breakers & fuses, blocks, connectors

G1 CIRCUIT BREAKERS & ACCESSORIES

Plastic Case Breakers

30406 12V Type III
Available in: 25, 30, 40, 50A.

30407 12V Type III, With Cross-Bracket
Available in: 15, 20, 25, 30, 40, 50A.

30423 24V Type III
Available in: 10 and 15A.

Glass Fuse Breakers

30410 12V Type II
An inexpensive way to upgrade your fuses to breakers! Breaker replaces 3AG (AGC) and SFE glass fuses: snaps into standard clips on Cole Hersee fuse blocks. (See page 61).

Available in 10, 15, 20, 25, 30, 35, 40A, and in BP as 30410-30 BP.

Mini Breakers

30419 12V Type II
Gray plastic housing with silver cover.
Available in 10, 15, 20 and 25A.

Breaker Types

SAE Type II and Type III are considered appropriate for marine applications. Type II remains open (circuit is broken) as long as the overload exists. It resets after the power is manually turned off and the overload is corrected. Type III is manual. It remains open until the button on the breaker is manually reset.
**ATC/ATO Breakers**
Conform to SAE J553. Replacement for ATC or ATO fuses. Color-coded housings with rating marked on the top: 10A red, 15A blue, 20A yellow, 25A silver, 30A green.

Terminals are grooved so that they can be easily snapped off with pliers to fit.

**30411 Type II**
Silver housing with rating marked on the top. Available in: 10, 15, 20, 25, and 30A.

**30413 Type III**
Available in: 10, 15, 20, 25, and 30A.

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**Inline Fuse/Breaker Holders**
Protect circuits and equipment from damaging overloads.

**30147 ATC/ATO Fuse Holder**
Accepts ATO and ATC fuses and circuit breakers from 3A to 20A. Easy to install and easy to change the fuse. 16AWG insulated copper wire leads, 4” (101.6mm) long. Brass contacts. Supplied without a fuse.

**3031 Glass Fuse Holder**
Accepts SFE fuses through 20A and 3AG (AGC) fuses through 30A. Positive twist-lock seal will not open accidentally; large brass contacts maintain solid contact with the fuse for maximum efficiency. 14AWG wire leads, 8” (203.2mm) long. Brass contacts. To install, cut wire loop.

**3031-0 Without Fuse**
**3031-14 With 14A Fuse**
**3031-20 With 20A Fuse**
**3031-30 With 30A Fuse**

**30183 Mini Fuse Holder**
Accepts Mini Fuses, or breakers 2-30A. Body material withstands high temperatures. Up to 32V at 30A.

**30186 Maxi Fuse Holder**
Accepts Maxi Fuses or breakers 20-60A. Up to 32V at 30A.

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**Breaker mounting brackets**
Durable, lightweight molded nylon. Breakers mount securely using stud and hexnut. Mounting holes .280” x .440” (7.1 x 11.2mm). Slots are .910” (23.1mm) on centers, and .210” (5.3mm) wide.

**87128-4, 4-Gang**
5.69” long (114.5mm), mounting holes 4.89” (124.2mm) on centers.

**87128-6, 6-Gang**
7.51” long (190.8mm), mounting holes 6.71” (170.4mm) on centers.

**87128-8, 8-Gang**
9.33” long (237.0mm), mounting holes 8.53” (216.7mm) on centers.

**87128-10, 10-Gang**
11.15” long (233.2mm), mounting holes 10.35” (262.9mm) on centers.
**Busbars**

For connecting circuit breakers to provide higher amperage ratings. Holes/slots are .910” (23.1mm) on centers. Hole size: .210” (5.3mm).

**Brass Busbars**

- **86099-2, 2-Gang**
- **86099-3, 3-Gang**
- **86099-4, 4-Gang**
- **86099-5, 5-Gang**

**Copper Busbars**

Slotted. Recommended for use with nylon mounting brackets 87128. Slots are .910” on centers. Slot width: .210” (5.3mm). Width of bar: .560” (14.2mm).

