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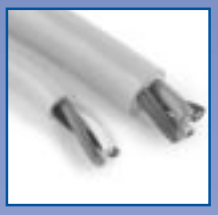

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# BOAT CABLE

## 105˚C DRY 75˚C WET (BC-5W2) 600V TINNED COPPER - FLAT CONSTRUCTIONS

Pacer stocks over 50 different marine boat cable constructions. Our stock includes both flat and round configurations with varying conductor and jacket colors. Pacer's boat cable has become the choice for hundreds of boat builders because of our extensive stock and quick shipments. Our manufacturing process extrudes a flexible yet tough PVC jacket onto the conductors. This extrusion process fills the voids (intertesies) between the conductors leaving no air space for condensation to accumulate. The inner conductors, which are the made to the exact specifications as our WUL primary wire, are talcum powder coated allowing for the easy removal of the jacket. The finished product is flexible, durable and easy to install.

Choose Pacer for the one of the largest selections of stocked marine boat cable in the country.

### FEATURES:

- Finely stranded (Type III) tinned copper conductors
- Color coded PVC jacket.
- Temperature Range: -20˚C to 105˚C
- Voltage Rating: 600V
- Resistant To: Acid, Alkalis, Abrasion, Flame, Gasoline, Oil, Ozone, Moisture, Fungus
- Applications: A/C and D/C internal wiring of boats

### COMPLIANCES:

UL Standard 1426
SAE: J1128, J378
ABYC: E-8.14, E-9.14
Coast Guard: 33 CFR part 183
NMMA

| (A) PART NUMBER | AWG | NUMBER OF COND(S) | CONDUCTOR STRANDING | JACKET THICKNESS | NOMINAL O.D. | STANDARD PUT-UPS | APPRX. SHIP LBS. |
|---|---|---|---|---|---|---|---|
| **DUPLEX BOAT CABLE - WHITE, BLACK, CONDUCTORS, WHITE JACKET.** | | | | | | | |
| W16/2 | 16 | 2 | 26/.0100 | .30 | .186 x .312 | C, TL, D, M | 51 |
| W14/2 | 14 | 2 | 41/.0100 | .30 | .205 x .348 | C, TL, D, M | 65 |
| W12/2 | 12 | 2 | 65/.0100 | .30 | .220 x .378 | C, TL, D, M | 82 |
| W10/2 | 10 | 2 | 105/.0100 | .30 | .245 x .428 | C, TL, D, M | 128 |
| W8/2 | 8 | 2 | 168/.0100 | .45 | .357 x .622 | C, TL, D, M | 230 |
| W6/2 | 6 | 2 | 266/.0100 | .45 | .436 x .785 | C, TL, D | 364 |
| **DUPLEX "DC" BOAT CABLE - RED, BLACK CONDUCTORS, WHITE JACKET (SILVER PRINT).** | | | | | | | |
| W16/2DC | 16 | 2 | 26/.0100 | .30. | 186 x .312 | C, TL, D, M | 51 |
| W14/2DC | 14 | 2 | 41/.0100 | .30 | .205 x .348 | C, TL, D, M | 65 |
| W12/2DC | 12 | 2 | 65/.0100 | .30 | .220 x .378 | C, TL, D, M | 82 |
| W10/2DC | 10 | 2 | 105/.0100 | .30 | .245 x .428 | C, TL, D, M | 128 |
| W8/2DC | 8 | 2 | 168/.0100 | .45 | .357 x .622 | C, TL, D, M | 230 |
| W6/2DC | 6 | 2 | 266/.0100 | .45 | .436 x .785 | C, TL, D | 364 |
| **DUPLEX "DC" BOAT CABLE - RED, BLACK CONDUCTORS, GREY JACKET.** | | | | | | | |
| W16/2DCG | 16 | 2 | 26/.0100 | .30 | .186 x .312 | C, TL, D, M | 51 |
| W14/2DCG | 14 | 2 | 41/.0100 | .30 | .205 x .348 | C, TL, D, M | 65 |
| W12/2DCG | 12 | 2 | 65/.0100 | .30 | .220 x .378 | C, TL, D, M | 82 |
| W10/2DCG | 10 | 2 | 105/.0100 | .30 | .245 x .428 | C, TL, D, M | 128 |
| **DUPLEX DUPLEX "DC" BOAT CABLE - RED, YELLOW CONDUCTORS, BLUE JACKET*.** | | | | | | | |
| W16/2RYB | 16 | 2 | 26/.0100 | .30 | .186 x .312 | C, TL, D, M | 51 |
| W14/2RYB | 14 | 2 | 41/.0100 | .30 | .205 x .348 | C, TL, D, M | 65 |
| W12/2RYB | 12 | 2 | 65/.0100 | .30 | .220 x .378 | C, TL, D, M | 82 |
| W10/2RYB | 10 | 2 | 105/.0100 | .30 | .245 x .428 | C, TL, D, M | 128 |
| W8/2RYB | 8 | 2 | 168/.0100 | .45 | .357 x .622 | C, TL, D, M | 230 |
| W6/2RYB | 6 | 2 | 266/.0100 | .45 | .436 x .785 | C, TL, D | 364 |

*ABYC section 9.14 Table IX recommends the use of red, yellow conductors as a "DC" circuit. Yellow being a substitute for the typical black ground to avoid confusion with the black conductor on "AC" circuits.

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **TRIPLEX "AC" BOAT CABLE - BLACK, GREEN, WHITE CONDUCTORS, WHITE JACKET.** | | | | | | | |
| W16/3 | 16 | 3 | 26/.0100 | .30 | .186 x .435 | C, TL, D, M | 70 |
| W14/3 | 14 | 3 | 41/.0100 | .30 | .205 x .485 | C, TL, D, M | 93 |
| W12/3 | 12 | 3 | 65/.0100 | .30 | .220 x .538 | C, TL, D, M | 128 |
| W10/3 | 10 | 3 | 105/.0100 | .30 | .245 x .613 | C, TL, D | 175 |
| W8/3 | 8 | 3 | 168/.0100 | .45 | .357 x .888 | C, TL, D | 340 |
| W6/3 | 6 | 3 | 266/.0100 | .45 | .436 x 1.130 | C, TL, D | 523 |
| **TRIPLEX "AC" BOAT CABLE - BLACK, GREEN, RED CONDUCTORS, BLUE JACKET.** | | | | | | | |
| W14/3B | 14 | 3 | 41/.0100 | .30 | .205 x .485 | C, TL, D, M | 93 |
| W12/3B | 12 | 3 | 65/.0100 | .30 | .220 x .538 | C, TL, D, M | 128 |
| W10/3B | 10 | 3 | 105/.0100 | .30 | .245 x .613 | C, TL, D | 175 |

**SEE TECHNICAL DATA PAGE 77 FOR CIRCULAR MIL AREA OF CONDUCTORS.**

**(B)**

| PUT-UP DESIGNATION | QTY. |
|---|---|
| -C | 100 |
| -TL | 250 |
| -D | 500 |
| -M | 1000 |

## ORDERING INFORMATION:

Order by standard put-up.
Combine Part Number (A) with Put-up Designation (B)
EXAMPLE: 14 AWG 3 Conductor, White Jacket 1000 Feet.= W14/3-M



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# BOAT CABLE

## 105˚C DRY 75˚C WET 600V TINNED COPPER - ROUND CONSTRUCTIONS

Round boat cables allow for easy installation where tight twist and turns are common. Many installers prefer the use of round cables because they are easier to organize and leave a more presentable finished looking installation. Round boat cables can contain many more conductors on a single run making installations efficient and quick.

Choose Pacer for the one of the largest selections of stocked marine boat cable in the country.

### FEATURES:

- Finely stranded (Type III) tinned copper conductors
- Color coded PVC jacket.
- Temperature Range: -20˚C to 105˚C
- Voltage Rating: 600V
- Resistant To: Acid, Alkalis, Abrasion, Flame, Gasoline, Oil, Ozone, Moisture, Fungus
- Applications: A/C and D/C internal wiring of boats

### COMPLIANCES:

UL Standard 1426
SAE: J1128, J378
ABYC: E-8.14, E-9.14
Coast Guard: 33 CFR part 183
NMMA

| (A) PART NUMBER | AWG | NUMBER OF COND(S) | CONDUCTOR STRANDING | JACKET THICKNESS | NOMINAL O.D. | STANDARD PUT-UPS | APPRX. SHIP LBS. |
|---|---|---|---|---|---|---|---|
| **ROUND DUPLEX BOAT CABLE - RED, BLACK, CONDUCTORS, GRAY JACKET.** | | | | | | | |
| WR16/2DCG | 16 | 2 | 26/.0100 | .30 | C, TL, D, M | 53 | |
| WR14/2DCG | 14 | 2 | 41/.0100 | .30 | C, TL, D, M | 67 | |
| WR12/2DCG | 12 | 2 | 65/.0100 | .30 | C, TL, D, M | 85 | |
| WR10/2DCG | 10 | 2 | 105/.0100 | .30 | C, TL, D | 130 | |
| **ROUND TRIPLEX "AC" BOAT CABLE - BLACK, GREEN, WHITE CONDUCTORS, GRAY JACKET.** | | | | | | | |
| WR16/3G | 16 | 3 | 26/.0100 | .30 | C, TL, D, M | 73 | |
| WR14/3G | 14 | 3 | 41/.0100 | .30 | C, TL, D, M | 96 | |
| WR12/3G | 12 | 3 | 65/.0100 | .30 | C, TL, D | 131 | |
| WR10/3G | 10 | 3 | 105/.0100 | .30 | C, TL, D | 178 | |
| **ROUND QUAD BOAT CABLE - BLACK, GREEN, RED, WHITE CONDUCTORS, GRAY JACKET.** | | | | | | | |
| W16/4G | 16 | 4 | 26/.0100 | .30 | .370 | C, TL, D, M | 108 |
| W14/4G | 14 | 4 | 41/.0100 | .30 | .400 | C, TL, D, M | 136 |
| W12/4G | 12 | 4 | 65/.0100 | .30 | .480 | C, TL, D | 185 |
| W10/4G | 10 | 4 | 105/.0100 | .30 | .565 | C, TL, D | 253 |
| W8/4G | 8 | 4 | 168/.0100 | .45 | .880 | C, TL, D | 475 |
| W6/3-8/1G | 6* | 4 | 266/.0100 | .45 | | C, TL | 650 |
| W4/3-6/1G | 4** | 4 | 420/.0100 | .45 | | C, TL | 920 |
| *Black, Red, White @ 6 AWG, Green @ 8 AWG<br>**Black, Red, White @ 4 AWG, Green @ 6 AWG | | | | | | | |
| **ROUND MULTIPLE CONDUCTOR BOAT CABLE - GRAY JACKET.** | | | | | | | |
| W16/6G | 16 | 6 | 26/.0100 | .30 | | C, TL, D, M | 130 |
| W14/6G | 14 | 6 | 41/.0100 | .30 | .515 | C, TL, D, M | 200 |
| W14/9G | 14 | 9 | 41/.0100 | .30 | | C, TL, D | 280 |
| W14/12G | 14 | 12 | 41/.0100 | .30 | .725 | C, TL | 375 |
| W12/8G | 12 | 8 | 65/.0100 | .45 | .640 | C, TL | 320 |

CONDUCTOR COLORS
16/6, 14/6 colors: Black, Brown, Red, Green, Blue, White
14/9 colors: Black, Red, Orange, Yellow, Green, Blue, Violet, Gray, White
14/12 colors: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White, White/Black, White/Brown
12/8 colors: Black, Red, Orange, Yellow, Green, White, White/Black

**SEE TECHNICAL DATA PAGE 77 FOR CIRCULAR MIL AREA OF CONDUCTORS.**

| (B) PUT-UP DESIGNATION | QTY. |
|---|---|
| -C | 100 |
| -TL | 250 |
| -D | 500 |
| -M | 1000 |

### ORDERING INFORMATION:

Order by standard put-up.
Combine Part Number (A) with Put-up Designation (B)
EXAMPLE: 10 AWG 4 Conductor, Gray Jacket 250 Feet.= WR10/4-TL

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# MARINE PRIMARY WIRE

## 105˚C DRY 75˚C WET 600V TINNED COPPER

Pacer's primary wire meets and exceeds the most stringent marine specification - UL Standard 1426 BC-5W2 (105˚C Dry 75˚C Wet). Our wire is constructed from finely stranded tinned plated copper and is covered with a flexible PVC insulation. Pacer's wire has been the choice of hundreds of boat builders for over 15 years. Our extensive stock, quick shipments, uncompromising quality and competitive prices have made us a standard in the industry.

For the best choice of wire to use in any marine environment, especially in saltwater environments use Pacer's Marine Primary Wire.

### FEATURES:

- Finely stranded tinned copper conductor (Type III)
- Color coded PVC insulation (See chart for specifics per gauge)
- Temperature Range: -20˚C to 105˚C
- Voltage Rating: 600V
- Resistant To: Acid, Alkalis, Abrasion, Flame, Gasoline, Oil, Ozone, Moisture, Fungus
- Applications: Internal wiring of electrical equipment.
  Internal wiring of panels and meters
  Point to point wiring

### COMPLIANCES:

UL Standard 1426 (BC-5W2)
AWM 1015/1230 (16-10 AWG)
AWM 1028/1231 (8 AWG)
CSA: TEW
ABYC: E-8.14, E-9.14
Coast Guard: 33 CFR part 183
NMMA

| PART NUMBER (A) | AWG | COND. STRAND THICKNESS | NOM. INSULATION | NOMINAL O.D. | STANDARD PUT-UPS | APPRX. SHIP LBS./M |
|---|---|---|---|---|---|---|
| WUL16 | 16 | 26/.0100 | .032 | .125 | C, D, M, 5M | 15 |
| WUL14 | 14 | 41/.0100 | .032 | .143 | C, D, M, 4M | 22 |
| WUL12 | 12 | 65/.0100 | .032 | .158 | C, D, M, 3M | 32 |
| WUL10 | 10 | 105/.0100 | .032 | .184 | C, D, M, 2M | 46 |
| WUL8 | 8 | 168/.0100 | .045 | .265 | C, D, M, | 73 |

**SEE TECHNICAL DATA PAGE 77 FOR CIRCULAR MIL AREA OF CONDUCTORS.**

| COLOR | COLOR ABBR. (B) | *STRIPE NUMBER (C) | 16 | 14 | 12 | 10 | 8 | PUT-UP DESIGNATION (D) | QTY. |
|---|---|---|---|---|---|---|---|---|---|
| BLACK | BK | -0 | | | | | | -C | 100 |
| BROWN | BR | -1 | | | | | | -D | 500 |
| | | | | | | | | -TL | 250 |
| RED | RD | -2 | | | | | | -M | 1000 |
| ORANGE | OR | -3 | | | | | | -2M | 2000 |
| YELLOW | YL | -4 | | | | | | -3M | 3000 |
| GREEN | GN | -5 | | | | | | -4M | 4000 |
| LT. GREEN | LG | N/A | | | | | | -5M | 5000 |
| BLUE | BL | -6 | | | | | | | |
| LT. BLUE | LB | N/A | | | | | | | |
| VIOLET | VI | -7 | | | | | | | |
| GRAY | GY | -8 | | | | | | | |
| WHITE | WH | -9 | | | | | | | |
| TAN | TN | N/A | | | | | | | |
| PINK | PK | N/A | | | | | | | |

### ORDERING INFORMATION:

Order by standard put-up.
Combine Part Number (A) with Color Abbreviation (B), Optional Stripe Designation (C) and Put-up Designation (D)
EXAMPLE: 12 AWG Black, 500 Feet = WUL12BK-D
EXAMPLE WITH STRIPE: 12 AWG Red/Violet, 500 Feet = WUL12RD-7-D
*500 foot minimums for all stripes

# MARINE BATTERY CABLE

## 105˚C DRY 600V TINNED COPPER

One of the primary concerns of professional technicians is cable flexibility. Pacer's battery cable is made of type III rope stranded tinned copper, providing the maximum flexibility available. Marine applications are characteristically enclosed areas with sharp turns. The less flexible the cable the more difficult the job will become. The two factors effecting a cables softness are its stranding and its insulation. Pacer's UL listed marine battery cable is rope stranded and insulated with a pliable yet durable compound. It maintains key physical and electrical insulation resistance properties. Pacer Marine's battery cable's flexibility and consistent quality has made it the preferred choice among hundreds of marine OEM's.

Pacer stock a full line of gauges and colors. Put up sizes are 50, 100 and 500 foot put-ups.

### FEATURES:

- Finely stranded tinned copper conductor (Type III)
- Color coded PVC insulation (See chart for specifics per gauge)
- Temperature Range: -20˚C to 105˚C
- Voltage Rating: 600V
- Resistant To: Acid, Alkalis, Abrasion, Flame, Gasoline, Oil, Ozone, Moisture, Fungus
- Applications: Connecting battery or generator to switch, starter or ground
- Windlass
- Inverter or any high amperage equipment

### COMPLIANCES:

UL Standard 1426 (BC-5W2)
AWM 1232/1283 (6-2 AWG)
AWM 1232/1284 (1 AWG - 4/0)
CSA: TEW
ABYC: E-8.14, E-9.14
Coast Guard: 33 CFR part 183 Subpart I
NMMA

| PART NUMBER (A) | AWG | COND. STRAND THICKNESS | NOM. INSULATION | NOMINAL O.D. | STANDARD PUT-UPS | APPRX. SHIP LBS./M |
|---|---|---|---|---|---|---|
| WUL6 | 6 | 266/.0100 | .060 | .340 | C, TL, D | 136 |
| WUL4 | 4 | 420/.0100 | .060 | .398 | L, C, TL, D | 189 |
| WUL2 | 2 | 665/.0100 | .060 | .464 | L, C, TL, D | 292 |
| WUL1 | 1 | 836/.0100 | .080 | .567 | L, C, TL, D | 305 |
| WUL1/0 | 0 | 1064/.0100 | .080 | .621 | L, C, TL, D | 450 |
| WUL2/0 | 00 | 1330/.0100 | .080 | .653 | L, C, TL, D | 551 |
| WUL4/0 | 0000 | 2109/.0100 | .080 | .785 | L, C, TL, D | 820 |

**SEE TECHNICAL DATA PAGE 77 FOR CIRCULAR MIL AREA OF CONDUCTORS.**

| COLOR | COLOR ABBR. (B) | 6 | 4 | 2 | 1 | 1/0 | 2/0 | 4/0 | PUT-UP DESIGNATION (C) | QTY. |
|---|---|---|---|---|---|---|---|---|---|---|
| BLACK | BK | | | | | | | | -L | 50 |
| RED | RD | | | | | | | | -C | 100 |
| ORANGE | OR | | | | | | | | -TL | 250 |
| YELLOW | YL | | | | | | | | -D | 500 |
| GREEN | GN | | | | | | | | | |
| WHITE | WH | | | | | | | | | |

### ORDERING INFORMATION

Order by standard put-up size.
Combine Part Number (A) with Color Abbreviation (B) and Put-up Designation (C)
EXAMPLE: 2/0 AWG Black, 250 Feet = WUL2BK-TL

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# WIRE AND CABLE FACTS

There are currently thousands of configurations of wire and cable in use today. All of which are specifically designed to achieve a certain purpose. Pacer Electronics of Florida, Inc. our original company, specializes in stocking and attaining a great deal of specialized electrical and electronic wire and cable. Pacer Marine specializes in wire specifically suited for the marine industry as determined by The United States Coast Guard, American Boat and Yacht Council (ABYC) and Underwriters Laboratories (UL). Safety, suitability to application as well as economics were considered in determining a range of materials to be used. The focus of marine wire specifications concern electrical or power wiring as opposed to electronic, signal or data conducting wire.

There are 3 primary considerations to be evaluated when choosing wire for marine applications, assuming copper as the conducting material:

- Conductor Stranding
- Conductor Coating
- Conductor Insulation

## CONDUCTOR STRANDING

Stranding is vital in the marine industry. All agencies will require that marine wire be at least type II stranding. The primary reasoning for stranded over solid wire is it's flexibility. The benefits of flexible stranding are:

- Usable life of the cable: Stranded wire withstands more vibration and flexing before fracture.
- Damage: Nicks or cuts on a strand are less likely to become a conductor fracture.
- Installation: A highly stranded cable is more flexible and easier to install.

In considering stranding, a good rule of thumb is the more strands in a cable, the easier the installation and the longer the life span of the cable.

## CONDUCTOR COATING

Although there are several coating materials used in wire today, the most common is tinned plating. Coating copper wire began over 40 years ago for the primary purpose of speeding and improving the quality of soldered applications. Bare copper oxidizes to form a copper oxide film. Copper oxide film is a poor conductor of electricity. To effectively solder a copper conductor the oxidation must be removed. Tin oxidizes much more slowly than bare copper, it is also of relatively low cost making it the dominant coating material for general purpose applications. Tin coating helps to make a tin-solder connection sound. The corrosion resistance of tinned copper has an added benefit in marine applications. Harsh, caustic environments that marine vessels can be subject to will quickly undermine a boat's electrical system causing loss of conductivity and key component failure. Tin plating extends a wire's life span considerably. Pacer highly recommends the use of tinned copper in most applications.

## INSULATING MATERIALS

Insulation materials are meant to protect the conductor as well as to provide environmental protection from abrasion, moisture, oil etc. Insulation materials also provide high dielectric strength and insulation resistance. The overwhelming majority of insulation found in marine applications are synthetic polymers such as polyvinyl chloride (PVC) or polyethylene. Synthetic polymers have been widely used to replace natural rubber as a primary insulation for over 50 years. Pacer Marine, Inc. in concert with its sister company JMS Wire, Inc., have worked on developing a PVC compound that answers the needs of the marine related conditions such as:

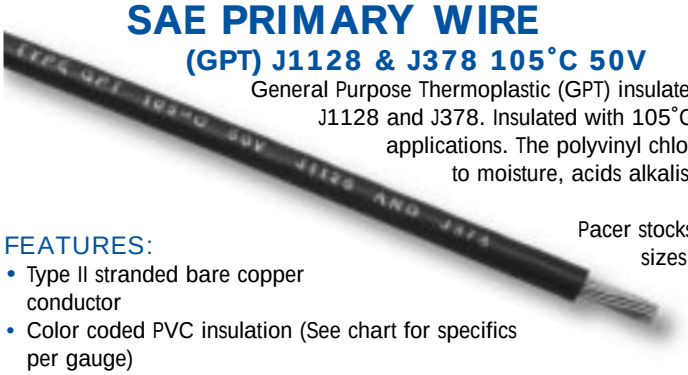
- High humidity
- High ambient temperature
- Flame Resistance
- Contact with oils
- Mechanical stresses
- Possible electrical overloads

Some compounds respond extremely well to one or two of these elements while possibly sacrificing others. PVC, in general, is a good general purpose compound which handles the above listed conditions. Pacer Marine employs a PVC compound rated for 105˚C dry, 75˚C wet, it has a low durometer rating, thus making cables extremely flexible, while also meeting all the stringent UL electrical characteristics necessary for marine boat cable.

The wire and cable outlined by the above listed agencies answer most applications found in boat wiring but not all. Pacer's goal is not only to provide the best materials outlined by ABYC and UL but also to provide the materials needed to handle any wiring application found on pleasure boating.

# SAE PRIMARY WIRE

## (GPT) J1128 & J378 105˚C 50V



General Purpose Thermoplastic (GPT) insulated primary wire conforms to SAE specifications J1128 and J378. Insulated with 105˚C PVC. GPT is intended for 50V or less applications. The polyvinyl chloride insulation provides excellent resistance to moisture, acids alkalis, oil gasoline, flame and abrasion.

### FEATURES:

- Type II stranded bare copper conductor
- Color coded PVC insulation (See chart for specifics per gauge)
- Temperature Range: -20˚C to 105˚C
- Voltage Rating: 50V
- Resistant To: Acid, Alkalis, Abrasion, Flame, Gasoline, Oil, Ozone, Moisture, Fungus
- Applications: General Purpose marine, industrial, automotive and truck use
- Electrical installations operating at potentials of less than 50V

Pacer stocks GPT primary wire in all colors and gauge sizes from 16 through 8 gauge. Put up sizes are 100ft., 500ft. and 1000ft. All standard put-ups are available for immediate shipment.

### COMPLIANCES:

S.A.E. GPT J1128 & J378
Coast Guard: 33 CFR part 183.430

| PART NUMBER (A) | AWG | COND. STRAND THICKNESS | NOM. INSULATION | NOMINAL O.D. | STANDARD PUT-UPS | APPRX. SHIP LBS./M |
|---|---|---|---|---|---|---|
| WSA16 | 16 | 19/.0112 | .023 | .105 | C, D, M, 6M | 13 |
| WSA14 | 14 | 19/.0141 | .023 | .120 | C, D, M, 5M | 18 |
| WSA12 | 12 | 19/.0176 | .026 | .145 | C, D, M, 3.5M | 28 |
| WSA10 | 10 | 19/.0223 | .031 | .179 | C, D, M, 2.5M | 43 |
| WSA8 | 8 | 96/.0126 | .037 | .220 | C, D, M, | 70 |

**SEE TECHNICAL DATA PAGE 77 FOR CIRCULAR MIL AREA OF CONDUCTORS.**

| COLOR | COLOR ABBR. (B) | *STRIPE NUMBER (C) | 16 | 14 | 12 | 10 | 8 | PUT-UP DESIGNATION (D) | QTY. |
|---|---|---|---|---|---|---|---|---|---|
| BLACK | BK | -0 | | | | | | -C | 100 |
| BROWN | BR | -1 | | | | | | -D | 500 |
| RED | RD | -2 | | | | | | -M | 1000 |
| ORANGE | OR | -3 | | | | | | -2.5M | 2500 |
| YELLOW | YL | -4 | | | | | | -3.5M | 3500 |
| GREEN | GN | -5 | | | | | | -5M | 5000 |
| LT. GREEN | LG | N/A | | | | | | -6M | 6000 |
| BLUE | BL | -6 | | | | | | | |
| LT. BLUE | LB | N/A | | | | | | | |
| VIOLET | VI | -7 | | | | | | | |
| GRAY | GY | -8 | | | | | | | |
| WHITE | WH | -9 | | | | | | | |
| TAN | TN | N/A | | | | | | | |
| PINK | PK | N/A | | | | | | | |

### ORDERING INFORMATION:

Order by standard put-up.
Combine Part Number (A) with Color Abbreviation (B), Optional Stripe Designation (C) and Put-up Designation (D)
EXAMPLE: 12 AWG Black, 500 Feet = WUL12BK-D
EXAMPLE WITH STRIPE: 12 AWG Red/Violet, 500 Feet = WUL12RD-7-D
*500 foot minimums for all stripes

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# SAE BATTERY CABLE

## (SGT) J1127 & J378 105˚C 50V

Starter or Ground Thermoplastic (SGT) insulated battery cable conforms to SAE specifications J1127 and J378. Insulated with 105˚C PVC. SGT is intended for 50V or less applications. The polyvinyl chloride insulation provides excellent resistance to moisture, acids, alkalis, oil, gasoline, flame, and abrasion.

### FEATURES:

- Type II stranded bare copper conductor
- Color coded PVC insulation (See chart for specifics per gauge.)
- Temperature Range: -20˚C to 105˚C
- Voltage Rating: 50V
- Resistant To: Acid, Alkalis, Abrasion, Flame, Gasoline, Oil, Ozone, Moisture, Fungus

### COMPLIANCES:

S.A.E. SGT J1127 & J378
Coast Guard: 33 CFR part 183.430

| PART NUMBER (A) | AWG | COND. STRAND THICKNESS | NOM. INSULATION THICKNESS | NOMINAL O.D. | STANDARD PUT-UP SIZES | APPRX. SHIP LBS./M |
|---|---|---|---|---|---|---|
| WSA6 | 6 | 49/.0226 | .060 | .334 | C, TL, D, M | 107 |
| WSA4 | 4 | 70/.0226 | .065 | .375 | C, TL, D | 166 |
| WSA2 | 2 | 133/.0226 | .065 | .450 | C, TL, D | 208 |
| WSA1 | 1 | 133/.0243 | .065 | .515 | C, TL, D | 323 |
| WSA1/0 | 1/0 | 133/.0282 | .065 | .530 | C, TL, D | 431 |
| WSA2/0 | 2/0 | 133/.0308 | .065 | .595 | C, TL, D | 497 |

**TECHNICAL DATA PAGE 77 FOR CIRCULAR MIL AREA OF CONDUCTORS.**

| COLOR | COLOR ABBR. (B) | 6 | 4 | 2 | 1 | 1/0 | 2/0 | PUT-UP DESIGNATION (C) | QTY. |
|---|---|---|---|---|---|---|---|---|---|
| BLACK | BK | | | | | | | -C | 100 |
| RED | RD | | | | | | | -TL | 250 |
| GREEN | GN | | | | | | | -D | 500 |
| WHITE | WH | | | | | | | | |

### ORDERING INFORMATION:

Order by standard put-up.
Combine Part Number (A) with Color Abbreviation (B) and Put-up Designation (C)
EXAMPLE: 2 AWG Red, 100 Feet. = WSA2RD-C



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# SAE DUPLEX, TRIPLEX, QUAD

## (Type GPT) J1128 & J378 105˚C 50V


Duplex, triplex and quad cables are constructed with type II stranded copper, insulated with 105˚C rated PVC and a 105˚C rated soft PVC jacket. The insulating compounds used for these cables are the same high quality, UL approved compounds used on boat cables. The finished product is more pliable and easier to use than typical automotive grade cables. For use on less than 50V applications such as automotive, trucks or trailers.

### FEATURES:

- Stranded bare copper conductor
- Gray PVC outer jacket
- Black and White internal conductors
- Temperature Range: -20˚C to 105˚C
- Voltage Rating: 50V
- Resistant To: Acid, Alkalis, Abrasion, Flame, Gasoline, Oil, Ozone, Moisture, Fungus

### COMPLIANCES:

S.A.E. J1128 & J378 Type GPT
(General Purpose, Thermoplastic Insulated)
Coast Guard: 33 CFR part 183.430

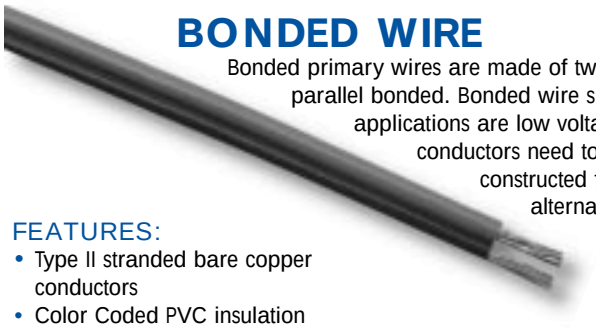
| (A) PART NUMBER | AWG | NUMBER OF COND(S) | CONDUCTOR STRAND | NOMINAL O.D. | STANDARD PUT-UP | APPRX. SHIP LBS./M |
|---|---|---|---|---|---|---|
| WAUTO16/2 | 16 | 2 | 19/.0112 | .159 X .262 | C,D,M | 40 |
| WAUTO16/3 | 16 | 3 | 19/.0112 | .159 X .365 | C,D,M | 65 |
| WAUTO16/4 | 16 | 4 | 19/.0112 | .159 X .468 | C,D,M | 80 |
| WAUTO14/2 | 14 | 2 | 19/.0141 | .173 X .290 | C,D,M | 57 |
| WAUTO14/3 | 14 | 3 | 19/.0141 | .173 X .420 | C,D,M | 83 |
| WAUTO14/4 | 14 | 4 | 19/.0141 | .173 X .550 | C,D,M | 99 |
| WAUTO12/2 | 12 | 2 | 19/.0176 | .208 X .350 | C,D,M | 84 |
| WAUTO12/3 | 12 | 3 | 19/.0176 | .208 X .500 | C,D,M | 121 |
| WAUTO10/2 | 10 | 2 | 19/.0223 | .242 X .418 | C,D,M | 112 |
| WAUTO10/3 | 10 | 3 | 19/.0223 | .242 X .590 | C,D | 169 |
| WAUTO8/2 | 8 | 2 | 96/.0126* | .291 X .508 | C,D | 118 |

**SEE TECHNICAL DATA PAGE 77 FOR CIRCULAR MIL AREA OF CONDUCTORS.**

| (B) PUT-UP DESIGNATION | QTY. |
|---|---|
| -C | 100 |
| -D | 500 |
| -M | 1000 |

### ORDERING INFORMATION:

Order by standard put-up.
Combine Part Number (A) with Put-up Designation (B)
EXAMPLE: 16 AWG 2 Conductor, 1000 Feet.= WAUTO16/2-C



# BONDED WIRE

Bonded primary wires are made of two, three and four conductors of various colors parallel bonded. Bonded wire simplifies the installation of DC circuits. Typical applications are low voltage lights, trailer lights or where multiple conductors need to be routed quickly and easily. Bonded wire is constructed from 105˚C SAE GPT primaries, it is an economical alternative to jacketed wire.

