







BEP

MARINE

EMERGENCY VEHICLE

INDUSTRIAL

RV

2023

PEC

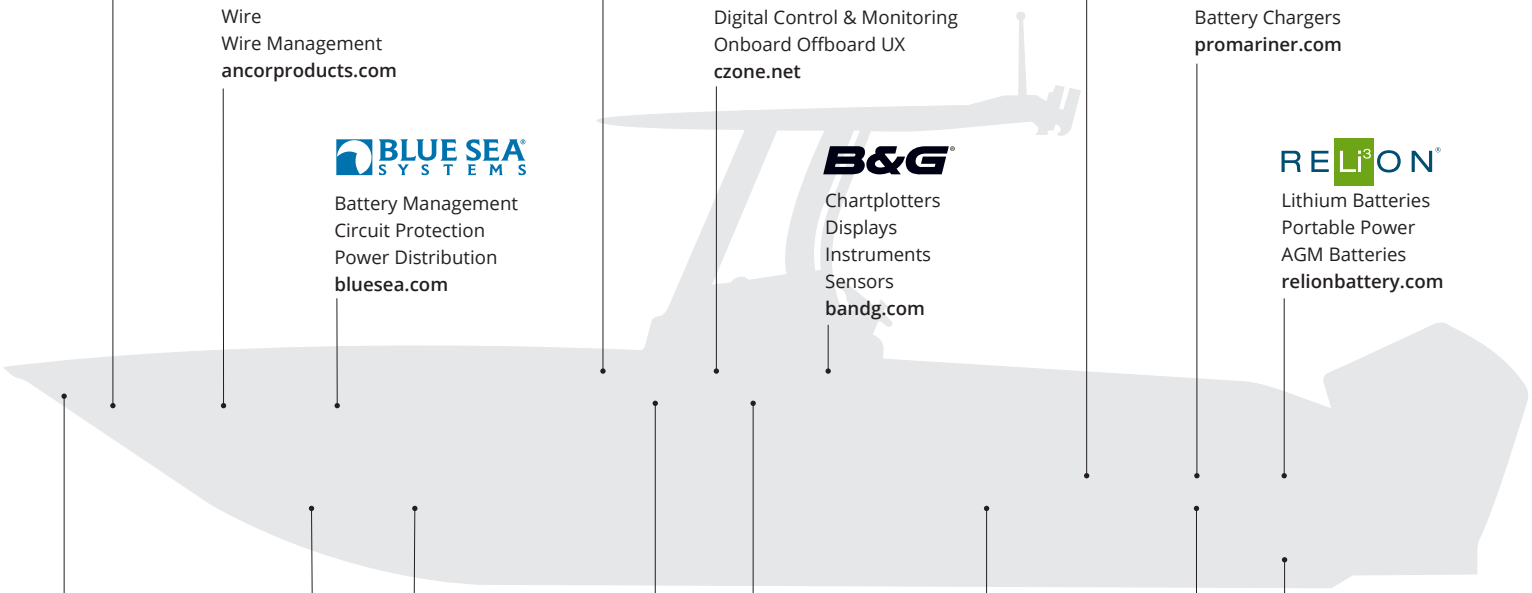
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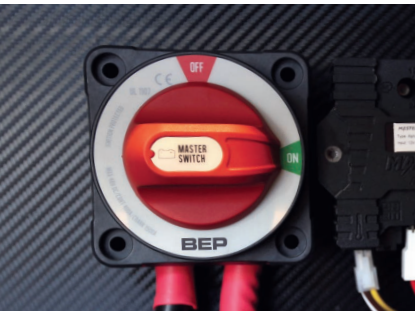
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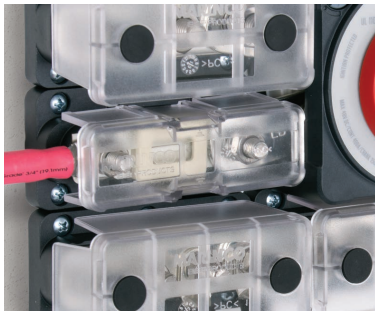
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What makes BEP different:

Founder's Vision

BEP offers a range of high quality electrical solutions designed for the harsh Marine and RV environments. Every product meets exacting performance specifications and is designed to withstand extreme conditions, both at sea, and on land.

Solutions Focused

The BEP team is intimate with the marine environment and develops solutions that improve the installation and use of the products they design. The new products developed reduce assembly time, save space and improve the user experience.

Innovation & Engineering

BEP's innovative culture and engineering excellence is focused on simplifying the installation and optimizing the user experience with thoroughly tested products that will thrive in the harsh marine environment.

Worldwide Support

BEP customers have global support in APAC, EMEA and the Americas. The network of support will resolve any issues that come up in supply, technical support and installation questions. BEP is committed to provide the products and support needed to make your installation and experience the best in the industry.

Trusted Quality

BEP products are designed in New Zealand to withstand prolonged exposure in the harshest environments. Our products have stood the test of time in marine and automotive installations around the world and remain the product of choice by world leading recreational and commercial manufacturers. We stand behind our products and proudly offer a “Trusted Quality” 5-year warranty on all parts.

Please note, many catalog pages have been removed from this copy. For complete BEP Catalog, please ask Prairie Equipment Company

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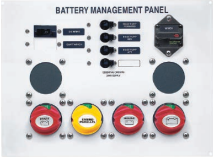


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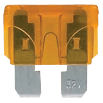
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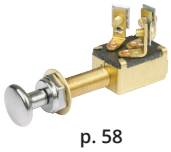

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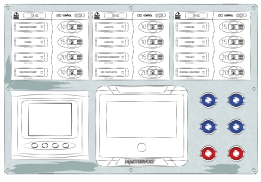

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Pro Installer Battery Switches

The Pro Installer range of premium quality battery switches offer ease and flexibility of installation, and optimal performance in the harsh marine environment. With models that offer on/off, selector and dual bank control functionalities, the switches feature improved contactor design, ergonomics that provide clear intuitive operation, an industry standard mounting footprint and all switches meet global industry standards. The innovative dual bank control switch offers the functionality of three switches in one. The patented EZ-Mount switch range allows wiring from the front simplifying installation and saving labor. All Pro Installer EZ-Mount switches feature a common interconnection height with the full line of Pro Installer power management products, which allow them to "cluster" with other products utilizing solid link bars. Attention to all aspects of switch function and use has created superior installation options, high power capacity and improved reliability.



All Pro Installer Switches:

- Meets global industry standards UL1107, CE and ABYC
- Ignition protected
- IP66 rated *(see inside back cover)*
- Removable side plates
- Ergonomic removable switch knobs

See page 32 for more Pro Installer products to complete your cluster.

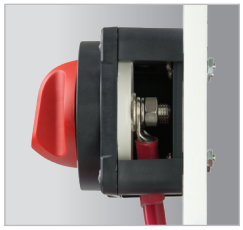
Pro Installer Standard Mount Switches

This powerful generation of battery switches have a 400A rating with outstanding performance and features for both the installer and end user. Three mounting options: surface, rear panel and front panel mounting, plus optimized cable access makes installation a breeze. Pro Installer switches set the new benchmark with outstanding ergonomics, intuitive look/feel, and are engineered from the finest materials to withstand the harsh marine environment.



- Switch studs face back of switch (when viewed from front)
- Panel mounting allows direct access to the switch studs from rear of panel
- Does not share Pro Installer interconnection height due to different mount options
- Accepts metric or imperial fasteners with innovative nut retention

