

Controls and Power Conversion

Construction
Agriculture
Heavy duty trucks

Bus/Coach
Specialty vehicles

Commercial vehicle solutions



EATON

Powering Business Worldwide



Your trusted partner for electrical power chain safety, efficiency, reliability and control

In 2012, Eaton and Cooper united, and now have joined together complementary product lines from both entities to provide complete, reliable and cost effective solutions for commercial vehicle power management and control.

The engineering strength and proven track record of the Eaton, Bussmann, Sure Power and Omnex product portfolio provides customers with the capability to accelerate “smart system” and custom component development resulting in innovative, industry-leading solutions. When Eaton combined those previously distinct product lines, we made it a priority to lower the total cost to the customer by maximizing design, manufacturing and business efficiencies. We wanted to be able to provide an entire system backbone for your commercial vehicle needs.

These combined capabilities deliver leadership in safe, reliable and efficient power conversion and power management solutions while providing our customers with custom-off-the-shelf products to meet their specific needs.

These solutions range from commercial off-the-shelf catalog products to fully customized next generation systems that enable differentiation. With the broad support and tools available within Eaton, continuous new product and technology development offers you a competitive advantage and a technology portfolio that minimizes excessive tooling and time required to produce OEM-specific solutions.

It is our mission to respond completely and uniquely to OEM requirements for cost effective and customizable electronic products and control solutions to help customers optimize their productivity and uptime.

We are experts on the effects of harsh environments relating to temperature extremes, vibration, high moisture, chemicals and transient power fluctuations. We know vehicle power and control systems from the smallest to largest platforms and will partner with you to develop reliable products and system solutions.

Headquartered in Portland, Oregon, Eaton commercial vehicle control solutions has a global manufacturing, sales and engineering presence in North America, Asia, Australia and Europe. Our facilities are ISO 9000-2001 and TS1649 certified to meet the highest quality and environmental standards.

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Power conversion

Conversion, conditioning, balanacing
and battery charging

Eaton's power conversion solutions provide standard and custom products for a wide range of DC to DC conversion, battery equalizer and DC to AC inverter requirements. Exceeding the most stringent performance requirements of military, commercial vehicle, agriculture and construction applications, Eaton provides rugged products that maximize vehicle productivity and useful life.

Power Converters

Eaton standard product and custom developed DC-DC converters provide regulated power directly to accessory or main loads. Eaton DC-DC converters produce 24V power from a 12V source and 12V power from a 24V, 48V and 72V sources.

Features & Benefits

Operating with a typical efficiency of 94%, Eaton DC-DC converters are optimally ruggedized for transportation applications including state of the art vibration, emissions and abnormal use features, such as reverse polarity protection.

Options

Eaton DC-DC converters are designed to meet specific customer requirements including, SAE, ISO, E mark, CE and military standards, as well as application specific environmental requirements.

Standards & Certifications

RoHS, EMI/EMC Compliance



Model	Voltage (input / output)	Output Current	Function	Design Features
12000 Series - UP Converters				
12010C10	12 / 24	10	Converter	Switched output
12025C00	12 / 24	25	Converter	Switched output / available offset output
12040C10	12 / 24	40	Converter	Switched output with offset output
12055C02	12 / 24	55	Converter	12V or 24V selectable input
21000 Series - DOWN Converters				
21005C10	24 / 12	5	Converter	IP 67, RoHS, switched and unswitched output
21008C10	24 / 12	7.5	Converter	IP 67, RoHS, switched and unswitched output
21010C10	24 / 12	10	Converter	IP 67, RoHS, switched and unswitched output
21012C10	24 / 12	12	Converter	IP 67, RoHS, switched and unswitched output
21015C10	24 / 12	15	Converter	IP 67, RoHS, switched and unswitched output
21020C10	24 / 12	20	Converter	IP 67, RoHS, switched and unswitched output
21030C10	24 / 12	30	Converter	IP 67, switched and unswitched output, RoHS
52304	24 / 12	40	Converter	High current converter
21060C00	24 / 12	60	Converter	IP 67, high current converter
21080C00	24 / 12	80	Converter	IP 67, high current converter
21100C00	24 / 12	100	Converter	IP 67, high current converter, RoHS
41020C10	28-70 / 113.5	20	Converter	IP 67, switched output / unswitched 12V output
71030i	57-124 / 13.5	30	Converter	Isolated output / unswitched 12V output
Trail Chargers - TDC/DC Battery Chargers				
11010C11	9-14 / 14	10	Boost Converter	IP 67, temp. compensated output
11020C11	9-14 / 14	20	Boost Converter	IP 67, temp. compensated output
11020CL1	9-14 / 14	20	Boost Converter	IP 67, temp. compensated output, reduced current mode w/lockouts

Series 12000 DC Converter

12010C10

Eaton's 12010 Series DC Converter provides 10A of regulated 24V power from a 12V input. Allowing 24V loads to be powered from a 12V electrical system.

Features & Benefits

- Easily implemented into a system providing 24V power
- Allows use of 24V electrical components in a 12V electrical system providing greater system flexibility
- Clean output power able to power sensitive loads including radios and controllers
- Proven reliability with over 500,000 fielded units

Key Differentiators

- Sealed input and output connectors
- Switched and un-switched outputs
- IP67 Sealing
- EMC performance
- Operation to 85C
- RoHS Compliant
- Output short circuit protection
- Over temperature protection
- Low standby power draw



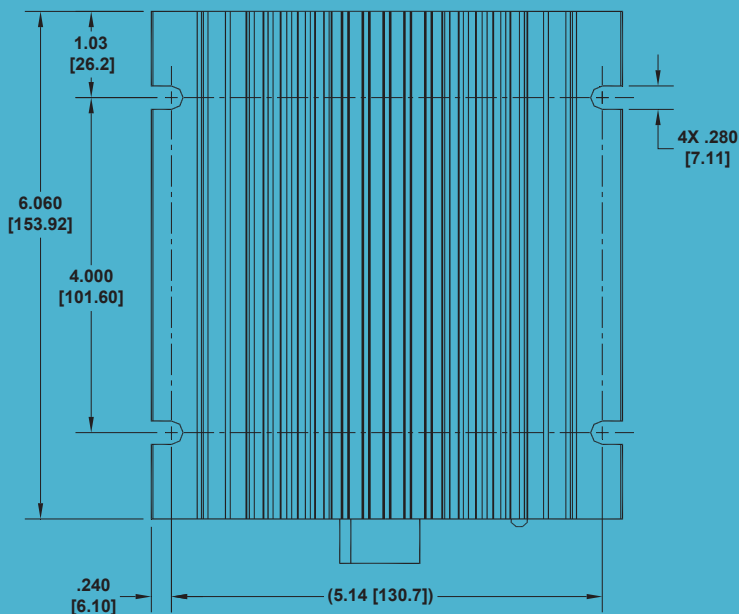
Options

- Deutsch mating connectors
- 10A to 55A models available
- Powder coated housing
- Battery Equalizer with output voltage of twice the input voltage

Standards & Certifications

SAE J1455, J1113, CISPR 25, E mark, RoHS

Dimensions in Inches (mm)



Series 12040 DC Converter

Eaton's 12040 Series DC Converter provides 24V power in a 12V system, which requires 24V power. The 12040 Series DC Converter provides an output current of 40 amps, has an enable turning on the converter and is IP67 sealed.

Features & Benefits

Easily implemented into a system providing 24V power from a 12V input allowing use of 12V and 24V components on a vehicle

Allows use of 24V electrical components in a 12V electrical system providing greater system flexibility

With a low standby current of 0.7mA power is not used by the DC Converter when it is not required.

Clean output power able to power sensitive loads including radios and controllers

Proven reliability with over 200,000 fielded units

Key Differentiators

- IP67 Sealing
- EMC performance
- Operation to 85C
- Output short circuit protection
- Over temperature protection
- Low standby power draw
- Ignition enable
- Terminal cover
- Powder coated housing



Options

10A to 55A models available

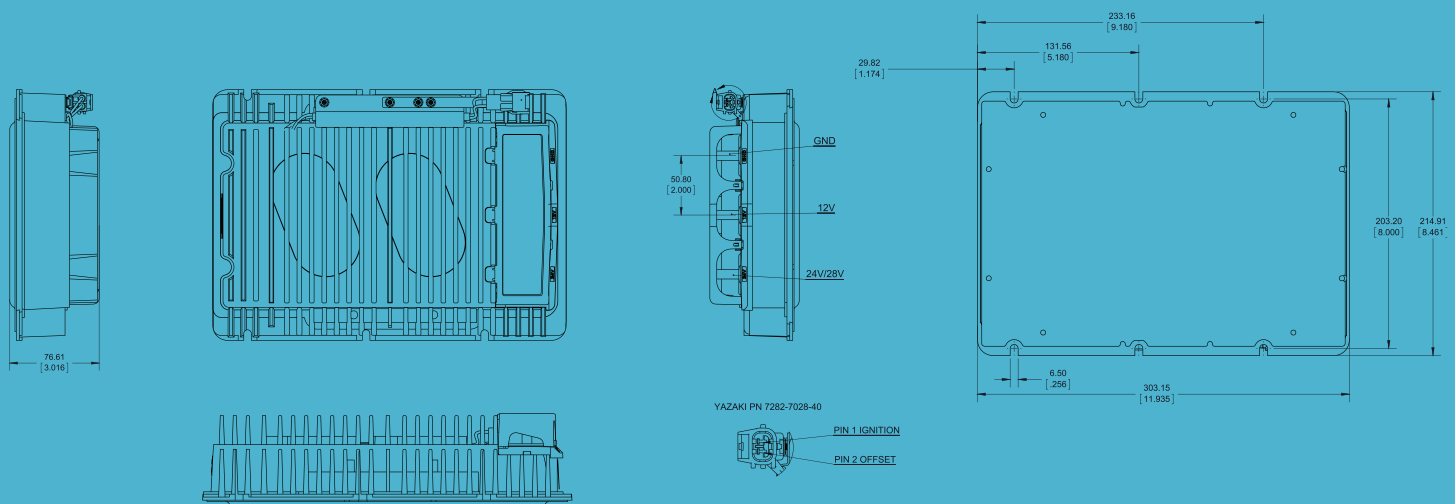
Output voltage offset to increase the output voltage

Battery Equalizer with output voltage of twice the input voltage

Standards & Certifications

SAE J1455, J1113, CISPR 25, E mark, RoHS

Dimensions in Inches (mm)



Series 21000 DC Converter

21005C10, 21008C10, 21010C10, 21012C10

The 21000 series of DC converters provide regulated 12V power from a 24V input. Featuring sealed connectors and an IP67 sealed housing, the 21000 series of DC converters provide dependable power in the most challenging environments. Available with output currents of 5A, 8A, 10A, or 12A, the 21000 series of DC converters is sized to meet your power requirements.

Features & Benefits

- Easily implemented into a system providing 12V power
- Allows use of 12V electrical components in a 24V electrical system providing greater system flexibility
- Clean output power for sensitive loads including radios and controllers
- Proven reliability with over 500,000 fielded units

Key Differentiators

- Sealed input and output connectors
- Switched and un-switched outputs
- Full output current up to 85C
- IP67 Sealing
- ISO EMC performance
- Continuous operation up to 85C
- RoHS Compliant
- Output short circuit protection
- 5A, 8A, 10A and 12A in same package size



Options

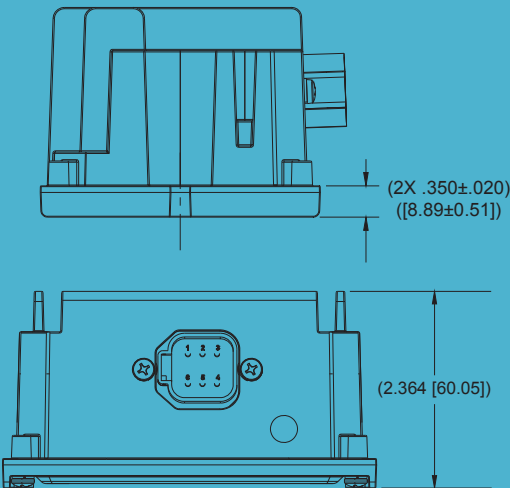
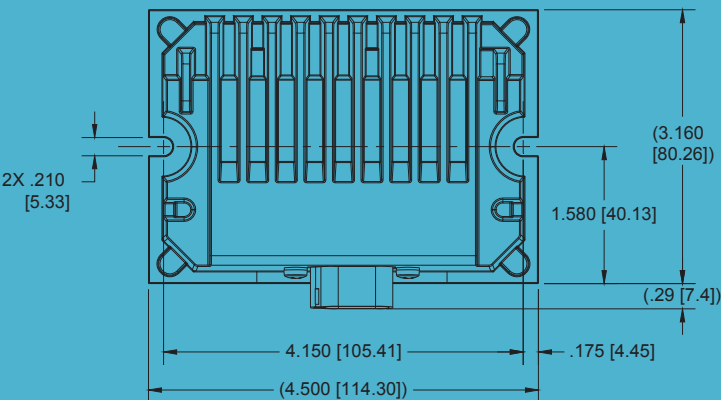
- Deutsch mating connectors
- 5A to 12A models available

Standards & Certifications

SAE J1455, J1113, CISPR 25, E mark, RoHS

Model	Voltage (input / output)	Output Current	Design Features
21005C10	24 / 12	5	IP 67, switched & unswitched output
21008C10	24 / 12	7.5	IP 67, switched & unswitched output
21010C10	24 / 12	10	IP 67, switched & unswitched output
21012C10	24 / 12	12	IP 67, switched & unswitched output

Dimensions in Inches (mm)



Series 21000 DC Converter

21015C10, 21020C10

The 21000 series of DC converters provide regulated 12V power from a 24V input. Featuring sealed connectors and an IP67 sealed housing, the 21000 series of DC converters provide dependable power in the most challenging environments. Available with output currents of 15A or 20A, the 21000 series of DC converters is sized to meet your power requirements.

Features & Benefits

- Easily implemented into a system providing 12V power
- Allows use of 12V electrical components in a 24V electrical system providing greater system flexibility
- Clean output power for sensitive loads including radios and controllers
- Proven reliability with over 500,000 fielded units

Key Differentiators

- Sealed input and output connectors
- Switched and un-switched outputs
- IP67 Sealing
- ISO EMC performance
- Continuous operation up to 85C
- RoHS Compliant
- Output short circuit protection
- 15A and 20A in same package size



Options

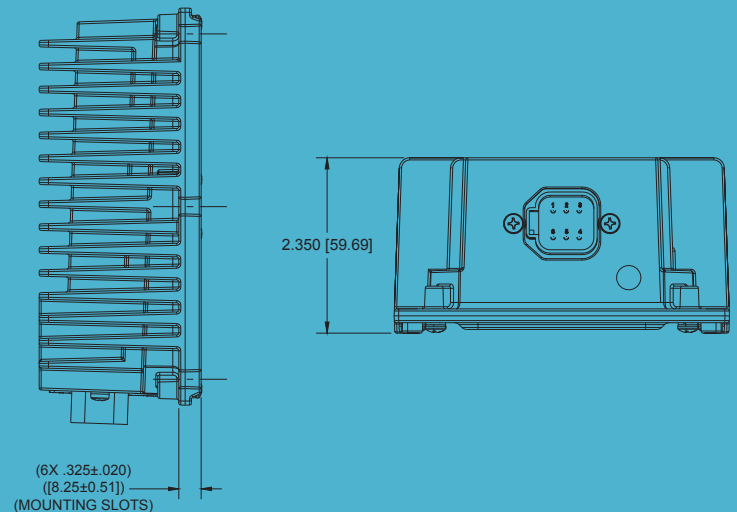
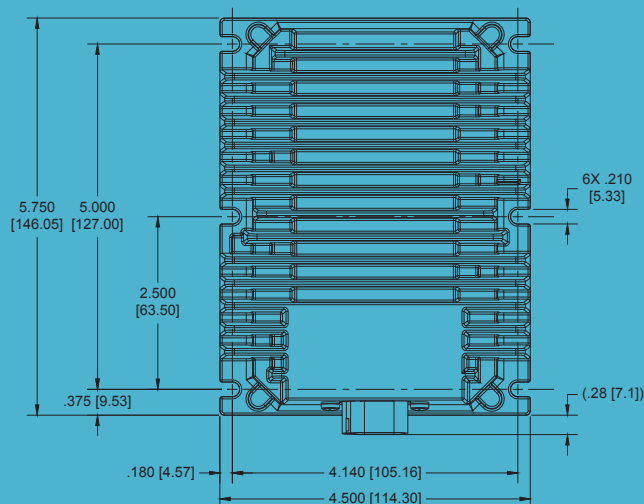
- Deutsch mating connectors
- 15A to 20A models available

Standards & Certifications

SAE J1455, J1113, CISPR 25, E mark, RoHS

Model	Voltage (input / output)	Output Current	Design Features
21015C10	24 / 12	15	IP 67, switched & unswitched output
21020C10	24 / 12	20	IP 67, switched & unswitched output

Dimensions in Inches (mm)



Series 21000 DC Converter

21030C10

The 21030C10 DC converter provides regulated 12V power from a 24V input. Featuring sealed connectors and an IP67 sealed housing, the 21030C10 DC converter provides dependable power in the most challenging environments.

Features & Benefits

- Easily implemented into a system providing 12V power
- Allows use of 12V electrical components in a 24V electrical system providing greater system flexibility
- Clean output power for sensitive loads including radios and controllers
- Proven reliability with millions of operating hours

Key Differentiators

- Sealed input and output connectors
- Switched and un-switched outputs
- Full output current up to 85C
- IP67 Sealing
- ISO EMC performance
- Operation to 85C
- RoHS Compliant



Options

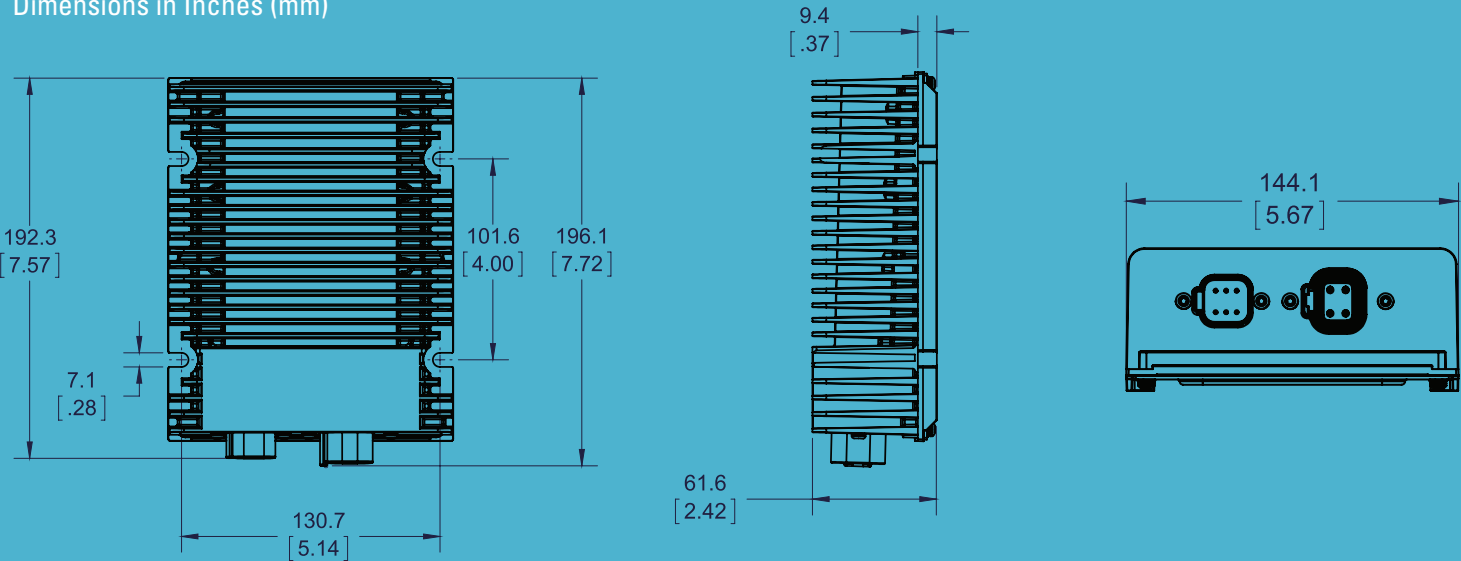
- Powder coated housing
- Battery Equalizer with output voltage of ½ the input voltage
- Deutsch mating connectors

Standards & Certifications

SAE J1455, J1113, CISPR 25, E mark, RoHS

Model	Voltage (input / output)	Output Current	Design Features
21030C10	24 / 12	30	IP 67, switched & unswitched output

Dimensions in Inches (mm)



Series 21000 DC Converter

21060C00, 21080C00, 21100C00

The 21000 series of DC converters provide up to 100A of 12V power from a 24V input. Providing a fixed output voltage of 13.5V, the 21000 series of DC converters provide clean and reliable power for high current 12V loads.

Features & Benefits

Easily implemented into a system providing 12V power

Allows use of 12V electrical components in a 24V electrical system providing greater system flexibility

Leverage increased power of a 24V starting and charging system without having to migrate all components to 24V.

Proven reliability with over 200,000 fielded units

Key Differentiators

IP67 Sealing

Up to 100A DC Converter

MIL 461 EMC performance

Operation to 85C

Over temperature protection with reduced output current

Options

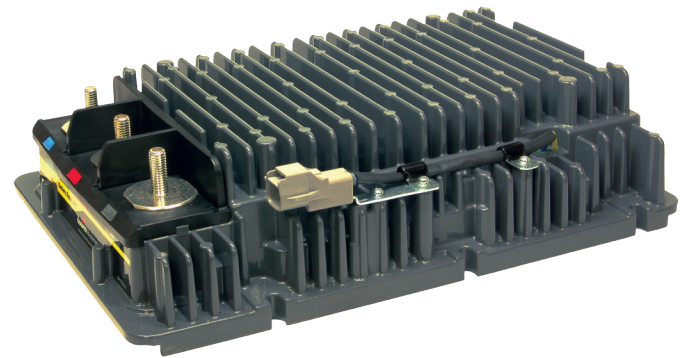
60A, 80A or 100A models available

Snap on terminal cover

Terminal barriers

Color coded terminal labels

RoHS

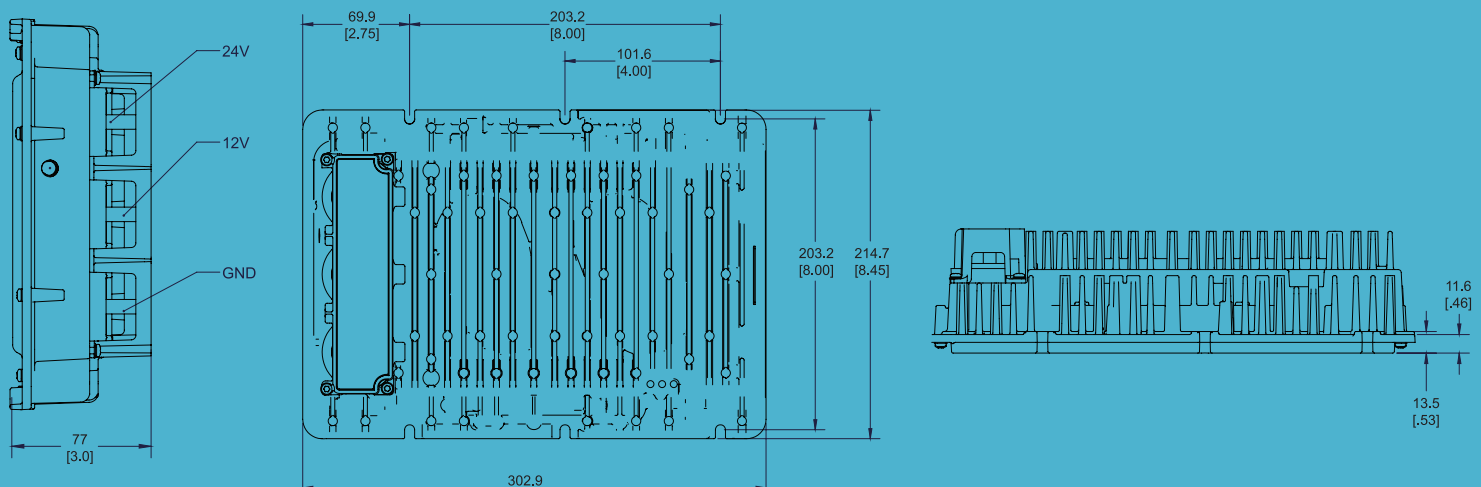


Standards & Certifications

SAE J1455, J1113, CISPR 25, E mark

Model	Voltage (input / output)	Output Current	Design Features
21060C00	24 / 12	60	IP 67, high current converter
21080C00	24 / 12	80	IP 67, high current converter
21100C00	24 / 12	100	IP 67, high current converter

Dimensions in Inches (mm)



Trail Charger Series

The Eaton Trail Charger DC/DC battery chargers allow operators to charge a remote battery bank at a temperature compensated voltage. This technology eliminates voltage loss due to long wire lengths and automatically adjusts for temperature extremes. The Trail Charger charges lift gate and other batteries at the voltage needed, working to keep batteries charged and ready for your next lift. The Trail Charger smart reduce mode also eliminates the need for additional cables.

Features & Benefits

- Compensates for voltage drop optimizing battery charge
- Temperature compensation provides optimal charge voltage
- Low standby current reduces drain on the vehicle
- Smart reduce mode circuitry ensures no interference with vehicle ABS systems

Key Differentiators

- IP 67 sealed units provide flexibility in mounting locations
- Temperature compensated charging without external sensors
- Trouble free operation with ABS systems
- Charge batteries through existing 7-way connector or dedicated single pole or double pole connectors
- Proven field reliability
- LED indicator with diagnostics



Options

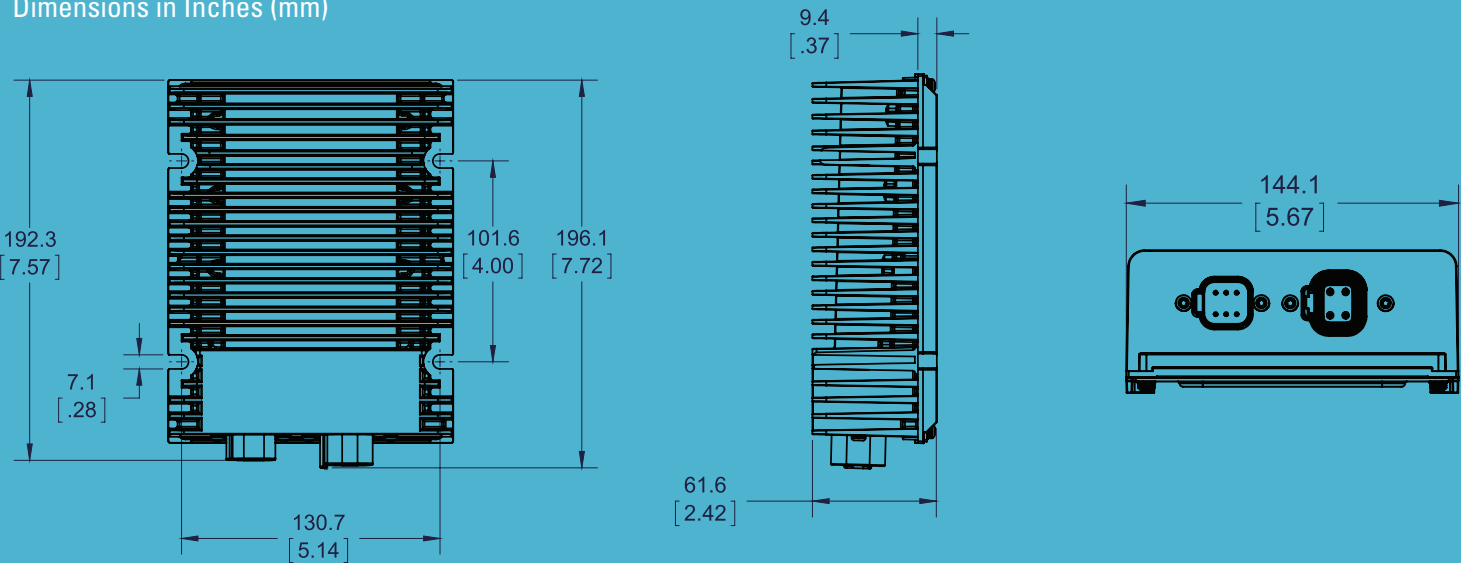
- 10A & 20A models available
- Reduce feature limits output current
- LED and diagnostics output

Standards & Certifications

Eaton DC-DC trail charger are designed to meet specific customer requirements including, SAE, ISO, E mark, CE and military standards, as well as application specific environmental requirements and IP67 certification.

	11010C11	11020C11 11020CL1
Output	10A	20A
Lift gate motor draw	175A	175A
Seconds of lift run time	25 sec	25 sec
Amp hours used per lift	1.2Ahr	1.2Ahr
Lifts during daily operations	50	100
Total Amp / hours used during day	60Ahr	120Ahr
Total run time required to charge battery	8 hours	8 hours
Voltage regulation	Temp. compensated	Temp. compensated
IP67 sealed	Yes	Yes

Dimensions in Inches (mm)



Battery Equalizers

Eaton standard product and custom developed battery equalizers maintain battery balance in vehicle applications with multiple voltages and high peak load demand. Eaton battery equalizers produce 10A to 100A outputs to equalize 12V and 24V systems.

Features & Benefits

Operating with a typical efficiency of 94%, Eaton battery equalizers are optimally ruggedized for transportation applications including state of the art vibration, emissions and abnormal use features, such as reverse polarity protection. Provides robust fail safe operation for dual voltage systems.

Options

Eaton battery equalizers are designed to meet specific customer requirements including, SAE, ISO, E mark, CE and military standards, as well as application specific environmental requirements.

Standards & Certifications

RoHS, EMI/EMC Compliance



Model	Voltage (input / output)	Output Current	Function	Design Features
Up Conversion Equalizers				
12010E10	12 / 24	10	Equalizer	Switched output
12025E00	12 / 24	25	Equalizer	Switched output / available offset output
12040E10	12 / 24	40	Equalizer	Switched output with offset output
Down Conversion Equalizers				
21030E10	24 / 12	30	Equalizer	IP 67, RoHS
52204	24 / 12	40	Equalizer	High current equalizer
21060E00	24 / 12	60	Equalizer	IP 67, high current equalizer
21080E00	24 / 12	80	Equalizer	IP 67, high current equalizer
21100E00	24 / 12	100	Equalizer	IP 67, high current equalizer

Series 12000 Battery Equalizer

12010E10

The 12010E10 battery equalizer provides 10A of 24V power from a 12V input, allowing 24V loads to be powered from a 12V electrical system. Efficiently convert electrical power from one voltage level to another. Used in battery balancing applications, the 12010E10 provides an output of twice the input voltage keeping batteries charged and balanced.

Features & Benefits

Easily implemented into a system providing 24V power from a 12V input allowing use of 12V and 24V components

Allows use of 24V electrical components in a 12V electrical system providing greater system flexibility

Clean output power able to power sensitive loads including radios and controllers

Proven reliability with over 25 years field experience

Key Differentiators

Sealed input and output connectors

Un-switched output

IP67 Sealing

EMC performance

Operation to 85C

RoHS Compliant

Output short circuit protection

Over temperature protection

Low standby power draw



Options

Deutsch mating connectors

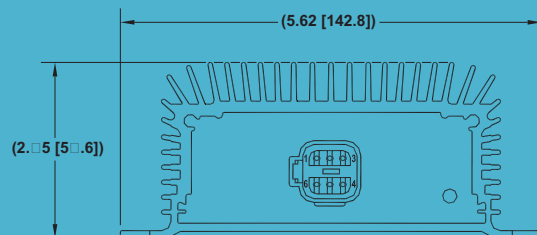
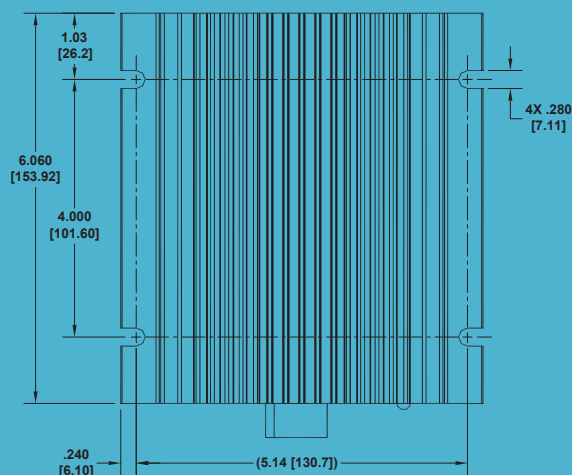
Powder coated housing

DC converter with fixed output voltage

Standards & Certifications

SAE J1455, J1113, CISPR 25, E mark, RoHS

Dimensions in Inches (mm)



Series 12040E10 Battery Equalizer

Eaton's 12040E10 Battery Equalizer provides 24V power and maintains battery balance in a 12V system, which requires 24V power. The 12040E10 Battery Equalizer has an output current of 40 amps, has a switched output with offset output and is IP67 sealed.

Features & Benefits

Easily implemented into a system providing 24V power from a 12V input allowing use of 12V and 24V components on a vehicle

Allows use of 24V electrical components in a 12V electrical system providing greater system flexibility

Leverage increased power of a 24V starting and charging system without having to migrate all components to 24V.

Clean output power able to power sensitive loads including radios and controllers

Proven reliability with over 200,000 fielded units

Key Differentiators

IP67 Sealing

EMC performance

Operation to 85C

Output short circuit protection

Over temperature protection

Low standby power draw



Options

10A to 55A models available

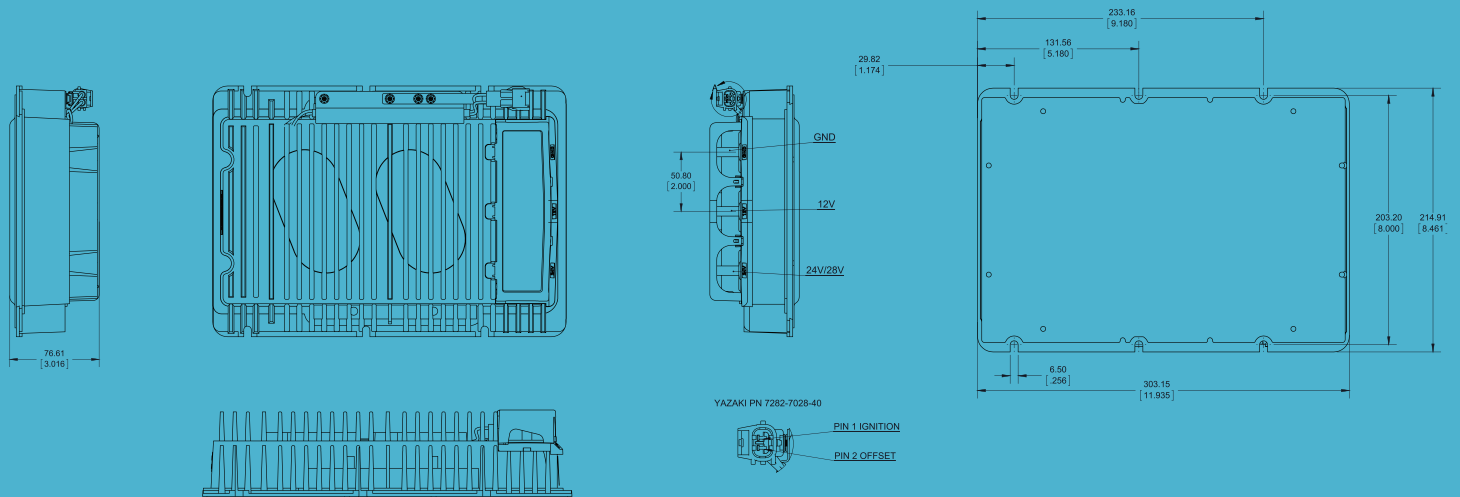
Output voltage offset to increase the output voltage

DC converter with fixed output voltage

Standards & Certifications

SAE J1455, J1113, CISPR 25, E mark, RoHS

Dimensions in Inches (mm)



Series 21030 Battery Equalizer

21030E10

The 21030E10 battery equalizer maintains the balance of a 24V series battery pack, allowing large 12V loads to be powered from the 12V center tap and providing 30A of output current to maintain battery balance. The 21030E10 battery equalizer allows the inrush current of 12V loads to be supported by the batteries while maintaining battery balance. The 21030E10 reduces overall system cost and improves system reliability.

Features & Benefits

Easily implemented into a system providing 12V power with system redundancy reducing vehicle downtime

Allows use of 12V electrical components in a 24V electrical system providing greater system flexibility

Leverage increased power of a 24V starting and charging system without having to migrate all components to 24V.

Proven reliability with more than a billion fielded hours

Key Differentiators

Sealed input and output connector

Full output current up to 85C

IP67 Sealing

Voltage regulation of +/- 0.1V

ISO EMC performance

Operation to 85C

RoHS Compliant



Options

Powder coated housing

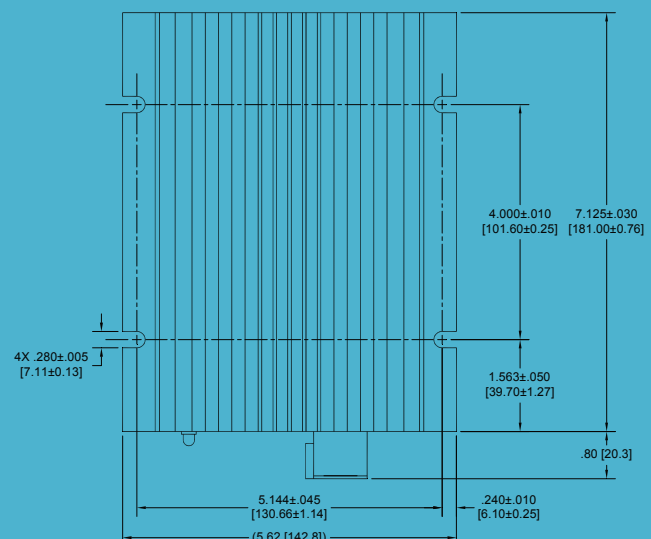
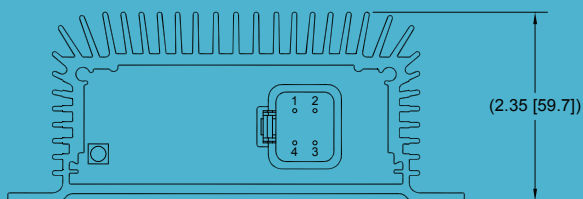
DC converter with fixed output voltage

Deutsch mating connector

Standards & Certifications

SAE J1455, J1113, CISPR 25, E mark, RoHS

Dimensions in Inches (mm)



Series 21000 Battery Equalizer

21060E00, 21080E00, 21100E00

The 21000 series of battery equalizers maintain the balance of a 24V series battery pack, allowing large 12V loads to be powered from the 12V center tap and providing 60A, 80A or 100A of output current to maintain battery balance. The 21000 series of battery equalizers allow the inrush current of 12V loads to be supported by the batteries while maintaining battery balance. The 21000 series reduces overall system cost and improves system reliability.

Features & Benefits

- Easily implemented into a system providing 12V power
- Allows use of 12V electrical components in a 24V electrical system providing greater system flexibility
- Leverage increased power of a 24V starting and charging system without having to migrate all components to 24V.
- Proven reliability with over 200,000 fielded units

Key Differentiators

- IP67 Sealing
- Up to 100A DC current
- MIL 461 EMC performance
- Operation to 85C
- Over temperature protection with reduced output current



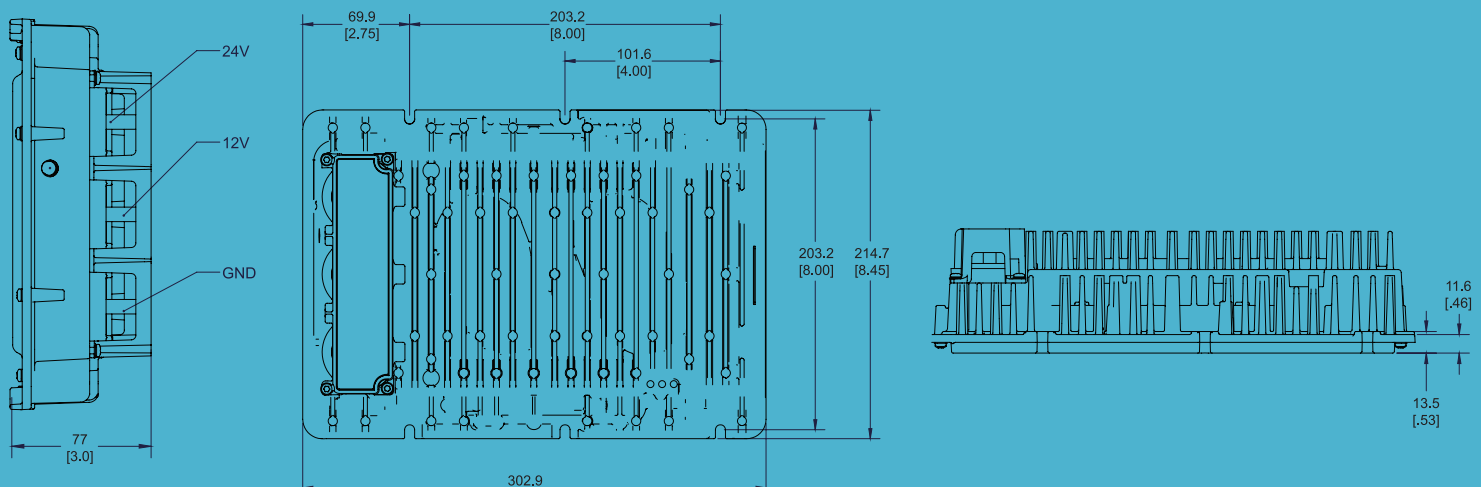
Options

- 60A, 80A or 100A
- Snap on terminal cover
- Terminal barriers
- Color coded terminal labels
- RoHS
- DC converter with fixed output voltage

Standards & Certifications

- SAE J1455, J1113, CISPR 25, E mark

Dimensions in Inches (mm)



True Sine Wave Inverter

The Eaton True Sine Wave Inverter provides clean, reliable AC power in a commercial truck application. Featuring a True Sine Wave output, the Inverter is designed and tested to meet SAE environmental and EMC Standards.

