					FEET	METERS	DESCRIPTION
2 POLE	3 POLE	4 POLE	5 POLE	6 POLE			
84003	84803	84703	84603	—	3	0.91	M Plug
84006	84806	84706	84606	84266	6	1.83	M Plug
84012	84812	84712	84612	84272	12	3.66	M Plug
84020	84820	84720	84620	84290	20	6.10	M Plug



90° FEMALE PLUGS

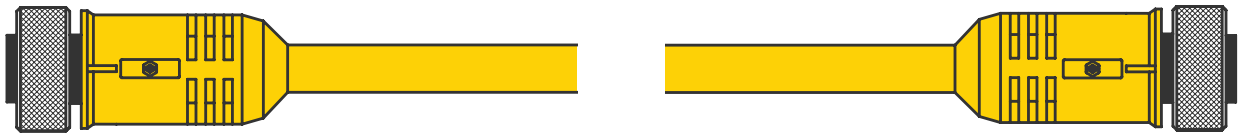
PART NO.				FEET	METERS	DESCRIPTION
3 POLE	4 POLE	5 POLE	6 POLE			
89303	89403	89503	CL16D09F003	3	0.91	90° F Plug
89306	89406	89506	CL16D09F006	6	1.83	90° F Plug
89312	89412	89512	CL16D09F012	12	3.66	90° F Plug
89320	89420	89520	CL16D09F020	20	6.10	90° F Plug

NOTE: For stainless steel coupling rings, add "SS" to end of part number, i.e.: 84203SS

(continued from previous page)

16 AWG Quick-Connect™ 2-6 Pole Cord Sets

ORDERING INFORMATION *(Call for pricing & availability)*



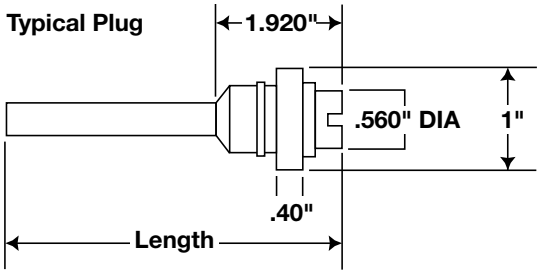
M/F EXTENSION SET

PART NO.					FEET	METERS	DESCRIPTION
2 POLE	3 POLE	4 POLE	5 POLE	6 POLE			
84921	84901	84935	84968	84953	3	0.91	M/F
84922	84902	84936	84969	84954	6	1.83	M/F
84923	84903	84937	84970	84955	12	3.66	M/F
84929	84909	84919	84979	84956	20	6.10	M/F

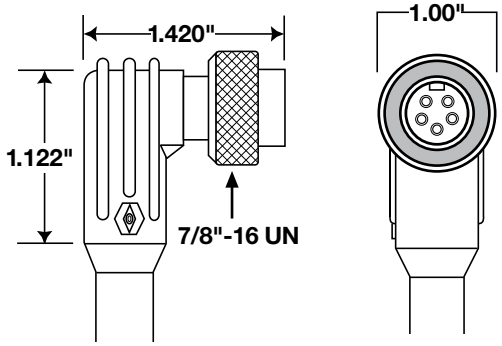
NOTE: For stainless steel coupling rings, add "SS" to end of part number, i.e.: 84203SS

DIMENSIONAL INFORMATION

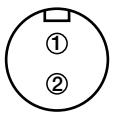
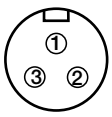
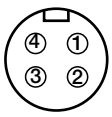
2, 3, 4, 5, 6 POLE STRAIGHT DIMENSIONS



2, 3, 4, 5 POLE 90° PLUG DIMENSIONS

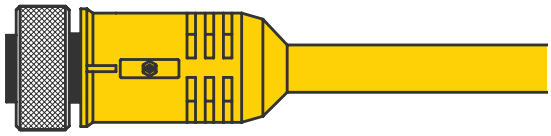


FACE VIEW OF FEMALE CONNECTORS "A" SIZE (7/8"-16 COUPLING THREAD)

 2 POLE	 3 POLE	 4 POLE	 5 POLE	 6 POLE A Size
1. White 2. Black	1. Green 2. Black 3. White	1. Black 2. White 3. Red 4. Green	1. White 2. Red 3. Green 4. Orange 5. Black	1. White 2. Red 3. Green 4. Orange 5. Black 6. Blue

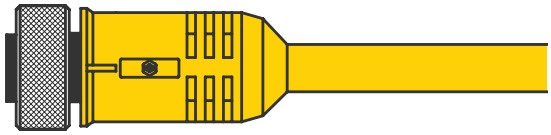
16 AWG Quick-Connect™ 6-8 Pole Cord Sets

ORDERING INFORMATION *(Call for pricing & availability)*



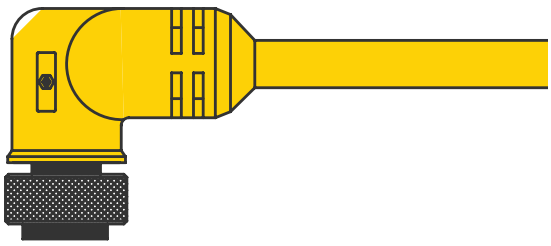
FEMALE PLUGS

PART NO.			FEET	METERS	DESCRIPTION
6 POLE	7 POLE	8 POLE			
84666	**84766**	**84866**	6	1.83	F Plug
84672	**84772**	**84872**	12	3.66	F Plug
84690	**84790**	**84890**	20	6.10	F Plug



MALE PLUGS

PART NO.			FEET	METERS	DESCRIPTION
6 POLE	7 POLE	8 POLE			
84566	**84466**	**84366**	6	1.83	M Plug
84572	**84472**	**84372**	12	3.66	M Plug
84590	**84490**	**84390**	20	6.10	F Plug



90° FEMALE PLUGS

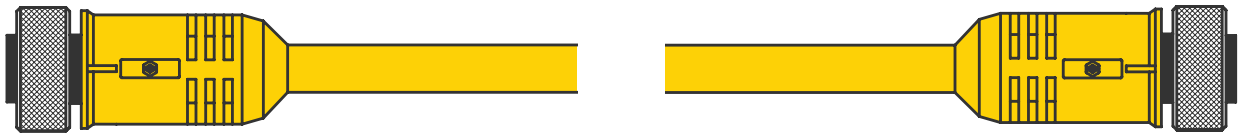
PART NO.			FEET	METERS	DESCRIPTION
6 POLE	7 POLE	8 POLE			
CM16D09F006	**CM17D11F006**	**CM18D12F006**	6	1.83	90° F PLUG
CM16D09F012	**CM17D11F012**	**CM18D12F012**	12	3.66	90° F PLUG
CM16D09F020	**CM17D11F020**	**CM18D12F020**	20	6.10	90° F PLUG

Custom lengths and configurations are available

(continued from previous page)

16 AWG Quick-Connect™ 6-8 Pole Cord Sets

ORDERING INFORMATION *(Call for pricing & availability)*

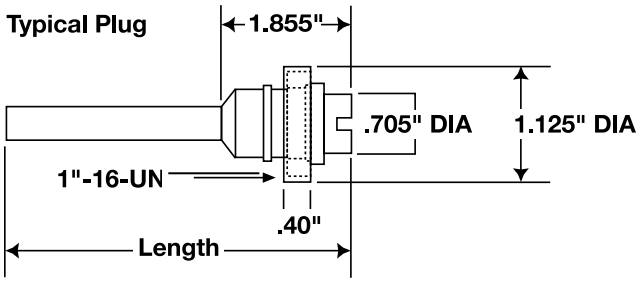


M/F EXTENSION SET						
PART NO.			FEET	METERS	DESCRIPTION
6 POLE	7 POLE	8 POLE			
84963	84973	84983	3	0.91	M/F
84964	84974	84984	6	1.83	M/F
84965	84975	84985	12	3.66	M/F
84966	84976	84986	20	6.10	M/F

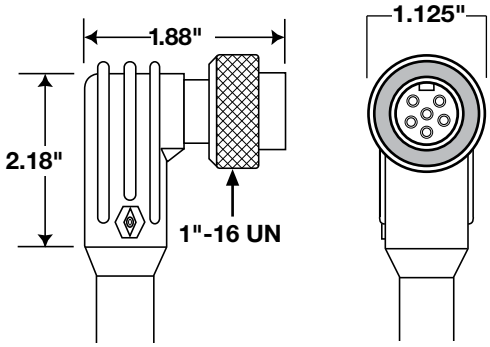
Custom lengths and configurations are available

DIMENSIONAL INFORMATION

6, 7, 8 POLE STRAIGHT DIMENSIONS



6, 7, 8 POLE 90° PLUG DIMENSIONS



FACE VIEW OF FEMALE CONNECTORS "B" SIZE (1"-16 COUPLING THREAD)

6 POLE

1. Orange
2. Blue
3. Black
4. White
5. Red
6. Green

7 POLE

1. Wht-Blk Tr.
2. Black
3. White
4. Red
5. Orange
6. Blue
7. Green

8 POLE

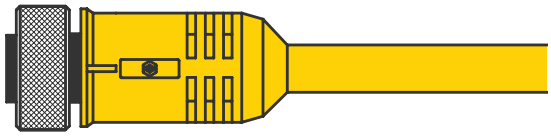
1. Orange
2. Blue
3. Wht-Blk Tr.
4. Black
5. White
6. Red
7. Green
8. Red-Blk Tr.

16 AWG Quick-Connect™ 9, 10, 12 Pole Cord Sets

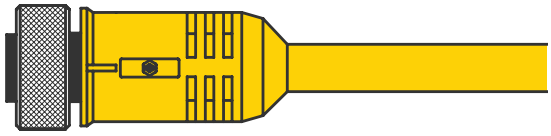
• Meets IP68 & IP69K Requirements for Dust and Water • 600 Volt • RoHS Compliant

Quick-Connects make replacement of electrical and electronic control devices quick and simple

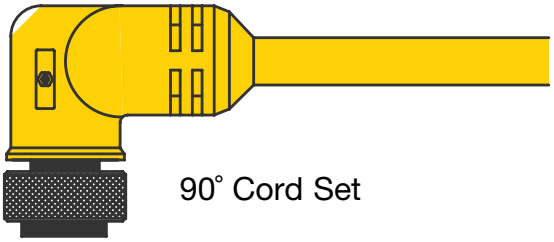
CONSTRUCTION FEATURES & BENEFITS



Female Cord Set



Male Cord Set



90˚ Cord Set

PLUG SETS MADE WITH *SUPER-TREX*®
Superior first-line defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat resistant. Extreme all-weather flexibility.

EXTRA LONG PLUG BODY IS SPECIALLY COMPOUNDED, THERMOSET ELASTOMER
Provides long flex life, resists heat and oil deterioration.

MOLDED AND KEYED, VULCANIZED THERMOSET ASSEMBLY
Provides rapid and secure connect and disconnect. Ensures a water, oil, and dust tight seal.

HARD COATED MIL SPEC. ANODIZED ALUMINUM KNURLED COUPLING RING
Resists corrosion, provides quick and secure assembly.

SOLID BRASS CONTACT PINS ARE NICKEL COATED AND GOLD PLATED, MACHINE CRIMPED TO CONDUCTORS
Provides long life, resists corrosion, easy positive engagement. Excellent for high/low voltage and low level signal applications.

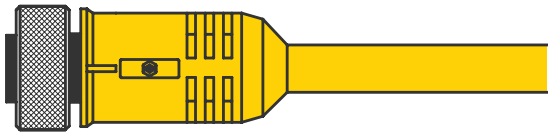
EXTRA LONG GROUNDING PIN
Ensures first-in, last-out contact for safety.

TPC WIRE & CABLE CORP. • USA 800-521-7935 • CANADA 800-545-0122 • MEXICO 001-877-283-1696

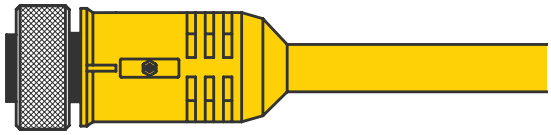
(continued from previous page)

16 AWG Quick-Connect™ 9, 10, 12 Pole Cord Sets

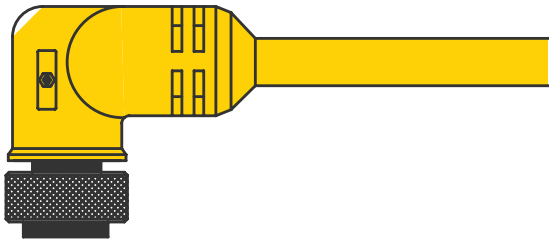
ORDERING INFORMATION *(Call for pricing & availability)*



FEMALE PLUGS						
PART NO.			FEET	METERS	DESCRIPTION
9 POLE	10 POLE	12 POLE			
83296	83286	83276	6	1.83	F Plug
83291	83281	83271	12	3.66	F Plug
83292	83282	83272	20	6.10	F Plug



MALE PLUGS						
PART NO.			FEET	METERS	DESCRIPTION
9 POLE	10 POLE	12 POLE			
83196	83186	83176	6	1.83	M Plug
83191	83181	83171	12	3.66	M Plug
83192	83182	83172	20	6.10	M Plug



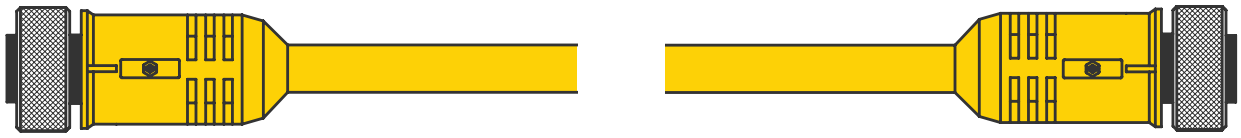
90° FEMALE PLUGS						
PART NO.			FEET	METERS	DESCRIPTION
9 POLE	10 POLE	12 POLE			
CN19D13F006	CN110D14F006	CN112D15F006	6	1.83	90° F PLUG
CN19D13F012	CN110D14F012	CN112D15F012	12	3.66	90° F PLUG
CN19D13F020	CN110D14F020	CN112D15F020	20	6.10	90° F PLUG

Custom lengths and configurations are available

(continued from previous page)

16 AWG Quick-Connect™ 9, 10, 12 Pole Cord Sets

ORDERING INFORMATION *(Call for pricing & availability)*

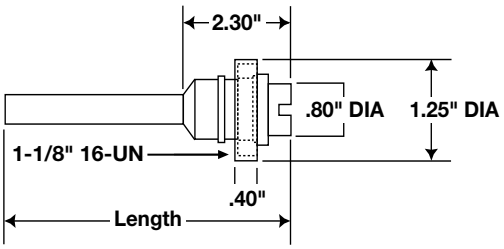


M/F EXTENSION SET

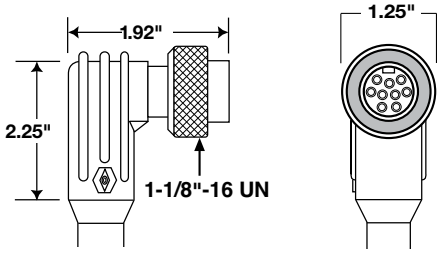
PART NO.			FEET	METERS	DESCRIPTION
9 POLE	10 POLE	12 POLE			
—	—	83573	3	0.91	M/F
—	—	83576	6	1,83	M/F
83591	83581	83571	12	3.66	M/F
83592	83582	83572	20	6.10	M/F
—	—	83575	25	6.54	M/F

DIMENSIONAL INFORMATION

9, 10, 12 POLE STRAIGHT FEMALE DIMENSIONS



9, 10, 12 POLE 90° PLUG DIMENSIONS



FACE VIEW OF FEMALE DIMENSIONS "C" SIZE (1-1/8"-16 COUPLING THREAD)

9 POLE FEMALE FACE VIEW

1. Orange	6. Red
2. Blue	7. Green
3. Red/Blk. Tr.	8. White/Blk. Tr.
4. Green/Blk. Tr.	9. Black
5. White	

10 POLE FEMALE FACE VIEW

1. Orange	6. Orange/Blk. Tr.
2. Blue	7. Red
3. White/Blk. Tr.	8. Green
4. Red/Blk. Tr.	9. Black
5. Green/Blk. Tr.	10. White

12 POLE FEMALE FACE VIEW

1. Orange	7. Blue/Blk. Tr.
2. Blue	8. Blk./White Tr.
3. White/Blk. Tr.	9. Green
4. Red/Blk. Tr.	10. Red
5. Green/Blk. Tr.	11. White
6. Orange/Blk. Tr.	12. Black

CABLE SIZE	NOM. O.D. (IN.)
16/9	0.560
16/10	0.580
16/12	0.590

16 AWG Quick-Connect™ 2-12 Pole Receptacles

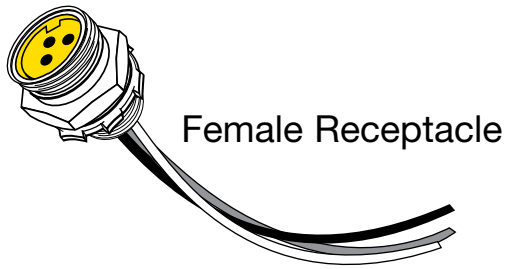
• Meets IP68 & IP69K Requirements for Dust and Water • 600 Volt • RoHS Compliant

A pre-wired Quick-Connect Receptacle can reduce downtime and labor costs

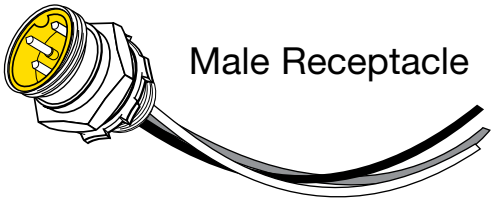
CONSTRUCTION FEATURES & BENEFITS

RECEPTACLE INSERTS ARE SPECIALLY COMPOUNDED, THERMOSET ELASTOMER

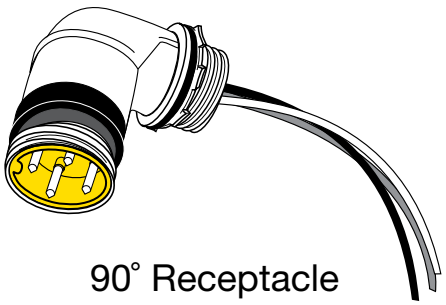
Provides long flex life, resists heat and oil deterioration.



Female Receptacle



Male Receptacle



90˚ Receptacle

MOLDED AND KEYED, VULCANIZED THERMOSET ASSEMBLY

Provides rapid and secure connect and disconnect. Ensures a water, oil, and dust tight seal.

HARD COATED MIL SPEC. ANODIZED ALUMINUM RECEPTACLE SHELL

Resists corrosion, provides quick and secure assembly.

SOLID BRASS CONTACT PINS ARE NICKEL COATED AND GOLD PLATED, MACHINE CRIMPED TO CONDUCTORS

Provides long life, resists corrosion, easy positive engagement. Excellent for high/low voltage and low level signal applications.

UNIQUE STAINLESS SLEEVE OVER THE GOLD PLATED FEMALE PINS

Prevents pin deformation resulting in loss of signal and electrical continuity. Superior performance in high vibration and continuous motion environments. Probe proof.

EXTRA LONG GROUNDING PIN

Ensures first-in, last-out contact for safety.

FLUOROELASTOMER SEALING O-RING AND LOCKNUT

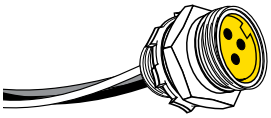
Seals out oil, chemicals and other contaminants. Locknut included with each unit.

16 AWG STRANDED, TINNED COPPER PIGTAILS INSULATED WITH 125°C CROSS LINKED POLYETHYLENE

Provides excellent oil and heat resistance.

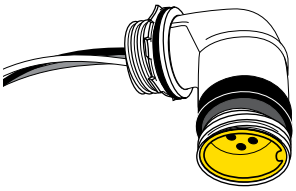
16 AWG Quick-Connect™ 2-6 Pole Receptacles

ORDERING INFORMATION *(Call for pricing & availability)*



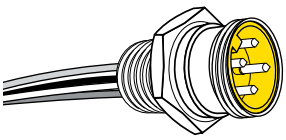
FEMALE RECEPTACLES *(48" PIGTAILS)*

PART NO.					PIGTAIL		
2 POLE	3 POLE	4 POLE	5 POLE	6 POLE	LGTH. FT	METERS	DESCRIP.
84000	84800	84700	84600	84561	4	1.22	F Recept.



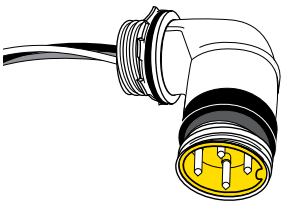
FEMALE 90° RECEPTACLES *(48" PIGTAILS)*

PART NO.					PIGTAIL		
2 POLE	3 POLE	4 POLE	5 POLE	6 POLE	LGTH. FT	METERS	DESCRIP.
89000	89800	89700	89600	—	4	1.22	90° F



MALE RECEPTACLES *(12" PIGTAILS)*

PART NO.					PIGTAIL		
2 POLE	3 POLE	4 POLE	5 POLE	6 POLE	LGTH. FT	METERS	DESCRIP.
84200	84300	84400	84500	84661	1	0.30	M Recept.

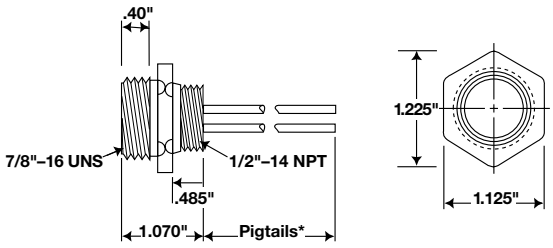


MALE 90° RECEPTACLES *(12" PIGTAILS)*

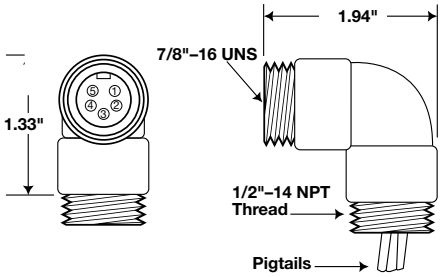
PART NO.					PIGTAIL		
2 POLE	3 POLE	4 POLE	5 POLE	6 POLE	LGTH. FT	METERS	DESCRIP.
89200	89300	89400	89500	—	1	0.30	90° M

DIMENSIONAL INFORMATION

2, 3, 4, 5, 6 POLE RECEPTACLE DIMENSIONS



90° RECEPTACLE



NOTES: The length of the pigtails on the male receptacles is 12", and the length of the pigtails on the female receptacles is 48".

FACE VIEW OF FEMALE RECEPTACLES "A" SIZE

2 POLE	3 POLE	4 POLE	5 POLE	6 POLE A Size
1. White 2. Black	1. Green 2. Black 3. White	1. Black 2. White 3. Red 4. Green	1. White 2. Red 3. Green 4. Orange 5. Black	1. White 2. Red 3. Green 4. Orange 5. Black 6. Blue

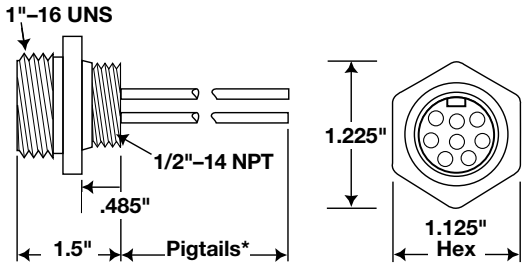
16 AWG Quick-Connect™ 6-8 Pole Receptacles

ORDERING INFORMATION *(Call for pricing & availability)*

FEMALE RECEPTACLES *(48" PIGTAILS)*					
PART NO.			FEET	METERS	DESCRIPTION
6 POLE	7 POLE	8 POLE			
84560	84460	84360	4	1.22	F Recept.

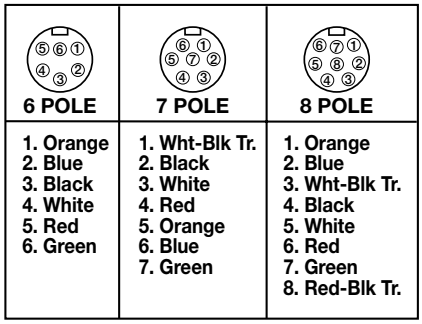
MALE RECEPTACLES *(12" PIGTAILS)*					
PART NO.			FEET	METERS	DESCRIPTION
6 POLE	7 POLE	8 POLE			
84660	84770	84880	1	0.30	M Recept.

6, 7, 8 POLE STRAIGHT RECEPTACLE "B" SIZE



NOTE: The length of the pigtails on the male receptacles is 12", and the length of the pigtails on the female receptacles is 48".

FACE VIEW OF FEMALE RECEPTACLE



6 POLE	7 POLE	8 POLE
1. Orange 2. Blue 3. Black 4. White 5. Red 6. Green	1. Wht-Blk Tr. 2. Black 3. White 4. Red 5. Orange 6. Blue 7. Green	1. Orange 2. Blue 3. Wht-Blk Tr. 4. Black 5. White 6. Red 7. Green 8. Red-Blk Tr.

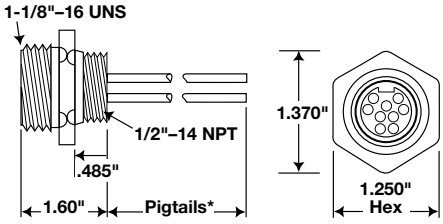
16 AWG Quick-Connect™ 9-12 Pole Receptacles

ORDERING INFORMATION *(Call for pricing & availability)*

FEMALE RECEPTACLES *(12" PIGTAILS)*					
PART NO.			FEET	METERS	DESCRIPTION
9 POLE	10 POLE	12 POLE			
83360	83350	83340	1	0.30	F Recept.

MALE RECEPTACLES *(12" PIGTAILS)*					
PART NO.			FEET	METERS	DESCRIPTION
9 POLE	10 POLE	12 POLE			
83390	83380	83370	1	0.30	M Recept.

9, 10, 12 POLE STRAIGHT RECEPTACLE "C" SIZE



9 POLE FEMALE FACE VIEW

1. Orange
2. Blue
3. Red/Blk. Tr.
4. Green/Blk.Tr.
5. White
6. Red
7. Green
8. White/Blk. Tr.
9. Black

10 POLE FEMALE FACE VIEW

1. Orange
2. Blue
3. White/Blk. Tr.
4. Red/Blk.Tr.
5. Green/Blk.Tr.
6. Orange/Blk. Tr.
7. Red
8. Green
9. Black
10. White

12 POLE FEMALE FACE VIEW

1. Orange
2. Blue
3. White/Blk. Tr.
4. Red/Blk.Tr.
5. Green/Blk.Tr.
6. Orange/Blk. Tr.
7. Blu/Blk. Tr.
8. Blk/Wht. Tr.
9. Green
10. Red
11. White
12. Black

16 AWG Quick-Connect™ Accessories

TECHNICAL INFORMATION

90° SHORT ELBOW

- 100% aluminum.
- For 16 AWG, 2-12 Pole Quick-Connects.
- Elbow is threaded to industry standard to ensure interchangeability.

CLOSURE CAP

- Hard coated black anodized aluminum.
- Provides a dust proof environment for the Quick-Connect face.
- Two threaded configurations for either cord sets or receptacles.
- Convenient chain which attaches to the cord to prevent misplacing the dust cap.
- Chain length 6".

ADAPTER

- Hard coated black anodized aluminum which is corrosion resistant.
- For 16 AWG, 2-12 Pole Quick-Connects.
- Adapter is threaded to industry standard to ensure interchangeability with the rest of the standard connectors now in use.
- Slotted for easy installation and removal.

QUICK-CONNECT STRAIN-RELIEF

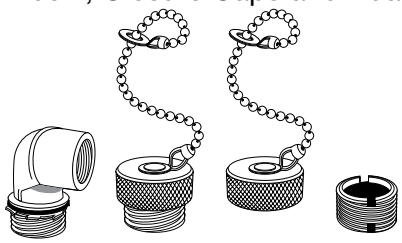
- Full length double-woven stainless steel mesh provides exceptional gripping strength, longer life and corrosion resistance.
- Tapered body holds coupler and mesh and provides excellent pull-out strength.
- For 16 AWG, 2-5 Pole Quick-Connects.
- Designed to fit a range of Quick-Connects, this reduces the need to carry large inventories.
- One-piece design, nothing to assemble, ensures convenience.

GRIP-SEAL™

- Nylon compression nut and threaded body, resists impact and corrosion.
- Multiple synthetic sealing bushing provides a high uniform seal on the cord surface, sealing out water, oil and other contaminants.
- Nylon friction ring provides uniform pressure, preventing bushing damage. The result is a tight seal.
- Locknut with fluoroelastomer O-ring seals out contaminants.

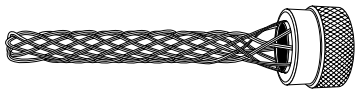
ORDERING INFORMATION *(Call for pricing & availability)*

90° Elbow, Closure Caps and Adapter



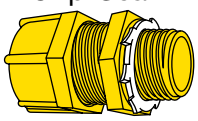
PART NO.	DESCRIPTION
84101	1/2" 90° Short Elbow
84102	Closure Cap for Receptacles 2-6 pin (A-Size)
84103	Closure Cap for Plugs 2-6 pin (A-Size)
84104	Adapter 2-6 pin (A-Size)
84106	Closure Cap for Receptacles 6, 7, 8 pin (B-Size)
84107	Closure Cap for Plugs 6, 7, 8 pin (B-Size)
84108	Adapter 6, 7, 8 pin (B-Size)
84109	Closure Cap for Receptacles 9, 10, 12 pin (C Size)
84110	Closure Cap for Plugs 9, 10, 12 pin (C Size)
84111	Adapter 9, 10, 12 pin (C Size)
84120	Closure Cap for Receptacles 1-3/16"–16

Quick-Connect Kord-Gard™ Strain Relief



PART NO.	DESCRIPTION
84115	16 AWG 2, 3, 4, 5 Pole Strain Relief

Grip-Seal™



PART NO.	CORD DIAMETER RANGE	THREADED FITTING SIZE	NO. OF BUSHING	CORD SET SIZE
55505	0.180" – 0.430"	3/8"	4	2-3 Pole
55513	0.188" – 0.500"	1/2"	5	2-4 Pole
55515	0.310" – 0.560"	1/2"	5	2-6 Pole
55516	0.188" – 0.625"	1/2"	7	2-7 Pole
55530	0.560" – 0.750"	3/4"	2	6-12 Pole

Field Installable Mini Connectors

• IP67 Rated • Meets SAE Standards—H1738-2 • RoHS Compliant

CONSTRUCTION FEATURES & BENEFITS

NYLON INSERT & SLEEVE Impact and crush resistant.

IP67 SHELL PROTECTION Product is sealed to provide protection against dust and water spray.

SCREW LOCKING SYSTEM Secure connection using only a screw driver.

ANODIZED ALUMINUM KNURLED COUPLING RING Resists corrosion and gives quick, secure assembly.

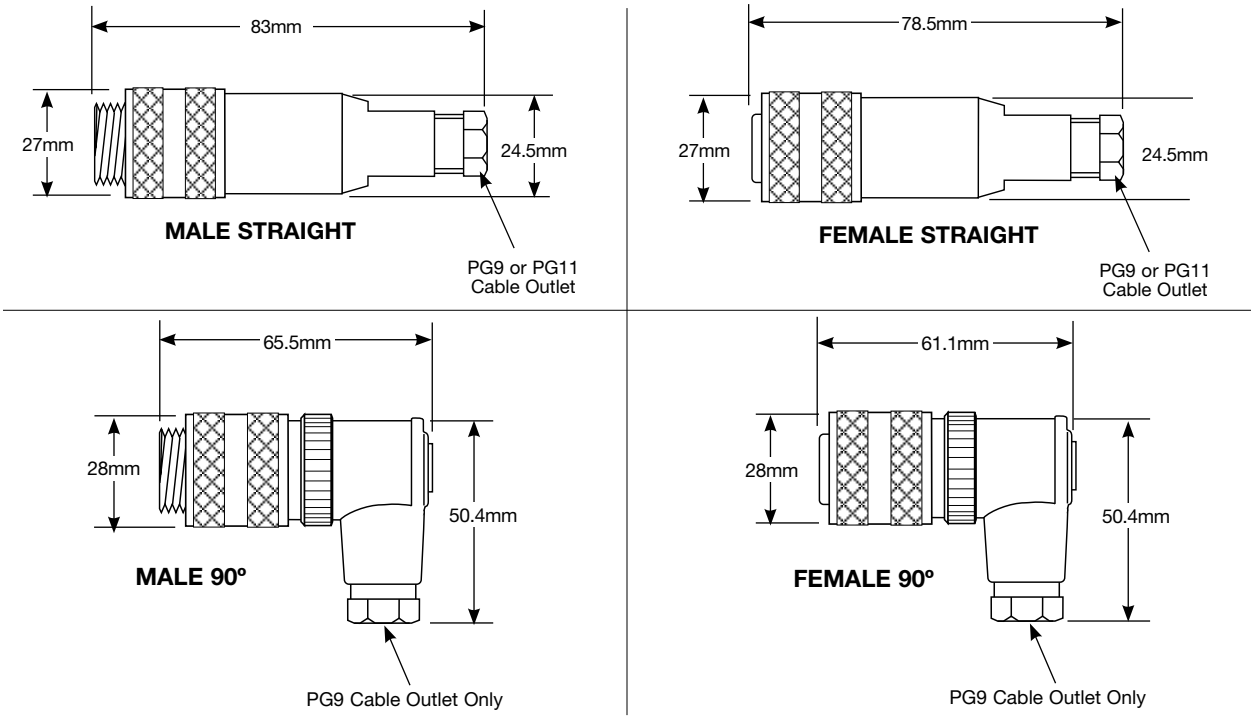
RUBBER SEALING BUSHING & PINCH RING IP67 Rated, providing internal protection from dust and fluid spray.

PRESSING SCREW Nylon pressing screw threads into body sleeve and compresses pinch ring and seal to provide IP67 rating, and grips cable to protect conductors from pulling out of connector.

GOLD PLATED BRASS PINS & SOCKETS Provide long life, resist corrosion, easy positive engagement, extra long ground pin ensures first-in, last-out contact for safety.

GENERAL CHARACTERISTICS 250 V rated, product will withstand temperature ranges of 85°C (185°F) to -40°C (-40°F).

MECHANICAL SPECIFICATIONS



APPLICATIONS

TPC Field Installable Mini Quick-Connects™ are designed to be used with the following cables:

Verify cable OD before making your selection

SUPER-TREX®

AC & DC SJOO Micro Cord Sets – 18/3, 18/4 & 18/5

Ultra-Gard™ – 18/3, 18/4, 16/3 & 16/4

TREX-ONICS®

AC & DC Micro Cord Sets – 18/3, 18/4 & 18/5

Cords – 16/3, 16/4, 18/3 & 18/4

DeviceNet™ Thin Cable & Thin Cable Assemblies

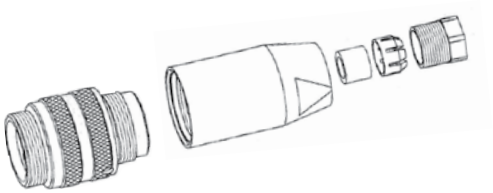
(continued from previous page)

Field Installable Mini Connectors

ORDERING INFORMATION *(Call for pricing & availability)*

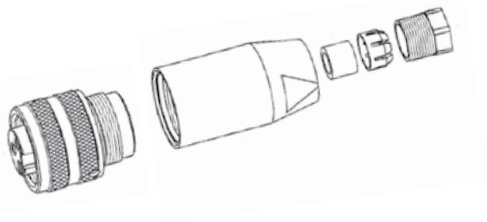
MALE STRAIGHT

PART NO.	DESCRIPTION	CABLE OUTLET	FITS CABLE SIZE
33800	3 Pole Male Straight	PG9	0.236" – 0.315"
33700	4 Pole Male Straight	PG9	0.236" – 0.315"
33600	5 Pole Male Straight	PG9	0.236" – 0.315"
33801	3 Pole Male Straight	PG11	0.315" – 0.450"
33701	4 Pole Male Straight	PG11	0.315" – 0.450"
33601	5 Pole Male Straight	PG11	0.315" – 0.450"



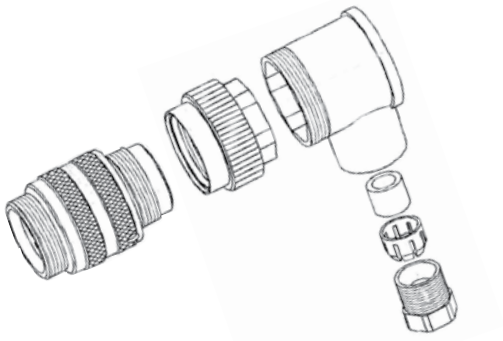
FEMALE STRAIGHT

PART NO.	DESCRIPTION	CABLE OUTLET	FITS CABLE SIZE
33300	3 Pole Female Straight	PG9	0.236" – 0.315"
33400	4 Pole Female Straight	PG9	0.236" – 0.315"
33500	5 Pole Female Straight	PG9	0.236" – 0.315"
33301	3 Pole Female Straight	PG11	0.315" – 0.450"
33401	4 Pole Female Straight	PG11	0.315" – 0.450"
33501	5 Pole Female Straight	PG11	0.315" – 0.450"



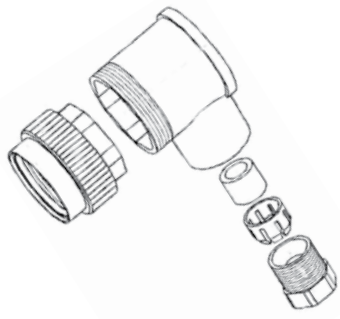
MALE 90°

PART NO.	DESCRIPTION	CABLE OUTLET	FITS CABLE SIZE
33890	3 Pole Male 90°	PG9	0.236" – 0.315"
33790	4 Pole Male 90°	PG9	0.236" – 0.315"
33690	5 Pole Male 90°	PG9	0.236" – 0.315"



FEMALE 90°

PART NO.	DESCRIPTION	CABLE OUTLET	FITS CABLE SIZE
33390	3 Pole Female 90°	PG9	0.236" – 0.315"
33490	4 Pole Female 90°	PG9	0.236" – 0.315"
33590	5 Pole Female 90°	PG9	0.236" – 0.315"



14 AWG Quick-Connect™ Cord Sets

• Meets IP68 & IP69K Requirements for Dust and Water • 600 Volt • RoHS Compliant

14 AWG Quick-Connect Cord Sets provide a fast and durable method for connecting and disconnecting electrical devices

CONSTRUCTION FEATURES & BENEFITS

CORD SETS MADE WITH ULTRA-GARD™ PORTABLE CORD
Provides the best defense against tearing, abrasion, oil, ozone and most chemicals. Flame and heat resistant. Extreme all-weather flexibility.

SILVER PLATED BRASS SLEEVES
Provides superior long life electrical contract. Corrosion resistant. Ensures snugness through repeated disconnects.

ONE PIECE MOLDED PLUG BODY
Reduces cable stress by allowing the entire assembly to flex.

SPECIAL CORK SEAL
Positive seal keeps out dust, moisture and oils.

DOUBLE KEY
Unique double key on the 4 pole configuration reduces the chance of improper installation.

TECHNICAL INFORMATION

CABLE is Super-Trex® Ultra-Gard™ oil, heat and impact resistant portable cord.

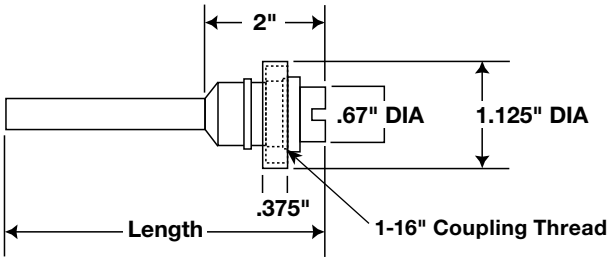
FEMALE PLUG BODY is Super-Trex® TSE™ compound, factory molded to the cord.

DOUBLE KEYED 4 pole assembly protects against accidental mis-wiring.

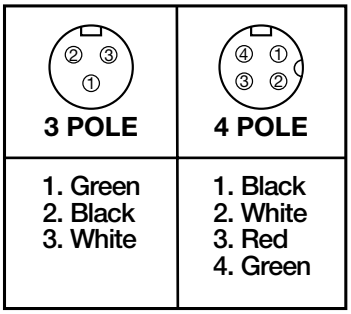
SLEEVES are machine crimped silver plated brass.

DIMENSIONAL & WIRING INFORMATION

FEMALE PLUG ASSEMBLY



FACE VIEW OF FEMALE PLUG ASSEMBLY



AMPACITY

3 Pole — 18 Amps

4 Pole — 15 Amps

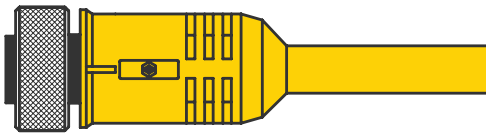
(continued from previous page)

14 AWG Quick-Connect™ Cord Sets

ORDERING INFORMATION *(Call for pricing & availability)*

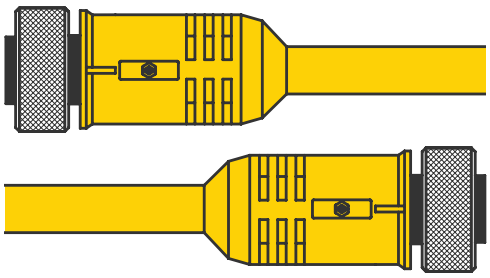
QUICK-CONNECT 14 AWG FEMALE PLUGS

PART NO.	DESCRIPTION	AMPS
83303	3' 3 Pole Female Plug	18
83306	6' 3 Pole Female Plug	18
83312	12' 3 Pole Female Plug	18
83320	20' 3 Pole Female Plug	18
83403	3' 4 Pole Female Plug	15
83406	6' 4 Pole Female Plug	15
83412	12' 4 Pole Female Plug	15
83420	20' 4 Pole Female Plug	15



14 AWG M/F EXTENSION SET

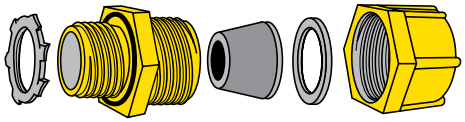
PART NO.	DESCRIPTION	AMPS
83336	6' 3 Pole M/F Ext Set	18
83321	12' 3 Pole M/F Ext Set	18
83322	20' 3 Pole M/F Ext Set	18
83426	6' 4 Pole M/F Ext Set	15
83421	12' 4 Pole M/F Ext Set	15
83422	20' 4 Pole M/F Ext Set	15



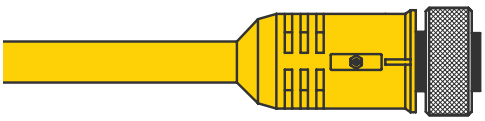
QUICK-CONNECT 14 AWG KIT CONTENTS

STRAIGHT MALE RECEPTACLE

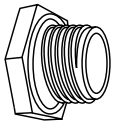
GRIP-SEAL™ STRAIN-RELIEF



FEMALE PLUG



FEMALE REDUCER 3/4" to 1/2"



PART NO. **11008**

3/4" LOCKNUT

PART NO. **11002**

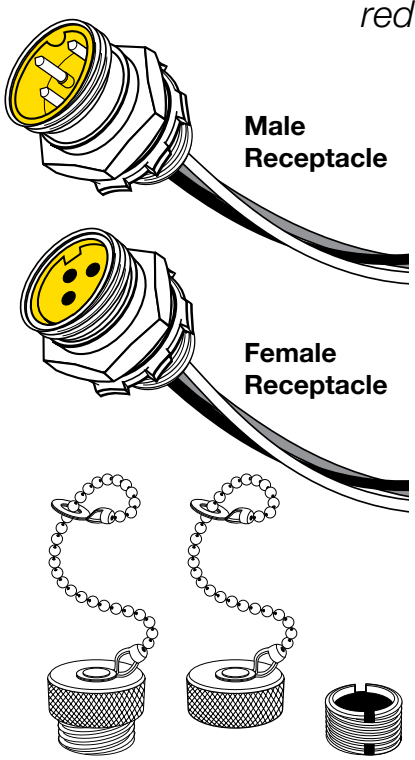
PART NO.	DESCRIPTION	AMPS
83005	3' 3 Pole 14 AWG Kit	18
83003	6' 3 Pole 14 AWG Kit	18
83001	12' 3 Pole 14 AWG Kit	18

PART NO.	DESCRIPTION	AMPS
83006	3' 4 Pole 14 AWG Kit	15
83004	6' 4 Pole 14 AWG Kit	15
83002	12' 4 Pole 14 AWG Kit	15

14 AWG Quick-Connect™ Receptacles

• Meets IP68 & IP69K Requirements for Dust and Water • 600 Volt • RoHS Compliant

A pre-wired Quick-Connect Receptacle can reduce downtime and labor costs



MULTIPLE CONFIGURATIONS
Available in male three or four pole straight.

SPECIALLY COMPOUNDED THERMOSET INSERT KEYED AND HERMETICALLY SEALED IN BODY
Soft, non-plastic face ensures cork seal. Provides an oil, water and dust tight seal.

ANODIZED ALUMINUM BODY WITH SEALING LOCKNUT
Durable, compact fittings. Resists corrosion. Easy to install.

HEAVY GAUGE SILVER PLATED BRASS PINS AND SLEEVES
Ensures superior electrical contact. Maintains contact through repeated disconnects.

14 AWG STRANDED, TINNED COPPER PIGTAILS INSULATED WITH 125°C CROSS-LINKED POLYETHYLENE
Provides excellent oil and heat resistance.

EXTENDED GROUND PIN
Ensures "first in — last out" contact.

ORDERING INFORMATION *(Call for pricing & availability)*

MALE RECEPTACLES *(12" PIGTAILS)*

PART NO.			
ALUMINUM	NYLON	DESCRIPTION	AMPS
83300	83300N2	Straight 3 Pole w/Locking Nut	18
83400	83400N2	Straight 4 Pole w/Locking Nut	15

FEMALE RECEPTACLES *(48" PIGTAILS)*

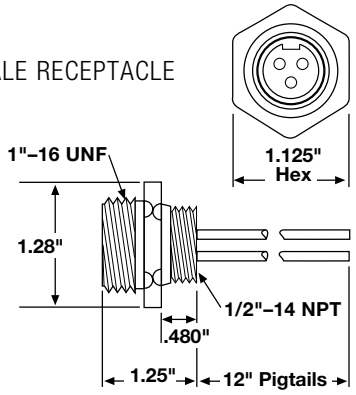
PART NO.			
ALUMINUM	NYLON	DESCRIPTION	AMPS
83301	83301N2	Straight 3 Pole w/Locking Nut	18
83401	83401N2	Straight 4 Pole w/Locking Nut	15

CLOSURE CAPS & ADAPTERS

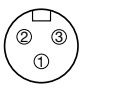
PART NO.	DESCRIPTION
84201A	Aluminum Closure Cap for Recept. 10, 12, 14 AWG
84202A	Aluminum Closure Cap for Plugs 10, 12, 14 AWG
84038A	Aluminum Adapter 10, 12, 14 AWG
84203N	Black Delrin Closure Cap for Recept. 10, 12, 14 AWG
84204N	Black Delrin Closure Cap for Plugs 10, 12, 14 AWG
84038N	Delrin Adapter

DIMENSIONAL & WIRING INFO

MALE RECEPTACLE



FACEVIEW OF FEMALE RECEPTACLE



3 POLE	4 POLE
1. Green 2. Black 3. White	1. Black 2. White 3. Red 4. Green

90° Molded Quick-Connect™ Cord Sets

• Meets IP69K Requirements • 600 Volt • RoHS Compliant • Heavy Duty Design

CONSTRUCTION FEATURES & BENEFITS

10, 12 & 14 AWG MOLDED 90° QUICK-CONNECT CORD SETS HOLD UP TO WASHDOWNS

IP69K rated, provides a fast and durable method for connecting and disconnecting electrical motors and electrical equipment.

CORD SETS MADE WITH SUPER-TREX® ULTRA-GARD™ PORTABLE CORD, RATED 90°C

Provides the best defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat resistant. Extreme all-weather flexibility.

HEAVY GAUGE BRASS SLEEVES AND CONTACT PINS

Provides superior long life electrical contact. Ensures electrical continuity through repeated disconnects.

RECEPTACLE HAS STRANDED, TINNED COPPER PIGTAILS INSULATED WITH 125°C CROSS LINKED POLYETHYLENE

Provides excellent oil and heat resistance.

PLUG BODY IS DESIGNED WITH SUPER-TREX® TSE COMPOUND

Provides super resistance to oil, ozone, and most chemicals. Flame and heat resistant. Extreme all-weather flexibility.

ORDERING INFORMATION *(Call for pricing & availability)*

90° FEMALE CORD SETS

AWG	PART NO.			DESCRIPTION
	3'	6'	12'	
10	**CX14D64F003N**	**CX14D64F006N**	**CX14D64F012N**	4 Pole
12	**CY13D65F003N**	**CY13D65F006N**	**CY13D65F012N**	3 Pole
12	**CY14D66F003N**	**CY14D66F006N**	**CY14D66F012N**	4 Pole
14	**CZ13D67F003N**	**CZ13D67F006N**	**CZ13D67F012N**	3 Pole
14	**CZ14D68F003N**	**CZ14D68F006N**	**CZ14D68F012N**	4 Pole

DELRAN RECEPTACLES — STRAIGHT MALE

AWG	PART NO.		DESCRIPTION
	1/2"	3/4"	
10	**84210N2**	**84210N4**	4 Pole, 25 AMPS
12	**84230N2**	**84230N4**	3 Pole, 25 AMPS
12	**84240N2**	**84240N4**	4 Pole, 20 AMPS
14	**83300N2**	**—**	3 Pole, 18 AMPS
14	**83400N2**	**—**	4 Pole, 15 AMPS

Build Your Own
90° Molded Quick-Connect™ Cord Sets

Type	Size	Ends	Poles	Head configuration	Cable	UOM	Length	Coupling
C	Y	1	4	D	66	F	006	N

Part No.

Coupling
N = Nylon

Cable Length
(3 characters) example:
5 = **"005"**
50 = **"050"**
500 = **"500"**

Unit of Measure
F = Feet
M = Meters
A = Inches

Head Configuration
D = Female 90°

# of Poles
3 or 4

Single Ended
1 = Single End

Size
X = 10 AWG
Y = 12 AWG
Z = 14 AWG

Type
C = Cordset

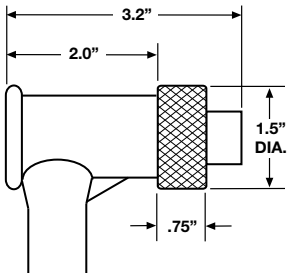
Cable Type – must be two digits

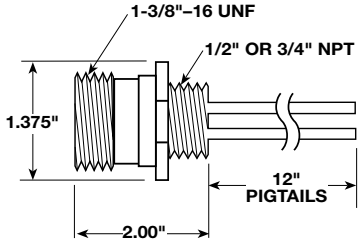
Super-Trex®	**66** = 12/4 - 87200
64 = 10/4 - 87201	**67** = 14/3 - 87194
65 = 12/3 - 87195	**68** = 14/4 - 87199

In the sample part number above, **CY14D66F006N** is a 90° molded Quick-Connect, single ended, 4 pole, female, using 12/4 Super-Trex cable (87200), 6 ft. long, with a nylon coupler.