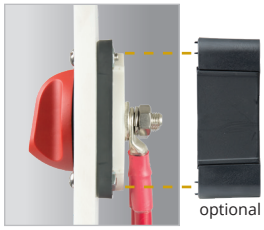
Standard Mounting Options



Surface Mount

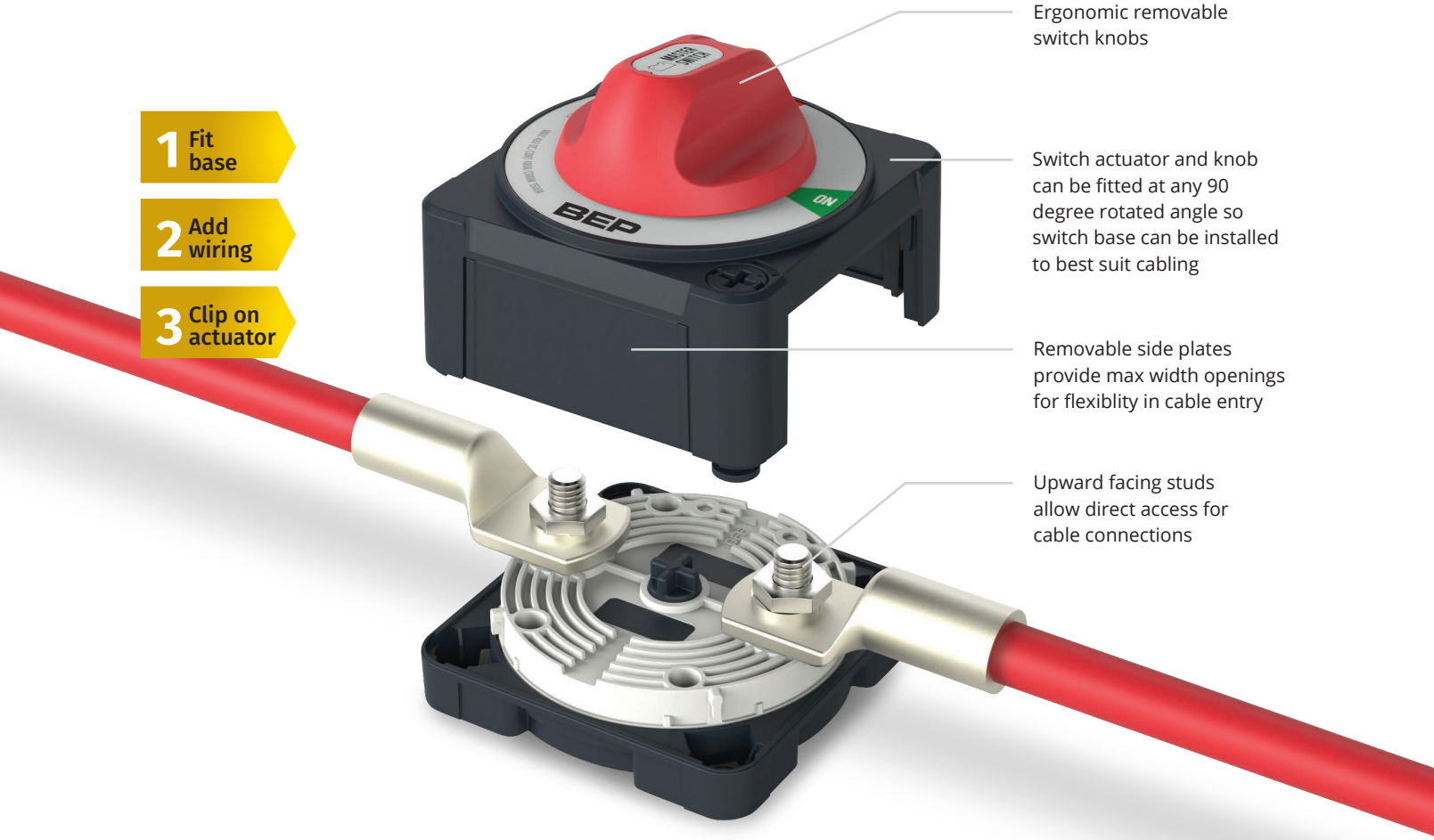


Front Panel Mount



Rear Panel Mount

Check out our Award Winning Pro Installer EZ-Mount Switches

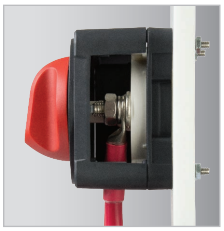


Pro Installer EZ-Mount Switches

Why Pro Installer EZ-Mount?

As easy as 1, 2, 3, these revolutionary, patented battery switches from BEP allow you to wire from the front. Simply remove the back, wire, and then clip the actuator and cover in place. Never has installation been so easy. These durable switches accept large cables or multiple lugs and feature intuitive, ergonomic switch positioning and clear graphics. The EZ-Mount switches have a compact, industry standard footprint, the ability to cluster with other Pro Installer products saving valuable onboard space, and are rated 400A continuous, 600A intermittent. Constructed for longevity in the marine environment, they meet rigorous global standards.





Surface Mount Only

Miami Boatshow

IBEX

Multi award winning including the prestigious METS DAME award.

Pro Installer Battery Switches

On/Off Battery Switches

For isolation of a single positive supply e.g. as a main House or Start battery switch

Double Pole On/Off Battery Switches

Used where positive and negative supplies must be isolated at the same time.

Selectors (771-S-EZ & 771-S) & Selector with Field Disconnect (771-SFD) Battery Switches

Power requirements on boats have increased, and these Selector switches offer high power capacity (400A continuous), the ability to easily fit doubled cables, and conform to the industry standard mounting footprint (Guest, Perko, Blue Sea Systems).

Please note selector switches will not separate electronics from harmful engine starting spikes.

Related Products

START

Label Sets page 84



770-DP-EZ

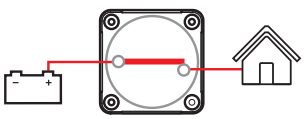


771-S

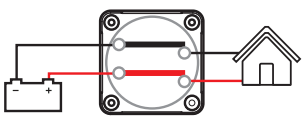
	On/Off Switch		Double Pole Switch		Selector Switch		Selector w/ Field Disconnect
	EZ-Mount	Standard	EZ-Mount	Standard	EZ-Mount	Standard	Standard
Part #	770-EZ	770*	770-DP-EZ	770-DP	771-S-EZ	771-S	771-SFD
OEM #	770-EZ-B	770-B	770-DP-EZ-B	770-DP-B	771-S-EZ-B	771-S-B	—
Mounting	Surface ONLY	Surface, Rear or Front	Surface ONLY	Surface, Rear or Front	Surface ONLY	Surface, Rear or Front	Surface, Rear or Front
Voltage	48V DC (for 12–48V systems)				48V DC (for 12–48V systems)		
Rating‡	400A Cont / 600A Inter / 1500A Crank				400A Cont / 600A Inter / 1500A Crank		
Dims	3.85" x 3.85" x 3.62" (98 x 98 x 92 mm)				3.85" x 3.85" x 3.62" (98 x 98 x 92 mm)		
Operation	On/Off				1-2-Both-Off		
Stud	2x 10 mm (3/8")		4x 10 mm (3/8")		3x 10 mm (3/8")		

*Emergency Parallel option Part # **770-KEY-EP**.
‡120mm² or 4/0 cable required to meet rating.

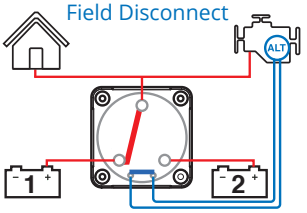
On/Off



Double Pole



Selector Switch with Alternator Field Disconnect



SAFETY NOTE 770-DP & 770-DP-EZ: These switches are not recommended for switching house and start battery systems at the same time, for safety reasons. You may need to isolate your engine battery in an emergency, but not your house battery which typically powers the communications. For this application please use the new Dual Bank Control Switch (772-DBC or 772-DBC-EZ) or one of our battery switch clusters.

Battery Switches



701

Contour Battery Master Switch

- Patented Contour Locking System allows switch to be a stand alone unit, or locked together with other switches.
- Control knob can be removed by switching to counter-clockwise 45° position.
- Three removable side plates for access of up to 1/0 cables plus a rear cover insulating the rear terminals against any short circuits. This ensures the switch meets ABYC requirements.
- 2.1" (52 mm) hole for mounting.



701S

Battery Selector Switch

The 701S is the most compact selector switch available on the market. Housed in the same dimensions as the 701, and includes the same removable side plates and back cover ensuring that it meets ABYC requirements.

- While BEP recommends isolated battery systems as outlined with our distribution clusters, the 701S offers a simple economical way of separating two batteries.

Please note selector switches will not separate electronics from harmful engine starting spikes.



700

Easyfit™ Battery Switch

Created primarily for installations where switches need to be recessed through varying thicknesses of panels.

- Easily removable threaded ring allows for panel thicknesses up to 3/4" (19 mm).
- Same features as the 701 with the removable knob 45° past the off position.
- Includes removable back cover ensuring that it meets ABYC requirements.
- Surface mount option offers a unique style compared to other switches available on the market.
- Can easily be retro-fitted in place of most European post and lever type switches.



720/720-DP

Heavy-Duty Battery Switch

The 720 is well suited to larger vessels, being capable of handling the high electrical loads found on today's boats and RV's plus starting large diesel engines.

- Rated at 600A continuous and 2500A cranking.
- Can be rear panel, or surface mounted.
- Uses the same proven style of self cleaning sliding copper contact used inside the 701.
- Can be locked with padlock for safely isolating circuits.



721

Heavy-Duty Battery Selector Switch

The 721 is our heavy-duty selector switch. Housed in the same module as the 720, it includes the same removable plates and back cover.

Please note selector switches will not separate electronics from harmful engine starting spikes.

POWER TIP

BEP Battery Switch Construction

All BEP battery switches are molded in a high strength, fiber reinforced plastic which provides excellent high temperature performance, and the greatest resistance to chemicals that damage other plastic types.

Related Products



Label Sets page 84

Interchangeable labeling system available (Part # 713 or 715)

Specifications - All recessed or surface mount, tin-plated copper studs & nuts, ignition-protected

Part #	OEM #	LxWxH in	LxWxH mm	Cont.	Inter. (5 min)	Crank. (10 sec)	Voltage	Operation	Studs	Cable to meet rating (AWG/mm²)
700	700B	2.7" x 2.7" x 4.3"	68 x 68 x 110 mm	275A	455A	1250A	48V DC	On/Off	2x 3/8" (10mm)	3/0 / 95mm²
701	701B	2.75" x 2.75" x 3"	69 x 69 x 75 mm	275A	455A	1250A	48V DC	On/Off	2x 3/8" (10mm)	3/0 / 95mm²
701S	701S-B	2.75" x 2.75" x 3"	69 x 69 x 75 mm	200A	300A	1000A	48V DC	1-2-Both-Off	3x 5/16" (8mm)	1/0 / 50mm²
720	720B	4" x 4" x 3.5"	102 x 102 x 90 mm	600A	800A	2500A	48V DC	On/Off	2x 1/2" (12mm)	2x 3/0 / 2x 95mm²
720-DP	720-DP/B	4" x 4" x 3.5"	102 x 102 x 90 mm	600A	800A	2500A	48V DC	On/Off/DP	2x 1/2" (12mm)	2x 3/0 / 2x 95mm²
721	721B	4" x 4" x 3.5"	102 x 102 x 90 mm	600A	800A	2500A	48V DC	1-2-Both-Off	2x 1/2" (12mm)	2x 2/0 / 2x 95mm²

Remote Operated Battery Switches

The motor driven range of battery switches allow you to install the battery switch very close to the battery, allowing remote operation to manage the increased electrical loads found on today's boats. This reduces cable lengths and sizes, providing significant savings in expense and weight of copper battery cable. They are ideal for remote isolation of bow and stern thrusters. The 720-MDO has been enhanced to offer easy standard installation, or advanced options capable of switching different voltage circuits from the main supply.