## FEATURES:

- Type II stranded bare copper conductors
- Color Coded PVC insulation
- Temperature Range: -20˚C to 105˚C
- Voltage Rating: 50V
- Resistant To: Acid, Alkalis, Abrasion, Flame, Gasoline, Oil, Ozone, Moisture, Fungus
- Applications: Electrical installations operating at potentials of less than 50V

## COMPLIANCES:

S.A.E. J1128 & J378 Type GPT
Coast Guard: 33 CFR part 183.430

Standard put-up sizes are 100, 500 and 1000 feet.

| PART NUMBER | AWG | NUMBER OF CONDUCTORS | CONDUCTOR STRANDING | APPRX. SHIP LBS./M |
|---|---|---|---|---|
| WB16BK-RD | 16 | 2 | 19/.0112 | 25 |
| WB16BK-BL | 16 | 2 | 19/.0112 | 25 |
| WB16BK-GY | 16 | 2 | 19/.0112 | 25 |
| WB16BK-PK | 16 | 2 | 19/.0112 | 25 |
| WB16-3 | 16 | 3 | 19/.0112 | 38 |
| WB16-4 | 16 | 4 | 19/.0112 | 50 |
| WB14BK-RD | 14 | 2 | 19/.0141 | 35 |
| WB14BK-BL | 14 | 2 | 19/.0141 | 35 |
| WB14BK-GY | 14 | 2 | 19/.0141 | 35 |
| WB14-3 | 14 | 3 | 19/.0141 | 52 |

**TECHNICAL DATA PAGE 77 FOR CIRCULAR MIL AREA OF CONDUCTORS.**

## ORDERING INFORMATION:

Order by standard put-up size.



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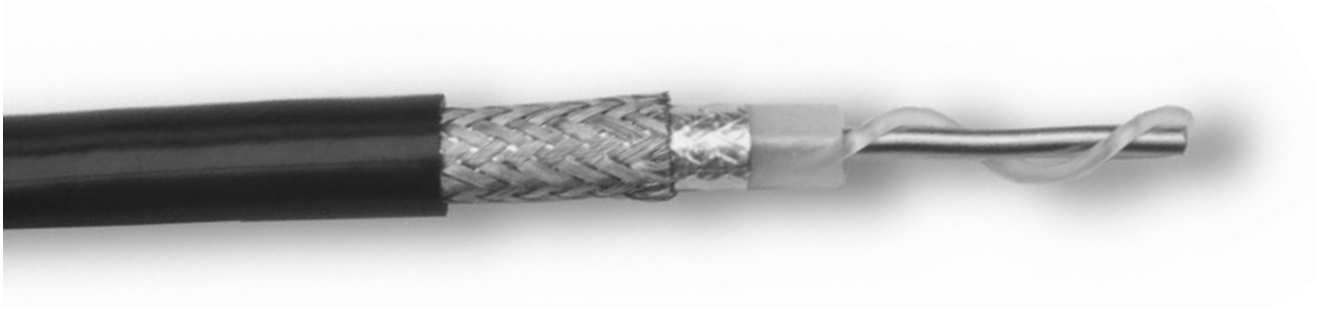

# SIGNAL INTERFERENCE

When a particular installation is prone to EMI (Electromagnetic), RFI (Radio Frequency), ESI (electrostatic), interference from either internal or external sources, some form of cable shielding will be required. The types of interference, or noise, cables are exposed to can determine the type of shielding required. There are basically four type of noise which will affect the wiring or cabling of an instrument or control circuit: static, magnetic, common mode and crosstalk.

**STATIC NOISE.** This refers to signal distortion due to the electrical field radiated by a voltage source, which has coupled into the signal-bearing circuit. Simple shielding of the full circuit is a typical means of mitigating this electrostatic type of interference. Foil shields, which offer 100% shielding efficiency, have proven most effective against this type of interference. It is critical that the shield be continued to, and completely encompass, the transmitting and receiving ends of the circuit if high levels of noise reduction are required. Effective grounding of the shield is also required; "floating" of non-grounded shields only partially reduce the effects of noise. To effectively ground the shield, the non-insulated "drain" wire must be grounded on both ends of the circuit.

**MAGNETIC NOISE.** Magnetic fields, radiated by power wiring found in large AC motors, transformers and knife switches, can set up current flows in opposition to the instrument circuit field. The result is the superimposing of a noise current on the signal current. The simplest and best means of mitigating the effects of such magnetic interference is by simple twisting of the cable elements.

**COMMON MODE NOISE.** Common mode interference is the result of currents flowing between different potential grounds located at various points within a system. Receivers with very high common mode rejection ratios minimize this type of interference.

**CROSSTALK.** This refers to the superimposing of either pulsed DC or standard AC signals carried on one wire pair to another wire pair in close proximity. Although pair twist tends to reduce crosstalk levels, the most effective means of mitigation is individual pair shielding coupled to pair twist.

# COAXIAL CABLES


Pacer stocks a wide variety of coaxial cables, including most standard configurations as well as specialized constructions created for marine environmental conditions. Pacer maintains access to the more popular 50 and 75 ohm designs and other difficult to attain 93 ohm and miniature coaxial products for smaller high speed applications. Let us help you find the proper cable for your application.

## 50 OHM COAXIAL CABLES

| PART NUMBER | COND. AWG | INSUL. MATERIAL | SHIELD COVERAGE | JKT. MATERIAL/ NOM. O.D. | NOMINAL CAP. pF/ft | NOMINAL CAP. pF/m | VELOCITY PROPAGATION | NOMINAL IMPEDANCE Ω |
|---|---|---|---|---|---|---|---|---|
| MRG8/U1154 | 13 (7x21) Bare Copper | Solid Polyethylene | 95% Bare Copper Braid 1.2Ω/M | Black PVC .405 | 29.5 | 96.76 | 66 | 52 |
| MRG8/U1180 | 9 1/2 Bare Copper | Solid Polyethylene | 100% Bonded Foil + 88% Tinned Copper Braid 1.8Ω/M | Black PVC .405 | 24.0 | 78.72 | 84 | 50 |
| MRG8/U1198 | 11 (19x24) Bare Copper | Solid Polyethylene | 95% Bare Copper Braid 1.2Ω/M | Black PVC .405 | 26.0 | 85.28 | 78 | 50 |
| MRG8MINI | 16 (19x28) Bare Copper | Cellular Polyethylene | 95% Bare Copper Braid 3.7Ω/M | Black PVC .242 | 28.0 | 91.84 | 78 | 50 |
| MRG8XW | 16 (19x28) Tinned Copper | Solid Polyethylene | 95% Tinned Copper Braid 3.7Ω/M | **White PVC** .242 | 28.0 | 91.84 | 78 | 50 |
| MRG58A/U | 20 (19x.0071) Bare Copper | Solid Polyethylene | 95% Tinned Copper Braid 4.1Ω/M | Black PVC .195 | 30.8 | 101.02 | 66.0 | 50 |
| MRG58A/UW | 20 (19x.0071) Tinned Copper | Solid Polyethylene | 95% Tinned Copper Braid 4.1Ω/M | **White PVC** .195 | 30.8 | 101.02 | 66.0 | 50 |
| MRG213/U | 13 (7x21) Bare Copper | Solid Polyethylene | 95% Bare Copper Braid 1.2Ω/M | Black PVC .405 | 30.8 | 101.02 | 66.0 | 50 |
| MRG214/U | 13 (7x.0296) .089 Silver Coated Copper | Solid Polyethylene | 98% 2 Silver Coated Copper Braid .70Ω/M | Black PVC .425 | 30.8 | 101.02 | 66.0 | 50 |

## 75 OHM COAXIAL CABLES

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| MRG6/U | 18 Solid Copper Clad Steel | Cellular Polyethylene | 100% Flexfoil +61% Tinned Copper Braid 5.2Ω/M | Black PVC .270 | 17.3 | 56.74 | 78 | 75 |
| MRG6/UW | 18 Solid Copper Clad Steel | Cellular Polyethylene | 100% Flexfoil +95% Tinned Copper Braid 5.2Ω/M | **White PVC** .270 | 17.3 | 56.74 | 78 | 75 |
| MRG11/U | 14 Solid Bare Copper | Cellular Polyethylene | 95% Flexfoil Copper Braid 1.24Ω/M | Black Polyethylene .405 | 17.3 | 56.75 | 78 | 75 |
| MRG59/U | 22 Solid Copper Clad Steel | Cellular Polyethylene | 100% Flexfoil +40% Aluminum Braid 55.8Ω/M | Black PVC .238 | 16.5 | 54.12 | 78 | 80 |
| MRG59/UW | 22 Solid Copper Clad Steel | Solid Polyethylene | 95% Tinned Copper Braid 2.6Ω/M | **White PVC** .242 | 20.5 | N/A | 66% | 73 |

### ORDERING INFORMATION:

Cut as Required.

# COAXIAL CABLE CONNECTORS

| PART NUMBER | CONNECTOR TYPE | FOR CABLE TYPE | PLATING TYPE |
|---|---|---|---|
| EPL259 | UHF SERIES-PLUG | RG 8, 11, 213, 214 | NICKEL |
| EPL259S | UHF SERIES-PLUG | RG 8, 11, 213, 214 | SILVER |
| EUG175 | REDUCER FOR PL259 | RG 58 | NICKEL |
| EUG175S | REDUCER FOR PL259S | RG 58 | SILVER |
| EUG176 | REDUCER FOR PL259 | RG 59, 62, 8X | NICKEL |
| EUG176S | REDUCER FOR PL259S | RG 59, 62, 8X | SILVER |
| EPL258 | JACK-JACK PL259 COUPLER | | NICKEL |
| EF59 | F-CONN. PLUG | RG 59, 62, 8X | NICKEL |
| EF6 F-CONN. PLUG | RG 6 | NICKEL | |
| EF59WP | F-CONN. PLUG WATERPROOF | RG 59, 62, 8X | CADMIUM |
| EF6WP | F-CONN. PLUG WATERPROOF | RG 6 | CADMIUM |
| EF81 | F-CONN. FEMALE-FEMALE COUPLER | | NICKEL |
| EBNC-58 | BNC SERIES 3 PC. | RG 58 | NICKEL |
| EBNC-59 | BNC SERIES 3 PC. | RG 59, 62, 8X | NICKEL |
| EBNC-58 | TNC SERIES 3 PC. | RG 58 | NICKEL |

EPL259

EUG175 & EUG176

EPL258

EF59 & EF6

EF59WP & EF6WP

EF81

## ORDERING INFORMATION:

Available by the piece.

# MULTI-CONDUCTOR SHIELDED CABLES

Multi-conductor shielded cables are primarily used to provide R.F. interference protection. Their applications range from internal and external interconnection of electronic equipment to data transmission and signaling systems. Unless otherwise specified of our shielded cables have 100% aluminum/polyester foil tape with a 25% overlap and a stranded tinned copper drain wire.

## FEATURES:

- Finely stranded tinned copper conductors
- Color coded PVC insulation
- Shield: 100% aluminum/polyester foil with a stranded tinned copper drain wire
- Gray PVC jacket
- Temperature Range - 20˚C to 80˚C (some cables may vary, call for specific information)
- Voltage Rating: 300V
- Resistant To: Acid, Alkalis, Abrasion, Ozone, Flame
- Applications: Computer interconnections
  Remote control circuits
  Data transmission
  Industrial Equipment

## COMPLIANCES:

NEC Article 800 Type CM (UL: 75(C)
UL Style 2464 (UL: 80˚C, 300V)
CSA PCC (CSA: 60˚C)
Passes UL 70,000 Btu Vertical Tray Flame Test
Passes CSA FT4 Flame Test

| PART NUMBER | # OF COND. | COND. STRAND | NOM. INSULATION THICKNESS | NOMINAL JACKET THICKNESS | NOMINAL O.D. |
|---|---|---|---|---|---|
| M22/2F | 2 | 7/30 | .010 | .032 | .169 |
| M22/3F | 3 | 7/30 | .010 | .032 | .177 |
| M22/4F | 4 | 7/30 | .010 | .032 | .190 |
| M22/6F | 6 | 7/30 | .010 | .032 | .219 |
| M22/8F | 8 | 7/30 | .010 | .032 | .235 |
| M22/10F | 10 | 7/30 | .010 | .032 | .269 |
| M22/15F | 15 | 7/30 | .010 | .032 | .304 |
| M22/20F | 20 | 7/30 | .010 | .032 | .335 |
| M22/25F | 25 | 7/30 | .010 | .032 | .369 |
| M20/2F | 2 | 7/28 | .015 | .032 | .207 |
| M20/3F | 3 | 7/28 | .015 | .032 | .217 |
| M20/4F | 4 | 7/28 | .015 | .032 | .236 |
| M20/6F | 6 | 7/28 | .015 | .032 | .276 |
| M20/8F | 8 | 7/28 | .015 | .032 | .297 |
| M20/10F | 10 | 7/28 | .015 | .032 | .345 |
| M20/15F | 15 | 7/28 | .015 | .032 | .393 |
| M20/20F | 20 | 7/28 | .015 | .032 | .435 |
| M18/2F* | 2 | 16/30 | .013 | .037 | .227 |
| M18/3F* | 3 | 16/30 | .013 | .037 | .238 |
| M18/4F | 4 | 16/30 | .010 | .035 | .245 |
| M18/6F | 6 | 16/30 | .017 | .032 | .310 |
| M18/8F | 8 | 16/30 | .017 | .032 | .330 |
| M18/10F | 10 | 16/30 | .017 | .032 | .390 |
| M18/15F | 15 | 16/30 | .017 | .032 | .450 |
| M16/2F* | 2 | 19/.0117 | .013 | .037 | .243 |
| M16/2F* | 2 | 19/.0117 | .013 | .037 | .243 |
| M16/3F* | 3 | 19/.0117 | .013 | .037 | .255 |
| M16/4F | 4 | 19/.0117 | .017 | .032 | .290 |
| M16/6F | 6 | 19/.0117 | .017 | .032 | .350 |
| M16/8F | 8 | 19/.0117 | .017 | .032 | .380 |
| M14/2F* | 2 | 19/.0147 | .013 | .042 | .290 |
| M14/3F* | 3 | 19/.0147 | .013 | .042 | .300 |
| M12/2F* | 2 | 19/.0185 | .013 | .042 | .320 |
| M12/3B** | 3 | 65/30 | .020 | .030 | .380 |

*Compliance's: NEC Article 725 Power-Limited Tray Cable (UL: 105˚C, 300V). Passes UL 70,000 Btu Vertical Tray Flame Test.
** Braid Shield. Compliance's: NEC Article 800 Type CM, UL Style 2095

## ORDERING INFORMATION:

Cut as required.

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# MULTI-PAIRED SHIELDED AND INDIVIDUALLY FOIL SHIELDED CABLES

Multi-paired shielded cables are specialty cables designed where total isolation of signal is required. Pacer offers a variety of paired cables for a wide range of applications. Twisted paired cables are used to mitigate magnetic noise from sources such as AC motors or transformers. The foil shields will reduce static noise or signal distortion due to the electrical field radiated by a voltage source which has coupled into the signal-bearing circuit. If crosstalk is a problem use individually shielded pairs. Listed are our most popular selections, if your application requires a cable not listed let us source if for you.

## FEATURES:

- Finely stranded tinned copper conductors
- Color coded PVC insulation
- All constructions
- Shield: 100% aluminum/polyester foil with a stranded tinned copper drain wire Each individually shielded pair contains a tinned copper drain wire
- Gray PVC jacket
- Temperature Range -20˚C to 80˚C (Except where otherwise noted)
- Voltage Rating: 300V
- Resistant To: Acid, Alkalis, Abrasion, Ozone, and Flame

### MULTI-PAIR, OVERALL SHIELD

Applications: Computers, Ind. Equipment, Data Transmission, Control Circuits
Features: Provides good flexibility, Superior shielding where noise rejection is critical.
Compliances: NEC Art.800 Type CM, UL Style 2464, CSA PCC FT4

| PART NUMBER | # OF PAIRS | COND. STRAND | NOM. INSULATION THICKNESS | NOMINAL JACKET THICKNESS | NOMINAL O.D. |
|---|---|---|---|---|---|
| M22/2PRF | 2 | 7/30 | .010 | .032 | |
| M22/4PRF | 4 | 7/30 | .010 | .032 | .190 |
| M22/6PRF | 6 | 7/30 | .010 | .032 | .219 |
| M22/8PRF | 8 | 7/30 | .010 | .032 | .235 |

### MULTI-PAIR, INDIVIDUALLY SHIELDED w/OVERALL SHIELD

Applications: Computers, Ind. Equipment, Control circuits where total isolation of signal is required
Features: Excellent high frequency properties, Mechanical durability
Compliances: NEC Art.800 Type CM, UL Style 2835, CSA PCC FT1

| PART NUMBER | # OF PAIRS | COND. STRAND | NOM. INSULATION THICKNESS | NOMINAL JACKET THICKNESS | NOMINAL O.D. |
|---|---|---|---|---|---|
| M22/2PRIF | 2 | 7/30 | .010 | .028 | .208 |

### MULTI-PAIR, INDIVIDUALLY SHIELDED NO OVERALL SHIELD

Compliances: NEC Art.800 Type CM, UL Style 2919, CSA PCC FT1

| PART NUMBER | # OF PAIRS | COND. STRAND | NOM. INSULATION THICKNESS | NOMINAL JACKET THICKNESS | NOMINAL O.D. |
|---|---|---|---|---|---|
| M22/3PRIF | 3 | 7/30 | .011 | .032 | .292 |

### POWER-LIMITED TRAY CABLE, INDIVIDUALLY SHIELDED PAIRS

Applications: Burglar Alarms, Power Limited Circuits, Intercom Systems, Computer Interconnects
Features: Superior temperature characteristics, Robust, highly durable, Sunlight resistant jacket
Compliances: NEC Art.725 (UL: 105(C, 300V), UL Style 2464, CSA PCC FT1

| PART NUMBER | # OF PAIRS | COND. STRAND | NOM. INSULATION THICKNESS | NOMINAL JACKET THICKNESS | NOMINAL O.D. |
|---|---|---|---|---|---|
| M18/2PRIF | 2 | 16/30 | .015 | .042 | .380 |
| M18/3PRIF | 3 | 16/30 | .015 | .053 | .437 |

## ORDERING INFORMATION:

Cut as required.

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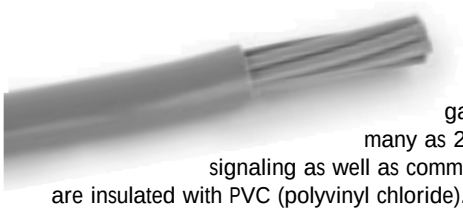

# MULTI-CONDUCTOR CABLES

Pacer stocks a large variety of cables ranging from 12 gauge to 22 gauge, with the number of individual conductors varying from 2 to as many as 25. These cables are used for control purposes such as remote signaling as well as communications and broadcast applications. Our multi-conductor cables are insulated with PVC (polyvinyl chloride). Conductors are tinned for excellent corrosion resistance. These cables are manufactured to meet the latest UL, CSA and NEC requirements. Because temperatures and voltages may not be the same from cable to cable, call for specifications on the item you require. See Round Boat Cables for multi-conductor cables 16 AWG and larger with 2, 3 or 4 conductor configurations. Page 7.

## FEATURES:

- Finely stranded tinned copper conductors
- Color coded PVC conductors
- Gray PVC jacket
- Temperature Range -20˚C to 80˚C (some cables may vary, call for specific information)
- Voltage Rating: 300V
- Resistant To: Acid, Alkalis, Abrasion, Ozone, Flame
- Applications: Public address and intercom systems
  Remote control circuits
  Internal telephones

## COMPLIANCES:

NEC Article 800 Type CM (UL: 75˚C)
UL Style 2464 (UL: 80˚C, 300V)
CSA PCC (CSA: 80˚C)
Passes UL 70,000 BTU Vertical Tray Flame Test
Passes CSA FT4 Flame Test

| PART NUMBER | # OF COND. | COND. STRAND | NOM. INSULATION THICKNESS | NOMINAL JACKET THICKNESS | NOMINAL O.D. |
|---|---|---|---|---|---|
| M22/2* | 2 | 7/30 | .013 | .037 | .190 |
| M22/3* | 3 | 7/30 | .013 | .037 | .198 |
| M22/4 | 4 | 7/30 | .010 | .032 | .190 |
| M22/5 | 5 | 7/30 | .010 | .032 | .203 |
| M22/6 | 6 | 7/30 | .010 | .032 | .219 |
| M22/7 | 7 | 7/30 | .010 | .032 | .225 |
| M22/8 | 8 | 7/30 | .010 | .032 | .235 |
| M22/9 | 9 | 7/30 | .010 | .032 | .249 |
| M22/10 | 10 | 7/30 | .010 | .032 | .269 |
| M22/12 | 12 | 7/30 | .010 | .032 | .276 |
| M22/15 | 15 | 7/30 | .010 | .032 | .304 |
| M22/20 | 20 | 7/30 | .010 | .032 | .335 |
| M22/25 | 25 | 7/30 | .010 | .032 | .369 |
| M20/2* | 2 | 7/28 | .013 | .037 | .207 |
| M20/3* | 3 | 7/28 | .013 | .037 | .217 |
| M20/4 | 4 | 7/28 | .016 | .032 | .236 |
| M20/5 | 5 | 7/28 | .016 | .032 | .254 |
| M20/7 | 7 | 7/28 | .016 | .032 | .275 |
| M20/9 | 9 | 7/28 | .016 | .032 | .317 |
| M20/12 | 12 | 7/28 | .016 | .032 | .354 |
| M20/15 | 15 | 7/28 | .016 | .032 | .393 |
| M18/2* | 2 | 16/30 | .013 | .037 | .227 |
| M18/3* | 3 | 16/30 | .013 | .037 | .238 |
| M18/4* | 4 | 16/30 | .013 | .037 | .257 |
| M18/5 | 5 | 16/30 | .016 | .032 | .280 |
| M18/7 | 7 | 16/30 | .016 | .032 | .309 |
| M18/9 | 9 | 16/30 | .016 | .032 | .358 |
| M18/12 | 12 | 16/30 | .016 | .032 | .401 |
| M18/15 | 15 | 16/30 | .016 | .032 | .445 |
| M18/25 | 25 | 16/30 | .016 | .032 | .549 |
| M16/5 | 5 | 19/.0117 | .021 | .032 | .334 |
| M16/7 | 7 | 19/.0117 | .021 | .032 | .364 |
| M16/8 | 8 | 19/.0117 | .021 | .032 | .395 |
| M16/9 | 9 | 19/.0117 | .021 | .032 | .425 |
| M16/12 | 12 | 19/.0117 | .021 | .032 | .479 |
| M16/15 | 15 | 19/.0117 | .021 | .032 | .530 |
| M16/25 | 25 | 19/.0117 | .021 | .032 | .657 |

## ORDERING INFORMATION:

Cut as required.

*Power-Limited Tray Cable, NEC Type PLTC, 105˚C

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## AUDIO CABLE

Pacer stocks audio cable in gauge sizes ranging from 20 AWG through 12 AWG. Audio cable is insulated with clear PVC. Polarity is distinguished by one tinned copper conductor, and one bare copper conductor.

### FEATURES:

- Finely stranded tinned and bare copper conductors.
- Clear PVC insulation
- Temperature Range: -20˚C to 80˚C
- Voltage Rating: 90V
- Standard put-up sizes are 100, 500 and 1000 feet.
- Resistant To: Acid, Alkalis, Abrasion, Ozone, and Flame

| PART NUMBER | AWG | CONDUCTOR STRANDING | NOMINAL O.D. | APPRX. SHIP LBS./M |
|---|---|---|---|---|
| W20-2ACLR | 20 | 10/.0100 | .093 x .160 | 13 |
| W18-2ACLR | 18 | 16/.0100 | .100 x .187 | 17 |
| W16-2ACLR | 16 | 26/.0100 | .112 x .210 | 25 |
| W14-2ACLR | 14 | 41/.0100 | .120 x .230 | 35 |
| W12-2ACLR | 12 | 65/.0100 | .160 x .335 | 55 |

### ORDERING INFORMATION:

Order by standard put-up size.

## STO CABLES

STO yellow “Ship-to-Shore” cable is constructed of finely stranded fully annealed copper conductors insulated with color coded PVC and covered with tough thermoplastic (PVC) jacket. Made primarily for use as a portable cord. STO is designed to resist moisture, acids alkalis, ozone, and oil. Rated at 600V.

| PART NUMBER | WIRE AWG | NUM. OF CONDUCTORS | STRANDING NUM./AWG. | NOMINAL O.D. | CURRENT AMPS* | APPRX. LBS/M |
|---|---|---|---|---|---|---|
| MSTO16/3 | 16 | 3 | 26/30 | .390 | 13 | 87 |
| MSTO10/3 | 10 | 3 | 105/30 | .660 | 30 | 272 |
| MSTO10/4 | 10 | 4 | 105/30 | .715 | 25 | 333 |
| MSTO6/3 | 6 | 3 | 266/30 | .865 | 50 | 415 |
| MSTO6/4 | 6 | 4 | 266/30 | 1.150 | 50 | 570 |
| MSTO2/4 | 2** | 4 | 665/30 | 1.500 | 100 | 1,195 |

*Ampacity is based on 1996 NEC Table 400-5 (A) with a 30˚C ambient temperature. NOTE the ampacity chart is provide for engineering information only. Pacer cannot recommend or express the use of these ampacities since the exact application may need approval from the authority having local jurisdiction.

** White, Black and Red conductors are 2 AWG, Green conductor is 4 AWG.

### ORDERING INFORMATION:

STO cable is cut in 50 or 100 foot length.

# HOW TO DETERMINE THE SUM DIAMETER OF BUNDLED CABLES

Use this chart as a guide to help determine the proper diameter size of material to purchase.

1. **Determine the sum of the cable diameter to be covered = (C). (Refer to the charts in the Wire and Cable section for dimensional information.)**

EX:: 3 wires @ 10 AWG (UL) .185 x 3 = .555
2 wires @ 14 AWG (UL) .141 x 2 = .282
1 wire @ 16 AWG (UL) .123 x 1 = .123

SUM TOTAL: .960

2. **Determine constant for harness = (K)**

| Num. of Cables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| K | 3.15 | 2.58 | 2.18 | 1.95 | 1.74 | 1.58 | 1.48 | 1.39 | 1.32 | 1.29 |
| Num. of Cables | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| K | 1.21 | 1.15 | 1.11 | 1.07 | 1.03 | .99 | .98 | .95 | .93 | .91 |

EX: The constant (K) for 6 wires = 1.58

3. **Determine the diameter of the combined wires = (D)**

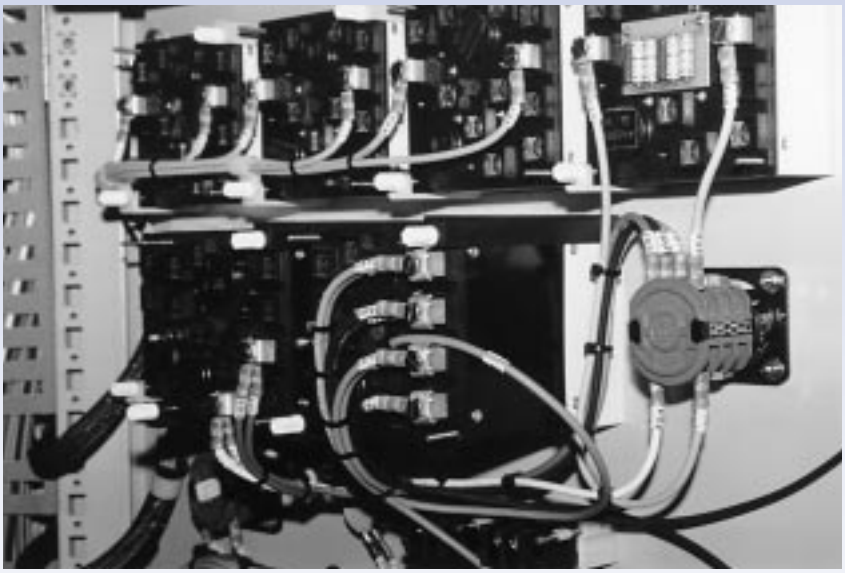
$$\frac{C \times K}{3.1416} = \text{DIAMETER (D)}$$

EX: $\frac{\text{(C) .96 x (K) 1.58}}{3.1416}$ = (D) .483

4. **Choose the (D) factor closest to your harness diameter.**

| (D) | .294 | .347 | .420 | .525 | .630 | .840 |
|---|---|---|---|---|---|---|
| Size | 3/8" | 7/16" | 1/2" | 5/8" | 3/4" | 1" |

**The closest (D) factor to .483 is .525 or 5/8". Use Wire Management materials which will accommodate 5/8" diameter cables.**

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# 3-TO-1

## ADHESIVE LINED, HIGH SHRINK RATIO

3- to-1 is a semi-flexible, cross-linked polyolefin tube which possesses a meltable inner lining of adhesive that flows when heated. In addition to insulation and mechanical protection, this tubing provides a moisture-proof seal for encapsulation of wires, splices, breakouts, and components.

### FEATURES:

- 3:1 Shrink ratio.
- Continuous operating temperature range of -55˚C to 110˚C.
- Semi-Flexible
- Moisture sealing
- Flame retardant (except clear)

### APPLICABLE SPECIFICATIONS:

AMS 3634
MIL-I-23053/4 - Class 1

| PART NUMBER | EXPANDED I.D. INCHES | RECOVERED I.D. INCHES | RECOVERED WALL THICKNESS | AVAILABLE COLORS |
|---|---|---|---|---|
| BEHS-1/8 | .125 | .023 | .038 | BK, RD, CL |
| BEHS-3/16 | .188 | .060 | .045 | BK, RD, CL |
| BEHS-1/4 | .250 | .080 | .047 | BK, RD, CL |
| BEHS-3/8 | .375 | .135 | .050 | BK, RD, CL |
| BEHS-1/2 | .500 | .195 | .055 | BK, RD, CL |
| BEHS-3/4 | .750 | .313 | .065 | BK, RD, CL |
| BEHS-1 | 1.000 | .400 | .075 | BK, RD, CL |
| BEHS-1.5 | 1.500 | .600 | .120 | BK |
| BEHS-2.05 | 2.050 | .800 | .150 | BK |

### ORDERING INFORMATION:

BK = Black, RD = Red, CL = Clear
Combine PART NUMBER with COLOR. EX: BEHS-1/2BK = 1/2" Blk
All sizes sold in 48" lengths.

# HEAVY WALL TUBING

Heavy wall heat shrinkable tubing affords maximum reliability for insulating and sealing electrical connections and terminations. BHW is tough and durable, installs quickly and easily protecting electrical connections in the most adverse conditions including direct burial and submersible installations. BHW is coated internally with a dual purpose thermoplastic liner which flows and encapsulates when heated. When cooled the tubing offers the mechanical strength of a superior adhesive and the corrosion protection of a high quality mastic.

### FEATURES:

- 3:1 Shrink ratio.
- Higher than usual dielectric strength at 500 volts/mil thickness
- Highly abrasion and impact resistant
- The thermoplastic liner will adhere to PVC, neoprene, polyolefins, EPR, as well as steel, aluminum, and lead
- Easy installation, shrinks when heated over 120˚C

### APPLICABLE SPECIFICATIONS:

U.L. 486D - Insulated wire connects for use with underground conductors
C.S.A. C22.2 No. 198 - Underground cable splicing kits
ANSI C119.1 - Sealed insulated underground connector systems rated at 600V

| PART NUMBER | EXPANDED I.D. INCHES | RECOVERED I.D. INCHES | APPLICATION RANGE AWG* (INCHES) | RECOVERED WALL THICKNESS |
|---|---|---|---|---|
| BHW-3/4BK | .750 | .240 | #6-#1 (.25-.65) | .09 |
| BHW-3/4RD | .750 | .240 | #6-#1 (.25-.65) | .09 |
| BHW-1.1BK | 1.100 | .350 | 1/0-4/0 (.40-.95) | .12 |
| BHW-1.1RD | 1.100 | .350 | 1/0-4/0 (.40-.95) | .12 |

*Recommended cable size range for single conductor.

### ORDERING INFORMATION:

BK = Black, RD = Red
All sizes sold in 12" lengths.

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# 2-TO-1

## FLEXIBLE, MULTI-PURPOSE

BHS is made from a cross-linked polyolefin, offering excellent electrical, chemical and physical properties. BHS is excellent for insulation, harnessing, strain relief and identification purposes.