- **86126-2, 2-Gang**
  1.41” L (35.81mm).
- **86126-4, 4-Gang**
  3.23” L (82.1mm).
- **86126-6, 6-Gang**
  5.05” L (128.3mm).
- **86126-8, 8-Gang**
  6.87” L (174.5mm).
- **86126-9, 9-Gang**
  7.78” L (197.6mm).
- **86126-12, 12-Gang**
  10.51” L (267.0mm).

**Brackets & Busbars**

Nylon Brackets and Busbars

Brackets in a range from 4-gang to 10 gang conveniently house and organize the stud-type circuit breakers and can be used with slotted busbars from 2-gang to 12-gang to create a variety of circuitries.

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**ABYC Busbar Standards**

Boats are built and repaired to ABYC standards, which are requirements based on years of practical experience.

E9.16.K.

(10) No more than four conductors shall be secured to any one terminal stud. If additional connections are necessary, two or more terminal studs shall be connected together by means of jumpers or copper straps.

(11) Ring and captive spade type terminal connectors shall be the same nominal size as the stud.

(12) Conductors terminating at switchboards, in junction boxes, or fixtures shall be arranged to provide a length of conductors to be fanned at terminal studs.

(13) The shanks of terminals shall be protected against accidental shorting by the use of insulation barriers or sleeves, except for those used in grounding systems.

**Dead Batteries in Inactive Boats**

Your fully charged battery could be dead within as little as two months if your boat is inactive!

Today’s boats all have electronics, and although they require only a very small amount of current to maintain their memory, over time that’s enough to kill a battery.

Any minor breakdown in insulation in the boat’s electrical system can result in the same problem. Insulation degradation can occur as a result of abrasion or infiltration of contaminants such as seawater, or from the use of test prods.

Apart from the disappointment and inconvenience, there are two very important reasons to avoid complete battery discharge.

First, contaminants can crystallize on the battery plates, and the battery will no longer hold a full charge – an irreversible process. The second problem occurs with cold temperatures. When a battery is fully charged, its electrolyte freezes at -83°F (-64°C), but when it’s discharged it freezes at a higher temperature closer to 32°F (0°C). Resulting ice buildup can break intercell connections or even crack the case.

A good way to prevent a dead battery is to fully charge it, then disconnect the ground cable. In this state the battery can hold a charge for about a year. This procedure is highly recommended when a boat is stored, but it is inconvenient for short term storage. Installation of a Cole Hersee Master Disconnect or a SureStart™ Low Voltage Disconnect will prevent problems.
Connectors

30245 Quick-Connect Bullet Socket
Provides fast and easy connect and disconnect for many applications, including vehicle to trailer connections. For 18AWG to 14AWG wires. 20 per pack.

30223 Quick-Tap Splicer and Tap
10 per pack.

Quick-Tap Wire Splicer

No need to strip the wire!

To make a Tap Splice
With the splicer open:
Press the existing circuit wire (red wire in the picture) into the outer channel.
Press the tap wire (yellow) into the inner channel.
Snap the splicer cover into place.
Squeeze with pliers.

To make an Inline Splice
With the splicer open:
Press one wire (yellow) into the outer channel.
Press the other wire (red) into the inner channel.
Snap the splicer cover into place.
Squeeze with pliers.

To make a Pigtail Splice
With the splicer open:
Press one wire (red) into the outer channel.
Press the other wire (yellow) into the inner channel.
Snap the splicer cover into place.
Squeeze with pliers.

Fuses

Part number suffixes indicate the amperage, eg: AGC98113-10 is a 10A glass fuse. Note that all fuses have a 3-letter prefix to match industry standards. Circuit breakers and fuses are a cost-effective solution to protecting wiring, equipment and subsystems. Essentially, fuses are a one-time, disposable solution. Circuit breakers can be re-used after overload.