- Motor driven by remote operation
- Battery switch can be mounted alongside battery, reducing cable lengths and cable sizes (large cost and weight saving in copper cables)
- Reduced installation labor, due to shorter battery cable runs
- Manual override option to meet CE/ABYC requirements
- Power draw with switch off for 701-MD @ 15mA and 701-MDCZ @ 12mA
- LED status identification for remote control switch
- Can be either surface, or rear panel mounted
- Uses interchangeable labelling system (Part # 713 or 715 on page 84)



701-MD &
701-MDCZ



720-MDO

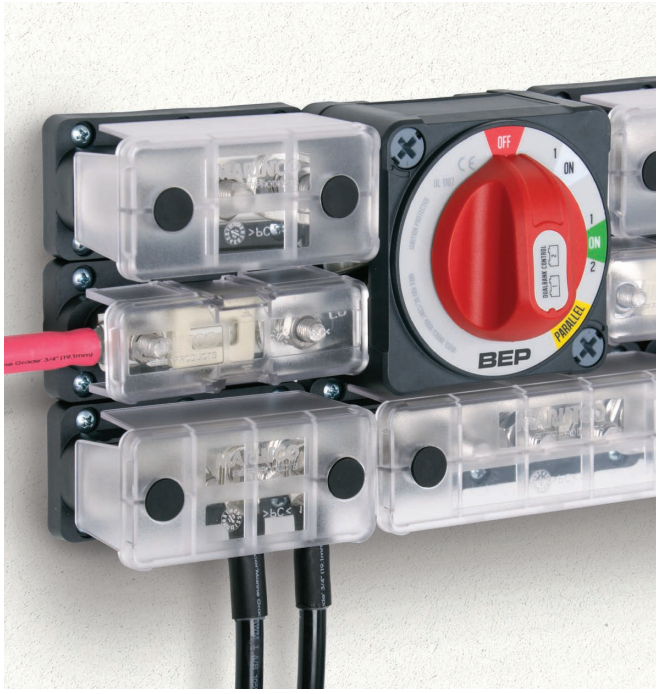
Optical sensor benefits (720-MDO only)

- Same easy connection for standard installation
- Ability to control different voltage circuits
- Can be used to switch positive or negative lines
- Main contacts can be isolated from control circuit allowing operation via another battery source
- Low stand by current draw (<5mA)

Specifications - All recessed or surface mount, tin-plated copper studs & nuts, ignition-protected UL1107

Part #	LxWxH in	LxWxH mm	Cont.	Inter. (5 min)	Crank. (10 min)	Voltage	Function	Studs	Cable to meet rating
701-MD	2.7" x 2.7" x 4"	69 x 69 x 101 mm	275A	455A	1250A	9.5–32V DC	On/Off	2x 3/8" (10 mm)	3/0 AWG (95mm²)
701-MD-D	(Deutsch Plug) Same dimensions and ratings as above								
720-MDO	4" x 4" x 4.33"	102 x 102 x 110 mm	500A	700A	2500A	9.5–32V DC	On/Off	2x 1/2" (12 mm)	3/0 AWG (95mm²)





Pro Installer Series

Onboard power demands continue to increase as boaters request the comforts of home on their boats. BEP looked at the common products used by electrical installers every day and made significant improvements to their design and construction. The result is a robust product line with greater capacity and extended product life.

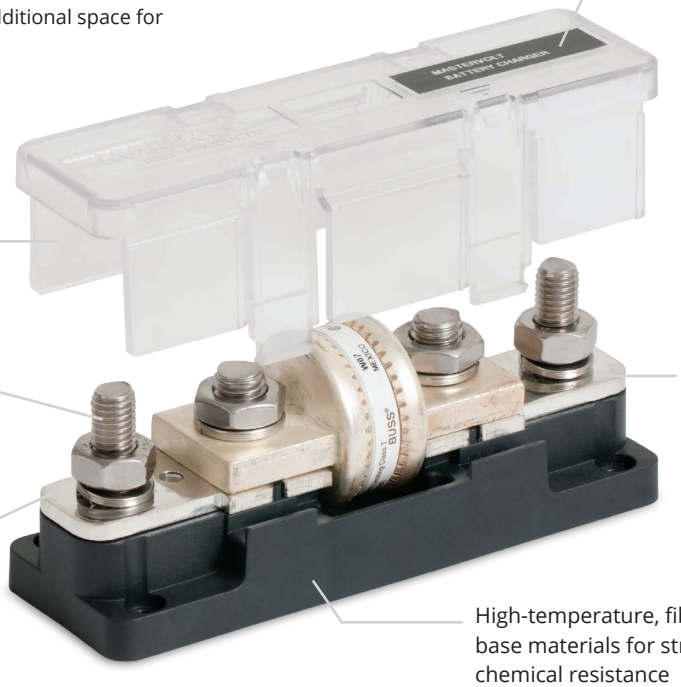
The valuable space saved onboard gives builders or installers greater flexibility when designing power systems. Since Pro Installer modular assemblies are designed for fast, flexible installation in tight spaces, it's easy to “cluster” products and reduce their mounting footprint. The common interconnection height enables solid link bars to connect multiple Pro Installer products — a smart design feature for watercraft. Like all BEP products, you can be assured of durable construction engineered specifically to handle the challenging marine environment. High-temperature, fiber-reinforced base material provides strength and chemical resistance.

All Pro Installer products include a common interconnection height, label recess on the cover, ability to “cluster” and a compact footprint. All studs, washers and nuts are made of stainless steel.

See page 14 for Pro Installer Battery Switches to complete your cluster.

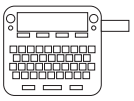
Features and Benefits:

- Common interconnection height makes it easy to ‘cluster’ products
- Modular assemblies offer unrivalled flexibility in design/layout
- Reduced individual footprints save additional space for the most compact installations
- Robust construction for the harshest of marine environments



Innovative clear covers insulate/protect on three sides, and include recesses for convenient labeling*

Use any label maker with 1/2" stock to create your label



Covers feature snap-out side skirts for additional cable entry as required

Stainless steel studs, washers and nuts

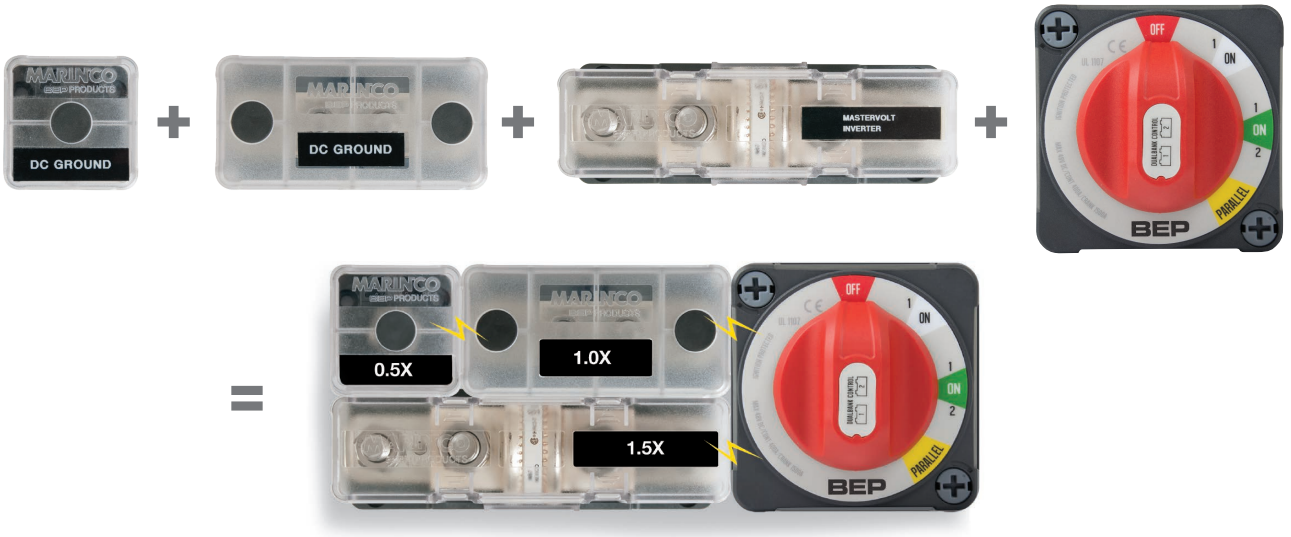
Tin-plated copper conductors

Radiused bar ends and generous stud lengths improve cable routing options for large cables

High-temperature, fiber reinforced base materials for strength and chemical resistance

*Does not come with label fitted

Typical Cluster example



Product Footprints

		.5x	1x	1.5x	2.5x
		49mm(1.9") × 49mm(1.9")	98mm(3.8") × 49mm(1.9")	147mm(5.8") × 49mm(1.9")	249mm(9.8") × 49mm(1.9")
Heavy-duty Bus Bars					
777-BB4S-500	4 Stud		✔		
777-BB3S-650	3 Stud		✔		
777-BB5S-650	5 Stud			✔	
777-BB8S-650	8 Stud				✔
Z Bus Bars					
777-Z10W-200	10-way		✔		
777-Z18W-200	18-way			✔	
ANL Fuse Holders					
778-ANL	ANL		✔		
778-ANL2S	ANL with additional cable clamping studs			✔	
778-ANLTP	ANL Through Panel		✔		
Class-T Fuse Holders					
778-T2S-400	225–400A			✔	
778-T2S-600	450–600A			✔	
Insulated Studs					
IST-8MM-1S	Single 8 mm	✔			
IST-8MM-2S	Double 8 mm	✔			
IST-10MM-8MM	Double 10 mm / 8 mm	✔			
IST-10MM-1S	Single 10 mm	✔			
IST-10MM-2S	Double 10 mm	✔			
IST-8MM-1SPT	Single 8 mm with power tapping plate	✔			
IST-10MM-1SPT	Single 10 mm with power tapping plate	✔			

Pro Installer Heavy-duty Bus Bars

Pro Installer Heavy-duty Bus Bars provide a robust means to connect (bus) together the multitude of large cables found in modern electrical installations. They offer unrivaled flexibility to meet the requirements of any installation, saving significant cost and space.