When shore power is available, the inverter automatically switches DC power to AC utility power, minimizing battery discharge and eliminating the need for external switching. Combined with an optional 40A internal battery charger, the Eaton True Sine Wave Inverter creates a complete vehicle AC power solution.

Key Differentiators

- True sine wave quality to safely power all AC appliances
- < 87% typical efficiency under all load conditions and temperatures
- AC pass through feature with 12V 40A smart battery charger option
- Ground Fault Circuit Interrupt (GFCI) protection
- Integrated AC transient, over and under voltage protection
- Integrated DC over and under voltage projection
- Over temperature protection
- User configurable charger current, battery type, low voltage disconnect and alarms

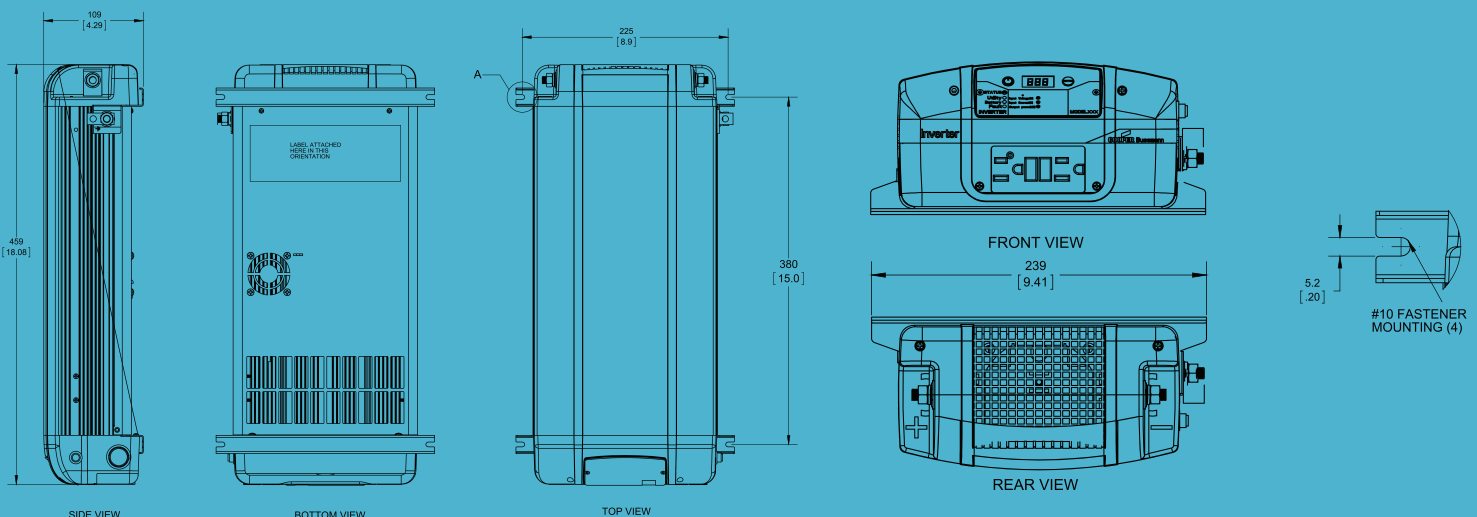
Standards & Certifications

- US 458 Listed
- CSA C22.2, No. 107.1
- SAE J1113, SAE J1114, SAE J1455 and MIL-STD-202G standard tested



Model	Voltage (In/Out)	Output Power	AC Transfer Switch	40A Battery Charger
12-110-1000	12 Vdc/100 Vac	1000W	Yes	No
12-110-1000-B4	12 Vdc/100 Vac	1000W	Yes	Yes
12-110-1800	12 Vdc/100 Vac	1800W	Yes	No
12-110-1800-B4	12 Vdc/100 Vac	1800W	Yes	Yes

Dimensions in Inches (mm)



Power management

Sensing, controlling and isolating

Eaton's commercial vehicle power management product range features a wide variety of battery management and protection solutions including manual and automatic low voltage disconnects, battery isolators, and intelligent battery separators to manage multiple battery banks. Eaton also has expertise in providing specialty control solutions such as solid state flashers, daytime running lights and DC current sensors.



DC Current Sensor

Eaton DC Current Sensors are a series of Hall-effect sensors used to measure the current flow in a wire.

Features & Benefits

Eaton DC Current Sensors are optimally ruggedized for transportation applications with outstanding environmental performance characteristics.

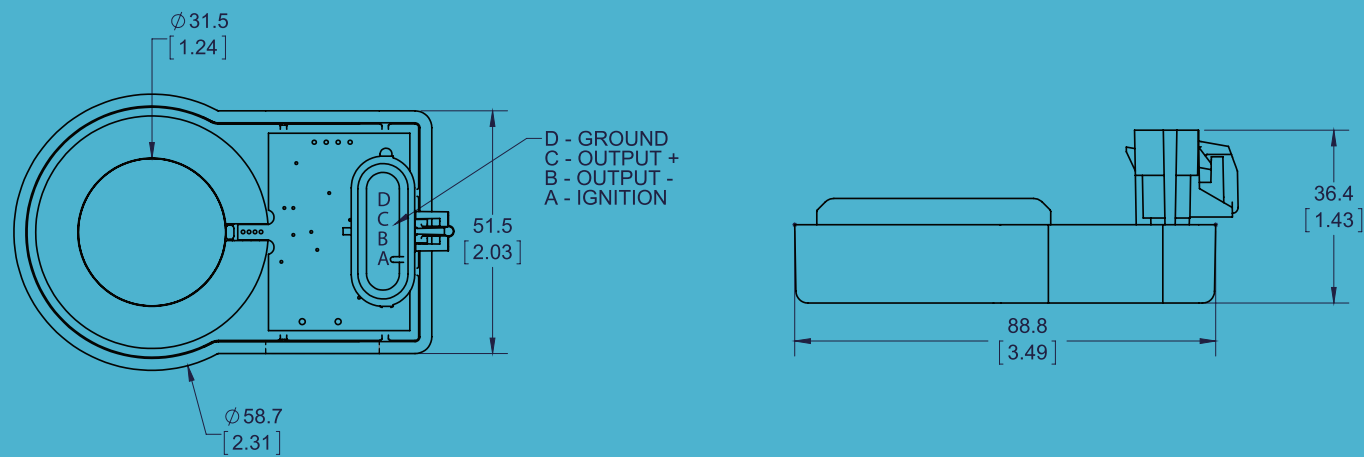
Options

Eaton DC Current Sensors provide instrumentation ready single ended outputs and bi-polar current measurement functionality.



Model	Current Range	Sensor Output
DCCS50-100	± 100A	± 50mV
DCCS50-200	± 200A	± 50mV
DCCS50-300	± 300A	± 50mV
DCCS100-100	± 100A	± 100mV
DCCS100-200	± 200A	± 100mV
DCCS100-300	± 300A	± 100mV
DCCS45-200	± 200A	0.5V to 4.5V
DCCS45-300	± 300A	0.5V to 4.5V

Dimensions in Inches (mm)



Battery Separators

Eaton’s battery separators manage multiple battery banks by combining all batteries during charging cycles and separating primary and auxiliary batteries during discharge cycles.

Features & Benefits

- Designed for use in multi-battery applications as a solenoid priority system
- Allows multiple batteries to be charged from one charging source
- Prioritized charging, charges primary battery and then remaining batteries
- Uni-directional: charge two batteries from two sources
- Interconnect/controller: can be used as a uni-directional separator, or low voltage disconnect (LVD), where the solenoid opens when battery voltage drops too low, or an isolator/interconnect, which provides isolated charging of two batteries from one source
- Isolates batteries when fully charged
- Protection circuitry absorbs coil generated voltage spikes
- Prevents charging system overload
- Start assist feature parallels batteries for added power during start
- Universally suited for mounting on tow vehicles

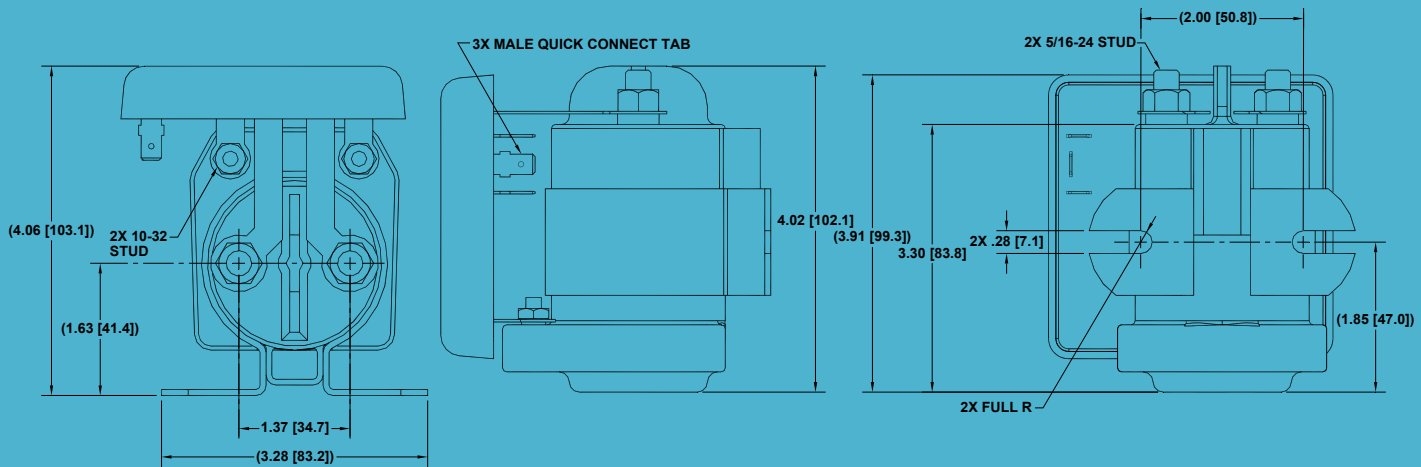
Options

The battery separator has a built in “jump start” feature option. Connect the start signal to the start input and the battery separator will parallel the primary and auxiliary batteries when the starter motor is cranked, but only if the auxiliary battery has sufficient voltage to assist with the start. The battery separator provides a lamp driver output if the operator wants to know when the jump start feature is functioning.



Part #	Input (V)	Current (A)	Description
1314A	12	100	Battery separator, uni-directional w/ aux start
1314-200	12	200	Battery separator, uni-directional w/ aux start
1315A	12	100	Battery separator, bi-directional w/ aux start
1315-200	12	200	Battery separator, bi-directional w/ aux start
1318A	24	100	Battery separator, uni-directional
1319A	24	100	Battery separator, bi-directional

Dimensions in Inches (mm)



Note: 200A model shown

Interconnect Controller

Eaton's Interconnect Controllers are general use interconnect devices that operate in four modes depending on user defined settings. These modes include unidirectional battery separator, bidirectional battery separator, low voltage disconnect and isolator/interconnect mode.

Features & Benefits

Eaton Interconnect Controllers are optimally ruggedized for transportation applications with outstanding environmental performance characteristics.

Battery Management

Eaton's Interconnect Controllers provide reliable battery management functionality based on settable low voltage disconnect values, engine lock out inputs and toggle switch inputs. The high value results include: fewer jump starts, longer battery life and 100% control with the push of a button.

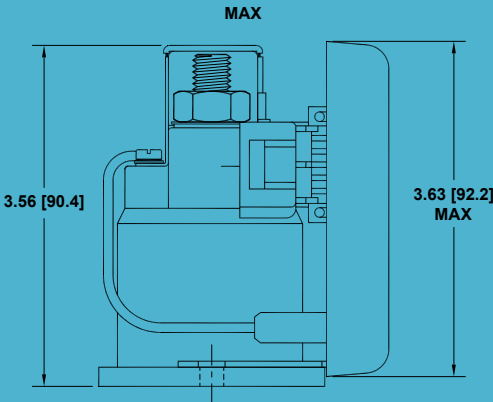
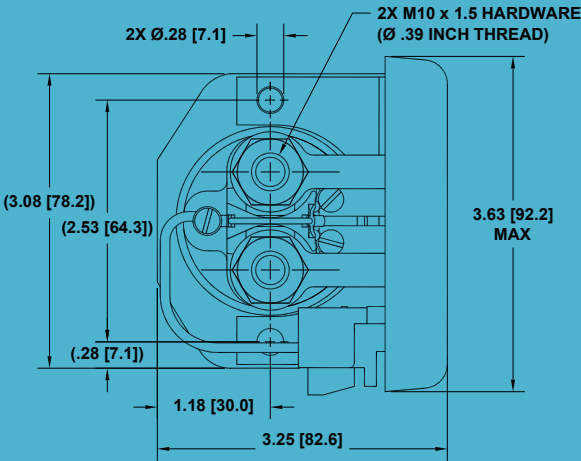
Options

Eaton's Interconnect Controllers provide the same value as standalone battery separators and low voltage disconnect devices with the added advantage of exceptional configuration flexibility.



Part #	Input (V)	Current (A)	Description
3103	24	300	Interconnect / Controller
3104	12	300	Interconnect / Controller
3105G	12	300	Interconnect / Controller
3115	12	300	Interconnect / Controller

Dimensions in Inches (mm)



Battery Isolators

Eaton Battery Isolators are diode based products that allow a single alternator to charge multiple battery banks while completely isolating the battery banks. Single or multiple alternator options are available for one, two or three battery banks.

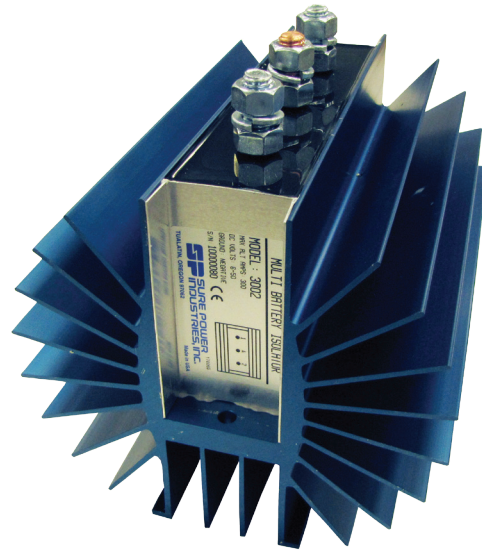
Standard or Schottky diode options are available.

Features & Benefits

Simple and safe to operate with the engineered safety margins required for high power vehicle applications ranging from 6V to 48V and 25A to 350A.

Options

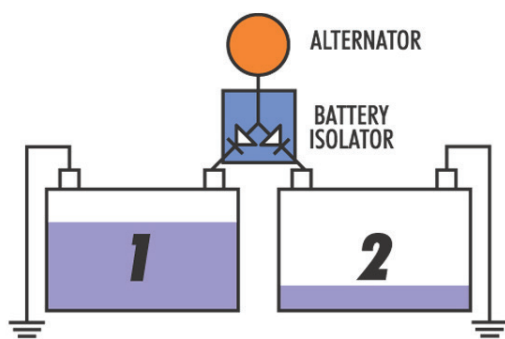
Eaton's Battery Isolator options include single and dual inputs and single, dual and triple output configurations. Specific configuration options for numerous OEM (Ford, Chrysler, Toyota, Honda, etc) applications.



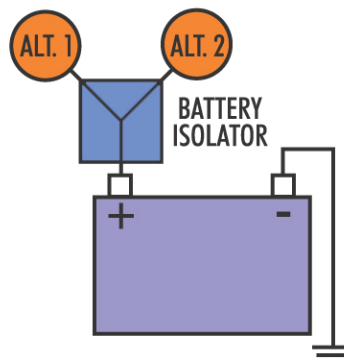
Model	Current (A)	Input	Output	Application
Group One				<p>General Motors (Delcotron and Delphi) Except Delcotron / Delphi CS Series alternators (CS used on most 1985 and newer GM vehicles)</p> <p>Ford Up to 1998</p> <p>Chrysler All models, all years Includes Nippondenso externally regulated alternators</p> <p>Jeep Equipped with Nippondenso externally regulated alternators</p> <p>Motorola Load Handler Series or 8EM Remote Sense Series</p> <p>Japanese Imports With alternators using external voltage regulator or external sensing</p>
122	25	1	2	
702	70	1	2	
703	70	1	3	
704	70	1	4	
2702	70	2	2	
2703	70	2	3	
952	95	1	2	
1202	120	1	2	
1203	120	1	3	
3202	120	2	2	
3203	120	2	3	
1302	130	1	2	
1602	160	1	2	
1603	160	1	3	
2003	200	1	2	
2402	240	1	2	
2403	240	1	3	
3002	300	1	2	
3003	300	1	3	
3303	95 / 160	2	3	
3603	120 / 160	2	3	
31822	160	1	2	
31922	240	1	2	

Model	Current (A)	Input	Output	Application	
Group Two					
9523A	95	1	2	General Motors (Delcotron and Delphi)	Equipped with Delcotron / Delphi CS Series alternators (most 1985-1993) or CS 130-D Series alternators (most 1993 and newer)
12023A	120	1	2		
12033A	120	1	3		
13023A	130	1	2		
13033A	130	1	3	Ford	Many 1998 and newer
16023A	160	1	2	Jeep	Vehicles equipped with Delcotron / Delphi CS Series alternator (most 1985-1990)
16033A	160	1	3		
24023A	240	1	2	Toyota, Honda, and some other imports	1985 and newer equipped with Nippondenso alternator with internal regulators or alternators with an “S” (sense) terminal
32033A	120	2	3		
Group Three*					
2703R	70	2	3	Bosch	Requiring regulator sensing
203R	120	2	3	Motorola	Other than Load Handler Series*
952R	95	1	2	Many European style alternators	Requiring regulator sensing*
702R	70	1	2		
Group Four					
If the alternator is not compatible with battery isolators, a battery separator would be the next alternative. Alternators with internal voltage sensing, e.g. some Mitsubishi and Hitachi, or single wire self-exciting Delco / Delphi alternators, some Hondas and selected imports.				2005 and newer General Motors applications using the Delphi alternators (may also be labeled Bosch) with two pin terminal connectors will not work with Battery Isolators: use Battery Separator. Note: Dodge Sprinter classified under Group 4.	
Special Applications*					
31322	60	1	2	Schottky Isolator	
122P	25	2	1		
702P	70	2	1		
1602P	160	2	1		
31622P	160	2	1	Positive ground isolators can be used as charging source combiners	
92061	300 / 160	2	1		

*Please contact technical support (800.845.6269) at Eaton for proper application of special application isolators.



Typical Isolator Application



Typical Combiner Application

Low Voltage Disconnects

The Low Voltage Disconnect (LVD) Series is a 100% solid state electronic or electromechanical protection module which disconnects predetermined auxiliary loads from the starting battery bank to assure enough power is left in the batteries for starting. The unit is capable of directly powering loads of up to 100A continuous draw.

The LVD continually senses and monitors battery voltage. During normal operation when the battery is sufficiently charged, the LVD connects the loads. Once the battery voltage reaches the shut off set point, the auxiliary loads are automatically disconnected from the battery(s) preventing further battery drain.

Features & Benefits

- Automatically disconnects non-critical loads from the battery(ies) to prevent excessive battery discharge
- Automatically reconnects loads if vehicle is started or battery is recharged
- Manual override for connecting or disconnecting during emergencies
- Selectable pre-set models available ranging from 9.0V to 12.8V
- Audible or visual alarm output activates 1 minute before disconnect
- 100% Solid-State logic and switching circuitry on most models
- Fully protected
- Low standby current

Key Differentiators

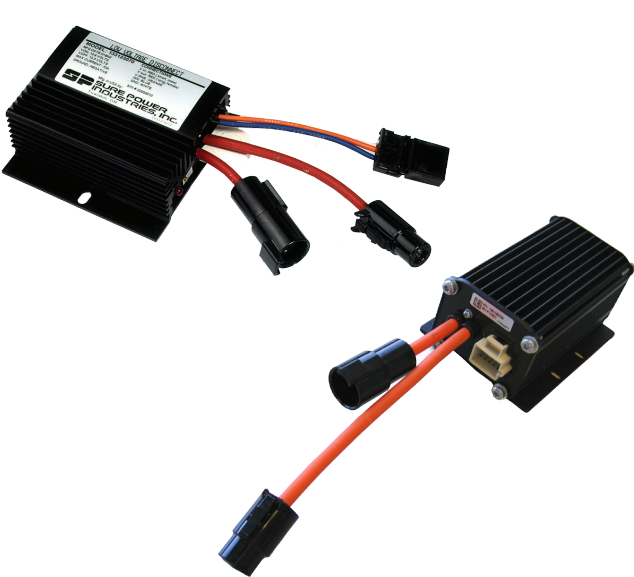
- Low current draw when disconnected, reducing unwanted power drain on the batteries. Many competitive products use relays that require the contacts be energized to remain open and disconnect the loads.
- 100A continuous solid state switch eliminates the wear and voltage spikes of relays
- Ability to control up to 2 external relays for higher current switching, disconnecting at a higher voltage than the primary output for load shedding.
- CAN switching and diagnostics

Options

- Disconnect voltage set point
- CAN diagnostics and control
- Relay control for secondary circuits
- 20A electromechanical version w/floating contacts

Standards & Certifications

CE Mark and E Mark for Selected Models



Model	Disconnect Voltage (V)	Current (A)	Description
130512	Adjustable 9.0 - 12.15	20	Low voltage switch, electromechanical
133121070	12.1	70	Solid-state LVD, V _{IN} and V _{OUT}
137121100	12.1	100	Solid-state LVD, Connections with 8mm studs
137123100	12.3	100	Solid-state LVD, Connections with 8mm studs
1381180706	11.8	70	CAN capable / 6 guage wire
1381180708	11.8	70	CAN capable / 8 guage wire

* Select models only

Battery Disconnect Switch

Series 15250

Specifications

Battery disconnect switch

Applications: A non-fused current interrupt disconnect designed for opening the circuit between a battery and the complete electrical load of a battery-powered system.

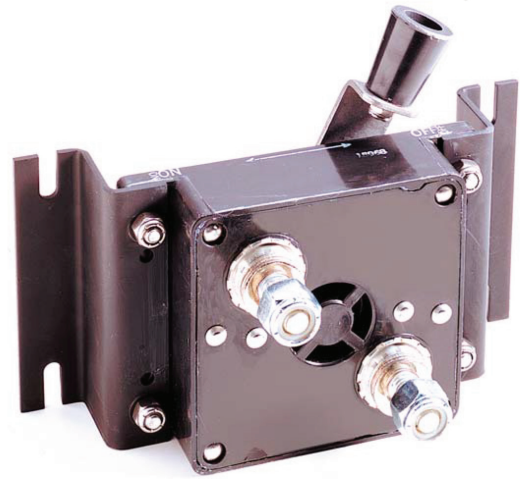
Rating: 400A continuous, 50Vac/VDC. Vehicle cranking and max. surge currents to 2000A (based on 20% duty cycle with ON times of 5 seconds max.).

Temperature Rating: -40°F (-40°C) to 150°F (65°C).

Termination: 1/2-13 Copper alloy stud.

Torque Rating: 420 in-lbs (47.5N • m) max.

Mounting Torque Rating:
with mounting brackets: 48 in-lbs (5.4N • m) max;
without mounting brackets: 10 in-lbs (1.1N • m) max



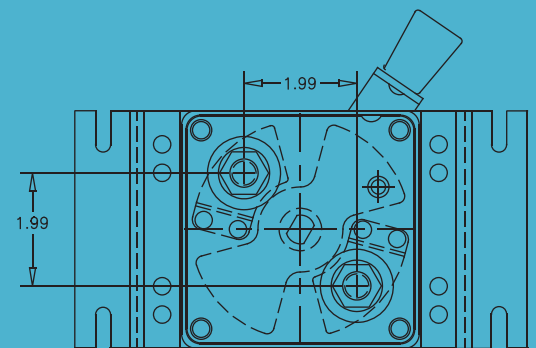
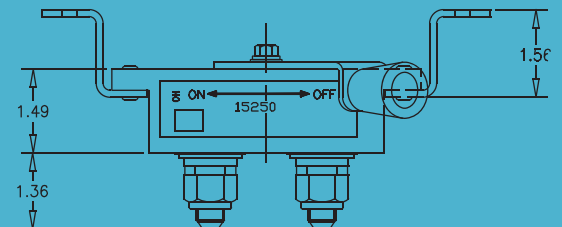
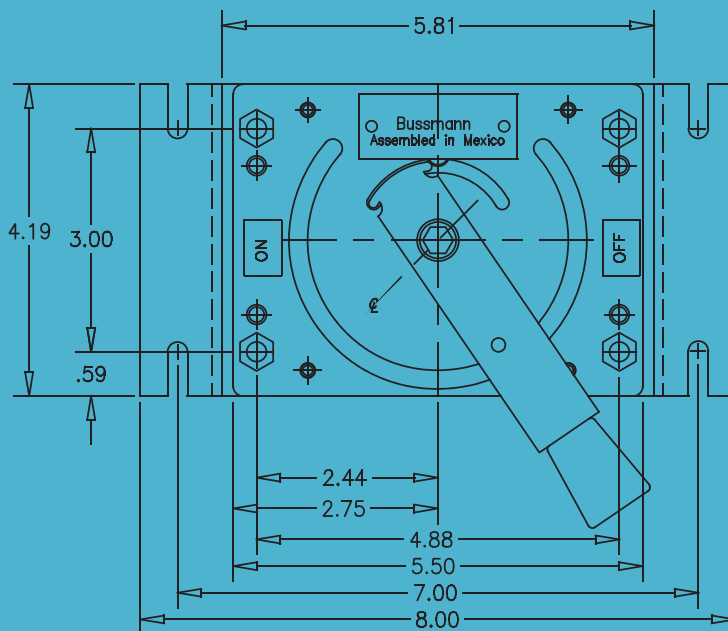
Options

Handles: Three handle styles available

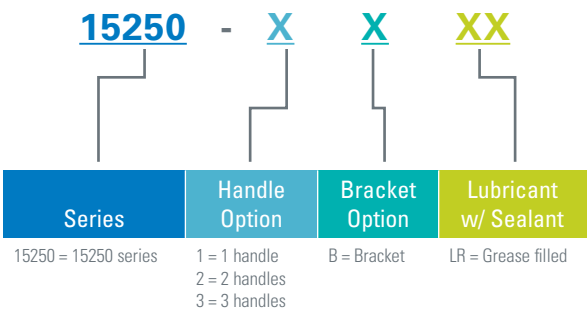
Other: Lubricant-filled body with silicone sealant

Additional current ratings and configurations available

Dimensions in Inches (mm)



Ordering information



Solid State Flashers

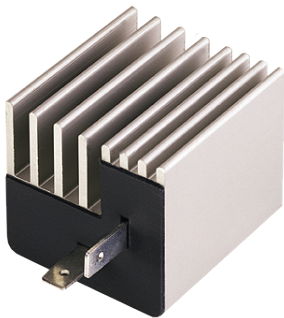
Eaton offers a wide variety of fully solid-state 24V and 12V flashers for heavy-duty, off-highway, truck and commercial applications. Eaton flashers have been designed, tested and manufactured to outperform other flashers on the market. Independent testing, along with extended use of these flashers in the harshest environments, has proven the durability and reliability of Eaton's flashers to be unsurpassed. This 100% solid-state series of flashers will surpass the toughest OEM and SAE specifications and provide a fully featured and fully protected dependable operation.



More Flash For Less

The 1421 Flasher is a smaller, lighter, 100% solid state two-wire turn signal flasher with less footprint than its predecessor. The turn signal indicators connected to the unit will flash on and off at a rate and duty cycle controlled by the unit. The rate and duty cycle are independent of the number and type of turn signal indicators. The flasher can operate any number of both incandescent and LED based turn signal indicators as long as the load current does not exceed 25A and the load is greater than the minimum load requirements.

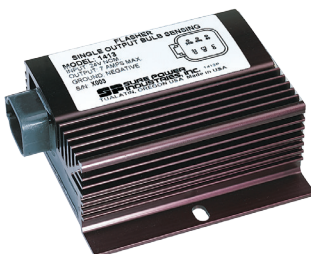
Model	Operating Voltage (V)	Current (A)	Description
1421	12	25	Solid-state two-wire hazard / turn signal flasher, meets SAE J1690



Truck, Bus & Commercial

Used by many of the world's leading truck and chassis manufacturers, this series of products provides one of the industry's most reliable and dependable flasher operations. Independent life cycle testing failed to find a failure before the test was terminated at over 42 million flashes. Is it any wonder that both OEMs and fleets are using these to provide dependable flasher operation and peace of mind?

Model	Operating Voltage (V)	Current (A)	Description
1415	12	25	Solid-state two-wire hazard / turn signal flasher
1417	12	38	Solid-state two-wire hazard / turn signal flasher
1419	12	25	Solid-state three-wire remote mount hazard / turn signal flasher
1419S	12	25	Solid-state three-wire flasher with audible tone
1425	24	25	Solid-state two-wire hazard / turn signal flasher
1425MB	24	25	Solid-state two-wire hazard / turn signal flasher with mounting bracket



Heavy-Duty Off-Highway

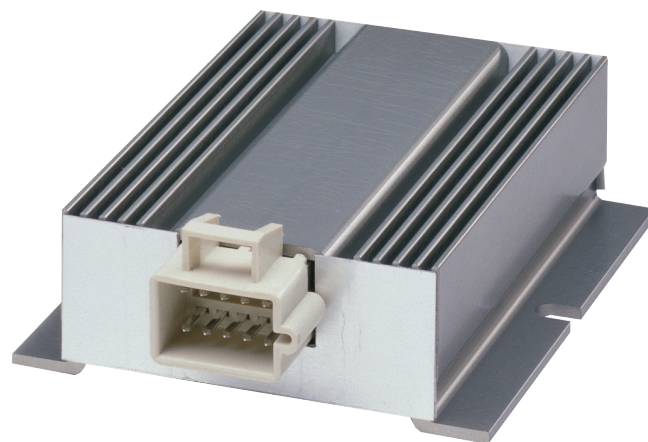
Eaton supplies the world's leading manufactures of heavy-duty equipment with the industry's most durable and reliable flashers. Capable of connecting to either 12V or 24V systems, these 100% solid-state units are shock and vibration resistant.

Model	Operating Voltage (V)	Current (A)	Description
1410	12 or 24	12.6	Solid-state two-wire remote mount hazard / turn signal flasher
1412	12 or 24	12.6	Solid-state with Deutsch 3-pin connector

Daytime Running Light (DRL) Controls

The Eaton Daytime Running Light (DRL) Controls offer simple installation and are readily adaptable to electrical systems that automatically turn on low-beam head lamps or DRL lamps at a reduced voltage to significantly enhance vehicle safety. Safe protected against common failure modes, including loss of ground, overcurrent and short-circuit conditions, the Eaton DRL Controls are reliable and not affected by radio or electromagnetic interference.

Eaton DRL Controls adapt to existing systems in order to operate headlamps in the low-beam circuit at reduced power while vehicle is in operation. The Eaton DRL Controls series automatically activate when the ignition is turned on, however parking brake release or other methods of activation are also possible.



Design Features

- 100% solid-state
- Environmentally splashproof or sealed depending on model
- Reduced power operation, thus minimizing early lamp failure and electrical load
- Low failure possibility reduces vehicle down possibility
- Superior provision of Daytime Running Light Controls complies with CMVSS-108; CAN/CSA=D603-88, Type2; FMVSS-108
- Designed per SAE J1211, J1455

Model	Input (V)	Output	Dimensions
1323	12	85% of input	4.5"L x 3.0"W x 2.15"H
1323F	12	85% of input	4.5"L x 3.0"W x 2.15"H
1325F	12	85% of input	4.5"L x 3.1"W x 2.38"H
1327	12	12.5V w/turn signal logic	4.5"L x 3.1"W x 2.35"H

Feature	Linear Approach	Pulse Width Modulation*	Series Parallel
Designed to eliminate radiated or conducted interference	YES	NO May affect AM-FM or communications radios, on-board computers, engine and transmission controls	YES
Simple wiring change	YES	NO Splicing is required	NO Excessive wiring required
Protected against loss of ground	YES	NO Major damage to module can occur	NO Loss of ground may result in loss of headlamps
Protected against overcurrent	YES (electronic)	YES Some models	NO Unless fuse added
Protected against short-circuit	YES	YES Some models	NO Unless fuse added
Both lamps protected against extinguishing when (1) filament fails	YES	YES	NO
Fully solid-state	YES	YES	NO
Low voltage protection	YES	NO	NO
Fail-safe operation	YES	YES	NO
Protected against control failure which results in loss of both headlamps	YES	YES	NO

Power distribution

Flexible, rugged, custom solutions

Eaton's off-the shelf and custom designed power distribution products provide and protect vehicle power distribution including vehicle electric centers, power distribution modules, fuse panels, fuse holders and junction blocks. Our product range offers multiplexing capabilities, high power ratings, ignition protection options, and flexible configurations with rugged and serviceable agency compliant designs with a range of sealing options up to IP6K9K.



Vehicle Electrical Center (VEC) Series

Eaton Vehicle Electrical Centers (VECs) are power distribution centers capable of high power density and water & dust ingress protection with the flexibility to customize per customer wiring schematic. Widely used in the transportation industry, they use patented configurable 3D matrix technologies that can be easily modified to accommodate changes to an electrical system. The product requires no tooling charges for implementation.

Features & Benefits

The VEC product series is based upon 2.8mm wide terminal technology (mini-component footprint).

Power Density: Using patented Eaton VEC 'power grid' technology, ideal for high current circuits networking electronics. Each VEC is rated at 200-300 Amps, with individual outputs rated up to 30A, and a maximum of 64 outputs possible with the Dual Vehicle Electrical Center (DVEC). Both 12 & 24 volt systems are supported.

Rugged: Water-resistant to high pressure spraying (IP66). The ssVEC line of products is designed and manufactured with robust features such as a heavy-duty housing, silicon and Gortex seals, and protective conformal coated electronics, to operate in demanding vehicle environments such as those found in construction, agriculture, heavy truck, bus, RV, marine and specialty vehicle markets.

Flexible: The VEC product series is offered in various standard and customized versions, with custom versions being configured to OEM wiring requirements. The VEC accepts relays, fuses, circuit breakers, resistors, diodes & transorbs, serviceable designs, ignition protected options and agency compliance based on the industry standard 2.8mm footprint

Options

Mounting: compression limiters on mounting feet

Labeling to customer specifications

Customized circuit layouts, standard and custom CAN messages

Cover marking: laser etching inside, outside or both

Wire terminal – Delphi Metri-pak 280 Series (tanged or tangless)*

Internal spare fuse holder and socket for fuse extraction tool

Standards & Certifications

Ingress Protection – IP65 or IP66



Images shown with blue and yellow mating connectors attached.
Connectors not included.

**Not sold by Eaton*

Series 31000 - VEC

Single Vehicle Electrical Center

The 31000 series VEC is capable of operating in various environments such as those with high vibration and moisture (compliant with IP65 standards). The VEC provides efficient and compact power distribution for OEMs with demanding applications in the transportation industry including construction, agriculture, heavy trucks, bus, marine and specialty vehicles. As with all VECs, the single VEC uses the patented Eaton 'power grid' technology easily configured to accommodate various OEM wiring requirements.

Features & Benefits

Eaton VECs all feature a unique color-coded and keyed connector system, and accepts plug-in fuses, relays, circuit breakers, resistors, diodes and transorbs, based on the industry standard 2.8mm footprint.

Options

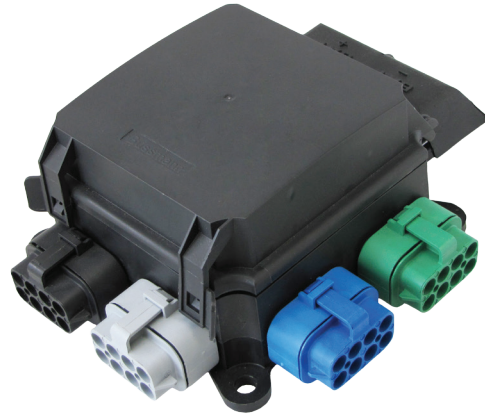
Cover: Solid domed cover with gasket

Cover marking: Optional laser etching inside, outside, or both

Mounting: External feet with mounting holes or internal mounting holes

Components: Fuse, breaker, relay, resistor, diode and transorb installation to be specified by customer

Sealed option available (ssVEC)



Images shown with blue and green mating connectors attached.
Connectors not included.

Specifications

Capacity

- 200A maximum rating
- 30A per output 8 relays/8 fuses
- Maximum of 32 fuses or various combinations thereof (unique design configurations may be required)

Materials

- Housing and connector cavities: UL 94 V-0 rated Thermoplastic
- Internal power grid: tin-plated copper
- Stud input covers: silicone

Operating temperature

- -40°F (-40°C) to 221°F (105°C)

Ingress protection

- IP55 with vented cover (IP65 with sealed cover and output connector wire seals and plugs)

Maximum torque rating

- M8 input stud: 18 FT-LBS
- Mounting: 2.5 FT-LBS

Connections

Output: Standard Eaton 32006 VEC connectors

- 8-way, colored/keyed, sealed connectors sealed (IP65 with wire seals & plugs)
- 30A maximum per terminal
- 100A maximum per connector
- Accepts Delphi Metri-Pack 280 Series terminals (tanged/tangless)

Input: Studded or Connectorized

- Studded input option: Supports two M8 input power studs for DC power into the VEC power grid (100A maximum per stud)
- Connectorized: Accepts up to two Eaton 32004 VEC input connectors (two terminals each, colored/keyed, sealed connectors)
- 60A maximum per terminal, providing power to the VEC Power Grid

Termination

Output

- Delphi Metri-Pack 280 Series terminals (sealed/unsealed and tanged/tangless)
- Delphi Metri-Pack 280 Series cavity plugs are installed where wires are not used.

Wire Sizes

- With wire seals: #12-22 AWG (0.35-5.0mm²)
- Without wire seals: #10-22 AWG (0.35-5.0mm²)

Input

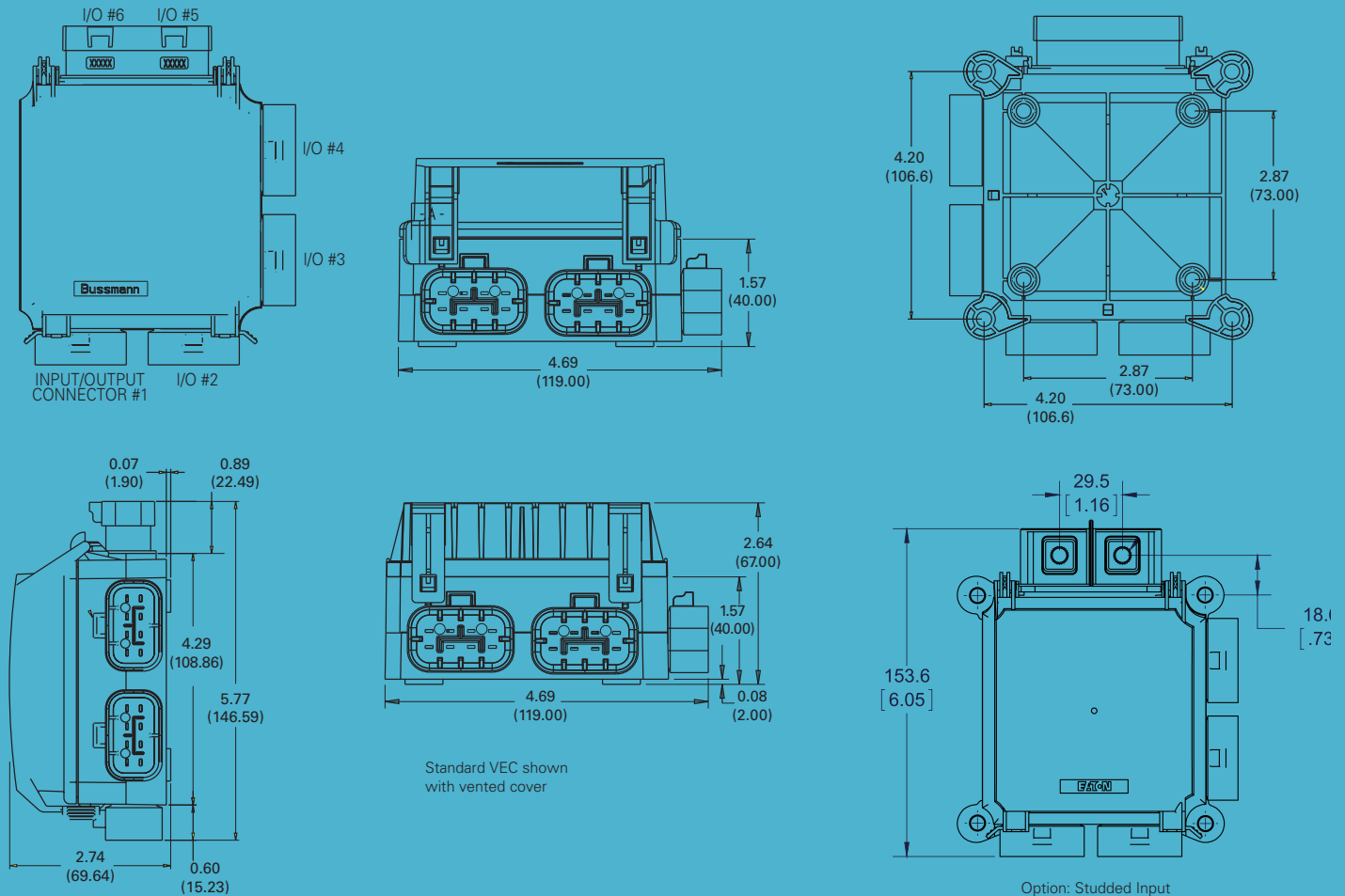
- Delphi Metri-Pack 800 Series terminals (sealed/unsealed)

Wire Sizes

- With wire seals: #10-14 AWG (2.0-8.0mm²)
- Without wire seals: #8-14 AWG (2.0-8.0mm²)

Notes: Each design is customer specific. Consult your sales representative today for your application. Electrical terminals, cable seals and cavity plugs are NOT supplied by Eaton.

