Eaton low-voltage and power conversion catalog

Markets Served:
Trucks/Bus
Construction/
Agriculture
Military
Emergency vehicle
Specialty vehicle
Material handling

Commercial vehicle solutions

EATON
Powering Business Worldwide

Table of contents

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
SP41222	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 / 13.5	20	Converter	IP 67, switched output / unswitched 12V output
41020C10UL	28-70 / 13.5	20	Converter	UL, IP 67, switched output / unswitched 12V output
41040C11	28-70 / 13.5	40	Converter	CAN, 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
- Series 12000 DC Converter
- 12010C10

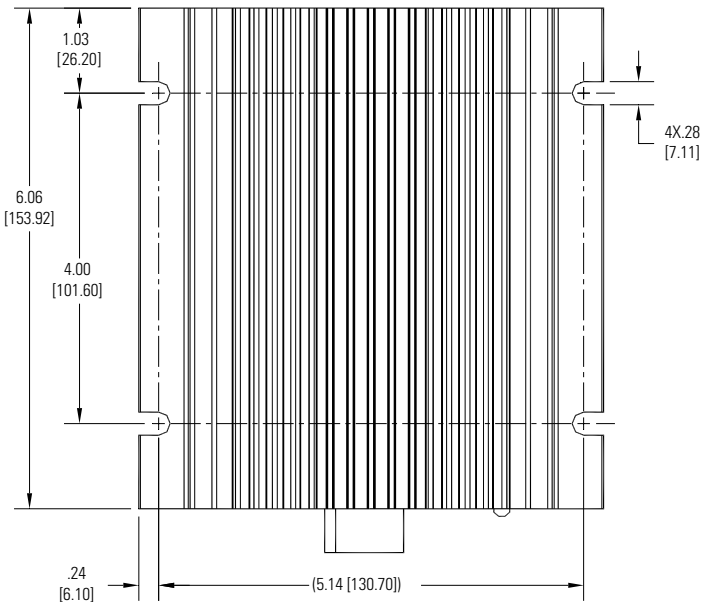
Options

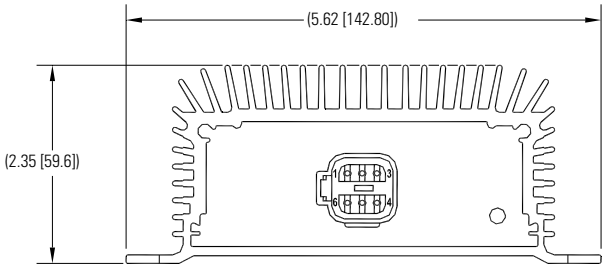
- Deutsch mating connectors
- 10A to 55A models available
- Powder coated housing
- Battery Equalizer with output voltage of twice the input voltage

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

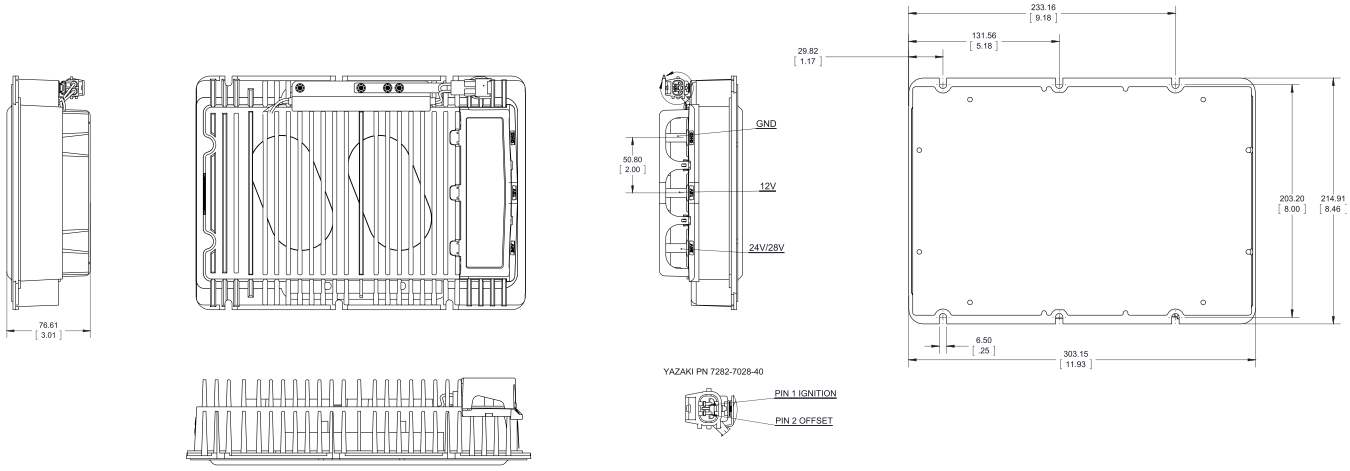
Options

- 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

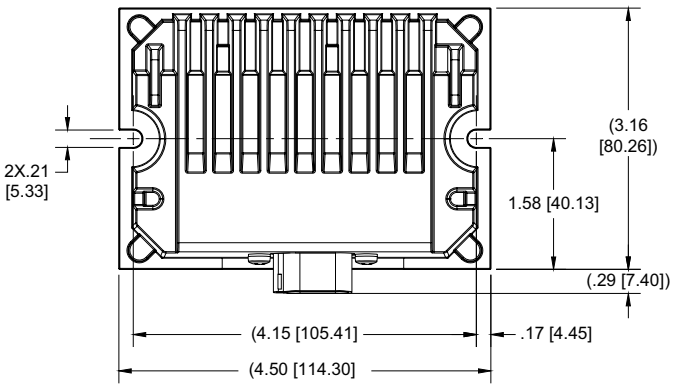
- Deutsch mating connectors
- 5A to 12A models available

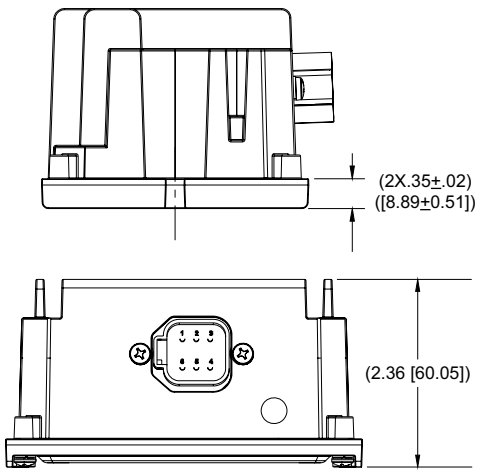
Standards & certifications

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

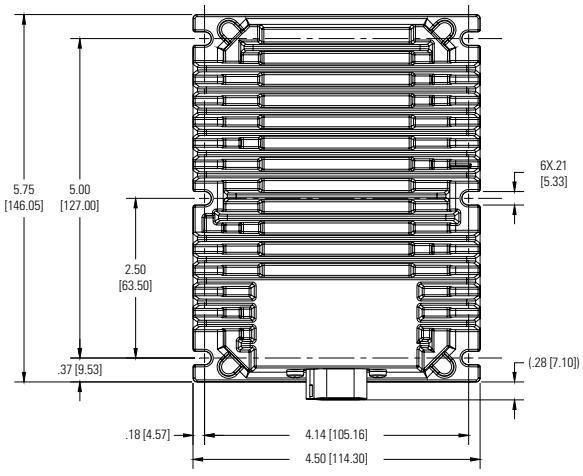
- Deutsch mating connectors
- 15A to 20A models available

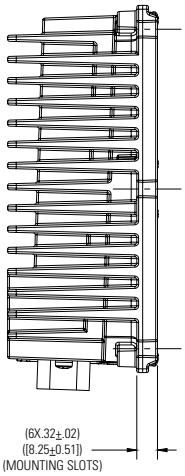
Standards & Certifications

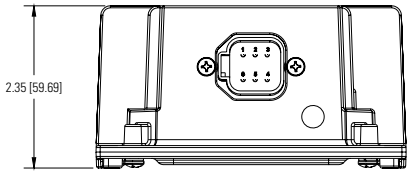
SAE J1455, J1113, CISPR 25, E mark, RoHS

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

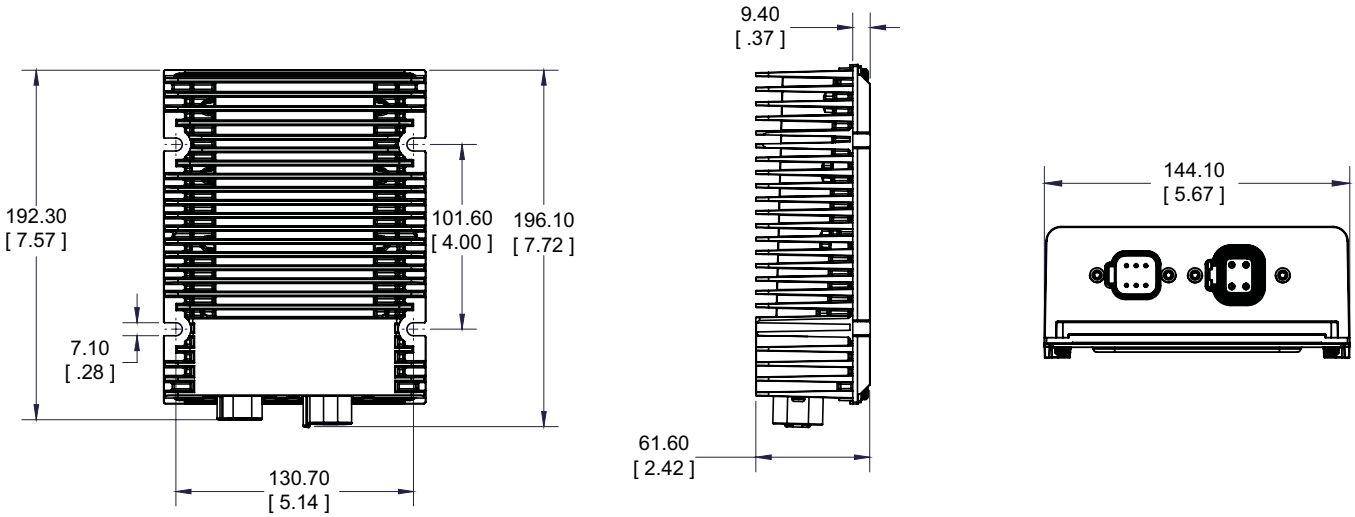
- Powder coated housing
- Battery Equalizer with output voltage of ½ the input voltage
- Deutsch mating connectors

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

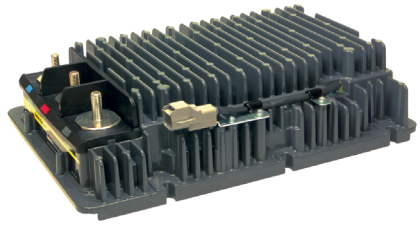
Dimensions in inches (mm)



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

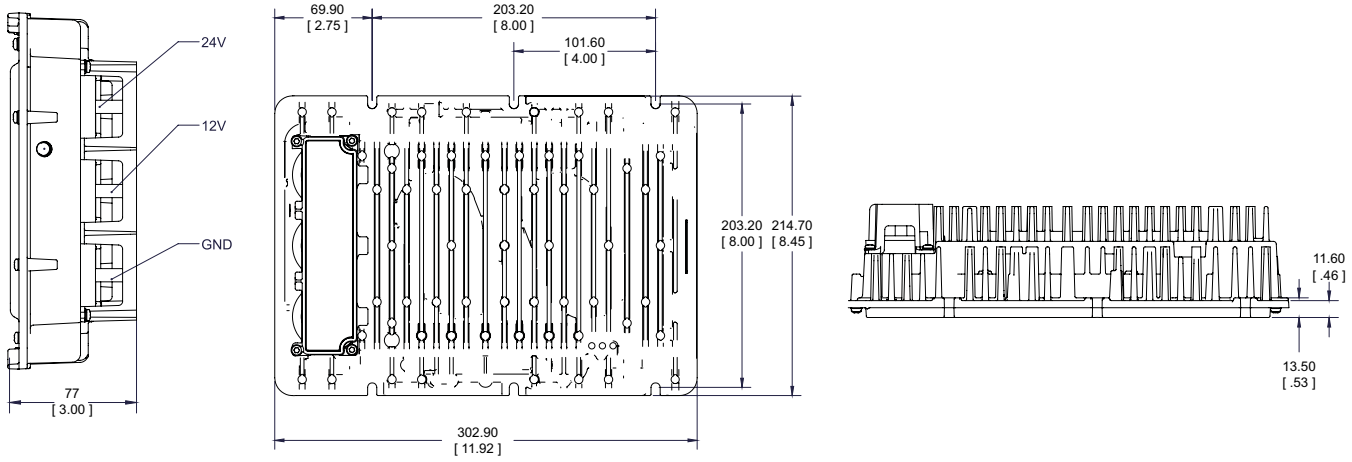
- 60A, 80A or 100A models available
- Snap on terminal cover
- Terminal barriers
- Color coded terminal labels
- RoHS

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

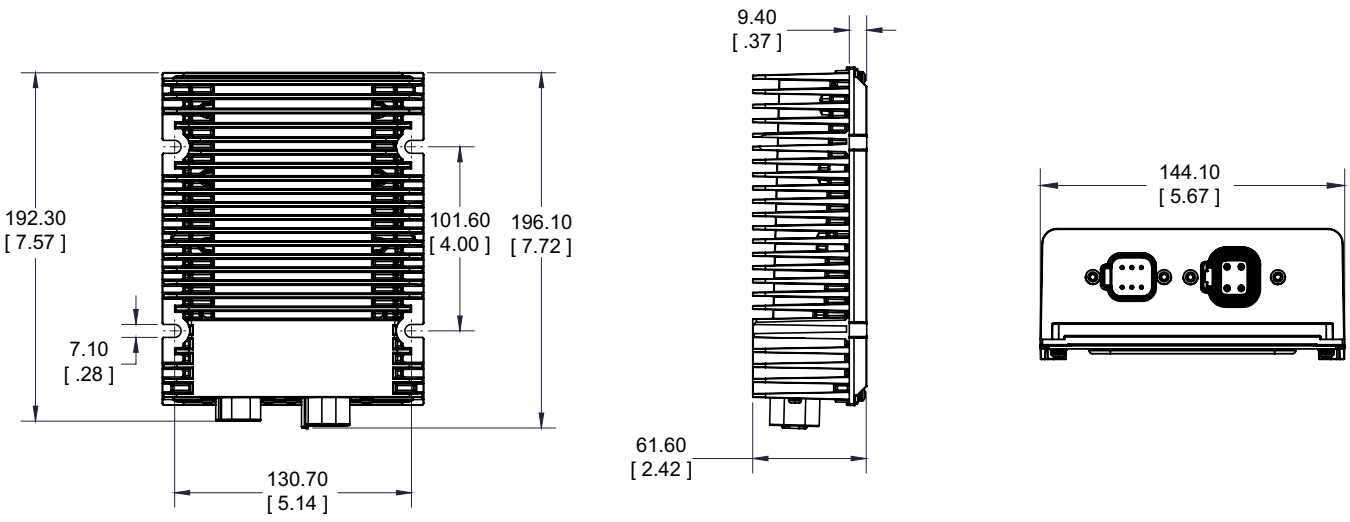
- 10A & 20A models available
- Reduce feature limits output current
- LED and diagnostics output

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.

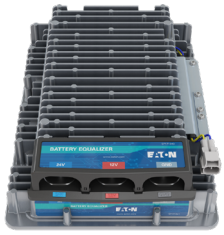
	11010C11	11020C11 11020CL1
Output	10A	20A
Lift gate motor draw	175A	175A
Seconds of lift run time	25 sec	25 sec
Amp hours used per lift	1.2AHr	1.2AHr
Lifts during daily operations	50	100
Total Amp / hours used during day	60AHr	120AHr
Total run time required to charge battery	8 hours	8 hours
Voltage regulation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

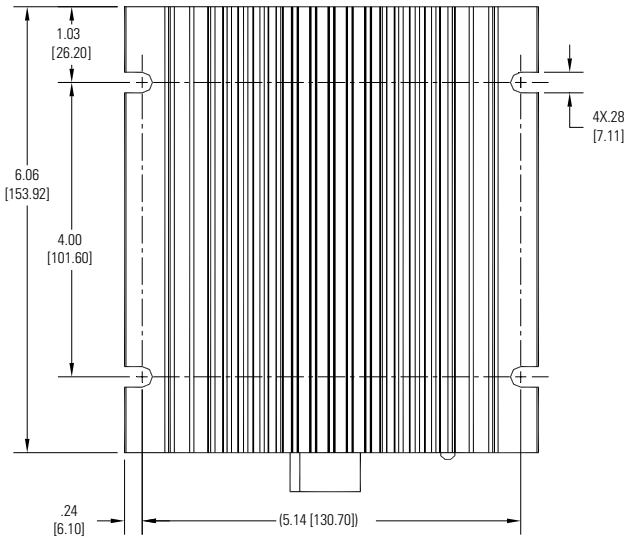
Options

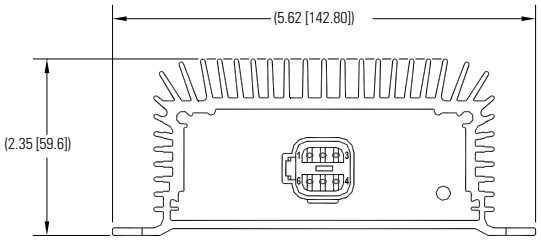
- Deutsch mating connectors
- Powder coated housing
- DC converter with fixed output voltage

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

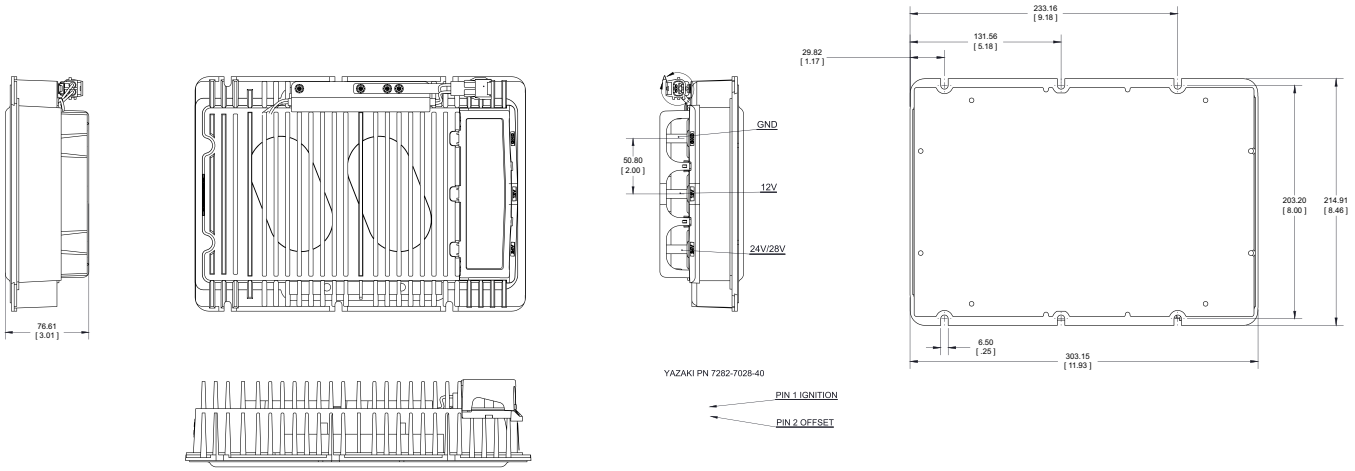
Options

- 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

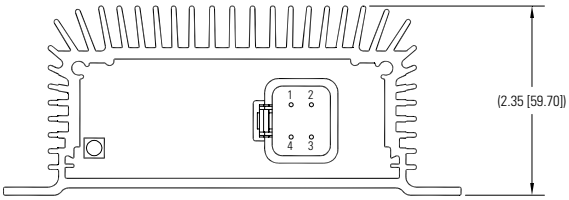
Options

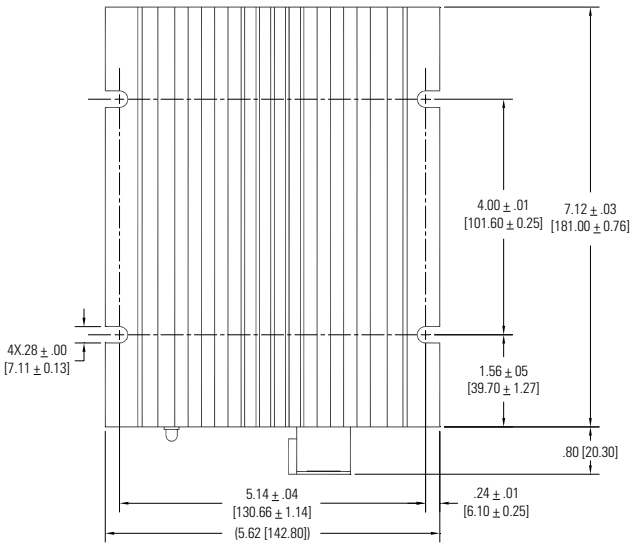
- Powder coated housing
- DC converter with fixed output voltage
- Deutsch mating connector

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

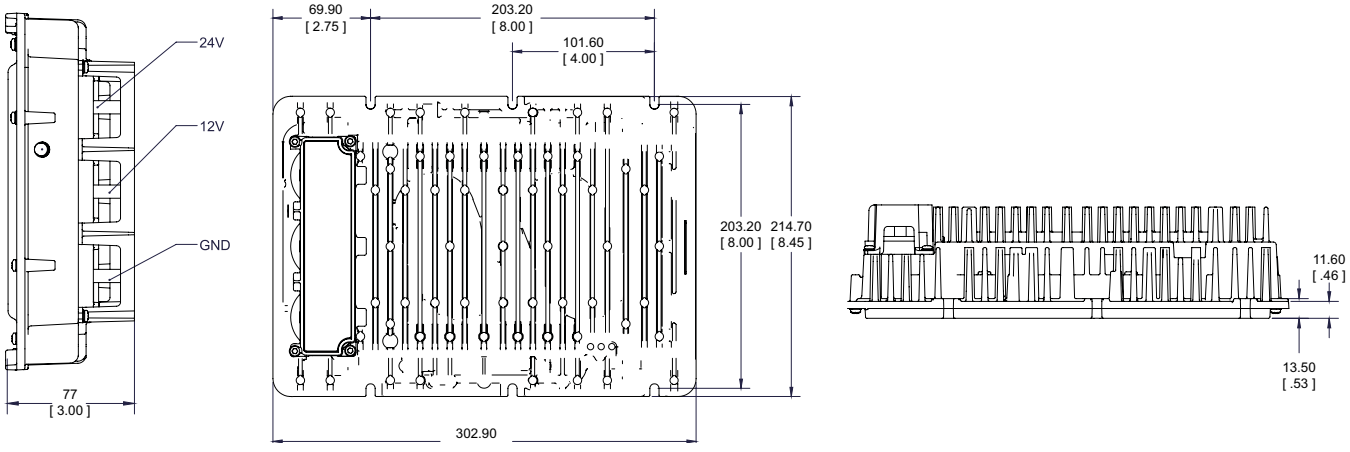
Options

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

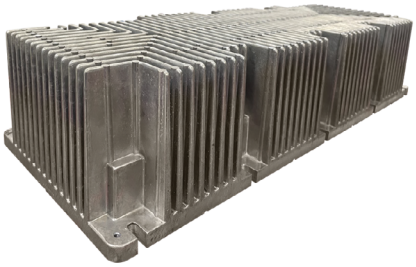
Standards & certifications

SAE J1455, J1113, CISPR 25, E mark

Dimensions in inches (mm)



Rugged DC/AC Inverter
120V / 230V



Features

The ruggedized inverter includes IP 67 sealing and is designed to meet the rigorous military requirements for EMC, vibration and temperature extremes. Leveraging our commercial and military experience, our inverter is designed to provide clean reliable power in harsh and severe environments.

Featuring a True Sine Wave output, the inverter is able to power all electrical loads (including sleep apnea machines, tools, motors and other demanding electrical devices,) providing the full 1800W output from -40°C to +52°C.

The use of sealed connectors provides robust connections which are easy to install and provide increased reliability. A J1939 CAN connection allows for easy control and monitoring of the inverter with the existing vehicle

CAN network.

- True Sine Wave output
- IP 67 Sealed
- Battery over voltage protection
- Over temperature shutdown
- Automatic over load protection
- Short circuit protection
- Ground fault protection*
- AC and DC connectors
- CAN communications

Inverter

Input: 23 – 32 VDC, compliant with MIL-STD-1275D

- Output: 120 VAC +/- 2%
- Output: 230 VAC +/- 2%
- Frequency: 60 Hz +/- 5%
- Frequency: 50 Hz +/- 5%
- Max Power: 1800W @ 23-32VDC @42°C, 1600W @52°C
- Regulation 2% over full load range
- Ambient: -40°C to + 52°C
- Cooling: Full conduction, attached to the vehicle chassis
- Nominal Size: 20”L x 4”H x 8”W
- Weight: 25 Lbs
- Efficiency: > 85%
- Communication: J1939 CAN message
- Combat Override
- Input OK
- Output power
- Fault – when output disabled, report reason

Connectors

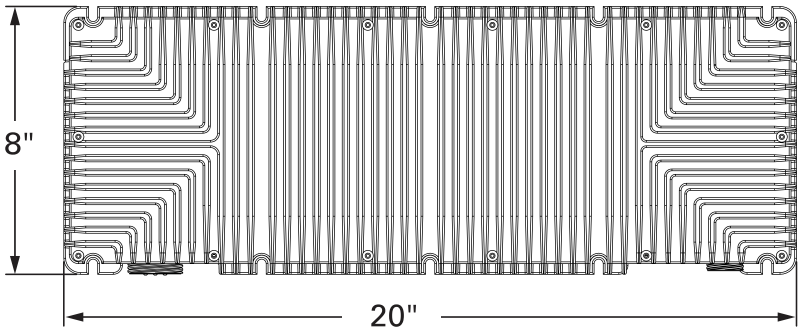
1) INPUT---------- MS3452L24-10P /
Amphenol GTC030-24-12P-027
or equivalent
2) OUTPUT--------MS3452L16-10S /
Amphenol GTC030-16-10S-027
or equivalent
3) CAN BUS--------MS3452L14S-7S /
Amphenol GTC030-14S-7S-027 (B30)
or equivalent
Protection

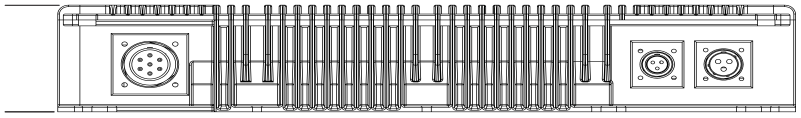
- Input under/over voltage protection
- Heat sink over temperature protection
- Output overvoltage protection
- Over current protection
- Ground fault protection*

* Not available during Combat Override

Environmental

- MIL-STD-810F
  - Thermal shock, thermal stress, mechanical shock and vibration
    Operation: -40°C to 52°C, attached to the vehicle chassis
    Storage: -50°C to 71°C
- SAE J1455
  - Dust, sand and gravel bombardment
- MIL-STD-461F EMC
  - CS101 power leads
  - CS114 bulk cable injection
  - CS115 bulk current injection
  - RE102, electric field (with exceptions)
  - RS103, electric field
- Altitude, 0-12,000 ft.
- Sealed to IP67





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

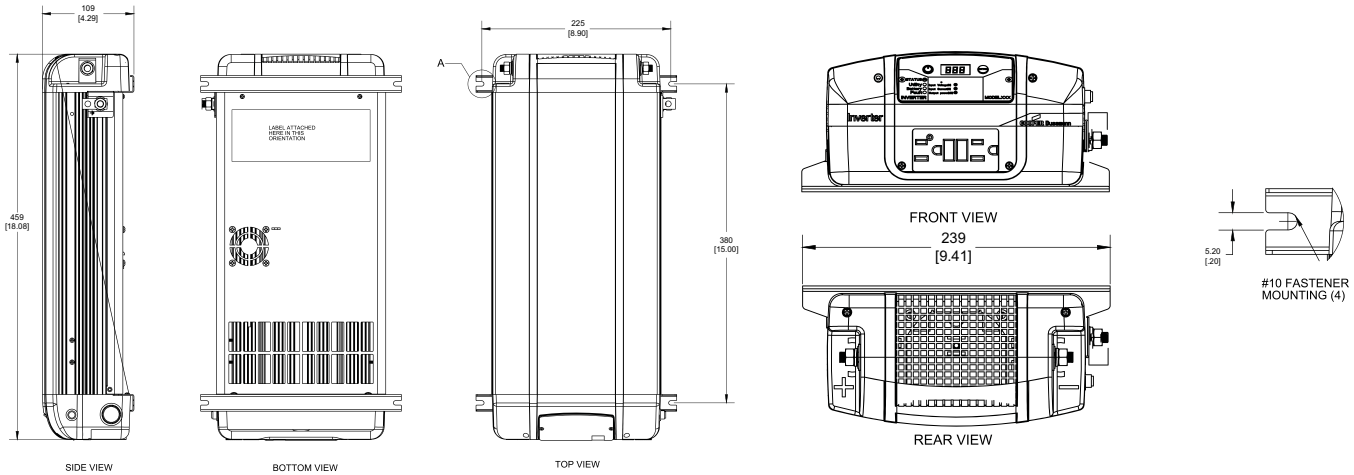
- True sine wave quality to safely power all AC appliances
- < 87% typical efficiency under all load conditions and temperatures
- AC pass through feature with 12V 40A smart battery charger option
- Ground Fault Circuit Interrupt (GFCI) protection
- Integrated AC transient, over and under voltage protection
- 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
12-110-1250M	12 Vdc/110 Vac	1250W	Yes	No
12-110-1250-B4M	12 Vdc/110 Vac	1250W	Yes	Yes
12-110-1800M	12 Vdc/110 Vac	1800W	Yes	No
12-110-1800-B4M	12 Vdc/110 Vac	1800W	Yes	Yes

Dimensions in inches (mm)



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

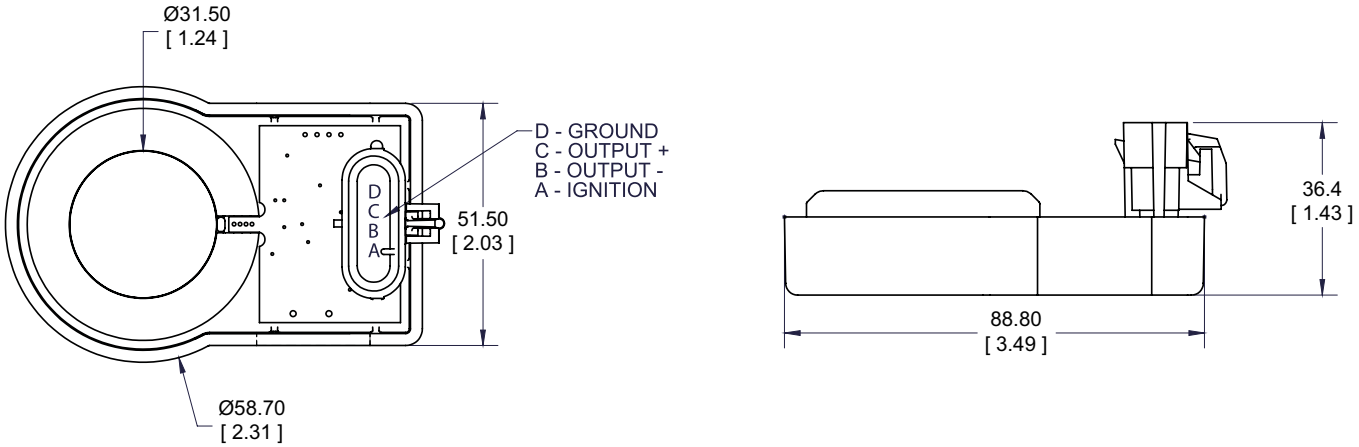
Eaton DC Current Sensors are optimally ruggedized for transportation applications with outstanding environmental performance characteristics.

Options

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

Model	Current range	Sensor output
DCCS50-300	± 300A	± 50mV
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 ad separating primary and auxiliary batteries during discharge cycles.

Features & benefits

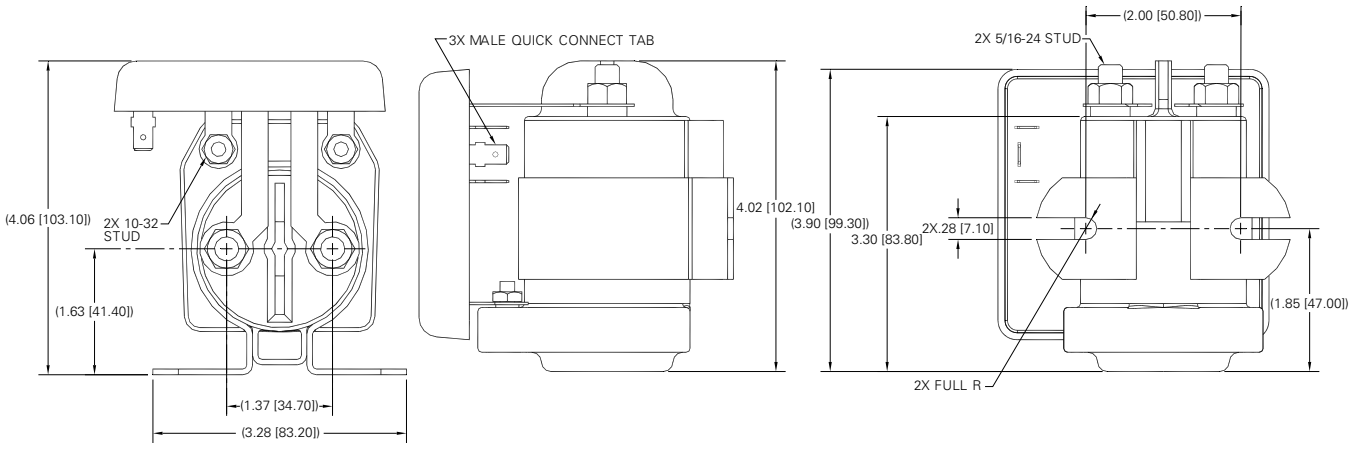
- Designed for use in multi-battery applications as a solenoid priority system
- Allows multiple batteries to be charged from one charging source
- Prioritized charging, charges primary battery and then remaining batteries
- Uni-directional: charge two batteries from two sources
- Interconnect/controller: 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
1318-200	24	200	Battery separator, uni-directional w/ aux start
1319A	24	100	Battery separator, bi-directional
1319-200	24	200	Battery separator, bi-directional w/ aux start

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

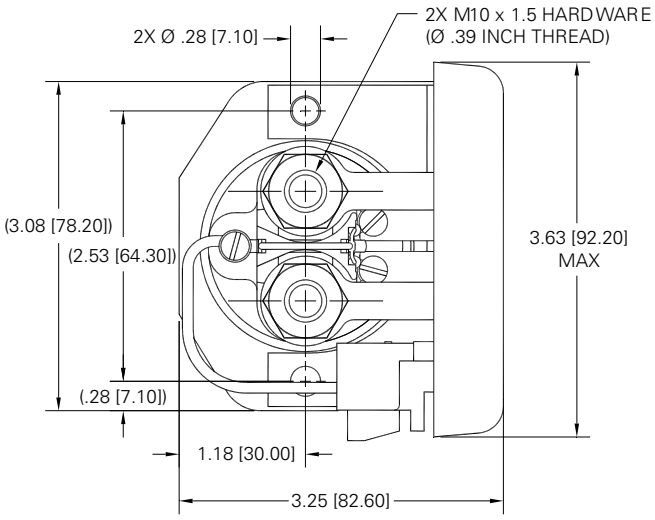
Eaton's Interconnect Controllers provide reliable battery management functionality based on settable low voltage disconnect values, engine lock out inputs and toggle switch inputs. The high value results include: fewer jump starts, longer battery life and 100% control with the push of a button.

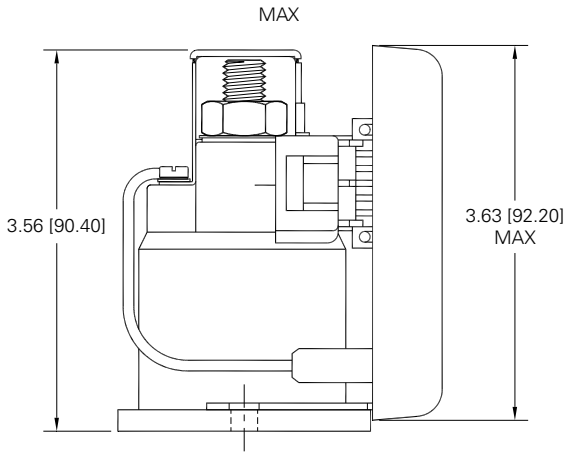
Options

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)

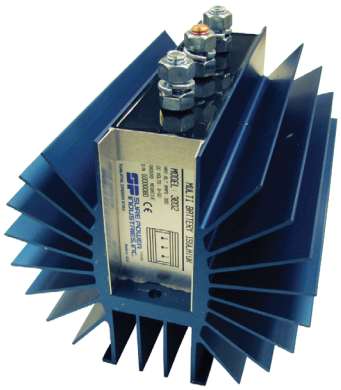




Battery isolators

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.

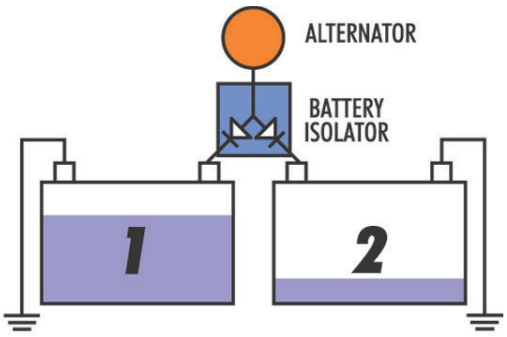
Options

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.

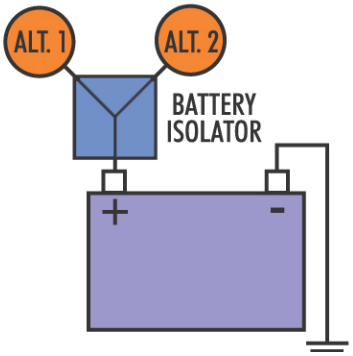
Model	Current (A)	Input	Output	Application	
Group one					
122	25	1	2		
702	70	1	2		
703	70	1	3		
2702	70	2	2		
2703	70	2	3		
952	95	1	2	**General motors (Delcotron and Aptiv)**	**Except** Delcotron / Aptiv CS Series alternators (CS used on most 1985 and newer GM vehicles
1202	120	1	2	**Ford**	Up to 1998
3202	120	2	2	**Chrysler**	All models, all years Includes Nippondenso externally regulated alternators
3203	120	2	3	**Jeep**	Equipped with Nippondenso externally regulated alternators
1302	130	1	2	**Motorola**	Load Handler Series or 8EM Remote Sense Series
1602	160	1	2	**Japanese imports**	With alternators using external voltage regulator or external sensing
1603	160	1	3		
2402	240	1	2		
2403	240	1	3		
3002	300	1	2		
31822	160	1	2		
31922	240	1	2		
Group two					
9523A	95	1	2		
12023A	120	1	2		
12033A	120	1	3	**General motors (Delcotron and Aptiv)**	Equipped with Delcotron / Aptiv CS Series alternators (most 1985-1993) or CS 130-D Series alternators (most 1993 and newer)
13023A	130	1	2	**Ford**	Many 1998 and newer
13033A	130	1	3	**Jeep**	Vehicles equipped with Delcotron / Aptiv CS Series alternator (most 1985-1990)
16023A	160	1	2	**Toyota, Honda, and some other imports**	1985 and newer equipped with Nippondenso alternator with internal regulators or alternators with an "S" (sense) termina
24023A	240	1	2		
32033A	120	2	3		

Model	Current (A)	Input	Output	Application	
Group three*					
2703R	70	2	3	**Bosch**	Requiring regulator sensing
203R	120	2	3	**Motorola**	Other than Load Handler Series*
702R	70	1	2	**Many european style alternators**	Requiring regulator sensing*
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 / Aptiv alternators, some Hondas and selected imports.				2005 and newer General Motors applications using the Aptiv 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*					
702P	70	2	1	Positive ground isolators can be used as charging source combiners	
1602P	160	2	1	Positive ground isolators can be used as charging source combiners	

*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

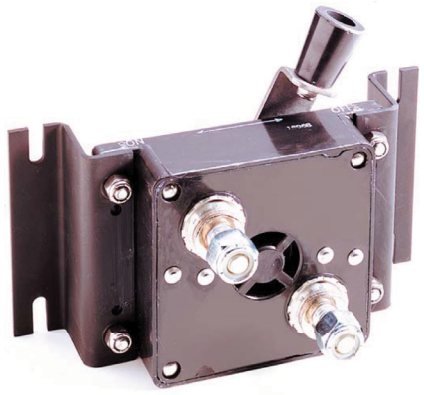
Standards & certifications

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

Battery disconnect switch

Series 15250



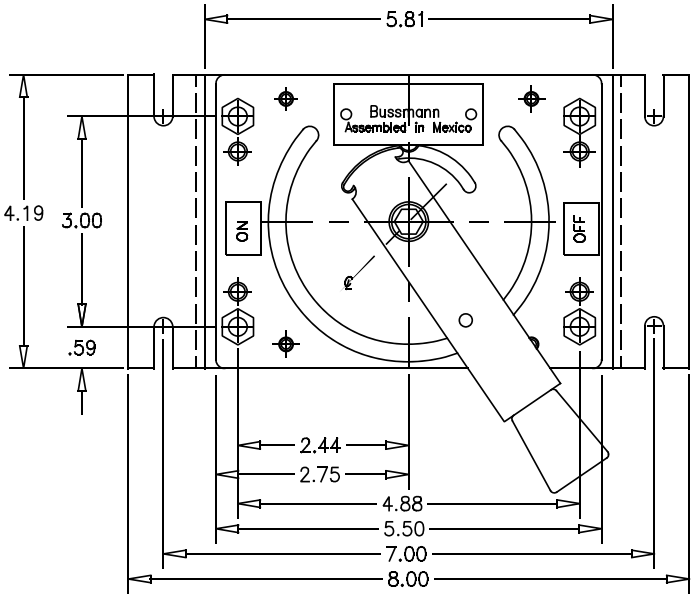
Specifications

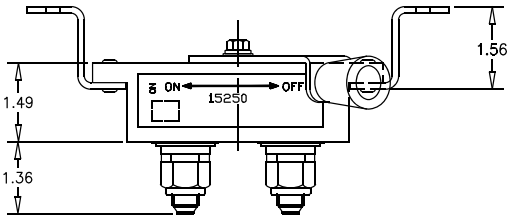
- Battery disconnect switch
- **Applications:** A non-fused current interrupt disconnect designed for opening the circuit between a battery and the complete electrical load of a battery-powered system.
- **Rating:** 400A continuous,. 50Vac/ VDC. Vehicle cranking and max. surge currents to 2000A (based 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

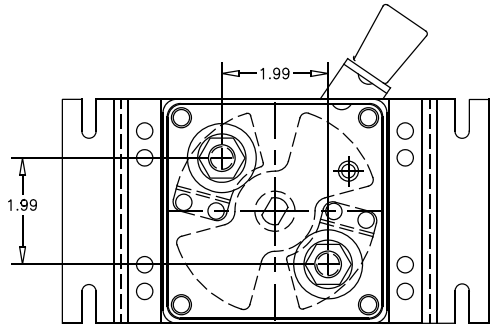
Options

- **Handles:** Three handle styles available
- **Other:** Lubricant-filled body with silicone sealant
- Additional current ratings and configurations available

Dimensions in inches (mm)







Ordering information

15250 X X XX

Series	Handle option	Bracket	Lubricant w/ Sealant
15250: 15250 series	**1:** 1 handle **2:** 2 handles **3:** 3 handles	**B:** Bracket	**LR:** Grease filled

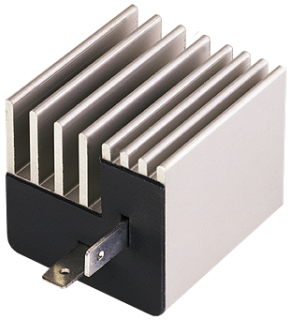
Solid state flashers

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.

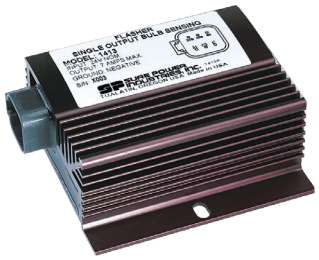
Model	Operating Voltage (V)	Current (A)	Description
1421	12	25	Solid-state two-wire hazard / turn signal flasher, meets SAE J1690



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

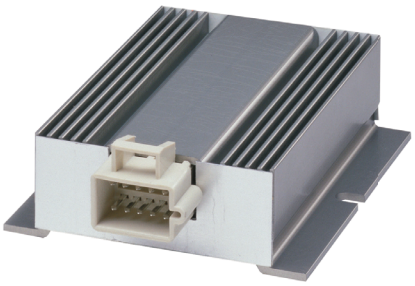
eaton supplies the world's leading manufactures of heavy-duty equipment with the industry's most durable and reliable flashers. Capable of connecting to either 12V or 24V systems, these 100% solid-state units are shock and vibration resistant.

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 – Aptiv Metri-pak 280 Series (tanged or tangless)*
- Internal spare fuse holder and socket for fuse extraction tool

Standards & certifications

- Ingress Protection – IP65 or IP66

Note:

*Not sold by Eaton

Images shown with blue and yellow mating connectors attached.

Connectors not included.

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.

Images shown with blue, green, black and gray mating connectors attached.

Connectors not included.

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)

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 Aptiv 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

- Aptiv Metri-Pack 280 Series terminals (sealed/unsealed and tanged/tangless)
- Aptiv 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

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

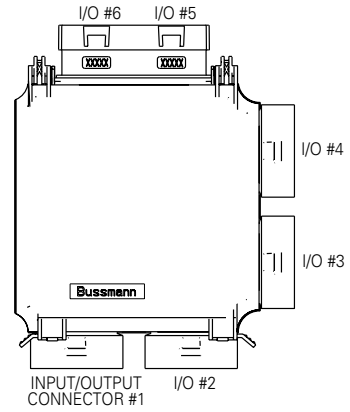
Wire sizes

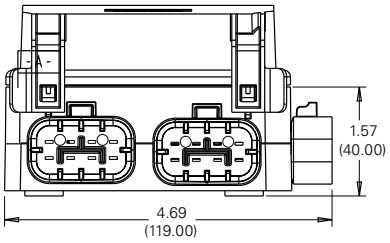
- With wire seals: #10-14 AWG (2.0-8.0mm2)
- Without wire seals: #8-14 AWG (2.0-8.0mm2)

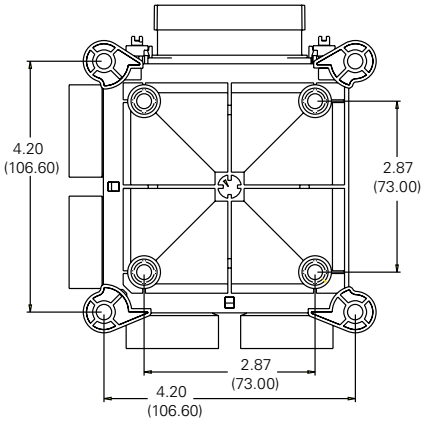
Note:

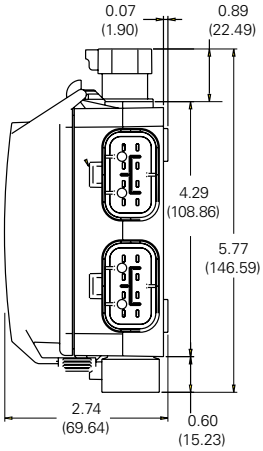
① Each design is customer specific. Consult your sales representative today for your application. Electrical terminals, cable seals and cavity plugs are NOT supplied by Eaton.

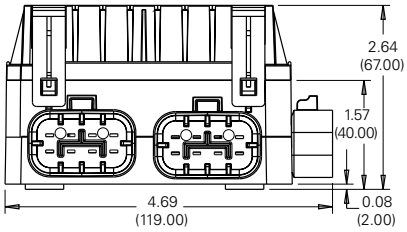
Dimensions in inches (mm)



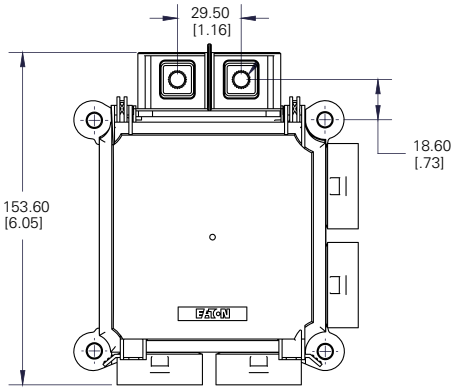








Standard VEC shown with vented cover



Option: Studded Input

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)

Standard configurations

- 31S-000-0 (8 fused Relays)
- 31S-001-0 (16 Fuses and 6 Relays)
- 31S-002-0 (16 Fuses and 8 Relays)
- 31S-003-0 (29 Fuses)
- 31S-004-0 (8 Fuses and 8 Relays)

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

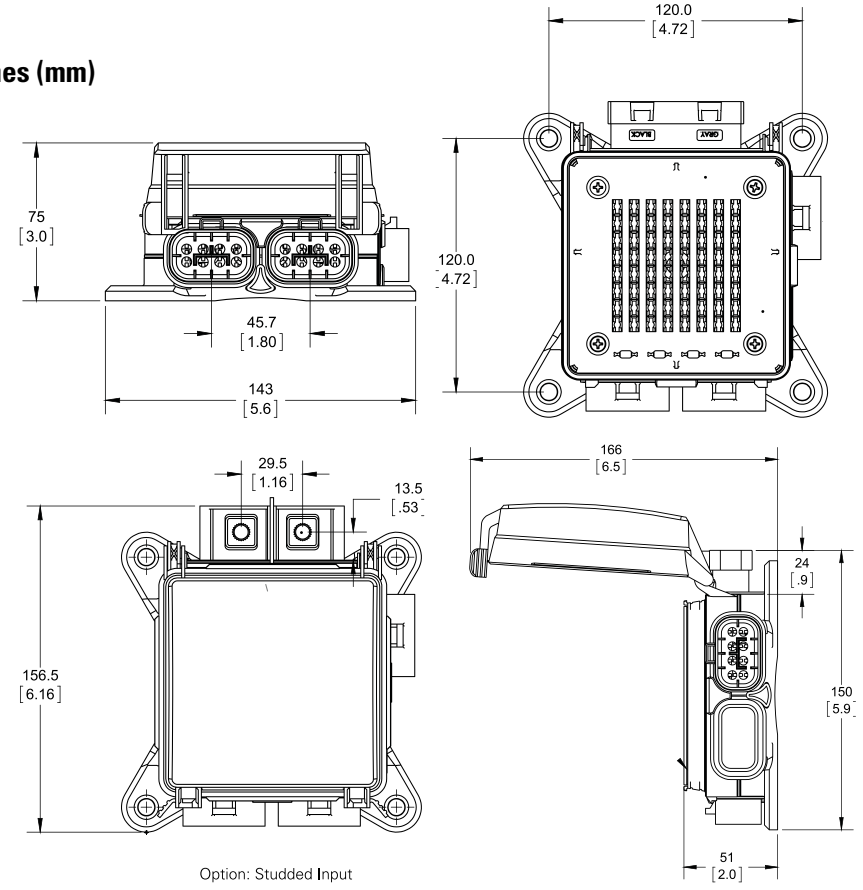
- Delphi Metri-Pack 800 Series terminals (sealed/unsealed)

Wire sizes

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

Note: 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)



Option: Studded Input

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

Standard configurations (250kpbs)

- 31M-000-2 (16 Fuses and 8 Relays)
- 31M-300-0 (8 Fuses and 12 Relays)
- 31M-327-0 (23 Fuses and 4 Relays)

Standard configurations (500kpbs)

- 31M-000-2-5 (16 Fuses and 8 Relays)
- 31M-300-0-5 (8 Fuses and 12 Relays)
- 31M-327-0-5 (23 Fuses and 4 Relays)

For inductive loads
(coils, solenoids, motors, etc.)
Must have clamping/suppression devices.

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 Aptiv 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 Aptiv Metri-Pack 800 series terminals

Terminations

Output

- Aptiv Metri-Pack 280 Series terminals (sealed/unsealed and tanged/tangless)
- Aptiv 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

- Aptiv 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

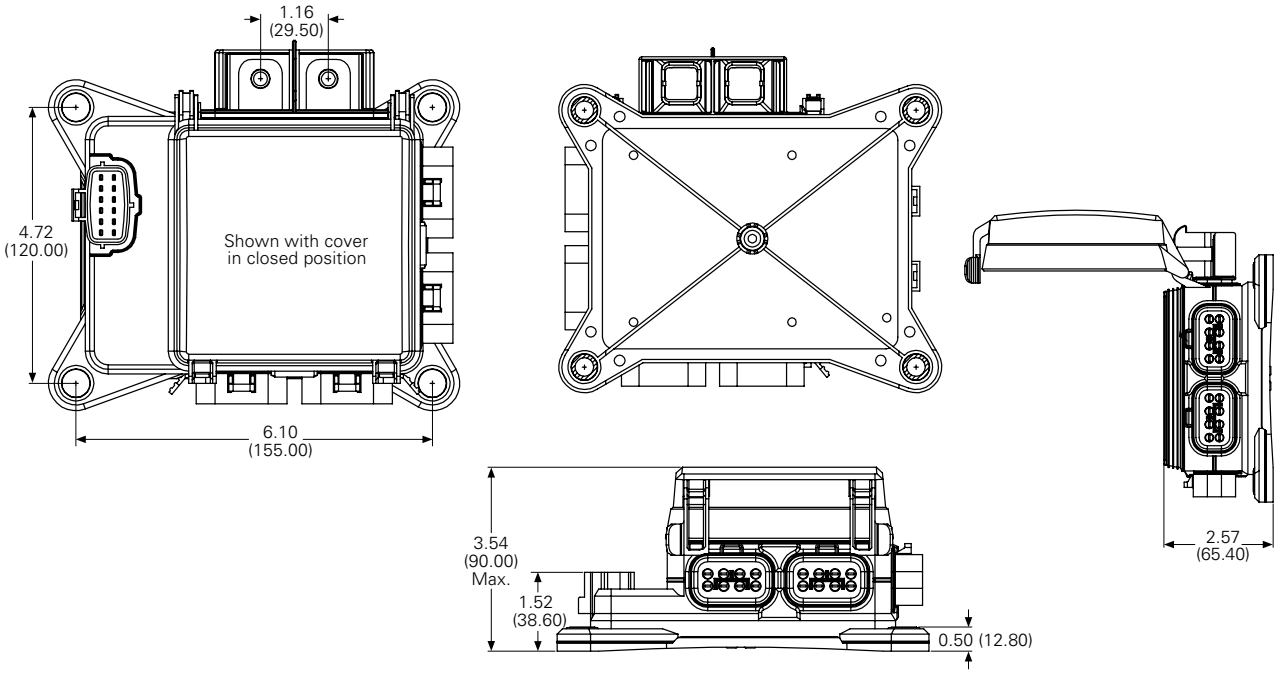
- Uses AMP SSC 12-position sealed connector
- CAN connector provides CAN signaling, power, ground, addressing, auxiliary relay control and reserve connections to mVEC "smart" layer

Maximum torque rating

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

Note: 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 per connector
- 100A maximum per connector
- Accepts Aptiv 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, connectors)
- 60A maximum per terminal, providing power to the VEC Power Grid; uses Aptiv Metri-Pack 800 series terminals

Terminations

Output

- Aptiv Metri-Pac 280 Series terminals (sealed/unsealed and tanged/tangless)
- Aptiv 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

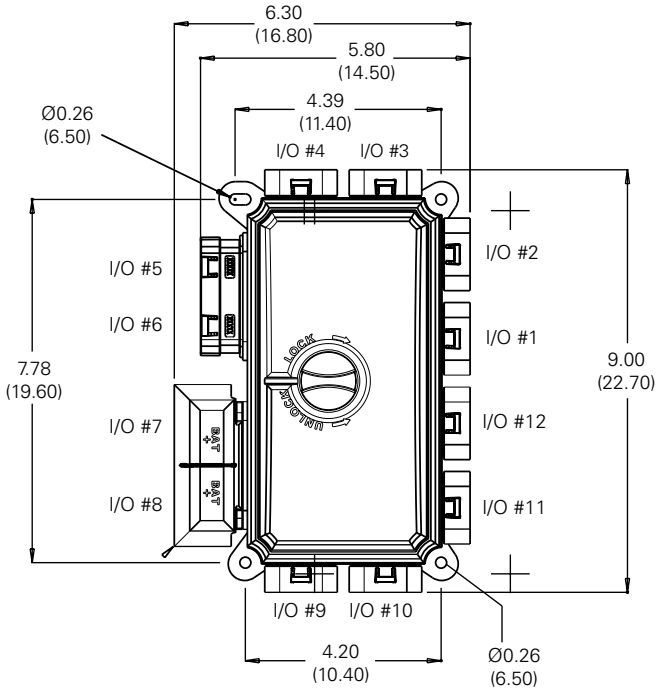
- Aptiv Metri-Pack 800 Series terminals (sealed/ unsealed)

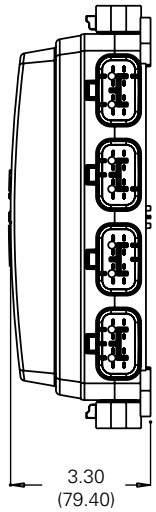
Wire sizes

- With wire seals: #10-14 AWG (2.0-8.0mm^2)
- Without wire seals: #8-14 AWG (2.0-8.0mm^2)

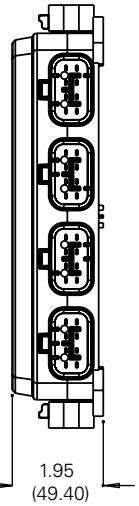
Note: Each design is customer specific. Consult your sales representative today for your application. Electrical terminals, cable seals and cavity plugs are NOT supplied by Eaton.