MAX 98111 Maxi Blade Fuse
Available in 20, 30, 40, 50A and 20, 30, 40A.

ATC 98108 Blade Fuse
Available in 5, 10, 15, 20, 25, 30, 40A and 10, 15, 20, 30A.

ATM 98107 Mini Blade Fuse
Fast-acting type.
Available in 5, 10, 15, 20, 25, 30A and 10, 15, 20, 30A.

AGC 98113 Glass Fuse
Available in 1/4, 1/2, 1, 1/2, 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20, 30, 40A and 1/4, 1/2, 1, 3, 4, 5, 7, 10, 20A.

Upgrade Your System To Breakers!

If you use a terminal block that accepts glass fuses, it’s easy to upgrade to 30410 breakers. See page 55.
Terminal Blocks, Common Busbar

With One Busbar

Available in solid brass or tin-plated solid brass.

M-449 10-Gang
Solid brass busbar safely carries up to 150A. Two 1/4-20 brass studs with hexnuts. 8-32 round head screws for attachment of wires. Two mounting holes accept No.10 countersink flathead screws. Moisture-resistant molded thermoplastic insulator base. 5 3/4"L x 1 1/4"W x 1 1/32"H (146.0 x 31.7 x 26.1mm). Two mounting holes 5.19" (131.8mm) on centers.

M-449-04 10-Gang, Tin-Plated Brass
Same as M-449, but all brass is tinned for corrosion-resistance.

M-448 20-Gang
Same as M-449, but with 20 outlets. Length: 8 7/8" (225.4mm). Two mounting holes 8.31" (211.1mm) on centers.

M-448-02 20-Gang, Tin-Plated Brass

With Two Busbars

Two solid brass busbars, hard fiber insulator base, 8-32 screws. Width: 2.25" (57.2mm), height: 3/8" (9.5mm). Mounting holes .75" (19.1mm) on centers.

M-649-04 4-Gang
2.75" long (98.5mm).

M-649-06 6-Gang
4.25" long (108.0mm).

M-649-08 8-Gang
5.75" long (146mm).

46206-04
4-gang, with solid brass busbar. 10-32 stud terminals with hexnuts and lockwashers. Two eyelets for mounting with 3/16" (4.76mm) screws (not included). Eyelets are 3.125" (79.4mm) on centers. Moisture-repellent thermoset plastic insulator base. 3 7/8"L x 5/8"W x 27/32"H (44.4 x 15.9 x 21.4mm).

Red Light On – White Light Off

**Terminal Blocks, Individual Feed**

*Moisture-repellent molded Bakelite insulator base with barrier strips. Nickel-plated brass terminal links and 8-32 binding head screws. Width: 1.31" (33.3mm), height: .67" (17.0mm).*

**M-426 4-Gang**
Length: 3.22" (81.8mm). Paired mounting holes 2.81" (71.4mm) on centers.

**M-427 6-Gang**
Length: 4.33" (110.1mm). Paired mounting holes 3.93" (99.9mm) on centers.

**M-428 8-Gang**
Length: 5.46" (138.7mm). Paired mounting holes 5.06" (128.5mm) on centers.

**M-429 10-Gang**
Length: 6.59" (167.4mm). Paired mounting holes 6.19" (157.2mm) on centers.

**M-456 14-Gang**
Length: 8.84" (224.5mm). Paired mounting holes 8.44" (214.4mm) on centers.

**With Stud Terminals**

10-32 thread stud terminals with hexnuts, flat washers and lock-washers. Two eyelet mounting holes for 3/16" (4.8mm) screws (screws not included). Moisture-repellent phenolic insulator base. 5/8" (15.9mm) wide x 27/32" (21.4mm) high.