### APPLICABLE SPECIFICATIONS:

U.L. 224, 125˚C
C.S.A. 125˚C
MIL-I-23053/5

### FEATURES:

- 2:1 Shrink ratio.
- Continuous operating temperature range of -55˚C to 135˚C.
- Flexible
- High tensile strength
- Flame retardant (except clear)
- UL/CSA/MIL approved
- Resistant to common fluids and solvents

| PART NUMBER | EXPANDED I.D. INCHES | RECOVERED I.D. INCHES | RECOVERED WALL INCHES | AVAILABLE COLORS |
|---|---|---|---|---|
| BHS-1/16 | .062 | .031 | .018 | BK, RD, CL, WH, GN, BL, YL |
| BHS-1/8 | .125 | .063 | .020 | BK, RD, CL, WH, GN, BL, YL |
| BHS-3/16 | .188 | .094 | .020 | BK, RD, CL, WH, GN, BL, YL |
| BHS-1/4 | .250 | .125 | .025 | BK, RD, CL, WH, GN, BL, YL |
| BHS-3/8 | .375 | .188 | .025 | BK, RD, CL, WH, GN, BL, YL |
| BHS-1/2 | .500 | .250 | .025 | BK, RD, CL, WH, GN, BL, YL |
| BHS-3/4 | .750 | .375 | .030 | BK, RD, CL, WH, GN, YL |
| BHS-1 | 1.000 | .500 | .035 | BK, RD, CL |
| BHS-1.5 | 1.500 | .750 | .040 | BK |
| BHS-2 | 2.000 | 1.000 | .045 | BK |
| BHS-3 | 3.000 | 1.500 | .050 | BK |
| BHS-4 | 4.000 | 2.000 | .055 | BK |

### ORDERING INFORMATION:

BK = Black, RD = Red, CL = Clear, WH = White, GN = Green, BL = Blue, YL = Yellow
Combine PART NUMBER with COLOR. EX: BHS-1/2RD = 1/2" Red
All sizes sold in 48" lengths.

### TECHNICAL DATA:

| Properties | Test Method | Typical Values |
|---|---|---|
| Tensile Strength | ASTM D2671 | 2300PSI |
| Ultimate Elongation | ASTM D2671 | 400% |
| Operating Temp. | — | -55˚C to +135˚C |
| Min. Shrink Temp. | — | 100˚C |
| Longitudinal Change | ASTM D2671 | ± 5% |
| Dielectric Strength | ASTM 876 | 800 volts/mil |
| Volume Resistivity | ASTM 876 | 1016 ohm-cm |
| Fluid Resistance | MIL-I-23053/5 | Good to Excellent |
| Corrosion Resistance | MIL-I-23053/5 | Non-Corrosive |
| Fungus Resistance | ASTM G21 | No Growth |
| Water Absorption | ASTM D570 | 0.1% (max) |

### HEAT SHRINK SIZE SELECTOR GUIDE FOR 2-TO-1 TUBING

| WIRE AWG | RECOMMENDED TUBING SIZE |
|---|---|
| 24 | 1/16" |
| 22 | 1/16" |
| 20 | 3/32" |
| 18 | 1/8" |
| 16 | 3/16" |
| 14 | 3/16" |
| 12 | 3/16" |
| 10 | 1/4" |
| 8 | 1/4" OR 3/8" |
| 6 | 3/8" OR 1/2" |
| 4 | 1/2" OR 3/4" |
| 2 | 3/4" OR 1" |

**NOTE:** The chart above is only a general recommendation. Insulation varies with different types of wire, a different diameter of tubing may actually be required. Also, when choosing a size consider any components or connectors that may need to be covered



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# WIRING DUCT

Wire management, protection and organization becomes simplified with the use of slotted wall wiring duct. The restricted slot design allows wires to be added or removed by simply deflecting the fingers on the side of the duct. The restricted slot then retains the wire preventing their accidental removal. Wiring duct is unique in that wires can be easily added and removed at any time. The cover is flush with the base for mounting in tight areas. Constructed from rigid PVC.

## APPLICATIONS:

Wiring of electrical control panels where breakouts are frequent and when adding or removing wire is a factor. The superior product to use when organizing large numbers of wires into a small, professionally laid out area.

## FEATURES:

- Rigid, Non-Flammable Polyvinyl Chloride
- Flammability Rating U.L. 94V-0
- Temperature up to 50˚C (122˚F)
- Available in White or Light Gray
- Resistant to Acids, Alkalis, Fuels, Oils
- Rounded edges along slots protect wires and hands from abrasion
- Non-slip cover design

## FOR OPTIMAL USE:

Follow the formula below to determine the maximum number of wires used in various sizes of wiring duct, based on a 50% fill capacity.

$$\text{Number of wires} = \frac{\text{Duct W x H}}{2 \times (\text{Wire O.D.})^2}$$

Cutting wiring duct is easily achieved by using a fine tooth hand saw for small quantities. For large quantities use a fine tooth bandsaw or circular saw.

## PART NUMBER INFORMATION

**BASE**

**BG 2 X 4 WH6**

- BG 2 X 4 → WIDTH
- WH6 → HEIGHT
- LG6 = LT. GRAY, WH6 = WHITE

**COVER**

**BDC 2 WH6**

- BDC 2 → WIDTH
- WH6 → LG6 = LT. GRAY, WH6 = WHITE

| PART NUMBER | NOMINAL DUCT SIZES | | MAX. NUMBER OF 14 AWG (WUL) WIRES | COVER PART NUMBER |
|---|---|---|---|---|
| | WIDTH INCH | HEIGHT INCH | | |
| BG1X1 | 1.00 | 1.00 | 26 | BDC1 |
| BG1X2 | | 2.00 | 52 | |
| BG1.5X1 | 1.50 | 1.00 | 39 | BDC1.5 |
| BG1.5X1.5 | | 1.50 | 58 | |
| BG2X1 | 2.00 | 1.00 | 52 | BDC2 |
| BG2X2 | | 2.00 | 104 | |
| BG2X4 | | 4.00 | 207 | |
| BG3X3 | 3.00 | 3.00 | 233 | BDC3 |
| BG4X2 | 4.00 | 2.00 | 207 | BDC4 |
| BG4X3 | | 3.00 | 311 | |
| BG4X4 | | 4.00 | 414 | |

## ORDERING INFORMATION:

Add: LG6 = for Lt. Gray
WH6 = for White

Sold in 6 ft. lengths.
**Cover is ordered separately.**

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# SPLIT CONDUIT

BSC Split Conduit is an excellent general purpose cable and harness protector. Convoluted tubing provides an efficient method for binding wire harness assemblies, supplying protection against abrasion, crushing and impact while reducing installation damage. It is economical and quick to install.

## FEATURES:

- Protection from heat, sunlight, salt, friction and vibration
- Longitudinally split for easy installation
- Lightweight
- Economical
- Operating temperature -20˚C to 93˚C
- Black UV resistant polyethylene

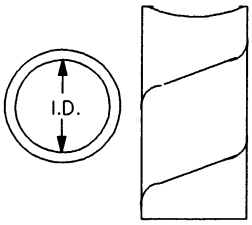
| PART NUMBER | SIZE | I.D. RANGE INCHES | O.D. RANGE (INCHES) | STANDARD PUT-UP |
|---|---|---|---|---|
| BSC1/4 | 1/4" | .236-.264 | .376-.400 | 100ft |
| BSC3/8 | 3/8" | .337-.362 | .491-.516 | 100ft |
| BSC1/2 | 1/2" | .484-.509 | .670-.695 | 100ft |
| BSC5/8 | 5/8" | .605-.630 | .790-.836 | 100ft |
| BSC3/4 | 3/4" | .730-.755 | .960-.985 | 100ft |
| BSC1 | 1" | 1.00-1.039 | 1.278-1.306 | 100ft |
| BSC1.25 | 1.125" | 1.250-1.276 | 1.437-1.484 | 50ft |
| BSC1.5 | 11.5" | 1.500-1.528 | 1.858-1.925 | 50ft |
| BSC2 | 2" | 1.980-2.035 | 2.343-2.409 | 50ft |

## ORDERING INFORMATION:

See standard put length.

# SPIRAL WRAP

Spiral wrap provides abrasion protection for wire and cable insulation as well as hydraulic and pneumatic tubing. Excellent for harnessing multiple cables into a single manageable bundle. Spiral wrap is also handy for kink-proofing all types of tubing. The spiral cut allows for expendability, easy wire breakouts at any point and excellent flexibility. For maximum abrasion resistance butt the edges together while installing, for flexibility leave a gap between the edges.




## FEATURES:

- Available in natural polyethylene and black (UV) weather-resistant polyethylene
- Tool supplied in each package
- Flexible, neat, fast
- Easy wire breakouts
- Operating temperature -20˚C to 80˚C
- Melt temperature 115˚C
- UL recognized
- Resistant to: Acids, Solvents, gas and oil

| PART NUMBER | FOR NATURAL ADD | FOR (UV) BLACK ADD | SIZE I.D. | BUNDLE DIAMETER RANGE | STANDARD PUT UP |
|---|---|---|---|---|---|
| BSW1/8 | C | B | .125 | 1/16" TO 1/2" | 100 |
| BSW1/4 | C | B | .250 | 3/16" TO 2" | 100 |
| BSW3/8 | C | B | .35 | 5/16" TO 3" | 100 |
| BSW1/2 | C | B | .500 | 3/8" TO 4" | 100 |
| BSW3/4 | C | B | .750 | 5/8" TO 5" | 100 |
| BSW1 | C | B | 1.000 | 7/8" TO 6" | 100 |

## ORDERING INFORMATION:

For Natural add a “C” EX: BSW1/2B = 1/2" Black UV resistant spiral wrap
For (UV) Black add a “B” Available in 100ft. rolls.

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# EXPANDABLE SLEEVING

Braided expandable sleeving provides a unique lightweight harnessing solution. Made from P.E.T. (Polyethylene Terephthalate) expandable sleeving will provide continuous abrasion protection while the flexible open weave will not trap heat or moisture. The flexibility and braid design also allows it to be installed over irregular shapes.

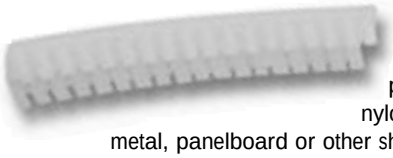
## FEATURES:

- Continuous abrasion resistance for wires, cables and tubing
- Lightweight
- Braided design will not trap heat or moisture
- Rated for use up to 257˚F (125˚C)
- UL recognized, CSA certified

| PART NUMBER | NOMINAL I.D. INCHES | NOM. DIAMETER RANGE (INCHES) | STANDARD PUT-UP |
|---|---|---|---|
| B1/4FLEX | 1/4" | .094-.250 | 100ft |
| B1/2FLEX | 1/2" | .250-.750 | 100ft |
| B3/4FLEX | 3/4" | .500-.1.25 | 100ft |
| B1.25FLEX | 1-1/4" | .750-.1.50 | 100ft |
| B1.5FLEX | 1-1/2" | 1.00-.2.25 | 50ft |
| B1.75FLEX | 1-3/2" | 1.25-.2.75 | 50ft |

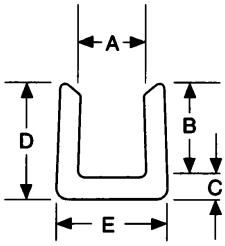
## ORDERING INFORMATION:

See standard put-up length.



# GROMMET EDGING

BGE Grommet Edging is used primarily to line panel edges and knockouts where the chaffing of passing wires is a concern. Made from natural nylon, it is ideal for the protection of glass, sheet metal, panelboard or other sheet materials. Grommet edging is available in 8 sizes, of 100ft. lengths, for sheet materials from .030" to .250". In most applications grommet edging will grip tightly by itself, if not, a small application of epoxy will secure it.




## FEATURES:

- Natural Nylon
- 8 stocked sizes
- UL Flammability 94V-2

| PART NUMBER | A MAX. PANEL THICKNESS | B | C | D | E |
|---|---|---|---|---|---|
| BGE-040 | .040 | .150 | .040 | .190 | .125 |
| BGE-052 | .052 | .150 | .040 | .190 | .125 |
| BGE-062 | .062 | .155 | .045 | .200 | .170 |
| BGE-085 | .085 | .155 | .045 | .200 | .170 |
| BGE-100 | .100 | .175 | .050 | .220 | .210 |
| BGE-125 | .125 | .175 | .050 | .220 | .205 |
| BGE-187 | .187 | .222 | .050 | .270 | .275 |
| BGE-250 | .250 | .230 | .050 | .280 | .370 |

## ORDERING INFORMATION:

Available in 100ft. packs

# SKINTOP® II LIQUID TIGHT CONNECTORS

SKINTOP® II Liquid tight, non-metallic strain relief connectors are an easy method of sealing out moisture from electrical boxes or between bulkheads. SKINTOP® II connectors meet the most stringent demands of safety and operational reliability. The internal ratchet mechanism allows the cap to be tightened without twisting the cord as it compresses. An integrated locking system prevents the cap from loosening even when subjected to severe vibration. Used both as a strain relief and liquid tight connector, SKINTOP® II is an all in one connector for panels, switches, control boxes, submersible pumps, and many other applications.

## FEATURES:

- International approvals, UL, CSA, VDE, SEV
- NPT Threads
- Continuous operating temperature range of -20˚C to 80˚C.
- Protection up to 70 PSI
- Resistant to common fluids and solvents
- Material: Polyamide - flame retardant and self-extinguishing nylon with neoprene bushing
- Seal: IP 68 (International Protection highest rating, comparable to NEMA 6)
- Available in gray

| PART NUMBER | DIAMETER RANGE | A MOUNTING HOLE | B MAX. OVERALL LENGTH | C MAX. LENGTH | D WRENCHING NUT | E WRENCHING FLATS |
|---|---|---|---|---|---|---|
| BSLC-3/8 | .157-.314 | .675 | 1.692 | .563 | .218 | .743 |
| BSLC-1/2 | .236-.476 | .825 | 1.734 | .563 | .218 | .938 |
| BSLC-3/4 | .545-.709 | 1.050 | 1.969 | .563 | .563 | 1.297 |
| BSLC-1 | .708-.984 | 1.303 | 2.283 | .563 | .563 | 1.654 |

## ORDERING INFORMATION:

Order by the piece. Locking Nuts sold separately.

# LOCKING NUTS

- Made from 6/6 gray nylon
- Meets UL flammability 94 V-2
- Maximum temperature rating 125˚C

| PART NUMBER | THREAD SIZE | G THICKNESS | H WRENCHING FLATS |
|---|---|---|---|
| BSLN-3/8 | 3/8" | .265 | 1.078 |
| BSLN-1/2 | 1/2" | .265 | 1.078 |
| BSLN-3/4 | 3/4" | .265 | 1.313 |
| BSLN-1 | 1" | .265 | 1.625 |

## ORDERING INFORMATION:

Order by the piece.



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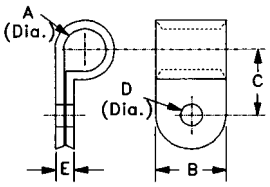
# NYLON C-CLAMPS

Nylon C-Clamps have a self aligning feature which eases installation and enhances appearance. Self-aligning clamps are available in natural 6/6 nylon or heat/UV stabilized black nylon. All sizes from 3/16" and larger are manufactured in durable 1/2" width. Mounted with a #10 screw BCCH C-Clamps are an economical, fast and efficient mounting system for a wide variety of materials including cables, harnesses, and hoses.

## FEATURES:

- Stocked in Natural and Heat/UV Stabilized Black 6/6 Nylon
- Self-Aligning
- 1/2" Width for strength
- Sizes from 1/8" to 1-1/2"
- UL Flammability 94 V-2neoprene bushing




| PART NUMBER (NATURAL) | PART NUMBER (BLACK) | SIZE | A | B | C | D | E |
|---|---|---|---|---|---|---|---|
| BCCH02-C | BCCH02-C0 | 1/8" | .114 | .333 | .375 | .167 | .257 |
| BCCH03-C | BCCH03-C0 | 3/16" | .172 | .375 | .500 | .203 | .241 |
| BCCH04-C | BCCH04-C0 | 1/4" | .234 | .407 | .500 | .203 | .241 |
| BCCH05-C | BCCH05-C0 | 5/16" | .297 | .445 | .500 | .203 | .280 |
| BCCH06-C | BCCH06-C0 | 3/8" | .359 | .484 | .500 | .203 | .291 |
| BCCH07-C | BCCH07-C0 | 7/16" | .422 | .522 | .500 | .203 | .263 |
| BCCH08-C | BCCH08-C0 | 1/2" | .484 | .560 | .500 | .203 | .272 |
| BCCH09-C | BCCH09-C0 | 9/16" | .547 | .590 | .500 | .203 | .236 |
| BCCH10-C | BCCH10-C0 | 5/8" | .609 | .637 | .500 | .203 | .290 |
| BCCH11-C | BCCH11-C0 | 11/16" | .672 | .694 | .500 | .203 | .327 |
| BCCH12-C | BCCH12-C0 | 3/4" | .734 | .726 | .500 | .203 | .326 |
| BCCH13-C | BCCH13-C0 | 13/16i" | .797 | .776 | .500 | .203 | .323 |
| BCCH14-C | BCCH14-C0 | 7/8" | .859 | .833 | .500 | .203 | .310 |
| BCCH16-C | BCCH16-C0 | 1" | .984 | .881 | .500 | .203 | .292 |
| BCCH20-C | BCCH20-C0 | 1-1/4” | 1.227 | 1.010 | .500 | .203 | .339 |
| *BCCH24-C | *BCCH24-C0 | 1-1/2” | 1.500 | 1.114 | .500 | .203 | .218 |

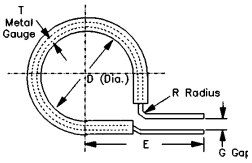
*Not Self-Aligning.

## ORDERING INFORMATION:

Available in 100pcs bags.

# STAINLESS-STEEL CUSHION CLAMPS

Stainless-Steel Cushion Clamps are designed for mounting wires, cables or hoses where weight and vibration are a factor. Stainless-steel clamps offer strength and durability. BSSC are composed of 302/321 stainless steel with black neoprene cushions for protection of harnesses or hoses. Neoprene cushions also serve to dampen vibrations. The strength and corrosion resistance of stainless-steel combined with the protection of neoprene provide a long term, reliable mounting solution.




## FEATURES:

- Stainless steel meets MIL-S-5059/AMS5510
- General purpose neoprene AMS3209
- 1/4" Mounting hole
- 1/2" Width for strength
- Sizes from 1/4" to 4"

## ADVANTAGES OVER ALUMINUM:

Stainless-steel will not pit and become brittle with prolonged exposure to salt water environment.

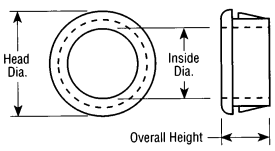
| PART NUMBER | SIZE (INCHES) | D | E | G | R | T | WIDTH |
|---|---|---|---|---|---|---|---|
| BSSC04-1/4 | 1/4" | .250 | .529 | .062 | .062 | .032 | .500 |
| BSSC06-3/8 | 3/8" | .375 | .592 | .062 | .062 | .032 | .500 |
| BSSC08-1/2 | 1/2" | .500 | .654 | .062 | .062 | .032 | .500 |
| BSSC10-5/8 | 5/8" | .625 | .780 | .062 | .109 | .032 | .500 |
| BSSC12-3/4 | 3/4" | .750 | .842 | .062 | .109 | .032 | .500 |
| BSSC14-7/8 | 7/8" | .875 | .889 | .062 | .109 | .032 | .500 |
| BSSC16-1 | 1" | 1.000 | .951 | .062 | .109 | .032 | .500 |
| BSSC20-1.25 | 1-1/4" | 1.250 | 1.092 | .094 | .125 | .032 | .500 |
| BSSC24-1.5 | 1-1/2" | 1.500 | 1.217 | .094 | .125 | .032 | .500 |
| BSSC28-1.75 | 1-3/4" | 1.750 | 1.342 | .094 | .125 | .032 | .500 |
| BSSC32-2 | 2" | 2.000 | 1.475 | .125 | .125 | .040 | .500 |
| BSSC40-2.5 | 2-1/2" | 2.500 | 1.728 | .125 | .125 | .040 | .500 |
| BSSC44-2.75 | 2-3/4" | 2.750 | | .125 | .125 | .040 | .500 |
| BSSC48-3 | 3" | 3.000 | 1.976 | .125 | .125 | .040 | .500 |
| BSSC64-4 | 4" | 4.000 | | .125 | .125 | .040 | .500 |

## ORDERING INFORMATION:

Order by the piece.

# SNAP BUSHINGS

Snap Bushings are use to eliminate sharp edges and to protect wires when passing through holes. Designed to accommodate a variety of panel or box thickness' snap bushings will easily "snap" into place and resist up to 35 pounds of pull.




| PART NUMBER | MOUNTING HOLE DIAMETER | INSIDE DIAMETER | HEAD DIAMETER | OVERALL HEIGHT |
|---|---|---|---|---|
| BSB-1/4 | 1/4" | 1/8" | .312 | .312 |
| BSB-3/8 | 3/8" | 1/4" | .468 | .406 |
| BSB-1/2 | 1/2" | 3/8" | .578 | .406 |
| BSB-5/8 | 5/8" | 1/2" | .718 | .406 |
| BSB-3/4 | 3/4" | 5/8" | .843 | .406 |
| BSB-7/8* | 7/8" | 11/16" | .953 | .453 |
| BSB-1 | 1" | 3/4" | 1.125 | .453 |
| BSB-1.25 | 1-1/4" | 15/16" | 1.359 | .453 |
| BSB-1.375 | 1-3/8" | 1 | 1.468 | .453 |
| BSB-1.5 | 1-1/2" | 1-5/16" | 1.609 | .453 |
| BSB-1.75 | 1-3/4" | 1 3/8" | 1.875 | .453 |
| BSB-2 | 2" | 1-5/8" | 2.125 | .453 |

* Fit standard 1/2" electrical knockouts.

## ORDERING INFORMATION

Order by the piece.

# CABLE TIES

Cable ties are the most widely used and versatile bundling and harnessing material available. Pacer offers a wide selection in both size and capacity. Cable ties are stocked in natural 6/6 nylon and weather resistant, UV stabilized, black 6/6 nylon. Sizes range from ties with a maximum of 1 inch diameter to ties that have a diameter up to 9 inches.

## PHYSICAL PROPERTIES OF NYLON CABLE TIES

| DESIGN CRITERIA | | NATURAL 6/6 NYLON | WEATHER RESISTANT 6/6 NYLON |
|---|---|---|---|
| TENSILE STRENGTH 73˚C (psi) | | 11,200 | 9,000 |
| COLOR | | NATURAL | BLACK |
| UL FLAMMABILITY | | UL 94V-2(1/16") | UL 94V-2(1/16") |
| WATER ABSORPTION (24 Hrs) | | 1.2% | 1.2% |
| ULTRAVIOLET LIGHT RESISTANCE | | POOR | GOOD |
| MAX. CONTINUOUS USE TEMP. | | 185˚F | 185˚F |
| MIN. CONTINUOUS USE TEMP. | | -40˚F | -40˚F |
| LOOP TENSILE STRENGTH @ 120˚F 20% RH | | | |
| | MIN (M) | 18 LB. | 18 LB. |
| | INT. (I) | 30/40 LB. | 30/40 LB. |
| | STD. (S) | 50 LB. | 50 LB. |
| | HVY. (H) | 120/175 LB. | 120/175 LB. |
| | X-HVY (EH) | 250 LB. | 250 LB. |

## PART NUMBER SYSTEM

**CTMR 2 S - 0**

**CABLE TIE TYPE**
CT = Standard
CTMR = Mounting Ring

**APPROX. BUNDLE DIAMETER**
1 = 1"
1.5 = 1.5"
2 = 2"
3 = 3"
4 = 4"

**LOOP TENSILE STRENGTH**
M = Mini (18 lbs.)
I = Intermediate (30/40 lbs.)
S = Standard (50 lbs.)
H = Heavy Duty (120 lbs.)
EH = Extra Heavy Duty (250 lbs.)

Designates Black (UV) Cable Ties

## STANDARD

| PART NUMBER NATURAL | PART NUMBER BLACK | PACKAGE QUANTITY | CROSS SECTION | LENGTH (INCHES) | MIN. LOOP WIDTH (INCHES) | MAX. TENSILE STRENGTH (LBS.) | BUNDLE DIAMETER (INCHES) |
|---|---|---|---|---|---|---|---|
| CT1M-C | CT1M-C0 | 100 | Min. | 3.9 | .10 | 18 | .87 |
| CT1M-M | CT1M-M0 | 1000 | Min. | 3.9 | .10 | 18 | .87 |
| CT1.5I-C | CT1.5I-C0 | 100 | Inter. | 5.6 | .14 | 40 | 1.38 |
| CT1.5I-M | CT1.5I-M0 | 1000 | Inter. | 5.6 | .14 | 40 | 1.38 |
| CT2S-C | CT2S-C0 | 100 | Std. | 7.4 | .19 | 50 | 1.88 |
| CT2S-M | CT2S-M0 | 1000 | Std. | 7.4 | .19 | 50 | 1.88 |
| CT3S-C | CT3S-C0 | 100 | Std. | 11.5 | .19 | 50 | 3.00 |
| CT3S-M | CT3S-M0 | 1000 | Std. | 11.5 | .19 | 50 | 3.00 |
| CT3H-L | CT3H-L0 | 50 | Hwy. | 11.4 | .30 | 120 | 3.00 |
| CT3H-TL | CT3H-TL0 | 250 | Hwy. | 11.4 | .30 | 120 | 3.00 |
| CT4S-C | CT4S-C0 | 100 | Std. | 14.5 | .19 | 50 | 4.00 |
| CT4S-M | CT4S-M0 | 1000 | Std. | 14.5 | .19 | 50 | 4.00 |
| CT4H-L | CT4H-L0 | 50 | Hwy. | 14.5 | .30 | 120 | 4.00 |
| CT4H-TL | CT4H-TL0 | 250 | Hwy. | 14.5 | .30 | 120 | 4.00 |
| CT7LH-L | CT7LH-L0 | 50 | Lt. Hwy. | 24.7 | .30 | 120 | 7.00 |
| CT9LH-L | CT9LH-L0 | 50 | Lt. Hwy. | 30.6 | .30 | 120 | 9.00 |

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## MOUNTING RING CABLE TIES

| PART NUMBER NATURAL | PART NUMBER BLACK | PACKAGE QUANTITY | CROSS SECTION | LENGTH (INCHES) | WIDTH (INCHES) | MIN. LOOP TENSILE STRENGTH (LBS.) | MAX. BUNDLE DIAMETER (INCHES) |
|---|---|---|---|---|---|---|---|
| CTMR1M-C | CTMR1M-C0 | 100 | Min. | 3.9 | .10 | 18 | .87 |
| CTMR1M-M | CTMR1M-M0 | 1000 | Min. | 3.9 | .10 | 18 | .87 |
| CTMR1.5I-C | CTMR1.5I-C0 | 100 | Inter. | 5.6 | .14 | 40 | 1.38 |
| CTMR1.5I-M | CTMR1.5I-M0 | 1000 | Inter. | 5.6 | .14 | 40 | 1.38 |
| CTMR2S-C | CTMR2S-C0 | 100 | Std. | 7.4 | .19 | 50 | 1.88 |
| CTMR2S-M | CTMR2S-M0 | 1000 | Std. | 7.4 | .19 | 50 | 1.88 |
| CTMR4S-C | CTMR4S-C0 | 100 | Std. | 14.5 | .19 | 50 | 4.00 |
| CTMR4S-M | CTMR4S-M0 | 1000 | Std. | 14.5 | .19 | 50 | 4.00 |
| CTMR4H-L | CTMR4H-L0 | 50 | Hwy. | 14.5 | .30 | 120 | 4.00 |
| CTMR4H-TL | CTMR4H-TL0 | 250 | Hwy. | 14.5 | .30 | 120 | 4.00 |

### ORDERING INFORMATION:

Order by standard package quantity.

# CABLE TIE MOUNTS

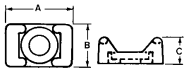
Pacer offers three styles of cable tie mounts.

CTM are screw fastened nylon cradles which provide maximum stability and rigidity to the wire bundle. They are available in natural or ultraviolet resistant black.

CTMTP are screw fastened multiple tie plates. These plates allow multiple wire bundles to be quickly fastened in a neat organized fashion. These plates can be especially useful when separating A/C cables to avoid heat build-up between conductors.

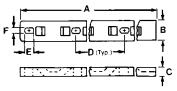
CAB are 4-way adhesive backed mounts. Adhesive mounts are fast and easy to use. Peel the backing paper off and apply to any clean, dry, smooth, grease-free surface. These mounts are composed of ABS plastic and have a rubber backing.

## SCREW DOWN MOUNTS




| PART NUMBER NATURAL | PART NUMBER BLACK | PACKAGE QUANTITY | A | B | C | USED WITH CABLE TIES* | MOUNT METHOD |
|---|---|---|---|---|---|---|---|
| CTM1S6 | CTM1S6BK | 100 | .505 | .325 | .230 | M | #6 Screw |
| CT2S8 | CT2S8BK | 100 | .585 | .375 | .270 | M,I,S | #8 Screw |
| CT3S10 | CT3S10BK | 100 | .875 | .625 | .380 | M,I,S,H | #8 Screw |
| | CTMEH25BK | 25 | 1.65 | .740 | .610 | EH | 1/4" Screw |

## MULTIPLE TIE MOUNTING PLATES




| PART NUMBER NATURAL | PACKAGE QUANTITY | A | B | C | D | E | F | USED WITH CABLE TIES* | MOUNT METHOD |
|---|---|---|---|---|---|---|---|---|---|
| CTMTP3-10 | PC | 4.25 | .50 | .125 | 1.25 | .30 | .20 | M,I,S | #10 Screw |
| CTMTP6-10 | PC | 9.59 | .62 | .203 | 1.50 | .30 | .20 | M,I,S,H | #10 Screw |

## ADHESIVE BACKED MOUNTS

| PART NUMBER NATURAL | PART NUMBER BLACK | PACKAGE QUANTITY | A | B | C | USED WITH CABLE TIES* | MAX. STATIC LOAD LBS. |
|---|---|---|---|---|---|---|---|
| CABM.5 | | 100 | .50 | .50 | .195 | M | .13 |
| CABM.75 | CABM.75BK | 100 | .75 | .75 | .195 | M, I | .30 |
| CABM1 | CABM1BK | 100 | 1.00 | 1.00 | .204 | M, I, S | .50 |

### ORDERING INFORMATION:

Order by standard package quantity.
*Cable tie cross section sizes: M = Miniature, I = Intermediate, S = Standard, LH = Light Heavy, H = Heavy, EH = Extra Heavy

## 3M DUAL LOCK

3M Dual Lock is a 1" wide, self-adhering, reclosable fastening system. 3M stem type locking system is five times stronger than conventional hook and loop fasteners. The adhesive backing will adhere instantly to many surfaces. When pressing together, an “audible” snap assures secure closure.

Part Number: **BDLOCK-BK** 2 - 1" rolls, 1@170 stems, 1@400 stems. 4.9 yards each.

### ORDERING INFORMATION:

Available in mini packs of 4.9 yards.

## 3M ELECTRICAL TAPE

### 3M 3M Super 33+

Scotch Brand Super 33+ is a premium-grade, 7-mil tape that applies well at -18˚C/0˚F and has an operating temperature range up to 105˚C/220˚F. Use Super 33+ as a primary insulation for wire and cable splices up to 600V and for fixture and wire splices up to 1 kV.

### FEATURES:

- 7-mil (18mm) Thick
- -18˚C/0˚F to 105˚C/220˚F
- Hot and Cold Weather Resistant
- UL Listed, CSA Certified
- 3/4" x 66"
- RESISTS: abrasion, UV rays, moisture, alkalis, solvents and many more

Part Number: **ETBLK105**

### 3M 3M Scotch 35

3M Scotch 35 color coded, American made, electrical tapes are general tapes are general purpose insulating tapes. They are economical and durable with excellent resistance to a wide range of contaminant's and weather conditions.

### FEATURES:

- 7-mil (18mm) Thick
- Indoor and Outdoor use
- For use up to 80˚C/176˚F
- Flame retardant
- UL Listed, CSA Certified
- 3/4" x 66"
- RESISTS: abrasion, UV rays, moisture, alkalis, solvents and many more

| PART NUMBER | COLOR |
|---|---|
| ETBRN80 | BROWN |
| ETRED80 | RED |
| ETORG80 | ORANGE |
| ETYEL80 | YELLOW |
| ETGRN80 | GREEN |
| ETBLU80 | BLUE |
| ETVIO80 | VIOLET |
| ETGRY80 | GRAY |
| ETWHT80 | WHITE |

## 3M 3M Temflex

3M Temflex is an economical, general purpose tape for indoor/outdoor use.

### FEATURES:

- 7-mil (18mm) Thick
- Indoor and Outdoor use
- Flame retardant
- Rated for use up to 80˚C/176˚F
- UL Listed, CSA Certified
- 3/4" x 60"
- RESISTS: abrasion, UV rays, moisture, alkalis, solvents and many more

Part Number: **ETBLK80**

## 3M 3M 130C Linerless Rubber Splicing Tape

3M 130C is a highly conformable linerless rubber (EPR), high-voltage insulating tape formulated to provide excellent thermal dissipation of splice heat. Designed for use in splicing and terminating wires and cables, moisture sealing electrical connections, bus bar insulating, and end-sealing cables.