Dimensions in Inches (mm)



Series 31s - ssVEC

Severe Service Vehicle Electrical Center

The ssVEC is capable of operating in various environments such as those with high vibration and moisture (compliant with IP66 standards). The ssVEC provides efficient and compact power distribution for OEMs with demanding applications in the transportation industry including construction, agriculture, heavy trucks, bus, marine and specialty vehicles. As with all VECs, the ssVEC uses the patented Eaton 'power grid' technology easily configured to accommodate various OEM wiring requirements.

Features & Benefits

Eaton ssVECs all feature a unique color-coded and keyed connector system, and accepts 2.8mm (mini) footprint fuses, relays, circuit breakers, resistors, diodes and transorbs

Additionally the ssVEC has these features:

- Durable plastic housing featuring a Gortex vent
- Internal silicone gasket between all seams and plastic to terminal interfaces

Options

Cover: Solid domed cover with gasket

Cover marking: Laser etching inside, outside, or both

Components: Fuse, breaker, relay, diodes and transorbs

Compression limiters on mounting feet

Internal spare fuse holder and socket for fuse extraction tool

Dual version (400A) available (see ssDVEC)

Multiplex option available (see mVEC)



Specifications

Capacity

- 200A maximum rating
- 30A per output
- Maximum of 8 relays or 8 fuses, or various combinations thereof (unique design configurations may be required)

Materials

- Housing and connector cavities: UL 94 V-0 rated thermoplastic
- Internal power grid: tin-plated copper
- Internal gaskets stud input covers: silicone

Operating temperature ratings

- 40°F (-40°C) to 221°F (105°C)

Ingress protection

- Application dependant up to IP66 requirements

Maximum torque rating

- 200 to 300 in-lbs with compression limiters
- 24 in-lbs without compression limiters

Connections

Output: Standard Eaton 32006 VEC connectors

- 8-way, colored/keyed, sealed connectors sealed (IP66 with wire seals & plugs)
- 30A maximum per terminal
- 100A maximum per connector
- Accepts Delphi Metri-Pack 280 Series terminals (tanged/tangless)

Input: Studded or Connectorized

- Studded input option: Supports two M8 input power studs for DC power into the VEC power grid (100A maximum per stud)
- Connectorized: Accepts up to two Eaton 32004 VEC input connectors (two terminals each, colored/keyed, sealed connectors)
- 60A maximum per terminal, providing power to the VEC Power Grid

Terminations

Output

- Delphi Metri-Pack® 280 Series terminals (sealed/unsealed and tanged/tangless)
- Delphi Metri-Pack 280 Series cavity plugs are installed where wires are not used.

Wire Sizes

- With wire seals: #12-22 AWG (0.35-5.0mm²)
- Without wire seals: #10-22 AWG (0.35-5.0mm²)

Input

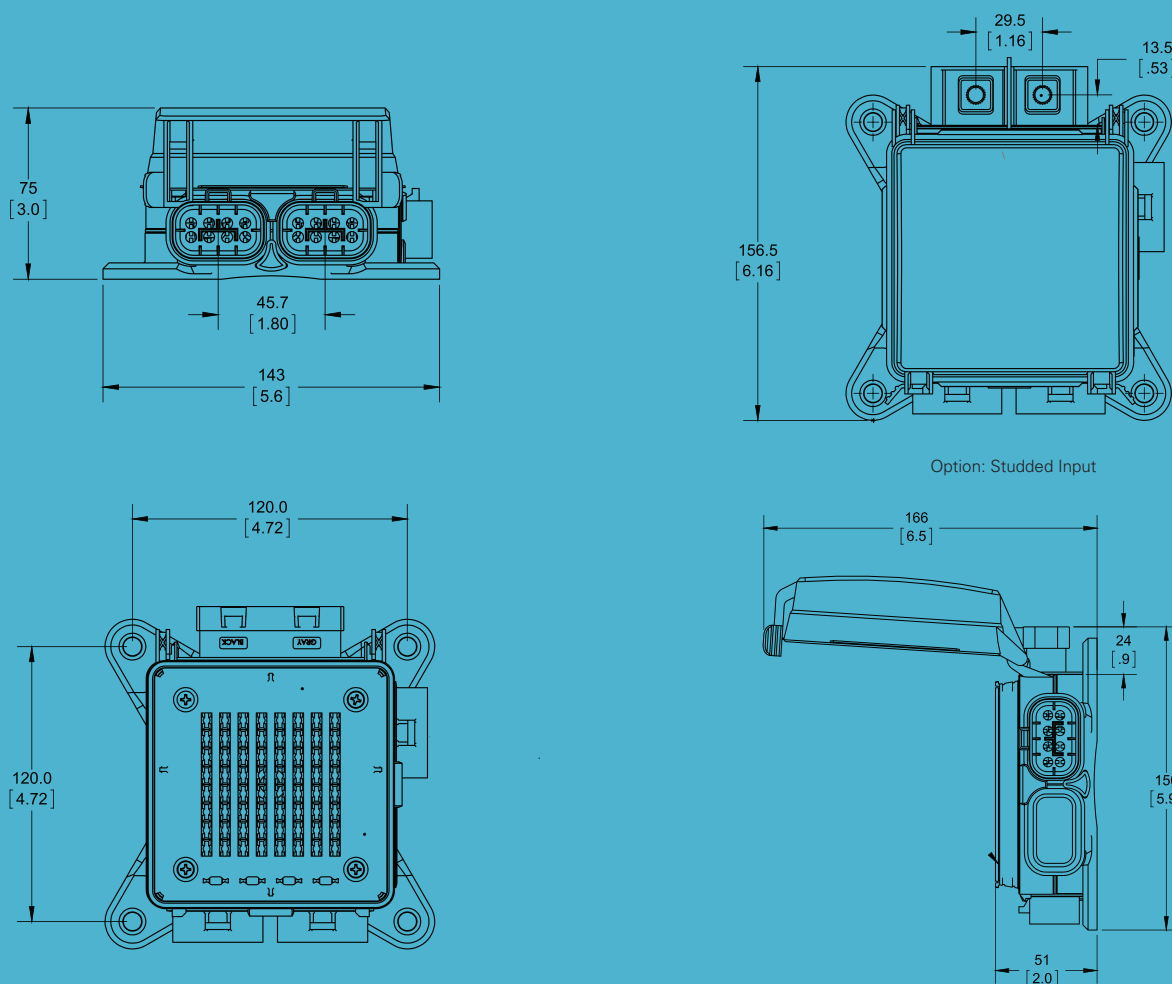
- Delphi Metri-Pack 800 Series terminals (sealed/unsealed)

Wire Sizes

- With wire seals: #10-14 AWG (2.0-8.0mm²)
- Without wire seals: #8-14 AWG (2.0-8.0mm²)

Notes: Each design is customer specific. Consult your sales representative today for your application. Electrical terminals, cable seals and cavity plugs are NOT supplied by Eaton.

Dimensions in mm (inches)



Series 31m - mVEC

Multiplexed Vehicle Electrical Center

The multiplexed Vehicle Electrical Center (mVEC) offers economical CAN Network oversight for high power circuits in vehicle power distribution. Rated for 200A; the mVEC may be configured to provide various OEM circuit protection and switching functions, using 2.8mm (mini footprint) fuses, relays and breakers, with the status and control of each circuit accessible through J1939 CAN messages. The mVEC is based on proven and patented technology and is suited for the most demanding transportation vehicle applications.

Features & Benefits

The mVEC acts as a slave module on a J1939 network communicating via the vehicle data bus with the master controller. Functionality as a node in existing vehicle networks is available today with plans for limited stand-alone capability planned for the future. Features include relay control as well as diagnostic reports for fuses, relays and circuit breakers via the vehicle's CAN bus. Both 12 & 24V functionality is available along with high-side & low-side control.

Options

Cover: Solid domed cover with gasket

Cover marking: Laser etching inside, outside, or both

Components: 2.8mm (mini) footprint fuse, breaker, relay, etc.

Standard & customized circuit layouts

Standard & custom CAN messages

Compression limiters on mounting feet

Internal spare fuse holder and socket for fuse extraction tool



Specifications

Capacity

- 200A maximum rating
- 30A per output (100A per output connector)
- Maximum of 12 relays or 32 fuses, or various combinations thereof (unique design configurations may be required)

Materials

- Housing and connector cavities: UL 94 V-0 rated thermoplastic
- Internal power grid: tin-plated copper
- CAN circuit board: conformally coated

Operating temperature ratings

–40°F (–40°C) to 185°F (85°C)

Ingress protection

IP66 compliant

Foot torque rating

- 60 in-lbs brass compression limiters
- 200 to 300 in-lbs with stainless steel compression limiters

Connections

Output: Standard Eaton 32006 VEC connectors

- 8-way, colored/keyed, sealed (IP66 with wire seals & plugs) connectors
- 30A maximum per terminal (100A per connector)
- Accepts Delphi Metri-Pack® 280 Series terminals (tanged/tangless)

Input: Studded or Connectorized

- Studded input option: Supports two M8 input power studs for DC power into the VEC power grid (100A maximum per stud)
- Connectorized: Accepts up to two Eaton 32004 VEC input connectors (two terminals each, colored/keyed, sealed connectors)
- 60A maximum per terminal, providing power to the VEC Power Grid; uses Delphi Metri-Pack 800 series terminals

Terminations

Output

- Delphi Metri-Pack 280 Series terminals (sealed/unsealed and tanged/tangless)
- Delphi Metri-Pack 280 Series cavity plugs are installed where wires are not used.

Wire Sizes

- With wire seals: #12-22 AWG (0.35-5.0mm²)
- Without wire seals: #10-22 AWG (0.35-5.0mm²)

Input

- Delphi Metri-Pack 800 Series terminals (sealed/unsealed)

Wire Sizes

- With wire seals: #10-14 AWG (2.0-8.0mm²)
- Without wire seals: #8-14 AWG (2.0-8.0mm²)

CAN

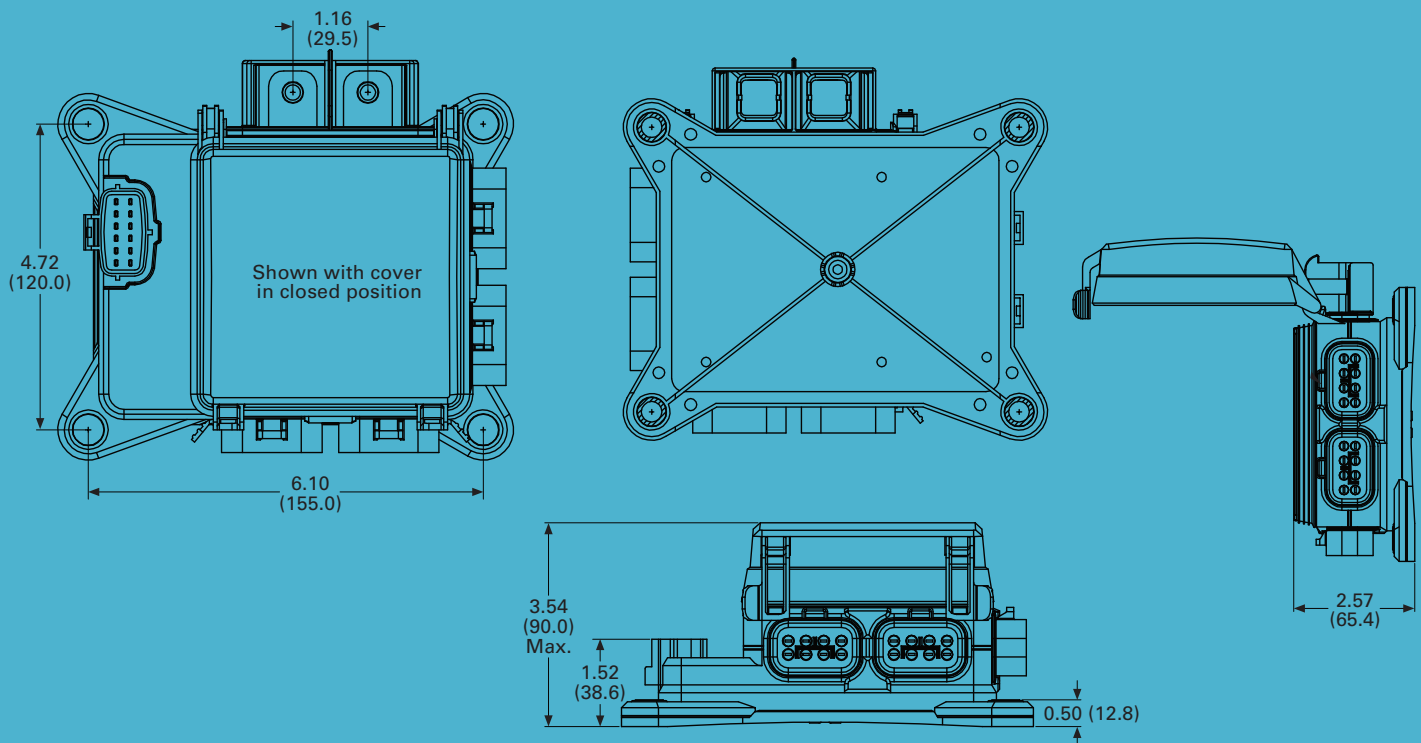
- Uses AMP SSC 12-position sealed connector
- CAN connector provides CAN signaling, power, ground, addressing, auxiliary relay control and reserve connections to mVEC “smart” layer

Maximum torque rating

- M8 input stud: 18 FT-LBS
- Mounting: 2.5 FT-LBS

Notes: Each design is customer specific. Consult your sales representative today for your application. Electrical terminals, cable seals and cavity plugs are NOT supplied by Eaton.

Dimensions in Inches (mm)



Series 32000 - DVEC

Dual Vehicle Electrical Center

The DVEC is capable of operating in various environments such as those with high vibration & moisture (up to IP65 specifications). The unit provides efficient and compact power distribution for demanding applications associated with construction, agriculture, heavy trucks, bus and specialty vehicles.

Features & Benefits

Eaton DVECs all feature a unique color-coded and keyed connector system, and accepts common plug-in fuses, relays, circuit breakers, resistors, diodes and transorbs based on the industry standard 2.8mm footprint.

Options

Cover: solid domed cover with gasket

Cover label: inside cover or none

Input Style: 8.0mm blade terminals or M8/M6 studs

Internal spare fuse holder and socket for fuse extraction tool

Components: fuse, breaker, relay, diodes and transorbs



Specifications

Terminal ratings

Capacity

- 400A max rating
- 30A per output
- Maximum of 32 relays, 64 fuses/circuit breakers or various combinations thereof (unique design configurations may be required)

Materials

- Housing and connector cavities: UL 94 V-0 thermoplastic
- Internal power grid: tin-plated copper

Operating temperature ratings

- -40°F (-40°C) to 221°F (105°C)

Ingress protection

- IP55 (IP65 with sealed cover and output connector wire seals and plugs)

Maximum torque rating

- M8 input stud: 18 FT-LBS
- Mounting: 2.0 FT-LBS

Connections

Output: Standard Eaton 32006 VEC connectors

- 8-way, colored/keyed, sealed (IP66 with wire seals & plugs) connectors
- 30A maximum per terminal (100A per connector)
- 100A maximum per connector
- Accepts Delphi Metri-Pack® 280 Series terminals (tanged/tangless)

Input: Standard Eaton 32004 VEC connectors

- Studded input option: Supports four M8 or M6 input power studs for DC power into the VEC power grid (100A maximum per stud)
- Connectorized: Accepts up to four Eaton 32004 VEC input connectors (two terminals, colored/keyed, sealed connectors)
- 60A maximum per terminal, providing power to the VEC Power Grid; uses Delphi Metri-Pack 800 series terminals

Terminations

Output

- Delphi Metri-Pack 280 Series terminals (sealed/unsealed and tanged/tangless)
- Delphi Metri-Pack 280 Series cavity plugs are installed where wires are not used.

Wire Sizes

- With wire seals: #12-22 AWG (0.35-5.0mm²)
- Without wire seals: #10-22 AWG (0.35-5.0mm²)

Input

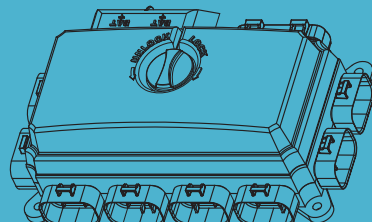
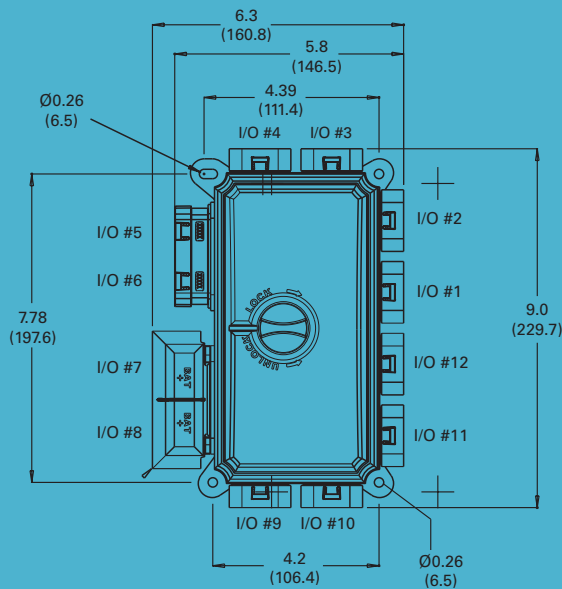
- Delphi Metri-Pack 800 Series terminals (sealed/ unsealed)

Wire Sizes

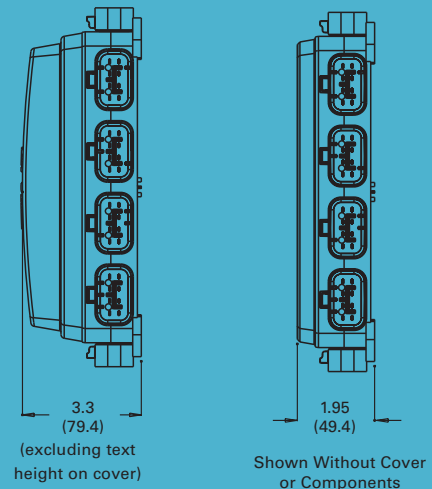
- With wire seals: #10-14 AWG (2.0-8.0mm²)
- Without wire seals: #8-14 AWG (2.0-8.0mm²)

Notes: Each design is customer specific. Consult your sales representative today for your application. Electrical terminals, cable seals and cavity plugs are NOT supplied by Eaton.

Dimensions in Inches (mm)

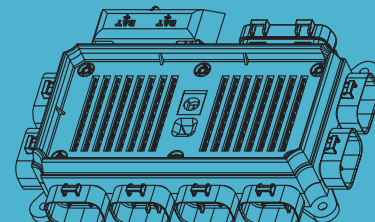


Version with cover



(excluding text height on cover)

Shown Without Cover or Components



Version without cover

Series 32s - ssDVEC

Severe Service Dual Vehicle Electrical Center

The ssDVEC is capable of operating in various environments such as those with high vibration and moisture, up to direct high pressure spray (IP66). The ssDVEC provides efficient and compact power distribution for OEMs with demanding applications in the transportation industry including construction, agriculture, heavy trucks, bus, marine and specialty vehicles. As with all VECs, the ssDVEC uses the patented Eaton 'power grid' technology easily programmable to accommodate various OEM wiring requirements.

Features & Benefits

Eaton DVECs all feature a unique color-coded/keyed connector system, and accepts common plug-in fuses, relays, circuit breakers, resistors, diodes and transorbs based on the industry standard 2.8mm footprint.

Additionally the ssDVEC has these features:

- Durable plastic housing
- Gortex vent minimizing effects of water condensation
- Internal silicone gasket between all seams and plastic terminal interfaces
- Internal spare fuse holder and socket for fuse extraction tool

Options

Cover: Solid domed cover with gasket

Cover marking: Laser etching (outside only)

Components: Fuse, breaker, relay, diodes and transorbs

Compression limiters on mounting feet

Internal spare fuse holder and socket for fuse extraction tool



Specifications

Capacity

- 400A maximum rating
- 30A per output
- Maximum of 32 relays or 64 fuses, or various combinations thereof (unique design configurations may be required)

Materials

- Housing and connector cavities: UL 94 V-0 rated thermoplastic
- Internal power grid: tin-plated copper
- Internal gaskets stud input covers: silicone

Operating temperature ratings

- -40°F (-40°C) to 221°F (105°C)

Ingress protection

- Application dependent up to IP66 requirements

Maximum torque rating

- M8 input stud: 18 FT-LBS
- Mounting: 2.5 FT-LBS without compressions limiters
- Mounting: 25 FT-LBS with compression limiters

Connections

Output: Standard Eaton 32006 VEC connectors

- 8-way, colored/keyed, sealed (IP66 with wire seals & cavity plugs) connectors
- 30A maximum per terminal
- 100A maximum per connector
- Accepts Delphi Metri-Pack® 280 Series terminals (tanged/tangless)

Input: Studded or Connectorized

- Studded input option: Supports four M8 input power studs for DC power into the VEC power grid (100A maximum per stud)
- Connectorized: Accepts up to four Eaton 32004 VEC connectors (two terminals each, colored/keyed, sealed connectors)
- 60A maximum per terminal, providing power to the VEC Power Grid

Terminations

Output

- Delphi Metri-Pack 280 Series terminals (sealed/unsealed and tanged/tangless)
- Delphi Metri-Pack 280 Series cavity plugs are installed where wires are not used.

Wire Sizes

- With wire seals: #12-22 AWG (0.35-5.0mm²)
- Without wire seals: #10-22 AWG (0.35-5.0mm²)

Input

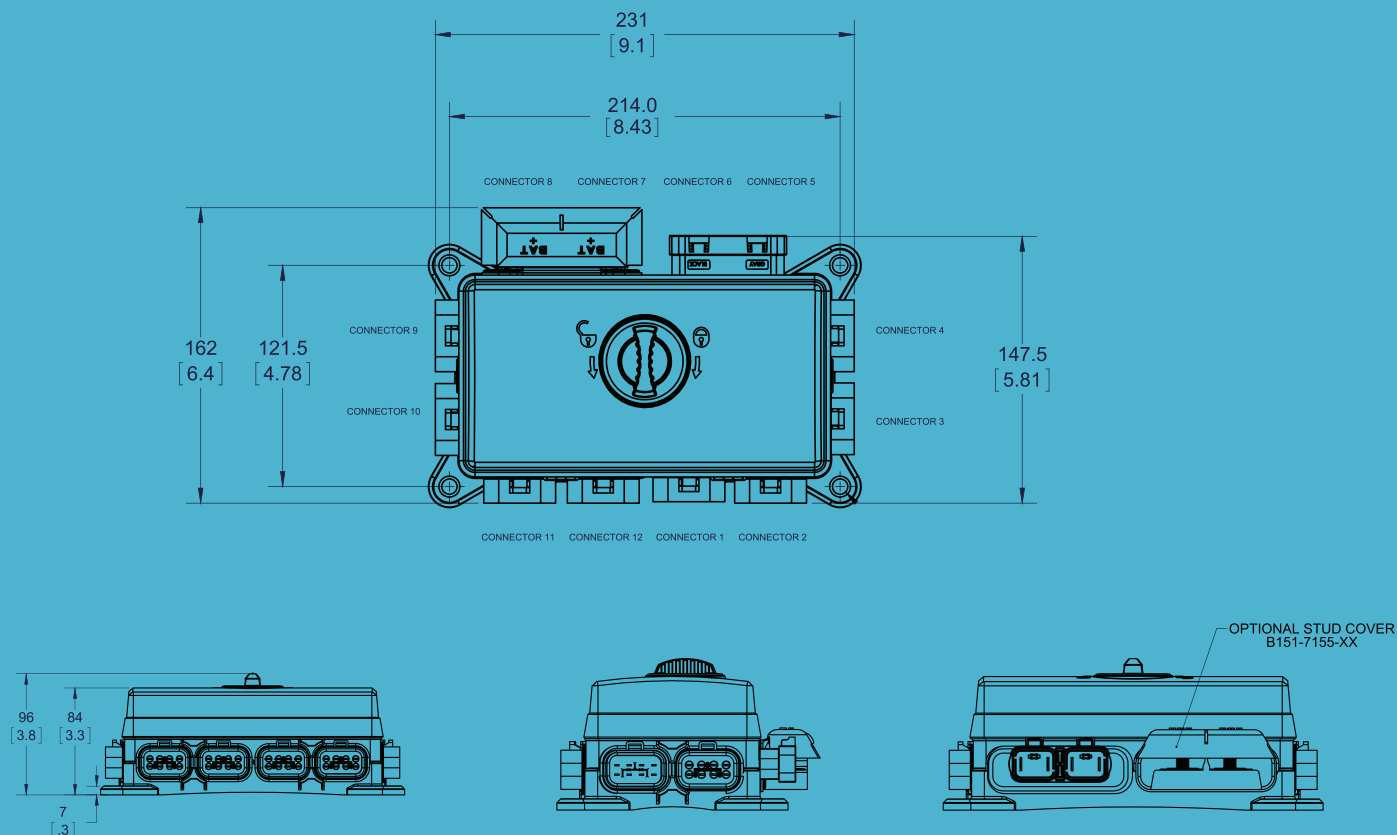
- Delphi Metri-Pack 800 Series terminals (sealed/unsealed)

Wire Sizes

- With wire seals: #10-14 AWG (2.0-8.0mm²)
- Without wire seals: #8-14 AWG (2.0-8.0mm²)

Notes: Each design is customer specific. Consult your sales representative today for your application. Electrical terminals, cable seals and cavity plugs are NOT supplied by Eaton.

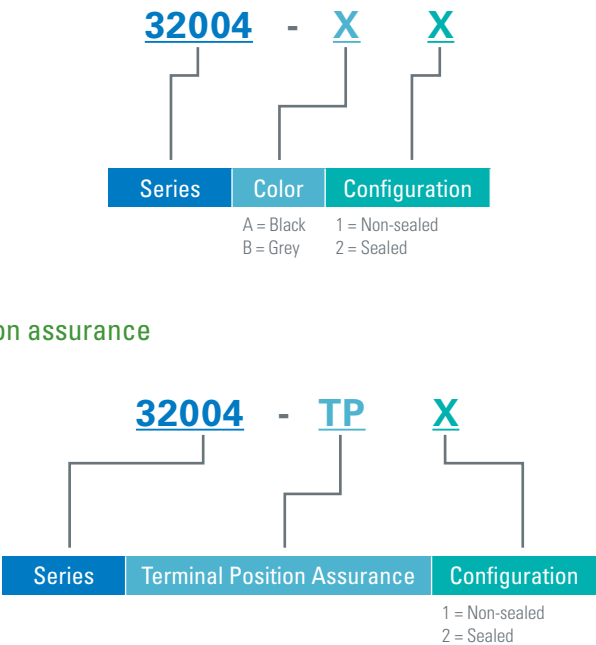
Dimensions in mm (inches)



VEC Connector

32004-XX Power Connector

Male input connector



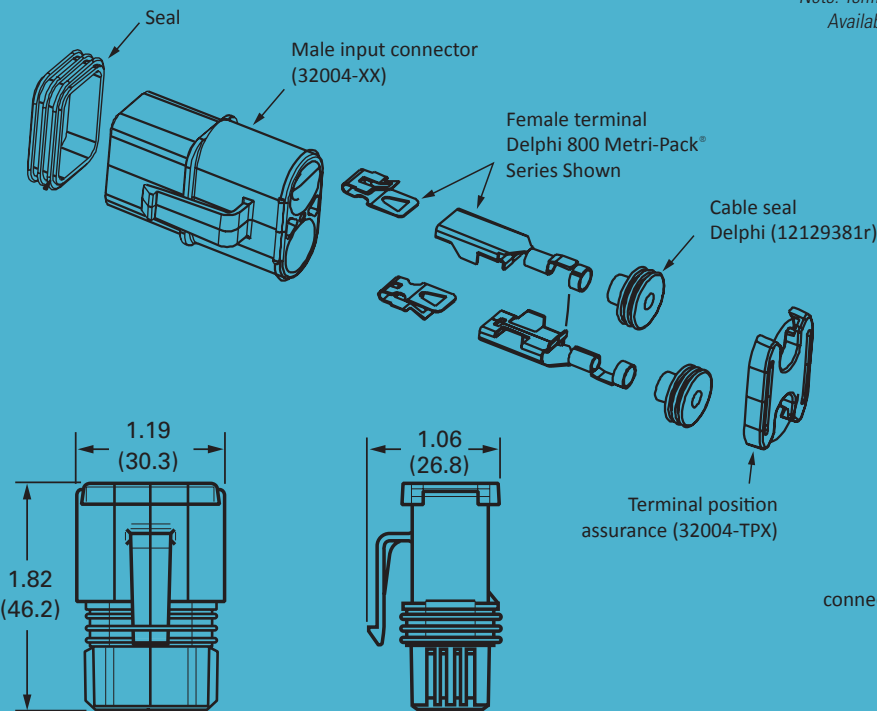
Terminal position assurance



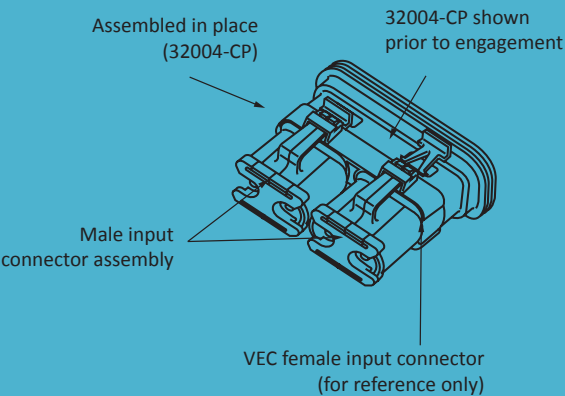
Connector position assurance

32004-CP (ships in bulk)

Dimensions in Inches (mm)



Note: Terminals and terminal seal components are not provided with connectors. Available from Delphi. Contact factory for part list and terminal removal tool. Sealed connector option includes outer body seal.



VEC Connector

32006-XX Output Connector

Male output connector

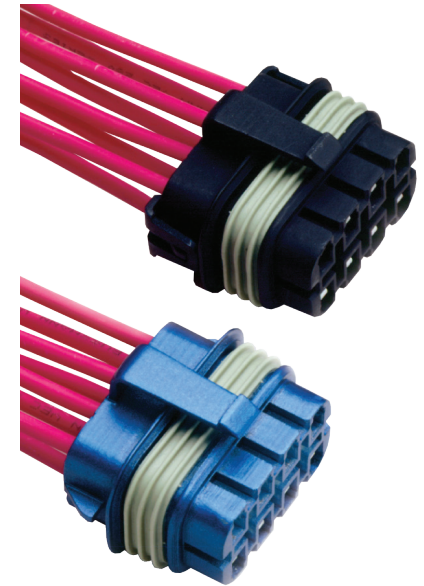
32006 - X X X

Series	Color	Cavity Configuration	Configuration
A = Black B = Grey C = Green D = Blue E = Yellow	F = Red G = Orange H = Brown J = Neutral (only available for -JP2 option)	1 = Tang-less female (Delphi 280) 2 = With tang female (Delphi 280) P = All cavities plugged	1 = Non-sealed 2 = Sealed

Terminal position assurance

32006 - TP X

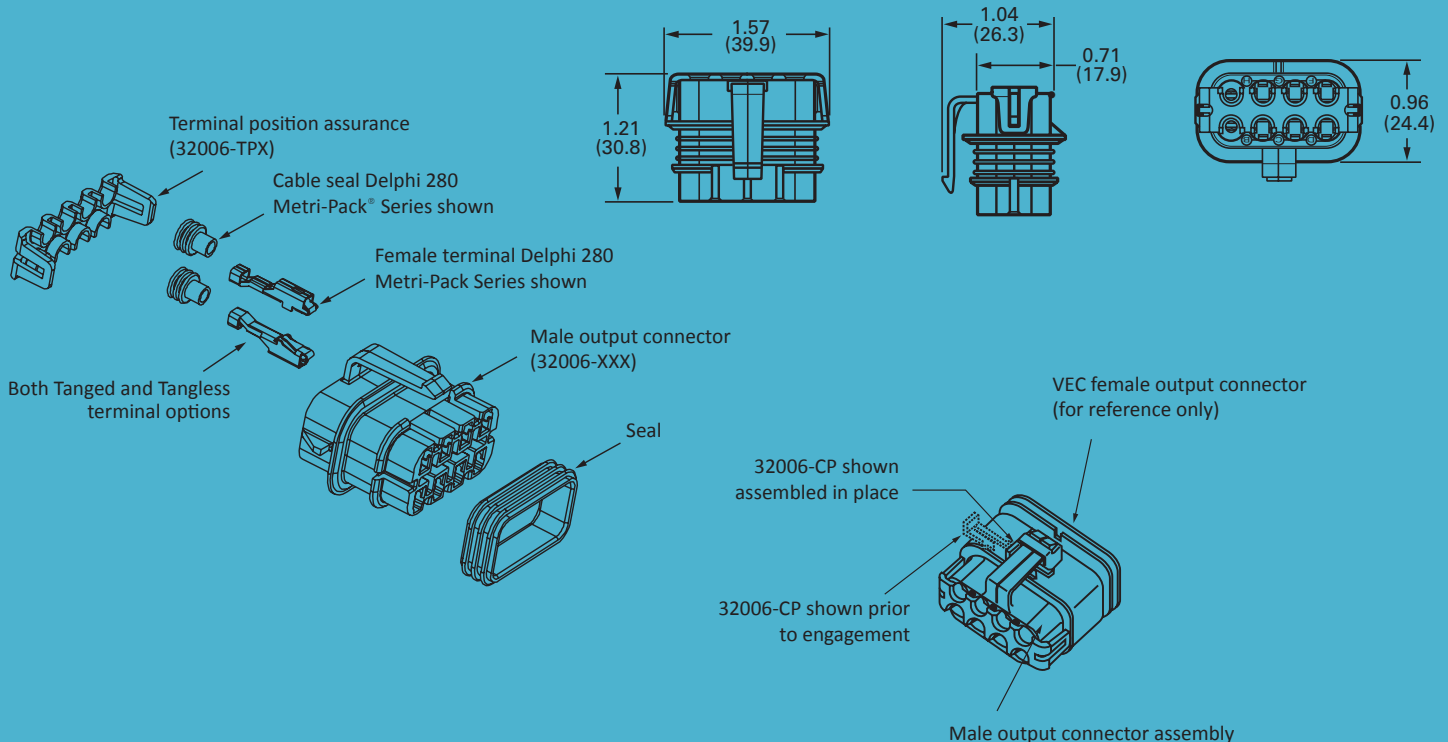
Series	Terminal Position Assurance	Configuration
		1 = Non-sealed 2 = Sealed



Connector position assurance

32006-CP (ships in bulk)
(shown with optional connector seal)

Dimensions in Inches (mm)



2.8mm Blade Plug-in Electrical Components Series 229

Features & Benefits

Color coded and keyed

Specifications

Materials:

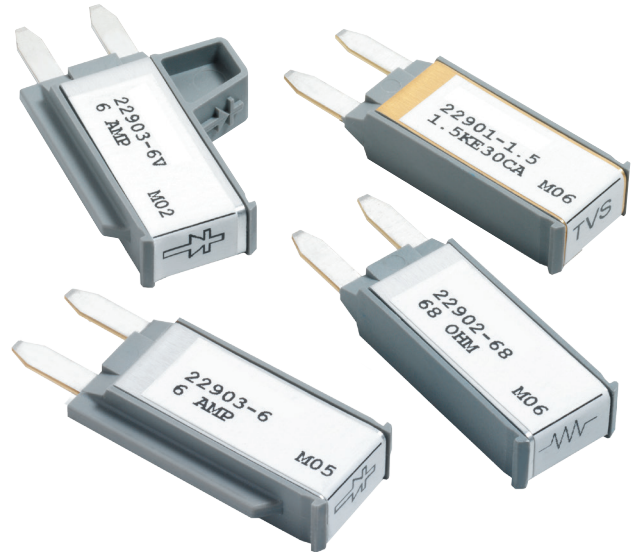
- Grey UL 94-V0 thermoplastic housing with metal cover

Termination type:

- Compatible with 2.8mm type fuse blocks using 8.1 mm centerline

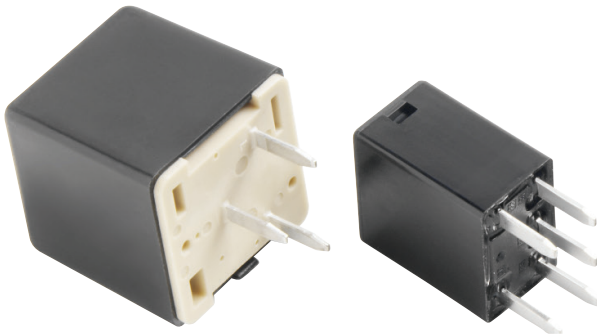
Diode key features:

- Standard key denotes installation direction.
- Extended key available for error proof installation in VEC



Series 229 diode, resistor and transorb

Consult factory for available ratings and part numbers.



Relays

Consult factory for available amperage ratings.

Available for VEC, DVEC, RFRM or RTMR

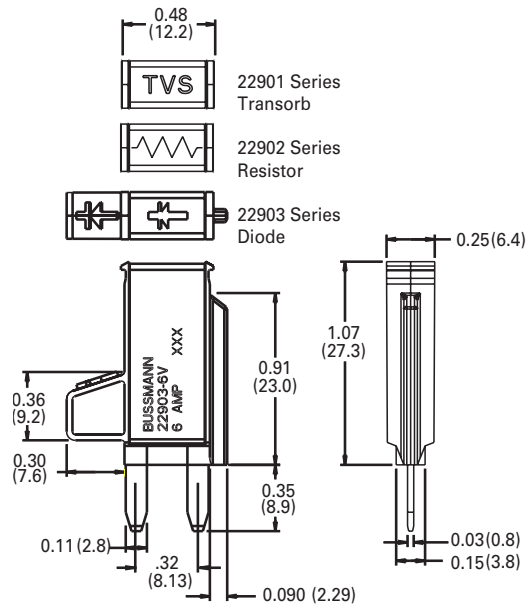
Types:

- 5-pin mini-relay, 12 VDC and 24 VDC
- 5-pin micro-relay, 12 VDC and 24 VDC
- 4-pin mini-micro relay, 12 VDC

Termination Type:

- Compatible with 2.8mm type fuse blocks using 8.1mm centerline

Sealed versions of some relays also available



Series 229 dimensions

Dimensions shown are for reference only.
Please consult factory for latest prints.

VEC Optional Components



Series B109-7031 (for use with 32000 DVEC)

External bus bar can be used with the Dual VEC to bus together studded power inputs.



Series 32011BS (input connector cap)
& Series 32012BS (output connector cap)

Connector caps can be assembled to the mating VEC harness connectors (Series 32004 and 32006) when not in use.

Series 15300 - RTMR

Rear Terminal Mini Fuse & Relay

The Rear Terminal Mini Fuse and Relay (RTMR) provides efficient power distribution in a rugged, compact form for applications in marine, construction, agriculture, heavy trucking, specialty vehicles, etc. This innovative product offers a weather resistant enclosure (IP66) for various mini (2.8mm) blade components when cover, cable seals and cavity plugs are installed. It is available with various degrees of internal electrical bussing, custom labels and multiple hardware configurations in order to meet the needs of any application.



Specifications

Input terminal rating: M6 input studs on bussed/partially bussed inputs. 80A max input on bussed fuse side, 80A max input on bussed relay side.

Output terminal rating: 2.8mm blade terminals (30A max per terminal), temperature dependent

Temperature rating: -40°F (-40°C) to 221°F (105°C) - Consult factory for power derating at higher temperatures

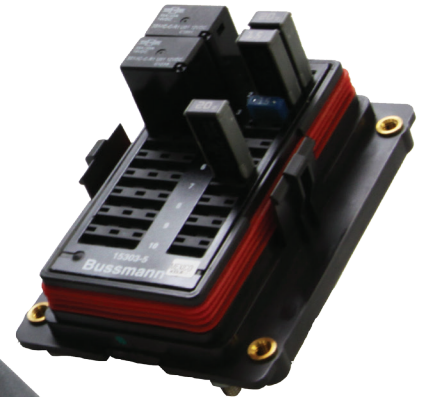
Materials: UL 94 V-0 thermoplastic housing, tin-plated copper internal bussing, bright nickel-plated brass studs (on bussed versions)

Termination: Delphi Metri-Pack® 280 Series terminals (tangless).* (IP66 w/wire seals & cavity plugs installed) Accepts #12-22 AWG wire sizes.