Specifications:

- 4 Stud-500A bus bar: 8 mm (5/16") stainless steel studs
- 3, 5, and 8 stud-650A bus bars: 10 mm (3/8") stainless steel studs
- Studs treated with anti-seize lubricant
- 50V DC
- Tinned CDA102 Copper conductors
- Stainless steel studs, washers, nuts for longevity in the marine environment
- Generous stud lengths, metric threads

Description	Part #	OEM #	Footprint*
3 Stud Bus Bar	**777-BB3S-650**	**777-BB3S-650-B**	1 x
4 Stud Bus Bar	**777-BB4S-500**	**777-BB4S-500-B**	1 x
5 Stud Bus Bar	**777-BB5S-650**	**777-BB5S-650-B**	1.5 x
8 Stud Bus Bar	**777-BB8S-650**	**777-BB8S-650-B**	2.5 x

* See page 33 for Footprint details

Related Products



Pro Installer Link Bars
page 37

Pro Installer Z Bus Bars

BEP products have created a completely new concept for small cable termination with the Z-Bar range. These Bus Bars maximize power density by utilizing high and low level bars to optimize cable runs, saving even more installation space.

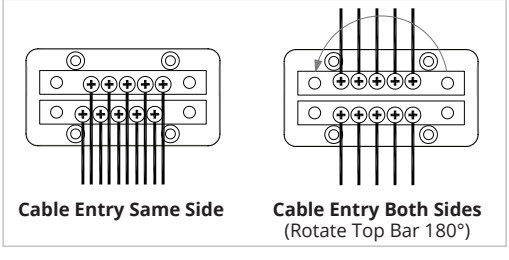


Specifications:

- 10-way and 18-way versions
- 4x 6 mm (1/4") studs with anti-seize lubricant
- 4 mm (5/32") terminals with captive lock washers
- 200A maximum per bar (2x 200A)
- 50V DC
- Tinned CDA102 Copper conductors
- Stainless steel studs, washers, nuts for longevity in the marine environment
- Metric threads

Description	Part #	OEM #	Footprint*
10-way, Z Bus Bar	**777-Z10W-200**	**777-Z10W-200-B**	1 x
18-way, Z Bus Bar	**777-Z18W-200**	**777-Z18W-200-B**	1.5 x

* See page 33 for Footprint details



Cable Entry Same Side

Cable Entry Both Sides
(Rotate Top Bar 180°)

Related Products



Pro Installer Link Bars
page 37

Pro Installer ANL Fuse Holders

These ANL fuse holders offer unparalleled circuit protection choice for both the installer and end-user. The innovative Through-Panel fuse holder (778-ANLTP) provides superior access for fuse inspection and replacement. Small electrical loads are catered to with the compact 778-ANL unit while additional cable security and highest capacity is provided by the 778-ANL-2S, featuring additional studs for separate clamping of cables.

Specifications:

- Cable connection studs: 8 mm (5/16") studs on 778-ANL, 10 mm (3/8") studs on 778-ANL-TP and 778-ANL-2S
- Fuse mounting studs: 8 mm (5/16")
- Double washers allow any ANL fuse brand to be fitted
- Fuse type: ANL or ANN (fast blow)
- Swinging fuse style allows changing fuse without removal of fastening nuts
- Amperage: determined by fuse sizing, 778-ANL: 35-300A, 778-ANL2S: 35-750A, 778-ANLTP, 35-500A
- 50V DC
- Tinned CDA102 copper conductors 778-ANL-2S
- Tinned CDA260 high conductivity brass conductors 778-ANLTP



Description	Part #	OEM #	Footprint*
Fuse Holder, ANL	**778-ANL**	**778-ANL-B**	1 x
Fuse Holder, ANL with additional cable clamping studs	**778-ANL2S**	**778-ANL2S-B**	1.5 x
ANL Through Panel	**778-ANLTP**	**778-ANLTP-B**	1 x

* See page 33 for Footprint details

Related Products



Pro Installer Link Bars page 37



ANL Fuses page 46

Pro Installer Class-T Fuse Holders

Class-T fusing provides the ultimate protection for high power circuits, and where extremely fast fuse blow characteristics are required. Modern battery technologies such as Mastervolt Lithium Ion or AGM are capable of very high short circuit currents which may be beyond the interrupt rating of standard circuit breakers and other types of fuse. Two sizes of Pro Installer Class-T Fuse Holder are available which accommodate fuses from 225-400A, and 450-600A respectively.

Specifications:

- Cable connection studs: 10 mm (3/8") studs
- Fuse mounting studs: 10 mm (3/8") 225-400A holder, 12 mm (1/2") 450-600A holder
- Fuse type: Class-T (JLLN / TJN / A3T)
- Maximum amperage: Determined by fuse sizing, either 400A or 600A
- 50V DC
- High temperature, fiber reinforced plastic base provides strength and chemical resistance
- Clear polycarbonate cover
- Tinned CDA102 Copper conductors
- Stainless steel studs, washers and nuts for longevity in the marine environment
- Metric threads



Description	Part #	OEM #	Footprint*
Fuse Holder, Class-T 225–400A	**778-T2S-400**	**778-T2S-400-B**	1.5 x
Fuse Holder, Class-T 450–600A	**778-T2S-600**	**778-T2S-600-B**	1.5 x

* See page 33 for Footprint details

Related Products



Pro Installer Link Bars page 37



Class T Fuses page 46

Pro Installer Insulated Studs

Pro Installer Insulated studs are available in single and twin stud versions, featuring 8 mm (5/16") and 10 mm (3/8") variants. A double stud version with 10 mm and 8 mm studs is also included for extending outboard motor cables. The Power Tapping Plate single stud models provide convenient termination points for additional small cables. Pro Installer family features are replicated with these insulated studs, generous stud length, modular footprint, insulating covers with label recess, and common interconnection height.

Specifications:

- Power tapping plate: 4x 4 mm (5/16") terminals
- Maximum current through power tapping plate: 50A per terminal (4x 50A maximum)
- Note: no power passes through the stud so no amp rating is given 50V DC
- High temperature, fiber reinforced plastic base provides strength and chemical resistance
- Clear polycarbonate cover with snap-out extra cable access
- Stainless steel studs, screws and nuts for longevity in the marine environment
- Insert moulded studs with metric threads
- Double studs feature 'snap out' insulating partition, to allow linking of studs

Description	Part #	OEM #	Footprint*
Single 8 mm	IST-8MM-1S	IST-8MM-1S-B	0.5 x
Double 8 mm	IST-8MM-2S	IST-8MM-2S-B	0.5 x
Double 10 mm / 8 mm	IST-10MM-8MM	IST-10MM-8MM-B	0.5 x
Single 10 mm	IST-10MM-1S	IST-10MM-1S-B	0.5 x
Double 10 mm	IST-10MM-2S	IST-10MM-2S-B	0.5 x
Single 8 mm with power Tapping Plate	IST-8MM-1SPT	IST-8MM-1SPT-B	0.5 x
Single 10 mm with power Tapping Plate	IST-10MM-1SPT	IST-10MM-1SPT-B	0.5 x

* See page 33 for Footprint details

Related Products



Pro Installer Link Bars page 37



IST-8MM-1S



IST-8MM-2S



IST-10MM-8MM



IST-10MM-1S



IST-10MM-2S



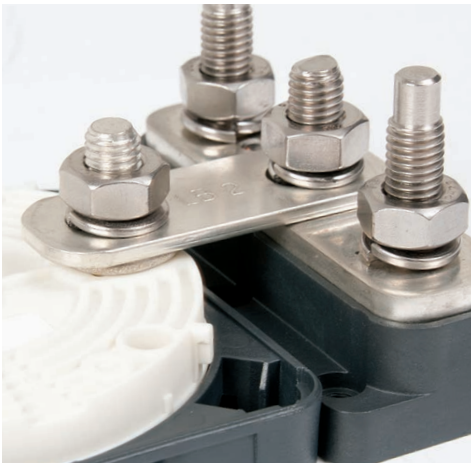
IST-8MM-1SPT



IST-10MM-1SPT

Pro Installer Link Bars

- A range of linking bars to complement the Pro Installer range of products
- High purity copper, tin plated for optimum marine electrical performance
- Fastest, most economic way of connecting products
- Saves space, allows clustering for the most compact installations
- Links can be doubled for higher loads



Chosing a Link Bar

Step 1: Use selection guide below to determine the correct link bar.

Step 2: If multiple opitons exist, see diagrams for layout options on page 39.

Step 3: Find the part number in the specifications table on page 38.