Dimensions in Inches (mm)

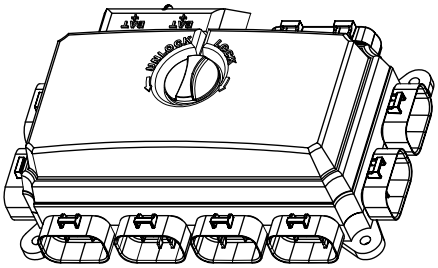




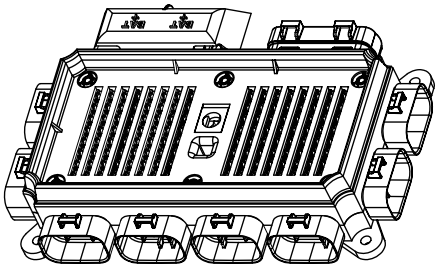
(excluding text height on cover)



Shown Without Cover or Components



Version with cover



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 Aptiv 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

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

Wire Sizes

- With wire seals: #12-22 AWG (0.35-5.0mm^2)
- Without wire seals: #10-22 AWG (0.35-5.0mm^2)

Input

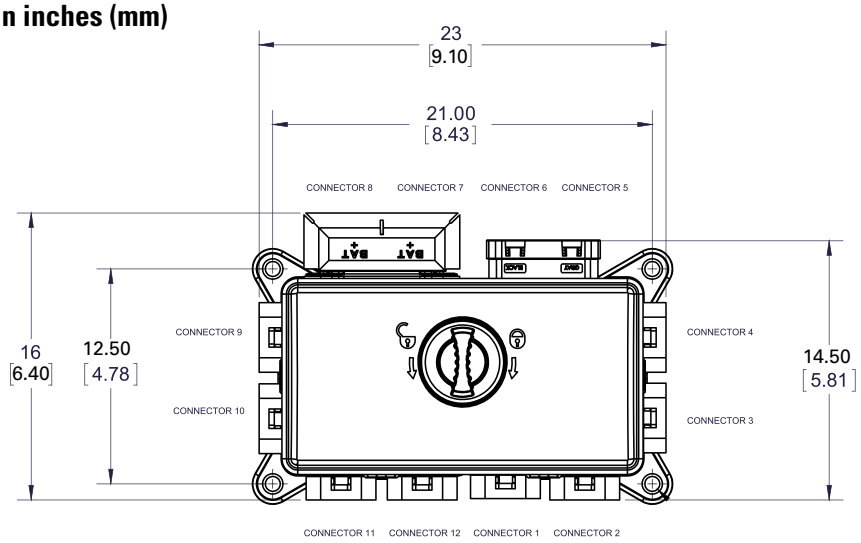
- Aptiv Metri-Pack 800 Series terminals (sealed/ unsealed)

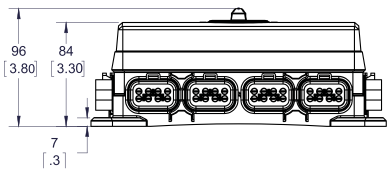
Wire Sizes

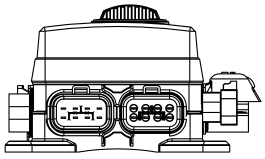
- With wire seals: #10-14 AWG (2.0-8.0mm^2)
- Without wire seals: #8-14 AWG (2.0-8.0mm^2)

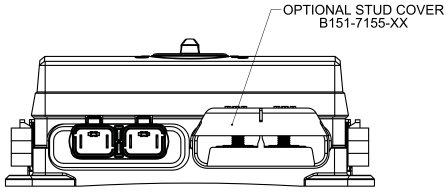
Note: Each design is customer specific. Consult your sales representative today for your application. Electrical terminals, cable seals and cavity plugs are NOT supplied by Eaton.

Dimensions in inches (mm)









VEC Connector

32004-XX Power connector

Male input connector

32004	X	X
Series	Color	Configuration
	A: Black **B:** Grey	**1:** Non-sealed **2:** Sealed

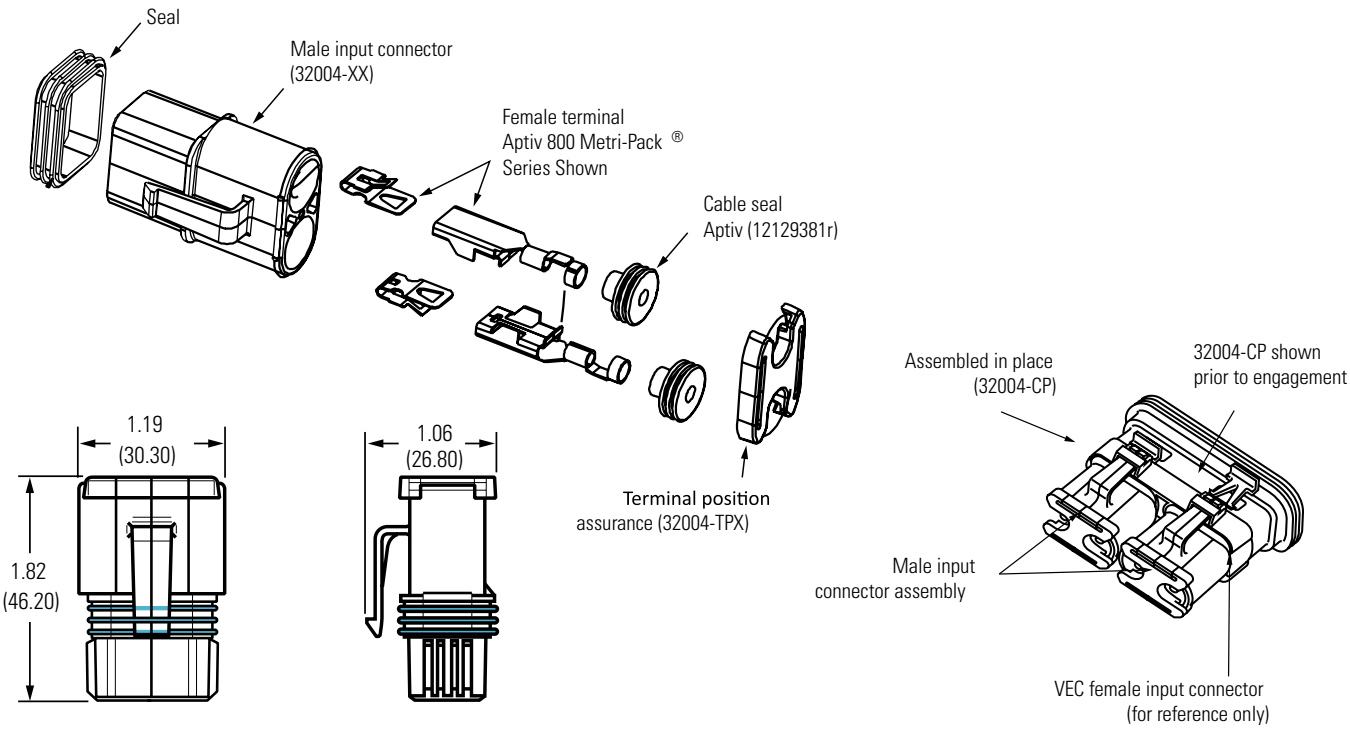
Terminal position assurance

32004	TP	X
Series	Terminal Position Assurance	Configuration
		1: Non-sealed **2:** Sealed

Connector position assurance

32004-CP (ships in bulk)

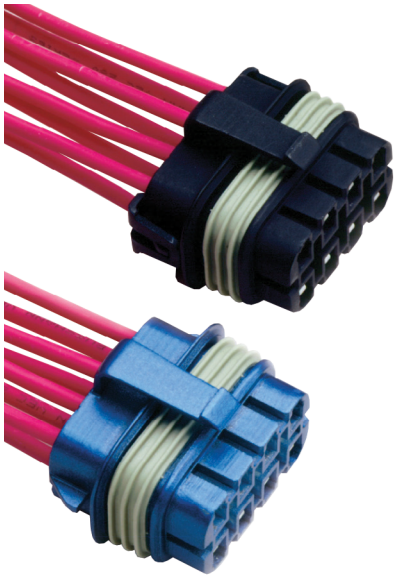
Dimensions in inches (mm)



Note: Terminals and terminal seal components are not provided with connectors. Available from Aptiv. 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 (Aptiv 280) **2:** With tang female (Aptiv 280) **P:** All cavities plugged	**1:** Non-sealed **2:** Sealed

Terminal position assurance

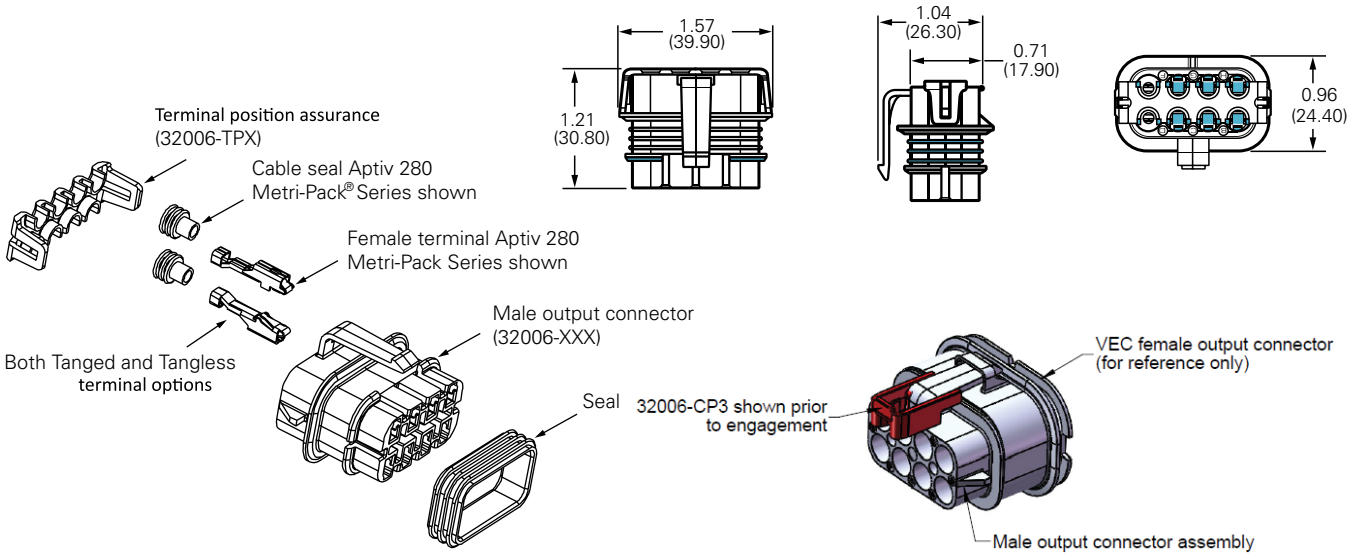
32006 TP X

Series	Terminal position assurance	Configuration
		1: Non-sealed **2:** Sealed

Connector position assurance

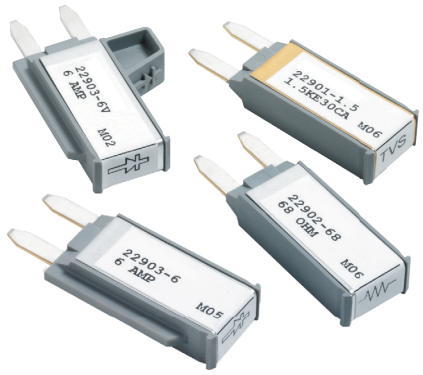
32006-CP (ships in bulk)
(shown with optional connector seal)

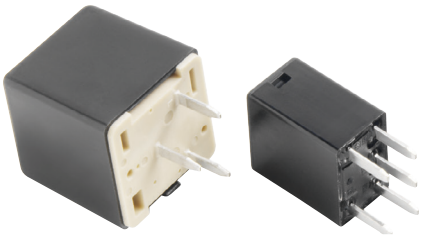
Dimensions in inches (mm)

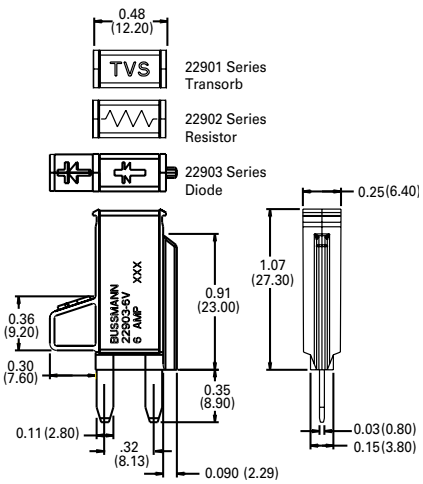


2.8mm Blade plug-in electrical components

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 busing, 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: Aptiv 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*

*Consult Aptiv distribution for availability

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 outside only.

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

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

Ordering information

1530 X X X X X

RTMR
1530x: Standard RTMR

Mounting
5: #10-32 (brass) insert
6: M5x0.8 (tin) insert (Metric)
7: No insert

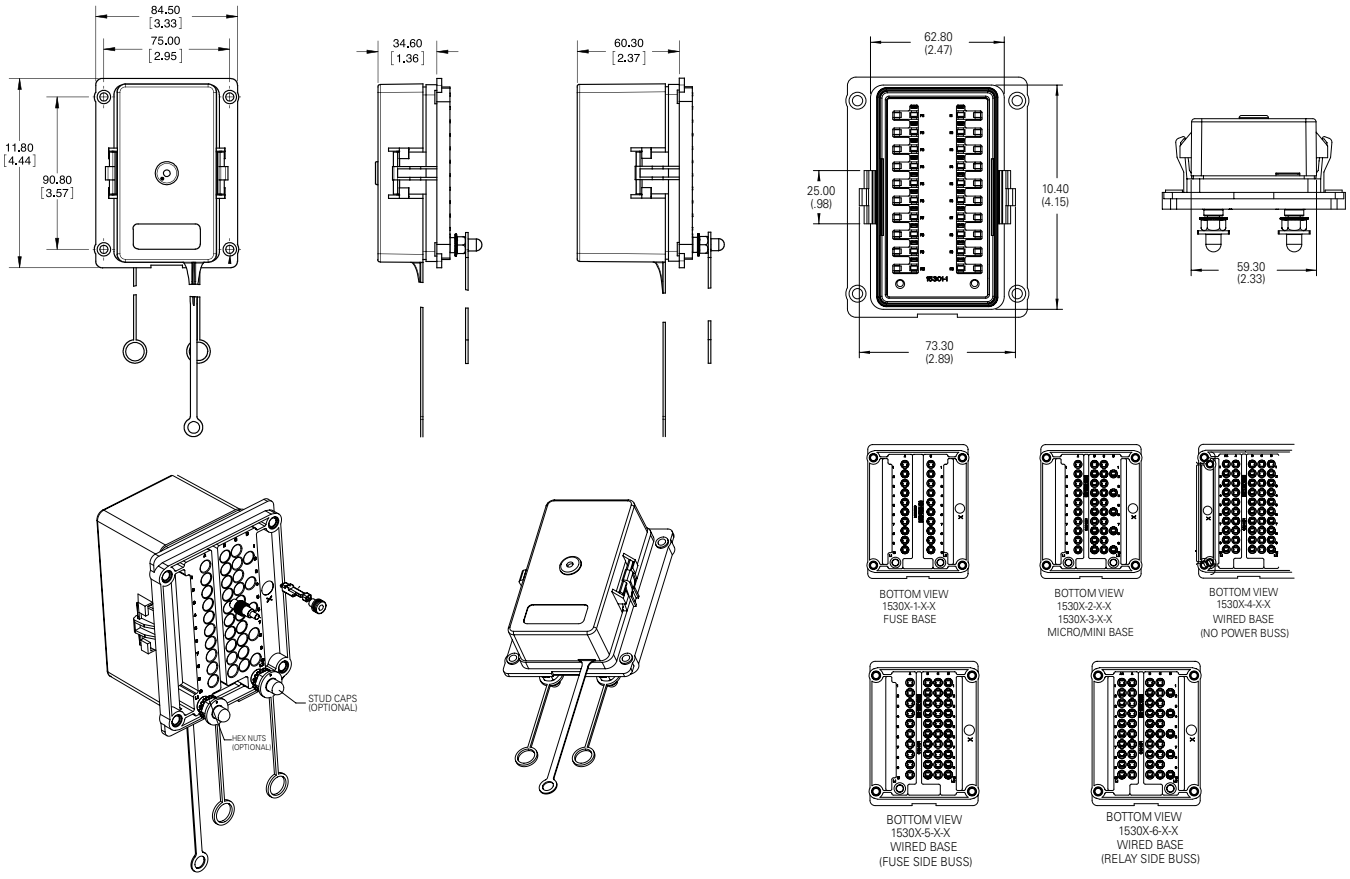
Base
1: Fuse/CB base (for 20 fuses/cb)
3: Mini relay base (for 3 micro relays with 10 fuses/cb)*
4: Wired base, non bussed, no input studs, for fuses/cb and relays
5: Wired base, input stud fuse side only, for fuses/cb and relays
6: Wired base, input stud relay side only, for fuses/cb and relays*

Cover
0: None
3: Fuse
4: Relay/CB

Hardware
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)

Marking
Special labels, consult factory

Dimensions in inches (mm)



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
  - 14-12 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)

NOTE: Cover marking only on the outside only. Too many tool marks on the inside therefore not etchable on the inside.

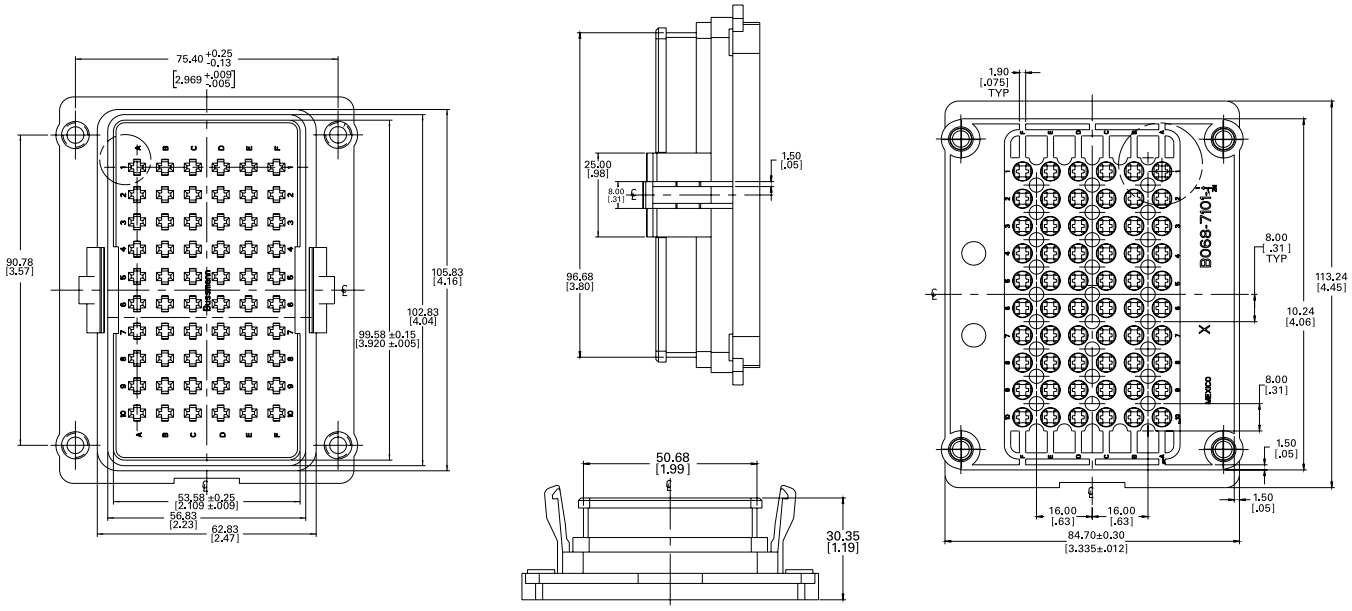
*Consult Aptiv distribution for availability

Ordering information

15310 X X X

RTMR	Mounting	Cover	Marking
15310: Standard RTMR	**1:** #10-32 (brass) threaded insert **2:** M5 (tin) threaded insert **3:** Without insert	**0:** None **1:** Fuse **2:** Relay/CB	Consult factory for custom marking options

Dimensions in inches (mm)



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:** Aptiv 280 Series Metri-Pack® sealed/tang style terminals*
- **Cavity plugs:** Aptiv 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

Note:

- 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.

*Consult Aptiv distribution for availability

Ordering information

1540 X X X X X X

RTMR
- **1540**: Standard RTMR

Bus bars
- **1:** Dual
- **2:** Left only
- **3:** Right only
- **4:** None

Base
- **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

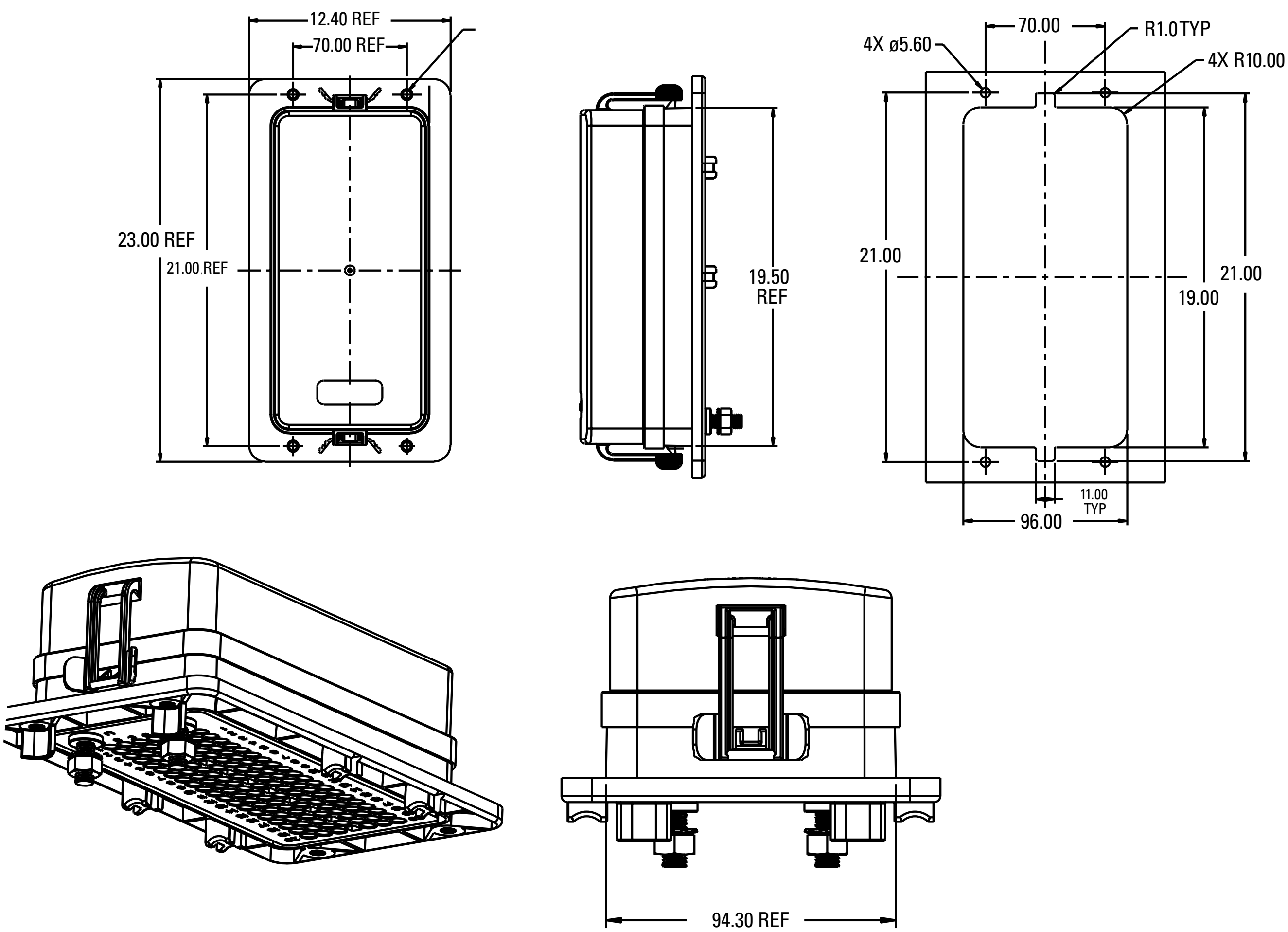
Hardware
- **0:** None
- **1:** Nuts (shipped bulk)
- **2:** Nuts (shipped assembled)

Cover
- **0:** None
- **1:** Standard

Label
- **0:** Standard

Label options
- **A:** Standard
- **B-Z:** Private

Dimensions in inches (mm)



Note: Terminal studs and wire guides optional

PDM-AMI sealed bolt-in fuse holder for multiple AMI fuses

Eaton now offers a heavy duty fuse panel called the PDM-AMI. The PDM-AMI is used for main branch primary fusing and accepts multiple (two, three, or four) industry standard AMI fuses. Using a common input bus bar, the PDM-AMI requires just one input connection to power all fuses. The PDM-AMI provides efficient power distribution suitable for many battery box and "under the hood" applications, including marine, construction, agriculture, heavy trucking, bus and specialty vehicle markets.

Rugged

Designed and manufactured to withstand waterproof to high pressure spray (IP66) and up to one meter of submersion (IP67), the PDM-AMI family offers robust features such as heavy duty housing, silicone gaskets, tin plated copper bus bars, MB cable input/output studs and stainless steel compression limiters in the mounting feet.

Images

From top left to bottom right

- PDM-AMI3
- PDM-AMI4
- PDM-AMI2

Flexible

Eaton offers the PDM-AMI in three base versions; a two position, three position or four position for the sealed use of Eaton AMI fuses. Custom options are available for factory fuse population, cover laser etching and hardware.

High power

Designed for high current power distribution, the PDM-AMI family supports AMI fuses up to 200A per channel and distributes 200A continuous for the two position, 225A for the three position and 425A for the four position - all rated at 135% overcurrent at 105°C.

Specifications

Sizing

- 2, 3, and 4 positions available

Ratings

- Maximum combined current ratings at 1354 overcurrent and 105°
- PDM-AMI2: 200A
- PDM-AMI3: 225A
- PDM-AMI4: 425A

Temperature

- -40°C (-40°F) to 105°C (185°F)

Termination

- Input: M8 stud and keps nut
- Fuse output: M8 stud and keps nut

Torques

- Mounting: 80 in-lbs (9.0 N-m)
- Fuse mounting: 13.3 in-lbs (1.5 N-m)
- Input: 44.3-in lbs (5 N-m)

Material

- Housing and cover: UL 94 V0 glass reinforced PBT
- Bus bars: Tin plated copper
- Studs: Zinc plated steel, PEM

Part numbering system

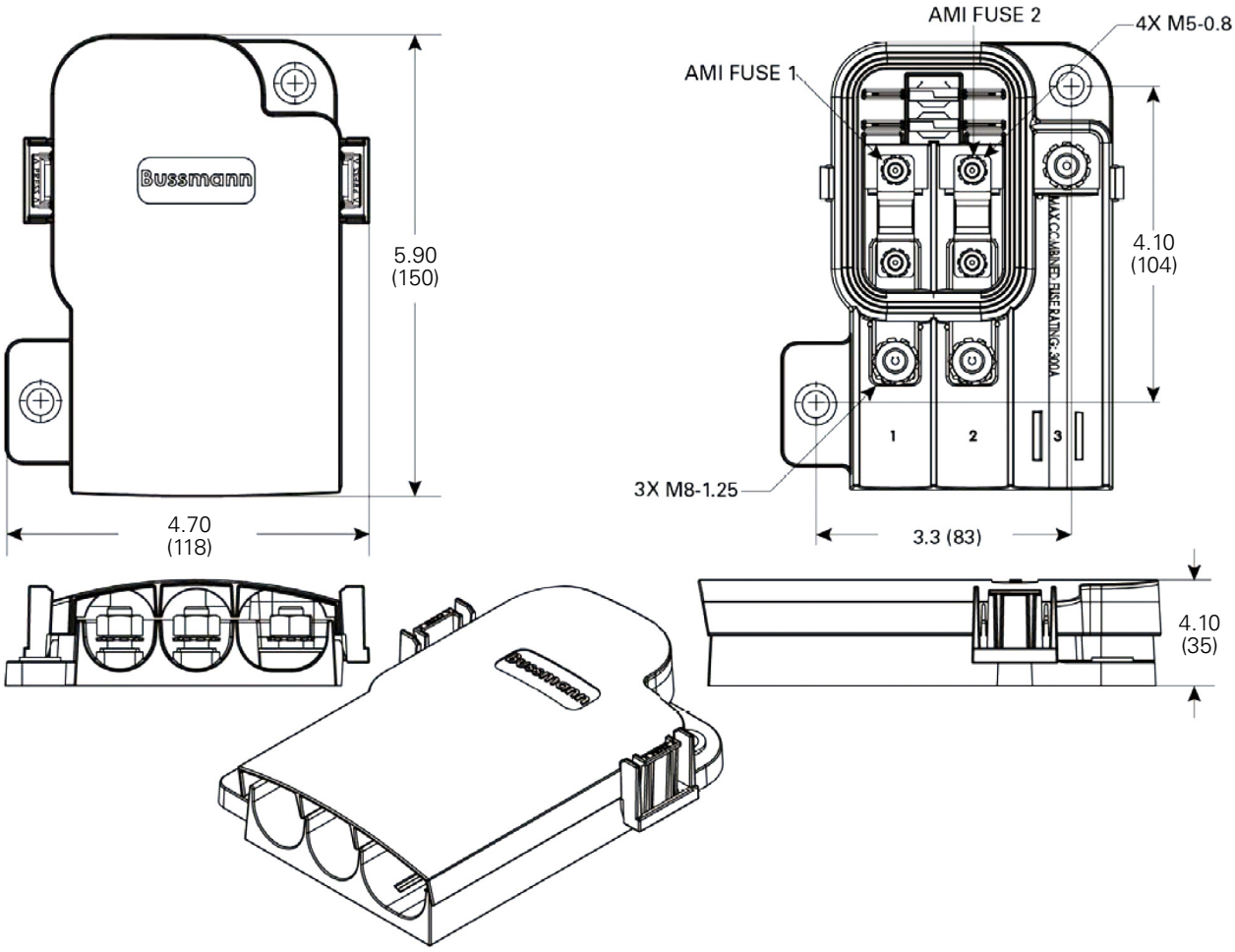
PDM AMI X XX(XX) X

Number of fuse positions
2: 2 positions
3: 3 positions
4: 4 positions

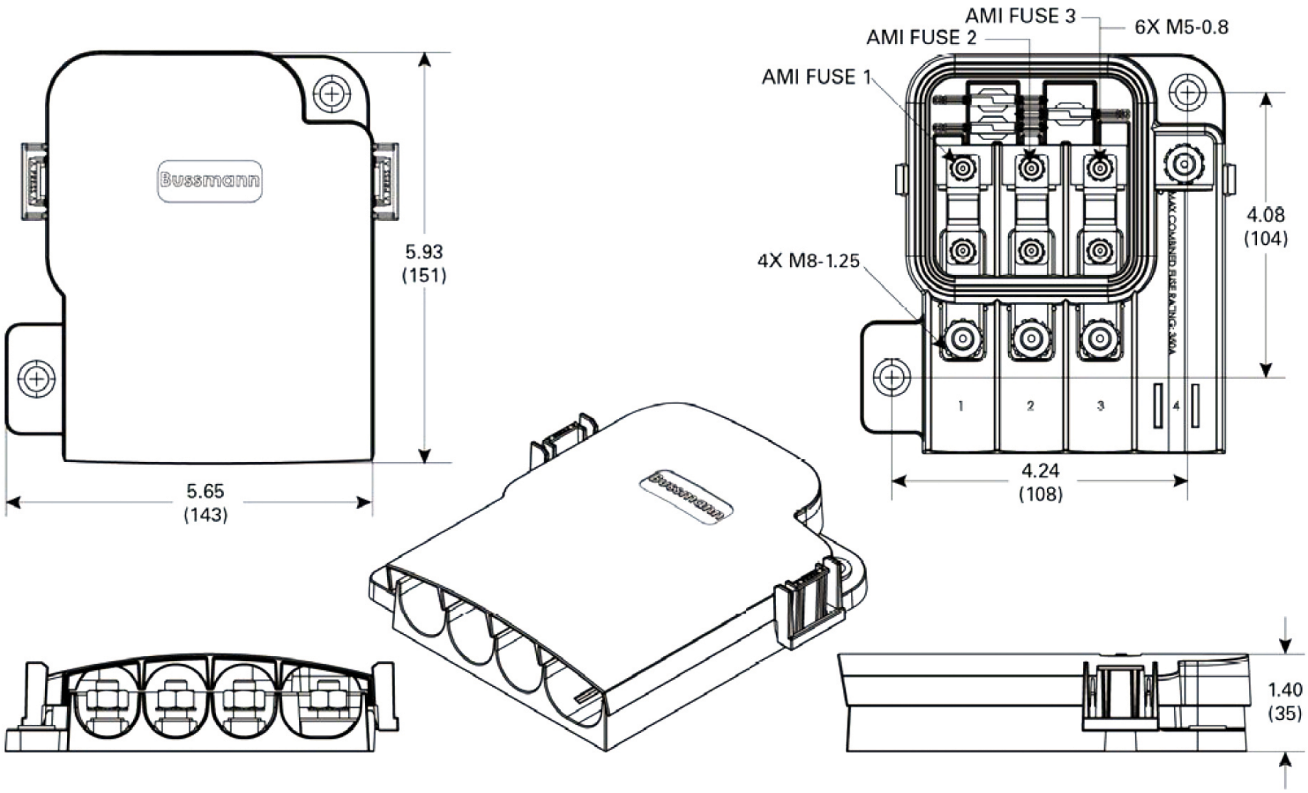
Hardware options
A: No Hard
B: Hardware Zinc Plated Bulk
C: Hardware Zinc Plated Installed

Fuse configurations	
Up to 4 digit sequence	
Populated from Left to Right	
A: No Fuse	**G:** 80A
B: 30A	**H:** 100A
C: 40A	**J:** 125A
D: 50A	**K:** 150A
E: 60A	**M:** 175A
F: 70A	**N:** 200A

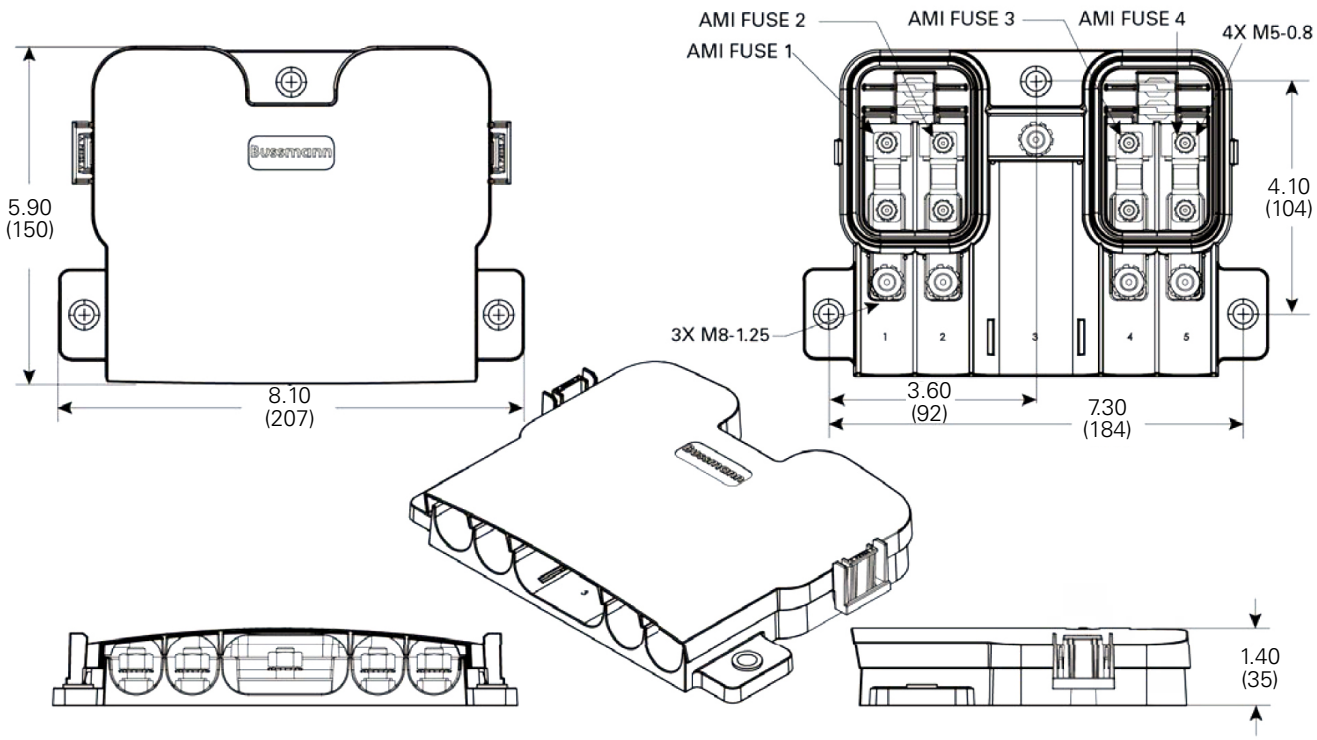
PDM-AMI2-XXX Dimensions in inches (mm)



PDM-AMI3-XXXX Dimensions in inches (mm)



PDM-AMI4-XXXX 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

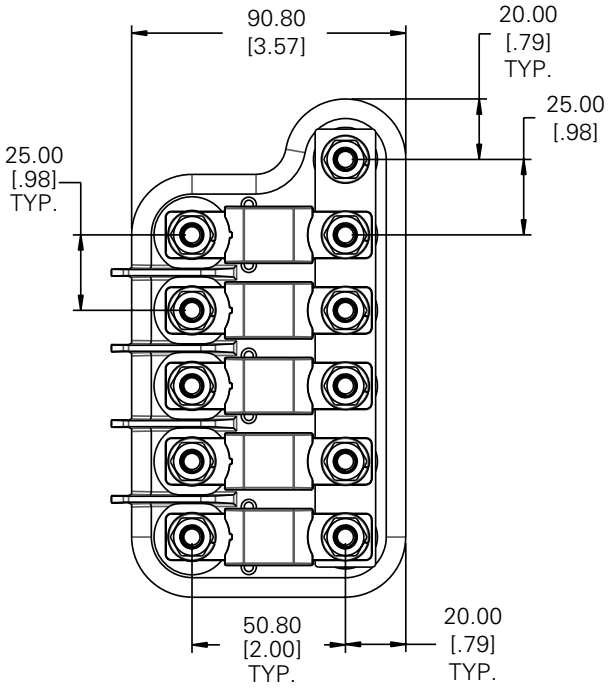
- Based on numerous variations possible between # of LMG poles, fuses selected, input wiring and output wiring, all applications should be tested by the installer to verify the product meets their requirements.
- Housing must not exceed 130°C.

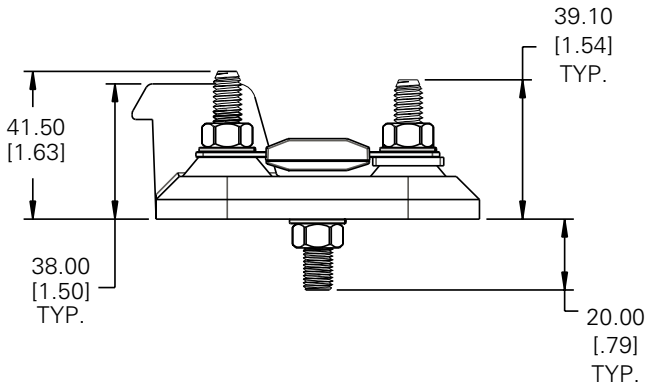
Ordering information

LMG X X X XXX

LMG	# Fuse positions	Hardware	Mounting	Fuse configurations
LMG: Standard LMG	**2:** 2 positions **3:** 3 positions **5:** 5 positions	**M:** Metric **Blank:** English	**1:** Standard Consult factory for custom marking options	Unique identifying number reflecting fuse configurations assigned by Eaton **000:** No fuse, no cover **001:** No fuse, with cover **002:** No fuse, no cover, no bus bar

Dimensions in inches (mm)





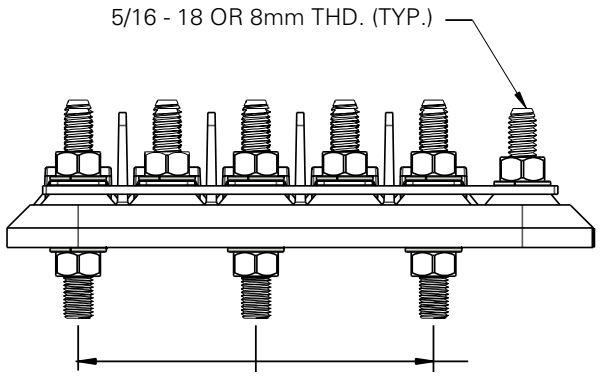


Table 1

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

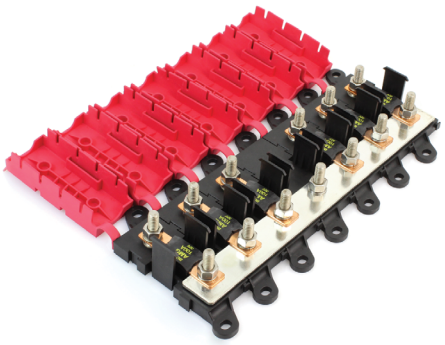
Series LMG

Modular AMG Fuse Holder

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

The LMG fuse holder provides efficient power distribution suitable for many applications, such as marine, construction, agriculture, heavy trucking, bus and specialty vehicles. LMG fuse holders can be assembled with Eaton's MBF fuse holders for a custom power distribution solution.

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.



Specifications

- **Sizing:** One fuse module per AMG fuse, one input module and bus bar required per LMG2-LMG7 assembly, maximum of seven modules per assembly
- **Ratings**
- Maximum total combined rating is 600A continuous.Not to exceed 300A on either side of the input terminal and for a single LMG fuse holder
- Rated to 56VDC
- **Temperature** -40°F (-40°C) to 185°F (85°C)
- **Termination** Stainless Steel M8-1.25 or 5/16-18 stud
- **Torques**
  - Terminals: 13.5 Nm (119 in-lbs) Max
  - Mounting: 6.0 Nm (53 in-lbs) Max
  - Use smooth flat washer under mounting screw head
- **Material**
  - Housing: HTN black UL 94-V0 thermoplastic
  - Cover (standard on all modules): Red EPDM/
  - Santoprene cover for protection from accidental shorts

Options

- When ordering individual LMG modules for assembly by the customer, busbars can be individually ordered using part# SP500859-x (x= 2,3,4,5,6, or 7), with that digit representing the number of total modules that the busbar will connect.
- To order custom assembled units, the minimum order quantity is 30 units.
- Attach all wire cables with the ring terminals in direct contact with the fuse or busbar (i.e. no fasteners or washers between ring terminal and fuse/busbar).

Ordering information

LMG XY - Z - xxxxxxxy

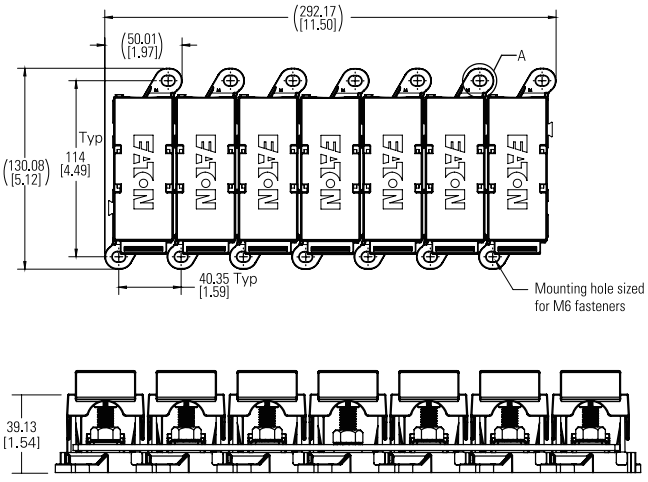
(X)
1-7 [Number of total modules (fuse modules and/or input modules); 7 max]

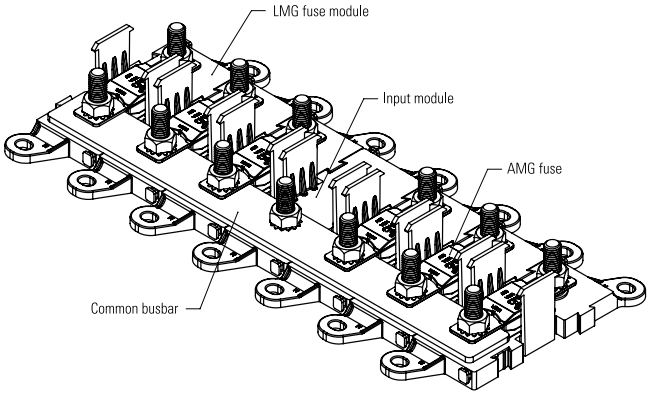
Stud table (Y)		
Stud code	Stud description	
	Input module	Fuse module
E	5/16-18 SS	
M	M8-1.25 SS	
Note: Studs within one assembly will be the same (All english or all metric)		

Hardware table (Z)	
Hardware code	Description
0	None
1*	SS hex nut and washer, installed
2	SS hex nut and washer,bulk
3*	SS keps nut,installed
4	SS keps nut, bulk
* Required for LMG2 or greater	

Module table (xxxxxxx)		
Module code	Module description	Fuse AMP rating
Blank	None	N/A
0	Fuse module	No fuse
1	Input module	N/A
A	Fuse module	80A
B		100A
C		125A
D		150A
E		175A
F		200A
G		225A
H		250A
J		300A
K		350A
L		400A
M		450A
N		500A
Note: Upto seven modules per assembly, listed left to right. Refer example for fuse locations		

Dimensions in mm [inches]



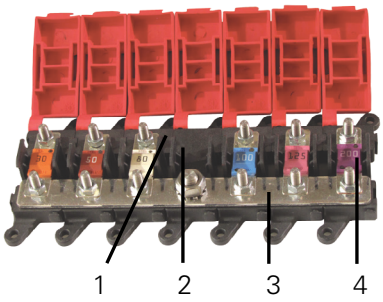


Series LMI

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 B109-7091-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(XXXXXX)

LMI

LMI: Standard LMI

 # Fuse positions

1-7: Number of total modules (fuse modules and/or input modules).

Max: 7 including input module

Hardware

M: Metric
E: English

Hardware options

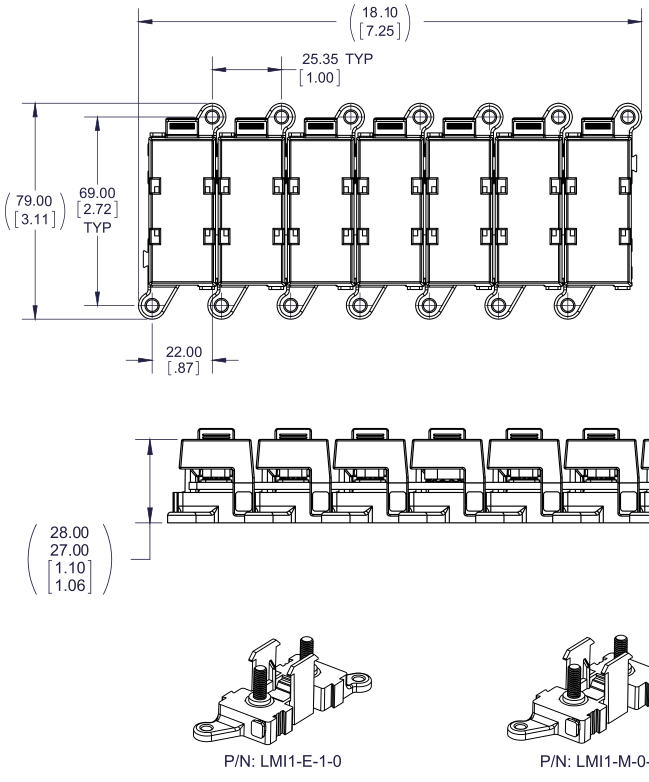
0: None (for individual components only)
1: SS Keps Nut in bulk (for individual components only)
2: SS Keps Nut installed (only for assembled LMI2-LMI7)

Fuse configurations

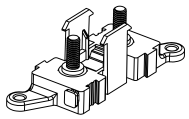
Up to 7-digit sequence representing each module in assembly, left to right, with bus bar in the front/ bottom.

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

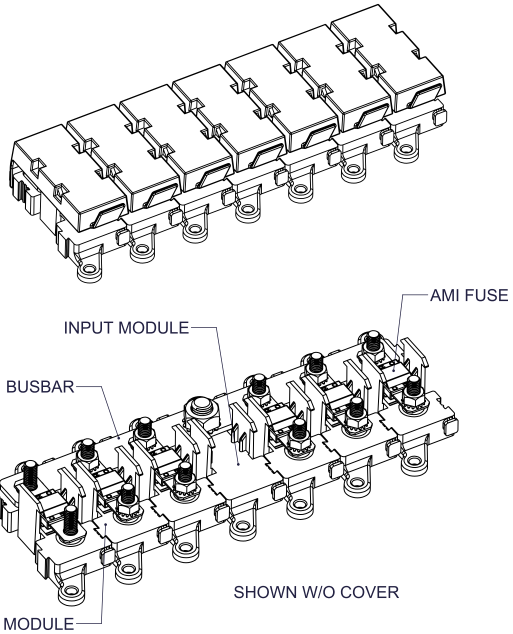
Dimensions in inches (mm)



P/N: LMI1-E-1-0



P/N: LMI1-M-0-C



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:

- 12020321 (16/14 AWG)
  12020400 (12/10 AWG)
- Aptiv 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

Note:

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

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).

Ordering information

1571X XX-XX X X X

Series
- **15711:** Single stud, single circuit supply
- **15712:** Double stud, split supply circuit
- **15713:** Triple buss, split supply circuit

 # Positions

15711 Series
- **08-032:** Total (increments of 4)

15712 Series
- **06-28:** Left side (increments of 2)
- **06-28:** Right side (increments of 2)

Minimum 12 Positions

15713 Series
- **16-32:** Total Pos (increments of 4 max. total of 32)
- **08-16:** Left Side (increments of 4) (middle bus is fixed at 4 pos)

Minimum 16 Positions

Cover options
- **0:** None
- **1:** Fuse cover
- **2:** CB cover

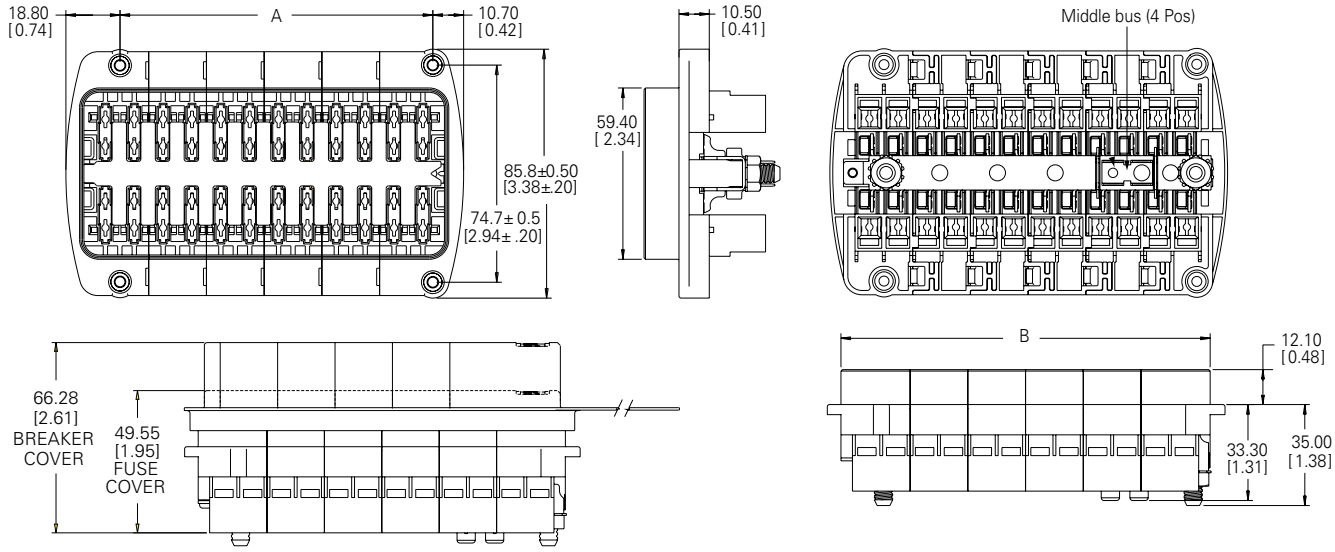
Hardware options
- **0:** None
- **1:** Nuts (shipped in bulk)
- **2:** Nuts (shipped assembled

Marking option
- **A:** Standard

Consult factory for special marking options

15711 - Minimum 8 Positions
15712 - Minimum 12 Positions
15713 - Minimum 16 Positions

Dimensions in inches (mm)



	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

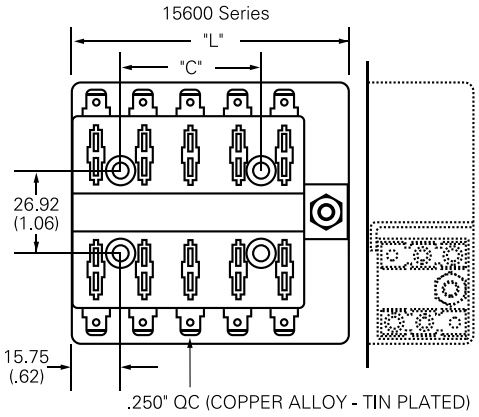
- **Positions:** 4-20 circuits available
- **Split power:** Single or dual bus options

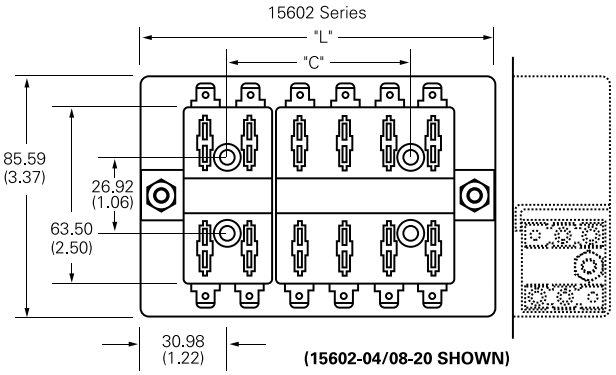
Ordering information

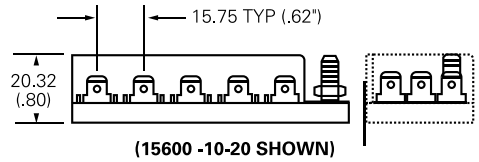
1560X XX-XX X X

Series	# Positions	Hardware options	Ground terminal option
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:** Include ground pad

Dimensions in inches (mm)







No. of fuse	"C"	15600 "L"	15602 "L"
04	-	1.84	2.44
06	0.62	2.47	3.06
08	1.25	3.09	3.688
10	1.87	3.75	4.32
12	2.50	4.34	4.94
14	3.12	4.97	5.56

No. of fuse	"C"	15600 "L"	15602 "L"
16	3.76	5.59	6.19
18	4.37	6.22	6.81
20	5.00	6.84	7.43

Dims in inches, Multiply by 25.4 for metric.

Series 37700 - PFM/PRM

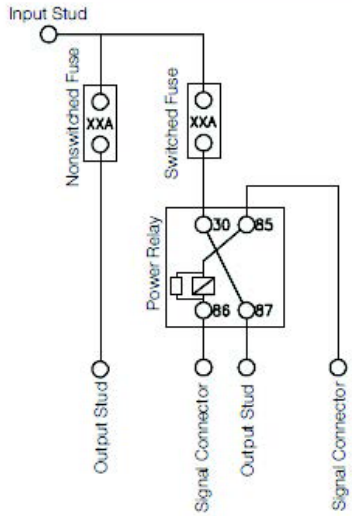
Power fuse modules (PFM)
Power relay modules (PRM)

Eaton offers a sealed Power Relay Modue (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.).