DIMENSIONAL & WIRING INFORMATION

10 AWG & 12 AWG





FACEVIEW OF MALE RECEPTACLE

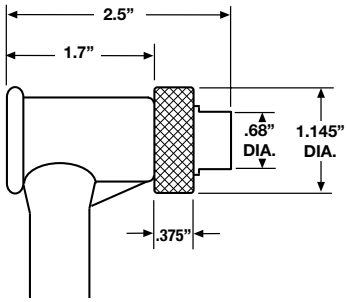
3 POLE

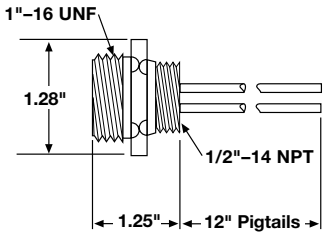
1. Black
2. White
3. Green

4 POLE

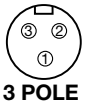
1. Black
2. Green
3. Red
4. White

14 AWG





FACEVIEW OF MALE RECEPTACLE



3 POLE

1. Green
2. Black
3. White

4 POLE

1. Black
2. White
3. Red
4. Green

10 & 12 AWG Quick-Connects™

- **Meets IP68 & IP69K Requirements for Dust and Water**
- **600 Volt**
- **20-25 Amp Rated**
- **RoHS Compliant**
- **Heavy Duty Design**

10 & 12 AWG Quick-Connect Cord Sets provide a fast and durable method for connecting and disconnecting electrical devices

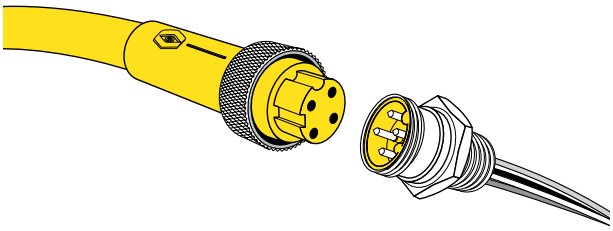
CONSTRUCTION FEATURES & BENEFITS

CORD SETS MADE WITH *SUPER-TREX*® ULTRA-GARD™ PORTABLE CORD, RATED 90ºC

Provides the best defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat resistant. Extreme all-weather flexibility.

MULTIPLE CONFIGURATIONS

Available in numerous lengths and configurations.



PLUG BODY IS DESIGNED WITH *SUPER-TREX* TSE COMPOUND

Provides superior resistance to oil, ozone and most chemicals. Flame and heat resistant. Extreme all-weather flexibility.

HEAVY GAUGE BRASS SLEEVES AND CONTACT PINS

Provides superior long life electrical contact. Ensures electrical continuity through repeated disconnects.

STRANDED, TINNED COPPER PIGTAILS INSULATED WITH 125ºC CROSS LINKED POLYETHYLENE

Provides excellent oil and heat resistance. Available in various lengths.

TECHNICAL INFORMATION

CABLE is ***SUPER-TREX*** Ultra-Gard oil, heat and impact resistant 10 or 12 AWG portable cord.

MALE & FEMALE PLUGS are ***SUPER-TREX*** TSE compound, factory molded to the cord.

AVAILABLE with an anodized aluminum or nylon coupler ring and receptacle body.

SPECIALLY KEYED assembly protects against accidental mis-wiring.

CONTACT PINS & SLEEVES are heavy-duty brass, machine crimped to provide positive electrical contact.

PIGTAILS are 10 or 12 AWG stranded, tinned copper insulated with 125ºC cross-linked polyethylene to provide excellent oil and heat resistance.

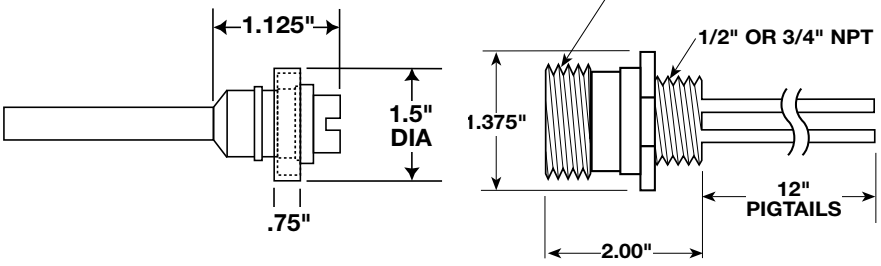
AN EXTENDED GROUND PIN ensures "first in — last out" contact providing an electrically safe connection.

THE RECEPTACLE BODY is a specially compounded thermoset elastomer, hermetically sealed in the shell with clear epoxy.

THE RECEPTACLE INSERT is keyed to ensure correct mating with the plug every time.

DIMENSIONAL & WIRING INFORMATION

FACE VIEW OF FEMALE PLUG ASSEMBLY



3 POLE	4 POLE
1. Black 2. White 3. Green	1. Black 2. Green 3. Red 4. White

(continued from previous page)

10 & 12 AWG Quick-Connects™

ORDERING INFORMATION *(Call for pricing & availability)*

10 AWG (1-3/8"-16 COUPLING THREAD)

PART NO.		DESCRIPTION	AMPS
ALUMINUM	NYLON		
84213A	84213N	3' 4 Pole Female Plug	25
84216A	84216N	6' 4 Pole Female Plug	25
84217A	84217N	12' 4 Pole Female Plug	25
84283A	84283N	3' 4 Pole Male Plug	25
84286A	84286N	6' 4 Pole Male Plug	25
84287A	84287N	12' 4 Pole Male Plug	25
84253A	84253N	3' 4 Pole Male/Female Extension Set	25
84256A	84256N	6' 4 Pole Male/Female Extension Set	25
84257A	84257N	12' 4 Pole Male/Female Extension Set	25

PART NO.				DESCRIPTION	AMPS
ALUMINUM 1/2"	ALUMINUM 3/4"	NYLON 1/2"	NYLON 3/4"		
84210A2	84210A4	84210N2	84210N4	Straight 4 Pole, Male Receptacle	25
84250A2	84250A4	84250N2	84250N4	Straight 4 Pole, Female Receptacle	25

12 AWG (1-3/8"-16 COUPLING THREAD)

PART NO.		DESCRIPTION	AMPS
ALUMINUM	NYLON		
84233A	84233N	3' 3 Pole Female Plug	25
84236A	84236N	6' 3 Pole Female Plug	25
84237A	84237N	12' 3 Pole Female Plug	25
84243A	84243N	3' 4 Pole Female Plug	20
84246A	84246N	6' 4 Pole Female Plug	20
84247A	84247N	12' 4 Pole Female Plug	20
84273A	84273N	3' 3 Pole Male Plug	25
84276A	84276N	6' 3 Pole Male Plug	25
84277A	84277N	12' 3 Pole Male Plug	25
84293A	84293N	3' 4 Pole Male Plug	20
84296A	84296N	6' 4 Pole Male Plug	20
84297A	84297N	12' 4 Pole Male Plug	20
84274A	84274N	3' 3 Pole Male/Female Extension Set	25
84275A	84275N	6' 3 Pole Male/Female Extension Set	25
84278A	84278N	12' 3 Pole Male/Female Extension Set	25
84279A	84279N	20' 3 Pole Male/Female Extension Set	25
84294A	84294N	3' 4 Pole Male/Female Extension Set	20
84295A	84295N	6' 4 Pole Male/Female Extension Set	20
84298A	84298N	12' 4 Pole Male/Female Extension Set	20
84299A	84299N	20' 4 Pole Male/Female Extension Set	20

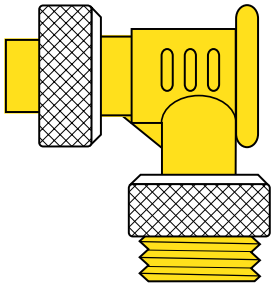
PART NO.				DESCRIPTION	AMPS
ALUMINUM 1/2"	ALUMINUM 3/4"	NYLON 1/2"	NYLON 3/4"		
84231A2	84231A4	84231N2	84231N4	Straight 3 Pole, Female Receptacle	25
84230A2	84230A4	84230N2	84230N4	Straight 3 Pole, Male Receptacle	25
84241A2	84241A4	84241N2	84241N4	Straight 4 Pole, Female Receptacle	20
84240A2	84240A4	84240N2	84240N4	Straight 4 Pole, Male Receptacle	20

NOTE: Male receptacles have 12" pigtails, female receptacles have 48" pigtails.

Quick-Connects™ Wiring System Accessories

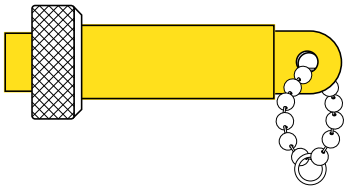
• RoHS Compliant

Unique products for special applications



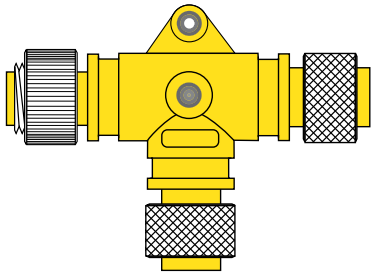
16 AWG 90º ADAPTER

Allows easy conversion from straight receptacle to a 90º connection. Oil resistant. All-molded construction. Available in 2, 3, 4, and 5 pole configurations.



MALE SHORTING PLUG

Internally wired shorting plug allows for die identification on stamping presses or circuit interlock. Oil and shock resistant. Male, all-molded, pre-wired construction. Available in 16, 14, and 12 AWG with various pin configurations. Chain included.

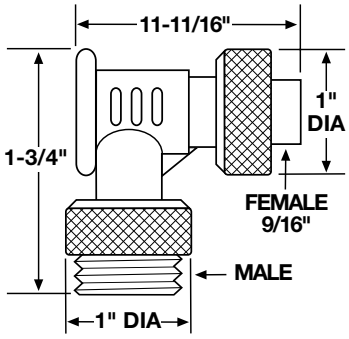


3/3/4 & 4/4/5 THREE-WAY RECEPTACLES

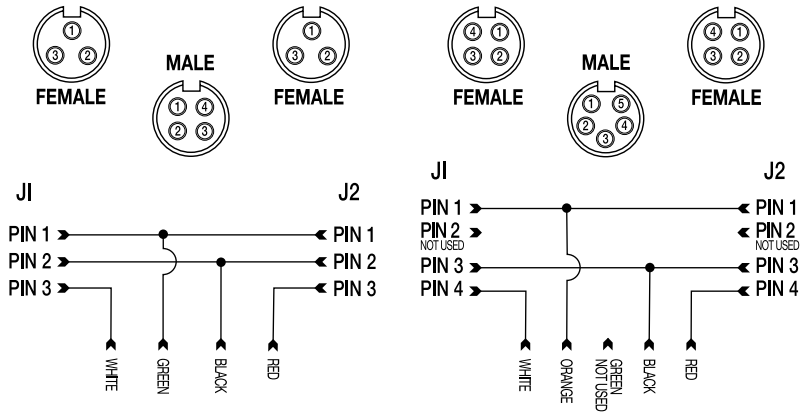
Allows for easy wiring consolidation. Oil and shock resistant. All molded construction. Connects with standard 16 AWG cord sets. Additional configurations available.

DIMENSIONAL & WIRING INFORMATION

2-5 POLE ADAPTER



THREE-WAY RECEPTACLES PART NO. 84023

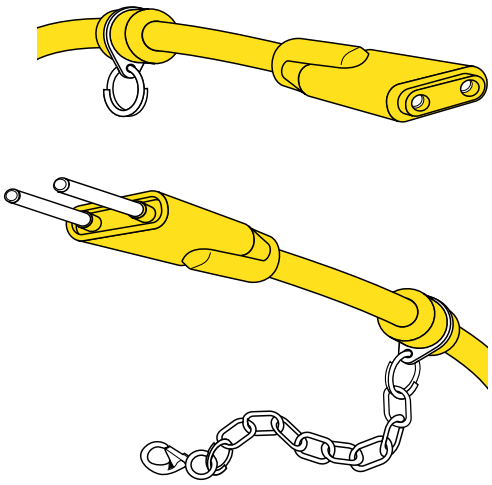


ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	DESCRIPTION	AMPACITY	AVAILABILITY
84011	2 Pole 90° Adapter	13	In stock
84013	3 Pole 90° Adapter	13	In stock
84014	4 Pole 90° Adapter	8	In stock
84015	5 Pole 90° Adapter	8	In stock
84023	3/3/4 Three-way Receptacle	10	In stock
84024	4/4/5 Three-way Receptacle	8	In stock
–	Shorting Plug	Engineered to order, call for availability	

Quick-Connects™ Power Assemblies

• 600 Volt • ICEA Type W Cable • RoHS Compliant



SUPER-TREX® TYPE W POWER CABLE
Superior first line defense against cutting, tearing, abrasion and impact. Extreme all-weather flexibility. Flame and heat resistant.

100% TRANSFER MOLDED TSE PLUG AND CONNECTOR BODY
"No pressure" process prevents induced stresses. Body integrity and complete bonding mean longer life.

RUBBER COLLAR MOLDED AT BASE OF MALE PINS
Forms a "Cork Seal" when plugged into a TPC matching unit. Provides dust and liquid protection and reduces carbon arcing.

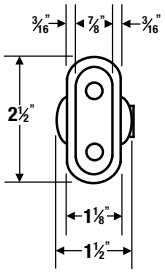
ROTATING SAFETY CHAIN COLLAR
Bearing action will not cut through cable when twisted or flexed.

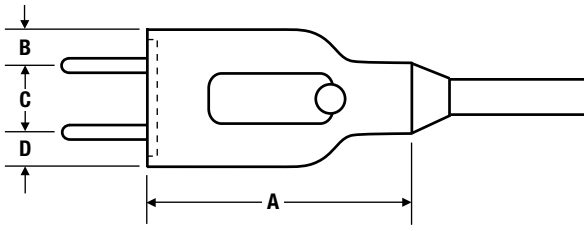
STANDARD PIN AND SLEEVE CONFIGURATION
Interchangeable with most standard connectors now in use.

BRASS PINS AND CONTACT SLEEVES
Ensures a positive electrical connection.

DIMENSIONAL INFORMATION

Chain Length is 12"





CONFIGURATION

DIMENSION	2/2 MALE	2/2 FEMALE	6/2 MALE	6/2 FEMALE
A	5-1/8"	5-3/8"	4-7/16"	4-7/8"
B	9/16"	3/16"	9/16"	3/16"
C	1-3/8"	2-1/8"	1-3/8"	2-1/8"
D	9/16"	3/16"	9/16"	3/16"

Quick-Connect Power Assemblies improve service life and quick change capability

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CABLE SIZE AWG/COND.	ASSEMBLY LENGTH (FT.)	PLUG CONFIGURATION	STANDARD PIN SIZE	AMPACITY	WT. (LBS.) PER UNIT	SAFETY CHAIN
85520	6/2	6'	Male/Female	5/16"	65	6	Yes
85521	6/2	6'	Female	5/16"	65	5	Yes
85526	6/2	85'	Female	5/16"	65	55	Yes
85527	6/2	100'	Female	5/16"	65	65	Yes
85540	6/2	6'	Male	5/16"	65	5	Yes
85530	2/2	6'	Male/Female	3/8"	100	10	Yes
85531	2/2	6'	Female	3/8"	100	8	Yes
85532	2/2	6'	Male	3/8"	100	8	Yes

Build Your Own Mini Cord Sets

Type	Style	Ends	Poles	Head configuration	Cable	UOM	Length	Coupling
C	L	2	4	E	05	F	017	

Part No.

Coupling: Blank=Regular
S= Stainless Steel
P= Plastic

Cable Length
(3 characters) example:
5 = **"005"**
50 = **"050"**
500 = **"500"**

Unit of Measure
F=Feet
M=Meters
A=Inches

Cable Type – must be two digits

Mini (Super-Trex®)
01 = 16/2 - 87191
02 = 16/3 - 87193
04 = 16/3 (auto color code) - 87193AU
05 = 16/4 - 87198
07 = 16/5 - 87202
08 = 16/5 (auto color code) - 87202AU
09 = 16/6 - 87206
11 = 16/7 - 87207
12 = 16/8 - 87208
13 = 16/9 - 88509
14 = 16/10 - 88510
15 = 16/12 - 88512

Other Cable Options
50 = 18/3 Super-Trex SOO Mini - 87192
51 = 18/4 Super-Trex SOO Mini - 87197
52 = 18/5 (auto color code) Super-Trex SOO
54 = 16/4 Cenelec

Head Configuration
A = Male Straight
B = Male 90˚
C = Female Straight
D = Female 90˚

E = Male Straight to Female Straight
F = Male Straight to Female 90˚
G = Male 90˚ to Female Straight
H = Male 90˚ to Female 90˚

J = Male Straight to Male Straight*
K = Male Straight to Male 90˚*
L = Male 90˚ to Male 90˚*
*Male to male configurations only available in Nanos

M = Female Straight to Female Straight
N = Female Straight to Female 90˚
P = Female 90˚ to Female 90˚

# of Poles
2 – 12

Single or Double Ended
1 = Single End (or receptacle)
2 = Double End

Style
L = Mini (2-6 pole) "A"size
M = Mini (6, 7, 8 pole) "B"size
N = Mini (9, 10, 12 pole) "C"size

Type
C = Cordset
R = Receptacle

In the sample part number above, **CL24E05F017** is a Mini Cordset, Double Ended, 4 Pole, male straight to female straight, using 16/4 Super-Trex cable (87198), and is 17 feet long.

18 AWG SJOO Micro Quick-Connects™

- SJOO 300 Volt
- 90°C Rated
- Dual Key Design
- Straight & 90° Configuration
- Meets IP68 Requirements for Dust and Water
- RoHS Compliant

100% Rubber Molded Design

PLUG SETS MADE WITH SUPER-TREX® TYPE SJOO ULTRA-GARD™ PORTABLE CORD, RATED 90ºC
Superior first-line defense against tearing, abrasion, impact, oil, ozone and most chemicals. Flame and heat resistant. Extreme all-weather flexibility.

EXTRA LONG PLUG BODY IS SPECIALLY COMPOUNDED,THERMOSET ELASTOMER
Provides long life, resists heat and oil deterioration.

SOLID BRASS CONTACT PINS ARE NICKEL COATED AND GOLD PLATED
Provides long life, resists corrosion, easy positive engagement. Ensures electrical integrity in both AC and DC applications.

HARD COATED MIL SPEC. ANODIZED ALUMINUM KNURLED COUPLING NUT
Resists corrosion. Provides quick and secure assembly.

UNIQUE RATCHETING NUT DESIGN
Resists loosening caused by vibration and constant movement applications. Insures a secure connection in the toughest environments.

COMPLETELY MOLDED DESIGN
Eliminates bonding agents between jacket and plug. Ensures a water, oil and dust tight seal that will not break down under repeated flexing.

FLUOROELASTOMER O-RING
Seals out oil, chemicals and other contaminants. Provides a positive seal on mated components.

ORDERING INFORMATION *(Call for pricing & availability)*

AC

PART NO.	SIZE	STRANDING	AMPACITY	NOMINAL O.D.	WT. (LBS.) PER 1000'
87003	18/3	41/34	10	0.315	65
87004	18/4	41/34	7	0.345	88
87005	18/5	41/34	5.6	0.380	101

DC

PART NO.	SIZE	STRANDING	AMPACITY	NOMINAL O.D.	WT. (LBS.) PER 1000'
87013	18/3	41/34	10	0.315	65
87014	18/4	41/34	7	0.345	88
87015	18/5	41/34	5.6	0.380	101

18 AWG AC SJOO Micro Quick-Connect™

• RoHS Compliant

APPLICATIONS

- Computer Interfaces
- Heat Pressure and Flow Meters
- Instrumentation
- I/O (input/output) Devices
- Programmable Controllers
- Programmable Limit Switches
- Proximity Switches
- Robotics
- Servo Motors
- Sensors and Relays
- Solenoid Valves
- Torque-Tool Monitoring Equipment
- X-Ray Monitors
- Variable Speed Motors

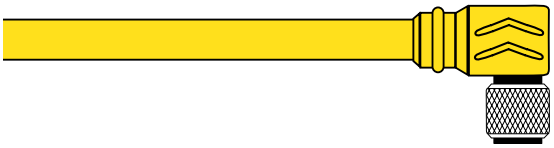
ORDERING INFORMATION *(Call for pricing & availability)*

AC

STRAIGHT FEMALE AC PLUG

PART NO.			FEET	METERS	DESCRIPTION
3 PIN	4 PIN	5 PIN			
CG13C28F003	CG14C29F003	CG15C30F003	3	0.91	Female Plug
CG13C28F006	CG14C29F006	CG15C30F006	6	1.83	Female Plug
CG13C28F012	CG14C29F012	CG15C30F012	12	3.66	Female Plug
CG13C28F020	CG14C29F020	CG15C30F020	20	6.10	Female Plug
CG13C28F030	CG14C29F030	CG15C30F030	30	9.15	Female Plug

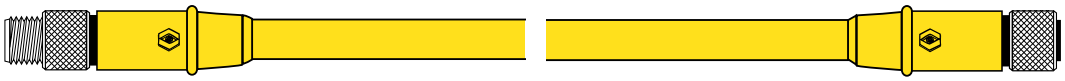
AC



90° FEMALE AC PLUG

PART NO.			FEET	METERS	DESCRIPTION
3 PIN	4 PIN	5 PIN			
CG13D28F003	CG14D29F003	CG15D30F003	3	0.91	90° Female Plug
CG13D28F006	CG14D29F006	CG15D30F006	6	1.83	90° Female Plug
CG13D28F012	CG14D29F012	CG15D30F012	12	3.66	90° Female Plug
CG13D28F020	CG14D29F020	CG15D30F020	20	6.10	90° Female Plug
CG13D28F030	CG14D29F030	CG15D30F030	30	9.15	90° Female Plug

AC



MALE/FEMALE AC EXTENSION CORD SET

PART NO.			FEET	METERS	DESCRIPTION
3 PIN	4 PIN	5 PIN			
CG23E28A018	CG24E29A018	CG25E30A018	1.5	0.45	M/F Ext. Set
CG23E28F003	CG24E29F003	CG25E30F003	3	0.91	M/F Ext. Set
CG23E28F006	CG24E29F006	CG25E30F006	6	1.83	M/F Ext. Set
CG23E28F009	CG24E29F009	CG25E30F009	6	2.74	M/F Ext. Set
CG23E28F012	CG24E29F012	CG25E30F012	12	3.66	M/F Ext. Set
CG23E28F015	CG24E29F015	CG25E30F015	15	4.75	M/F Ext. Set
CG23E28F020	CG24E29F020	CG25E30F020	20	6.10	M/F Ext. Set
CG23E28F030	CG24E29F030	CG25E30F030	30	9.15	M/F Ext. Set

(continued from previous page)

18 AWG AC SJOO Micro Quick-Connect™

ORDERING INFORMATION *(Call for pricing & availability)*

MALE/90° FEMALE AC EXTENSION CORD SET

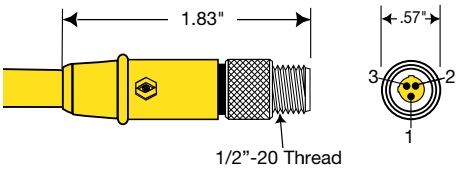
PART NO.			FEET	METERS	DESCRIPTION
3 PIN	4 PIN	5 PIN			
CG23F28A018	CG24F29A018	CG25F30A018	1.5	0.45	M/90° F AC
CG23F28F003	CG24F29F003	CG25F30F003	3	0.91	M/90° F AC
CG23F28F006	CG24F29F006	CG25F30F006	6	1.83	M/90° F AC
CG23F28F012	CG24F29F012	CG25F30F012	12	3.66	M/90° F AC
CG23F28F020	CG24F29F020	CG25F30F020	20	6.10	M/90° F AC
CG23F28F030	CG24F29F030	CG25F30F030	30	9.15	M/90° F AC

90° MALE/FEMALE AC EXTENSION CORD SET

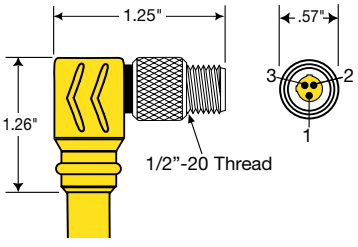
PART NO.			FEET	METERS	DESCRIPTION
3 PIN	4 PIN	5 PIN			
CG23G28F003	CG24G29F003	CG25G30F003	3	0.91	90° M/F AC
CG23G28F006	CG24G29F006	CG25G30F006	6	1.83	90° M/F AC
CG23G28F012	CG24G29F012	CG25G30F012	12	3.66	90° M/F AC
CG23G28F020	CG24G29F020	CG25G30F020	20	6.10	90° M/F AC
CG23G28F030	CG24G29F030	CG25G30F030	30	9.15	90° M/F AC

SPECIFICATIONS

STRAIGHT MALE AC PLUG



90° MALE AC PLUG



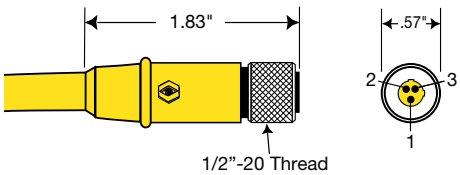
FACE VIEW OF FEMALE PLUGS

3 POLE
1. Green
2. Red/Black
3. Red/White

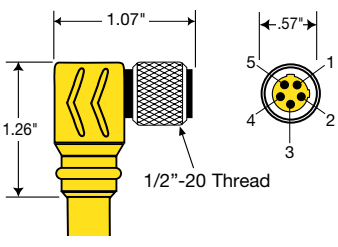
4 POLE
1. Red/Black
2. Red/White
3. Red
4. Green

5 POLE
1. Red/White
2. Red
3. Green
4. Red/Yellow
5. Red/Black

STRAIGHT FEMALE AC PLUG



90° FEMALE AC PLUG



18 AWG AC SJOO
Micro Quick-Connect™ Receptacles

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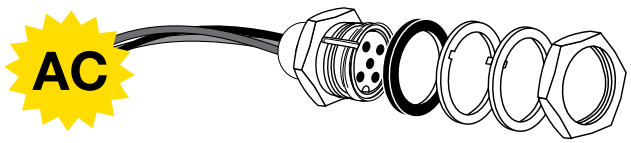
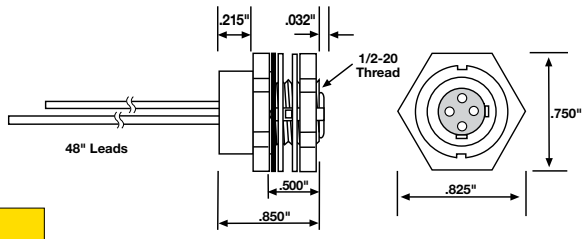
ORDERING INFORMATION *(Call for pricing & availability)*



FEMALE RECEPTACLE — BACK MOUNT

PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
67308	RG13Q28F004	3P Female Back Mount	48"
67408	RG14Q29F004	4P Female Back Mount	48"
67508	RG15Q30F004	5P Female Back Mount	48"

SPECIFICATIONS



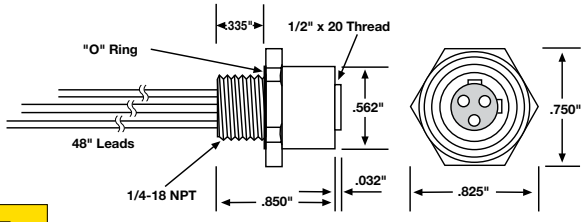
O-Ring & Locknut Included

ORDERING INFORMATION *(Call for pricing & availability)*

FEMALE RECEPTACLE — PANEL MOUNT

PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
67302	RG13T28F004	3P Female Panel Mount	48"
67402	RG14T29F004	4P Female Panel Mount	48"
67502	RG15T30F004	5P Female Panel Mount	48"

SPECIFICATIONS

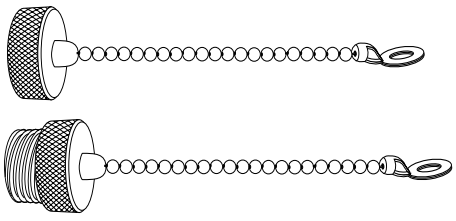


O-Ring & Locknut Included

ORDERING INFORMATION *(Call for pricing & availability)*

AC MICRO CLOSURE CAPS WITH CHAIN

PART NO.	DESCRIPTION
64901	Closure Cap w/6" Chain for Male Plug & Receptacles w/External Thread
64902	Closure Cap w/6" Chain for Female Plug & Receptacles w/Internal Thread



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18 AWG AC SJOO Micro Quick-Connect™ Receptacles

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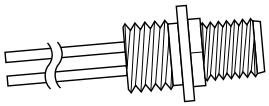
ORDERING INFORMATION *(Call for pricing & availability)*

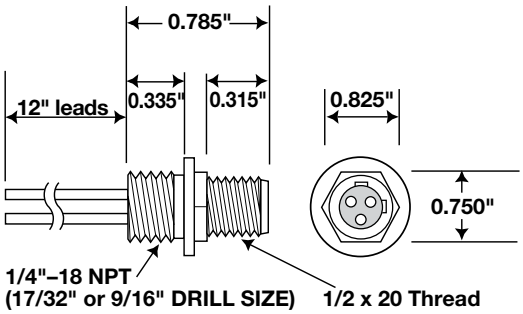
AC



MALE RECEPTACLE — PANEL MOUNT

PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
65302	RG13R28F001	3P Male Panel Mount	12"
65402	RG14R29F001	4P Male Panel Mount	12"
65502	RG15R30F001	5P Male Panel Mount	12"
—	RG13R28F004	3P Male Panel Mount	48"
—	RG14R29F004	4P Male Panel Mount	48"
—	RG15R30F004	5P Male Panel Mount	48"

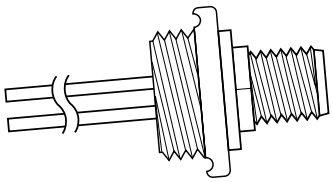
SPECIFICATIONS



O-Ring & Locknut Included

ORDERING INFORMATION *(Call for pricing & availability)*

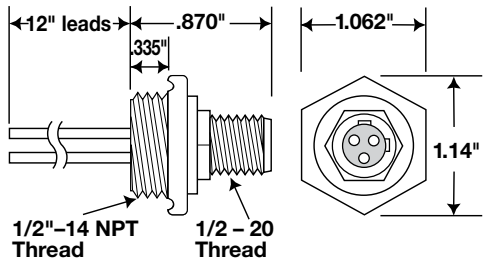
AC



MALE RECEPTACLE — SWITCH BODY MOUNT

PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
65307	RG13S28F001	3P Male Switch Body	12"
65407	RG14S29F001	4P Male Switch Body	12"
65507	RG15S30F001	5P Male Switch Body	12"
—	RG13S28F004	3P Male Switch Body	48"
—	RG14S29F004	4P Male Switch Body	48"
—	RG15S30F004	5P Male Switch Body	48"

SPECIFICATIONS



O-Ring & Locknut Included

FACE VIEW OF FEMALE PLUGS

3 POLE	4 POLE	5 POLE
1. Green 2. Red/Black 3. Red/White	1. Red/Black 2. Red/White 3. Red 4. Green	1. Red/White 2. Red 3. Green 4. Red/Yellow 5. Red/Black

18 AWG DC M12 SJOO Micro Quick-Connect™

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APPLICATIONS

- Bar Code Readers
- Computer Interfaces
- Digital Remote Controls
- Encoders and Resolvers
- Heat Pressure and Flow Meters
- Instrumentation
- I/O (input/output) Devices
- Load Cell Monitors
- Programmable Controllers
- Programmable Limit Switches
- Proximity Switches
- Robotics
- Servo Motors
- Sensors and Relays
- Solenoid Valves
- Tachometers
- Telecommunications
- Torque-Tool Monitoring Equipment
- X-Ray Monitors
- Variable Speed Motors

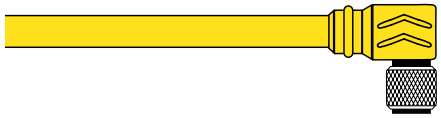
ORDERING INFORMATION *(Call for pricing & availability)*

DC

STRAIGHT FEMALE DC PLUG

PART NO.			FEET	METERS	DESCRIPTION
3 PIN	4 PIN	5 PIN			
CF13C24M001	CF14C25M001	CF15C26M001	3.27	1	Female Plug
CF13C24M002	CF14C25M002	CF15C26M002	6.56	2	Female Plug
CF13C24M004	CF14C25M004	CF15C26M004	13.08	4	Female Plug
CF13C24M006	CF14C25M006	CF15C26M006	19.67	6	Female Plug
CF13C24M010	CF14C25M010	CF15C26M010	31.80	10	Female Plug

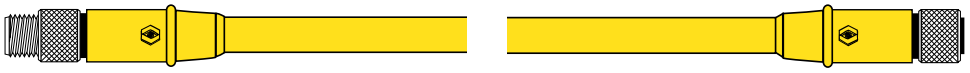
DC



90° FEMALE DC PLUG

PART NO.			FEET	METERS	DESCRIPTION
3 PIN	4 PIN	5 PIN			
CF13D24M001	CF14D25M001	CF15D26M001	3.27	1	90° Female Plug
CF13D24M002	CF14D25M002	CF15D26M002	6.56	2	90° Female Plug
CF13D24M004	CF14D25M004	CF15D26M004	13.08	4	90° Female Plug
CF13D24M006	CF14D25M006	CF15D26M006	19.67	6	90° Female Plug
CF13D24M010	CF14D25M010	CF15D26M010	31.80	10	90° Female Plug

DC



MALE/FEMALE AC EXTENSION CORD SET

PART NO.			FEET	METERS	DESCRIPTION
3 PIN	4 PIN	5 PIN			
CF23E24A020	CF24E25A020	CF25E26A020	1.63	.5	M/F Ext. Set
CF23E24M001	CF24E25M001	CF25E26M001	3.27	1	M/F Ext. Set
CF23E24M002	CF24E25M002	CF25E26M002	6.56	2	M/F Ext. Set
CF23E24M003	CF24E25M003	CF25E26M003	9.84	3	M/F Ext. Set
CF23E24M004	CF24E25M004	CF25E26M004	13.08	4	M/F Ext. Set
CF23E24M005	CF24E25M005	CF25E26M005	16.00	5	M/F Ext. Set
CF23E24M006	CF24E25M006	CF25E26M006	19.67	6	M/F Ext. Set
CF23E24M010	CF24E25M010	CF25E26M010	31.80	10	M/F Ext. Set

(continued from previous page)

18 AWG DC M12 SJOO Micro Quick-Connect™

ORDERING INFORMATION *(Call for pricing & availability)*

MALE/90° FEMALE DC EXTENSION CORD SET

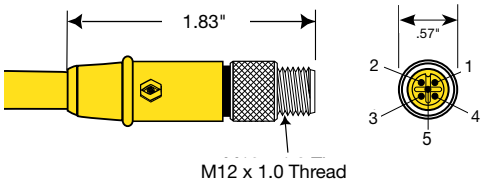
PART NO.			FEET	METERS	DESCRIPTION
3 PIN	4 PIN	5 PIN			
CF23F24A020	CF24F25A020	CF25F26A020	1.63	0.5	M/90° F DC
CF23F24M001	CF24F25M001	CF25F26M001	3.27	1	M/90° F DC
CF23F24M002	CF24F25M002	CF25F26M002	6.56	2	M/90° F DC
CF23F24M003	CF24F25M003	CF25F26M003	9.84	3	M/90° F DC
CF23F24M004	CF24F25M004	CF25F26M004	13.08	4	M/90° F DC
CF23F24M005	CF24F25M005	CF25F26M005	16.00	5	M/90° F DC
CF23F24M006	CF24F25M006	CF25F26M006	19.67	6	M/90° F DC
CF23F24M010	CF24F25M010	CF25F26M010	31.80	10	M/90° F DC

90° MALE/FEMALE DC EXTENSION CORD SET

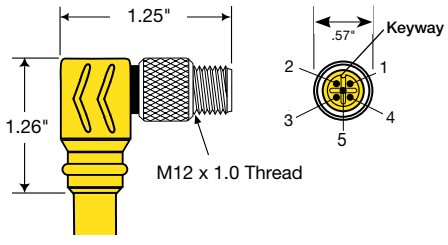
PART NO.			FEET	METERS	DESCRIPTION
3 PIN	4 PIN	5 PIN			
CF23G24M001	CF24G25M001	CF25G26M001	3.27	1	90° M/F DC
CF23G24M002	CF24G25M002	CF25G26M002	6.56	2	90° M/F DC
CF23G24M004	CF24G25M004	CF25G26M004	13.08	4	90° M/F DC
CF23G24M006	CF24G25M006	CF25G26M006	19.67	6	90° M/F DC
CF23G24M010	CF24G25M010	CF25G26M010	31.80	10	90° M/F DC

SPECIFICATIONS

STRAIGHT MALE DC PLUG



90° MALE DC PLUG



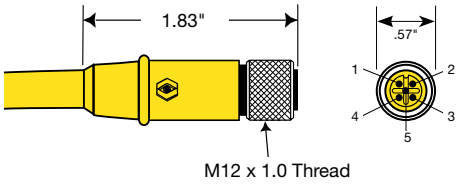
FACE VIEW OF FEMALE PLUGS

3 POLE
1. Brown
2. Not Used
3. Blue
4. Black
5. Not Used

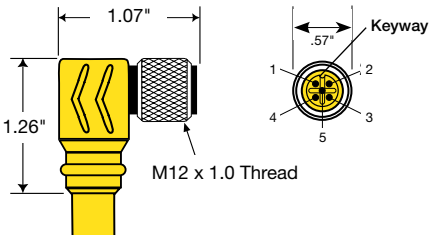
4 POLE
1. Brown
2. White
3. Blue
4. Black
5. Not Used

5 POLE
1. Brown
2. White
3. Blue
4. Black
5. Gray

STRAIGHT FEMALE DC PLUG



90° FEMALE DC PLUG



18 AWG DC M12 SJOO Micro Quick-Connect™ Receptacles

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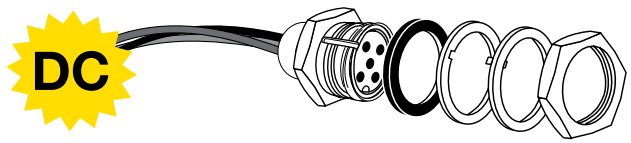
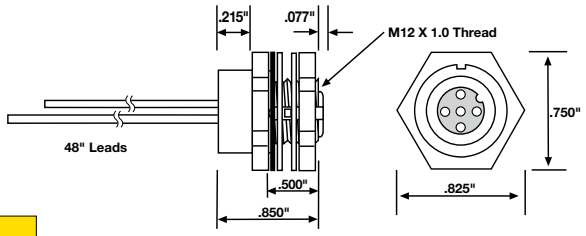


FEMALE RECEPTACLE — BACK MOUNT

PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
63308	RF13Q24F004	3P Female Back Mount	48"
63408	RF14Q25F004	4P Female Back Mount	48"
63508	RF15Q26F004	5P Female Back Mount	48"

SPECIFICATIONS



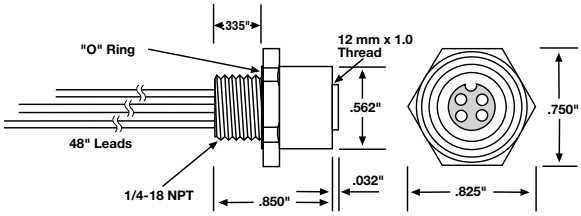
O-Ring & Locknut Included

ORDERING INFORMATION *(Call for pricing & availability)*

FEMALE RECEPTACLE — PANEL MOUNT

PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
63302	RF13T24F004	3P Female Panel Mount	48"
63402	RF14T25F004	4P Female Panel Mount	48"
63502	RF15T26F004	5P Female Panel Mount	48"

SPECIFICATIONS

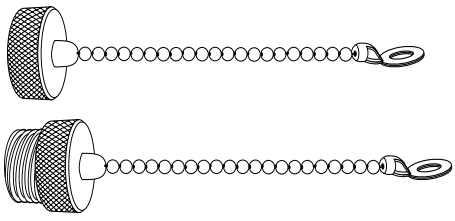


O-Ring & Locknut Included

ORDERING INFORMATION *(Call for pricing & availability)*

DC MICRO CLOSURE CAPS WITH CHAIN

PART NO.	DESCRIPTION
64801	Closure Cap w/6" Chain for Male Plug & Receptacles w/External Thread
64802	Closure Cap w/6" Chain for Female Plug & Receptacles w/Internal Thread



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18 AWG DC M12 SJOO Micro Quick-Connect™ Receptacles

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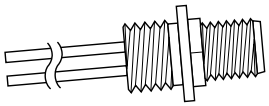
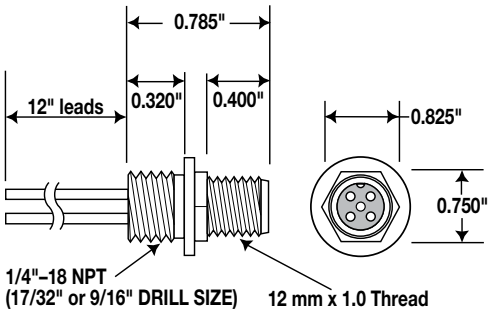
DC



MALE RECEPTACLE — PANEL MOUNT

PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
64302	RF13R24F001	3P Male Panel Mount	12"
64402	RF14R25F001	4P Male Panel Mount	12"
64502	RF15R26F001	5P Male Panel Mount	12"
—	RF13R24F004	3P Male Panel Mount	48"
—	RF14R25F004	4P Male Panel Mount	48"
—	RF15R26F004	5P Male Panel Mount	48"

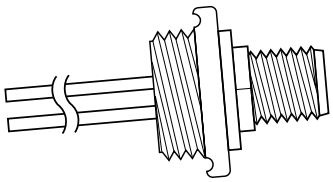
SPECIFICATIONS



O-Ring & Locknut Included

ORDERING INFORMATION *(Call for pricing & availability)*

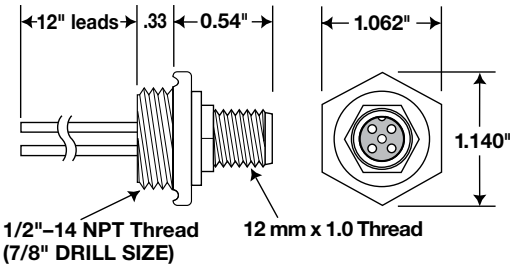
DC



MALE RECEPTACLE — SWITCH BODY MOUNT

PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
64307	RF13S24F001	3P Male Switch Body	12"
64407	RF14S25F001	4P Male Switch Body	12"
64507	RF15S26F001	5P Male Switch Body	12"
—	RF13S24F004	3P Male Switch Body	48"
—	RF14S25F004	4P Male Switch Body	48"
—	RF15S26F004	5P Male Switch Body	48"

SPECIFICATIONS



O-Ring & Locknut Included

FACE VIEW OF FEMALE PLUGS

3 POLE	4 POLE	5 POLE
1. Brown **2.** Not Used **3.** Blue **4.** Black **5.** Not Used	**1.** Brown **2.** White **3.** Blue **4.** Black **5.** Not Used	**1.** Brown **2.** White **3.** Blue **4.** Black **5.** Gray

Build Your Own SJOO Micro Cord Sets

Type	Style	Ends	Poles	Head configuration	Cable	UOM	Length	Coupling	
C	F	2	5	E	25	F	020		Part No.

Coupling: Blank=Regular
S = Stainless Steel
P = Plastic

Cable Length
(3 characters) example:
5 = **"005"**
50 = **"050"**
500 = **"500"**

Unit of Measure
F = Feet
M = Meters
A = Inches

Cable Type – must be two digits
Micro (Super-Trex)
24 = 18/3 (DC) - 87013
25 = 18/4 (DC) - 87014
26 = 18/5 (DC) - 87015
27 = 18/2 (AC) - 87002
28 = 18/3 (AC) - 87003
29 = 18/4 (AC) - 87004
30 = 18/5 (AC) - 87005

Head Configuration
A = Male Straight
B = Male 90˚
C = Female Straight
D = Female 90˚

E = Male Straight to Female Straight
F = Male Straight to Female 90˚
G = Male 90˚ to Female Straight
H = Male 90˚ to Female 90˚

J = Male Straight to Male Straight*
K = Male Straight to Male 90˚*
L = Male 90˚ to Male 90˚*
*Male to male configurations only available in Nanos

M = Female Straight to Female Straight
N = Female Straight to Female 90˚
P = Female 90˚ to Female 90˚

Micro Receptacles - Micros Only
Q = Female Back Mount
R = Male Panel Mount
S = Male Switch Mount
T = Female Panel Mount

# of Poles
2 – 5

Single or Double Ended
1 = Single End (or receptacle)
2 = Double End

Style
F = DC Micro
G = AC Micro

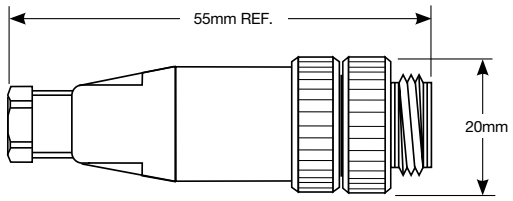
Type
C = Cordset
R = Receptacle

In the sample part number above, **CF25E25F020** is a DC micro, double ended cordset, 5 poles, male straight to female straight with 18/4 SJOO cable (87014), 20 feet long.

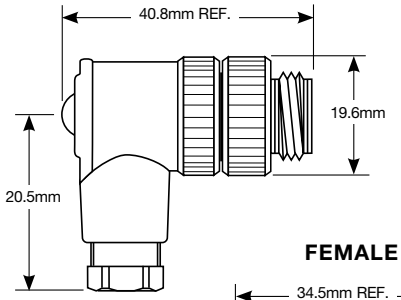
Field Installable AC and DC Micro Connectors

• IP67 Rated • RoHS Compliant • DC Single Key — 4 - 5 Pole • AC Dual Key — 3 Pole

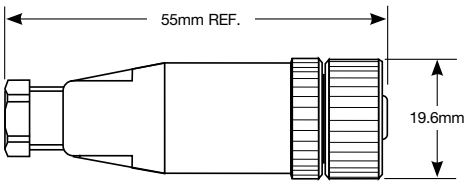
MALE STRAIGHT



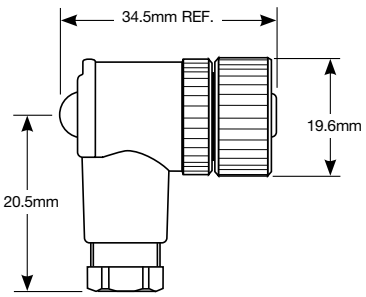
MALE 90º



FEMALE STRAIGHT



FEMALE 90º



COUPLING THREAD – AC 1/2" UNF – DC M12 X 1

FEATURES & BENEFITS

SELECTION
AC and DC, straight and 90º connectors, both male and female.

SEALING GROMMET
Provides a liquid tight seal to protect the connection from contamination.

CABLE SELECTION
Designed to fit a wide range of cord sizes from 0.158" – 0.315".

SCREW LOCK SYSTEM
Provides secure connection using only a screw driver.

FIELD INSTALLABLE DESIGN
Easy to install for quick on-site repairs.

CURRENT RATING
3 amps DC. 4 amps AC.

NYLON BODY AND INSERT
Impact and crush resistant.

ORDERING INFORMATION *(Call for pricing & availability)*

DC — FIELD INSTALLABLE MICROS

PART NO.	DESCRIPTION	CORD O.D. RANGE
30700	4 Pole Male Straight DC	0.158" – 0.236"
30600	5 Pole Male Straight DC	0.236" – 0.315"
30400	4 Pole Female Straight DC	0.158" – 0.236"
30500	5 Pole Female Straight DC	0.236" – 0.315"
39700	4 Pole Male 90º DC	0.158" – 0.236"
39600	5 Pole Male 90º DC	0.236" – 0.315"
39400	4 Pole Female 90º DC	0.158" – 0.236"
39500	5 Pole Female 90º DC	0.236" – 0.315"

AC — FIELD INSTALLABLE MICROS

PART NO.	DESCRIPTION	CORD O.D. RANGE
30801	3 Pole Male Straight AC	0.158" – 0.236"
30301	3 Pole Female Straight AC	0.158" – 0.236"
39801	3 Pole Male 90º AC	0.158" – 0.236"
39301	3 Pole Female 90º AC	0.158" – 0.236"

SJOO "Y" Splitter

- 300 Volt Rated
- 4 Amps
- Meets IP68 Requirements for Dust and Water
- RoHS Compliant

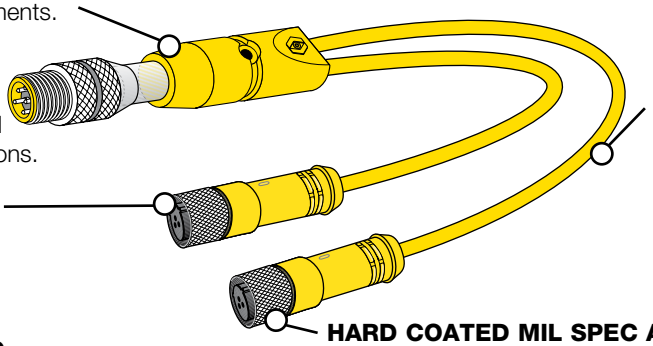
UNIQUE RATCHETING NUT DESIGN
Resists loosening caused by vibration and constant movement applications. Insures a secure connection in the toughest environments.

SOLID BRASS CONTACT PINS
Nickel coated and gold plated. Resists corrosion, ensures electrical integrity in DC low voltage applications.

FLUOROELASTOMER O-RING
Seals out oil, chemicals and other contaminants. Provides a positive seal on mated components.

COMPACT DESIGN COMBINED WITH MICRO TECHNOLOGY
Helps to reduce wiring and termination points, simplifying installation and maintenance.

DESIGN FLEXIBILITY
Designed for both Micro and Mini applications. Wiring and lead lengths can be made to fit the application. Contact our Engineered Products Department for additional information.



***SUPER-TREX®* SJOO HEAVY DUTY CABLE**
Superior performance in abrasion, cutting, oil and chemicals.

HARD COATED MIL SPEC ANODIZED ALUMINUM KNURLED COUPLING NUT
Resists corrosion. Provides quick and secure assembly.

UNIQUE MOUNTING FEATURES
Designed to mount securely with either a wire tie or thru bolt for ease of installation.

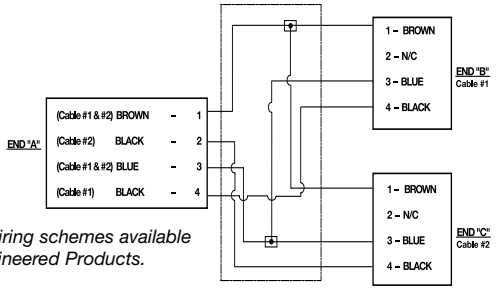
ROLE OF PRODUCT

This product is designed for industrial applications where there may be periodic exposure to oils, coolants, water, chemicals and grease. Applications for this product include use with proximity switches, optical sensors, cylinders and other dual input applications.