Input stud torque rating: 50in-lbs max

Mounting torque rating: #10-32 (brass) or (M5) tin threaded inserts; 24in-lbs max

Ingress protection rating: IP66-IEC 60529 - valid when properly installed (no more than 90° from horizontal) with cover, sealed terminals and cavity plugs*



Options

Input terminal stud end caps: Protective silicone end caps available for studded versions

Mounting: brackets available for surface-mounting

- Plated steel: B028-7021-O
- Stainless steel: B028-7021-P

Labels: Consult factory for custom label options

Replacement accessories: Consult factory for available service parts

Cover marking: Laser etching on inside, outside or both

Cover options: Two heights (fuses only or relays/circuit breakers)

Latch position assurance: 15300-LP (available in bulk only)



*Consult Delphi distribution for availability

Ordering information

1530

X

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X

X

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X

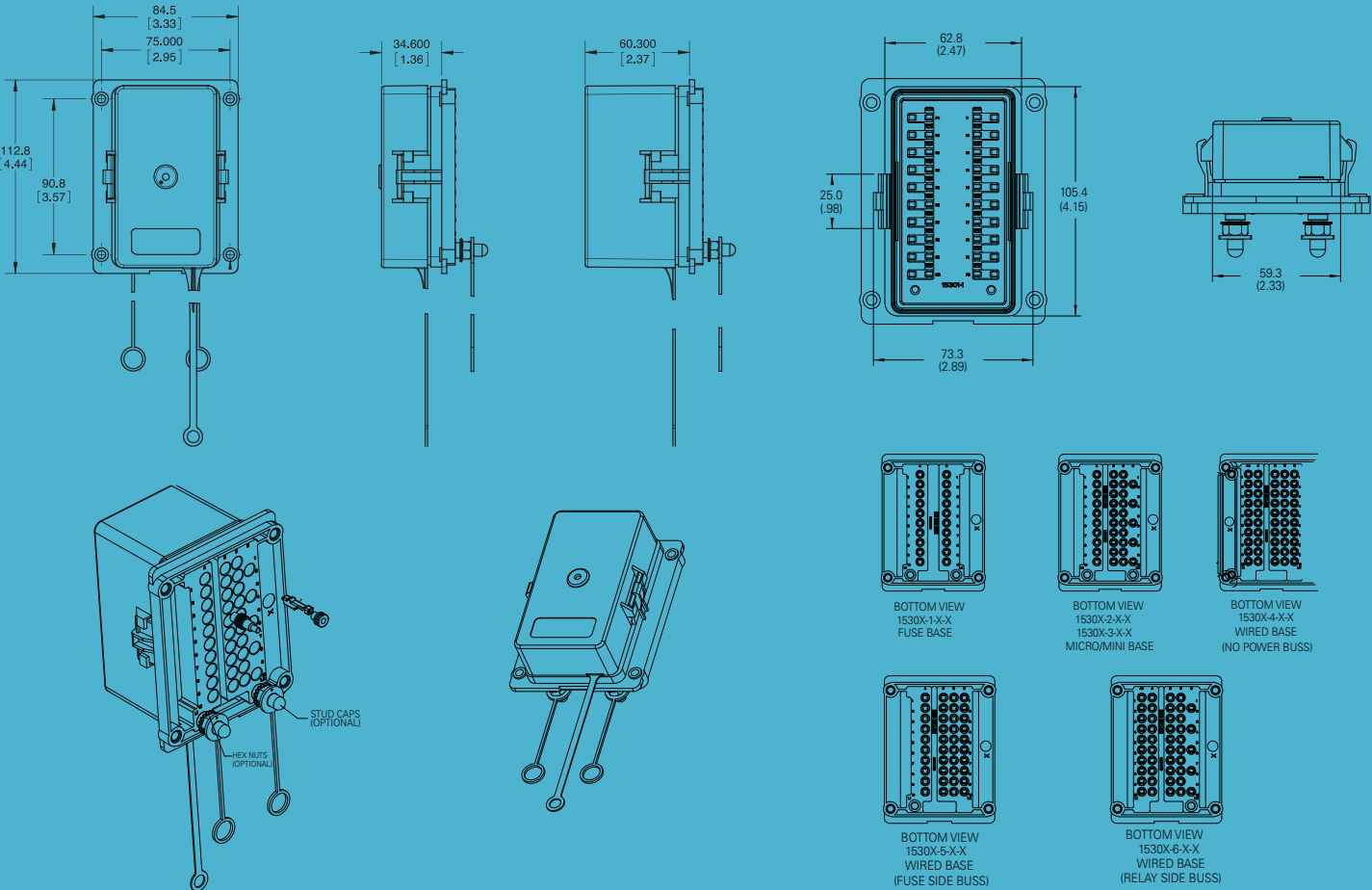
X

RTMR	Mounting	Base	Hardware	Cover	Marking
1530x = Standard RTMR	3 = #10-32 (brass) insert (English) 4 = M5x0.8 (tin) insert (Metric)	1 = Fuse/CB base (for 20 fuses/cb) 2 = Micro relay base (for 5 micro relays with 10 fuses/cb)* 3 = Mini relay base (for 3 micro relays with 10 fuses/cb)* 4 = Wired base, non bussed, no input studs, for fuses/cb and relays 5 = Wired base, input stud fuse side only, for fuses/cb and relays 6 = Wired base, input stud relay side only, for fuses/cb and relays*	0 = None 1 = Nuts (shipped bulk) 2 = Nuts (shipped assembled) 3 = Stud caps (shipped bulk) 4 = Stud caps (shipped assembled) 5 = Nuts & stud caps (shipped bulk) 6 = Nuts & stud caps (shipped assembled)	0 = None 3 = Fuse 4 = Relay/CB	Special labels, consult factory

*Input stud bussed to pin 86 on relay

Base options:
See product specifications below for base option images.

Dimensions in mm (inches)



Series 15310 - 60-position RTMR

Rear Terminal Mini Fuse & Relay

The 15310 Series of power distribution modules provides efficient power distribution in a rugged, compact form with 60 open cavity positions. This non-bussed unit allows insertion of components, cable seals and plugs, providing a weather tight enclosure (IP66 w/ wire seals & cavity plugs installed) for power distribution, making the 15310 suitable for marine, construction, agriculture, heavy trucking and specialty vehicle applications.

Specifications

Blade terminals: Accepts 2.8mm blade fuses, circuit breakers, as well as other components such as relays, flashers, diodes and transorbs with 2.8mm blades on 8.1mm centerline spacing

Mounting: #10-32 (brass) or M5 (tin) threaded inserts;
24 in-lbs max torque

Material: Housing and cover - UL 94 V-0 thermoplastic

Grid labels: Standard product without label, consult factory for label options

Cover Marking: Custom laser etching inside, outside or both

Ratings: 30A max per terminal (temperature dependent)

Temperature rating: -40°F (-40°C) to 221°F (105°C)
rating on PDM only

Ingress protection rating: IP66-IEC 60529 - valid when properly installed (no more than 90° from horizontal) with cover, sealed terminals and cavity plugs*

Terminals: Tyco AMP® MCP2.8 Series (#12-#20 AWG)

20-16 AWG (0.50-1.00mm²): Terminal #1-968855-1 Seal #828904-1

20-16 AWG (1.50-2.50mm²): Terminal #1-968857-1 Seal #828905-1

Cavity plugs: Tyco AMP MCP2.8 Series #828922-1

Related items

Optional mounting brackets available:

- Plated steel: B028-7012-O
- Stainless steel: B028-7012-P

Latch position assurance: 15300-LP (available in bulk only)

Cover options: Two heights (fuses only or relay/circuit breakers)



**Consult Delphi distribution for availability*

Ordering information

15310

X

-

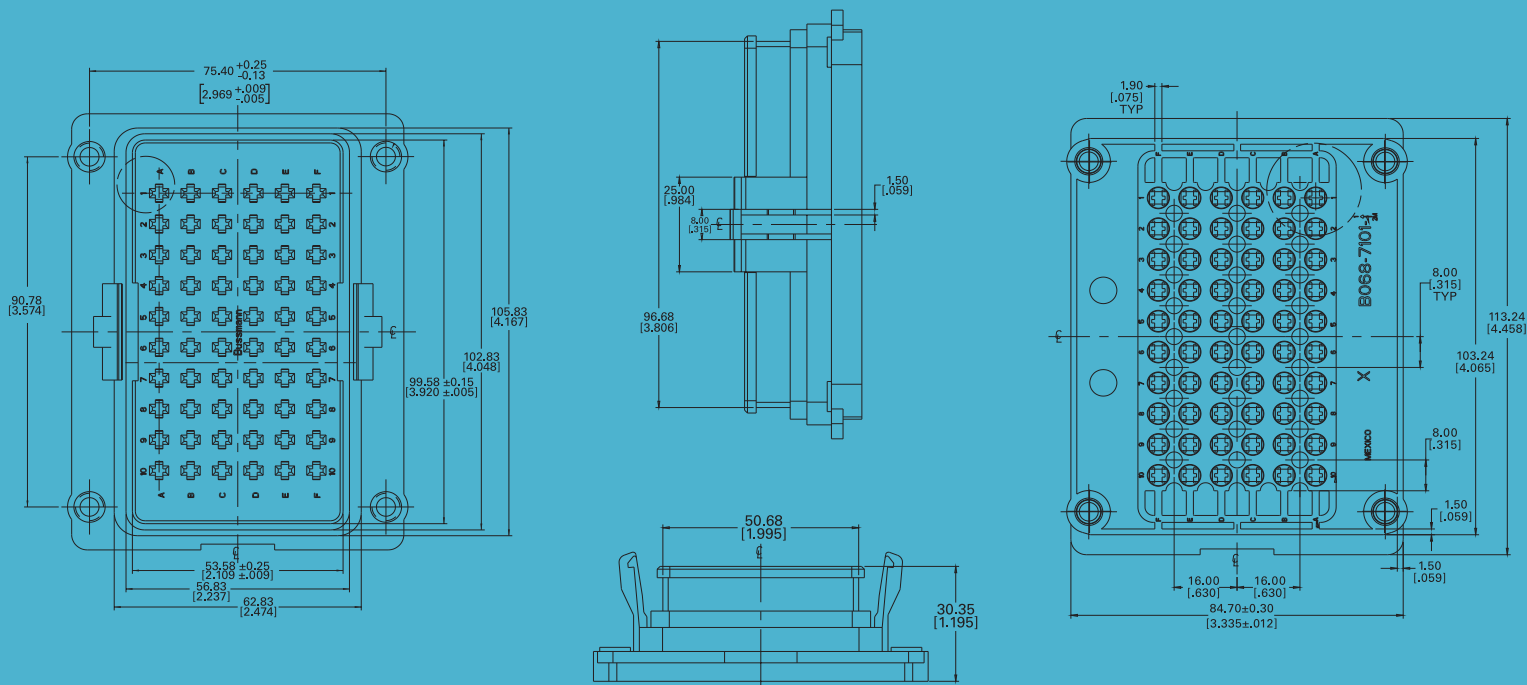
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X

RTMR	Mounting	Cover	Marking
15310 = Standard RTMR	1 = #10-32 (brass) threaded insert 2 = M5 (tin) threaded insert	0 = None 1 = Fuse 2 = Relay/CB	Consult factory for custom marking options

Dimensions in mm (inches)



Note: Tall cover also available

Series 15400 - RFRM

Rear-fed Fuse & Relay Module

The Series 15400 RFRM offers a main power distribution module capable of operating in harsh environment applications. Based on the industry standard 2.8mm (mini) footprint, the Eaton RFRM accepts plug-in fuses, relays, circuit breakers, resistors and diodes to meet numerous power management requirements. The RFRM is available with multiple internal bussing options, accommodating various OEM requirements.

Specifications

Material: UL 94 V-0 thermoplastic, plated copper bus bar, silicone rubber gasket, EPDM - internal tether

Power ratings: Nominal 12VDC and 24VDC systems, 100A per bus bar, 200A max

Temperature rating: -40F (-40°C) to 185°F (85°C)

Ingress protection: IP66 (with use of cover, seals and cavity plugs)

Plug-in component capacity: Up to 10 micro relays and a combination of 40 fuses/circuit breakers (2.8mm blade / 8.1mm center line)

Mounting: #10-32 or M5 x 0.8 available, 24 in-lbs max; max (orientation intended for horizontal to 90°)

Wire size: Accepts #12-22 AWG wire sizes

Terminals: Delphi 280 Series Metri-Pack® sealed/tang style terminals*

Cavity plugs: Delphi 280 Series cavity plug (where output wires are not used), input studs (for bussed version): M8 x 1.25 thread, 70 in-lbs max*

M8 input stud torque: 70 in-lbs max

Options

Internal tether accessory not shown.
It is included with cover option 1

Image shows RFRM with optional yellow fuse puller (part #32013BS)

Image shows RFRM 'stuffed' with components.
RFRM sold without components

Multiplex option coming soon



Notes

- Ingress protection rating has been validated with approved panel mounting applications. Consult factory for testing procedures.
- Consult factory for other mounting orientations.
- Eaton does not supply wires, wire terminals, terminal seals or cavity plugs
- Consult factory for options including custom labels and replacement accessories.

Ordering information

1540

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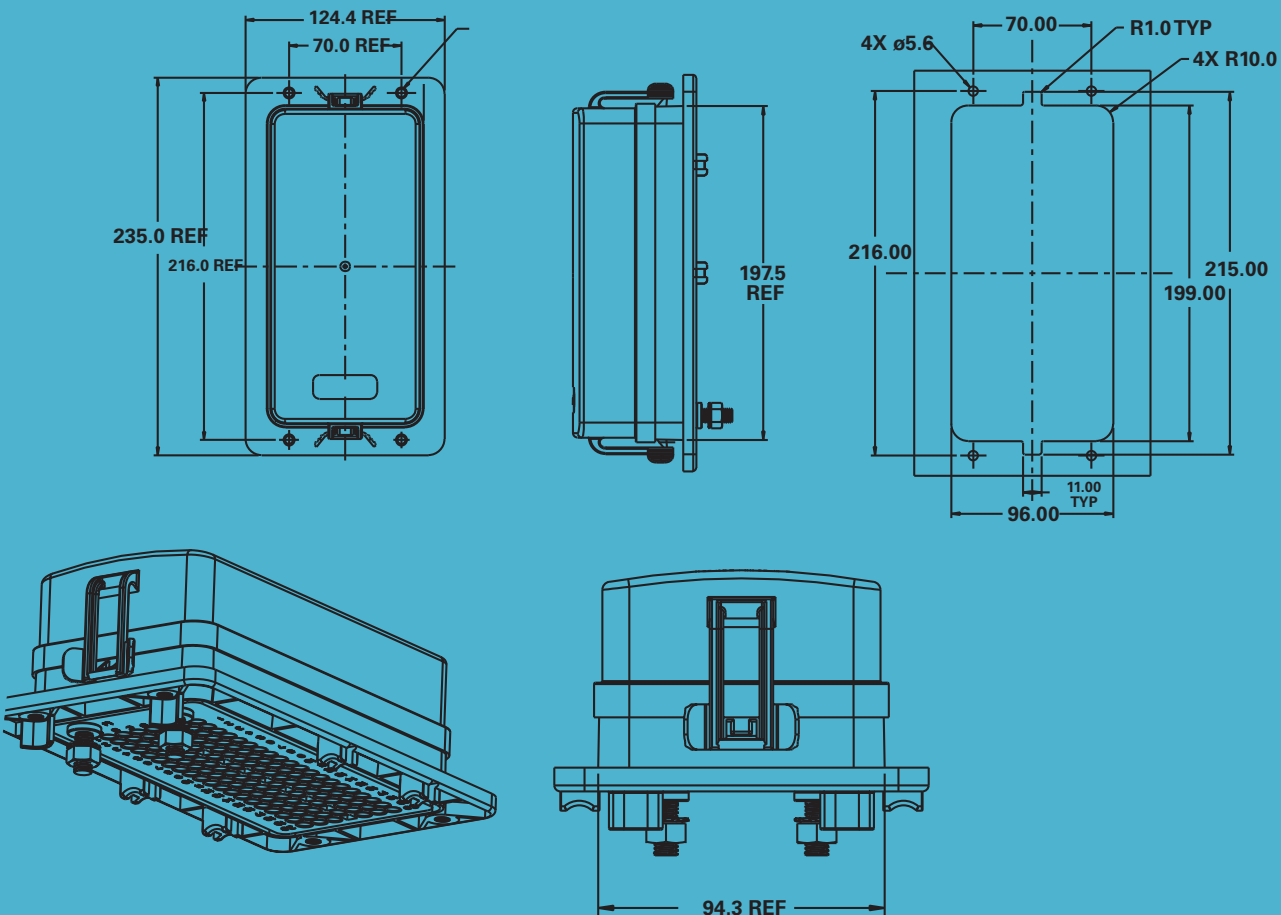
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RTMR	Bus Bars	Base	Hardware	Cover	Label	Label Options
1540 = Standard RFRM	1 = Dual 2 = Left only 3 = Right only 4 = None	1 = English MTG inserts and cable managers 2 = English MTG inserts, w/o cable managers 3 = Metric MTG inserts and cable managers 4 = Metric MTG inserts, w/o cable managers	0 = None 1 = Nuts (shipped bulk) 2 = Nuts (shipped assembled)	0 = None 1 = Standard	0 = Standard	A = Standard B-Z = Private

Dimensions in Inches (mm)



Note: Terminal studs and wire guides optional

PDM-AMI

Multiple fuse holder family

The PDM-AMI family of fuse holders has been designed to allow up to four bolt-in style AMI (SAE Type SF30) fuses to be connected while providing protection from difficult environmental conditions. With the fuses and their spares enclosed in an IP6k9k enclosure, input and output connections are made through ring terminals reducing harness costs while protecting critical circuits. This holder is a sealed solution for your higher current (30A-200A) requirements. It has multiple fuses with spares contained in the same sealed location.

Specifications

Sealing: IP6K9K

Vibration: SAE J1455

Sizing: 2, 3, and 4 positions available

Ratings: 30A to 200A AMI (SAE Type SF30) fuses; Maximum combined current ratings at 135% overcurrent and 105°

- PDM-AMI2: 200A
- PDM-AMI3: 225A
- PDM-AMI4: 425A

Temperature: -40°F (-40°C) to 185°F (105°C)

Termination: Input: M8 stud and keps nut; Fuse Output: M8 stud and keps nut

Torques: Mounting: 80" lbs. (9.0 N•m); Fuse Mounting: 40" lbs. (4.5 N•m); Input: 75" lbs. (8.5 N•m)

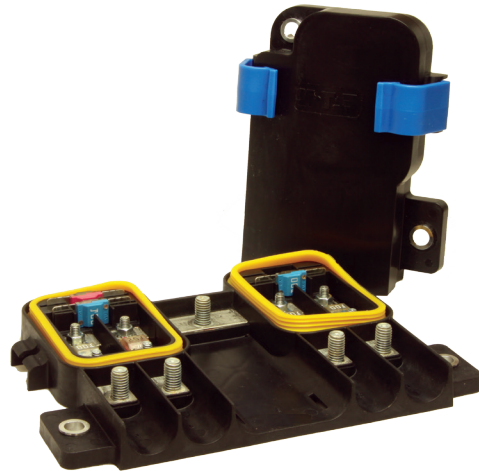
Material: Housing & Cover: UL 94 VØ glass reinforced PBT; Bus Bars: Tin plated copper; Studs: Zinc plated steel, PEM

Options

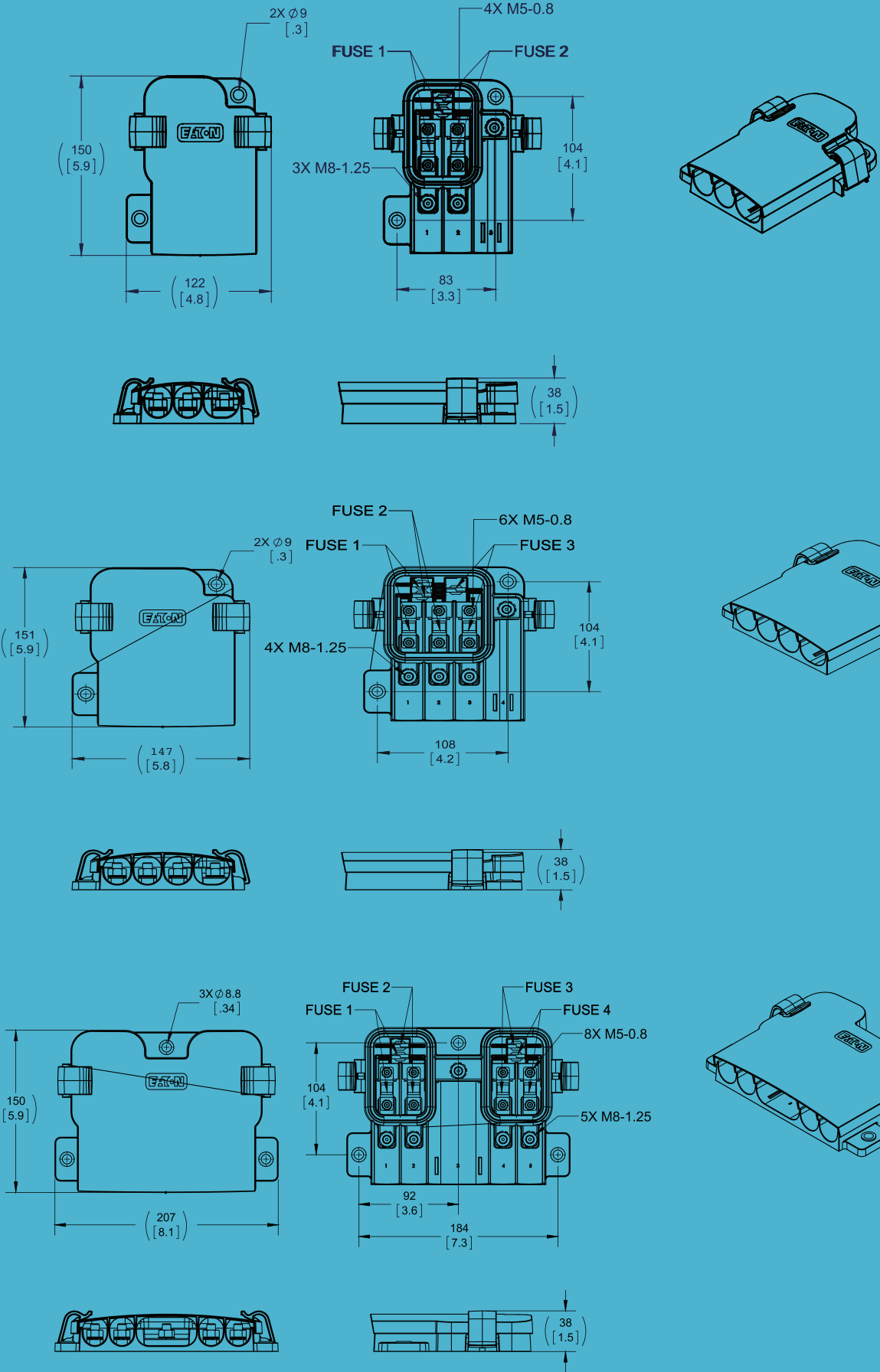
Laser etch capable cover (both inside & out)

2, 3 or 4 fuse models (supplied with or without fuses installed)

Single or dual input cable terminals (on the four-position fuse holder)



Dimensions in Inches (mm)



Series LMG

Multiple AMG fuse holder

Eaton offers a heavy duty power distribution module called the LMG used for main branch primary fusing and accepts multiple (two, three or five) industry standard AMG (mega) fuses. Using a common input bus bar, the LMG requires just one input connection to power all fuses, providing efficient power distribution suitable for challenging applications.

Specifications

Sizing: 2, 3 and 5 positions available

Ratings: Maximum total combined rating is 300A continuous

Temperature: -40°F (-40°C) to 185°F (85°C)

Termination: 5/16 - 18 or M8 studs, nuts and lock washers for fuse and surface mounting

Torques:

- Mounting: 100 in-lbs max
- Power input/output: 120 in-lbs max

Material:

- Housing: Black UL 94-V0 thermoplastic
- Cover: Red EPDM cover for protection from accidental shorts
- Studs: Plated steel

Options

Fuse options: LMGs may be supplied with various fuse configurations. If fuses are selected, the input side of fuses are torqued to specification at Eaton factory and given a custom part number.

Mounting hardware: Installed or in bulk (English/Metric available)

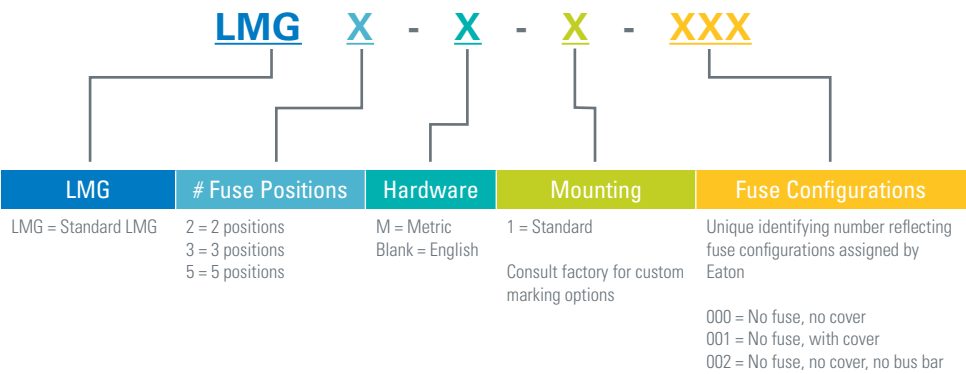
Cover: Installed, in bulk or no cover.



Notes

- Based on numerous variations possible between # of LMG poles, fuses selected, input wiring and output wiring, all applications should be tested by the installer to verify the product meets their requirements.
- Housing must not exceed 130°C.

Ordering information



Dimensions in Inches (mm)

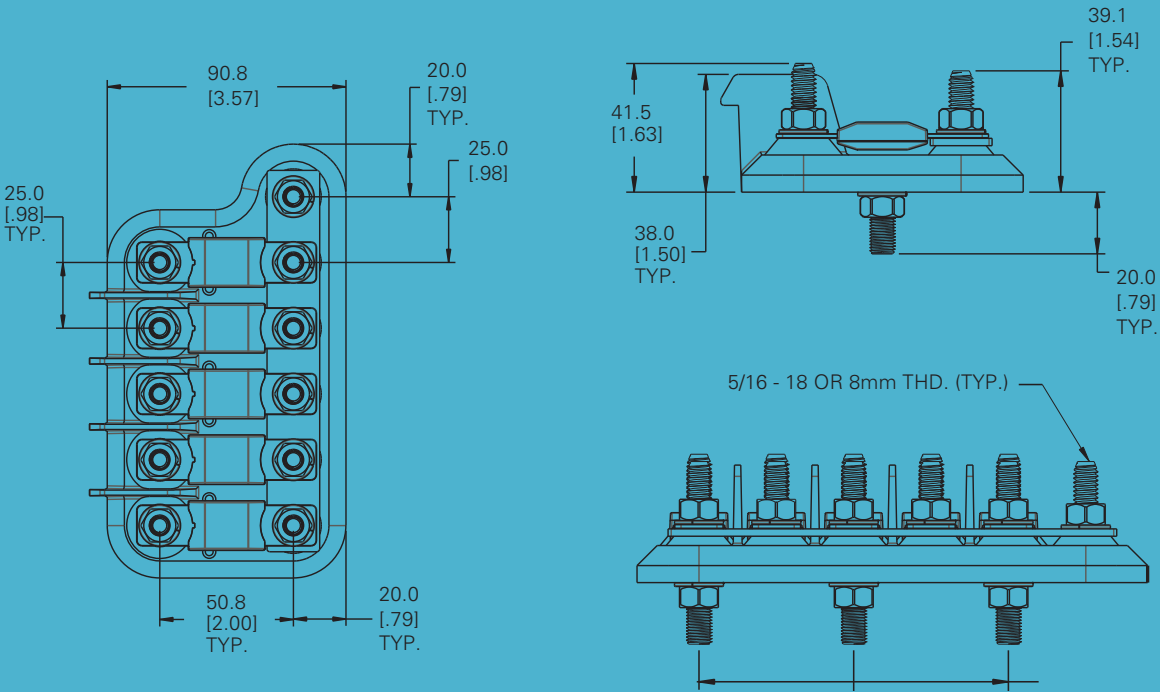


Table 1	
Pole	"X" mm
2	25
3	50
5	50
5 (ALT)	100

Series LMI

Configurative AMI fuse holder system

The LMI fuse holder series can be used for main branch primary fusing and accepts multiple (up to six) industry standard AMI (midi) fuses. Sold by individual component piece or assembled, the LMI uses a common input bus bar for assemblies of two or more fuses.

The LMI provides efficient power distribution suitable for many applications, such as marine, construction, agriculture, heavy trucking, bus and specialty vehicles.

Specifications

Sizing: One fuse module per AMI fuse, one input module and bus bar required per LMI2-LMI7 assembly, maximum of seven modules per assembly

Ratings: Maximum total combined rating is 400A continuous*

Temperature: -40°F (-40°C) to 185°F (85°C)

Termination:

Input module: Stainless Steel M8 or 5/16-18 stud and keps nut

Fuse module: Stainless Steel M5 or #10-32 studs and keps nuts

Torques:

- Mounting: 22 in-lbs max
- Input module: 75 in-lbs max
- Fuse module: 39.8 in-lbs max

Material:

- Housing: HTN black UL 94-V0 thermoplastic
- Cover: Red EPDM/Santoprene cover for protection from accidental shorts
- Studs: Stainless Steel



Options

All modules (input or fuse holder) will match same units in a given assembly, either all metric or all English, as specified.

“E” represents “10-32” stud for fuse modules and “5/16-18” for input module. “M” represents M5 stud for fuse module and M8x1.25 size for input module.

The largest possible LMI assembly that can be created is 7 modules total; 6 fuse modules and one input module. At most, 7 positions can be shown in suffix -X(XXXXX).

Eaton does not recommend more than 6 bussed fuse modules being connected together (with one input module). The input module should be located in the center of the assembly for bus bar efficiencies

Bus bars are included for all assemblies greater than or equal to an LMI2

All modules come with covers.

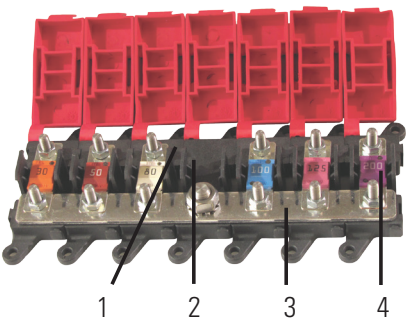
When ordering individual LMI modules for assembly by the customer, bus bars can be individually ordered using part number B109-7046-x (where “x” represents the number of total modules, including input module, that the bus bar will connect)

When ordering LMI1 with fuse and/or nuts, both fuse and nuts will ship bulk.

To order assembled units, the minimum order quantity is 100 units.

Attach all wire cables with the ring terminals in direct contact with the fuse or bar (i.e. no fasteners or washers between ring terminal and fuse/buss bar)

Based on numerous variations possible between numbers of poles used, fuses selected, input wiring and output wiring, all applications should be tested by installer to verify the product meets their requirements.



Item	Description
1	LMI fuse module
2	LMI input module
3	Bus bar
4	AMI fuse

Ordering information

LMI

X

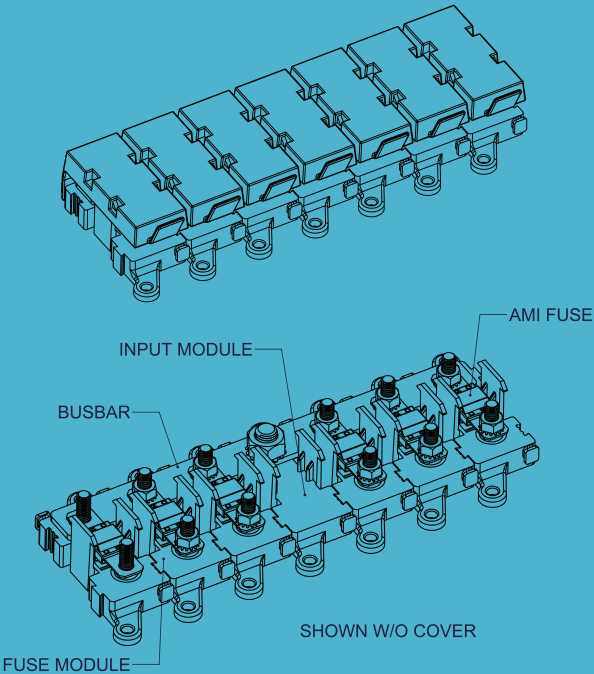
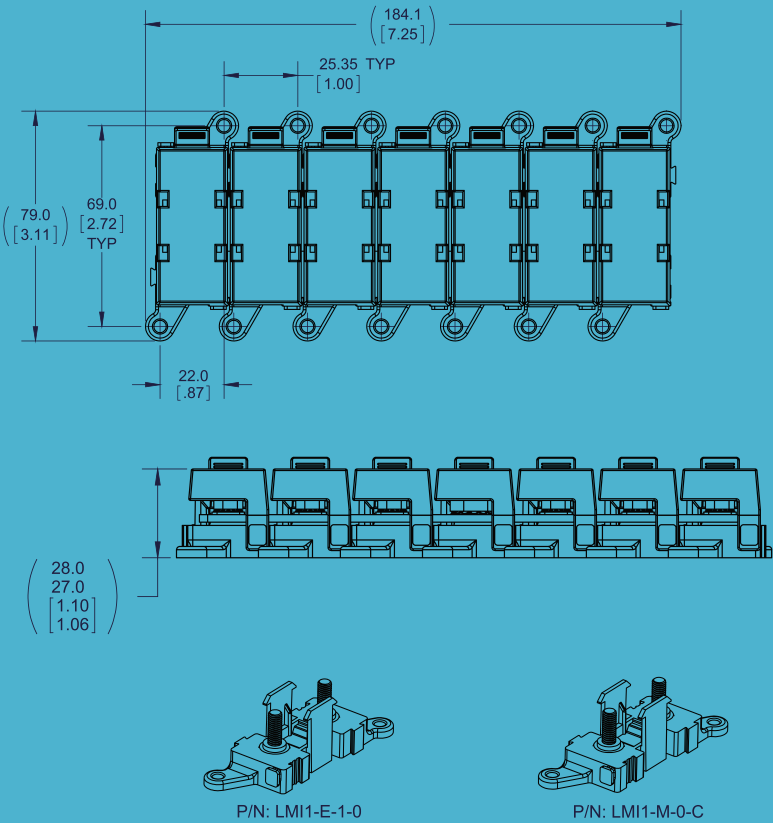
X

X

X(XXXXXXX)

LMI	# Fuse Positions	Hardware	Hardware Options	Fuse Configurations
LMI = Standard LMI	1-7 = Number of total modules (fuse modules and/or input modules). Max: 7 including input module	M = Metric E = English	0 = None (for individual components only) 1 = SS Keps Nut in bulk (for individual components only) 2 = SS Keps Nut installed (only for assembled LMI2-LMI7)	Up to 7-digit sequence representing each module in assembly, left to right, with bus bar in the front/ bottom. 0 = Fuse module w/o fuse 1 = Input module A = Fuse module w/30A AMI fuse B = Fuse module w/40A AMI fuse C = Fuse module w/50A AMI fuse D = Fuse module w/60A AMI fuse F = Fuse module w/70A AMI fuse G = Fuse module w/80A AMI fuse H = Fuse module w/100A AMI fuse I = Fuse module w/125A AMI fuse J = Fuse module w/150A AMI fuse K = Fuse module w/175A AMI fuse L = Fuse module w/200A AMI fuse

Dimensions in Inches (mm)



Series 15700 - RTA

Rear Terminal ATC Fuse Panel

The Rear Terminal ATC® Fuse Panel (RTA) is a rear-fed panel with high component retention, which makes it an ideal choice for high vibration environments including construction, agriculture, bus, recreational vehicles, heavy trucking equipment, etc. It is available in multiple lengths and internal bussing configurations. This allows for up to four separate power input circuits and 32 individual output circuits.

Specifications

Input terminal rating: 1/4-20 stud; quick-connect terminals provided on middle bus (Series 15713 & 714); 200A max total input for unit

Output terminal rating: 30A max load per circuit

Temperature rating: -40°F (-40°C) to 260°F (125°C)

Materials: UL 94 V-0 thermoplastic

Termination:

- Delphi Pack-Con® Series 3 & 5
- Input wire size: #4-6 AWG
- Output wire size: #10-16 AWG
- Torque Rating: 50 in-lbs max
- Mounting torque rating: #10-32 threaded inserts, 24 in-lbs max torque

Options

Positions: 8-32 circuits available

Split power: Single, dual, triple or quadruple bus options

Cover: Short cover for fuses only and taller cover for use with circuit breakers

Locks: Secondary locs available for securing of output terminals (#15710-TP - comes in multiples of 8 positions. Must order multiple strips to cover length of selected RTA).



Notes

- Consult Delphi distribution for availability
- For Series 15712, 15713 and 15714, there is a maximum total of 32 positions and must be in increments of 4.

Ordering information

1571X

XX-XX

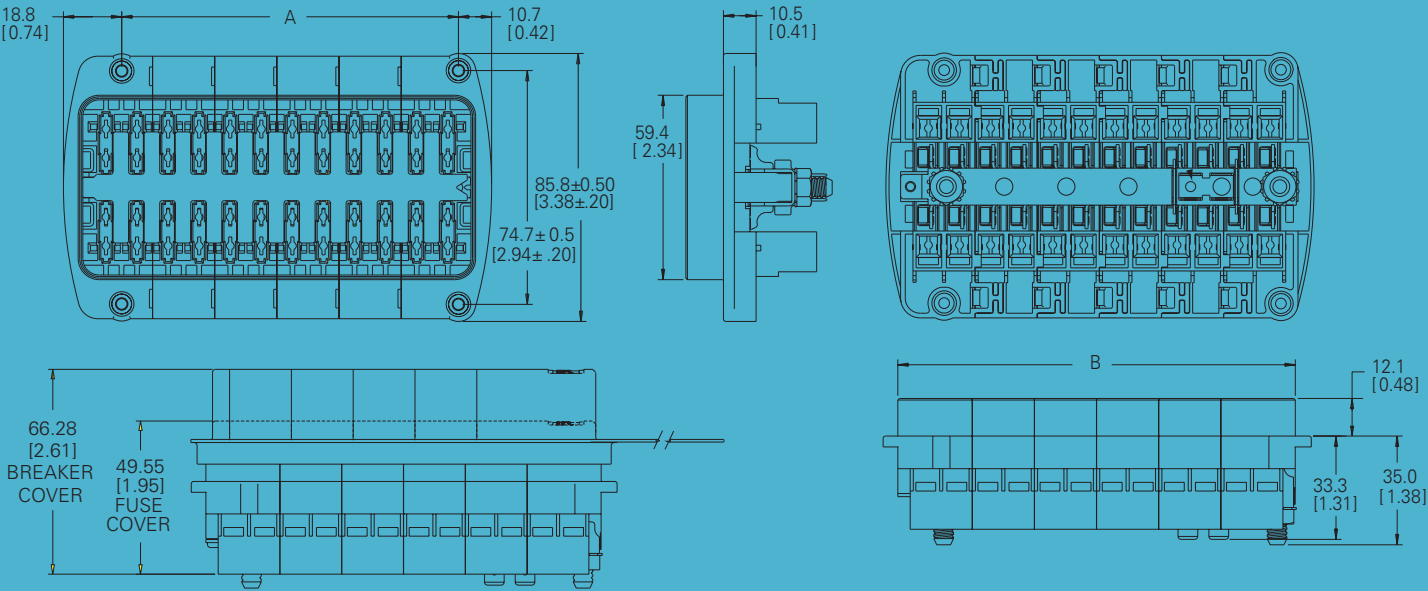
X

X

X

Series	# Positions	Hardware Options	Cover Options	Marking Option
15711 = Single stud, single circuit supply 15712 = Double stud, split supply circuit 15713 = Triple buss, split supply circuit 15714 = Quadruple buss, split supply circuit	15711 Series 08-32 = Total 15712 Series 06-28 = Left side 04-28 = Right side 15713 Series 14-31 = Left side 06-24 = Right side 15714 Series 14-31 = Left side 06-24 = Right side	0 = None 1 = Nuts (shipped in bulk) 2 = Nuts (shipped assembled)	0 = None 1 = Fuse cover 2 = CB cover	A = Standard Consult factory for special marking options

Dimensions in mm (inches)



	DIM 'A' VALUE	DIM 'B' VALUE
8 POLE	28.0	47.5
12 POLE	48.0	67.0
16 POLE	67.8	87.0
20 POLE	87.5	107.0
24 POLE	107.0	126.5
28 POLE	127.0	146.5
32 POLE	147.0	166.5

Series 15600

ATC Type Fuse Panel

The 15600 ATC® fuse panel is a compact power distribution module. It is available in a single or dual internal bus electrical configuration featuring an optional ground pad terminal strip. The 15600 fuse panel is surface mounted, uses convenient quick-connect terminals and is recommended as a supplemental power distribution module.

Specifications

Input terminal rating: #10-32 threaded studs (100A max)

Output terminal rating: 30A max per circuit

Temperature rating: 0°C (-20°F) to 65°C (150°F)

Materials: UL 94 V-0 thermoplastic

Termination: 0.250" x 0.032" quick-connect terminals*

Ground terminal pad option available

Input wire size: #4-6 AWG

Output wire size: #12-16 AWG

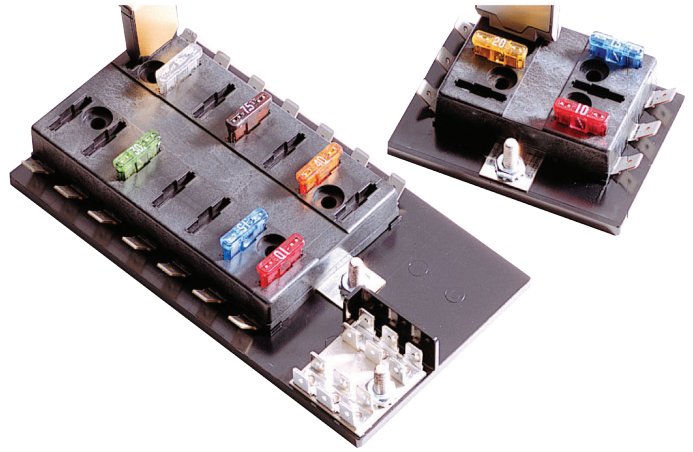
Torque Rating: 20 in-lbs max

Mounting torque rating: 8 in-lbs max

Options

Positions: 4-20 circuits available

Split power: Single or dual bus options



**Consult electrical distribution for availability*

Ordering information

1560X

-

XX-XX

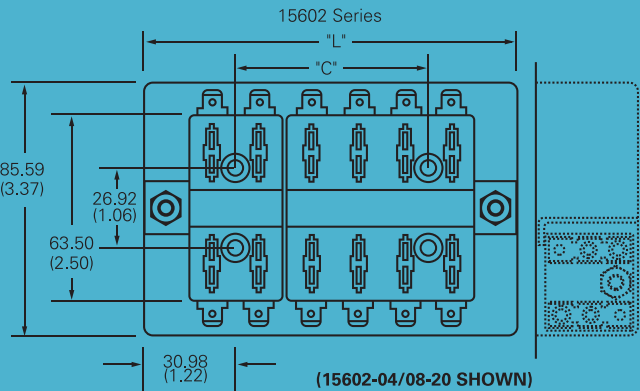
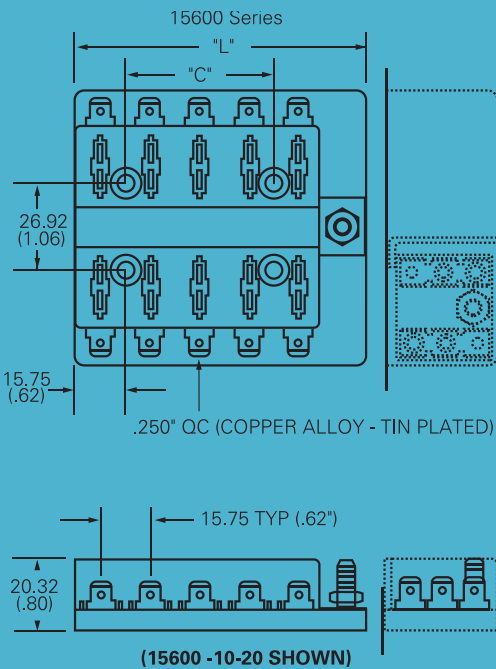
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X

X

Series	# Positions	Hardware Options	Cover Options
15600 = Single stud, single circuit supply 15602 = Double stud, split supply circuit	15600 Series 04-20 = Total 15602 04-16 = Left side 04-16 = Right side Max combination of 20	0 = None 1 = Nuts (shipped in bulk) 2 = Nuts (shipped assembled)	0 = None 1 = Fuse cover 2 = CB cover

Dimensions in Inches (mm)



No. of fuse	"C"	15600 "L"	15602 "L"	No. of fuse	"C"	15600 "L"	15602 "L"
04	-	1.84	2.44	16	3.76	5.59	6.19
06	0.62	2.47	3.06	18	4.37	6.22	6.81
08	1.25	3.09	3.688	20	5.00	6.84	7.43
10	1.87	3.75	4.32				
12	2.50	4.34	4.94				
14	3.12	4.97	5.56				

Dims in inches. Multiply by 25.4 for metric.