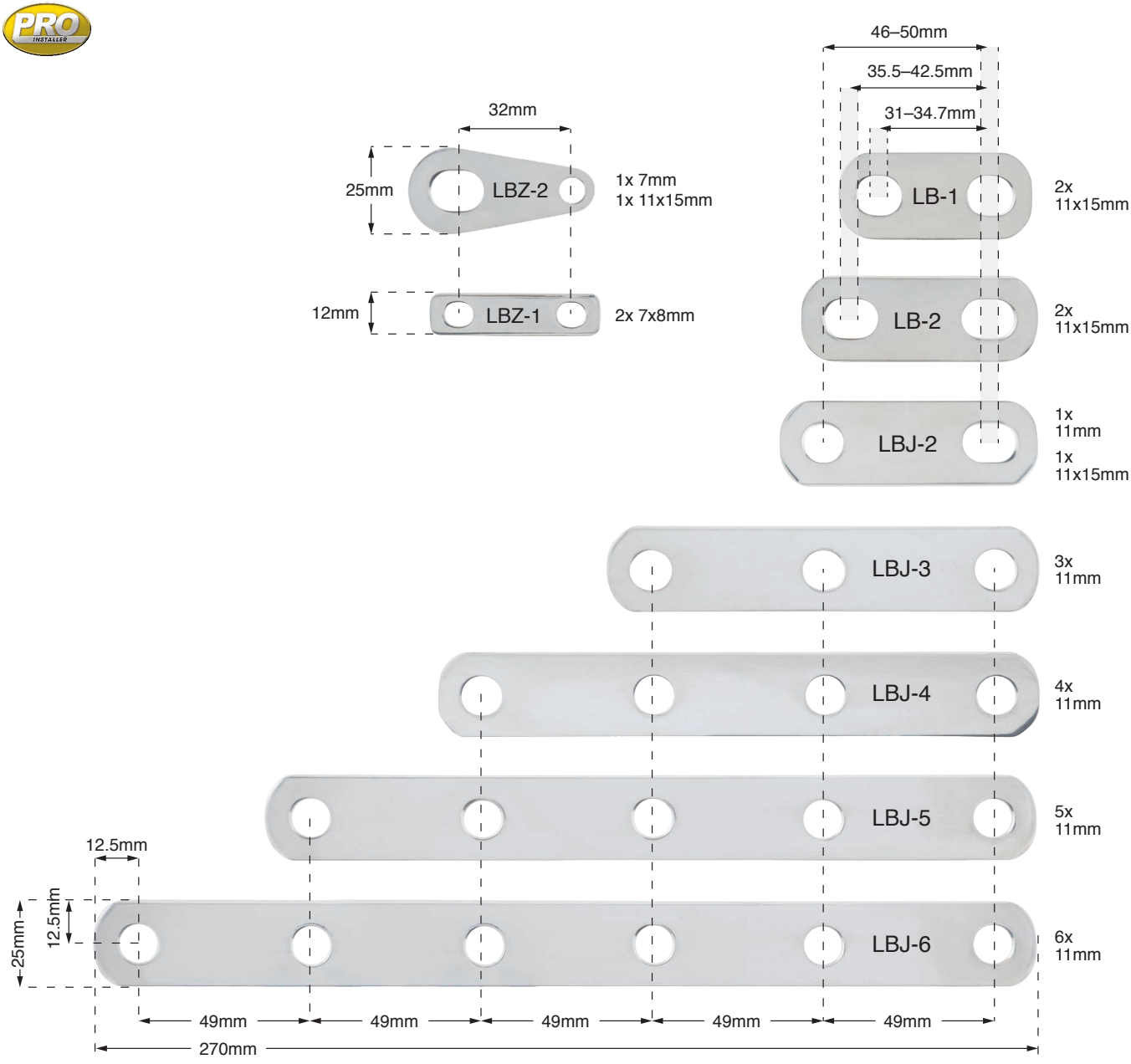
Linking Selection Guide

	3, 4, 5, & 8 Stud Heavy Duty Bus Bars	10 & 18 Way Z Bus Bars	778-ANL Fuse Holder	ANL Through Panel Fuse Holder	ANL & Class T Double Stud Fuse Holders	Single Insulated Studs	Double Insulated Studs	EZ Mount Battery Switch On/Off
Bus Bars								
3, 4, 5, & 8 Stud Heavy Duty Bus Bars	LB-1	LBZ-2	LB-1	—	LB-1 (4 Stud Gap)	LB-2	S:E LB-1 Gap LB-1	O: LB-2 C: LB-1
10 & 18 Way Z Bus Bars	LBZ-2	LBZ-1	LBZ-2	—	LBZ-2	—	Gap LBZ-2	LBZ-2
Fuse Holders								
778-ANL Fuse Holder	LB-1	LBZ-2	LB-2	—	LB-1	LB-2	S:E LB-1 Gap LB-1	O: LB-2 C: LB-1
ANL Through Panel Fuse Holder	—	—	—	LB-2	—	—	—	—
ANL & Class T Double Stud Fuse Holders	LB-1	LBZ-2	LB-1	—	LB-1	LB-2	S:E LB-1 Gap LB-1	O: LB-2 C: LB-1
Insulated Studs								
Single Insulated Studs	LB-2	—	LB-2	—	LB-2	LBJ-2	LB-1	LBJ-2 C: LB-2
Double Insulated Studs	S:E LB-1 Gap LB-1	Gap LBZ-2	S:E LB-1 Gap LB-1	—	S:E LB-1 Gap LB-1	LB-1	S:S LBJ-2 Gap LB-1	O: LB-1 C: Gap LB-1
EZ Mount Battery Switches								
EZ Mount Battery Switch On/Off	O: LB-2 C: LB-1	LBZ-2	O: LB-2 C: LB-1	—	O: LB-2 C: LB-1	O: LBJ-2 C: LB-2	O: LB-1 C: Gap LB-1	LB-1
EZ Mount Selector Battery Switch -"Battery" Studs	LB-2 (4 Stud LB-1)	LBZ-2	LB-2	—	O: LB-1 C: LB-2	LBJ-2	LB-1	—
EZ Mount Selector Battery Switch -"Common" Stud	O: LB-2 C: LB-1	LBZ-2	O: LB-2 C: LB-1	—	O: LB-2 C: LB-1	O: LBJ-2 C: LB-2	O: LB-1 C: Gap LB-1	—
EZ Mount Double Pole/ Dual Bank Control	O: LB-2 C: LB-1	—	O: LB-2 C: LB-1	—	O: LB-2 C: LB-1	O or C: LB-1	O: LBJ-2 C: LBJ-2	LB-2

Side to Side Joining Selection Guide

	Marking
Joining 2 products	LBJ-2
Joining 3 products	LBJ-3
Joining 4 products	LBJ-4
Joining 5 products	LBJ-5
Joining 6 products	LBJ-6

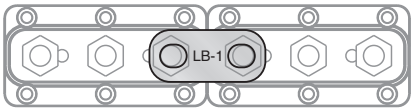
Pro Installer Link Bars



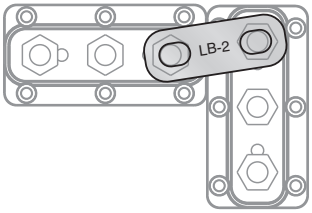
Specifications

Marking	OEM #	Pkg Qty	Description	Function	Max. Amps	L x W	L x W
LB-1	**779-LB-1-B**	5	Link Bar 31-34.7 mm	Short Link Bar 8 & 10 mm studs	650A	2.2" x 1.0"	56 x 25 mm
LB-2	**779-LB-2-B**	5	Link Bar 35.5-42.5 mm	Medium Link Bar 8 & 10 mm studs	650A	2.8" x 1.0"	69 x 25 mm
LBJ-2	**779-LBJ-2-B**	1	Joiner 2-way 46-50 mm	Long Link Bar 8 & 10 mm studs	650A	3.0" x 1.0"	74 x 25 mm
	779-LBJ-2-B5	5					
LBZ-1	**779-LBZ-1-B**	5	Link Z Bar to Z Bar	Joins Z Bars End to End, Back to Back	250A	2.0" x 0.5"	49 x 12 mm
LBZ-2	**779-LBZ-2-B**	5	Link Z Bar to Bus Bar or F-holder	Joins Z Bars to Bus Bars or F-holders	400A	2.1" x 1.0"	53 x 25 mm
LBJ-3	**779-LBJ-3-B**	1	Joiner 3-way	Side to Side joiner 3 products	525A	4.9" x 1.0"	123 x 25 mm
LBJ-4	**779-LBJ-4-B**	1	Joiner 4-way	Side to Side joiner 4 products	450A	6.9" x 1.0"	172 x 25 mm
LBJ-5	**779-LBJ-5-B**	1	Joiner 5-way	Side to Side joiner 5 products	400A	8.8" x 1.0"	221 x 25 mm
LBJ-6	**779-LBJ-6-B**	1	Joiner 6-way	Side to Side joiner 6 products	350A	10.8" x 1.0"	270 x 25 mm

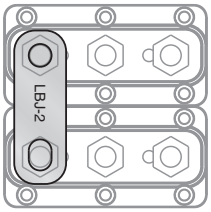
Diagrams



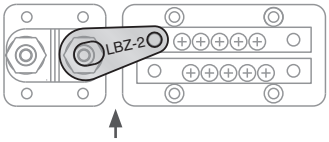
E:E End to End linking



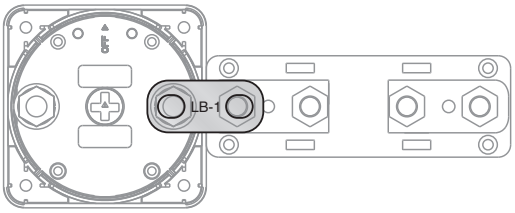
S:E Side to End linking



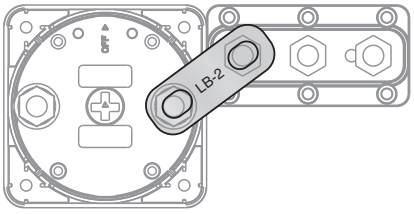
S:S Side to Side joining



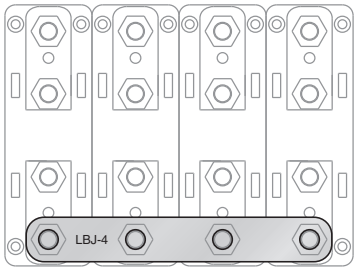
Gap For small gaps between products



C: Centerline linking



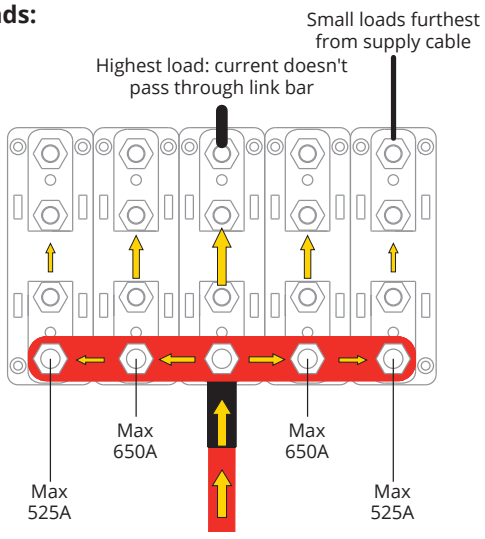
O: Offset linking



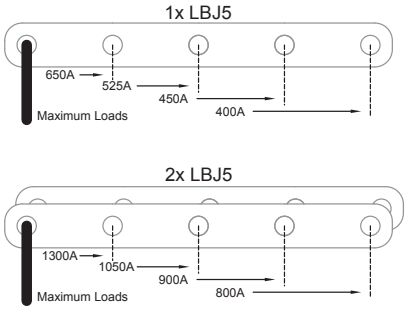
Joining

Best Electrical Practice for High Loads:

- Supply power to the center of link bars or bus bars to balance loads
- Connect highest loads directly/closest to the supply cable



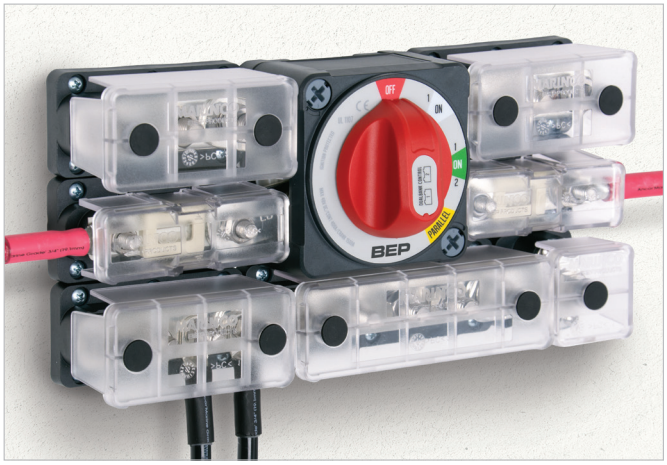
Note: Link bars can be doubled to increase load capacity

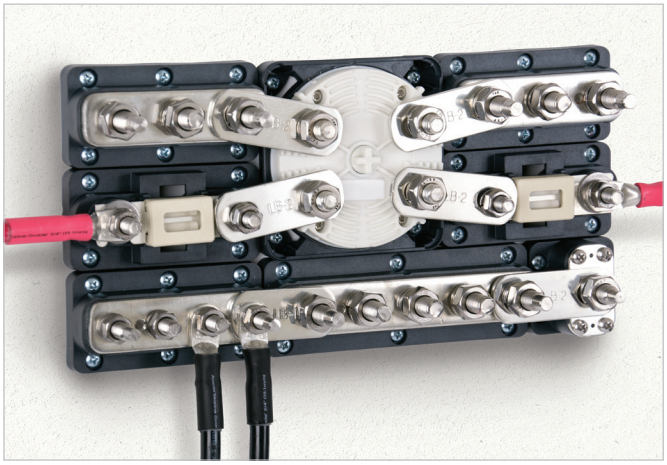


Pro Installer Clusters

Example shown below using Pro Installer distribution components, link bars and the award winning EZ-Mount Battery Switch (page 14).

- Saves time
- Saves space
- Eliminates the need for jumper wires between products
- Common Interconnection heights allow “clustering” utilizing solid link bars
- Customize clusters for your application





Insulated Studs & Covers

- Made with high temperature plastic bases
- Dual studs ideal for +ve / -ve connections, branch circuits, windlass or inverter installations.
- Stud covers push securely over the threaded stud covering to ABYC standards
- Covers supplied with display versions.


IS-6MM-1


IS-10MM-1


IS-10MM-1R


IS-6MM-2


IS-10MM-2


IS-10MM-2/L

Single Studs

Part #	OEM #	Stud Size	Polarity
IS-6MM-1R/DSP*	**IS-6MM-1R**	1/4" (6 mm)	Positive
IS-6MM-1/DSP*	**IS-6MM-1**	1/4" (6 mm)	Negative
—	**IS-8MM-1**	5/16" (8 mm)	Negative
—	**IS-10MM-1R**	3/8" (10 mm)	Positive
—	**IS-10MM-1**	3/8" (10 mm)	Negative

*Part #'s come with cover, OEM #'s do not.

Dual Studs

Part #	OEM #	Stud Size
IS-6MM-2/DSP*	IS-6MM-2	2x 1/4" (6 mm)
—	IS-10MM-2	2x 3/8" (10 mm)
—	IS-10MM-2/L	2x 3/8" (10 mm) with link plate
—	IS-10MM-8MM	1x 3/8" (10 mm), 1x 5/16" (8 mm)

*Part #'s come with cover, OEM #'s do not.

Covers

Part #	Description	Color
ISC-6-2	Double 6 mm	black
ISC-6-2R	Double 6 mm	red
ISC-10BK	Single 10 mm	black
ISC-10R	Single 10 mm	red


ISC-10BK

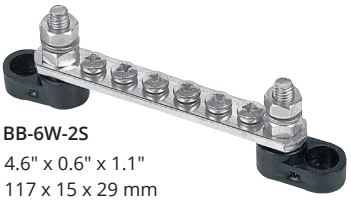
ISC-10R


ISC-6-2

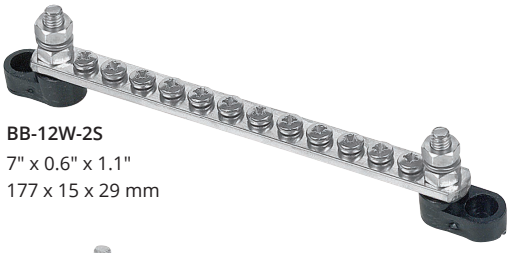
ISC-6-2R

Bus Bars

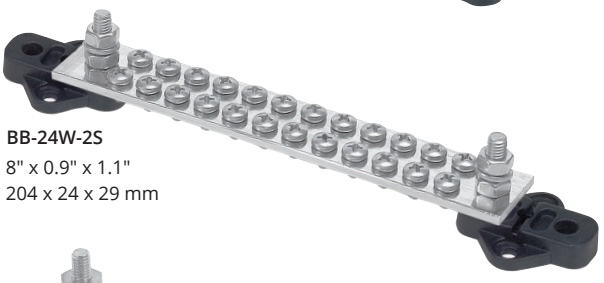
- Now with easy-fit covers to ABYC standards, with polarity ID
- 5/32" (4 mm) stainless steel screws with shakeproof washers
- 2 x 1/4" (6 mm) input studs
- Tin-plated, brass-insulated mounting bases with recessed mounting holes to avoid accidental shorts on aluminum surfaces
- Supplied standard with all BEP AC & DC control panels
- Display pack versions supplied with cover



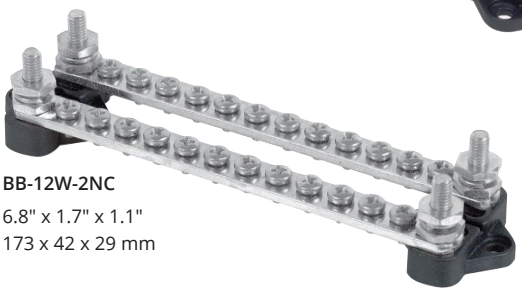
BB-6W-2S
4.6" x 0.6" x 1.1"
117 x 15 x 29 mm



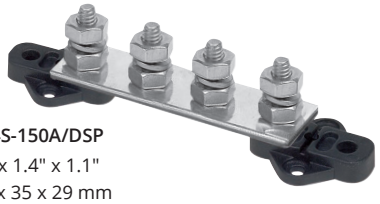
BB-12W-2S
7" x 0.6" x 1.1"
177 x 15 x 29 mm



BB-24W-2S
8" x 0.9" x 1.1"
204 x 24 x 29 mm



BB-12W-2NC
6.8" x 1.7" x 1.1"
173 x 42 x 29 mm



BB-4S-150A/DSP
5.4" x 1.4" x 1.1"
138 x 35 x 29 mm

Part #	OEM #	Bus Type	Output screws	Input studs	Rating
BB-6W-2S/DSP	BB-6W-2S	Single	6	2	100A
BB-12W-2S/DSP	BB-12W-2S	Single	12	2	100A
BB-24W-2S/DSP	BB-24W-2S	Single	24	2	150A
BB-12W-2NC/DSP	BB-12W-2NC	Double	2 x 12	2 x 12-way	100A
BB-4S-150A/DSP	BB-4S-150A	4-way	1 x 4	4 x 6 mm (1/4 stud)	150A

Bus Bar Covers

- Flame-resistant flexible plastic
- Color-coded for polarity
- Unique push-on fit
- Supplied standard with bus bars when ordered in display packs (for bulk packaging ordered separately)



6 W
BBC-6WR Positive
BBC-6WBK Negative



12 W
BBC-12WR Positive
BBC-12WBK Negative



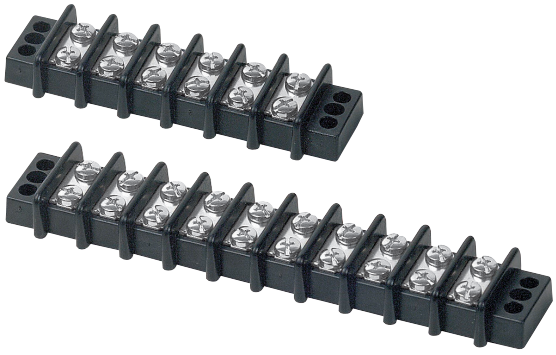
24 W
BBC-24WR Positive
BBC-24WBK Negative

Terminal Blocks

Ideal for isolated connections up to 30A. Suitable for connecting tails from AC and DC panels.