### FEATURES:

- Indoor and Outdoor use
- Flame retardant
- Rated for use up to 90˚C continuous, short term overload service to 130˚C
- Provides immediate moisture seals and void-free buildups
- Used for low and high-voltage (through 69 kV) applications
- Meets requirements of HHI-553C, Grade A & B and ASTM D-4388, Type III

| PART NUMBER | DESCRIPTION |
|---|---|
| ET130C-1 | 1" x 30' |
| ET130C-1.5 | 1.5" x 30' |


## SILICONE RUBBER, SELF-FUSING TAPE

Stretchy, non-sticky, self-fusing silicone rubber tape forms an air and water tight bond around an object, it can even be wrapped around an object underwater. The tape will fuse to itself within minutes after wrapping. 1000's of uses.

### FEATURES:

- Available in black, red, green or white.
- 1" width, 30 mils thick, 12 feet per roll

| PART NUMBER | DESCRIPTION |
|---|---|
| ETSILICON-12-BK | BLACK |
| ETSILICON-12-RD | RED |
| ETSILICON-12-GN | GREEN |
| ETSILICON-12-WH | WHITE |

### ORDERING INFORMATION:

All tapes can be ordered by the roll.



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# TERMINALS & LUGS

NON-INSULATED
BRAZED

VINYL
FUNNEL ENTRY

NYLON FUNNEL
ENTRY WITH
INSULATION
SUPPORT SLEEVE

EPOXY
HEAT SHRINKABLE
TERMINALS

**PART NUMBER SYSTEM**

**T NF 14 - 10 R**

**TERMINAL TYPE**
T = RING, FORK or PIN
TAE = TINNED CLOSED END LUGS
TBS = BUTT SPLICE
TC, TL, TF = BATTERY TERMINALS
TD = DISCONNECTS
TB = BULLETS
TL = BRAZED LUGS

**INSULATION**
BLANK = NON-INSULATED
E = ADHESIVE HEAT SHRINK
N = NYLON
NF = NYLON, FUNNEL ENTRY w/INSULATION SLEEVE
V = VINYL, FUNNEL ENTRY

**WIRE RANGE**
18 = #22-18 AWG
14 = #16-14 AWG
10 = #12-10 AWG
8 = #8 AWG
6 = #6 AWG
4 = #4 AWG
2 = #2 AWG
1 = #1 AWG
1/0 = #0
2/0 = #00
3/0 = #000
4/0 = #0000

**STUD SIZE**
6 = #6
8 = #8
10 = #10
14 = 1/4”
56 = 5/16“
38 = 3/8“
12 = 1/2”

**TAB SIZE (DISCONNECTS)**
110 = .110 x .032
187 = .187 x .032
250 = .250 x .032

**TONGUE CONFIGURATION**
FF = FLANGED FORK
P = PIN
R = RING
SLF = SHORT LOCKING FORK
DISCONNECT CONFIG.
A = ADAPTER
FI = FULLY INSUL.(FEMALE)
FIM = FULLY INSUL.(MALE)
M = MALE
PB = PIGGYBACK
BLANK = FEMALE

## NYLON INSULATED TERMINALS WITH INSULATION GRIP SLEEVE

Pacer's premium non-sealing terminal. The 3-piece design allows for superior crimping and insulation grip. Terminals are constructed from pure annealed, electroplated tin copper, with a brazed seam and a serrated inner barrel. A permanently attached, funnel shaped, tin-plated brass sleeve encompasses the barrel and extends over the wire to be use as a insulation grip. The terminal is insulated with durable, abrasion resistant nylon.
Operating Temperature: 105˚C/600V

## VINYL INSULATED TERMINALS

Vinyl terminals combine the top quality construction of our non-insulated terminals with a specially designed PVC (polyvinyl chloride) insulation. The color coded vinyl is funneled to speed and simplify wire insertion without fraying strands. The vinyl insulation extends beyond the barrel to be crimped, forming an insulation support.
Operating Temperature: 105˚C/600V

## NON-INSULATED TERMINALS

Non-insulated terminals are constructed from pure annealed electroplated tin copper, with a brazed seam and a serrated inner barrel. The bell mouth entry eases installation of conductors. One piece construction provides an economical, high quality terminal. Non-insulated connectors are excellent to use if crimping and soldering a connection is necessary. They can also be handy if space constraints are a factor. Insulate these terminals with standard or adhesive heat shrink tubing.

**PERFORMANCE REQUIREMENTS FOR #22 - #10 AWG TERMINALS ON COPPER WIRE:**

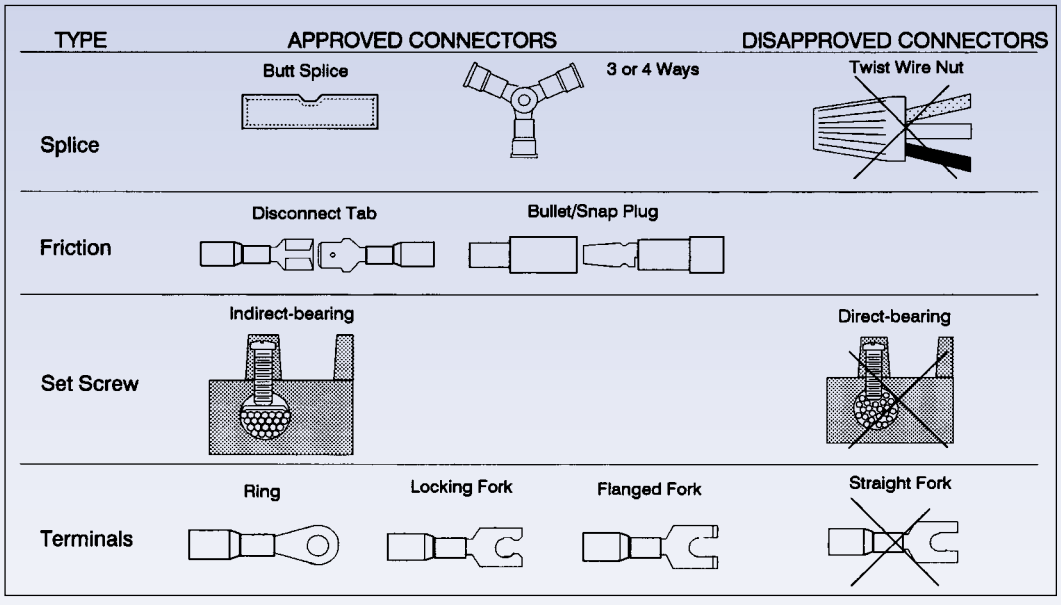
**MIL-T-7928G**

| AWG | 22 | 20 | 18 | 16 | 14 | 12 | 10 |
|---|---|---|---|---|---|---|---|
| A | 9 | 11 | 16 | 22 | 32 | 45 | 55 |
| B | 7 | - | 7 | 8 | 5 | 5.5 | 4 |
| C | 15 | 19 | 38 | 50 | 70 | 110 | 150 |

**UL 486A**

| AWG | 22 | 20 | 18 | 16 | 14 | 12 | 10 |
|---|---|---|---|---|---|---|---|
| D | 9 | 12 | 17 | 16 | 30 | 35 | 50 |
| C | 8 | 13 | 20 | 30 | 50 | 70 | 80 |

A = Test Current (AMPS)
B = Voltage Drop (MV) Max Allowable
C = Min. Tensile Strength (lbs) Pull-out force of the crimped terminal
D = Test Current for Max 50C Rise (AMPS)



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# HEAT SHRINKABLE TERMINALS

Heat shrinkable terminals have quickly become the most requested connector among marine professionals. They uniquely solve several different conditions that undermine marine electrical circuits, such as corrosion. Excessive vibration and abrasion are controlled to a much greater extent than with traditional terminals. The ease and speed by which these connectors create a fully environmentally sealed connection is unmatched. Heat shrink terminals are constructed from high-grade, fully annealed, tinned plated copper with a brazed barrel seam. The insulation is a tough, quick-to-shrink polyolefin.

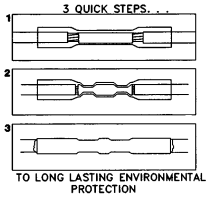
## FEATURES:

- Protects terminations from water, condensation, salt spray and corrosion
- Provides strain relief
- Added vibration protection in rugged environments
- Cost effective by extending the longevity of wire
- Operating Temperature: -55˚C to 125˚C
- Shrink Ratio: Approx. 3 to 1 at 135˚C
- Dielectric Strength: 900V/mil
- Volume Resistively: 1015 ohm-cm3
- Available in gauge sizes 22 through 8

| WIRE RANGE | STUD SIZE | PART NUMBER | INSUL. COLOR | STANDARD PACKAGE |
|---|---|---|---|---|
| **BUTT SPLICES** | | | | |
| #22-18 AWG | | TBSE18 | RED | 25, 50, 100, 500, 1000 |
| #16-14 AWG | | TBSE14 | BLUE | 25, 50, 100, 500, 1000 |
| #12-10 AWG | | TBSE10 | YELLOW | 25, 50, 100, 500 |
| #8 AWG | | TBSE8 | PINK | 10, 25, 50, 100, 250 |
| **RING TERMINALS** | | | | |
| #22-18 AWG | #6 | TE18-6R | RED | 25, 50, 100, 500, 1000 |
| | #8 | TE18-8R | RED | 25, 50, 100, 500, 1000 |
| | #10 | TE18-10R | RED | 25, 50, 100, 500, 1000 |
| | 1/4" | TE18-14R | RED | 25, 50, 100, 500, 1000 |
| | 5/16" | TE18-56R | RED | 25, 50, 100, 500, 1000 |
| | 3/8" | TE18-38R | RED | 25, 50, 100, 500, 1000 |
| #16-14 AWG | #6 | TE14-6R | BLUE | 25, 50, 100, 500, 1000 |
| | #8 | TE14-8R | BLUE | 25, 50, 100, 500, 1000 |
| | #10 | TE14-10R | BLUE | 25, 50, 100, 500, 1000 |
| | 1/4" | TE14-14R | BLUE | 25, 50, 100, 500, 1000 |
| | 5/16" | TE14-56R | BLUE | 25, 50, 100, 500, 1000 |
| | 3/8" | TE14-38R | BLUE | 25, 50, 100, 500, 1000 |
| | 1/2" | TE14-12R | BLUE | 25, 50, 100, 500, 1000 |
| #12-10 AWG | #6 | TE10-6R | YELLOW | 25, 50, 100, 500 |
| | #8 | TE10-8R | YELLOW | 25, 50, 100, 500 |
| | #10 | TE10-10R | YELLOW | 25, 50, 100, 500 |
| | 1/4" | TE10-14R | YELLOW | 25, 50, 100, 500 |
| | 5/16" | TE10-56R | YELLOW | 25, 50, 100, 500 |
| | 3/8" | TE10-38R | YELLOW | 25, 50, 100, 500 |
| | 1/2" | TE10-12R | YELLOW | 25, 50, 100, 500 |
| #8 AWG | #10 | TE10-10R | PINK | 10, 25, 50, 100, 250 |
| | 1/4" | TE10-14R | PINK | 10, 25, 50, 100, 250 |
| | 5/16" | TE10-56R | PINK | 10, 25, 50, 100, 250 |
| | 3/8" | TE10-38R | PINK | 10, 25, 50, 100, 250 |
| | 1/2" | TE10-12R | PINK | 10, 25, 50, 100, 250 |
| **LOCKING "SNAP" FORKS** | | | | |
| #22-18 AWG | #6 | TE18-6SLF | RED | 25, 50, 100, 500, 1000 |
| | #8 | TE18-8SLF | RED | 25, 50, 100, 500, 1000 |
| | #10 | TE18-10SLF | RED | 25, 50, 100, 500, 1000 |
| #16-14 AWG | #6 | TE14-6SLF | BLUE | 25, 50, 100, 500, 1000 |
| | #8 | TE14-8SLF | BLUE | 25, 50, 100, 500, 1000 |
| | #10 | TE14-10SLF | BLUE | 25, 50, 100, 500, 1000 |
| | 1/4" | TE14-14SLF | BLUE | 25, 50, 100, 500, 1000 |
| #12-10 AWG | #6 | TE10-6SLF | YELLOW | 25, 50, 100, 500 |
| | #8 | TE10-8SLF | YELLOW | 25, 50, 100, 500 |
| | #10 | TE10-10SLF | YELLOW | 25, 50, 100, 500 |
| | 1/4" | TE10-14SLF | YELLOW | 25, 50, 100, 500 |
| **DISCONNECTS** | | | | |
| | ***FEMALE*** | ***MALE*** | | |
| #22-18 AWG | TDE18-250 | TDE18-250M | RED | 25, 50, 100, 500, 1000 |
| #16-14 AWG | TDE14-250 | TDE14-250M | BLUE | 25, 50, 100, 500, 1000 |
| #12-10 AWG | TDE10-250 | TDE10-250M | YELLOW | 25, 50, 100, 500 |

## ORDERING INFORMATION:

Order by standard package.




## INSTALLATION:

**STEP 1:** Strip wire 0.3" for butt splices or .25" for ring terminals. Insert into crimp barrel.

**STEP 2:** Crimp using the 3M TR-490 or any tool for pre-insulated terminals.

**STEP 4:** Heat splice or terminal from the crimped section out to the wire, with a heat source until tubing recovers.

# MULTILINK - CRIMPED, SOLDERED AND SEALED ELECTRICAL CONNECTIONS

ABYC states that solder should not the sole means of connection for marine applications. Multilink solves the need to get reliable strength and conductivity that solder offers with the mechanical strength of a crimped terminals. Multilink goes a step further by providing an integral, heat shrinkable, adhesive, polyolefin tubing. For the ultimate in reliable marine splicing use multilink.

### FEATURES:

- Flux coated, pre-measured, low temperature solder sleeve
- Zipper brazed terminal seam for superior crimp performance
- Seals terminations from water, condensation, salt spray, and corrosion
- Provides strain relief
- Added vibration protection in rugged environments
- Cost effective by extending the longevity of wire
- Operating Temperature: -55˚C to 125˚C
- Shrink Ratio: Approx. 3 to 1 at 135˚C
- Available in gauge sizes 22 through 10

### INSTALLATION INSTRUCTIONS:

1. Strip wire 5/16", insert into crimp barrel. Repeat for the other side
2. Crimp using the 3M TR-490, Sargent VT3120CT, or Klein VT1005
3. Heat Splice or terminal from the crimped section out to the wire until the adhesive flows
4. Focus the heat on the terminal and solder ring until the solder flows

## MULTILINK SPLICES

| WIRE RANGE | PART NUMBER | INSUL. COLOR | STANDARD PACKAGE |
|---|---|---|---|
| #22-18 AWG | TBML18 | RED | 10, 25, 50, 100 |
| #16-14 AWG | TBML14 | BLUE | 10, 25, 50, 100 |
| #12-10 AWG | TBML10 | YELLOW | 10, 25, 50, 100 |

### ORDERING INFORMATION:

Ordered by standard package.

## BUTT SPLICES

For use whenever two wires need to be connected. Available in three styles: premium nylon insulated, vinyl insulated and non-insulated. Non-insulated butt splices have a brazed seam to prevent separation during crimping. All butt splices have a bell shaped wire entry with a serrated inner barrel for added pull-out strength.

| WIRE RANGE | NYLON INSULATED | VINYL INSULATED | NON-INSULATED | INSULATION COLOR | STANDARD PACKAGE |
|---|---|---|---|---|---|
| #22-18 AWG | TBSN18 | TBSV18 | TBS18 | RED | 10, 25, 50, 100 |
| #16-14 AWG | TBSN14 | TBSV14 | TBS14 | BLUE | 10, 25, 50, 100 |
| #12-10 AWG | TBSN10 | TBSV10 | TBS10 | YELLOW | 10, 25, 50, 100 |

### ORDERING INFORMATION:

Ordered by standard package.



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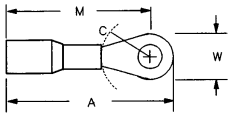
## RING TERMINALS

Rings terminals are available in all three configurations, nylon insulation grip, funnel entry vinyl, and non-insulated terminals. Ring terminals are the most secure type of tongue style because they cannot slip off a screw or stud, they should be used on all key circuits.

| WIRE RANGE | STUD SIZE | NYLON INSULATED | VINYL INSULATED | NON-INSULATED | INSUL. COLOR | A | W | C | M | STANDARD PACKAGE |
|---|---|---|---|---|---|---|---|---|---|---|
| 22-18 AWG | #6 | TNF18-6R | TV18-6R | T18-6R | RED | .80 | .25 | .20 | .69 | 50, 100, 500, 1000 |
| | #8 | TNF18-8R | TV18-8R | T18-8R | RED | .91 | .31 | .27 | .75 | 50, 100, 500, 1000 |
| | #10 | TNF18-10R | TV18-10R | T18-10R | RED | .91 | .31 | .27 | .75 | 50, 100, 500, 1000 |
| | 1/4" | TNF18-14R | TV18-14R | T18-14R | RED | 1.11 | .46 | .38 | .88 | 50, 100, 500, 1000 |
| | 5/16" | TNF18-56R | TV18-56R | T18-56R | RED | 1.11 | .46 | .38 | .88 | 50, 100, 500, 1000 |
| | 3/8" | TNF18-38R | TV18-38R | T18-38R | RED | 1.19 | .53 | .43 | .93 | 50, 100, 500, 1000 |
| 16-14 AWG | #6 | TNF14-6R | TV14-6R | T14-6R | BLUE | .92 | .31 | .27 | .75 | 50, 100, 500, 1000 |
| | #8 | TNF14-8R | TV14-8R | T14-8R | BLUE | .92 | .31 | .27 | .75 | 50, 100, 500, 1000 |
| | #10 | TNF14-10R | TV14-10R | T14-10R | BLUE | .92 | .31 | .27 | .75 | 50, 100, 500, 1000 |
| | 1/4" | TNF14-14R | TV14-14R | T14-14R | BLUE | 1.13 | .46 | .38 | .88 | 50, 100, 500, 1000 |
| | 5/16' | TNF14-56R | TV14-56R | T14-56R | BLUE | 1.13 | .46 | .38 | .88 | 50, 100, 500, 1000 |
| | 3/8" | TNF14-38R | TV14-38R | T14-38R | BLUE | 1.21 | .53 | .43 | .93 | 50, 100, 500, 1000 |
| | 1/2" | TNF14-12R | TV14-12R | T14-12R | BLUE | 1.31 | .71 | .50 | 1.10 | 50, 100, 500, 1000 |
| 12-10 AWG | | | | | | | | | | |
| | #6 | TNF10-6R | TV10-6R | T10-6R | YELLOW | 1.06 | .31 | .33 | .91 | 50, 100, 500 |
| | #8 | TNF10-8R | TV10-8R | T10-8R | YELLOW | 1.06 | .31 | .33 | .91 | 50, 100, 500 |
| | #10 | TNF10-10R | TV10-10R | T10-10R | YELLOW | 1.06 | .31 | .33 | .91 | 50, 100, 500 |
| | 1/4" | TNF10-14R | TV10-14R | T10-14R | YELLOW | 1.24 | .52 | .40 | .98 | 50, 100, 500 |
| | 5/16" | TNF10-56R | TV10-56R | T10-56R | YELLOW | 1.24 | .52 | .40 | .98 | 50, 100, 500 |
| | 3/8" | TNF10-38R | TV10-38R | T10-38R | YELLOW | 1.32 | .58 | .44 | 1.03 | 50, 100, 500 |
| | 1/2" | TNF10-12R | TV10-12R | T10-12R | YELLOW | 1.46 | .71 | .50 | 1.10 | 50, 100, 500 |

A and M dimensions apply to insulated terminals only.




### ORDERING INFORMATION:

Order by standard package.

## FORK TERMINALS

Pacer stocks two variations to the standard "fork or "spade" terminal. Marine applications require a means of securing the terminal to a post or screw beyond just the pressure of the screw to the terminal itself. Two innovations to the straight fork have been made, locking forks or "Snap Spades" and flanged forks. Locking forks have projections inside the fork causing the connector to "snap" onto the screw or bolt holding the terminal captive. Flanged forks have the ends turned up, holding the terminal captive should the screw loosen. Functionally, fork terminals are great to use in rework situations where it can be difficult to completely remove the fastener. Pacer has captive forks available in nylon funnel entry with insulation grip, funnel entry vinyl, and brazed seam non-insulated.

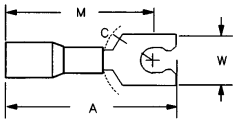
| WIRE RANGE | STUD SIZE | NYLON INSULATED | VINYL INSULATED | NON-INSULATED | INSUL.. COLOR | A | W | C | M | STANDARD PACKAGE |
|---|---|---|---|---|---|---|---|---|---|---|
| **SHORT LOCKING FORKS** | | | | | | | | | | |
| 22-18 AWG | #6 | TNF18-6SLF | TV18-6SLF | T18-6SLF | RED | .80 | .25 | .20 | .68 | 50, 100, 500, 1000 |
| | #8 | TNF18-8SLF | TV18-8SLF | T18-8SLF | RED | .85 | .29 | .23 | .73 | 50, 100, 500, 1000 |
| | #10 | TNF18-10SLF | TV18-10SLF | T18-10SLF | RED | .86 | .33 | .23 | .73 | 50, 100, 500, 1000 |
| 16-14 AWG | #6 | TNF14-6SLF | TV14-6SLF | T14-6SLF | BLUE | .80 | .25 | .20 | .68 | 50, 100, 500, 1000 |
| | #8 | TNF14-8SLF | TV14-8SLF | T14-8SLF | BLUE | .85 | .29 | .23 | .73 | 50, 100, 500, 1000 |
| | #10 | TNF14-10SLF | TV14-10SLF | T14-10SLF | BLUE | .86 | .33 | .23 | .73 | 50, 100, 500, 1000 |
| | 1/4" | TNF14-14SLF | TV14-14SLF | T14-14SLF | BLUE | .95 | 44 | .33 | .79 | 50, 100, 500, 1000 |
| 12-10 AWG | #6 | TNF10-6SLF | TV10-6SLF | T10-6SLF | YELLOW | .89 | .25 | .20 | .77 | 50, 100, 500 |
| | #8 | TNF10-8SLF | TV10-8SLF | T10-8SLF | YELLOW | .94 | .29 | .28 | .82 | 50, 100, 500 |
| | #10 | TNF10-10SLF | TV10-10SLF | T10-10SLF | YELLOW | .95 | .33 | .28 | .82 | 50, 100, 500 |
| | 1/4" | TNF10-14SLF | TV10-14SLF | T10-14SLF | YELLOW | 1.04 | .45 | .34 | .88 | 50, 100, 500 |

| WIRE RANGE | STUD SIZE | NYLON* INSULATED | NON-INSULATED | INSUL.. COLOR | A | W | C | M | STANDARD PACKAGE |
|---|---|---|---|---|---|---|---|---|---|
| **FLANGED FORKS** | | | | | | | | | |
| 22-18 AWG | #6 | TN18-6FF | — | RED | .78 | .28 | .20 | .63 | 50, 100, 500, 1000 |
| | #8 | TN18-8FF | T18-8FF | RED | .89 | .31 | .23 | .64 | 50, 100, 500, 1000 |
| | #10 | TN18-10FF | — | RED | .89 | .38 | .23 | .64 | 50, 100, 500, 1000 |
| 16-14 AWG | #6 | TN14-6FF | T14-6FF | BLUE | .78 | .28 | .20 | .63 | 50, 100, 500, 1000 |
| | #8 | TN14-8FF | T14-8FF | BLUE | .89 | .31 | .23 | .64 | 50, 100, 500, 1000 |
| | #10 | TN14-10FF | — | BLUE | .89 | .38 | .23 | .64 | 50, 100, 500, 1000 |
| 12-10 AWG | #8 | TN10-8FF | — | YELLOW | 1.02 | .37 | .26 | .78 | 50, 100, 500 |
| | #10 | TN10-10FF | T10-10FF | YELLOW | 1.02 | .37 | .26 | .78 | 50, 100, 500 |

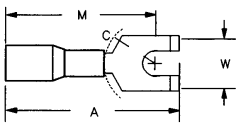
* Nylon insulated flanged forks are not funnel entry.
A and M dimensions apply to insulated terminals only.

### ORDERING INFORMATION:

Order by standard package.



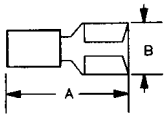

**Short Locking Forks**



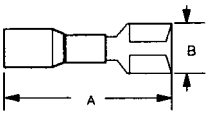

**Flanged Forks**

## DISCONNECTS

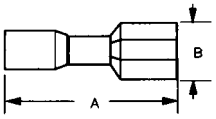
Also known as quick connect or slip-on connectors. Connection is accomplished by fitting the female part over the male tab. Holding force is excellent due to a indentation on the tongue of the female part which locks into a hole on the male tab. Available in non-insulated brazed seam, partially insulated vinyl (covers wire barrel only) or fully insulated nylon.




**Non-Insulated Female/Male**




**Vinyl Partially Insulated**




**Nylon Fully Insulated**

### NON-INSULATED FEMALE/MALE

| WIRE RANGE | TAB SIZE | FEMALE | MALE | A | B | STANDARD PACKAGE |
|---|---|---|---|---|---|---|
| 22-18 AWG | .188 x .032 | TD18-188 | — | .59 | .23 | 50, 100, 500, 1000 |
| | .250 x .032 | TD18-250 | TD18-250M | .66 | .29 | 50, 100, 500, 1000 |
| 16-14 AWG | .188 x .032 | TD14-188 | — | .59 | .23 | 50, 100, 500, 1000 |
| | .250 x .032 | TD14-250 | TD14-250M | .66 | .29 | 50, 100, 500, 1000 |
| 12-10 AWG | .250 x .032 | TD10-250 | TD10-250M | .76 | .29 | 50, 100, 500 |

### VINYL PARTIALLY INSULATED

| WIRE RANGE | TAB SIZE | FEMALE | MALE | A | B | STANDARD PACKAGE |
|---|---|---|---|---|---|---|
| 22-18 AWG | .188 x .032 | TDV18-188 | — | .84 | .23 | 50, 100, 500, 1000 |
| | .250 x .032 | TDV18-250 | TDV18-250M | .89 | .29 | 50, 100, 500, 1000 |
| 16-14 AWG | .188 x .032 | TDV14-188 | — | .84 | .23 | 50, 100, 500, 1000 |
| | .250 x .032 | TDV14-250 | TDV14-250M | .89 | .29 | 50, 100, 500, 1000 |
| 12-10 AWG | .250 x .032 | TDV10-250 | TDV10-250M | 1.04 | .29 | 50, 100, 500 |

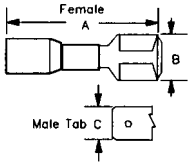
### NYLON FULLY INSULATED

| WIRE RANGE | TAB SIZE | FEMALE | MALE | A | B | STANDARD PACKAGE |
|---|---|---|---|---|---|---|
| 22-18 AWG | .250 x .032 | TDNF18-250FI | TDNF18-250FIM | .84/.97 | .35/.40 | 50, 100, 500, 1000 |
| 16-14 AWG | .250 x .032 | TDNF14-250FI | TDNF14-250FIM | .84/.97 | .35/.40 | 50, 100, 500, 1000 |
| 12-10 AWG | .250 x .032 | TDNF10-250FI | TDNF10-250FIM | 1.07/1.17 | .36/.40 | 50, 100, 500 |

*Dimension "B" refers to female disconnects only. Right angle disconnects available upon request.

### ORDERING INFORMATION:

Order by standard package.




### PIGGYBACKS DISCONNECTS

Piggybacks are female and male tabs combined into one disconnect. Primarily used to allow additional circuits to be added to existing equipment without costly rework. Available in vinyl insulation only.

| WIRE RANGE | TAB SIZE | PART NUMBER | A | B | C | STANDARD PACKAGE |
|---|---|---|---|---|---|---|
| 22-18 AWG | .250 x .032 | TDV18-250PB | .87 | .30 | .25 | 50, 100, 500, 1000 |
| 16-14 AWG | .250 x .032 | TDV14-250PB | .87 | .30 | .25 | 50, 100, 500, 1000 |
| 12-10 AWG | .250 x .032 | TDV10-250PB | 1.01 | .30 | .25 | 50, 100, 500 |

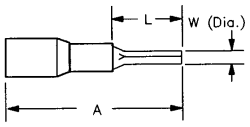
### ORDERING INFORMATION:

Order by standard package.

### DISCONNECT ADAPTERS

Part Number: TD250A

Part Number: TD250FMF




## PIN TERMINALS

Pin connectors are primarily designed for compression type terminal blocks. Available in vinyl insulation only.

| WIRE RANGE | VINYL INSULATED | INSULATION COLOR | A | L | W | STANDARD PACKAGE |
|---|---|---|---|---|---|---|
| 22-18 AWG | TV18-47P | RED | .84 | .47 | .08 | 50, 100, 500, 1000 |
| 16-14 AWG | TV14-47P | BLUE | .84 | .47 | .08 | 50, 100, 500, 1000 |
| 12-10 AWG | TV10-55P | YELLOW | 1.12 | .55 | .11 | 50, 100, 500 |

### ORDERING INFORMATION:

Order by standard package.

## 3-WAY AND 4-WAY CONNECTORS

3 or 4 ring terminals are tightly riveted together to allow the connection of multiple wires into one circuit. The center hole diameter is .160". Available in vinyl insulation only.

| WIRE RANGE | 3-W VINYL INSULATED | 4-W VINYL INSULATED | STANDARD PACKAGE |
|---|---|---|---|
| 22-18 AWG | TV18-3W | TV18-4W | 50, 100, 500, 1000 |
| 16-14 AWG | TV14-3W | TV14-4W | 50, 100, 500, 1000 |
| 12-10 AWG | TV10-3W | TV10-4W | 50, 100, 500 |

### ORDERING INFORMATION:

Order by standard package.

## BULLET CONNECTORS

Bullet Connectors have advantages similar to disconnects, providing a reliable in-line connection. Terminals are made to close tolerances to produce holding friction when parts are mated.

| WIRE RANGE | SIZE | PLUG PART NUMBER | RECEPTACLE PART NUMBER | INSULATION COLOR | STANDARD PACKAGE |
|---|---|---|---|---|---|
| 22-18 AWG | .156 | TBPV18-156 | TBRV18-156 | RED | 50, 100, 500, 1000 |
| 22-18 AWG | .180 | TBPV18-180 | TBRV18-180 | RED | 50, 100, 500, 1000 |
| 16-14 AWG | .156 | TBPV14-156 | TBRV14-156 | BLUE | 50, 100, 500, 1000 |
| 16-14 AWG | .180 | TBPV14-180 | TBRV14-180 | BLUE | 50, 100, 500, 1000 |

### ORDERING INFORMATION:

Order by standard package.

## CRIMPABLE WIRE JOINTS

Also known as "pigtails," wire joints can be used as a splice, wire butt, parallel or dead end cap. Each size has a minimum and maximum range of wires it will accept. Available in nylon insulation.

| MIN/MAX* RANGE | PLUG PART NUMBER | INSULATION COLOR | STANDARD PACKAGE |
|---|---|---|---|
| 2@18 - 2@16 AWG | TJN218-216 | CLEAR | 100, 500, 1000 |
| 4@18 - 2@12 AWG | TJN418-212 | CLEAR | 100, 500, 1000 |
| 3@14 - 4@12 AWG | TJN314-412 | CLEAR | 100, 500 |

### ORDERING INFORMATION:

Order by standard package.

# TINNED PLATED "CLOSED END" LUGS

General purpose seamless electrical terminals. Made from 100% pure electrolytic copper, fully annealed to prevent cracking while being crimped and while in service. Tinned plated for optimum corrosion resistance. All lugs have a flared "bell" shaped entry to facilitate wire insertion. Pacer's closed end lugs are uniquely made so that there is no exposed seam on the outside of the terminal.