Series 37700 - PFM/PRM

Power Fuse Modules (PFM)

Power Relay Modules (PRM)

Eaton offers a sealed Power Relay Module (PRM) along with an accompanying Power Fuse Module (PFM). These compact power distribution modules are designed for high current applications and are suitable for placement in high moisture and vibration environments.

The PRM contains a relay and two female Maxi fuse positions. One of these fuses protects the relay and the other is a single-circuit inline fuse. The PFM contains only two fuses - each a separate circuit. A silicone seal and removable cover offer a weather-tight enclosure (IP66) for the fuse positions.

PRMs/PFMs also feature rugged M8 power input studs with output options that include terminal studs (M6) or sealed (IP66) connector (PRM only). Multiple units may be connected together via a custom buss bar or can be bussed to any of the Eaton PDMs (i.e. the 31000/32000 Series VEC/DVEC, 15300 Series RTMR, etc.).

Specifications

PRM rating: 60A, 12VDC steady-state relay;
or 25a, 24VDC steady-state relay

Relay protection fuse: Up to 60A for 12V relay & 30A for 24V relay

Nonswitched Inline fuse: Up to 60A (12V or 24V)

PFM rating: each inline fuse rated up to 60A

Materials: UL 94-V0 thermoplastic (excluding cover);
silicone seal; tin-plated copper terminals; plated steel studs

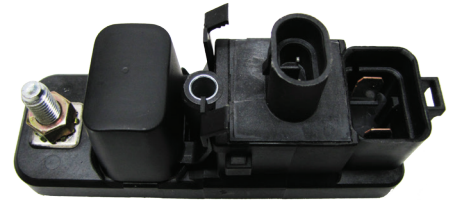
Input termination: M8 threaded stud

PRM switching/trigger signal connector:: Delphi Metri-Pack® 150 Series or AMPSEAL® 16 (dependent upon part number configuration)

Output termination: Two M6 threaded studs or Eaton Series 32004 sealed connector (PRM only); accepts Delphi Packard 800 series terminals.

Torque ratings:

- Input stud: 144in-lbs max
- Output stud: 48in-lbs max
- Mounting: 48in-lbs max



Options

Mounting: Counter rotation feature (CRF) available to prevent rotation on single bolt installations

Bussing: Custom bussing available for joining multiple PRMs/PFMs; options also available for bussing PRMs/PFMs to other Eaton PDMs

Accessories: Buss bar, stud cap

Signal connector part numbers:

- Delphi: Black - 12052641; grey - 12052644 (consult Delphi distribution)
- AMP: Red - 776427-1; grey - 776427-2; yellow - 776427-3; green - 776427-4 (consult Tyco distribution)

Standards & Certifications

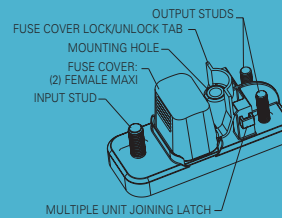
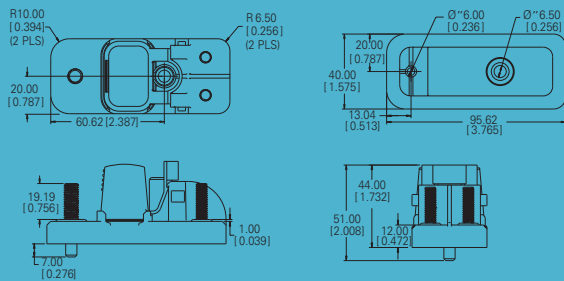
Ingress protection rating: IP66 (excluding stud connections)

Compliances: SAE 31171 (ignition protected)

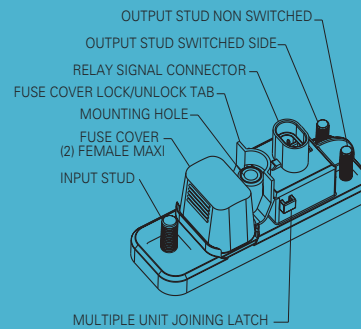
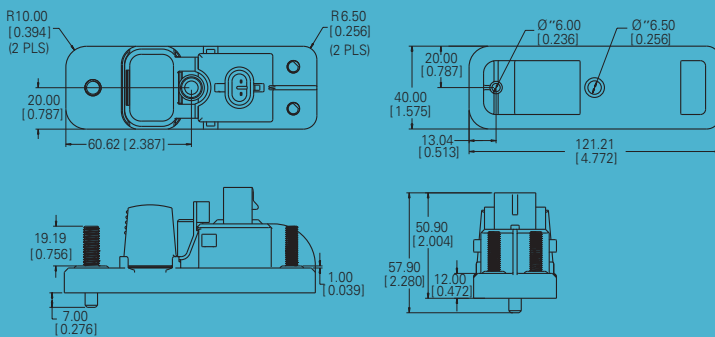
Ordering information

<div> <div>3770X</div> <div>-</div> <div>X</div> <div>X</div> <div>X</div> <div>X</div> <div>X</div> <div>X</div> <div>X</div> </div>								
Series	Output/ Signal Type	Signal Key	Output Key	Nonswitched Fuse	Switched Fuse	Cover Option	Hardware Option	Private Label
37701 = PFM 37702 = 12V PRM 37703 = 24V PRM	PFM 1 = Stud - Delphi PRM 1 = Stud - Delphi 2 = Connector Delphi 3 = Stud - AMP® 4 = Connector - AMP®	PFM N = Not available on PFM PRM A = Black - Delphi only B = Grey C = Green - AMP® only F = Red - AMP® only Y = Yellow - AMP® only	N = Stud output (n key) A = Black B = Grey	0 = None 2 = 20A 3 = 30A 4 = 40A 5 = 50A 6 = 60A	0 = None 2 = 20A 3 = 30A 4 = 40A 5 = 50A 6 = 60A (12V only)	0 = None 1 = Cover (bulk) 2 = Cover (installed)	0 = None 1 = Nuts (bulk) 2 = Nuts (installed) 3 = CRF 4 = CRF, nuts (bulk) 5 = CRF, nuts (installed)	X = Consult factory

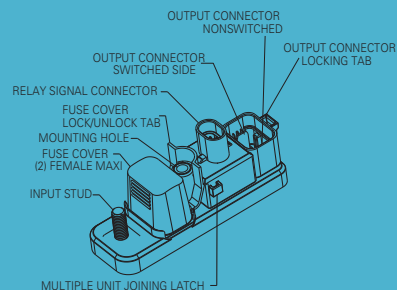
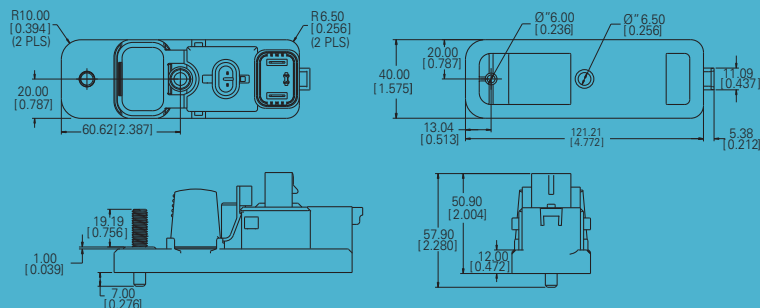
Dimensions in Inches (mm)



37701-1N Series



**37702 & 37703 Series
stud output**



37702 & 37703 Series

HMG Fuse Holder

The HMG fuse holder accepts industry standard AMG (Mega) fuses for primary fusing applications. The narrow rugged body makes it ideal for demanding environments such as 'under the hood' locations in construction, agriculture, heavy trucking and specialty vehicle applications.

Specifications

Rating: For use with AMG (Mega) fuses from 100A - 300A

Temperature rating: -40°F (-40°C) to 260°F (125°C)

Materials: UL 94 V-0 thermoplastic with zinc-plated steel studs

Termination: M8 or 5/16-18 threaded studs and hex nuts for fuse mounting. Wire sizes: #8 AWG - 1/0

Torque rating: 150 in-lbs max

Mounting torque rating: Optional mounting hole patterns, 44 in-lbs max

Features

Side-stackable

Bottom side can be insulated from the mounting panel

Splash resistant cover

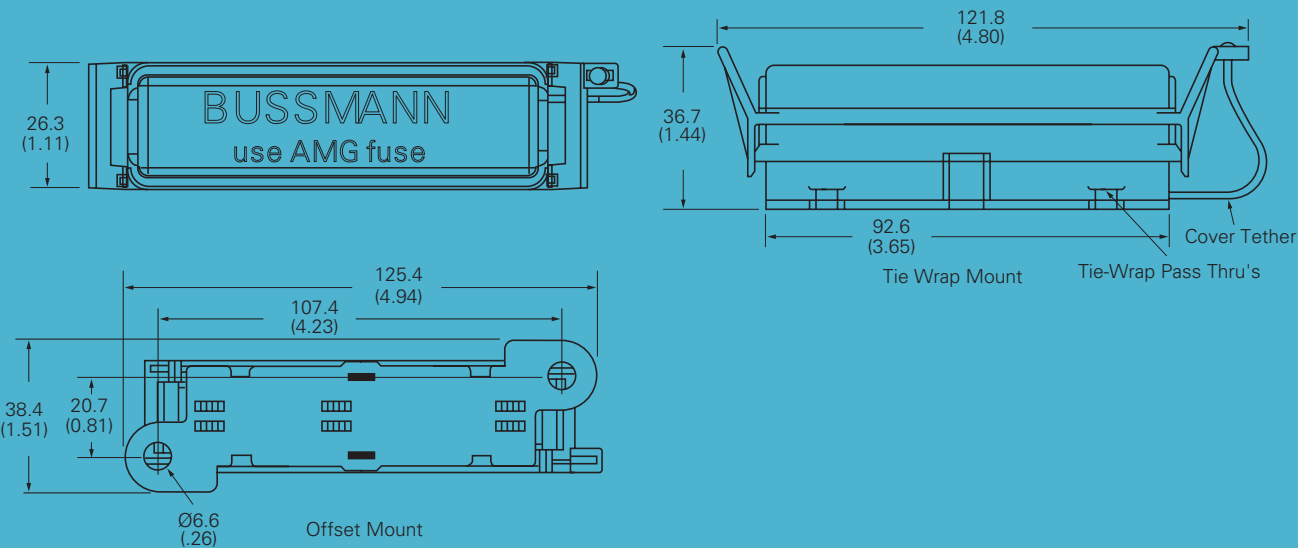


Ordering information

HMG - X X X

Series	Base	Hardware Options	Cover
HMG = HMG fuse holder	1 = Tie wrap mount 2 = Offset mounted	1 = 5/16-18 studs w/nuts installed 2 = 5/16-18 studs w/nuts bulk 3 = 5/16-18 studs w/o nuts 4 = M8 x 1.25 studs w/nuts installed 5 = M8 x 1.25 studs w/nuts bulk 6 = M8 x 1.25 studs w/o nuts	0 = None 1 = Cover installed 2 = Cover bulk

Dimensions in mm (inches)



FMG Fuse Holder

The FMG fuse holder accepts industry standard AMG fuses for primary fusing applications. The FMG is offered with a tough elastomer cover for fuse protection, yet allows for cable input from various orientations. This fuse holder cover is available in multiple colors and lengths. Similar to the Eaton HMG holder, the FMG is well suited for demanding environments such as 'under the hood' locations in construction, agriculture, heavy trucking and specialty vehicle applications. The FMG fuse holder allows for full access for cables and can be routed to studs from nearly every direction.

Specifications

Rating: For use with AMG fuses from 100A - 500A

Temperature rating: -40°F (-40°C) to 260°F (125°C)

Materials: Black thermoplastic with zinc-plated steel studs; thermoplastic cover available in black or red, in normal or extended length

Termination: M8 or 5/16-18 threaded studs and hex nuts for fuse mounting. Wire sizes: #8 AWG - 1/0

Torque rating: 120 in-lbs max

Mounting torque rating: 1/4-20 screws with washers (recommended), 44 in-lbs max

Options

Extended cover available

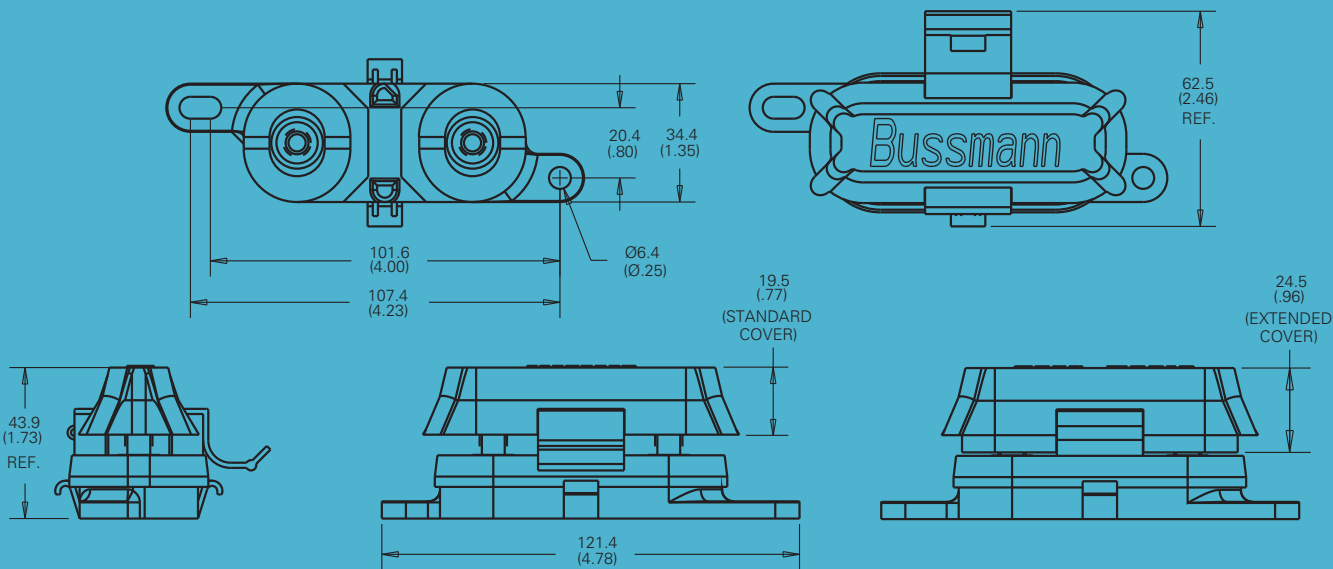


Ordering information

FMG - X X X

Series	Base	Hardware Options	Cover
FMG = FMG fuse holder	1 = M8 studs 2 = 5/16 - 18 studs 3 = M8 x 1.25 stainless studs 4 = 5/16- 18 UNC stainless studs	1 = Nuts - installed 2 = Nuts - bulk 3 = Stainless nuts and lockwashers - installed 4 = Stainless nuts and lockwashers - bulk	0 = No cover 1 = Black cover - installed 2 = Black cover - bulk 4 = Red cover - installed 5 = Red cover - bulk 6 = Extended black cover - installed 7 = Extended black cover - bulk 8 = Extended red cover - installed 9 = Extended red cover - bulk

Dimensions in mm (inches)



Series CFH

Connector Fuse Holder

The Connector Fuse Holder (CFH) is a small easy-to-use power distribution module which can hold up to four 2.8mm footprint protective devices. Designed to hold relays, circuit breakers, fuses, diodes, resistors and/or transorbs, the CFH is ready to support all of your small or last minute power distribution requirements. Options include color of connector, length of cover and type of bracket. Qualified to IP66 for ingress protection, this product can be installed where required to eliminate excess wiring.

Specifications

Max amperage: The CFH is limited to a total of 100A maximum rating when designed under SAE guidelines. Terminal limitations are according to Delphi Metri-pak 280 guidelines (consult Delphi documentation)

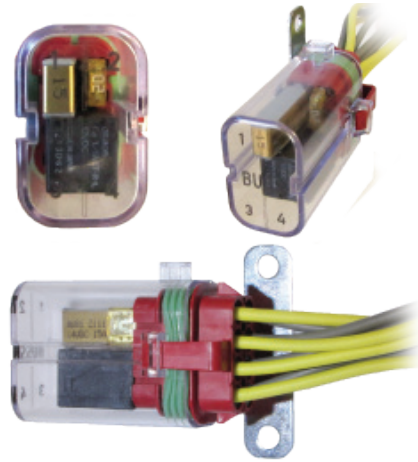
Temperature rating: -40°F (-40°C) to 260°F (125°C)

Materials:

- Cover: UL 94-V0 clear polycarbonate
- Connector: UL 94-V0 thermoplastic
- Brackets: Side and end - zinc plated steel with chromate finish

Servicable parts:

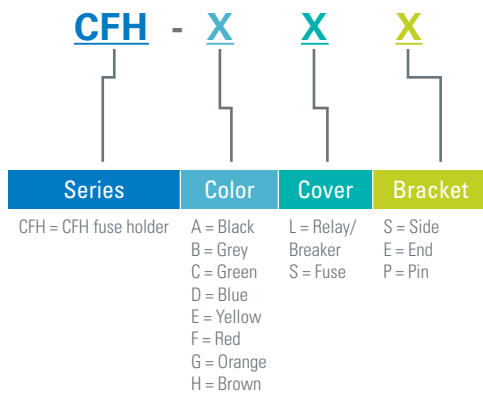
- Cover: B151-7184-S (fuse) or B151-7184-L (relay/breaker)
- Brackets: B028-7013 (side bracket); B028-7015 (end bracket); B028-7016 (pin bracket).



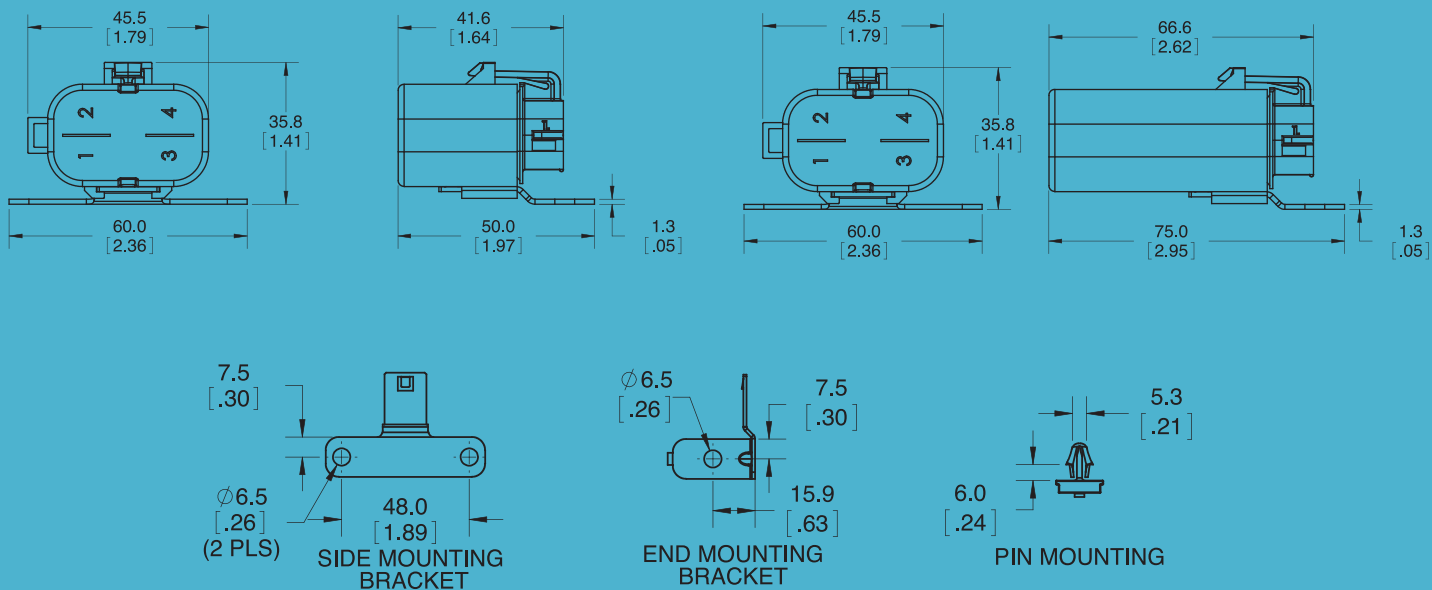
Notes

- Terminals, seals and plugs are not included.
- Connector uses Delphi-Delphi Metri-Pack sealed / Tang style terminals, seals and plugs. (consult Delphi distribution for availability)

Ordering information



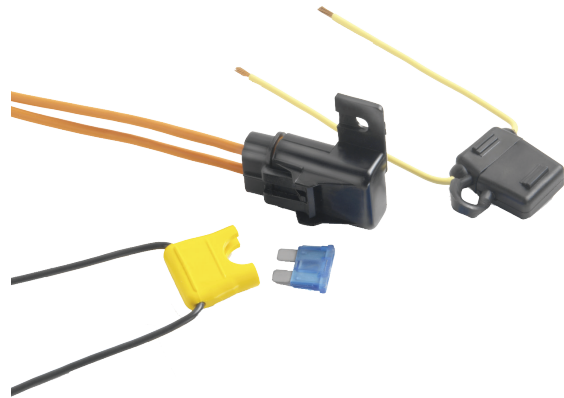
Dimensions in mm (inches)



Inline Fuse Holders

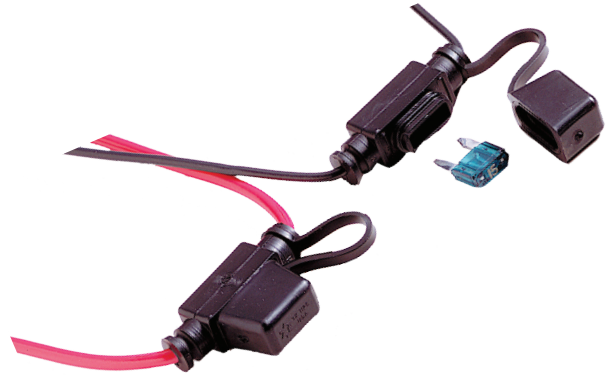
ATC® blade-type fuses

- HHC, HHF, HHG and HHR
- Rating: 32V; see table for maximum amperage
- “Write-in” space for circuit identification on HHC holder
- HHR holder has a locking cover and mounting hole



ATM MINI® blade-type fuses

- HHL and HHM
- Rating: 32V; see table for maximum amperage
- Body material withstands high temperatures
- Protective cover has removable straps



MAXI™ fuses

- HHX
- Rating: 32V, 60A maximum
- Firewall mounting hole permits two or more holders to be mounted together
- Cover comes with removable strap

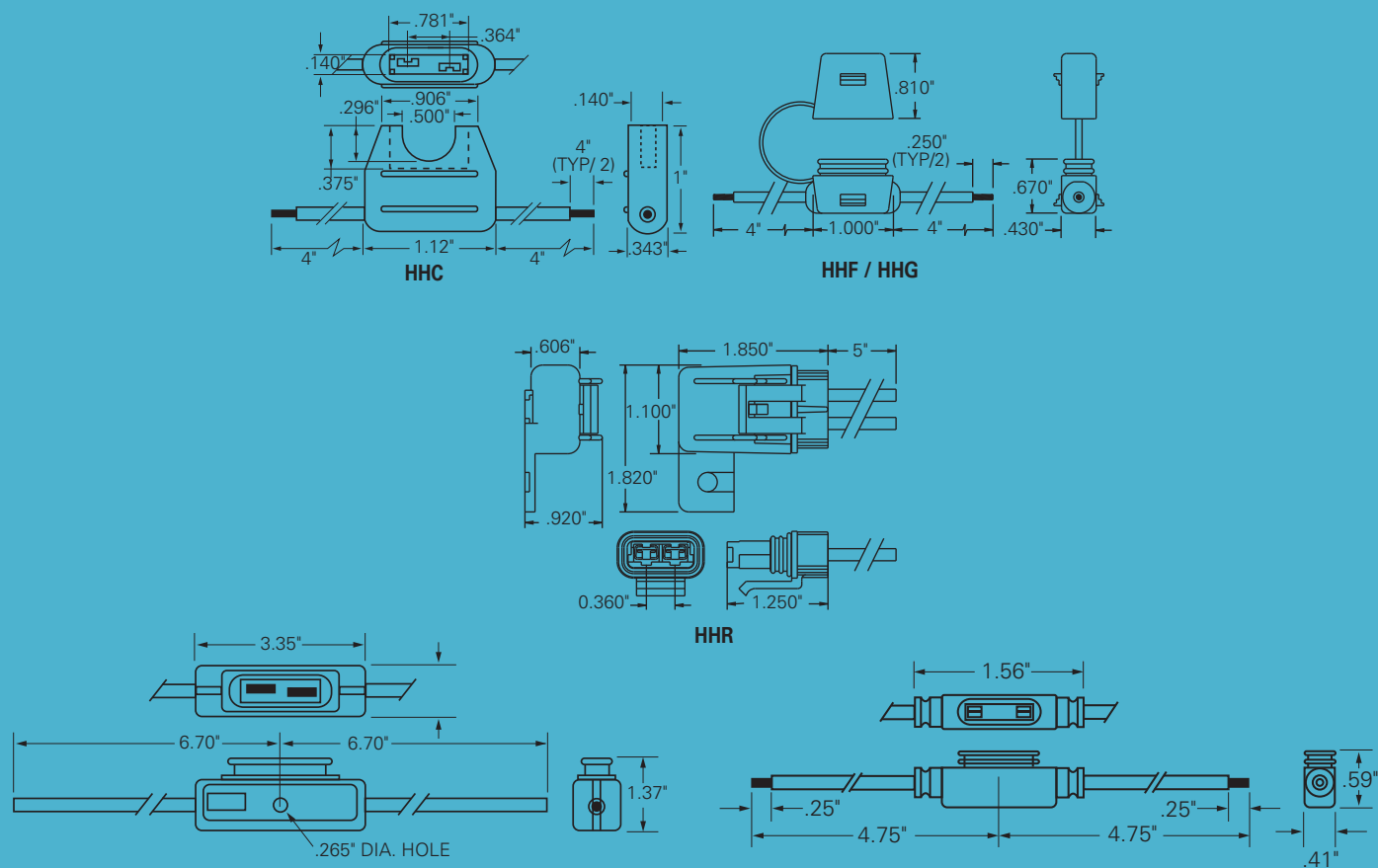


Inline fuse holder ordering information

Catalog Number	Description	Fuse Size	Electrical Connection
ATC® blade type holder			
HHC	Yellow fuse holder (body only)	1A - 20A	#16 AWG lead black wire
HHF	Black fuse holder with cover	1A - 20A	#16 AWG lead yellow wire
HHG	Black fuse holder with cover	1A - 30A	#12 AWG lead yellow wire
HHR	Black waterproof fuse holder with locking cover and mounting hole	1A - 30A	#12 AWG lead orange wire, 5" length
MINI® Fuse blade type holder			
HHL	Fuse holder with cover	2A - 20A	#16 AWG lead black wire; 4" length
HHM	Fuse holder with cover	2A - 30A	#12 AWG lead red wire; 4" length
MAXI® Fuse blade type holder			
HHX	Fuse holder with cover	20A - 60A	#6 AWG lead wire; 5" length

Note: consult factory for additonal wire gauge options.

Dimensions in Inches (mm)



Stud Type Junction Blocks

Single stud type junction blocks

With a maximum torque rating at 48 in-lbs, the single stud type junction blocks are ideal for heavy-duty ground or power connection points in AC or DC circuits. The modular design offers design and manufacturing flexibility with feed thru or stand alone mount options available for transformers, communication and computer power sections along with various vehicle electrical systems.

Non feed-thru multiple stud type

Series C4559 and C6083

Rating: 30A, 600V

Temperature rating: 250°F (120°C)

Materials: Black thermoplastic with zinc-plated steel studs

Termination: #10-24 threaded studs on 0.750" centers.

Studs feature a 'dog point' to guide nut onto thread

Torque rating: 25 in-lbs max

Mounting torque rating: 24 in-lbs max

Postions: 2 - 16 positions available

Series C5237 and JB1032

Rating: UL: 30A, 300V; CSA: 30A, 600V

Temperature rating: 250°F (120°C)

Materials: Black thermoplastic with yellow zinc-plated brass studs

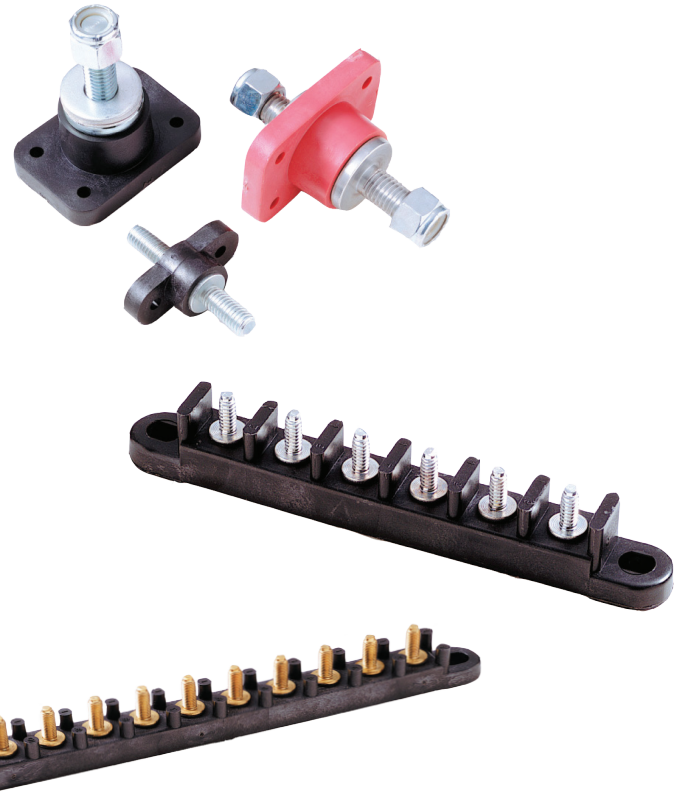
Termination: #10-32 threaded studs on 0.625" centers.

Studs feature a 'dog point' to guide nut onto thread

Torque rating: 25 in-lbs max

Mounting torque rating: 24 in-lbs max

Postions: 1 - 15 positions available



Single stud type junction blocks

Please see the following page for specific part numbers and ordering information.

Series C4559 and C6083

Please see the following page for specific part numbers and ordering information. Numbers and arrows molded on top of barriers indicate terminals.

Series C5237 and JB1032

Please see the following page for specific part numbers and ordering information. Numbers and arrows molded on top of barriers indicate terminals.



Suggested Max Termination Rating

Thread / stud size	Amperages (A)
#10	50
#1/4 & M6	100
#5/16	200
#3/8	250
#1/2	400

Dimensions in Inches (mm)

Letters correspond to tables on following pages

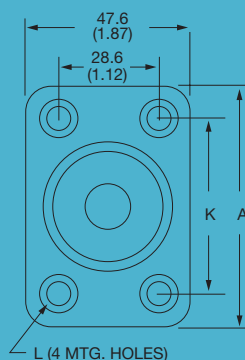
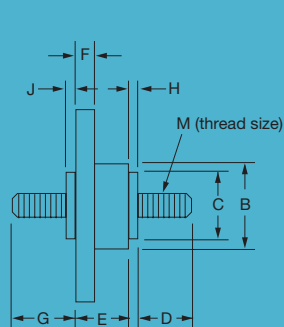


Fig. 1

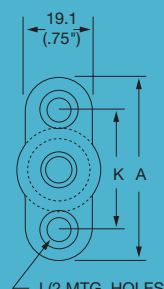


Fig. 2

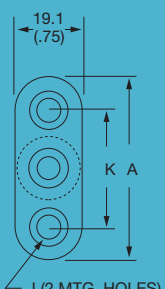
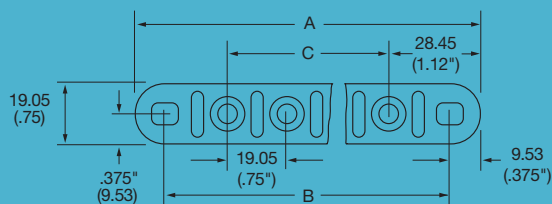
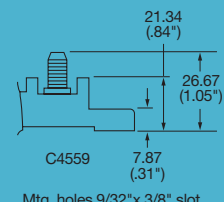
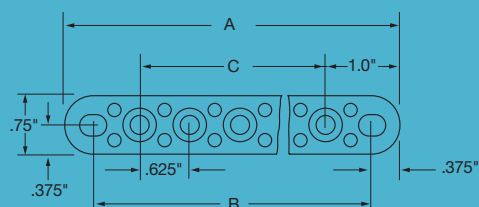


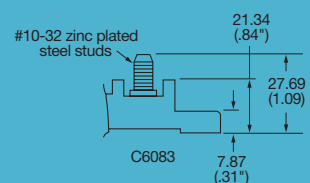
Fig. 3



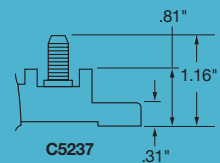
Other series available with .750" centers:



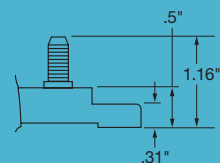
Mtg. holes 9/32"x 3/8" slot



(A,B,C Dimensions are the same as C4559)



Mtg. holes 9/32"x3/8" slot



JB1032-120-XX

(No bosses between studs)

(A,B,C Dimensions are the same as C5237)

Dimensions

Part Number	A	B	C
Series C4559			
C4559-2	3.00 (76.2)	2.25 (57.1)	0.75 (19.0)
C4559-3	3.75 (95.2)	3.00 (76.2)	1.50 (38.1)
C4559-4	4.50 (114.3)	3.75 (95.2)	2.25 (57.1)
C4559-5	5.25 (133.3)	4.50 (114.3)	3.00 (76.2)
C4559-6	6.00 (152.4)	5.25 (133.3)	3.75 (95.2)
C4559-7	6.75 (171.4)	6.00 (152.4)	4.50 (114.3)
C4559-8	7.50 (190.5)	6.75 (171.4)	5.25 (133.3)
C4559-9	8.25 (209.5)	7.50 (190.5)	6.00 (152.4)
C4559-10	9.00 (228.6)	8.25 (209.5)	6.75 (171.4)
C4559-11	9.75 (247.6)	9.00 (228.6)	7.50 (190.5)
C4559-12	10.50 (266.7)	9.75 (246.6)	8.25 (209.5)
C4559-13	11.25 (285.7)	10.50 (266.7)	9.00 (228.6)
C4559-14	12.00 (308.4)	11.25 (285.7)	9.75 (246.6)
C4559-15	12.75 (323.8)	12.00 (308.4)	10.50 (266.7)
C4559-16	13.50 (342.9)	12.75 (323.8)	11.25 (285.7)

Part Number	A	B	C
Series C5237			
C5237-1	2.00 (50.8)	1.25 (31.7)	-
C5237-2	2.62 (66.7)	1.87 (47.5)	0.625 (15.9)
C5237-3	3.25 (82.5)	2.50 (63.4)	1.25 (31.7)
C5237-4	3.87 (98.4)	3.12 (79.4)	1.87 (47.5)
C5237-5	4.50 (114.3)	3.75 (95.2)	2.50 (63.4)
C5237-6	5.12 (130.8)	4.37 (111.1)	3.12 (79.4)
C5237-7	5.75 (146.0)	5.00 (127.0)	3.75 (95.2)
C5237-8	6.37 (161.9)	5.62 (142.9)	4.37 (111.1)
C5237-9	7.00 (177.8)	6.25 (158.7)	5.00 (127.0)
C5237-10	7.62 (193.7)	6.87 (174.6)	5.62 (142.9)
C5237-11	8.25 (209.5)	7.50 (190.5)	6.25 (158.7)
C5237-12	8.87 (225.4)	8.12 (206.4)	6.87 (174.6)
C5237-13	9.50 (241.3)	8.75 (222.2)	7.50 (190.5)
C5237-14	10.12 (257.2)	9.37 (238.1)	8.12 (206.4)
C5237-15	10.75 (273.0)	10.00 (254.0)	8.75 (222.2)

Ordering information for single stud type junction blocks

Part	Fig.	A	B	C	D	E	F	G	H	J	K	L	M	Max. Torque (in-lbs)	Material	Color
C1925*	1	2.75 (69.8)	1.5 (38.1)	1.25 (31.7)	1.25 (31.7)	1.12 (28.6)	.37 (9.5)	1.12 (28.6)	.19 (4.8)	.19 (4.8)	2.0 (50.8)	.22 Dia. w/ 44 dia. C'bore x .16 deep	1/2 - 13	300	Thermoplastic / Zinc-plated Brass	Red
C1925B*	1	2.75 (69.8)	1.5 (38.1)	1.25 (31.7)	1.25 (31.7)	1.12 (28.6)	.37 (9.5)	1.12 (28.6)	.19 (4.8)	.19 (4.8)	2.0 (50.8)	.22 Dia. w/ 44 dia. C'bore x .16 deep	1/2 - 13	300	Thermoplastic / Zinc-plated Brass	Black
C1925-1*	1	2.75 (69.8)	1.5 (38.1)	1.25 (31.7)	1.25 (31.7)	1.12 (28.6)	.37 (9.5)	1.12 (28.6)	.19 (4.8)	.19 (4.8)	2.0 (50.8)	.22 Dia. w/ 44 dia. C'bore x .16 deep	1/2 - 13	300	Thermoplastic / Tin-plated Brass	Red
C1925-1B*	1	2.75 (69.8)	1.5 (38.1)	1.25 (31.7)	1.25 (31.7)	1.12 (28.6)	.37 (9.5)	1.12 (28.6)	.19 (4.8)	.19 (4.8)	2.0 (50.8)	.22 Dia. w/ 44 dia. C'bore x .16 deep	1/2 - 13	300	Thermoplastic / Tin-plated Brass	Black
C1925-2*	1	2.75 (69.8)	1.5 (38.1)	1.25 (31.7)	1.25 (31.7)	1.12 (28.6)	.37 (9.5)	1.12 (28.6)	.19 (4.8)	.19 (4.8)	2.0 (50.8)	.22 Dia. w/ 44 dia. C'bore x .16 deep	3/8 - 16	150	Thermoplastic / Tin-plated Brass	Red
C1925-2B*	1	2.75 (69.8)	1.5 (38.1)	1.25 (31.7)	1.25 (31.7)	1.12 (28.6)	.37 (9.5)	1.12 (28.6)	.19 (4.8)	.19 (4.8)	2.0 (50.8)	.22 Dia. w/ 44 dia. C'bore x .16 deep	3/8 - 16	150	Thermoplastic / Tin-plated Brass	Black
C1933	1	2.75 (69.8)	1.44 (36.60)	1.25 (31.7)	1.5 (38.1)	1.12 (28.6)	.37 (9.5)	None	.19 (4.8)	None	2.0 (50.8)	.22 dia.	1/2 - 13	300	Thermoplastic / Zinc-plated Brass	Black
C1933-1	1	2.75 (69.3)	1.44 (36.3)	1.25 (31.7)	1.5 (38.1)	1.12 (28.6)	.37 (9.5)	None	.19 (4.8)	None	2.0 (50.8)	.22 dia.	5/16 - 18	75	Thermoplastic / Zinc-plated Brass	Black
C1938*	2	2.06 (52.4)	.94 (23.8)	.69 (17.5)	.87 (22.2)	.69 (17.5)	.31 (7.9)	.94 (23.8)	.06 (1.6)	.06 (1.6)	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	3/8 - 16	200	Thermoplastic / Zinc-plated Brass	Black
C1938R*	2	2.06 (52.4)	.94 (23.8)	.69 (17.5)	.87 (22.2)	.69 (17.5)	.31 (7.9)	.94 (23.8)	.06 (1.6)	.06 (1.6)	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	3/8 - 16	200	Thermoplastic / Zinc-plated Brass	Red
C1938-1*	2	2.06 (52.4)	.94 (23.8)	.69 (17.5)	.87 (22.2)	.69 (17.5)	.31 (7.9)	.94 (23.8)	.06 (1.6)	.06 (1.6)	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	5/16 - 18	100	Thermoplastic / Tin-plated Brass	Black
C1938-1R*	2	2.06 (52.4)	.94 (23.8)	.69 (17.5)	.87 (22.2)	.69 (17.5)	.31 (7.9)	.94 (23.8)	.06 (1.6)	.06 (1.6)	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	5/16 - 18	100	Thermoplastic / Tin-plated Brass	Red
C4044*	2	2.06 (52.4)	.87 (22.2)	.62 (15.9)	.62 (15.9)	1.12 (28.6)	.31 (7.9)	.94 (23.8)	.06 (1.6)	.06 (1.6)	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	3/8 - 16	150	Thermoplastic / Zinc-plated Brass	Black
C4044-1*	2	2.06 (52.4)	.87 (22.2)	.62 (15.9)	.62 (15.9)	1.12 (28.6)	.31 (7.9)	.94 (23.8)	.06 (1.6)	.06 (1.6)	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	3/8 - 16	150	Thermoplastic / Tin-plated Brass	Black
C4044-1R*	2	2.06 (52.4)	.87 (22.2)	.62 (15.9)	.62 (15.9)	1.12 (28.6)	.31 (7.9)	.94 (23.8)	.06 (1.6)	.06 (1.6)	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	3/8 - 16	150	Thermoplastic / Tin-plated Brass	Red

Notes:

*Feed-thru single stud type junction block

Option of nuts and washers. Consult factory for more information.

continued on next page >>

Part	Fig.	A	B	C	D	E	F	G	H	J	K	L	M	Max. Torque (in-lbs)	Material	Color
C5898*	2	2.06 (52.4)	.94 (23.8)	.69 (17.5)	.87 (22.2)	.69 (17.5)	.31 (7.9)	.94 (23.8)	.06 (1.6)	.06 (1.6)	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	3/8 - 16	150	Thermoplastic / Zinc-plated Brass	Red
C6344-2	2	2.06 (52.4)	.87 (22.2)	.62 (15.9)	.62 (15.9)	1.12 (15.9)	.31 (7.9)	None	.06 (1.6)	None	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	1/2 - 20	150	Thermoplastic / Zinc-plated Brass	Black
C7020*	2	2.06 (52.4)	.94 (23.8)	.69 (17.5)	.88 (22.2)	.69 (17.5)	.31 (8.0)	1.25 (31.8)	.06 (1.6)	.06 (1.6)	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	3/8 - 16	150	Thermoplastic / Zinc-plated Brass	Red
JB3816-2	2	2.12 (54.0)	.98 (24.9)	.62 (15.9)	.87 (22.2)	.69 (17.5)	.31 (7.9)	None	.06 (1.6)	None	1.37 (34.9)	.22 Dia. w/ .37 dia. C'bore x .14 deep	3/8 - 16	150	Thermoplastic / Zinc-plated Brass	Black
JB3816-3	2	2.12 (54.0)	.98 (24.9)	.62 (15.9)	.87 (22.2)	.69 (17.5)	.31 (7.9)	None	.06 (1.6)	None	1.37 (34.9)	.22 Dia. w/ .37 dia. C'bore x .14 deep	3/8 - 16	150	Thermoplastic / Zinc-plated Brass	Red
C2791*	3	2.06 (52.4)	.69 (17.5)	.44 (11.2)	.62 (15.9)	.69 (17.5)	.31 (7.9)	.69 (17.5)	.06 (1.6)	.06 (1.6)	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	1/4 - 20	30	Thermoplastic / Zinc-plated Brass	Black
C2791-R*	3	2.06 (52.4)	.69 (17.5)	.44 (11.2)	.62 (15.9)	.69 (17.5)	.31 (7.9)	.69 (17.5)	.06 (1.6)	.06 (1.6)	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	1/4 - 20	30	Thermoplastic / Zinc-plated Brass	Red
C2909*	3	2.06 (52.4)	.69 (17.5)	.44 (11.2)	.62 (15.9)	1.0 (25.4)	.31 (7.9)	.69 (17.5)	.06 (1.6)	.06 (1.6)	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	10 - 32	24	Thermoplastic / Zinc-plated Brass	Black
C2909-1*	3	2.06 (52.4)	.69 (17.5)	.44 (11.2)	.62 (15.9)	1.0 (25.4)	.31 (7.9)	.69 (17.5)	.06 (1.6)	.06 (1.6)	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	1/4 - 20	30	Thermoplastic / Zinc-plated Brass	Black
C7018*	3	2.06 (52.4)	.69 (17.5)	.44 (11.2)	.47 (11.9)	.69 (17.5)	.31 (7.9)	.53 (13.5)	.06 (1.6)	.06 (1.6)	1.31 (33.3)	.22 Dia. w/ 41 dia. C'bore x .14 deep	M6	55	Thermoplastic / Zinc-plated Brass	Black

Notes:

*Feed-thru single stud type junction block

Option of nuts and washers. Consult factory for more information.