CONSTRUCTION SPECIFICATIONS

The SUPER-TREX® "Y" Splitter design is constructed using TPC Micro Quick-Connect technology coupled with a one piece focal point. The focal point unit is constructed of an oil, abrasion, impact and chemical resistant urethane compound designed to protect the unit from hostile industrial environments. Each conductor lead is molded into the focal point. Each focal point is designed with mounting points for either wire tie or thru bolt installation. Each unit is 100% factory tested to insure out-of-the-box performance. AC and DC variations available upon request.

AVAILABLE WIRING SCHEMATICS



Additional wiring schemes available through Engineered Products.

ORDERING INFORMATION *(Call for pricing & availability)*

DC				
PART NO.	**IN-PUT CORD LENGTH**	**SINGLE-END CONFIGURATION**	**DOUBLE END SIDE #1**	**DOUBLE END SIDE #2**
81401	0.5'	4 Pole Male	3 Pole Female	3 Pole Female
81402	1.0'	4 Pole Male	3 Pole Female	3 Pole Female
81404	2.0'	4 Pole Male	3 Pole Female	3 Pole Female
81411	0.5'	4 Pole Female	3 Pole Male	3 Pole Male
81412	1.0'	4 Pole Female	3 Pole Male	3 Pole Male
81414	2.0'	4 Pole Female	3 Pole Male	3 Pole Male

18 AWG AC Micro Dual Key Quick-Connects™

- 300 Volt
- 4 Amps
- Dual Key Design
- RoHS Compliant
- Meets IP68 Requirements for Dust and Water

CORD SETS MADE WITH *TREX-ONICS*® CONTROL CABLE

Designed for high cycle, constant motion applications. Provides excellent defense against impact, cutting, abrasion, oil and chemicals.

EXTENDED NUT DESIGN

Protects the insert, pins and sleeves from impact and abuse. Easy to grip.

SPECIALLY COMPOUNDED POLYURETHANE INSERT

Compatible with all industry standards for both AC and DC applications. Provides a superior seal against fluid and dust penetration.

SOLID BRASS CONTACT PINS ARE NICKEL COATED AND GOLD PLATED

Resists corrosion. Ensures electrical integrity in both AC and DC low voltage applications.

UNIQUE STAINLESS STEEL SLEEVED FEMALE PIN DESIGN

Prevents pin deformation resulting in loss of signal and electrical continuity. Superior performance in high vibration and continuous motion applications. Probe proof.

ALL POLYURETHANE DESIGN, HEAD AND CORD

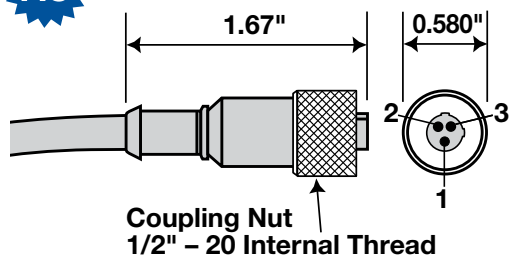
Ensures a 100% bond between head and cord. Eliminates glues and bonding materials that break down and leak over time, resulting in loss of signal and continuity.

APPLICATIONS

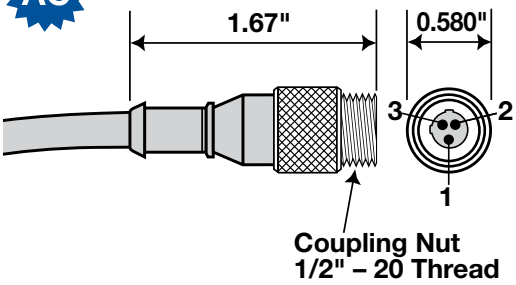
- Bar Code Readers
- Computer Interfaces
- Digital Remote Controls
- Encoders or Resolvers
- Heat Pressure and Flow Meters
- Instrumentation
- I/O (input/output) Devices
- Load Cell Monitors
- Programmable Controllers
- Programmable Limit Switches
- Proximity Switches
- Robotics
- Servo Motors
- Sensors and Relays
- Solenoid Valves
- Tachometers
- Telecommunications
- Torque-Tool Monitoring Equipment
- X-Ray Monitors
- Variable Speed Motors

SPECIFICATIONS

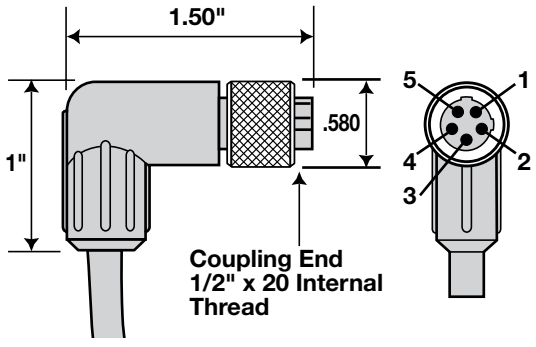
FEMALE AC PLUG



MALE AC PLUG



90° FEMALE AC PLUG



FACE VIEW OF FEMALE PLUGS

3 POLE	4 POLE	5 POLE
1. Green 2. Red/Black 3. Red/White	1. Red/Black 2. Red/White 3. Red 4. Green	1. Red/White 2. Red 3. Green 4. Red/Yellow 5. Red/Black

18 AWG AC Micro Dual Key Quick-Connects™

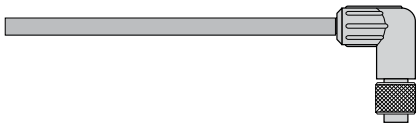
ORDERING INFORMATION *(Call for pricing & availability)*

AC

STRAIGHT FEMALE AC PLUG

PART NO.			FEET	METERS	DESCRIPTION
3 POLE	4 POLE	5 POLE			
65303	**65403**	**65503**	3	0.91	Female Plug
65306	**65406**	**65506**	6	1.83	Female Plug
65312	**65412**	**65512**	12	3.66	Female Plug
65320	**65420**	**65520**	20	6.10	Female Plug

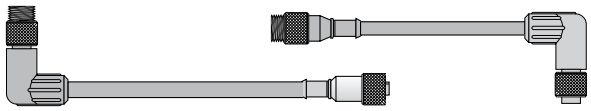
AC



90° FEMALE AC PLUG

PART NO.			FEET	METERS	DESCRIPTION
3 POLE	4 POLE	5 POLE			
69393	**69493**	**69593**	3	0.91	90° Female Plug
69396	**69496**	**69596**	6	1.83	90° Female Plug
69392	**69492**	**69592**	12	3.66	90° Female Plug
69390	**69490**	**69590**	20	6.10	90° Female Plug

AC



MALE/FEMALE AC EXTENSION CORD SET

PART NO.			FEET	METERS	DESCRIPTION
3 PIN	4 PIN	5 PIN			
67323	**67423**	**67523**	3	0.91	M/F Ext. Set
67326	**67426**	**67526**	6	1.83	M/F Ext. Set
67327	**67427**	**67527**	9	2.70	M/F Ext. Set
67332	**67432**	**67532**	12	3.66	M/F Ext. Set
67333	**67433**	**67533**	15	4.60	M/F Ext. Set
—	**67434**	**—**	18	5.50	M/F Ext. Set
67340	**67440**	**67540**	20	6.10	M/F Ext. Set

PART NO. 3 POLE	METERS	FEET	DESCRIPTION
67923	0.91	3	Male 90°/Female Str. Ext. Set
67926	1.83	6	Male 90°/Female Str. Ext. Set
67932	2.70	9	Male 90°/Female Str. Ext. Set

PART NO. 3 POLE	METERS	FEET	DESCRIPTION
69923	0.91	3	Str. Male/90° Female Ext. Set
69926	1.83	6	Str. Male/90° Female Ext. Set
67927	2.70	9	Str. Male/90° Female Ext. Set
69933	4.60	15	Str. Male/90° Female Ext. Set
69940	6.10	20	Str. Male/90° Female Ext. Set

UNSHIELDED MICRO QUICK-CONNECT CABLE

AC PART NO.	SIZE	STRANDING	NOMINAL O.D.	WT. (LBS.) PER 1000'
62013	18/3	41/34	0.220	35.1
62014	18/4	41/34	0.240	41.5
62015	18/5	41/34	0.255	50.3

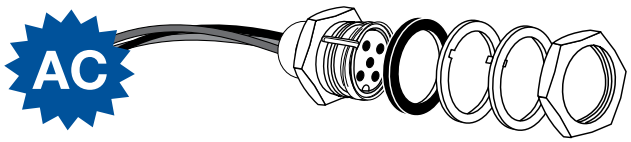
18 AWG AC Micro Dual Key Quick-Connect™ Receptacles

• RoHS Compliant

APPLICATIONS

- Bar Code Readers
- Computer Interfaces
- Digital Remote Controls
- Encoders or Resolvers
- Heat Pressure and Flow Meters
- Instrumentation
- I/O (input/output) Devices
- Load Cell Monitors
- Programmable Controllers
- Programmable Limit Switches
- Proximity Switches
- Robotics
- Servo Motors
- Sensors and Relays
- Solenoid Valves
- Tachometers
- Telecommunications
- Torque-Tool Monitoring Equipment
- X-Ray Monitors
- Variable Speed Motors

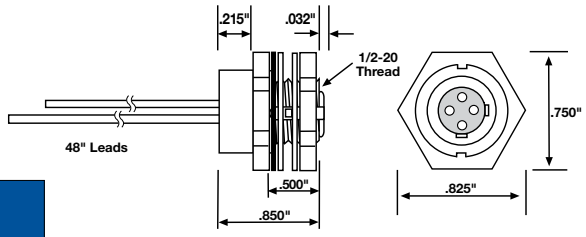
ORDERING INFORMATION *(Call for pricing & availability)*



FEMALE RECEPTACLE — BACK MOUNT

PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
67308	RG13Q28F004	3P Female Back Mount	48"
67408	RG14Q29F004	4P Female Back Mount	48"
67508	RG15Q30F004	5P Female Back Mount	48"

SPECIFICATIONS



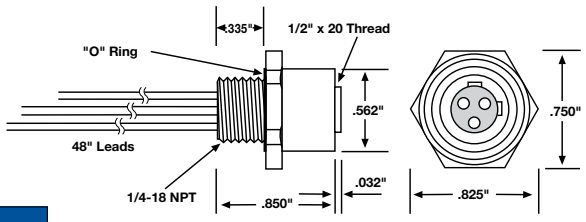
O-Ring & Locknut Included

ORDERING INFORMATION *(Call for pricing & availability)*

FEMALE RECEPTACLE — PANEL MOUNT

PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
67302	RG13T28F004	3P Female Panel Mount	48"
67402	RG14T29F004	4P Female Panel Mount	48"
67502	RG15T30F004	5P Female Panel Mount	48"

SPECIFICATIONS

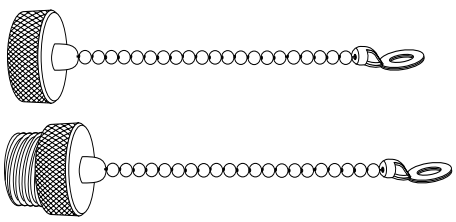


O-Ring & Locknut Included

ORDERING INFORMATION *(Call for pricing & availability)*

AC MICRO CLOSURE CAPS WITH CHAIN

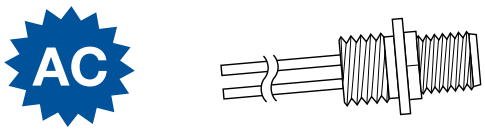
PART NO.	DESCRIPTION
64901	Closure Cap w/6" Chain for Male Plug & Receptacles w/External Thread
64902	Closure Cap w/6" Chain for Female Plug & Receptacles w/Internal Thread



18 AWG AC Micro Dual Key Quick-Connect™ Receptacles

• RoHS Compliant

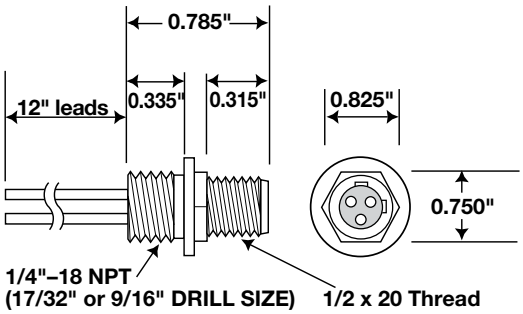
ORDERING INFORMATION *(Call for pricing & availability)*



MALE RECEPTACLE — PANEL MOUNT

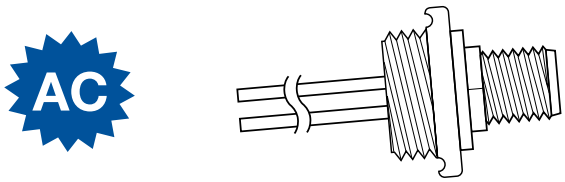
PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
65302	RG13R28F001	3P Male Panel Mount	12"
65402	RG14R29F001	4P Male Panel Mount	12"
65502	RG15R30F001	5P Male Panel Mount	12"
—	RG13R28F004	3P Male Panel Mount	48"
—	RG14R29F004	4P Male Panel Mount	48"
—	RG15R30F004	5P Male Panel Mount	48"

SPECIFICATIONS



O-Ring & Locknut Included

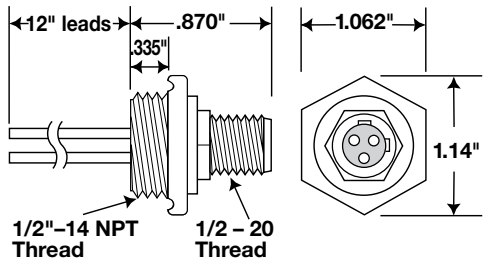
ORDERING INFORMATION *(Call for pricing & availability)*



MALE RECEPTACLE — SWITCH BODY MOUNT

PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
65307	RG13S28F001	3P Male Switch Body	12"
65407	RG14S29F001	4P Male Switch Body	12"
65507	RG15S30F001	5P Male Switch Body	12"
—	RG13S28F004	3P Male Switch Body	48"
—	RG14S29F004	4P Male Switch Body	48"
—	RG15S30F004	5P Male Switch Body	48"

SPECIFICATIONS



O-Ring & Locknut Included

FACE VIEW OF FEMALE PLUGS

3 POLE	4 POLE	5 POLE
1. Green 2. Red/Black 3. Red/White	1. Red/Black 2. Red/White 3. Red 4. Green	1. Red/White 2. Red 3. Green 4. Red/Yellow 5. Red/Black

DC Micro M12 Single Key Quick-Connects™

- 300 Volt Rated
- 4 Amps
- Single Key Design
- RoHS Compliant
- Meets IP68 & IP69K Requirements for Dust and Water

CORD SETS MADE WITH *TREX-ONICS*® CONTROL CABLE

Designed for high cycle, constant motion applications. Provides excellent defense against impact, cutting, abrasion, oil and chemicals.

SPECIALLY COMPOUNDED POLYURETHANE INSERT

Compatible with all industry standards for both AC and DC applications. Provides a superior seal against fluid and dust penetration.

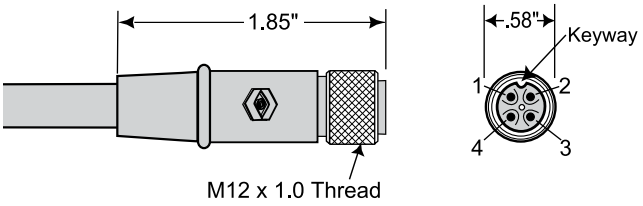
ALL POLYURETHANE DESIGN, HEAD AND CORD

Ensures a 100% bond between head and cord. Eliminates glues and bonding materials that break down and leak over time, resulting in loss of signal and continuity.

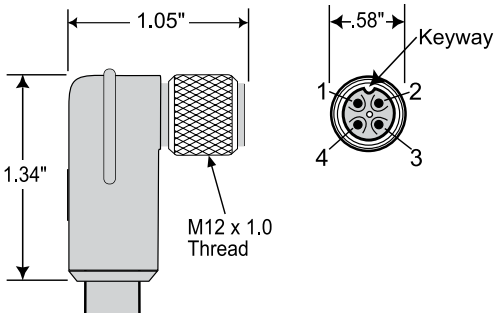
APPLICATIONS

- Bar Code Readers
- Computer Interfaces
- Digital Remote Controls
- Encoders or Resolvers
- Heat Pressure and Flow Meters
- Instrumentation
- I/O (input/output) Devices
- Load Cell Monitors
- Programmable Controllers
- Programmable Limit Switches
- Proximity Switches
- Robotics
- Servo Motors
- Sensors and Relays
- Solenoid Valves
- Tachometers
- Telecommunications
- Torque-Tool Monitoring Equipment
- X-Ray Monitors
- Variable Speed Motors

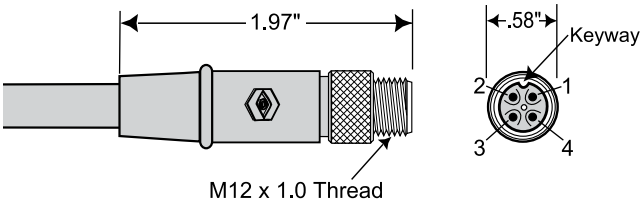
STRAIGHT FEMALE DC PLUG



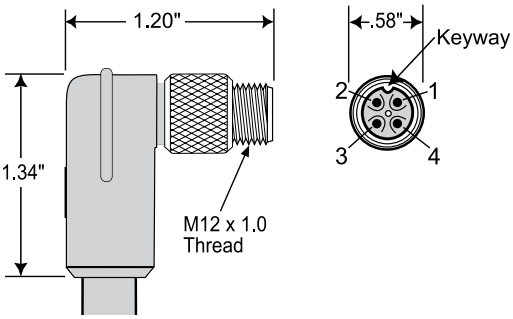
90° FEMALE DC PLUG



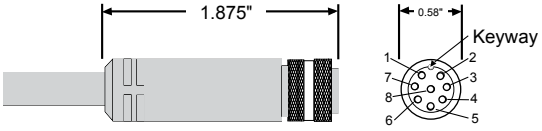
STRAIGHT MALE DC PLUG



90° MALE DC PLUG



STRAIGHT FEMALE 8 PIN DC PLUG



FACE VIEW OF FEMALE

2 POLE	3 POLE	4 POLE	5 POLE	8 POLE
1 Not Used	1 Brown	1 Brown	1 Brown	1 White
2 Not Used	2 Not Used	2 White	2 White	2 Brown
3 Brown	3 Blue	3 Blue	3 Blue	3 Green
4 Blue	4 Black	4 Black	4 Black	4 Yellow
5 Not Used	5 Not Used	5 Not Used	5 Gray	5 Gray
				6 Pink
				7 Blue
				8 Red

(continued from previous page)

ORDERING INFORMATION *(Call for pricing & availability)*

DC — STRAIGHT FEMALE PLUG

PART NO.						METERS	FEET
2 POLE	3 POLE	4 POLE	5 POLE	8 POLE	8 POLE (Shielded)		
64203	64303	64403	64503	CF18C60M001	CF18C61M001	1	3.27
64206	64306	64406	64506	CF18C60M002	CF18C61M002	2	6.56
64212	64312	64412	64512	CF18C60M004	CF18C61M004	4	13.08
64220	64320	64420	64520	CF18C60M006	CF18C61M006	6	19.67

DC — 90° FEMALE PLUG

PART NO.						METERS	FEET
2 POLE	3 POLE	4 POLE	5 POLE	8 POLE	8 POLE (Shielded)		
69203	69303	69403	69503	CF18D60M001	CF18D61M001	1	3.27
69206	69306	69406	69506	CF18D60M002	CF18D61M002	2	6.56
69212	69312	69412	69512	CF18D60M004	CF18D61M004	4	13.08
69220	69320	69420	69520	CF18D60M006	CF18D61M006	6	19.67

DC — MALE/FEMALE EXTENSION SET

PART NO.						METERS	FEET
2 POLE	3 POLE	4 POLE	5 POLE	8 POLE	8 POLE (Shielded)		
CF22E16A020	CF23E17A020	63422	CF25E19A020	CF28E60A020	CF28E61A020	0.5	1.64
63223	63323	63423	63523	CF28E60M001	CF28E61M001	1	3.27
63226	63326	63426	63526	CF28E60M002	CF28E61M002	2	6.56
CF22E16M003	CF23E17M003	63427	CF25E19M003	CF28E60M003	CF28E61M003	3	9.84
63232	63332	63432	63532	CF28E60M004	CF28E61M004	4	13.08
CF22E16M005	CF23E17M005	63433	CF25E19M005	CF28E60M005	CF28E61M005	5	16.00
63240	63340	63440	63540	CF28E60M006	CF28E61M006	6	19.67

MALE 90°/FEMALE STRAIGHT EXTENSION SET

PART NO. 4 POLE	METERS	FEET
63923	1	3.27
63926	2	6.56
63932	4	13.08

STRAIGHT MALE/90° FEMALE EXTENSION SET

PART NO. 4 POLE	METERS	FEET
69422	.5	1.64
69423	1	3.27
69426	2	6.56
69427	3	9.84
69432	4	13.08
69440	6	19.67

DC — MICRO QUICK-CONNECT CABLE

DC PART NO.	SIZE	STRANDING	NOMINAL O.D.	WT. (LBS.) PER 1000'
62022	18/2 (Unshielded)	41/34	0.220	31.0
62023	18/3 (Unshielded)	41/34	0.220	35.1
62024	18/4 (Unshielded)	41/34	0.240	41.5
62025	18/5 (Unshielded)	41/34	0.255	50.3
60018	22/8 (Unshielded)	7/30	0.245	32.6
60019	22/8 (Shielded)	7/30	0.280	59.6

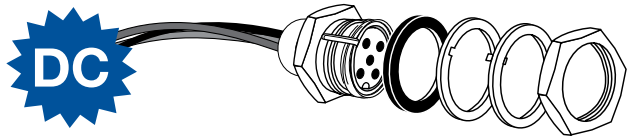
DC Micro M12 Single Key Quick-Connect™ Receptacles

• IP69K Rated • RoHS Compliant

APPLICATIONS

- Bar Code Readers
- Computer Interfaces
- Digital Remote Controls
- Encoders or Resolvers
- Heat Pressure and Flow Meters
- Instrumentation
- I/O (input/output) Devices
- Load Cell Monitors
- Programmable Controllers
- Programmable Limit Switches
- Proximity Switches
- Robotics
- Servo Motors
- Sensors and Relays
- Solenoid Valves
- Tachometers
- Telecommunications
- Torque-Tool Monitoring Equipment
- X-Ray Monitors
- Variable Speed Motors

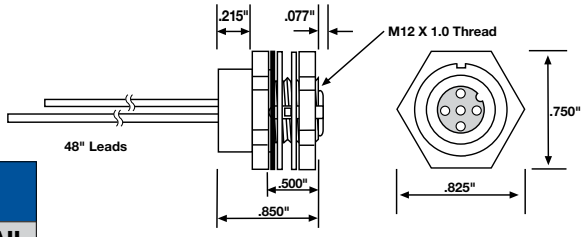
ORDERING INFORMATION *(Call for pricing & availability)*



FEMALE RECEPTACLE — BACK MOUNT

PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
63308	RF13Q24F004	3P Female Back Mount	48"
63408	RF14Q25F004	4P Female Back Mount	48"
63508	RF15Q26F004	5P Female Back Mount	48"

SPECIFICATIONS



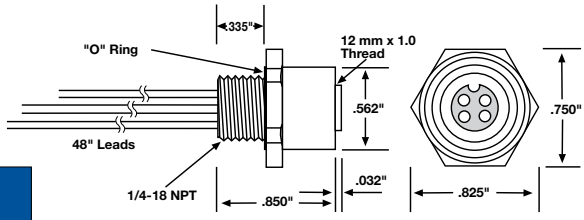
O-Ring & Locknut Included

ORDERING INFORMATION *(Call for pricing & availability)*

FEMALE RECEPTACLE — PANEL MOUNT

PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
63202	—	2P Female Panel Mount	48”
63302	RF13T24F004	3P Female Panel Mount	48"
63402	RF14T25F004	4P Female Panel Mount	48"
63502	RF15T26F004	5P Female Panel Mount	48"
—	RF18T60M001	8P F Panel Mt. (Unshielded)	1 m
—	RF18T61M001	8P F Panel Mt. (Shielded)	1 m

SPECIFICATIONS

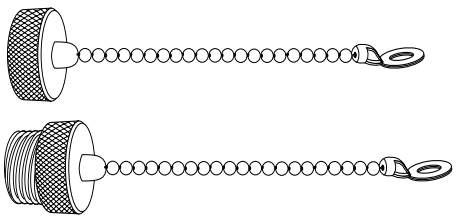


O-Ring & Locknut Included

ORDERING INFORMATION *(Call for pricing & availability)*

DC MICRO CLOSURE CAPS WITH CHAIN

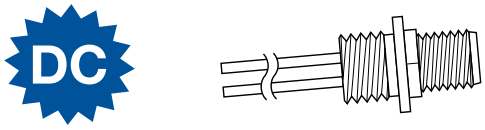
PART NO.	DESCRIPTION
64801	Closure Cap w/6" Chain for Male Plug & Receptacles w/External Thread
64802	Closure Cap w/6" Chain for Female Plug & Receptacles w/Internal Thread



DC Micro M12 Single Key Quick-Connect™ Receptacles

• IP69K Rated • RoHS Compliant

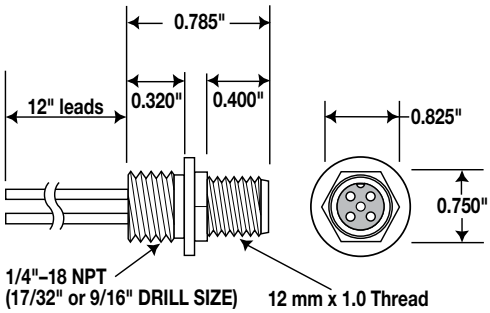
ORDERING INFORMATION *(Call for pricing & availability)*



MALE RECEPTACLE — PANEL MOUNT

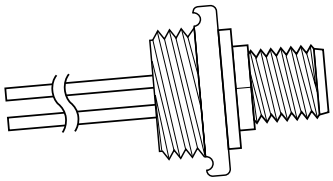
PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
64202	—	2P Male Panel Mount	12"
64302	RF13R24F001	3P Male Panel Mount	12"
64402	RF14R25F001	4P Male Panel Mount	12"
64502	RF15R26F001	5P Male Panel Mount	12"
—	RF13R24F004	3P Male Panel Mount	48"
—	RF14R25F004	4P Male Panel Mount	48"
—	RF15R26F004	5P Male Panel Mount	48"
—	RF18R60M001	8P F Panel Mt. (Unshielded)	1 m
—	RF18R61M004	8P F Panel Mt. (Shielded)	1 m

SPECIFICATIONS



O-Ring & Locknut Included

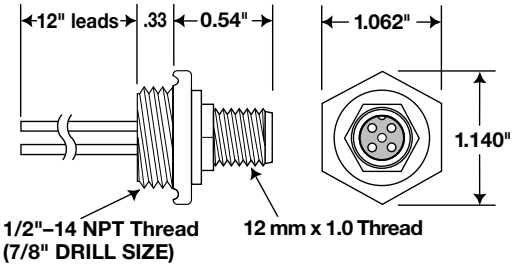
ORDERING INFORMATION *(Call for pricing & availability)*



MALE RECEPTACLE — SWITCH BODY MOUNT

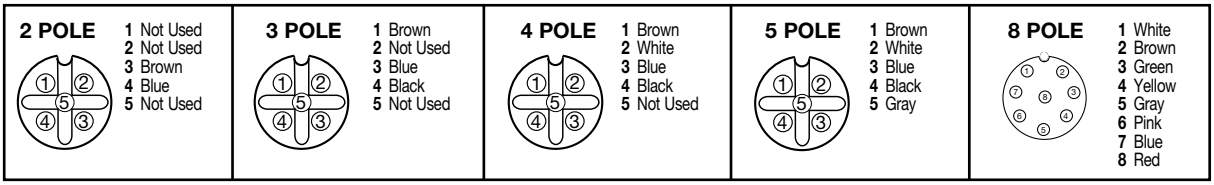
PART NO.	PART NO.	DESCRIPTION	PIGTAIL LENGTH
64207	—	2P Male Switch Body	12"
64307	RF13S24F001	3P Male Switch Body	12"
64407	RF14S25F001	4P Male Switch Body	12"
64507	RF15S26F001	5P Male Switch Body	12"
—	RF13S24F004	3P Male Switch Body	48"
—	RF14S25F004	4P Male Switch Body	48"
—	RF15S26F004	5P Male Switch Body	48"

SPECIFICATIONS



O-Ring & Locknut Included

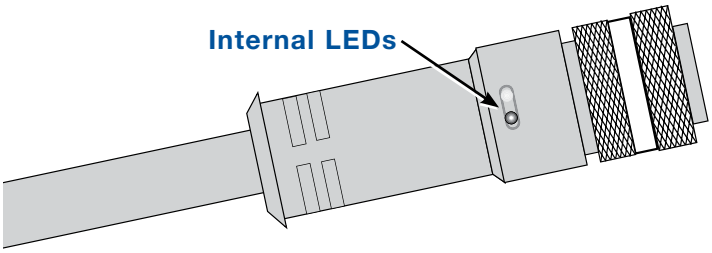
FACE VIEW OF FEMALE PLUGS



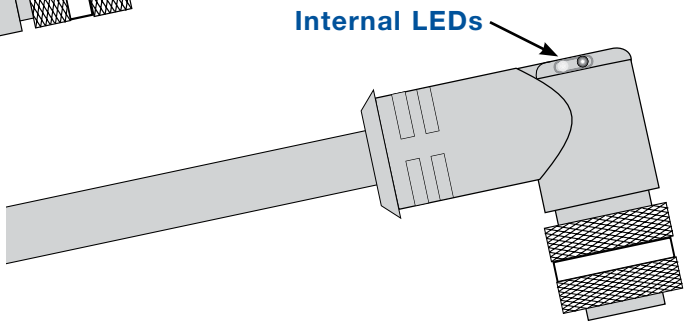
DC Micro Quick-Connects™ with LEDs

- 10 - 30 Volt DC
- RoHS Compliant
- Single Key Design
- 80°C
- NEMA 6P & 13
- Meets IP68 & IP69K Requirements for Dust & Water

3 Pole Straight Female Plug



3 Pole 90º Female Plug



ORDERING INFORMATION *(Call for pricing & availability)*

DC — 3 POLE STRAIGHT FEMALE PLUG

PART NO.		METERS	FEET	DESCRIPTION
PNP WIRED	NPN WIRED			
CD13C62M001	CE13C62M001	1	3.27	3 Pole Female Plug
CD13C62M002	CE13C62M002	2	6.56	3 Pole Female Plug
CD13C62M004	CE13C62M004	4	13.08	3 Pole Female Plug
CD13C62M006	CE13C62M006	6	19.67	3 Pole Female Plug

DC — 3 POLE 90° FEMALE PLUG

PART NO.		METERS	FEET	DESCRIPTION
PNP WIRED	NPN WIRED			
CD13D62M001	CE13D62M001	1	3.27	3 Pole Female 90° Plug
CD13D62M002	CE13D62M002	2	6.56	3 Pole Female 90° Plug
CD13D62M004	CE13D62M004	4	13.08	3 Pole Female 90° Plug
CD13D62M006	CE13D62M006	6	19.67	3 Pole Female 90° Plug

DC — 3 POLE EXTENSION CORD SETS

PART NO.		METERS	FEET	DESCRIPTION
PNP WIRED	NPN WIRED			
CD23E62M001	CE23E62M001	1	3.27	3 Pole M/F Ext. Set
CD23E62M002	CE23E62M002	2	6.56	3 Pole M/F Ext. Set
CD23E62M004	CE23E62M004	4	13.08	3 Pole M/F Ext. Set
CD23E62M006	CE23E62M006	6	19.67	3 Pole M/F Ext. Set

DC — MICRO QUICK-CONNECT CABLE

DC PART NO.	SIZE	STRANDING	NOMINAL O.D.
62033	22/3	41/34	0.220

(continued from previous page)

DC Micro Quick-Connects™ with LEDs

FEATURES & BENEFITS

MADE WITH TREX-ONICS® CONTROL CABLE
Designed for high cycle, constant motion applications. Provides excellent defense against impact, cutting, abrasion, oil and chemicals.

ALL POLYURETHANE DESIGN, HEAD AND CORD
Ensures a 100% bond between head and cord. Eliminates glues and bonding materials that break down and leak over time, resulting in loss of signal and continuity.

DUAL LEDs
Green for POWER and yellow for OUTPUT indication.

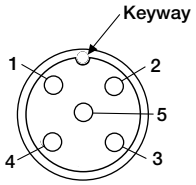
TRANSPARENT POLYURETHANE HEAD
Provides excellent visibility of LED status from multiple angles.

FLUOROELASTOMER O-RING
Seals out oil, dust, chemicals and other contaminants. Provides an IP68 water tight seal.

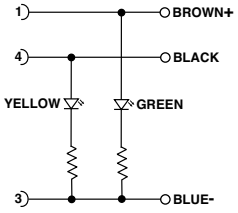
HARD COATED MIL SPEC. ANODIZED ALUMINUM KNURLED COUPLING NUT
Resists corrosion. Provides quick and secure assembly.

SPECIFICATIONS

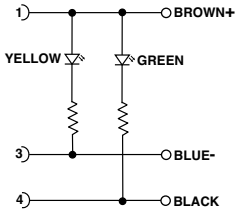
FACE VIEW OF FEMALE



PNP



NPN



18 AWG “Y” Splitter

• 300 Volt Rated • RoHS Compliant

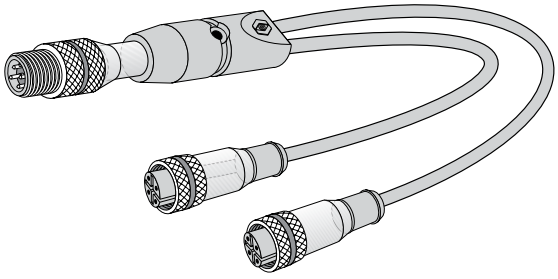
ALL *TREX-ONICS*® HEAVY-DUTY POLYURETHANE DESIGN Ensures a 100% bond between the focal point and cord. Eliminates glues and bonding materials that break down and leak over time, resulting in loss of signal continuity.

COMPACT DESIGN COMBINED WITH MICRO TECHNOLOGY Helps to reduce wiring and termination points, simplifying installation and maintenance.

EXTENDED NUT DESIGN Protects the insert, pins and sleeves from impact and abuse. Easy to grip.

DESIGN FLEXIBILITY Designed for both Micro and Mini applications. Wiring and lead lengths can be made to fit the application. Contact our Engineered Products Department for additional information.

SPECIALLY COMPOUNDED POLYURETHANE INSERTS Compatible with all industry standards for both AC and DC applications. Provides a superior seal against fluid and dust penetration.

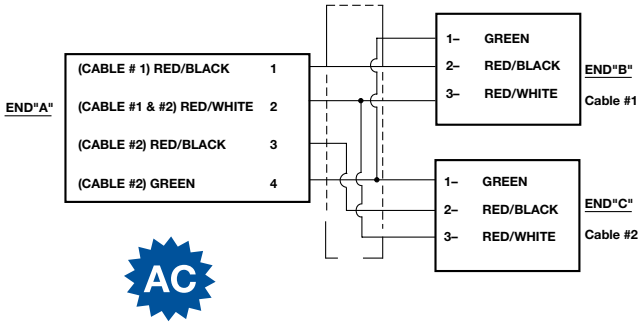


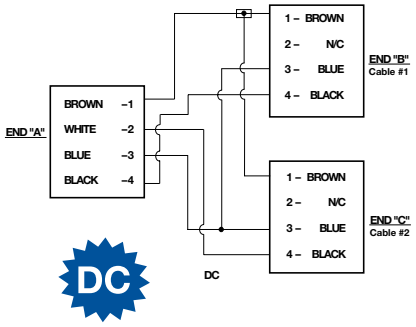
UNIQUE MOUNTING FEATURES Designed to mount securely with either a wire tie or thru bolt for ease of installation.

UNIQUE STAINLESS STEEL SLEEVED FEMALE PIN DESIGN Prevents pin deformation resulting in loss of signal and electrical continuity. Superior performance in high vibration and continuous motion applications.

SOLID BRASS CONTACT PINS Nickel coated and gold plated. Resists corrosion, ensures electrical integrity in both AC and DC low voltage application.

CONSTRUCTION SPECIFICATIONS





Additional wiring schemes available through Engineered Products.

ORDERING INFORMATION *(Call for pricing & availability)*

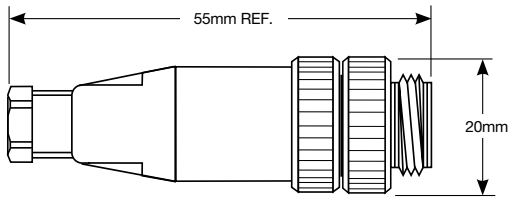
AC VERSION				
PART NO.	**IN-PUT CORD LENGTH**	**SINGLE-END CONFIGURATION**	**DOUBLE END SIDE #1**	**DOUBLE END SIDE #2**
64061	0.5'	4 Pole Male	3 Pole Female	3 Pole Female
64062	1'	4 Pole Male	3 Pole Female	3 Pole Female
64063	1.5'	4 Pole Male	3 Pole Female	3 Pole Female
64064	2'	4 Pole Male	3 Pole Female	3 Pole Female

DC VERSION				
PART NO.	**IN-PUT CORD LENGTH**	**SINGLE-END CONFIGURATION**	**DOUBLE END SIDE #1**	**DOUBLE END SIDE #2**
64066	1'	4 Pole Male	3 Pole Female	3 Pole Female
64067	1.67'	4 Pole Male	3 Pole Female	3 Pole Female
64068	2'	4 Pole Male	3 Pole Female	3 Pole Female
64966	1'	4 Pole Male	90˚/3 Pole Female	90˚/3 Pole Female

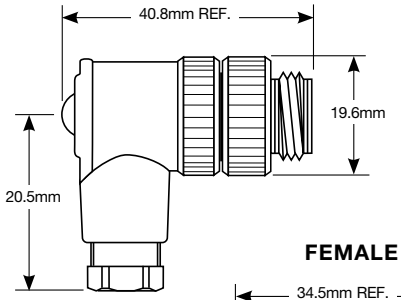
Field Installable AC and DC Micro Connectors

• IP67 Rated • RoHS Compliant • DC Single Key — 4 - 5 Pole • AC Dual Key — 3 Pole

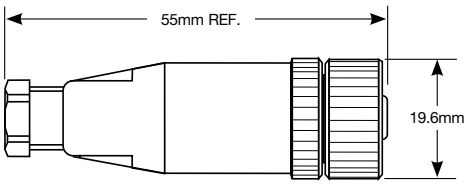
MALE STRAIGHT



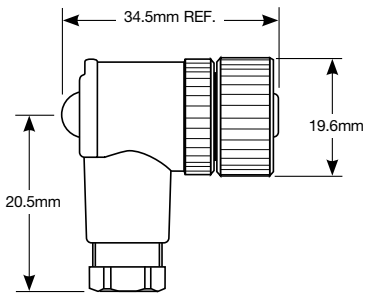
MALE 90º



FEMALE STRAIGHT



FEMALE 90º



COUPLING THREAD – AC 1/2" UNF – DC M12 X 1

FEATURES & BENEFITS

SELECTION
AC and DC, straight and 90º connectors, both male and female.

SEALING GROMMET
Provides a liquid tight seal to protect the connection from contamination.

CABLE SELECTION
Designed to fit a wide range of cord sizes from 0.158" – 0.315".

SCREW LOCK SYSTEM
Provides secure connection using only a screw driver.

FIELD INSTALLABLE DESIGN
Easy to install for quick on-site repairs.

CURRENT RATING
3 amps DC. 4 amps AC.

NYLON BODY AND INSERT
Impact and crush resistant.

ORDERING INFORMATION *(Call for pricing & availability)*

DC — FIELD INSTALLABLE MICROS

PART NO.	DESCRIPTION	CORD O.D. RANGE
30700	4 Pole Male Straight DC	0.158" – 0.236"
30600	5 Pole Male Straight DC	0.236" – 0.315"
30800	8 Pole Male Straight DC	0.236" – 0.315"
30400	4 Pole Female Straight DC	0.158" – 0.236"
30500	5 Pole Female Straight DC	0.236" – 0.315"
30900	8 Pole Female Straight DC	0.236" – 0.315"
39700	4 Pole Male 90º DC	0.158" – 0.236"
39600	5 Pole Male 90º DC	0.236" – 0.315"
39400	4 Pole Female 90º DC	0.158" – 0.236"
39500	5 Pole Female 90º DC	0.236" – 0.315"

AC — FIELD INSTALLABLE MICROS

PART NO.	DESCRIPTION	CORD O.D. RANGE
30801	3 Pole Male Straight AC	0.158" – 0.236"
30301	3 Pole Female Straight AC	0.158" – 0.236"
39801	3 Pole Male 90º AC	0.158" – 0.236"
39301	3 Pole Female 90º AC	0.158" – 0.236"

Build Your Own Micro Cord Sets

Type	Style	Ends	Poles	Head configuration	Cable	UOM	Length	Coupling	
C	F	2	5	E	19	F	020		Part No.

Coupling: Blank=Regular
S=Stainless Steel
P=Plastic

Cable Length
(3 characters) example:
5 = **"005"**
50 = **"050"**
500 = **"500"**

Unit of Measure
F=Feet
M=Meters
A=Inches

Cable Type – must be two digits

Micro (Trex-Onics®)
16 = 18/2 (DC) - 62022
17 = 18/3 (DC) - 62023
18 = 18/4 (DC) - 62024
19 = 18/5 (DC) - 62025
20 = 18/3 (AC) - 62013
21 = 18/4 (AC) - 62014
22 = 18/5 (AC) - 62015

Other Cable Options
60 = Trex-Onics 22/8 DC Unshielded #60018
61 = Trex-Onics 22/8 DC Shielded #60019
63 = Trex-Onics 18/3 DC Shielded #62003

Head Configuration
A = Male Straight
B = Male 90˚
C = Female Straight
D = Female 90˚

E = Male Straight to Female Straight
F = Male Straight to Female 90˚
G = Male 90˚ to Female Straight
H = Male 90˚ to Female 90˚

J = Male Straight to Male Straight*
K = Male Straight to Male 90˚*
L = Male 90˚ to Male 90˚*
*Male to male configurations only available in Nanos

M = Female Straight to Female Straight
N = Female Straight to Female 90˚
P = Female 90˚ to Female 90˚

Micro Receptacles - Micros Only
Q = Female Back Mount
R = Male Panel Mount
S = Male Switch Mount
T = Female Panel Mount

# of Poles
2 – 8

Single or Double Ended
1 = Single End (or receptacle)
2 = Double End

Style
F = DC Micro
G = AC Micro

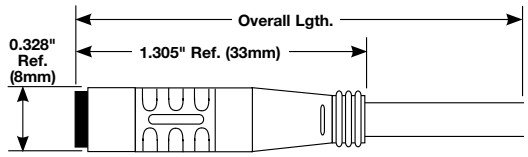
Type
C = Cordset
R = Receptacle

In the sample part number above, **CF25E19F020** is a DC micro, double ended cordset, 5 poles, male straight to female straight with 18/5 Trex-Onics cable (62025), 20 feet long.

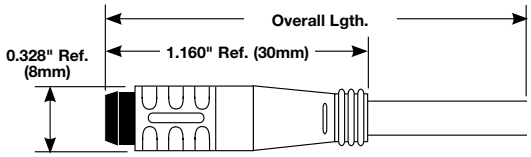
Nano M8 Quick-Connects™

• 300 Volt Rated • IP68 Rated • -30°F to 90°C • RoHS Compliant

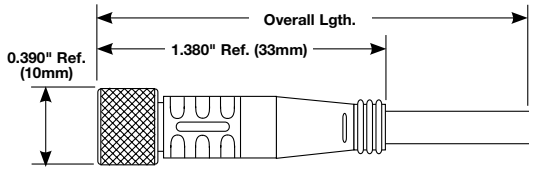
STRAIGHT FEMALE SNAP LOCK



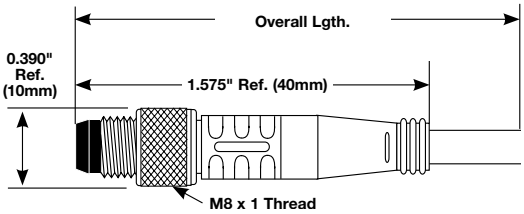
STRAIGHT MALE SNAP LOCK



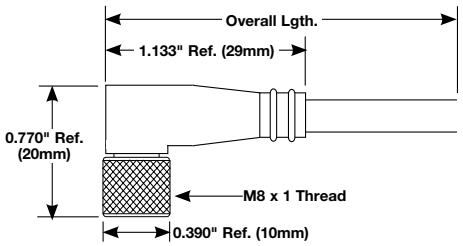
STRAIGHT FEMALE THREADED COUPLING



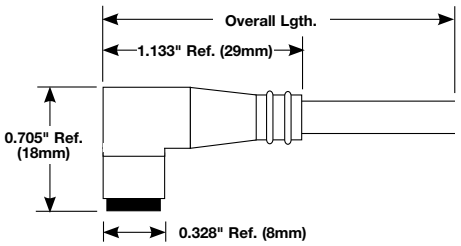
STRAIGHT MALE THREADED COUPLING



90° FEMALE THREADED COUPLING



90° FEMALE SNAP LOCK



FEATURES & BENEFITS

CORD SETS MADE WITH TREX-ONICS® 24 AWG NANO CORD
Designed for high cycle, constant motion applications. Provides excellent defense against impact, cutting, abrasion, oil and chemicals.

SNAP-LOCK OR THREADED COUPLING SYSTEMS
Select configurations best suited for your applications.

SPECIALLY COMPOUNDED NYLON INSERT
Compatible with all industry standards for nano applications. Provides a superior seal against fluid and dust penetration.

CONTACT PINS/SLEEVES ARE COPPER ALLOY AND GOLD PLATED
Ensures electrical integrity in low voltage applications. Resists corrosion.

ALL MOLDED DESIGN
Ensures a 100% bond between head and cord. Eliminates glues and bonding materials that break down and leak over time, resulting in loss of signal and continuity.