Base material: Phenolic; Current rating 30A; Max. voltage rating: 300V AC/DC; Screw size: 0.25" (6.3 mm)

TB-118-6P 6 connections
TB-118-10P 10 connections



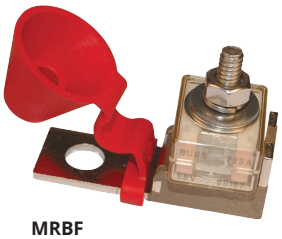
Marine Rated Battery Fuse

Features:

- Weatherpoof IP66 design *(see inside back cover)*
- Compact heavy duty protection
- Insulated cap to prevent short circuit
- Ignition Protected
- Easy installation
- Suitable for high capacity battery banks

Specifications:

- **Voltage Rating:** 58V DC Maximum
- **Amperage Rating:** 30A - 300A
- **Ingress Protection:** IP66
- **Ignition Protected:** Per SAEJ1117



MRBF
Terminal mount heavy-duty fuse holder and cover



Rating (A)	Qty/ Pkg	Part #	OEM #
50	1	MRBF-50A	MRBF-50A-B
80	1	MRBF-80A	MRBF-80A-B
100	1	MRBF-100A	MRBF-100A-B
125	1	MRBF-125A	MRBF-125A-B

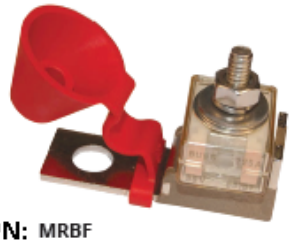
Marine Rated Battery Fuse

Features:

- Weatherpoof IP66 design *(see inside back cover)*
- Compact heavy duty protection
- Insulated cap to prevent short circuit
- Ignition Protected
- Easy installation
- Suitable for high capacity battery banks

Specifications:

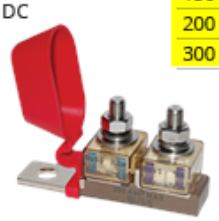
- **Voltage Rating:** 58V DC Maximum
- **Amperage Rating:** 30A - 300A
- **Ingress Protection:** IP66
- **Ignition Protected:** Per SAEJ1117
- **Interrupt Rating:** 10000A @ 14V DC, 5000A @ 32V DC, 2000A @ 58V DC
- **Torque Rating:** Maximum 12Nm (106 in-lbs)
- **Material:** Body – Ceramic, Housing & Cover: UL-rated 94V0
- Thermoplastic, Ring Terminals - Tin Plated
- **Compliances:** ISO 8820-6
- Available in other sizes upon request, from 30–300A



PN: **MRBF**
Terminal mount heavy-duty fuse holder and cover



Rating (A)	Qty/ Pkg	Part #
50	1	MRBF-50A
80	1	MRBF-80A
100	1	MRBF-100A
125	1	MRBF-125A
150	1	MRBF-150A
200	1	MRBF-200A
300	1	MRBF-300A



PN: MRBF-DUAL

Specifications:

- **Rating:** 25-200A, 48V DC
- **Interrupt Rating:** Main Breaker Protection Interrupt Rating (5,000A@ 14V DC, 3,000A@ 28V DC and 1,500A@ 48V DC)
- **Operating Temperature Rating:** -40°F (-40°C) to 185°F (85°C)
- **Storage Temperature Rating:** -40°F (-40°C) to 260°F (125°C)
- **Materials:** Black UL-rated 94V0 thermoset plastic body
- Cover and lever are UL-rated 94V0 thermoplastic
- **Marking:** Standard marking includes amp/volt ratings
- **Termination:** 5/16-18 threaded studs
- **Torque Rating:** 75 in-lbs (8.5Nm) max
- **Mounting Torque Rating:** Panel or surface-mount options; 50 in-lbs (5.6 Nm) max
- **Ingress Protection Rating:** IP66
- **Compliances:** ABYC E-11; CE; SAE J1171 (ignition protected)
- Available in other sizes upon request, from 25–150A



MRCBF-200A



MRCBP-200A

Mounting	Rating (A)	Part #	OEM #
Surface	200	MRCBF-200A	MRCBF-200A-B
Panel	200	MRCBP-200A	MRCBP-200A-B

Wire & Cable Technical Data

Conductors Sized (AWG) for 3% Voltage Drop

Use 3% voltage drop for any "critical application" affecting the safety of the vessel or its passengers: bilge pumps, navigation lights, electronics, etc....

Important!

Length (feet): Determined by measuring the length of the conductor from the positive (+) power source connection to the electrical device and back to the negative (-) power source connection. Note that the power source connection may be either the battery, panelboard or switchboard.

Current (amps): Determined by adding the total amps on a circuit. Conductor sizes not covered in Table B or Table C may be calculated by using the following formula:

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

After calculating the Circular Mil Area (CM), use Table E to determine the proper conductor size (National Fire Protection Agency and Coast Guard require that the next larger conductor be used when the calculated CM area falls between the two conductor sizes).

CM = Circular Mil Area of Conductors

K = 10.75 (Constant representing the mil-foot resistance of copper)

I = Current - amps / **L** = Length - feet

E = Voltage drop at load (in voltage drop in a decimal expression)

For Example...

Q: A bilge pump draws 10 amps. The positive run is 11 feet from the power panel, including the float switch. The negative run is only 10 feet. What size is the wire?

A: Use the formula to reach the correct answer:

Table D shows that 12 AWG wire has a CM area of 6,500 and is the correct choice. However, SAE wire has a CM area of only 5,833. Under NFPA and USCG regulations, 10 SAE wire must be used.

3% Voltage Drop at 12 Volts

		Current (Amps)												
Length		5	10	15	20	25	30	40	50	60	70	80	90	100
10'	3 m	18	14	12	10	10	8	6	6	6	6	6	4	4
15'	5 m	16	12	10	10	8	8	6	6	4	4	4	2	2
20'	6 m	14	10	10	8	6	6	6	4	4	2	2	2	2
25'	8 m	12	10	8	6	6	6	4	4	2	2	2	1	1
30'	9 m	12	10	8	6	4	4	4	2	2	2	2	1	1
40'	12 m	10	8	6	6	4	4	2	2	1	1/0	1/0	2/0	2/0
50'	15 m	10	6	6	4	4	2	2	1	1/0	2/0	3/0	4/0	4/0
60'	18 m	10	6	6	4	2	2	1	1/0	2/0	3/0	3/0	4/0	4/0
70'	21 m	8	6	4	2	2	1	1/0	2/0	3/0	3/0	4/0	4/0	
80'	24 m	8	6	4	2	2	1	1/0	2/0	3/0	4/0	4/0		
90'	27 m	8	4	2	2	1	1/0	2/0	3/0	4/0	4/0			
100'	30 m	6	4	2	2	1	1/0	2/0	3/0	4/0				
110'	33 m	6	4	2	2	1	1/0	2/0	3/0	4/0				
120'	36 m	6	4	2	1	1/0	2/0	3/0	4/0					
130'	40 m	6	2	2	1	1/0	2/0	3/0	4/0					
140'	43 m	6	2	2	1/0	2/0	3/0	4/0						
150'	46 m	6	2	1	1/0	2/0	3/0	4/0						
160'	49 m	6	2	1	1/0	2/0	3/0	4/0						
170'	52 m	6	2	1	2/0	3/0	3/0	4/0						

3% Voltage Drop at 24 Volts

		Current (Amps)												
Length		5	10	15	20	25	30	40	50	60	70	80	90	100
10'	3 m	18	18	16	14	12	12	10	10	10	8	8	8	6
15'	5 m	18	16	14	12	12	10	10	8	8	6	6	6	6
20'	6 m	18	14	12	10	10	10	8	6	6	6	6	4	4
25'	8 m	16	12	12	10	10	8	6	6	6	4	4	4	4
30'	9 m	16	12	10	10	8	8	6	6	4	4	4	2	2
40'	12 m	14	10	10	8	6	6	6	4	4	2	2	2	2
50'	15 m	12	10	8	6	6	6	4	4	2	2	2	1	1
60'	18 m	12	10	8	6	6	4	4	2	2	1	1	1/0	1/0
70'	21 m	12	8	6	6	4	4	2	2	1	1	1/0	1/0	2/0
80'	24 m	10	8	6	6	4	4	2	2	1	1/0	1/0	2/0	2/0
90'	27 m	10	8	6	4	4	2	2	1	1/0	1/0	2/0	2/0	3/0
100'	30 m	10	6	6	4	4	2	2	1	1/0	2/0	2/0	3/0	3/0
110'	33 m	10	6	6	4	2	2	1	1/0	1/0	2/0	3/0	3/0	4/0
120'	36 m	10	6	4	4	2	2	1	1/0	2/0	3/0	3/0	4/0	4/0
130'	40 m	8	6	4	2	2	2	1	1/0	2/0	3/0	3/0	4/0	4/0
140'	43 m	8	6	4	2	2	1	1/0	2/0	3/0	3/0	4/0	4/0	
150'	46 m	8	6	4	2	2	1	1/0	2/0	3/0	3/0	4/0	4/0	
160'	49 m	8	6	4	2	2	1	1/0	2/0	3/0	4/0	4/0	4/0	
170'	52 m	8	6	2	2	1	1	2/0	3/0	3/0	4/0	4/0		

3% Voltage Drop at 32 Volts

		Current (Amps)												
Length		5	10	15	20	25	30	40	50	60	70	80	90	100
10'	3 m	18	18	16	16	14	14	12	12	10	10	10	8	8
15'	5 m	18	16	14	14	12	12	10	10	8	8	8	6	6
20'	6 m	18	16	12	12	12	10	10	8	8	6	6	6	6
25'	8 m	18	14	12	12	10	10	8	8	6	6	6	6	4
30'	9 m	16	14	10	10	10	8	8	6	6	6	4	4	4
40'	12 m	16	12	10	10	8	8	6	6	4	4	4	2	2
50'	15 m	14	12	8	8	8	6	6	4	4	2	2	2	2
60'	18 m	14	10	8	8	6	6	4	4	2	2	2	2	1
70'	21 m	12	10	6	6	6	6	4	2	2	2	1	1	0
80'	24 m	12	10	6	6	6	4	4	2	2	1	1	0	0
90'	27 m	12	8	6	6	6	4	2	2	2	1	1/0	1/0	2/0
100'	30 m	12	8	6	6	4	4	2	2	1	1/0	1/0	2/0	2/0
110'	33 m	10	8	6	6	4	4	2	2	1	1/0	1/0	2/0	2/0
120'	36 m	10	8	6	4	4	2	2	1	1/0	1/0	2/0	2/0	3/0
130'	40 m	10	8	6	4	4	2	2	1	1/0	2/0	2/0	3/0	3/0
140'	43 m	10	6	6	4	2	2	1	1/0	1/0	2/0	3/0	3/0	3/0
150'	46 m	10	6	6	4	2	1	1	1/0	2/0	2/0	3/0	3/0	4/0
160'	49 m	10	6	4	4	2	1	1	1/0	2/0	3/0	3/0	4/0	4/0
170'	52 m	8	6	4	2	2	1	1	1/0	2/0	3/0	3/0	4/0	4/0

Wire & Cable Technical Data

Conductors Sized (AWG) for 10% Voltage Drop

Use 10% voltage drop for any "non-critical" applications: windlass, cabin lights, etc....