PRM Wiring



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:** Aptiv 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 Aptiv 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:

- Aptiv Black - 12052641; grey - 12052644 (consult Aptiv 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

3770X X X X X X X X X

Series
- **37701:** PFM
- **37702:** 12VPRM
- **37703:** 24V PRM

Output/Signal type

PFM
- **1:** Stud - Aptiv

PRM
- **1:** Stud - Aptiv
- **2:** Connector Aptiv
- **3:** Stud - AMP®
- **4:** Connector - AMP®

Signal key

PFM
- **N:** Not available on PFM

PRM
- **A:** Black - Aptiv only
- **B:** Grey
- **C:** Green - AMP® only
- **F:** Red - AMP® only
- **Y:** Yellow - AMP® only

Output key
- **N:** Stud output (n key)
- **A:** Black
- **B:** Grey

Nonswitched fuse
- **0:** None
- **2:** 20A
- **3:** 30A
- **4:** 40A
- **5:** 50A
- **6:** 60A

Switched fuse
- **0:** None
- **2:** 20A
- **3:** 30A
- **4:** 40A (12V only)
- **5:** 50A (12 V only)
- **6:** 60A (12V only)

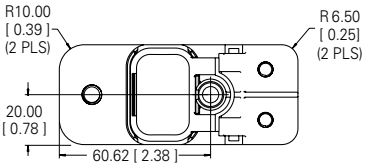
Cover option
- **0:** None
- **1:** Cover (bulk)
- **2:** Cover (installed

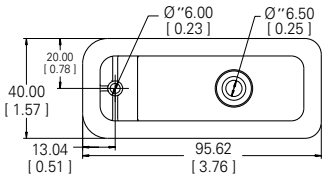
Hardware option
- **0:** None
- **1:** Nuts (bulk)
- **2:** Nuts (installed)
- **3:** CRF
- **4:** CRF, nuts (bulk)
- **5:** CRF, nuts (installed)

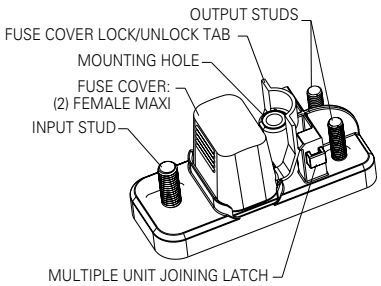
Private label
- **X:** Consult factory

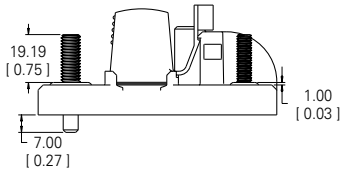
Dimensions in inches (mm)

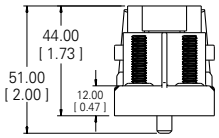
37701-1N Series



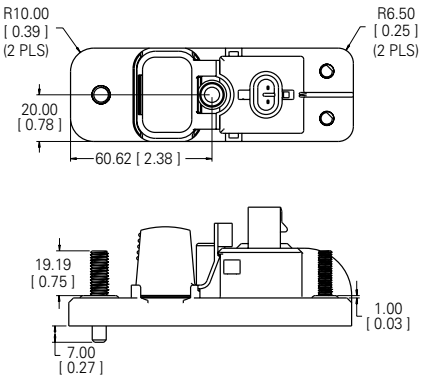


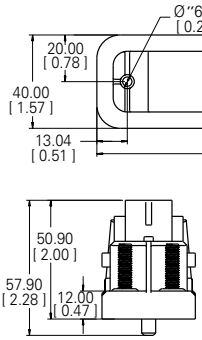


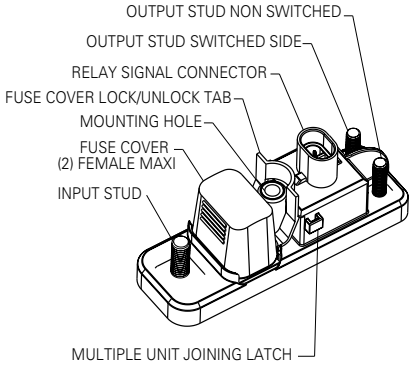




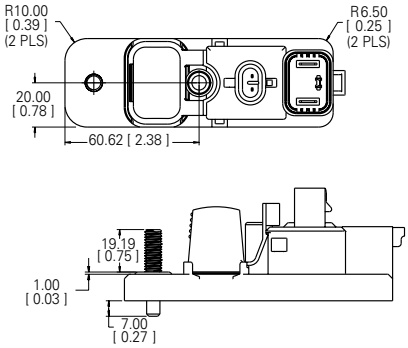
37702 & 37703 Series stud output

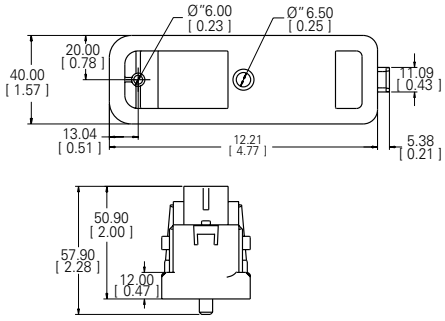


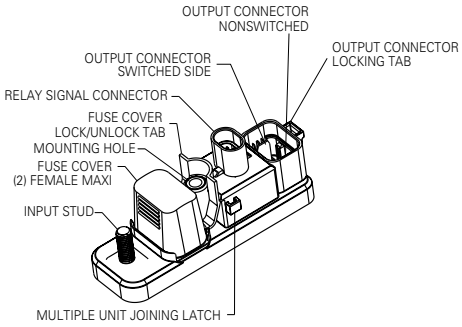




37702 & 37703 Series







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

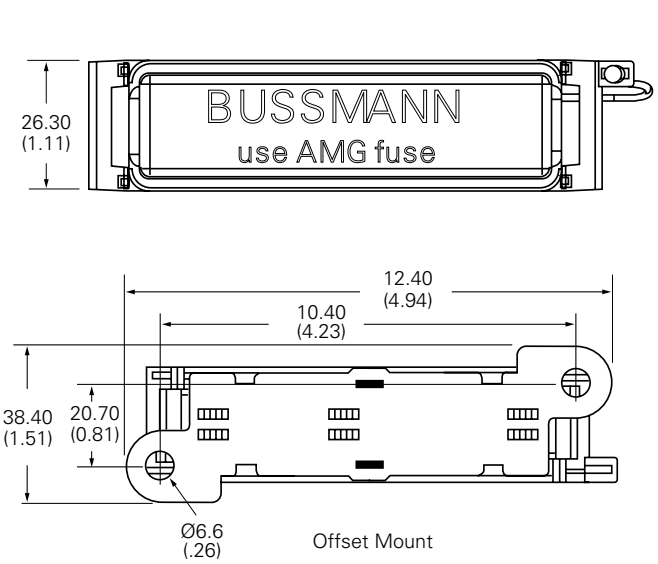
- Side-stackable
- Bottom side can be insulated from the mounting panel
- Splash resistant cover

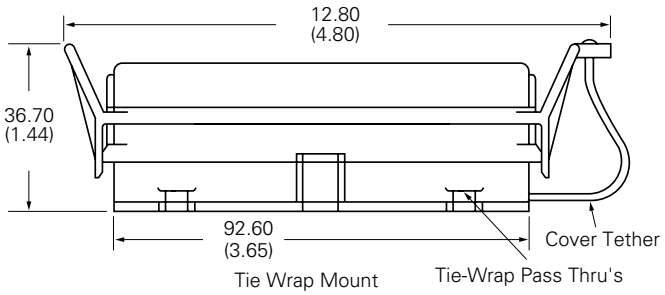
Ordering information

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 inches (mm)





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

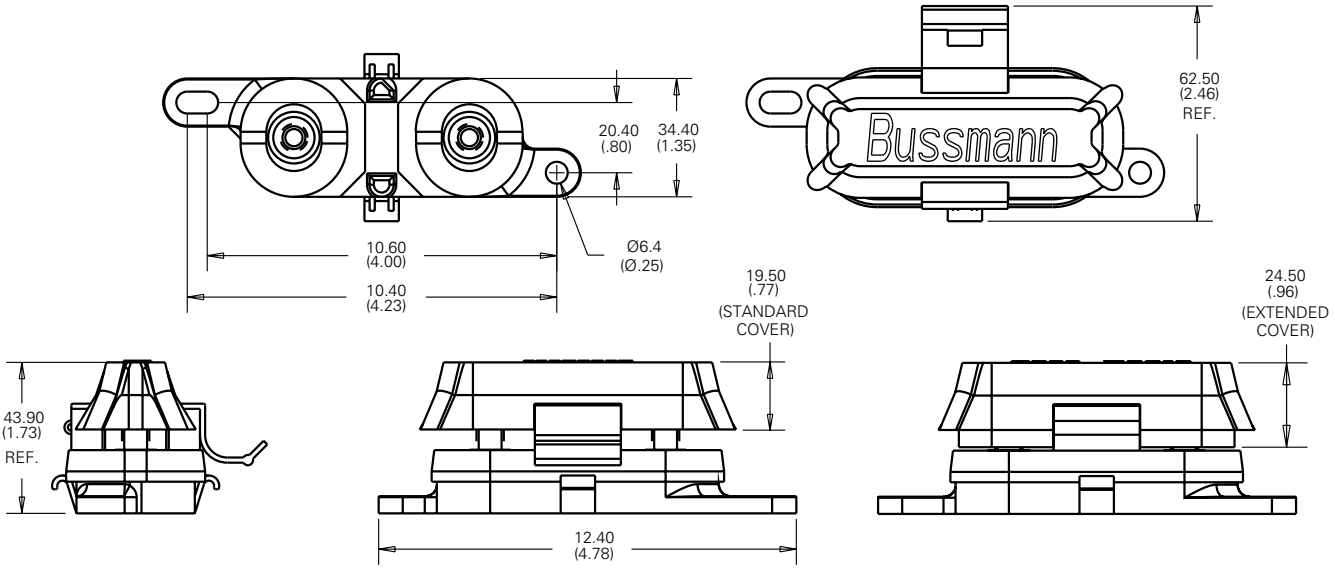
Series
FMG: FMG fuse holder

Base
1: M8 studs
2: 5/16 - 18 studs
3: M8 x 1.25 stainless studs
4: 5/16- 18 UNC stainless studs

Hardware options
1: Nuts - installed
2: Nuts - bulk
3: Stainless nuts and lockwashers - installed
4: Stainless nuts and lockwashers - bulk

Cover
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

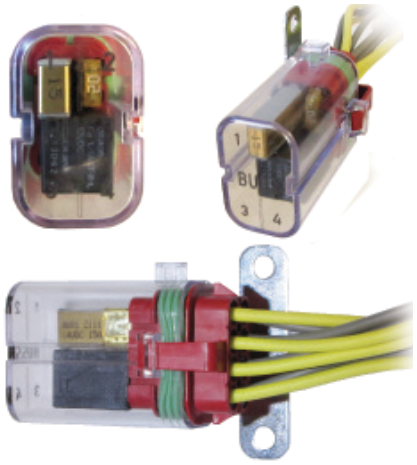
Dimensions in inches (mm)



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 Aptiv Metri-pak 280 guidelines (consult Aptiv 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

Note:

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

Servicable parts:

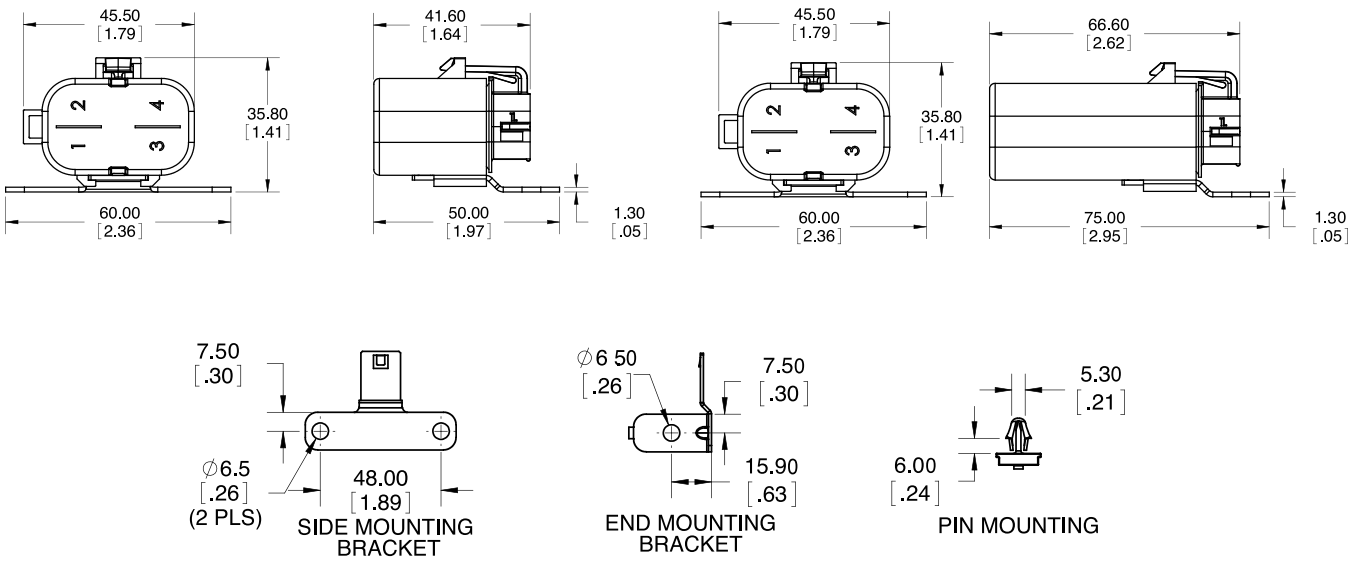
- **Cover:** B151-7184-S (fuse) or B151-7184-L (relay/breaker)
- **Brackets:** B028-7013 (side bracket); B028-7015-SRV (end bracket); B028-7016-SRV (pin bracket).

Ordering information

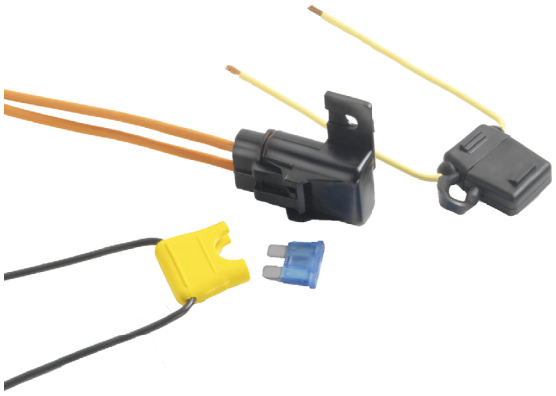
CFH X X X

Series	Color	Cover	Bracket
CFH: CFH fuse holder	**A:** Black **B:** Grey **C:** Green **D:** Blue **E:** Yellow **F:** Red **G:** Orange **H:** Brown	**L:** Relay/Breaker **S:** Fuse	**S:** Side **E:** End **P:** Pin

Dimensions in inches (mm)

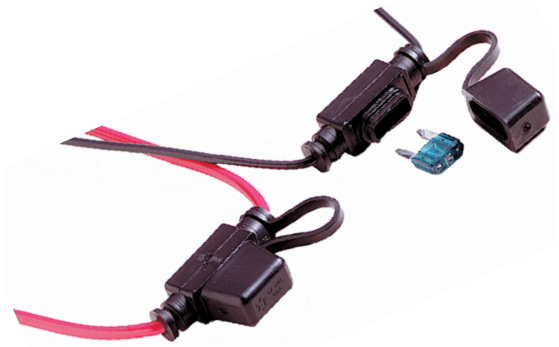


Inline fuse holders



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

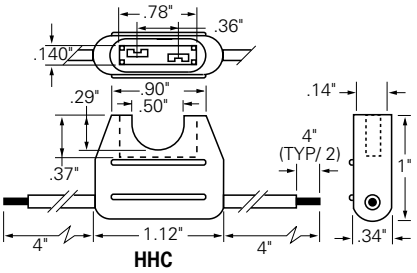
MAXI™ fuses

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

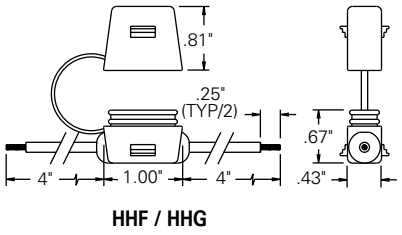
Inline fuse holder ordering information

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

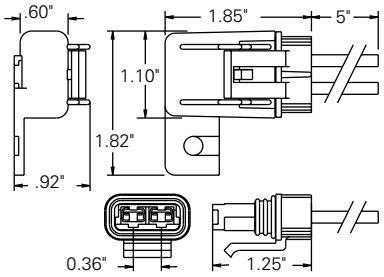
Dimensions in inches (mm)



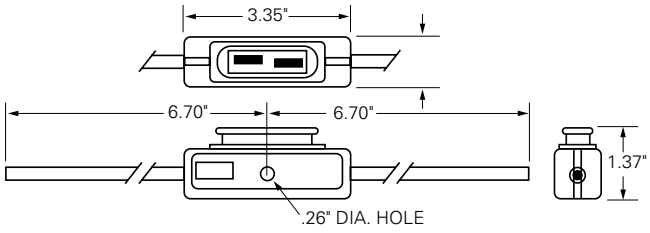
HHC

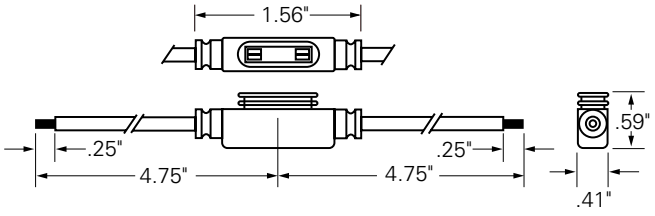


HHF / HHG

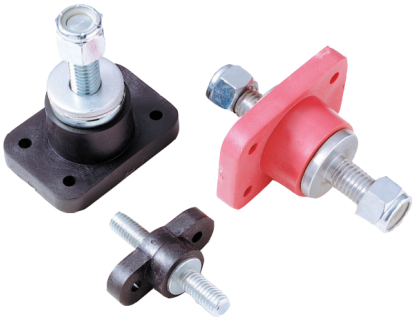


HHR





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 (#10-24) and C6083 (#10-32)

Rating: 30A, 600V

Temperature rating: 250°F (120°C)

Materials: Black thermoplastic with zinc-plated steel studs

Termination: 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 (No bosses between studs)

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

Temperature rating: 250°F (120°C)

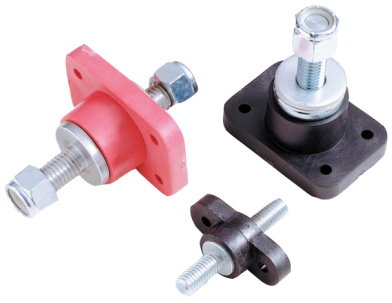
Materials: Black thermoplastic with yellow zinc-plated brass studs.

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 (No bosses between studs)

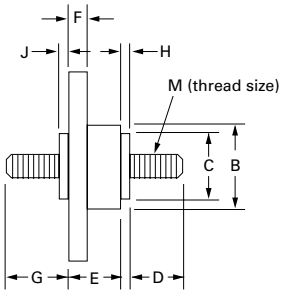
Please see the following page for specific part numbers and ordering information. Numbers and arrows molded on top of barriers indicate terminals.

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



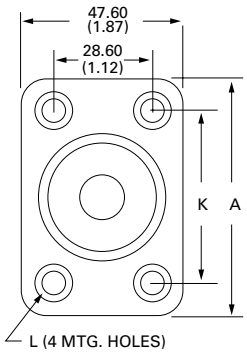


Fig. 1

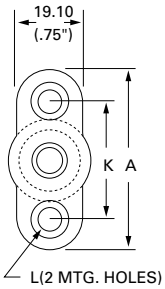


Fig. 2

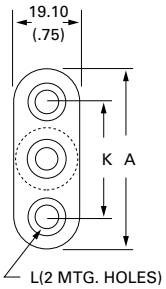
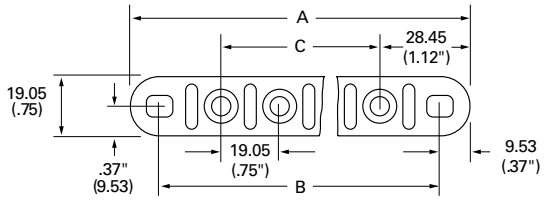
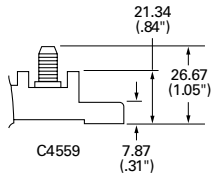


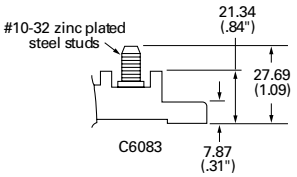
Fig. 3



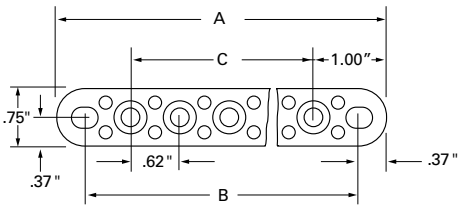
0ther series available with .75" centers:

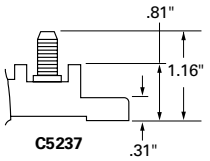


Mtg. holes9/32"x 3/8" slot

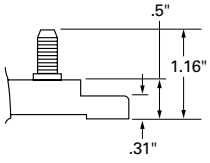


(A,B,C Dimensions are the same as C4559)





Mtg. holes9/32"X3/8" slot



JB1032-120-XX

(No bosses between studs)

(A,B,C Dimensions ars 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 (24.6)	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 (24.6)
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)
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

Power distribution

Part	Fig.	A	B	C	D	E	F	G	H	J	K	L	M	Max. torque (in-lbs)	Material	Color
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 (15.9)	.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 (15.9)	.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
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

Note:

*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:** 200A 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:

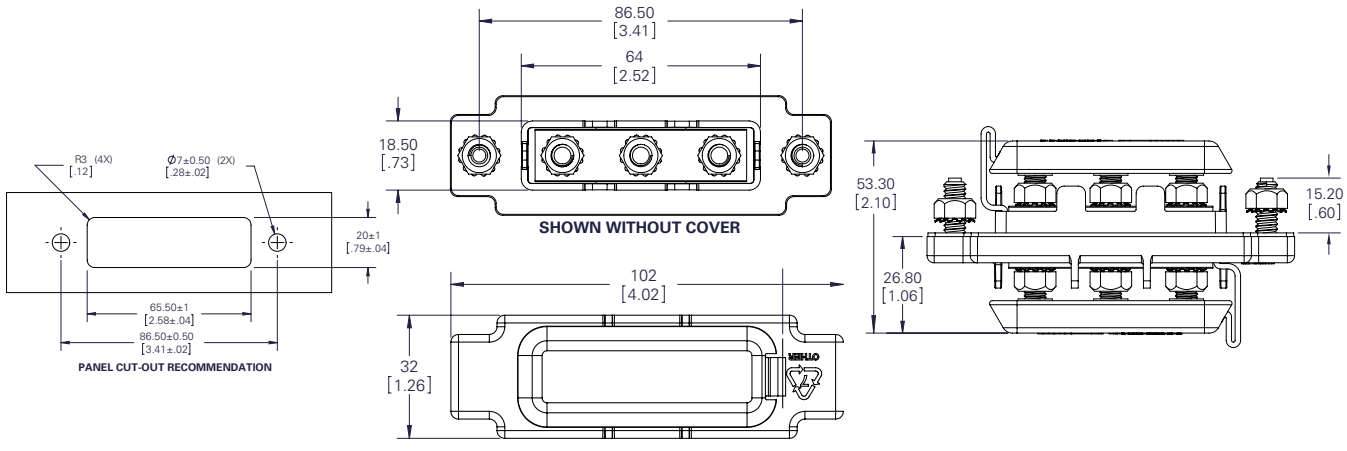
- **Cover:** B151-7192 (black), B151-7194-R (red)
- **Bus bar:** B109-7050

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

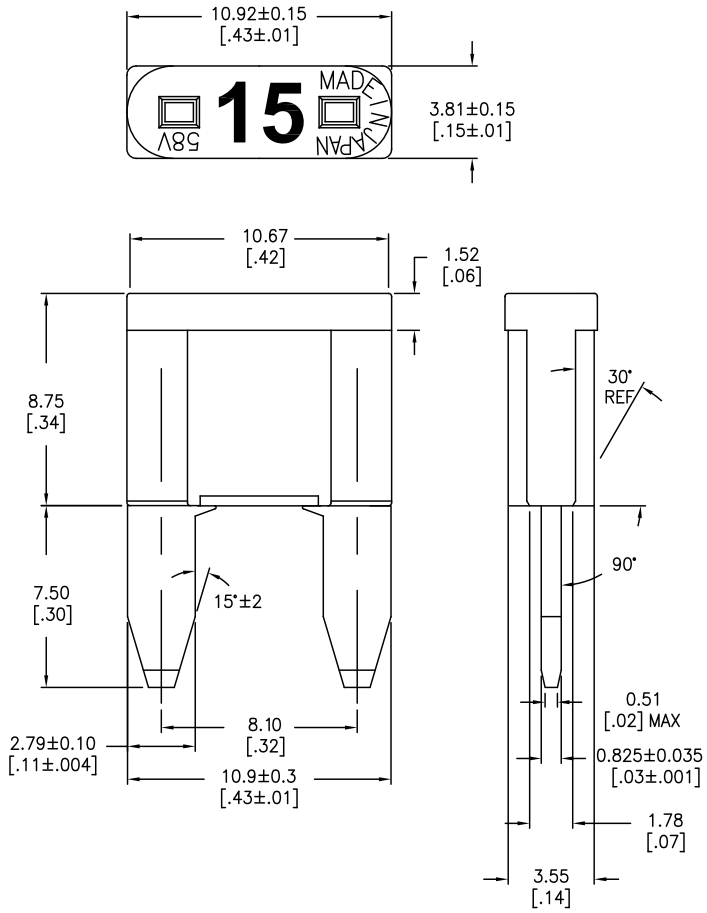
Eaton's leadership in circuit protection extends into commercial vehicles with blade and bolt-on circuit protection devices, including a variety of thermal circuit breaker and fuse solutions. Eaton solutions range from low current branch circuit fuses and circuit breakers up through 200 Amp switchable 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.

MINI Blade fuses

Specifications

- Fast acting
- **Current rating:** 2-30A
- **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:** UL-Listed; SAE J2077; ISO 8820-3; SAE J1171 (Ignition protected)
- Consult factory for higher voltage fuses.

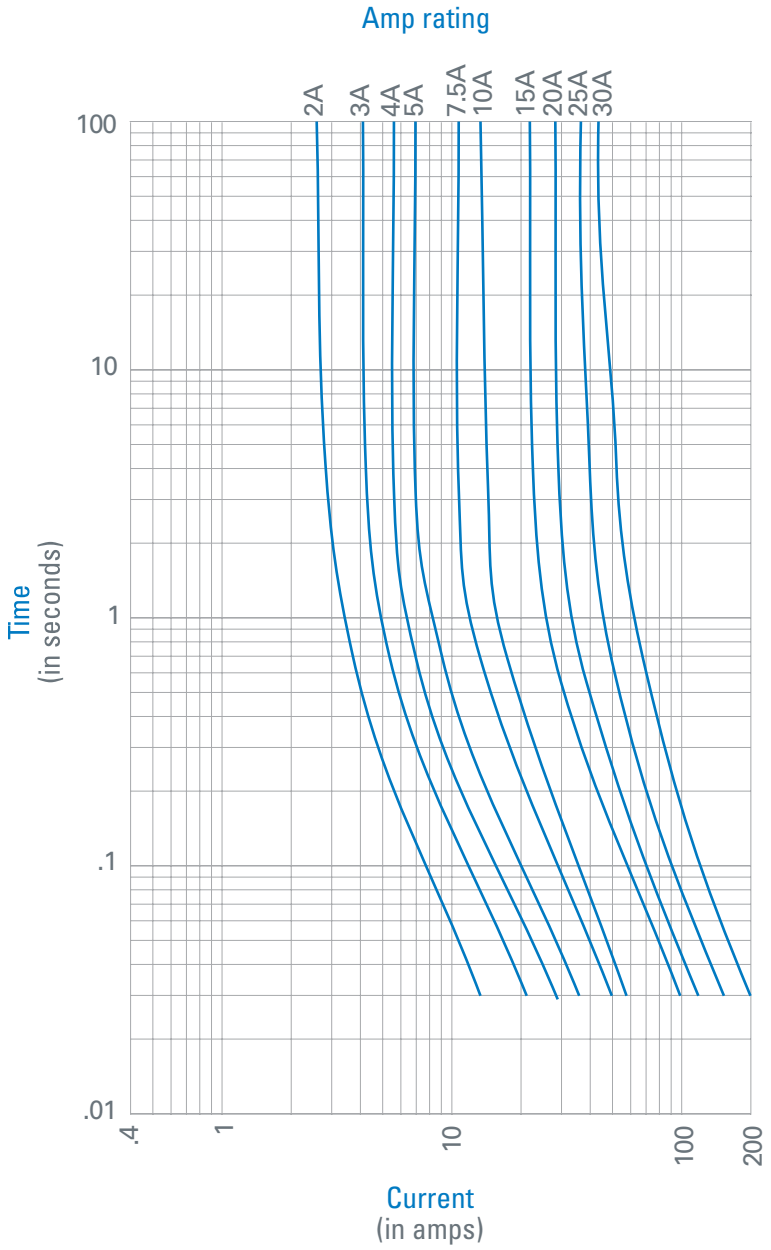
Dimensions in inches (mm)



Specifications

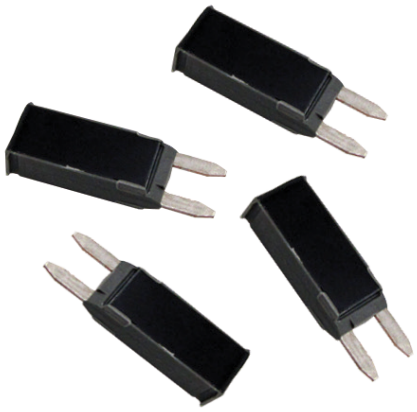
Part number	Amp rating	Color
BK-ATM-2	2	Grey
BK-ATM-3	3	Violet
BK-ATM-4	4	Pink
BK-ATM-5	5	Tan
BK-ATM-7.5	7.5	Brown
BK-ATM-10	10	Red
BK-ATM-15	15	Light Blue
BK-ATM-20	20	Yellow
BK-ATM-25	25	Natural
BK-ATM-30	30	Green

Time current curves



Series 21X

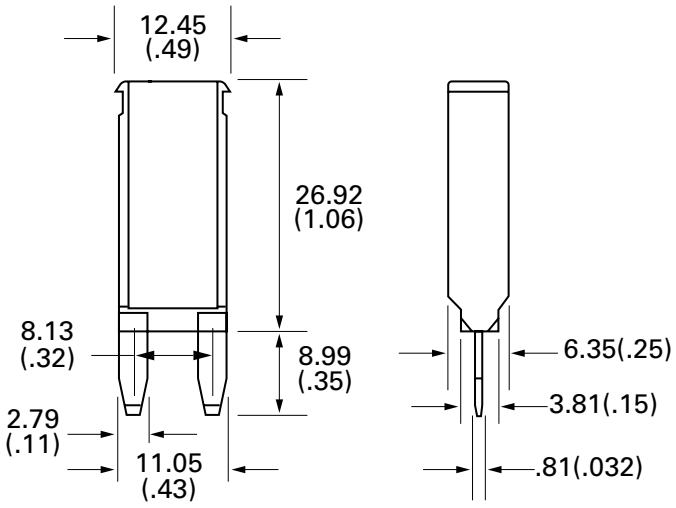
Mini circuit breakers



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

21X XX X X

Series
211: Type 1, 14VDC
212: Type II, 14VDC

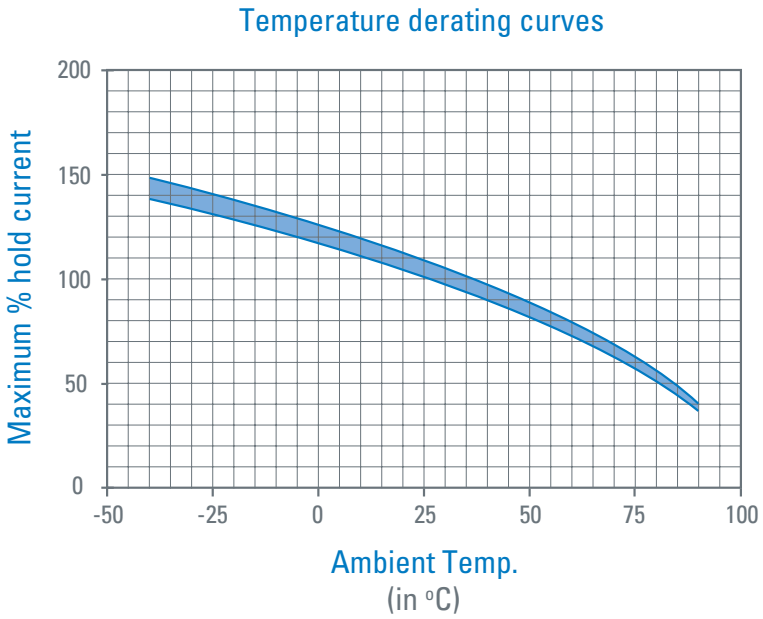
Rating
05: 5 amps
75: 7.5 amps
10: 10 amps
15: 15 amps
20: 20 amps
25: 25 amps
30: 30 amps

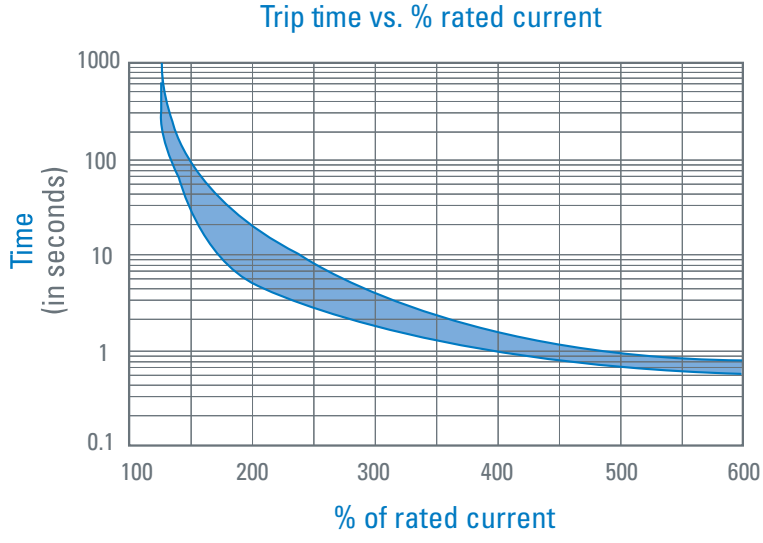
Marking
00: Standard

(Consult factory for special marking options)

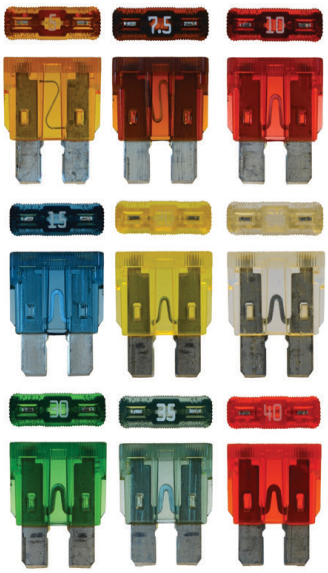
Special options
Consult factory for special options

Temperature derating / Time current curves





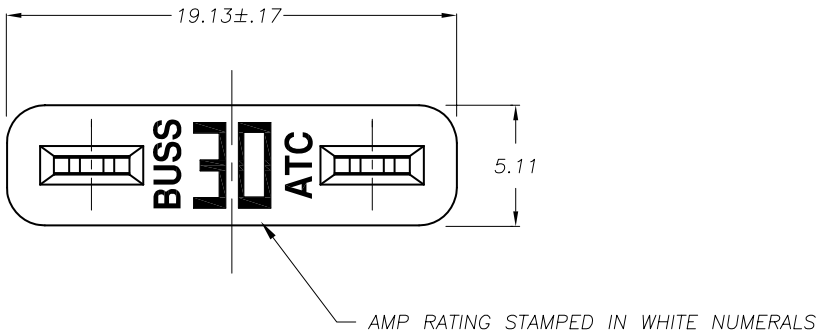
ATC® Blade fuses

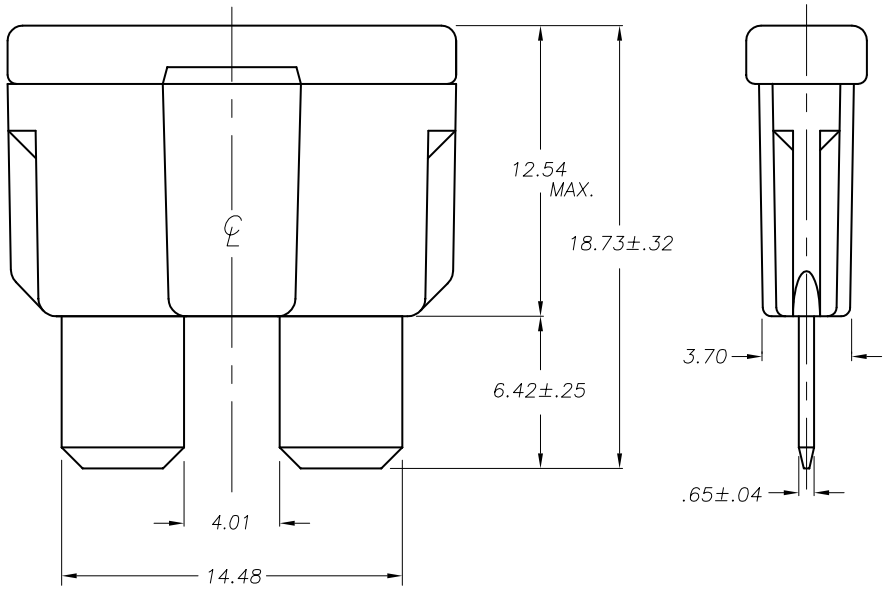


Specifications

- 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)

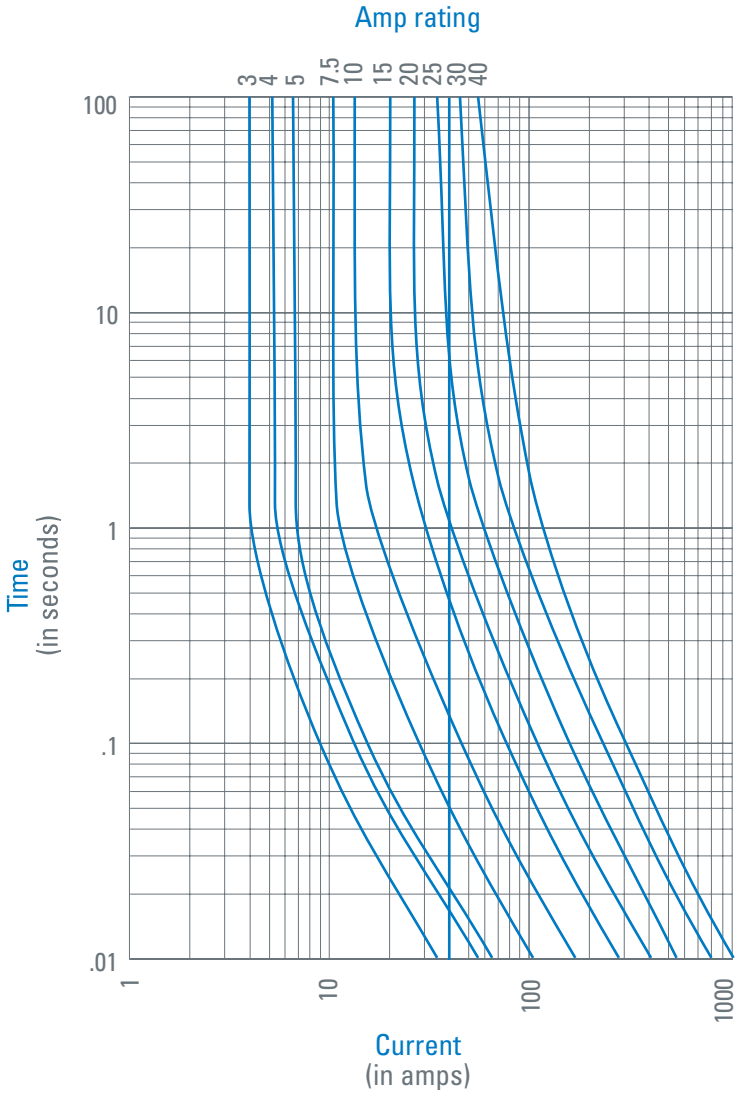




Specifications

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

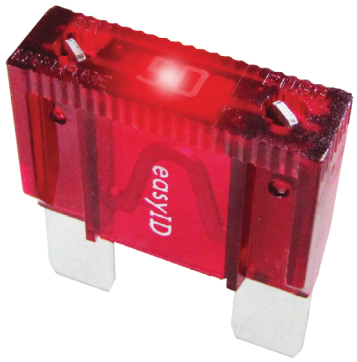
Time current curves



easyIDTM

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

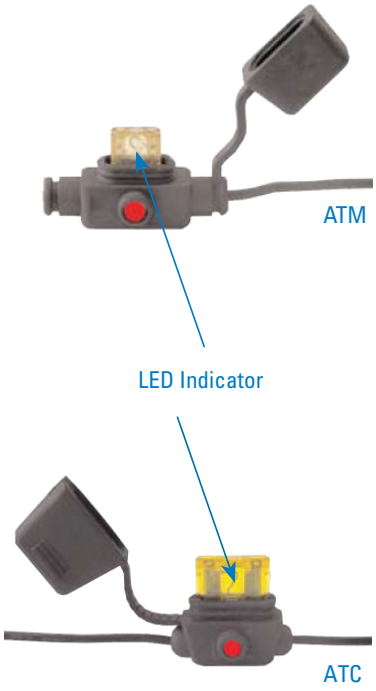
easyID™ ATC Illuminating blade fuses

Introduced in the late '70s, ATC® blade fuses are widely used by automotive OEMs. With a large installed base, the Eaton ATC easy IDTM 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.



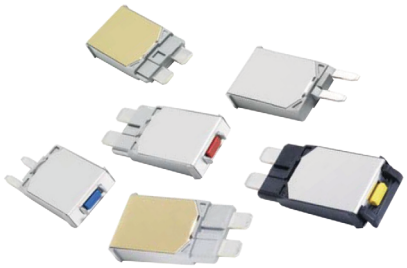
easyID™ Illuminating holders for blade fuses

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) & manufal (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)

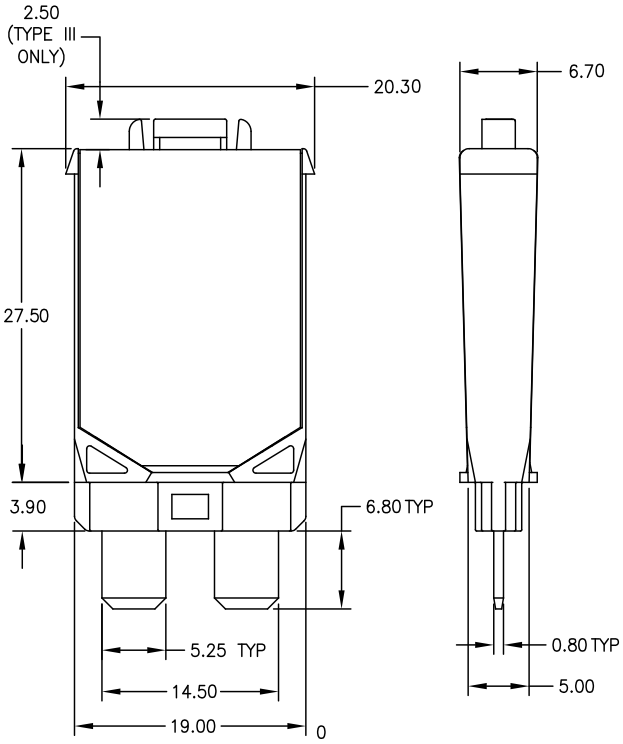


Figure 1. 22XXX-0XX With general dimensions

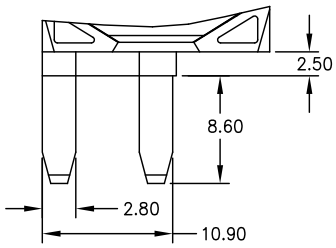


Figure 2. 22XXX-2XX

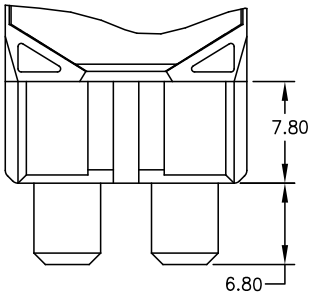


Figure 3. 22XXX-3XX

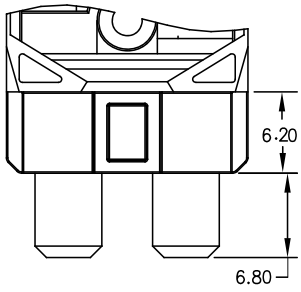


Figure 4. 22XXX-4XX

Ordering information

22X XX X XX

Series

221: Type I, 14 VDC
222: Type II, 14 VDC
223: Type III, 24 VDC

Consult factory for terminal option availability.

Rating

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)

Terminal

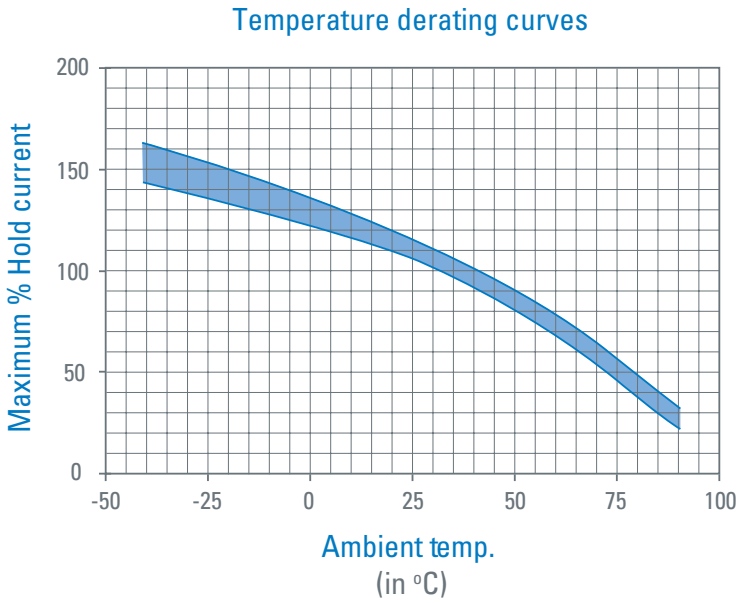
0: ATC® Fuse, 4mm insertion depth
2: 8.1mm Centerline 280 (MINI)
3: ATC® Fuse, Aptiv Autofuse Block (e.g. 12004943)
4: ATC® Fuse, Blocks with raised shrouds, 6.4mm insertion depth

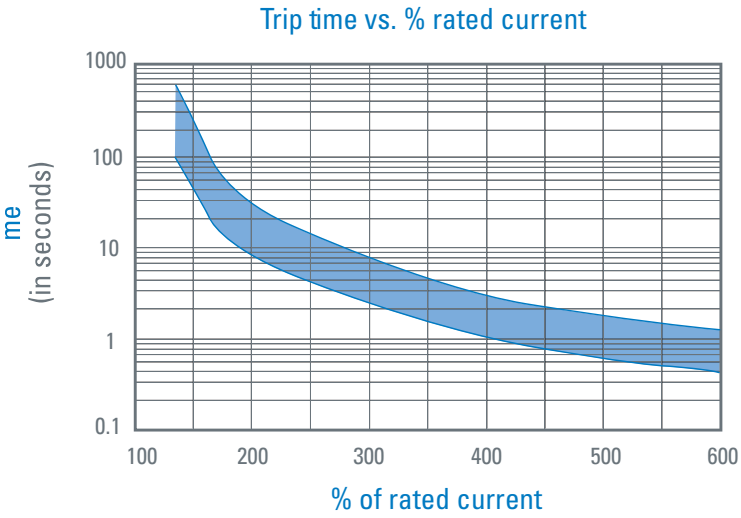
Marking

00: Standard

(Consult factory for special marking options)

Temperature derating / Time current curves





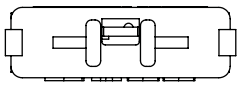
Series 227

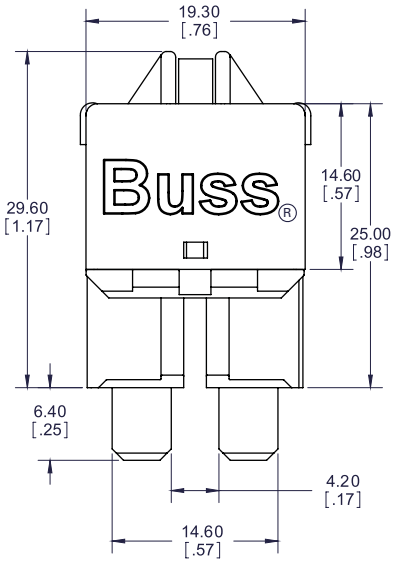
ATC Circuit breakers (low profile)

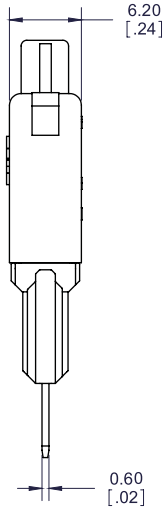
Specifications

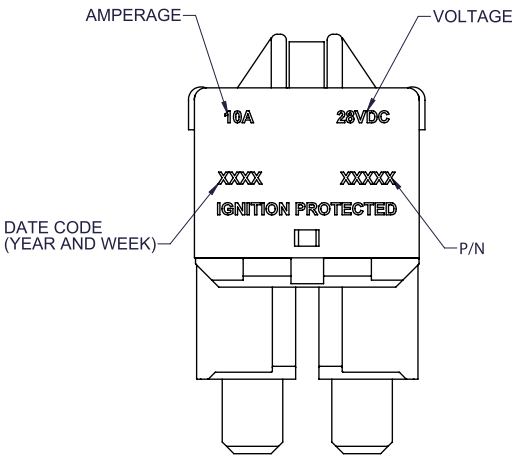
- Manual reset
- Single Pole Thermal Type Breakers
- **Rating:** 5-30A, 28VDC
- **Interrupt Rating:** 2000A @ 28VDC
- **Operating Temperature Rating:** –40°F (–40°C) to 185°F (85°C)
- **Storage Temperature Rating:** –40°F (–40°C) to 260°F (125°C)
- **Materials:** UL 94-V0 thermoplastic body. Tin-plated 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)







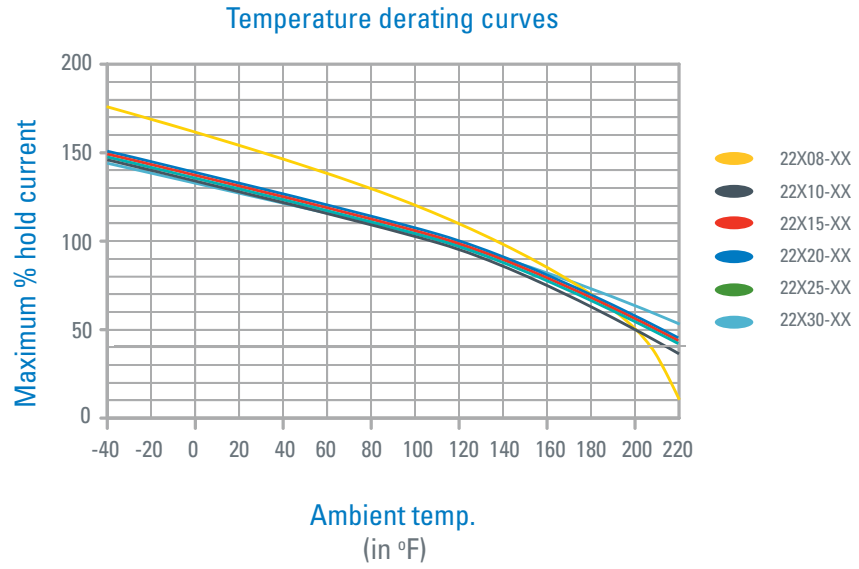


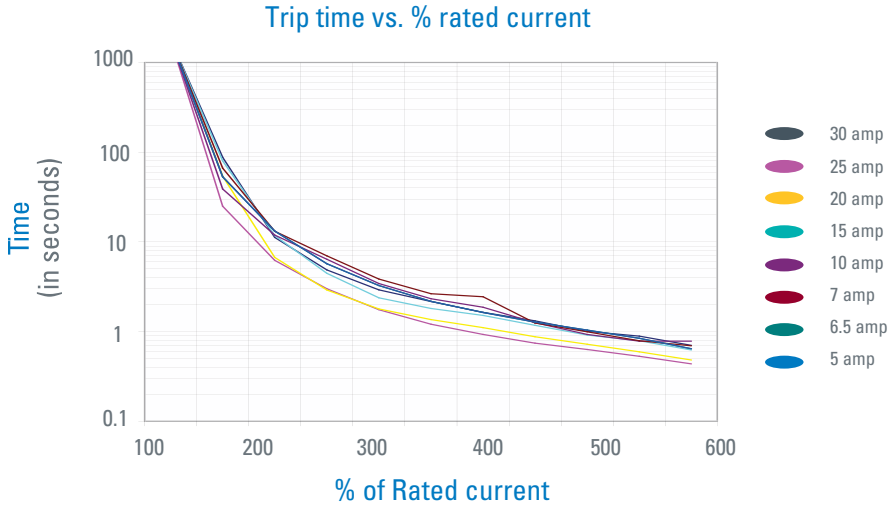
Ordering information

227 XX XX

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



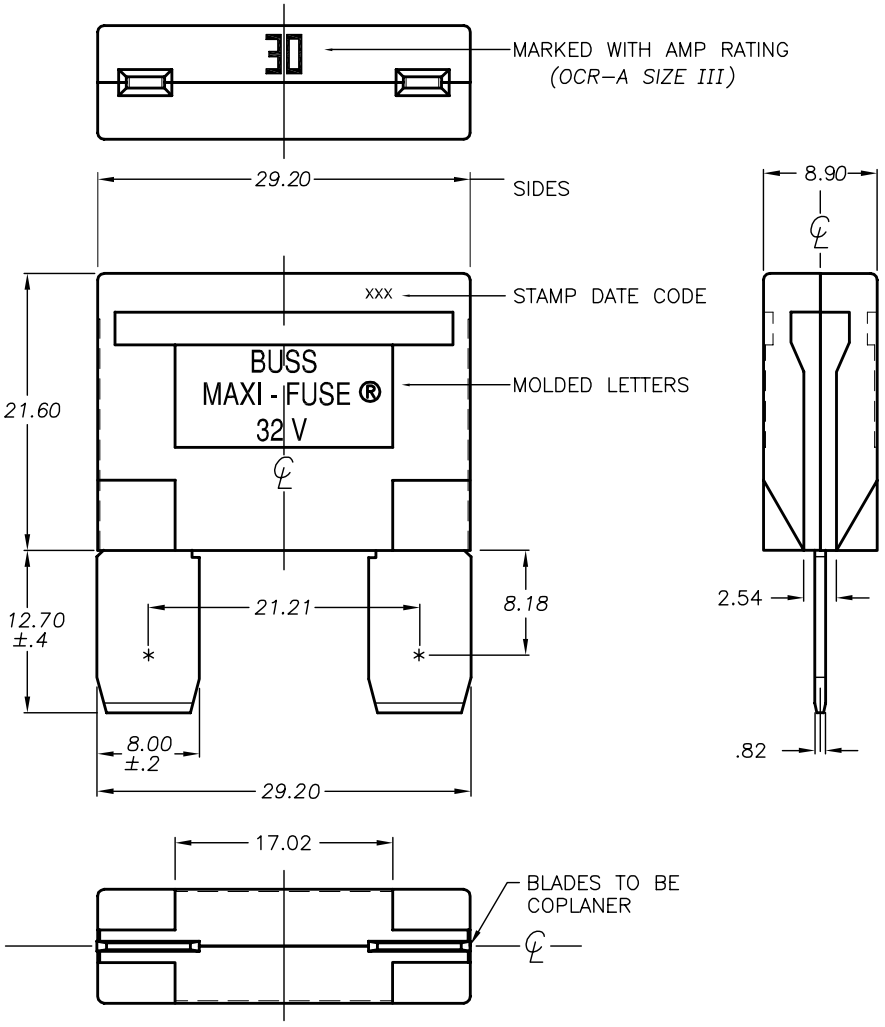


MAXI Blade fuses

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)