APPLICATIONS

- Bar Code Readers
- Computer Interfaces
- Digital Remote Controls
- Encoders or Resolvers
- Heat Pressure and Flow Meters
- Instrumentation
- I/O (input/output) Devices
- Load Cell Monitors
- Programmable Controllers
- Programmable Limit Switches
- Proximity Switches
- Robotics
- Servo Motors
- Sensors and Relays
- Solenoid Valves
- Tachometers
- Telecommunications
- Torque-Tool Monitoring Equipment
- X-Ray Monitors
- Variable Speed Motors

ORDERING INFORMATION *(Call for pricing & availability)*

DC — NANO CABLE

DC PART NO.	SIZE	STRANDING	NOMINAL O.D.	COLOR CODE
62323	24/3	7/32	0.170	Brown, Black, Blue
62324	24/4	7/32	0.180	Brown, White, Black, Blue

Nano M8 Single Ended Cable Assemblies

KEY CHARACTERISTICS

- Snap Lock Configuration IP68 Rated
- Threaded Coupling Configuration IP68 Rated
- Nickel Plated Brass Coupling Nut
- Gold Plated Copper Alloy Pins
- 1 to 6 Meter Standard Lengths
- 300V Rated & 4 Amp Rated

ORDERING INFORMATION *(Call for pricing & availability)*

STRAIGHT FEMALE SINGLE ENDED SNAP LOCK

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CB13C33M001	3 Pole Single Ended Straight Female – Snap	3.3	1
CB13C33M002	3 Pole Single Ended Straight Female – Snap	6.6	2
CB13C33M004	3 Pole Single Ended Straight Female – Snap	13.1	4
CB13C33M005	3 Pole Single Ended Straight Female – Snap	16.4	5
CB13C33M006	3 Pole Single Ended Straight Female – Snap	19.7	6
CB14C34M001	4 Pole Single Ended Straight Female – Snap	3.3	1
CB14C34M002	4 Pole Single Ended Straight Female – Snap	6.6	2
CB14C34M004	4 Pole Single Ended Straight Female – Snap	13.1	4
CB14C34M005	4 Pole Single Ended Straight Female – Snap	16.4	5
CB14C34M006	4 Pole Single Ended Straight Female – Snap	19.7	6

STRAIGHT MALE SINGLE ENDED SNAP LOCK

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CB13A33M001	3 Pole Single Ended Straight Male – Snap	3.3	1
CB13A33M002	3 Pole Single Ended Straight Male – Snap	6.6	2
CB13A33M004	3 Pole Single Ended Straight Male – Snap	13.1	4
CB13A33M005	3 Pole Single Ended Straight Male – Snap	16.4	5
CB13A33M006	3 Pole Single Ended Straight Male – Snap	19.7	6
CB14A34M001	4 Pole Single Ended Straight Male – Snap	3.3	1
CB14A34M002	4 Pole Single Ended Straight Male – Snap	6.6	2
CB14A34M004	4 Pole Single Ended Straight Male – Snap	13.1	4
CB14A34M005	4 Pole Single Ended Straight Male – Snap	16.4	5
CB14A34M006	4 Pole Single Ended Straight Male – Snap	19.7	6

STRAIGHT FEMALE SINGLE ENDED THREADED COUPLING

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CA13C33M001	3 Pole Single Ended Straight Female – Threaded	3.3	1
CA13C33M002	3 Pole Single Ended Straight Female – Threaded	6.6	2
CA13C33M004	3 Pole Single Ended Straight Female – Threaded	13.1	4
CA13C33M005	3 Pole Single Ended Straight Female – Threaded	16.4	5
CA13C33M006	3 Pole Single Ended Straight Female – Threaded	19.7	6
CA14C34M001	4 Pole Single Ended Straight Female – Threaded	3.3	1
CA14C34M002	4 Pole Single Ended Straight Female – Threaded	6.6	2
CA14C34M004	4 Pole Single Ended Straight Female – Threaded	13.1	4
CA14C34M005	4 Pole Single Ended Straight Female – Threaded	16.4	5
CA14C34M006	4 Pole Single Ended Straight Female – Threaded	19.7	6

Nano M8 Single Ended Cable Assemblies

KEY CHARACTERISTICS

- Snap Lock Configuration IP68 Rated
- Threaded Coupling Configuration IP68 Rated
- Nickel Plated Brass Coupling Nut
- Gold Plated Copper Alloy Pins
- 1 to 6 Meter Standard Lengths
- 300V Rated & 4 Amp Rated

ORDERING INFORMATION *(Call for pricing & availability)*

STRAIGHT MALE SINGLE ENDED THREADED COUPLING

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CA13A33M001	3 Pole Single Ended Straight Male – Threaded	3.3	1
CA13A33M002	3 Pole Single Ended Straight Male – Threaded	6.6	2
CA13A33M004	3 Pole Single Ended Straight Male – Threaded	13.1	4
CA13A33M005	3 Pole Single Ended Straight Male – Threaded	16.4	5
CA13A33M006	3 Pole Single Ended Straight Male – Threaded	19.7	6
CA14A34M001	4 Pole Single Ended Straight Male – Threaded	3.3	1
CA14A34M002	4 Pole Single Ended Straight Male – Threaded	6.6	2
CA14A34M004	4 Pole Single Ended Straight Male – Threaded	13.1	4
CA14A34M005	4 Pole Single Ended Straight Male – Threaded	16.4	5
CA14A34M006	4 Pole Single Ended Straight Male – Threaded	19.7	6

90° FEMALE SINGLE ENDED THREADED COUPLING

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CA13D33M001	3 Pole Single Ended 90° Female – Threaded	3.3	1
CA13D33M002	3 Pole Single Ended 90° Female – Threaded	6.6	2
CA13D33M004	3 Pole Single Ended 90° Female – Threaded	13.1	4
CA13D33M005	3 Pole Single Ended 90° Female – Threaded	16.4	5
CA13D33M006	3 Pole Single Ended 90° Female – Threaded	19.7	6
CA14D34M001	4 Pole Single Ended 90° Female – Threaded	3.3	1
CA14D34M002	4 Pole Single Ended 90° Female – Threaded	6.6	2
CA14D34M004	4 Pole Single Ended 90° Female – Threaded	13.1	4
CA14D34M005	4 Pole Single Ended 90° Female – Threaded	16.4	5
CA14D34M006	4 Pole Single Ended 90° Female – Threaded	19.7	6

90° FEMALE SINGLE ENDED SNAP LOCK

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CB13D33M001	3 Pole Single Ended 90° Female – Snap	3.3	1
CB13D33M002	3 Pole Single Ended 90° Female – Snap	6.6	2
CB13D33M004	3 Pole Single Ended 90° Female – Snap	13.1	4
CB13D33M005	3 Pole Single Ended 90° Female – Snap	16.4	5
CB13D33M006	3 Pole Single Ended 90° Female – Snap	19.7	6
CB14D34M001	4 Pole Single Ended 90° Female – Snap	3.3	1
CB14D34M002	4 Pole Single Ended 90° Female – Snap	6.6	2
CB14D34M004	4 Pole Single Ended 90° Female – Snap	13.1	4
CB14D34M005	4 Pole Single Ended 90° Female – Snap	16.4	5
CB14D34M006	4 Pole Single Ended 90° Female – Snap	19.7	6

Nano M8 Double Ended Cable Assemblies

KEY CHARACTERISTICS

- Snap Lock Configuration IP68 Rated
- Threaded Coupling Configuration IP68 Rated
- Nickel Plated Brass Coupling Nut
- Gold Plated Copper Alloy Pins
- 1 to 6 Meter Standard Lengths
- 300V Rated & 4 Amp Rated

ORDERING INFORMATION *(Call for pricing & availability)*

STRAIGHT FEMALE/STRAIGHT FEMALE DOUBLE ENDED THREADED COUPLING

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CA23M33M001	3 Pole Double Ended Straight F/F – Threaded	3.3	1
CA23M33M002	3 Pole Double Ended Straight F/F – Threaded	6.6	2
CA23M33M004	3 Pole Double Ended Straight F/F – Threaded	13.1	4
CA23M33M005	3 Pole Double Ended Straight F/F – Threaded	16.4	5
CA23M33M006	3 Pole Double Ended Straight F/F – Threaded	19.7	6
CA24M34M001	4 Pole Double Ended Straight F/F – Threaded	3.3	1
CA24M34M002	4 Pole Double Ended Straight F/F – Threaded	6.6	2
CA24M34M004	4 Pole Double Ended Straight F/F – Threaded	13.1	4
CA24M34M005	4 Pole Double Ended Straight F/F – Threaded	16.4	5
CA24M34M006	4 Pole Double Ended Straight F/F – Threaded	19.7	6

STRAIGHT FEMALE/STRAIGHT MALE DOUBLE ENDED THREADED COUPLING

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CA23E33M001	3 Pole Double Ended Straight F/M – Threaded	3.3	1
CA23E33M002	3 Pole Double Ended Straight F/M – Threaded	6.6	2
CA23E33M004	3 Pole Double Ended Straight F/M – Threaded	13.1	4
CA23E33M005	3 Pole Double Ended Straight F/M – Threaded	16.4	5
CA23E33M006	3 Pole Double Ended Straight F/M – Threaded	19.7	6
CA24E34M001	4 Pole Double Ended Straight F/M – Threaded	3.3	1
CA24E34M002	4 Pole Double Ended Straight F/M – Threaded	6.6	2
CA24E34M004	4 Pole Double Ended Straight F/M – Threaded	13.1	4
CA24E34M005	4 Pole Double Ended Straight F/M – Threaded	16.4	5
CA24E34M006	4 Pole Double Ended Straight F/M – Threaded	19.7	6

STRAIGHT FEMALE/ STRAIGHT FEMALE DOUBLE ENDED SNAP LOCK

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CB23M33M001	3 Pole Double Ended Straight F/F – Snap	3.3	1
CB23M33M002	3 Pole Double Ended Straight F/F – Snap	6.6	2
CB23M33M004	3 Pole Double Ended Straight F/F – Snap	13.1	4
CB23M33M005	3 Pole Double Ended Straight F/F – Snap	16.4	5
CB23M33M006	3 Pole Double Ended Straight F/F – Snap	19.7	6
CB24M34M001	4 Pole Double Ended Straight F/F – Snap	3.3	1
CB24M34M002	4 Pole Double Ended Straight F/F – Snap	6.6	2
CB24M34M004	4 Pole Double Ended Straight F/F – Snap	13.1	4
CB24M34M005	4 Pole Double Ended Straight F/F – Snap	16.4	5
CB24M34M006	4 Pole Double Ended Straight F/F – Snap	19.7	6

Nano M8 Double Ended Cable Assemblies

KEY CHARACTERISTICS

- Snap Lock Configuration IP68 Rated
- Threaded Coupling Configuration IP68 Rated
- Nickel Plated Brass Coupling Nut
- Gold Plated Copper Alloy Pins
- 1 to 6 Meter Standard Lengths
- 300V Rated & 4 Amp Rated

ORDERING INFORMATION *(Call for pricing & availability)*

STRAIGHT FEMALE/STRAIGHT MALE DOUBLE ENDED SNAP LOCK

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CB23E33M001	3 Pole Double Ended Straight F/M – Snap	3.3	1
CB23E33M002	3 Pole Double Ended Straight F/M – Snap	6.6	2
CB23E33M004	3 Pole Double Ended Straight F/M – Snap	13.1	4
CB23E33M005	3 Pole Double Ended Straight F/M – Snap	16.4	5
CB23E33M006	3 Pole Double Ended Straight F/M – Snap	19.7	6
CB24E34M001	4 Pole Double Ended Straight F/M – Snap	3.3	1
CB24E34M002	4 Pole Double Ended Straight F/M – Snap	6.6	2
CB24E34M004	4 Pole Double Ended Straight F/M – Snap	13.1	4
CB24E34M005	4 Pole Double Ended Straight F/M – Snap	16.4	5
CB24E34M006	4 Pole Double Ended Straight F/M – Snap	19.7	6

STRAIGHT MALE/STRAIGHT MALE DOUBLE ENDED THREADED COUPLING

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CA23J33M001	3 Pole Double Ended Straight M/M – Threaded	3.3	1
CA23J33M002	3 Pole Double Ended Straight M/M – Threaded	6.6	2
CA23J33M004	3 Pole Double Ended Straight M/M – Threaded	13.1	4
CA23J33M005	3 Pole Double Ended Straight M/M – Threaded	16.4	5
CA23J33M006	3 Pole Double Ended Straight M/M – Threaded	19.7	6
CA24J34M001	4 Pole Double Ended Straight M/M – Threaded	3.3	1
CA24J34M002	4 Pole Double Ended Straight M/M – Threaded	6.6	2
CA24J34M004	4 Pole Double Ended Straight M/M – Threaded	13.1	4
CA24J34M005	4 Pole Double Ended Straight M/M – Threaded	16.4	5
CA24J34M006	4 Pole Double Ended Straight M/M – Threaded	19.7	6

STRAIGHT MALE/STRAIGHT MALE DOUBLE ENDED SNAP LOCK

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CB23J33M001	3 Pole Double Ended Straight M/M – Snap	3.3	1
CB23J33M002	3 Pole Double Ended Straight M/M – Snap	6.6	2
CB23J33M004	3 Pole Double Ended Straight M/M – Snap	13.1	4
CB23J33M005	3 Pole Double Ended Straight M/M – Snap	16.4	5
CB23J33M006	3 Pole Double Ended Straight M/M – Snap	19.7	6
CB24J34M001	4 Pole Double Ended Straight M/M – Snap	3.3	1
CB24J34M002	4 Pole Double Ended Straight M/M – Snap	6.6	2
CB24J34M004	4 Pole Double Ended Straight M/M – Snap	13.1	4
CB24J34M005	4 Pole Double Ended Straight M/M – Snap	16.4	5
CB24J34M006	4 Pole Double Ended Straight M/M – Snap	19.7	6

Nano M8 Double Ended Cable Assemblies

KEY CHARACTERISTICS

- Snap Lock Configuration IP68 Rated
- Threaded Coupling Configuration IP68 Rated
- Nickel Plated Brass Coupling Nut
- Gold Plated Copper Alloy Pins
- 1 to 6 Meter Standard Lengths
- 300V Rated & 4 Amp Rated

ORDERING INFORMATION *(Call for pricing & availability)*

STRAIGHT FEMALE/90° FEMALE DOUBLE ENDED THREADED COUPLING

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CA23N33M001	3 Pole Double Ended Straight F/90° F – Threaded	3.3	1
CA23N33M002	3 Pole Double Ended Straight F/90° F – Threaded	6.6	2
CA23N33M004	3 Pole Double Ended Straight F/90° F – Threaded	13.1	4
CA23N33M005	3 Pole Double Ended Straight F/90° F – Threaded	16.4	5
CA23N33M006	3 Pole Double Ended Straight F/90° F – Threaded	19.7	6
CA24N34M001	4 Pole Double Ended Straight F/90° F – Threaded	3.3	1
CA24N34M002	4 Pole Double Ended Straight F/90° F – Threaded	6.6	2
CA24N34M004	4 Pole Double Ended Straight F/90° F – Threaded	13.1	4
CA24N34M005	4 Pole Double Ended Straight F/90° F – Threaded	16.4	5
CA24N34M006	4 Pole Double Ended Straight F/90° F – Threaded	19.7	6

STRAIGHT MALE/90° FEMALE DOUBLE ENDED THREADED COUPLING

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CA23F33M001	3 Pole Double Ended Straight M/90° F – Threaded	3.3	1
CA23F33M002	3 Pole Double Ended Straight M/90° F – Threaded	6.6	2
CA23F33M004	3 Pole Double Ended Straight M/90° F – Threaded	13.1	14
CA23F33M005	3 Pole Double Ended Straight M/90° F – Threaded	16.4	5
CA23F33M006	3 Pole Double Ended Straight M/90° F – Threaded	19.7	6
CA24F34M001	4 Pole Double Ended Straight M/90° F – Threaded	3.3	1
CA24F34M002	4 Pole Double Ended Straight M/90° F – Threaded	6.6	2
CA24F34M004	4 Pole Double Ended Straight M/90° F – Threaded	13.1	4
CA24F34M005	4 Pole Double Ended Straight M/90° F – Threaded	16.4	5
CA24F34M006	4 Pole Double Ended Straight M/90° F – Threaded	19.7	6

STRAIGHT FEMALE/90° FEMALE DOUBLE ENDED SNAP LOCK

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CB23N33M001	3 Pole Double Ended Straight F/90° F – Snap	3.3	1
CB23N33M002	3 Pole Double Ended Straight F/90° F – Snap	6.6	2
CB23N33M004	3 Pole Double Ended Straight F/90° F – Snap	13.1	4
CB23N33M005	3 Pole Double Ended Straight F/90° F – Snap	16.4	5
CB23N33M006	3 Pole Double Ended Straight F/90° F – Snap	19.7	6
CB24N34M001	4 Pole Double Ended Straight F/90° F – Snap	3.3	1
CB24N34M002	4 Pole Double Ended Straight F/90° F – Snap	6.6	2
CB24N34M004	4 Pole Double Ended Straight F/90° F – Snap	13.1	4
CB24N34M005	4 Pole Double Ended Straight F/90° F – Snap	16.4	5
CB24N34M006	4 Pole Double Ended Straight F/90° F – Snap	19.7	6

Nano M8 Double Ended Cable Assemblies

KEY CHARACTERISTICS

- Snap Lock Configuration IP68 Rated
- Threaded Coupling Configuration IP68 Rated
- Nickel Plated Brass Coupling Nut
- Gold Plated Copper Alloy Pins
- 1 to 6 Meter Standard Lengths
- 300V Rated & 4 Amp Rated

ORDERING INFORMATION *(Call for pricing & availability)*

90° FEMALE/90° FEMALE DOUBLE ENDED THREADED COUPLING

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CA23P33M001	3 Pole Double Ended 90° F/90° F – Threaded	3.3	1
CA23P33M002	3 Pole Double Ended 90° F/90° F – Threaded	6.6	2
CA23P33M004	3 Pole Double Ended 90° F/90° F – Threaded	13.1	4
CA23P33M005	3 Pole Double Ended 90° F/90° F – Threaded	16.4	5
CA23P33M006	3 Pole Double Ended 90° F/90° F – Threaded	19.7	6
CA24P34M001	4 Pole Double Ended 90° F/90° F – Threaded	3.3	1
CA24P34M002	4 Pole Double Ended 90° F/90° F – Threaded	6.6	2
CA24P34M004	4 Pole Double Ended 90° F/90° F – Threaded	13.1	4
CA24P34M005	4 Pole Double Ended 90° F/90° F – Threaded	16.4	5
CA24P34M006	4 Pole Double Ended 90° F/90° F – Threaded	19.7	6

90° FEMALE/90° FEMALE DOUBLE ENDED SNAP LOCK

PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CB23P33M001	3 Pole Double Ended 90° F/90° F – Snap	3.3	1
CB23P33M002	3 Pole Double Ended 90° F/90° F – Snap	6.6	2
CB23P33M004	3 Pole Double Ended 90° F/90° F – Snap	13.1	4
CB23P33M005	3 Pole Double Ended 90° F/90° F – Snap	16.4	5
CB23P33M006	3 Pole Double Ended 90° F/90° F – Snap	19.7	6
CB24P34M001	4 Pole Double Ended 90° F/90° F – Snap	3.3	1
CB24P34M002	4 Pole Double Ended 90° F/90° F – Snap	6.6	2
CB24P34M004	4 Pole Double Ended 90° F/90° F – Snap	13.1	4
CB24P34M005	4 Pole Double Ended 90° F/90° F – Snap	16.4	5
CB24P34M006	4 Pole Double Ended 90° F/90° F – Snap	19.7	6

STRAIGHT MALE/90° FEMALE DOUBLE ENDED SNAP LOCK

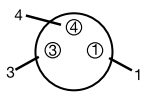
PART NO.	DESCRIPTION	CORD LENGTH (FT.)	CORD LENGTH (M.)
CB23F33M001	3 Pole Double Ended Straight M/90° F – Snap	3.3	1
CB23F33M002	3 Pole Double Ended Straight M/90° F – Snap	6.6	2
CB23F33M004	3 Pole Double Ended Straight M/90° F – Snap	13.1	4
CB23F33M005	3 Pole Double Ended Straight M/90° F – Snap	16.4	5
CB23F33M006	3 Pole Double Ended Straight M/90° F – Snap	19.7	6
CB24F34M001	4 Pole Double Ended Straight M/90° F – Snap	3.3	1
CB24F34M002	4 Pole Double Ended Straight M/90° F – Snap	6.6	2
CB24F34M004	4 Pole Double Ended Straight M/90° F – Snap	13.1	4
CB24F34M005	4 Pole Double Ended Straight M/90° F – Snap	16.4	5
CB24F34M006	4 Pole Double Ended Straight M/90° F – Snap	19.7	6

Nano M8 Receptacles

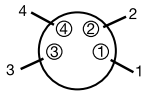
KEY CHARACTERISTICS

- Designed to work with Snap & Threaded Coupling Configurations
- IP68 Rated
- 300V Rated
- 4 Amp Rated
- Gold Plated Copper Alloy Pins
- Nickel Plated Brass Coupling Nut
- 1.2 Meter (4 Ft.) Standard Lengths

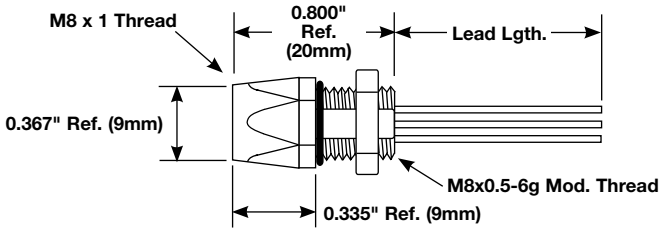
FACE VIEW OF FEMALES



1. Brown
3. Blue
4. Black



1. Brown
2. White
3. Blue
4. Black



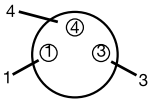
ORDERING INFORMATION *(Call for pricing & availability)*

FEMALE RECEPTACLE			
PART NO.	**DESCRIPTION**	**CORD LENGTH** (FT.)	**CORD LENGTH** (M.)
RC13C33F004	3 Pole F Panel Mount Recept. Snap/Thread	4.0	1.2
RC14C34F004	4 Pole F Panel Mount RecepT. Snap/Thread	4.0	1.2

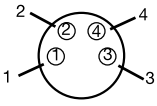
KEY CHARACTERISTICS

- Designed to work with Snap & Threaded Coupling Configurations
- IP68 Rated
- 300V Rated
- 4 Amp Rated
- Gold Plated Copper Alloy Pins
- Nickel Plated Brass Coupling Nut
- 0.3 Meter (1 Ft.) Standard Lengths

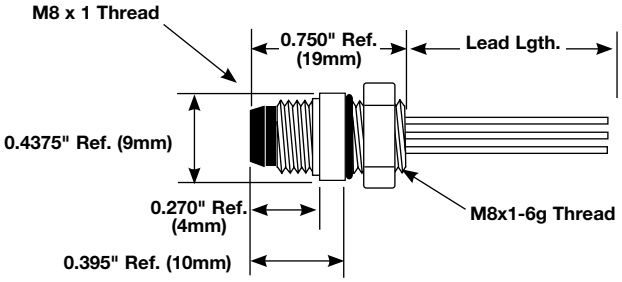
FACE VIEW OF MALES



1. Brown
3. Blue
4. Black



1. Brown
2. White
3. Blue
4. Black



ORDERING INFORMATION *(Call for pricing & availability)*

MALE RECEPTACLE			
PART NO.	**DESCRIPTION**	**CORD LENGTH** (FT.)	**CORD LENGTH** (M.)
RC13A33F001	3 Pole M Panel Mount Recept. Snap/Thread	4.0	1.2
RC14A34F001	4 Pole M Panel Mount RecepT. Snap/Thread	4.0	1.2

Build Your Own Nano M8 Cord Sets

Type	Style	Ends	Poles	Head configuration	Cable	UOM	Length	Coupling	
C	A	2	4	E	34	F	020		Part No.

Coupling: Blank = Regular
S = Stainless Steel
P = Plastic

Cable Length
(3 characters) example:
5 = **"005"**
50 = **"050"**
500 = **"500"**

Unit of Measure
F = Feet
M = Meters
A = Inches

Cable Type – must be two digits
Nano (Trex-Onics)
33 = Nano 3 Conductor - 62323
34 = Nano 4 Conductor - 62324

Head Configuration
A = Male Straight
B = Male 90˚
C = Female Straight
D = Female 90˚

E = Male Straight to Female Straight
F = Male Straight to Female 90˚
G = Male 90˚ to Female Straight
H = Male 90˚ to Female 90˚

J = Male Straight to Male Straight
K = Male Straight to Male 90˚
L = Male 90˚ to Male 90˚

M = Female Straight to Female Straight
N = Female Straight to Female 90˚
P = Female 90˚ to Female 90˚

# of Poles
3 – 4

Single or Double Ended
1 = Single End (or receptacle)
2 = Double End

Style
A = Nano Threaded Coupling
B = Nano Snap Coupling
C = Nano Receptacle (threaded/snap)

Type
C = Cordset
R = Receptacle

In the sample part number above, **CA24E34F020** is a Nano threaded coupling cordset, double ended, 4 pole, male straight to female straight, using 4 conductor Trex-Onics cable (62324) and is 20 feet long.

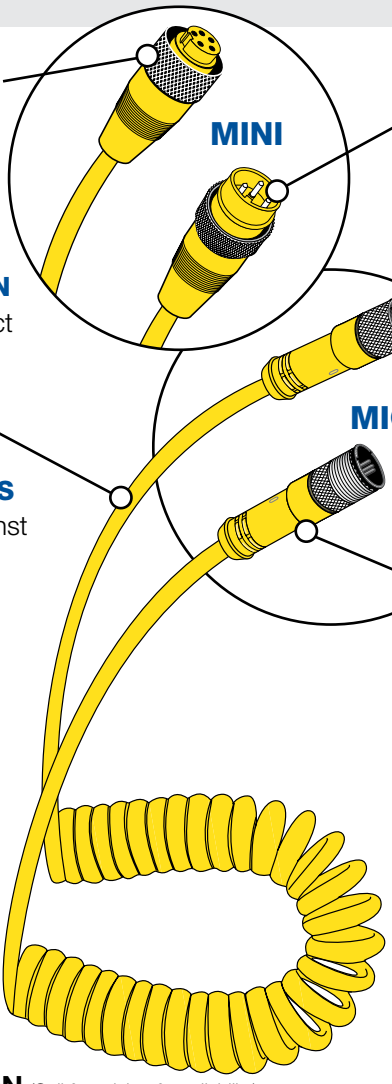
Trex-Onics® Retractile Quick-Connects™

- 80˚C
- 16 AWG Mini - 600V
- 18 AWG Micro - 300V AC & DC
- Male/Female Configurations
- RoHS Compliant

HARD COATED MIL SPEC ANODIZED ALUMINUM KNURLED COUPLING NUT
Resists corrosion. Provides quick and secure assembly.

EXTRA LONG GROUND PIN
Ensures first-in, last-out contact for safety in AC applications

PLUG SETS MADE WITH TREX-ONICS® HIGH FLEX ULTRA-COIL RETRACTILES
Superior first line defense against tearing, abrasion, impact, oil ozone and most chemicals. Extreme all weather flexibility.

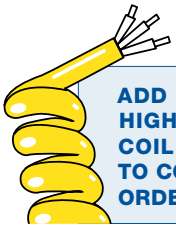


SOLID BRASS CONTACTS ARE NICKEL COATED AND GOLD PLATED
Provides long life, resists corrosion, easy positive engagement. Excellent for high/low voltage and low level signal applications.

PIN ORIENTATIONS ARE DESIGNED TO MEET MINI AND MICRO

SAE SPECIFICATION PULL-OUT VALUES EXCEED SAE SPECIFICATIONS

ALL POLYURETHANE HEAD DESIGN
Chemical, abrasion and impact resistant construction, designed to protect the pins and sleeves from damage.



ADD TREX-ONICS® HIGH-FLEX ULTRA COIL RETRACTILES TO COMPLETE YOUR ORDER! *See Page 47.*

APPLICATIONS

- Pendants
- Portable Tools
- Packaging Equipment
- Scissor Lifts
- Robots

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	CORD SIZE AWG/COND	EXTENSION SET DESCRIPTION	AMPACITY (1)	COIL LENGTH RETRACTED (FT.)	COIL LENGTH EXTENDED (FT.)	PIGTAIL LENGTH (IN.)
60601	16/3	3 Pole Mini Male/Female	13	1'	5'	12"
60603	16/3	3 Pole Mini Male/Female	13	3'	15'	12"
60621	16/4	4 Pole Mini Male/Female	10	1'	5'	12"
60623	16/4	4 Pole Mini Male/Female	10	3'	15'	12"
60891	18/12	12 Pole Mini Male/Female	6	1'	5'	12"
60893	18/12	12 Pole Mini Male/Female	6	3'	15'	12"
60801	18/3	3 Pole AC Micro Male/Female	4	1'	5'	12"
60803	18/3	3 Pole AC Micro Male/Female	4	3'	15'	12"
60821	18/4	4 Pole AC Micro Male/Female	4	1'	5'	12"
60823	18/4	4 Pole AC Micro Male/Female	4	3'	15'	12"
60811	18/3	3 Pole DC Micro Male/Female	4	1'	5'	12"
60813	18/3	3 Pole DC Micro Male/Female	4	3'	15'	12"
60851	18/4	4 Pole DC Micro Male/Female	4	1'	5'	12"
60853	18/4	4 Pole DC Micro Male/Female	4	3'	15'	12"

NOTE: (1) Ampacities are based on 30˚C ambient and 90˚C conductor temperature. These values are to be used as a guideline and may vary according to the actual cable application.

Chem-Gard™ DC Micro Quick-Connects™

- **300 Volt Rated**
- **Single Key Design**
- **Meets IP68 Requirements for Dust and Water**
- **RoHS Compliant**
- **90°C**

CORD SETS MADE WITH CHEM-GARD™ 200°C CABLE

Unique fluoropolymer cable design provides superior resistance to chemicals and weld splatter. The 200°C temperature rating provides added protection along the cable run in harsh industrial conditions. The cable is designed for continuous flex applications, and the small cable diameter allows for use in areas requiring a tight bend radius.

FULLY BONDED DESIGN

The fluoropolymer cable is fully bonded to the polyurethane head using a unique process providing an IP68 seal against moisture.

SPECIALLY COMPOUNDED NYLON INSERTS

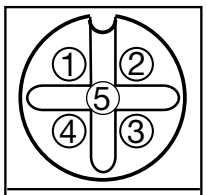
Compatible with all industry standards for DC applications.

SOLID BRASS CONTACT PINS ARE NICKEL COATED AND GOLD PLATED

Provides long life, resists corrosion, easy positive engagement. Ensures electrical integrity in DC applications.

Straight DC Micro Quick-Connect

90° DC Micro Quick-Connect



4 POLE
1. Brown
2. White
3. Blue
4. Black
5. Not Used

APPLICATIONS

- Conveyors
- Pumps
- Motor Operated Valves
- Emergency Isolation Valves
- Kiln Fans
- Furnaces

Chemical Resistance

	ETFE/FEP
Acid	Excellent
Alcohol	Excellent
Alkali	Excellent
Benzol Toluene	Excellent
Degreaser Solvent	Excellent
Gasoline/Kerosene	Excellent
MEK	Excellent
Oil	Excellent
Oxidation Resistance	Excellent
UV Rays	Excellent
Water	Excellent

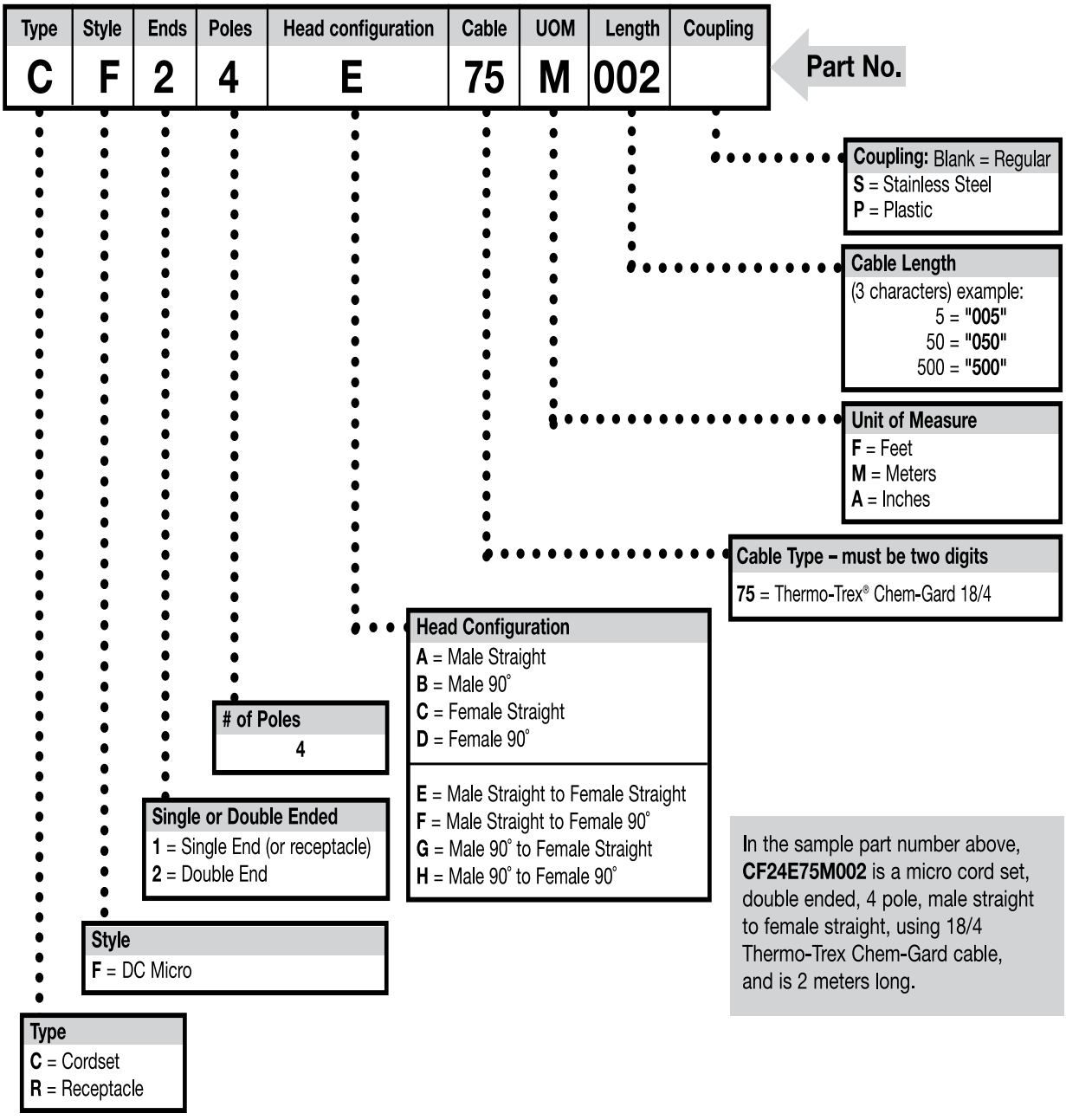
- Broad range of applications
- Withstands extreme cold and heat
- Durable; abrasion resistant
- Chemically resistant; performs in harsh chemical environments
- High flexibility

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.	DESCRIPTION	FEET	METERS
CF14C75M001	4 Pole Straight F	3.28	1
CF14C75M002	4 Pole Straight F	6.56	2
CF14C75M004	4 Pole Straight F	13.12	4
CF14C75M006	4 Pole Straight F	19.68	6
CF14D75M001	4 Pole 90° F	3.28	1
CF14D75M002	4 Pole 90° F	6.56	2
CF14D75M004	4 Pole 90° F	13.12	4
CF14D75M006	4 Pole 90° F	19.68	6
CF24G75M001	4 Pole M 90°/F Straight	3.28	1
CF24G75M002	4 Pole M 90°/F Straight	6.56	2
CF24G75M004	4 Pole M 90°/F Straight	13.12	4

PART NO.	DESCRIPTION	FEET	METERS
CF24E75A020	4 Pole M/F	1.64	0.5
CF24E75M001	4 Pole M/F	3.28	1
CF24E75M002	4 Pole M/F	6.56	2
CF24E75M003	4 Pole M/F	9.84	3
CF24E75M004	4 Pole M/F	13.12	4
CF24E75M005	4 Pole M/F	16.40	5
CF24E75M006	4 Pole M/F	19.68	6
CF24F75A020	4 Pole M Straight/F 90°	1.64	0.5
CF24F75M001	4 Pole M Straight/F 90°	3.28	1
CF24F75M002	4 Pole M Straight/F 90°	6.56	2
CF24F75M003	4 Pole M Straight/F 90°	9.84	3
CF24F75M004	4 Pole M Straight/F 90°	13.12	4
CF24F75M005	4 Pole M Straight/F 90°	19.68	6

Build Your Own Chem-Gard™ DC Micro Quick-Connects™



In the sample part number above, **CF24E75M002** is a micro cord set, double ended, 4 pole, male straight to female straight, using 18/4 Thermo-Trex Chem-Gard cable, and is 2 meters long.

Chem-Gard™ Extreme Duty Stainless Steel M12 DC Micro Quick-Connects™

- **Stainless Steel Connector Construction**
- **Chemical Resistant**
- **250 Volts**
- **4 Amps**
- **Chem-Gard Cable — Excellent Chemical, Heat and Abrasion Resistance**
- **Male and Female Configurations**
- **IP69K Environmental Protection**

Chem-Gard Extreme Duty Quick-Connects have been shown to last 8 to 10 times longer than typical connector assemblies in real world applications. The M12 DC Micro Quick-Connect has a temperature rating of 85°C and -25°C. For those cable runs through hot oil, grease, harsh chemicals, or extreme temperatures, our Chem-Gard cable provides excellent resistance to chemicals and weld splatter and is designed for continuous flex applications while providing protection up to 200°C and -60°C.

The combination of full Stainless Steel M12 Connector bodies and Chem-Gard cable make this one tough connector assembly. Contact your TPC Sales Representative today to learn more about this amazing product.

APPLICATIONS

- Conveyors
- Pumps
- Motor Operated Valves
- Emergency Isolation Valves
- Kiln Fans
- Furnaces

ORDERING INFORMATION *(Call for pricing & availability)*

Connector Assemblies			
PART NO.	**DESCRIPTION**	**FEET**	**METERS**
CW14A75M001S	4P Male Plug	3.27	1
CW14A75M002S	4P Male Plug	6.56	2
CW14A75M004S	4P Male Plug	13.08	4
CW14A75M006S	4P Male Plug	19.67	6
CW14A75M010S	4P Male Plug	31.80	10
CW14C75M001S	4P Female Plug	3.27	1
CW14C75M002S	4P Female Plug	6.56	2
CW14C75M004S	4P Female Plug	13.08	4
CW14C75M006S	4P Female Plug	19.67	6
CW14C75M010S	4P Female Plug	31.80	10
CW24E75M001S	4P M to F Ext. Set	3.27	1
CW24E75M002S	4P M to F Ext. Set	6.56	2
CW24E75M004S	4P M to F Ext. Set	13.08	4
CW24E75M006S	4P M to F Ext. Set	19.67	6
CW24E75M010S	4P M to F Ext. Set	31.80	10

Stainless Steel Field Installable Connectors – DC M12 Micro	
PART NO.	**DESCRIPTION**
30400SS	Female – for 0.120" to 0.215" O.D. Cable
30700SS	Male – for 0.120" to 0.215" O.D. Cable

Closure Caps – Stainless Steel	
PART NO.	**DESCRIPTION**
64801S	Closure Cap for Male Plug – with 6" Chain
64802S	Closure Cap for Female Plug – with 6" Chain

Chem-Gard™ Cable	
PART NO.	**DESCRIPTION**
42804	Chem-Gard 200°C Cable 18 AWG/4c Unshielded

Receptacles – Stainless Steel	
PART NO.	**DESCRIPTION**
RF14T75F004S	Female Panel Mt. Recept. w/Chem-Gard Leads
RF14R75F001S	Male Panel Mt. Recept. w/Chem-Gard Leads
RF14S75F001S	Male Switch Mt. Recept. w/Chem-Gard Leads

TPC WIRE & CABLE CORP. • USA 800-521-7935 • CANADA 800-545-0122 • MEXICO 001-877-283-1696

Build Your Own Chem-Gard™ Stainless Steel Quick-Connects™

Type	Style	Ends	Poles	Head Configuration	Cable	UOM	Length	Coupling
C	W	2	4	E	75	F	005	S

Coupling
S = Stainless Steel

Cable Length
(3 characters) example:
5 = **"005"**
50 = **"050"**
500 = **"500"**

Unit of Measure
F = Feet
M = Meters
A = Inches

Cable Type – must be two digits
75 = Chem-Gard 18/4 Unshielded 200°C #42804

Head Configuration
A = Male Straight
C = Female Straight
E = Male Straight to Female Straight

# of Poles
4

Single or Double Ended
1 = Single End
2 = Double End

Style
W = Field Installable Stainless Steel DC Micro

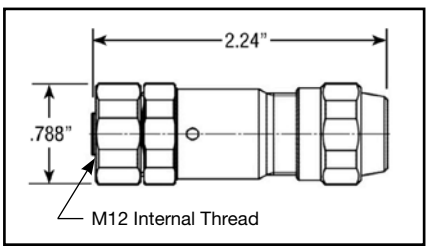
Type
C = Cordset
R = Receptacle

FEATURES AND BENEFITS

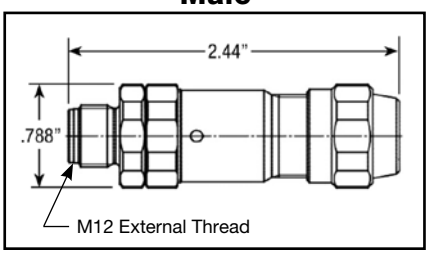
- Suitable for applications in food and beverage industry, chemical plants, and process automation.
- IP69K Rated – Holds up against high pressure spray.
- Resistant to most chemicals, oils and grease.
- TPC's **Chem-Gard** M12 DC Micro Quick-Connects provide outstanding chemical resistance.
- Quick-Connect design allows connectors to be quickly changed "on the fly".
- Purchase the connectors individually or as an assembly with **Chem-Gard** cable.
- Stainless steel closure caps and receptacles also available.

SPECIFICATIONS

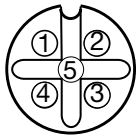
Female



Male



Female Face View



4 POLE

500-Plus Silicone Mini Quick-Connect™ 3-5 Pole Cord Sets

• Rated to 180°C • 600V • IP68 • RoHS Compliant

500-Plus Mini Quick-Connects are designed with a tear-resistant silicone jacket. It is an ideal choice for applications exposed to high temperatures up to 180°C, UV light and mechanical abuse.

ORDERING INFORMATION *(Call for pricing & availability)*

FEMALE PLUGS

PART NO.	DESCRIPTION
CH13C83F003S	Female Plug, 3 Pole, 3 ft.
CH13C83F006S	Female Plug, 3 Pole, 6 ft.
CH13C83F012S	Female Plug, 3 Pole, 12 ft.
CH13C83F020S	Female Plug, 3 Pole, 20 ft.
CH14C84F003S	Female Plug, 4 Pole, 3 ft.
CH14C84F006S	Female Plug, 4 Pole, 6 ft.
CH14C84F012S	Female Plug, 4 Pole, 12 ft.
CH14C84F020S	Female Plug, 4 Pole, 20 ft.
CH15C85F003S	Female Plug, 5 Pole, 3 ft.
CH15C85F006S	Female Plug, 5 Pole, 6 ft.
CH15C85F012S	Female Plug, 5 Pole, 12 ft.
CH15C85F020S	Female Plug, 5 Pole, 20 ft.

90° FEMALE PLUGS

PART NO.	DESCRIPTION
CH13D83F003S	Female Plug 90°, 3 Pole, 3 ft.
CH13D83F006S	Female Plug 90°, 3 Pole, 6 ft.
CH13D83F012S	Female Plug 90°, 3 Pole, 12 ft.
CH13D83F020S	Female Plug 90°, 3 Pole, 20 ft.
CH14D84F003S	Female Plug 90°, 4 Pole, 3 ft.
CH14D84F006S	Female Plug 90°, 4 Pole, 6 ft.
CH14D84F012S	Female Plug 90°, 4 Pole, 12 ft.
CH14D84F020S	Female Plug 90°, 4 Pole, 20 ft.
CH15D85F003S	Female Plug 90°, 5 Pole, 3 ft.
CH15D85F006S	Female Plug 90°, 5 Pole, 6 ft.
CH15D85F012S	Female Plug 90°, 5 Pole, 12 ft.
CH15D85F020S	Female Plug 90°, 5 Pole, 20 ft.

MALE/FEMALE EXTENSION SETS

PART NO.	DESCRIPTION
CH23E83F003S	M/F Ext. Set, 3 Pole, 3 ft.
CH23E83F006S	M/F Ext. Set, 3 Pole, 6 ft.
CH23E83F012S	M/F Ext. Set, 3 Pole, 12 ft.
CH23E83F020S	M/F Ext. Set, 3 Pole, 20 ft.
CH24E84F003S	M/F Ext. Set, 4 Pole, 3 ft.
CH24E84F006S	M/F Ext. Set, 4 Pole, 6 ft.
CH24E84F012S	M/F Ext. Set, 4 Pole, 12 ft.
CH24E84F020S	M/F Ext. Set, 4 Pole, 20 ft.
CH25E85F003S	M/F Ext. Set, 5 Pole, 3 ft.
CH25E85F006S	M/F Ext. Set, 5 Pole, 6 ft.
CH25E85F012S	M/F Ext. Set, 5 Pole, 12 ft.
CH25E85F020S	M/F Ext. Set, 5 Pole, 20 ft.

90° CORD SET FEMALE CORD SET

FULLY BONDED DESIGN
The silicone cable is fully bonded to the silicone head using a unique process providing an IP68 seal against moisture.

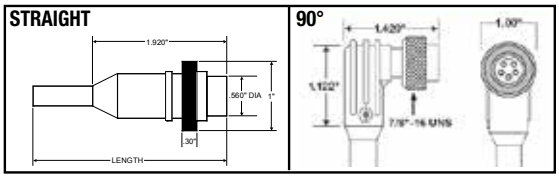
CORD SETS MADE WITH THERMO-TREX 500-PLUS SILICONE CABLE
Silicone cable and head set provides protection to temperatures up to 180°C.

EXTRA LONG GROUNDING PIN
Ensures first-in, last-out contact for safety.

STAINLESS STEEL KNURLED COUPLING RINGS AND RETAINING WASHER
Resists corrosion, provides quick and secure assembly.

SOLID BRASS CONTACT PINS ARE NICKEL COATED AND GOLD PLATED
Provides long life, resists corrosion, easy positive engagement. Excellent for low voltage/low level signal applications.

3, 4, 5 POLE DIMENSIONS



3 POLE	4 POLE	5 POLE
1. Green 2. Black 3. White	1. Black 2. White 3. Red 4. Green	1. White 2. Red 3. Green 4. Orange 5. Black

FACE VIEW OF FEMALE CONNECTORS "A" SIZE (7/8"-16 COUPLING)

CONNECTOR SYSTEMS & ASSEMBLIES

DIN CONNECTORS

7 PIN MOLDED VALVE PLUGS

MILITARY CONNECTORS

RECTANGULAR CONNECTORS

HDLC SERIES CONNECTORS

DIN Connectors

KEY CHARACTERISTICS

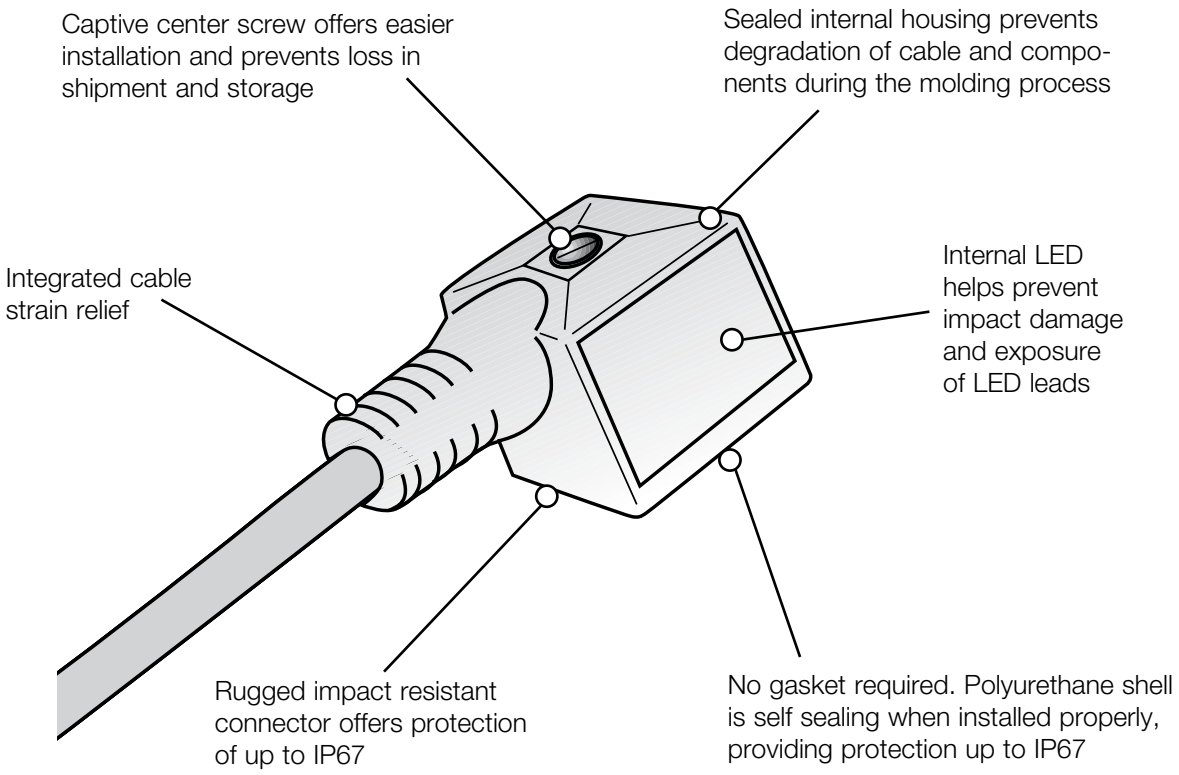
- IP67/NEMA 6 Rated
- Molded Sealed Unit
- White Translucent Body with LED Power Status Indicator
- Varistor Surge Suppression
- No Sealing Gasket Required

Connection Voltage	**6 – 24V AC/DC or 120V AC@ 50/60 Hz**
Nom. Power	**10 amps**
Connection Test Voltage	**250V AC max, 300V DC max**
Suppressor Clamping Voltage	**24V AC/DC - 30V AC Continuous – 38V DC 120V AC - 130V AC Continuous – 170V DC**
Connector Material	**Durable Polyurethane**
Protection Rating	**IP67/NEMA 6**
Cable Type/Color Code	**Trex-Onics® 18/3**
Conductor Size/Color Code	**Green/Yellow, Black (1), Black (2)**
Center Screw	**M3 x 28mm**
Temperature Rating	**-25°C to +80°C (-13°F to +176°F)**

DIN Connector Assemblies

• RoHS Compliant

BLUNT CUT OR WITH A MICRO OR MINI PLUG



SPECIAL CONSTRUCTION FEATURES & BENEFITS

SECURITY YELLOW TREX-ONICS® 18 AWG 3 CONDUCTOR CABLE WITH HEAVY DUTY POLYURETHANE JACKET
A superior first line defense against tearing abrasion, impact, oil, ozone and most chemicals.

RUGGED POLYURETHANE SHELL DESIGN
Resists damage from impact, abrasion, oil and most chemicals.

ZYTEL INSERT
Durable fiberglass filled nylon insert.

MOLDED ASSEMBLY
DIN Plug is secured to the cord to seal the unit, preventing dust and moisture from damaging the internal wiring.

SURGE SUPPRESSION
Built into each Plug to protect against electrical spikes or surges.

SUPER BRIGHT LED STATUS LIGHT
Incorporated into translucent DIN body, protecting LED from damage. Easily visible from multiple angles.

SELF SEALING UNIT
Polyurethane shell seals without the need for a gasket, providing protection up to IP67.

IP67/NEMA 6
Once properly installed the connection is protected from dust, moisture and oil.

ALL POLYURETHANE MICRO OR MINI-HEAD DESIGN
Ensures 100% bonding between jacket and head.

DIN CONNECTORS IN INDUSTRY STANDARD CONFIGURATIONS AVAILABLE WITH TPC TREX-ONICS MINI OR MICRO QUICK-CONNECTS™

DIN 43650 Molded Cable Assemblies

TERMS & TECHNOLOGY

What is DIN?

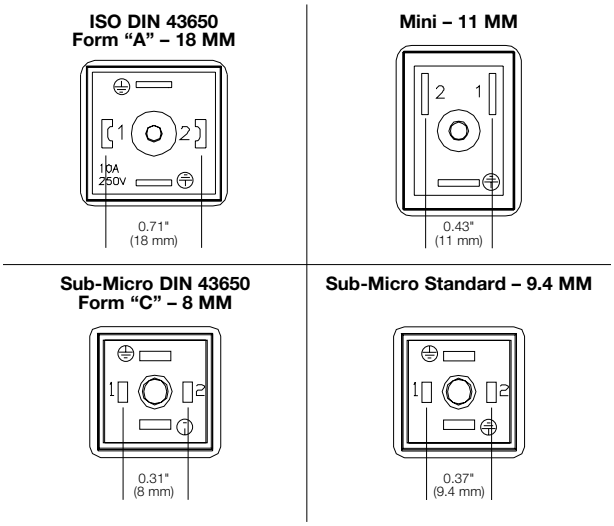
DIN (or Deutsch Industrial Normale) is a series of uniformity standards developed in Germany, which apply to commonly manufactured items.

What is DIN 43650?

DIN 43650 is the standard for a series of electrical connectors, which are commonly used with solenoids (especially those used on valves in hydraulics and pneumatics). Other applications include special sensors, such as pressure switches, optical switches and limit switches.

What does DIN 43650 include?

DIN 43650 is a family of four connectors:



Although their official names are listed on top, we generally refer to them as 18, 11, 9.4 or 8v millimeter, which is the actual spacing between PIN #1 and PIN #2.

How are the connectors applied?

Generally, the female connector is attached to the solenoid valve or sensor and the male Quick-Connect™ side or blunt cut end attaches to the controller. The DIN connectors are offered either as blunt cut cable or with molded mini or micro male Quick-Connects.

Why use a molded assembly?

Molded assemblies provide a more secure installation, offer many technical advantages and save installation time, labor and cost. Hand wiring a DIN connector is very labor intensive. Considering the overall cost of the connector, wire and labor, cable assemblies generally are much less expensive.

What other advantages do molded assemblies offer?

- Solid molded connector offers superior durability
- Impact resistant, with great cable strain relief
- Available in all DIN 43650 pin configurations
- In standard cable lengths of 2, 3, 4, 5 and 6 meters
- With built in LED and suppression

What are the other advantages of our assemblies?

- Tighter surge suppression clamping
- Better circuit ratings
- Solid post molded construction
- Sealed against dirt and moisture
- Shorter profile
- Superior cable for better durability

Why use surge suppression?

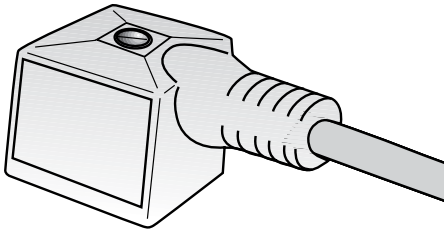
In solenoid valve applications, a magnetic field is created around the coil. When the power is turned off (as the coil is de-energized) the remaining magnetic field collapses back onto the coil. This creates an electrical surge which can exceed 3000 volts (this happens in both AC and DC applications, with operating voltages as low as 12 volts). The resulting surge can cause component damage (both immediate and long term) and create problems with noise interference. Building in surge suppression into the connector, stops the transient surge at the source. The suppressor circuit generally offered with the molded assemblies is a varistor (to be more specific an MOV), which is polarity independent, works with AC and DC and offers a small release delay time.