**4721-P2 2-Gang**
Length: 2.62" (66.5mm). Eyelets are 1.87" (47.5mm) on centers.

**4721-P3 3-Gang**
Length: 3.25" (82.6mm). Eyelets are 2.50" (63.5mm) on centers.

**4721-P4 4-gang**
Length: 3.87" (98.3mm). Eyelets are 3.12" (79.2mm) on centers.

**4721-P5 5-Gang**
Length: 4.5" (114.3mm). Eyelets are 3.75" (95.3mm) on centers.

**4721-P6 6-Gang**
Length: 5.12" (130.0mm). Eyelets are 4.38" (111.3mm) on centers.

**4721-P8 8-Gang**
Length: 6.37" (161.8mm). Eyelets are 5.62" (142.7mm) on centers.

**4721-P10 10-Gang**
Length: 7.62" (193.5mm). Eyelets are 6.87" (174.5mm) on centers.

**4721-P12 12-Gang**
Length: 8.87" (225.3mm). Eyelets are 8.12" (206.2mm) on centers.

**4721-P14 14-Gang**
Length: 10.12" (257.0mm). Eyelets are 9.37" (238.0mm) on centers.

**Smart Battery Isolators**

Prevents loads on an auxiliary battery from draining the starting battery. More versatile than conventional isolators, it works with all types of alternator, and allows bi-directional charging from alternator to shore power. See page 46.
For Glass Fuses and 30410 Breakers
For SFE 20A or 3AG (AGC) fuses, and 30410 circuit breakers. (See page 55 & 58).

Individual Hot Feed
Nickel-plated phosphor-bronze plated fuse clips. Hard fiber insulator base with 11/64" (4.4mm) diameter mounting holes. Width: 2 1/4" (57.2mm), height 5/8" (15.9mm). Brass terminals and screws. Mounting holes .75" (19.0mm) on centers.

M-412 2-Gang
Length: 1 1/4" (31.8mm).

M-414 4-Gang
Length: 2 3/4" (69.9mm).

M-415 5-Gang
Length: 3 1/2" (88.9mm).

No More Dead Batteries!
SureStart™ Low Voltage Disconnect switches automatically disconnect ancillary loads before battery power is insufficient to start the boat. They automatically reconnect when voltage has been restored. Prolongs battery life by preventing irreversible damage due to excessive discharge. See section E1.

Common Hot Feed
Fiber base, 2.24" (56.9mm) wide, with 11/64" (4.4mm) diameter mounting holes. Solid brass busbar, phosphor-bronze fuse clips. Height: 5/8" (15.9mm). Brass terminals and screws.

M-414-01 Brass 4-Gang
Length: 2 3/4" (98.5mm).

M-415-01 Brass 5-Gang
Length: 3 1/2" (88.9mm).
Also available with steel terminals and screws: 4625-01.

M-641-01 Brass 6-Gang
Length: 4 1/4" (108.0mm).
Also available with steel terminals and screws: 4626-01.

M-643-01 Brass 8-Gang
Length: 5 3/4" (146.1mm).

M-645-01 Brass 10-Gang
Length: 7 1/4" (184.2mm).

M-647-01 Brass 12-Gang
Length: 8 3/4" (222.3mm).

New Ignition Switches
New 95060 Series is fully sealed and has an integral Deutsch connector. See page 1.

★ Rapid ship item.  ◄ Available in retail clamshell pack.  ★ Minimum order quantity may apply.  Part numbers needed in BOX require a -BX suffix on the purchase order.
For Plug-In Breakers & Fuses

For ATC and ATO fuses and circuit breakers. Fuse/breaker contacts are recessed for safety. Recessed area in the center of the block accepts a label. Electrical ratings: 25A maximum per circuit at 12V to 24V DC. 150A maximum total for the block at 12V DC. For 24V DC applications use only ATC or ATO fuses.

Black thermoplastic block. Blade terminals are .25" wide (6.4mm). Stud terminal is 10-32 with hexnut, flat washer and lockwasher. Four .218" (5.5mm) diameter mounting holes take #10 screws. Size: 3.375" wide x .812" high (85.7 x 20.6mm). Mounting holes 1.06" (27.0mm) on centers, widthwise.