10% Voltage Drop at 12 Volts

		Current (Amps)												
Length		5	10	15	20	25	30	40	50	60	70	80	90	100
10'	3 m	18	18	18	16	16	14	14	12	12	10	10	10	10
15'	5 m	18	18	16	14	14	12	12	10	10	8	8	8	8
20'	6 m	18	16	14	14	12	12	10	10	8	8	8	6	6
25'	8 m	18	16	14	12	12	10	10	8	8	6	6	6	6
30'	9 m	18	14	12	12	10	10	8	8	6	6	6	6	4
40'	12 m	16	14	12	10	10	8	8	6	6	6	4	4	4
50'	15 m	16	12	10	10	8	8	6	6	4	4	4	2	2
60'	18 m	14	12	10	8	8	6	6	4	4	2	2	2	2
70'	21 m	14	10	8	8	6	6	6	4	2	2	2	2	1
80'	24 m	14	10	8	8	6	6	4	4	2	2	2	1	1
90'	27 m	12	10	8	6	6	6	4	2	2	2	1	1	1/0
100'	30 m	12	10	8	6	6	4	4	2	2	1	1	1/0	1/0
110'	33 m	12	8	8	6	6	4	2	2	2	1	1/0	1/0	1/0
120'	36 m	12	8	6	6	4	4	2	2	1	1	1/0	1/0	2/0
130'	40 m	12	8	6	6	4	4	2	2	1	1/0	1/0	2/0	2/0
140'	43 m	10	8	6	6	4	2	2	1	1	1/0	2/0	2/0	2/0
150'	46 m	10	8	6	4	4	2	2	1	1/0	1/0	2/0	2/0	3/0
160'	49 m	10	8	6	4	4	2	2	1	1/0	2/0	2/0	3/0	3/0
170'	52 m	10	6	6	4	2	2	2	1	1/0	2/0	2/0	3/0	3/0

10% Voltage Drop at 24 Volts

		Current (Amps)												
Length		5	10	15	20	25	30	40	50	60	70	80	90	100
10'	3 m	18	18	18	18	18	18	16	16	14	14	14	12	12
15'	5 m	18	18	18	18	16	16	14	14	12	12	12	10	10
20'	6 m	18	18	18	16	16	14	14	12	12	10	10	10	10
25'	8 m	18	18	16	16	14	14	12	12	10	10	10	8	8
30'	9 m	18	18	16	14	14	12	12	10	10	8	8	8	8
40'	12 m	18	16	14	14	12	12	10	10	8	8	8	6	6
50'	15 m	18	16	14	12	12	10	10	8	8	6	6	6	6
60'	18 m	18	14	12	12	10	10	8	8	6	6	6	6	4
70'	21 m	16	14	12	10	10	8	8	6	6	6	6	4	4
80'	24 m	16	14	12	10	10	8	8	6	6	6	4	4	4
90'	27 m	16	12	10	10	8	8	6	6	6	4	4	4	2
100'	30 m	16	12	10	10	8	8	6	6	4	4	4	2	2
110'	33 m	14	12	10	8	8	8	6	6	4	4	2	2	2
120'	36 m	14	12	10	8	8	6	6	4	4	2	2	2	2
130'	40 m	14	12	10	8	8	6	6	4	4	2	2	2	2
140'	43 m	14	10	8	8	6	6	6	4	2	2	2	2	1
150'	46 m	14	10	8	8	6	6	4	4	2	2	2	2	1
160'	49 m	14	10	8	8	6	6	4	4	2	2	2	1	1
170'	52 m	12	10	8	6	6	6	4	2	2	2	2	1	1

10% Voltage Drop at 32 Volts

		Current (Amps)												
Length		5	10	15	20	25	30	40	50	60	70	80	90	100
10'	3 m	18	18	18	18	18	18	18	16	16	14	14	14	14
15'	5 m	18	18	18	18	18	18	16	14	14	14	12	12	12
20'	6 m	18	18	18	18	16	16	14	14	12	12	12	10	10
25'	8 m	18	18	18	16	16	14	14	12	12	10	10	10	10
30'	9 m	18	18	18	16	14	14	12	14	10	10	10	10	8
40'	12 m	18	18	16	14	14	12	12	10	10	8	8	8	8
50'	15 m	18	16	14	14	12	12	10	10	8	8	8	6	6
60'	18 m	18	16	14	12	12	10	10	8	8	8	6	6	6
70'	21 m	18	14	14	12	10	10	8	8	8	6	6	6	6
80'	24 m	18	14	12	12	10	10	8	8	6	6	6	6	4
90'	27 m	18	14	12	10	10	10	8	6	6	6	6	4	4
100'	30 m	16	14	12	10	10	8	8	6	6	6	4	4	4
110'	33 m	16	14	12	10	10	8	8	6	6	6	4	4	4
120'	36 m	16	12	10	10	8	8	6	6	6	4	4	4	2
130'	40 m	16	12	10	10	8	8	6	6	6	4	4	2	2
140'	43 m	14	12	10	8	8	8	6	6	4	4	2	2	2
150'	46 m	14	12	10	8	8	6	6	6	4	4	2	2	2
160'	49 m	14	12	10	8	8	6	6	4	4	2	2	2	2
170'	52 m	14	12	10	8	8	6	6	4	4	2	2	2	2

Wire & Cable Technical Data

Conductor Sizes

AWG	mm²	AWG CM area	SAE CM area	Ampacity Engine Space Outside	Inside
18	0.8	1,600	1,537	20	17
16	1	2,600	2,336	25	21
14	2	4,100	3,702	35	30
12	3	6,500	5,833	45	38
10	5	10,500	9,343	60	51
8	8	16,800	14,810	80	68
6	13	26,600	24,538	120	102
4	21	42,000	37,360	160	136
2	34	66,500	62,450	210	178
1	42	83,690	77,790	245	208
1/0	53	105,600	98,980	285	242
2/0	68	133,100	125,100	330	280
3/0	85	167,800	158,600	385	327
4/0	107	211,600	205,500	445	378

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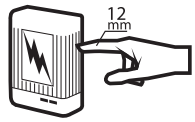
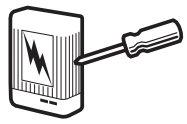
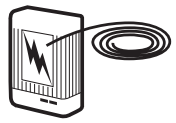
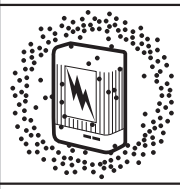
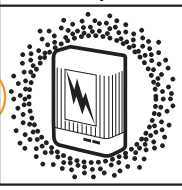
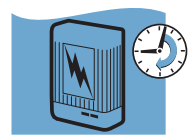
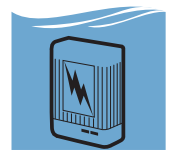
Ingress Protection (IP) Ratings Guide

Example:
An IP65 rating can be determined using the adjacent table and example:

- The first number of the rating example, 6, in the gray column means the enclosure is dust tight
- The second number of the rating example, 5, in the blue column means the enclosure is protected against jets of water

The IP rating system was established by the International Electrotechnical Commission (IEC), an organization for international standards and conformity assessment. The IEC collaborates closely with the International Organization for Standardization (ISO). A complete description of the IP ratings and associated tests is found in IEC Publication 529. Although these ratings were initially developed as a way to classify enclosures, they now provide a convenient, practical way to compare levels of sealing. Many electrical products have an Ingress Protection (IP) rating which identifies the environmental factors needing consideration prior to the product's installation.

This is important when deciding when to mount products in a dry and clean environment versus a wet and/or dusty environment. The IP rating indicates the degree of protection provided. The numbers following IP represent levels of sealing and can range from no protection to full protection against dust and water. The table provides a description of the protection at each level.

	SOLIDS	WATER
1	 Protected against a solid object greater than 50 mm such as a hand.	 Protected against vertically falling drops of water. Limited ingress permitted.
2	 Protected against a solid object greater than 12 mm such as a finger.	 Protected against vertically falling drops of water with enclosure tilted up to 15 degrees from the vertical. Limited ingress permitted.
3	 Protected against a solid object greater than 2.5 mm such as a screwdriver.	 Protected against sprays of water up to 60 degrees from the vertical. Limited ingress permitted for three minutes.
4	 Protected against a solid object greater than 1 mm such as a wire.	 Protected against water splashed from all directions. Limited ingress permitted.
5	 Dust Protected. Limited ingress of dust permitted. Will not interfere with operation of the equipment. Two to eight hours.	 Protected against jets of water. Limited ingress permitted.
6	 Dust tight. No Ingress of dust. Two to eight hours.	 Water from heavy seas or water projected in powerful jets shall not enter the enclosure in harmful quantities.
7		 Protection against the effects of immersion in water between 15 cm and 1 m for 30 minutes.
8		 Protection against the effects of immersion in water under pressure for long periods.

Rating Example:



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