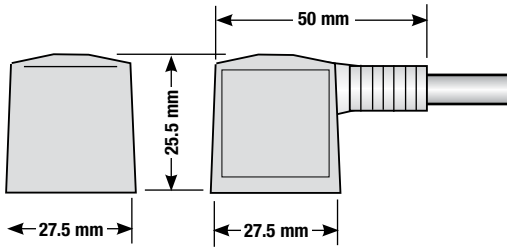
ORDERING INFORMATION *(Call for pricing & availability)*

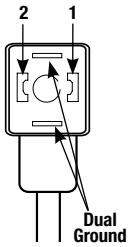
PART NO.	SIZE	STRANDING	NOM. O.D.	WT. (LBS.) PER 1000'
60143	18/3	41/34	0.220	40
60144	18/4	41/34	0.240	45

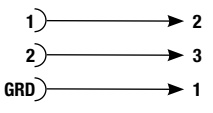
ISO DIN Form "A" — 18 MM

SPECIFICATIONS







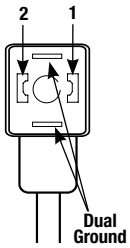


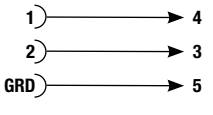
CONNECTOR FACE VIEWS

Mini Male

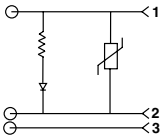
AC Micro Male

ISO DIN Form "A" – 18 MM *COLOR CODE*	
DC 24V	**AC 115V**
1-Black (1)	**1**-Black (1)
2-Black (2)	**2**-Black (2)
3-Green/Yellow	**3**-Green/Yellow





DC Micro Male



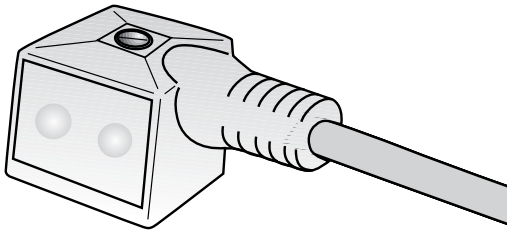
LED INDICATOR & VARISTER SUPPRESSION

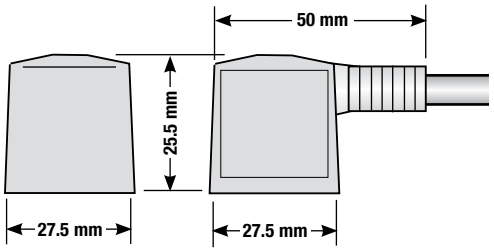
ORDERING INFORMATION *(Call for pricing & availability)*

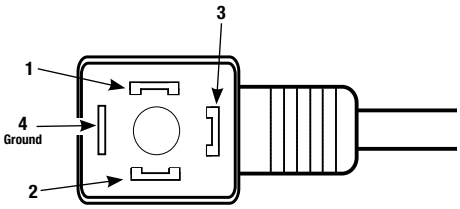
BLUNT CUT PART NO.	AC MICRO PART NO.	DC MICRO PART NO.	MINI PART NO.	DESCRIPTION	CORD LENGTH	
					FEET	METERS
D01134XXAM002	D01134GCAM002	—	D01134LCAM002	18 MM DIN Form A – 115V DIN Conn w/LED & Suppression	6.56	2
D01134XXAM003	D01134GCAM003	—	D01134LCAM003	18 MM DIN Form A – 115V DIN Conn w/LED & Suppression	9.84	3
D01134XXAM004	D01134GCAM004	—	D01134LCAM004	18 MM DIN Form A – 115V DIN Conn w/LED & Suppression	13.12	4
D01134XXAM005	D01134GCAM005	—	D01134LCAM005	18 MM DIN Form A – 115V DIN Conn w/LED & Suppression	16.4	5
D01134XXAM006	D01134GCAM006	—	D01134LCAM006	18 MM DIN Form A – 115V DIN Conn w/LED & Suppression	19.68	6
D01234XXAM002	D01234GCAM002	D01234FCAM002	D01234LCAM002	18 MM DIN Form A – 24V DIN Conn w/LED & Suppression	6.56	2
D01234XXAM003	D01234GCAM003	D01234FCAM003	D01234LCAM003	18 MM DIN Form A – 24V DIN Conn w/LED & Suppression	9.84	3
D01234XXAM004	D01234GCAM004	D01234FCAM004	D01234LCAM004	18 MM DIN Form A – 24V DIN Conn w/LED & Suppression	13.12	4
D01234XXAM005	D01234GCAM005	D01234FCAM005	D01234LCAM005	18 MM DIN Form A - 24V DIN Conn w/LED & Suppression	16.4	5
D01234XXAM006	D01234GCAM006	D01234FCAM006	D01234LCAM006	18 MM DIN Form A - 24V DIN Conn w/LED & Suppression	19.68	6

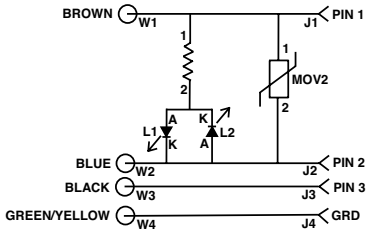
3 Wire Plus Ground DIN — 18 MM

SPECIFICATIONS









LED INDICATOR & VARISTER SUPPRESSION

18 MM (3 WIRE PLUS GROUND)

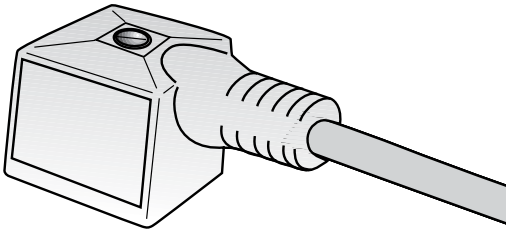
- Molded Sealed Unit – provides IP67/NEMA 6 protection for harsh industrial applications.
- Each unit molded to TPC Trex-Onics® high quality cable for longer life in flexing or torsional applications.
- White translucent body makes LEDs visible from almost any angle.
- No sealing gasket required, no separate gaskets to lose or struggle with when installing product.
- Rugged polyurethane shell offers high durability and versatility.

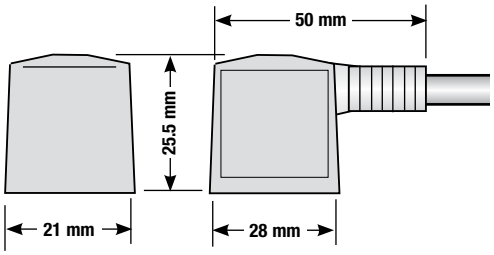
ORDERING INFORMATION *(Call for pricing & availability)*

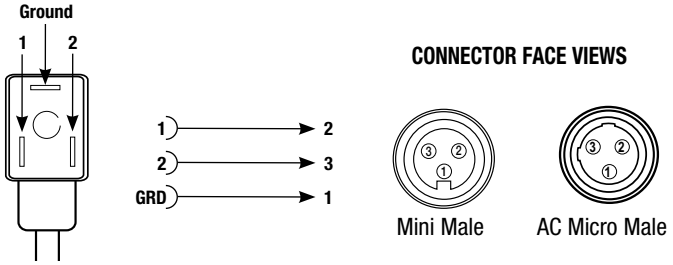
PART NO.	DESCRIPTION	CORD LENGTH	
		FEET	METERS
D05145XXBM002	DIN – 3 Wire Plus Ground 115v (Ground away from cable outlet)	6.56	2
D05145XXBM003	DIN – 3 Wire Plus Ground 115v (Ground away from cable outlet)	9.84	3
D05145XXBM004	DIN – 3 Wire Plus Ground 115v (Ground away from cable outlet)	13.12	4
D05145XXBM005	DIN – 3 Wire Plus Ground 115v (Ground away from cable outlet)	16.4	5
D05145XXBM006	DIN – 3 Wire Plus Ground 115v (Ground away from cable outlet)	19.68	6
D05245XXBM002	DIN – 3 Wire Plus Ground 24v (Ground away from cable outlet)	6.56	2
D05245XXBM003	DIN – 3 Wire Plus Ground 24v (Ground away from cable outlet)	9.84	3
D05245XXBM004	DIN – 3 Wire Plus Ground 24v (Ground away from cable outlet)	13.12	4
D05245XXBM005	DIN – 3 Wire Plus Ground 24v (Ground away from cable outlet)	16.4	5
D05245XXBM006	DIN – 3 Wire Plus Ground 24v (Ground away from cable outlet)	19.68	6

Mini DIN Standard — 11 MM

SPECIFICATIONS

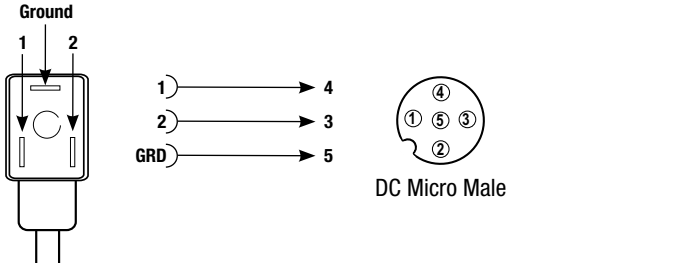


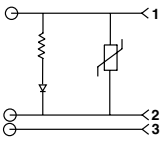




CONNECTOR FACE VIEWS

Mini DIN Connector — 11 MM *COLOR CODE*	
DC 24V	**AC 115V**
1-Black (1)	**1**-Black (1)
2-Black (2)	**2**-Black (2)
3-Green/Yellow	**3**-Green/Yellow





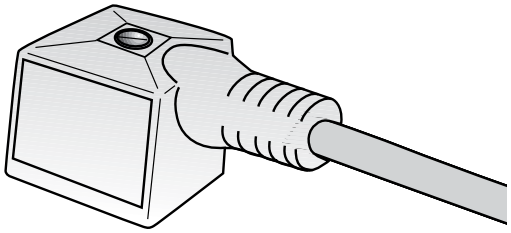
LED INDICATOR & VARISTER SUPPRESSION

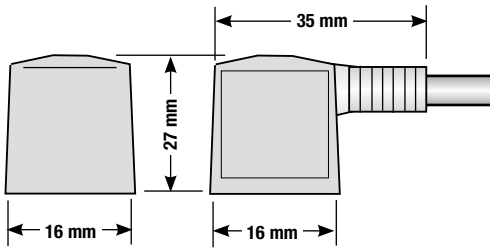
ORDERING INFORMATION *(Call for pricing & availability)*

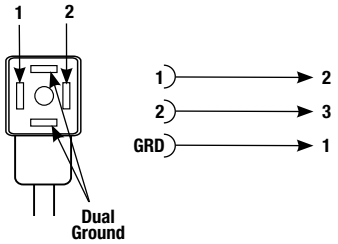
BLUNT CUT PART NO.	AC MICRO PART NO.	DC MICRO PART NO.	MINI PART NO.	DESCRIPTION	CORD LENGTH	
					FEET	METERS
D02135XXAM002	D02135GCAM002	—	D02135LCAM002	11 MM Mini DIN – 115V Conn w/LED & Suppression	6.56	2
D02135XXAM003	D02135GCAM003	—	D02135LCAM003	11 MM Ind Std B – 115V Conn w/LED & Suppression	9.84	3
D02135XXAM004	D02135GCAM004	—	D02135LCAM004	11 MM Ind Std B – 115V Conn w/LED & Suppression	13.12	4
D02135XXAM005	D02135GCAM005	—	D02135LCAM005	11 MM Ind Std B – 115V Conn w/LED & Suppression	16.4	5
D02135XXAM006	D02135GCAM006	—	D02135LCAM006	11 MM Ind Std B – 115V Conn w/LED & Suppression	19.68	6
D02235XXAM002	D02235GCAM002	D02235FCAM002	D02235LCAM002	11 MM Ind Std B – 24V Conn w/LED & Suppression	6.56	2
D02235XXAM003	D02235GCAM003	D02235FCAM003	D02235LCAM003	11 MM Ind Std B – 24V Conn w/LED & Suppression	9.84	3
D02235XXAM004	D02235GCAM004	D02235FCAM004	D02235LCAM004	11 MM Ind Std B – 24V Conn w/LED & Suppression	13.12	4
D02235XXAM005	D02235GCAM005	D02235FCAM005	D02235LCAM005	11 MM Ind Std B – 24V Conn w/LED & Suppression	16.4	5
D02235XXAM006	D02235GCAM006	D02235FCAM006	D02235LCAM006	11 MM Ind Std B – 24V Conn w/LED & Suppression	19.68	6

Sub-Micro DIN Standard — 9.4 MM

SPECIFICATIONS

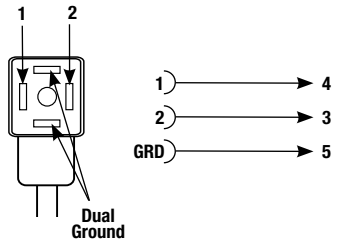


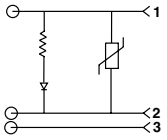




CONNECTOR FACE VIEWS

Sub-Micro DIN Standard — 9.4 MM *COLOR CODE*	
DC 24V	**AC 115V**
1-Black (1)	**1**-Black (1)
2-Black (2)	**2**-Black (2)
3-Green/Yellow	**3**-Green/Yellow





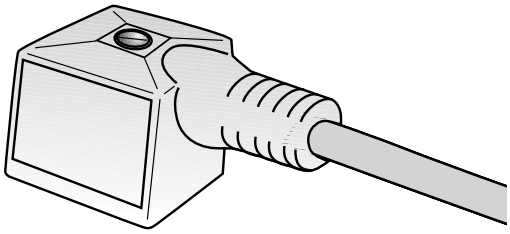
LED INDICATOR & VARISTER SUPPRESSION

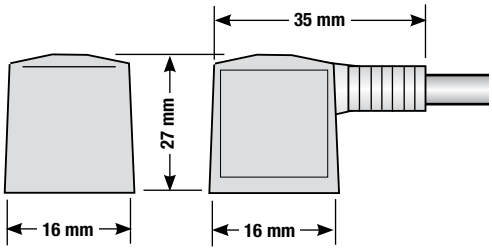
ORDERING INFORMATION *(Call for pricing & availability)*

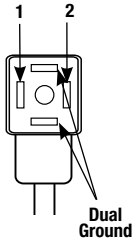
BLUNT CUT PART NO.	AC MICRO PART NO.	DC MICRO PART NO.	MINI PART NO.	DESCRIPTION	CORD LENGTH	
					FEET	METERS
D03134XXAM002	D03134GCAM002	—	D03134LCAM002	9.4 MM Ind Std C – 115V DIN Conn w/LED & Suppression	6.56	2
D03134XXAM003	D03134GCAM003	—	D03134LCAM003	9.4 MM Ind Std C – 115V DIN Conn w/LED & Suppression	9.84	3
D03134XXAM004	D03134GCAM004	—	D03134LCAM004	9.4 MM Ind Std C – 115V DIN Conn w/LED & Suppression	13.12	4
D03134XXAM005	D03134GCAM005	—	D03134LCAM005	9.4 MM Ind Std C – 115V DIN Conn w/LED & Suppression	16.4	5
D03134XXAM006	D03134GCAM006	—	D03134LCAM006	9.4 MM Ind Std C – 115V DIN Conn w/LED & Suppression	19.68	6
D03234XXAM002	D03234GCAM002	D03234FCAM002	D03234LCAM002	9.4 MM Ind Std C – 24V DIN Conn w/LED & Suppression	6.56	2
D03234XXAM003	D03234GCAM003	D03234FCAM003	D03234LCAM003	9.4 MM Ind Std C – 24V DIN Conn w/LED & Suppression	9.84	3
D03234XXAM004	D03234GCAM004	D03234FCAM004	D03234LCAM004	9.4 MM Ind Std C – 24V DIN Conn w/LED & Suppression	13.12	4
D03234XXAM005	D03234GCAM005	D03234FCAM005	D03234LCAM005	9.4 MM Ind Std C – 24V DIN Conn w/LED & Suppression	16.4	5
D03234XXAM006	D03234GCAM006	D03234FCAM006	D03234LCAM006	9.4 MM Ind Std C – 24V DIN Conn w/LED & Suppression	19.68	6

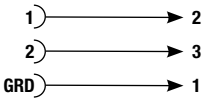
Sub-Micro DIN Form “C” — 8 MM

SPECIFICATIONS







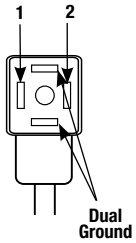


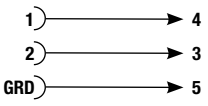
CONNECTOR FACE VIEWS

Mini Male

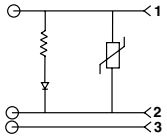
AC Micro Male

Sub-Micro DIN Form “C” — 8 MM *COLOR CODE*	
DC 24V	**AC 115V**
1-Black (1)	**1**-Black (1)
2-Black (2)	**2**-Black (2)
3-Green/Yellow	**3**-Green/Yellow





DC Micro Male



LED INDICATOR & VARISTER SUPPRESSION

ORDERING INFORMATION *(Call for pricing & availability)*

BLUNT CUT PART NO.	AC MICRO PART NO.	DC MICRO PART NO.	MINI PART NO.	DESCRIPTION	CORD LENGTH FEET	CORD LENGTH METERS
D04134XXAM002	D04134GCAM002	—	D04134LCAM002	8 MM DIN Form C– 115V DIN Conn w/LED & Suppression	6.56	2
D04134XXAM003	D04134GCAM003	—	D04134LCAM003	8 MM DIN Form C– 115V DIN Conn w/LED & Suppression	9.84	3
D04134XXAM004	D04134GCAM004	—	D04134LCAM004	8 MM DIN Form C– 115V DIN Conn w/LED & Suppression	13.12	4
D04134XXAM005	D04134GCAM005	—	D04134LCAM005	8 MM DIN Form C– 115V DIN Conn w/LED & Suppression	16.4	5
D04134XXAM006	D04134GCAM006	—	D04134LCAM006	8 MM DIN Form C– 115V DIN Conn w/LED & Suppression	19.68	6
D04234XXAM002	D04234GCAM002	D04234FCAM002	D04234LCAM002	8 MM DIN Form C– 24V DIN Conn w/LED & Suppression	6.56	2
D04234XXAM003	D04234GCAM003	D04234FCAM003	D04234LCAM003	8 MM DIN Form C– 24V DIN Conn w/LED & Suppression	9.84	3
D04234XXAM004	D04234GCAM004	D04234FCAM004	D04234LCAM004	8 MM DIN Form C– 24V DIN Conn w/LED & Suppression	13.12	4
D04234XXAM005	D04234GCAM005	D04234FCAM005	D04234LCAM005	8 MM DIN Form C– 24V DIN Conn w/LED & Suppression	16.4	5
D04234XXAM006	D04234GCAM006	D04234FCAM006	D04234LCAM006	8 MM DIN Form C– 24V DIN Conn w/LED & Suppression	19.68	6

Build Your Own DIN Cord Sets

Plug Style	DIN Conn Style	Voltage	Number of Cond	Ground Position	Head Style	Head Config	Cable Type	UOM	Length
D	01	2	3	4	F	C	A	F	005

Part No.

Length (3 characters)
5 = 005
10 = 010
20 = 020

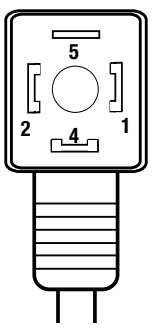
UOM
M = Meters
F = Feet
A = Inches

Cable Type
A = Trex-Onics® (60143)
B = Trex-Onics (60144)

Head Configuration
C = Male Straight
D = Male 90°
X = Blunt Cut

Head Style
F = DC Micro
G = AC Micro
L = Mini (A size)
X = Blunt Cut

Ground Position
1 = Right of Cable Outlet
2 = Left of Cable Outlet
4 = At Cable Outlet
5 = Away from Cable Outlet



Cable Outlet

No. of Conductors
3 = 3 Cond (2 + grd.)
4 = 4 Cond (3 + grd.)

Voltage
1 = 115v
2 = 24v (DC only)

DIN Connector Style
01 = 18MM Varistor & LED (2 wire + grd.)
02 = 11MM Varistor & LED (2 wire + grd.)
03 = 9.4MM Varistor & LED (2 wire + grd.)
04 = 8MM Varistor & LED (2 wire + grd.)
05 = 18MM Varistor & LED (3 wire + grd.)

Plug Style
D = Din

7 Pin Molded Valve Plugs

• Available in Straight & 90° with No Assembly Required • RoHS Compliant

CONSTRUCTION FEATURES & BENEFITS

TREX-ONICS® C-FLEX CABLE
Superior performance in continuous flex applications. TPC's unique cable 18/6 shielded design has been tested to over 25 million cycles without electrical failure.

O-RING SEAL
Each connector head is protected with an o-ring seal. The o-ring compresses when tightened, sealing the connector end from contaminants.

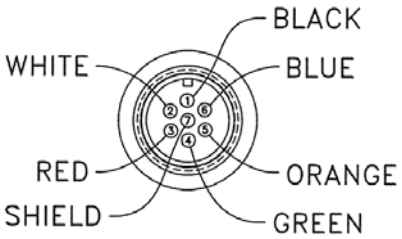
90° OR STRAIGHT CONSTRUCTION
Select the proper configuration for the application.

PUR MOLDED HEAD DESIGN
Rugged polyurethane head is molded to the Trex-Onics cable to provide a sealed connection, eliminating the risk of failure due to contaminants.

COUPLING NUT WITH MACHINED HOLE
Hole can be used to tie down coupling ring and eliminate possible loosening caused by vibration and constant movement. Insures a secure connection in the toughest environments.

THREAD
7/8"-20

FACE VIEW



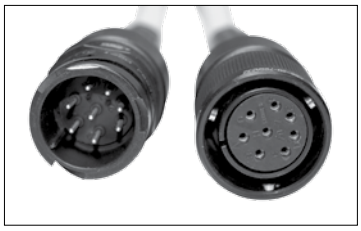
APPLICATIONS

- Used with Atos, Moog, Vickers and Rexroth servo or proportional valves.

ORDERING INFORMATION *(Call for pricing & availability)*

PART NO.		DESCRIPTION	LENGTH (FT.)
STRAIGHT	90°		
77003	**77903**	7 Pin Female Plug	3
77006	**77906**	7 Pin Female Plug	6
77009	**77909**	7 Pin Female Plug	9
77012	**77912**	7 Pin Female Plug	12
77015	**77915**	7 Pin Female Plug	15
77020	**77920**	7 Pin Female Plug	20
77050	**77950**	7 Pin Female Plug	50
77060	**77960**	7 Pin Female Plug	60

Threaded MIL-C-5015



TPC's Circular Connectors are designed and manufactured to MIL-C-5015 standards to operate in most environmental conditions. This connector style has been used in the military for over 50 years with a proven track record. The design is well suited to commercial applications where a rugged threaded connector is required.

TPC has taken the standard MIL-C-5015 design and developed a new back shell that incorporates a sealing grommet and strain relief for added cable life. The shell design is a machined aluminum incorporating a low profile design and a reduced overall length for close quarter installations.

There are over 180 contact layouts available ranging from 1 to 65 positions and up to 150 amps per contact. The standard MIL-C-5015 layouts allow the mixing of power and signal contacts, power only or signal only. Contact sizes range from size 20AWG up to 1/0.

The combination of TPC's High Performance Cable, the proven reliability of the MIL-C-5015 connector and the Flex/Strain Relief of our new back shell design makes for an unbeatable system.

APPLICATIONS

- Earth Moving Equipment
- Engines
- Industrial Machinery
- Mobile Equipment
- Motion Control
- Off-road Vehicles
- Power Generators
- Sensors
- Ships
- Telecommunications

TECHNICAL INFORMATION

OPERATING VOLTAGE/TEST VOLTAGE

SERVICE RATING*	TEST VOLTAGE	SUGGESTED* OPERATING VOLTAGE		AIR SPACING NOM.	CREEPAGE DISTANCE NOM.
		DC	AC		
I	1,000	250	200	—	1/16
A	2,000	700	500	1/16	1/8
D	2,800	1,250	900	1/8	3/16
E	3,500	1,750	1,250	3/16	1/4
B	4,500	2,450	1,750	1/4	5/16

MS connectors show no evidence of breakdown when the test voltages given are applied between the two closest contacts and between the shell and the contacts closest to the shell for a period of one minute per MIL-STD-1344 Method 3001.

**Each insulator has a specific service rating. These should be used by the designer only as a guide.*

Technical Specifications

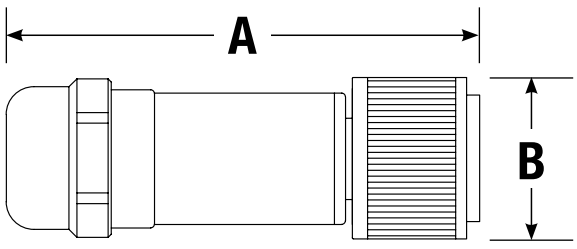
Current Rating & Contact Resistance

CONTACT SIZE	TEST CURRENT	POTENTIAL DROP
16	13 AMPS	49 MILLIVOLTS
12	23 AMPS	42 MILLIVOLTS
8	46 AMPS	26 MILLIVOLTS
4	80 AMPS	23 MILLIVOLTS
0	150 AMPS	21 MILLIVOLTS

Maximum total current to be carried per connector in wire bundles as specified in MIL-W-5088. Contact resistance when tested to MIL-C-39029 will not exceed voltage drops listed in above table.

Wlre Range Sizes	20 to 0 AWG up to 150 amps
Insulation Resistance	>5000 megohms at 77°F (25°C) per MIL-C-5015
Operating Temperature	-55° to +125°C (-67° to +257°F) 60 hrs./185°F 1000 hrs.
Sealing	48 hours in 6 feet of water per MIL-C-5015 Meets 20 day extreme humidity testing per MIL-C-5015 (NOTE: using epoxy backfill option)
Mating Life	100 cycles minimum to MIL-C-5015
Chemical Resistance	20 hour full immersion unmated in hydraulic fluid and lubricating oil per MIL-C-5015 minimum
Vibration	10 to 2,000Hz (15 g's) 10 microseconds maximum discontinuity to MIL-STD-1344 Method 2005 per MIL-C-5015
Shock	50g's, 11ms duration, three major axes 10 microseconds maximum discontinuity to MIL-C-5015
Polarization	Integral key and keyway
Approvals	MIL-C-5015 • VG 95 342

Back Shell Dimensions



SHELL SIZE	A	B
8S	2.302	0.8440
10S	2.302	0.9690
10SL	2.802	1.0000
12, 12S	3.049	1.0620
14, 14S	3.049	1.1560
16, 16S	3.300	1.2500
18	3.300	1.3440
20	3.549	1.4690
22	3.549	1.5940
24	3.594	1.7190
28	4.094	1.9690
32	5.887	2.2190
36	5.887	2.4690

MIL-C-5015 Layout by Number of Contacts

CONTACTS 1

LAYOUT	8S-1	10S-2	12S-4	12-5	16-12	18-7	20-2	22-7
# OF CONTACTS	1-#16	1-#16	1-#16	1-#12	1-#4	1-#8	1-#0	1-#0
SERVICE RATING	A	A	D	D	A	B	D	E

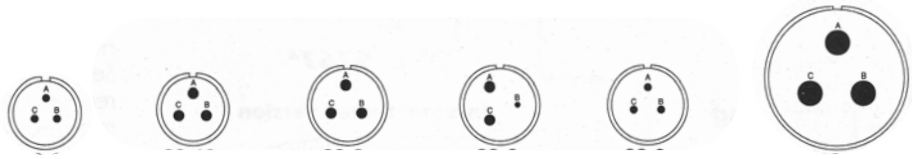
CONTACTS 2

LAYOUT	10SL-4*	12S-3*	14S-9*	16S-4	16-11	18-3	20-23
# OF CONTACTS	2-#16	2-#16	2-#16	2-#16	2-#12	2-#12	2-#8
SERVICE RATING	A	A	D	A	D	A	A

LAYOUT	22-8	22-11	24-9	28-7	32-5
# OF CONTACTS	2-#12	2-#16	2-#4	2-#4	2-#0
SERVICE RATING	E	B	A	D	D

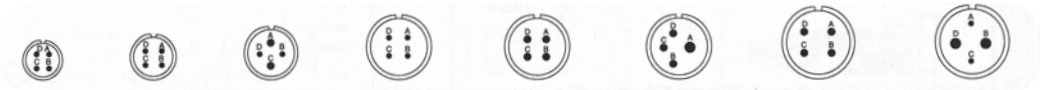
CONTACTS 3

LAYOUT	10SL-3*	14S-1	14S-7*	16S-5	16S-6	16-10*	18-5	18-22
# OF CONTACTS	3-#16	3-#16	3-#16	3-#16	3-#16	3-#12	1-#16; 2-#12	3-#16
SERVICE RATING	A	A	A	A	A	A	D	D



LAYOUT	20-3	20-19	22-2	22-6	22-9	36-4
# OF CONTACTS	3-#12	3-#8	3-#8	1-#16; 2-#8	3-#12	3-#0
SERVICE RATING	D	A	D	D	E	D(A), A(B,C)

CONTACTS 4

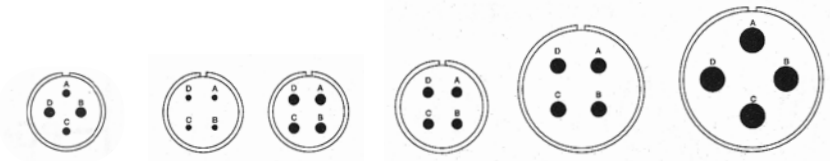


LAYOUT	12SA-10	14S-2*	16-9	18-4*	18-10*	18-13	20-4*	20-24
# OF CONTACTS	4-#16	4-#16	2-#16, 2-#12	4-#16	4-#12	3-#12; 1-#8	4-#12	2-#16; 2-#8
SERVICE RATING	I	I	A	D	A	A	D	A

*Most popular layout

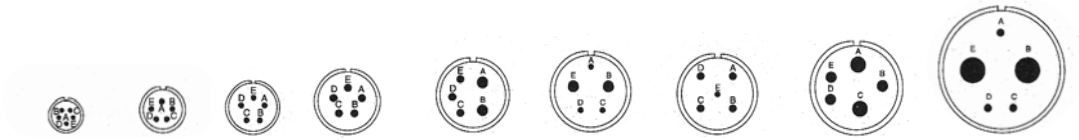
MIL-C-5015 Layout by Number of Contacts

CONTACTS 4 *(Continued)*



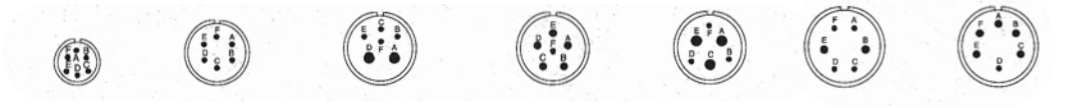
LAYOUT	22-4	22-10	22-22*	24-22*	32-17	36-5
# OF CONTACTS	2-#12; 2-#8	4-#16	4-#8	4-#8	4-#4	4-#0
SERVICE RATING	A	E	A	D	D	A

CONTACTS 5

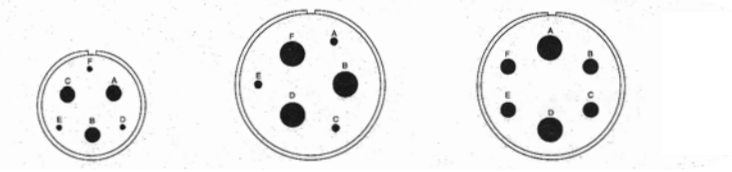


LAYOUT	10SLA-4	14S-5*	16S-8*	18-11*	20-14	22-12	22-13	24-12	34-1
# OF CONTACTS	5-#20	5-#16	5-#16	5-#12	3-#12; 2-#8	3-#16; 2-#8	1-#16; 4-#12	3-#12; 2-#4	3-#12; 2-#0
SERVICE RATING	A	I	A	A	A	D	A(A,D); D(E)	A	E(A); D(balance)

CONTACTS 6

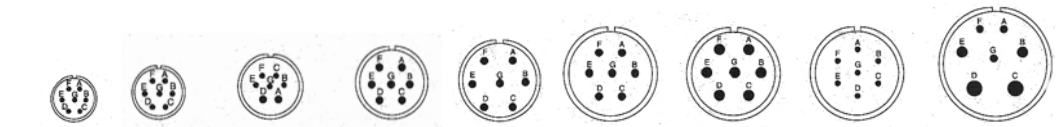


LAYOUT	14S-6*	18-12	20-8	20-17	20-22	22-5	22-15
# OF CONTACTS	6-#16	6-#16	4-#16; 2-#8	1-#16; 5-#12	3-#16; 3-#8	4-#16; 2-#12	1-#16; 5-#12
SERVICE RATING	I	A	I	A	A	D	A(A,B,C,E,F); E(D)



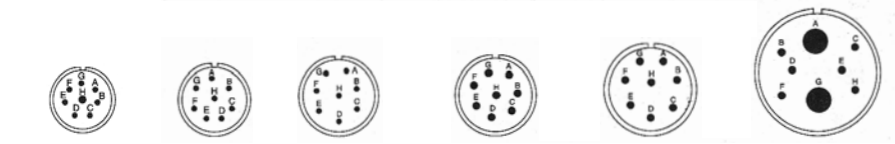
LAYOUT	28-22	36-3	36-6
# OF CONTACTS	3-#16; 3-#4	3-#12; 3-#0	4-#4; 2-#0
SERVICE RATING	D	D	A

CONTACTS 7



LAYOUT	14SA7	16S-1*	18-9	20-15*	22-28	24-2	24-10	24-27	28-10
# OF CONTACTS	7-#16	7-#16	5-#16; 2-#12	7-#12	7-#12	7-#12	7-#8	7-#16	3-#12; 2-#8; 2-#4
SERVICE RATING	I	A	I	A	A	D	A	E	D(G); A(balance)

CONTACTS 8

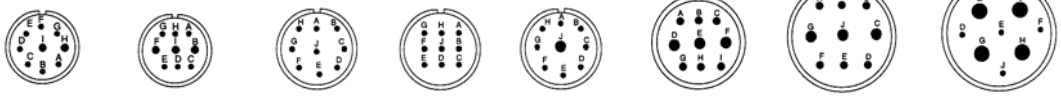


LAYOUT	18-8*	20-7*	22-18	22-23	24-6	32-15
# OF CONTACTS	7-#16; 1-#12	8-#16	8-#16	8-#12	8-#12	6-#12; 2-#0
SERVICE RATING	A	A(C-F); D(A,B,G,H)	A(C-E); D(balance)	D(H); A(balance)	D(A,G,H); A(balance)	D

*Most popular layout

MIL-C-5015 Layout by Number of Contacts

CONTACTS 9



LAYOUT	20-16	20-18*	22-17	22-20	22-27	24-11*	28-1	28A16
# OF CONTACTS	7-#16; 2-#12	6-#16; 3-#12	8-#16; 1-#12	9-#16	8-#16; 1-#8	6-#12; 3-#8	6-#12; 3-#8	5-#16; 4-#4
SERVICE RATING	A	A	D(A); A(balance)	A	D(J); A(balance)	A	D(A,E,J) A(balance)	A

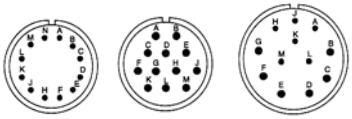
CONTACTS 10

LAYOUT	18-1*	18-19	28-19
# OF CONTACTS	10-#16	10-#16	6-#16; 4-#12
SERVICE RATING	A(B,C,F,G) I(balance)	A	A(C,E,G,J,K,L) B(H,M); D(A,B)

CONTACTS 11

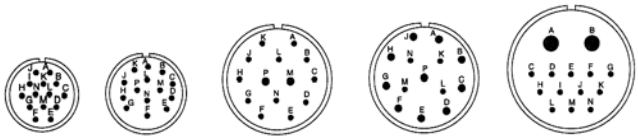
LAYOUT	20-33	24-20	28-14
# OF CONTACTS	11-#16	9-#16; 2-#12	11-#16
SERVICE RATING	A	D	D

CONTACTS 12



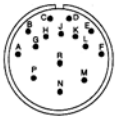
LAYOUT	24-19	24A24	28-9
# OF CONTACTS	12-#16	12-#12	6-#16; 6-#12
SERVICE RATING	A	A	D

CONTACTS 14



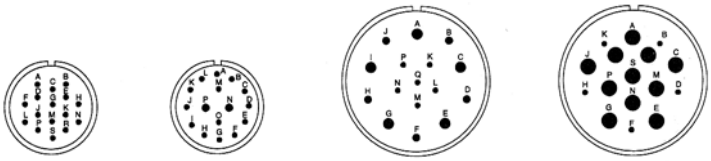
LAYOUT	20-27*	22-19*	28-2	28-20	32-9
# OF CONTACTS	14-#16	14-#16	12-#16; 2-#12	4-#16; 10-#12	12-#16; 2-#4
SERVICE RATING	A	A	D	A	D

CONTACTS 15



LAYOUT	28-17*
# OF CONTACTS	15-#16
SERVICE RATING	A(A-L); B(R); D(M-P)

CONTACTS 16

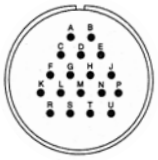


LAYOUT	24-5	24-7*	36-14	36A70
# OF CONTACTS	16-#16	14-#16; 2-#12	6-#16; 5-#12; 5-#8	5-#16; 11-#4
SERVICE RATING	A	A	D	

CONTACTS 17

LAYOUT	20-29*
# OF CONTACTS	17-#16
SERVICE RATING	A

CONTACTS 18

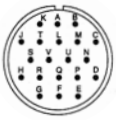


LAYOUT	36A16
# OF CONTACTS	18-#12
SERVICE RATING	A

CONTACTS 19

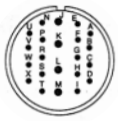
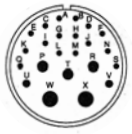
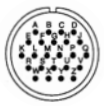
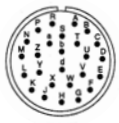
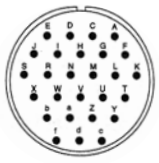
LAYOUT	22-14*
# OF CONTACTS	19-#16
SERVICE RATING	A

CONTACTS 20

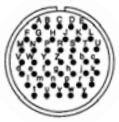
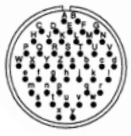
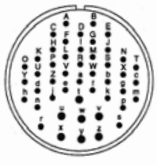
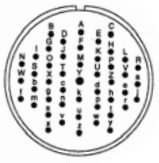


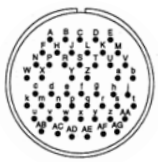
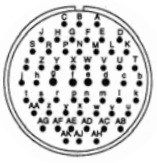
LAYOUT	28-16
# OF CONTACTS	20-#16
SERVICE RATING	A

MIL-C-5015 Layout by Number of Contacts

CONTACTS	22	23	24	26	27
					
LAYOUT # OF CONTACTS SERVICE RATING	**28-11*** 18-#16; 4-#12 A	**32-6** 16-#16; 2-#12; 2-#4; 3-#8 A	**24-28*** 24-#16 I	**28-12*** 26-#16 A	**36A46** 27-#12 A

CONTACTS	30	31	35		
					
LAYOUT # OF CONTACTS SERVICE RATING	**32-8** 24-#16; 6-#12 A A	**36-9** 14-#16; 14-#12; 2-#8; 1-#4	**28-15*** 35-#16 A A(balance)	**32-7*** 28-#16; 7-#12 I(A,B,h,j); A(balance)	**36-15** 35-#16 D(m);

CONTACTS	37	43	47		
					
LAYOUT # OF CONTACTS SERVICE RATING	**28-21*** 37-#16 A	**28A51** 43-#16 A	**32A47** 47-#16 A	**36-7*** 40-#16; 7-#12 A	**36-8** 46-#16; 1-#12 A

CONTACTS	48	52	54	56
				
LAYOUT # OF CONTACTS SERVICE RATING	**36-10*** 48-#16 A	**36A-34** 52-#16	**32A10** 54-#16 A	**36A66** 52-#16; 4-#12 A

*Most popular layout

MIL-C-5015 Layout by Shell Size

LAYOUT	CONTACTS							SERVICE RATING
	TOTAL	20	16	12	8	4	0	
8S-1	1		1					A
10S-2	1		1					A
10SL-3	3		3					A
10SL-4	2		2					A
12S-3	2		2					A
12S-4	1		1					D
12-5	1			1				D
14S-1	3		3					A
14S-2	4		4					I
14S-5	5		5					I
14S-6	6		6					I
14S-7	3		3					A
14S-9	2		2					A
14SA7	7		7					A
16S-1	7		7					A
16S-4	2		2					D
16S-5	3		3					A
16S-6	3		3					A
16S-8	5		5					A
16-9	4		2	2				A
16-10	3		3					A
16-11	2			2				A
16-12	1					1		A
18-1	10		10					A(B,C,F,G) I (all others)
18-3	2			2				D
18-4	4		4					D
18-5	3		1	2				D
18-7	1				1			B
18-8	8		7	1				A
18-9	7		5	2				I
18-11	5			5				A
18-12	6		6					A
18-13	4			3	1			A
18-51	6		6					A
18-52	5			5				A
18-53	6		6					A
18-54	4			4				A
18-56	10		10					A
18-57	6		6					A
18-59	6		6					A
18-60	5			5				A
18-61	6		6					A
18-62	6		6					A
18-63	4			4				A
18-65	6		6					A
18-66	10		10					A
18-67	6		6					A
18-68	5			5				A
18-69	10		10					A
18-70	5			5				A
18-71	4			4				A

MIL-C-5015 Layout by Shell Size

LAYOUT	CONTACTS							SERVICE RATING
	TOTAL	20	16	12	8	4	0	
18-72	4			4				D
18-73	7		5	2				A
18-74	6		6					A
18A31	10		10					A(B,C,F,G) I (all others)
20-2	1						1	D
20-3	3			3				D
20-4	4			4				D
20-7	8		8					A(B,C,F,G) I (all others)
20-8	6		4		2			I
20-14	5			3	2			A
20-15	7			7				A
20-16	9		7	2				A
20-17	6		1	5				A
20-18	9		6	3				A
20-19	3				3			A
20-22	6		3		3			A
20-23	2				2			A
20-24	4		2		2			A
20-27	14		14					A
20-29	17		17					A
20-33	11		11					A
22-2	3				3			D
22-4	4			2	2			A
22-5	6		4	2				D
22-6	3		1		2			D
22-7	1					1		E
22-8	2			2				E
22-9	3			3				E
22-10	4		4					E
22-11	2		2					B
22-12	5		3		2			A
22-13	5		1	4				A(A-D) D(E)
22-14	19		19					A
22-15	6		1	5				A(A-C,E,F) E(D)
22-17	9		8	1				D(A) A(all others)
22-18	8		8					A(C-E) D(all others)
22-19	14		14					A
22-20	9		9					A
22-22	4				4			A
22-23	8			8				D(H) A(all others)
22-27	9		8		1			D(J) A(all others)
22-28	7			7				A
24-2	7			7				D
24-5	16		16					A
24-6	8			8				D(A,G,H) A(all others)
24-7	16		14	2				A
24-9	2					2		A
24-10	7				7			A
24-11	9			6	3			A
24-12	5			3		2		A
24-19	12		12					A

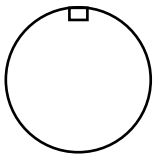
MIL-C-5015 Layout by Shell Size

LAYOUT	CONTACTS							SERVICE RATING
	TOTAL	20	16	12	8	4	0	
24-20	11		9	2				D
24-22	4				4			D
24-27	7		7					E
24-28	24		24					I
24A24	12			12				A
28-1	9			6	3			D(A,E,J) A(all others)
28-2	14		12	2				D
28-7	2					2		D
28-9	12		6	6				D
28-10	7			3	2	2		D(G) A(all others)
28-11	22		18	4				A
28-12	26		26					A
28-14	11		11					D
28-15	35		35					A
28-16	20		20					A
28-17	15		15					A(A-L) B(R) D(M-P)
28-19	10		6	4				A
28-20	14		4	10				A
28-21	37		37					A
28-22	6		3			3		D
28A16	9		5			4		A(E), I (all others)
28A51	43		43					A
32-5	2						2	D
32-6	23		16	2	3	2		A
32-7	35		28	7				I(A,B,H,J) A(all others)
32-8	30		24	6				A
32-9	14		12			2		D
32-15	8			6			2	D
32-17	4					4		D
32A10	54		54					
32A47	47		47					A
36-3	6			3			3	D
36-4	3						3	A(B,C) D(A)
36-5	4						4	A
36-6	6					4	2	A
36-7	47		40	7				A
36-8	47		46	1				A
36-9	31		14	14	2	1		A
36-10	48		48					A
36-14	16		6	5	5			D
36-15	35		35					D(M) A(all others)
36A34	52		52					A
36A46	27			27				A
36A70	16			5		11		I

Build Your Own Military Connector Assembly

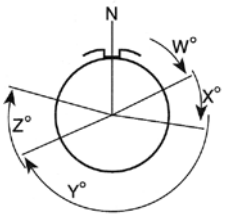
The chart below lists components with which to "build" the exact assembly needed. Begin at left with column **1**. Select a code line and write the letters in the box at the top of the column. Next, in column **2**, identify the layout. Write the number in the box at the top of the column. Select components from all remaining columns, writing the code letters and/or numbers chosen in the box at the top of each column. See example below.

1	2	3	4
MC	363	A	4
CODE LINE	**INSERT LAYOUT**	**END 1**	**BACKEND HARDWARE END 1**
MB Bayonet 5015 (IP69K Rated)	Select Insert Layout from charts on pages 272-275, 282 & 286.	**StraightPlug** **A** Male **B** Female	**1** No Mesh/ No Epoxy
MC Threaded 5015		**90° Plug** **C** Male **D** Female	**2** No Mesh/ With Epoxy
ME Bayonet 26482 Series 1		**Panel Mount Receptacle*** **E** Male **F** Female	**3** Mesh/ No Epoxy
MF Bayonet 26482 Series 2		**In-Line Receptacle** **G** Male **H** Female	**4** Mesh/ With Epoxy
			5 Molded Back End
			9 Pigtails for Panel Mount Receptacle*
			Mesh is *NOT* recommended for high flexing applications



NORMAL INSERT ROTATION STANDARD

*Panel Mount Receptacles are supplied with 16 AWG blue MTW cable



MATING FACE VIEW OF PIN INSERTS

If an alternate ***insert position*** or ***special pinout*** is required, contact a TPC Sales Representative or our Customer Service Department.

5	6	7	8	9
B	4	87193	F	070
END 2	**BACKEND HARDWARE END 2**	**CABLE TPC PART NO.**	**UNIT OF MEASURE**	**LENGTH**
Straight Plug **A** Male **B** Female **90° Plug** **C** Male **D** Female **In-Line Receptacle** **G** Male **H** Female	**1** No Mesh/ No Epoxy **2** No Mesh/ With Epoxy **3** Mesh/ No Epoxy **4** Mesh/ With Epoxy **5** Molded Back End **0** None Mesh is ***NOT*** recommended for high flexing applications	List TPC Cable Part Number or **PT** for Pigtails* ***NOTE:*** If using a shielded cable and shield requires termination, contact TPC	**F** = Feet **M** = Meters **A** = Inches	Enter a three digit code in box above *i.e.* **5=005** **50=050** **500=500** *etc.*

EXAMPLE

After you finish "building" an assembly, the combination of numbers and letters represent the part number you should order. ***For example . . .***
a threaded 5015 with insert layout 36-3; end 1 has straight male plug with epoxy/mesh backend hardware; end 2 has straight female epoxy/mesh backend hardware; with 70 feet of 87193 Super-Trex cable would have the part number **"MC 363 A4B4 87193 F070".** Its that easy!

Rectangular Multi-Conductor Connector Assemblies

Designed for Industrial Applications

ALL OF OUR ASSEMBLIES INCLUDE:

SUPER-TREX® & TREX-ONICS® CABLES
Proven performers in industrial environments where flexing, abrasion, impact and oil can cause premature cable failure.

PRODUCT TESTING
All assemblies are 100% tested for continuity and configuration. Ensures Out-of-the-Box reliability.

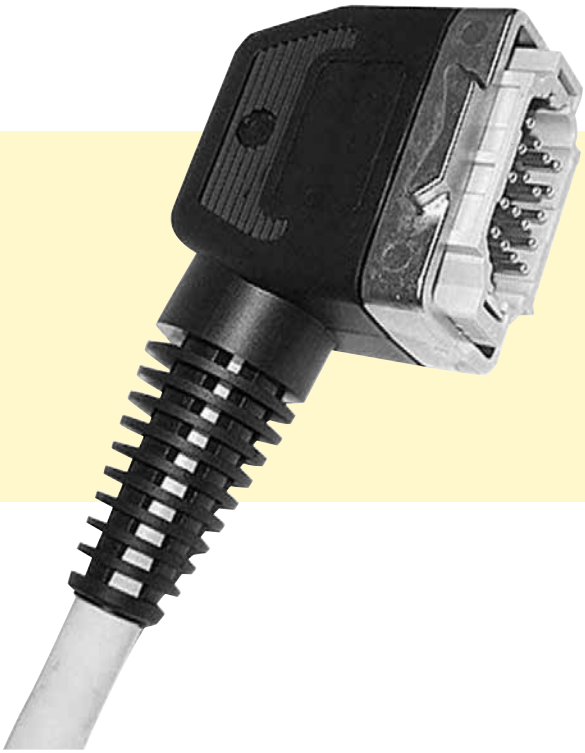
CUSTOM LENGTHS
Helps to eliminate excessive cable on the application, reduces cost.

ENGINEERING SUPPORT
For those non-standard applications requiring special wiring and design.

TPC Wire & Cable Corp., Your Source for Rectangular Connector Assemblies

Molded Assemblies

Designed for Industrial Applications



FEATURES & BENEFITS

SUPER-TREX® OR TREX-ONICS®
High Performance Cables designed for abusive industrial applications.

BUILT-IN STRAIN RELIEF
Eliminates the need for Mesh or Grip-Seal™ strain relief. Provides 250 lbs. of pull-out protection.

TAMPER PROOF
Molded design seals and protects the terminations from tampering or miss-wiring.

Available in the following configurations...