GB3000 Series

Pass-thru distribution block

The GB3000 pass-thru distribution blocks allow one ground or power device to meet multiple ground/power requirements, in both the cab and engine compartment of your vehicle. A gasket is included for ingress protection. Designed to meet all your ground/power needs, the GB3000 series provides robust connections, eliminates the need to stack cables and reduces associated warranty claims based on affiliated problems. The GB3000 series also provides power distribution suitable for many feed thru applications in marine, construction, agriculture, bus, military, RV and specialty vehicles.

Specifications

Current: 300A maximum

Temperature rating: -40°F (-40°C) to 185°F (85°C)

Torque: M6 stud 50 in-lbs max; M6 mounting 50 in-lbs max

Termination: M6 nuts

Materials:

- Housing: Black UL rated 94V-0 thermoplastic
- Cover: Black or red santoprene cover (rated UL 94V-0) for protection from accidental shorts
- Current carrying studs: Zinc-plated brass
- Mounting studs: Stainless steel
- Gasket: Black santoprene gasket rated UL 94V-0
- RoHS Compliant: Yes

Servicable parts:

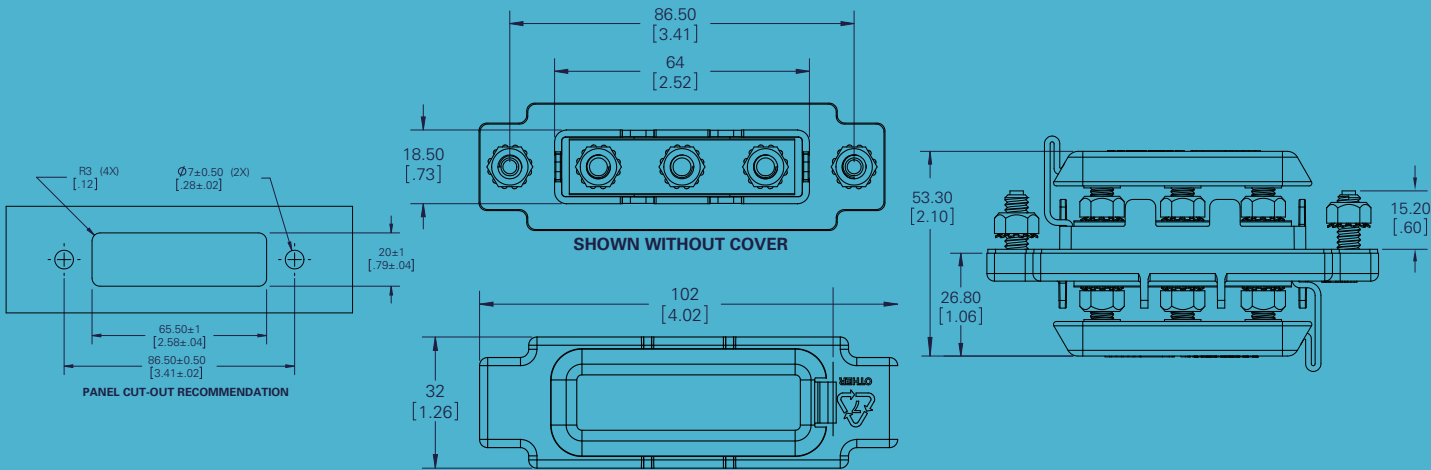
- Cover: B151-7192 (black), B151-7194-R (red)
- Bus bar: B109-7050



Ordering information

GB300X - X X (X)			
Series	Option	Cover	Marking
GB3000 = Ground block GB3001 = Pass thru block	0 = No nut 1 = Nuts in bulk	B = Black R = Red	Consult factory for special labels

Dimensions in Inches (mm)





Circuit protection

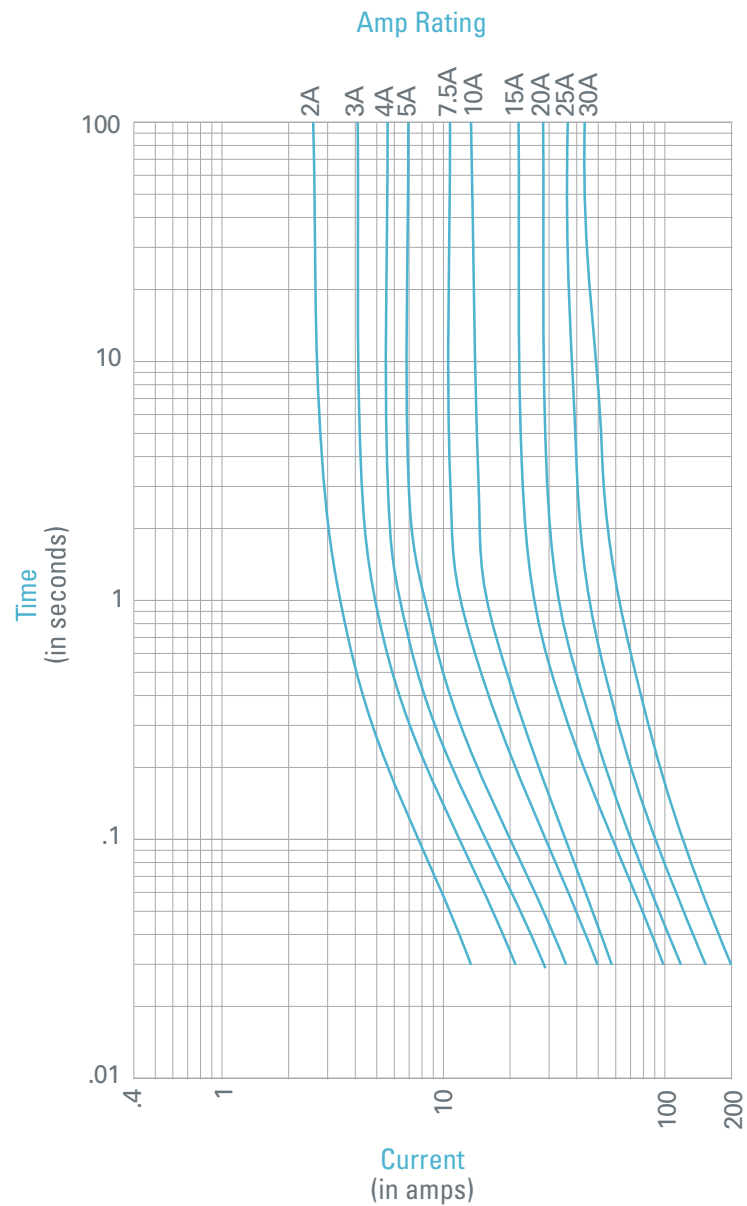
Protection against overcurrent and short circuit in commercial vehicle electrical systems

Eaton's leadership in circuit protection extends into commercial vehicles with blade and bolt-on circuit protection devices, including a variety of thermal circuit breaker and fuse solutions. Eaton solutions range from low current branch circuit fuses and circuit breakers up through 200 Amp switchable circuit breakers that protect and control heavy vehicle electrical systems. Eaton also offers a range of manual and automatic battery disconnects in our line of commercial vehicle power management products.

Specifications

Part Number	Amp Rating	Color
BK-ATM-2	2	Grey
BK-ATM-3	3	Violet
BK-ATM-4	4	Pink
BK-ATM-5	5	Tan
BK-ATM-7.5	7.5	Brown
BK-ATM-10	10	Red
BK-ATM-15	15	Light Blue
BK-ATM-20	20	Yellow
BK-ATM-25	25	Natural
BK-ATM-30	30	Green

Time Current Curves



Series 21X

Mini Circuit Breakers

Specifications

Auto (Type 1) & modified (Type 2) reset available

Single Pole Thermal Type Breakers

Rating: 5-30A; 14VDC

Interrupt Rating: 150A @ 14VDC (5-10A versions); 225A @ 14VDC (15A version); 300A @ 14VDC (20A version); 450A @ 14VDC (25-30A versions)

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: Grey UL 94-V0 thermoplastic housing with metal cover:
Breaker type indicated by subscript next to amperage rating on end of breaker

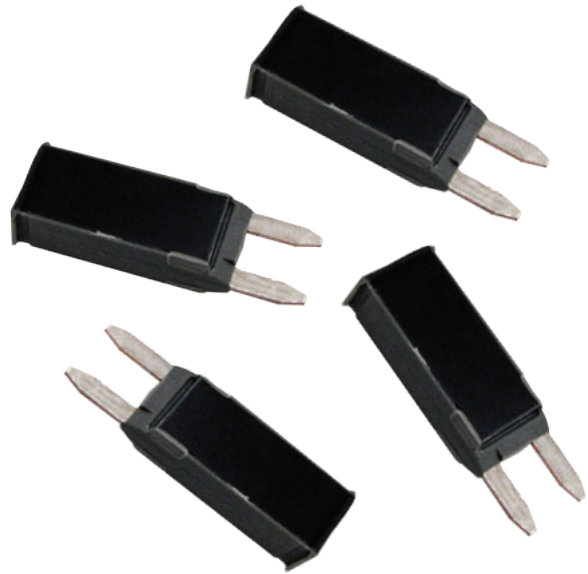
Marking: Standard marking includes amp/voltage ratings, part number, and date code. OCR marking is available.

Termination: Compatible with 2.8mm (280) Type fuse blocks using 0.32in. (8.1mm) centerline spacing

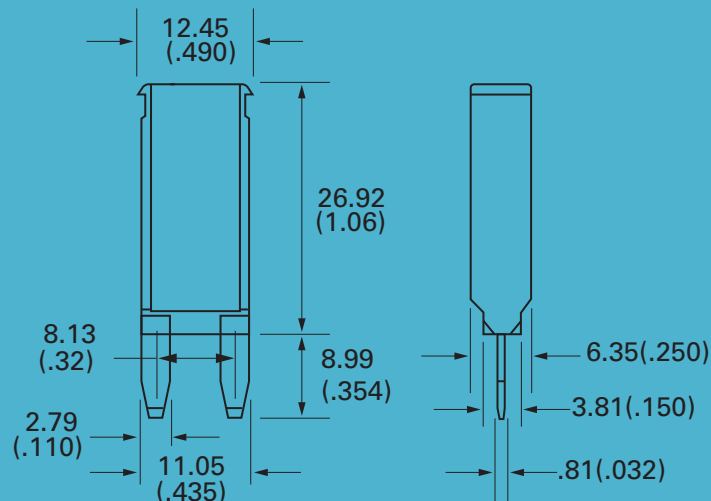
Compliances: SAE J553 Type I and Type II Circuit Breakers

RoHS compliant

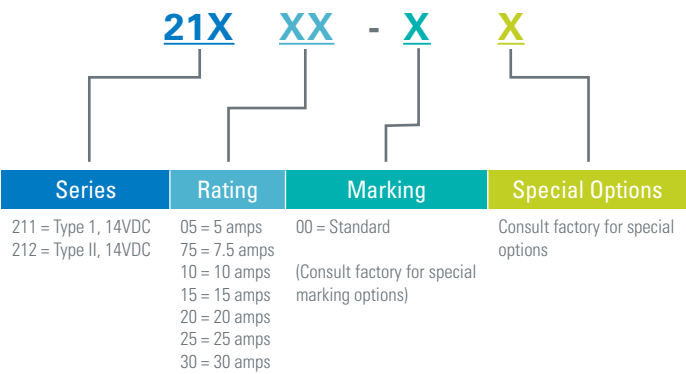
Anti weld-contacts available



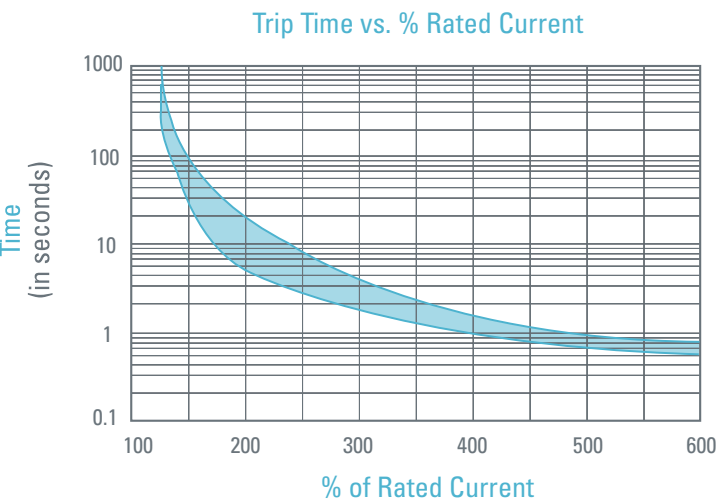
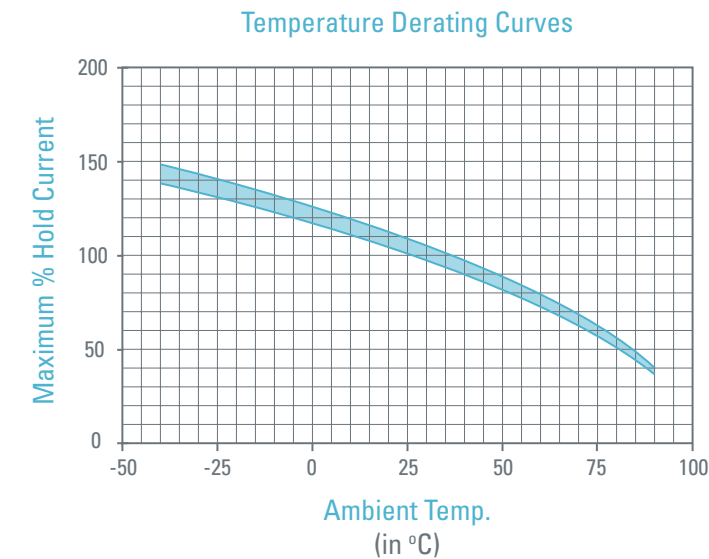
Dimensions in Inches (mm)



Ordering information



Temperature Derating / Time Current Curves



ATC[®] Blade Fuses

Specifications

Fast acting

Current Rating: 1-40A

Voltage Rating: 32VDC

Interrupt Rating: 1000A @ 32VDC

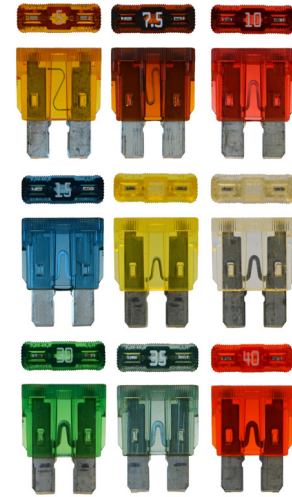
Housing Material: UL 94-V0 rated

Terminal Material: Tin-plated zinc alloy

Temperature Rating: -76°F (-60°C) to 230°F (110°C)

Marking: Amperage marking is OCR compliant.

Compliances: UL-Recognized (3-40A) available; SAE J1284;
ISO 8820-3; SAE J1171 (Ignition Protection) available, RoHS compliant



Dimensions in Inches (mm)

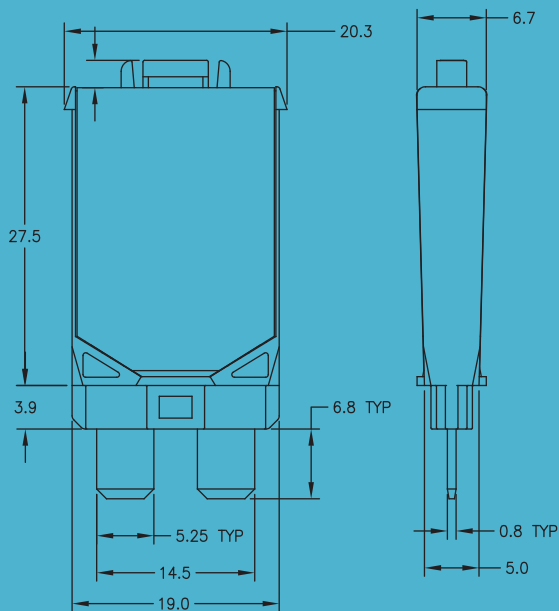


FIGURE 1. 22XXX-0XX WITH GENERAL DIMENSIONS

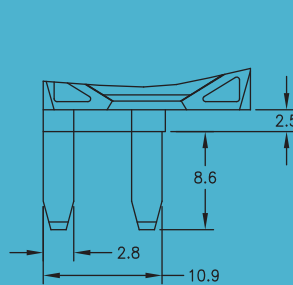


FIGURE 2. 22XXX-2XX

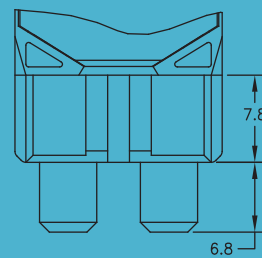


FIGURE 3. 22XXX-3XX

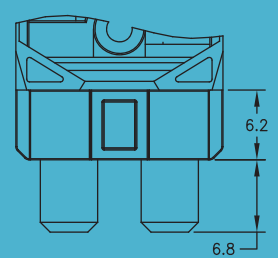
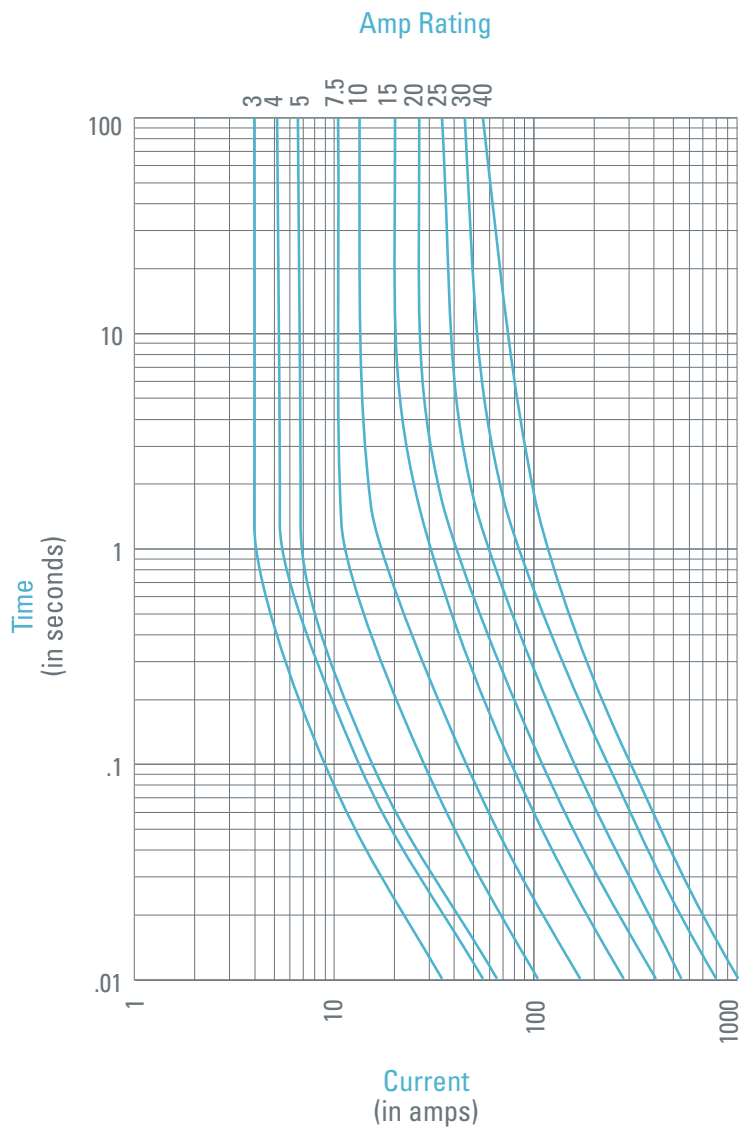


FIGURE 4. 22XXX-4XX

Specifications

Part Number (Amp)	Fuse Body Color
BK-ATC-1	Black
BK-ATC-2	Gray
BK-ATC-3	Violet
BK-ATC-4	Pink
BK-ATC-5M	Tan
BK-ATC-7-1-2M	Brown
BK-ATC-10M	Red
BK-ATC-15M	Blue
BK-ATC-20M	Yellow
BK-ATC-25M	Clear
BK-ATC-30M	Green
BK-ATC-35	Blue/Green
BK-ATC-40	Orange

Time Current Curves



easyID™

Illuminating Blade Fuses & Fuse Holders

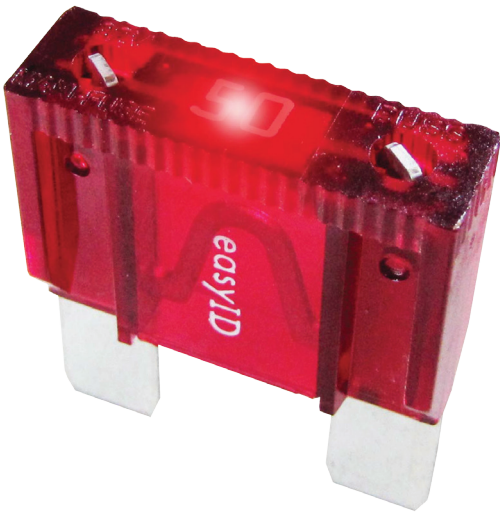
Now, a drop-in replacement is available for low-voltage applications up to 100 amps that can benefit from open fuse indication. The Eaton line of easyID™ illuminating blade fuses and holders use Light Emitting Diode (LED) technology to show that a fuse has opened, making them easy to spot in fuse panels tucked up under darkdashboards.

Features

The ATM (3-30A), ATC® (3-40A) and Maxi® (20-100A) cover the most common replacement fuse needs

Illuminating fuse holders with easyID™ use regular ATM and ATC blade fuses and feature a red LED that glows when the fuse opens

The ATM, ATC and MAXI fuses all use the same universal color-coding as traditional non-illuminating fuses, making it easier to match up an indicating replacement for an open fuse



easyID™ ATM Illuminating Blade Fuses

Following on the popularity and wide application of ATM fuses for late-model OEM vehicles, the easy ID illuminating ATM fuse line is available in popular ATM amp ratings with packaging that's designed for easy retail selling.

Part Number	Amp Rating	Color
BK-ATM-3ID	3	Violet
BK-ATM-5ID	5	Tan
BK-ATM-7-1-2ID	7.5	Brown
BK-ATM-10ID	10	Red
BK-ATM-15ID	15	Light Blue
BK-ATM-20ID	20	Yellow
BK-ATM-25ID	25	Natural
BK-ATM-30ID	30	Green



easyID™ ATC Illuminating Blade Fuses

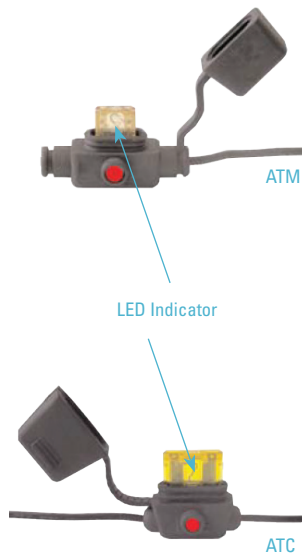
Introduced in the late '70s, ATC® blade fuses are widely used by automotive OEMs. With a large installed base, the Eaton ATC easy ID™ illuminating fuse line has great selling potential with popular ATC amp ratings in packaging that's designed for easy retail selling.

Part Number	Amp Rating	Color
BK-ATC-3ID	3	Violet
BK-ATC-5ID	5	Tan
BK-ATC-7-1-2ID	7.5	Brown
BK-ATC-10ID	10	Red
BK-ATC-15ID	15	Light Blue
BK-ATC-20ID	20	Yellow
BK-ATC-30ID	30	Green
BK-ATC-40ID	40	Amber



easyID™ Maxi® (MAX) Illuminating Blade Fuses

Used for protecting circuits in wiring harnesses (usually found under the hood, in a fuse panel or supplementary panel near the battery) Maxi Fuses are finding increased popularity in domestic cars and some import models. Current OEM applications range up to 60 amps, but some aftermarket accessories (such as high-end stereos) require protection up to 80 amps. The Eaton easy ID Maxi illuminating fuse line is a sure seller for the high amp circuit protection market.



easyID™ Illuminating Holders for Blade Fuses

Now customers have a way to get open fuse indication when adding circuits with easy ID illuminating inline fuse holders for ATM and ATC blade fuses. Attractive blister backs increase impulse sales.

Fuse Type	Part Number	Max Volts / Amps	Description
ATM	ATM-FHID	32V / 20A	Inline fuse holder with protective cap and open fuse illuminating LED
ATC	ATC-FHID	32V / 20A	Inline fuse holder with protective cap and open fuse illuminating LED

Series 22X

Circuit Breakers

Specifications

Auto (Type 1), modified (Type 2) & manual (Type 3) reset breakers

Single Pole Thermal Type Breakers

Rating: 5-30A, 14VDC; 28VDC (Series 223 & 226).

Interrupt Rating: 150A @ 14VDC (5-10A versions); 225A @ 14VDC (15A version); 300A @ 14VDC (20A version); 450A @ 14VDC (25-30A versions)

Operating Temperature Rating: -40°F (-40°C) to 185°F (85°C).

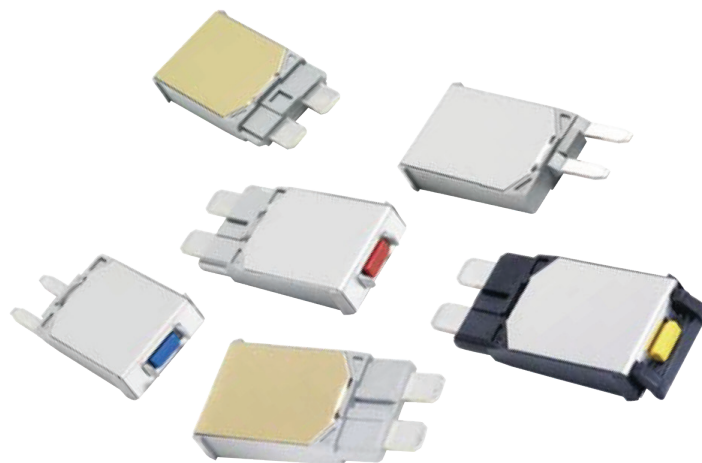
Storage Temperature Rating: -40°F (-40°C) to 260°F (125°C).

Materials: UL 94-V0 thermoplastic housing with gold metal cover (Type I) or silver metal cover (Type II & III)

Marking: Standard marking includes amp/volt ratings, part number, and date code. Type III reset buttons are color-coded to amperage ratings. Push-to-trip option is available on manual reset version. OCR marking is available.

Termination: Compatible with 280 Type or ATC® fuse blocks.

Compliances: SAE J553, SAE J1171 (ignition protection)



Dimensions in Inches (mm)

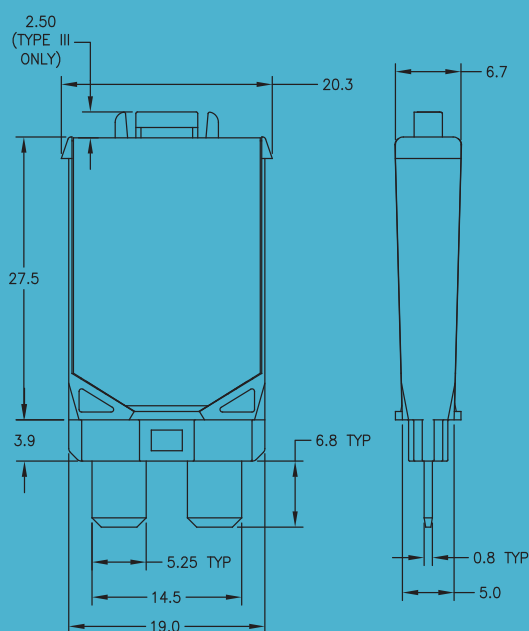


FIGURE 1. 22XXX-0XX WITH GENERAL DIMENSIONS

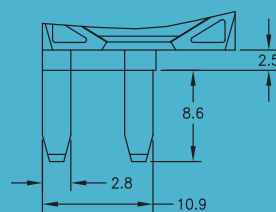


FIGURE 2. 22XXX-2XX

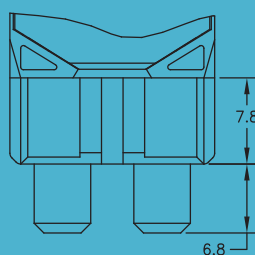


FIGURE 3. 22XXX-3XX

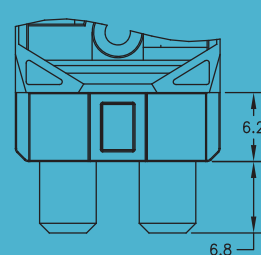


FIGURE 4. 22XXX-4XX

Ordering information

22X

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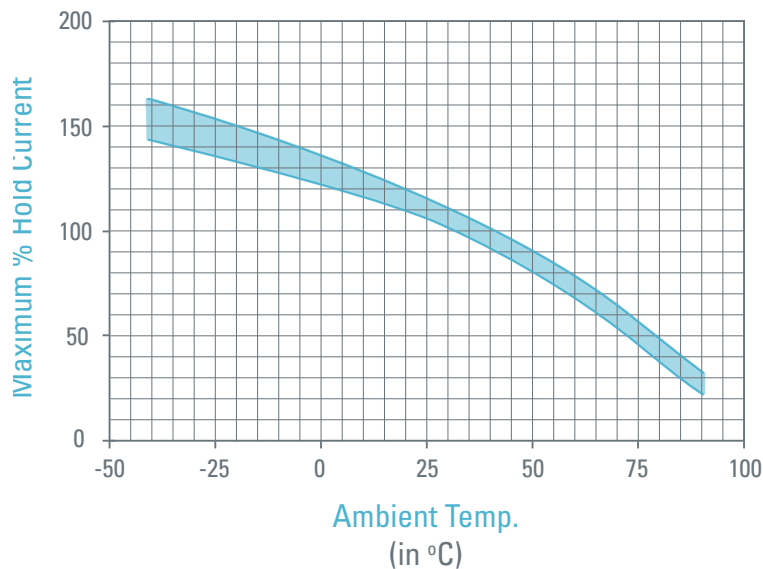
X

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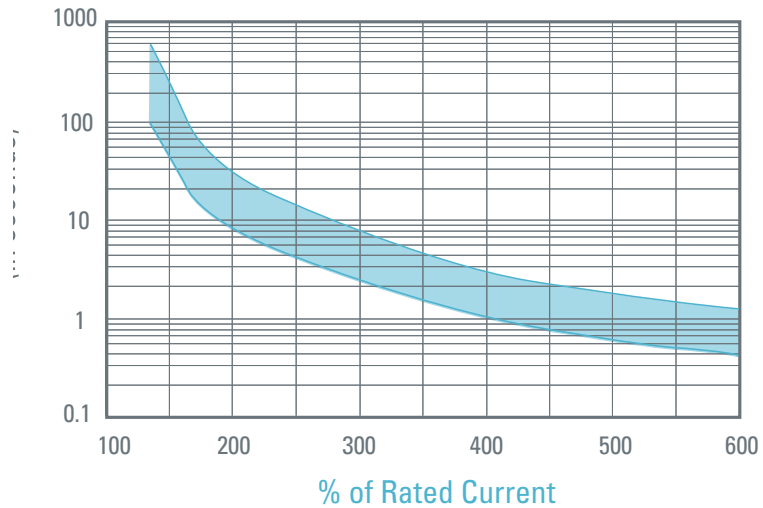
Series	Rating	Terminal	Marking
221 = Type I, 14 VDC 222 = Type II, 14 VDC 223 = Type III, 24 VDC 226 = Type III w/ Push-to-trip option, 24 VDC Consult factory for terminal option availability.	05 = 5 amps [light brown (tan)]* 75 = 7.5 amps [brown]* 10 = 10 amps [red]* 15 = 15 amps [blue]* 20 = 20 amps [yellow]* 25 = 25 amps [white]* 30 = 30 amps [green]* *Reset button color (223 & 226 only)	0 = ATC® Fuse, 4mm insertion depth 2 = 8.1mm Centerline 280 (MINI) 3 = ATC® Fuse, Delphi Autofuse Block (e.g. 12004943) 4 = ATC® Fuse, Blocks with raised shrouds, 6.4mm insertion depth	00 = Standard (Consult factory for special marking options)

Temperature Derating / Time Current Curves

Temperature Derating Curves



Trip Time vs. % Rated Current



Series 227

ATC Circuit Breakers (low profile)

Specifications

Manual reset

Single Pole Thermal Type Breakers

Rating: 5-30A, 28VDC

Interrupt Rating: 2000A @ 28VDC

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: UL 94-V0 thermoplastic body. Tin-plated copper alloy terminals

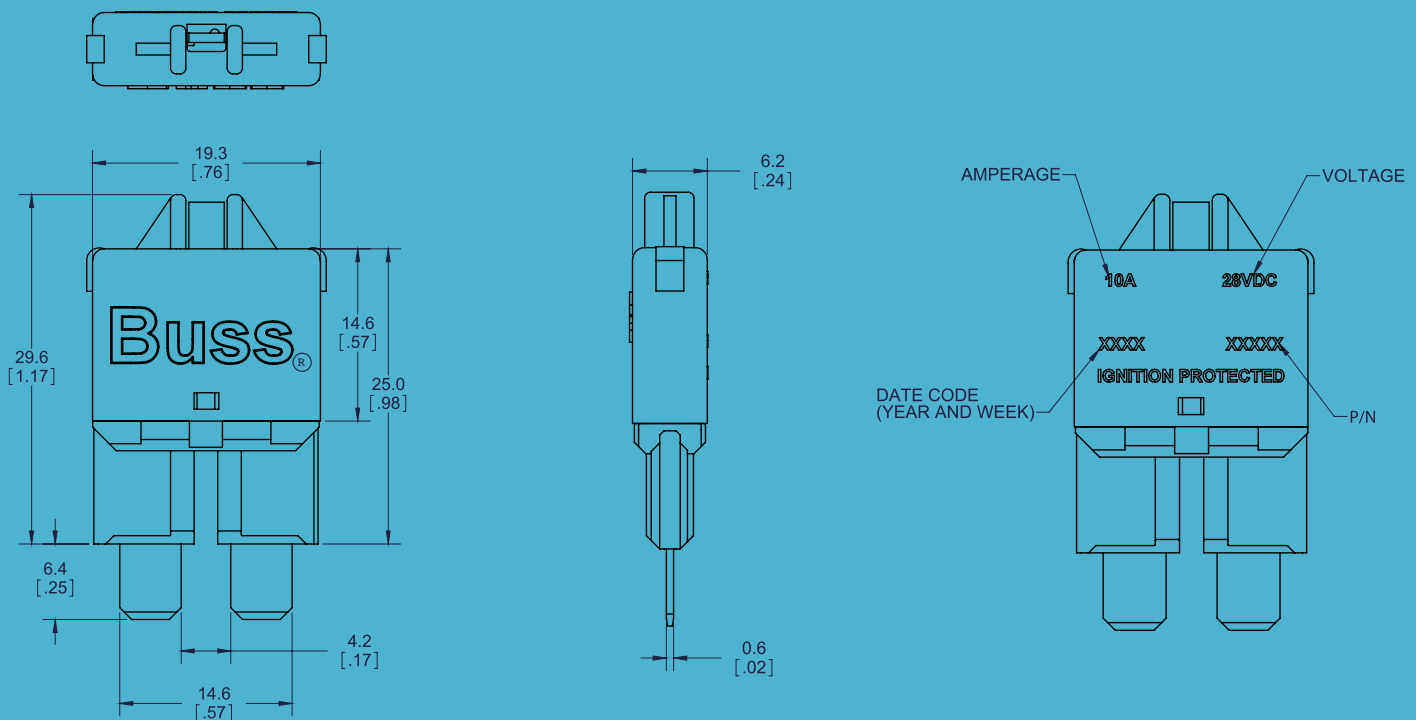
Marking: Cover is color-coded to amperage ratings

Termination: 5.2mm wide blades compatible with ATC® type fuse blocks

Compliances: SAEJ553; SAEJ1171 (ignition protected)



Dimensions in Inches (mm)



Ordering information

227

XX

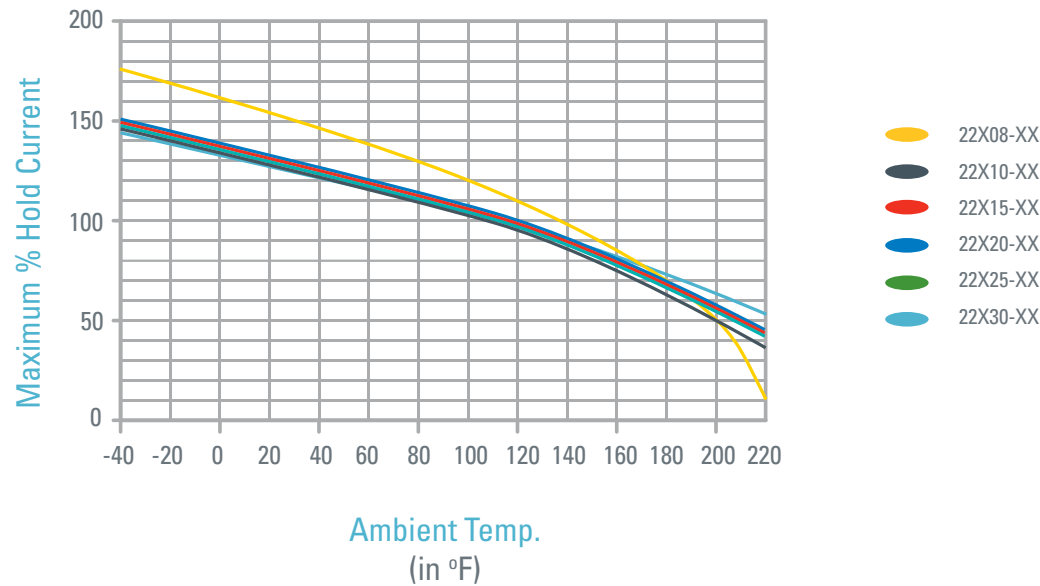
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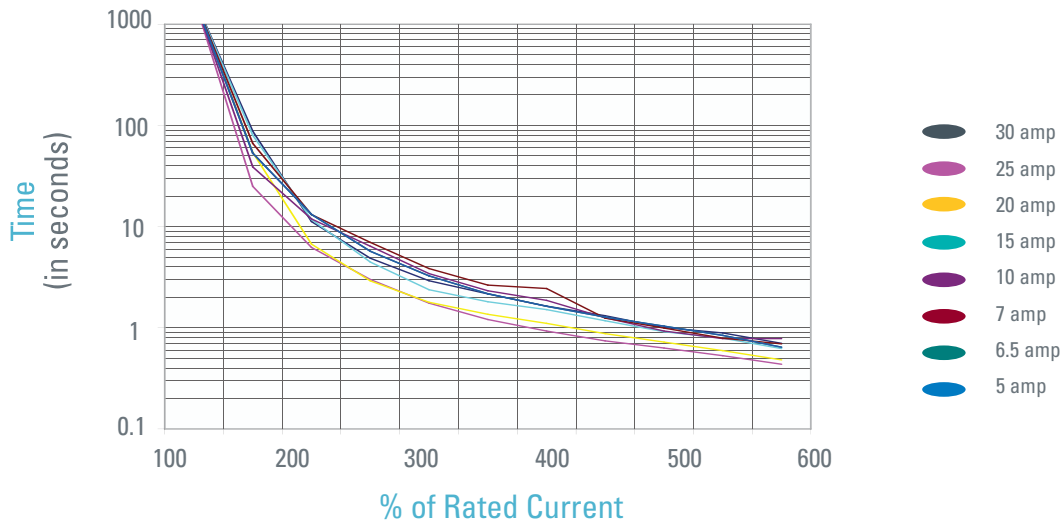
Series	Rating	Marking
227 = 227 series	05 = 5 amps [light brown (tan)] 06 = 6 amps [moss green] 75 = 7.5 amps [brown] 10 = 10 amps [red] 15 = 15 amps [blue] 20 = 20 amps [yellow] 25 = 25 amps [white] 30 = 30 amps [green]	00 = Standard (Consult factory for special marking options)