## FEATURES:

- Tinned plated, E.T.P. (Electrolytic Tough Pitch) CDA-110, ASTM-B-152 copper, rated at 100% conductivity
- UL and CSA Approved
- Flexible: A single, double or three-way connection can be made by stacking parts
- No exposed seams

| WIRE RANGE | STUD SIZE | PART NUMBER | LENGTH | WIDTH | CLEARANCE | STANDARD PACKAGE |
|---|---|---|---|---|---|---|
| #8 AWG | #10 | TAE8-10R-T | 1.187 | .438 | .344 | 25, 50, 100, 500 |
| | 1/4" | TAE8-14R-T | 1.187 | .438 | .344 | 25, 50, 100, 500 |
| | 5/16" | TAE8-56R-T | 1.187 | .438 | .344 | 25, 50, 100, 500 |
| | 3/8" | TAE8-38R-T | 1.344 | .609 | .406 | 25, 50, 100, 500 |
| | 1/2" | TAE8-12R-T | 1.484 | .766 | .469 | 25, 50, 100, 500 |
| # 6 AWG | #10 | TAE6-10R-T | 1.266 | .438 | .344 | 25, 50, 100, 500 |
| | 1/4" | TAE6-14R-T | 1.266 | .438 | .344 | 25, 50, 100, 500 |
| | 5/16" | TAE6-56R-T | 1.266 | .438 | .344 | 25, 50, 100, 500 |
| | 3/8" | TAE6-38R-T | 1.406 | .609 | .406 | 25, 50, 100, 500 |
| | 1/2" | TAE6-12R-T | 1.547 | .766 | .469 | 25, 50, 100, 500 |
| # 4 AWG | #10 | TAE4-10R-T | 1.500 | .531 | .406 | 25, 50, 100, 500 |
| | 1/4" | TAE4-14R-T | 1.500 | .531 | .406 | 25, 50, 100, 500 |
| | 5/16" | TAE4-56R-T | 1.500 | .531 | .406 | 25, 50, 100, 500 |
| | 3/8" | TAE4-38R-T | 1.500 | .531 | .406 | 25, 50, 100, 500 |
| | 1/2" | TAE4-12R-T | 1.688 | .766 | .469 | 25, 50, 100, 500 |
| # 2 AWG | 1/4" | TAE2-14R-T | 1.625 | .609 | .406 | 10, 25, 50, 100 |
| | 5/16" | TAE2-56R-T | 1.625 | .609 | .406 | 10, 25, 50, 100 |
| | 3/8" | TAE2-38R-T | 1.625 | .609 | .406 | 10, 25, 50, 100 |
| | 1/2" | TAE2-12R-T | 1.750 | .766 | .469 | 10, 25, 50, 100 |
| # 1 AWG | 1/4" | TAE1-14R-T | 1.719 | ..692 | .406 | 10, 25, 50, 100 |
| | 5/16" | TAE1-56R-T | 1.719 | .692 | .406 | 10, 25, 50, 100 |
| | 3/8" | TAE1-38R-T | 1.719 | .692 | .406 | 10, 25, 50, 100 |
| | 3/8" | TAE1-12R-T | 1.719 | .692 | .469 | 10, 25, 50, 100 |
| # 1/0 AWG | 1/4" | TAE1/0-14R-T | 1.844 | .734 | .406 | 10, 25, 50, 100 |
| | 5/16" | TAE1/0-56R-T | 1.844 | .734 | .406 | 10, 25, 50, 100 |
| | 3/8" | TAE1/0-38R-T | 1.844 | .734 | .406 | 10, 25, 50, 100 |
| | 1/2" | TAE1/0-12R-T | 1.844 | .734 | .469 | 10, 25, 50, 100 |
| # 2/0 AWG | 1/4" | TAE2/0-14R-T | 2.063 | .813 | .500 | 10, 25, 50, 100 |
| | 5/16" | TAE2/0-56R-T | 2.063 | .813 | .500 | 10, 25, 50, 100 |
| | 3/8" | TAE2/0-38R-T | 2.063 | .813 | .500 | 10, 25, 50, 100 |
| | 1/2" | TAE2/0-12R-T | 2.063 | .813 | .500 | 10, 25, 50, 100 |
| # 3/0 AWG | 1/4" | TAE3/0-14R-T | 2.172 | .906 | .500 | 10, 25, 50, 100 |
| | 5/16" | TAE3/0-56R-T | 2.172 | .906 | .500 | 10, 25, 50, 100 |
| | 3/8" | TAE3/0-38R-T | 2.172 | .906 | .500 | 10, 25, 50, 10 |
| | 1/2" | TAE3/0-12R-T | 2.172 | .906 | .500 | 10, 25, 50, 100 |
| # 4/0 AWG | 1/4" | TAE4/0-14R-T | 2.344 | .984 | .547 | 10, 25, 50, 100 |
| | 5/16" | TAE4/0-56R-T | 2.344 | .984 | .547 | 10, 25, 50, 100 |
| | 3/8" | TAE4/0-38R-T | 2.344 | .984 | .547 | 10, 25, 50, 100 |
| | 1/2" | TAE4/0-12R-T | 2.344 | .984 | .547 | 10, 25, 50, 100 |

Heavy Duty Starter/Battery Lugs with longer barrels and heavier wall thickness are available upon request.

## ORDERING INFORMATION:

Order by standard package.

**PACER MARINE - SARASOTA**
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# BRAZED SEAM TINNED BATTERY LUGS

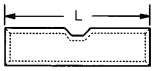
Made from pure electrolytic copper for high conductivity and electro-plated with tin for maximum corrosion protection. Wire barrels are silver alloy brazed, allowing the lug to be crimped anywhere, even on the seam, without splitting. The inside of the barrel is serrated with "V" grooves, which when crimped, grip the wire adding to the holding power. These lugs are very sturdy and durable even in the most demanding conditions.

NON-INSULATED

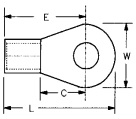
## FEATURES:

- Tinned plated, E.T.P. (Electrolytic Tough Pitch) CDA-110, ASTM-B-152 copper, rated at 100% conductivity
- UL and CSA Approved
- Flexible: A single, double or three-way connection
  can be made by stacking parts
- Silver Alloy Brazed Seam.

NYLON INSULATED




**Butt Splices**




**Ring Lugs**

**BUTT SPLICES**

| WIRE RANGE | PART NUMBER NON-INS. | PART NUMBER NYLON INS. | INS. COLOR | L NON-INS. | L INSULATED | STANDARD PACKAGE |
|---|---|---|---|---|---|---|
| #8 AWG | TBS8 | TBSN8 | RED | .77 | 1.45 | 25, 50, 100, 500 |
| #6 AWG | TBS6 | TBSN6 | BLUE | 1.02 | 1.86 | 25, 50, 100, 500 |
| #4 AWG | TBS4 | TBSN4 | YELLOW | 1.20 | 2.03 | 25, 50, 100, 500 |
| #2 AWG | TBS2 | | | 1.37 | | 10, 25, 50, 100 |
| #1/0 | TBS1/0 | | | 1.52 | | 10, 25, 50, 100 |
| #2/0 | TBS2/0 | | | 1.58 | | 10, 25, 50, 100 |
| #4/0 | TBS4/0 | | | 1.58 | | 10, 25, 50, 100 |

**RING LUGS**

| WIRE RANGE | STUD SIZE | NON INS. | NYLON INS. | INS. COLOR | L NON-INS | E NON-INS | C | W | STANDARD PACKAGE |
|---|---|---|---|---|---|---|---|---|---|
| #8 AWG | #10 | TL8-10R | TLNF8-10R | RED | .960 | .720 | .388 | .374 | 25, 50, 100, 500 |
| | 1/4" | TL8-14R | TLNF8-14R | RED | .960 | .720 | .388 | .374 | 25, 50, 100, 500 |
| | 5/16" | TL8-56R | TLNF8-56R | RED | 1.007 | .720 | .388 | .374 | 25, 50, 100, 500 |
| | 3/8" | TL8-38R | TLNF8-38R | RED | 1.136 | .785 | .453 | .583 | 25, 50, 100, 500 |
| | 1/2" | TL8-12R | TLNF8-12R | RED | 1.432 | .968 | .636 | .810 | 25, 50, 100, 500 |
| # 6 AWG | #10 | TL6-10R | TLNF6-10R | BLUE | 1.215 | .896 | .511 | .480 | 25, 50, 100, 500 |
| | 1/4" | TL6-14R | TLNF6-14R | BLUE | 1.215 | .896 | .511 | .480 | 25, 50, 100, 500 |
| | 5/16" | TL6-56R | TLNF6-56R | BLUE | 1.215 | .896 | .511 | .480 | 25, 50, 100, 500 |
| | 3/8" | TL6-38R | TLNF6-38R | BLUE | 1.296 | .896 | .511 | .643 | 25, 50, 100, 500 |
| | 1/2" | TL6-12R | TLNF6-12R | BLUE | 1.479 | .988 | .603 | .825 | 25, 50, 100, 500 |
| # 4 AWG | #10 | TL4-10R | TLNF4-10R | YELLOW | 1.288 | .994 | .547 | .475 | 25, 50, 100, 500 |
| | 1/4" | TL4-14R | TLNF4-14R | YELLOW | 1.288 | .994 | .547 | .475 | 25, 50, 100, 500 |
| | 5/16" | TL4-56R | TLNF4-56R | YELLOW | 1.288 | .994 | .547 | .475 | 25, 50, 100, 500 |
| | 3/8" | TL4-38R | TLNF4-38R | YELLOW | 1.385 | .994 | .547 | .665 | 25, 50, 100, 500 |
| | 1/2" | TL4-12R | TLNF4-12R | YELLOW | 1.385 | .994 | .547 | .665 | 25, 50, 100, 500 |
| # 2 AWG | 1/4" | TL2-14R | - | - | 1.578 | 1.218 | .703 | .630 | 10, 25, 50, 100 |
| | 5/16" | TL2-56R | - | - | 1.578 | 1.218 | .703 | .630 | 10, 25, 50, 100 |
| | 3/8" | TL2-38R | - | - | 1.578 | 1.218 | .703 | .630 | 10, 25, 50, 100 |
| | 1/2" | TL2-12R | - | - | 1.695 | 1.218 | .703 | .864 | 10, 25, 50, 100 |
| # 1 AWG | 1/4" | TL1-14R | - | - | 1.840 | - | - | .710 | 10, 25, 50, 100 |
| | 5/16" | TL1-56R | - | - | 1.840 | - | - | .710 | 10, 25, 50, 100 |
| | 3/8" | TL1-38R | - | - | 1.930 | - | - | .710 | 10, 25, 50, 100 |
| | 1/2" | TL1-12R | - | - | 1.930 | - | - | .880 | 10, 25, 50, 100 |
| # 1/0 | 1/4" | TL1/0-14R | - | - | 1.949 | - | - | .820 | 10, 25, 50, 100 |
| | 5/16" | TL1/0-56R | - | - | 1.949 | - | - | .820 | 10, 25, 50, 100 |
| | 3/8" | TL1/0-38R | - | - | 1.949 | - | - | .820 | 10, 25, 50, 100 |
| | 1/2" | TL1/0-12R | - | - | 1.980 | - | - | .864 | 10, 25, 50, 100 |
| # 2/0 | 1/4" | TL2/0-14R | - | - | 2.180 | - | - | .928 | 10, 25, 50, 100 |
| | 5/16" | TL2/0-56R | - | - | 2.180 | - | - | .928 | 10, 25, 50, 100 |
| | 3/8" | TL2/0-38R | - | - | 2.180 | - | - | .928 | 10, 25, 50, 100 |
| | 1/2" | TL2/0-12R | - | - | 2.180 | - | - | .928 | 10, 25, 50, 100 |
| # 3/0 | 1/4" | TL3/0-14R | - | - | 2.180 | - | - | 1.047 | 10, 25, 50, 100 |
| | 5/16" | TL3/0-56R | - | - | 2.180 | - | - | 1.047 | 10, 25, 50, 100 |
| | 3/8" | TL3/0-38R | - | - | 2.180 | - | - | 1.047 | 10, 25, 50, 100 |
| | 1/2" | TL3/0-12R | - | - | 2.180 | - | - | 1.047 | 10, 25, 50, 100 |
| # 4/0 | 1/4" | TL4/0-14R | - | - | 2.242 | - | - | 1.115 | 10, 25, 50, 100 |
| | 5/16" | TL4/0-56R | - | - | 2.242 | - | - | 1.115 | 10, 25, 50, 100 |
| | 3/8" | TL4/0-38R | - | - | 2.242 | - | - | 1.115 | 10, 25, 50, 100 |
| | 1/2" | TL4/0-12R | - | - | 2.242 | - | - | 1.115 | 10, 25, 50, 100 |

## ORDERING INFORMATION:

Order by standard package.

# BATTERY TERMINALS

All battery terminals are cast using 131 contact copper which is 93% to 95% copper. They are electro-plated with a bright tin finish. Each terminal has raised letters to provide legibility of important information such as wire size and post type. Our battery terminals are sand cast which makes them more durable and reliable than die cast parts. A deep chamfer entry promotes the ease of wire installation. For corrosion protection a thin layer of epoxy is applied to the surface of the nuts and bolts. This thin layer does not effect the ease of assembly and will maintain consistent torque and galvanic protection.

## FEATURES:

- Tinned plated, 131 contact copper
- Straight, Left and Right Angle and Flag Terminals in stock
- Chamfered Entry
- Wire sizes from 6 AWG through 4/0
- Anti-corrosion coating applied on all nuts and bolts

### STRAIGHT TOP POST TERMINALS

| WIRE RANGE | PART NUMBER | DESCRIPTION | STANDARD PACKAGE |
|---|---|---|---|
| # 6 AWG | TC-6-U | UNIVERSAL | 5, 10, 25 |
| # 4 AWG | TC-4-P | POSITIVE | 5, 10, 25 |
| | TC-4-N | NEGATIVE | 5, 10, 25 |
| # 1-2 AWG | TC-2-P | POSITIVE | 5, 10, 25 |
| | TC-2-N | NEGATIVE | 5, 10, 25 |
| # 1/0 | TC-10-P | POSITIVE | 5, 10, 25 |
| | TC-10-N | NEGATIVE | 5, 10, 25 |
| # 2/0 | TC-20-P | POSITIVE | 5, 10, 25 |
| | TC-20-N | NEGATIVE | 5, 10, 25 |
| # 4/0 | TC-40-P | POSITIVE | 5, 10, 25 |
| | TC-40-N | NEGATIVE | 5, 10, 25 |

### LEFT AND RIGHT ELBOWS TOP POST TERMINALS

| WIRE RANGE | PART NUMBER LEFT | PART NUMBER RIGHT | | STANDARD PACKAGE |
|---|---|---|---|---|
| # 1-2 AWG | TL-2-P | TR-2-P | POSITIVE | 5, 10, 25 |
| | TL-2-N | TR-2-N | NEGATIVE | 5, 10, 25 |
| # 1/0 | TL-10-P | TR-10-P | POSITIVE | 5, 10, 25 |
| | TL-10-N | TR-10-N | NEGATIVE | 5, 10, 25 |
| # 2/0 | TL-20-P | TR-20-P | POSITIVE | 5, 10, 25 |
| | TL-20-N | TR-20-N | NEGATIVE | 5, 10, 25 |
| # 4/0 | TL-40-P | TR40-P | POSITIVE | 5, 10, 25 |
| | TL-40-N | TR-40-N | NEGATIVE | 5, 10, 25 |

### RIGHT ANGLE FLAG TOP POST TERMINALS

| WIRE RANGE | PART NUMBER | DESCRIPTION | STANDARD PACKAGE |
|---|---|---|---|
| # 1/0 | TF-10-P | POSITIVE | 5, 10, 25 |
| | TF-10-N | NEGATIVE | 5, 10, 25 |
| # 2/0 | TF-20-P | POSITIVE | 5, 10, 25 |
| | TF-20-N | NEGATIVE | 5, 10, 25 |
| # 4/0 | TF-40-P | POSITIVE | 5, 10, 25 |
| | TF-40-N | NEGATIVE | 5, 10, 25 |

### MARINE TYPE TOP POST TERMINALS

| PART NUMBER | DESCRIPTION | STANDARD PACKAGE |
|---|---|---|
| TC-200-P | POSITIVE | 5, 10, 25 |
| TC-210-N | NEGATIVE | 5, 10, 25 |
| TC-200-U* | UNIVERSAL | 5, 10, 25 |

* Lead Alloy Battery Terminal.

## ORDERING INFORMATION:

Order by standard package.

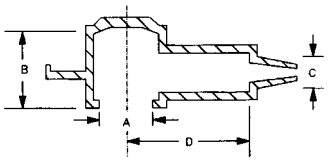
# BATTERY INSULATOR BOOTS

Battery terminal insulators increase product safety by preventing electrical shorts and shock, avoiding injury and potential liability. Additionally, the use of terminal insulators assures customers that your product was designed with the highest standards of quality. Protective boots and caps extend battery life by protecting against corrosion. Constructed from durable, heavy-duty PVC. Available in straight, marine, and alternator type.

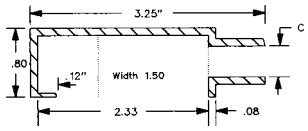
## FEATURES:

- Recommended per ABYC E-10.6(1)
- Polyvinyl Chloride 105˚C
- Meets Coast Guard 33 CFR Part 183 Subpart 1
- Meets S.A.E. J378 and J1128 (Low voltage caps)
- Meets UL 94 V2 Rated 105˚C

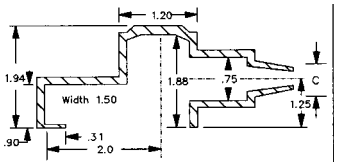
ABYC recommends that "Except for circuits provided with over current protection in accordance with ABYC E-9.11. Continuously energized parts, such as positive battery terminals and both ends of all wires connected thereto, shall be protected to prevent accidental short circuits."




**Alternator Type**




**Straight Type**




**Marine Type**

### ALTERNATOR TYPE

| WIRE RANGE | PART NUMBER | TERMINAL O.D. "A" | POST HEIGHT "B" | CABLE ENTRY "C" MIN/MAX | COLOR | STANDARD PACKAGE |
|---|---|---|---|---|---|---|
| 10-6 AWG | TBCA6-R | .48 | .75 | .30/.50 | RED | 10, 25, 50 |
| | TBCA6-B | .48 | .75 | .30/.50 | BLACK | 10, 25, 50 |
| 8-2 AWG | TBCA2-R | .87 | 1.05 | .30/.50 | RED | 5, 10, 25 |
| | TBCA2-B | .87 | 1.05 | .30/.50 | BLACK | 5, 10, 25 |
| 2-4/0 AWG | TBCA20-R | .87 | 1.05 | .50/.70 | RED | 5, 10, 25 |
| | TBCA20-B | .87 | 1.05 | .50/.70 | BLACK | 5, 10, 25 |
| 4/0 AWG | TBCA40-R | 1.37 | 1.60 | .70/.90 | RED | 5, 10, 25 |
| | TBCA40-B | 1.37 | 1.60 | .70/.90 | BLACK | 5, 10, 25 |

### STRAIGHT TYPE

| WIRE RANGE | PART NUMBER | CABLE ENTRY | COLOR | STANDARD PACKAGE |
|---|---|---|---|---|
| 6-2 AWG | TBCS2-R | .500 | RED | 5, 10, 25 |
| | TBCS2-B | .500 | BLACK | 5, 10, 25 |
| 2-2/0 AWG | TBCS20-R | .625 | RED | 5, 10, 25 |
| | TBCS20-B | .625 | BLACK | 5, 10, 25 |
| 4/0 AWG | TBCS40-R | .700 | RED | 5, 10, 25 |
| | TBCS40-B | .700 | BLACK | 5, 10, 25 |

### MARINE TYPE

| WIRE RANGE | PART NUMBER | CABLE ENTRY "C" MIN/MAX | COLOR | STANDARD PACKAGE |
|---|---|---|---|---|
| 6-2 AWG | TBCS2-R | .30/.50 | RED | 5, 10, 25 |
| | TBCS2-B | .30/.50 | BLACK | 5, 10, 25 |
| 2-2/0 AWG | TBCS20-R | .50/.70 | RED | 5, 10, 25 |
| | TBCS20-B | .50/.70 | BLACK | 5, 10, 25 |
| 4/0 AWG | TBCS40-R | .75 | RED | 5, 10, 25 |
| | TBCS40-B | .75 | BLACK | 5, 10, 25 |

## ORDERING INFORMATION:

Order by standard package.

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1-800-634-5031 • FAX: 954-763-8062

# TERMINAL BOXES

Scoop type compartment boxes are a handy way of organizing and neatly transporting terminals, screws and all types of fasteners. Two types of boxes are available.

## METAL

Metal boxes are made of prime cold rolled steel, finished with rust and acid resistant baked enamel (gray). Both the large and small boxes have 21 compartments with one long compartment for tool storage. A catch type latch keeps the lid secure. Racks with two or four drawers are also available for convenient storage.

## PLASTIC

Manufactured from high strength, oil resistant polypropylene, plastic boxes are durable and economical. The transparent plastic boxes are furnished with heavy-duty reinforced hinges that allow the lid to stand up in the open position. The cover overlaps on all sides fitting snugly against the edges. Two snap latches securely close the lid and prevent parts from moving between compartments.

| PART NUMBER | DESC. | BOX O.D. WIDTH | BOX O.D. HEIGHT | BOX O.D. DEPTH | COMPARTMENT I.D. WIDTH | COMPARTMENT I.D. HEIGHT | COMPARTMENT I.D. DEPTH | NO. OF COMPARTMENTS | WT. LBS. |
|---|---|---|---|---|---|---|---|---|---|
| VBOX-MS | SMALL | 13 3/8” | 2” | 9 1/4” | 1 7/8” | 1 7/8” | 2 1/4” | 21 | 4 |
| VBOX-ML | LARGE | 18” | 3” | 12” | 2 3/4” | 2 7/8” | 2 7/8” | 21 | 8 |
| VBOX-PL | PLASTIC | 11 | 1 3/4” | 6 3/4” | 1 3/4” | 1 9/16” | 2” | 18 | .7 |

## ORDERING INFORMATION:

Order by the box.



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# ELECTRICAL SEALANTS & COATINGS


## 3M™ Electrical Coating

3M™ Scotchkote™ electrical coating provides a tough, oil-resistant outer seal on electrical insulation subjected to abnormal weathering, oil, or moisture conditions. The brush applied coating provides added oil and moisture protection when used over an application of Scotch™ Vinyl electrical tapes.

FEATURES:

- Provides a tough oil-resistant seal
- Integral Brush and Cap
- Easy to Coat.
- Fast Drying
- 15 Fl. Oz. (443 ml) per can

Part Number = **VSCOTCHKOTE**


## 3M™ Insulating Sealers

3M™ 1602 and 1603 Sealers insulate, refinish, and protect. Use to overcoat outdoor electrical splices and splice cases to impede the effects of weather, moisture, acids, alkalies, and oils.

FEATURES:

- Provides 850V per mil insulation
- Inhibits Rust
- Impede the effects of weather, moisture, acids, alkalies, and oils
- 15.13 fl. oz. (447 ml)

| PART NUMBER | COLOR |
|---|---|
| E1602RD | RED |
| E1603BK | BLACK |


## CORROSION X™ MARINE...

**CORROSION X™ MARINE:**

The new generation in corrosion control. Corrosion X™ Marine takes corrosion protection to a higher level. It keeps corrosion from starting and kills it where it already has a foothold, by displacing moisture to provide long-lasting protection. Also, Corrosion X™ is a superior penetrate. Use Corrosion X™ Marine on any metal fixture or electrical component.

| PART NUMBER | COLOR |
|---|---|
| VCX-16 | 16 OZ. |
| VCX-6 | 6 OZ. |


# MARKER BOOKS

For convenience and portability, pocket size marker books are an economical and handy way to utilize the benefits of wire markers. The markers are composed of impregnated vinyl cloth to resist solvents. A 1/4" long, terminal block marker is provided for each full length marker. Each book contains 10 pages.

## FEATURES:

- Portable and convenient
- Temperature Range -40˚C to 121˚C
- Minimum application temperature 4˚C
- Nominal Thickness 10.0 mil.
- For use on wire outside diameters up to 3/8"
- Intended for indoor use
- Large variety of selections

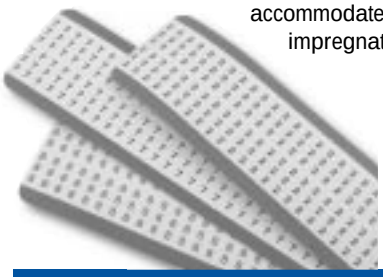
| PART NUMBER | LEGEND | NUMBER OF MARKERS FOR EACH LEGEND | STANDARD PACKAGE |
|---|---|---|---|
| VPCMB-1 | 0 through 9 | 45 | 1 |
| VPCMB-2 | A through Z, 0 through 15, +, -, / | 10 | 1 |
| VPCMB-3 | 1 through 45 | 10 | 1 |
| VPCMB-4 | 1, 2, 3 | 150 | 1 |
| VPCMB-5 | A, B, C | 150 | 1 |
| VPCMB-6 | T1, T2, T3 | 150 | 1 |
| VPCMB-7 | L1, L2, L3 | 150 | 1 |
| VPCMB-8 | 1 through 15, (16 through 90)<br>A through Z, +, -, /, 0 | 6, (4)<br>2 | 1 |
| VPCMB-9 | 1, 2, 3, A, B, C, (L1, L2, L3, T1, T2, T3) | 45, (30) | 1 |
| VPCMB-10 | Solid NEMA colors* | 45 | 1 |
| VPCMB-11 | 1 through 30 | 15 | 1 |
| VPCMB-12 | A through Z, (+)<br>-, (Blank Write-on) | 15, (8)<br>7, (21) | 1 |
| VPCMB-13 | +, -, AC, DC, (POS, NEG, GND)<br>NEUT, (SPARE, Blank Write-on) | 45, (33)<br>27, (21) | 1 |
| VPCMB-14 | 46 through 90 | 10 | |
| VPCMB-16 | 0 through 33, A, B, C, +, -<br>L1, L2, L3, T1, T2, T3 | 10<br>10 | 1 |
| VPCMB-25 | 0 through 9, (L1, L2, L3, T1, T2, T3) | 45, (15) | 1 |

## ORDERING INFORMATION:

Order by standard package.

# MARKER CARDS

All cards are designed so the edge can be pulled back for easy marker removal, then folded back to it's original position to keep unused markers fresh. All markers are 1-1/2" long to accommodate cable diameters up to 3/8". Markers are composed of vinyl impregnated cloth that resist solvents. Legends are available from 0 through 9.



## FEATURES:

- Temperature Range -40˚C to 121˚C
- Minimum application temperature 4˚C
- Nominal Thickness 10.0 mil.
- For use on wire outside diameters up to 3/8"
- Intended for indoor use

| PART NUMBER | DESCRIPTION | LEGEND | MARKERS PER CARD | STANDARD PACKAGE |
|---|---|---|---|---|
| VPCM-0 | CLOTH | 0 | | 5 or 25 Cards |
| VPCM-1 through VPCM-9 | MARKERS | 1 through 9 | 36 | 5,25 |

## ORDERING INFORMATION:

Order by standard package.

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# MARKER ROLLS AND DISPENSER

Uniquely designed dispenser cuts the tape by pressing the cover, no tearing or knife necessary. The cut is clean with no serrated edges assuring better adhesion. Markers are made of a polyester film which is resistant to heat, oil, and solvents. The tough polyester material is suitable of being used on indoor or outdoor applications. One of the advantages of marker rolls is that they can be cut to any length, using only what you need.

## FEATURES:

- Holds ten rolls of tape
- Legends are visible through cover window for fast selection
- Tough polypropylene construction, single piece design
- Intended for indoor or outdoor use

| PART NUMBER | PRODUCT DESCRIPTION | LEGEND | STANDARD PACKAGE |
|---|---|---|---|
| VPMD | Empty Dispenser | — | 1 |
| VPMD-0-9 | Filled Dispenser | 0 through 9 | 1 |
| VPMDR-0 | | 0 | 1 |
| VPMDR-1 | Individual Tape Rolls | 1 | 1 |
| through | | through | |
| VPMDR-9 | | 9 | |

## ORDERING INFORMATION:

Order by standard package.

# SNAP-ON WIRE MARKERS

Snap-On wire markers are made of acetal and designed with a chevron type of cut allowing the legends of multiple clips to stay aligned. Recessed legends will not rub off or fade. Acetal maintains lubricity and durability under continual flexing so the product can be removed and reused. Snap-On markers exceed the requirements of Mil-H-560C and Mil-L-7808.

## FEATURES:

- Durable acetal construction
- Chevron design maintains legend alignment
- Recessed legends
- Temperature Range -30˚C to 90˚C
- Intended for indoor or outdoor use

| LEGEND | PART NUMBER | | | | |
|---|---|---|---|---|---|
| WIRE O.D. RANGE → | .110" - .130" | .130" - .150" | .185" - .234" | .234" - .267" | .360" - .450 |
| 0 | VPCA11-0 | VPCA13-0 | VPCA18-0 | VPCA23-0 | VPCA36-0 |
| 1 | VPCA11-1 | VPCA13-1 | VPCA18-1 | VPCA23-1 | VPCA36-1 |
| through | through | through | through | through | through |
| 9 | VPCA11-9 | VPCA13-9 | VPCA18-9 | VPCA23-9 | VPCA36-9 |
| 0 through 9 | VPCA11-0-9 | VPCA13-0-9 | VPCA18-0-9 | VPCA23-0-9 | VPCA36-0-9 |
| # OF MARKERS PER WAND | 30 | 30 | 30 | 15 | 15 |
| WAND I.D. COLOR | RED | BLUE | YELLOW | BROWN | WHITE |

## ORDERING INFORMATION:

Order by the wand.

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# WRITE-ON MARKERS AND DISPENSER KITS

Marker dispensers are made of tough polypropylene. Replacement rolls of marker tape are easily loaded. Rolls do not have a carrier strip, facilitating installation and reducing mess.

| PART NUMBER | PRODUCT DESCRIPTION | WRITE-ON AREA (L x W) | TOTAL MARKER SIZE (L x W) | MARKERS PER ROLL | STANDARD PACKAGE |
|---|---|---|---|---|---|
| VPLD-1 | KIT* | .75" x 1" | 1.5" x 1" | 200 | 1 |
| VPLD-2 | KIT* | .75" x 1" | 3" x 1" | 100 | 1 |
| VPLDR-1 | REPLACEMENT TAPE | .75" x 1" | 1.5" x 1" | 200 | 1 |
| VPLDR-2 | REPLACEMENT TAPE | .75" x 1" | 3" x 1" | 100 | 1 |

## ORDERING INFORMATION:

Order by Standard Package.

*Kit contains a dispenser, tape and marking pen.

# MARKING PENS

Specially formulated ink produces a quick-to-dry, non-smearing legend. Our marking pens write on glossy surfaces, even nylon.

| PART NUMBER | DESCRIPTION | COLOR | STANDARD PACKAGE |
|---|---|---|---|
| VPX-0 | REGULAR TIP | BLACK | 1 |
| VPX-2 | REGULAR TIP | RED | 1 |
| VPX-10 | REGULAR TIP | WHITE | 1 |
| VPFX-0 | FINE TIP | BLACK | 1 |
| VPFX-2 | FINE TIP | RED | 1 |

## ORDERING INFORMATION:

Order by standard package.



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## MASTER® Ultratorch®

Ultratorches are multipurpose portable soldering irons, butane torches and flameless heat tools. They are completely cordless, running on refillable butane fuel. Excellent for field maintenance and repairs.

## P/N: VUT-100

Standard ULTRATORCH® comes complete with one ejector for soldering and heat tip applications and one ejector for torch applications. Also included are: a heat shrink attachment, a tool holder, a solder sponge, spanner wrench, soldering tip, heat tip, and a metal carrying case.

## P/N: VUT-100Si

The 100Si is a Self-Igniting butane heat tool. It comes complete with one ejector for soldering, a soldering and heat tip, a spanner wrench, open end wrench, shrink attachment and protective cap. The self-igniting ULTRATORCH® operates only as a soldering iron and a heat tool.

## P/N: VUT-100Sik

The 100Sik is the same tool as the VUT-100Si that comes complete with all the same accessories, attachments and a metal carrying case.

### APPLICATIONS:

- On-site marine repairs
- Heat shrink tubing
- Soft solder of copper tubing and pipes
- Soldering circuit boards
- Heat shrinkable environmental splices and solder preforms
- Welding plastics
- Adhesive Activation

### SPECIFICATIONS:

| | VUT-100 | VUT100Si & VUT100Sik |
|---|---|---|
| **Overall Length** | | |
| w/soldering tip | 242mm (6.5") | 260mm (10.3") |
| w/heat | 227mm (6") | 247mm (9.8") |
| as torch | 199mm (5.2") | |
| **Weight** | | |
| (when gas filled) | 3.7 oz | 5.5" oz |
| **Approximate Temperature** | | |
| soldering tip | 200-500˚C | 200-500˚C |
| heat tip | 700˚C | 650˚C |
| torch | 1260˚C | **No torch mode** |
| **Gas capacity container** | 28ml (15.8 gm) | 28ml (15.8 gm) |
| **Approximate operating time** (one gas filling) | 2 hrs. at #3 setting | 3 hrs. at #3 setting |

### OPTIONAL ACCESSORIES:

For a complete list of accessories available to the VUT-100 and VUT100Si models please call for a free brochure detailing Master ULTRATORCH® products. Pacer stocks a complete line of replacement parts and accessories for Master heat tools.

### ORDERING INFORMATION:

Available by the tool.

## RONSON® Butane

Pacer stocks Ronson butane in 150 gram canisters. Ronson fuel burns clean and extends the life of Master butane products. Order individually or by the case (12 cans).

P/N: VBUTANE

# MICRO-TORCH

Butane micro-torch provides a pinpoint 1300˚C flame. Converts a regular lighter into a useful torch capable of lightweight welding, plastic molding, loosening of nuts and bolts, desoldering pipes, etc. Effective in heavy wind and weather.