With Common Hot Feed Only

**46377-6 6-gang**  
Length: 2.47" (62.7mm). Mounting holes .625" (15.9mm) on centers.

**46377-8 8-Gang**  
Length: 3.09" (78.5mm). Mounting holes 1.25" (31.8mm) on centers.

**46377-10 10-Gang**  
Length: 3.72" (94.5mm). Mounting holes 1.875" (47.6mm) on centers.

**46377-12 12-Gang**  
Length: 4.34" (110.0mm). Mounting holes 2.5" (63.5mm) on centers.

**46377-14 14-Gang**  
Length: 4.97" (126.2mm). Mounting holes 3.125" (79.4mm) on centers.

**46377-18 18-Gang**  
Length: 6.22" (158.0mm). Mounting holes 4.375" (111.1mm) on centers.

With Common Hot Feed & Common Ground

**46379-6 6-Gang**  
Length 3.77" (95.8mm). Mounting holes .625" (15.9mm) on centers.

**46379-8 8-Gang**  
Length 4.39" (111.5mm). Mounting holes 1.25" (31.8mm) on centers.

**46379-10 10-Gang**  
Length 5.02" (127.5mm). Mounting holes 1.88" (47.6mm) on centers.

M-674 Combination Fuse Block & Terminal Block

For SFE 20A or 3AG (AGC) fuses. Common hot feed to four independently-fused circuits, and common ground strip for four circuits. Solid brass busbars, terminals and terminal screws. Nickel-plated phosphor-bronze fuse clips. Two eyelet holes for mounting with 3/16" (4.8mm) screws, 2.25" (57.2mm) on centers. 3 1/2"L x 2 3/4"W x 25/32"H (88.2 x 69.8 x 19.8mm).

Interchange

Want to select a replacement part? Check Section J.

Reversing Polarity Switches

For changing the direction of permanent magnet motors.

Sealed Rocker Switches (Page 12)
- 58027-18  Mom On - Off - Mom On
- 58311-18  Mom On - Off - Mom On

Toggle Switches (Page 18)
- 55046-06  Mom On - Off - Mom On

Rapid ship item.  Available in retail clamshell pack.  Minimum order quantity may apply.  Part numbers needed in BOX require a -BX suffix on the purchase order.
**TRAILER CONNECTORS**

Connectors with Screw-on Caps
Molded insulator bodies. Precision-machined contacts. Knurled caps unscrew for easy connection of wires, and protect against weather and dirt. Terminal ID .110” (2.8mm) accepts up to 12AWG stranded wire.

**M-118 2-Pole Pair, Polarized, Brass Screws**

**1238 2-Pole Polarized Plug And Socket**
Screw-on cap protects the socket from dirt and moisture when not in use. Polarized for proper mating of circuits. Includes one 1102-F plug. Mount in 45/64” (17.9mm) diameter hole in panels up to 3/8” (9.5mm) thick. Plated steel cap and housing.

Connectors with Rubber Caps
Polarized to assure proper mating of circuits. Molded insulator bodies. Precision-machined brass contacts. Rubber caps protect connectors.

**1134 4-Pole Pair**
Circuit identification printed on the insulator.

**M-115 4-Pole Pair, Brass Screws**
Same as 1134, but with brass terminal screws.

**M-114 3-Pole Pair, Brass Screws**
Brass terminal screws.

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**Recommended Wire Sizes**

Fire can result when a wire gets overheated because there’s too much current flowing through it. It is important to use the correct wire size that’s appropriate to the amperage and length of the wire that you’re using. Use the wire rating next above the amperage needed.

Both fuses and circuit breakers stop dangerous overcurrent by rapidly shutting down an overloaded circuit. Fuses are one-use devices; circuit breakers can be re-set.