Han EE 90˚ – available in 10, 18, 32 and 46 position
Straight available – 32 position

Han E 90˚ – available in 10, 16 and 24 position
Straight available – 16 position

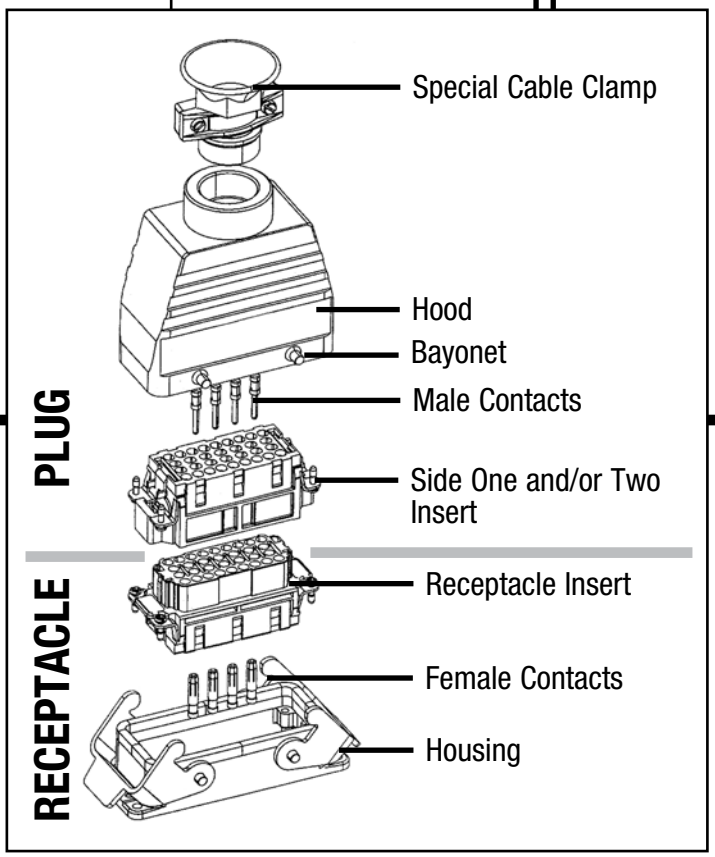
Han DD 90˚ – available in 24 position

TPC Wire & Cable Corp., Your Source for Molded Assemblies

Build Your Own Rectangular Connector Assemblies

END 1

TR	A16	M	T	D	M
TR	**Series No. of Contacts**	**Gender**	**Hood**	**Latching**	**Strain Relief**
TR TPC Rectangular Connector	**A** 3, 4, 10, 16, 32 **D** 7, 8, 15, 25, 40, 50, 64 **DD** 24, 42 **E** 6, 10, 16, 24, 32, 48 **EE** 10, 18, 32, 46, 64	**M** Male **F** Female	**T** Top Entry **S** Side Entry **CT** Cable to Cable Top Entry **CS** Cable to Cable Side Entry **Receptacle Housing** **J** Surface Single Entry **K** Surface Double Entry **M** Bulkhead	**D** Double Latch **S** Single Latch **E** Double Bayonet **R** Single Bayonet	**M** Mesh **G** Grip-Seal **R** Receptacle Pigtails



HOW TO ORDER

After completing the chart above, call your TPC Representative to answer any questions, verify your requirements and place your order.

The chart below lists components with which to "build" the exact assembly needed. Begin at left with the first column. Write a **"TR"** in the box at the top of the column. From the next column, identify the series. Write the appropriate letter in the box at the top of the column. Select components from all remaining columns, writing the desired letters or numbers chosen in the box at the top of each column.

END 2

F	S	D	M	88516	F	010
Gender	**Hood**	**Latching**	**Strain Relief**	**Cable Part No.**	**Unit of Measure**	**Length**
M Male **F** Female **Z** None	**T** Top Entry **S** Side Entry **CT** Cable to Cable Top Entry **CS** Cable to Cable Side Entry **Z** None	**D** Double Latch **S** Single Latch **E** Double Bayonet **R** Single Bayonet **Z** None	**M** Mesh **G** Grip-Seal **Z** None **If single ended assembly or receptacle** **B** Blunt End **L** Labeled	If assembly, use TPC cable part number Receptacle Pigtails **A** All Red* **B** All Blue* (standard) *Numbered Conductors	**F** = Feet **M** = Meters **A** = Inches	Enter a three digit code in box above *i.e.* **5=005** **50=050** **500=500** *etc.*

Standard wiring pinout is on next page — if a different pinout is required, the ***SMART PART NUMBER*** cannot be used. For a special wiring pinout, please call for a special part number.

NOTES

Number of Contacts: Smart part number is limited to 64 contacts. If more contacts are desired, contact a TPC Sales Representative.

Contact Type: Silver-Crimp is standard. For screw terminals contact a TPC Sales Representative for availability.

Hood Type: The High Hood is standard. The Low Hood is typically used when there is a clearance issue. If clearance is a factor, contact a TPC Sales Representative.

Latching: Double latches are becoming the standard in the market. Bayonet references the pins or pegs that the latches grab onto to lock the connector down. Typically the latches are on the receptacle and the bayonets are on the assembly.

Cable: TPC cable is used on assemblies. Receptacles are red or blue pigtails. If receptacle color code needs to be the same as the cable, enter the cable part number for the receptacle.

Cable Exit: On side entry assemblies the cable exit will be away from position #1 on the insert. If needed the other way, contact a TPC Sales Representative.

Smart Part Number
Rectangular Pinout Standard

Non-Shield Cable

For non-shielded color coded cable the green conductor will connect to ground pin.

For non-shielded cables with all black conductors the last conductor will be connected to the ground pin.

If the insert has more contacts than the cable has conductors then the ground pin will still be used in place of a contact.

In the case of more conductors than contacts, the extra conductors will be spares.

Example

Black – Pin 1
White – Pin 2
Red – Pin 3
Green – Ground Screw
Orange – Pin 4
Etc.

Overall Shielded Cable

For shielded cable the shield will always be connected to the ground pin.

Example

Black – Pin 1
White – Pin 2
Red – Pin 3
Green – Pin 4
Orange – Pin 5
Shield – Ground Screw

Individually Shielded Cable

Individual shields will be trimmed out and overall shield will be connected to ground pin.

Example

PR1
Black – Pin 1
Red – Pin 2
Individual Shield – Cut out

PR2
Black – Pin 3
White – Pin 4
Individual Shield – Cut out
Overall Shield – Ground Screw

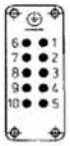
A
250V
16 Amp

Contact arrangement female mating view

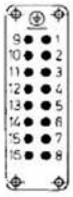
3 + Grd

4 + Grd

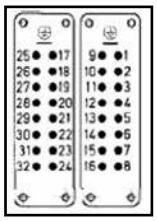
10 + Grd



16 + Grd



32 + Grd
(2 - 16 pole inserts in 1 hood)



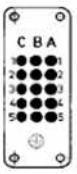
D
250V
10Amp

Contact arrangement female mating view

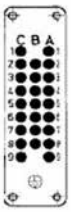
7 + Grd

8

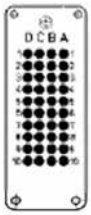
15 + Grd



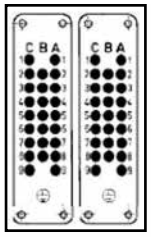
25 + Grd



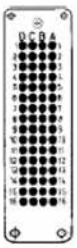
40 + Grd



50 + Grd
(2 - 25 pole inserts in 1 hood)



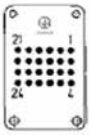
64 + Grd



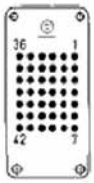
DD
250V
10 Amp

Contact arrangement female mating view

24 + Grd



42 + Grd

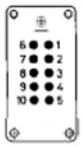


E
500V
16 Amp

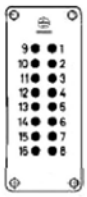
Contact arrangement female mating view

6 + Grd

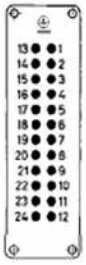
10 + Grd



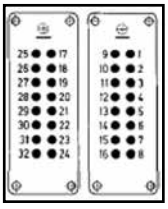
16 + Grd



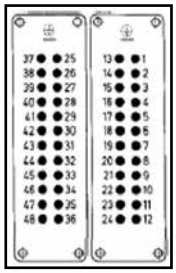
24 + Grd



32 + Grd
(2 - 16 pole inserts in 1 hood)



48 + Grd
(2 - 24 pole inserts in 1 hood)

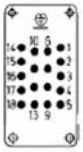


EE
500V
16 Amp

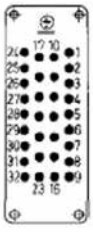
Contact arrangement female mating view

10 + Grd

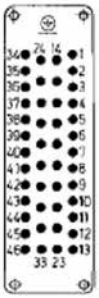
18 + Grd



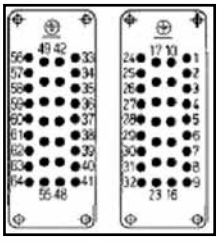
32 + Grd



46 + Grd



64 + Grd
(2 - 32 pole inserts in 1 hood)



Connector Assemblies

Introducing the HDLC Series

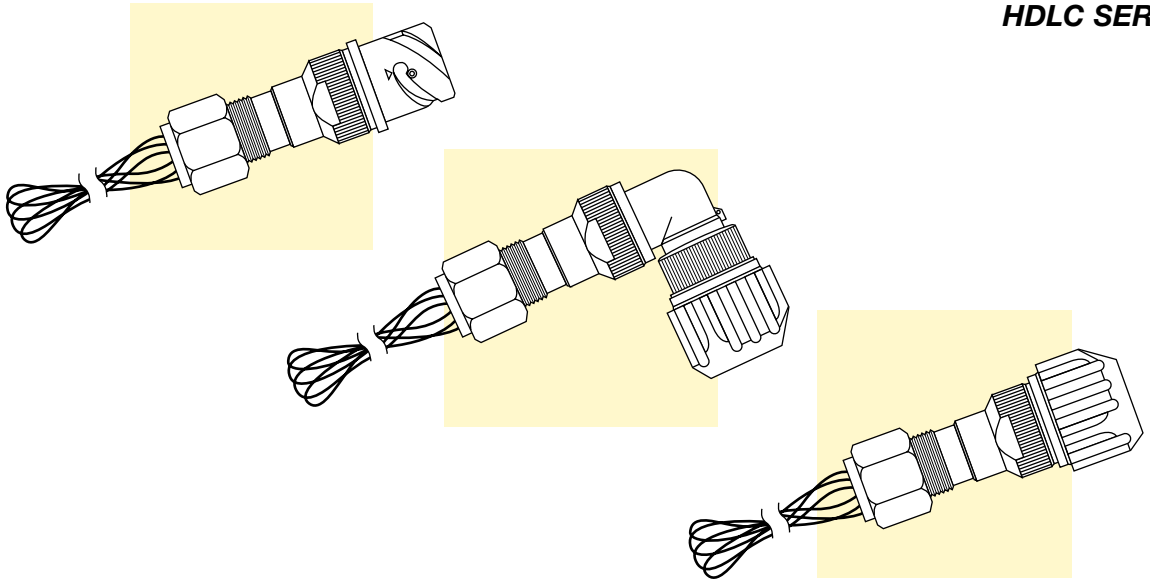
Heavy Duty Locking Connectors

The most advanced line of connectors available according to MIL-C-5015 and VG95234. They were developed specifically to meet the demands of industrial environments. The HDLC connector series has the same lay-out arrangements as MIL-C-5015, with advanced features that are engineered specifically for those applications where inexpensive and weak connectors often fail and cause injury or damage.

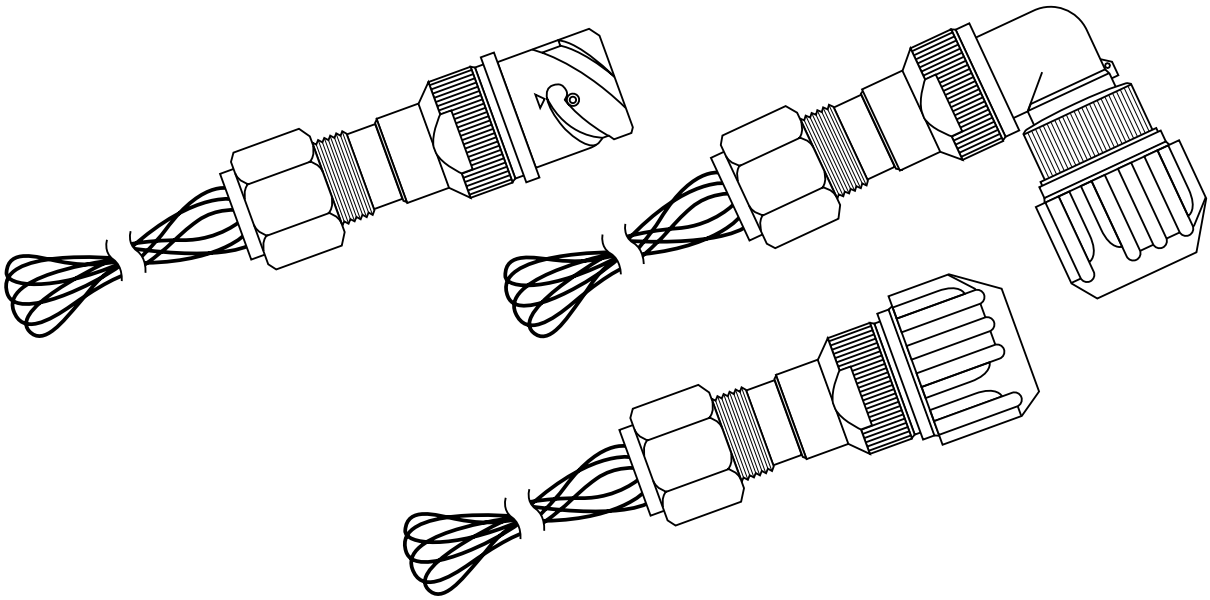
The HDLC Series shares the same shell dimensions, contact layouts, and electrical performance characteristics as the common MIL-C-5015 connectors with the following application engineered features that make the HDLC Series the ideal “bulletproof” choice for your applications:

- Superior three-quarter turn reverse bayonet coupling system.
- Rubber covered coupling ring for superior grip and damage prevention.
- Superior sealing and strain relief system.
- First-mate, last-break screw machined crimp contacts for reliability and safety.
- Over 91 contact layouts available with wire sizes from 16 AWG to 0 AWG.
- Superior shock and vibration resistant design.
- Environmentally friendly black zinc shell plating. (No cadmium)
- And much, much more…

HDLC SERIES



HDLC Series Connectors
Heavy Duty Locking Connectors



THREE QUARTER TURN REVERSE BAYONET COUPLING SYSTEM
Easy to connect and disconnect, positive locking indent prevents accidental uncoupling.

RUBBER COVERED COUPLING RING
Protects the nut against damage from impact, provides a large non-slip gripping surface for easy mating.

ENVIRONMENTALLY SEALED
The inserts of the HDLC are environmentally sealed to protect the connection against oil, water and chemical contamination. The endbells are sealed with a tapered grommet sized to the specific cable providing a waterproof seal.

MESH STRAIN RELIEF
Each assembly end comes with a double weave strain relief for pull-out protection as well as flex relief for the cable.

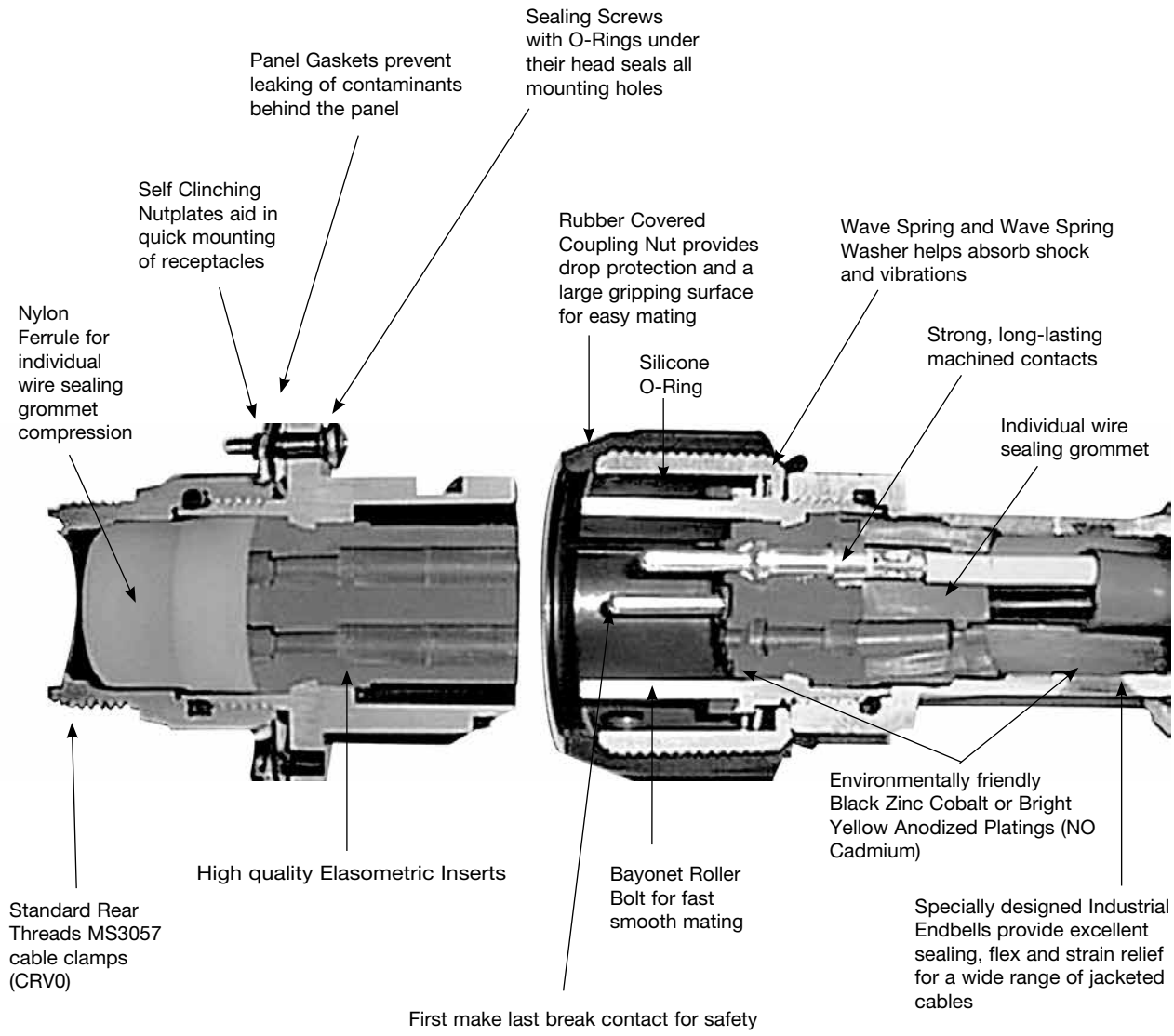
FIRST MATE – LAST BREAK CONTACT
An extended ground pin insures first mate/last break contact for safety.

MACHINED CONTACTS
All contacts are machined, not stamped. This produces a heavier industrial contact that is less likely to crack or break during the crimp process.

SUPERIOR SHOCK AND VIBRATION RESISTANCE
Each connector contains a wave spring and wave spring washer designed to absorb shock and vibration in the coupler before it reaches the contacts. This helps to eliminate pin elongation and damage that may cause arcing and connector failure.

AVAILABLE IN AWG SIZES RANGING FROM #18 TO #1/0
The HDLC connector accepts a wide range of Gauge sizes and configurations to meet your connector needs.

HDLC Series Connectors
Heavy Duty Locking Connectors



Your first choice in
Industrial Connector Systems

Technical Specifications

Materials & Finishes

Shell	Aluminum alloy (Shells can be grounded)
Plating	Black zinc cobalt, bright yellow anodized
Contacts	Copper alloy
Platings	Hard silver plating
Insulator	Resilient polychloroprene (Neoprene)
Seals	Neoprene

Electrical Data

The indicated values for the "operating voltage" are limits concerning the electrical function. In any case, when the working voltage exceeds 50V, safety precautions must be in accordance with the following standards: VDE 0100, IEC 309-1 or applicable national standards.

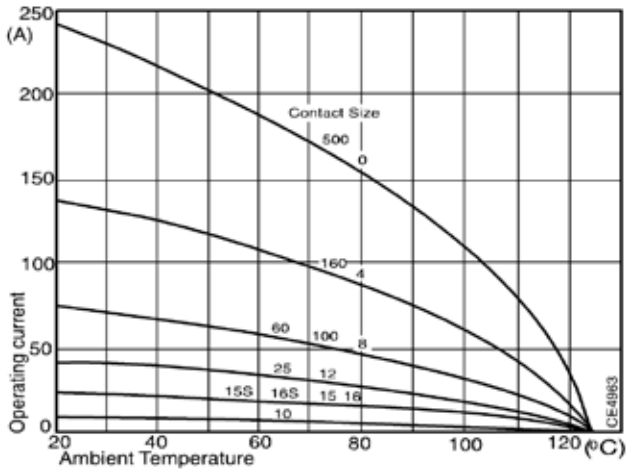
Operating Voltage/Test Voltage According to MIL-C-5015

SERVICE RATING	OPERATING VOLTAGE		TEST VOLTAGE AC VRMS
	DC V	AC VRMS	
I	250	200	1,000
A	700	500	2,000
D	1,250	900	2,800
E	1,750	1,250	3,500
B	2,450	1,750	4,500

Current Rating at 68˚ F (+20˚C)

CONTACT SIZE	MAX. CURRENT (AMPS)
16/16S	22
12	41
8	74
4	135
0	245

Current Rating (by ambient temperature)



Wire Range Sizes 26 AWG to 0 AWG *(See contact selection on page 306-309)*.

Contact Resistance

Tested according to VG95234 Test 5.10.

CONTACT SIZE	CONTACT RESISTANCE MILLIOHM MAX
16/16S	6
12	3
8	1
4	0.5
0	0.2

Technical Specifications

Mechanical	*Insulation Resistance*	>1000 Megohm According to VG 95 319 Test 5.12 and VG 95 210 Part 32, Test condition B.
	Operating Temperature	-55° to +125°C (-67° to +257°F)
Sealing	Fully submersible to 1 bar (35 feet) when mated. Meets IP67, DIN 40 050, VG 95 234.	

Wire Sealing Range

The connector is designed for individual wire sealing. Sealing of an outer cable jacket on multiconductor cables is accomplished with the sealed endbell. Sealing is only guaranteed if wires according to MIL-W-5086 or within the listed ranges are used.

CONTACT SIZE	**WIRE SIZE** (MIL-W-5086)	**INSULATION O.D. LIMIT** (IN.)	
		MIN. (MM.)	**MAX.** (MM.)
16/16S	16	0.087 (2.2)	0.110 (2.8)
12	12	0.122 (3.1)	0.138 (3.5)
8	8	0.220 (5.6)	0.256 (6.5)
4	4	0.335 (8.5)	0.370 (9.4)
0	0	0.452 (11.5)	0.512 (13.0)

Mating Life	2,000 cycles minimum (commercial) 500 cycles minimum (to VG 95 234)
Salt Spray	Salt-spray resistant platings
Heat	+125°C (+257°F) for 1000 hours
Chemical Resistance	Tested un-mated and mated according to VG 95 234 for hydraulic fluid, lubricating oil, fuels, humidity, water, salt water, solvents, and corrosion resistance.
Vibration	200 m/s^2 at 10 to 2,000 Hz. To VG 95 234 Test 5.16
Shock	50g 11ms, three major axes. To VG 95 234 Test 5.17
Contact Type	Hard silver crimp
No. of Circuits	1 to 65
Contact Insertion	From rear with simple hand tool. Removable, 5 cycles minimum.

Contact Retention

Pin and socket contacts are designed to resist severe vibration and repeated connection and disconnection. Contact retention and separation is tested according to VG 95 319 Part 2. Contact retention to test 5.4 with test force in mating direction. Separations force test 5.7 using required test gauge.

CONTACT SIZE	**RETENTION FORCE NEWTONS** (LBS.)		**SEPARATION FORCE MIN. NEWTONS** (LBS.)		**GAUGE**
16	35"	(7.9)	1"	(0.22)	G 1.56
12	55"	(12.4)	1.5"	(0.34)	G 2.36
8	80"	(18.0)	3"	(0.67)	G 3.58
4	90"	(20.2)	4"	(0.90)	G 5.69
0	95"	(21.4)	8.5"	(1.9)	G 9.04

Layout by Number of Contacts

VIEW FROM MATING FACE OF PIN INSULATOR ***= MOST POPULAR LAYOUTS**

3 CONTACTS





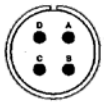
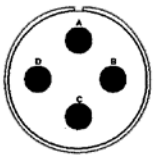

LAYOUT	20-3	20-6	20-19	22-2	22-9	22-21
# OF CONTACTS	3-#12	3-#16	3-#8	3-#8	3-#12	2-#16; 1-#0
SERVICE RATING	D	D	A	D	E	A

4 CONTACTS



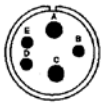


LAYOUT	20-24	22-4	22-10	22-22*	24-4
# OF CONTACTS	2-#16; 2-#8	2-#12; 2-#8	4-#16	4-#8	3-#16; 1-#0
SERVICE RATING	A	A	E	A	D

LAYOUT	24-22*	36-5
# OF CONTACTS	4-#8	4-#0
SERVICE RATING	D	A

5 CONTACTS

LAYOUT	22-12	24-12
# OF CONTACTS	3-#16; 2-#8	3-#12; 2-#4
SERVICE RATING	D	A

6 CONTACTS


LAYOUT	20-8	20-22
# OF CONTACTS	4-#16: 2-#8	3-#16; 3-#8
SERVICE RATING	I	A

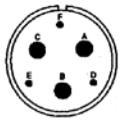
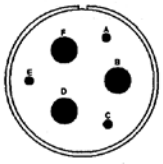
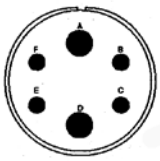
(6 CONTACTS - Continued on next page)

Layout by Number of Contacts

VIEW FROM MATING FACE OF PIN INSULATOR ***= MOST POPULAR LAYOUTS**

6 CONTACTS

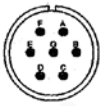
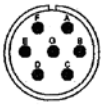
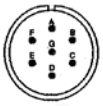


LAYOUT	22-5	22-15	28-22	36-3	36-6
# OF CONTACTS	4-#16; 2-#12	1-#16; 5-#12	3-#16; 3-#4	3-#12; 3-#0	4-#4; 2-#0
SERVICE RATING	D	A(A,B,C,E,F); E(D)	D	D	A

7 CONTACTS

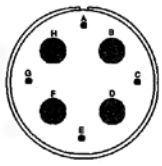



LAYOUT	20-15*	22-28	24-2	24-10	24-27	28-10
# OF CONTACTS	7-#12	7-#12	7-#12	7-#8	7-#16	3-#12; 2-#8; 2-#4
SERVICE RATING	A	A	D	A	E	D(G); A(balance)

8 CONTACTS



LAYOUT	20-7*	22-18	22-23	36A35
# OF CONTACTS	8-#16	8-#16	8-#12	4-#16; 4-#0
SERVICE RATING	A(C-F); D(A,B,G,H)	A(C-E); D(balance)	D(H); A(balance)	A

9 CONTACTS





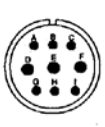
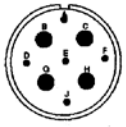
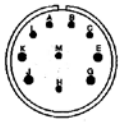
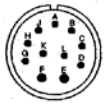

LAYOUT	20A9	20-16	20-18*	22-16	22-20	22-27
# OF CONTACTS	9-#12	7-#16; 2-#12	6-#16; 3-#12	6-#16; 3-#12	9-#16	8-#16; 1-#8
SERVICE RATING	D(J); all others I	A	A	A	A	D(J); A(balance)

(9 CONTACTS - Continued on next page)

Layout by Number of Contacts

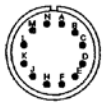
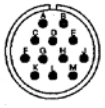
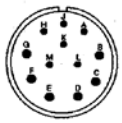
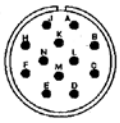
VIEW FROM MATING FACE OF PIN INSULATOR ***= MOST POPULAR LAYOUTS**

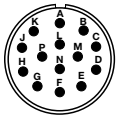
9 CONTACTS / 10 CONTACTS / 11 CONTACTS

LAYOUT	24-11*	28A16	28-19	24-20
# OF CONTACTS	6-#12; 3-#8	5-#16; 4-#4	6-#16; 4-#12	9-#16; 2-#12
SERVICE RATING	A	A	A(C,E,G,J,K,L); B(H,M); D(A,B)	D

12 CONTACTS / 13 CONTACTS / 14 CONTACTS

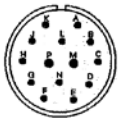
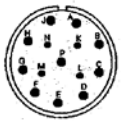
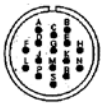





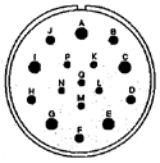



LAYOUT	24-19	24A24	28-51	28-51	20-11	20-27*	22-19*
# OF CONTACTS	12-#16	12-#12	6-#16; 6-#12	12-#12	13-#16	14-#16	14-#16
SERVICE RATING	A	A	D	D	I	A	A

(14 CONTACTS - Continued in next row)

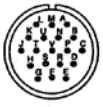
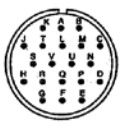
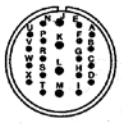
14 CONTACTS / 16 CONTACTS / 17 CONTACTS




LAYOUT	28-2	28-20	24-5	24-7*	36-14	20-29*
# OF CONTACTS	12-#16; 2-#12	4-#16; 10-#12	16-#16	14-#16; 2-#12	6-#16; 5-#12; 5-#8	17-#16
SERVICE RATING	D	A	A	A	D	A

19 CONTACTS / 20 CONTACTS / 22 CONTACTS

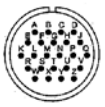





LAYOUT	20A48	22-14*	28-16	28-11*
# OF CONTACTS	19-#16	19-#16	20-#16	18-#16; 4-#12
SERVICE RATING	I	A	A	A

Layout by Number of Contacts

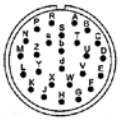
VIEW FROM MATING FACE OF PIN INSULATOR ***= MOST POPULAR LAYOUTS**

24 CONTACTS



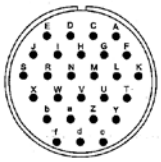
LAYOUT	24-28*
# OF CONTACTS	16/24
SERVICE RATING	I

26 CONTACTS



LAYOUT	28-12*
# OF CONTACTS	26-#16
SERVICE RATING	A

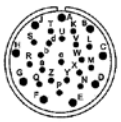
27 CONTACTS



LAYOUT	36A46
# OF CONTACTS	27-#12
SERVICE RATING	A

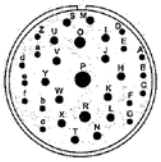
28 CONTACTS

LAYOUT	24A28
# OF CONTACTS	28-#16
SERVICE RATING	I



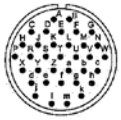
LAYOUT	28A63
# OF CONTACTS	9-#12; 19-#16
SERVICE RATING	A

31 CONTACTS

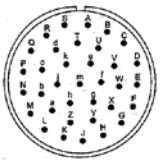


LAYOUT	36-9
# OF CONTACTS	14-#16; 14-#12; 2-#8; 1-#4
SERVICE RATING	A

35 CONTACTS

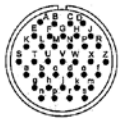


LAYOUT	28-15*
# OF CONTACTS	35-#16
SERVICE RATING	A



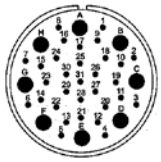
LAYOUT	36-15
# OF CONTACTS	35-#16
SERVICE RATING	D(M); A(balance)

37 CONTACTS



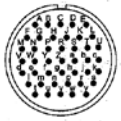
LAYOUT	28-21*
# OF CONTACTS	37-#16
SERVICE RATING	A

39 CONTACTS



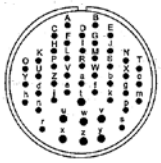
LAYOUT	36A98
# OF CONTACTS	8-#8; 31-#16
SERVICE RATING	A

43 CONTACTS

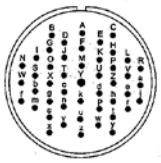


LAYOUT	28A51
# OF CONTACTS	43-#16
SERVICE RATING	A

47 CONTACTS

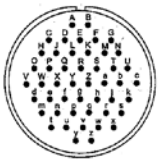


LAYOUT	36-7*
# OF CONTACTS	40-#16; 7-#12
SERVICE RATING	A



LAYOUT	36-8
# OF CONTACTS	46-#16; 1-#12
SERVICE RATING	A

48 CONTACTS



LAYOUT	36-10*
# OF CONTACTS	48-#16
SERVICE RATING	A

Number of Contacts

LAYOUT	TOTAL	16	16S	12	8	4	0
20-3	3			3			
20-4	4			4			
20-6	3	3					
20-7	8	8					
20-8	6	4			2		
20-11	13	13					
20-15	7			7			
20-16	9	7		2			
20-18	9	6		3			
20-19	3				3		
20-22	6	3			3		
20-24	4	2			2		
20-27	14	14					
20-29	17	17					
20A9	9		9				
20A48	19	19					
22-2	3				3		
22-4	4			2	2		
22-5	6	4		2			
22-9	3			3			
22-10	4	4					
22-12	5	3			2		
22-14	19	19					
22-15	6	1		5			
22-16	9	6		3			
22-19	14	14					
22-20	9	9					
22-21	3	2				1	
22-22	4				4		
22-23	8			8			
22-27	9	8			1		
22-28	7			7			
24-2	7			7			
24-5	16	16					
24-7	16	14		2			
24-10	7				7		

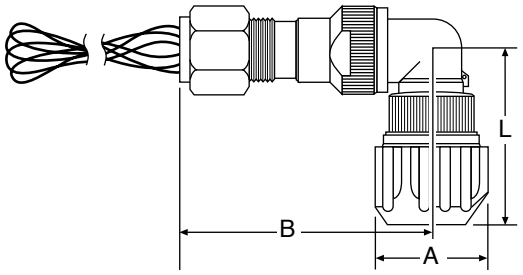
LAYOUT	TOTAL	16	16S	12	8	4	0
24-11	9			6	3		
24-12	5				3		2
24-19	12	12					
24-20	11	9		2			
24-22	4				4		
24-27	7	7					
24-28	24	24					
24A24	12			12			
24A28	28	28					
28-2	14	12		2			
28-9	12	6		6			
28-10	7			3	2	2	
28-11	22	18		4			
28-12	26	26					
28-15	35	35					
28-16	20	20					
28-19	10	6		4			
28-20	14	4		10			
28-21	37	37					
28-22	6	3				3	
28-51	12			12			
28A16	9	5				4	
28A51	43	43					
28A63	28	19		9			
36-3	6			3			3
36-5	4						4
36-6	6					4	2
36-7	47	40		7			
36-8	47	46		1			
36-9	31	14		14	2	1	
36-10	48	48					
36-14	16	6		5	5		
36-15	35	35					
36A35	8	4					4
36A46	27			27			
36A98	39	31			8		

Dimensions

90° CABLE PLUG

90° cable plugs are for cable connection to the receptacle where a sharp turn is required and are supplied with crimp contacts, individual wire sealing grommet, ferrule, deluxe strain relief backshell and rubber covered coupling ring.

SHELL SIZE	A DIA. MAX.	B REF.	L REF.
20	2.028	4.680	2.638
22	2.205	4.680	2.638
24	2.362	5.000	2.875
28	2.638	5.250	2.875
32	2.992	5.675	3.080
36	3.240	6.360	3.190



SHELL SIZE	CABLE RANGE
20	0.188" – 0.875"
22	0.188" – 0.875"
24	0.688" – 0.875"

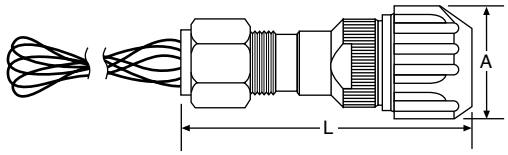
SHELL SIZE	CABLE RANGE
28	0.562" – 1.125"
32	0.750" – 1.125"
36	0.875" – 1.688"

PART NUMBER	DESCRIPTION
3N	90° Male Plug
4N	90° Female Plug

STRAIGHT PLUG

Straight cable plugs are for cable connection to the receptacle and are supplied with crimp contacts, individual wire sealing grommet, ferrule, deluxe strain relief backshell and rubber covered coupling ring.

SHELL SIZE	A DIA. MAX.	L REF.
20	2.028	5.100
22	2.205	5.600
24	2.362	5.800
28	2.638	5.840
32	2.992	6.080
36	3.240	6.350



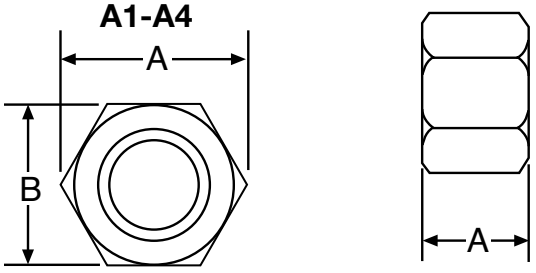
SHELL SIZE	CABLE RANGE
20	0.188" – 0.875"
22	0.188" – 0.875"
24	0.688" – 0.875"

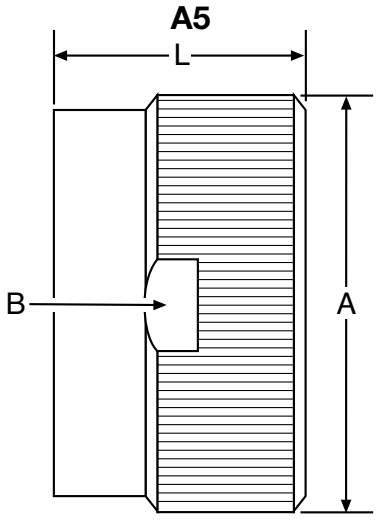
SHELL SIZE	CABLE RANGE
28	0.562" – 1.125"
32	0.750" – 1.125"
36	0.875" – 1.688"

PART NUMBER	DESCRIPTION
3X	Straight Male Plug
4X	Straight Female Plug

GLAND SEAL AND CABLE MESH SECURING NUTS

SIZE	A DIA. MAX.	B WRENCH FLATS REFS.	L REF.
A1	1.450	1.260	0.750
A2	1.720	1.510	1.000
A3	2.000	1.750	1.000
A4	2.600	2.250	1.250
A5	2.750	2.625	1.625

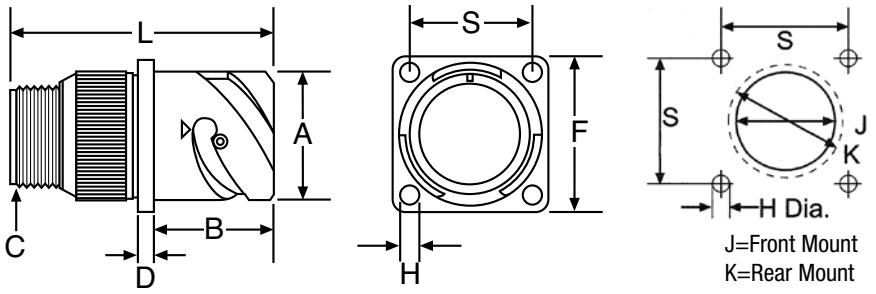




Dimensions

PANEL MOUNT RECEPTACLE

Panel mount receptacles are for wall or panel mounting and are supplied with crimp contacts, individual wire sealing grommet, ferrule, endbell, gasket, nutplate and screws.



SHELL SIZE	A DIA.	B	C THREAD	D	L MAX.	F	S	H	J	K
20	1.350	0.910	1-3/16-18UNEF-2A	0.160	2.480	1.500	1.160	0.130	1.160	1.360
22	1.470	0.910	1-3/16-18UNEF-2A	0.160	2.600	1.650	1.250	0.130	1.290	1.490
24	1.610	0.910	1-7/16-18UNEF-2A	0.160	2.720	1.750	1.370	0.150	1.420	1.630
28	1.840	0.950	1-7/16-18UNEF-2A	0.160	2.760	2.000	1.560	0.150	1.650	1.850
32	2.100	0.950	1-3/4-18UNS-2A	0.160	2.790	2.240	1.750	0.170	1.900	2.120
36	2.350	0.950	2-18UNS-2A	0.160	2.870	2.500	1.940	0.170	2.150	2.360

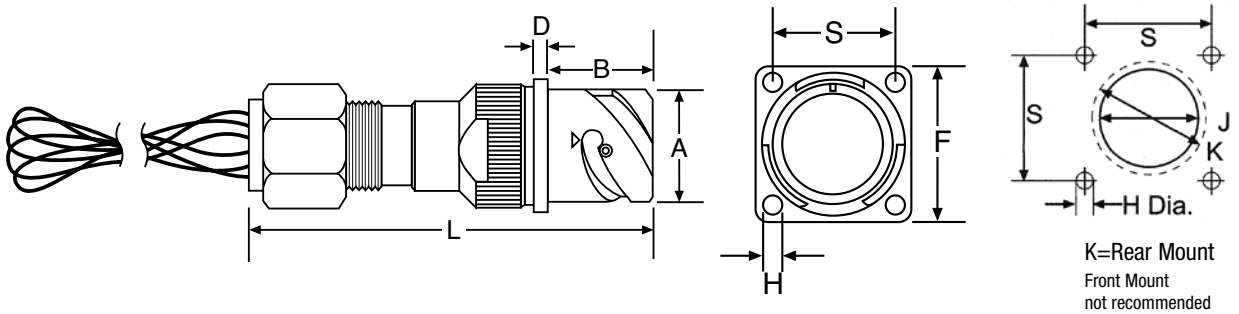
PART NUMBER	DESCRIPTION
1X	Straight Male Panel Mount Receptacle
2X	Straight Female Panel Mount Receptacle

SHELL SIZE	CABLE RANGE
20	0.188" – 0.875"
22	0.188" – 0.875"
24	0.688" – 0.875"

SHELL SIZE	CABLE RANGE
28	0.562" – 1.125"
32	0.750" – 1.125"
36	0.875" – 1.688"

CABLE CONNECTING RECEPTACLE

Cable connecting receptacles are for in-line cable connection and are supplied with crimp contacts, individual wire sealing grommet, ferrule, deluxe strain relief backshell, gasket, nutplate and screws.



SHELL SIZE	A DIA.	B	D	L REF.	F	S	H	K
20	1.346	0.907	0.157	5.400	1.496	1.157	0.126	1.358
22	1.472	0.907	0.157	5.830	1.654	1.252	0.126	1.488
24	1.610	0.907	0.157	6.030	1.752	1.374	0.146	1.626
28	1.839	0.947	0.157	6.050	2.000	1.563	0.146	1.854
32	2.102	0.947	0.157	6.280	2.244	1.752	0.169	2.118
36	2.346	0.947	0.157	6.560	2.500	1.937	0.169	2.362

PART NUMBER	DESCRIPTION
5X	Straight In-line Male Receptacle
6X	Straight In-line Female Receptacle

SHELL SIZE	CABLE RANGE
20	0.188" – 0.875"
22	0.188" – 0.875"
24	0.688" – 0.875"

SHELL SIZE	CABLE RANGE
28	0.562" – 1.125"
32	0.750" – 1.125"
36	0.875" – 1.688"

Build Your Own HDLC Assembly

3X	4X	36A22	88522	F	070
END ONE (1)	**END TWO (2)**	**INSERT LAYOUT**	**CABLE TPC PART NO.**	**UNIT OF MEASURE**	**LENGTH**
3X- Male Plug **4X-** Female Plug **3N-** 90˚ Male Plug **4N-** 90˚ Female Plug **5X-** Male In-line Receptacle **6X-** Female In-line Receptacle **1X-** Male Panel Mount Receptacle **2X-** Female Panel Mount Receptacle	**3X-** Male Plug **4X-** Female Plug **3N-** 90˚ Male Plug **4N-** 90˚ Female Plug **WM-** Jacket stripped back with Wire Markers (Singled Ended Assembly) **PT-** Pigtail (for Panel Mount Receptacle only) **1X-** Male Panel Mount Receptacle **2X-** Female Panel Mount Receptacle	Select from Contact Layout Charts in this section	List TPC Cable Part Number or PT for Pigtails *NOTE:* If using a shielded cable and shield requires termination, contact TPC	**F** = Feet **M** = Meters **A** = Inches	Enter a three digit code in box above *i.e.* **5=005** **50=050** **500=500** *etc.*

In the example shown above, **H3X4X36A2288522F070** is a male plug to a female plug using a 36A22 insert layout with 70 ft. of 16/22 Reduced Diameter Control Cable.

Molded Assemblies for both Welding and Temporary Power Applications

TAPER NOSE
Mates with any series 16, E1016, J Series or taper nose style plugs for welding applications.

BALL NOSE
Mates with any series 18, E1018, Standard Series or ball nose style plugs for welding applications.

LOCKING BALL NOSE
Mates with any series 22, E1022, Standard Series.

FEATURES & BENEFITS

SUPER-TREX® WELD CABLE
First line defense against oils, ozone and UV exposure as well as most chemicals. Extreme all weather flexibility. Proven performance lasts up to 8 times longer than standard weld cables.*

COMPLETELY MOLDED DESIGN
All rubber construction reduces cable stress and provides an environmental seal between the cable and the connector head.

SIZED FOR 2 AWG – 4/0 CABLES
Designed to meet your application needs for both welding and temporary power.

MATED CONNECTION PROVIDES A CORK AND BOTTLE SEAL
Forms a water, oil and dust resistant seal, protects the connection from contamination.

QUICK DISCONNECT
¾ turn Quick disconnect system, provides a secure connection. Compatible with both Series 16 Taper Nose and Series 18 Ball Nose.

MOLDED HEAD COLORS	
• Yellow (Standard)	• Blue
• Black	• Green
• Red	• Orange
• White	• Brown

APPLICATIONS

- Government shipyards
- Commercial and Navy shipbuilding and repair sites
- Welding ground cables
- Motor and generator applications
- Construction sites
- Temporary power for concerts, carnivals, conventions, theme parks, etc.
- Utility applications
- Mining applications
- Ship to shore power

**Data available for customer use*

Build Your Own Molded Assemblies

Weld Assembly	Series	End 1	End 2	Cable No.	Length	Head Color
WA	16	M	F	86317	F100	Y

Part No.

Series

16	Taper Nose
18	Ball Nose
22	Locking Ball Nose

End 1

M	Male
F	Female

End 2

M	Male
F	Female
O	None

Cable No.

2 AWG through 4/0 cable

Head Color

Y	Yellow (Standard)
BK	Black
R	Red
W	White
BL	Blue
G	Green
BN	Brown
O	Orange

Length

F	Feet
M	Meters
A	Inches

In the example shown above, **WA16MF86317F100Y** is a taper nose style weld assembly, male to female molded plugs with 100 ft. of 86317 (4/0 600 V welding cable) and yellow heads.

CUSTOM ENGINEERED PRODUCTS

Custom Solutions

Introducing Custom Engineered Products

TPC provides custom engineered products designed with application and environmental information supplied by the customer. These products are built specifically to solve a particular problem for an individual customer and represent a valuable service. The engineers who solve these problems are from the electrical, mechanical, chemical and industrial engineering disciplines.

CUSTOM CAPABILITIES

CONNECTORS

TPC's custom connectors are manufactured to address a specific industry or environmental issue and can also improve upon a well established method.

- Molded Circular Connectors – Now an in house capability at TPC
- Molded Locking Cam-Locks – IP69K Rated
- Molded Ball Nose Cam-Lock Connector – Quickly connects and disconnects
- Many others...

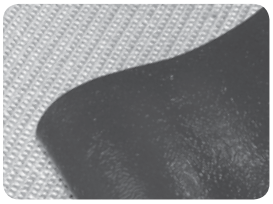
ASSEMBLIES

Providing a complete solution saves the customer valuable downtime and labor costs. TPC can provide a "plug and play" option for a customer's assembly needs.

- Friction Coupling System — Prevents component destruction due to unforeseen pulling forces
- Over Molded Back Shell Assembly — Over molded with thermoplastic elastomer
- Pond Aeration Cable Assemblies — Meets a specific need for specific market segment
- Cable Carrier Systems — Can create a complete system; connectorized and pre-loaded

MATERIALS/PRODUCTS

Striving to meet customer expectations, TPC provides materials and products to enhance a custom solution.



- SS Tubing — Extra level of protection for cable that is exposed to sharp edges, metal chips, abrasion and harsh outdoor environments
- Stainless Steel Overbraid — Provides protection for a very high temperature range
- Light Stringers — Custom lengths that accept standard light bulb sizes
- High Temperature Blanket — Provides exceptional strength and insulation properties

Let TPC Design the Perfect Cable for You!

Custom Solutions

Custom Designed & Engineered

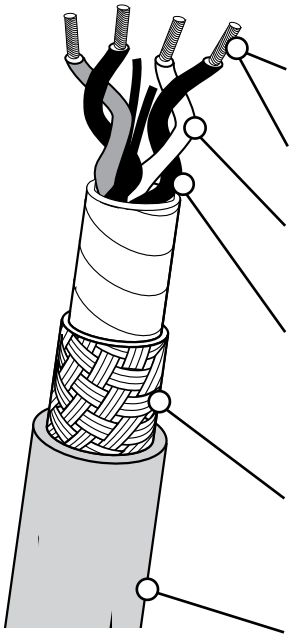
TYPICAL CUSTOM CABLE ENVIRONMENTS

- Abrasive Surfaces
- Alarm Systems
- Cable Carriers
- Cable Reels
- Control Pendants
- Critical Circuits
- Cutting Lubricants
- Elevators
- Encoder/Resolver
- Festoon Systems
- Ladle Cars
- Melt Furnaces
- Metal Machining
- Metal Treatment
- Outdoor Use
- Paint Booths
- Robotic Systems
- Sanitizing Areas
- Shuttle Presses
- Stage Power
- Submersible
- Underwater
- Vision Systems
- Wash Down Areas

CUSTOM CABLE DESIGNS

- Abrasion Resistant
- Antimicrobial
- Aramid Reinforced
- Chemically Resistant
- Composite Systems
- Custom Data & Communication
- Ethernet Systems
- Fiber Optics
- Halogen Free Flame Retardant
- Halogen Free Low Smoke
- High Temperature
- High Temperature Blankets
- High Temperature Ethernet Systems
- High Temperature RS-485
- High Temperature Sleeving
- High Temperature VFD
- High Tension Reeling
- IEC Shipboards
- Low Capacitance
- Low Temperature
- Stainless Steel overbraid
- Thermocouple Extension
- Unique Insulation Systems
- Water Resistant

CABLE COMPONENTS



CONSTRUCTION: Includes cabling and positioning of the conductors within the jacket to reduce the internal stresses and maximizing performance.

CONDUCTORS: Can be bare copper or copper that is plated with nickel, tin, or silver. The type of conductor is determined by both the application and the environment.

STRANDING: Makeup has a significant impact on the flexibility of the final cable design. Selecting the proper stranding is critical to the product's overall flexibility.

INSULATION: Life is affected by voltage, ampacity, temperature, flexing and frequency. Matching the insulation system to the application and environment is critical to maximizing cable performance.

CABLING: "Lay" of the conductors is the length of the twist applied to the conductors for one complete rotation. Depending on what the cable is designed to do, the conductors are twisted together in different ways. The longer the lay the better the cable will perform in twisting applications. The shorter the lay the better the cable will perform in bending applications.

SHIELDING: Protects the electrical signal against EM and RF interference. In power cables, the shielding contains potential interference within the cable so that it does not affect control/ communications conductors under the same jacket and other cables in close proximity.

JACKETING: The first line of defense for any cable. Selection of the proper jacketing or over jacket materials is critical for cable life.