### FEATURES:

- Pinpoint 1300˚C flame
- Refillable lighter cartridge
- Outdoor use, ideal for home and light industrial

PART NUMBER = VMICROTORCH

# ELECTRIC HEAT GUNS

## MASTER® PROHEAT

A lightweight and easy to use heat gun. Ergonomically designed and compact for superior balance and grip. PROHEAT weighs only 1 lb. 10 oz. (with cordset) makes it easy to hold for long periods of time. Our most popular electric heat gun, PROHEAT heat tools perform excellently with airflow at 15CFM/3650FPM and temperatures up to 1050F. Master PROHEAT will meet the temperature and airflow requirements of most materials. A variety of attachments are also available making PROHEAT versatile as well as efficient.

## MASTER® HEAT GUN

The perfect heavy duty, flameless heat tool for hundreds of electronic and industrial applications. Comes with a adjustable rubber-backed base that permits full 90 degree rotation of the heat gun. Designed for bench top use.

### APPLICATIONS

- On-site marine repairs
- Shrink Tubing
- De-solder
- Heat shrink packaging
- Strip paint and varnish
- Activates adhesives
- General heating and drying

| PART NUMBER | TEMPERATURE | VOLTS | AMPS |
|---|---|---|---|
| VPRO HEAT | 570˚F & 1050˚ | 120 | 6A &12A |
| VHG-301A | 300˚ - 500˚F | 120 | 12A |

Please call for a brochure containing the complete line of MASTER Appliance heat tools.

### ORDERING INFORMATION:

Order by the piece.

# CABLE TIE CUTTER

The preferred cable tie cutting tool in the industry because of the following designed benefits and advantages.
LIGHTWEIGHT: Fast and easy to operate.
VERSATILE: Installs mini, intermediate, or standard cable ties with the flip of a selector knob.
CUTS: Flush with the edge of the cable tie when the predetermined tension is reached. Flush cut cable ties prevent sharp edges which can cause injury.

P/N: VTGS2B

# CABLE CUTTERS

These handy and economical tools can handle most cable cutting jobs easily. Curved shear edges allow for a clean efficient cut without compression or fraying ends. The VT63050 is capable of cutting up to 2/0 battery cable yet the cutter is only 9 1/2" long. The VT63055 is 8" long and has a compact cutting head for use in tight areas. The handles are made of a tough red plastic. (Tools are not designed for cutting steel or ACSR.)

| PART NUMBER | DESCRIPTION |
|---|---|
| VT63050 | HIGH LEVERAGE CABLE CUTTER |
| VT63055 | COMPACT CABLE CUTTER |

### ORDERING INFORMATION:

Order by the piece.

VT63055 VT63050



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## HEAVY DUTY RATCHET CUTTER

Capable of cutting up to 3 inch in diameter cables. A high leverage ratchet system multiplies hand force making even large gauge cable cutting easy. Its small size (13" in length) allows it to be used in tight, hard to reach areas and for easy storage in tool boxes. There is no substitute when cutting 2/0 and larger battery cables or STO ship-to-shore cables.

P/N: VT85-0030

NOTE: This cutter is not designed to cut steel or steel-reinforced conductors.

## WIRE STRIPPER CUTTER

Easy to use and economical wire stripper and cutters. Overall length is 6" with a narrow nose designed to fit into tight places. Made from hardened steel with precision ground stripping holes, with gauge sizes marked on both sides. Available in two sizes 16 to 26 AWG and 8 to 18 AWG. Stripping holes are sized for stranded conductors.

| PART NUMBER | HANDLE COLOR | STRIPS STRANDED WIRE GAUGES |
|---|---|---|
| VT45-121 | RED | 16, 18, 20, 22, 24, 26 |
| VT45-124 | RED | 8, 10, 12, 14, 16, 18 |

## MULTI-PURPOSE TOOLS

VT1002

All purpose cutter/stripper/crimper. The VT1002 and VT1010 are specially designed to handle many stripping and terminating functions.

### FEATURES:

- Strips 10-22 AWG
- Knife type wire cutter
- Cuts 5 bolt sizes
- Crimps insulated and non-insulated terminals
- Color coded crimping and die sizes
- Measures stud sizes

VT1010

**CAUTION:** ***Never use any pliers or cutters on live electrical circuits.***

| PART NUMBER | DESCRIPTION |
|---|---|
| VT1002 | ELECTRICIAN ALL-PURPOSE TOOL |
| VT1010 | LONG NOSE ALL-PURPOSE |

### ORDERING INFORMATION:

All tools are available individually.

## IDEAL STRIPMASTER®

VT45-292

VT45-265

To assure quality wire stripping time after time, automatic strippers have been the accepted standard in the industry for over thirty years. Gripper pads clamp down and securely hold wire while precision cutting blades strip and remove the insulation. The controlled, one-step process greatly reduces the chance of conductor damage. Model VT45-292 strips wires from 8 AWG through 22 AWG. Model VT45-265 greatly eases the tedious process of stripping RG59/U coaxial cable.

| PART NUMBER | DESCRIPTION |
|---|---|
| VT45-292 | FOR STRIPPING FROM 22 - 8 AWG |
| VT45-265 | FOR STRIPPING RG 59/U COAXIAL CABLE |

## SWIVEL-BLADE® CABLE STRIPPERS

Used for both end or center stripping of coaxial or power cables from 1/4" through 3/4" O.D. Strips insulation up to 5/32" thick including PVC, Rubber, Neoprene, Teflon, Polyethylene, Nylon, Kapton, Fiberglass, Fabric, and others.

| PART NUMBER | DESCRIPTION |
|---|---|
| VT45-128 | CABLE STRIPPER FOR 1/4" TO 3/4" DIAMETER |
| VT45-7486 | REPLACEMENT SLITTING BLADE (PKG. OF 2) |

## KLEIN® CRIMP TOOLS

Sturdily built from hardened steel, these crimpers have a tapered nose for work in confined areas as well as a specially hardened wire cutter on the tip. This tool is a favorite amongst marine repair professionals because of its unsurpassed reliability, and ease of use. The VT1005 and VT1006 are our most economical cutter crimpers.

| PART NUMBER | DESCRIPTION |
|---|---|
| VT1005 | FOR INSULATED AND NON-INSULATED TERMINALS |
| VT1006 | FOR NON-INSULATED TERMINALS ONLY |

VT1006

## IDEAL® CONTROLLED CYCLE CRIMP TOOLS

An excellent low cost ratchet controlled stripper. The frame is constructed from high grade stamp hardened steel and put together with steel pins that will not stretch with use. The tool is full cycle, compound leverage and triple ratcheted to give exact precision to every crimp. Dual “jaws” in the die set allow for the tool to crimp both the barrel and the insulation grip. A built-in safety release is included for removal of connectors improperly placed in the die cavity. Crimp dies are interchangeable. Pacer stock a wide variety of crimp dies, from insulated and non-insulated dies to dies specially milled for coax connectors, such as F-connectors.

P/N: VT50-2001

## SARGENT CONTROLLED CYCLE CRIMP TOOL

A simple, economical, and easy to use crimp tool. Sargent’s controlled cycle crimp tool is our preferred tool for use on heat shrink terminals or Multi-link terminals. Each die cavity is color coded and labeled with the appropriate gauge size.

P/N: VT3120CT

## 3M® RATCHET CONTROLLED CRIMP TOOL

The 3M® VTR-490 crimps insulated and non-insulated terminals from 22 through 10 AWG all in one tool. The non-insulated die has an indented shape while the die for the insulated terminals is oval in shape. The VTR-490 is capable of field adjustment for proper calibration. The ratchet ensures a controlled full cycle close to ensure proper crimp. Made with hardened steel jaws and handles with a corrosion resistant finish. Handles are vinyl cushion insulated for ease and convenience of use.

P/N: VTR-490



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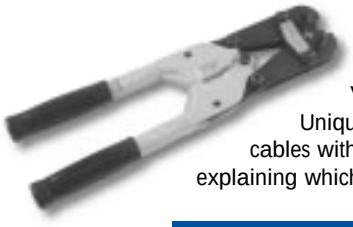


## AMP ROTA-CRIMP®

High quality, heavy-duty battery terminal crimper. Available in two sizes VT601075 for gauge sizes #8-1/0 and VT600850 for gauge sizes #8 - 4/0. Unique, spring-loaded, rotating crimp dies allows the user to crimp a full range of cables without switching out loose die pieces. Each tool comes with a die order table explaining which die letter to use and how many times to crimp.

| PART NUMBER | CRIMP RANGE | LENGTH | WEIGHT |
|---|---|---|---|
| VT601075 | #8 - 1/0 | 15" | 4.8 LBS. |
| VT600850 | #8 - 4/0 | 25" | 7.2 LBS. |

### ORDERING INFORMATION:

All tools are available individually.

### ROTA-CRIMP®

*Proper Crimping Technique*

To insure a proper crimp time after time, follow these procedures.

A) Rotate dies until the settings correspond with the wire gauge being crimped. (To set, open handles and depress spring loaded pins, rotate dies, release pins—make sure the pins return fully.)

B) Strip wire so that the conductor is flush or extended slightly beyond the end of the lug's wire barrel. (Do not use wires with nicked or missing strands.)

C) Make sure the conductor is fully inserted into the lug. The wire insulation must be butted against the edge of the terminal.

D) Position the brazed seam against one of the "flats" of the dies.

E) Close handles until bottomed to complete the crimp.

F) For dual crimp terminals, allow room for two separate crimp areas. Do not overlap crimps.

For more detailed instructions on ROTA-CRIMP[1] tools, see the instructions included with each crimper.

# CIRCUIT BREAKERS

**Pacer stocks circuit protection devices designed with the characteristics necessary to protect the special conditions unique to marine electrical systems.**

**LONG DELAYS:** Necessary to prevent nuisance tripping during ignition. See charts for percentage of rated current vs. trip time.

**SERIES TRIP:** Breakers where the sensing coil and contacts are in series with the load being protected.

**TRIP FREE:** The circuit will open even if forcibly held on, preventing an operator from damaging a circuit by holding the handle in the on position

**MOUNTING:** Pacer stocks breakers that can be panel mounted or surface mounted depending on the location conditions.

Refer to the technical characteristics of each breaker for the proper specifications necessary for your application.

## HOW MAGNETIC CIRCUIT BREAKERS FUNCTION

All magnetic circuit breakers are composed of an electromagnetic coil and a armature device which will open a set of contacts, thus protecting the circuit if the current exceeds a predetermined amount. The cause for the armature opening is the amount of current in the electromagnetic coil. Inside the coil is a non-magnetic delay tube, housing a spring biased, movable magnetic core. As the current is increased, the magnetic field strengthens, drawing the movable magnetic core up to the pole piece. (Fig. 1)

When an overload occurs the magnetic core moves fully into the coil. The maximum electromagnetic force is attained causing the armature to be attracted to the pole piece, unlatching a trip mechanism and opening the contacts (Fig. 2)

The time delay for opening the circuit is the time it takes for the magnetic core to get to the fully “in” position. The speed at which the core moves can be controlled by filling the delay tube with a viscous fluid. A heavy viscosity fluid causes a long delay. Marine applications require long delays in breakers because of surges during motor start ups.

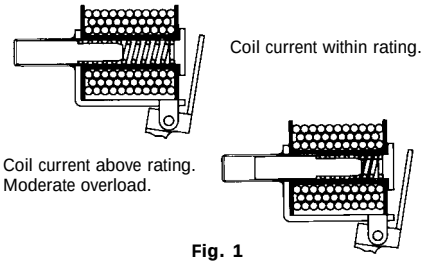



**Fig. 1**

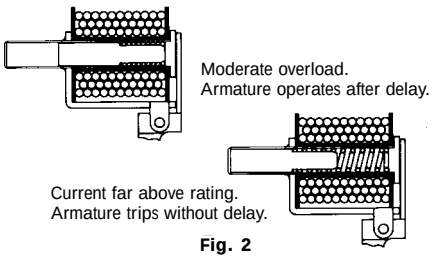



**Fig. 2**

## FUNCTIONS OF A CIRCUIT BREAKERS

- Close or open a circuit manually
- Carry rated current continuously despite extremes of temperature
- Withstand mechanical shock and vibration
- Withstand non-hazardous transient voltage or current
- Opens the circuit automatically whenever an overcurrent occurs

## ADVANTAGES OF MAGNETIC CIRCUIT BREAKERS

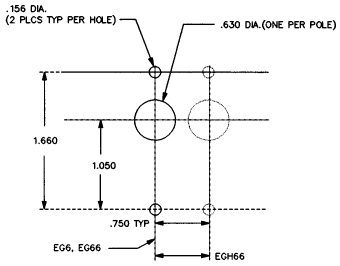
- Provides manual switching, opens automatically under overload conditions, carries full rated current
- Highly versatile, ideal for coordination with other forms of protection
- Operates as a function of current only
- When appropriate, can provide pulse tolerant design to protect against nuisance tripping, or high amplitude transients, while still providing for maximum equipment protection
- A better choice over the thermal breakers due to temperature extremes on boats

# MAGNETIC CIRCUIT BREAKERS "A" FRAME

Magnetic circuit breakers are a low cost answer to power switching and reliable circuit protection. Temperature will not effect the operation of magnetic circuit breakers, as is the case with thermal breakers or fuses. The opening of the circuit is accomplished by the amount of current passing through an electromagnetic coil. As the current exceeds the amount specified by the breaker the circuit will open. (See chart, "Percentage overload vs. trip time.") "A" frame breakers are designed to have long trip delays to avoid nuisance tripping. Pacer stocks this style in amperages ranging from 5 to 50 amp. All breakers are DC-50/60Hz and are available in white, black and red handles.

## FEATURES:

- Series Trip
- "Trip Free"
- Magnetic Operation, operates as a function of current only
- Panel mounted
- Power Switching
- Round Cutout .500 diameter




### PERCENTAGE OVERLOAD VS. TRIP TIME IN SECONDS AT +25(C (VERTICAL MOUNT)

| DELAY | 100% | 135% | 150% | 200% | 400% | 600% | 800% | 1000% |
|---|---|---|---|---|---|---|---|---|
| DC/60Hz LONG DELAY | NO TRIP | 7-130 | 3-60 | 1.3-20 | .085-3 | .02-2 | .015-.8 | .01-.26 |

### "A" FRAME INTERRUPTING CAPACITY, AMPS

(REFER TO TABLE 5 - TECHNICAL DATA FOR ABYC CIRCUIT BREAKER MIN. AMPERE INTERRUPTING CAPACITY)

| MAX. RATING | VOLTAGE FREQUENCY | PHASE | CURRENT RATING FULL LOAD AMPS | INTERRUPTING CAPACITY UL/CSA WITHOUT BACKUP FUSE |
|---|---|---|---|---|
| 80 | DC | | 0.02 - 30 | 3000 |
| 65 | DC | | 31 - 50 | 5000 |
| 125/250 | 50/60Hz | 1Ø | 0.02 - 30 | 3000 |
| 125/250 | 50/60Hz | 1Ø | 31 - 50 | 2000 |

**TECHNICAL SPECIFICATION AND TEST RESULTS**
**Series Trip -** Long Delay
**Inrush Pulse Tolerance:** 10 times rated current
**Operating Temperature:** -40˚C to 85˚C
**Shock:** Withstands 100g or more without tripping while carrying full rated current per MIL-Std-202, Method 213, Cond. 1.
**Vibration:** Withstands 10g without tripping while carrying full rated current per MIL-Std-202, Method 204, Cond. A.
**Endurance:** Withstands 10,000 operations at rated voltage and current or withstands 50 operations of 600% AC or 1000% DC rated current at rated voltage and current, in accordance with UL 1077.
**Moisture Resistance:** Meets requirements of MIL-C-55629, tested in accordance with MIL-STD-202, Method 106.
**Salt Spray:** Meets requirements of MIL-C-55629, tested in accordance with MIL-STD-202, Method 101.
**Trip Free:** Trips open on overload, cannot be forcibly held on.

| RATED AMPS | SINGLE POLE | DOUBLE POLE | |
|---|---|---|---|
| | | SINGLE THROW | DOUBLE THROW |
| 5 | EG6-1-5 | | |
| 10 | EG6-1-10 | EG66-1-10 | EGH66-1-10 |
| 15 | EG6-1-15 | EG66-1-15 | EGH66-1-15 |
| 20 | EG6-1-20 | EG66-1-20 | EGH66-1-20 |
| 25 | EG6-1-25 | EG66-1-25 | EGH66-1-25 |
| 30 | EG6-1-30 | EG66-1-30 | EGH66-1-30 |
| 40 | EG6-1-40 | | |
| 50 | EG6-1-50 | | |

| COLOR ABBREVIATION |
|---|
| WH = WHITE |
| BK = BLACK |
| RD = RED |

## ORDERING INFORMATION:

Combine the part number and the color abbreviation. All breakers are available by the piece.

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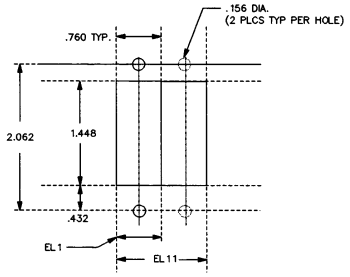
# MAGNETIC CIRCUIT BREAKERS
# "C" FRAME

Designed for use in the industrial, military and marine applications. "C" frame breakers are suitable for use in any situation where precision operation is required. Magnetic circuit breakers are a low cost answer to power switching and reliable circuit protection. Temperature will not effect the operation of magnetic circuit breakers, as is the case with thermal breakers or fuses. Available in DC-50/60Hz through 50 Amps and DC above 50 amps. Stocked in white and black handles.

## FEATURES:

- Series Trip
- "Trip Free"
- Magnetic Operation, operates as a function of current only
- Panel mounted
- Rectangular Panel Cutout: .500 width, 1.000 height
- Power Switching




### PERCENTAGE OVERLOAD VS. TRIP TIME IN SECONDS AT +25˚C (VERTICAL MOUNT)

| DELAY | 100% | 125% | 150% | 200% | 400% | 600% | 800% | 1000% |
|---|---|---|---|---|---|---|---|---|
| DC/60Hz LONG DELAY | NO TRIP | 6.5-115 | 3-65 | 1.2-20 | .08-3 | .018-2.5 | .015-.8 | .009-.25 |

### "C" FRAME INTERRUPTING CAPACITY, AMPS

(REFER TO TABLE 5 - TECHNICAL DATA FOR ABYC CIRCUIT BREAKER MIN. AMPERE INTERRUPTING CAPACITY)

| MAX. RATING | VOLTAGE FREQUENCY | PHASE | CURRENT RATING FULL LOAD AMPS | INTERRUPTING CAPACITY UL/CSA WITHOUT BACKUP FUSE |
|---|---|---|---|---|
| 80 | DC | | 0.02 - 70 | 7500 |
| 65 | DC | | 71 - 100 | 5000 |
| 125/250 | 50/60Hz | 1Ø | 0.02 - 50 | 3000 |

**TECHNICAL SPECIFICATION AND TEST RESULTS**
**Series Trip -** Long Delay
**Inrush Pulse Tolerance:** 12 times rated current
**Operating Temperature:** -40˚C to 85˚C
**Shock:** Withstands 100g or more without tripping while carrying full rated current per MIL-Std-202, Method 213.
**Vibration:** Withstands 10g without tripping while carrying full rated current per MIL-Std-202, Method 204.
**Endurance:** Per UL 1077 (6000 operations at rated load plus 4000 operations with no load). Tested at a maximum rate of 6 times per minute.
**Moisture Resistance:** Designed to meet the requirements of MIL-C-55629, when tested in accordance with MIL-STD-202, Method 106.
**Salt Spray:** Designed to meet the requirements of MIL-C-55629, when tested in accordance with MIL-STD-202, Method 101.
**Trip Free:** Will trip open even when forcibly held on or restrained.
**Meets:** UL recognized, CSA Certified

| RATED AMPS | SINGLE POLE | DOUBLE POLE DOUBLE THROW |
|---|---|---|
| 15 | EL1-1-15 | |
| 20 | EL1-1-20 | EL11-1-20 |
| 25 | EL1-1-25 | EL11-1-25 |
| 30 | EL1-1-30 | EL11-1-30 |
| 40 | EL1-1-40 | EL11-1-40 |
| 50 | EL1-1-50 | EL11-1-50 |
| 60 | EL1-1-60 | EL11-1-60 |
| 70 | EL1-1-70 | EL11-1-70 |
| 80 | EL1-1-80 | EL11-1-80 |
| 90 | EL1-1-90 | EL11-1-90 |
| 100 | EL1-1-100 | EL11-1-100 |

| COLOR ABBREVIATION |
|---|
| WH = WHITE |
| BK = BLACK |
| RD = RED |

## ORDERING INFORMATION:

Combine the part number and the color abbreviation. All breakers are available by the piece.

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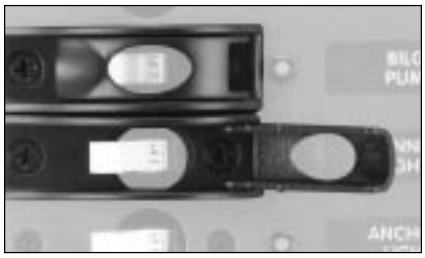
BLUE SEA SYSTEMS

## BREAKER TOGGLE GUARD

Protects critical function circuits from being accidentally switched off at the breaker. Fits all “A” frame breakers. Mounts on the surface of the panel with 2, 6-32 x 3/8" mounting screws (included).



P/N: EG6-GUARD

ORDERING INFORMATION:
Available by the piece.

## ADAPTER PLATES

“A” frame to “C” frame adapter plates fit exactly over our EG6 breakers, converting its face design to a EL1 rectangular type. With this adapter, a EG6 breaker can easily be used in a pre-cut EL1 slot.

P/N: EG-EL

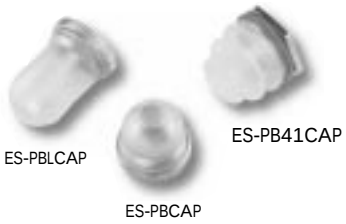
ORDERING INFORMATION:
Available by the piece.

# BREAKER BOOTS AND COVERS

Pacer stocks a variety of breaker boots and covers to protect and increase the life span of our circuit protection devices. All boots and covers protect panel mounted toggle type and push button type breakers. Constructed from silicone rubber with nickel-plated brass nuts. Temperature range -160˚F to 500˚F. Resist salt, water, acids, weather, dust, sunlight, and ozone.

SCREW ON BREAKER BOOTS, FOR PUSH BUTTON TYPE BREAKERS

| PART NUMBER | COLOR | HEIGHT | THREAD | FOR USE WITH |
|---|---|---|---|---|
| ES-PBCAP | CLEAR | 9/16" | 3/8" | ETS658 SERIES |
| ES-PBLCAP | CLEAR | 15/16" | 3/8" | ETS45 SERIES |
| ES-PB41CAP | CLEAR | Variable | 15/32" | ETS41 SERIES |




BOOTS FOR TOGGLE TYPE BREAKERS

| PART NUMBER | COLOR | MOUNT METHOD | MARKED | FOR USE WITH | |
|---|---|---|---|---|---|
| EG-SGLBOOT | CLEAR | Behind Panel | ON | "A" Frame Sgl. | EG6 |
| EG-DBLBOOT | CLEAR | Behind Panel | ON | "A" Frame Dbl. | EG66 & EGH66 |
| EL-SGLBOOT | CLEAR | Front Panel | ON/OFF | "C" Frame Sgl. | EL1 |
| EL-DBLBOOT | CLEAR | Front Panel | ON/OFF | "C" Frame Dbl. | EL11 |


## ORDERING INFORMATION:

Available by the boot.

# BREAKER BUS BARS

Tinned copper breaker bus bars are designed to tie together the load side of "A" frame and "C" frame breakers. Available in 1ft. and 3ft. lengths.

| PART NUMBER | THICKNESS | LENGTH |
|---|---|---|
| EBB-BRKR1 | 1/8" | 1 FT. |
| EBB-BRKR3 | 1/8" | 3 FT. |

## ORDERING INFORMATION:

Available by the piece.

# BREAKER MOUNTING SCREWS

Black painted, general purpose, Phillips round head screws 6-32 x 3/8".

P/N: EGF-6-32-375

## ORDERING INFORMATION:

Available in 50 piece bags.



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# PANEL MOUNT THERMAL BREAKERS

SERIES 658: Economical, series trip, thermal breakers.
White and black actuators.

SERIES 45: Cost effective, series trip, thermal breakers with ON/OFF switching.

SERIES 41: Series trip, thermal breakers with ON/OFF switching. Corrosion, humidity and fungus resistant housing. Ampere ratings to 70 AMPS.

| SERIES | 658 | 45 | 41 (<30 AMPS) | 41 (30A through 70A) |
|---|---|---|---|---|
| **DESCRIPTION** | Series trip | Series trip. Push ON, push OFF switching, B & W reset button for trip indication | Series trip. Push-pull ON-OFF switching | Series trip. Push-pull ON-OFF switching |
| **CURRENT RATINGS** | 5 through 30 AMPS | 5 through 30 AMPS | 15 through 25 AMPS | 30 through 70 AMPS |
| **MAXIMUM VOLTAGE RATINGS** | 250V AC or 28V DC | 250V AC or 28V DC | 115V AC or 28V DC | 115V AC or 28V DC |
| **MAXIMUM INTERRUPTING** | 2000A UL tested according to standard 1077 | 10 times rated current of circuit breaker, normal use. UL rated up to 2000A | 10 times rated current for current ratings 1-5A, 1000A for current ratings 8-25A | 2000A at 28V DC |
| **LIFE** | 2000 cycles at rated current | 6000 cycles (UL 1077) 10,000 mechanical | 4000 cycles at 200% rated current | 2000 cycles at rated current |
| **TERMINALS** | .250 quick connect | .250 quick connect 30A have screw terminals | Screw terminals | Screw terminals |
| **APPROVALS** | UL 1077 up to 25A CSA up to 25A VDE | UL 1077 up to 16A CSA up to 15A VDE | will meet MIL-E-5272C | will meet MIL-E-5272C |
| **DESIGN NOTES** | N/A | N/A | Melamine housing. Corrosion, humidity, and fungus resistant | Melamine housing. Corrosion, humidity, and fungus resistant |

## TRIPPING TIMES IN SECONDS AT 70F (21C)

| | | | | |
|---|---|---|---|---|
| **100%** | NO TRIP | NO TRIP | NO TRIP | NO TRIP |
| **200%** | 1.5 - 8 | 10 - 40 | 10 - 65 | 12 - 80 |
| **300%** | 1 - 5 | 3 - 18 | 3 - 20 | 3 - 25 |
| **400%** | | 2 - 9 | 1.5 - 12 | 1.2 - 12 |
| **500%** | | 1 - 6 | 1 - 8 | 1 - 7 |
| **600%** | | .6 - 5 | .6 - 6 | .5 - 5 |
| **1000%** | | .2 - 2.5 | .2 - 3.5 | .1 - 2 |

| RATED AMPS | P/N | P/N | P/N | P/N |
|---|---|---|---|---|
| **5** | **ETS658-5** | **ETS45-5** | **N/A** | |
| **7.5** | **ETS658-7.5** | **ETS45-7.5** | **N/A** | |
| **10** | **ETS658-10** | **ETS45-10** | **N/A** | |
| **15** | **ETS658-15** | **ETS45-15** | **ETS41-15** | |
| **20** | **ETS658-20** | **ETS45-20** | **ETS41-20** | |
| **25** | **ETS658-25** | **ETS45-25** | **ETS41-25** | |
| **30** | **ETS658-30** | **ETS45-30** | | **ETS41-30** |
| **40** | | | | **ETS41-40** |
| **50** | | | | **ETS41-50** |
| **60** | (For clear caps use P/N) | (For clear caps use P/N) | (For clear caps use P/N) | **ETS41-60** |
| **70** | (ES-PBCAP) Previous Pg. | (ES-PBLCAP) Previous Pg. | (ES-PB41CAP) Previous Pg. | **ETS41-70** |

## ORDERING INFORMATION:

Available in 50 piece bags.

***FOR SERIES 658 BREAKERS ADD WH=WHITE OR BK=BLACK TO THE END OF THE P/N.**
**EX: ETS658-10WH - SERIES 658 w/WHITE ACTUATOR**

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# SURFACE MOUNT BREAKERS

Surface mounts breakers provides high amperage (40-150 AMPS) circuit protection where panel mounting can be difficult. Surface mount breakers combine manual switching and reliable circuit protection into one unit. "Trip-free" and Vapor proof (conforming to SAE J1171) they are safe for installation aboard gas powered boats. Surface mount breakers maintain functionality not found in other panel mounts or manual reset breakers.

## FEATURES:

- Switching and circuit protection
- Waterproof
- Trip-Free
- Vapor Proof (SAE J1171)
- Interrupt Capacity: 3000Amperes
- Circuit Breaker Type: Thermal
- Maximum Voltage: 30 Volts DC
- Surface Mount

| RATED AMPS | PART NUMBER |
|---|---|
| 40 | ESM-40 |
| 50 | ESM-50 |
| 75 | ESM-75 |
| 100 | ESM-100 |
| 125 | ESM-125 |
| 150 | ESM-150 |

## ORDERING INFORMATION:

Available by the piece.

# THERMAL "PUSH-TO-RESET" CIRCUIT BREAKERS

Klixon commercial type circuit breakers combine trip-free protection with fast response time. Their high rupture capacity and resistance to shock and vibration are unequaled in their simple design, rugged construction, reliable performance, and long life.

All circuit breakers of this type have the proven, Klixon snap acting disc, assuring positive contact action. The result is a lightweight, compact, foolproof breaker capable of handling the rigors of the marine environment.

## FEATURES:

- Weatherproof
- Trip-free
- Manual reset
- Amperage stamped on the actuator
- Ignition protected
- Panel Mounted

| STYLE TYPE | STYLE 1 | STYLE 2 |
|---|---|---|
| **CURRENT** | AC/DC | AC/DC |
| **INTERRUPT CAPACITY** | 600 AMPS AT 30 VDC | 900 AMPS AT 30 VDC |
| **TERMINALS** | 8/32" NC-2 Screw | .25-28 x .50 Hex Head Screw |
| **MOUNTING METHOD** | Panel, w/eyelet #10 Screw | Panel, w/eyelet #10 Screw |
| **SHOCK RESISTANCE** | In excess of 10G | In excess of 10G |
| **RATED AMPS** | **PART NUMBER (STYLE 1)** | **PART NUMBER (STYLE 2)** |
| 5 | EPTR-5 | |
| 10 | EPTR-10 | |
| 15 | EPTR-15 | |
| 20 | EPTR-20 | |
| 25 | EPTR-25 | |
| 30 | EPTR-30 | |
| 40 | EPTR-40 | |
| 50 | EPTR-50 | |
| 60 | | EPTR-60 |
| 70 | | EPTR-70 |
| 80 | | EPTR-80 |
| 90 | | EPTR-90 |
| 100 | | EPTR-100 |
| 105 | | EPTR-105 |
| 120 | | EPTR-120 |
| 150 | | EPTR-150 |

## ORDERING INFORMATION:

Order by the piece.



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# THERMAL CIRCUIT BREAKERS

Standard automotive Type III (manual reset) breakers.
Manual reset breakers are rated up to a maximum of 24 volts DC applications where the breaker has to be manually reset with the push of a button. Plastic housing with 10-32 stud terminals and right angle mounting brackets.

## FEATURES:

- Circuit Breaker Type: Thermal
- Surface Mount
- Current: DC
- 10-32 Studs
- Non-corrosive housing and cover

| RATED AMPS | PART NUMBER |
|---|---|
| 10 | EMNL-10 |
| 20 | EMNL-20 |
| 25 | EMNL-25 |
| 30 | EMNL-30 |
| 40 | EMNL-40 |
| 50 | EMNL-50 |

## ORDERING INFORMATION:

Available by the breaker

# THERMAL CIRCUIT BREAKER BOOTS

Insulates breakers from shorting out with a protective cover.
Fits over breakers with or without mounting brackets.

P/N: EMNL-BOOT

## ORDERING INFORMATION:

Available by the breaker

# AGC TYPE GLASS FUSES AND FUSE HOLDERS

## FEATURES:

- Dimensions: 1/4" dia. By 1-1/4" long

| RATED AMPS | PART NUMBER |
|---|---|
| 1 | EAGC1 |
| 2.5 | EAGC2.5 |
| 3 | EAGC3 |
| 5 | EAGC5 |
| 7.5 | EAGC7.5 |
| 10 | EAGC10 |
| 12.5 | EAGC12.5 |
| 15 | EAGC15 |
| 20 | EAGC20 |
| 25 | EAGC25 |
| 30 | EAGC30 |

## ORDERING INFORMATION:

Order by multiples of 5.