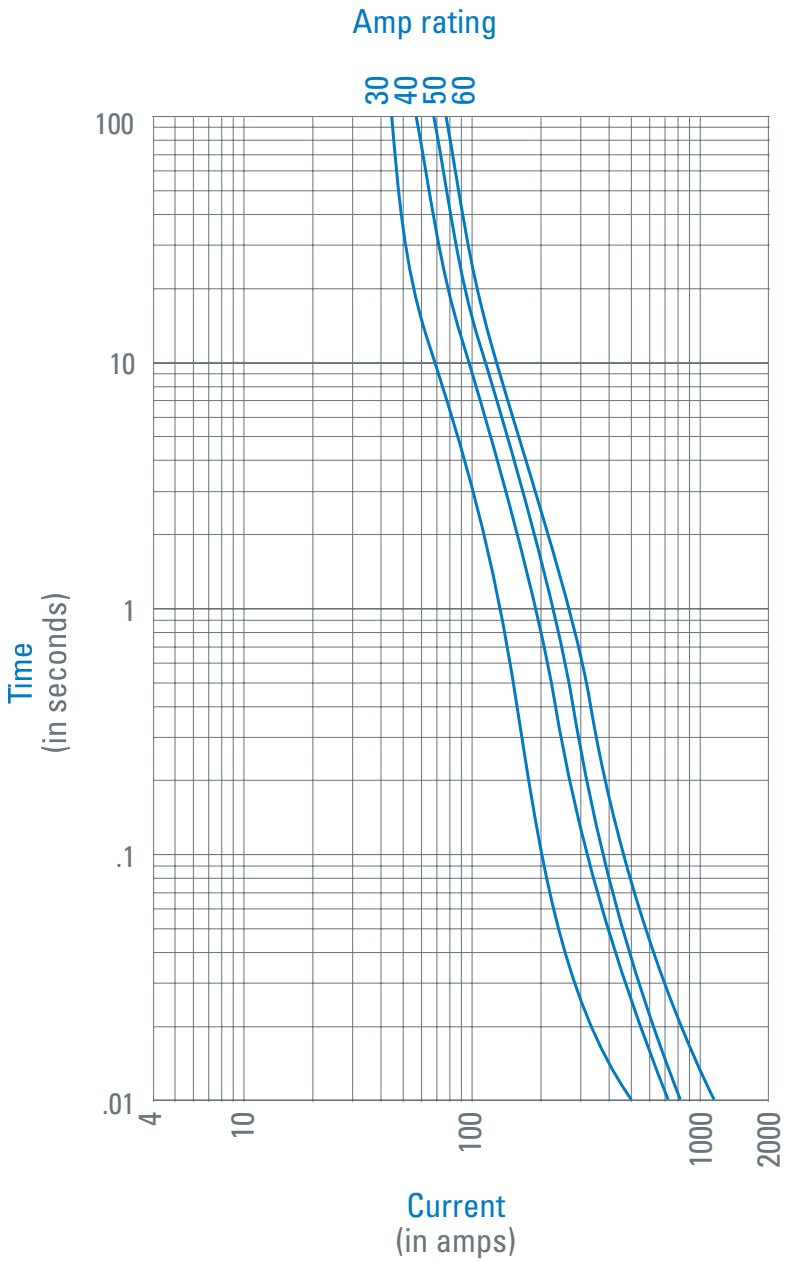
Dimensions in inches (mm)



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)

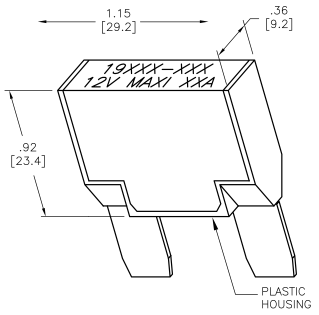


FIGURE 1. TYPES 1, 2, 4 & 5

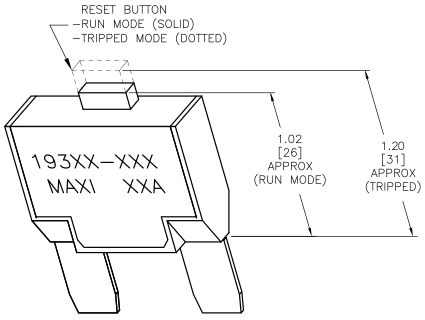
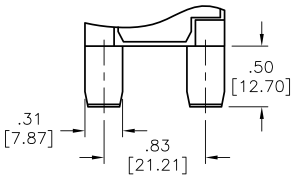
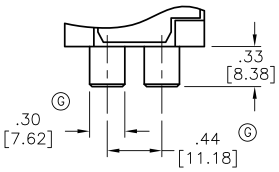


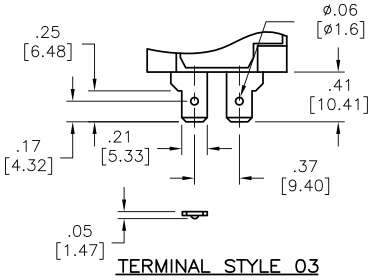
FIGURE 2. TYPE 3



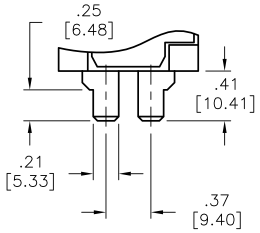
TERMINAL STYLE 01



TERMINAL STYLE 02



TERMINAL STYLE 03



TERMINAL STYLE 04

Ordering information

19X XX XX X X

Series

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

Rating

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

Cover

M: Metal

Terminal

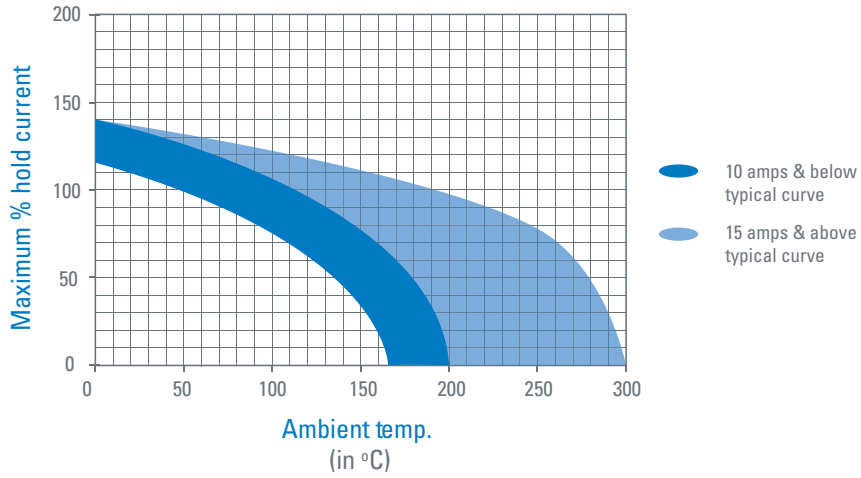
01: MAXI®
02: Wide ATC®
03: Long ATC® (w/dimple)
04: Long ATC® (no dimple)

Marking

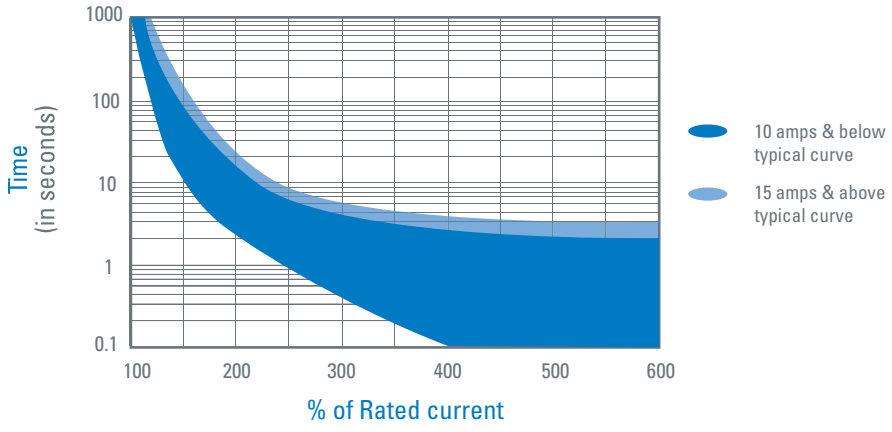
00: Standard
(Consult factory for special marking options)

Temperature derating / Time current curves

Temperature derating curves



Trip time vs. % rated current



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
3200: 3200 series

Rating			
Top	**Right**	**Bottom**	**Left**
0: MINI CB	MINI Fuse	ATC® CB	ATC®
1: MINI CB	Blank	ATC® CB	Fuse
2: MINI CB	Blank	MINI Fuse	Blank
3: ATC® CB	Blank	ATC® Fuse	Blank
			Blank

Series 32013

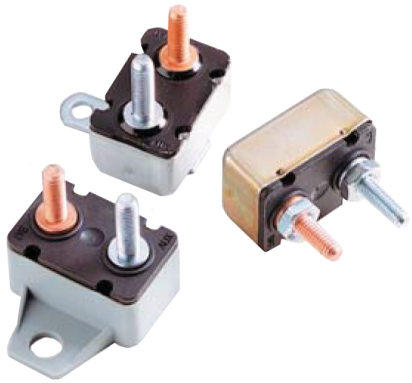
2.8mm (mini) fuse and circuit breaker insertion/extraction tool. Can be used with Series 32000 Dual Vehicle Electrical Center.

Features

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

Series 12X

Shortstop circuit breakers



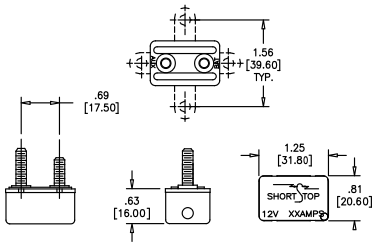
Specifications

- 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)

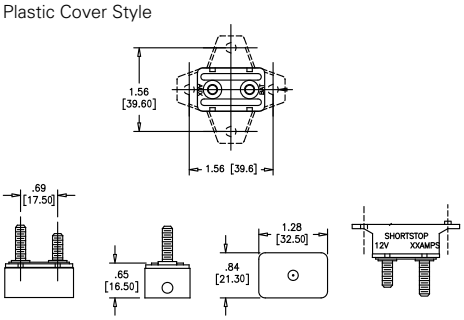
Dimensions in inches (mm)

12XXXX-XXX-XX-XX

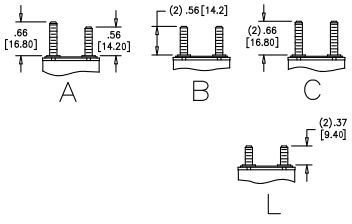
Metal Cover Style



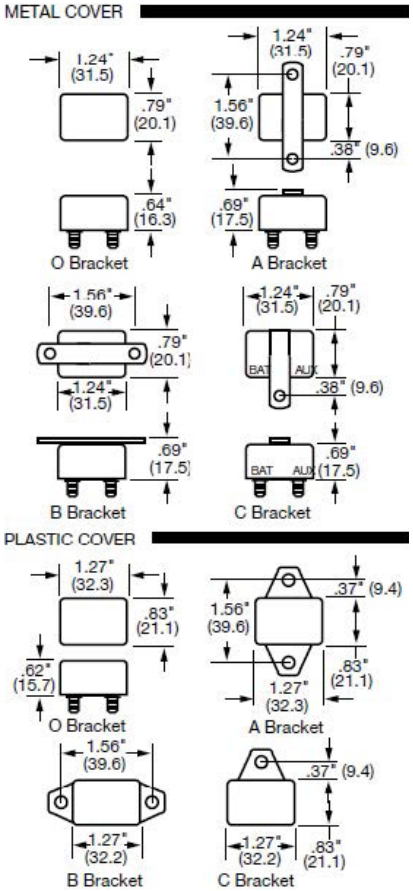
Plastic Cover Style



Termination Styles



Cover & bracket options



Ordering information

12X X XX X X X XX XX

Series
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

Terminal
01: MAXI®
02: Wide ATC®
03: Long ATC® (w/dimple)
04: Long ATC® (no dimple)

Rating
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

Bracket
0: No bracket
A: Bracket
B: Bracket
C: Bracket
E: Bracket (plastic only)

Mtg. holes
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

Cover*
M: Metal
P: Plastic

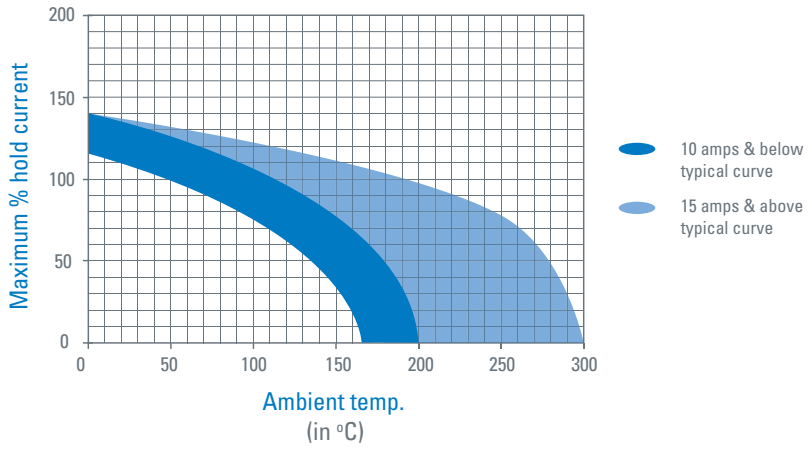
Options
01: Waterproof (metal covers only)
02: Splash proof (optional on metal covers- add 02 suffix; std. on plastic covers - omit 02 suffix.)

Hardware
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

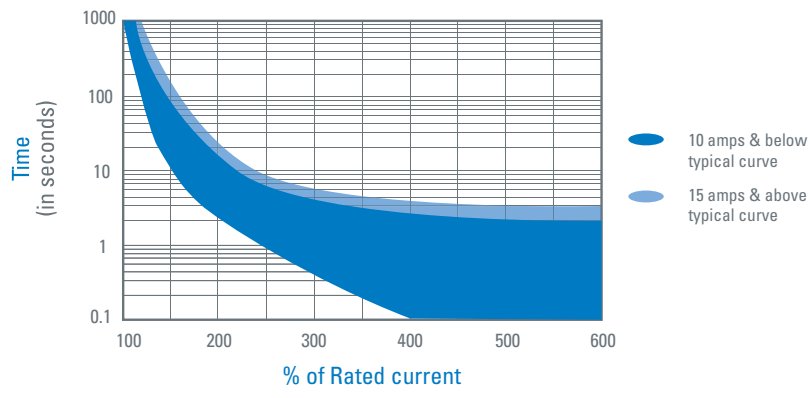
*Series 123 available in plastic cover only.
Series 122 & 125 available in metal cover only.
**40A maximum
***30A maximum
Please consult factory regarding configuration availability.

Temperature derating / Time current curves

Temperature derating curves



Trip time vs. % rated current

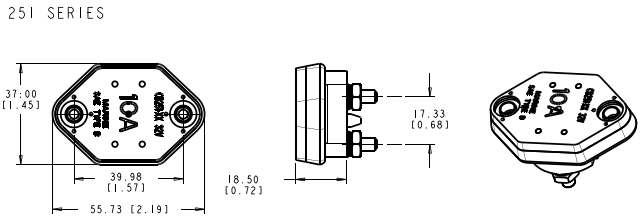


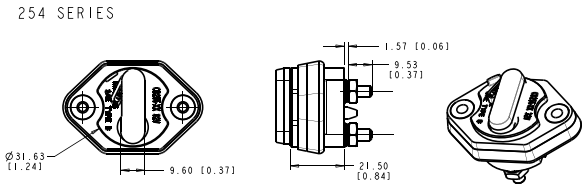
Series 25X Mid-Range circuit breakers

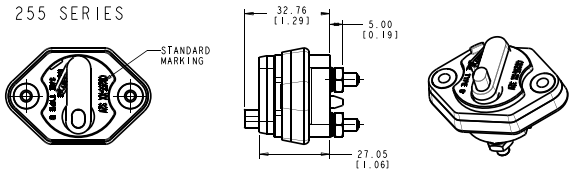
Specifications

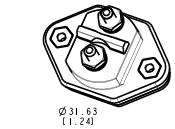
- Auto (Type 1), Modified (Type 2) & Manual (Type 3) breakers available
- Single Pole Thermal Type Breakers
- **Applications:** This unit is external ignition protected and weatherproof. It is typically used in DC power systems in marine applications (as a main or branch circuit breaker), truck, bus 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)

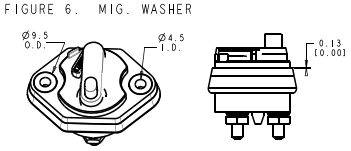
Dimensions in inches (mm)



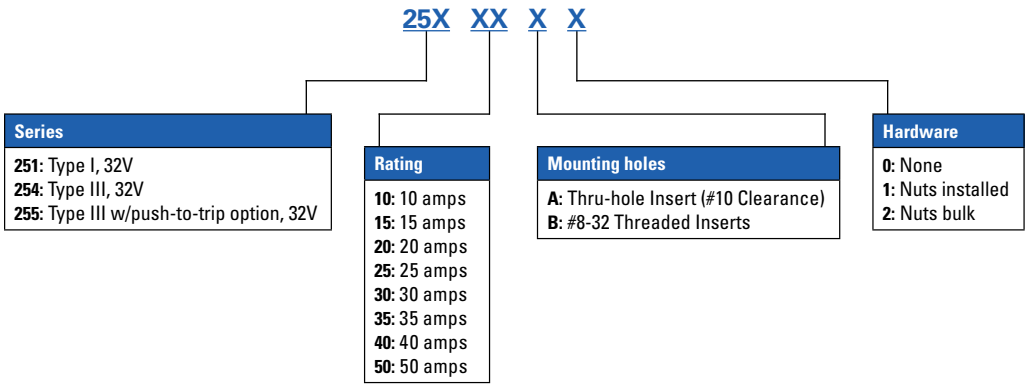








Ordering information



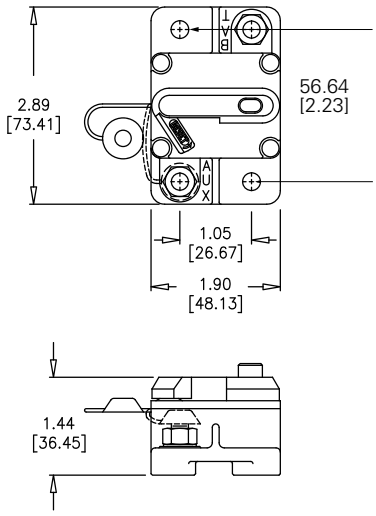
Series 18X Hi-Amp circuit breaker

Specifications

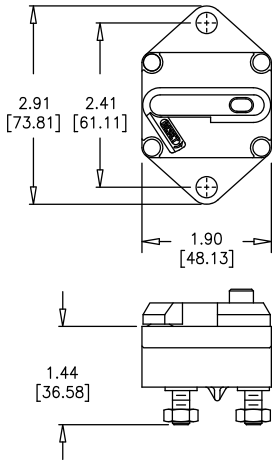
- Auto (Type 1), Modified (Type 2) & Manual (Type 3) breakers available
- Single Pole Thermal Type Breakers
- **Applications:** Typically used in auxiliary and accessory circuits in truck, bus', RVs and marine systems. Others include battery chargers and DC audio systems. Series 181, 184 & 185 are sealed 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



Ordering information

18X XXX X XX X

Series
- **181:** Type I, 30V
- **183:** Type I*, 30V
- **184:** Type III, 42V
- **185:** Type III-PTT, 42V

*183 available in panel mount only (coverless)

Rating
- **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

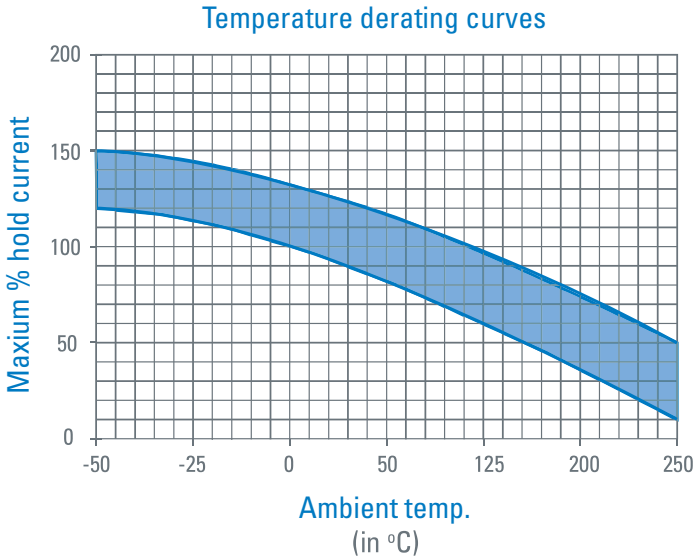
Mounting
- **F:** Surface mount
- **P:** Panel mount

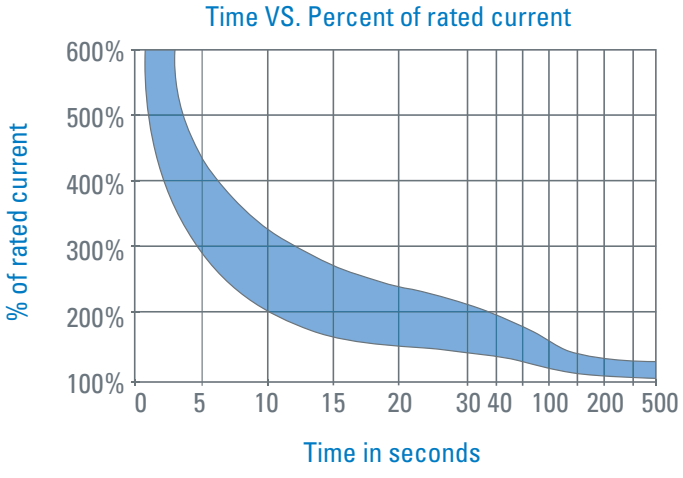
Terminal hardware
- **00:** Ship w/o nuts
- **01:** Sems nuts installed
- **02:** Sems nuts shipped bulk
- **03:** Stainless Steel Std. nuts & washers installed
- **04:** Stainless Steel Std. nuts & washers shipped bulk
- **07:** Flange gasket & Sems nuts installed (Panel Mount Only)
- **08:** Threaded insert and Sems nuts installed
- **12:** Stainless steel nuts and lock washers installed
- **13:** Stainless steel Sems nut installed

Marking
- **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





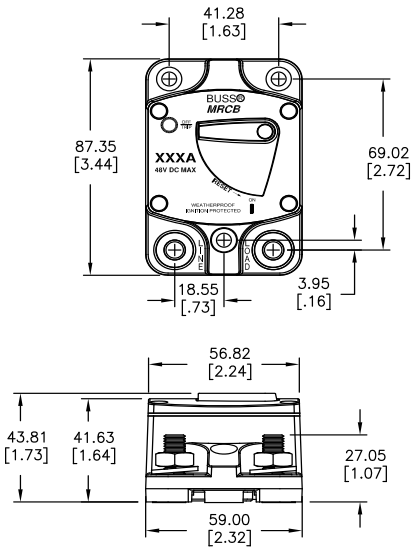
Series 187 Marine rated circuit breaker (MRCB)

Specifications

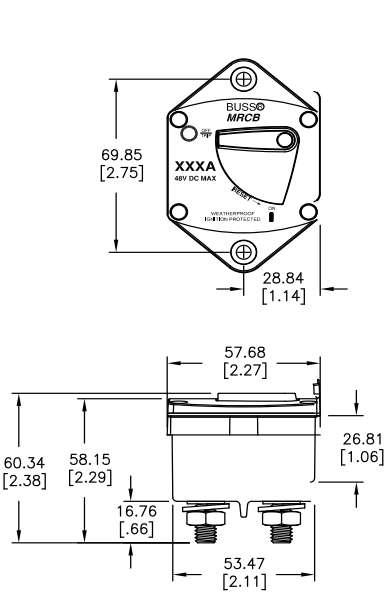
- Manual (Type 3) breakers available
- Single Pole Thermal Type Breakers
- **Applications:** Typically used in DC power systems in marine applications (as a main or branch circuit breaker), truck and bus systems, RV systems, add-on protection for accessories, lift gates, etc. This unit is external ignition 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)

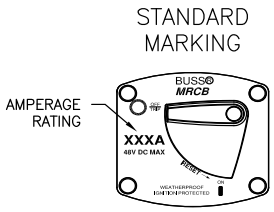
FIREWALL MOUNT



PANEL MOUNT



MARKING

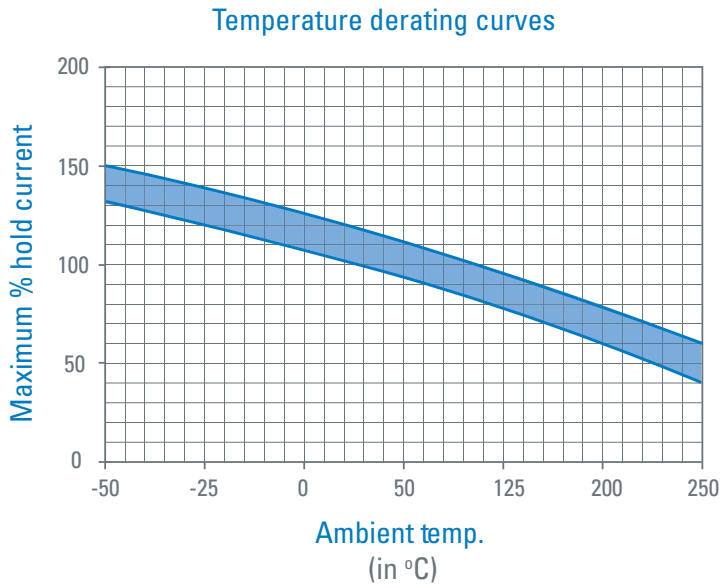


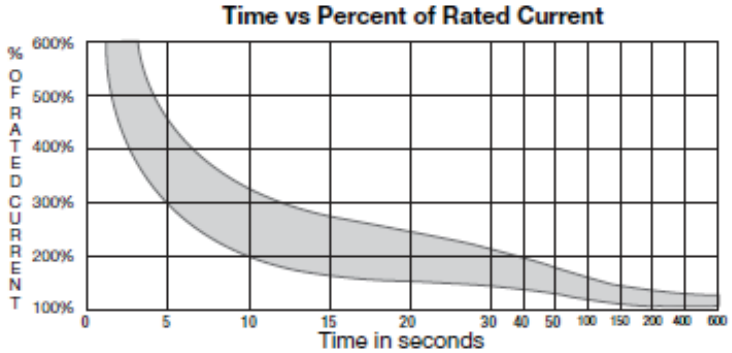
Ordering information

187 XXX X XX X

Series	Rating	Mounting	Hardware	Marking
187 = Manual Reset - Switching Style Circuit Breaker	**025:** 25 amps **030:** 30 amps **035:** 35 amps **040:** 40 amps **050:** 50 amps **060:** 60 amps **070:** 70 amps **090:** 90 amps **100:** 100 amps **110:** 110 amps **120:** 120 amps **135:** 135 amps **150:** 150 amps **200:** 200 amps	**F:** Surface mount **P:** Panel mount	**00:** No hardware **03:** Stainless nuts & lockwashers - installed on studs **04:** Stainless nuts & lockwashers - supplied	**1:** Standard Marking; Part Number, Amp Rating Consult factory for special markings.

Temperature derating / Time current curves





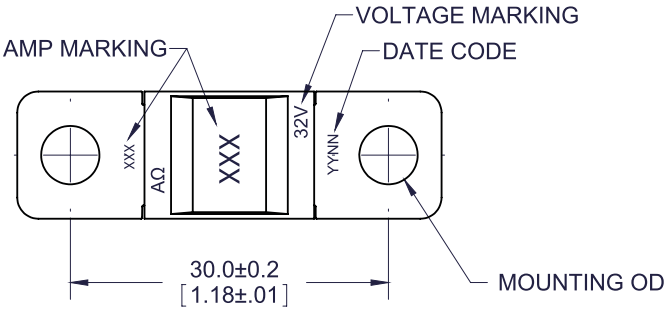
AMI Series

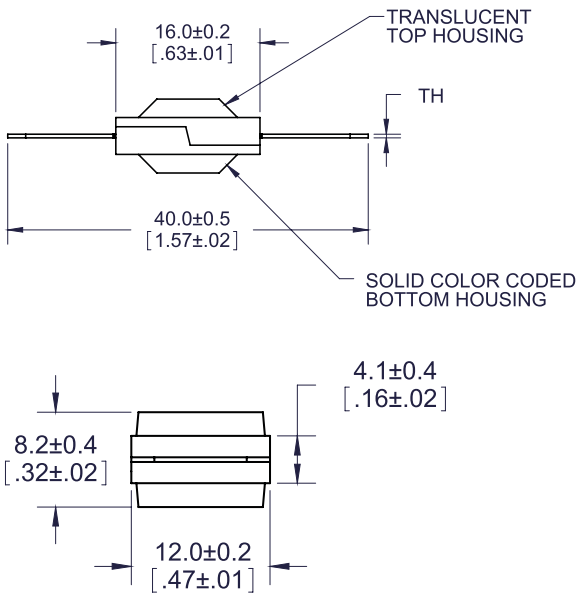
SAE/ISO SF30 fuse

Specifications

- Bolt in style fuses
- **Current Rating:** 30-200A
- **Voltage Rating:** 32VDC
- **Interrupt Rating:** 2000A @ 32VDC; 5000A@ 16VDC
- **Housing Material:** UL 94-V0 thermoplastic
- **Teminal 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)



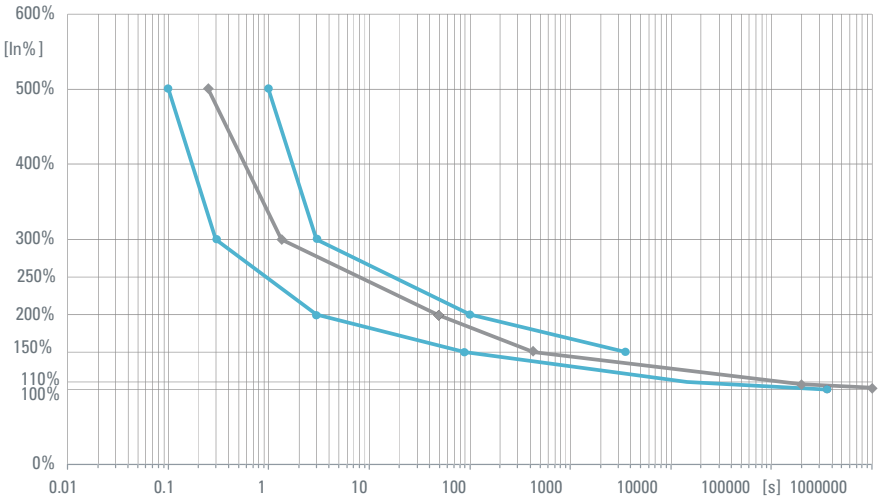


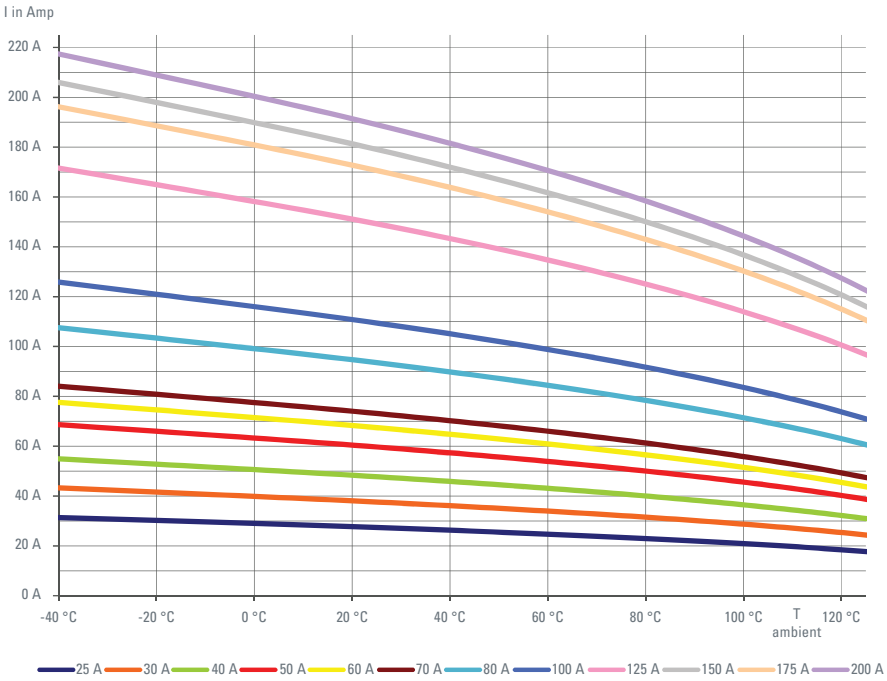
Ordering information

BK-AMI 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



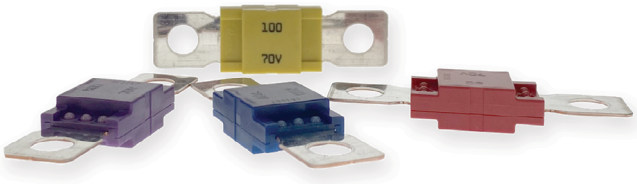


Time current specifications

	30A - 125A		150A - 200A	
% of rating	**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



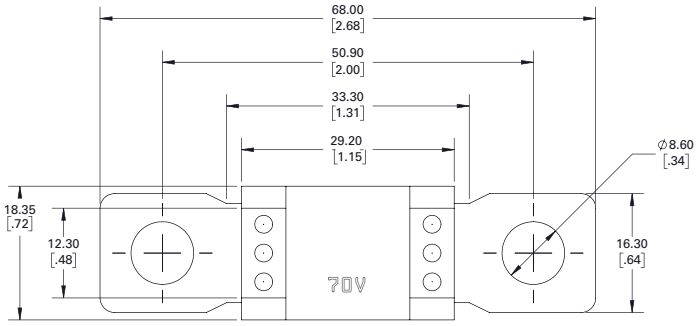
- **Catalog symbol:**
- AMG-(amp)
- BP/AMG-(amp)-RP
- BK/AMG-(amp)
- **Description:**
- Bussmann™ series AMG stud-mount

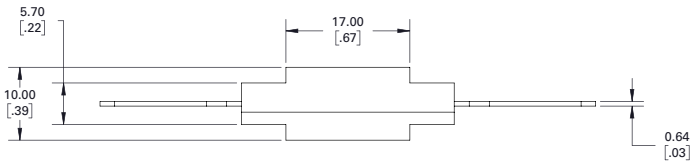
Specifications:

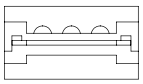
- **Ratings**
- **Volts -** 70 Vdc
- **Amps -** 60-500A
- **Interrupting rating -** 2,500 A @ 70 Vdc
- **Agency information**
- RoHS
- ISO 20934
- **Operating temperature range**
- -40°C to 120°C
- **Materials**
- **Housing materials -** UL-Rated 94V-0 thermoplastic.
- **Terminal material -** Copper
- **Mounting**
- M8 or 5/16-18 or less studs on 2.00 in
- (50.8mm) centers
- HMEG - Used up to 500A (Wiring can be 8
- AWG to 1/0 AWG)
- **Marking**
- Color-coded amperage ratings

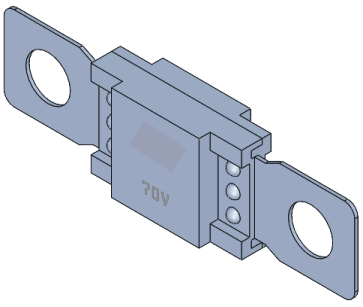
*Consult factory for higher voltage fuses.

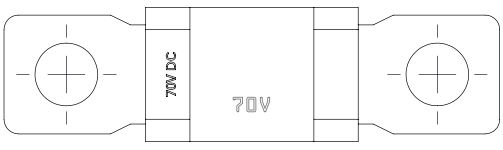
Dimensions in inches (mm)









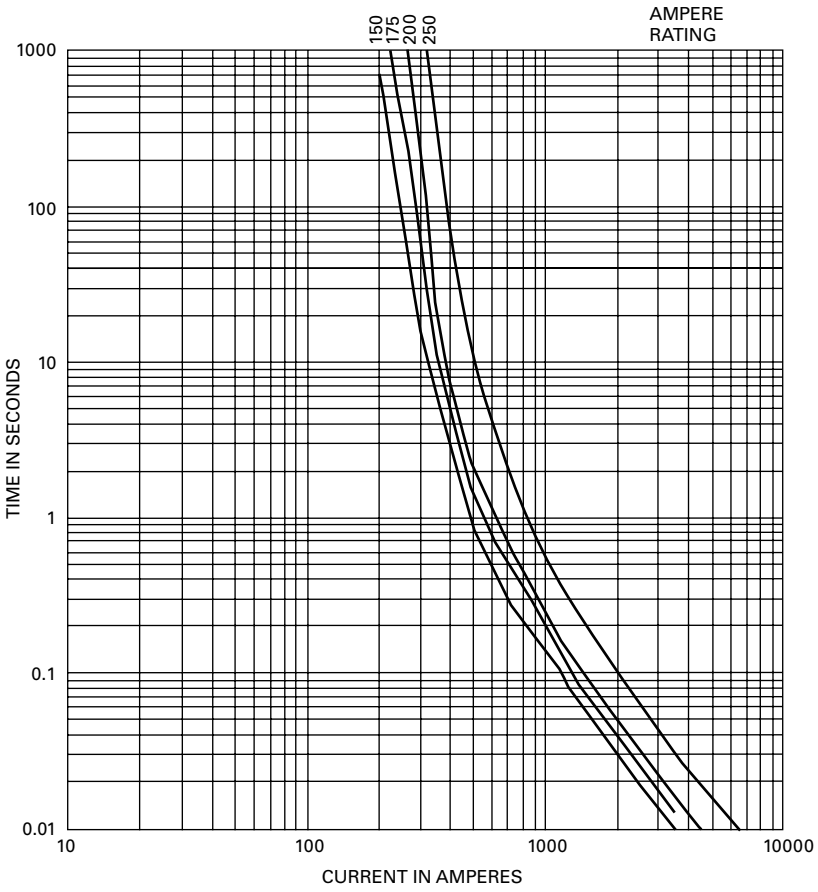


Ordering information

BK-AMG X

Series	Suffix
BK-AMG: AMG series	**100:** 100A **125:** 125A **150:** 150A **175:** 175A **200:** 200A **225:** 225A **250:** 250A

Temperature derating / Time current Curves



Time current specifications

80A-250A

% of rating	Min	Max
100	4 hrs	—
135	120s	1800s
150	20s	450s
200	1s	15s
350	0.3x	5s
600	0.02s	1s

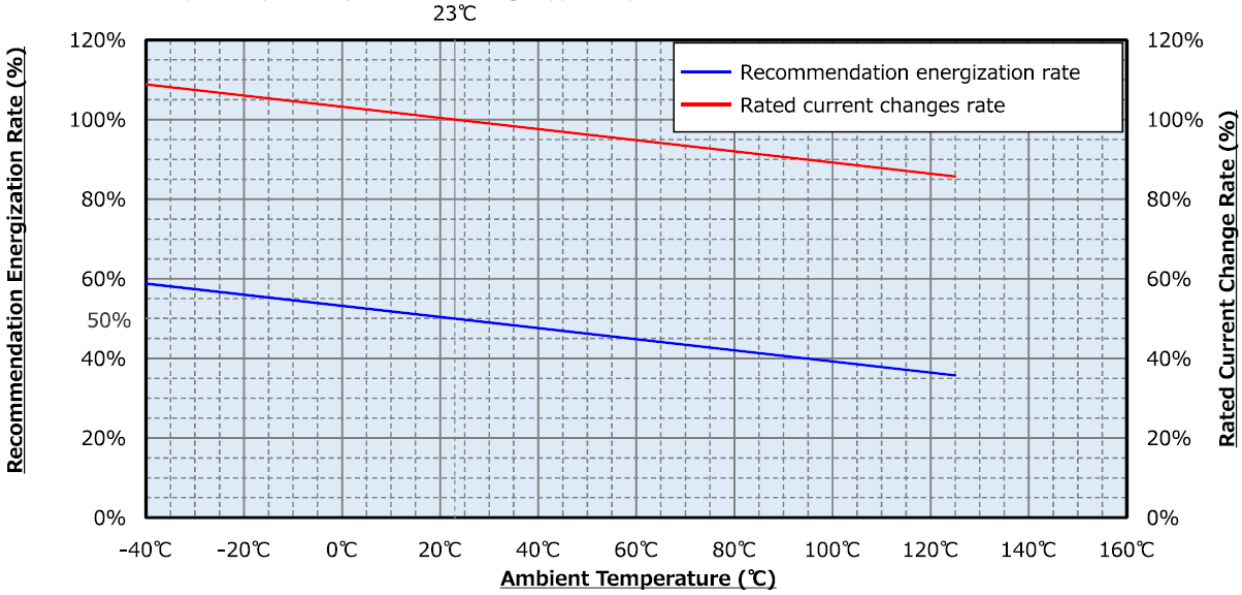
300A-500A

% of rating	Min	Max
75%	4 hrs	—
200%	1s	15s
350%	0.5s	5s

SBFW Series Derating Curve

(SBFW-L, K, L48V, K48V. Apply to all rated current)

The changing ratio of rated current of this product (or Series) is -0.14%/℃, since this product (or Series)'s element is using Copper alloy and Tin.



This product (or Series) is recommended to use less than 50% of rated current at 23℃ ambient temperature. However, it can be used at higher than 50% of rated current depending on actual usage condition.

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)

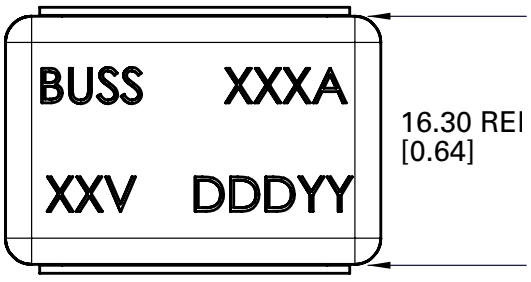
Material:

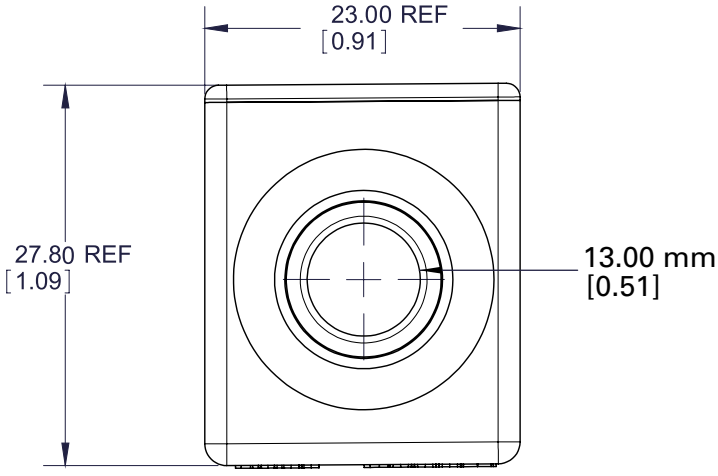
- Body - Ceramic
- Housing & Cover: UL 94-V0 Thermoplastic
- Ring Terminals - Tin Plated

Operating times

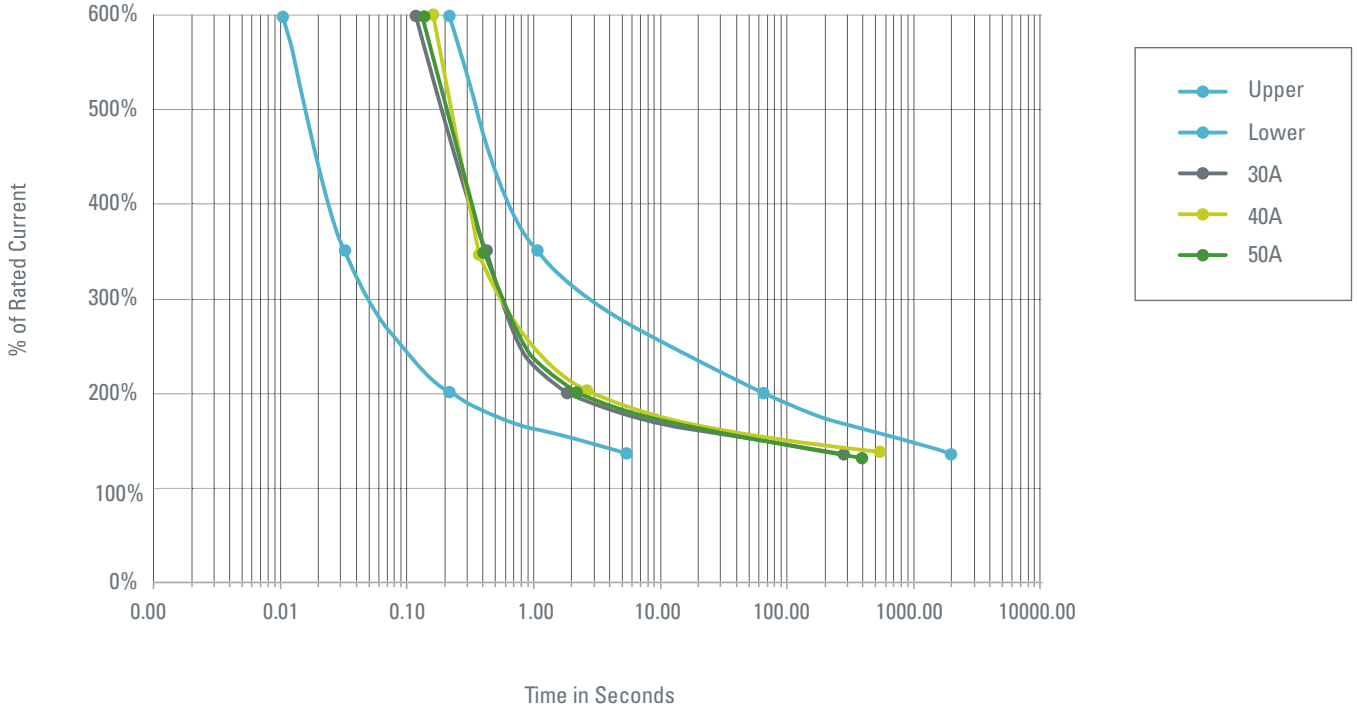
Rating	100%	135%		200%		350%		600%
30A - 300A	> 100 hrs	min	max	min	max	min	max	< 0.2s
	> 100 hrs	-	900s	-	60s	0.1s	1s	< 0.2s

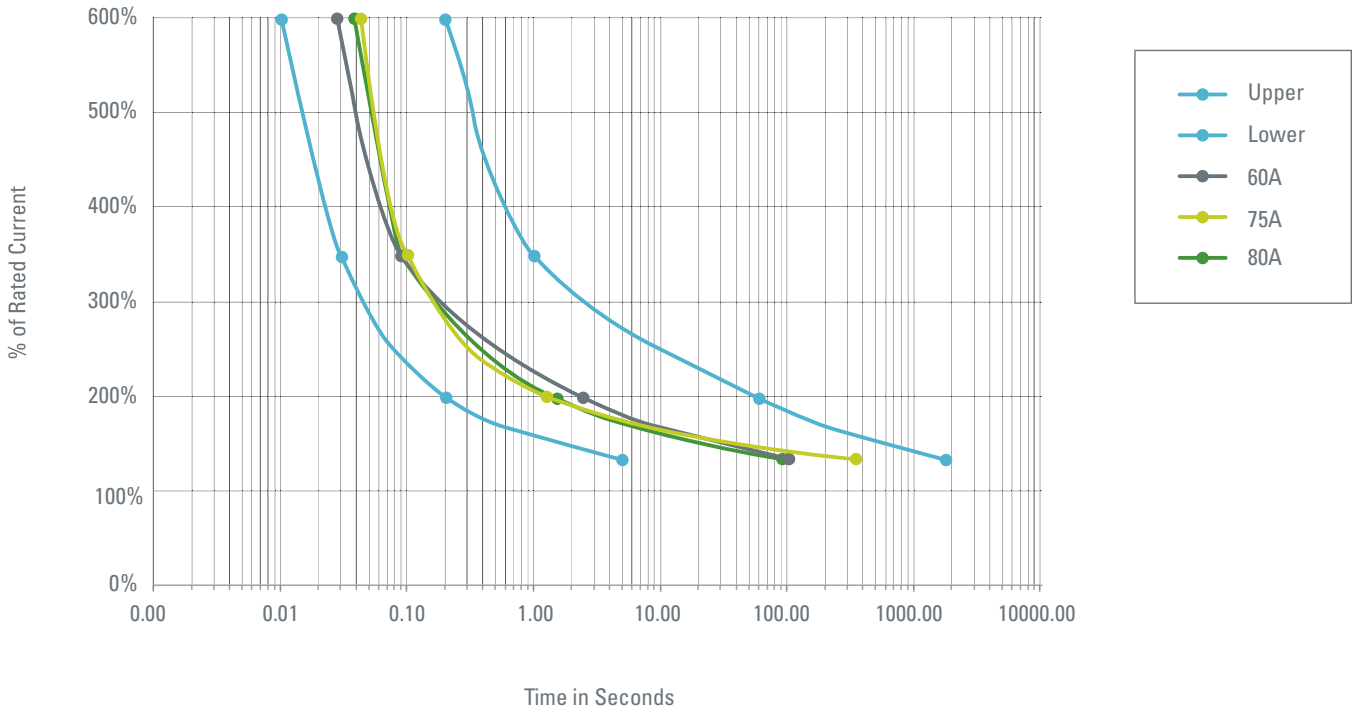
Dimensions in inches (mm)



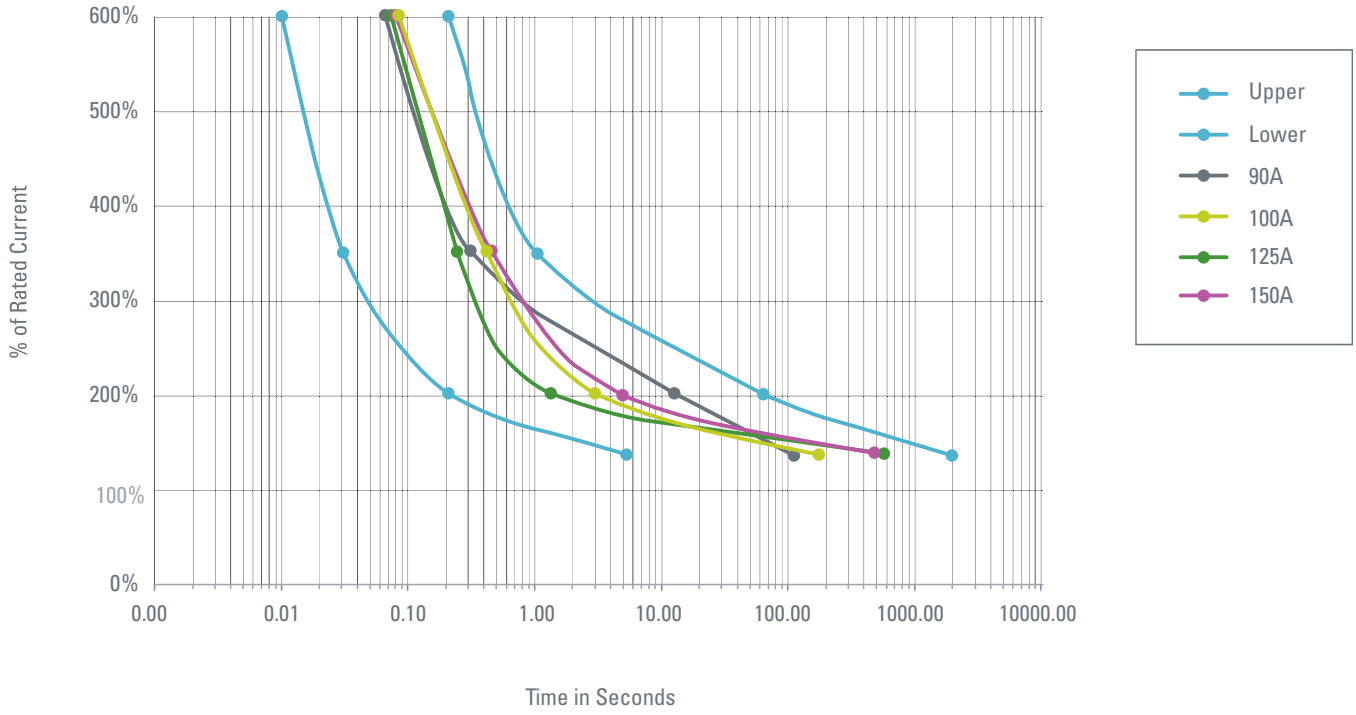


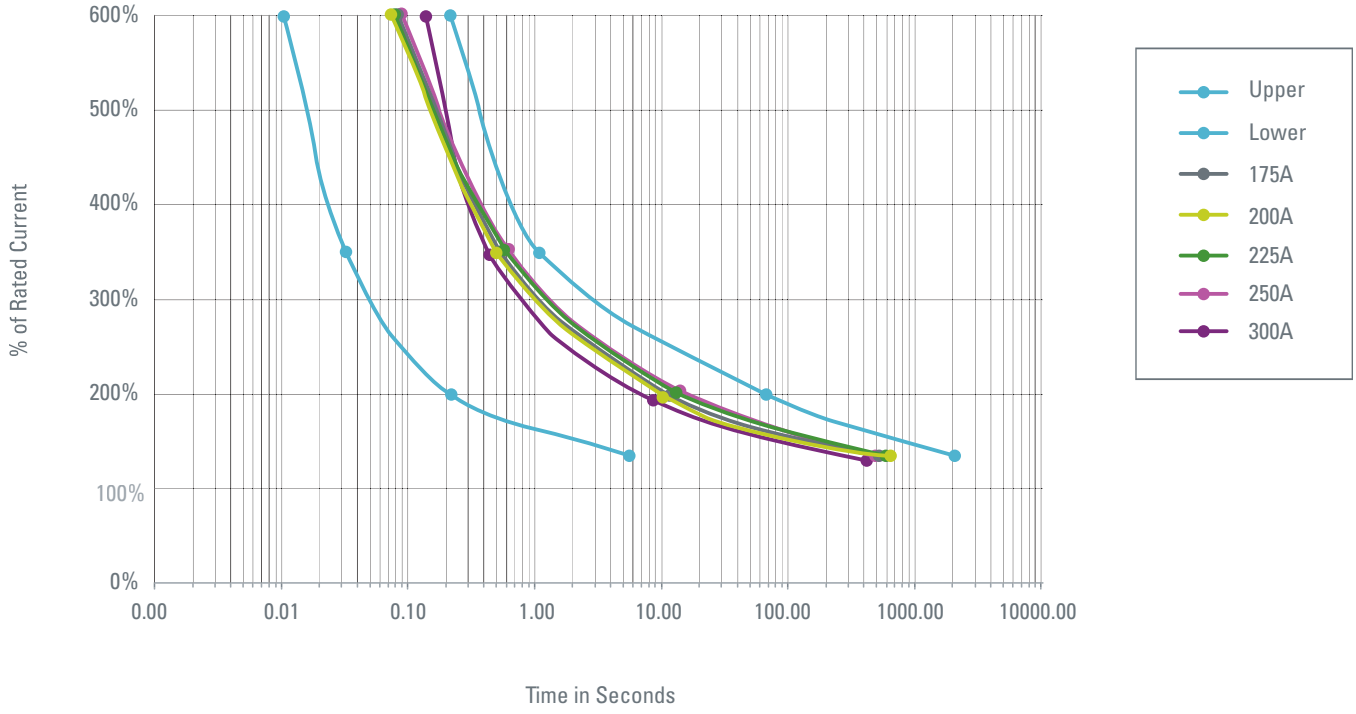
Temperature derating / Time current curves





Temperature derating / Time current curves



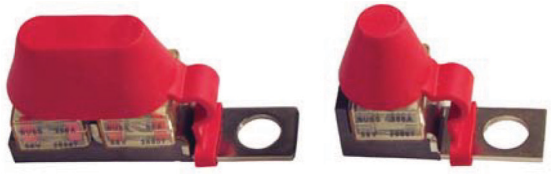


Ordering information

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]
SFBAR2 - M8XBP	46.5 [1.83]	13.5 [0.531]

Wireless mobile machine controls

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" transflective 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

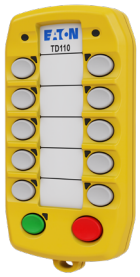
T151 Portable 14-Function radio remote control transmitter

- 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

Mobile machine control



TD110 two-way handheld remote control

- Two-way communication for real-time and precise machine feedback
- Robust construction with superior ingress protection, purposefully built for the harshest environments (IP65 and IP67 ratings)
- 1650 ft. range at 900 MHz (900 ft. @ 2.4 GHz)
- Multi-color indicator LEDs on control buttons give operator real time status and information
- Built-in rechargeable long-life lithium battery pack
- Contactless charging

TD2100 two-way handheld remote control

- 1650 ft. range at 900 MHz (900 ft. @ 2.4 GHz)
- 2-inch backlit FSTN monochrome LCD display with graphics capability
- Compact design with user-customized configuration control options of paddles, 2-axis joysticks, buttons, standard & specialized toggle switches, and potentiometers
- Multiple battery options: rechargeable long-life lithium battery pack or off-the-shelf alkaline batteries, external battery charger available
- Bluetooth connectivity to Eaton wireless accessory
- Tether as alternate to wireless connectivity and for user configurability
- E-stop function with twist to release
- Available accessories including tether cable and external battery pack charger

TD1140 two-way handheld remote control

- 1650 ft. range at 900 MHz (900 ft. @ 2.4 GHz)
- OMNEX Trusted Wireless FHSS technology
- 1.8-inch backlit monochrome LCD display with graphics capability
- Proportional button capability with user-customized sensitivity
- Multiple battery options: rechargeable long-life lithium battery pack or off-the-shelf alkaline batteries
- Contactless charging and external battery charger available
- Bluetooth connectivity to Eaton wireless accessory
- Tether as alternate to wireless connectivity and for fast & simple user configurability
- E-stop option (twist to release)

TD3100 small belly-pack remote control

- 1650 ft. range at 900 MHz (900 ft. @ 2.4 GHz)
- 3-inch backlit FSTN monochrome LCD display with graphics capability
- Compact design with user-customized configuration control options of paddles, 2-axis joysticks, 3-axis joysticks, buttons, standard & specialized toggle switches, and potentiometers
- Multiple battery options: rechargeable long-life lithium battery pack or off-the-shelf alkaline batteries
- Contactless charging and external battery charger available
- Bluetooth connectivity to Eaton wireless accessory
- Tether as alternate to wireless connectivity and for user configurability
- E-stop function with twist to release

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

R270 remote control receiver

- 900 MHz and 2.4 GHz
- OMNEX Trusted Wireless FHSS technology
- Dual J1939 or proprietary CAN interfaces are designed for seamless network integration
- Three I/O options, for additional auxiliary controls
- CAN interface ensures suitability for the multiplexed environment
- Two-way radio technology allows machine operation data to be fed back to an operator
- Rugged IP67 rated enclosure ensures maximum protection against environmental exposure
- Custom programming options for flexible and precise control across a diverse application base
- Compatibility with T110, T150, and T300 remotes preserves equipment investment
- Simple, tool-free pairing with transmitters eliminates risk of service damage to the enclosure
- Up to 2,300' (700m) line-of-sight operational range
- Field upgradable (via USB port)

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

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.