TECHNICAL DATA & PART NO. INDEX

Temperature Conversion Chart

This table is for converting from degrees Celsius to degrees Fahrenheit or from degrees Fahrenheit to degrees Celsius. The relation between degrees Fahrenheit and degrees Celsius may be expressed by: **˚C = 0.556(˚F-32) or ˚F = 1.8(˚C)+32**

°F	°C	°F	°C	°F	°C	°F	°C	°F	°C
-100	-73	170	77	640	338	1110	599	1580	860
-95	-71	180	82	650	343	1120	604	1590	866
-90	-68	190	88	660	349	1130	610	1600	871
-85	-65	200	93	670	354	1140	616	1610	877
-80	-62	210	99	680	360	1150	621	1620	882
-75	-59	220	104	690	366	1160	627	1630	888
-70	-57	230	110	700	371	1170	632	1640	893
-65	-54	240	116	710	377	1180	638	1650	899
-60	-51	250	121	720	382	1190	643	1660	904
-55	-48	260	127	730	388	1200	649	1670	910
-50	-46	270	132	740	393	1210	654	1680	916
-45	-43	280	138	750	399	1220	660	1690	921
-40	-40	290	143	760	404	1230	666	1700	927
-35	-37	300	149	770	410	1240	671	1710	932
-30	-34	310	154	780	416	1250	677	1720	938
-25	-32	320	160	790	421	1260	682	1730	943
-20	-29	330	166	800	427	1270	688	1740	949
-15	-26	340	171	810	432	1280	693	1750	954
-10	-23	350	177	820	438	1290	699	1760	960
-5	-21	360	182	830	443	1300	704	1770	966
0	-18	370	188	840	449	1310	710	1780	971
5	-15	380	193	850	454	1320	716	1790	977
10	-12	390	199	860	460	1330	721	1800	982
15	-9	400	204	870	466	1340	727	1810	988
20	-7	410	210	880	471	1350	732	1820	993
25	-4	420	216	890	477	1360	738	1830	999
30	-1	430	221	900	482	1370	743	1840	1,004
35	2	440	227	910	488	1380	749	1850	1,010
40	4	450	232	920	493	1390	754	1860	1,016
45	7	460	238	930	499	1400	760	1870	1,021
50	10	470	243	940	504	1410	766	1880	1,027
55	13	480	249	950	510	1420	771	1890	1,032
60	16	490	254	960	516	1430	777	1900	1,038
65	18	500	260	970	521	1440	782	1910	1,043
70	21	510	266	980	527	1450	788	1920	1,049
75	24	520	271	990	532	1460	793	1930	1,054
80	27	530	277	1000	538	1470	799	1940	1,060
85	29	540	282	1010	543	1480	804	1950	1,066
90	32	550	288	1020	549	1490	810	1960	1,071
95	35	560	293	1030	554	1500	816	1970	1,077
100	38	570	299	1040	560	1510	821	1980	1,082
110	43	580	304	1050	566	1520	827	1990	1,088
120	49	590	310	1060	571	1530	832	2000	1,093
130	54	600	316	1070	577	1540	838		
140	60	610	321	1080	582	1550	843		
150	66	620	327	1090	588	1560	849		
160	71	630	332	1100	593	1570	854		

Chemical Resistance of Common Insulation Materials

	RUBBER	SILICONE	FLUOROPOLYMER
OXIDATION RESISTANCE	F	E	O
OIL RESISTANCE	P	F-G	O
UV RESISTANCE	F	O	O
WATER RESISTANCE	G	G-E	E
ACID RESISTANCE	F-G	F-G	E
ALKALI RESISTANCE	F-G	F-G	E
GASOLINE KEROSENE	P	P-F	E
BENZOL TOLUENE	P	P	E
DEGREASER SOLVENT	P	P-G	E
ALCOHOL RESISTANCE	G	G	E

O = *OUTSTANDING* E = *EXCELLENT* G = *GOOD* F = *FAIR* P = *POOR*

Fraction, Decimal & Millimeter Equivalents

INCHES FRACTIONS	INCHES DECIMALS	MM
	0.0004	0.01
	0.004	0.10
	0.01	0.25
1/64	0.0156	0.397
	0.0197	0.50
	0.0295	0.75
1/32	0.03125	0.794
	0.0394	1
3/64	0.0469	1.191
	0.059	1.5
1/16	0.062	1.588
5/64	0.0781	1.984
3/32	0.0787	2
	0.094	2.381
7/64	0.984	2.5
	0.109	2.778
1/8	0.1181	3
	0.125	3.175
	0.1378	3.5
9/64	0.141	3.572
5/32	0.156	3.969
	0.1575	4
11/64	0.172	4.366
	0.177	4.5
3/16	0.1875	4.763
	0.1969	5
13/64	0.203	5.159
	0.2165	5.5
7/32	0.219	5.556
15/64	0.234	5.953
	0.2362	6
1/4	0.250	6.350
	0.2559	6.5
17/64	0.2656	6.747
	0.2756	7
9/32	0.281	7.144
	0.2953	7.5
19/64	0.297	7.541
5/16	0.312	7.938
	0.315	8
21/64	0.328	8.334
	0.335	8.5
11/32	0.344	8.731
	0.3543	9
23/64	0.359	9.128
	0.374	9.5
3/8	0.375	9.525
25/64	0.391	9.922
	0.3937	10
13/32	0.406	10.319
	0.413	10.5
27/64	0.422	10.716
	0.4331	11
7/16	0.438	11.113
29/64	0.453	11.509

INCHES FRACTIONS	INCHES DECIMALS	MM
15/32	0.469	11.906
	0.4724	12
31/64	0.484	12.303
	0.492	12.5
1/2	0.500	12.700
	0.5118	13
33/64	0.5156	13.097
17/32	0.531	13.494
35/64	0.547	13.891
	0.5512	14
9/16	0.563	14.288
	0.571	14.5
37/64	0.578	14.684
	0.5906	15
19/32	0.594	15.081
39/64	0.609	15.478
5/8	0.625	15.875
	0.6299	16
41/64	0.6406	16.272
	0.6496	16.5
21/32	0.656	16.669
	0.6693	17
43/64	0.672	17.066
11/16	0.6875	17.463
45/64	0.703	17.859
	0.7087	18
23/32	0.719	18.256
	0.7283	18.5
47/64	0.734	18.653
	0.7480	19
3/4	0.750	19.050
49/64	0.7656	19.447
25/32	0.781	19.844
	0.7874	20
51/64	0.797	20.241
13/16	0.8125	20.638
	0.8268	21
53/64	0.828	21.034
27/32	0.844	21.431
55/64	0.859	21.828
	0.8661	22
7/8	0.875	22.225
57/64	0.8906	22.622
	0.9055	23
29/32	0.9062	23.019
59/64	0.922	23.416
15/16	0.9375	23.813
	0.9449	24
61/64	0.953	24.209
31/32	0.969	24.606
	0.9843	25
63/64	0.9844	25.003
1	1.000	25.400
	1.0236	26
1-1/32	1.0312	26.194

INCHES FRACTIONS	INCHES DECIMALS	MM
1-1/16	1.062	26.9
	1.063	27
1-3/32	1.094	27.781
	1.1024	28
1-1/8	1.125	28.575
	1.1417	29
1-5/32	1.156	29.369
	1.1811	30
1-3/16	1.1875	30.163
1-7/32	1.219	30.956
	1.2205	31
1-1/4	1.250	31.750
	1.2598	32
1-9/32	1.281	32.544
	1.2992	33
1-5/16	1.312	33.338
	1.3386	34
1-11/32	1.344	34.131
1-3/8	1.375	34.925
	1.3779	35
1-13/32	1.406	35.917
	1.4173	36
1-7/16	1.438	36.513
	1.4567	37
1-15/32	1.469	37.306
	1.4961	38
1-1/2	1.500	38.100
1-17/32	1.531	38.894
	1.5354	39
1-9/16	1.562	39.688
	1.5748	40
1-19/32	1.594	40.481
	1.6142	41
1-5/8	1.625	41.275
	1.6535	42
1-21/32	1.6562	42.069
1-11/16	1.6875	42.863
	1.6929	43
1-23/32	1.719	43.65
	1.7323	44
1-3/4	1.750	44.450
	1.7717	45
1-25/32	1.781	45.244
	1.8110	46
1-13/16	1.8125	46.038
1-27/32	1.844	46.831
	1.8504	47
1-7/8	1.875	47.625
	1.8898	48
1-29/32	1.9062	48.419
	1.9291	49
1-15/16	1.9375	49.213
	1.9685	50
1-31/32	1.969	50.006
2	2.000	50.800

Conversion Factors

Centimeters	X	0.3937	=	Inches
Circular Mils	X	0.7854	=	Square Mills
	X	5.061×10^{-4}	=	Square Millimeters
Cubic Centimeters	X	0.0610	=	Cubic Inches
Cubic Inches	X	16.386	=	Cubic Centimeters
Inches	X	2.54	=	Centimeters
Kilograms	X	2.2046	=	Pounds
Kilograms/Kilometer	X	0.6720	=	Pounds/1000 Feet
Kilometers	X	0.6214	=	Miles
	X	3280.8	=	Feet
Meters	X	3.2808	=	Feet
Mils	X	0.001	=	Inches
	X	0.0254	=	Millimeters
Miles	X	1.6093	=	Kilometers
Millimeters	X	0.03937	=	Inches
Ohms/Kilometer	X	0.3048	=	Ohms/1000 Feet
Ohms/1000 Feet	X	3.2808	=	Ohms/Kilometer
Pounds	X	0.4536	=	Kilograms
Pounds/1000 Feet	X	1.4881	=	Kilograms/Kilometer
Square Centimeters	X	1.55×10^{5}	=	Square Mils
Square Inches	X	1.97×10^{5}	=	Circular Mils
	X	1.2732×10^{6}	=	Circular Mils
Square Millimeter	X	645.16	=	Square Millimeters
	X	0.1974	=	Circular Mils

Metric (MM^2) to AWG Conductor Conversion

METRIC SIZE MM^2	CIRCULAR MILL AREA	NEAREST AWG SIZE	ACTUAL CMA OF AWG
0.05	98.7	30	100
0.08	158	28	159
0.14	276	26*	253
0.22	434	24*	405
0.25	493	24*	405
0.30	591	22	643
0.34	671	22*	643
0.35	690	22*	643
0.38	750	21	812
0.50	987	20	1,020
0.75	1,480	18	1,620
0.80	1,579	18	1,620
1.00	1,974	17	2,050
1.25	2,467	16	2,580
1.5	2,960	15	3,260
2	3,948	14	4,110
2.5	4,934	13	5,180
3	5,922	12	6,530
3.5	6,907	12*	6,530
4	7,894	11	8,230
5	9,867	10	10,380
5.5	10,853	10*	10,380
6	11,841	9	13,090

METRIC SIZE MM^2	CIRCULAR MILL AREA	NEAREST AWG SIZE	ACTUAL CMA OF AWG
8	15,788	8	16,533
10	19,735	7	20,820
12	23,682	6	26,218
14	27,629	6*	26,218
16	31,576	5	33,090
22	43,417	4*	41,799
25	49,338	3	52,620
35	69,073	2*	66,357
38	74,993	1	83,690
42	82,888	1	83,690
50	98,676	1/0	104,500
60	118,411	2/0	133,000
70	138,147	2/0*	133,000
90	177,617	3/0*	167,613
95	187,485	4/0	210,400
120	236,823	250MCM	
150	96,029	300MCM	
185	365,102	350MCM*	
240	473,646	500MCM	
300	592,058	600MCM	
400	789,410	750MCM*	
500	986,763	1,000MCM	

**When converting from mm^2 to AWG, nearest LARGER AWG should be used whenever possible — NEVER drop to a smaller-cma wire.*

Copper Conductor Data

AWG[1]	Stranding	Type Stranding[2]	Diameter[3]		Area		Weight		D.C. Resistance @ 20°C[4]			
									Tin Coating[5]		Bare or Silver Coating	
			in.	mm.	circ. mils	sq.mm	lbs./M'	kg./km.	ohms/M'	ohms/km	ohms/M'	ohms/km.
32	7/40	Co or Bu	0.010	0.254	100	0.051	0.21	0.31	176	577		
30	Solid		0.010	0.254	100	0.051	0.30	0.45	113	371	102	340
	Solid[6]		0.010	0.254	100	0.051	0.30	0.45			122	400
	7/38	Bu	0.012	0.305	112	0.057	0.35	0.52	106	348	92.6	303
	7/38[7]	Bu	0.012	0.305	112	0.057	0.35	0.52				
29	Solid[6]		0.011	0.287	128	0.065	0.39	0.58			95.9	315
28	Solid		0.013	0.320	159	0.081	0.48	0.72	70.8	232	65.3	214
	7/36	Co	0.015	0.381	175	0.089	0.55	0.82	67.5	221	59.3	194
	7/36[6]	Co	0.015	0.381	175	0.089	0.58	0.86			71.4	234
27	Solid		0.014	0.361	202	0.102	0.61	0.91	55.6	182	51.4	169
	7/35	Co or Bu	0.018	0.455	220	0.111	0.69	1.04	53.8	176		
	65/44	Bu	0.018	0.455	260	0.131	0.70	1.05			42.0	138
26	Solid		0.016	0.404	253	0.128	0.77	1.14	44.5	146	41.0	135
	Solid6		0.016	0.404	253	0.128	0.77	1.14			48.4	159
	7/34	Co or Bu	0.019	0.483	278	0.141	0.87	1.29	42.5	139	37.3	122
	10/36	Bu	0.019	0.483	250	0.127	0.78	1.15	47.3	155	40.4	133
	19/38	Bu or Co	0.021	0.533	304	0.154	0.97	1.44	38.9	128	34.1	112
	19/38[6]	Co, Eq or Un	0.021	0.533	304	0.154	0.97	1.44		37.3	122	
24	Solid		0.020	0.511	404	0.205	1.22	1.82	27.2	89.2	25.7	84.2
	7/32	Co or Bu	0.024	0.610	448	0.227	1.38	2.05	25.7	84.2	23.1	75.9
	16/36	Bu	0.023	0.609	400	0.201	1.25	1.64	29.5	96.8	27.5	90.2
	19/36	Co or Bu	0.025	0.635	475	0.241	1.48	2.20	24.9	81.7	21.8	71.6
22	Solid		0.025	0.643	643	0.324	1.94	2.89	16.7	54.8	16.2	53.2
	7/30	Co or Bu	0.031	0.787	700	0.355	2.19	3.26	16.6	54.4	14.8	48.6
	19/34	Bu or Eq	0.032	0.813	754	0.382	2.35	3.50	15.5	50.8	13.8	45.1
20	Solid		0.032	0.813	1.020	0.519	3.10	4.61	10.5	34.4	10.1	33.2
	7/28	Co or Bu	0.038	0.965	1.111	0.562	3.49	5.19	10.3	33.8	9.33	30.6
	10/30	Bu	0.036	0.914	1.000	0.507	3.14	4.67	11.4	37.4	10.4	34.0
	19/32	Co, Bu or Eq	0.040	1.02	1.216	0.616	3.84	5.71	9.48	31.1	8.53	28.0
	19/.0071[8]	Eq	0.036	0.914	957	0.485	2.95	4.39	12.6	41.3		
	26/34	Bu	0.037	0.940	1.032	0.523	3.28	4.88	11.3	37.1		
	42/36	Bu	0.038	0.965	1.050	0.532	3.34	4.97	11.2	36.7		
19	Solid		0.036	0.912	1.290	0.653	3.90	5.80			8.05	26.4
18	Solid		0.040	1.02	1.620	0.823	4.92	7.32	6.77	22.2	6.39	21.0
	7/26	Co or Bu	0.048	1.22	1.770	0.897	5.55	8.26	6.45	21.2	5.86	19.2
	16/30	Bu	0.046	1.17	1.600	0.810	5.01	7.45	7.15	23.4	6.48	21.3
	19/30	Co, Bu or Eq	0.050	1.27	1.900	0.963	5.95	8.85	6.10	20.0	5.46	17.9
	19/.0092	Bu	0.046	1.17	1.608	0.814	5.10	7.59			5.10	16.7
	41/34	Bu	0.047	1.19	1.627	0.824	5.09	7.08	7.08	23.2	6.60	21.6
16	Solid		0.051	1.29	2.580	1.31	7.81	11.6	4.47	14.7	4.16	13.6
	7/.0192	Bu	0.058	1.47	2.581	1.31	7.90	11.8			4.16	13.6
	19/29[8]	Bu or Eq	0.057	1.45	2.426	1.23	7.52	11.2	4.82	15.8	4.27	14.0
	19/.0117	Bu	0.059	1.50	2.601	1.32	8.02	11.9	4.39	14.4	4.13	13.5
	26/30	Bu	0.060	1.52	2.600	1.32	8.15	12.1	4.39	14.4	3.99	13.1
	65/34	Bu	0.060	1.52	2.580	1.31	7.98	11.9	4.47	14.7	4.16	13.6
14	Solid		0.064	1.63	4.110	2.08	12.4	18.5	2.68	8.79	2.52	8.28
	7/.0242	Bu	0.073	1.85	4.100	2.08	12.7	18.9			2.61	8.56
	19/27[8]	Co, Eq or Un	0.071	1.80	3.831	1.94	12.1	18.0	3.05	10.00	2.71	8.88
	19/.0147	Bu	0.074	1.88	4.106	2.08	12.7	18.9			2.61	8.56
	41/30	Bu	0.069	1.75	4.100	2.08	12.9	19.2	2.81	9.22	2.53	8.30

Copper Conductor Data

AWG[1]	Stranding	Type Stranding[2]	Diameter[3]		Area		Weight		D.C. Resistance @ 20°C[4]			
									Tin Coating[5]		Bare or Silver Coating	
			in.	mm.	circ. mils	sq.mm	lbs./M'	kg./km.	ohms/M'	ohms/km	ohms/M'	ohms/km.
12	Solid		0.081	2.05	6.530	3.31	19.8	29.5	1.69	5.54	1.59	5.21
	7/.0305	Co	0.092	2.34	6.512	3.30	20.2	30.1			1.64	5.38
	19/25[8]	Co, Eq or Un	0.090	2.29	6.088	3.08	19.04	28.9	1.87	6.13	1.70	5.59
	19/.0185	Bu	0.093	2.36	6.503	3.30	20.2	30.1			1.60	5.23
	65/30	Bu	0.091	2.31	6.500	3.29	20.8	31.1	1.82	5.97	1.60	5.23
10	Solid		0.102	2.59	10.380	5.26	31.4	46.8			1.00	3.28
	7/.0385	Co	0.116	2.95	10.376	5.25	32.0	47.6			1.00	3.28
	19/.0234	Bu	0.117	2.97	10.404	5.27	32.0	47.6			0.98	3.21
	37/.0169	Co	0.112	2.84	9.361	4.74	29.2	43.4			1.25	4.10
	49.27[8]	Ro 7x7/27	0.120	3.04	9.880	5.01	32.4	48.2			1.28	4.20
	105/30	Bu	0.130	3.30	10.500	5.32	33.1	49.2	1.10	3.61	0.99	3.24
9	7/.0432	Co	0.130	3.30	13.064	6.61	43.0	64.0			0.82	2.69
8	Solid		0.129	3.26	16.510	8.37	49.9	74.3			0.62	2.06
	7/.0486	Co	0.146	3.71	16.534	8.38	50.1	74.5			0.65	2.13
	19/.0295	Bu or Eq	0.144	3.66	16.535	8.38	50.0	74.4			0.65	2.13
	133.29	Ro 19x7/29	0.167	4.24	16.983	8.61	54.0	80.4	0.71	2.33		
	168.30	Ro 7x24/30	0.174	4.42	16.800	8.51	53.1	79.0	0.70	2.30		
6	Solid		0.162	4.12	26.240	13.30	79.4	118			0.40	1.30
	7/.0612	Co	0.184	4.67	26.218	13.28	81.1	121			0.41	1.34
	19/.0372	Bu	0.186	4.72	26.293	13.33	81.1	121			0.40	1.30
	133/27	Ro 19x7/27	0.210	5.33	26.818	13.60	84.1	125	0.43	1.41		
	266/30	Ro 7x38/30	0.204	5.18	26.600	13.49	83.2	124	0.44	1.44		
4	Solid		0.204	5.19	41.740	21.15	126	188			0.25	0.82
	7/.0772	Co	0.232	5.89	41.719	21.15	129	192			0.26	0.85
	19/.0469	Co	0.235	5.97	41.793	21.19	129	192			0.24	0.79
	133/25	Ro 19x7/25	0.257	6.53	42.615	21.61	135	201	0.29	0.95		
	420/30	Ro 7x60/30	0.257	6.53	42.000	21.29	140	208	0.28	0.92		
2	19/.0591	Co	0.292	7.42	66.407	33.67	205	205			0.17	0.56
	665/30	Ro 19x35/30	0.338	8.59	66.500	33.72	213	317	0.18	0.59		
1	19/.0664	Co	0.332	8.43	83.771	42.47	266	396			0.13	0.43
1/0	19/.0745	Eq	0.373	9.47	105.455	53.47	326	485			0.11	0.36
	37/.0534	Eq	0.370	9.40	105.508	53.49	326	485			0.10	0.33
	259/24	Ro 7x37/24	0.424	10.77	104.639	53.05	331	493	0.11	0.36		
	1045/30[8]	Ro 19x55/30	0.410	10.41	104.500	52.98	335	498	0.12	0.39		
2/0	37/.0600	Co	0.420	10.67	133.200	67.53	411	612			0.08	0.26
	259/.0227	Ro 7x37/.0227	0.456	11.58	129.956	65.89	430	640	0.09	0.30		
	1330/30	Ro 19x70/30	0.496	12.60	133.300	67.58	430	640	0.09	0.30		
3/0	37/.0673	Co	0.470	11.94	167.584	84.97	518	771			0.07	0.23
4/0	37/.0756	Eq	0.530	13.46	211.468	107.23	653	972			0.05	0.16
	427/.0223	Ro61x71/.0223	0.602	15.29	212.343	107.65	676	1.006	0.06	0.20		
	2107/30	Ro7x7x43/30	0.608	15.44	210.700	106.82	674	1.003	0.06	0.20		

1 *In stranded conductors, nearest AWG size .*
2 *Bu – Bunched; Co – Concentric; EQ – Equilay; Ro – Rope; Un - Unilay*
3 *Actual nominal diameter for solid wires, theoretical average diameter for stranded wires.*
4 *Typical DC. Resistance values of uninsulated wires. Multiply by 104 for typical values after insulation.*
5 *Values are for tinned, heavy tinned, prefused, overcoated or topcoated conductors*
6 *Alloy 135 (High strength cadmium chromium copper)*
7 *Copper-covered steel, hard drawn, 40% conductivity*
8 *Does not meet UL conductor stranding requirements.*

Cable Application & Installation Guide

There are many different types of Multi-Conductor cables designed for a wide variety of applications. By definition, multi-conductor cables consist of two or more conductors primarily used for remote control, although power can be provided in some applications.

Typical Multi-Conductor types are:

• Small diameter • Tray cables • High temperature • Payout and retractile • Control • Low temperature

The decision to use one type over another is dependent upon the application and the applicable codes. **Typical Multi-Conductor Applications include:**

• Forced Directional Reeling and Pulling applications • Bending applications such as Cat-Tracks
• Robotic applications – Twisting and Bending • Pendant Applications – Pulling

TPC PRODUCT ADVANTAGES

- Engineered for maintenance to reduce usage and eliminate costly repairs and downtime through performance
  - Continual research and development
  - Extensive inventories – available in a wide variety of put-ups
- Complete range of product sizes cut to order
- Innovative product solutions to solve customer problems with specific products for a specific need

PRODUCT APPLICATION GUIDE

Forced Directional Reeling — is one of the toughest dynamic applications for a multi-conductor cable. This application places tremendous stresses on the jacket and conductors. If the correct cable is not used and installed properly, the cable will quickly begin to cork screw and ultimately fail.

Application	■ Any type of reeling application where the cable is being pulled.
Cable Design Characteristics	**Typically these cables have the following design characteristics:** ■ Reinforced jacket or strength member. ■ Hard Durometer jacket. ■ Constructed on a Planetary Cabler to eliminate conductor stress. ■ Conductor insulation has a very low coefficient of friction – allowing the conductors to slide freely within the conductor jacket. ■ A short lay length – a shorter lay length is preferred for bending applications. These cables typically fail when the jacket begins to stretch because of the pulling tension. When the jacket begins to stretch, the conductors are pulled out of their lay within the cable, and the cable begins to corkscrew. When the jacket has stretched enough, the conductors begin bearing the weight of the pull tension. At this point the individual conductors begin to work harder and fail.
Installation Keys	■ Select a cable with reinforced jacket or strength member. ■ Do not exceed the cable's rated pull tension (spring loaded reel tension increases as reel pays-out). ■ Select a reel drum diameter large enough for cable being used (the reel drum diameter should be at least 16 times cable O.D.). ■ Before installing on reel, pre-cut cable to length and hang for 24 hours to relieve spool storage memory. ■ Use a mesh strain relief at both ends of cable. This will spread jacket load and helps prevent jacket stretch.

TPC RECOMMENDED PRODUCTS:

- ***Super-Trex***® P&R Cable, Type W Portable Power & Automation, Triple-Gard, 4/0 Type TC Power, Type G and Extra Heavy Duty All Weather Reeling Cable
- ***Trex-Onics***® Multi-Conductor Cable and Individually Shielded Pair Cable — All Configurations

Cable Application & Installation Guide

Bending Applications Such As Cat-Tracks — Constant bending applications such as cat-tracks are abusive on multi-conductor cables because of both the bend radius of the application and the repetition of the motion. This application places stresses on the conductors as they are forced to move with the bend. If the correct cable is not used and installed properly, the conductors will begin to quickly work harden and break.

Application	■ Any type of bending application, such as a cat-track. ■ Where there is constant bending motion but no direct pulling of the cable.
Cable Design Characteristics	**Typically these cables have the following design characteristics:** ■ Smaller overall cable OD is preferred. ■ Reinforcement of the jacket is not necessary. ■ Softer jacket with a lower Durometer. ■ Constructed on a Planetary Cabler to eliminate conductor stress. ■ Conductor insulation that has a very low coefficient of friction– allowing the conductors to slide freely within the conductor jacket. ■ The construction cannot have a single center conductor or drain wire. ■ A short lay length – a shorter lay length is preferred for bending applications. **Cables typically fail in bending applications for two reasons:** the movement of the cable is restricted or the bend radius is too small for the cable. Wire tying the cables to the cable tray or to each other restricts constricts the movement of the conductors within the jacket, resulting in premature failure. Using too small a bend radius causes the conductors to be overstressed, resulting in work hardening of the conductors and ultimately conductor failure.
Installation Keys	■ Allow the cable to hang freely for 24 hours so that any tensions from being stored on a reel are released. ■ Do not exceed the cable's bend radius. ■ Use a mesh strain relief at both ends of the cable. This will help spread the load on the jacket, helping to prevent jacket stretch.

TPC RECOMMENDED PRODUCTS:
- ***Super-Trex***® Reduced Diameter Control Cable • ***Super-Trex***® P&R Cable
- ***Trex-Onics***® Multi-Conductor and Individually Shielded Pair Cable

Robotic Applications — These types of applications expose the cable to both bending and twisting motions. This is one of the tougher applications for a cable since the cable is moving in multiple axes. This type of motion requires a cable design similar to the cat-track cable but with a modified lay length to accommodate the twisting motion.

Application	■ Robotic – where there is a constant bending and twisting of the cable. ■ No direct pulling of the cable.

Cable Design Characteristics	**Typically these cables have the following design characteristics:**
	■ Smaller overall cable OD is preferred.
	■ Reinforcement of the jacket is not necessary.
	■ Often has a softer jacket with a lower Durometer – allows the cable to bend more freely.
	■ Constructed on a Planetary Cabler to eliminate conductor stress.
	■ Conductor insulation has a very low coefficient of friction – allowing the conductors to slide freely within the conductor jacket.
	■ The construction cannot have a single center conductor or drainwire.
	■ A medium lay length – a shorter lay length is preferred for bending applications – a longer lay length is preferred for twisting applications. **These cables typically fail because:**
	  ■ The cable bend exceeds the cable design – this is typically an equipment design flaw.
	  ■ The cable was tied down with wire ties. If applied too tightly, wire ties can constrict the movement of the conductors within the jacket causing work hardening of the conductors and failure.

Installation Keys	■ Allow the cable to hang freely for 24 hours so that any tensions from being stored on a reel are released. ■ Use a cable with a small overall OD. ■ Do not exceed the cables bend radius. ■ Use a mesh strain relief at both ends of the cable. This will help spread the load on the jacket, helping to prevent jacket stretch.

TPC RECOMMENDED PRODUCTS:
- ***Super-Trex***® Reduced Diameter Control Cable • ***Super-Trex***® P&R Cable
- ***Trex-Onics***® Multi-Conductor and Individually Shielded Pair Cable
- ***Super-Trex***® and ***Trex-Onics***® Power Cables

Cable Application & Installation Guide

Pendant Applications — These applications appear to be a very light duty application for a cable but in reality can be one of the most abusive. The cables are typically hanging from a junction box 15-20' up. They have a pendant box on the end that may weight 5-10 lbs. They have an operator pulling on the pendant box adding another 20-30 lbs of force to cable. This application places tremendous stresses on the jacket and conductors. If the correct cable is not used and installed properly, the cable will quickly begin to cork screw and ultimately fail.

Application	■ Any type of reeling application where the cable is being pulled. ■ Pendant applications where the weight of the cable and or the pendant box can cause the cable jacket to potentially stretch..
Cable Design Characteristics	**Typically these cables have the following design characteristics:** ■ Reinforced jacket or Strength member. ■ Hard Durometer jacket. ■ Constructed on a Planetary Cabler to eliminate conductor stress. ■ Conductor insulation has a very low coefficient of friction – allowing the conductors to slide freely within the conductor jacket. ■ A short lay length – a shorter lay length is preferred for bending applications. These cables typically fail when the jacket begins to stretch because of the pulling tension. When the jacket begins to stretch, the conductors are pulled out of their lay within the cable, and the cable begins to corkscrew. When the jacket has stretched enough, the conductors begin bearing the weight of the pull tension. At this point the individual conductors begin to work harden and fail.
Installation Keys	■ Select a cable with a reinforced jacket or strength member. ■ Do not exceed the cable's rated pull tension. ■ Use a mesh strain relief at both ends of the cable. This will help spread the jacket load, helping to prevent jacket stretch. ■ For a quick pendant change option, use a TPC connectorized pendant. This allows for an immediate swap out of a broken pendant box with no downtime.

TPC RECOMMENDED PRODUCTS:
- ***Super-Trex***® P&R Cable • ***Super-Trex***® Extra Heavy Duty All Weather Reeling Cable
- ***Trex-Onics***® Multi-Conductor and Individually Shielded Pair Cable

INSTALLATION GUIDE FOR CABLE CARRIERS

1. **Correct Track Size Measure** diameter of all track cables/hoses. Cables require 10% min. clearance from sides, separators, and other cables/hoses. Hoses require 20% min. clearance from sides, separators, and other cables/hoses. A larger track is required for application if these min. clearances can not be met.
2. **Correct Minimum Bend Radius** Verify track has bend radius large enough to accommodate largest cable in carrier. Minimum track height must be at least 16 times O.D. of largest cable in carrier (see FIG.1 below).
3. **Correctly Prepare Cable** Hang cables for 24 hours before installing in track to relieve spool storage memory.
4. **Plan the Correct Layout** Cable/hose weight should be distributed evenly across track window. Heavier cables should be placed toward outside of carrier.
5. **Load Cables/Hoses Correctly** Using the planned layout, load each cable/hose individually. They should not weave in between or around each other. Do not attach cables/hoses to each other or track. Now secure cable/hoses ONLY at fixed end bracket using grip seals or machined capture block. Zip Ties are not recommended.
6. **Test Cycle/Fine Tune Cycle** track 2-5 times to allow cables/hoses to self center properly inside track. Cables/hoses should follow centerline of track curve, not touching inside or outside crossbars around the curve. Manual adjustment may be required. Do not pull cables taught or allow any slack. Once completed, secure cables/hoses to the moving end bracket with grip seals or machined capture block. Zip Ties are not recommended.

TPC RECOMMENDED PRODUCTS:
- ***Super-Trex***® Reduced Diameter, Portable Power and Automation, P&R Cable and Control Cable
- ***Trex-Onics***® Multi-Conductor and Individually Shielded Pair Cable, C-Flex and VFD

Cable Application & Installation Guide

INSTALLATION GUIDE FOR REELING & PENDANT APPLICATIONS

1. Cable Preparation

i) As in the case with rolling up a garden hose, reeling cable is best done with the natural "set" of the cable. The natural set occurs during the manufacturing of the cable. The cable is curved in one direction with a definite tendency to be reeled one way as opposed to another. The cable must be put on the reel using its natural set with care exercised not to have the reel oppose the natural set.

ii) Ideally the cable should be pre-cut and hung suspended for 24 hours to develop its most natural set prior to installation.

iii) Measure off the cable and cut to the desired length. The length should allow for the Cat-Track length plus extra for routing and termination.

2. Bend Radius

i) See bend radius calculations for Cat-Track Applications.

3. Cable Tension

i) Cable tension plays a very important role in determining cable life in reeling and pendant applications. The copper conductors are the principal strength members in flexible cable construction. The following chart can be used as a guide in determining the proper cable tension and to prevent the cable from being overstressed.

ii) The primary symptom of too much tension on a cable is called "corkscrewing". This is characterized by the conductors bunching or twisting under the jacket. In severe cases it is possible for the conductors to punch through the jacket. This condition will ultimately result in cable failure.

iii) The lower the reeling tension, the longer the cable life, all other things being equal.

4. Reeling Speed & Temperature

i) Reeling speed and temperature are not as controllable as drum size and reel tension. If the reeling speed and/or temperature are extreme in any way, other considerations must be applied. A cold weather application might call for a larger drum diameter, whereas a high temperature may dictate a larger AWG size to reduce inner conductor temperatures.

ii) In general, the slower the reeling speed and/or the warmer the temperature, the longer the cable life.

iii) Cable speed normally should not exceed 400 feet per minute.

GENERAL GUIDELINES FOR CABLE SELECTION & INSTALLATION

1. **DO NOT** exceed the bend radius of the cable! 8-10 times the O.D. of the cable is an optimum bend radius.
2. **DO NOT** restrict cable movement with wire ties or clamps.
3. Where possible, always use some type of Strain Relief.
4. **ALWAYS** use a cable with a reinforced jacket or strength member in reeling or pendant application.
5. Allow the cable to hang for **24 HOURS** before installation.
6. **DO NOT** confuse flex life with flexibility. A cable may be very flexible but if it is not designed properly for the application it may have a very short flex life.
7. All things considered, use the smallest O.D. cable you can.

CABLE SIZE AWG/COND.	MAX. CONTINUOUS TENSION (LBS.)
20/2 20/1 pr	5
20/6 20/3 pr	16
20/12 20/6 pr	33
20/18 20/9 pr	49
20/24 20/12 pr	65
18/2 18/1 pr	10
18/6 18/3 pr	25
18/12 18/6 pr	51
18/18 18/9 pr	76
18/24 18/12 pr	102
18/5	19
18/12	45
18/19	71
18/25	93

CABLE SIZE AWG/COND.	MAX. CONTINUOUS TENSION (LBS.)
18/33	123
18/49	182
18/65	242
16/5	30
16/6	35
16/7	41
16/8	47
16/10	59
16/12	71
16/16	94
16/19	113
16/20	118
16/22	128
16/24	141

CABLE SIZE AWG/COND.	MAX. CONTINUOUS TENSION (LBS.)
16/25	148
16/30	177
16/31	180
16/33	196
16/36	212
16/41	239
16/47	279
16/49	291
16/60	350
16/65	386
14/6	56
14/7	65
14/8	75
14/10	93

CABLE SIZE AWG/COND.	MAX. CONTINUOUS TENSION (LBS.)
14/12	112
14/16	150
14/20	187
14/24	224
12/6	89
12/8	119
12/12	179
12/16	238
12/20	297
12/30	446
10/6	143
10/8	191
10/12	286

All values are nominal. Maximum Continuous Tension based on the following formula: $MCT = \frac{2.3 \times CMA}{1000} \times Cn$

Where: **MCT =** Maximum Continuous Tension **CMA =** Circular Mill Area **Cn =** Number of Conductors

Environmental Ratings

Code Letters (Ingress Protection)	First Index Figure (Foreign Bodies Protection)	Second Index Figure (Water Protection)
IP	6	5

INDEX FIGURE	DEGREE OF PROTECTION
0	No Protection
1	Protection against large foreign bodies.
2	Protection against medium sized foreign bodies.
3	Protection against small solid foreign bodies.
4	Protection against grain-shaped foreign bodies.
5	Protection against injurious deposits of dust.
6	Protection against ingress of dust.

INDEX FIGURE	DEGREE OF PROTECTION
0	No protection against water.
1	Drip-proof, against vertical water drips.
2	Drip-proof, against water drips, up to a 15º angle.
3	Spray-proof
4	Splash-proof
5	Hose-proof
6	Protected against flooding
7	Protected against immersion
8	Water-tight
9K	Protected against high-pressure liquids

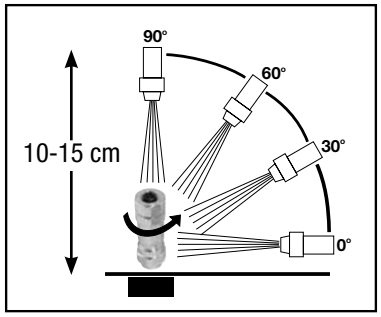
IP69K Rating

What does IP69K mean?

IP69K is an environmental rating for products being used where high pressure and high temperature spray may be used to sanitize equipment. The test specification was originally developed to test electrical connections used on road vehicles like dump trucks, cement mixers, snow plows, etc. In recent years this test has been widely adopted by the food and beverage industry to test electrical connectors that must withstand sanitary wash down.

How are the products tested?

Products that carry the IP69K rating are subject to a heated high pressure spray and must not allow any ingress of water that might interfere with the correct operation of equipment. The water is heated to 78°C and sprayed at a pressure of 1,500 PSI for 2 minutes on the mated connection. During the two minute process the connected assembly is rotated and subjected to the heated high pressure spray positioned at angles of 0°, 30°, 60° and 90° for 30 seconds each. The goal of the testing is to simulate high pressure, high temperature cleaning conditions that exist on the plant floor in the food and beverage industry.



Hazardous Locations

Class	Hazardous Material in Surrounding Atmosphere
Class I	Hazardous because flammable gases or vapors are present in the air in quantities sufficient to produce explosive or ignitable mixtures.
Class II	Hazardous because combustible or conductive dusts are present.
Class III	Hazardous because ignitable fibers or flying's are present, but not likely to be in suspension in sufficient quantities to produce ignitable mixtures. (Group classifications are not applied to this class.)

Division	Presence of Hazardous Material
Division I	The substance referred to by class is present during normal conditions.
Division 2	The substance referred to by class is present only in abnormal conditions, such as a container failure or system breakdown.

TPC cables rated as "Extra-Hard Usage" are suitable for Class I, II and III, Division 1 and 2 when installed per NEC articles 501, 502 and 503.

Group	Hazardous Material in Surrounding Atmosphere
Group A	Acetylene
Group B	Hydrogen, fuel and combustible process gases containing more than 30% hydrogen by volume or gases of equivalent hazard such as butadiene, ethylene, oxide, propylene oxide and acrolein.
Group C	Ethyl and ethylene or gases of equivalent hazard.
Group D	Gasoline, acetone, ammonia, benzene, butane, cyclopropane, ethanol, hexane, methanol, methane, natural gas, naphtha, propane or gases of equivalent hazard.
Group E	Combustible metal dusts, including aluminum, magnesium and their commercial alloys or other combustible dusts whose particle size, abrasiveness and conductivity present similar hazards in connection with electrical equipment.
Group F	Carbonaceous dusts, coal black, charcoal, coal or coke dusts that have more than 8% total entrapped volatiles or dusts that have been sensitized by other material so they present an explosion hazard.
Group G	Flour dust, grain, wood, plastic and chemicals.

Ethernet Chart

CHARACTERISTIC	CATAGORY 3	CATAGORY 5_E	CATAGORY 6_A	CATAGORY 7_A
Frequency Bandwidth	16 MHz	100 MHz	500 MHz	1,000 MHz
Digital Bandwidth	10 MB/s	1,000 MB/s	10,000 MB/s	20,000 MB/s
Attenuation (Min.@100MHz)	N/A	32db	29 db	27 db
Characteristic Impedance	100 Ohms	100 Ohms	100 Ohms	100 Ohms
Compatibility	CAT3	$CAT5_E$ CAT5 CAT3	$CAT6_A$/CAT6 $CAT5_E$/CAT5 CAT3	CAT7/$CAT6_A$ CAT6/$CAT5_E$ CAT5/CAT3
Standards Committee	TIA/EIA	TIA/EIA	ISO/IEC	ISO/IEC

Frequency Bandwidth — Measured in MegaHertz (MHz), is a measure of how big the opening is to get data through. A larger value equates to a faster data rate.

Digital Bandwidth — Measured in Megabits (MB/s), is a measure of the speed that the data moves. A larger value indicates a faster data rate.

Attenuation — Measured in decibels (db), is a measure of the relative differences in signal strength. A smaller value indicates less signal loss.

Characteristic Impedance — Measured in Ohms, is the input impedance (AC resistance) of the circuit. When impedances are matched, it provides the best data transfer.

Standards — TIA/EIA is the American standards organization for data communications. ISO/IEC is the international standards organization for data communications.

Selection Guide — Maximum Horsepower for VFD Cables*

FAMILY	CONDUCTOR SIZE	AMPACITY @ 30°C	2011 NEC TABLE	220-240 VOLT 3-PHASE	440-480 VOLT 3-PHASE	550-600 VOLT 3-PHASE
Trex-Onics®	16	18	310.15(B)(16)	0.120	10 HP	10 HP
Trex-Onics®	14	25	310.15(B)(16)	0.120	10 HP	10 HP
Trex-Onics®	12	30	310.15(B)(16)	0.120	15 HP	20 HP
Trex-Onics®	10	40	310.15(B)(16)	0.120	20 HP	30 HP
Trex-Onics®	8	55	310.15(B)(16)	0.260	30 HP	40 HP
Trex-Onics®	6	75	310.15(B)(16)	0.120	40 HP	50 HP
Trex-Onics®	4	85	310.15(B)(16)	25 HP	50 HP	60 HP
Super-Trex®/Standard Flex	4	114	B310.15(B)(2)(3)	30 HP	60 HP	75 HP
Super-Trex®/Standard Flex	2	152	B310.15(B)(2)(3)	40 HP	75 HP	100 HP
Super-Trex®/Standard Flex	1/0	205	B310.15(B)(2)(3)	60 HP	125 HP	150 HP
Super-Trex®/Standard Flex	2/0	237	B310.15(B)(2)(3)	60 HP	150 HP	200 HP
Super-Trex®/Standard Flex	4/0	316	B310.15(B)(2)(3)	100 HP	200 HP	250 HP
Super-Trex®/Standard Flex	262	362	B310.15(B)(2)(3)	100 HP	200 HP	300 HP
Super-Trex®/Standard Flex	373	449	B310.15(B)(2)(3)	125 HP	250 HP	350 HP
Super-Trex®/Standard Flex	444	497	B310.15(B)(2)(3)	150 HP	300 HP	400 HP
Super-Trex®/Standard Flex	535	555	B310.15(B)(2)(3)	150 HP	350 HP	450 HP

** Recommended horsepower is based on full-load current in Table 430.250 for the 2011 NEC Handbook and multiplied by 1.25 according to Article 430.22A and 430.122. Cable ampacities are based on 90°C conductor temperature and 30°C ambient temperature per the specified NEC Table.*

Actual horsepower is subject to the drive/motor manufacturers nameplate full-load current, and the local Authority Having Jurisdiction (AHJ).

Glossary

A

A — Common abbreviation for ampere (See ampere).

AC Motor — An electric motor that is operated on an AC (Alternating Current) circuit is an AC motor. The circuit and motor will be either single phase or three phase. Voltages will be 114V, 208V, 230V single phase; or 208V, 230V, 460V, 575V, three phase.

AAR — 589-591 Diesel locomotive. (American Association of Railroads)

AB — High voltage butyl cable.

ABC — Armored bushed cable. BX-armored building wire with polyvinyl chloride insulation, 600V.

ABP — Butyl polyethylene high voltage cable, 75°.

Abrasion Resistance — Ability of material or cable to resist surface wear.

AC — Branch circuit and feeder cables with flexible metal tape armor.

ACA — Synthetic tapes, felted asbestos, glazed cotton or glass braid, 1000V, 90°C.

Accelerated Aging — A test in which voltage, temperature, etc. are increased above normal values to obtain observable deterioration over a short period of time.

ACR — Corona resisting insulation.

ACSR — Aluminum cable, steel reinforced.

ACT — Armored cable continuing plastic conductors.

ACU — Armored cable containing latex rubber-insulated conductors.

ACV — Varnished cambric insulation, polyvinyl chloride interlocked armor, 5000V.

Alloy — A combination of two or more metals to form a new or different metal.

Alternating Current — An electrical current that continually reverses its direction, expressed in cycles per second.

Ambient Temperature — The temperature of a medium surrounding an object.

American Wire Gauge (AWG) — A standard system for designating wire diameter. Also referred to as the Brown and Sharpe (B&S) wire gauge.

Ampacity — The maximum current an insulated wire or cable can safely carry without exceeding either the insulation or jacket material limits.

Ampere — The unit of current. One ampere is the current flowing through one ohm resistance at one volt potential.

Anneal — To subject to high heat and then slowly cooled. This softens the metal and renders it less brittle.

Appendix B — United States Nuclear Regulatory Commission Quality Assurance (QA) criteria for New Reactor Licensing and Vendor QA within 10 CFR 50 Appendix B.

Aramid — Aramid fibers are a class of heat-resistant and strong synthetic fibers. They are used in aerospace and military applications for ballistic rated body armor and as a strength member to support cable designs.

AWM — Designation for appliance wiring material.

B

Bearing — A bearing is the device that supports the motor shaft. The shaft rotates in the bearing. The bearing may be a frequent source of trouble for maintenance and the motor may have to be replaced because of bearing problems.

Binder or Serve — A spirally served tape or thread used for holding assembled cable components in place awaiting subsequent manufacturing operations.

Breakout — The point at which a conductor or group of conductors is separated for a multi-conductor cable to complete circuits at various points along the new cable.

Building Wire — Wire used for light and power in permanent installation using 600V or less. Usually in an enclosure which would not be exposed to the outdoors.

Bunch Stranding — A group of wires of the same diameter twisted together without a predominant pattern.

C

Cable Assembly — A completed cable and its associated hardware ready to install.

Canadian Standards Association – *see CSA.*

Capacitance — The ratio of the eletrostatic charge on a conductor to the potential difference between the conductors required to maintain that charge.

CAT — Category.

Catenary — The curve made by a flexible material (cord, rope, etc.) suspended between two points.

CE — Abbreviation for the French phrase "Conformite Europeenne". Marking on a product is a manufacturer's declaration that the product complies with the essential requirements of the relevant European health, safety and environmental protection legislation in practice by many of the so-called Product Directives.

Ceramic — Ceramic is a heat and corrosion resistant, hard material made by firing clay or other minerals consisting of one or more metals in combination with a non-metal, usually oxygen. Ceramics can withstand continuous temperatures of 2600°F and short-term exposure to 3000°F without losing flexibility.

Circular Mil — The area of a circle one mil (0.001") in diameter; 7,845 x 10^{-7} sq. in. Used in expressing wire cross section of area.

Color Code — A system for circuit identification through use of solid colors and contrasting tracers.

Concentric "Lay" Strand — A group of uninsulated strands twisted together and containing a center core of (usually) six over one to form a seven strand with subsequent layers spirally wrapped. Normally, the adjacent layers have a reverse direction of lay. Concentric conductors are generally formed in a layer pattern consisting of 7, 19, 37, 61 and 91 strands. Control cables commonly use 7 and 19 strands while power cables tend to facilitate the use of 7 through 91 strands depending on application and size.

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Glossary

Concentricity — In wire and cable, the measurement of the location of the center of the conductor with respect to the geometric center of the circular insulation.

Conductor Types —

Copper – Excellent conductivity. Copper is rated at 100% conductivity. Most copper used in high temperature applications is OFHC (Oxygen Free High Conductivity) as opposed to the more common ETP (Electrolytic Tough Pitch). OFHC will not oxidize in high temperature environments and, therefore, offers an improved signal carrying capability.

Aluminum – 61% of the conductivity of copper and 13% of the weight. The most commonly used in the wire industry.

Copperweld – A thin coating of copper fused to a steel core. Used in line wire for strength.

Copperclad – A thin coating of copper fused to an aluminum core. Sometimes used in building wire in larger sizes of #12 and up.

AWG – A system for specifying wire size. AWG stands for the "American Wire Gauge." An increase of three gauge numbers: doubles area and weight and cuts in half the DC resistance. In general, the larger the AWG size, the smaller the wire, except when the size exceeds #1 AWG. Then the larger the number means the larger the wire size.

Contactor — A contactor is a motor controller that can be either remotely operated or has a start/stop push button in the cover of its enclosure. It is used to turn an electrical device on and off.

Continuous Usage Temperature — The product can survive for an indefinite period of time/years.

Continuous Vulcanization — Simultaneously extruding and curing of elastometric wire coating materials.

Control Cable — A multi-conductor cable made for operation in control or signal circuits.

Corrosion — The destruction of the surface of a metal by chemical reaction.

Coupling — A coupling (with reference to motors) is a mechanical linkage connecting the shaft to the device that the motor is driving.

Crazing — The minute cracks on the surface of plastic materials.

CSA — Abbreviation for Canadian Standards Association, a non-profit, independent organization which operates a listing service for electrical and electronic materials and equipment. The Canadian counterpart of the Underwriters Laboratories.

cUL — UL Mark for Canada, indicates a product is Listed to Canadian Standards, and has used Canadian standards to evaluate the product. *See UL.*

Current Carrying Capacity — The maximum current an insulated conductor can safely carry without exceeding its insulation and jacket temperature limitations.

CV — Continuous vulcanization.

D

DC Motor — An electric motor that is operated on a DC (Direct Current) circuit is a DC motor. There is no reference to "phase" in a DC circuit. The voltage, in applications for Quick-Connects, will be 90V or 180V. Either 2 or 4 leads come out of the motor for motors that can be adapted to the Quick-Connect cord set.

Dead Front — This term refers to the fact that no "live" metallic electrical parts, such as contacts or blades are exposed when the male and female elements are disengaged.

Derating Factor — A factor used to reduce the current carrying capacity of a wire when used in environments other than that for which the value was established.

Dielectric — A nonconducting substance; insulator.

Direct Current — An electrical current that flows in one direction only.

DLO Cable — Diesel Locomotive cable is a 2000 volt, CT rated cable suitable for use in conduit and cable trays.

Drain Wire — In a cable, the uninsulated wire laid over the component or components and used as a ground connection.

Drive — A drive is the system for converting the power generated by the rotating shaft of the motor to its usable form for the particular application.

Durometer — A device used to measure the hardness of a substance.