# AGC FUSE HOLDERS

### WATERPROOF
Accepts 18 through 12 AWG wire, 30 AMP maximum. One piece construction, recommended for use where holder will come into contact with dust, dirt, moisture and harsh environments.
P/N: EFH-WP

### MOLDED WATERPROOF
A push together, water-tight, inline fuse holder, with a 8 inch, 14 or 10 AWG wire loop molded into the assembly. Made with heat-resistant, non-breakable plastic. AGC type fuses included.

| PART NUMBER | WIRE AWG & FUSE TYPE |
|---|---|
| EFH-MWP30 | 10 AWG, 30 AMP AGC FUSE |
| EFH-MWP15 | 14 AWG, 15 AMP AGC FUSE |

### PANEL MOUNT "KNOB TYPE"
Recommended panel cutout .505 diameter. Terminals: .250 quick connects.
P/N: EFH-PMKT

### IN-LINE "KNOB TYPE"
Spring loaded with wire included.
P/N: EFH-KT

### UNIVERSAL IN-LINE "TWIST LOCK"
Low cost, spring loaded fuse holder with a "twist" locking mechanism.
P/N: EFH-TL

# AGC FUSE BLOCKS

STYLE 1

STYLE 2

### BRASS FUSE BLOCKS
Made with brass clips and screws with a common bus bar connected to the fuse clips.
Available in two Styles:

STYLE 1: Common bus bar connected to the fuse clips.

STYLE 2: Common bus bar connected to the fuse clips and a additional independent bus.

| NUMBER OF CIRCUITS | STYLE 1 | STYLE 2 | BASE | MATERIAL CLIP/SCREW |
|---|---|---|---|---|
| 2 | EFB20-2 | N/A | BAKELITE | BRASS |
| 4 | EFB20-4 | EFB20-4IB | BAKELITE | BRASS |
| 6 | EFB20-6 | EFB20-6IB | BAKELITE | BRASS |
| 8 | EFB20-8 | EFB20-8IB | BAKELITE | BRASS |
| 12 | EFB20-12 | EFB20-12IB | BAKELITE | BRASS |

# BLUE SEA SYSTEMS FUSE BLOCK SYSTEM

Blue Sea Systems offers a unique, long lasting, fuse block. The fuse block utilizes all nickel-plated metal components. Beryllium copper contact clips are rated at 30 Ampere. The unique clear insulating covers with label recesses protect all conductive parts, satisfying all ABYC/USGA requirements. Spare fuses can also be stored in the cover. Fits AGC fuses and all other 3AG Glass fuses.

### FEATURES:
- Material: Glass-filled Nylon
- Maximum Amperage per Circuit: 30 Amperes
- Maximum Amperage per Block: 100 Amperes
- Maximum Voltage: 32 Volts DC
- Clear, insulating, plastic cover with label recesses
- Spare fuse storage
- Nickel plated metal components
- Independent ground bus

| NUMBER OF CIRCUITS | PART NUMBER |
|---|---|
| 3 | EFB30-31BC |
| 6 | EFB30-61BC |



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# ATC TYPE FUSES AND FUSE HOLDERS AND BLOCKS

## FEATURES:

- Standard 1/4" blade type automotive fuses.

| RATED AMPS | PART NUMBER | COLOR |
|---|---|---|
| 1 | EATC1 | BLACK |
| 3 | EATC3 | VIOLET |
| 5 | EATC5 | TAN |
| 7.5 | EATC7.5 | BROWN |
| 10 | EATC10 | RED |
| 15 | EATC15 | LT. BLUE |
| 20 | EATC20 | YELLOW |
| 25 | EATC25 | NATURAL |
| 30 | EATC20 | LT. GREEN |

## ORDERING INFORMATION:

Order by multiples of 5.

# ATC FUSE HOLDERS

### WATERPROOF

Molded side mount ATC or ATO fuse holder. Made with black hi-temp Alcryn construction. 12 AWG leads. Rated a 30 AMPS.
P/N: EFH-ATC-WP

# ATC FUSE BLOCKS

Patented ATC/ATO style fuse blocks allow you to design your own fuse panel. Interlocking modules in various sizes snap together to create any configuration needed. All blocks have 1/4" tab terminals and 8-32 threaded screws. Tin plated copper contacts, flame retardant glass reinforced polyester base and cover. Rated for 30 AMP maximum per circuit, 160 AMP Total for the block.

## FEATURES:

- Accepts ATC/ATO fuses
- Modular, various sizes will snap together
- Tinned plated copper contacts
- Maximum: 30 AMP per Circuit
- Maximum: 160 AMP for Total Block

| NUMBER OF CIRCUITS | PART NUMBER |
|---|---|
| 4 | EFB30-4ATC |
| 6 | EFB30-6ATC |
| 10 | EFB30-10ATC |
| 14 | EFB30-14ATC |

## ORDERING INFORMATION:

Order by the piece.

# ANL TYPE FUSES AND FUSE HOLDERS AND BLOCKS

## ANL FUSES


### FEATURES:

- Low voltage limiter, 32Volts AC or Less
- Interrupt Capacity: 6,000 AMPS
- Isolates faults in battery operated systems.
- Silver-plated copper links
- Link element visible through mica window.

| RATED AMPS | PART NUMBER |
|---|---|
| 40 | EANL40 |
| 50 | EANL50 |
| 60 | EANL60 |
| 80 | EANL80 |
| 100 | EANL100 |
| 130 | EANL130 |
| 150 | EANL150 |
| 175 | EANL175 |
| 200 | EANL200 |
| 225 | EANL225 |
| 250 | EANL250 |
| 275 | EANL275 |
| 300 | EANL300 |
| 350 | EANL350 |
| 400 | EANL400 |
| 500 | EANL500 |

### ORDERING INFORMATION:

Available by the piece.

## ANL FUSE BLOCKS

### FEATURES:

- 3 13/32"long x 15/16 wide x .483" thick.
- Stud 1 1/4" x 5/16" x 24 UNF.
- Rating 700A
- Mounting holes: 1" apart, .217" diameter with .438 counterbore.

P/N: EFB-ANL

### ORDERING INFORMATION:

Order by the piece.



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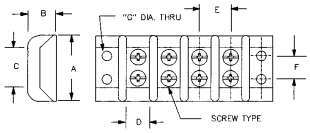



# TERMINAL BLOCKS

Flat mount terminal blocks are used extensively in the marine industry for a variety of purposes, including: simplifying wiring work, eliminating splicing, stopping short circuits, etc. Commonly used in panels, electronic and electrical equipment and in wire harnesses. Pacer stocks double row terminal blocks composed of general purpose Phenolic with nickel plated brass hardware for maximum life span in marine environments. Their triangular base design and solid sealed back provide added stability and corrosion resistance from moisture and condensation underneath the block.

## FEATURES:

- Heat Resistance: 290˚F Continuous
- Dielectric strength: 350Kv
- Nickel-plated brass hardware
- Phenolic base
- Eliminates Splicing and Simplifies Wiring
- UL recognized, CSA certified

| NUMBER OF POSITIONS | 20 AMP PART NUMBER | 30 AMP PART NUMBER | 50 AMP* PART NUMBER |
|---|---|---|---|
| 2 | E20TB2 | E30TB2 | E50TB2 |
| 3 | E20TB3 | E30TB3 | E50TB3 |
| 4 | E20TB4 | E30TB4 | E50TB4 |
| 6 | E20TB6 | E30TB6 | E50TB6 |
| 8 | E20TB8 | E30TB8 | E50TB10 |
| 10 | E20TB10 | E30TB10 | |
| 12 | E20TB12 | E30TB12 | |
| 15 | E20TB15 | E30TB15 | |
| 20 | E20TB20 | E30TB20 | |

*Open back design.

| SERIES | RATED VOLTS | WIRE RANGE | SCREW TYPE | DIMENSION A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|---|---|---|
| 20 AMP | 250V | 16-14 AWG | 6-32 x 1/4" | 1.12 | .53 | .75 | .34 | .44 | .42 | .175 |
| 30 AMP | 600V | 14-10 AWG | 8-32 x 5/16" | 1.31 | .71 | .94 | .42 | .56 | .50 | .203 |
| 50 AMP | 600V | 10-8 AWG | 10-32 x 3/8" | 1.81 | .75 | 1.06 | .47 | .69 | .62 | .275 |

# TERMINAL BLOCK JUMPERS

Terminal block jumpers are constructed of nickel plated brass and are available in two styles enclosed and slotted.

| PART NUMBER | STYLE | FOR USE WITH |
|---|---|---|
| E20TBJ | ENCLOSED | 20 AMP BLOCKS |
| E20TBJ-S | SLOTTED | 20 AMP BLOCKS |
| E30TBJ | ENCLOSED | 30 AMP BLOCKS |
| E30TBJ-S | SLOTTED | 30 AMP BLOCKS |
| E50TBJ | ENCLOSED | 50 AMP BLOCKS |

## ORDERING INFORMATION:

Available by the piece.

# EUROPEAN TERMINAL BLOCKS

Double row designed terminal blocks are constructed from Polyamide PA 6 nylon with recessed, brass captive screws and tinned plated brass inserts. The wire guards are constructed from stainless spring steel. Protective covers are available for the E500-12 position terminal block.

## FEATURES:

- Constructed from 6/6 Nylon
- Closed back design
- Tinned Plated Brass Inserts
- Eliminates Splicing and Simplifies Wiring
- Easily Cut to the Specific Number of Circuits Needed
- Recessed Screws and Terminals to Avoid Shock Hazard
- UL recognized, CSA certified

Covers for the E500-12 terminal block.
P/N: E500C-12

| PART NUMBER | NUMBER OF POSITIONS | CURRENT RATINGS | RATED VOLTS | WIRE RANGE |
|---|---|---|---|---|
| E150-12 | 12 | 15 | 300 | 16-14 AWG |
| E200-12 | 12 | 20 | 300 | 14-12 AWG |
| E500-12 | 12 | 40 | 600 | 12-10 AWG |
| E650-12 | 12 | 65 | 600 | 10-8 AWG |

## ORDERING INFORMATION:

Available by the piece.

# BLUE SEA SYSTEMS BUS BARS

Pacer stocks a wide variety of bus bars for a large variety of uses. Including 500 and 600 AMP continuous rated power buses. Improper or corroded buses can rob precious voltage from a circuit. In starter and anchor windlass circuits where hundreds of amps flow, this could mean a big difference in cranking/lifting capability. **Connect all high amperage cables securely.**

## FEATURES:

- 48 Volts DC Maximum
- Tinned Plated Brass Bus
- Base Material: Glass Reinforced Nylon

### SINGLE POST BUSES

| PART NUMBER | STUD TYPE | CURRENT RATING | CONFIGURATION |
|---|---|---|---|
| ESB1-10 | #10 | N/A* | MINI POST |
| ESB1-1/4 | 1/4" | N/A* | MINI POST |
| ESB1-5/16 | 5/16" | N/A* | POWER POST |
| ESB1-3/8 | 3/8" | N/A* | POWER POST |
| ESB1-8-5/16 | 5/16" | 150 | POWER POST w/8 (#8) SCREWS |
| ESB1-8-3/8 | 3/8" | 150 | POWER POST w/8 (#8)SCREW |

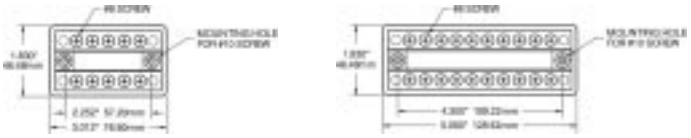
* Not Rated - Amperage flow is between terminals stacked on the post and is dependent on the wire and terminals used.

### MINI BUSS

| PART NUMBER | STUD TYPE | CURRENT RATING | CONFIGURATION | COVER PART NUMBER |
|---|---|---|---|---|
| EMB2-5 | (2) 10-24 | 100 | MINI BUS w/2 POSTS AND 5 (#8) SCREWS | EMBC |
| EMB4 | (4) 10-24 | 100 | MINI BUS w/4 POSTS | EMBC |

### DUAL BUS COMMON BUSES

| PART NUMBER | STUD TYPE | CURRENT RATING | CONFIGURATION | COVER PART NUMBER |
|---|---|---|---|---|
| EDB10 | N/A | 100 | DUAL BUS, 5 x 8-32 SCREWS EACH SIDE | EDB10C |
| EDB20 | N/A | 100 | DUAL BUS, 10 x 8-32SCREWS EACH SIDE | EDB20C |





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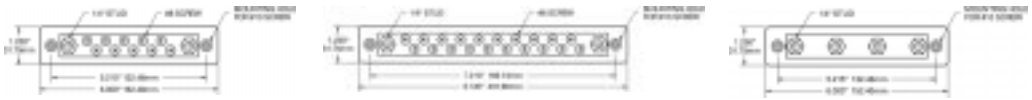
## COMMON BUS BARS

| PART NUMBER | STUD TYPE | CURRENT RATING | CONFIGURATION | COVER PART NUMBER |
|---|---|---|---|---|
| EBB2-10 | (2) 1/4" | 150 | BUS w/2 POSTS AND 10 (#8) SCREWS | EBB2-10C |
| EBB2-20 | (2) 1/4" | 150 | BUS w/2 POSTS AND 20 (#8) SCREWS | EBB2-20C |
| EBB4 | (4) 1/4" | 150 | BUS w/4 POSTS | EBB2-10C |



## MAXI BUS BARS

| PART NUMBER | STUD TYPE | CURRENT RATING | CONFIGURATION | COVER PART NUMBER |
|---|---|---|---|---|
| EMXB2-10 | (2) 5/16" | 250 | BUS w/2 POSTS AND 10 (#10) SCREWS | EMXBC |
| EMXB4 | (4) 5/16" | 250 | BUS w/4 POSTS | EMXBC |

## POWERBAR

Blue Sea Systems power bar is a unique high amperage power distribution bus. Constructed from tinned-plated CDA110 copper with a GE Lexan polycarbonate base. Rated at 48 volts DC maximum.

| PART NUMBER | STUD TYPE | CURRENT RATING | CONFIGURATION | COVER PART NUMBER |
|---|---|---|---|---|
| EPB4-4 | (4) 3/8" | 600 | BUS w/4 POSTS AND 8 (#8) SCREWS | EPB4-4C |

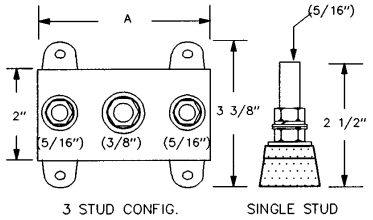
## COMMON BUS BARS

Constructed from 1/4" thick nickel plated copper with nickel plated bronze studs and durable Lexan mounting pads.

| PART NUMBER | STUD TYPE | CURRENT RATING |
|---|---|---|
| EPB3W | 5/16", 3/8", 5/16" | 500 |
| EPB4W | 5/16", (2) 3/8", 5/16" | 500 |
| EPB5W | 5/16", (3) 3/8", 5/16" | 500 |
| EPB7W | 5/16", (5) 3/8", 5/16" | 500 |

### ORDERING INFORMATION:

All buses are available individually.

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## TYPICAL USES FOR SWITCHES ON BOATS

| ON-OFF | OFF-(ON) | ON-(OFF) | ON-ON | ON-OFF-ON | (ON)-OFF-(OFF) | ON-OFF-(ON) |
|---|---|---|---|---|---|---|
| Accessories<br>Auto-Pilot<br>Bilge Pumps<br>Lights<br>Wipe/Off/(Wash)<br>Deck Wash Pump<br>Depth Finder<br>Loran<br>Radios<br>Recorder<br>Stereo<br>Water Pressure | Horn<br>Head Flush<br>Macerator<br>Pre-Heat<br>Converter | Alarm Silence | Meter-Read<br>Battery 1/Battery 2<br>Bilge Pumps<br>Auto., Man.<br><br>Fuel Tank -<br>Gauge Select<br>Port/Starboard<br>Motor Reverse<br>Forward/ Reverse | Bilge Pump<br>Auto/Off/Man.<br>Aerator<br>Timed/Off/Man.<br>Fuel Gauge<br>Spot/Off/Flood<br>Navigation Lights<br>Run/Off/Anchor<br>Motor Control<br>Fwd/Off/Rev. | Meter Read<br>Port/Off/Starboard<br>Trim Tabs<br>Up/Off/Down<br>Spotlight<br>Raise/Off/Lower<br>Hatch<br>Open/Off/Close | Bilge Pump<br>Auto/Off/(Man)<br>Wiper/Washer<br><br>Windlass |

# METAL BAT TOGGLE SWITCHES

Toggle switches are rated at 15A/120VAC, available in single or double pole with functions ranging from single and double throw to momentary single and double throw. All switches contain a slow-make, slow-break contact mechanism. UL, CSA and VDE approvals.

### TECHNICAL DATA:
Metal bat toggle switches

### MATERIAL:
- Base: Phenolic
- Actuator (Bat): Brass/Nickel plated
- Bushing: Brass/Nickel plated

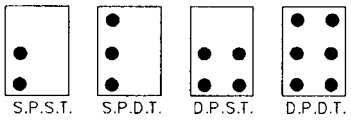
### CHARACTERISTICS:
- Dielectric Strength 1000V (minimum)
- Insulation Resistance 100 MegOhms (minimum)
- Rating: 15A 125VAC
  10A 250VAC
  3/4" HP 125-250VAC

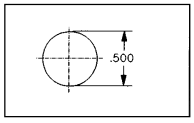
### MEETS:
UL, CSA and VDE Approvals

### MOUNTING METHOD:
- Panel mounting hole: 1/2" Diameter.
- Bushing Length: .468"

### TERMINATION:
Screw: Size 6-32NC-2

### DESCRIPTION:
S.P.S.T. = Single Pole, Single Throw
S.P.D.T. = Single Pole, Double Throw
D.P.S.T. = Double Pole, Single Throw
D.P.D.T. = Double Pole, Double Throw




# SILICONE RUBBER BOOTS

Silicone rubber boots are resistant to salt water, acids, weather, dust, sunlight and ozone. One piece bonded construction. Designed for use on metal bat toggle switches.

### FEATURES:
- Molded Black Silicone Rubber
- Height: 15/16"
- Thread: 15/32"

P/N: ES-BOOT

### SINGLE POLE SWITCHES

| PART NUMBER | SWITCH FUNCTION | DESCRIPTION |
|---|---|---|
| ES-B2FA54 | ON-OFF | S.P.S.T. |
| ES-B2FB54 | ON-ON | S.P.D.T. |
| ES-B2FC54 | ON-OFF-ON | S.P.D.T. CENTER OFF |
| ES-B2GE54 | ON-ON-ON | S.P.T.T |
| **(MOMENTARY)** | | |
| ES-B6FA54 | (ON)-OFF | S.P.S.T. |
| ES-B6FA58 | ON-(OFF) | S.P.S.T |
| ES-B6FB54 | ON-(ON) | S.P.D.T |
| ES-B6FC54 | (ON)-OFF-(ON) | S.P.D.T. CENTER OFF |
| ES-B6FC58 | ON-OFF-(ON) | S.P.D.T. CENTER OFF |

### DOUBLE POLE SWITCHES

| PART NUMBER | SWITCH FUNCTION | DESCRIPTION |
|---|---|---|
| ES-B2GK54 | ON-OFF | D.P.S.T. |
| ES-B2GL54 | ON-ON | D.P.D.T. |
| ES-B2GM54 | ON-OFF-ON | D.P.D.T. CENTER OFF |
| **(MOMENTARY)** | | |
| ES-B6GK5E | (ON)-OFF | S.P.S.T. |
| ES-B6GK5S | ON-(OFF) | S.P.S.T |
| ES-B6GL5E | ON-(ON) | S.P.D.T |
| ES-B6GM5S | (ON)-OFF-(ON) | S.P.D.T. CENTER OFF |
| ES-B6GM5E | ON-OFF-(ON) | S.P.D.T. CENTER OFF |
| ES-B6GG54 | (ON)-ON-OFF | S.P.D.T. IGNITION SWITCH |

### ORDERING INFORMATION:
Order by the piece.

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# V-SERIES CONTURA II & III

The V-Series CONTURA II and III versions, with sealed front panel components, are certified to IP66 and IP68, signifying complete protection against dust, prolonged spray and submersion under pressure. Contura's are recognized at UL1500 - Ignition Protection for Marine Products. These switches feature removable actuator styles and colors, available in singe and double pole configurations, and can be illuminated with bar shaped lenses. All switches are 12V black base with black actuators and red lenses. See the chart below to purchase alternate actuators.

## CHARACTERISTICS:

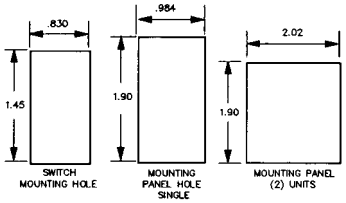
- Base Material: Polyester
- Dielectric Strength 2000V RMS
- Insulation Resistance 50 MegOhms
- Rating: 20A 12V

## CERTIFICATIONS:

UL and CSA
Tested in accordance with requirements of MIL STD 202F

## MOUNTING METHOD:

- Panel mounting hole: See Dimensional Specifications.
- Can be mounted directly on the panel or mounted using the Contura mounting panel.




PANEL CUTOUTS

## TERMINATION:

.250 Quick Connects with Barriers

## DESCRIPTION:

S.P.S.T. = Single Pole, Single Throw
S.P.D.T. = Single Pole, Double Throw
D.P.S.T. = Double Pole, Single Throw
D.P.D.T. = Double Pole, Double Throw

### SINGLE POLE SWITCHES

| PART NUMBER | SWITCH FUNCTION | DESCRIPTION | ACTUATOR DESCRIPTION |
|---|---|---|---|
| ES-V1DA | ON-OFF | S.P.S.T. | BLACK w/SGL RED LENS |
| ES-V4DA | ON-ON | S.P.D.T. | BLACK w/DBL RED LENS |
| ES-V6DA | ON-OFF-ON | S.P.D.T. CENTER OFF | BLACK w/DBL RED LENS |
| **(MOMENTARY)** | | | |
| ES-V2DA | (ON)-OFF | S.P.S.T. | BLACK w/SGL RED LENS |
| ES-V3DA | ON-(OFF) | S.P.S.T | BLACK w/SGL RED LENS |
| ES-V5DA | ON-(ON) | S.P.D.T | BLACK w/DBL RED LENS |
| ES-V8DA | (ON)-OFF-(ON) | S.P.D.T. CENTER OFF | BLACK w/DBL RED LENS |
| ES-V7DA | ON-OFF-(ON) | S.P.D.T. CENTER OFF | BLACK w/DBL RED LENS |

### DOUBLE POLE SWITCHES

| PART NUMBER | SWITCH FUNCTION | DESCRIPTION | ACTUATOR DESCRIPTION |
|---|---|---|---|
| ES-V1DA | ON-OFF | S.P.S.T. | BLACK w/SGL RED LENS |
| ES-VADA | ON-OFF | D.P.S.T. | BLACK w/SGL RED LENS |
| ES-VDDA | ON-ON | D.P.D.T. | BLACK w/DBL RED LENS |
| ES-VJDA | ON-OFF-ON | D.P.D.T. CENTER OFF | BLACK w/DBL RED LENS |
| **(MOMENTARY)** | | | |
| ES-VBDA | (ON)-OFF | S.P.S.T. | BLACK w/SGL RED LENS |
| ES-VCDA | ON-(OFF) | S.P.S.T | BLACK w/SGL RED LENS |
| ES-VFDA | ON-(ON) | S.P.D.T | BLACK w/DBL RED LENS |
| ES-VLDA | (ON)-OFF-(ON) | S.P.D.T. CENTER OFF | BLACK w/DBL RED LENS |
| ES-VKDA | ON-OFF-(ON) | S.P.D.T. CENTER OFF | BLACK w/DBL RED LENS |

### OPTIONAL ACTUATORS

| PART NUMBER | DESCRIPTION |
|---|---|
| ESA-VVCMC | BLACK w/SGL RED LENS |
| ESA-VVCNC | BLACK w/DBL RED LENS |
| ESA-VVCBC | BLACK w/SGL AMBER LENS |
| ESA-VVCCC | BLACK w/DBL AMBER LENS |
| ESA-VVCGC | BLACK w/SGL GREEN LENS |
| ESA-VVCHC | BLACK w/DBL GREEN LENS |
| ESA-VVCTC | BLACK w/SGL BLUE LENS |
| ESA-VVCUC | BLACK w/DBL BLUE LENS |

### MOUNTING PANELS

| PART NUMBER | DESCRIPTION |
|---|---|
| ES-CVMS | SINGLE MOUNTING PANEL |
| ES-CVMM | MIDDLE PANEL |
| ES-CVME | END PANEL |
| ES-CVHP | HOLE PLUG |

## ORDERING INFORMATION:

All Contura switches are sold with red lens actuators. Other actuator styles can be ordered separately. Order by the piece.

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# INDICATOR LIGHTS

3L Series are compact style lights that snap-fit into a 5/16" hole and are secured with spring clip. Long body style with a built in resistor, 3L lights are constructed with Dupont Zytel 132F with a 14, 28, and 125 volt incandescent bulb, flush type mount, and a translucent lexan lens. All lights come with a 6" 105˚C tinned copper wire leads. Base and bezel colors are black. UL Listed.

E3L

5S Series lights snapfit into a 1/2" hole, and are secured into place with self locking ears. The lights are constructed with the same materials as the3L series and are available in 14, 28, 125 volt ranges. All lights have a silver plated bezel.

## FEATURES:

- Multiple voltage ratings
- Available in Red, Green, Amber and Blue
- 6" UL Tinned Copper Lead Wires
- Built-in Resistor

E5S

| PART RATING | VOLTAGE METHOD | MOUNTING PANEL DEPTH | REQUIRED THICKNESS | PANEL | NUMBER |
|---|---|---|---|---|---|
| E3L-14 | 14 | SNAP IN w/SPRING CLIP | 5/16" (.312) | 1.420" | .030" MIN. |
| E3L-28 | 28 | SNAP IN w/SPRING CLIP | 5/16" (.312) | 1.420" | .030" MIN. |
| E3L-125 | 125 | SNAP IN w/SPRING CLIP | 5/16" (.312) | 1.420" | .030" MIN. |
| E5S-14 | 14 | SELF LOCKING EARS | 1/2" (.500) | .900" | .025" TO .080" |
| E5S-28 | 28 | SELF LOCKING EARS | 1/2" (.500) | .900" | .025" TO .080" |
| E5S-125 | 125 | SELF LOCKING EARS | 1/2" (.500) | .900" | .025" TO .080" |

*ADD THE FOLLOWING EXTENSION FOR LENS COLOR.

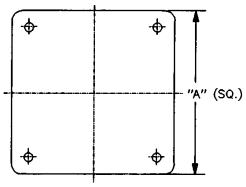
-R for RED lens
-G for GREEN lens
-A for AMBER lens
-B for BLUE lens
EXAMPLE: E3L-14-B = E3L series, 14 volt with a Blue lens.

## ORDERING INFORMATION:

Order by the piece.

# "SHIP SHORE" POWER TRANSFER SWITCHES

Blue Line "Ship-Shore" power transfer switches are specifically designed for the boating industry. A simple manual selection with this switch provides a convenient method for obtaining electrical power from the ship's onboard generator or from the shore. Other positions can be provided when multisources of either ship and/or shore power are available. With the exception of the normal current carrying components, the entire switch body is made from rugged, non-corrosive nylon and melamine materials. This solid safety feature eliminates the possibility of electrical shock to the operator should any hot wire come into contact with the switch body. Power transfer "Rotary" switches come in a wide variety of configurations. Alternate configurations available upon request.




**SWITCHES ARE DOUBLE THROW WITH "SHORE-OFF-SHIP" 60˚ SWITCHING**

| PART NUMBER | NUMBER OF POLES | GENERAL PURPOSE (UL) RATED AMPS | THERMAL CURRENT AMPS | DIMENSIONS "A" (SQ.) |
|---|---|---|---|---|
| EPTS-2P-10A-S00 | 2 | 10 | 10 | 1.18" |
| EPTS-3P-10A-S00 | 3 | 10 | 10 | 1.18" |
| EPTS-2P-15A-S0 | 2 | 16 | 20 | 1.89" |
| EPTS-3P-15A-S0 | 3 | 16 | 20 | 1.89" |
| EPTS-2P-35A-S1 | 2 | 35 | 40 | 2.52" |
| EPTS-3P-35A-S1 | 3 | 35 | 40 | 2.52" |
| EPTS-4P-35A-S1 | 4 | 35 | 40 | 2.52" |
| EPTS-2P-50A-S1 | 2 | 50 | 63 | 2.52" |
| EPTS-3P-50A-S1 | 3 | 50 | 63 | 2.52" |
| EPTS-4P-50A-S1 | 4 | 50 | 63 | 2.52" |
| EPTS-2P-65A-S1 | 2 | 65 | 80 | 2.52" |
| EPTS-3P-65A-S1 | 3 | 65 | 80 | 2.52" |
| EPTS-4P-65A-S1 | 4 | 65 | 80 | 2.52" |
| EPTS-3P-100A-S2 | 3 | 100 | 125 | 3.46" |
| EPTS-4P-100A-S2 | 4 | 100 | 125 | 3.46" |
| EPTS-3P-150A-S2 | 3 | 150 | 200 | 3.46" |
| EPTS-4P-150A-S2 | 4 | 150 | 200 | 3.46" |
| **MULTI-STEP "SHORE1, SHORE1 & 2, GEN"** | | | | |
| EPTS-MS-65A-S1 | | 65 | 80 | 2.52" |

**ALTERNATE ESCUTCHEON PLATES AVAILABLE UPON REQUEST**

## ORDERING INFORMATION:

Order by the piece.

# BATTERY SELECTOR SWITCHES

Pacer stocks a large variety of battery selector switches. To select the proper battery switch size, make sure your engine's cold cranking amperage is lower than the momentary rating of the switch.

## GUEST BATTERY SWITCHES

Guest switches feature an innovative "sweep contact" design, which provides a large, flat surface area for maximum conductivity and efficiency without the excessive wear, carbon tracking and contact burns of interior line-contact designs. All Guest battery switches safely provide positive battery disconnect, isolate all circuits, and conform to U.S.C.G. safety standard 183.410 for ignition protection.

### FEATURES:

- Heavy Duty Copper Sweep Contacts
- Positive Click Stop on all Positions
- For 12, 24, and 32 Volt Systems
- Marine UL Listed
- "Make Before Break" contacts allow selection of all positions except "Off" while engine is running
- 1 Year Limited Warranty

**SWITCHES ARE DOUBLE THROW WITH "SHORE-OFF-SHIP" 60° SWITCHING**

| PART NUMBER | DESCRIPTIONS | DIMENSIONS | AMPS CONTINUOUS/MOMENTARY |
|---|---|---|---|
| EBS-2111 | UNIVERSAL SELECTOR | 5.5" DIAMETER x 2.63" DEPTH | 230/345 |
| EBS-2112 | UNIVERSAL ON/OFF | 5.5" DIAMETER x 2.63" DEPTH | 230/345 |
| EBS-2300A | HEAVY DUTY SELECTOR | 5.5" SQUARE x 3.5" DEPTH | 450/800 |
| EBS-2303A | HEAVY DUTY ON/OFF | 5.5" SQUARE x 3.5" DEPTH | 450/800 |
| EBS-2304A | EXTRA HEAVY DUTY ON/OFF | 5.5" SQUARE x 3.5" DEPTH | 600/1000 |

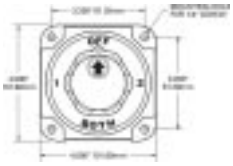
## BLUE SEA SYSTEMS BATTERY SWITCHES

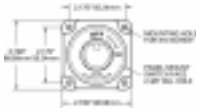
Blue Sea Systems,' compact high amperage switches are vapor/ignition protected and UL listed.

### FEATURES:

- Luminous label for low light readability
- 300 Amp Rating - 25% higher than most switches
- Vapor Proof/Ignition Protected
- Case design allows surface or flush mounting
- For 12, 24 and 32 Volt Systems
- Mounting Holes for #10 Screws

| PART NUMBER | DESCRIPTIONS | DIMENSIONS | AMPS CONTINUOUS/MOMENTARY |
|---|---|---|---|
| EBS-9001 | HIGH AMP SELECTOR | 4.0" SQUARE (3.2" DIA. FLUSH MOUNT) | 300/400 |
| EBS-9003 | HIGH AMP ON/OFF | 4.0" SQUARE (3.2" DIA. FLUSH MOUNT) | 300/400 |
| EBS-9005 | MINI ON/OFF KEYED | 2.7" SQUARE (2.175" DIA. FLUSH MOUNT) | 250/375 |
| EBS-9006 | MINI ON/OFF KNOB | 2.7" SQUARE (2.175" DIA. FLUSH MOUNT) | 250/375 |





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# METERS

Pacer stocks a variety of meters including both AC and DC, Volt and AMP meters, with front and back mounting styles. All meters stocked are analog. Digital meters are available by request.