E31 eSM—Keypad multiplexed switch module

Electronic products

Product description

Because your vehicle is continuously exposed to nature's elements, we offer the latest in Eaton's multiplexed line of switch product, the E31 Keypad. Eaton's E31 Keypad multiplex switch module offers a flexible and sealed solution for high-density switch requirements in severe environments.
The keypad can be configured with any graphic/switch, as well as with customerdefined illumination. For customers requiring additional switches, expansion modules can be used with no requirement for additional CAN nodes.
For additional product flexibility and differentiated operator control the E31 Keypad is designed to communicate with E33 rocker expansion modules.

Application description

Great for specialty vehicle, construction, and agricultural equipment markets.
The keypad is especially suitable for severe environmental applications and where there is a desire to move to a multiplexed solution to simplify wiring and control requirements.
Typical applications are:

Target market segments

- Tractors
- Wheel loaders
- Refuse vehicles
- Concrete mixers
- Street sweepers
- Mining equipment
- Emergency vehicles
- Transit buses

Features and benefits

Key features

- J1939/CAN 2.0b compliant, 250kb speed
- IP68 degree of protection from front and rear of module
- E33 rocker expansion module capability
- Exceptional illumination characteristics
  - LED backlighting of icons
  - Four color daylightvisible indicators per switch
  - Message-controlled dimming and flash rates
- Large switch surface area and alignment ridges for ease of gloved hand use
- Exceptional tactile and audible feedback of switch actuation
- Electrical/mechanical life to over 1,000,000 cycles
- 9–32 Vdc operating voltage
- Immunity per SAE J1455/1113
  - Power disturbance
  - Radiated immunity
  - Radiated emissions

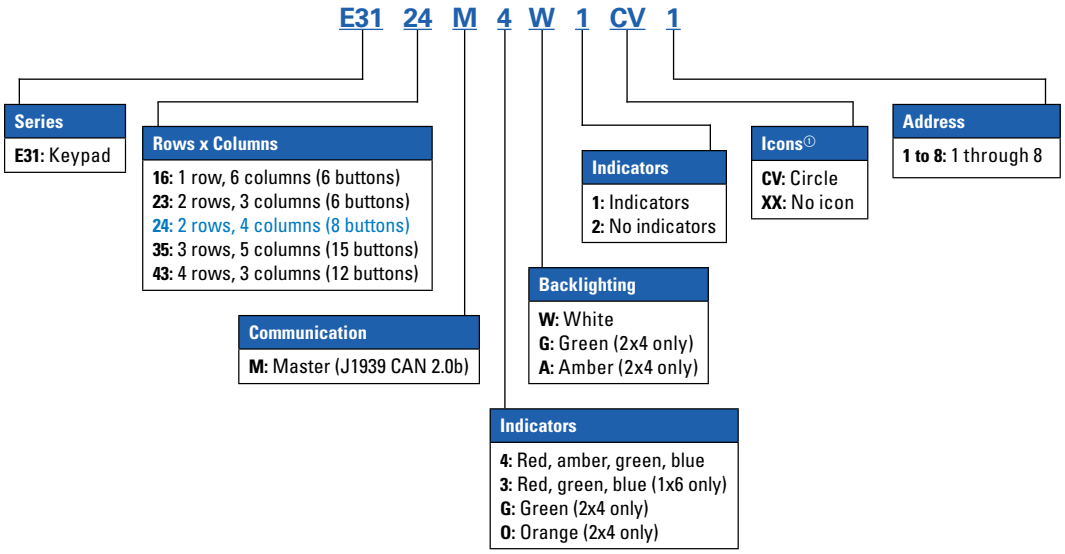
Advantages

- Reduced assembly labor due to ease of installation, allowing for mounting and connection of eight switches at one time as opposed to individually
- Reduced wire harness complexity; uses one harness to a controller, reducing wiring, connection point, and controller requirements
- Reduced harness size offers an overall reduction in weight, improving operational efficiency of the equipment
- Increase in life-cycle over traditional electromechanical switches
- Front, rear, and panel sealing for harsh environments

Catalog number selection

How to order—E31 Keypad multiplexed switch module

To determine complete catalog number, start with the appropriate control type and add the appropriate code letters and/or numbers.



Note:

① Contact Eaton sales for custom graphics.
② For use of multiple masters on 1-system.

Technical data and specifications

Master module wiring harness

The interconnection between the master module and the controller uses a minimum four-wire harness with an additional two pins associated to expansion module interconnection. Wire sizes of 16–20 AWG can be accommodated with the Deutsch connector shown in the mating connector information.

Master wiring harness

PIN	Function
1	Vbat
2	Common
3	CAN (+)
4	CAN (–)
5	Common
6	LIN

Message structure

Each CAN message contains 8 bytes of data. The first data byte is used to define the type of data carried in bytes 2 through 8. This difference compared to common J1939 message structure allows a single J1939 PGN address to support all of the data needed for switch status, LED status, system status, wake ON change, dimmer level, and all other data used by a master and expansion.

Mating connector information

Deutsch DT Series connector

6-pin connector: DT06-6S

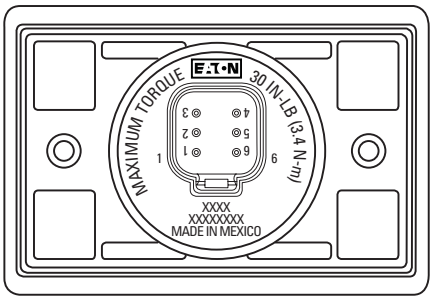
- EP11 (Black–Master)

6-pin wedge lock: W6S

Female terminal:
0462-201-16141
(16-18-20 AWG)

Hole plug: 0413-217-1605

Crimper: HDT-48-00



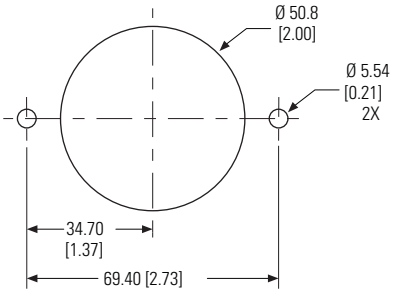
E32 and E33 Rocker expansion modules

The Keypad master module is capable of supporting Eaton's E33 product line of rocker. The E33 product line is an abovepanel– style rocker switch module that contains any combination of rocker or indicator functionality with no additional CAN node requirement to the system. Similar to the keypad, the rocker module offers icon graphic illumination with up to four center indicator bar LEDs for status or mode. This product is also fully functional to support dimming and flashing capabilities through software command.

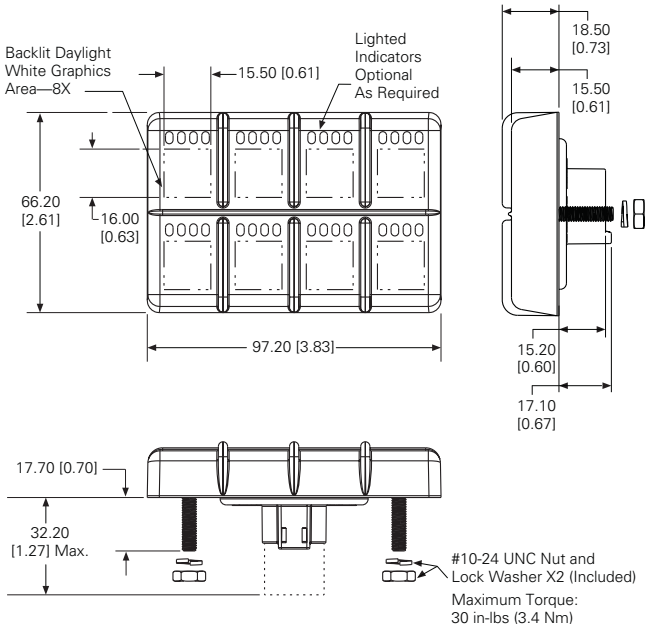
Dimensions

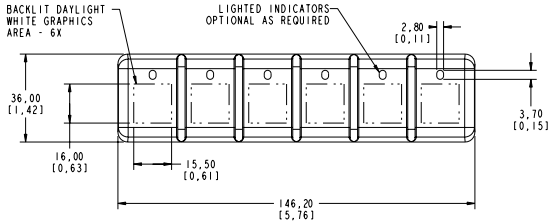
Approximate dimensions in mm [in]

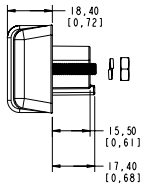
Mounting dimensions

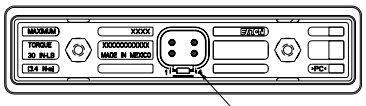


Mounting dimensions



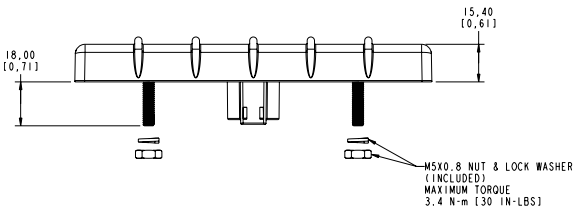


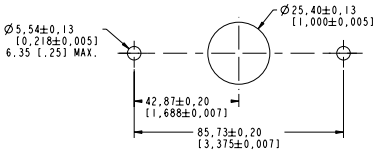




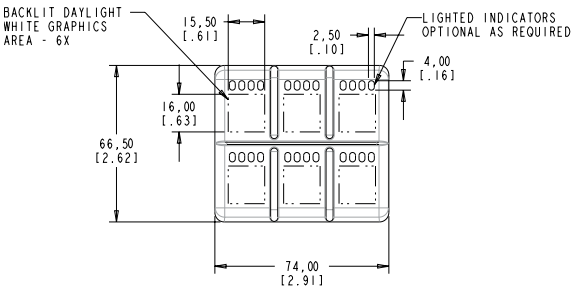
PIN NUMBER

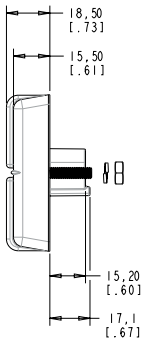
PIN NUMBER	FUNCTION
1	VBATT(12/24V)
2	COMMON
3	CAN HIGH
4	CAN LOW

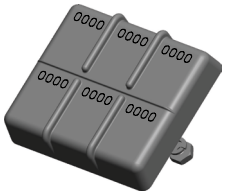


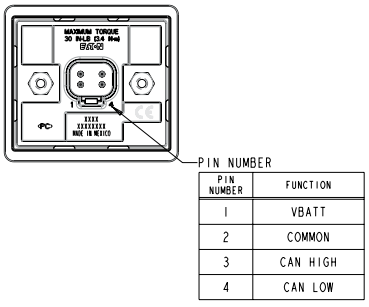


RECOMMENDED PANEL OPENING (FRONT VIEW)



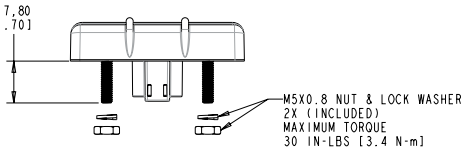


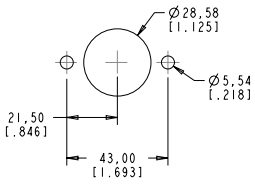




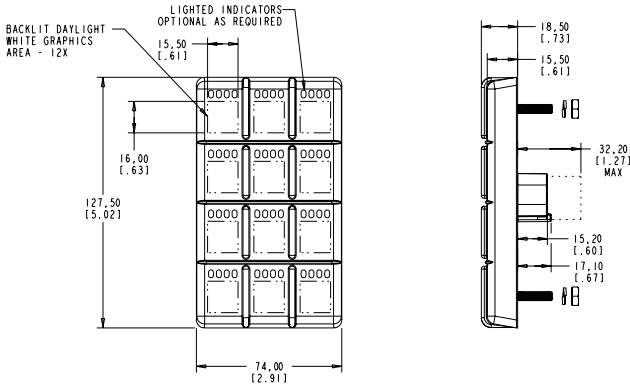
PIN NUMBER

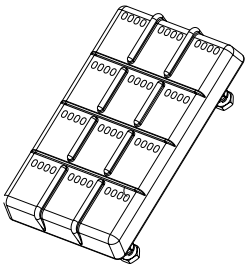
PIN NUMBER	FUNCTION
1	VBATT
2	COMMON
3	CAN HIGH
4	CAN LOW

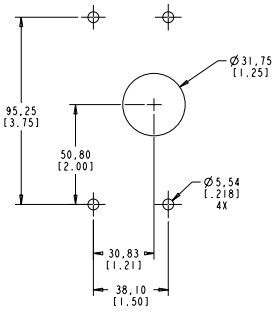




RECOMMENDED PANEL OPENING (FRONT VIEW)



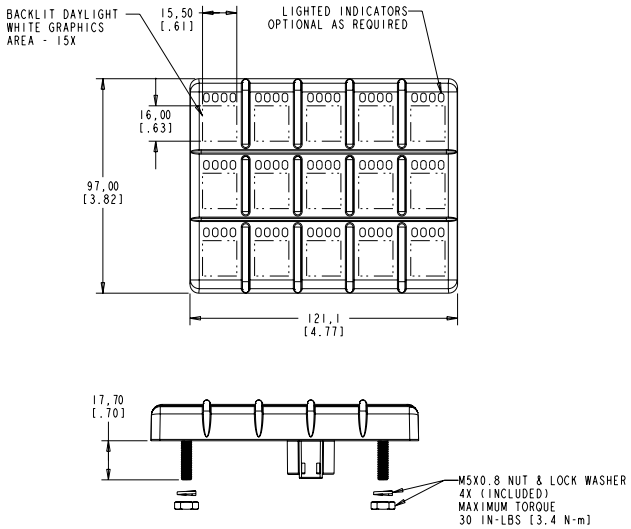


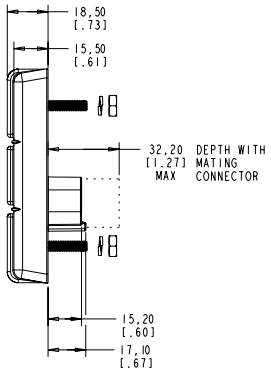


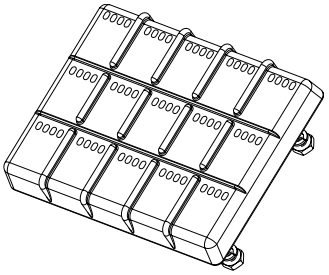
RECOMMENDED PANEL OPENING

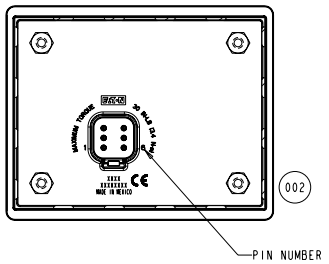
NOTES:
1. DIMENSIONS SHOWN AS MM[INCH].
2. MATING CONNECTOR: DEUTSCH PLUG DT06-6S,
WEDGE LOCK W6S,
SOCKET CONTACT 0462-201-16141
(1.0-0.5 MM^2 [16-20 AWG])
HOLE PLUG 0413-217-1605

PIN NUMBER	FUNCTION
1	VBATT
2	COMMON
3	CAN HIGH
4	CAN LOW
5	COMMON
6	LIN



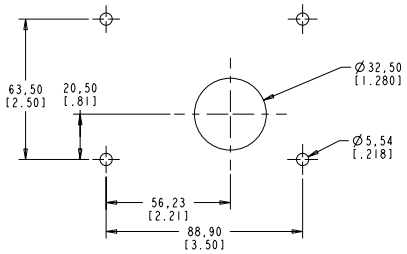






NOTES:
1. DIMENSIONS SHOWN AS MM[INCH].
2. MATING CONNECTOR: DEUTSCH PLUG DT06-6S,
WEDGE LOCK W6S,
SOCKET CONTACT 0462-201-16141
(1.0-0.5 MM^2 [16-20 AWG])
HOLE PLUG 0413-217-1605

PIN NUMBER	FUNCTION
1	VBATT
2	COMMON
3	CAN HIGH
4	CAN LOW
5	COMMON
6	LIN



RECOMMENDED PANEL OPENING

E33—Sealed multiplexed rocker switch module

E33 Multiplexed Rocker Switch Module

Product description

Sealed multiplexed master module using a lin sub bus to communicate with up to seven expansion modules.

eaton is pleased to introduce the newest line of multiplexed electronic Switch Modules, the E33 product line. The E33 offers an increased level of flexibility over previous modules including:

- Fully sealed to IP68 from the front and rear
- Locking rocker options
- Palm guard option

The E33 eSM offers a complete range of switch circuits as well as indicator options to meet all your control requirements. E33 includes individual icon lighting as well as a multi-color center indicator option allowing for steady state, flashing and dimming controlled via messaging. Additional flexibility is available by using the Eaton IP68 sealed SVR switch line for highcurrent,
hard-wired applications in conjunction with our multiplexed solution.

Compared with electromechanical switches, multiplexed switch modules offer several advantages.

- Reduced assembly labor due to ease of installation, allowing for mounting and connection of three switches at one time versus individually
- Reduced wire harness complexity, using one harness to a controller to accommodate up to 24 switches and a three-wire interconnect between expansion and master modules
- Reduced harness size offers an overall reduction in weight, improving operational efficiency of the equipment
- Increase in switch life-cycle over traditional electromechanical switches (500k cycles)
- Reduced connections resulting in less possible failure points

Application description

Target market segments

this product is targeted at harsh environment applications where a ruggedized product is needed to meet demanding requirements. Additionally, applications where there is concern over inadvertent switch actuation driving the need for guarding or locking features are also well-suited. Typical applications include:

- Construction equipment
- Agricultural equipment
- Specialty vehicle
- Material handling
- Emergency vehicle
- School and transit bus

Features and benefits

- J1939/CAN 2.0b compliant, 250kb speed
- IP68 degree of protection front and rear
- 9–32 V DC rated
- Immune to SAE J1455 and J1113 power disturbances
- Top, bottom and full guard option available
- Locking rocker available
- Front panel removable for ease of maintenance
- Sleep mode available to reduce current draw on the battery
- Wake on switch change configurable
- LED lighting in top, centerindicator and bottom position
- Decorative style rocker with matching indicator option
- Late point definition of circuit and rockers to reduce inventory
- Diagnostic

Product selection

To minimize inventory and maximize flexibility base modules and rocker assemblies can be ordered separately and assembled as required by the customer. All complete modules assembled with rocker buttons are custom ordered, contact your local Eaton Sales Representative for information.

Base module part number selection

Series	Number of switches (note 1)	Module type	LED Color top (note 2)	LED Color center (note 2)	LED Color bottom (note 2)	Guard (notes 3 and 4)	Address
E33	3	M	W	4	W	X	1
	3	M=Master E= Expansion	W = White R = Red G = Green B = Blue A = Amber	4 = 4 colors R/G/B/A)	W = White R = Red G = Green B = Blue A = Amber	X - None F = Full T = Top B = Bottom	F = unassigned or select 1-8

Note:

1. Only 3 switch modules available at this time.
2. The current available LED color combination is W4W, contact local your sales rep for price, MOQ and lead time for other options
3. Guard codes T & B are available in switch position 3 only.
4. Guard code F is available in any position In addition this guard can be ordered separately installed by the customer.
5. Base modules come assembled with the necessary switching components (plunger, spring, magnets and magnet holder). Rockers, circuit profiles and plunger seals must be purchased separately. See Rocker button assembly on table below.

Accessories

Rocker assemblies

Rocker				Top graphic	Top graphic color	Center indicator bar	Bottom graphic	Bottom graphic color	Circuit note 3
E33	BF			AW	W	Y	AS	W	XX
	Color	Description	Code	Graphics code	Description	Indicator	Graphics code	Description	XX = None see table below for circuit selection
Standard	Black	Full-throw	BF	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	XX = None Note 1	W = Daylight White D = Dead Front X = None	03, 04, 05, 06, 07, 10, 11
	Black	Half throw up	BU	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	XX = None Note 1	W = Daylight White D = Dead Front X = None	01 or 02
	Black	Half throw dow n	BD	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	XX = None Note 1	W = Daylight White D = Dead Front X = None	08 or 09
	Black	Indicator	BI	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	XX = None Note 1	W = Daylight White D = Dead Front X = None	None
	Black	Guard - Top/Bottom	BG	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	XX = None Note 1	W = Daylight White D = Dead Front X = None	03, 04, 05, 06, 07, 10, 11
	Black	Guard -Full	BL	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	XX = None Note 1	W = Daylight White D = Dead Front X = None	03, 04, 05, 06, 07, 10, 11
	Red	Full-throw	RF	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	XX = None Note 1	W = Daylight White D = Dead Front X = None	03, 04, 05, 06, 07, 10, 11
	Red	Half throw up	RU	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	XX = None Note 1	W = Daylight White D = Dead Front X = None	01 or 02
	Red	Half throw dow n	RI	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	XX = None Note 1	W = Daylight White D = Dead Front X = None	

Rocker				Top graphic	Top graphic color	Center indicator bar	Bottom graphic	Bottom graphic color	Circuit note 3
E33	**BF**			**AW**	**W**	**Y**	**AS**	**W**	**XX**
	Color	**Description**	**Code**	**Graphics code**	**Description**	**Indicator**	**Graphics code**	**Description**	**XX = None see table below for circuit selection**
	Red	Indicator	RD	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	XX = None Note 1	W = Daylight White D = Dead Front X = None	08 or 09
	Red	Guard - Top/Bottom	RG	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	XX = None Note 1	W = Daylight White D = Dead Front X = None	03, 04, 05, 06, 07, 10, 11
	Red	Guard -Full	RL	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	XX = None Note 1	W = Daylight White D = Dead Front X = None	03, 04, 05, 06, 07, 10, 11
Locking	Black	Low er - Lock dow n	LD	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	N/A (XX) Note 2	W = Daylight White D = Dead Front X = None	06
	Black	Low er - Lock up	LU	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	N/A (XX) Note 2	W = Daylight White D = Dead Front X = None	06
	Black	Low er - Lock both	LB	XX = None Note 1	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar	N/A (XX) Note 2	W = Daylight White D = Dead Front X = None	06
	Black	Upper - Lock down	UD	N/A (XX) Note 2	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar		W = Daylight White D = Dead Front X = None	06
	Black	Upper - Lock up	UU	N/A (XX) Note 2	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar		W = Daylight White D = Dead Front X = None	06
	Black	Upper - Lock both	UB	N/A (XX) Note 2	W = Daylight White D = Dead Front X = None	X = None Y = Dead Front Indicator Bar		W = Daylight White D = Dead Front X = None	06

Examples of rocker part numbers:

Catalog no.	Color	Style	Top	Center	Bottom	Circuit (Note 1)
E33RFXXXNXXXXX	Red	Guard				None
E33BFRWWYRXWXX	Black	No Guard				None
E33BFYSWYYTD10	Black	No Guard				10

Notes

1. Not applicable due to locking mechanism.
2. If the rocker is specified with a circuit profile it comes assembled with the profile (61-4079-xx) and the dust boot/plunger seal (32-3157), otherwise these two components must be purchased separately.
3. Rocker buttons used with guards are smaller than standard. Full and half guards require a different rocker button, see codes in table above.

Circuit profile

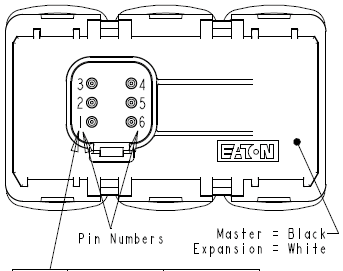
Circuit up-middle-down	Circuit number	Color	Catalog number
On-On-None	01	Black	61-4079
Mom-On-None (02)	02	Red	61-4079-2
On-On-On (03)	03	Light Blue	61-4079-3
Mom-On-Mom (04)	04	White	61-4079-4
Mom-On-On	05	Yellow	61-4079-5
On-None-On	06	Gray	61-4079-6
Mom-None-On	07	Pink	61-4079-7
None-On-On	08	Maroon	61-4079-8
None-On-Mom	09	Light Purple	61-4079-9
On-On-Mom	10	Orange	61-4079-10
On-None-Mom	11	Green	61-4079-11
All locking configurations	06	Gray	61-4079-6

Other accessories

Guard Assembly	Black	73-6194
Guard Assembly	Red	73-6194-2
Plunger Seal	N/A	32-3157
Panel seal	N/A	32-3163
Blank Rocker	Black	53-7832-4
Panel Blank	Black	E33X

Wiring

Master/expansion module wire harness



Pin	Master	Expansion
1	VBATT	VBATT
2	Common	Common
3	CAN High	LIN
4	CAN Low	LIN
5	Common	Common
6	LIN	VBATT

The interconnection between master module and controller uses a simple four-wire harness. Addressing of the master can be done by software or via address claim process. Interconnect wiring between masterexpansion as well as expansionexpansion uses a three-wire harness.

Mating connector information

- Mating connector: Deutsch plug DT06-6S
- Wedge lock: W6S
- Socket contact: 0462-201-16141 (1.0–0.5 mm^2 [16–20 AWG]
- Hole plug: 0413-217-1605

Technical data and specifications

E33 Specifications

Description	Specification
Operational Temperature	-40 to +85 C
Storage Temperature	-40 to +95 C
Operational Voltage	9 to 32 V DC
Degree of Protection	IP68
Mechanical Shock	30 g for 11 ms
Mechanical Vibration	MIL-STD-202F/201A, 3.6g Swept Sine
Electrical / Mechanical Life	500,000 cycles
Sleep Current Draw	Master = 800 µA, Expansion = 750 µA
EMC	SAE J1455/J1113
Communication	Master - SAE J1939 CAN 2.0B, Expansion - LIN 2.0

Full technical details and message formats are available in document TD070001EN

Dimensions

Standard cut-out

The modules are easily mounted with plastic retention clips. Modules are mounted in a single, spacesaving cutout reducing assembly time and accommodating up to three switches in a compact design.

Approximate Dimensions in Inches (mm)

Serviceability

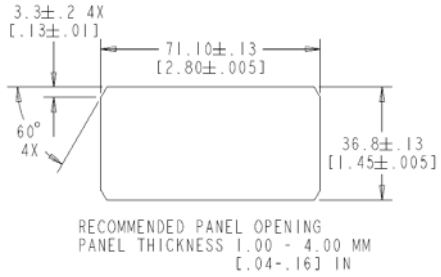
By modifying the standard cut-out to include the optional front panel removable slots shown below, the modules are easily serviceable from the front of the panel without further disassembly.

Due to the E33's design allowing for late-point definition on assembly, both the actuator and circuit profile are serviceable as individual component

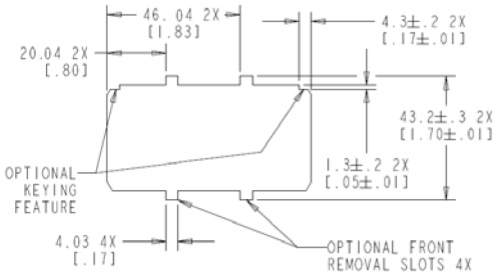
Commercial vehicle solutions

Vehicle controls

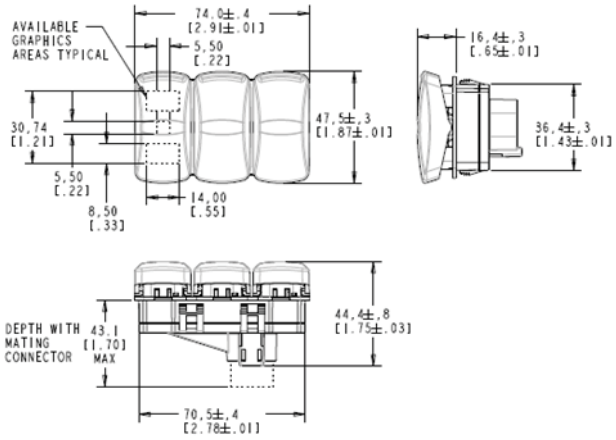
Standard cut-out



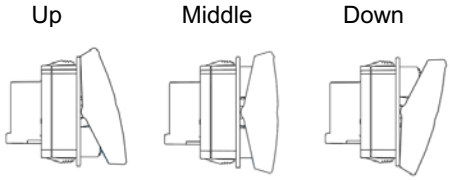
Optional front removal panel cut-out



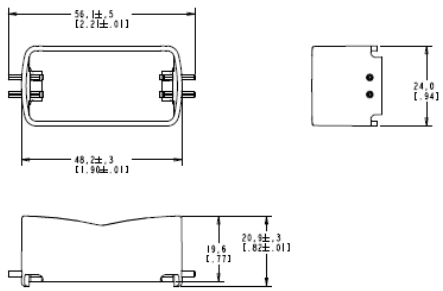
E33 eSM sealed multiplexed rocker switch units



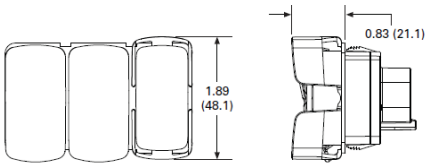
Switching positions



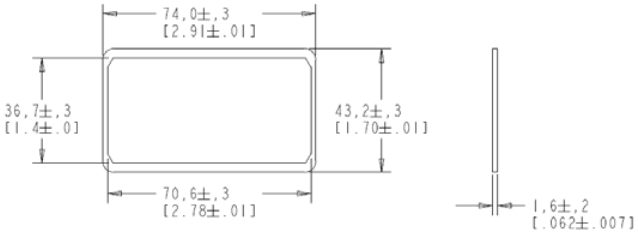
Guard assembly (full)



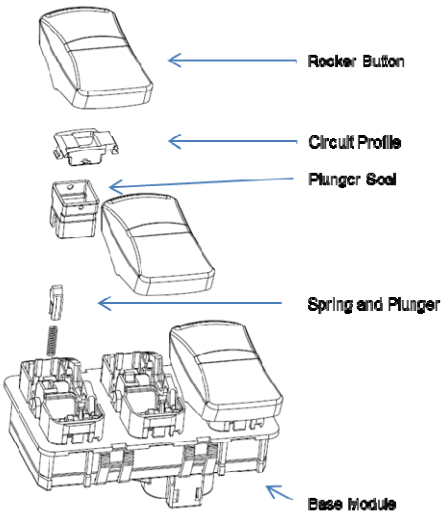
E33 eSM sealed multiplexed rocker switch units (palm guard version)



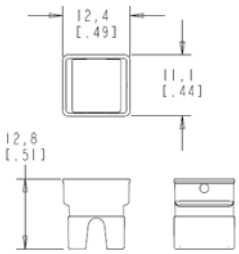
Panel seal



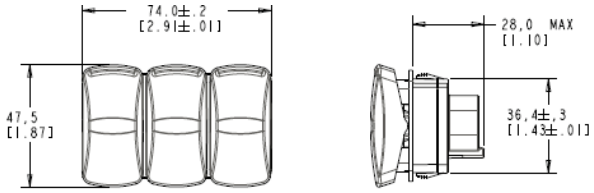
Rocker button assembly



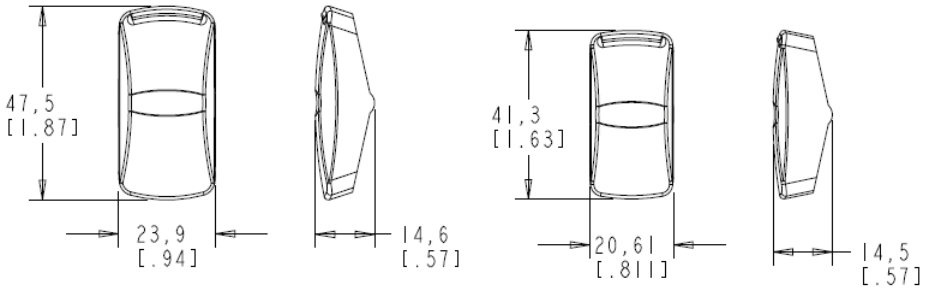
Plunger seal



Panel blank



Standard and guarded rocker



Rockers

Rocker selection guide

See technical data and dimensions for more details.

Rocker switches- illuminated and non-illuminated

NGR

SVR

Features	NGR	SVR
Ratings	15A at 125 Vac, 10A at 250 Vac;	12A at either 12 or 24 Vdc
	15A at 28 Vdc (14 Vdc rating)	
Certifications	RoHS, UL® Approvable	RoHS, UL Approvable
Panel opening	Rectangular	Octagonal
length	1.734 in (44.04 ± 0.13 mm)	0.830 in (21.10 mm); 0.680 in (17.30 mm)
width	0.867 in (22.02 ± 0.13 mm)	1.450 in (36.80 mm); 1.190 in (30.20 mm)
Seal		
Top (internal)	✓	✓
Rear terminal	—	✓
Panel	✓	✓
Actuator		
Rocker without bezel	—	✓
Rocker with bezel	✓	✓
Paddle	✓	✓
Snap-in lens	✓	✓
Locking	✓	—
Icon printing style		
Laser-etch	✓	✓
Pad-print	✓	✓
Poles		
Single	✓	✓
Double	✓	✓
Termination		
Spade	✓	✓
Illumination		
Incandescent 14 Vdc	✓	—
Incandescent 18 Vdc	✓	—
Incandescent 28 Vdc	✓	—
14V LED	✓	✓
28V LED	✓	✓
Catalog number selection	**Page 140**	**Page 165**
Technical data	**Page 146**	**Page 167**
Circuit diagrams	**Page 147**	**Page 168**
Dimensions	**Page 161**	**Page 169**

See technical data and dimensions for more details.

Rocker Switches—illuminated and non-illuminated, continued

8006/8007

8004/8005

Features	8006/8007	8004/8005
Ratings	10A at 250 Vac, 15A at 125 Vac, 3/4 hp at 250 Vac, recommended up to 15A at 28 Vdc	10A at 250 Vac, 15A at 125 Vac, 3/4 hp at 250 Vac, recommended up to 15A at 28 Vdc
Certifications	UL(CUR), RoHS	UL(CUR), RoHS
Panel opening	Octagonal	Rectangular
length	1.450 in (36.85 mm); 1.190 in (30.23 mm)	1.734 in (44.04 ± 0.13 mm)
width	0.830 in (21.08 mm); 0.680 in (17.27 mm)	0.867 in (22.02 ± 0.13 mm)
Seal		
Top (internal)	✓	✓
Actuator		
Rocker with bezel	✓	✓
Paddle	✓	—
Snap-in lens	✓	✓
Icon printing style		
Pad-print	✓	✓
Poles		
Single	✓	✓
Double	✓	✓
Termination		
Spade	✓	✓
Solder	✓	✓
Screw	✓	✓
Illumination		
Incandescent 18 Vdc	✓	✓
Incandescent 28 Vdc	✓	✓
Neon 125V	✓	✓
Neon 250V	✓	✓
Catalog number selection	**Page 204**	**Page 208**
Technical data	**Page 206**	**Page 210**
Circuit diagrams	**Page 222**	**Page 222**
Dimensions	**Page 206**	**Page 210**

NGR Rocker switches

Product description

Eaton presents its NGR Rocker Switches. This fieldproven line of full-sized rocker switches, initially developed for the heavy truck industry, is now found in a variety of vehicle-related applications.

The NGR offers both European styling and ergonomic design while still providing the solid durability that you have come to expect from Eaton switches.

Illuminated and nonilluminated versions with either incandescent bulbs or LEDs are available in either dependent or independent circuits and in a variety of popular switching circuits.

The NGR also offers a variety of rocker buttons and indicators with laser-etched or pad-printed icons, insertable lenses and adhesive-backed labels.

Features

- Sealing

Standard switch provides splash and dust resistance to IP42. The sealed version is sealed to IP67 when supplied with panel seal.

- Rocker

The standard actuator for the NGR is a clean, Europeanstyled, two-face rocker made of high-quality thermoplastic material. The rocker is replaceable and snaps on and off the switch. Both the rocker and the bezel are supplied with an aesthetically pleasing matte finish. Different colors are also available, but black is standard. Rockers can be ordered separately.

- Lighting

Each switch is capable of accommodating two incandescent light bulbs or LEDs for lighting purposes. A lamp or LED can be located at either end of the switch and oriented to be circuit dependent or independent. The incandescent bulbs are front replaceable. Two lamp or LED voltages, 14 Vdc and 28 Vdc, are standard. For additional voltages or colors, consult your local Eaton Sales Representative.

Standards and certifications

- Approvable under stringent UL and CSA standards
- For information, contact your local Eaton Sales Representative
- RoHS Compliant

RoHS COMPLIANT

Switch base

Rocker and paddle frame

Full palm guard

Panel seal and internal seal

To order rocker and switch base assembled, contact your local Eaton Sales Representative.

To order rocker buttons, see **Page 133**.

To order lenses, see **Page 135**.

To order indicator caps, see **Page 137**. For a complete indicator, see **Page 136.**

Catalog number selection

How to order—Switch base

To determine complete catalog number, start with the appropriate base prefix and add the appropriate code letters and/or numbers.

NGR 1501 4 B N A 0 N

Switch series (Unsealed)
NGR: Switch base

Circuit ①
1501: Circuit
See **Pages 147** to **160**

Frame color
B: Black

Switch contact plating ⑤
N: Standard
T: High rated
G: Gold

Frame style
1: Rocker and paddle frame
2: Palm guard (top)
3: Palm guard (bottom)
4: Full palm guard (top/bottom)
S: Panel seal and internal seal
G: Locking rocker ②
D: Locking rocker ③
F: Locking rocker ④
T: Internal seal

"A" Lamp type and color
0: No lamp
A: 14 Vdc incand./clear ⑥
B: 24 Vdc incand./clear ⑥
C: 28V LED/red ⑧
D: 28V LED/green ⑧
E: 28V LED/amber ⑧
R: 14V LED/red
G: 14V LED/green
Y: 14V LED/amber
K: 28V LED/red ⑦
L: 28V LED/green ⑦
T: 28V LED/amber ⑦
W: 28V LED/white ⑦
X: 28V LED/blue ⑦
H: 14V LED/high intensity red
J: 14V LED/high intensity green
P: 14V LED/high intensity amber
M: 14V LED/high intensity blue

"B" Lamp type and color
0: No lamp
A: 14 Vdc incand./clear ⑥
B: 24 Vdc incand./clear ⑥
C: 28V LED/red ⑧
D: 28V LED/green ⑧
E: 28V LED/amber ⑧
R: 14V LED/red
G: 14V LED/green
Y: 14V LED/amber
K: 28V LED/red ⑦
L: 28V LED/green ⑦
T: 28V LED/amber ⑦
W: 28V LED/white ⑦
X: 28V LED/blue ⑦
H: 14V LED/high intensity red
J: 14V LED/high intensity green
P: 14V LED/high intensity amber
M: 14V LED/high intensity blue

Rocker assembled
N: No

Note:

① Circuits show lighting options available. See **Pages 139** to **160**.
② Locks in DOWN position.
③ Locks in UP and DOWN positions.
④ Locks in UP position.
⑤ Switch contact construction plating—
N = Standard: Recommended for use on loads up to 12 amps at 14 Vdc.
T = High Rated: Recommended for use on loads greater than 12 amps at 14 Vdc.
G = Gold: Recommended for use on dry circuit/low level switching.
⑥ Replaceable.
⑦ Replaceable/wedge base LED.
⑧ PCB version LED.

Rocker buttons/actuators

Two-face rocker, no lens

Two-face rocker, snap-in lens

Decorative rocker, back-lit

Decorative paddle, back-lit

Locking rocker

Catalog number selection

How to order—Rocker buttons/Actuators

To determine complete catalog number, start with the appropriate button type and add the appropriate code letters and/or numbers.

3 C AF A 1 B AE C 4 A 3

Rocker button type
- **1:** Two-face, no lens rocker
- **2:** Two-face, snap-in lens rocker
- **3:** Decorative rocker, back-lit
- **4:** Decorative paddle, back-lit
- **5:** Locking rocker

Icon/Lens/Hole location
- **A:** "A" only
- **B:** "B" only
- **C:** "A" and "B"
- **D:** No icon/lens/hole

Icon "A" code
- **AF:** Unlock

Icon "A" orientation
- **A:** Standard orientation
- **B:** 90° clockwise
- **C:** 180° clockwise
- **D:** 270° clockwise
- **0:** No icon; no orientation

Icon "A" color
- **0:** No icon; no color
- **1:** Daylight white ①
- **2:** Deadfront ①
- **3:** White ②
- **4:** Black ②
- **5:** Lens hole (no lens)

Icon "B" code
- **AE:** Lock

Icon "B" orientation
- **A:** Standard orientation
- **B:** 90° clockwise
- **C:** 180° clockwise
- **D:** 270° clockwise
- **0:** No icon; no orientation

Icon "A" lighted color or lens color
- **A:** Red
- **B:** Green
- **C:** Amber
- **E:** Blue
- **F:** White
- **G:** Clear
- **0:** Non-lighted or no lens

Icon "B" color
- **0:** No icon; no color
- **1:** Daylight white ①
- **2:** Deadfront ①
- **3:** White ②
- **4:** Black ②
- **5:** Lens hole (no lens)

Icon "B" lighted color or lens color
- **A:** Red
- **B:** Green
- **C:** Amber
- **E:** Blue
- **F:** White
- **G:** Clear
- **0:** Non-lighted or no lens

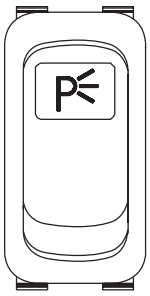
Indicator stripe location
- **1:** "A" Position
- **2:** "B" Position
- **3:** "A" and "B" Positions
- **0:** No stripe

Note:

① Decorative rocker only.
② Two-face rocker only.

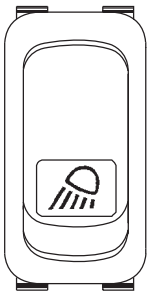
Icon location examples

Location A



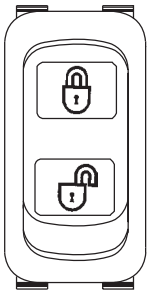
Rocker with Icon in "A" Position (Code A)

Location B



Rocker with Icon in "B" Position (Code B)

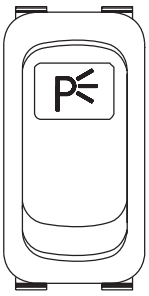
Location C



Rocker with Icon in "C" Position (Code C)

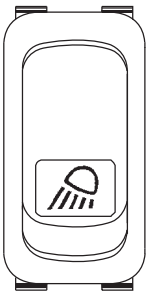
Icon orientation examples

Orientation A



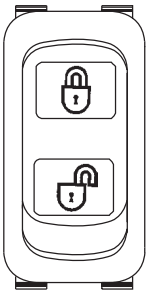
Rocker with Standard Orientation (Code A)

Orientation B



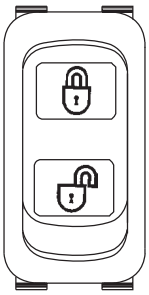
Rocker with Icon at 90° Clockwise (Code B)

Orientation C



Rocker with Icon at 180° Clockwise (Code C)

Orientation D



Rocker with Icon at 270° Clockwise (Code D)

Lens selection

For NGR rocker type “2” and indicator type “2CAP” only.

Translucent lens

Translucent lens

Catalog number selection

How to order—Translucent lenses ①②

To determine complete catalog number, start with the appropriate base prefix and add the appropriate code letters and/or numbers.

28-5863-2 AF A

Lens color	Base catalog number	Icon code	Orientation style code
Red Green Amber Blue White ④	**28-5863-2** **28-5863** **28-5863-3** **28-5863-9** **28-5863-8**	**AF:** Unlock	**A:** Standard orientation **B:** Rotated 90° clockwise **C:** Inverted 180° **D:** Rotated 270° clockwise

How to order—Transparent lenses ①②

To determine complete catalog number, start with the appropriate base prefix and add the appropriate code letters and/or numbers.

28-5863-5 AF A

Lens color	Base catalog number	Icon code	Orientation style code
Red Green Amber Blue White ④	**28-5863-5** **28-5863-4** **28-5863-6** **28-5863-10** **28-5863-7**	**AF:** Unlock	**A:** Standard orientation **B:** Rotated 90° clockwise **C:** Inverted 180° **D:** Rotated 270° clockwise

Note:

① When ordering a lens with an icon for the code B (bottom) position, specify code C orientation.
② Standard lens type.
③ Non-standard lens type.
④ Standard pad print for white and clear lens is black.

NGR Complete indicators and indicator caps

To order rocker buttons, see **Page 133**.

To order lenses, see **Page 135**.

Complete indicator and indicator cap assembled

Catalog number selection

How to order—Complete indicator

To determine complete catalog number, start with the appropriate indicator type and add the appropriate code letters and/or numbers.

2N C AA R 1 B AB A 0 A

Indicator type
- **2N:** Two-face, snap-in lens
- **3N:** Laser-etched

Icon/Lens/Hole location
- **A:** "A" only
- **B:** "B" only
- **C:** "A" and "B" icons
- **D:** No icon/lens/hole

Icon "A" Code
- **AA:** Horn

Lamp/LED type and color
- **A:** 14 Vdc incand./clear
- **B:** 28 Vdc incand./clear
- **0:** No lamp/LED
- **R:** 14V LED/red
- **G:** 14V LED/green
- **Y:** 14V LED/amber
- **K:** 28V LED/red
- **L:** 28V LED/green
- **T:** 28V LED/amber
- **H:** 14V LED/high intensity red
- **J:** 14V LED/high intensity green
- **P:** 14V LED/high intensity amber
- **M:** 14V LED/high intensity blue

Icon "A" Color
- **0:** No icon; no color
- **1:** Daylight white ①
- **2:** Deadfront ①
- **3:** White ②
- **4:** Black ②
- **5:** Lens hole (no lens)

Icon "A" Lighted color or lens color
- **A:** Red
- **B:** Green
- **C:** Amber
- **E:** Blue
- **F:** White
- **G:** Clear
- **0:** Non-lighted or no lens

Icon "B" Code
- **AB:** Battery

Lamp/LED Type and color
- **A:** 14 Vdc incand./clear
- **B:** 28 Vdc incand./clear
- **0:** No lamp/LED
- **R:** 14V LED/red
- **G:** 14V LED/green
- **Y:** 14V LED/amber
- **K:** 28V LED/red
- **L:** 28V LED/green
- **T:** 28V LED/amber
- **H:** 14V LED/high intensity red
- **J:** 14V LED/high intensity green
- **P:** 14V LED/high intensity amber
- **M:** 14V LED/high intensity blue

Icon "B" Color
- **0:** No icon; no color
- **1:** Daylight white ①
- **2:** Deadfront ①
- **3:** White ②
- **4:** Black ②
- **5:** Lens hole (no lens)

Icon "B" Lighted color or lens color
- **A:** Red
- **B:** Green
- **C:** Amber
- **E:** Blue
- **F:** White
- **G:** Clear
- **0:** Non-lighted or no lens

Note:

① Decorative rocker only.
② Two-face rocker only.

NGR indicator base and indicator caps

to order rocker buttons, see **Page 133**.

To order lenses, see **Page 135**.

To order complete indicator, see **Page 136**.

Indicator base

Indicator cap

Catalog number selection

How to order—Indicator base

To determine complete catalog number, start with the appropriate base prefix and add the appropriate code letters and/or numbers.

NGRIND A 0 N

Switch series (Unsealed)
NGRIND: Indicator base

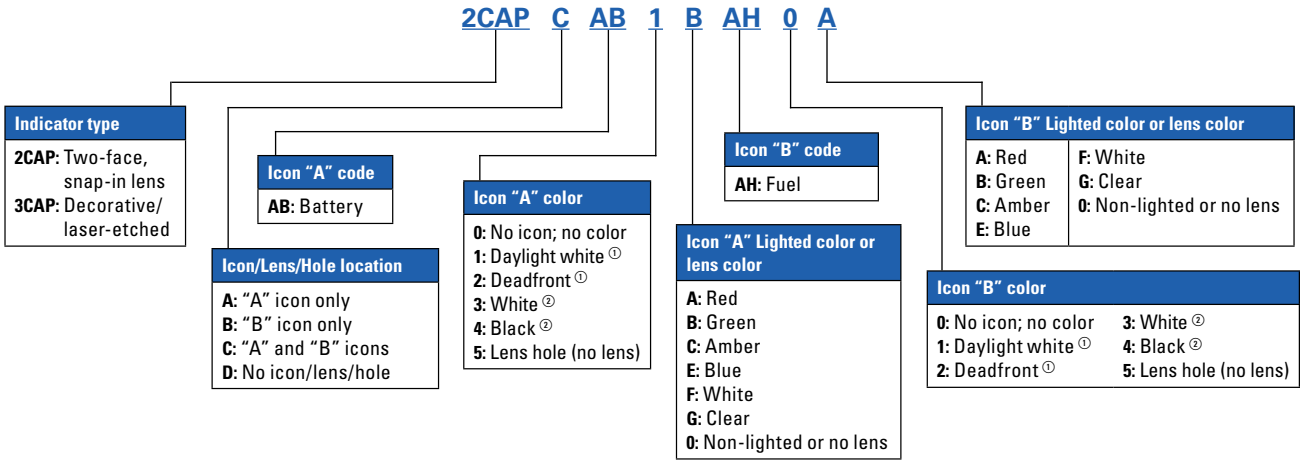
"A" Lamp type and color
0: No lamp
A: 14 Vdc incand./clear
B: 24 Vdc incand./clear
R: 14V LED/red
G: 14V LED/green
Y: 14V LED/amber
K: 28V LED/red
L: 28V LED/green
T: 28V LED/amber
X: 28V LED/blue
H: 14V LED/high intensity red
J: 14V LED/high intensity green
P: 14V LED/high intensity amber
M: 14V LED/high intensity blue

"B" Lamp type and color
0: No lamp
A: 14 Vdc incand./clear
B: 24 Vdc incand./clear
R: 14V LED/red
G: 14V LED/green
Y: 14V LED/amber
K: 28V LED/red
L: 28V LED/green
T: 28V LED/amber
X: 28V LED/blue
H: 14V LED/high intensity red
J: 14V LED/high intensity green
P: 14V LED/high intensity amber
M: 14V LED/high intensity blue

Rocker assembled
N: No

How to order—indicator cap

To determine complete catalog number, start with the appropriate indicator type and add the appropriate code letters and/or numbers.



Note:

① Decorative rocker only.
② Two-face rocker only.

Technical data and specifications

NGR Rocker switches

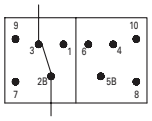
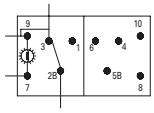
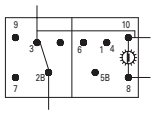
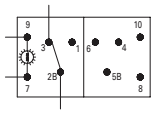
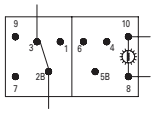
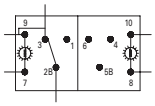
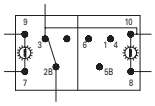
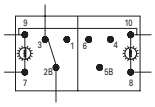
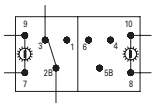
Description	Specification
Ratings ①	15A at 125 Vac, 10A at 250 Vac 15A at 28 Vdc (14 Vdc rating) Approvable under stringent UL and CSA standards
Contact mechanism	Slow-make/slow-break contact mechanism Butt action contact mechanism designed specifically for use on AC and low voltage DC applications
Contact material— Standard construction	Movable—copper alloy with silver alloy contact face button Stationary—silver-plated copper alloy with silver alloy contact face button
Maintained mechanical life	250,000 operations
Momentary mechanical life	50,000 operations
Operating force	.8 to 3.5 lbs
Electrical life	200,000 operations, minimum
Terminal type	Standard 0.25 in (6.35 mm) spade, silver-plated copper alloy
Base material	High-grade thermoplastic molding material
Dielectric	1000V rms, minimum
Mounting means	Snap-in mounting with plastic bezel
Mounting hole	Rectangular panel cutout 1.734 x 0.867 in (44 x 22 mm)
Panel thickness	0.040 to 0.156 in (1.0 to 4.0 mm) ②③
IP rating	Standard IP42; sealed option IP67
Operating temperature range	–40° to 185°F (–40° to 85°C)

Note:

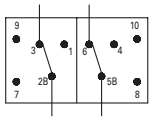
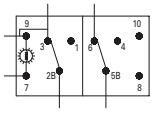
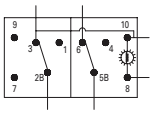
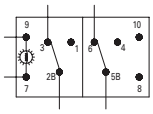
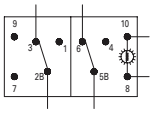
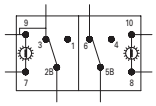
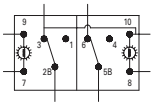
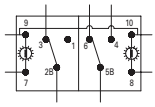
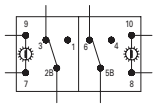
① For information, contact your local Eaton Sales Representative.
② Best results obtained between 0.060 and 0.118 in (1.5 and 3.0 mm).
③ On sealed versions, recommended panel thickness between 0.079 and 0.118 in (2.0 and 3.0 mm).