E

Elastomer — An elastic rubber-like substance such as natural or synthetic rubber.

Electrical Service — This term describes how the electricity is delivered by the local public utility to the facility.

Elongation — The fractional increase in length of a material stressed in tension.

Enclosure — A box that houses electrical devices or connections is called an enclosure. It normally is manufactured of steel, aluminum or fiberglass. Sizes can range from very small (2" x 4" x 2") to very large (48" x 72" x 18" or larger). They are rated by NEMA for various applications such as Type 1 (general purpose), Type 1A (dust-tight), Type 4 (water resistant), Type 12 (oil-tight).

ETL — abbreviation for ETL Testing Laboratories. The ETL Listed Mark is an alternative to UL and CSA marks and is used when denoting compliance with nationally recognized standards such as ANSI, IEC, UL and CSA.

Explosion Proof — This term refers to the classification of electrical devices that are permitted to be installed and operated in hazardous locations as defined in Articles 500 through 503 in the National Electrical Code (NEC). Such locations are where fire or explosion hazards may exist due to flammable gasses or vapors, flammable liquids, combustible dust, or ignitable fibers or filings.

Extreme Temperature Usage — The product is capable of surviving in this environment for only a few minutes after which it must be replaced.

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Glossary

F

F — Flat band metallic armor.

Farad — The unit of capacitance equal to a capacitor having a potential of 1 volt when charged with 1 coulomb of electricity.

FEP — Fluorinated ethylene propylene insulated wire.

FEPB — Fluorinated ethylene propylene insulated wire but with glass or asbestos braid.

FF-1 — Fixture wire, flexible, rubber insulated, single conductor, 300V, 60°C.

FF-2 — Same as FF-1, with 600V rating.

FFH-1 — Heat resistant fixture wire other wise same as FF01, 300V.

FFH-2 — Same as FF-1 with 600V rating.

Flex Life — The measurement of the ability of a conductor or cable to withstand repeated bending.

Flexibility — The quality of a cable which allows bend under the influence of an outside force, as opposed to limpness which is bending due to the cables overweight.

Fluoropolymer — Three fluoropolymers are commonly used in wire construction; tetrafluoroethylene (TFE) and two conventionally extruded materials, fluorinated ethylene propylene (FEP) and perfluoroalkoxy (PFA). Since TFE is difficult to extrude in long continuous lengths, it is often applied in the form of a tape wrap, or as a fluid dispersion used for impregnating fiberglass braids. Due to the excellent insulating properties of these compounds lead wire insulated with these materials can be half the size of conventional wire. Temperature ranges for these compounds: FEP – 200°C, PFA – 250°C, TFE – 250°C.

FRMR — Flame retarding, moisture resisting finish.

FT Ratings — Flame test ratings indicate how readily fire will spread along wire and cable. The tests are a complex formula of time, distance, diameter and set-up, but the following gives a general idea of what happens.

FT-1 – A Bunsen burner flame is applied to a vertical sample for five 15 second applications. Burning must cease within 60 seconds of removal of the burner with no more than 25% of a paper indicator charred. FT1 is applicable for wires such as NMD90 and TW75, which are used in combustible buildings. UL VW1 is similar to CSA FT-1.

FT-2 – A Bunsen burner flame is applied to a horizontal sample for five 15 second applications. The charred portion must not exceed 100mm from end to end and there shall be no flaming particles dropping from the sample. Products such as some S, SJ and HPN cords, as well as SIS wire, are rated FT-2.

FT-4 – Cables are strapped to an 8 ft vertical section of ladder tray and burned at 70,000 BTU for 20 minutes. The charred portion shall not exceed 1.5 meters. The FT-4 test is used on cable intended for tray or shaft applications.

FT-5 – Flame is applied to a horizontal sample, similar to the FT-2 fire test but with a much larger burner. The flame must extinguish in less than 4 minutes and the burn length shall not exceed 150mm. The FT-5 test is applicable to portable cables used in underground work areas such as mines and tunnels.

FT-6 – Cable samples on a horizontal tray in a tunnel type of chamber are burned at 300,000 BTU for 20 minutes. Flame spread not to exceed 1.5 meters, with a smoke density during the test of (a) 0.5 peak and 0.15 maximum average. FT-6 is used for cable in return air plenums.

FX — Single rubber insulated Christmas tree wire with outer braid, 125V, 60°C.

FXT — Single plastic insulated Christmas tree wire. 125V, 60°C.

G

G — Rubber insulated, neoprene jacketed, portable power cable with two to five #8 AWG or larger conductors with ground wires.

GFI — Ground Fault Interrupter. A protective device that detects abnormal current flowing to ground and then interrupts the circuit.

G-GC — A UL cable type. A portable power cable similar to Type G but also having a ground check conductor to monitor the continuity of the grounding circuit.

Glass — Glass is used in many high temperature wires as a jacket and as a filler. Since glass has low abrasion resistance, it is typically impregnated with silicone or fluoropolymer material. Glass is not a great insulator and its uses are usually restricted to the jacket. Glass melts at about 1800°F. When cooled, glass loses its flexibility and becomes brittle. Therefore, when the melting point of glass is reached, the cable most likely cannot be flexed although the cable has survived. Glass braids are also porous so they are typically finished with a fluoropolymer, silicone or aramid compound to improve moisture, chemical and heat resistance.

GOR — Gasoline and oil resistant wire.

Greenfield — This is a flexible, metallic conduit of circular cross-section that is used as a raceway to protect electrical conductors that run through it. Greenfield can be manufactured from steel or aluminum.

Ground — The connection between an electrical circuit and the earth or other large connecting body thus making a complete electrical circuit.

GTO — Gas tube sign and oil burner ignition cable. 5,000V – 15,000V.

H

H — Shielded power cable. Multi-conductor cables have paper or varnished cambric insulations applied directly over individual conductors. Spiraled metallic shielding tape over insulations with overall protective covering.

Hazardous Locations — These locations are defined in Articles 500 through 503 in the National Electrical Code 9 NEC). They are described as those locations where fire or explosion hazards may exist due to flammable gasses or vapors, flammable liquids, combustible dust, or ignitable fibers or filings.

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Glossary

HC — Two or more conductor heater cord, asbestos and rubber insulation with cotton braid over each conductor. Twisted, no overall covering.

HF — Polyethylene insulated radio hookup wire with or without braid.

HiPot — A test to determine the highest voltage that can be applied to a conductor without breaking down the insulation.

Horsepower — The amount of energy that the motor can deliver to the job it must do is measured in units of horsepower. For a rough calculation, in a DC circuit, one horsepower equals 746 watts. Since a watt = volts x amps, then 1 hp = 746 watts = 110 volts x 6.78 amps. This same calculation cannot be used for AC circuits, however, since the motor is an "inductive" load and a simple calculation is not possible.

HPN — Two conductor, neoprene insulated heater cord. Parallel construction. For use in damp locations.

HS — Rubber insulated heater cord. Cotton serve and rubber-jacketed overall. For use in damp locations #14 or #12 conductors. Also made with neoprene insulated inners.

HSJ — Same as type HS but with #18 or #16 conductors and differing thickness or jacket.

HSJO — Same as type HSJ but with neoprene jacket.

HSO — Neoprene jacketed heater cord.

HW — Radio hookup wire with polyvinyl insulation. With or without nylon jacket, braid or shield, 2500V.

Hydroscopic — Readily absorbing and retaining moisture.

I

I — Interlocked armor of aluminum, bronze or steel.

ICEA — Abbreviation for Insulated Cable Engineers Association, a pro-fessional not-for-profit organization dedicated to developing cable standards for electrical power, control and telecommunications industries.

ICEA 210,000 BTU Vertical Tray Flame Test (ICEA T-29-5200) —Though not a UL test, this test is similar to the 70,000 BTU per hour UL 1581 vertical tray test but with the heat source increased to 210,000 BTU per hour. This rating is not required by the NEC or CEC but sometimes required by end users.

ICEA Type G — A ground conductor for every primary conductor as well as two additional grounds. 90°C 2000V.

ICEA Type W — No ground conductors. 90°C 2000V.

IEEE — Institute of Electrical and Electronic Engineers.

Impedance —The measure of which an electric circuit resists the flow of electric current when an alternating current (AC) is applied. The impedance is affected by the resistance, inductance and capacitance in the circuit. Impedance is measured in Ohms.

Intrinsically Safe Circuit —A circuit in which any spark or thermal effect is incapable of causing ignition of a mixture of flammable or combustible material.

IPE — Irradiated polyethylene tape.

J

J — Asphalted jute, non-metallic armor.

K

K — Constant used to denote insulation resistance.

KCML — A newer term used to denote 1,000 circular mils.

L

L — Denotes lead sheath.

Lay — The length measured along the axis of a wire required for a single strand to make one complete turn about the axis of the cable. Left hand lay – Counterclockwise. Right hand lay – Clockwise.

Leads — This is the term that is used to describe electrical wires where the ends have been prepared or must be prepared for connection to either another wire (splicing), wire connector, or wire terminal.

LESCW — Low energy safety circuit wire.

Liquid-Tight Flexible Metal Conduit — This is a raceway of circular cross-section having an outer liquid-tight, non-metallic, resistant jacket over an inner flexible metal or plastic core with associated couplings, connectors, and fitting approved for the installation of electric conductors. Article 351 of the National Electrical Code (NEC) covers this device.

Long-Term Usage Temperature — The product can survive a brief exposure to this temperature (several days to several weeks) before replacement is required.

LW — Radio hookup wire with polyvinyl insulation. With or without nylon jacket, braid, or shielding braid 300V.

M

M — Suffix indicating two or more insulated, twisted conductors under an outer, non-metallic covering.

MC — Denotes cable with interlocking metal tape or corrugated tube enclosure.

MCM — One thousand circular mils.

MI — One or more conductors insulated with highly compressed refractory minerals and enclosed in a liquid-tight and gas-tight metallic tube sheathing.

Mica — Mica is an element with unique crystalline properties that allow for making very thin shavings. The highest rated mica has long term heat resistance of 1800°F and will melt at 2200°F. Due to its flaking characteristics, mica is usually bonded with a glass braid. Mica has good electrical properties and is used as both an insulator and a heat barrier in cable.

Mil — A unit used for measuring the diameter of a wire or thickness of insulation. One-one thousandth of an inch (0.001").

MIL — Military Specifications.

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Glossary

ML — Single conductor, paper lead cables twisted together without overall covering. Type A – AVC mine locomotive cable; Type B – Motor lead wire.

MM — Mining machine cable.

Modulus of Elasticity — The ratio of stress to strain in an elastic material.

Mold Cured — Cable which is first extruded with a mold unit onto a reel, then the whole reel is cured.

Motor Control — This is the term that covers the family of devices used to start and stop motors, reverse motors, change motor speeds and protect motors.

Motor Nameplate — A Motor Nameplate should be affixed to the housing or frame of the motor. Pertinent information relating to the installation and operation of the motor is normally contained on the nameplate. Such information includes Horsepower, Amperes, Voltage, Phase, Speed (in RPMs), Serial Number, Manufacturer's Name, etc.

Motor Protection — Motor protection is accomplished through the use of fuses, motor starters, thermostats or a combination of the three. The fuse specially designed for motor protection is the dual element fuse, commonly called a fusetron.

Motor Running Current — This is the value, in amperes, of the electrical current running through the motor windings when it is operating and delivering its rated horsepower. This value should be on the motor nameplate.

Motor Starting Current — This is the value, in amperes, of the electrical current running through the motor windings when the motor is started. Because of the inertia of the rotor when rotating from zero revolutions to high speed, the motor starting current is several times higher than the motor running current. The motor protection device (fuse, heater element, relay) must be designed to permit this higher current on starting.

MPF — Mine power feeder. 5-8-15kV.

MRFR — Moisture resistant, flame retardant finish.

MSHA — Mine Safety and Health Administration. The federal enforcement agency for employee safety in mines and mills.

MSHA Flame Test — This test is required by MSHA to ensure adequate fire resistance for cables used in the mining industry. In this test a 3 foot length of cable is mounted horizontally. During the test, all power conductors are connected to a current source to raise the conductor temperature to 400°F (204°C) to simulate overload conditions. A flame source consisting of a Tirrill burner with a heat output of approximately 3,000 BTU per hour is applied to the center of the cable for 60 seconds and then removed. Each of three test specimens must meet the following criteria:

1) The duration of burning must not exceed 240 seconds
2) The length of the burned (charred) area must not exceed 6 inches. Cables that meet this test requirement are printed with an MSHA acceptance number; the CSA FT-5 test is very similar.

MTW — Thermoplastic insulated machine tool wire. 90°C to 105°C, 600V.

Multiconductor — More than one conductor within a single cable complex.

MV — Medium voltage 5kV – 3kV.

MW — Radio hookup wire with polyvinyl insulation and plain or nylon jacket, or braid, or shield.

MYD — Marina yard and dock cable.

N

National Electric Code — A consensus standard published by the National File Protection Agency, the purpose is the practical safeguarding of persons and property from hazards arising from the use of electricity. The NEC is intended to be suitable for mandatory application by governmental bodies exercising legal jurisdiction over electrical insulations and for use by insurance inspections.

National Electrical Manufacturer's Association (NEMA) — This is a voluntary association of the leading US manufacturers of electrical devices and equipment. NEMA has published standards in various important product areas. This standardization has facilitated the inter-change of products and devices by the many manufacturers or similar products.

NBC — (Same properties of EZS.) A blend of acryonitrile butadiene rubber and polyvinyl chloride (PVC). Used for jacketing.

NEC — National Electrical Code.

NEMA — National Electrical Manufacturers Association.

NFPA — National Fire Protection Association.

Nickel — Coating used for conductors that operate at higher temperatures than silver. At these high temperatures, copper oxidizes rapidly if it isn't nickel-plated. However, one drawback of nickel is its poor solderability. Nickel is rated to temperatures to 200°C and above (450°C). The conductor is the metallic component of cable/wire through which electrical power or electrical signals are transmitted.

NM — Non-metallic sheathed cable, braid or plastic covered. For dry use, 60°C.

NMC — Non-metallic sheathed cable, braid or plastic covered. Wet or dry use, 60°C.

NRHW — Moisture and heat-resistant rubber insulation neoprene jacket for use in duets. Dry and wet locations, 600V, 75°C. Also RHWN.

O

OHM — Unit of resistance such that a constant current of one ampere produces a force of one volt.

OSHA — Abbreviation ofOccupational Safety and Health Act. Specifically the Williams-Steiger law passed in 1970 covering all factors relating to safety in places of employment.

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Glossary

P

P — Two or more rubber-insulated stranded conductors with cotton braid over each. Reinforced with overall covering of cotton braid over rubber filler. For pendant or portable use in damp locations. 300V– 600V.

PCG — Portable mine cable with power, control and ground conductors.

PD — Rubber insulated stranded conductors with cotton braid over each. Conductors twisted with braid overall. Light duty, dry locations on appliances, 300V.

Peckerhead — This is the generic term referring to the terminal box that is mounted on the motor frame.

PG — Portable mine cables having power and ground conductors. 600V.

Picofarad (pF) — Capacitance equal to one trillionth (10^{-12}) of a farad.

Picofarad/Foot (pF/Ft) — A common unit of measure used to measure capacitance of electrical cable.

Pilot Light — This is a motor control device that is used to indicate whether a circuit is on or off. It can be housed in the same enclosure as a push button, mounted independently, or in an electrical panel with a family of similar devices.

Plastic Deformation — Change to dimensions under load that is not recovered when the load is removed.

Plenum — The air return path of a central air handling system, either duct work or open space over a dropped ceiling.

Plenum Cable — Cable approved by UL for installations in plenums without the need for conduit.

PLSJ — All rubber, parallel-jacketed, two conductor, light duty cord for pendant or portable use in damp locations. 300V.

PLT — Same as PLSJ except thermoplastic insulations.

PLTC — Power Limited Tray Cable. A multi-conductor control or power cable rated for 300 volts and listed as suitable for use in cable trays per NEC Article 725.

PNA, PNW — Polyethylene insulated control cables with nylon sheath on individual conductors. Cabled tape and polyvinyl chloride jacket. Dry or wet locations, 600V, 75°C.

PO — Two stranded copper conductors with separator code rubber insulation and cotton braid over each. Laid parallel with cotton or rayon braid overall. For use in dry location on small appliances. 300V – 600V.

POSJ — All rubber, parallel, light duty rip cord for use on lamps and small appliances, 300V, 60°C.

POSJX — All rubber, parallel, #20 AWG. rip cord for use in lamps, clocks and Christmas trees. 125V.

POT — Thermoplastic, parallel, light duty rip cord. 300V, 60°C to 105°C.

Power Transmission — This term is used to cover the range of devices and systems that are used in conjunction with motors to accomplish tasks through the power of the motor. Power transmission systems convert the rotating power of the motor to do the particular work that is required.

POXT — Same as POT but #20 AWG for clock and Christmas tree use. 125V.

PS — Thermostat cable with solid conductors, individual rubber insulation and cotton braid. Twisted, rubber jacket and cotton braid overall.

Push Button — This is a motor control device that is used to start, stop, control speed, move up or down, etc. It can be housed in its own enclosure or mounted with other similar devices such as pilot lights, selector switches, etc.

PW — Moisture-proof, reinforced, portable cord with two or more rubber insulated conductors with individual cotton braid. Moisture resistant cotton braid finish over rubber jacket. 300V– 600V.

R

R — Code rubber insulated building wire, 600V, 60°C.

Rated Voltage — The maximum voltage at which an electrical component can operate for extended periods without undue degradation or safety hazard.

RD — Rubber insulated twin conductors, fibrous covered.

Resistance — A measure of the difficulty in moving electrical current through a medium when voltage is applied. Measured in ohms.

Retractile Cable — A cable that returns by its own stored energy from an extended condition to its original form.

Reversing Starter — This is a motor starter that is used to start and run a motor in either direction. Depending on the type of motor, this device is designed differently. Because it is a starter, however, it must also include a motor protection device.

RF — Fixture wire, code or latex rubber insulation and braid over solid or stranded conductor.

RFH — Same as RF but rubber or latex rubber insulation, heat resistant, 75°C.

RH — Rubber insulated, heat resistant building wire. 75°C.

RH/RW — Rubber insulated, heat and moisture resistant building wire. 75°C dry, 60°C wet.

RHD — Rubber insulated, twin conductor, heat resistant, fibrous covered wire.

RHDL — Same as RHD, except lead instead of fibrous covered.

RHH — Rubber insulated, heat resistant building wire. 90°C.

RHL — Same as RHH but with lead sheath overall.

RHM — Rubber insulated multiple conductors, heat resistant and overall fibrous covered.

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Glossary

RHML — Same as RHM but with lead cover overall.

RHW — Rubber insulated building wire, heat and moisture resistant. 75°C dry or wet.

RJ — Rubber insulated and jute covered cable.

RJFJ — Rubber insulated cable with flat band armor.

RJIJ — Rubber insulated with interlocking armor.

RL — Rubber insulated with lead sheath.

RLJFJ — Rubber insulated cable with lead, jute, flat band armor and overall jute covering.

RLJWJ — Rubber insulated cable with lead, jute, steel wire armor and overall jute covering.

RM — Rubber insulated multiple conductors with fibrous covering.

RML — Same as RM but lead instead of fibrous covering.

RoHS — Abbreviation for Restriction of Hazardous Substances. Also known as Directive 2002/95/EC, it originated in the European Union and restricts the use of lead, mercury, cadmium, hexavalent chromium, polybrominate biphenyls and polybrominated diphenyl ethers in new electrical and electronic products.

Rope Lay Bunched Stranded — A conductor formed by assembling 7 or 19 bunch stranded conductors to form a simple core in larger sizes 7, 19 and 37 simple ropes may be assembled to form the complete rope (conductor). For use in flexible power cables, portable power cords and welding cable, where greater flexibility is required.

Rope Lay Concentric Stranded — A conductor formed by assembling 7 or 19 concentric stranded conductors to form the completed conductor. Used in cables where some flexing is to be encountered and ease in bending is required.

RP — Performance grade rubber insulation, 60°C.

RPM — *See Speed.*

RR — Rubber insulation, neoprene jacket. *See type USE.*

RS — Integral rubber insulation and jacket on single conductor cables.

RU — Rubber insulated, latex building wire, 60°C.

RUH — Same as RU but heat resistant. 75°C.

RUW — Same as RU but moisture resistant. 60°C

RW — Rubber insulated building wire. Moisture resistant, 60°C.

RWS — Same as RW but synthetic rubber.

S

S — Heavy duty, rubber insulated portable cord. Stranded copper conductors with separator and individual rubber insulation. Two or more color coded conductor cabled with filler, wrapped with separator and rubber jacketed overall. 600V.

SA — Silicone rubber insulation, asbestos or glass braid, for use in dry locations. Maximum operating temperature for special applications, 125°C.

SB — Slow burning wire. Three cotton braids, impregnated. 90°C.

SD — Service drop cable. Two code-rubber-insulated conductors, tape, laid parallel with neutral conductor concentric thereover. Tape and braid overall. Also round construction.

SDN — Small diameter multi-conductor control cable with neoprene jacket and nylon sheath over polyethylene insulation.

SDT/TC — Thermo plastic 90°C tray cable.

SE — Above ground service entrance cable, not protected against mechanical abuse. Flame retardant, moisture resistant covering. Overall neoprene sheath. 60°C – 75°C.

SEA — Service entrance cable, steel armored under outer braid, one or two rubber insulated conductors with neutral conductor served concentrically, moisture resistant tape, weatherproof braid finish, 300V, 75°C.

Serve — Any filaments or group of filaments, such as wires or fibers vertically wound around a central core.

SEU — Same as SEA but not armored.

SEW, SEWF — Silicone rubber insulated equipment wire (CSA).

SF — Silicone rubber insulated fixture wire, solid or 7 stranded conductor, 200°C.

SG — Same as SW except with ground wires (CSA).

SGO — Same as SWO except with ground wires (CSA).

SH-A — Portable mine power cable, three or four individually shielded conductors. 5000V.

SH-B — Same as SH-A, except shield is overall.

SH-C — Same as SH-B but with grounding conductors.

SH-D — Same as SH-A but with grounding conductors.

Silver-plated — Conductors are used in high temperature environments. It is also used for high frequency applications where silver's high conductivity reduces attenuation at high frequencies. Silver is rated to temperatures up to 250°C.

Silicone — Silicone rubber is used as a heat resistant insulator and as a finisher on glass braids. Silicone has a 40 year life at 125°C, a 5 year life at 150°C, and can survive short-term temperatures of 200°C. Due to Silicone's relatively low price and favorable high temperature characteristics, it is one of the most widely used insulating material for applications below 200°C. Silicone is extremely moisture and chemical resistant, but has very low mechanical abrasion resistance. For this reason, silicone is usually used as a glass braid finisher or covered with a glass braid material.

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Glossary

Single Cable — A cable designed to carry current of usually one ampere or less.

Single Phase — AC (Alternating Current) motors are either single phase or three phase. Single phase motors are installed where single phase electrical service has been provided. Only two conductors (plus a ground) are available in single phase circuits. Single phase AC motors require a starting system such as "capacitor start." Voltages will be either 115V, 208V, or 230V.

SIS — Indicates single conductors having synthetic thermosetting insulation of heat resistant, moisture resistant, flame retarding grade. Also made with chemically cross-linked polyethylene insulation. Used for switchboard wiring only 90°C.

SJ — Junior hard service, rubber insulated pendant portable cord. Same construction as type S, but 300V. Jacket thickness different.

SJO — Same as SJ, but neoprene, oil resistant compound outer jacket. Can also be made "water resistant," 300V, 60°C.

SJT — Junior hard service thermoplastic or rubber insulated conductors with overall thermoplastic jacket. 300V, 60°C to 105°C.

SJTO — Same as SJT but oil resistant thermoplastic outer jacket. 60°C.

SL — Single conductor paper lead cables twisted together, without overall covering (Same as ML).

SO — Hard service cord, same construction as type S except oil resistant neoprene jacket. 600V, 60°C to 90°C.

SOO — Same construction as SO, with oil resistant insulation.

SOOW — Water resistant neoprene jacketed portable cord (CSA).

SP-1 — All rubber, parallel jacketed, two-conductor light duty cord for pendant use in damp locations. 300V.

SP-2 — Same as SP-1 but heavier construction, with or without third conductor for grounding purposes. 300V.

SP-3 — Same as SP-2 but heavier construction for refrigerators or room air conditioners. 300V.

SPC — Submersible pump cable.

Specific Gravity — The ratio of the density (mass per unit volume) of a material to the density of water.

Speed — The motor speed is normally stated on the Motor Nameplate in RPM's (Revolutions per Minute).

Spiral Wrap — The helical wrap of a tape or thread over a core.

SPT-1 — Same as SP-1 except all thermoplastic, 300V, with or without third conductor for grounding.

SPT-2 — Same as SP-2 except all thermoplastic, 300V, with or without third conductor for grounding.

SPT-3 — Same as SP-3 except all thermoplastic, 300V, with or without third conductor for grounding

SR — Silicone rubber control cable, 600V, 125°C.

SR-AW — Flexible nickel-plated copper conductor, silicone rubber insulation, glass braid. 500V, 200°C.

SR-C — Solid copper conductor, silicone rubber insulation, glass braid, 600V, 125°C.

SR-D — Portable range or dryer cable. Three or four rubber insulated conductors with rubber or neoprene jacket, flat or round construction. 300V, 60°C.

SRDT — Same as SR-D except all thermoplastic with a maximum temperature of 90°C.

SR-H—Silicone rubber insulated, asbestos braid. 500V, 125°C.

SSF — Same as SF except flexible stranding, 150°C.

ST — Hard service cord, jacketed, same as type S except all plastic construction. 600V, 60°C to 105°C.

Starter — A motor starter is used to start and stop a motor and to provide motor protection. It can be either manual or magnetic.

STO — Same as ST but with oil resistant thermoplastic outer jacket. 600V, 60°C.

STOO — Same as STO with oil resistant thermoplastic insulation.

Stranding — A system used to twist together or "lay up" small individual wires to form a single conductor. Stranding provides increased flexibility, flex life, ease of handling and/or vibration resistance.

Surge — A temporary large increase in the voltage or current in an electric circuit or cable.

SV — Vacuum cleaner cord, two or three conductor, rubber insulated. Overall rubber jacket. For light duty in damp locations. 300V, 60°C.

SVO — Same as SV except neoprene jacket, 300V, 60°C.

SVT — Same as SV except all plastic construction. With or without third conductor for grounding purposes only. 300V, 60°C to 90°C.

SVTO — Same as SVT except with oil resistant thermoplastic jacket. 60°C.

SW — Rubber jacket power supply cable (8 AWG to 2 AWG) CSA. 600V.

SWO — Same as SW except neoprene jacketed (CSA).

SWT — Plastic jacketed power supply cable (8 AWG to 2 AWG) CSA. 600V.

T

T — Thermoplastic vinyl building wire, 600°C.

TBS — Switchboard wire, thermo-plastic insulation, flame proof cotton braid, 600V, 90°C.

TBWP — Three cotton braids, weatherproof saturated. No voltage rating.

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Glossary

TC — Tray cable article 340 NEC.

Tear Strength — The force required to initiate or continue a tear in a material under specified conditions.

Temperature Rating — The maximum and minimum temperature at what a material or cable may be used in continuous operation without loss of its basic properties.

Tensile Strength — The pull stress required to break a given specimen.

TEW — Canadian Standards Association type appliance wires. Solid or stranded single conductor, plastic insulated. 600V, 105°C.

TF — Fixture wire, thermoplastic covered solid or 7 strands. 60°C.

TFE — Tetrafluoroethylene.

TFF — Same as TF but flexible stranding.

TFFN — Same as TFF but with nylon sheath.

TG — Flexible nickel or nickel clad copper conductor, fluoropolymer tape, glass braid. 200°C.

TGS — Solid or flexible copper, nickel clad iron or copper, or nickel conductor. Fluoropolymer tape silicon glass braid. 600V, 250°C.

Thermoplastic — A material which softens when heated or reheated and becomes firm upon cooling.

Thermoset — A material that hardens or sets by heat, chemical, or radiation techniques and that, once set, cannot be resoftened by heating.

THHN — 90°C 600V nylon jacketed building wire.

Three Phase — AC (Alternating Current) motors are either single phase or three phase. Three phase motors are installed where three phase electrical service has been provided. Three conductors (plus a ground) are available in three phase circuits. Three phase motors do not require a starting system. Three phase voltages will be either 208V, 230V, 460V or 575V.

THW — Thermoplastic vinyl insulated building wire. Flame retardant, moisture and heat resistant. 75°C. Dry and wet locations.

THWN — Same as THW but with nylon jacket overall. 75°C.

TIA/EIA — Abbreviation for Telecommunications Industry Association/ Electronic Industries Alliance. TIA is a trade association for the information, communications and entertainment technology industry. TIA serves through its leadership in standards development, and domestic and international policy advocacy. TIA represents the communications sector of the Electronic Industries Alliance (EIA).

Tinned Copper — Tin coating added to copper to aid in soldering and inhibit corrosion.

TP — Parallel tinsel cord. All rubber insulation and jacket over two extremely flexible conductors. Light duty, attached to appliances of 50W or less. For use in damp locations in lengths of eight feet or less.

TPE — Thermoplastic Elastomer.

TPO — Same construction as type PO but with extra flexible tinsel conductors. 125V.

TPT — Same as TP but all thermoplastic insulation and jacket. 125V.

Tray — A cable tray system is a unit or assembly of units or sections, made of non-combustible materials forming a rigid structural system used to support cables.

Tray Cable — A multi-conductor control signal, or power cable specifically approved under the NEC for installation in trays only.

Triaxial Cable — A cable construction having three coincident axes such as conductor, first shield and second shield all insulated from one another.

TS — Two or three conductor rubber insulated and jacketed tinsel cord. Light duty, attached to an appliance of 50W or less. For use in damp places in lengths of eight feet or less.

TSO — Same as type TS but with neoprene jacket, 125V.

TST — Same as TS but all thermoplastic insulation and jacket.

TT — Polyvinyl chloride insulation and sheath, aerial and duct.

TW—Thermoplastic vinyl jacketed building wire, moisture resistant, 60°C.

U

UF — Thermoplastic underground feeder and branch circuit cable.

UL — Underwriters Laboratory, a non-profit independent organization, which operates a listing service for electrical and electronic materials and equipment.

cUL – UL Mark for Canada, indicates a product is Listed to Canadian Standards, and has used Canadian standards to evaluate the product.

UL Listed – UL has determined that the manufacturer has demonstrated the ability to produce a product that complies with UL requirements. This may include product compliance testing.

UL Recognized – UL has determined that the manufacturer has demonstrated the ability to produce a component for use in an end product that complies with UL requirements.

UL VW-1 Vertical Wire Flame Test (UL: 1581) — This small-scale test conducted on a single 24 inch length of wire. The flame source is a Tirrill burner (similar to a Bunsen burner) with a heat output of approximately 3,000 BTUs per hour. The flame is applied for 15 seconds and is then reapplied 4 more times each time the wire ceases to burn. If the sample burns longer than 60 seconds after any application, or if the indicator flag or cotton batting is ignited during the test, the cable fails the test.

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Glossary

ULTC (Tray Cable) Flame Test (UL 1581) — This test is conducted on cables lashed to a vertical metal ladder tray 8 feet in height. The combustion source is a ribbon burner with a flame temperature of approximately 1500°F (815°C) which supplies 70,000 BTUs of heat per hour. The flame application time is 20 minutes. This rating requires the cable to self-extinguish prior to reaching the tip of the tray. A "tray rated" cable must meet this test.

URC — Weatherproof wire.

USE — Underground service entrance cable, rubber insulated, neoprene jacketed.

V

V — Varnished cambric insulation with fibrous covering.

VCB — Varnished cambric insulation, lead covered cable. Ends must be hermetically sealed.

VCL — Varnished cambric insulation, lead covered cable. Ends must be hermetically sealed.

VD — Indicates a twin wire having two type V conductors laid parallel under an outer fibrous covering.

Velocity of Propagation — The speed of an electrical signal down a length of cable compared to speed in free space expressed as a percent. It is the reciprocal of the square root of the dielectric constant of the cable insulation.

VFD — Variable Frequency Drive.

VG — Varnished glass tape over a flexible copper conductor. Varnished glass or nylon braid. 600V or 3000V, 130°C.

VM – Indicates a cable having two or more type V conductors twisted together under an outer fibrous covering.

Volt — A unit of electromotive force.

Voltage Rating — The highest voltage that may be continuously applied to a wire.

VW-1 — *See UL VW-1.*

W

W — Heavy-duty portable power cable, one to six conductors, 2000V without grounds.

Watt — A unit of electric power.

Wicking — The longitudinal flow of a liquid in a wire or cable due to capillary action.

WP — Weatherproof construction, two or three impregnated cotton braids, 80°C.

WTTC — Wind Turbine Tray Cable (NEC Article 336).

X

X — Two FX wires twisted together, color-coded, 125V. 60°C.

XHHW — High temperature (90°C) chemically cross-linked polyethylene jacketed small diameter building wire.

XLPE — Cross-linked polyethylene.

XT — Two FXT wire twisted together, color-coded, 125V. 60°C.

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TPC Wire & Cable Corp.

STANDARD TERMS & CONDITIONS OF SALE

1. PLEASE READ THIS AGREEMENT CAREFULLY. IT CONTAINS THE ONLY TERMS AND CONDITIONS OF SALE THAT APPLY TO THE PURCHASE OF PRODUCTS FROM TPC WIRE & CABLE CORP. ("COMPANY"). THESE TERMS PREVAIL OVER ANY TERMS SET FORTH IN CUSTOMER'S PURCHASE ORDER OR SIMILAR COMMUNICATION REGARDLESS WHETHER OR WHEN CUSTOMER HAS SUBMITTED ANY SUCH PURCHASE ORDER OR SIMILAR COMMUNICATION, AND ANY SUCH TERMS ARE OBJECTED TO AND SHALL NOT BE BINDING ON THE COMPANY. BY PLACING AN ORDER FOR PRODUCTS FROM THE COMPANY, OR BY ACCEPTING DELIVERY OF THE PRODUCTS DESCRIBED ON THE APPLICABLE PACKING SLIP, BILL OF LADING AND/OR INVOICE RECEIVED WITH THE PRODUCTS, CUSTOMER AGREES TO BE BOUND BY AND ACCEPT THESE TERMS AND CONDITIONS OF SALE. These Terms and Conditions and each accompanying confirmation of sale and/or invoice from the Company comprise the entire agreement between the parties, and supersede all prior or contemporaneous understandings, agreements, negotiations, representations and warranties, and communications, both written and oral. These Terms and Conditions may only be amended or modified in a writing which specifically states that it amends these Terms and Conditions and is signed by an authorized representative of each party. Notwithstanding anything herein to the contrary, if a written contract signed by an authorized representative of each party is in existence covering the sale of the goods or services covered hereby, the terms and conditions of said contract shall prevail to the extent they are inconsistent with these Terms and Conditions of Sale.

2. AVAILABILITY AND PRICING: Catalog product listings, specifications, availability, and pricing are subject to change without notice. Orders are not binding upon the Company until accepted by an authorized representative of the Company. The Company reserves the right to refuse service, terminate accounts or cancel orders in its sole discretion. The Company may also change or modify these Terms and Conditions of Sale from time to time without notice. For scheduled deliveries over 60 calendar days, the Company reserves the right to charge the Customer the price of the products at shipment if higher. The Company's quoted prices do not reflect the cost of accommodating Customer's purchases via credit card or any third party procurement services, software or e-commerce providers and the Company may accordingly pass through the additional charges incurred as a result of Customer's use of such purchasing methods. Prices shown do not include any Federal, State or local taxes or any present or future sales, use, excise, value-added or similar taxes. Where applicable, such taxes shall be billed as a separate item and paid by Customer. Orders are accepted with the understanding that such taxes will be added, as required by law. The Company charges local sales tax unless Customer has a valid sales tax exemption certificate on file with the Company. Orders under $100.00 U.S. Dollars and $150.00 Canadian Dollars will be subject to a $25.00 U.S. Dollars and $50.00 Canadian Dollars service charge respectively.

3. PAYMENT TERMS: Standard terms for Customers that are registered businesses and meet the Company's credit criteria are Net 30 days from invoice date unless otherwise agreed by the Company in writing. All payments are due within 30 days of the invoice date, without any deductions or setoffs. Customers shall not withhold payment of any amounts due and payable by reason of any deduction or set-off of any claim or dispute with Company, whether relating to Company's breach, bankruptcy or otherwise. The Company shall have the right of set-off and deduction for any sums owed. If Customer fails to pay within payment terms, the Company may defer shipments until such payment is made and may, at its option, cancel all or any part of unshipped orders. A late payment charge of 2% per month shall be charged on all past due accounts and Customer shall pay the Company all costs incurred by it in collecting any past due account from Customer, including all court costs and attorney's fees, provided, however, if the foregoing charges exceed that rate which may be lawfully charged under applicable law, then such charges shall be calculated so as not to exceed the lawful rate. The Company reserves the right to add a $35.00 service charge on all returned checks. Credits granted by the Company must be used within one year. Credits not taken within one year are subject to cancellation, and the Company shall have no further liability. Any remedies described in these Terms and Conditions shall not be exclusive, and shall be in addition to any other remedies available at law or in equity.

4. OPEN ACCOUNTS/CUSTOMER'S FINANCIAL CONDITION: A Customer that desires to open an account must furnish such information as requested by the Company. The Company reserves the right in its absolute discretion to grant, refuse or discontinue any extensions of credit, or reduce or suspend any credit limit at any time. Company also reserves the right to cancel any order, require payment in advance, or require the Customer to provide adequate assurance of performance, without any liability by the Company, in the event of the Customer's insolvency, filing of a petition in bankruptcy, the appointment of a receiver or trustee for Customer, or the execution by Customer of an assignment for the benefit of creditors.

5. CREDIT CARDS: We accept credit and procurement cards from American Express®, MasterCard®, VISA® and Government Purchase Cards. A surcharge may be assessed for Customers who routinely pay past due invoices by credit card.

6. RETURNS: Permission for return of products must first be secured from the Company in writing. Products returned without a Return Material Authorization Form will not be accepted. All Return Material Authorizations are conditional and are not final until the product is received and inspected by the Company. Credit will be issued at the original price charged less handling and transportation charges, where applicable. Returns may be subject to a restocking charge. All claims for shortages must be made within 72 hours of receipt of product.

7. INTERNATIONAL ORDERS: Export orders requiring special handling, packaging, freight costs, and documentation are subject to additional charges; please contact your Company Sales Representative for further details. Customer acknowledges that some products may not be available for shipment outside the U.S.

8. EXPORT CONTROLS: Products purchased or received under these Terms and Conditions of Sale are subject to export control laws, restrictions, regulations and orders of the United States. Customer agrees to comply with all applicable export laws, restrictions and regulations of the United States or foreign agencies or authorities, and shall not export, or transfer for the purpose of re-export, any product to any prohibited or embargoed country or to any denied, blocked, or designated person or entity as mentioned in any such United States or foreign law or regulation. Customer represents and warrants that it is not on the Denied Persons, Specially Designated Nationals or Debarred Persons List and is not otherwise prohibited by law from purchasing the products or services hereunder. Customer shall be responsible to obtain any license to export, re-export or import as may be required.

9. DELIVERY & DAMAGES: All U.S. domestic shipments are FOB Shipping Point in accordance with Incoterms 2000 and in all cases title shall pass upon delivery to the carrier at point of shipment and thereafter all risk of loss or damage shall be upon Customer (without regard to which party pays for the shipping costs). If Company is notified by Customer of a loss or damage during shipment, the Company will gladly lend its assistance to Customer in securing an adjustment from the carrier. Company and carrier handling charges apply and are not included in the price of products. In-stock catalog products are normally shipped within 24 hours after Company's receipt of order from the Company's warehouse. Next Day Air Service is available upon Customer request, otherwise Company shall choose the method of shipment. Delivery dates provided in advance are estimates only and shall not represent fixed or guaranteed delivery dates. Export shipments are on the basis of FOB Company Warehouse in accordance with Incoterms 2000, with the Company charging separately for all costs, including brokerage fees, duties, taxes, insurance, and freight to bring the products to the named place of destination.

10. WARRANTY & LIMITATION OF LIABILITY: There are no express or implied warranties for value added services, services bundled with the products, or other services provided by the Company. COPIES OF THE

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TPC Wire & Cable Corp.

MANUFACTURERS' WARRANTIES ARE AVAILABLE PRIOR TO THE PURCHASE OF PRODUCTS BY CONTACTING THE COMPANY. THE COMPANY MAKES NO OTHER WARRANTIES WHATSOEVER, WHETHER EXPRESS OR IMPLIED BY LAW, COURSE OF DEALING, COURSE OF PERFORMANCE, USAGE OF TRADE OR OTHERWISE, AND ANY AND ALL OTHER WARRANTIES, INCLUDING BUT NOT LIMITED TO WARRANTIES OF MERCHANTABILITY, TITLE, NON-INFRINGEMENT OR FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY DISCLAIMED. CUSTOMER IS RESPONSIBLE FOR INSTALLATION AND USE IN ACCORDANCE WITH MANUFACTURERS' INSTRUCTIONS AND THE COMPANY SHALL NOT BE RESPONSIBLE FOR CUSTOMER'S IMPROPER SELECTION OF A PRODUCT FOR A PARTICULAR APPLICATION OR OTHERWISE. NO WARRANTY WILL APPLY IF ITS PRODUCTS ARE IN ANY WAY ALTERED OR MODIFIED AFTER DELIVERY BY THE COMPANY OR DEFECT OR FAILURE ARISES BECAUSE CUSTOMER FAILED TO FOLLOW COMPANY'S INSTRUCTIONS AS TO THE STORAGE, INSTALLATION, COMMISSIONING, USE OR MAINTENANCE OF THE GOODS. NOTWITHSTANDING ANYTHING TO THE CONTRARY CONTAINED HEREIN OR IN ANY OTHER AGREEMENT AMONG THE PARTIES, (A) THE COMPANY'S LIABILITY ON ANY CLAIM ARISING OUT OF THIS AGREEMENT OR FROM THE PERFORMANCE OR BREACH OF THIS AGREEMENT OR CONNECTED IN ANY MANNER WITH THE SUPPLYING OF ANY PRODUCTS OR SERVICES HEREUNDER, OR THE SALE, RESALE, OPERATION OR USE ALLOCABLE TO SUCH PRODUCTS OR PART THEREOF INVOLVED IN THE CLAIM, WHETHER BASED ON CONTRACT, WARRANTY, TORT (INCLUDING NEGLIGENCE AND FOR PROPERTY DAMAGE AND DEATH) OR OTHER GROUNDS, SHALL NOT IN ANY EVENT EXCEED THE PRICE ALLOCABLE TO SUCH PRODUCTS OR PART THEREOF INVOLVED IN THE CLAIM, REGARDLESS OF CAUSE OR FAULT., AND (B) IN NO EVENT SHALL THE COMPANY BE RESPONSIBLE TO CUSTOMER OR ANY THIRD PARTY FOR ANY CONSEQUENTIAL, SPECIAL, INCIDENTAL, INDIRECT PUNITIVE OR EXEMPLARY DAMAGES, INCLUDING BUT NOT LIMITED TO LOSS OF PROFITS, REVENUES, SALES, DATA, BUSINESS, GOODWILL OR USE, OR DIMINUTION IN VALUE, EVEN IF THE COMPANY HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH LOSS OR DAMAGE OR IF SUCH LOSS OR DAMAGE COULD HAVE BEEN REASONABLY FORESEEN BY COMPANY, IN EACH CASE, REGARDLESS OF THE LEGAL OR EQUITABLE THEORY (CONTRACT, TORT OR OTHERWISE) UPON WHICH THE CLAIM IS BASED, AND NOTWITHSTANDING THE FAILURE OF ANY AGREED OR OTHER REMEDY OF ITS ESSENTIAL PURPOSE. THE PARTIES AGREE THAT WITHOUT THIS LIMITATION OF LIABILITY THE COMPANY WOULD NOT HAVE AGREED TO THE PRICE OR TERMS AND CONDITIONS OF THIS AGREEMENT. THE LIMITATION OF LIABILITY SET FORTH HEREIN APPLIES BOTH TO PRODUCTS AND SERVICES PURCHASED OR OTHERWISE PROVIDED HEREUNDER. Any cause of action against the Company must be instituted within 1 year from the date of purchase or provision of the products or services. If the Company provides Customer with advice, training, applications support, or other assistance which concern any products supplied hereunder, or any equipment, system or the like in which the product may be installed, the Company's giving of such advice or assistance will not subject the Company to any liability, whether based on contract, warranty, tort (including negligence) or other grounds. PRODUCTS MANUFACTURED BY A THIRD PARTY MAY CONSTITUTE, CONTAIN, BE CONTAINED IN, INCORPORATED INTO, ATTACHED TO OR PACKAGED TOGETHER WITH, THE GOODS SOLD PURSUANT TO THESE TERMS AND CONDITIONS, AND SUCH THIRD PARTY PRODUCTS ARE NOT COVERED BY THE COMPANY'S MANUFACTURER'S WARRANTIES OR ANY EXPRESS OR IMPLIED WARRANTY BY THE COMPANY.

11. CATALOG DESCRIPTIONS: All specifications, drawings, illustrations, descriptions and particulars of weights, dimensions or capacity and other details including, without limitation, statements regarding compliance with legislation or regulation (together "Descriptions") wherever they appear (including, without limitation, in this catalog, on web sites, on dispatch notes, invoices or packaging) are intended to give a general idea of the products, but will not form part of this Agreement. The Company accepts no liability in contract or tort, or under statute, regulation or otherwise for any error in or omission from such Descriptions whether caused by the Company's negligence or otherwise. The Company may make changes to the products as part of a program of improvement or to comply with legislation. The information contained on our website supersedes the information contained in any printed catalog or other publication.

12. INTELLECTUAL PROPERTY RIGHTS: The products offered for sale by the Company may be subject to patent, trademark, copyright, design and other rights of third parties. The Company shall in no event whatsoever be responsible or liable in the event of any claim of infringement of any such rights. The Company's entire catalog(s) and website(s), including without limitation, the content of the catalog(s) and website(s) is copyrighted as a collective work under United States of America laws and applicable international copyright laws and the Company, its parent company or its affiliates own the full copyright in its catalog(s) and website(s), including without limitation in the selection, coordination, arrangement and enhancement of the content contained therein. Except as stated below, none of the materials in the Company's catalog(s) or on its website(s) may be reproduced, distributed, republished, downloaded, copied in any form or by any means, displayed, posted, transmitted, modified, translated, added to, updated, compiled, or abridged without the prior written permission of the Company. Customer may download, store, print and copy selected portions of the content in the Company's catalog(s) and website(s) provided Customer: (1) only uses the content downloaded, stored, or printed for furthering Customer's business with the Company; (2) does not publish or post any part of the content from the catalog(s) or website(s) in any other catalog or on any other Internet site; (3) does not publish or broadcast any part of the content from the catalog(s) or website(s) in or on any other media; and (4) does not modify or alter the content from the catalog(s) or website(s) in any way or delete or modify any copyright or trademark notice. All non-public, confidential or proprietary information of Company, including, but not limited to, specifications, samples, patterns, designs, plans, drawings, documents, data, business operations, customer lists, pricing, discounts or rebates, disclosed by Company to Customer, whether disclosed orally or disclosed or accessed in written, electronic or other form or media, and whether or not marked, designated or otherwise identified as "confidential," in connection with the sale of goods or services under these Terms and Conditions is confidential, solely for the use of performing such sale and may not be disclosed or copied unless authorized in advance by Company in writing.

13. FORCE MAJEURE: The Company shall not be liable for loss or damage caused by any delay or failure to perform resulting in whole or in part from Acts of God, severe weather conditions, labor disruptions, governmental decrees or controls, insurrections, war, risks, shortages, inability to procure or ship product or obtain permits and licenses, insolvency or other inability to perform by the manufacturer, delay in transportation, any other commercial impracticability and/or any other circumstances beyond the control of the Company.

14. GOVERNING LAW: This Agreement and any sales hereunder shall be governed by the laws of the State of Ohio without regard to conflicts of laws rules and venue shall be exclusively in the federal and state courts of Cuyahoga County, State of Ohio, United States of America. The parties expressly exclude the application of the 1980 United Nations Convention of Contracts for the International Sales of Goods, if otherwise applicable.

15. SEVERABILITY: If any provision or provisions of this Agreement shall be held to be invalid, illegal or unenforceable, such provision(s) shall be enforced to the fullest extent permitted by applicable law, and the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby.

16. WAIVER: The Company's failure to insist on performance of any term or condition contained in this Agreement, or failure to exercise any of the Company's rights hereunder, shall not constitute a waiver of any of the Company's rights or remedies under this Agreement.

17. NO THIRD PARTY BENEFIT: The provisions set forth in these Terms and Conditions of Sale are for the sole benefit of the parties hereto, and confer no rights, benefits or claims upon any person or entity not a party hereto.

Notes

The Real Cost of Maintenance

The real cost of cord and cable maintenance includes not only the cost of material, but the cost of labor and down time that result from unnecessary repair and replacement of damaged or worn out cord and cable.

In addition to providing a unique product, TPC Wire & Cable Corp. provides:

- **Cost Value Analysis Reports** CVA | cost value analysis
- **Personal Sales Support**
- **Deep Inventories**
- **Hard to Find Cord and Cable Products**
- **Knowledgeable Customer Service**
- **Proven Product Reliability**
- **Product Management and Engineering Support**
- **High Performance Problem Solving Products**
- **Custom Engineered Products**

TPC WIRE & CABLE CORP.
EXPECT HIGH PERFORMANCE®

A Broad Line Supplier of High Quality, High Performance Wire and Cable Products Designed for Abusive Industrial Environments

FOOD & BEVERAGE

AUTOMOTIVE

CRANE/STEEL

TRANSPORTATION

UTILITIES

WOOD, PULP & PAPER

OIL & GAS

GOVERNMENT

MINING

SUPER-TREX® Power and Control Cables designed for Harsh Industrial Environments

TREX-ONICS® Designed for High Flexing Applications

DEFENDER® Designed for Extreme Heat, Cold and Chemical Exposure with Added Antimicrobial Protection

CHEM-GARD™ Designed for Extreme Heat, Cold and Chemical Exposure

THERMO-TREX® High Temperature Cable and Accessories

VULKO-WRAP™ Self Vulcanizing Insulated Wrap

QUICK-CONNECTS™ Quickly Switch Out Control Devices

KORD-GARD™ Strain Relief for Cords and Cables

GRIP-SEAL™ Cord and Cable Protection against Extreme Temperatures and Chemicals

CUSTOM ENGINEERED PRODUCTS Designed to Solve Your Unique Application Problems

TPC WIRE & CABLE CORP.
EXPECT HIGH PERFORMANCE®

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GSA Contract Holder
Contract GS-07F-080AA

TPC WIRE & CABLE CORP. HEADQUARTERS 9600 VALLEY VIEW RD, MACEDONIA, OHIO 44056
USA 800-521-7935 • FAX 866-528-2930 • CANADA 800-545-0122 • MEXICO 001-877-283-1696
CHILE 1230-020-0229 • COLOMBIA 0-1-800-915-7519 • PERU 0800-54863 • **WWW.TPCWIRE.COM**