Temperature Derating / Time Current Curves

Temperature Derating Curves



Trip Time vs. % Rated Current



MAXI Blade Fuses

Specifications

Fast acting

Current Rating: 20-80A

Voltage Rating: 32VDC

Interrupt Rating: 1000A @ 32VDC

Housing Material: UL 94-V0 thermoplastic

Terminal Material: Silver-plated zinc alloy

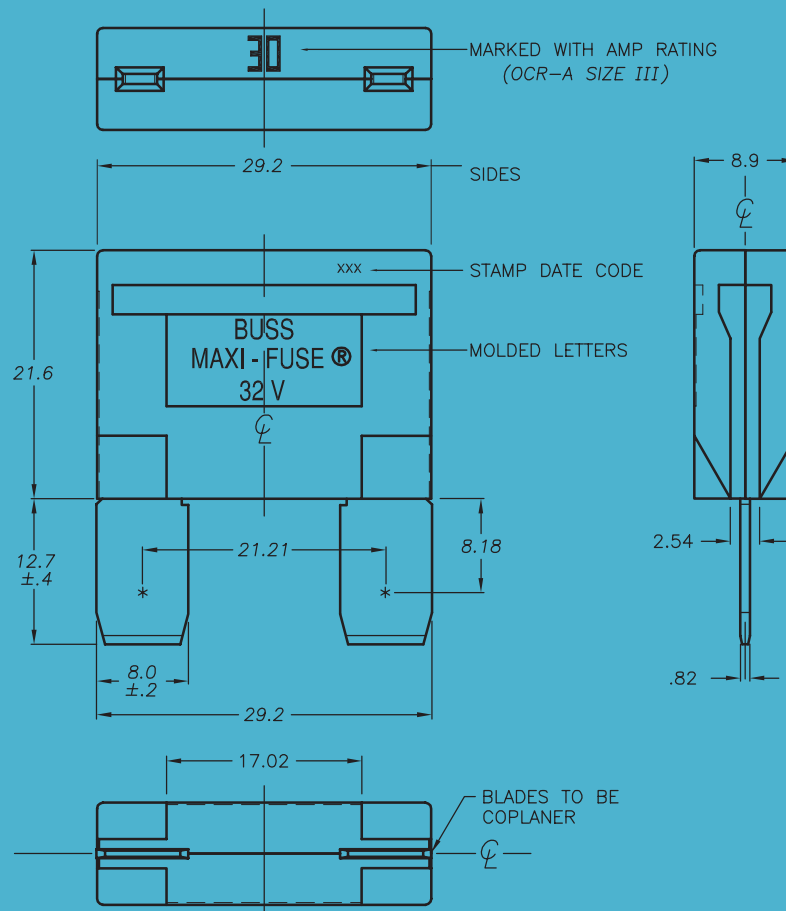
Temperature Rating: -40°F (-40°C) to 248°F (120°C)

Marking: Amperage marking is OCR compliant

Compliances: SAE J1888, ISO 8820-3, SAE J1171 (ignition protected)



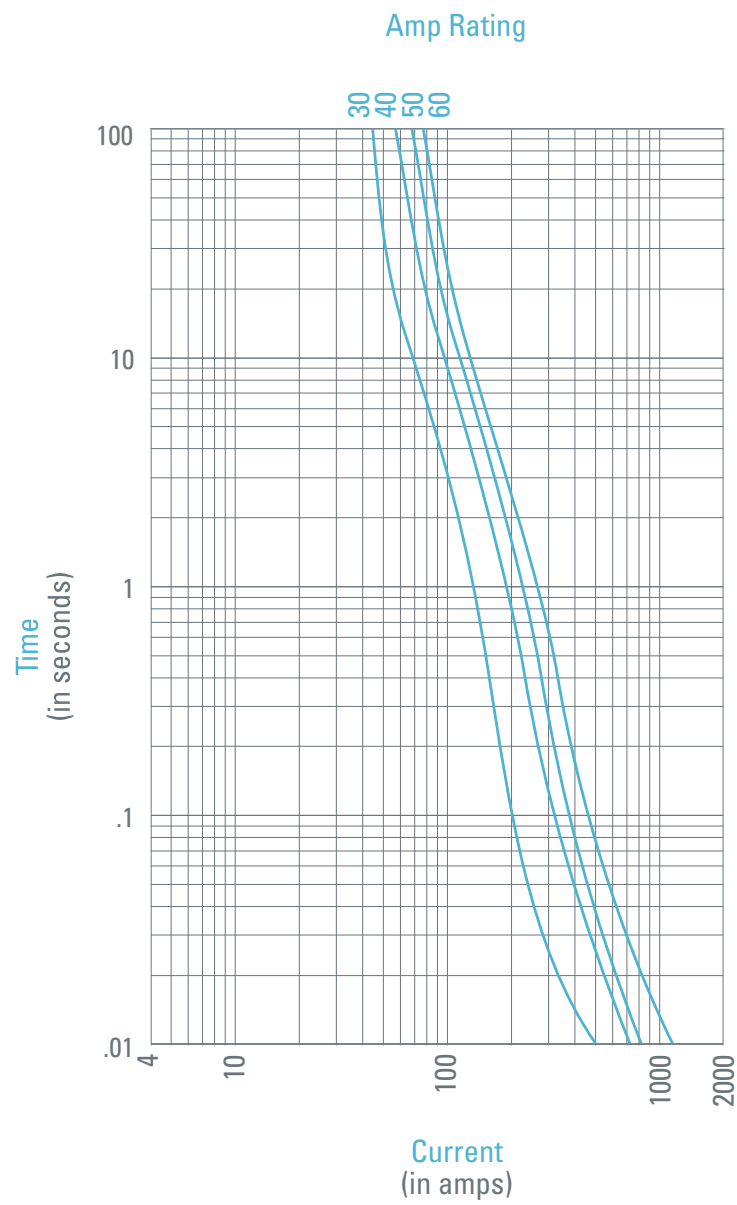
Dimensions in Inches (mm)



Specifications

Part Number	Amp Rating	Color
BK-MAX-20	20	Yellow
BK-MAX-30	30	Green
BK-MAX-40	40	Orange
BK-MAX-50	50	Red
BK-MAX-60	60	Blue
BK-MAX-70	70	Tan
BK-MAX-80	80	Neutral

Time Current Curves



Series 19X

MAXI[®] Circuit Breakers

Specifications

Auto (Type 1), modified (Type 2) & manual (Type 3) reset

Single Pole Thermal Type Breakers

Rating: 8-50A; 14VDC; 28VDC (Series 193, 194, & 195)

Interrupt Rating: 150A @ 14VDC (8-10A versions); 225A @ 14VDC (15A version); 300A @ 14VDC (20A version); 450A @ 14VDC (25-30A versions); 600A @ 4VDC (35-40A versions); 750A @ 14VDC (50A version)

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: Grey UL 94-V0 thermoplastic

Termination: Compatible with fuse blocks accepting MAXI[®] or ATC[®] blade fuses

Compliances: SAE J553, SAE J1171 (ignition protected)



Dimensions in Inches (mm)

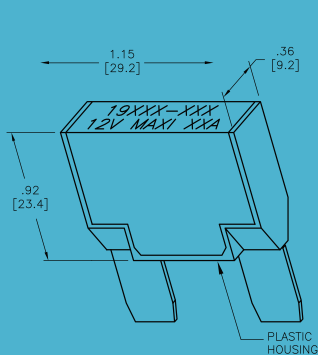


FIGURE 1. TYPES 1, 2, 4 & 5

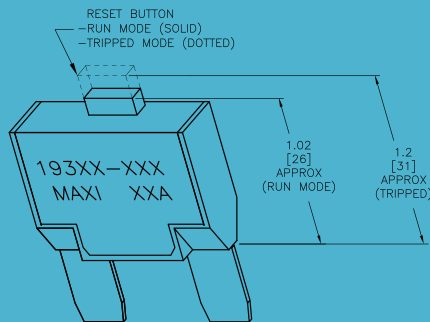
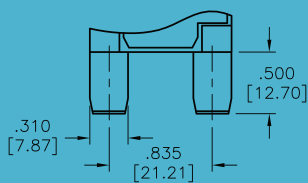
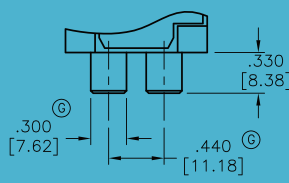


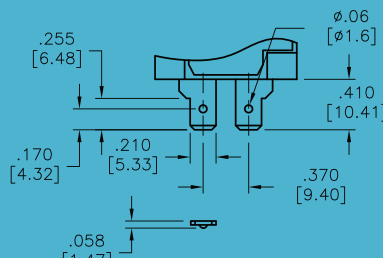
FIGURE 2. TYPE 3



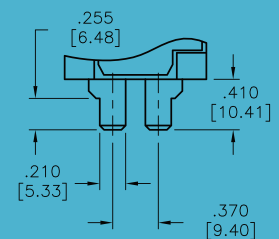
TERMINAL STYLE 01



TERMINAL STYLE 02



TERMINAL STYLE 03



TERMINAL STYLE 04

Ordering information

19X

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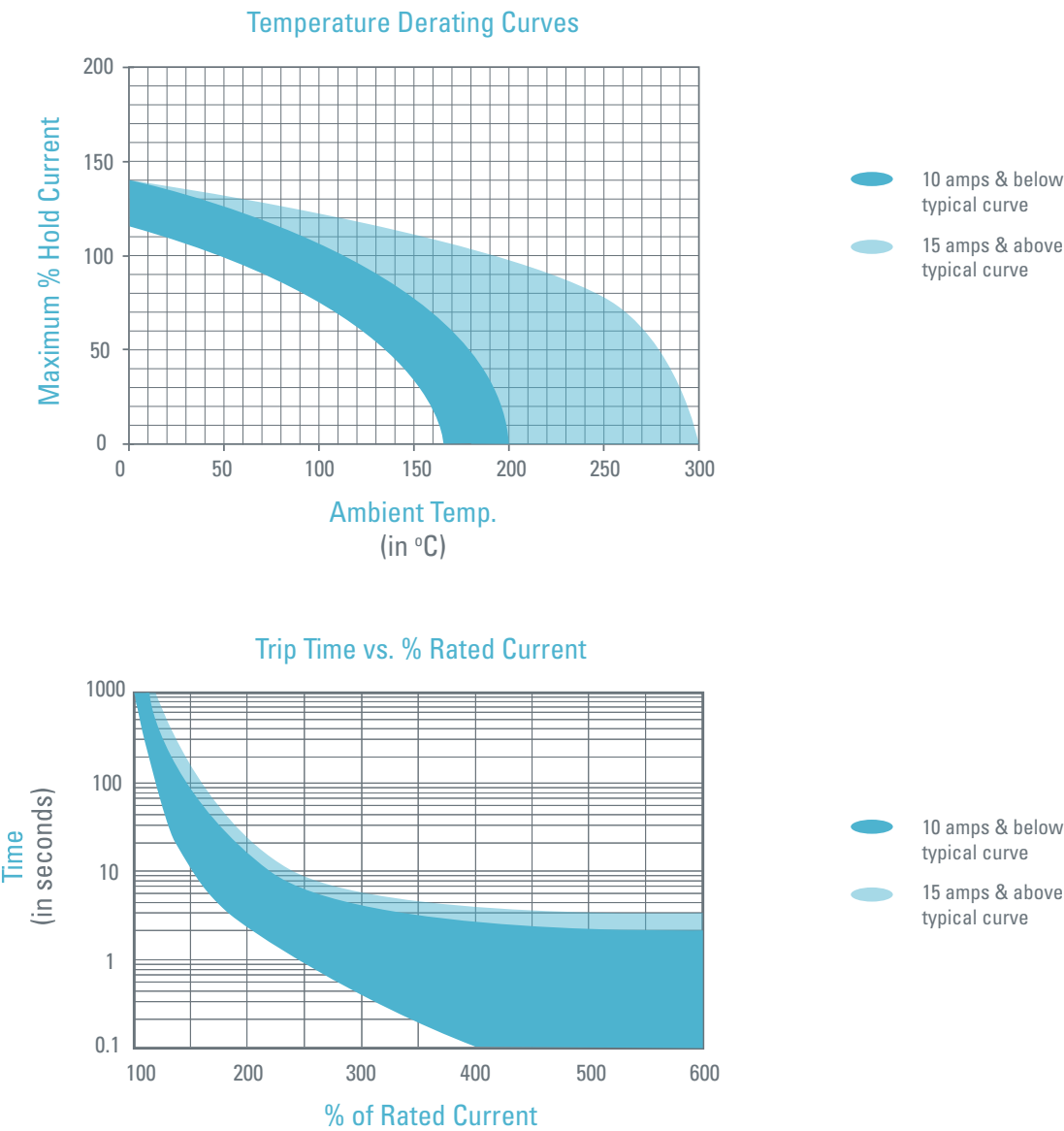
X

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X

Series	Rating	Terminal	Cover	Marking
191 = Type I, 14 VDC 192 = Type II, 14 VDC 193 = Type III, 12V / 24 VDC 194 = Type I, 24 VDC 195 = Type II, 24 VDC	08 = 8 amps 10 = 10 amps 15 = 15 amps 20 = 20 amps 25 = 25 amps 30 = 30 amps 35 = 35 amps** 40 = 40 amps** 50 = 50 amps* ** *(191, 193, 194 only) ** Not available with 03 or 04 terminal	01 = MAXI® 02 = Wide ATC® 03 = Long ATC® (w/dimple) 04 = Long ATC® (no dimple)	M = Metal	00 = Standard (Consult factory for special marking options)

Temperature Derating / Time Current Curves



Fuse/Circuit Breaker Insertion/Extraction Tool

Specifications

- Get only the extractors you need
- Eliminates design changes when protection requirements change
- Easy mounting using simple split-ball snap-lock post
- Tight grip allows devices to be removed and inserted
- High temperature resilient nylon 6/6 221°F (105°C)



3200

XX

Series	Rating			
3200 = 3200 series	Top	Right	Bottom	Left
	0 = MINI CB	MINI Fuse	ATC® CB	ATC® Fuse
	1 = MINI CB	Blank	ATC® CB	Blank
	2 = MINI CB	Blank	MINI Fuse	Blank
	3 = ATC® CB	Blank	ATC® Fuse	Blank

Series 32013

2.8mm (mini) fuse and circuit breaker insertion/extraction tool. Can be used with Series 32000 Dual Vehicle Electrical Center.

Features

- Tight grip allows devices to be removed and inserted
- High temperature resilient nylon 6/6 (105°C)



Series 12X

Shortstop Circuit Breakers

Specifications

Single Pole Thermal Type Breakers

Applications: Battery chargers, trucks, buses, RVs, trolling motors, etc

Rating: 5-50A, 14VDC; 28VDC (Series 123, 124, & 125)

Interrupt Rating: Main Circuit Protection: 1.5kA @ 12VDC (Series 123 w/plastic cover); Branch Circuit Protection: 2.5kA @ 12VDC (Series 121 & 124 -01 sealed & Series 123 w/plastic cover)

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 thermoplastic body (thermoset for Type II body & buttons). Cover is grey thermoplastic or steel-Type I gold, Type II silver

Marking: Custom marking available. Consult factory for options

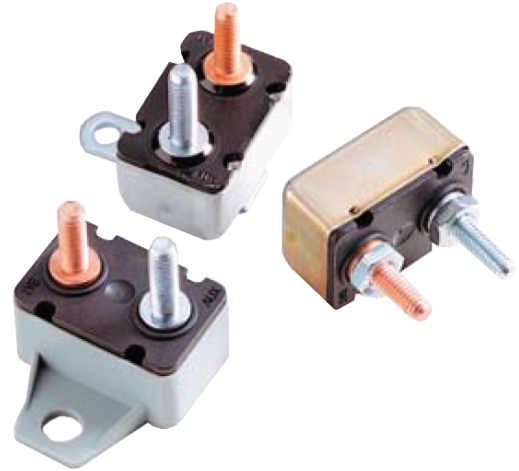
Termination: #10-32 thread and quick-connect options available

Torque Rating: 24 in-lbs (2.7N • m) max

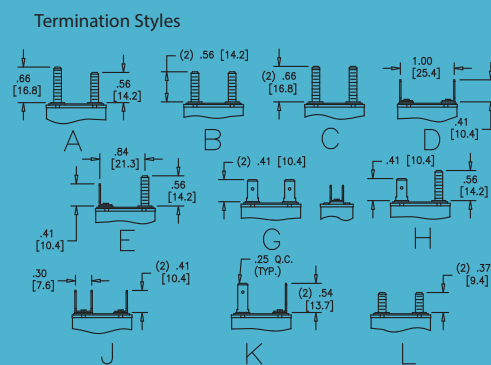
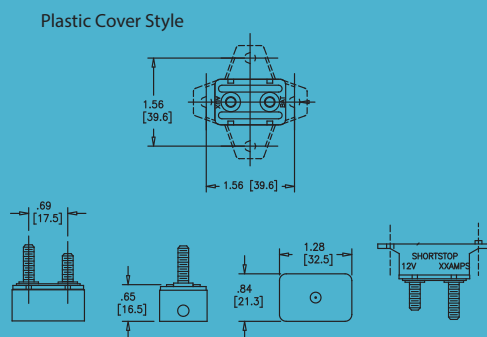
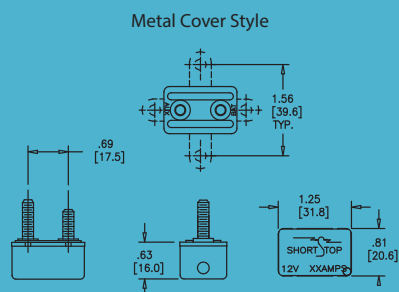
Mounting Torque Rating: Plastic cover - 15 in-lbs (1.7N • m);
Metal cover - 30 in-lbs (3.4N • m)

Ingress Protection Rating: IP66 On plastic cover version only (except for terminals)

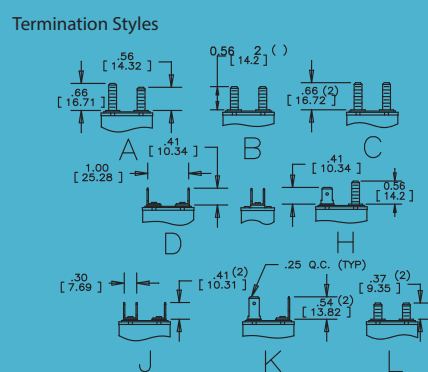
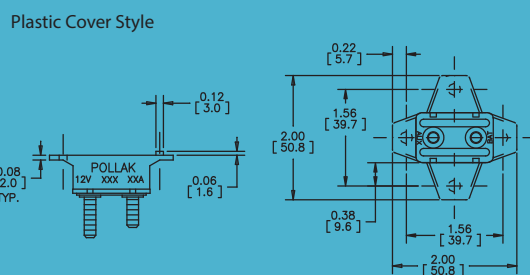
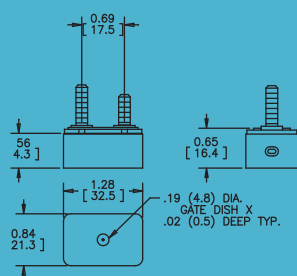
Compliances: SAE J553; SAE J1171 (ignition protected)



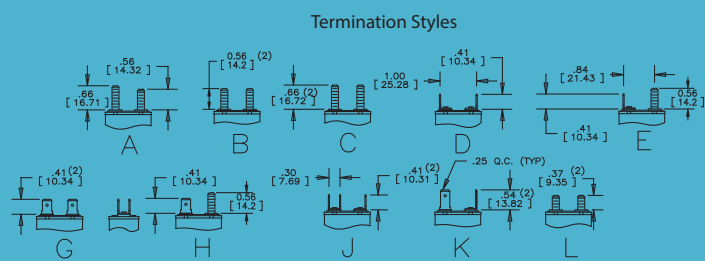
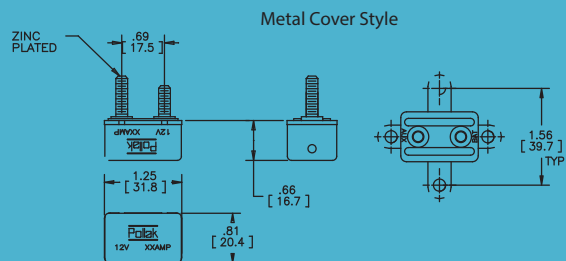
12XXX-XXX-XX-XX



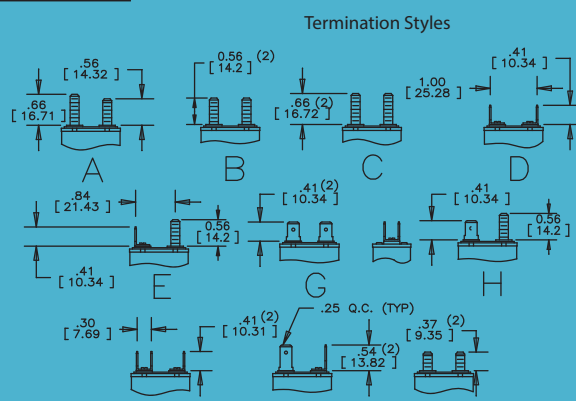
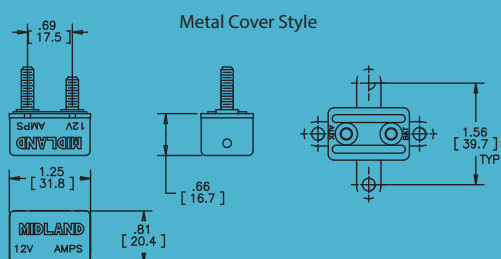
12XXX-XXP-26-XX



12XXX-XXM-26-XX



12XXX-XXM-18-XX



Ordering information

Series	Terminal	Rating	Bracket	Mtg. Holes	Cover*	Options	Hardware
121 = Type I, 12 VDC 122 = Type II, 12 VDC 123 = Type III, 24 VDC 124 = Type I, 24 VDC 125 = Type II, 24 VDC	A = Two 10-32 studs; .66 (Aux), .56 (Bat) B = Two 10-32 studs; .56 (Aux & Bat) C = Two 10-32 studs; .66 (Aux & Bat) D = Two .250 QC; (Aux & Bat)*** H = One 10-32 stud .56 (Bat), Double .250 QC Aux)** L = Two 10-32 studs; .37 (Aux & Bat)	05 = 5 amps 08 = 8 amps 10 = 10 amps 12 = 12 amps 15 = 15 amps 20 = 20 amps 25 = 25 amps 30 = 30 amps 35 = 35 amps 40 = 40 amps 50 = 50 amps	0 = No bracket A = Bracket B = Bracket C = Bracket E = Bracket (plastic only)	0 = No bracket 1 = .140 dia. 2 = .196 dia. 3 = .237 dia. (metal only) 4 = .265 dia. (plastic only) 5 = .228 dia. (plastic only) 6 = .221 dia. (metal only)	M = Metal P = Plastic	01 = Waterproof (metal covers only) 02 = Splash proof (optional on metal covers - add 02 suffix; std. on plastic covers - omit 02 suffix.)	WA = Whiz-lock nut assembled WB = Whiz-lock nut bulk HA = Nut & lock washer assembled HB = Nut & lock washer bulk KA = Keps lock nut assembled KB = Keps lock nut bulk

*Series 123 available in plastic cover only.

Series 122 & 125 available in metal cover only.

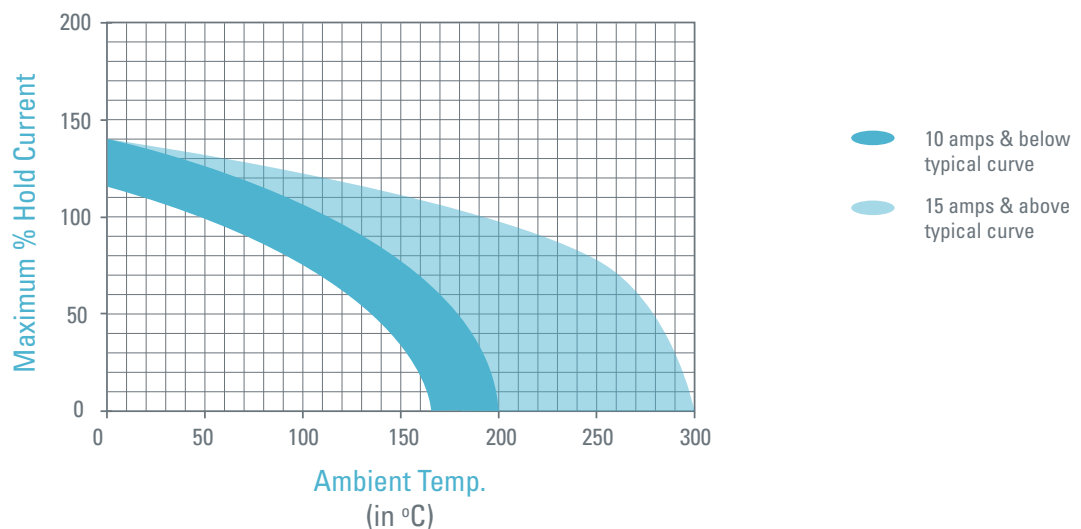
**40A maximum

***30A maximum

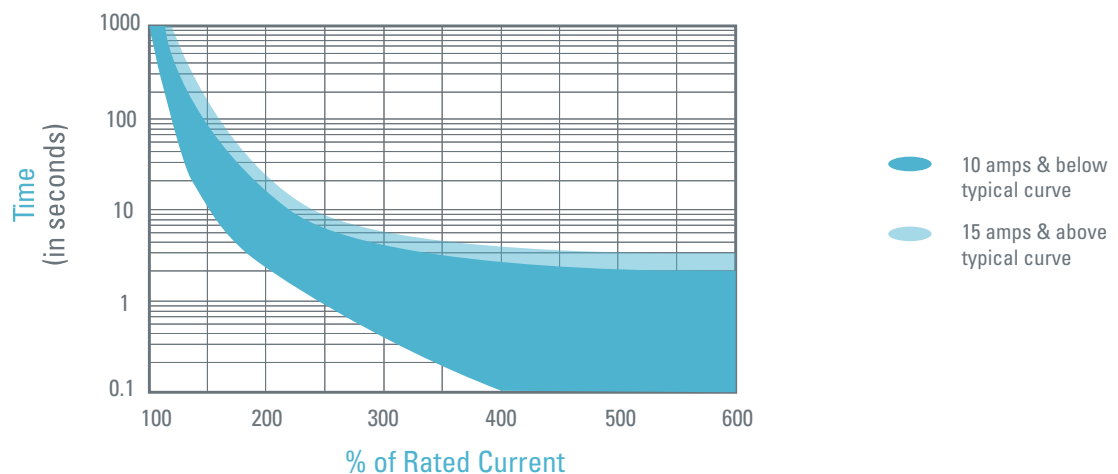
Please consult factory regarding configuration availability.

Temperature Derating / Time Current Curves

Temperature Derating Curves



Trip Time vs. % Rated Current



Series 25X Mid-Range Circuit Breakers

Specifications

Auto (Type 1), Modified (Type 2) & Manual (Type 3) breakers available

Single Pole Thermal Type Breakers

Applications: This unit is external ignition protected and weatherproof. It is typically used in DC power systems in marine applications (as a main or branch circuit breaker), truck, bus and RV systems, add-on protection for accessories, etc

Rating: 10-50A, 32VDC

Interrupt Rating: Circuit Protection (2.5kA) per ABYC E-11

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 94-V0 thermoset plastic body. Cover, lever, and button are UL Rated 94V0 thermoplastic. Cover has a black thermoplastic elastomer over mold

Marking: Standard marking includes amp/volt ratings, part numbers, and "SAE Type B"

Termination: #10-32 Threaded studs

Torque Rating: 24 in-lbs (2.7N • m) max



Mounting Torque Rating: Panel mount with either #8-32 threaded inserts or #10 clearance holes. 18 in-lbs (2.0N • m) max

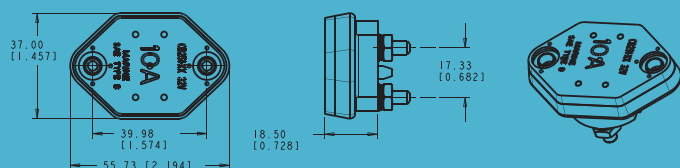
Ingress Protection Rating: IP66

Features / Options: Series 254 & 255 have a unique reset mechanism which provides a visual indication of tripped condition. Series 255 also features a push-to-trip option

Compliances: SAE J553; ABYC E-11; SAE J1171 (ignition protected)

Dimensions in Inches (mm)

251 SERIES



254 SERIES

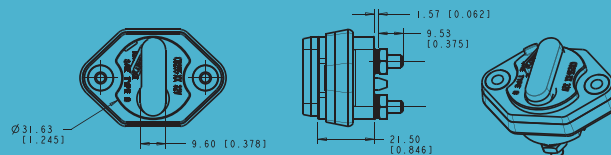


FIGURE 4. BOTTOM VIEW OF HOUSING

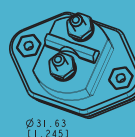
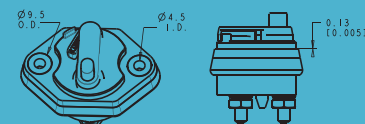
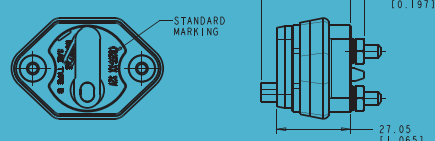


FIGURE 6. MIG. WASHER



255 SERIES



Ordering information

25X

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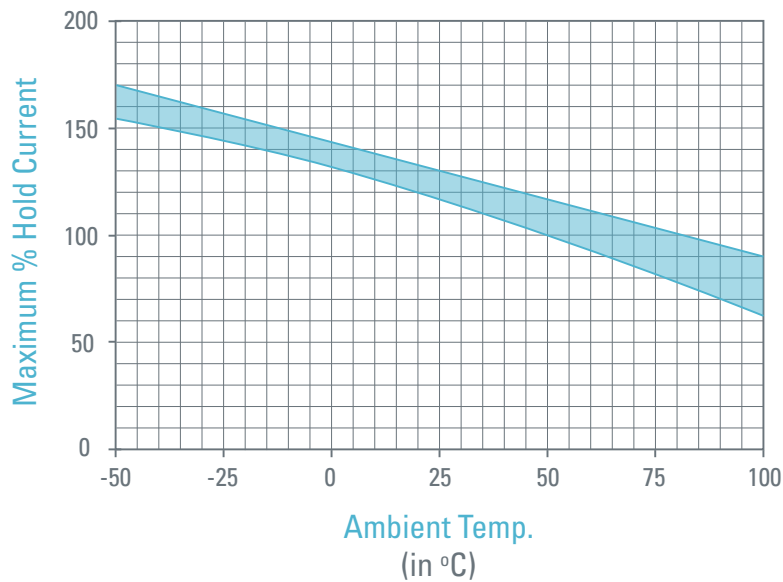
-

X

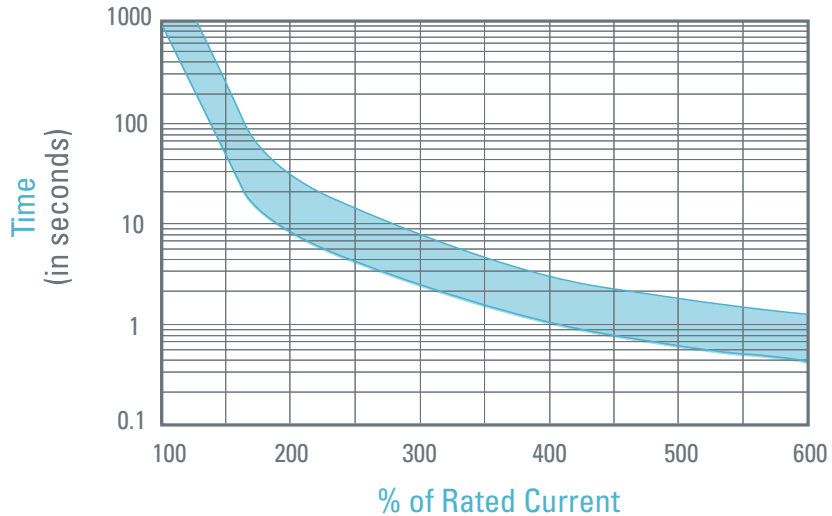
Series	Rating	Mounting Holes	Hardware
251 = Type I, 32V	10 = 10 amps	A = Thru-hole Insert (#10 Clearance)	0 = None
254 = Type III, 32V	15 = 15 amps	B = #8-32 Threaded Inserts	1 = Nuts installed
255 = Type III w/push-to-trip option, 32V	20 = 20 amps		2 = Nuts bulk
	25 = 25 amps		
	30 = 30 amps		
	35 = 35 amps		
	40 = 40 amps		
	50 = 50 amps		

Temperature Derating / Time Current Curves

Temperature Derating Curves



Trip Time vs. % Rated Current



Series 18X Hi-Amp Circuit Breaker

Specifications

Auto (Type 1), Modified (Type 2) & Manual (Type 3) breakers available

Single Pole Thermal Type Breakers

Applications: Typically used in auxiliary and accessory circuits in truck, bus, RVs and marine systems. Others include battery chargers and DC audio systems. Series 181, 184 & 185 are sealed for engine compartment and bilge area applications.

Rating: 25-150A, 30VDC; 42VDC Nom (Series 184 & 185)

Interrupt Rating: 3000A @ 30VDC

Operating Temperature Rating: -40°F (-40°C) to 185°F (85°C)

Storage Temperature Rating: -30°F (-34°C) to 300°F (149°C)

Materials: Black UL 94-V0 thermoset plastic. Thermoplastic elastomer stud insulators are provided on covered units with F-style (surface-mount) bases

Marking: Standard marking includes amp ratings and part numbers. Custom markings also available.

Termination: 1/4-28 threaded studs

Torque Rating: 50 in-lbs (5.6N • m) max



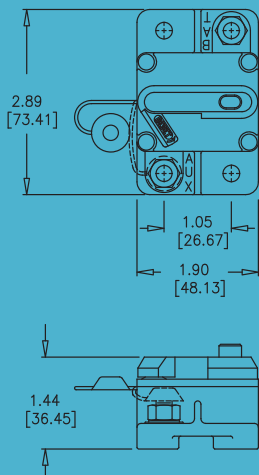
Mounting Torque Rating: Panel or surface-mount options; 50 in-lbs (5.6N • m) max. Threaded insert option has a max torque of 25 in-lbs (2.8N • m).

Ingress Protection Rating: IP67

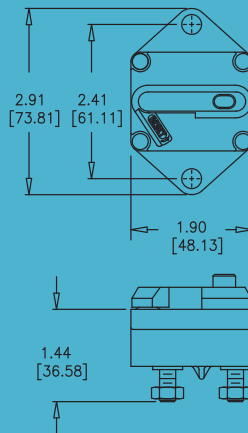
Features / Options: Series 184 & 185 have a unique reset mechanism which provides visual indication of tripped condition. Series 185 also features a push-to-trip option

Dimensions in Inches (mm)

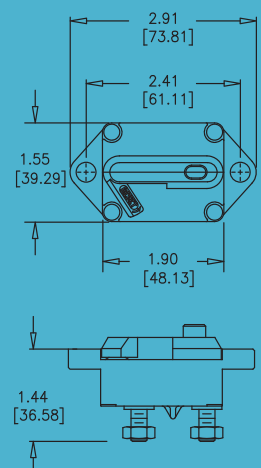
FIREWALL MOUNT



PANEL MOUNT



PANEL MOUNT W/ MOUNTING EARS ROTATED 90°



Ordering information

18X

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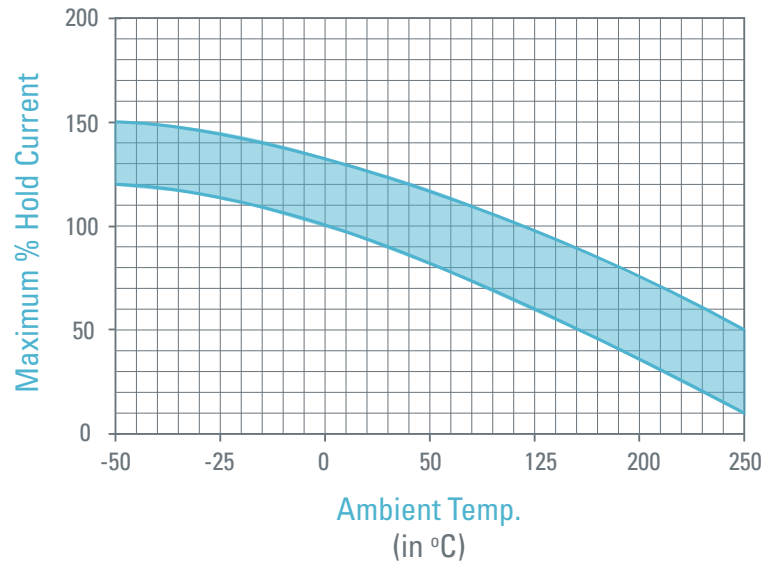
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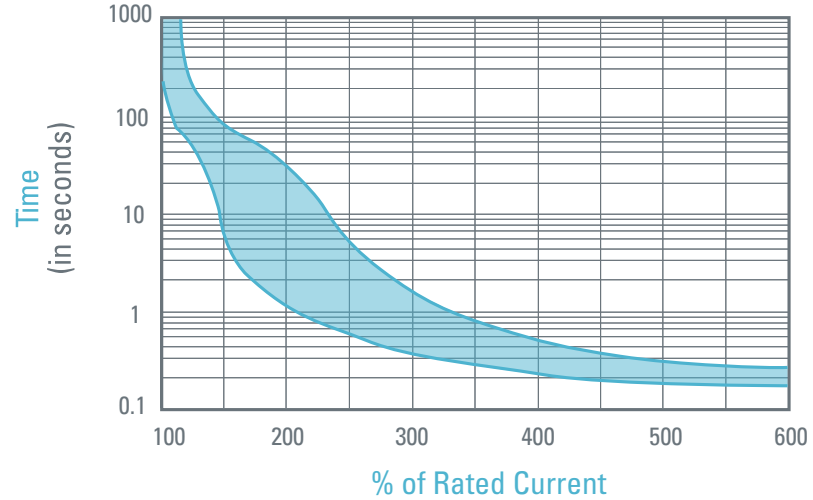
Series	Rating	Mounting	Terminal Hardware	Marking
181 = Type I, 30V 183 = Type I*, 30V 184 = Type III, 42V 185 = Type III-PTT, 42V *183 available in panel mount only (coverless)	025 = 25 amps 030 = 30 amps 035 = 35 amps 040 = 40 amps 050 = 50 amps 060 = 60 amps 070 = 70 amps 080 = 80 amps 090 = 90 amps 100 = 100 amps 110 = 110 amps 120 = 120 amps 135 = 135 amps 150 = 150 amps	F = Surface mount P = Panel mount	00 = Ship w/o nuts 01 = Sems nuts installed 02 = Sems nuts shipped bulk 03 = Stainless Steel Std. nuts & washers installed 04 = Stainless Steel Std. nuts & washers shipped bulk 07 = Flange gasket & Sems nuts installed (Panel Mount Only) 08 = Threaded insert and Sems nuts installed 12 = Stainless steel nuts and lock washers installed 13 = Stainless steel Sems nut installed	0 = Blank cover 1 = Standard Marking; Part Number, Amp Rating 181, 184, 185 Series - Top Surface 183 Series - Side Surface S = Standard Ignition Protected Marking Consult factory for special markings.

Temperature Derating / Time Current Curves

Temperature Derating Curves



Trip Time vs. % Rated Current



Series 187 Marine Rated Circuit Breaker (MRCB)

Specifications

Manual (Type 3) breakers available

Single Pole Thermal Type Breakers

Applications: Typically used in DC power systems in marine applications (as a main or branch circuit breaker), truck and bus systems, RV systems, add-on protection for accessories, lift gates, etc. This unit is external ignition protected and weatherproof.

Rating: 25-200A, 48VDC

Interrupt Rating: Main Breaker Protection Interrupt Rating (5,000A@ 14VDC, 3,000A@ 28VDC and 1,500A@ 48VDC).

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 94-V0 thermoset plastic body.

Cover and lever are UL 94-V0 thermoplastic

Marking: Standard marking includes amp/volt ratings.