Standard circuit diagrams

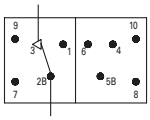
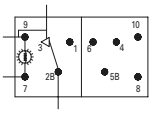
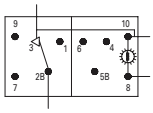
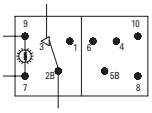
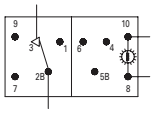
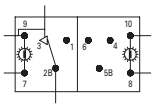
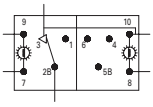
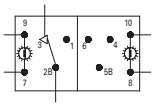
Single-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
1001		OFF	NONE	ON
		—	—	2B-3
1501		OFF	NONE	ON
		—	—	2B-3-9
1502		OFF	NONE	ON
		—	—	2B-3-10
1503		OFF	NONE	ON
		—	—	2B-3
1504		OFF	NONE	ON
		—	—	2B-3
1505		OFF	NONE	ON
		—	—	2B-3-9
1506		OFF	NONE	ON
		—	—	2B-3-10
1507		OFF	NONE	ON
		—	—	2B-3-9-10
1508		OFF	NONE	ON
		—	—	2B-3

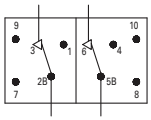
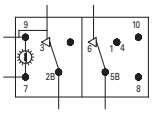
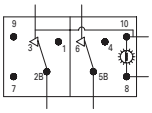
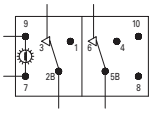
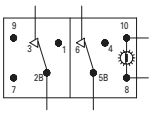
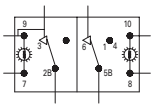
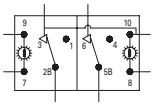
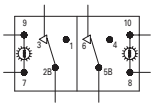
Two-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
2001		OFF	NONE	ON
		—	—	2B-3 5B-6
2501		OFF	NONE	ON
		—	—	2B-3-9 5B-6
2502		OFF	NONE	ON
		—	—	2B-3-10 5B-6
2503		OFF	NONE	ON
		—	—	2B-3 5B-6
2504		OFF	NONE	ON
		—	—	2B-3 5B-6
2505		OFF	NONE	ON
		—	—	2B-3-9 5B-6
2506		OFF	NONE	ON
		—	—	2B-3-10 5B-6
2507		OFF	NONE	ON
		—	—	2B-3-9-1 5B-6
2508		OFF	NONE	ON
		—	—	2B-3 5B-6

Single-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
1002		OFF	NONE	MOM. ON
		—	—	2B-3
1521		OFF	NONE	MOM. ON
		—	—	2B-3-9
1522		OFF	NONE	MOM. ON
		—	—	2B-3-10
1523		OFF	NONE	MOM. ON
		—	—	2B-3
1524		OFF	NONE	MOM. ON
		—	—	2B-3
1525		OFF	NONE	MOM. ON
		—	—	2B-3-9
1526		OFF	NONE	MOM. ON
		—	—	2B-3-10
1528		OFF	NONE	MOM. ON
		—	—	2B-3

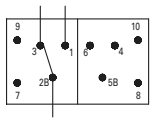
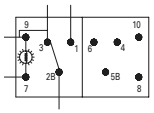
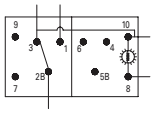
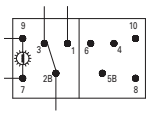
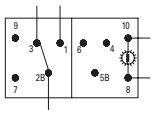
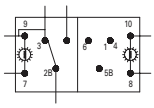
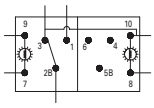
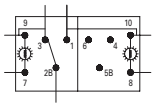
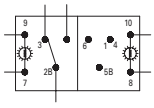
Two-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
2002		OFF	NONE	MOM. ON
		—	—	2B-3 5B-6
2521		OFF	NONE	MOM. ON
		—	—	2B-3-9 5B-6
2522		OFF	NONE	MOM. ON
		—	—	2B-3-10 5B-6
2523		OFF	NONE	MOM. ON
		—	—	2B-3 5B-6
2524		OFF	NONE	MOM. ON
		—	—	2B-3 5B-6
2525		OFF	NONE	MOM. ON
		—	—	MOM. ON
2526		OFF	NONE	MOM. ON
		—	—	2B-3-10 5B-6
2528		OFF	NONE	MOM. ON
		—	—	2B-3 5B-6

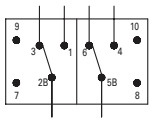
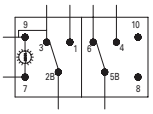
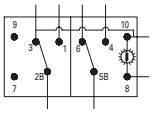
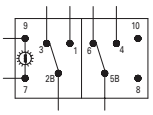
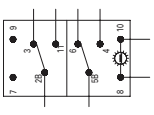
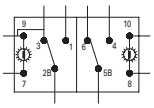
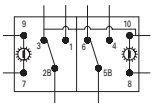
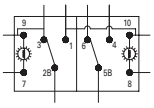
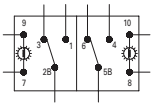
Commercial vehicle solutions

Vehicle controls

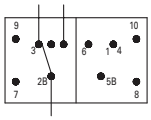
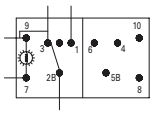
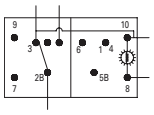
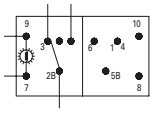
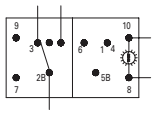
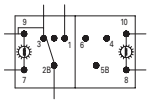
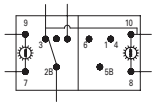
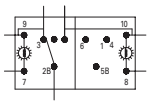
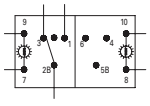
Single-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
1003		ON	NONE	ON
		2B-1	—	2B-3
1541		ON	NONE	ON
		2B-1	—	2B-3-9
1542		ON	NONE	ON
		2B-1	—	2B-3-10
1543		ON	NONE	ON
		2B-1	—	2B-3
1544		ON	NONE	ON
		2B-1	—	2B-3
1545		ON	NONE	ON
		2B-1	—	2B-3-9
1546		ON	NONE	ON
		2B-1	—	2B-3-10
1547		ON	NONE	ON
		2B-1-10	—	2B-3-9
1548		ON	NONE	ON
		2B-1	—	2B-3

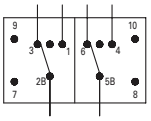
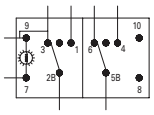
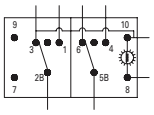
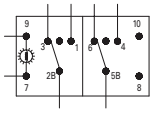
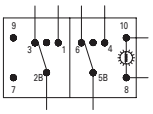
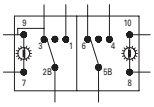
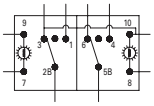
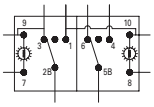
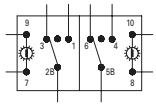
Two-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
2003		ON	NONE	ON
		2B-1 5B-4	—	2B-3 5B-6
2541		ON	NONE	ON
		2B-1 5B-4	—	2B-3-9 5B-6
2542		ON	NONE	ON
		2B-1 5B-4	—	2B-3-10 5B-6
2543		ON	NONE	ON
		2B-1 5B-4	—	2B-3 5B-6
2544		ON	NONE	ON
		2B-1 5B-4	—	2B-3 5B-6
2545		ON	NONE	ON
		2B-1 5B-4	—	2B-3-9 5B-6
2546		ON	NONE	ON
		2B-1 5B-4	—	2B-3-10 5B-6
2547		ON	NONE	ON
		2B-1-10 5B-4	—	2B-3-9 5B-6
2548		ON	NONE	ON
		2B-1 5B-4	—	2B-3 5B-6

Single-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
1004		ON	OFF	ON
		2B-1	—	2B-3
1561		ON	OFF	ON
		2B-1	—	2B-3-9
1562		ON	OFF	ON
		2B-1	—	2B-3-10
1563		ON	OFF	ON
		2B-1	—	2B-3
1564		ON	OFF	ON
		2B-1	—	2B-3
1565		ON	OFF	ON
		2B-1	—	2B-3-9
1566		ON	OFF	ON
		2B-1	—	2B-3-10
1567		ON	OFF	ON
		2B-1-10	—	2B-3-9
1568		ON	OFF	ON
		2B-1	—	2B-3

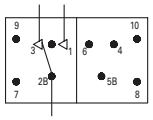
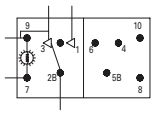
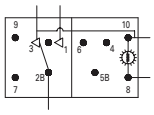
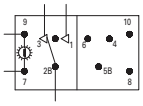
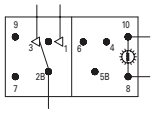
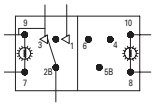
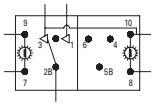
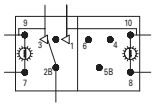
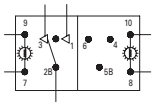
Two-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
2004		ON	OFF	ON
		2B-1 5B-4	—	2B-3 5B-6
2561		ON	OFF	ON
		2B-1 5B-4	—	2B-3-9 5B-6
2562		ON	OFF	ON
		2B-1 5B-4	—	2B-3-10 5B-6
2563		ON	OFF	ON
		2B-1 5B-4	—	2B-3 5B-6
2564		ON	OFF	ON
		2B-1 5B-4	—	2B-3 5B-6
2565		ON	OFF	ON
		2B-1 5B-4	—	2B-3-9 5B-6
2566		ON	OFF	ON
		2B-1 5B-4	—	2B-3-10 5B-6
2567		ON	OFF	ON
		2B-1-10 5B-4	—	2B-3-9 5B-6
2568		ON	OFF	ON
		2B-1 5B-4	—	2B-3 5B-6

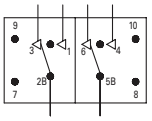
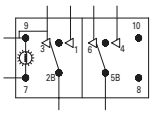
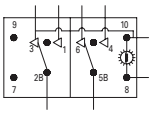
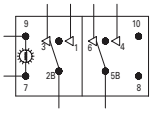
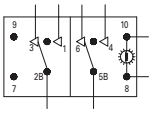
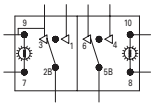
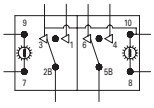
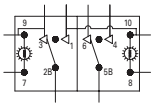
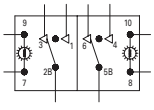
Commercial vehicle solutions

Vehicle controls

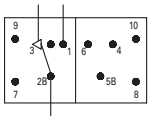
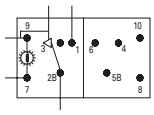
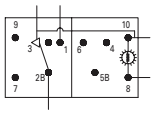
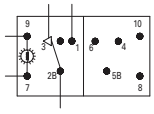
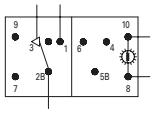
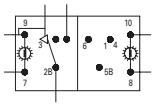
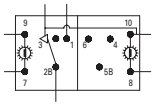
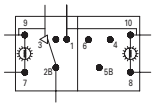
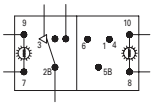
Single-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
1005		MOM. ON	OFF	MOM. ON
		2B-1	—	2B-3
1581		MOM. ON	OFF	MOM. ON
		2B-1	—	2B-3-9
1582		MOM. ON	OFF	MOM. ON
		2B-1	—	2B-3-10
1583		MOM. ON	OFF	MOM. ON
		2B-1	—	2B-3
1584		MOM. ON	OFF	MOM. ON
		2B-1	—	2B-3
1585		MOM. ON	OFF	MOM. ON
		2B-1	—	2B-3-9
1586		MOM. ON	OFF	MOM. ON
		2B-1	—	2B-3-10
1587		MOM. ON	OFF	MOM. ON
		2B-1-10	—	2B-3-9
1588		MOM. ON	OFF	MOM. ON
		2B-1	—	2B-3

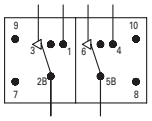
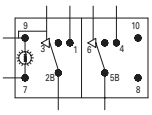
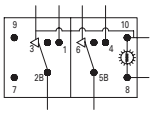
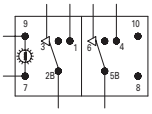
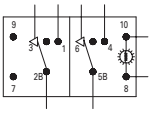
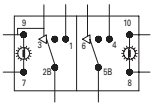
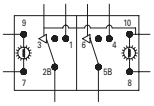
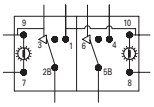
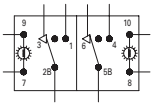
Two-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
2005		MOM. ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3 5B-6
2581		MOM. ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3-9 5B-6
2582		MOM. ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3-10 5B-6
2583		MOM. ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3 5B-6
2584		MOM. ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3 5B-6
2585		MOM. ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3-9 5B-6
2586		MOM. ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3-10 5B-6
2587		MOM. ON	OFF	MOM. ON
		2B-1-10 5B-4	—	2B-3-9 5B-6
2588		MOM. ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3 5B-6

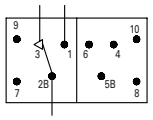
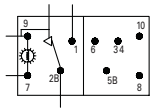
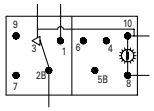
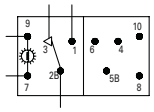
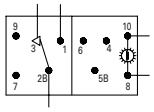
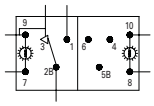
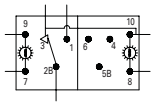
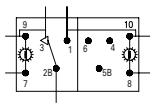
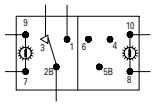
Single-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
1006		ON	OFF	MOM. ON
		2B-1	—	2B-3
1601		ON	OFF	MOM. ON
		2B-1	—	2B-3-9
1602		ON	OFF	MOM. ON
		2B-1	—	2B-3-10
1603		ON	OFF	MOM. ON
		2B-1	—	2B-3
1604		ON	OFF	MOM. ON
		2B-1	—	2B-3
1605		ON	OFF	MOM. ON
		2B-1	—	2B-3-9
1606		ON	OFF	MOM. ON
		2B-1	—	2B-3-10
1607		ON	OFF	MOM. ON
		2B-1-10	—	2B-3-9
1608		ON	OFF	MOM. ON
		2B-1	—	2B-3

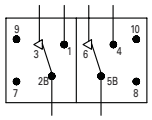
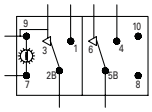
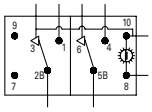
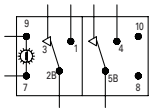
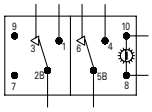
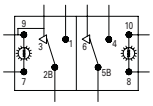
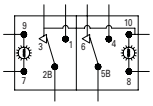
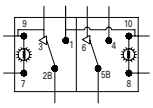
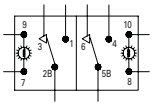
Two-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
2006		ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3 5B-6
2601		ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3-9 5B-6
2602		ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3-10 5B-6
2603		ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3 5B-6
2604		ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3 5B-6
2605		ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3-9 5B-6
2606		ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3-10 5B-6
2607		ON	OFF	MOM. ON
		2B-1-10 5B-4	—	2B-3-9 5B-6
2608		ON	OFF	MOM. ON
		2B-1 5B-4	—	2B-3 5B-6

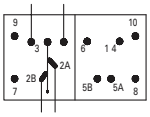
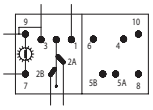
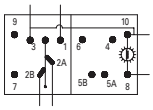
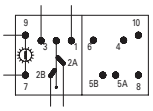
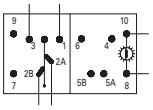
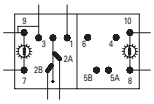
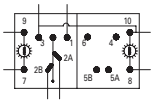
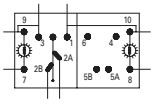
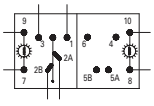
Single-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
1007		ON	NONE	MOM ON
		2B-1	—	2B-3
1621		ON	NONE	MOM ON
		2B-1	—	2B-3-9
1622		ON	NONE	MOM ON
		2B-1	—	2B-3-10
1623		ON	NONE	MOM ON
		2B-1	—	2B-3
1624		ON	NONE	MOM ON
		2B-1	—	2B-3
1625		ON	NONE	MOM ON
		2B-1	—	2B-3-9
1626		ON	NONE	MOM ON
		2B-1	—	2B-3-10
1627		ON	NONE	MOM ON
		2B-1-10	—	2B-3-9
1628		ON	NONE	MOM ON
		2B-1	—	2B-3

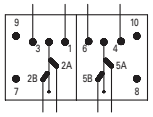
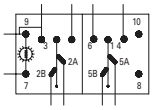
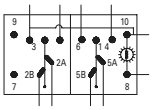
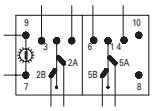
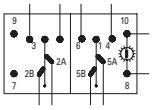
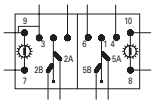
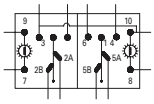
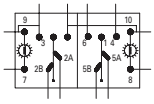
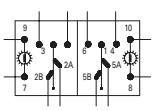
Two-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
2007		ON	NONE	MOM ON
		2B-1 5B-4	—	2B-3 5B-6
2621		ON	NONE	MOM ON
		2B-1 5B-4	—	2B-3-9 5B-6
2622		ON	NONE	MOM ON
		2B-1 5B-4	—	2B-3-10 5B-6
2623		ON	NONE	MOM ON
		2B-1 5B-4	—	2B-3 5B-6
2624		ON	NONE	MOM ON
		2B-1 5B-4	—	2B-3 5B-6
2625		ON	NONE	MOM ON
		2B-1 5B-4	—	2B-3-9 5B-6
2626		ON	NONE	MOM ON
		2B-1 5B-4	—	2B-3-10 5B-6
2627		ON	NONE	MOM ON
		2B-1-10 5B-4	—	2B-3-9 5B-6
2628		ON	NONE	MOM ON
		2B-1 5B-4	—	2B-3 5B-6

Single-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
3003		OFF	ON	ON
		2A-1	2A-2B	2B-3
3541		OFF	ON	ON
		2A-1	2A-2B	2B-3-9
3542		OFF	ON	ON
		2A-1	2A-2B	2B-3-10
3543		OFF	ON	ON
		2A-1	2A-2B	2B-3
3544		OFF	ON	ON
		2A-1	2A-2B	2B-3
3545		OFF	ON	ON
		2A-1	2A-2B	2B-3-9
3546		OFF	ON	ON
		2A-1	2A-2B	2B-3-10
3547		OFF	ON	ON
		2A-1-10	2A-2B	2B-3-9
3548		OFF	ON	ON
		2A-1	2A-2B	2B-3

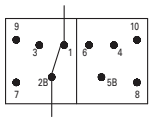
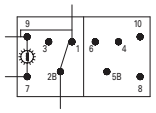
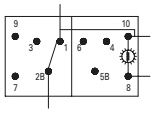
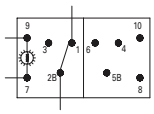
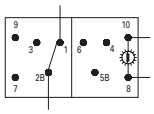
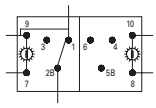
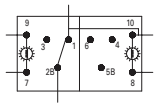
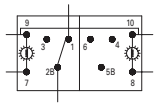
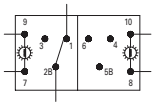
Two-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
3004		OFF	ON	ON
		2A-1 5A-4	2A-2B 5A-5B	2B-3 5B-6
3561		OFF	ON	ON
		2A-1 5A-4	2A-2B 5A-5B	2B-3-9 5B-6
3562		OFF	ON	ON 2B-3-10
		2A-1 5A-4	2A-2B 5A-5B	5B-6
3563		OFF	ON	ON
		2A-1 5A-4	2A-2B 5A-5B	2B-3 5B-6
3564		OFF	ON	ON
		2A-1 5A-4	2A-2B 5A-5B	2B-3 5B-6
3565		OFF	ON	ON
		2A-1 5A-4	2A-2B 5A-5B	2B-3-9 5B-6
3566		OFF	ON	ON
		2A-1 5A-4	2A-2B 5A-5B	2B-3-10 5B-6
3567		OFF	ON	ON
		2A-1-10 5A-4	2A-2B 5A-5B	2B-3-9 5B-6
3568		OFF	ON	ON
		2A-1 5A-4	2A-2B 5A-5B	2B-3 5B-6

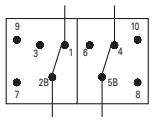
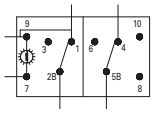
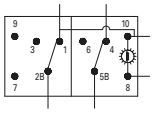
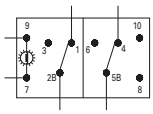
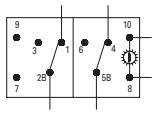
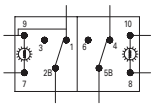
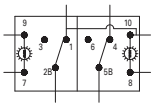
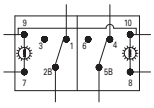
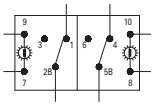
Commercial vehicle solutions

Vehicle controls

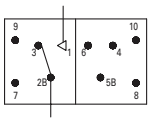
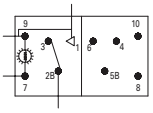
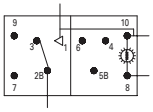
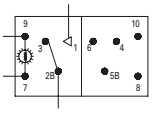
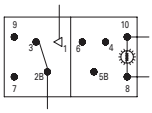
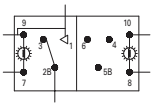
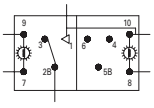
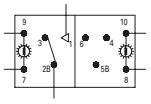
Single-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
5001		ON	NONE	OFF
		2B-1	—	—
5501		ON	NONE	OFF
		2B-1-9	—	—
5502		ON	NONE	OFF
		2B-1-10	—	—
5503		ON	NONE	OFF
		2B-1	—	—
5504		ON	NONE	OFF
		2B-1	—	—
5505		ON	NONE	OFF
		2B-1-9	—	—
5506		ON	NONE	OFF
		2B-1-10	—	—
5507		ON	NONE	OFF
		2B-1-9-10	—	—
5508		ON	NONE	OFF
		2B-1	—	—

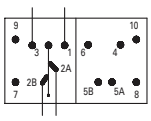
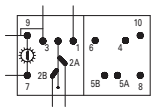
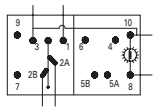
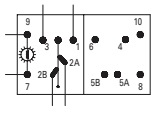
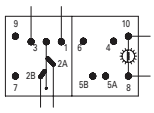
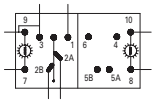
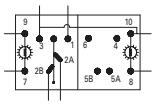
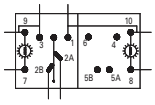
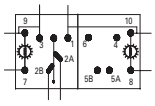
Two-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
5510		ON	NONE	OFF
		2B-1 5B-4	—	—
5511		ON	NONE	OFF
		2B-1-9 5B-4	—	—
5512		ON	NONE	OFF
		2B-1-10 5B-4	—	—
5513		ON	NONE	OFF
		2B-1 5B-4	—	—
5514		ON	NONE	OFF
		2B-1 5B-4	—	—
5515		ON	NONE	OFF
		2B-1-9 5B-4	—	—
5516		ON	NONE	OFF
		2B-1-10 5B-4	—	—
5517		ON	NONE	OFF
		2B-1-9-10 5B-4	—	—
5518		ON	NONE	OFF
		2B-1 5B-4	—	—

Single-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
5002		MOM. ON	NONE	OFF
		2B-1	—	—
5521		MOM. ON	NONE	OFF
		2B-1-9	—	—
5522		MOM. ON	NONE	OFF
		2B-1-10	—	—
5523		MOM. ON	NONE	OFF
		2B-1	—	—
5524		MOM. ON	NONE	OFF
		2B-1	—	—
5525		MOM. ON	NONE	OFF
		2B-1-9	—	—
5526		MOM. ON	NONE	OFF
		2B-1-10	—	—
5528		MOM. ON	NONE	OFF
		2B-1	—	—

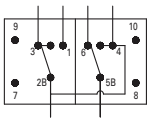
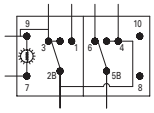
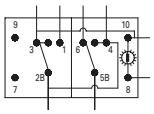
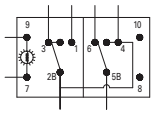
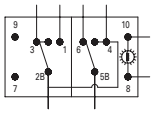
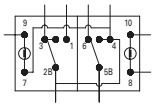
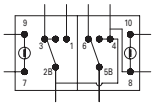
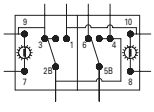
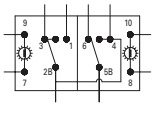
Two-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
5003		ON	ON	OFF
		2A-1	2A-2B	2B-3
5541		ON	ON	OFF
		2A-1	2A-2B	2B-3-9
5542		ON	ON	OFF
		2A-1	2A-2B	2B-3-10
5543		ON	ON	OFF
		2A-1	2A-2B	2B-3
5544		ON	ON	OFF
		2A-1	2A-2B	2B-3
5545		ON	ON	OFF
		2A-1	2A-2B	2B-3-9
5546		ON	ON	OFF
		2A-1	2A-2B	2B-3-10
5547		ON	ON	OFF
		2A-1-10	2A-2B	2B-3-9
5548		ON	ON	OFF
		2A-1	2A-2B	2B-3

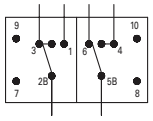
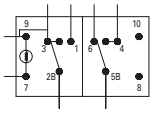
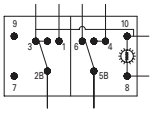
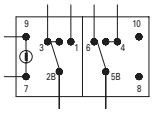
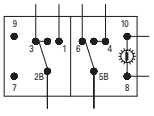
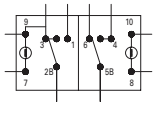
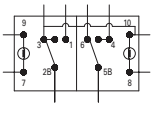
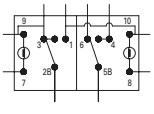
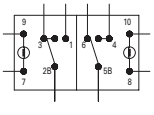
Commercial vehicle solutions

Vehicle controls

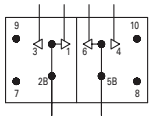
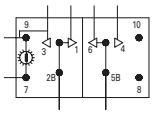
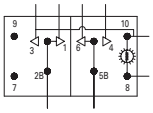
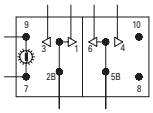
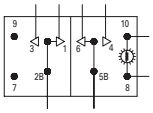
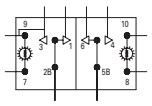
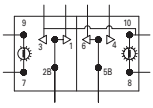
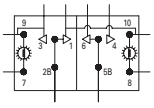
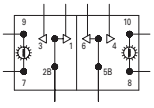
Single-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
3001		ON	ON	ON
		5B-4-2B-1	5B-4-2B-3	2B-3 5B-6
3501		ON	ON	ON
		5B-4-2B-1	5B-4-2B-3-9	2B-3-9 5B-6
3502		ON	ON	ON
		5B-4-2B-1	5B-4-2B-3-10	2B-3-10 5B-6
3503		ON	ON	ON
		5B-4-2B-1	5B-4-2B-3	2B-3 5B-6
3504		ON	ON	ON
		5B-4-2B-1	5B-4-2B-3	2B-3 5B-6
3505		ON	ON	ON
		5B-4-2B-1	5B-4-2B-3	2B-3 5B-6
3506		ON	ON	ON
		5B-4-2B-1	5B-4-2B-3	2B-3 5B-6
3507		ON	ON	ON
		5B-4-2B-1	5B-4-2B-3-9	2B-3-9 5B-6
3508		ON	ON	ON
		5B-4-2B-1	5B-4-2B-3	2B-3 5B-6

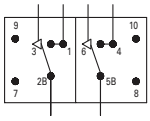
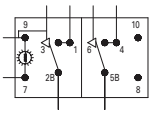
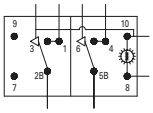
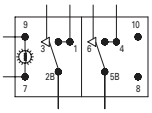
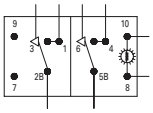
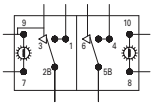
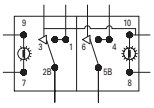
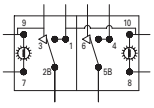
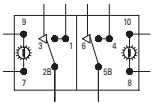
Two-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
3002		OFF	1–ON	2–ON
		2B-1 5B-4	2B-3 5B-4	2B-3 5B-6
3521		OFF	1–ON	2–ON
		2B-1 5B-4	2B-3-9 5B-4	2B-3-9 5B-6
3522		OFF	1–ON	2–ON
		2B-1 5B-4	2B-3-10 5B-4	2B-3-10 5B-6
3523		OFF	1–ON	2–ON
		2B-1 5B-4	2B-3 5B-4	2B-3 5B-6
3524		OFF	1–ON	2–ON
		2B-1 5B-4	2B-3 5B-4	2B-3 5B-6
3525		OFF	1–ON	2–ON
		2B-1 5B-4	2B-3-9 5B-4	2B-3-9 5B-6
3526		OFF	1–ON	2–ON
		2B-1 5B-4	2B-3-10 5B-4	2B-3-10 5B-6
3527		OFF	1–ON	2–ON
		2B-1-10 5B-4	2B-3-9 5B-4	2B-3-9 5B-6
3528		OFF	1–ON	2–ON
		2B-1 5B-4	2B-3 5B-4	2B-3 5B-6

Single-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
3005		MOM. ON 2B-1 5B-4	ON 2B-1 5B-6	MOM. ON 2B-3 5B-6
3581		MOM. ON 2B-1 5B-4	ON 2B-1 5B-6	MOM. ON 2B-3-9 5B-6
3582		MOM. ON 2B-1 5B-4	ON 2B-1 5B-6	MOM. ON 2B-3-10 5B-6
3583		MOM. ON 2B-1 5B-4	ON 2B-1 5B-6	MOM. ON 2B-3 5B-6
3584		MOM. ON 2B-1 5B-4	ON 2B-1 5B-6	MOM. ON 2B-3 5B-6
3585		MOM. ON 2B-1 5B-4	ON 2B-1 5B-6	MOM. ON 2B-3-9 5B-6
3586		MOM. ON 2B-1 5B-4	ON 2B-1 5B-6	MOM. ON 2B-3-10 5B-6
3587		MOM. ON 2B-1-10 5B-4	ON 2B-1-10 5B-6	MOM. ON 2B-3-9 5B-6
3588		MOM. ON 2B-1 5B-4	ON 2B-1 5B-6	MOM. ON 2B-3 5B-6

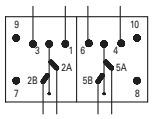
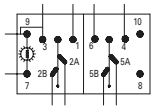
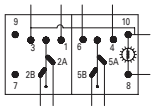
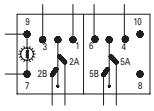
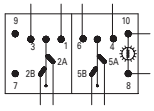
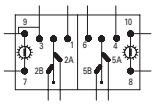
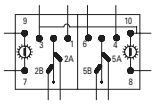
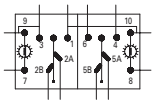
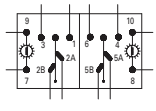
Two-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
4001		NONE 2B-1 5B-4	ON 2B-1 5B-4	MOM. ON 2B-3 5B-6
4501		NONE 2B-1 5B-4	ON 2B-1 5B-4	MOM. ON 2B-3-9 5B-6
4502		NONE 2B-1 5B-4	ON 2B-1 5B-4	MOM. ON 2B-3-10 5B-6
4503		NONE 2B-1 5B-4	ON 2B-1 5B-4	MOM. ON 2B-3 5B-6
4504		NONE 2B-1 5B-4	ON 2B-1 5B-4	MOM. ON 2B-3 5B-6
4505		NONE 2B-1 5B-4	ON 2B-1 5B-4	MOM. ON 2B-3-9 5B-6
4506		NONE 2B-1 5B-4	ON 2B-1 5B-4	MOM. ON 2B-3-10 5B-6
4507		NONE 2B-1-10 5B-4	ON 2B-1-10 5B-4	MOM. ON 2B-3-9 5B-6
4508		NONE 2B-1 5B-4	ON 2B-1 5B-4	MOM. ON 2B-3 5B-6

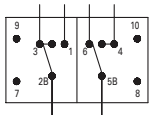
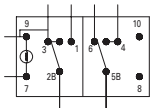
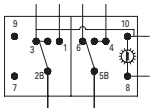
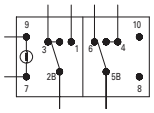
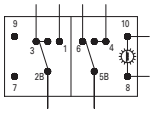
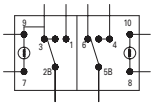
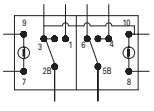
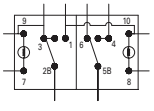
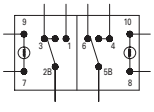
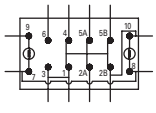
Commercial vehicle solutions

Vehicle controls

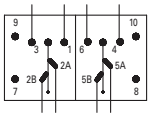
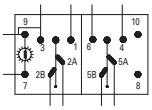
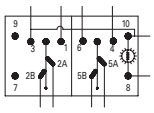
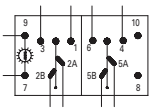
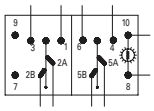
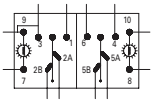
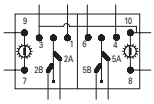
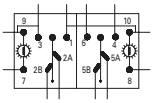
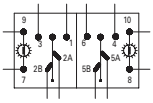
Single-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
5004		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3 5B-6
5561		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3-9 5B-6
5562		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3-10 5B-6
5563		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3 5B-6
5564		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3 5B-6
5565		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3-9 5B-6
5566		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3-10 5B-6
55		ON	ON	OFF
		2A-1-10 5A-4	2A-2B 5A-5B	2B-3-9 5B-6
5568		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3 5B-6

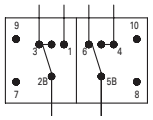
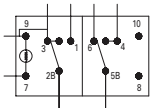
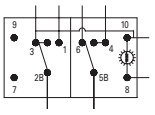
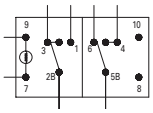
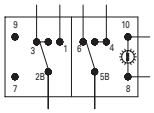
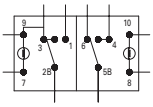
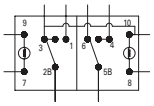
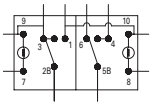
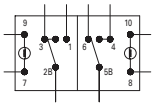
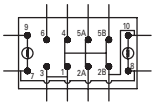
Two-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
5005		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3 5B-4	2B-3 5B-6
5581		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3-9 5B-4	2B-3-9 5B-6
5582		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3-10 5B-4	2B-3-10 5B-6
5583		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3 5B-4	2B-3 5B-6
5584		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3 5B-4	2B-3 5B-6
5585		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3-9 5B-4	2B-3-9 5B-6
5586		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3-10 5B-4	2B-3-10 5B-6
5587		2–ON	1–ON	OFF
		2B-1-10 5B-4	2B-3-9 5B-4	2B-3-9 5B-6
5588		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3 5B-4	2B-3-9 5B-6
6001		ON	NONE	ON
		2A-2B-5A-5B-10-1-4-3	—	3-6-1

Single-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
5004		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3 5B-6
5561		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3-9 5B-6
5562		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3-10 5B-6
5563		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3 5B-6
5564		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3 5B-6
5565		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3-9 5B-6
5566		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3-10 5B-6
55		ON	ON	OFF
		2A-1-10 5A-4	2A-2B 5A-5B	2B-3-9 5B-6
5568		ON	ON	OFF
		2A-1 5A-4	2A-2B 5A-5B	2B-3 5B-6

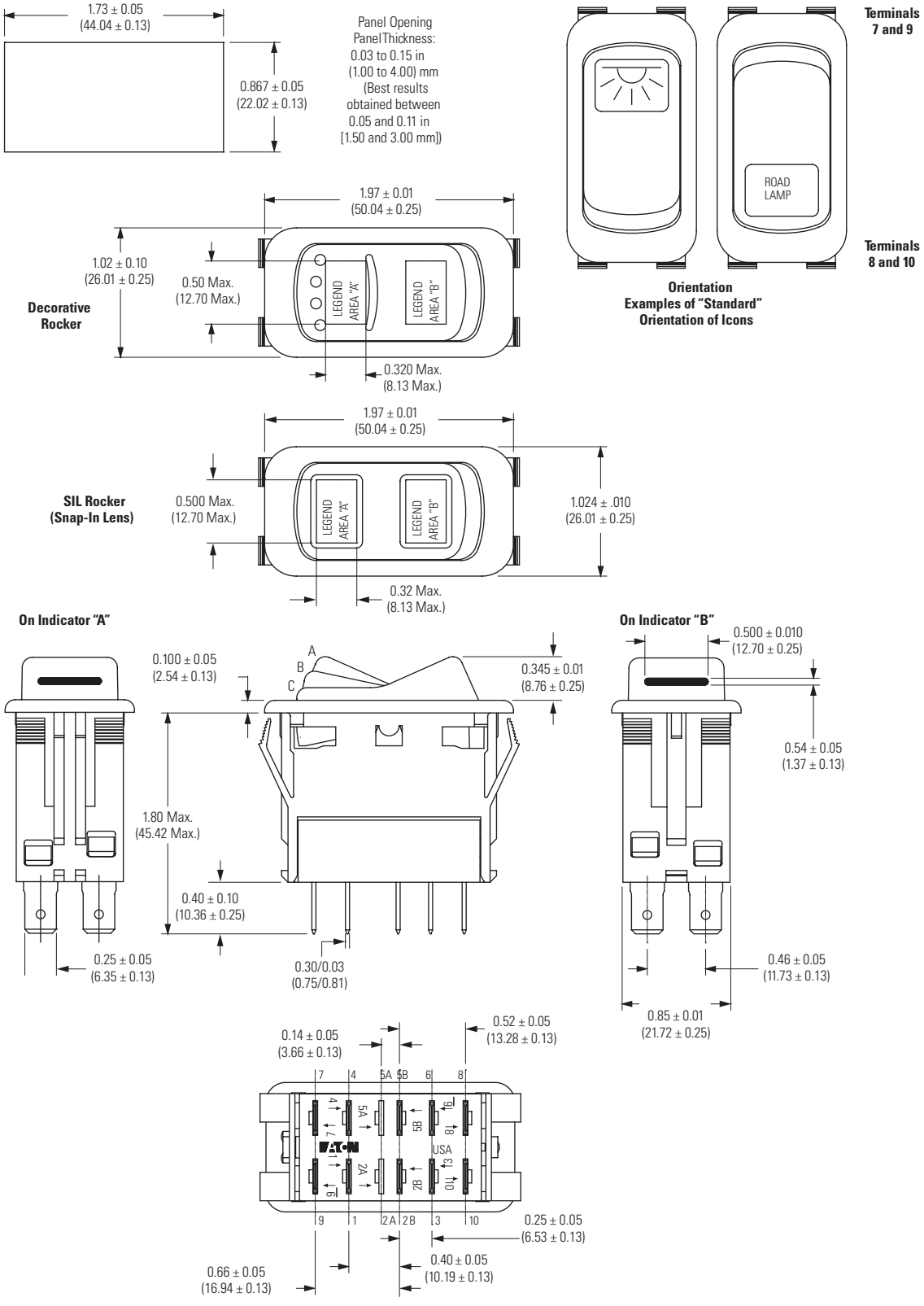
Two-Pole

Circuit no.	Schematic (Shown in UP position)	Circuit with rocker In … DOWN Position	CENTER Position	UP Position
5005		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3 5B-4	2B-3 5B-6
5581		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3-9 5B-4	2B-3-9 5B-6
5582		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3-10 5B-4	2B-3-10 5B-6
5583		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3 5B-4	2B-3 5B-6
5584		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3 5B-4	2B-3 5B-6
5585		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3-9 5B-4	2B-3-9 5B-6
5586		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3-10 5B-4	2B-3-10 5B-6
5587		2–ON	1–ON	OFF
		2B-1-10 5B-4	2B-3-9 5B-4	2B-3-9 5B-6
5588		2–ON	1–ON	OFF
		2B-1 5B-4	2B-3 5B-4	2B-3-9 5B-6
6001		ON	NONE	ON
		2A-2B-5A-5B-10-1-4-3	—	3-6-1

Dimensions

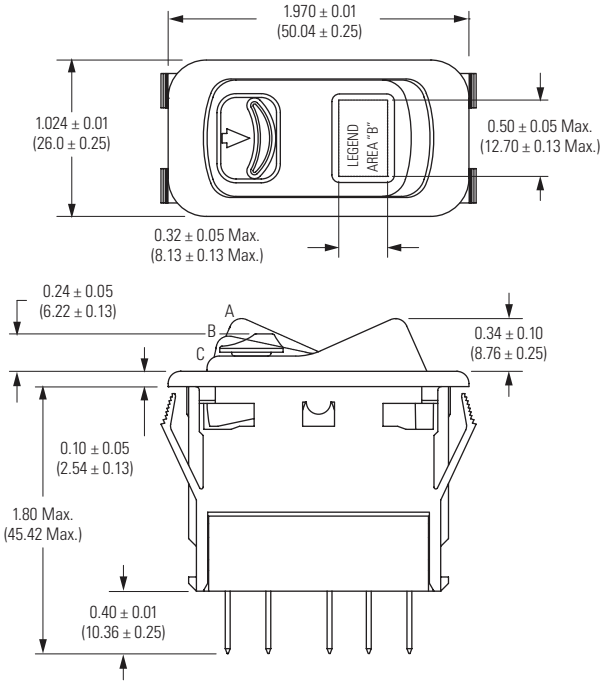
Approximate dimensions in inches (mm)

Switch base with rocker button

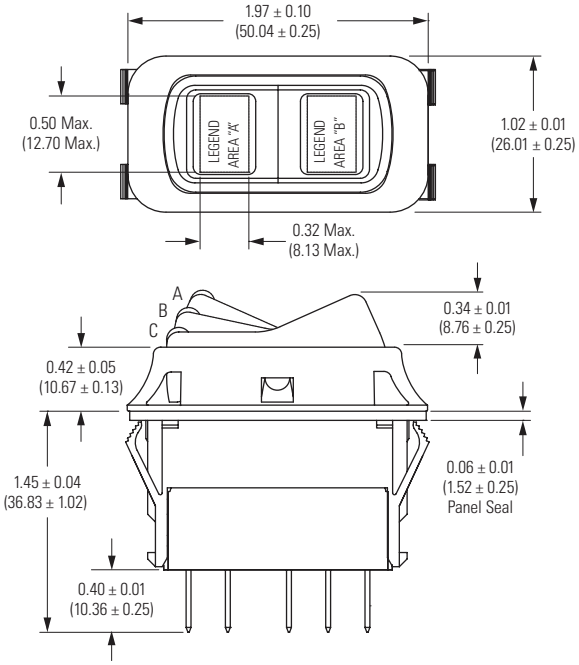


Approximate dimensions in inches (mm)

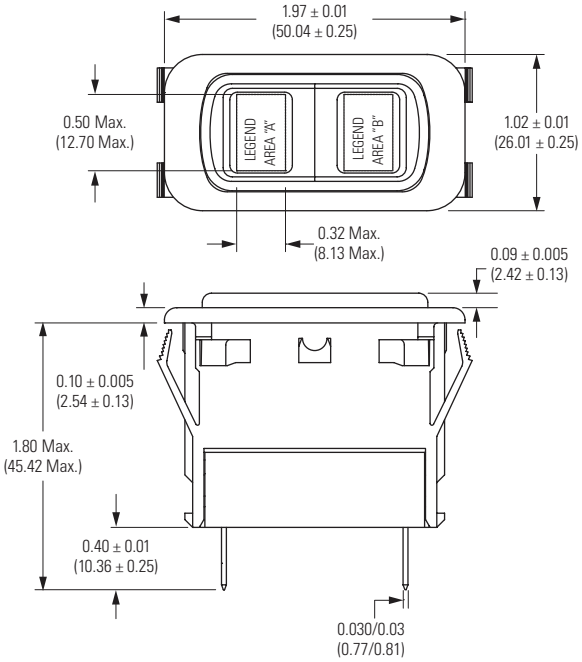
Locking rocker



Panel sealed rocker



Indicator



SVR—sealed vehicle rocker

Product description

The Sealed Vehicle Rocker (SVR) switch from Eaton's electrical business now offers an above panel actuator style in addition to the below panel and paddle actuators.

Designed to meet the severe environmental requirements of the construction and agricultural vehicle markets, the SVR is sealed at the front and back of the switch and meets the rigorous sealing requirements of IP68.

The small switch footprint minimizes the space taken on switch panels. SVR switches are assembled into panels by pressing the switch through the top of the panel and are held in place by retention tabs molded into the body of the switch; mounting hardware or special tools are not necessary.

The SVR is offered in single and two-pole switch circuits, with two- and three-position momentary and maintained circuits available. Switch and illumination circuits are terminated with 0.11 in (2.8 mm) tin-plated copper alloy spade terminals. The SVR connector can be loaded with the appropriate terminals and/or wire seals to accomplish sealing at the back end of the switch.

Features

Actuator

The SVR switch family includes three styles of actuators: above panel, below panel and paddle.

Switch performance and specifications are the same for all actuator styles. Black is standard, but other colors are also available. Matte finish is standard on all actuator styles, matching the finish on the bezels and all other visible SVR switch features and accessories.

Actuator styles

- Above panel rocker button offers new styling and a larger surface area. Eaton can offer assistance with unique designs of above panel actuators for applications where differentiation is desired
- Below panel rocker button is the same two-faced European styling that has been offered for SVR since its initial release. Indicator style matches the below panel rocker button style
- Paddle actuator allows toggle-type actuation of the SVR switch

Standards and certifications

- Approvable under stringent UL and CSA standards
- For information, contact your local Eaton Sales Representative
- RoHS Compliant

RoHS COMPLIANT

Illumination

Long life LEDs provide backlighting illumination for the SVR switch. Backlighting can be either independent of or dependent on the switch circuits, or a combination of both.
Standard LED color is amber, with red, green and blue also available.
LED protection circuitry is available to protect the LED from overvoltage and reverse voltage conditions.

Contact your local Eaton Sales Representative for more specific information about standard and custom circuit options.

Backlighting

- Each switch can accommodate up to two LEDs that can be connected to be either circuit dependent or independent
- Standard LED color is amber, with red, green and blue also available. Long life (100,000 hours) LEDs are standard
- Standard LED voltages are 12 and 24 Vdc
- The below panel rocker button style includes a single-piece back-lit actuator with laser-etched icons in either daylight white or deadfront styles. Without illumination, the icon is either daylight white or deadfront, but will change to the color of the chosen light source when illuminated

Snap-in lenses

- Above and below panel rocker buttons are available with or without one or two translucent lenses. Five standard lens colors are available: white, red, green, blue and amber

Icons

- Icon areas are provided on each end of the rocker button. Icons may be illuminated or nonilluminated and are padprinted in a contrasting color either directly on the rocker button or the lens

Mounting means

Snap-in mounting using four flexible plastic retainers integral with switch frame.

Circuits

The SVR switch is capable of single- or two-pole configurations with two- or three-position maintained, momentary or a combination of actuations.

The addition of jumpers between switch terminals expands the circuit possibilities.

Contact your local Eaton Sales Representative for more specific information about SVR standard and custom circuit options.

Sealing

SVR design includes a sealed contact chamber with dust and water resistance to IP68. The harness connection can also be sealed by using AMP wire seals Catalog Number 828905-1 (14–16 gauge) or 828904-1 (18–20 gauge) to seal the wires to the connector. For an application where a connector cavity is not being used, it can be sealed with AMP sealing plug Catalog Number 828922-1.

The above panel version may also be sealed to the panel using panel seal Catalog Number 32-2245.

Options

- Additional colors of actuators, mounting bezels and lenses
- Special circuits
- Special ratings
- Pad printing on the below panel switch bezel
- Low current capabilities
- Custom back-lit icons
- Gang-mount system including end bezel Catalog Number 17-22146 and center bezel 17-22152
- Palm Guard (below panel switch only) at either or both ends of the switch frame
- Polarized lock-on connector Catalog Number 25-13936
- Panel plug with connector retention feature Catalog Number 17-22145
- Non-illuminated below panel paddle actuator

Note: Contact your local Eaton Sales Representative for additional information on options.

Above-panel rocker switch

Catalog number selection

How to order—Above-panel SVR switch

To determine complete catalog number, start with the appropriate switch series and add the appropriate code letters and/or numbers.

S AC M 2X D G AT R AV X X

Switch series
S: SVR

Switch circuits/Illumination circuits

1st Digit (Circuit)	2nd Digit (Illumination)
	Single-Pole Illumination
A: ON-NONE-ON **C:** ON-NONE-ON ① **D:** ON-OFF-ON **E:** ON-OFF-ON ① **F:** ON*-OFF-ON* **G:** ON*-OFF-ON* ① **H:** ON*-OFF-ON **J:** ON*-OFF-ON ① **K:** ON-ON-ON ② **L:** ON-ON-ON ①② **M:** ON*-NONE-ON **P:** ON*-NONE-ON ① **R:** ON*-ON-ON* ② **S:** ON*-ON-ON* ①② **T:** ON*-ON-ON **U:** ON*-ON-ON ①	**A:** None **C:** Top/left (D) **D:** Bottom/right (D) **E:** Top/left (I) **F:** Bottom/right (I) **G:** Top/left (D)/bottom/right (I) **H:** Top/left (I)/bottom/right (D) **J:** Top/left (D)/bottom/right (D) **K:** Top/left (I)/bottom/right (I)
	Two-Pole Illumination **R:** None **S:** Top/left (D) **T:** Bottom/right (D) **U:** Top/left (I) **V:** Bottom/right (I) **W:** Top/left (D)/bottom/right (I) **Y:** Top/left (I)/bottom/right (D) **3:** Top/left (D)/bottom/right (D) **4:** Top/left (I)/bottom/right (I)

KEY: * = Momentary, **(I) =** Independent, **(D) =** Dependent.

Frame
M: Standard
L: Locking rocker (Lens version only)

LED (top/left)

1st Digit
X: None

14V Standard
K: Green
L: Amber
M: Blue
N: White

14V Over/Reverse Voltage Protection
1: Red
2: Green
3: Amber
7: Blue

28V Standard
E: Red
F: Green
G: Amber
H: Blue
P: White

28V Over/Reverse Voltage Protection
4: Red
5: Green
6: Amber
8: Blue

Icon (top/left)
XX: None
AT: Work light

Lens Color (top/left)
X: None
R: Red
G: Green
B: Blue
A: Amber
W: White

Decorative Icon Color
X: No icon
1: Daylight white

Actuator style
A: Decorative rocker
C: No lens
D: Top/left lens only
E: Bottom/right lens only
F: Top/left and bottom/right lenses

Locking rocker ONLY
U: Bottom lock
M: Top Lock
V: Top & bottom lock

LED (bottom/right)

2nd Digit
X: None
Same codes available as 1st digit.

LED Wavelengths:
Red: ~630 Nm
Amber: ~592 Nm
Green: ~526 Nm
Blue: ~472 Nm

White LED Coordinates:
White: 0.31 x 0.31

Rocker color
X: Black
R: Red ③

Special feature
X: None
For Eaton use only

Icon (bottom/right)
XX: None
AV: Hazard

Lens Color (bottom/right)
X: None
R: Red
G: Green
B: Blue
A: Amber
W: White

Decorative Icon Color
X: No icon
1: Daylight white
2: Deadfront

Note:

① Gold plated.

② Two-pole only. See Electrical Circuit Diagrams on **Page 160** and Illumination Circuit Diagrams on **Page 161**.

③ For red rocker, only actuator style options A, C and F are available.

Below-panel rocker switch

Catalog number selection

How to order—below-panel rocker switch

To determine complete catalog number, start with the appropriate switch series and add the appropriate code letters and/or numbers.

S AC S 2X 3 G AT R AC X X

Switch Series
S: SVR

Switch circuits/Illumination circuits

1st Digit (Circuit)	2nd Digit (Illumination)
	Single-Pole Illumination
A: ON-NONE-ON **C:** ON-NONE-ON ① **D:** ON-OFF-ON **E:** ON-OFF-ON ① **F:** ON*-OFF-ON* **G:** ON*-OFF-ON* ① **H:** ON*-OFF-ON **J:** ON*-OFF-ON ① **K:** ON-ON-ON ② **L:** ON-ON-ON ①② **M:** ON*-NONE-ON **P:** ON*-NONE-ON ① **R:** ON*-ON-ON* ② **S:** ON*-ON-ON* ①② **T:** ON*-ON-ON **U:** ON*-ON-ON ①	**A:** None **C:** Top/left (D) **D:** Bottom/right (D) **E:** Top/left (I) **F:** Bottom/right (I) **G:** Top/left (D)/bottom/right (I) **H:** Top/left (I)/bottom/right (D) **J:** Top/left (D)/bottom/right (D) **K:** Top/left (I)/bottom/right (I)
	Two-Pole Illumination **R:** None **S:** Top/left (D) **T:** Bottom/right (D) **U:** Top/left (I) **V:** Bottom/right (I) **W:** Top/left (D)/bottom/right (I) **Y:** Top/left (I)/bottom/right (D) **3:** Top/left (D)/bottom/right (D) **4:** Top/left (I)/bottom/right (I)
1st and 2nd Digit Indicators **NE:** 7-9 Illumination **NF:** 8-10 Illumination **NK:** Dual Illumination **N9:** Dual Illumination with 8-9 jumper	

KEY: * = Momentary, **(I) =** Independent, **(D) =** Dependent.

Frame
S: Standard-Below panel
T: Palm Guard-Top/left
B: Palm Guard-Bottom/right
F: Palm Guard-Full

LED (top/left)

1st Digit
X: None

14V Standard
J: Red
K: Green
L: Amber
M: Blue

14V Over/Reverse Voltage Protection
1: Red
2: Green
3: Amber
7: Blue

28V Standard
E: Red
F: Green
G: Amber
H: Blue

28V Over/Reverse Voltage Protection
4: Red
5: Green
6: Amber
8: Blue

LED (bottom/right)

2nd Digit
X: None
Same codes available as 1st digit.

LED Wavelengths
Red: ~630 Nm
Amber: ~592 Nm
Green: ~526 Nm
Blue: ~472 Nm

Actuator style
1: No lens
2: Top/left lens only
3: Bottom/right lens only
4: Top/left and bottom/right lenses
5: Paddle-No lens
6: Indicator-Top/left lens
7: Indicator-Bottom/right lens
8: Indicator-Top/left and Bottom/right lens
9: Indicator-No lens
A: Decorative rocker

Lens color (top/left)
X: None
R: Red
G: Green
B: Blue
A: Amber
W: White

Decorative Icon Color
1: Daylight white
2: Deadfront

Icon (top/left)
XX: None
AT: Work light

Special feature
X: None
For Eaton use only

Icon (bottom/right)
XX: None
AC: Fast

Lens color (bottom/right)
X: None
R: Red
G: Green
B: Blue
A: Amber
W: White

Decorative Icon Color
1: Daylight white
2: Deadfront

Special feature
X: None
For Eaton use only

Note:

① Gold plated.
② Two-pole only. See Electrical Circuit Diagrams on **Page 160** and Illumination Circuit Diagrams on **Page 161**.

Technical data and specifications

SVR—Sealed vehicle rocker

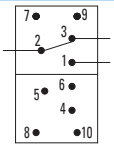
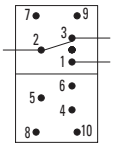
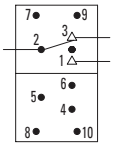
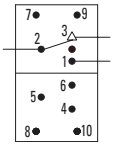
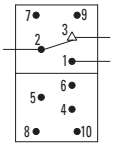
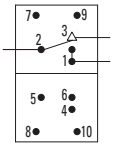
Description	Specification
Ratings	12A at either 12 or 24 Vdc, can be approved under stringent UL and CSA standards
Electrical life	
Gold plating	50,000 operations at 12A at either 12 or 24 Vdc. Life cycle testing conducted using both inductive and resistive loads
Standard plating	250,000 (maintained circuits)/50,000 (momentary circuits) operations at 10 mA at either 12 or 24 Vdc
Mechanical life	
Maintained circuits	250,000 operations minimum
Momentary circuits	50,000 operations minimum
Circuits	Single- or two-pole, two- or three-position, with momentary and maintained capabilities
Dielectric strength	1500 volts rms minimum
Operate force	1–3 lbs (4.4–13.2 Nm) depending on circuit configuration and actuator style
Temperature	
Operating range	–40° to 185°F (–40° to 85°C)
Storage range	–40° to 185°F (–40° to 85°C)
Contact material	
Movable	Copper alloy with silver alloy contact surface
Stationary	Silver-plated copper alloy with silver alloy contact surface
Gold-plated	Contacts are available for low level electrical loads
Terminal type	Standard 0.11 in (2.8 mm) tin-plated copper alloy spade terminal Mates to AMP Junior Power Timer Terminals ① Catalog Number 927766-3 (14–16 gauge) Catalog Number 927770-3 (18–20 gauge)
Plastic component UL ratings	
Base material	UL 94 V-0
Frame material	UL 94 H-B
IP rating	IP68
Sub-actuator material	UL 94 V-0
Actuator material	UL 94 V-0 (above panel rocker button) UL 94 H-B (below panel rocker button and paddle actuator)
Mounting hole	Standard panel cutout of 1.45 x 0.83 in (36.8 x 21.1 mm)
Panel thickness	0.04 to 0.16 in (1.0 to 4.0 mm) Best results obtained between 0.06 and 0.12 in (1.5 and 3.0 mm)

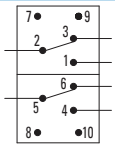
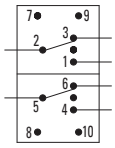
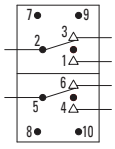
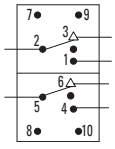
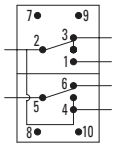
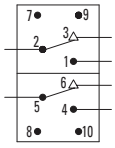
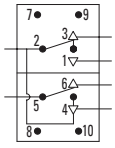
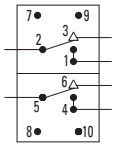
Note:

① See also Sealing, **Page 156**, for additional AMP components to seal the connector interface.