**SURFACE MOUNT.** Constructed with a polystyrene case, black textured finish and a crystal clear lens. White field with painted black scales with a zero-adjust front access. Meters are age and moisture resistant.
Panel Cutout: 2-1/64" diameter hole
Surface Dimensions: Height: 2.35, Width 2.55

DC AMMETERS - Taut Band, moving coil: Zero left, self contained (internal), or 50mV, shunt rated (external)

| PART NUMBER | SHUNT | RANGE | SHUNT PART NUMBER |
|---|---|---|---|
| EM-DCA-50S | INTERNAL ANALOG | 0 - 50 AMPS | N/A |
| EM-DCA-100S | 50mV EXTERNAL ANALOG | 0 - 100 AMPS | EM-ST100 |
| EM-DCA-150S | 50mV EXTERNAL ANALOG | 0 - 150 AMPS | EM-ST150 |

DC VOLTMETERS - Taut Band, moving coil: Zero left

| PART NUMBER | DESCRIPTION | RANGE |
|---|---|---|
| EM-DCV-8-16S | ANALOG | 8 - 16 VOLTS |

AC AMMETERS - Self-contained, rectifier type (internal), or Transformer rated, 0-5A, rectifier type (external)

| PART NUMBER | SHUNT | RANGE | CURRENT TRANSFORMER |
|---|---|---|---|
| EM-ACA-30S | INTERNAL | 0 - 30 AMPS | N/A |
| EM-ACA-50S | INTERNAL | 0 - 50 AMPS | N/A |
| EM-ACA-100S | EXTERNAL | 0 - 80 AMPS | EM-CT100 |

AC VOLTMETERS - Taut Band, moving coil: Zero left

| PART NUMBER | DESCRIPTION | RANGE |
|---|---|---|
| EM-ACV-150S | ANALOG | 0 - 150 VOLTS |
| EM-ACV-300S | ANALOG | 0 - 300 VOLTS |

**WINDOW MOUNT.** Constructed with a polystyrene case and a crystal clear lens. White field with painted black scales with a zero-adjust front access. Meters are age and moisture resistant.
Panel Cutout: 2-1/64" diameter hole Window Panel Cutout: 1.27" x 2.90"

DC AMMETERS - Taut Band, moving coil: Zero left, self contained (internal), or 50mV, shunt rated (external)

| PART NUMBER | SHUNT | RANGE | SHUNT PART NUMBER |
|---|---|---|---|
| EM-DCA-50W | INTERNAL ANALOG | 0 - 50 AMPS | N/A |
| EM-DCA-100W | 50mV EXTERNAL ANALOG | 0 - 100 AMPS | EM-ST100 |
| EM-DCA-150W | 50mV EXTERNAL ANALOG | 0 - 150 AMPS | EM-ST150 |

DC VOLTMETERS - Taut Band, moving coil: Zero left

| PART NUMBER | DESCRIPTION | RANGE |
|---|---|---|
| EM-DCV-8-16W | ANALOG | 8 - 16 VOLTS |

AC AMMETERS - Self-contained, rectifier type (internal), or Transformer rated, 0-5A, rectifier type (external)

| PART NUMBER | SHUNT | RANGE | CURRENT TRANSFORMER |
|---|---|---|---|
| EM-ACA-30W | INTERNAL | 0 - 30 AMPS | N/A |
| EM-ACA-50W | INTERNAL | 0 - 50 AMPS | N/A |
| EM-ACA-100W | EXTERNAL | 0 - 80 AMPS | EM-CT100 |

AC VOLTMETERS - Taut Band, moving coil: Zero left

| PART NUMBER | DESCRIPTION | RANGE |
|---|---|---|
| EM-ACV-150W | ANALOG | 0 - 150 VOLTS |
| EM-ACV-300W | ANALOG | 0 - 300 VOLTS |



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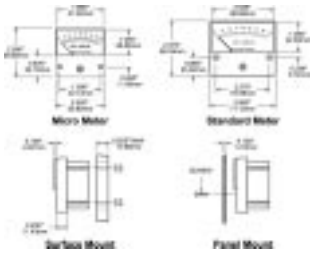
# BLUE SEA SYSTEMS METERS

Analog meters constructed using high quality rotating coil movements on jewel bearings.
All Blue Sea System meters are mountable on the front panel surface or from behind the panel. Accuracy on all meters is 3% of scale.
Standard Meters - Face Width/Mounting Hole: 2-1/2" / 2-1/16"
Micro Meters - Face Width/Mounting Hole: 2" / 1-3/4"
(Smaller Format For Mounting in Limited Space Locations)



## DC AMP METERS

Simple two-wire connection
from shunt no other power required.
All meters have shunts included.
Meter senses and powers from shunt. Packaged complete with shunt.
Meter Operating Amperage: 1 Milliampere

| PART NUMBER | DESCRIPTION | RANGE |
|---|---|---|
| EM-DCA-50BS | STANDARD EXTERNAL | 0 - 50 AMPS |
| EMM-DCA-50BS | *MICRO METER EXTERNAL | 0 - 50 AMPS |
| EM-DCA-75BS | STANDARD EXTERNAL | 0 - 75 AMPS |
| EM-DCA-100BS | STANDARD EXTERNAL | 0 - 100 AMPS |
| EM-DCA-150BS | STANDARD EXTERNAL | 0 - 150 AMPS |

## DC VOLT METERS

Displays to .2 Volts
Simple 2-wire Connection
8 - 16 volt Range

| PART NUMBER | DESCRIPTION | RANGE |
|---|---|---|
| EM-DCV-8-16BS | STANDARD ANALOG | 8 - 16 VOLTS |
| EMM-DCV-8-16BS | *MICRO METER ANALOG | 8 - 16 VOLTS |
| **EM-DCV-PCBS | PERCENT OF CHARGE ANALOG | 11.6 - 13.6 VOLTS |

****Input 8-16 volts, electronically dampened to display over 13.6 volts as "charging"**

## AC AMP METERS

50 Ampere Dial Marked in 2 Ampere Increments
Simple 2-wire Connection
Meter Senses and Powers From Coil Slipped Over Wire to be Measured.

| PART NUMBER | DESCRIPTION | RANGE |
|---|---|---|
| EM-ACA-50BS | STANDARD ANALOG | 0 - 50 AMPS |

## AC VOLT METERS

Marked in 5 Volt Increments
Simple 2-wire Connection to AC Hot and Neutral.
Meter senses and powers from the same connection.

| PART NUMBER | DESCRIPTION | RANGE |
|---|---|---|
| EM-ACV-150BS | STANDARD ANALOG | 0 - 150 VOLTS |

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# JUNCTION BOXES AND ENCLOSURES

Fiberglass reinforced polyester enclosures are designed for use as electrical junction boxes in highly corrosive environments such as marine installations. Enclosures are also suitable as instrument housings in both indoor and outdoor applications. Window enclosures provide easy visual inspection of interior components.

## FEATURES:

- Designed in accordance with the Joint Industrial Council (JIC)-USA
- Bases and covers are made of gray (RAL 7036), hot molded, fiberglass reinforced polyester
- Continuous gaskets made of polyurethane foam guarantee optimal integrity
- Cover screws holes in corners are outside of gasket area
- All mounting hardware is made of 316 stainless steel
- The enclosure can be readily worked with conventional tools
- Withstands continuous temperatures up to 150˚C.
- Enclosure are maintenance free and corrosion resistant
- Enclosures have three cover configurations:
  - Screw Fastened
  - Hinged and Screw Fastened
  - Hinged and Padlock Latch
- Aluminum mounting plates sold separately
- Junction boxes are sold with solid or clear covers

## JUNCTION BOXES WITH KNOCKOUTS

| PART NUMBER | OUTSIDE DIM. H | W | D | COVER STYLE |
|---|---|---|---|---|
| ENCL332 | 3.5 | 3.5 | 1.6 | SOLID |
| ENCL332C | 3.5 | 3.5 | 1.6 | CLEAR |
| ENCL533 | 4.7 | 2.7 | 2.7 | SOLID |
| ENCL533C | 4.7 | 2.7 | 2.7 | CLEAR |
| ENCL553 | 4.7 | 4.7 | 2.7 | SOLID |
| ENCL553C | 4.7 | 4.7 | 2.7 | CLEAR |

## ENCLOSURES

| PART NUMBER | OUTSIDE DIM. (INCH) H | W | D | INSIDE DIM. (INCH) H | W | D | COVER STYLE |
|---|---|---|---|---|---|---|---|
| ENCL606W | 7.31 | 7.31 | 4.96 | 6 | 6 | 4.15 | SCREW FASTED |
| ENCL606HW | | | | | | | HINGED & SCREW FASTENED |
| ENCL606HWPL1 | | | | | | | HINGED & LATCHED |
| ENCL806W | 9.30 | 7.31 | 4.96 | 8 | 6 | 4.15 | SCREW FASTED |
| ENCL806HW | | | | | | | HINGED & SCREW FASTENED |
| ENCL806HWPL1 | | | | | | | HINGED & LATCHED |
| ENCL1008W | 11.31 | 9.31 | 5.43 | 10 | 8 | 4.64 | SCREW FASTED |
| ENCL1008HW | | | | | | | HINGED & SCREW FASTENED |
| ENCL1008HWPL1 | | | | | | | HINGED & LATCHED |
| ENCL1008WG | | | | | | | SCREW FASTENED w/ GASKET WINDOW |
| ENCL1210W | 13.30 | 11.29 | 5.58 | 12 | 10 | 4.79 | SCREW FASTED |
| ENCL1210HW | | | | | | | HINGED & SCREW FASTENED |
| ENCL1210HWPL1 | | | | | | | HINGED & LATCHED |
| ENCL1412W | 15.32 | 13.30 | 6.70 | 14 | 12 | 5.79 | SCREW FASTED |
| ENCL1412HW | | | | | | | HINGED & SCREW FASTENED |
| ENCL1412HWPL2 | | | | | | | HINGED & LATCHED |
| ENCL1614W | 17.31 | 15.30 | 6.70 | 16 | 14 | 5.79 | SCREW FASTED |
| ENCL1614HW | | | | | | | HINGED & SCREW FASTENED |
| ENCL1614HWPL2 | | | | | | | HINGED & LATCHED |
| ENCL1816W | 19.31 | 17.31 | 9.58 | 18 | 16 | 8.67 | SCREW FASTED |
| ENCL1816HW | | | | | | | HINGED & SCREW FASTENED |
| ENCL1816HWPL2 | | | | | | | HINGED & LATCHED |

Gasket windows are stocked in 10x8x5, other sizes are available by request.

## ALUMINUM MOUNTING PLATES

| PART NUMBER | DIM. (INCH) H | W |
|---|---|---|
| EMP533 | N/A | N/A |
| EMP553 | N/A | N/A |
| EMP606A | 4.88 | 4.88 |
| EMP806A | 6.75 | 4.88 |
| EMP1008A | 8.75 | 6.88 |
| EMP1210A | 10.5 | 8.88 |
| EMP1412A | 12.75 | 10.88 |
| EMP1614A | 14.75 | 12.88 |
| EMP1816A | 16.75 | 14.88 |

## CALCULATING VOLTAGE DROP

All wire has a finite resistance to current flow. This resistance causes a voltage to develop across the length of a current carrying conductor. The result is that the intended load is robbed of the full potential of its source battery.

The tables below are calculated for the two allowable percent voltage drops specified by ABYC (cf. E-9.14). Conductors shall be sized for a voltage drop not to exceed:

- **3%:** For conductors feeding panelboard or switchboards, bilge blowers, navigation lights, electronic equipment, and any other circuit where voltage drop must be kept to a minimum.
- **10%:** For conductors used for general lighting (other than navigational lights) and other non-critical circuits.

To calculate the size of the wire required for a given voltage drop the following formula is used:

$$CM = \frac{K \times I \times L}{E}$$

where:

**CM** = The required circular mil area of the wire (See table 1).
**K** = Equals 10.75, (represents the mil-foot resistance of copper)
**I** = The load current in amperes. (Note: for maximum current carrying capabilities of a conductor refer to Table 4).
**L** = The round trip length of the wire measured in feet from the positive terminal of the source, to the load, and back to the source's negative terminal.
**E** = The voltage drop on the conductor in volts. For example, a 3% drop from a 12 volt source results in: E = (12 x 0.03) = 0.36

### TABLE 1: CONDUCTOR CIRCULAR MIL (CM) AREA

| AWG | Square mm | ABYC CM Area E-8 Tbl. 3 (All UL Wire) | SAE CM Area J1127, J1128 |
|---|---|---|---|
| 18 | 0.8 | 1,620 | 1,537 |
| 16 | 1 | 2,580 | 2,336 |
| 14 | 2 | 4,110 | 3,702 |
| 12 | 3 | 6,530 | 5,833 |
| 10 | 5 | 10,380 | 9,343 |
| 8 | 8 | 16,510 | 14,810 |
| 6 | 13 | 26,240 | 24,538 |
| 4 | 19 | 41,740 | 37,360 |
| 2 | 32 | 66,360 | 62,450 |
| 1 | 40 | 83,690 | 77,790 |
| 1/0 | 50 | 105,600 | 98,980 |
| 2/0 | 62 | 133,100 | 125,100 |
| 3/0 | 81 | 167,800 | 158,600 |
| 4/0 | 103 | 211,600 | 205,500 |

## TABLE 2: CONDUCTOR SIZES FOR 3% DROP IN VOLTAGE - 12 AND 24 VOLTS

### 12 VOLT - BASED ON MINIMUM CIRCULAR MIL (CM) AREA

| LENGTH | TOTAL CURRENT ON CIRCUIT IN AMPS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| 10 | 18 | 14 | 12 | 10 | 10 | 10 | 8 | 6 | 6 | 6 | 6 | 4 | 4 |
| 15 | 16 | 12 | 10 | 10 | 8 | 8 | 6 | 6 | 4 | 4 | 4 | 2 | 2 |
| 20 | 14 | 10 | 10 | 8 | 6 | 6 | 6 | 4 | 4 | 2 | 2 | 2 | 2 |
| 25 | 12 | 10 | 8 | 6 | 6 | 6 | 4 | 4 | 2 | 2 | 2 | 1 | 1 |
| 30 | 12 | 10 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 1 | 1 | 1/0 | 1/0 |
| 40 | 10 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 1 | 1/0 | 1/0 | 2/0 | 2/0 |
| 50 | 10 | 6 | 6 | 4 | 4 | 2 | 2 | 1 | 1/0 | 2/0 | 3/0 | 3/0 | 3/0 |
| 60 | 10 | 6 | 6 | 4 | 2 | 2 | 1 | 1/0 | 2/0 | 3/0 | 3/0 | 4/0 | 4/0 |
| 70 | 8 | 6 | 4 | 2 | 2 | 1 | 1/0 | 2/0 | 3/0 | 3/0 | 4/0 | 4/0 | |
| 80 | 8 | 6 | 4 | 2 | 2 | 1 | 1/0 | 2/0 | 3/0 | 4/0 | 4/0 | | |
| 90 | 8 | 4 | 2 | 2 | 1 | 1/0 | 2/0 | 3/0 | 4/0 | 4/0 | | | |
| 100 | 6 | 4 | 2 | 2 | 1 | 1/0 | 2/0 | 3/0 | 4/0 | | | | |
| 110 | 6 | 4 | 2 | 1 | 1/0 | 1/0 | 3/0 | 4/0 | 4/0 | | | | |
| 120 | 6 | 4 | 2 | 1 | 1/0 | 2/0 | 3/0 | 4/0 | | | | | |
| 130 | 6 | 2 | 2 | 1 | 1/0 | 2/0 | 3/0 | 4/0 | | | | | |
| 140 | 6 | 2 | 1 | 1/0 | 2/0 | 3/0 | 4/0 | | | | | | |
| 150 | 6 | 2 | 1 | 1/0 | 2/0 | 3/0 | 4/0 | | | | | | |
| 160 | 6 | 2 | 1 | 1/0 | 2/0 | 3/0 | 4/0 | | | | | | |
| 170 | 6 | 2 | 1 | 2/0 | 3/0 | 3/0 | 4/0 | | | | | | |

### 24 VOLT - BASED ON MINIMUM CIRCULAR MIL (CM) AREA

| LENGTH | TOTAL CURRENT ON CIRCUIT IN AMPS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| 10 | 18 | 18 | 16 | 14 | 12 | 12 | 10 | 10 | 10 | 8 | 8 | 8 | 6 |
| 15 | 18 | 16 | 14 | 12 | 12 | 10 | 10 | 8 | 8 | 6 | 6 | 6 | 6 |
| 20 | 18 | 14 | 12 | 10 | 10 | 10 | 8 | 6 | 6 | 6 | 6 | 4 | 4 |
| 25 | 16 | 12 | 12 | 10 | 10 | 8 | 6 | 6 | 6 | 4 | 4 | 4 | 4 |
| 30 | 16 | 12 | 10 | 10 | 8 | 8 | 6 | 6 | 4 | 4 | 4 | 2 | 2 |
| 40 | 14 | 10 | 10 | 8 | 6 | 6 | 6 | 4 | 4 | 2 | 2 | 2 | 2 |
| 50 | 12 | 10 | 8 | 6 | 6 | 6 | 4 | 4 | 2 | 2 | 2 | 1 | 1 |
| 60 | 12 | 10 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 1 | 1 | 1/0 | 1/0 |
| 70 | 12 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 1 | 1 | 1/0 | 1/0 | 2/0 |
| 80 | 10 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 1 | 1/0 | 1/0 | 2/0 | 2/0 |
| 90 | 10 | 8 | 6 | 4 | 4 | 2 | 2 | 1 | 1/0 | 1/0 | 2/0 | 2/0 | 3/0 |
| 100 | 10 | 6 | 6 | 4 | 4 | 2 | 2 | 1 | 1/0 | 2/0 | 2/0 | 3/0 | 3/0 |
| 110 | 10 | 6 | 6 | 4 | 2 | 2 | 1 | 1/0 | 1/0 | 2/0 | 3/0 | 3/0 | 4/0 |
| 120 | 10 | 6 | 4 | 4 | 2 | 2 | 1 | 1/0 | 2/0 | 3/0 | 3/0 | 4/0 | 4/0 |
| 130 | 8 | 6 | 4 | 2 | 2 | 2 | 1 | 1/0 | 2/0 | 3/0 | 3/0 | 4/0 | 4/0 |
| 140 | 8 | 6 | 4 | 2 | 2 | 1 | 1/0 | 2/0 | 3/0 | 3/0 | 4/0 | 4/0 | |
| 150 | 8 | 6 | 4 | 2 | 2 | 1 | 1/0 | 2/0 | 3/0 | 3/0 | 4/0 | 4/0 | |
| 160 | 8 | 6 | 4 | 2 | 2 | 1 | 1/0 | 2/0 | 3/0 | 4/0 | 4/0 | 4/0 | |
| 170 | 8 | 6 | 2 | 2 | 1 | 1 | 2/0 | 3/0 | 3/0 | 4/0 | 4/0 | | |

## TABLE 3: CONDUCTOR SIZES FOR 10% DROP IN VOLTAGE - 12 AND 24 VOLTS

### 12 VOLT - BASED ON MINIMUM CIRCULAR MIL (CM) AREA

| LENGTH | TOTAL CURRENT ON CIRCUIT IN AMPS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| 10 | 18 | 18 | 18 | 16 | 16 | 14 | 14 | 12 | 12 | 10 | 10 | 10 | 10 |
| 15 | 18 | 18 | 16 | 14 | 14 | 12 | 12 | 10 | 10 | 8 | 8 | 8 | 8 |
| 20 | 18 | 16 | 14 | 14 | 12 | 12 | 10 | 10 | 8 | 8 | 8 | 6 | 6 |
| 25 | 18 | 16 | 14 | 12 | 12 | 10 | 10 | 8 | 8 | 6 | 6 | 6 | 6 |
| 30 | 18 | 14 | 12 | 12 | 10 | 10 | 8 | 8 | 6 | 6 | 6 | 6 | 4 |
| 40 | 16 | 14 | 12 | 10 | 10 | 8 | 8 | 6 | 6 | 6 | 4 | 4 | 4 |
| 50 | 16 | 12 | 10 | 10 | 8 | 8 | 6 | 6 | 4 | 4 | 4 | 2 | 2 |
| 60 | 14 | 12 | 10 | 8 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 2 | 2 |
| 70 | 14 | 10 | 8 | 8 | 6 | 6 | 6 | 4 | 2 | 2 | 2 | 2 | 1 |
| 80 | 14 | 10 | 8 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 2 | 1 | 1 |
| 90 | 12 | 10 | 8 | 6 | 6 | 6 | 4 | 2 | 2 | 2 | 1 | 1 | 1/0 |
| 100 | 12 | 10 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 1 | 1 | 1/0 | 1/0 |
| 110 | 12 | 8 | 8 | 6 | 6 | 4 | 2 | 2 | 2 | 1 | 1/0 | 1/0 | 1/0 |
| 120 | 12 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 1 | 1 | 1/0 | 1/0 | 2/0 |
| 130 | 12 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 1 | 1/0 | 1/0 | 2/0 | 2/0 |
| 140 | 10 | 8 | 6 | 6 | 4 | 2 | 2 | 1 | 1 | 1/0 | 2/0 | 2/0 | 2/0 |
| 150 | 10 | 8 | 6 | 4 | 4 | 2 | 2 | 1 | 1/0 | 1/0 | 2/0 | 2/0 | 3/0 |
| 160 | 10 | 8 | 6 | 4 | 4 | 2 | 2 | 1 | 1/0 | 2/0 | 2/0 | 3/0 | 3/0 |
| 170 | 10 | 6 | 6 | 4 | 2 | 2 | 2 | 1 | 1/0 | 2/0 | 2/0 | 3/0 | 3/0 |

### 24 VOLT - BASED ON MINIMUM CIRCULAR MIL (CM) AREA

| LENGTH | TOTAL CURRENT ON CIRCUIT IN AMPS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | 10 | 15 | 20 | 25 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 |
| 10 | 18 | 18 | 18 | 18 | 18 | 18 | 16 | 16 | 14 | 14 | 14 | 12 | 12 |
| 15 | 18 | 18 | 18 | 18 | 16 | 16 | 14 | 14 | 12 | 12 | 12 | 10 | 10 |
| 20 | 18 | 18 | 18 | 16 | 16 | 14 | 14 | 12 | 12 | 10 | 10 | 10 | 10 |
| 25 | 18 | 18 | 16 | 16 | 14 | 14 | 12 | 12 | 10 | 10 | 10 | 8 | 8 |
| 30 | 18 | 18 | 16 | 14 | 14 | 12 | 12 | 10 | 10 | 8 | 8 | 8 | 8 |
| 40 | 18 | 16 | 14 | 14 | 12 | 12 | 10 | 10 | 8 | 8 | 8 | 6 | 6 |
| 50 | 18 | 16 | 14 | 12 | 12 | 10 | 10 | 8 | 8 | 6 | 6 | 6 | 6 |
| 60 | 18 | 14 | 12 | 12 | 10 | 10 | 8 | 8 | 6 | 6 | 6 | 6 | 4 |
| 70 | 16 | 14 | 12 | 10 | 10 | 8 | 8 | 6 | 6 | 6 | 6 | 4 | 4 |
| 80 | 16 | 14 | 12 | 10 | 10 | 8 | 8 | 6 | 6 | 6 | 4 | 4 | 4 |
| 90 | 16 | 12 | 10 | 10 | 8 | 8 | 6 | 6 | 6 | 4 | 4 | 4 | 2 |
| 100 | 16 | 12 | 10 | 10 | 8 | 8 | 6 | 6 | 4 | 4 | 4 | 2 | 2 |
| 110 | 14 | 12 | 10 | 8 | 8 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 2 |
| 120 | 14 | 12 | 10 | 8 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 2 | 2 |
| 130 | 14 | 12 | 10 | 8 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 2 | 2 |
| 140 | 14 | 10 | 8 | 8 | 6 | 6 | 6 | 4 | 2 | 2 | 2 | 2 | 1 |
| 150 | 14 | 10 | 8 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 2 | 2 | 1 |
| 160 | 14 | 10 | 8 | 8 | 6 | 6 | 4 | 4 | 2 | 2 | 2 | 1 | 1 |
| 170 | 12 | 10 | 8 | 6 | 6 | 6 | 4 | 2 | 2 | 2 | 2 | 1 | 1 |



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**TABLE 4A: ALLOWABLE AMPERAGE OF CURRENT CARRYING CONDUCTORS UNDER 50 VOLTS FOR 105˚C CABLES - ABYC TABLE IV - E.9**

| CONDUCTOR SIZE | SINGLE CONDUCTOR | |
|---|---|---|
| ENGLISH (METRIC) | OUTSIDE ENGINE SPACES | INSIDE ENGINE SPACES |
| **18 (0.8)** | 20 | 17.0 |
| **16 (1)** | 25 | 21.3 |
| **14 (2)** | 35 | 29.8 |
| **12 (3)** | 45 | 38.3 |
| **10 (5)** | 60 | 51 |
| **8 (8)** | 80 | 68 |
| **6 (13)** | 120 | 102 |
| **4 (19)** | 160 | 136 |
| **2 (32)** | 210 | 178 |
| **1 (40)** | 245 | 208 |
| **0 (50)** | 285 | 242 |
| **00 (62)** | 330 | 280 |
| **000 (81)** | 385 | 327 |
| **0000 (103)** | 445 | 378 |

**TABLE 4B: ALLOWABLE AMPERAGE OF CONDUCTORS WHEN MULTIPLE CONDUCTORS ARE BUNDLED TOGETHER FOR 105˚C CABLES - ABYC TABLE VA-D-E.8**

| CONDUCTOR SIZE | NO MORE THAN 2 CONDUCTORS ARE BUNDLED | | WHEN 3 CONDUCTORS ARE BUNDLED | | WHEN 4-6 CONDUCTORS ARE BUNDLED | | WHEN 7-24 CONDUCTORS ARE BUNDLED | |
|---|---|---|---|---|---|---|---|---|
| ENGLISH (METRIC) | OUTSIDE ENGINE SPACES | INSIDE ENGINE SPACES | OUTSIDE ENGINE SPACES | INSIDE ENGINE SPACES | OUTSIDE ENGINE SPACES | INSIDE ENGINE SPACES | OUTSIDE ENGINE SPACES | INSIDE ENGINE SPACES |
| **18 (0.8)** | 20 | 17.0 | 14.0 | 11.9 | 12.0 | 10.2 | 10.0 | 8.5 |
| **16 (1)** | 25 | 21.3 | 17.5 | 14.9 | 15.0 | 12.8 | 12.5 | 10.6 |
| **14 (2)** | 35 | 29.8 | 24.5 | 20.8 | 21.0 | 17.9 | 17.5 | 14.9 |
| **12 (3)** | 45 | 38.3 | 31.5 | 26.8 | 27.0 | 23.0 | 22.5 | 19.1 |
| **10 (5)** | 60 | 51.0 | 42.0 | 35.7 | 36.0 | 30.6 | 30.0 | 25.5 |
| **8 (8)** | 80 | 68.0 | 56.0 | 47.6 | 48.0 | 40.8 | 40.0 | 34.0 |
| **6 (13)** | 120 | 102.0 | 84.0 | 71.4 | 72.0 | 61.2 | 60.0 | 51.0 |
| **4 (19)** | 160 | 136.0 | 112.0 | 95.2 | 96.0 | 81.6 | 80.0 | 68.0 |
| **2 (32)** | 210 | 178.5 | 147.0 | 125.0 | 126.0 | 107.1 | 105.0 | 89.3 |
| **1 (40)** | 245 | 208.3 | 171.5 | 145.8 | 147.0 | 125.0 | 122.5 | 104.1 |
| **0 (50)** | 285 | 242.3 | 199.5 | 169.6 | 171.0 | 145.4 | 142.5 | 121.1 |
| **00 (62)** | 330 | 280.5 | 231.0 | 196.4 | 198.0 | 168.3 | 165.0 | 140.3 |
| **000 (81)** | 385 | 327.3 | 269.5 | 229.1 | 231.0 | 196.4 | 192.5 | 163.6 |
| **0000 (103)** | 445 | 378.3 | 311.5 | 264.8 | 267.0 | 227.0 | 222.5 | 189.1 |

## TABLE 5A & B

### A: CIRCUIT BREAKER INTERRUPTING CAPACITY (AMPS) ABYC TABLE I - E.8

| SHORE POWER | AMPS | MAIN BREAKER SHORE POWER DISCONNECT BREAKER | BRANCH BREAKER |
|---|---|---|---|
| 120V - 30A | 30A | 3,000 | 3,000 |
| 120V - 50A | 50A | 3,000 | 3,000 |

NOTE 1: The main circuit breaker is considered to be the first circuit breaker connected to a source of AC power. All subsequent breakers, including sub-main breakers, connected in series with a main circuit breaker shall be considered to be branch circuit breakers.

2: A fuse in series with, and ahead of, a circuit breaker may be required by the circuit breaker manufacturer to achieve the interrupting capacity in the above table.

### B: CIRCUIT BREAKER INTERRUPTING CAPACITY (AMPS) ABYC TABLE III - E.9

| | TOTAL CONNECTED BATTERY COLD CRANKING AMPS | MAIN BREAKER (AMPERES)* | BRANCH BREAKER (AMPERES)* |
|---|---|---|---|
| 12V/24V | 650 or LESS | 1500 | 750 |
| 12V/24V | 651 - 1100 | 3000 | 1500 |
| 12V/24V | OVER 1100 | 5000 | 2500 |

*NOTE: The main circuit breaker(s) is considered to be the first breaker(s) in a circuit connected in series with the battery. All subsequent breakers, including sub-main breakers, connected in series with a main circuit breaker shall be considered to be branch circuit breakers.

## NOTES:



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**TABLE 6: ENGINE AND ACCESSORY WIRING COLOR CODE PER ABYC E-9 TABLE XII**

| COLOR | PACE COLOR SUFFIX | ITEM | USE |
|---|---|---|---|
| Green, or Green w/Yellow stripe | GN, or GN-4 | | DC Grounding Conductors |
| Black or Yellow* | BK or YL | | DC Negative Conductors |
| Red | RD | | DC Positive Conductors |
| Yellow w/Red Stripe | YL-2 | Starting Circuit | Starting Switch to Solenoid |
| Brown/Yellow or | BR-4 | Bilge Blowers | Fuse or Switch to Blowers |
| Yellow (See note) | YL | | |
| Dark Gray | GY | Navigation Lights<br>Tachometer | Fuse or Switch to Lights<br>Tachometer Sender to Gauge |
| Brown | BR | Generator Armature<br>Alternator Charge Light<br><br><br>Pumps | Generator Armature to Regulator<br>Generator<br>Terminal/Alternator<br>Auxiliary Terminal to Light to Regulator<br>Fuse or Switch to Pumps |
| Orange | OR | Accessory Feed<br><br>Accessory Feeds | Ammeter to Alternator or Generator Output and Accessory Fuses or Switches<br>Distribution Panel to Accessory Switch |
| Violet (Purple) | VI | Ignition<br><br>Instrument Feed | Ignition Switch to Coil and Electrical Instruments<br>Distribution Panel to Electric Instruments |
| Dark Blue | BL | Cabin and Instrument Lights | Fuse or Switch to Lights |
| Light Blue | LB | Oil Pressure | Oil Pressure Sender to Gauge |
| Tan | TN | Water Temperature | Water Temperature Sender to Gauge |
| Pink | PK | Fuel Gauge | Fuel Gauge Sender to Gauge |
| Green/"Stripe" (Except GN-4) | GN-x | Tilt Down and/or Trim In | Tilt and/or Trim Circuits |
| Blue/"Stripe" | BL-x | Tilt Up and/or Trim Out | Tilt and/or Trim Circuits |

## CONVERSION FACTORS

***ENGLISH / METRIC***
***METRIC / ENGLISH***

**LENGTH**

Inch x 25.40 = Millimeters
Millimeters x 0.03973 = Inches
Feet x 0.3048 = Meters
Meters x 3.281 = Feet
Miles x 1.609 = Kilometers
Kilometers x 0.6214 = Miles
Ohms/km x 0.3048 = Ohms/kft

**AREA**

Sq. Inch x 6.452 = Sq. Centimeter
Sq. Centimeter x 0.155 = Sq. Inch
Sq. Foot x 0.0929 = Sq. Meter
Sq. Meter x 10.76 = Sq. Foot
Sq. Mile x 2.59 = Sq. Kilometer
Sq. Kilometer x 0.3861 = Sq. Mile
Circular Mil x 0.7854 = Sq. Mil

**VOLUME**

Cu. Inch x 16.39 = Cu. Centimeter
Cu. Cm. x 0.06102 = Cu. Inch
Cu. Foot x 0.02832 = Cu. Meter
Cu. Meter x 35.31 = Cu. Foot

**MASS**

Ounce x 28.35 = Gram
Gram x 0.03527 = Ounce
Pound x 0.4536 = Kilogram
Kilogram x 2.205 = Pound
Kilogram/km x 0.6214 = Pounds/kft
Pounds/kft x 1.4881 = Kilogram/km

TEMPERATURE CONVERSION FORMULAE

**CENTIGRADE/FARENHEIGHT**

$$°C = \frac{5}{9} (°F - 32)$$

**FARENHEIGHT/CENTIGRADE**

$$°F = \frac{9}{5} (°C + 32)$$

## NOTES:



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