Custom markings also available

Termination: 5/16-18 threaded studs

Torque Rating: 75 in-lbs (8.5N • m) max



Mounting Torque Rating: Panel or surface-mount options; 50 in-lbs (5.6 N • m) max

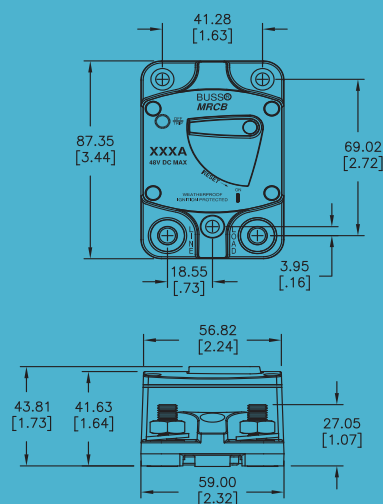
Ingress Protection Rating: IP66

Features / Options: A manual reset circuit breaker with On-Off switch capability

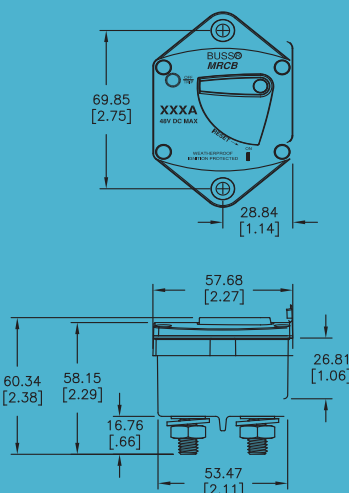
Compliances: ABYC E-11; CE; SAE J1171 (ignition protected)

Dimensions in Inches (mm)

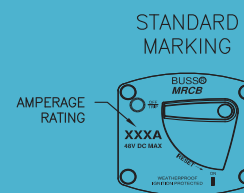
FIREWALL MOUNT



PANEL MOUNT



MARKING



Ordering information

187

XXX

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XX

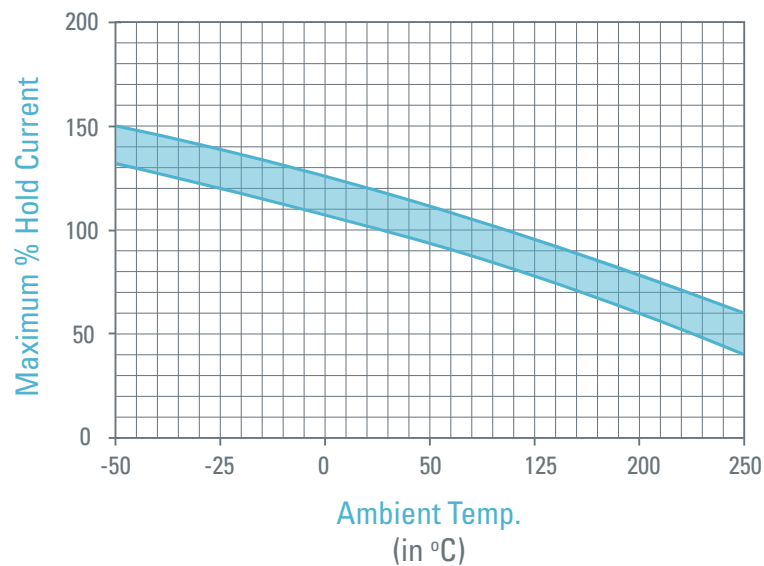
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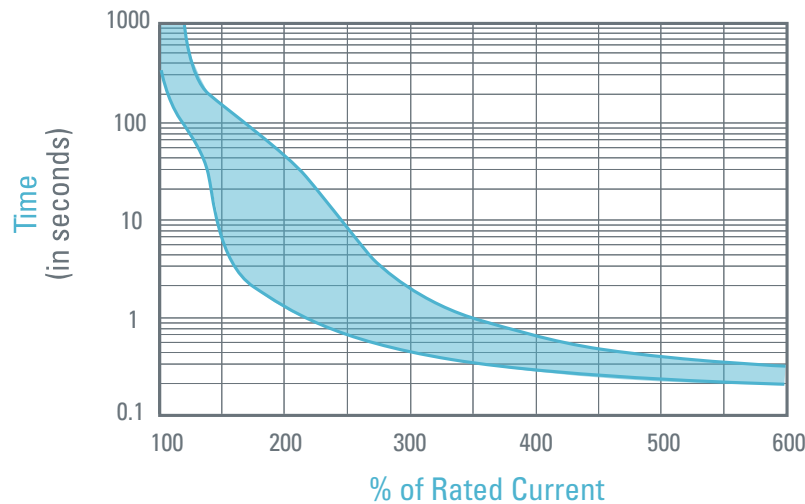
Series	Rating		Mounting	Hardware	Marking
187 = Manual Reset - Switching Style Circuit Breaker	025 = 25 amps	080 = 80 amps	F = Surface mount	00 = No hardware	1 = Standard marking; Part Number, Amp Rating
	030 = 30 amps	100 = 100 amps	P = Panel mount	03 = Stainless nuts & lockwashers - installed on studs	Consult factory for special markings.
	035 = 35 amps	110 = 110 amps		04 = Stainless nuts & lockwashers - supplied	
	040 = 40 amps	120 = 120 amps			
	050 = 50 amps	135 = 135 amps			
	060 = 60 amps	150 = 150 amps			
	070 = 70 amps	200 = 200 amps			

Temperature Derating / Time Current Curves

Temperature Derating Curves



Trip Time vs. % Rated Current



AMI Series

SAE/ISO SF30 Fuse

Specifications

Bolt in style fuses

Current Rating: 30-200A

Voltage Rating: 32VDC

Interrupt Rating: 2000A @ 32VDC; 5000A@ 16VDC

Housing Material: UL 94-V0 thermoplastic

Terminal Material: Tin-plated brass

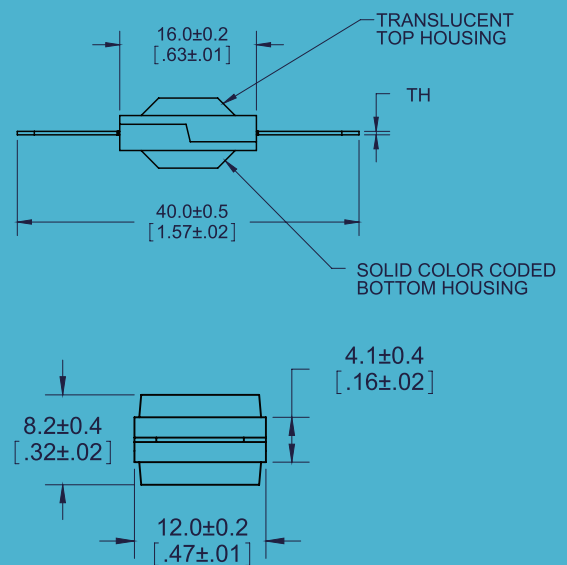
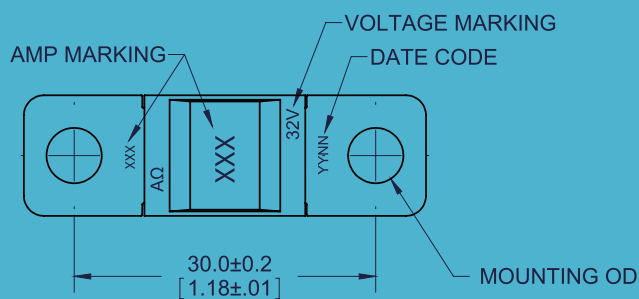
Mounting: Max torque of 35 in-lbs (4N • m)

Marking: Color-coded housings for each amperage

Compliances: SAE J1171 (ignition protected); ISO 8820-5



Dimensions in Inches (mm)



Ordering information

BK-AMI

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XXX

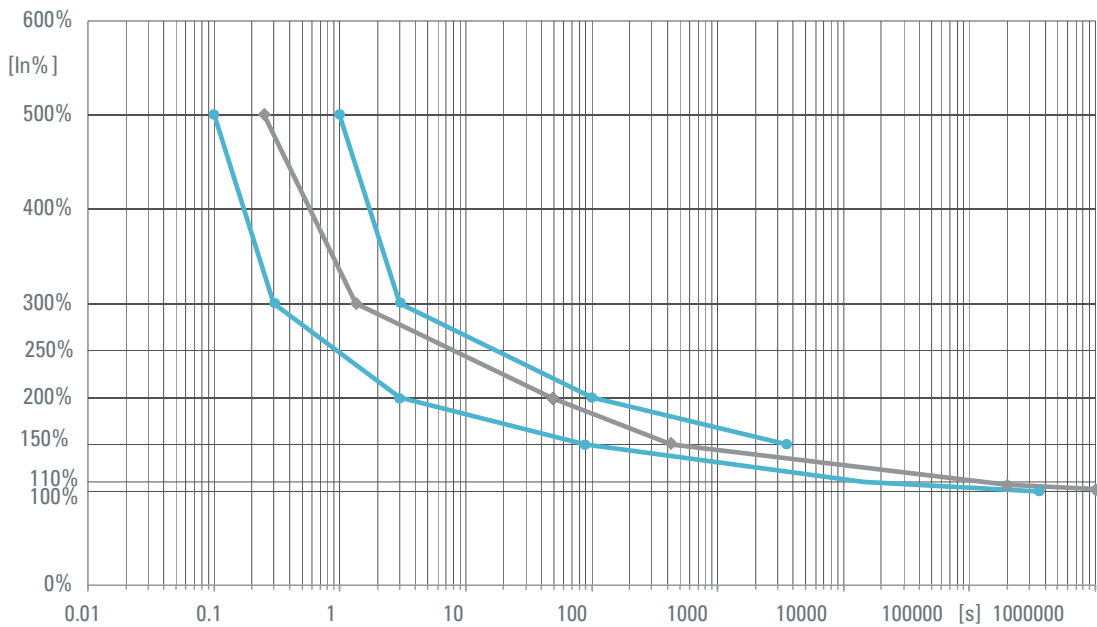
Series

Rating

BK-AMI = AMI series

030 = 30 amps [orange]
040 = 40 amps [green]
050 = 50 amps [red]
060 = 60 amps [yellow]
070 = 70 amps [brown]
080 = 80 amps [white]
100 = 100 amps [blue]
125 = 125 amps [pink]
150 = 150 amps [gray]
175 = 175 amps [light brown]
200 = 200 amps [violet]

Time Current Curve



Time Current Specifications

% of rating	30A - 125A		150A - 200A	
	min	max	min	max
75%	-	-	360.000s	∞
100%	360.000s	∞	-	-
110%	14.400s	∞	-	-
150%	90s	3.600s	-	-
200%	3s	100s	1s	15s
300%	0.3	3s	-	-
350%	-	-	0.3s	5s
500%	0.1	1s	-	-
600%	-	-	0.1s	1s

AMG Series

SAE/ISO SF51 Fuse

Specifications

Bolt in style fuses

Applications: For high current applications. Use with LMG, HMG or FMG fuse holders.

Current Rating: 100-300A.

Voltage Rating: 32VDC. Consult factory for higher voltage fuses.

Interrupt Rating: 1,000A @ 32VDC

Housing Material: UL 94-V0 thermoplastic

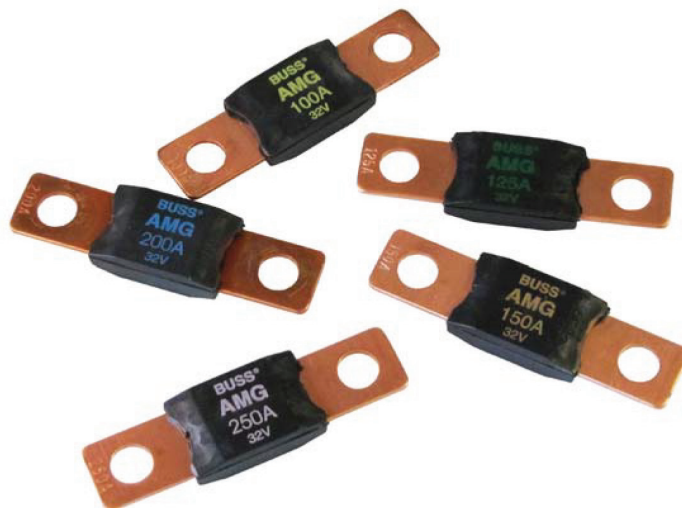
Terminal Material: Copper

Mounting: M8 or 5/16-18 or less studs on 2.00 in (50.8mm) centers

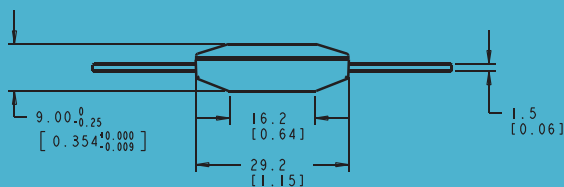
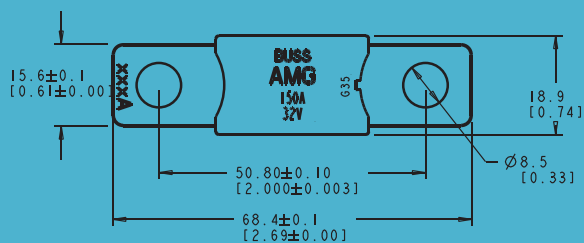
Max torque of 8.1 to 9.6 ft-lbs (12 ±1N • m)

Marking: Color-coded amperage ratings

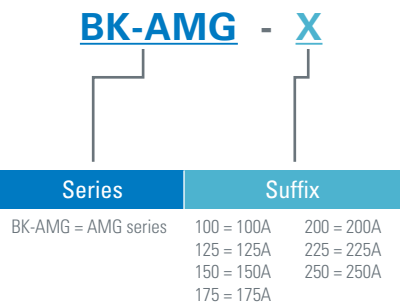
Compliances: SAE J1171 (ignition protected), ISO 8820-5



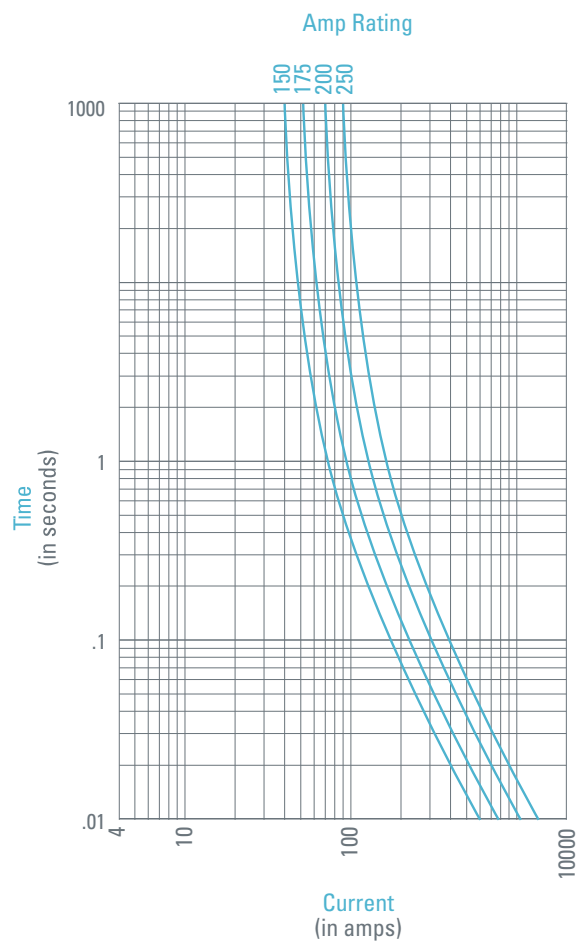
Dimensions in mm (inches)



Ordering information



Temperature Derating / Time Current Curves



Time Current Specifications

% of rating	80A - 250A	
	min	max
75%	-	-
100%	4 hrs	∞
135%	120s	1800s
200%	1s	15s
350%	0.3x	5s
600%	01s	1s

Marine Rated Battery Fuse

MRBF

Designed for the most demanding environment to provide high current protection for the tightest space constraints. Suitable for main and auxiliary circuit protection such as alternator outputs, starter motor inputs and accessory circuits. The breaking capacity meets the requirements of conventional vehicle batteries and 12V, 24V and 42V electrical networks.

Specifications

Applications: Full range circuit protection for automotive and marine applications. Break in capacity meets the requirements of conventional vehicle batteries and 42V electrical networks

Voltage Rating: 58VDC Maximum

Amperage Rating: 30A - 300A

Ingress Protection: IP66

Ignition Protected: Per SAE J1171

Color Coded

Torque Rating: Maximum 12 N • m (106 in-lbs)

Material:

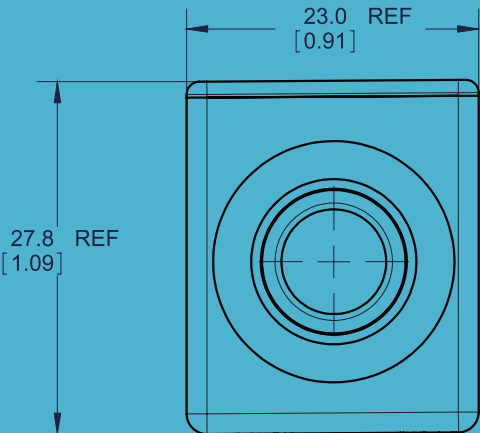
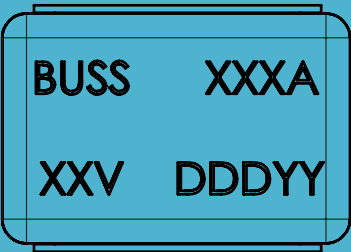
- Body - Ceramic
- Housing & Cover: UL 94-V0 Thermoplastic
- Ring Terminals - Tin Plated



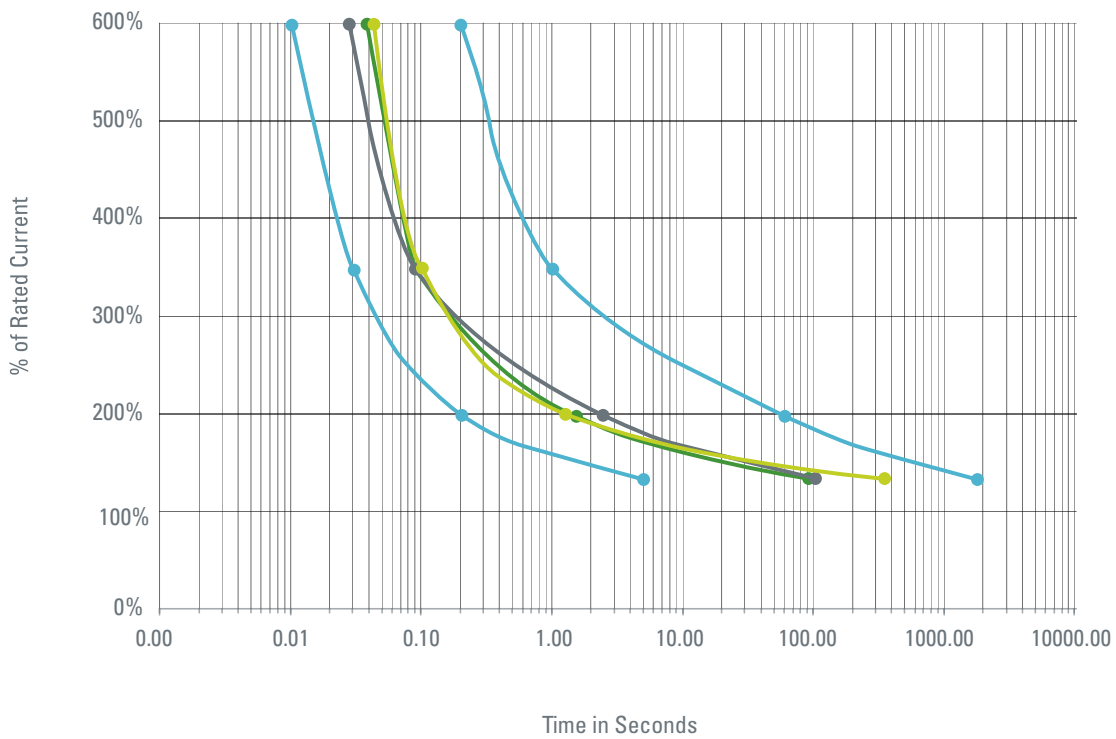
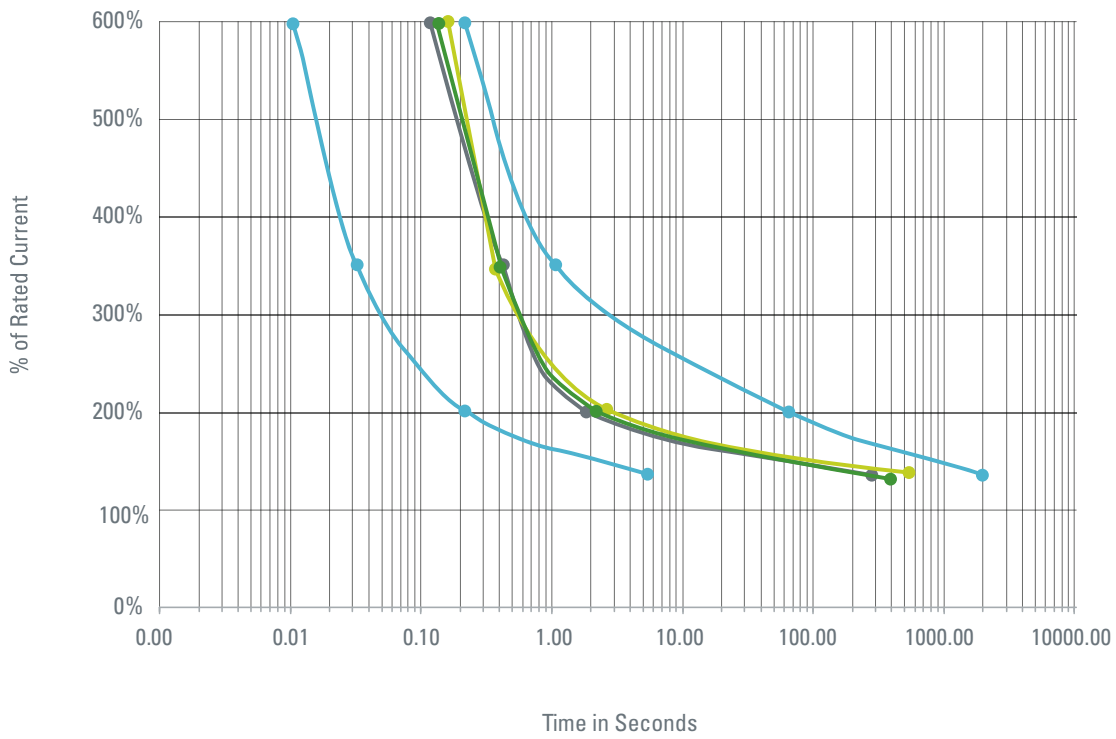
Operating Times

Rating	100%	135%		200%		350%		600%
30A - 300A	> 100 hrs	min	max	min	max	min	max	< 0.2s
		-	900s	-	60s	0.1s	1s	

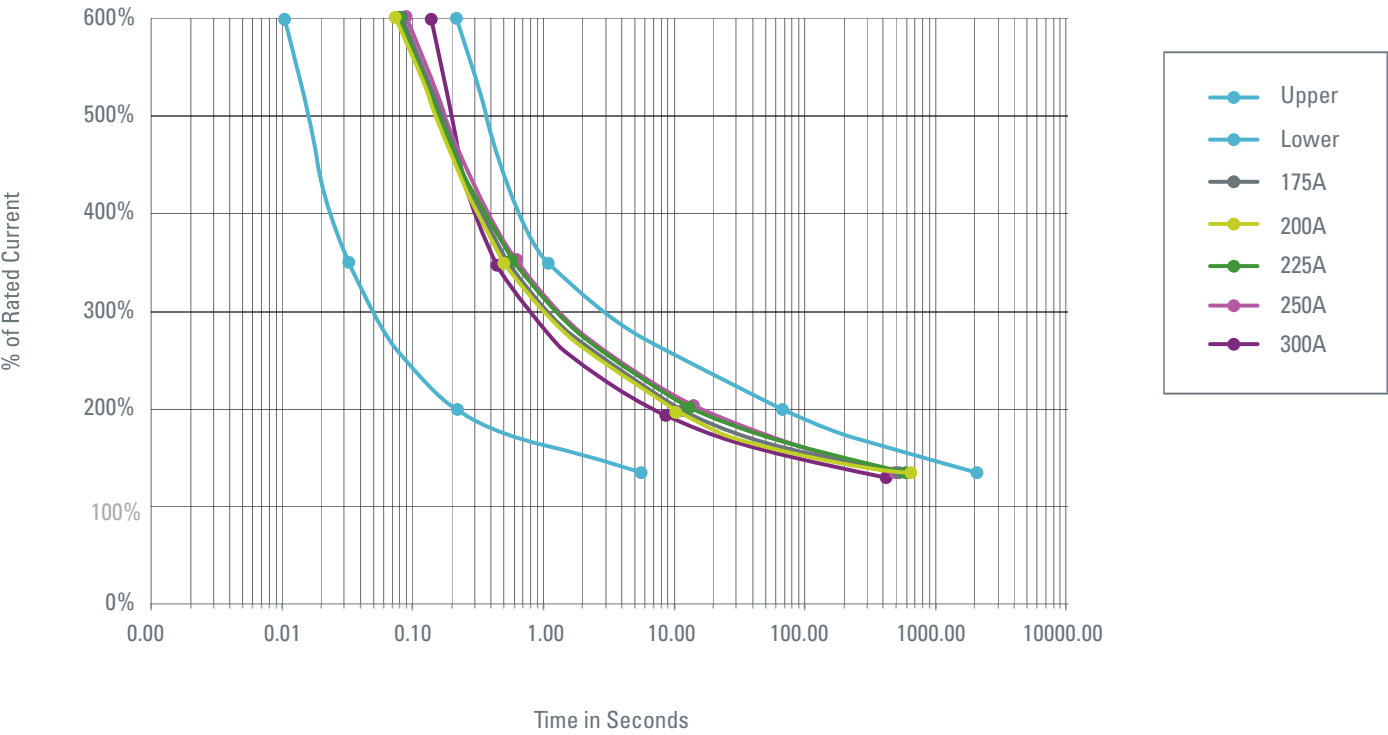
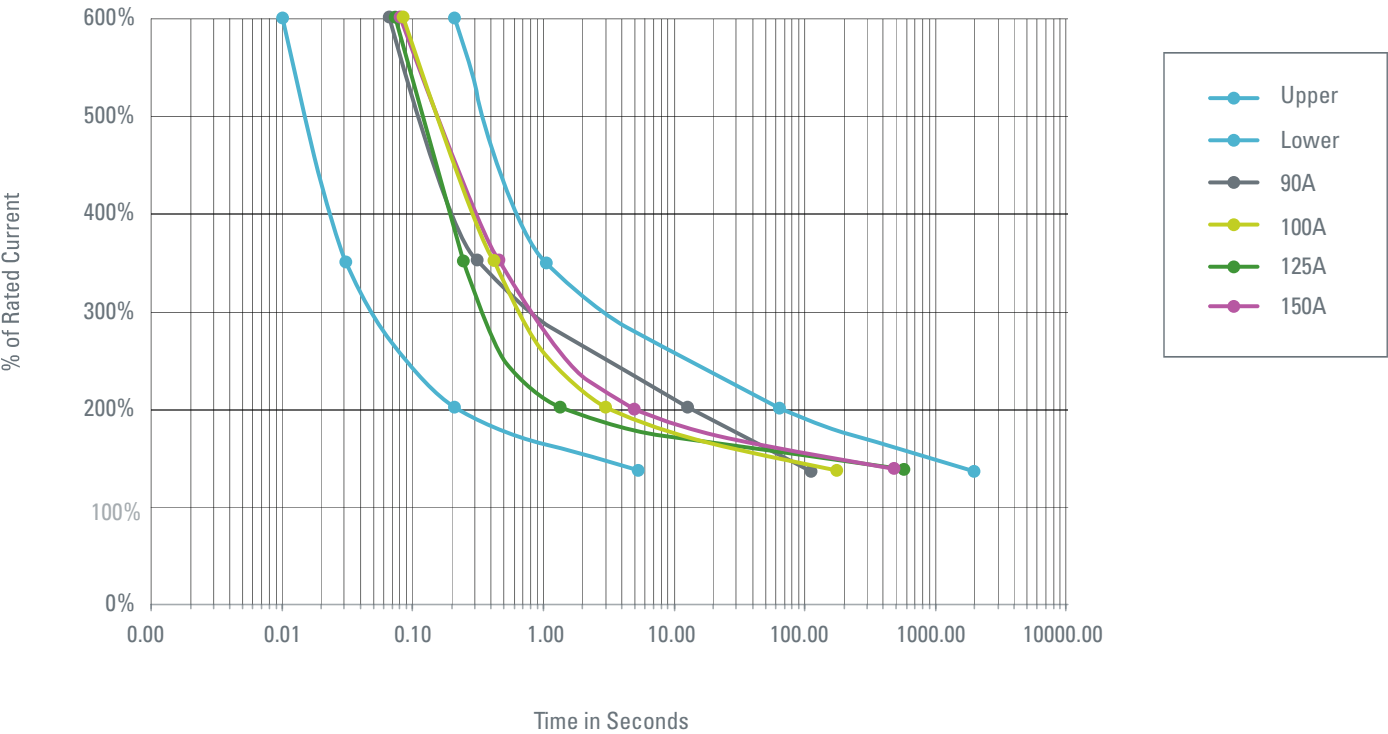
Dimensions in Inches (mm)



Temperature Derating / Time Current Curves



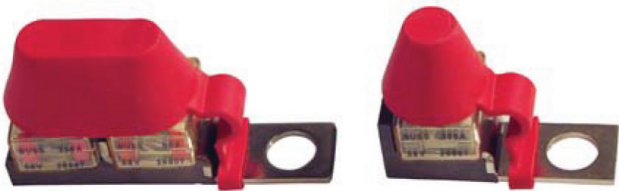
Temperature Derating / Time Current Curves



MRBF - XXX

Fuse	Rating	
MRBF = MRBF series	030 = 30 amps [light green]	125 = 125 amps [green]
	040 = 40 amps [light blue]	150 = 150 amps [orange]
	050 = 50 amps [red]	175 = 175 amps [white]
	060 = 60 amps [gold]	200 = 200 amps [blue]
	075 = 75 amps [brown]	225 = 225 amps [tan]
	080 = 80 amps [lime]	250 = 250 amps [pink]
	090 = 90 amps [purple]	300 = 300 amps [grey]
	100 = 100 amps [yellow]	

CF Cover



CFCOVER - X X

Cover	Stud	Cover Color
	1 = Single stud 2 = Double stud	B = Black R = Red

Part Number	Material	Color
CFCOVER-XB	Santoprene	Black
CFCOVER-XR	Santoprene	Red

CF Bar



CFBAR X - XXX X P

Bar	Stud	Stud Type	Mounting Hole	Standard Item
	1 = Single stud 2 = Double stud	250 = 1/4 - 20 stud M8X = M8 stud	S = 3/8" mounting hole B = 1/2" mounting hole	P = Standard

Part Number	Dimension "A"	Dimension Ø "B"
CFBAR1 - 250SP	44.5 [1.75]	10.3 [0.405]
CFBAR1 - M8XSP	46.5 [1.83]	10.3 [0.405]
CFBAR1 - 250BP	44.5 [1.75]	13.5 [0.531]
CFBAR1 - M8XBP	46.5 [1.83]	13.5 [0.531]
CFBAR2 - 250SP	44.5 [1.75]	10.3 [0.405]
CFBAR2 - M8XSP	46.5 [1.83]	10.3 [0.405]
CFBAR2 - 250BP	44.5 [1.75]	13.5 [0.531]
SFCBAR2 - M8XBP	46.5 [1.83]	13.5 [0.531]

Wireless technology

Trusted wireless technology for high-value mobile machinery

Robust, easy to use and configurable, OMNEX mobile control transmitters and receivers stand up to the most demanding industrial conditions. Eaton's OMNEX remote control products have been used to wirelessly control high value machinery in harsh environments with utmost reliability, precision and durability.

Eaton Wireless Products

Transmitters

Eaton's OMNEX robust, easy-to-use one-way and two-way remote control transmitters are designed to perform on a large variety of mobile industrial machines. OMNEX industrially-hardened Trusted Wireless FHSS radio technology and impact-resistant packaging are your assurance of dependable operation and precise control.



Receivers

OMNEX factory-configurable receivers are designed to work with OMNEX transmitters to provide complete mobile control solutions that stand up under the most demanding industrial conditions. Receivers directly connect to machine hydraulic valves and/or CANbus for complete control. OMNEX industrially-hardened Trusted Wireless FHSS radio technology and impact resistant packaging are your assurance of dependable operation and precise control.



Expansion Modules

OMNEX flexible expansion modules are designed to augment OMNEX remote control solutions with extra digital and/or proportional I/O. Developed to interface with any OMNEX Deutsch enclosure receiver, the expansion modules offer complete system control and minimal system wiring.



For more information and a downloadable catalog,
please visit www.eaton.com/wireless

Mobile Machine Control

Transmitters

Eaton's OMNEX remote control products are the industry pioneer and leader in developing rugged radio remote controls for heavy machinery and field operations. Our global network of hydraulic and electrical engineers develop OEM solutions for applications that require high degrees of operator flexibility and safety when operating and manipulating vehicle-mounted equipment and mobile machinery.

TD3200 Remote Control with Color LCD Display

State-of-the-art ergonomic design: lightweight
Customizable multi-function controller with extensive controls capability
Superior 2-way communication
Graphical display provides direct feedback from the machine
3.5" transfective color LCD display
20-hour battery life
Waist belt, 4 point and shoulder harness options



T110 Hand held 10/20-Function Radio Remote Control Transmitter

Compact 10-button remote with up to 20 functions
Button functions for momentary, non-latched and latched control
Configuration modes to control power up and shut down
Easily recharges with optional dock
Powered by 4 AA alkaline batteries
Rated to 160 hours of continuous use



T150 Portable 14-Function Radio Remote Control

15 configurable functions:
Momentary or latched switches
Potentiometer
Hall effect trigger
E-Stop
Optional tether cable models are available
Powered by 4 AA alkaline batteries
Rated to 160 hours of continuous use



T151 Portable 14-Function Radio Remote Control Transmitter

- 14 configurable functions
- Momentary or latched switches
- Potentiometer
- E-Stop
- Optional belt clip or magnetic base
- Powered by 4 AA alkaline batteries
- Rated to 160 hours of continuous use



T300 Portable 31-Function Radio Remote Control Transmitter

- 31 function compact and lightweight transmitter
- Up to 16 proportional functions using a combination of paddle and/or joystick controls
- Up to 3 proportional functions using potentiometers
- Up to 15 discrete functions using a combination of toggle or push button switches
- E-Stop function
- Powered by 4 C alkaline batteries
- Optional tether cable models available



Receivers

OMNEX factory-configurable receivers are designed to work with OMNEX transmitters to provide complete mobile control solutions that stand up under the most demanding industrial conditions. Receivers directly connect to machine hydraulic valves and/or CANbus for complete control. OMNEX industrially-hardened Trusted Wireless FHSS radio technology and impact-resistant packaging are your assurance of dependable operation and precise control.

R260 Programmable 20-Function CAN Controller

- Designed with the latest in mobile control network technology
- Robust, license-free, wireless I/O module and valve driver
- 2-way wireless communication
- 20 I/O combinations
- CAN-Bus Network Integration
- IEC 61131-3 compliant PLC programmability



R160 19-Function Remote Control Receiver

- 19 I/O combinations
- E-Stop output for safe emergency shutdown to outputs and external circuits
- Powered from a 12 VDC or a 24 VDC system
- Capable of operating 4 proportional outputs and up to 19 digital outputs



R170 CanBus Receiver

Designed for direct connection to CANbus

E-Stop relay function for safe emergency shutdown to outputs and external circuits

Compatible with SAE J1939 protocol

Customizable to work with other CANbus protocols

RS232 port for configuration, diagnostics, firmware upgrades and data logging capabilities

With 2x CAN, receiver can act as a CAN bridge



Expansion modules

OMNEX flexible expansion modules are designed to augment OMNEX remote control solutions with extra digital and/or proportional I/O. Developed to interface with any OMNEX Deutsch enclosure receiver, the expansion modules offer complete system control and minimal system wiring.

D160 19-Function Expansion Module Radio Remote Control

Can add extra I/O to any OMNEX FHSS Deutsch enclosure remote control system

Provides up to 19 additional digital ON/OFF outputs

Fully customizable to operate momentary, latched, toggled and interlocked functions



D160 19-Function Expansion Module Radio Remote Control

Can add extra I/O to any OMNEX FHSS Deutsch enclosure remote control system

Provides up to 19 additional digital ON/OFF outputs

Fully customizable to operate momentary, latched, toggled and interlocked functions



D180 14-Proportional Function Expansion Module Radio Remote Control

Can add extra I/O to any OMNEX FHSS Deutsch enclosure remote control system

Provides up to 14 additional proportional outputs

Fully customizable to provide Current Controlled, Voltage or PWM output signals



Vehicle controls

Total flexible solutions for all of your commercial vehicle switching needs

Eaton vehicle control solutions offer a broad range of solutions not only for on and off-road vehicles, but for many commercial machine applications requiring rugged, dependable switches. These products are at the heart of many systems including commercial vehicle applications like heavy-duty trucks, construction, and agriculture.

Eaton is proud to offer solid performance vehicle and commercial controls for global applications, including everything from electromechanical pushbutton rocker and toggle designs, to electronic rocker, indicator and display devices, all of which are customizable.

Eaton Vehicle Controls

Electronic Switch Modules and Vehicle Displays

Electronic Switch Modules (eSM) and the Electronic Vehicle Display (eVU) are custom ordered, application specific electronic communications products from Eaton's vehicle and commercial controls catalog.



Rocker Switches

Eaton offers a full field-proven line of rockers designed for excellence in any vehicle applications. They enable you to maximize efficiency and increase machine uptime even in the most extreme environments.



Toggles

Eaton's extensive line of toggle switches offers the widest selection of features and the design flexibility to meet the needs of almost any application.



Push Switches

Pushbuttons are available in a wide variety of configurations, for almost any standard industry application.



Panel Dimmers & Wiper Controls

Eaton's unique family of Dimmer and Wiper controls is field proven to be the market's most dependable offering of controls.

Special Devices

Eaton offers an extensive line of Special Devices.

For more information and a downloadable catalog,
please visit www.eaton.com/VC

Vehicle Control Highlights

Eaton Vehicle and Commercial Controls offer a broad range of solutions not only for on and off-road vehicles, but for many commercial machine applications requiring rugged, dependable switches and sensors. These products are at the heart of many systems including commercial appliances, power tools, food preparation equipment, test equipment, air conditioners and medical machines among others.

E32 Rocker Module

Fully compliant with J1939/CAN 2.0B messaging

Late point definition of circuits and rockers to reduce inventory

Exceptional lighting features with top, center, and bottom LED light positions

12V and 24 Vdc available



Photoelectric Sensors

Variety of package styles and optical modes (reflex, diffuse, background rejection, clear object detection) available

Harsh-duty stainless steel sensors for the toughest environments

Best-in-class Perfect Prox® background



Proximity Sensors

Both inductive (for sensing metals) and capacitive (for sensing liquids and other materials)

Extended ranges and auto-NPN/PNP technology for easy installation

Unique programmable iProx® has advanced sensing features



Limit Switches

Complete offering of IEC and NEMA® mechanical limit switches

Super-rugged switches like the E50 set the industrial standard

Safety-rated IEC switches with positive opening contacts



Unassembled Switches

Offer late point definition

Many standard actuator, indicator and base options

Full line of accessories

High performance for maximum uptime

Low current option

Industry-standard panel cutout

Wide range of circuit configurations and lighting options



High Level Sealed Switches

Sealed to IP68 above and below panel

Sealed connector option

Customizable

Low current option

Various circuit configurations and LED lighting options

High performance for maximum uptime



Snap Switches

Miniature precision snap action switches

Various termination options

Numerous operating characteristics

UL recognized and CSA certified

Designed to facilitate gang mounting

Can order with integral actuator



Key Pad

Fully compliant with J1939/CAN 2.0B messaging

IP68 from front and rear of module

Exceptional illumination with up to four color daylight-visible indicators per switch

Large switch surface area and alignment ridges for ease of gloved hand use

Electrical/mechanical life over 1 million cycles



Dimmer Controls

Paddle and slide styles available

Illumination option

Customizable



Keylocks

Space-saving design

Quick-make/Quick-break with self-cleaning contact design

Slow-make/Slow-break with large butt contacts for power applications

Rotary Wiper Controls

Four wiper control positions

Customizable

Meet SAE standards J1455, J1944 and J1988



Military Switches

Meet various military specifications

Lever seal available

Unique lever lock design

Medium- and heavy-duty designs

Various circuit configurations and ratings



Pushbuttons

Illuminated and non-illuminated options

Wide variety of circuit configurations and ratings

Complementary snap switch pushbutton line for precision switching



Toggle Switches

Sealing options include both dust and splash resistance

Illumination design

Numerous actuator styling options

Full line of accessories including indication plates and mounting hardware

Heavy-duty hesitation and high-capacity designs

Numerous certifications and ratings



Assembled Rocker Switches

High product endurance

Variety of actuator styling and lighting options

Numerous industry-standard panel cutouts

Various circuit configurations, ratings and certifications

Locking actuator designs

Sealing options up to IP67



X Series

AC rated toggles and rockers

Industry standard circuits

Stocked and ready



Sensors

A broad range of rugged solutions for industrial and vehicle applications

Eaton offers a wide range of sensing options for any application, from rugged mechanically-actuated switches to sophisticated non-contact inductive and photoelectric sensors. Sensor enclosure technologies offer robust ingress protection in the most challenging operating environments.

Eaton Sensors

Mechanical Limit Switches

Eaton's heavy-duty mechanical limit switches are versatile, reliable, and exceptionally durable in the most challenging operating environments. Robust switches in metal enclosures feature Viton seals for exceptional ingress protection in on-vehicle applications, and compact switch versions are well suited to more constricted mounting locations.

Inductive Proximity Sensors

Eaton offers a broad range of robust inductive sensors to suit a wide variety of industrial applications. High-Current Output versions are ideally suited for high-current loads and provide a non-contact alternative to limit switches for position sensing on industrial vehicles.

Photoelectric Sensors

Eaton's complete offering of Photoelectric sensors include the world's most rugged and best-sealed E58 Series sensor family. Stainless steel, PVDF and tempered glass components are mechanically assembled using Vitron seals to ensure resistance to chemicals and moisture intrusion. These and other photoelectric sensors from Eaton withstand heavy shock and vibration while providing unparalleled optical performance.

Custom & Modified Sensor Solutions

Eaton's Transportation Division Sensor Business has significant experience and expertise developing modified and customized sensor solutions tailored to specific OEM application requirements.



For more information and a downloadable catalog,
please visit www.eaton.com/sensors