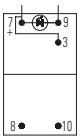
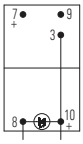
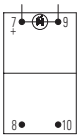
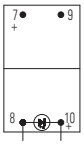
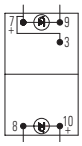
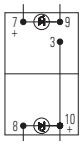
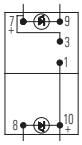
Circuit diagrams

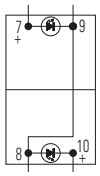
Switch circuit schematics

Code	Single-Pole schematic (Shown in top/left Actuated position)	TOP/ LEFT Actuated	CENTER	BOTTOM/ RIGHT Actuated
A C (Gold)		ON	NONE	ON
		2–3	—	2–1
D E (Gold)		ON	OFF	ON
		2–3	—	2–1
F G (Gold)		MOM. ON	OFF	MOM. ON
		2–3	—	2–1
H J (Gold)		MOM. ON	OFF	ON
		2–3	—	2–1
K L (Gold)		Two-pole only		
M P (Gold)		MOM. ON	NONE	ON
		2–3	—	2–1
R S (Gold)		Two-pole only		
T U (Gold)		MOM. ON	ON	ON
		2–3	2–1	2–1

Code	Single-Pole schematic (Shown in top/left Actuated position)	TOP/ LEFT Actuated	CENTER	BOTTOM/ RIGHT Actuated
A C (Gold)		ON	NONE	ON
		2–3 5–6	— —	2–1 5–4
D E (Gold)		ON	OFF	ON
		2–3 5–6	— —	2–1 5–4
F G (Gold)		MOM. ON	OFF	MOM. ON
		2–3 5–6	— —	2–1 5–4
H J (Gold)		MOM. ON	OFF	MOM. ON
		2–3 5–6	— —	2–1 5–4
K L (Gold)		ON	ON	ON
		2–3 5–6	5–4–2–3	5–4–2–1
M P (Gold)		MOM. ON	NONE	ON
		2–3 5–6	— —	2–1 5–4
R S (Gold)		MOM. ON	ON	MOM. ON
		2–3 5–6	5–4–2–3	5–4–2–1
T U (Gold)		MOM. ON	ON	ON
		2–3 5–6	2–1 5–4	2–1 5–4

Illumination schematics

Single- pole code	Two- pole code	Schematic ①
A	R	None
C	S	
D	T	
E	U	
F	V	
G	W	
H	Y	
J	3	
K	4	

Illumination code	Schematic ①
9	

Note:

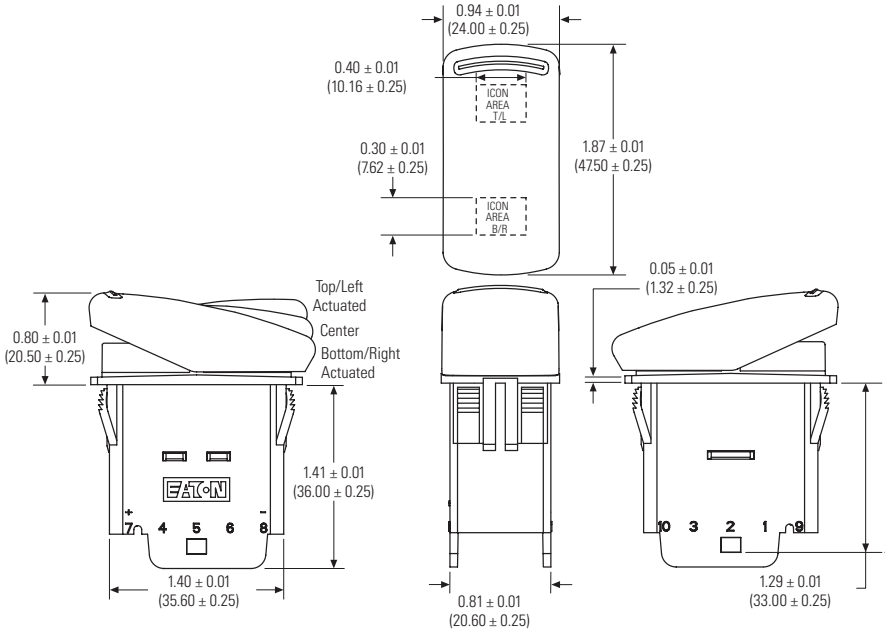
① LED for terminals 7–9 is at top/left side of switch. LED for terminals 8–10 is at bottom/right of switch.

Dimensions

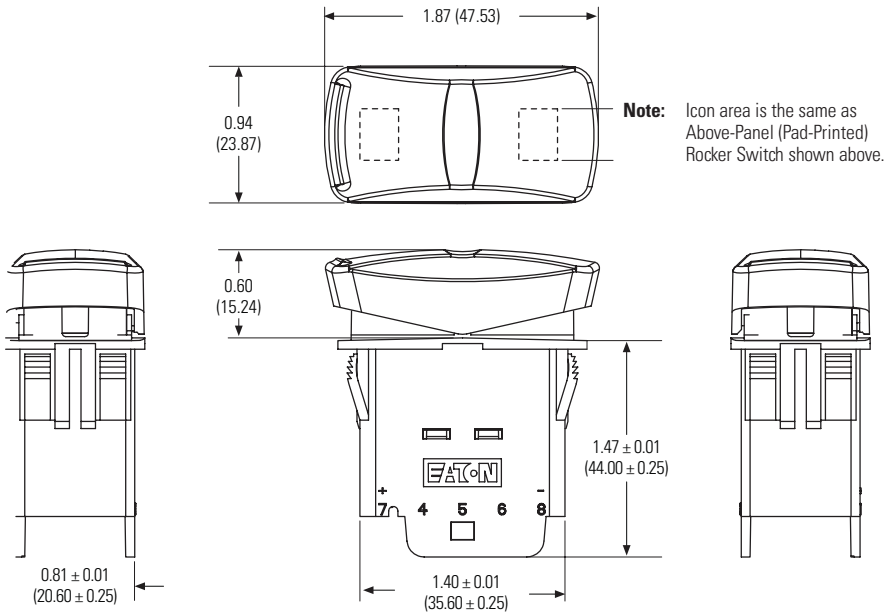
Above-panel rocker

Approximate dimensions in inches (mm)

Above-panel (pad-printed) rocker switch



Above-panel decorative (laser-etched) rocker switch

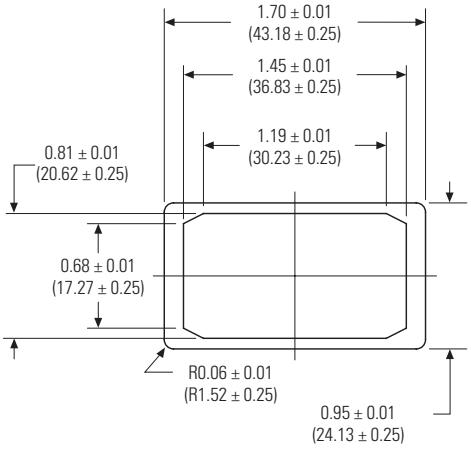


Above-panel rocker

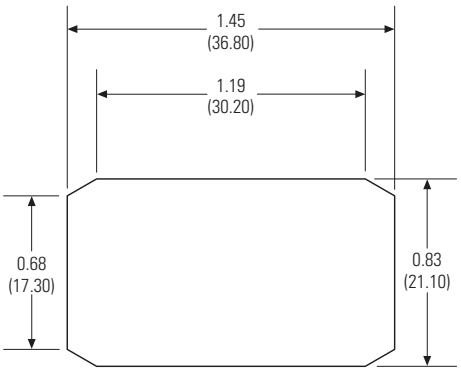
Approximate dimensions in inches (mm)

Panel seal gasket (above only)

Catalog Number 32-2245



Panel opening (above and below)

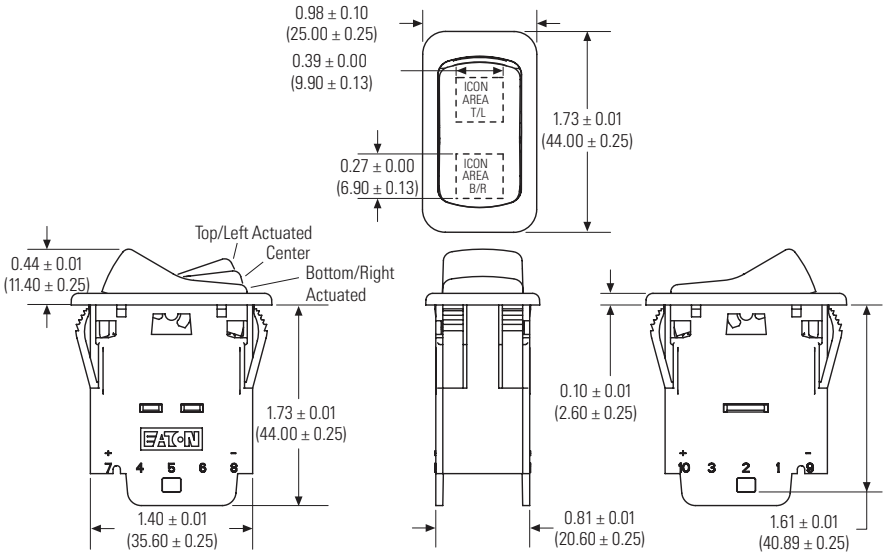


Note: Recommended panel thickness 0.03–0.15 in (1.00–4.00 mm). Best results obtained between 0.05 and 0.11 in (1.50 and 3.00 mm).

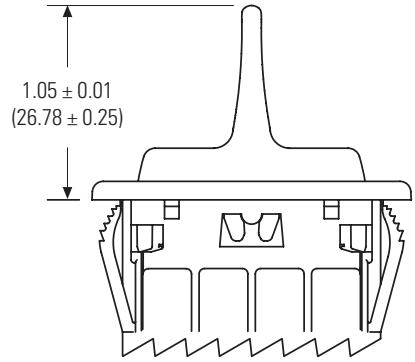
Below-panel rocker

Approximate dimensions in inches (mm)

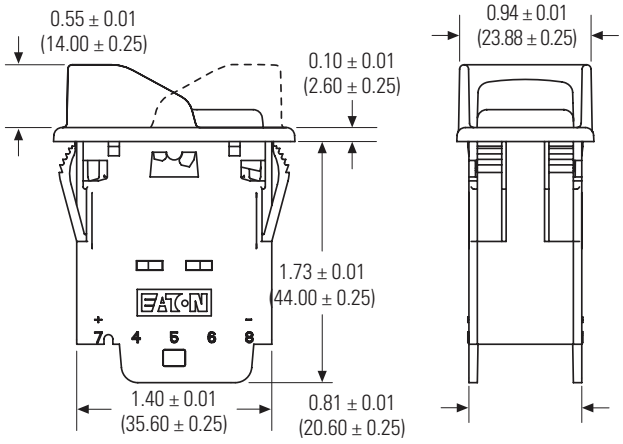
Below-panel rocker switch with actuator



Panel actuator (below-panel only)



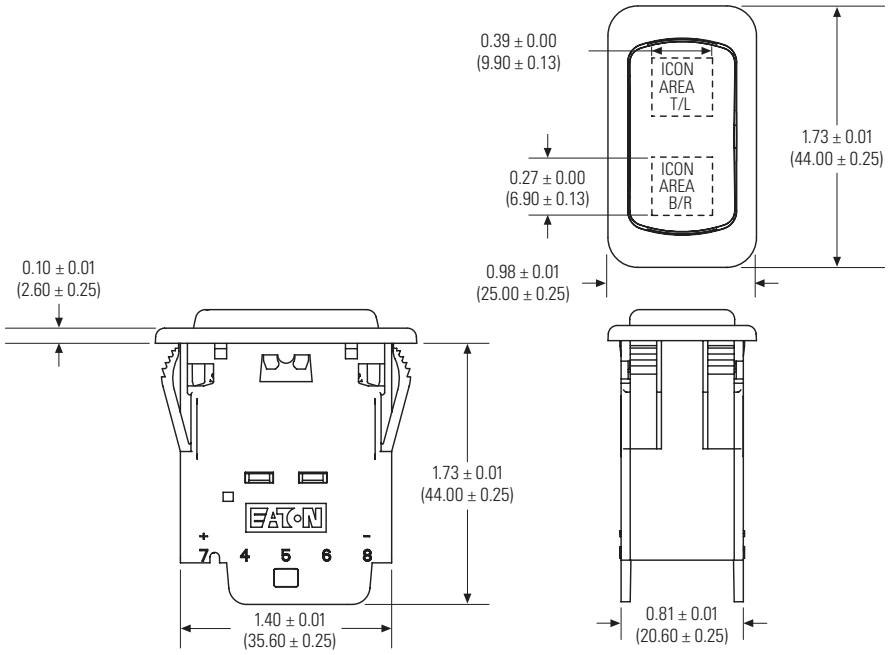
Panel guard (below-panel only)



Below-panel rocker

Approximate dimensions in inches (mm)

Indicator (below-panel only)

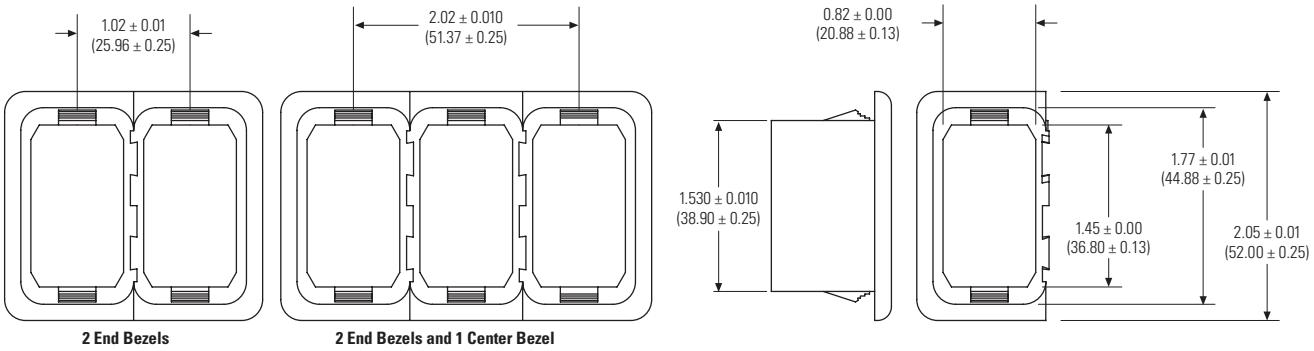


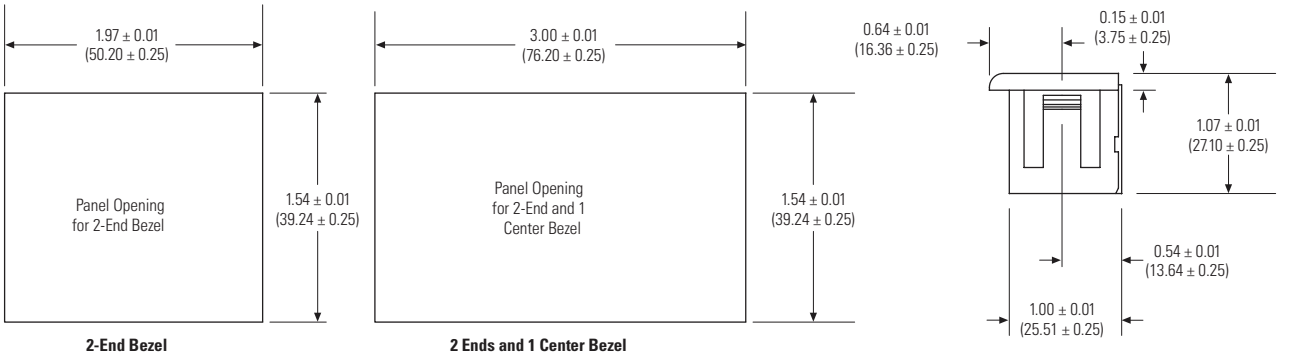
Accessories

Approximate dimensions in inches (mm)

Gang mount system

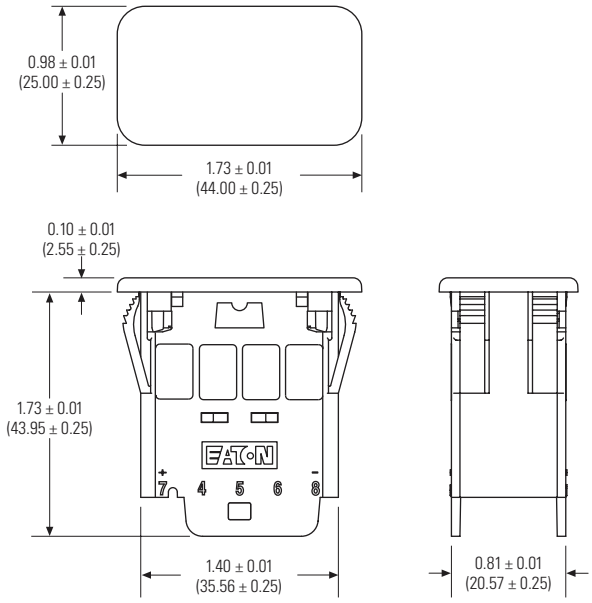
End Bezel Catalog Number 17-22146
Center Bezel Catalog Number 17-22152





Panel plug

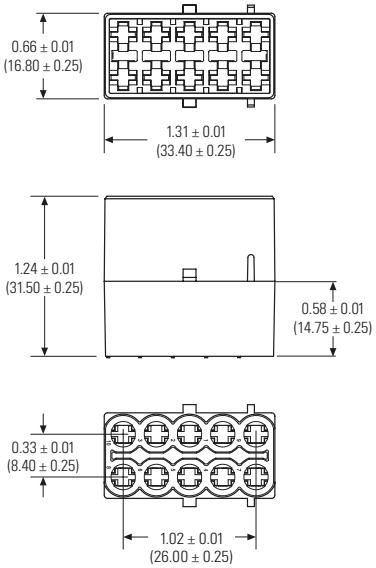
Catalog Number 17-22145



Connector

Catalog Number 25-13936

AMP Terminal Catalog Numbers:
927766-3 (14–16 gauge)
927770-3 (18–20 gauge)
AMP Wire Seal Catalog Numbers:
828905-1 (14–16 gauge)
828904-1 (18–20 gauge)
AMP Sealing Plug Catalog Number:
828922-1



1500/2500 Series

Product description

Eaton's 1500/2500 series rocker switch offers a designer touch that will enhance any product line.

Ideal applications include appliances, electronic instrumentation, data processing, communications and medical and office equipment. Custom legends are available on the switch actuator and bezel.

Options

High inrush option

The 1500H/2500H is designed to handle high inrush currents up to 100A peak inrush for 10 milliseconds.

Hi-Lite rocker with high inrush option

This two-color rocker version brightly indicates the ON position. This version spares the expense of more costly illuminated switches and is available with the high inrush option.

Standards and certifications

Note: See Catalog Number Selection for more detail.

International approvals

- UL Recognized
- CSA Certified
- ENEC
- RoHS Compliant

Midsize non-illuminated and illuminated

To determine complete catalog number, start with the appropriate base circuit number and add the appropriate code letters and/or numbers.

Catalog number selection

How to order—midsize non-illuminated

1500 2 1 E 038

- **Legend type (optional)**
  - **038:** ON/OFF
    See Most Popular Legends table on **Page 192**.
- **Rocker color**
  - **1:** Black
  - **2:** White
  - **3:** Red
- **Terminal type**
  - **E:** 6.3 mm tabs/0.25 in quick connect
  - **B:** Solder lugs

  Note: B style terminal not offered for 1506 Series.
- **Base and bezel color**
  - **1:** Black
  - **2:** White
  - **3:** Red

Rating	Poles and throw	Circuit with rocker in … UP position	CENTER position	DOWN ① position	Base circuit number ②	Circuit number ③
UL/CSA: 15A 125 Vac, 10A 250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 10(4)A 250V	1PST	ON MOM. ON ON	NONE NONE NONE	OFF OFF MOM. OFF	**1500** **1501** **1505**	1 3 4
	1PDT	ON ON	NONE NONE	ON MOM. ON	**1502** **1503**	5 7
UL/CSA: 15A 125 Vac, 10A 250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 10(2)A 250V	1PDT	ON	OFF	ON	**1504**	6
UL/CSA: 10A 125 Vac, 10A 250 Vac, 10A 28Vdc, 8A 14VT; **ENEC:** 10(2)A 250V	1PDT	MOM. ON MOM. ON	OFF OFF	MOM. ON ON	**1506** **1507**	9 8
UL/CSA: 15A 125 Vac, 10A 250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 10(4)A 250V	2PST	ON MOM. ON ON	NONE NONE NONE	OFF OFF MOM. OFF	**2500** **2501** **2505**	10 11 12
	2PDT	ON ON	NONE NONE	ON MOM. ON	**2502** **2503**	13 15
UL/CSA: 15A 125 Vac, 10A 250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 10(2)A 250V	2PDT	ON	OFF	ON	**2504**	14
UL/CSA: 10A 125 Vac, 10A 250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 10(2)A 250V	2PDT	MOM. ON MOM. ON	OFF OFF	MOM. ON ON	**2506** **2507**	17 16

How to order—midsize illuminated

2500 G 2 2 E 725

Base and bezel color
1: Black **2:** White **3:** Red

Terminal type
E: 6.3 mm tabs/0.25 in quick connect
B: Solder lugs

Legend type (optional)
725: ON/OFF
See Most Popular Legends table on **Page 181**

Lamp voltage
0: No lamp
1: 125V neon
2: 250V neon
4: 6V filament ④
5: 12V filament ④

Lens/Rocker color
A: Amber
G: Green
R: Red
W: White (clear)

Rating	Poles and throw	Circuit with rocker in … UP position	CENTER position	DOWN ① position	Base circuit number	Circuit number ③
UL/CSA: 15A 125 Vac, 10A 250 Vac, 10A 28Vdc, 8A 14VT; **ENEC:** 10(4)A 250V	1PST	ON MOM. ON	NONE NONE	OFF OFF	**1500** **1501**	18 21
	2PST	ON MOM. ON	NONE NONE	OFF OFF	**2500** **2501**	28 30

Note:

① 1500 Type—Lever depressed toward terminal #3. 2500 Type—Lever depressed toward terminals #13 and #26.
② #1500—#1507 switches are supplied in 1500 type base. #2500—#2507 switches are supplied in 2500 type base.
③ See Circuit Diagrams on **Page 192**.
④ 6V, 12V filament lamps are not UL, CSA, or ENEC.

Hi-lite rocker with high inrush

To determine complete catalog number, start with the appropriate base circuit number and add the appropriate code letters and/or numbers.

Catalog number selection

How to order—Hi-Lite rocker with high inrush option

1500H 1 2 4 E 038

Rating	Poles and throw	Circuit with rocker in … UP position	CENTER position	DOWN ① position	Base circuit number	Circuit number ③
UL/CSA: 15A 125 Vac, 10A 250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 10(4)A 250V	1PST	ON MOM. ON	NONE NONE	OFF OFF	**1500** **1501**	1 3
UL/CSA: 22A 125 Vac, 16A 250 Vac, 6A 125 VacL, 10A 14VT, 1 hp 125-250Vac; **ENEC:** 16(4)A 250V	1PST	ON	NONE	OFF	**1500H** ②	1

Terminal type
E: 6.3 mm tabs/0.25 in quick connect
B: Solder lugs ④

Legend type (optional)
038: ON/OFF
See Most Popular Legends table on **Page 181**

Base and bezel color
1: Black
2: White
3: Red

Rocker color
1: Black
2: White
3: Red

Hi-Lite Color
1: Black
2: White
4: Green
5: Gray
6: Red
7: Yellow

How to order—high inrush, non-illuminated

1500H 1 2 E 038

Rating	Poles and throw	Circuit with rocker in … UP position	CENTER position	DOWN ① position	Base circuit number	Circuit number ③
UL/CSA: 22A 125 Vac, 16A 250 Vac, 6A 125 VacL, 10A 14VT, 1 hp 125-250 Vac; **ENEC:** 16(4)A 250V	1PST	ON	NONE	OFF	**1500H**	1
	2PST	ON	NONE	OFF	**2500H**	10

Rocker color
1: Black **2:** White **3:** Red

Terminal type
E: 6.3 mm tabs/0.25 in quick connect

Legend type (optional)
038: ON/OFF
See Most Popular Legends table on **Page 181**.

Base and bezel color
1: Black
2: White
3: Red

How to order—high inrush illuminated

2500H G 2 2 E 725

Rating	Poles and throw	Circuit with rocker in … UP position	CENTER position	DOWN ① position	Base circuit number	Circuit number ③
UL/CSA: 22A 125 Vac, 16A 250 Vac, 6A 125 VacL, 10A 14VT, 1 hp 125–250 Vac; **ENEC:** 16(4)A 250V	1PST	ON	NONE	OFF	**1500H**	18
	2PST	ON	NONE	OFF	**2500H**	28

Lamp voltage
- **0:** No lamp
- **1:** 125V neon
- **2:** 250V neon
- **4:** 6V filament ⑤
- **5:** 12V filament ⑤

Lens/Rocker color
- **A:** Amber
- **G:** Green
- **R:** Red
- **W:** White (clear)

Terminal type
- **E:** 6.3 mm tabs/0.25 in quick connect

Base and bezel color
- **1:** Black
- **2:** White
- **3:** Red

Legend type (optional)
- **725:** ON/OFF
  See Most Popular Legends table on **Page 181**

Note:

① 1500 Type—Lever depressed toward terminal #2. 1500H Type—Lever depressed toward terminal #3. 2500H Type—Lever depressed toward terminals #13 and #26.
② High inrush capabilities available only on basic catalog numbers beginning with 1500H.
③ See Circuit Diagrams on **Page 192**.
④ Standard rating only.
⑤ 6V, 12V filament lamps are not UL, CSA, or ENEC.

Technical data and specifications

1500/2500—Midsize ac rated

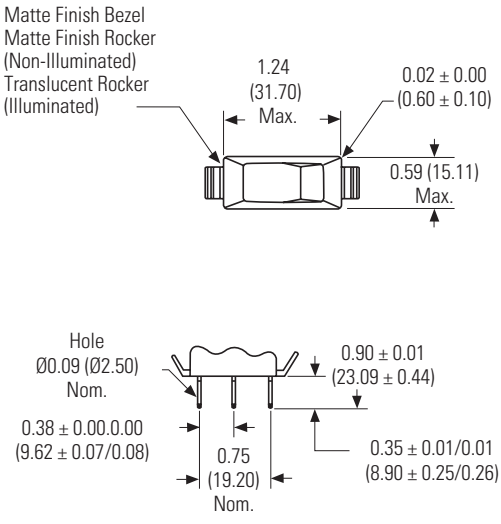
Description	Specification
Ratings	See selection tables on **Pages 168** and **170**.
Seal level	IP40
Circuits	
Standard	1PST, 1PDT, 2PST, 2PDT, maintained and momentary
High inrush option	1PST, 2PST, maintained
Hi-lite option	1PST, maintained
Contact mechanism	
Standard	Slow-make/slow-break butt contact
High inrush option	Slow-make/slow-break butt contact with mechanical break
Make—High inrush option	100A peak inrush at 250 Vac for 10 ms for 10,000 cycles minimum
Break—High inrush option	16A, 250 Vac for 10,000 cycles minimum
Contact material	Silver inlay over copper
Contact resistance	10M ohms max. at 1A, 4 Vdc

Description	Specification
Mechanical life	50,000 cycles minimum
Insulation resistance	50M ohms minimum
Dielectric withstand	1000V rms minimum
Terminal types	
Standard	6.3 mm Tabs/0.250 in Quick Connect
Optional	Solder lug
Termination material	
Common (center)	Copper fine silver-plated
End	Copper
Lamp	Brass
Mounting	See dimensions below
Operating temperature range	32° to 185°F (0° to 85°C)

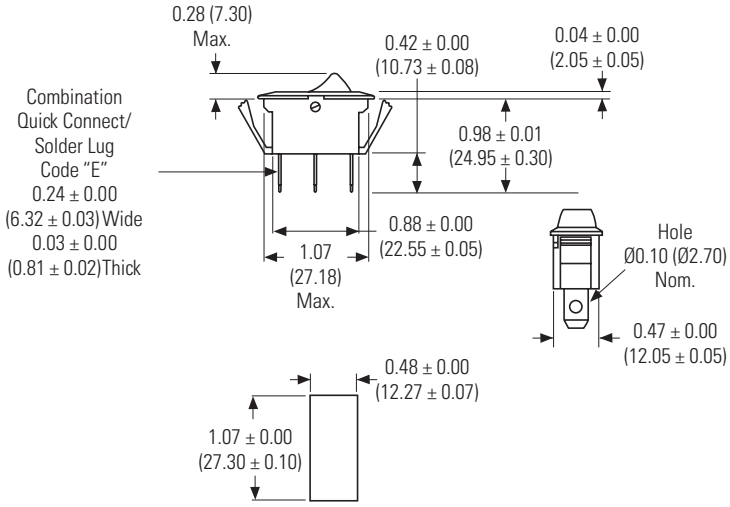
Dimensions

Approximate dimensions in inches (mm)

1500/1500H type base



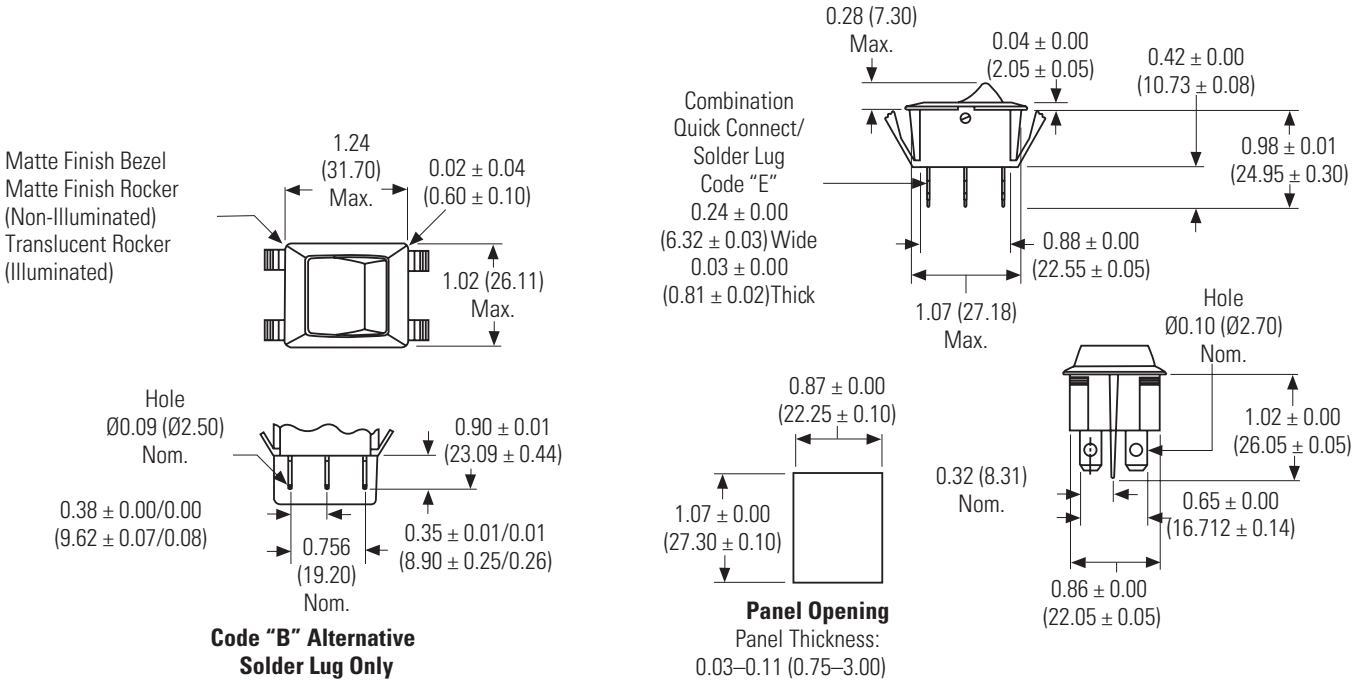
Code "B" Alternative Solder Lug Only



Panel Opening

Panel Thickness: 0.03–0.11 (0.75–3.00)

2500/2500H type base



1600/2600 Series

Product description

Eaton's 1600/2600 series of midsize snap-in rocker and paddle switches have worldwide approvals at up to 16A, 250 Vac. One switch can be used for both domestic and foreign markets.

Ideal applications include appliances, electronic instrumentation, data processing, communications, medical equipment, office equipment and many more. A wide circuit variety is offered in a choice of standard and custom colors for illuminated and nonilluminated versions.
Custom legends are available on the switch lever and bezel. High inrush and splashguard are also available.

Options

High inrush option

The 1600H/2600H is designed to handle high inrush currents up to 100A peak inrush for 10 milliseconds.

Splashguard option

This version features a uniquely designed seal that resists moisture and water, making it ideally suited for marine, RV and food processing applications. The oversized nylon lever with smooth, matte finish features a convenient thumb depression to ensure effortless touch control. Two-pole switches feature both a thumb depression and a convex curve.
See **Page 177.**

Standards and certifications

Note: See Catalog Number Selection for more detail.

International approvals

- UL Recognized
- CSA Certified
- ENEC
- RoHS Compliant

Non-Illuminated rocker

To determine complete catalog number, start with the appropriate base circuit number and add the appropriate code letters and/or numbers.

Catalog number selection

How to order—non-illuminated rocker

1600 M 2 1 E 038

Legend type (optional)
038: ON/OFF
See Most Popular Legends table on **Page 181**

Terminal type
E: 6.3 mm tabs/0.25 in quick connect
B: Solder lugs

Base and bezel color
1: Black
2: White
3: Red

Finish ④
Blank: Standard
M: Matte

Base and bezel color
1: Black
2: White
3: Red

Rating	Poles and throw	Circuit with rocker in … UP position	CENTER position	DOWN ① position	Base circuit number Rocker	Paddle ①	Circuit number ③
UL/CSA: 16A 125–250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 16(4)A 250V	1PST	ON MOM. ON ON	NONE NONE NONE	OFF OFF MOM. OFF	**1600** **1601** **1605**	**P1600** **P1601** **P1605**	1 3 4
	1PDT	ON ON	NONE NONE	ON MOM. ON	**1602** **1603**	**P1602** **P1603**	5 7
UL/CSA: 16A 125–250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 10(2)A 250V	1PDT	ON	OFF	ON	**1604**	**P1604**	6
UL/CSA: 10A 125–250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 10(2)A 250V	1PDT	MOM. ON MOM. ON	OFF OFF	MOM. ON ON	**1606** **1607**	**P1606** **P1607**	9 8
UL/CSA: 16A 125–250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 16(4)A 250V	2PST	ON MOM. ON ON	NONE NONE NONE	OFF OFF MOM. OFF	**2600** **2601** **2605**	**P2600** **P2601** **P2605**	10 11 12
	2PDT	ON ON	NONE NONE	ON MOM. ON	**2602** **2603**	**P2602** **P2603**	13 15
UL/CSA: 16A 125–250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 10(2)A 250V	2PDT	ON	OFF	ON	**2604**	**P2604**	14
UL/CSA: 10A 125–250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 10(2)A 250V	2PDT	MOM. ON MOM. ON	OFF OFF	MOM. ON ON	**2606** **2607**	**P2606** **P2607**	17 16

Note:

① Paddles are UL, CSA only.
② 1600 Type—Lever depressed toward terminal #3.
2600 Type—Lever depressed toward terminals #13 and #26.
③ See Circuit Diagrams on **Page 192**.
④ To order the standard, add a "dash" to the catalog number. Example: 1600–11E.

Illuminated rocker

To determine complete catalog number, start with the appropriate base circuit number and add the appropriate code letters and/or numbers.

Catalog number selection

How to order—illuminated rocker

1621X W 5 3 E 038

Rating	Poles and throw	Circuit with rocker in … UP position	CENTER position	DOWN ① position	Base circuit number ②	Circuit number ③
UL/CSA: 16A 125–250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 16(4)A 250V	1PST	ON	NONE	OFF	**1600**	18
		MOM. ON	NONE	OFF	**1601**	21
		ON	NONE	OFF	**1620X**	20
		MOM. ON	NONE	OFF	**1621X**	④
		ON	NONE	MOM. OFF	**1625X**	④
	1PDT	ON	NONE	ON	**1622X**	④
		ON	NONE	MOM. ON	**1623X**	④
UL/CSA: 16A 125–250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 10(2)A 250V	1PDT	ON	OFF	ON	**1624X**	④
UL/CSA: 10A 125–250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 10(2)A 250V	1PDT	MOM. ON	OFF	MOM. ON	**1626X**	④
		MOM. ON	OFF	ON	**1627X**	④
UL/CSA: 16A 125–250 Vac, 10A 28 Vdc, 8A 14VT; **ENEC:** 16(4)A 250V	2PST	ON	NONE	OFF	**2600**	28
		MOM. ON	NONE	OFF	**2601**	30
		ON	NONE	MOM. OFF	**2605**	31
—	—	Indicator	—	—	**1609**	32

Terminal type
E: 6.3 mm tabs/0.25 in quick connect
B: Solder lugs

Legend type (optional)
038: ON/OFF
See Most Popular Legends table on **Page 181**

Base and bezel color
1: Black
2: White
3: Red

Lamp voltage
0: No lamp
1: 125V neon
2: 250V neon
4: 6V filament ⑤
5: 12V filament ⑤

Lens/Rocker color
A: Amber
G: Green
R: Red
W: White (clear)

Note:

① 1600 Type—Lever depressed toward terminal #3.
2600 Type—Lever depressed toward terminals #13 and #26.
② #1600—#1609 switches are supplied in 1600 type base.
#1620—#1627 switches are supplied in 2600 type base. (Must have an "X" code.)
#2600—#2605 switches are supplied in 2600 type base.
③ See Circuit Diagrams on **Page 192**.
④ All independent lamps for IP switches to be assembled from terminal positions #24 and #26.
⑤ 6V, 12V filament lamps are not UL, CSA, or ENEC.

High inrush rockers

To determine complete catalog number, start with the appropriate base circuit number and add the appropriate code letters and/or numbers.

Catalog number selection

How to order—non-illuminated high inrush rockers

1600H M 2 1 E 038

Rating	Poles and throw	Circuit with rocker in … UP position	CENTER position	DOWN ② position	Base circuit number	Circuit number ⑤
UL/CSA: ① 22A 125 Vac, 16A 250 Vac, 6A 125 VacL, 10A 14VT, 1 hp 125–250 Vac; **ENEC:** 16(4)A 250V	1PST	ON	NONE	OFF	**1600H**	1
		ON	NONE	OFF	**1620H** ③	2
	2PST	ON	NONE	OFF	**2600H**	10

Legend type (optional)
038: ON/OFF
See Most Popular Legends table on **Page 181**

Rocker color
1: Black
2: White
3: Red

Terminal type
E: 6.3 mm tabs/0.25 in quick connect

Finish ④
Blank: Standard
M: Matte

Base and bezel color
1: Black
2: White
3: Red

How to order—illuminated high inrush rockers

1600H R 2 1 E 038

Legend type (optional)
038: ON/OFF
See Most Popular Legends table on **Page 181**

Base and bezel color
1: Black
2: White
3: Red

Terminal type
E: 6.3 mm tabs/0.25 in quick connect

Lens/Rocker color
A: Amber
G: Green
R: Red
W: White (clear)

Lamp voltage
0: No lamp
1: 125V neon
2: 250V neon
4: 6V filament ⑧
5: 12V filament ⑧
6: 24V filament ⑧

Rating	Poles and throw	Circuit with rocker in … UP position	CENTER position	DOWN ② position	Base circuit number	Circuit number ⑤
UL/CSA: ① 22A 125 Vac, 16A 250 Vac, 6A 125 VacL, 10A 14VT, 1 hp 125–250 Vac; **ENEC:** 16(4)A 250V	1PST	ON	NONE	OFF	**1600H**	18
		ON	NONE	OFF	**1620HX** ⑥	19
	2PST	ON	NONE	OFF	**2600H**	28
—	—	Indicator	Indicator	—	**1609**	32

Note:

① UL, CSA: 1 hp at 125V or 250 Vac; 6A, 125 Vac (L) rating; 10A, 14 Vdc. Marked on request only.
② 1600H Type—Rocker depressed toward terminal #2.
2600H Type—Rocker depressed toward terminals #13 and #26.
③ 1620H switch is supplied in 2600H base.
④ No code required.
⑤ See Circuit Diagrams on **Page 192**.
⑥ 1620H switch is supplied in 2600H type base. (Must have "X" code.)
⑦ 1600H Type—Rocker depressed toward terminal #3.
1620H Type—Rocker depressed toward terminals #13 and #26.
2600H Type—Rocker depressed toward terminals #13 and #26.
⑧ 6V, 12V, 24V filament lamps are not UL, CSA, or ENEC.

Technical data and specifications

1600/2600—Midsize AC rated

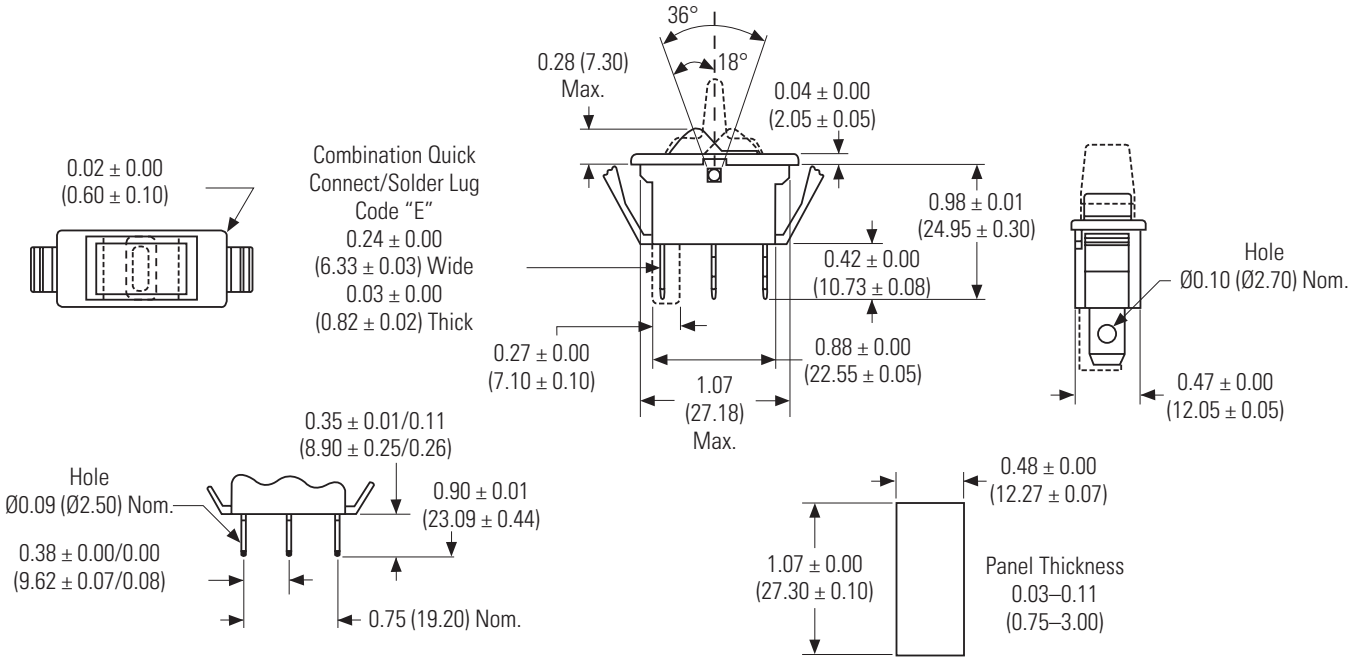
Description	Specification
Ratings	See selection tables on **Pages 175** to **188**.
Circuits	
Standard	1PST, 1PDT, 2PST, 2PDT maintained and momentary
High inrush option	1PST, 2PST maintained
Contact mechanism	
Standard	Slow-make/slow-break butt contact
High inrush option	Slow-make/slow-break butt contact with mechanical break
Make—High inrush option	100A, 250 Vac for 10 ms for 10,000 cycles min.
Break—High inrush option	16A, 250 Vac for 10,000 cycles min.
Contact material	Silver inlay over copper
Contact resistance	10M ohms max. at 1A, 4 Vdc
Mechanical life	50,000 cycles minimum

Description	Specification
Insulation resistance	100M ohms minimum
Dielectric withstand	1000V rms minimum
Terminal types	
Standard	6.3 mm tabs/0.250 in quick connect
Optional	Solder lug
Termination material	
Common (center)	Copper fine silver-plated
End	Copper
Lamp	Brass
Mounting	See dimensions below
Operating temperature range	32° to 185°F (0° to 85°C)

Dimensions

Approximate dimensions in inches (mm)

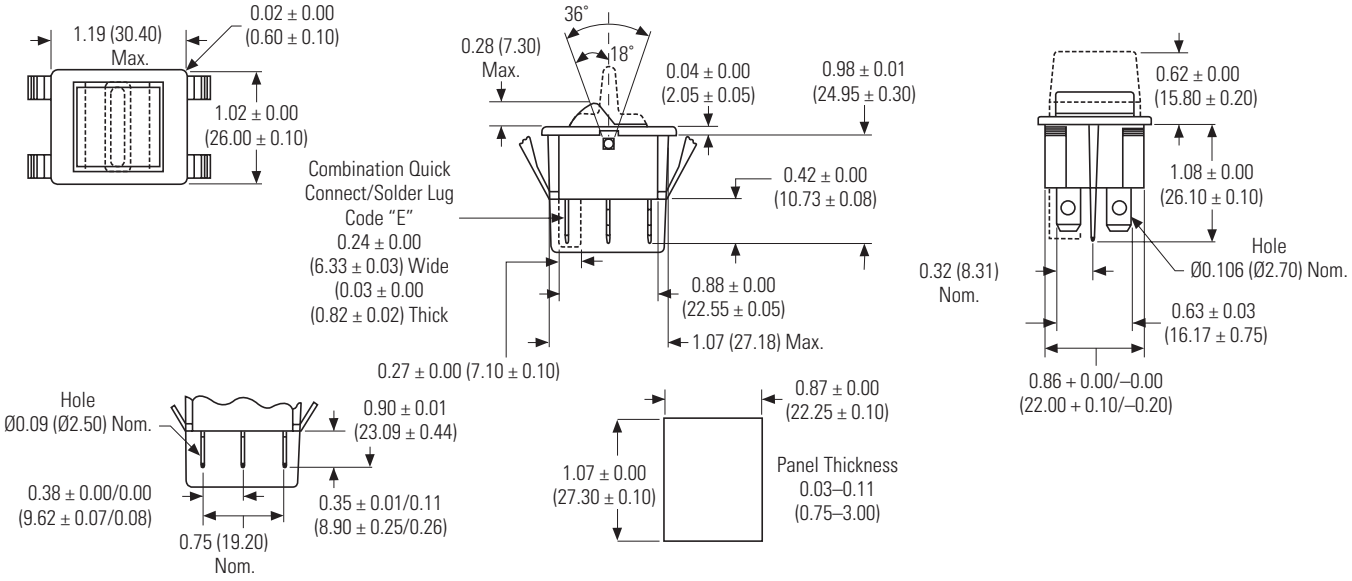
1600/1600H Type base



Code "B" Alternative Solder Lug Only

Panel Opening

2600/2600H Type base



Code "B" Alternative Solder Lug Only

Panel Opening

Accessories

Panel cutout fillers

If panel cutout fillers are required in anticipation of future rocker or paddle switch installation, order Catalog Number 1609DUM.

Specify color of base and filler portion by using the standard two-digit color code (base and lever) for non-illuminated switches.

Example: 1609DUM11

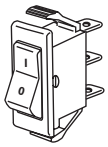
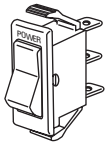
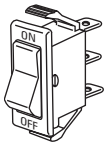
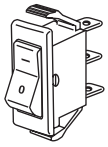
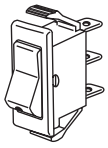
Legends

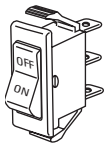
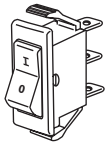
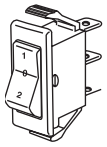
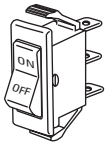
How to order—legends

To order a rocker with a legend marking, add the three-character code to the end of the catalog number. Example: 1500-21E becomes 1500-21E038.

Legends are for 1500/2500 and 1600/2600 only.

Most popular legends ①

Legend	Code
	014
	023
	038
	039
	630

Legend	Code
	653
	656
	657
	671

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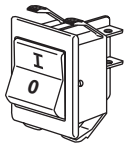
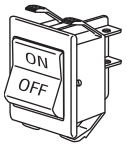
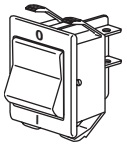
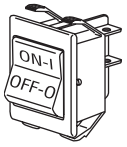
	714
	725
	730
	734

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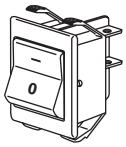
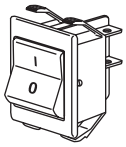
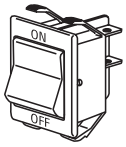
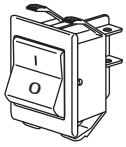
	735
	746
	752
	760

Note:

① For additional legend options, contact your local Eaton Sales Representative.

8006/8007 Series

Product description

Field-proven in America's roughest off-road applications, the standard size EURO SR is one tough and reliable rocker switch. Available with the complete range of rugged single- and two-pole, illuminated or non-illuminated circuits.

The EURO SR Series offers snap-in mounting and can be provided with a durable silicone seal that resists dust and moisture.

All EURO SR switches are molded in an aesthetically pleasing matte finish and operate with a crisp tactile feel, allowing for easy actuation.

The EURO SR will accept loads up to 15A. Terminal numbers are stamped on base for easy identification.

Features and benefits

- Contact Mechanism

Slow-make/slow-break contact mechanism. Butt action contact mechanism designed specifically for use on AC and low voltage DC applications.

- Rocker Material

Thermoplastic rocker actuators. Different colors are available. Rocker and bezel are a high-grade nylon supplied with matte finish.

- Lamps

Five lamp voltages—14 Vdc, 18 Vdc, 28 Vdc, 125 Vac neon and 250 Vac neon—are offered as standard. For additional lamp voltages, please contact your local Eaton Sales Representative.

- Mounting Means

Snap-in mounting with plastic bezel.

- Seal

Available in sealed and nonsealed versions. Sealed devices are furnished with silicone rubber seal, providing moisture and dust resistance with an IP67 rating.

Options

- Additional colors of rockers and bezels are available
- Special circuits
- Special ratings
- Pad-printed legends on rocker and bezel
- Special voltage bulbs
- Dry circuit capabilities
- Foam dust seal
- Reversing jumpers
- Printed circuit terminals and other terminal types
- Wire leads
- Dead back cover
- Palm guard
- Industry standard connector: 28-3426
- EURO SR panel plug: 53-3318

For information on optional features, contact your local Eaton Sales Representative.

Lens options

- Lens Part Numbers (if ordered separately)

Green	28-5415
Amber	28-5415-2
Red	28-5415-3
Blue	28-5415-4
White	28-5415-5

Standards and certifications

- UL Recognized and recognized component for Canada File E2702
- RoHS Compliant

EURO SR Standard size euro-style rocker switches

To determine complete catalog number, start with the appropriate base circuit number and add the appropriate code letters and/or numbers.

Catalog number selection

How to order—euro sr, non-illuminated

8006K23 N 1 T 1

Rating	Poles and throw	Circuit with rocker in … UP position	CENTER position	DOWN position	Terminal type 0.250 in spade	Solder lugs	Screw
10A, 250 Vac 15A, 125 Vac 15A, 28 Vdc	1PST	2-3 2-3 ①	NONE	OFF	**8006K23** **8006K35**	**8006K24** **8006K36**	**8006K25** **8006K37**
	1PDT	2-3 2-3 2-3 ① 2-3 ①	OFF NONE OFF OFF	2-1 2-1 2-1 2-1 ①	**8006K20** **8006K26** **8006K29** **8006K32**	**8006K21** **8006K27** **8006K30** **8006K33**	**8006K22** **8006K28** **8006K31** **8006K34**
	2PST	2-3, 5-6 2-3, 5-6 ①	NONE	OFF	**8006K43** **8006K55**	**8006K44** **8006K56**	**8006K45** **8006K57**
	2PDT	2-3, 5-6 2-3, 5-6 2-3, 5-6 ① 2-3, 5-6 ①	OFF NONE OFF OFF	2-1, 5-4 2-1, 5-4 2-1, 5-4 2-1, 5-4 ①	**8006K40** **8006K46** **8006K49** **8006K52**	**8006K41** **8006K47** **8006K50** **8006K53**	**8006K42** **8006K48** **8006K51** **8006K54**
	2PDT ②	2-3, 5-6	5-6	OFF	**8006K58**	**8006K59**	**8006K60**
	2PDT ③	5-6	5-3	5-1	**8006K61**	**8006K62**	**8006K63**

Seal option
1: Non-sealed
2: Sealed

Rocker color
M: White
T: Red
V: Black

Rocker style
1: Two-face

Mounting frame color/style
N: Black/standard
T: Black/top half palm guard
B: Black/bottom half palm guard

How to order—EURO SR, illuminated

8007K23 N 4 1 3 T 2 1

Seal option
1: Non-sealed
2: Sealed

Lens color
1: White **5:** No lens
2: Red **6:** Blue
3: Green **7:** Clear
4: Amber

Rocker color
M: White
T: Red
V: Black

Rocker style
3: Two-face w/1 lens ⑥
4: Two-face w/2 lenses ④

Lamp wiring
1: Dependent
2: Independent

Mounting frame color/style
N: Black/standard
T: Black/top half palm guard
B: Black/bottom half palm guard

Bulb voltage
1: 125V neon ⑦
2: 250V neon ⑦
3: 14 Vdc ⑧
4: 28 Vdc ⑧
7: 18 Vdc ⑧

Rating	Poles and throw	Circuit with rocker in … UP position	CENTER position	DOWN position	Terminal type 0.250 in spade	Solder lugs	Screw
10A, 250 Vac 15A, 125 Vac 15A, 28 Vdc	1PST	OFF NONE	NONE OFF	2-1 2-1 ①	**8007K23** **8007K35**	**8007K24** **8007K36**	**8007K25** **8007K37**
	1PDT ④	2-3 2-3 2-3 ① 2-3 ①	OFF NONE OFF OFF	2-1 2-1 2-1 2-1 ①	**8007K20** **8007K26** **8007K29** **8007K32**	**8007K21** **8007K27** **8007K30** **8007K33**	**8007K22** **8007K28** **8007K31** **8007K34**
	2PST	OFF 2-3, 5-6 ①	NONE OFF	2-1, 5-4 NONE	**8007K43** **8007K55**	**8007K44** **8007K56**	**8007K45** **8007K57**
	2PDT ④⑤	2-3, 5-6 2-1, 5-4 2-3, 5-6 ① 2-3, 5-6 ①	OFF NONE OFF OFF	2-1, 5-4 2-3, 5-6 2-1, 5-4 2-1, 5-4 ①	**8007K40** **8007K46** **8007K49** **8007K52**	**8007K41** **8007K47** **8007K50** **8007K53**	**8007K42** **8007K48** **8007K51** **8007K54**

Note:

① Momentary contact.
② 3A at 250 Vac, 6A at 125 Vac.
③ 1/4 hp at 125–250 Vac.
④ All double-throw circuits, both 1PDT and 2PDT, provided with two lamps and two lenses (Rocker Style 4). When lamp is wired independent of circuit for 1PDT switches, device is supplied with lamp centered in open-pole of base.
⑤ Not standard with lamp wired independent of circuit. All 2PDT switches must be dependent on circuit and use Rocker Style 4.
⑥ Not provided standard for double-throw circuits, both 1PDT and 2PDT. Must use Rocker Style 4 for all double-throw switches.
⑦ Available on single-pole versions only.
⑧ 14 Vdc, 18 Vdc and 28 Vdc bulbs are not UL, CSA when bulb is wired dependent to switch circuit.