This American Boat & Yacht Council table indicates how much amperage each wire can carry:

<table>
<thead>
<tr>
<th>Wire Size</th>
<th>Ohms per 1000ft</th>
<th>Ampacity inside the engine compartment</th>
<th>Ampacity outside the engine compartment</th>
</tr>
</thead>
<tbody>
<tr>
<td>18AWG 0.8mm²</td>
<td>6.385</td>
<td>20</td>
<td>17</td>
</tr>
<tr>
<td>16AWG 1mm²</td>
<td>4.016</td>
<td>25</td>
<td>21.3</td>
</tr>
<tr>
<td>14AWG 2mm²</td>
<td>2.525</td>
<td>35</td>
<td>29.8</td>
</tr>
<tr>
<td>12AWG 3mm²</td>
<td>1.588</td>
<td>45</td>
<td>38.3</td>
</tr>
<tr>
<td>10AWG 5mm²</td>
<td>0.9989</td>
<td>60</td>
<td>51</td>
</tr>
<tr>
<td>8AWG 8mm²</td>
<td>0.6282</td>
<td>80</td>
<td>68</td>
</tr>
<tr>
<td>6AWG 13mm²</td>
<td>0.3951</td>
<td>120</td>
<td>102</td>
</tr>
<tr>
<td>4AWG 19mm²</td>
<td>0.2485</td>
<td>160</td>
<td>136</td>
</tr>
<tr>
<td>2AWG 32mm²</td>
<td>0.1563</td>
<td>210</td>
<td>178.5</td>
</tr>
<tr>
<td>1AWG 40mm²</td>
<td>0.1239</td>
<td>245</td>
<td>208</td>
</tr>
<tr>
<td>0AWG 50mm²</td>
<td>0.09827</td>
<td>285</td>
<td>242.3</td>
</tr>
<tr>
<td>2/0AWG 62mm²</td>
<td>0.07793</td>
<td>330</td>
<td>280.5</td>
</tr>
<tr>
<td>3/0AWG 81mm²</td>
<td>0.06180</td>
<td>385</td>
<td>327.3</td>
</tr>
<tr>
<td>4/0AWG 103mm²</td>
<td>0.04901</td>
<td>445</td>
<td>378.3</td>
</tr>
</tbody>
</table>

You can calculate the voltage drop (volts) across a length of wire (ft) at a given amperage (amps)...Voltage drop = wire length x amperage divided by 1000 x ohms per 1000ft.
Universal Trailer Connectors
Weatherproof connectors & wire lead assemblies. Polarized to assure proper mating of circuits. Molded bodies. Color-coded 16AWG wire, 6” long (152.4mm). Conductors are properly aligned and bonded into the insulation, to assure minimal voltage drop, and for ease in connecting.

11135 5-Pole Pair

11134 4-Pole Pair

11134-08BP 4-Pole Pair, With Splicers
Retail pack with 11134 and eight 30223 Quick-Tap wire splicers.

11173 3-Pole Pair

11172 2-Pole Pair

Switch Connectors

31101 Sealed Key Switch Connector
Six-pole connector fits all 95060 Series switches. Connector is 0.77 x 0.77 x 1.26” (19.7 x 19.7 x 32.0mm) with six 16AWG (1.0mm²) GXL 6” (152.4mm) wire leads.

Ignition switch wire colors for use with 95060 Series switch per ABYC recommendation.

Pin 1 Red - Battery
Pin 2 Yellow with red stripe - Start
Pin 3 Orange - Accessory
Pin 4 Purple - Ignition
Pin 5 Purple - Ignition
Pin 6 Red - Battery

12804 LVD Connector
Color-coded wires conform to ABYC Standard Deutsch 4-pin plug with 6” wires fits Compact Low Voltage Disconnect 48513. 16AWG (1.00mm sq) SXL wires. Black wire to pin1, purple to 2, white to 3, orange to 4.

1160 Document Holder Tube
Weatherproof tube protects important papers. 5” x 1 1/8” (127.0 x 28.6mm). Captive brass screw-on cap. Brass flange, aluminum body. Three 3/16” (4.8mm) diameter mounting holes in the flange.