Technical data and specifications

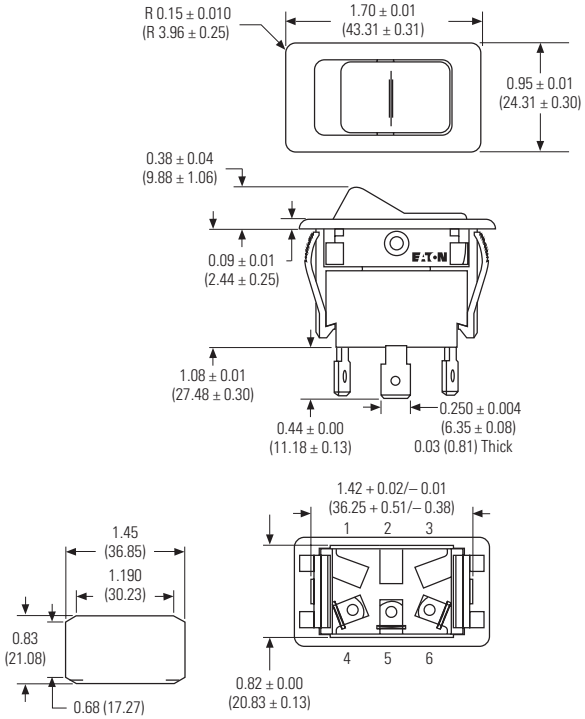
8006/8007—EURO SR

Description	Specification
Ratings	15A at 125 Vac 10A at 250 Vac 3/4 hp at 250 Vac (hp rating does not apply to lighted switches) Switch ratings at 125 Vac also apply to 28 Vdc
Circuits	1PST, 1PDT, 2PST and 2PDT Maintained and momentary action
Mechanical life	Maintained—100,000 operations, minimum Momentary—25,000 operations, minimum
Electrical life	25,000 operations minimum at full load
Terminal types	Standard 0.250 in (6.35 mm) Spade—Brass Screw—Brass (terminal screws provided unassembled) Solder—Tintillate-plated brass
Base material	Thermoset molding material
Rocker material	Thermoplastic rocker actuators
Dielectric	1000V rms, minimum
Seal level	IP67 (with optional seal)
Mounting means	Snap-in mounting with plastic bezel
Operating temperature	–40° to 185°F (–40° to 85°C)

Dimensions

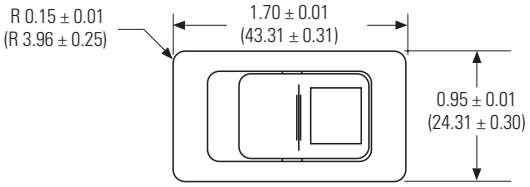
Approximate dimensions in inches (mm)

Non-Illuminated

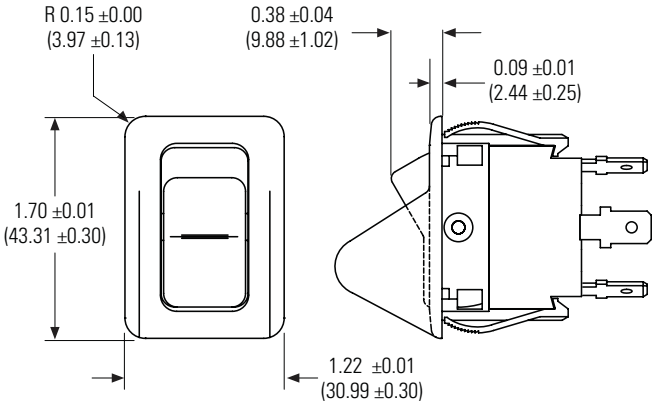


Panel Opening
Reference Only
Thickness:
0.040 to 0.140 (1.02 to 3.56)
Best Results Obtained from:
0.080 to 0.125 (2.03 to 3.18)

Illuminated



Palm guard



8004/8005–Euro full size

Product description

Eaton's 8004 and 8005 Euro- Look Series features matte finish European styling and snap-in mounting. These durable switches, field-tested in the most demanding truck and marine applications, are available with a variety of standard actuator options. Options include concave, two-face, illuminated, nonilluminated and the recessed feature, which allows placement of your label on the face of our rocker. All switches in this rugged lineup can be fitted with a silicone rubber seal to provide moisture and dust-resistance. Additionally, these switches can be gang-mounted into a single panel opening. Panel blanks are also available.

Features and benefits

- Contact Mechanism

Slow-make/slow-break contact mechanism. Butt action contact mechanism designed specifically for use on AC and low voltage DC applications.

- Rocker Material

Custom styled, multi-colored thermoplastic rocker actuators. The rocker and bezel are supplied with a matte finish.

- Lamps

Five lamp voltages—14 Vdc, 18 Vdc, 28 Vdc, 125 Vac neon and 250 Vac neon—are offered as standard. For additional lamp voltages, please contact your local Eaton Sales Representative.

- Mounting Means

Snap-in mounting with plastic bezel.

- Seal

Available in sealed and nonsealed versions. Sealed devices are furnished with a silicone rubber seal providing moisture and dust resistance with an IP54 rating.

Options

- Additional colors of rockers and mounting bezels are available
- Special circuits
- Special ratings
- Gold contacts
- Dry circuit capabilities
- Pad-printed legends on rocker and bezel
- Special lamp voltages
- Foam dust seal
- Reversing jumpers
- Printed circuit terminals and other terminal types
- Dead back cover (two-pole base) with wire leads
- Matching indicators
- Industry standard connector: 28-3426
- Full size Euro-Look gang mounting systems
- Full size Euro-Look panel plugs: 17-19544-2

For information on optional features, contact your local Eaton Sales Representative.

Lens options

- Lens Part Numbers (if ordered separately

8005 Two-Face	
Green	28-3425
Amber	28-3425-2
Red	28-3425-3
Blue.	28-3425-4
White	28-3425-5

Standards and certifications

- UL Recognized and recognized component for Canada File E2702
- RoHS Compliant

Full Size, Euro-look rocker switches

To determine complete catalog number, start with the appropriate base circuit number and add the appropriate code letters and/or numbers.

Catalog number selection

How to order—full size euro, non-illuminated

8004K23 N 1 T 1

Seal option
1: Non-sealed
2: Sealed

Rocker color
M: White
T: Red
V: Black
G: Gray

Rocker style
1: Two-face
6: Paddle

Mounting frame color
N: Black
M: White
T: Red
G: Gray

Rating	Poles and throw	Circuit with rocker in … UP position	CENTER position	DOWN position	Terminal type 0.250 in spade	Solder lugs	Screw
10A, 250 Vac 15A, 125 Vac 15A, 28 Vdc	1PST	2-3 2-3 ①	NONE	OFF	**8004K23** **8004K35**	**8004K24** **8004K36**	**8004K25** **8004K37**
	1PDT	2-3 2-3 2-3 ① 2-3 ①	OFF NONE OFF OFF	2-1 2-1 2-1 2-1 ①	**8004K20** **8004K26** **8004K29** **8004K32**	**8004K21** **8004K27** **8004K30** **8004K33**	**8004K22** **8004K28** **8004K31** **8004K34**
	2PST	2-3, 5-6 2-3, 5-6 ①	NONE	OFF	**8004K43** **8004K55**	**8004K44** **8004K56**	**8004K45** **8004K57**
	2PDT	2-3, 5-6 2-3, 5-6 2-3, 5-6 ① 2-3, 5-6 ①	OFF NONE OFF OFF	2-1, 5-4 2-1, 5-4 2-1, 5-4 2-1, 5-4 ①	**8004K40** **8004K46** **8004K49** **8004K52**	**8004K41** **8004K47** **8004K50** **8004K53**	**8004K42** **8004K48** **8004K51** **8004K54**
	2PDT ②	2-3, 5-6	5-6	OFF	**8004K58**	**8004K59**	**8004K60**
	2PDT ③	5-6	5-3	5-1	**8004K61**	**8004K62**	**8004K63**

How to order—full size euro, illuminated

8005K23 N 4 1 3 T 2 1

Seal option
1: Non-sealed
2: Sealed

Lens color
2: Red
3: Green
4: Amber
5: No lens
6: Blue

Rocker color
M: White
T: Red
V: Black
G: Gray

Rocker style
3: Two-face w/1 lens ⑤
4: Two-face w/2 lenses ④

Lamp wiring
1: Dependent
2: Independent

Bulb voltage
1: 125V neon ⑦
2: 250V neon ⑦
3: 14 Vdc ⑧
4: 28 Vdc ⑧
7: 18 Vdc ⑧

Mounting frame color
N: Black
M: White
T: Red
G: Gray

Rating	Poles and throw	Circuit with rocker in … UP position	CENTER position	DOWN position	Terminal type 0.250 in spade	Solder lugs	Screw
10A, 250 Vac 15A, 125 Vac 15A, 28 Vdc	1PST	OFF NONE	NONE OFF	2-1 2-1 ①	**8005K23** **8005K35**	**8005K24** **8005K36**	**8005K25** **8005K37**
	1PDT ④	2-3 2-3 2-3 ① 2-3 ①	OFF NONE OFF OFF	2-1 2-1 2-1 2-1 ①	**8005K20** **8005K26** **8005K29** **8005K32**	**8005K21** **8005K27** **8005K30** **8005K33**	**8005K22** **8005K28** **8005K31** **8005K34**
	2PST	OFF 2-3, 5-6 ①	NONE OFF	2-1, 5-4 NONE	**8005K43** **8005K55**	**8005K44** **8005K56**	**8005K45** **8005K57**
	2PDT ④⑥	2-3, 5-6 2-1, 5-4 2-3, 5-6 ① 2-3, 5-6 ①	OFF NONE OFF OFF	2-1, 5-4 2-3, 5-6 2-1, 5-4 2-1, 5-4 ①	**8005K40** **8005K46** **8005K49** **8005K52**	**8005K41** **8005K47** **8005K50** **8005K53**	**8005K42** **8005K48** **8005K51** **8005K54**

Note:

① Momentary contact.
② 3A at 250 Vac, 5A at 125 Vac.
③ 1/4 hp at 125–250 Vac.
④ All double-throw circuits, both 1PDT and 2PDT, provided with two lamps and two lenses (Rocker Style 4). When lamp is wired independent of circuit for 1PDT switches, device is supplied with lamp centered in open-pole of base.
⑤ Not standard available with lamp wired independent of circuit. All 2PDT switches must be dependent on circuit and use Rocker Style 4, 5 or 9.
⑥ Not provided standard for double-throw circuits, both 1PDT and 2PDT. Must use Rocker Style 4, 5 or 9 for all double-throw switches.
⑦ Available on single-pole versions only.
⑧ 14 Vdc and 28 Vdc bulbs are not UL, CSA when bulb is wired dependent to switch circuit.

Technical data and specifications

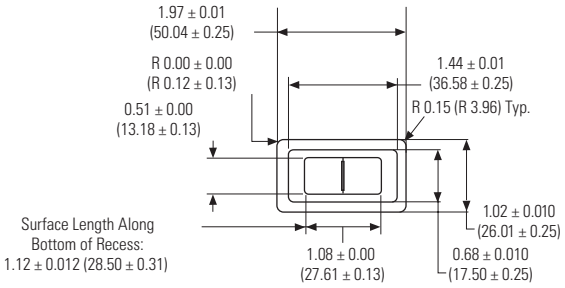
8004/8005—Euro full size

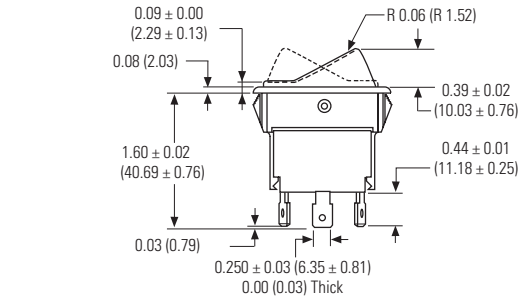
Description	Specification
Ratings	15A at 125 Vac; 10A at 250 Vac; 3/4 hp at 250 Vac (hp rating does not apply to lighted switches) Switch ratings at 125 Vac also apply to 28 Vdc
Circuits	1PST, 1PDT, 2PST and 2PDT; Maintained and momentary action
Contact material	Movable—Silver-plated copper with fine or coin silver contact face button Stationary—Copper with fine or coin silver contact face button
Mechanical life	Maintained—100,000 operations, minimum Momentary—25,000 operations, minimum
Electrical life	25,000 operations minimum at full load
Terminal types	Standard 0.250 in (6.35 mm) spade—Brass Screw—Brass #6-32 x 3/16 (terminal screws provided unassembled) Solder—Tintillate-plated brass; tintillate spade terminals
Base material	Thermoset molding material
Dielectric	1000V rms, minimum
Seal level	IP54 (with optional seal)
Mounting means	Snap-in mounting with plastic bezel

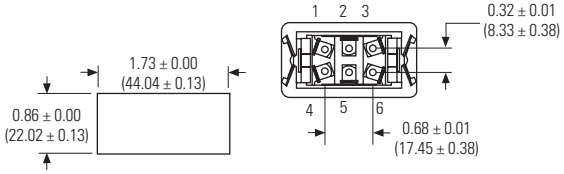
Dimensions

Approximate dimensions in inches (mm)

Non-Illuminated

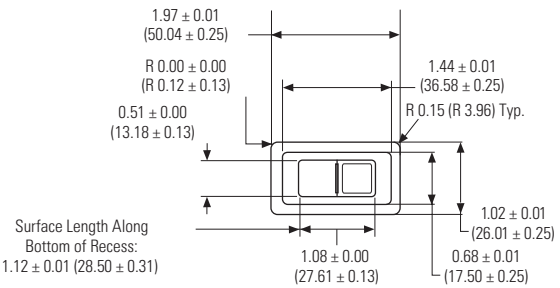


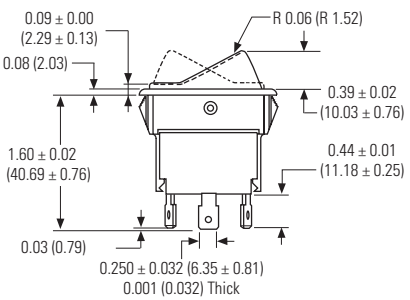


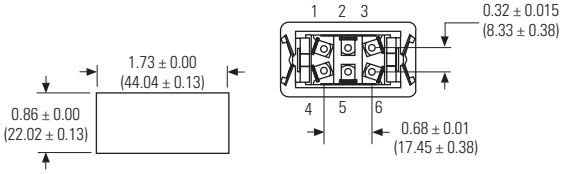


Panel Opening
Reference Only
Thickness:
0.03 to 0.19 (0.76 to 4.83)
Best Results Obtained From:
0.08 to 0.13 (2.03 to 3.30)

Illuminated





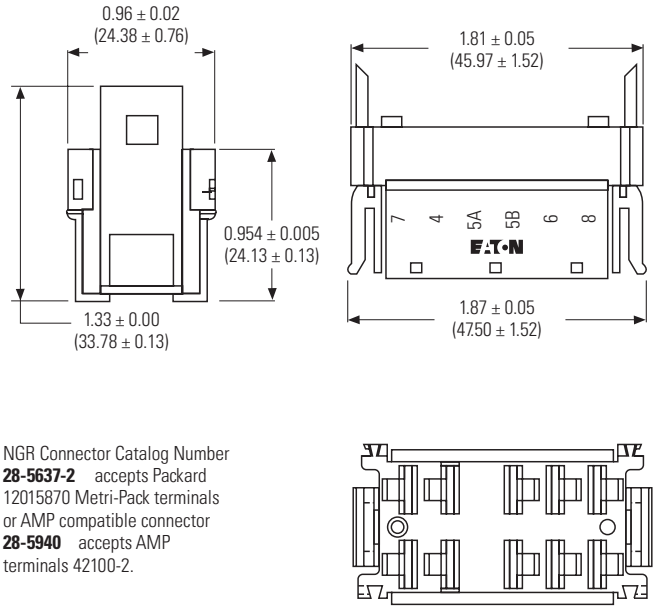


Panel Opening
Reference Only
Thickness:
0.03 to 0.19 (0.76 to 4.83)
Best Results Obtained From:
0.08 to 0.13 (2.03 to 3.30)

Dimensions for NGR, EURO SR, Full size euro-Look accessories

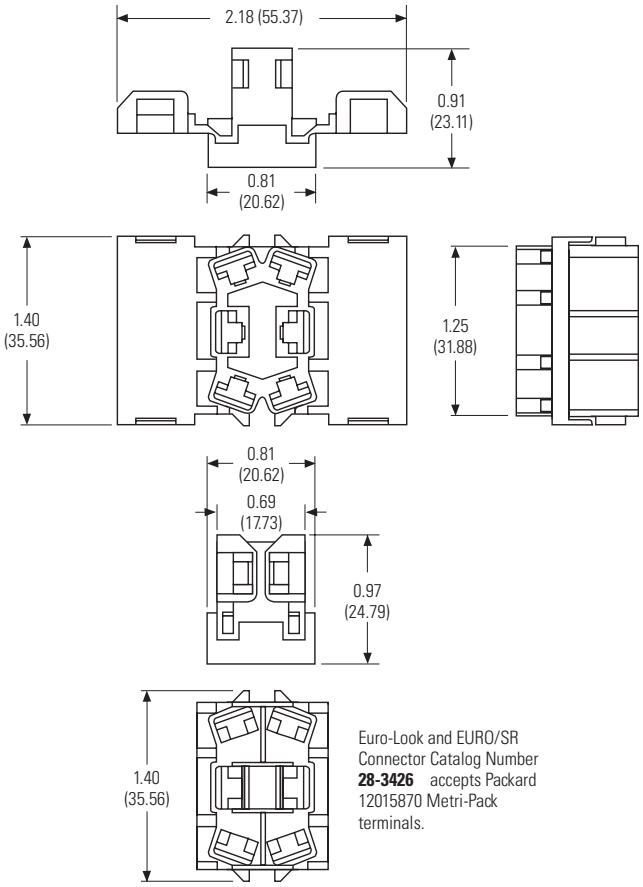
Approximate dimensions in inches (mm)

NGR Connector



NGR Connector Catalog Number
28-5637-2 accepts Packard 12015870 Metri-Pack terminals or AMP compatible connector
28-5940 accepts AMP terminals 42100-2.

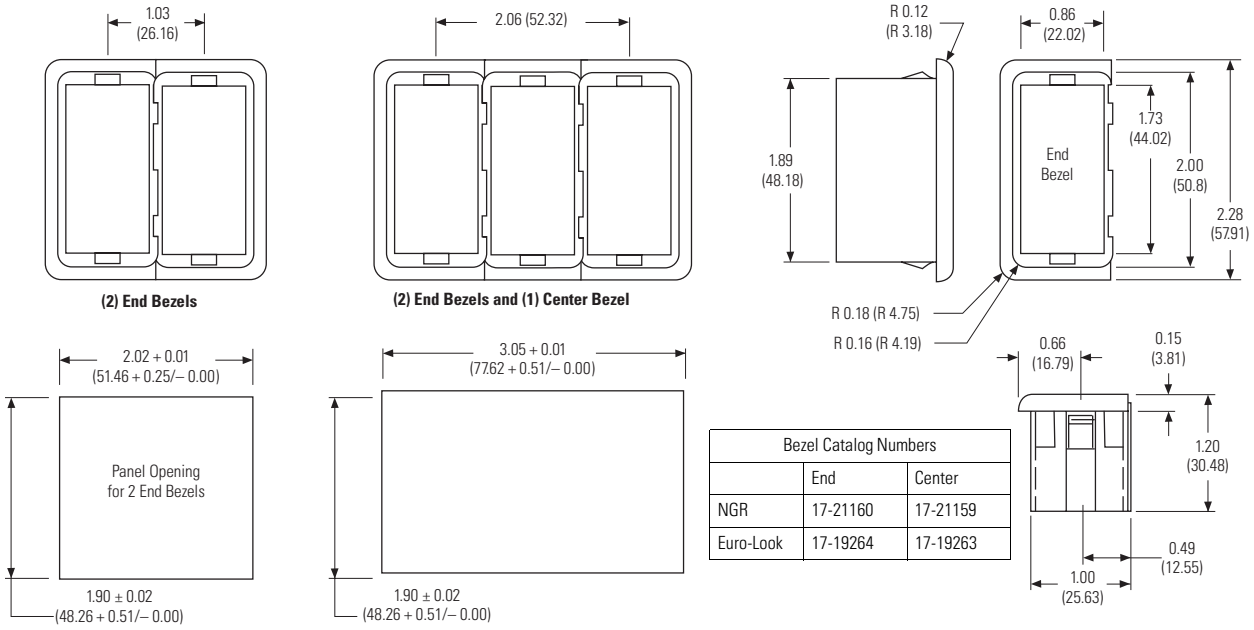
Euro/SR and full size euro-Look connector



Euro-Look and EURO/SR Connector Catalog Number
28-3426 accepts Packard 12015870 Metri-Pack terminals.

Approximate dimensions in inches (mm)

Gang mounting system



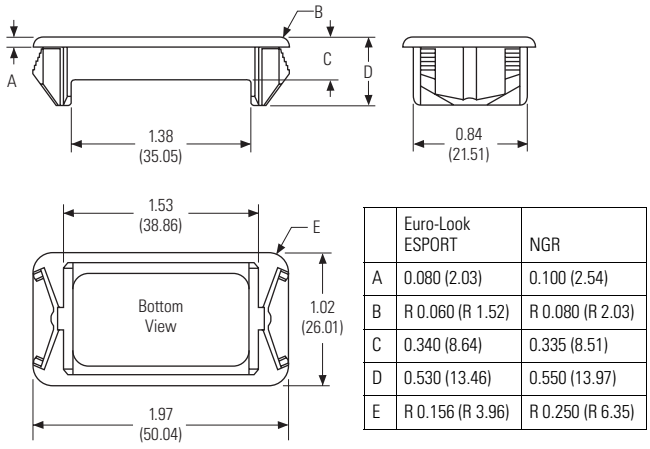
Bezel Catalog Numbers		
	End	Center
NGR	17-21160	17-21159
Euro-Look	17-19264	17-19263

Panel Opening—Reference Only
Thickness: 0.03 to 0.07 to 0.11
(1.00 to 2.00 to 3.00)

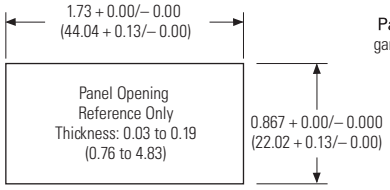
Dimensions: 2.02 + 0.25/–0.00 (51.46 + 0.25/–0.00)
Plus Number of Center BezelsTimes 1.03

Tolerance: +0.25/–0.00 (+ 0.25/–0.00) for Each
Center Bezel up to a Maximum of + 0.0002 (+ 0.050)

NGR, Euro-Look Panel plugs



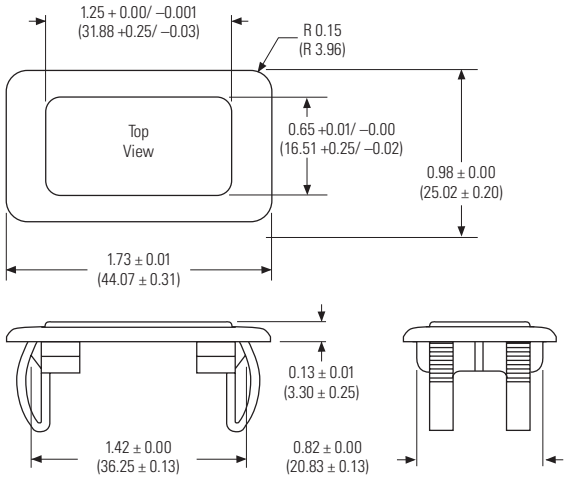
	Euro-Look ESPORT	NGR
A	0.080 (2.03)	0.100 (2.54)
B	R 0.060 (R 1.52)	R 0.080 (R 2.03)
C	0.340 (8.64)	0.335 (8.51)
D	0.530 (13.46)	0.550 (13.97)
E	R 0.156 (R 3.96)	R 0.250 (R 6.35)

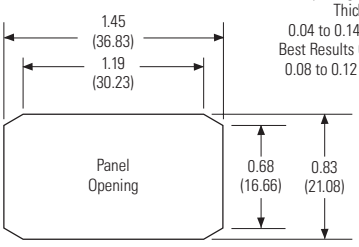


Part will also fit Eaton gang mounting boxes. Catalog Numbers **17-19263** and **17-19264**

Panel plug Catalog Number **17-19544-2** for Use with Euro-Look and ESPORT. NGR panel plug Catalog Number **17-21543** .

EURO SR Panel plugs





Panel Opening—Reference Only
Thickness:
0.04 to 0.14 (1.01 to 3.55)
Best Results Obtained From:
0.08 to 0.12 (2.03 to 3.17)

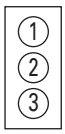
Panel Plug Catalog Number **53-3318**
For Use with EURO/SR

Terminal identification

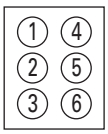
When specified on order, switches will have the terminals identified as shown in the illustration at right. Terminal markings will be ink-stamped on the side of the switch case and unused terminal positions will not be identified.

All views are rear of switch with keyway or at down as applicable. Terminal numbers 2, 2 and 5 and 5 and 8 are considered inboard terminals for single-, two- and four-pole switches respectively. All others are considered outboard.

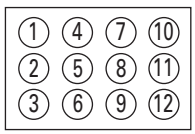
Single-Pole



Two-Pole



Four-Pole

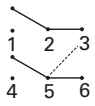
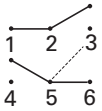
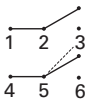


"Three independent" ON-ON-ON Circuit diagram

For switch modified with "Three Independent" ON-ON-ON special circuit. External jumpers are required. User to connect wiring per instructions given below.

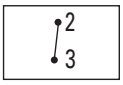
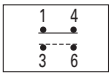
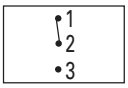
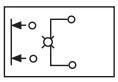
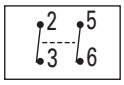
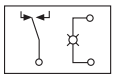
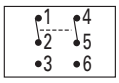
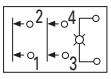
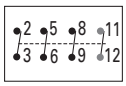
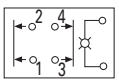
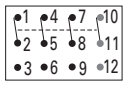
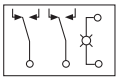
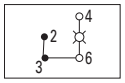
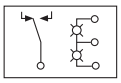
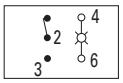
ON-ON-ON Special circuit

Connection points	Single-Pole
Connect common to terminals	2
Connect circuit "A" to terminals	6
Connect circuit "B" to terminals	4
Connect circuit "C" to terminals	1

		Circuit with Lever in …		
3 ON Independent	No. of Poles	UP position	CENTER Position (Maintained)	DOWN Position (Keyway)
		Circuit A	Circuit B	Circuit C
1 PDT	1			

Circuit diagrams

Rocker circuit diagrams

Circuit letter	Circuit letter	Circuit letter	Schematic
A 1PST		**I** 2 Circuit [8]	
B 1PDT		**J** 1PST	
C 2PST		**K** 1PDT	
D 2PDT		**L** 2PST	
E 4PST [9]		**M** 2PST	
F 4PDT [9]		**N** [8] 2PDT	
G [8] 1PST		**P** 1PDT	
H [9] 1PDT		**Q** [7] 2 Circuit	

Legends

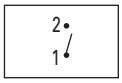
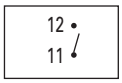
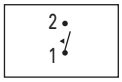
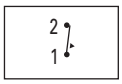
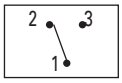
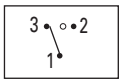
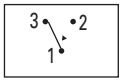
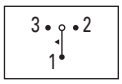
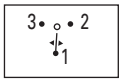
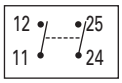
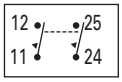
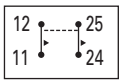
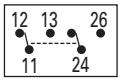
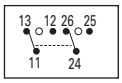
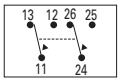
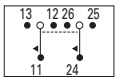
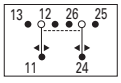
Rocker switch legend

Legend	Rocker switch type
●	Contact terminal—will make contact with switch lever
○	Isolated terminal—does not make contact with lever
↘●	Center terminal and switch lever
⌑	Bulb
⇢⇠	Momentary contact
●	Denotes mechanical contact portion

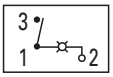
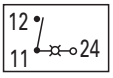
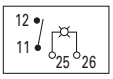
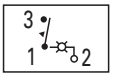
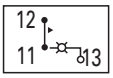
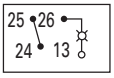
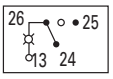
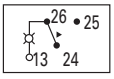
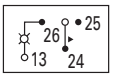
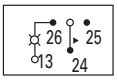
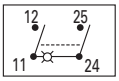
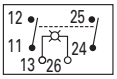
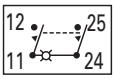
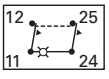
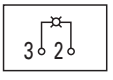
See next page for Midsize Switch Circuit Diagrams. See **Page 139** for NGR Circuit Diagrams.

Midsize switch circuit diagrams ①

Non-Illuminated

Circuit number (circuit designator)	Schematic	Circuit with rocker In … DOWN position	CENTER position	UP position
1 1PST		OFF	NONE	ON
2 1PST		OFF	NONE	ON
3 1PST		OFF	NONE	MOM. ON
4 1PST		OFF	NONE	ON
5 1PDT		ON	NONE	ON
6 1PDT		ON	OFF	ON
7 1PDT		MOM. ON	NONE	ON
8 1PDT		ON	OFF	MOM. ON
9 1PDT		MOM. ON	OFF	MOM. ON
10 2PST		OFF	NONE	ON
11 2PST		OFF	NONE	MOM. ON
12 2PST		MOM. OFF	NONE	ON
13 2PDT		ON	NONE	ON
14 2PDT		ON	OFF	ON
15 2PDT		MOM. ON	NONE	ON
16 2PDT		ON	OFF	MOM. ON
17 2PDT		MOM. ON	OFF	MOM. ON

Illuminated

Circuit number (circuit designator)	Schematic	Circuit with Rocker In … DOWN position	CENTER position	UP position
18 1PST		OFF	NONE	ON
19 1PST		OFF	NONE	ON
20 1PST ②		OFF	NONE	ON
21 1PST		OFF	NONE	MOM. ON
22 1PDT		MOM. OFF	NONE	ON
23 1PDT		ON	NONE	ON
24 1PDT		ON	OFF	ON
25 1PDT		MOM. ON	NONE	ON
26 1PDT		ON	OFF	ON
27 2PST		ON	OFF	ON
28 2PST		Off	NONE	ON
29 2PST ③		ON	NONE	ON
30 2PDT		MOM. ON	NONE	MOM. ON
31 2PDT		ON	NONE	ON
32 Indicator		—	—	—

Note:

① Terminal numbers 1, 2 and 3 denote single-pole base.
Terminal numbers 11, 12, 113, 24, 25 and 26 denote two-pole base.
② Single-pole in two-pole base with lamp independently wired.
③ Two-pole—independently wired lamp.

Military purpose toggles

Product description

Eaton's military purpose switches are designed to meet the requirements of MIL-S-83731. Sealed Switches have a silicone rubber lever seal assembled between the lever and the bushing to resist the entrance of contaminants such as dust, sand or water into the contact structure.

The switch mechanisms are completely enclosed to resist the entrance of contaminants into the switch. All metal parts are plated to resist corrosion. The heavy duty switches are offered in both standard toggle lever and lever lock versions. Circuit designations are stamped on the side of each switch.

Standards and certifications

- MIL-S-83731

AC rated (Heavy duty) MIL-S-83731 with lever seal

Current ratings	Poles and throw	Circuit with lever in … UP Position	CENTER Position	DOWN Position (Keyway)	Base circuit see Page 222	Bushing length "A" inches (mm)	Lever length "B" inches (mm)	Screw terminals With sealed lever MS Part number	Catalog number
Single-Pole									
See **A**	1PST	ON	NONE	OFF	A	0.468 (11.89)	0.687 (17.45)	**MS35058-22**	**8801K22**
below		ON	OFF	NONE				**MS35058-24**	**8801K23**
See **B**		ON	NONE	MOM. OFF				**MS35058-29**	**8813K17**
below		ON	MOM. OFF	NONE				**MS35058-25**	**8813K18**
		NONE	OFF	MOM. ON				**MS35058-28**	**8811K18**
		OFF	NONE	MOM. ON				**MS35058-30**	**8811K17**
See **A**	1PDT	ON	OFF	ON	B	0.468 (11.89)	0.687 (17.45)	**MS35058-21**	**8800K16**
below		ON	NONE	ON				**MS35058-23**	**8810K15**
See **B**		ON	NONE	MOM. ON				**MS35058-26**	**8804K13**
below		MOM. ON	OFF	MOM. ON				**MS35058-27**	**8812K14**
		ON	OFF	MOM. ON				**MS35058-31**	**8809K16**
Two-Pole									
See **C**	2PST	ON	NONE	OFF	C	0.468 (11.89)	0.687 (17.45)	**MS35059-22**	**8822K20**
below		ON	OFF	NONE				**MS35059-24**	**8822K21**
See **D**		ON	NONE	MOM. OFF				**MS35059-29**	**8828K13**
below		ON	MOM. OFF	NONE				**MS35059-25**	**8828K12**
		NONE	OFF	MOM. ON				**MS35059-28**	**8826K14**
		OFF	NONE	MOM. ON				**MS35059-30**	**8826K15**
See **C**	2PDT	ON	OFF	ON	D	0.468 (11.89)	0.687 (17.45)	**MS35059-21**	**8820K16**
below		ON	NONE	ON				**MS35059-23**	**8824K14**
See **D**		ON	NONE	MOM. ON				**MS35059-26**	**8830K13**
below		MOM. ON	OFF	MOM. ON				**MS35059-27**	**8834K5**
		ON	OFF	MOM. ON				**MS35059-31**	**8832K6**
See **E**	1P3T	ON ①	ON ②	ON ③	See **Page 222**	0.468 (11.89)	0.687 (17.45)	**MS25201-4**	**8860K4**
below	in a	ON ①	ON ②	MOM. ON ③				**MS25201-5**	**8860K5**
	2P base	MOM. ON ①	ON ②	MOM. ON ③				**MS25201-6**	**8860K6**
		ON ①	ON ②	ON ③				**MS25201-7**	**8860K7** ③
		ON ①	ON ②	MOM. ON ③				**MS25201-8**	**8860K8** ③
		MOM. ON ①	ON ②	MOM. ON ③				**MS25201-9**	**8860K9** ③
Four-Pole									
See **F**	4PST	ON	NONE	OFF	E	0.468 (11.89)	0.687 (17.45)	—	**7660K12**
below		ON	OFF	NONE				**MS25068-24**	**7660K13**
See **G**		ON	MOM. OFF	NONE				**MS25068-25**	**7668K7**
below		NONE	OFF	MOM. ON				**MS25068-28**	**7666K9**
		OFF	NONE	MOM. ON				—	**7666K6**
See **F**	4PDT	ON	OFF	ON	F	0.468 (11.89)	0.687 (17.45)	**MS25068-21**	**7662K7**
below		ON	NONE	ON				**MS25068-23**	**7664K5**
See **G**		ON	NONE	MOM. ON				**MS25068-26**	**7674K5**
below		MOM. ON	OFF	MOM. ON				**MS25068-27**	**7672K5**
		ON	OFF	MOM. ON				**MS25068-31**	**7670K6**

Current ratings

			Current capacity in amperes per pole								
			28 Vdc			115 Vac, 60 Hz			115 Vac, 400 Hz		
	Switch	Type of operation	Lamp load	Resistive load	Inductive load	Lamp load	Resistive load	Inductive load	Lamp load	Resistive load	Inductive Load
A	MS35058	Maintained	7	25	15	—	10	10	3	10	10
B	MS35058	Momentary	5	20	10	—	10	7	—	—	—
C	MS35059	Maintained	7	20	15	—	20	—	4	20	15
D	MS35059	Momentary	5	18	10	—	11	—	—	—	—8
E	MS25201	ON-ON-ON	5	18	10	2	11	8	2	11	15
F	MS25068	Maintained	5	20	12	—	—	—	4	20	5
G	MS25068	Momentary	4	18	10	—	—	—	2	11	

Note:

① Across terminals 2-3 and 5-6.
② Across terminals 1-2 and 5-6.
③ Across terminals 2-3 and 4-5.
④ Across terminals 1-2 and 4-5.
⑤ For "INDEPENDENT ON-ON-ON" circuit arrangement, see **Page 192**.

AC rated (heavy duty) mil-s-83731 lever lock with lever seal

Current ratings	Poles and throw	Circuit with lever in … UP Position	CENTER Position	DOWN Position (Keyway)	Base Circuit see Page 222	Lever lock bushing Style ①	Bushing length "A" inches (mm)	Lever length "B" inches (mm)	Screw terminals with sealed lever MS Part number	Catalog number
Single-Pole										
See **A**	1PST	ON	NONE	◄— OFF	A	3	0.562 (14.27)	1.000 (25.40)	**MS25125-C2**	**8857K47**
below		ON —►	NONE	◄— OFF		4			**MS25125-E2**	**8857K48**
See **B**		ON —►	◄— OFF	NONE		5			**MS25125-J4**	**8857K49**
See **A**	1PDT	ON	◄— OFF —►	ON	B	2	0.562 (14.27)	1.000 (25.40)	**MS25125-B1**	**8857K40**
below		ON	NONE	◄— ON		3			**MS25125-C3**	**8857K45**
		ON —►	NONE	◄— ON		4			**MS25125-E3**	**8857K44**
Two-Pole										
See **B**	2PDT	ON —►	◄— OFF —►	◄— ON	C	1	0.562 (14.27)	1.000 (25.40)	**MS25126-A1**	**8858K39**
below		ON	◄— OFF —►	ON		2			**MS25126-B1**	**8858K40**
		ON —►	NONE	◄— ON		4			**MS25126-E3**	**8858K44**
Four-Pole										
See **C**	4PDT	ON —►	NONE	◄— ON	F	4	0.562 (14.27)	1.000 (25.40)	**MS25127-E3**	**8859K44**
below										

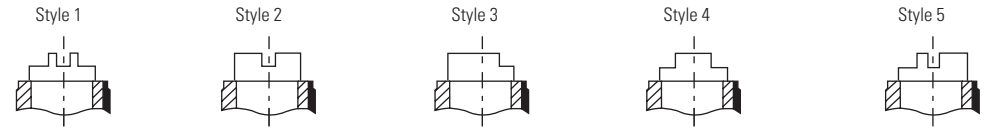
◄— Indicates direction against which lever is locked.

			Current capacity in amperes per pole								
			28 Vdc			115 Vac, 60 Hz			115 Vac, 400 Hz		
	Switch	Type of operation	Lamp load	Resistive load	Inductive load	Lamp load	Resistive load	Inductive load	Lamp load	Resistive load	Inductive load
A	MS25125	Maintained	5	20	15	—	—	—	3	10	10
B	MS25126	Maintained	7	20	15	—	—	—	4	20	15
C	MS25127	Maintained	5	20	15	—	—	—	4	20	15

Note:

① See illustrations below for lever lock bushing styles.

Lever lock bushing styles



These illustrations are for pictoral representation only—keyway on right-hand side.

AC rated (heavy duty) military with unsealed lever

Current ratings	Poles and throw	Circuit with lever in … UP Position	CENTER Position	DOWN Position (Keyway)	Base circuit see Page 222	Bushing length "A" inches (mm)	Lever length "B" inches (mm)	Solder lug terminals catalog number	Screw terminals catalog number
Single-pole									
See **A** below	1PST	ON	NONE	OFF	A	0.468 (11.89)	0.688 (17.45)	**7300K38**	**7300K36**
See **B** below		ON	NONE	MOM. OFF				**7304K38**	**7304K36**
		OF	NONE	MOM. ON				**7303K38**	**7303K36**
See **A** below	1PDT	ON	OFF	ON	B	0.468 (11.89)	0.688 (17.45)	**7301K38**	**7301K36**
		ON	NONE	ON				**7302K38**	**7302K36**
See **B** below		ON	NONE	MOM. ON				**7307K38**	**7307K36**
		MOM. ON	OFF	MOM. ON				**7306K38**	**7306K36**
		ON	OFF	MOM. ON				**7305K38**	**7305K36**
Two-pole									
See **C** below	2PST	ON	NONE	OFF	C	0.468 (11.89)	0.688 (17.45)	**7310K38**	**7310K36**
See **D** below		ON	NONE	MOM. OFF				**7314K38**	**7314K36**
		OFF	NONE	MOM. ON				**7313K38**	**7313K36**
See **C** below	2PDT	ON	OFF	ON	D	0.468 (11.89)	0.688 (17.45)	**7311K38**	**7311K36**
		ON	NONE	ON				**7312K38**	**7312K36**
See **D** below		ON	NONE	MOM. ON				**7317K38**	**7317K36**
		MOM. ON	OFF	MOM. ON				**7316K38**	**7316K36**
		ON	OFF	MOM. ON				**7315K38**	**7315K36**

Current Ratings

	Current capacity in amperes per pole								
	30 Vdc			125 Vac, 60 Hz			250 Vac, 60 Hz		
Type of operation	Lamp load	Resistive load	Inductive load	Resistive load	Inductive load	Horsepower	Resistive load	Inductive load	Horsepower
Single-pole									
A Maintained	5	20	15	15	—	—	6	—	—
B Momentary	4	15	10	15	—	—	6	—	—
Two-pole									
C Maintained	7	30	15	25	—	—	9	—	—
D Momentary	5	20	10	15	—	—	6	—	—

Technical data and specifications

Military purpose switches

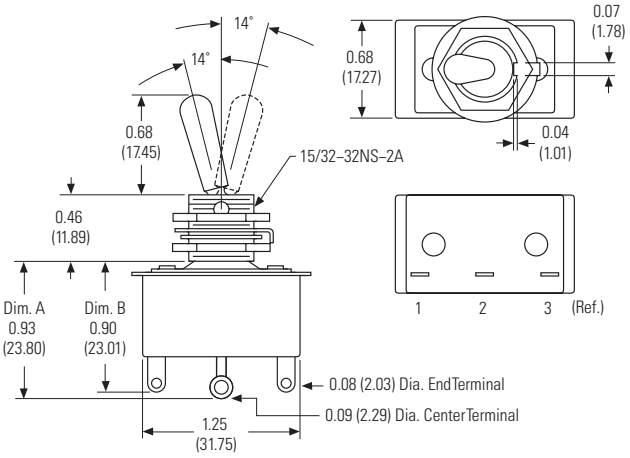
Description	Specification
Ratings	See Product Selection tables
Circuits	1PST, 1PDT, 2PST, 2PDT, 1P3T (ON-ON-ON), 4PST and 4PDT; maintained and momentary action
Contact action	Heavy duty—Slow-make/slow-break butt contact Medium duty—Quick-make/quick-break, wiping action
Contact material	Heavy duty: Movable—silver-plated copper with fine or coin silver contact face button Stationary—copper with fine or coin silver contact face button Medium duty: Movable—copper silver-plated Stationary—bronze silver-plated
Terminal types	Heavy duty MIL-S-83731 types: Screw terminals—brass designed to accept #6-32 x 6.35 mm (0.250 in) pan head (Catalog Number 11-1893) screws and Si bronze #6 helical lockwasher (Catalog Number 16-1096). Furnished unassembled. Terminal screws are tin dipped to facilitate soldering if required Heavy duty JAN-S-23 types: Screw terminals—brass designed to accept #6-32 x 4.78 mm (0.188 in) binding head (Catalog Number 811-2) screws. Furnished unassembled Solder lug terminals—tintillate plated brass Medium duty MIL-S-83731 types: Solder lugs—brass silver-plated furnished with 0.094 in (2.39 mm) dia. hole
Base material	Thermoset molding material
Mounting means	Threaded bushing—0.468 in (11.89 mm) dia., 32 threads/inch Keyway—0.068 x 0.035 in (1.73 x 0.89 mm) deep; provides anti-rotation feature Hardware supplied: MIL-S-83731 types— 2 hexagon facenuts (Catalog Number 15-966-6), 1 locking ring (Catalog Number 29-761) and 1 internal tooth lockwasher (Catalog Number 16-886). Furnished unassembled JAN-S-23 types—2 hexagon facenuts (Catalog Number 15-966-6). Furnished unassembled
Dielectric	1000V minimum
Operating temperature range	0° to 150°F (–17.8° to 65.6°C)

Dimensions

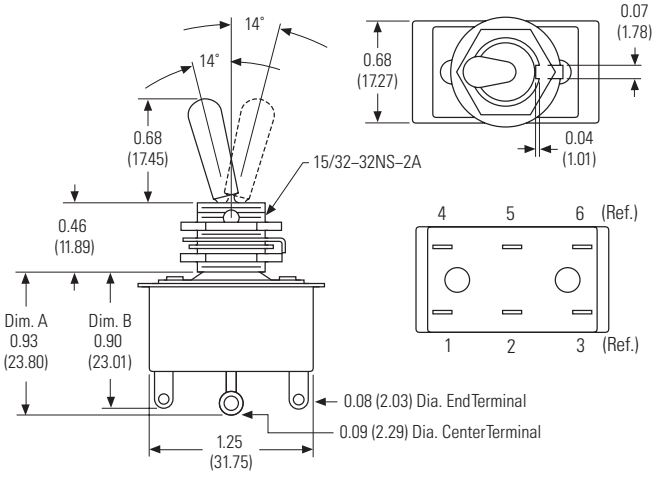
Approximate dimensions in inches (mm)

aC/DC Rated (Medium duty) MIL-83731 Switches

1PDT Maintained action (Solder lug)

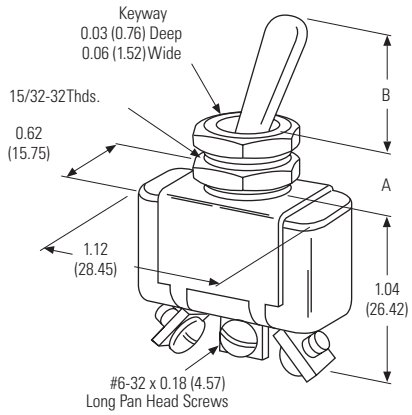


2PDT Maintained action (Solder lug)

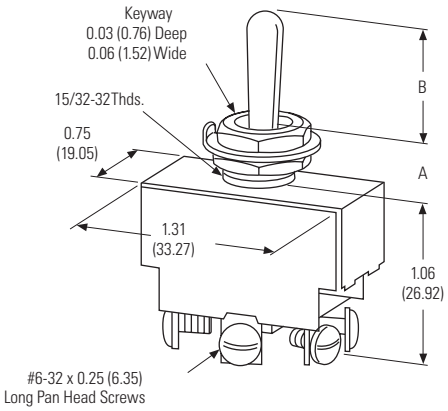


AC Rated (Heavy duty) MIL-83731 Switches with lever seal

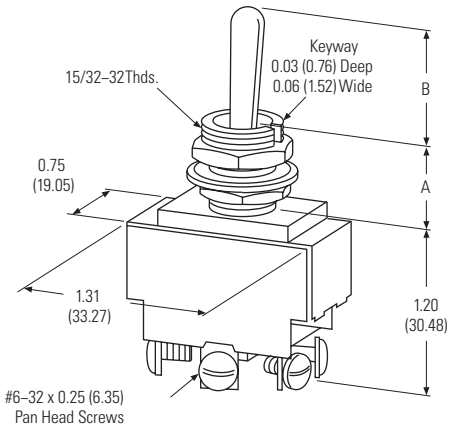
Single-Pole maintained and momentary action



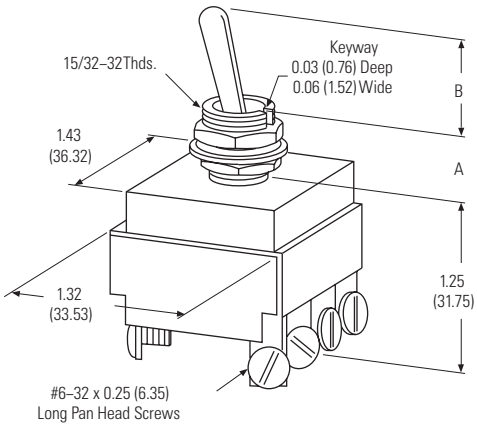
Two-Pole maintained action



Single-Pole maintained and momentary action



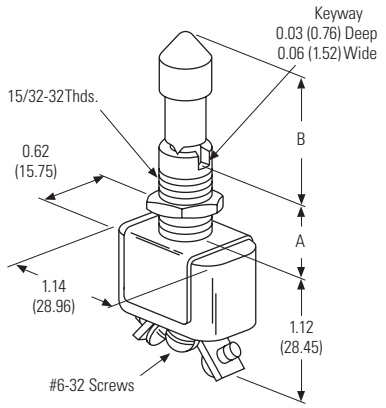
Two-Pole maintained action



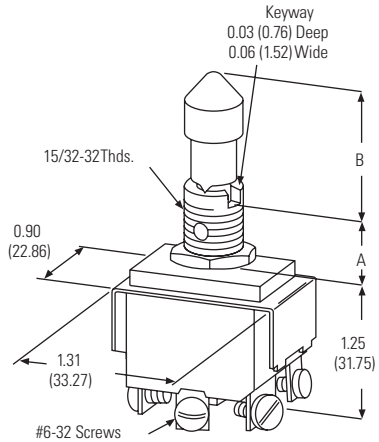
Approximate dimensions in inches (mm)

AC Rated (Heavy Duty) MIL-83731 lever lock switches with Lever Seal

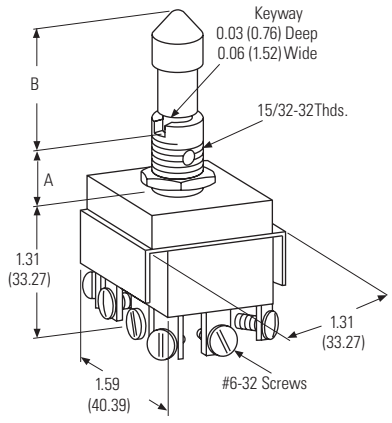
Single-Pole



Two-Pole

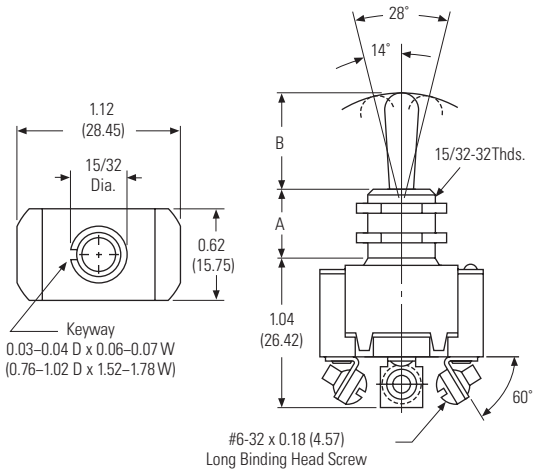


Four-Pole

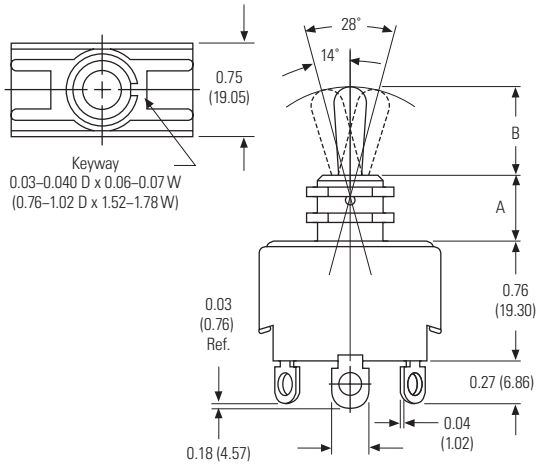


AC Rated (Heavy Duty)

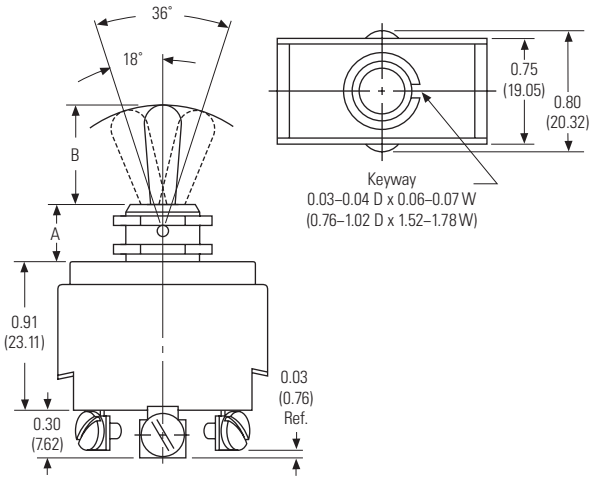
1PDT Maintained action



2PDT Maintained action



2PDT Momentary action



General purpose toggles

Product description

These AC rated toggle switches offer the widest selection of features and the design flexibility to meet a variety of applications.

Features

The optional features shown below may not be available on all toggle models. Contact your local Eaton Sales Representative.

7500, 7600, 7700 and 7900 Series

- 3-independent ON Circuit (2PDT or 4PDT only, see **Page 206**)
- Short (11/32 in) bushing
- Tall (15/32 in) bushing
- White nylon designer lever, see Dimensions on **Page 208**
- Black nylon designer lever, see Dimensions on **Page 208**
- Reversing jumpers (not for use with 3-independent ON circuit)
- Short (15/32 in) bat lever
- Tall (11/16 in) bat lever (not available with short bushing)
- Rotate keyway 180°
- Lever seal
- Omit one pole (2P, 3P, 4P only. Not for use with 3-independent ON circuit)

7800 Series Only

- 3-independent ON circuit (2PDT or 4PDT only, see **Page 206**)
- Reversing jumpers (Not for use with 3-independent ON circuit)
- Rotate keyway 180°
- Silicone lever seal (1P and 2P only)
- Omit one pole (2P, 3P, 4P only. Not for use with 3-independent ON circuit)

Options

Combi-Term option

This is an extension of our AC rated general purpose toggle switch. The "Combi-Term" design allows the user the option of screw terminals, 0.25 in quick connects or solder termination all on the same switch. The special clips and screws are provided in a poly bag with the switch.

Circuits

- 1PST, 1PDT, 2PST, 2PDT, 3PST, 3PDT, 4PST and 4PDT
- Maintained and momentary

Standards and certifications

- UL® Recognized
- CSA® Certified
- (except as noted)
- RoHS Compliant

RoHS COMPLIANT

Product selection

AC Rated toggle switches—Single-Pole

Rating	Poles and throw	Circuit with lever in … UP Position	CENTER Position	DOWN Position (Keyway)	Base circuit see Page 222	Bushing length "A" inches (mm)	Lever length "B" inches (mm)	Catalog number Solder lugs	Screw terminals	0.250 in Spade terminals
6A, 125 Vac 3A, 250 Vac	1PST	ON	NONE	OFF	A	0.344 (8.74) 0.469 (11.91)	0.563 (14.30) 0.563 (14.30)	**7580K7** **7580K6**	**7580K5** **7580K4**	**7580K9** **7580K8**
	1PDT	ON	OFF	ON	B	0.469 (11.91)	0.563 (14.30)	**7581K6**	**7581K4**	**7581K8**
	1PDT	ON	NONE	ON	B	0.469 (11.91)	0.563 (14.30)	**7582K6**	**7582K4**	**7582K8**
	1PDT	ON MOM. ON	NONE OFF	MOM. ON MOM. ON	B	0.469 (11.91)	0.563 (14.30)	**7585K6** **7587K6**	**7585K4** **7587K4**	**7585K8** **7587K8**
10A, 250 Vac 1/2 hp, 250 Vac	1PST	OFF	NONE	MOM. ON	A	0.469 (11.91)	0.563 (14.30)	**7506K3**	**7506K4**	**7506K6**
	1PST	OFF	NONE	MOM. ON	A	0.469 (11.91)	0.688 (17.48)	**7506K38**	**7506K36**	**7506K40**
	1PDT	MOM. ON ON	OFF NONE	MOM. ON MOM. ON	B	0.469 (11.91)	0.563 (14.30)	**7509K4** **7510K6**	**7509K5** **7510K7**	**7509K7** **7510K9**
	1PDT	ON MOM. ON	OFF OFF	MOM. ON MOM. ON	B	0.469 (11.91)	0.688 (17.48)	**7508K38** **7509K38**	**7508K36** **7509K36**	**7508K40** **7509K40**
15A, 125 Vac 10A, 250 Vac 3/4 hp, 250 Vac 1/2 hp, 125V Vac	1PST	ON	NONE	OFF	A	0.344 (8.74) 0.469 (11.91)	0.563 (14.30) 0.563 (14.30)	**7501K12** **7501K13**	**7500K13** ① **7500K14** ①	**7501K14** **7501K15**
15A, 125 Vac 10A, 250 Vac 1/2 hp, 125 Vac 3/4 hp, 250 Vac	1PDT	ON	OFF	ON	B	0.469 (11.91)	0.563 (14.30)	**7503K13** ①	**7502K13**	**7503K15**
	1PDT	ON	NONE	ON	B	0.469 (11.91)	0.563 (14.30)	**7505K4**	**7504K4** ①	**7505K6**
20A, 125 Vac 10A, 250 Vac 1/2 hp, 125 Vac 3/4 hp, 250 Vac	1PST	ON	NONE	OFF	A	0.469 (11.91)	0.688 (17.48)	**7546K38**	**7546K36**	**7546K40**
30A, 125 Vac 25A, 250 Vac②	1PST	ON	NONE	OFF	A	0.344 (8.74)	0.563 (14.30)	—	**7576K2**	—

Note:

① Also 4.2A L at 125 Vac rating.
② Single-pole switch in two-pole base.

AC Rated toggle switches—Two-Pole

Rating	Poles and throw	Circuit with lever in … UP Position	CENTER Position	DOWN Position (Keyway)	Base circuit see Page 222	Bushing length "A" inches (mm)	Lever length "B" inches (mm)	Catalog number Solder lugs	Screw terminals	0.250 in Spade terminals	Combi-Term
6A, 125 Vac 3A, 250 Vac 2A, 277 Vac 2.5A, L at 125 Vac	2PST	ON	NONE	OFF	C	0.469 (11.91)	0.563 (14.30)	**7590K6**	**7590K4**	**7590K8**	—
6A, 125 Vac 3A, 250 Vac 2.5A, L at 125 Vac	2PDT	ON	OFF	ON	D	0.469 (11.91)	0.563 (14.30)	**7591K6**	**7591K4**	**7591K8**	—
	2PDT	ON	NONE	ON	D	0.469 (11.91)	0.563 (14.30)	**7592K6**	**7592K4**	**7592K8**	—
6A, 125 Vac 3A, 250 Vac	2PDT	MOM. ON	OFF	MOM. ON	D	0.469 (11.91)	0.563 (14.30)	**7597K6**	**7597K4**	**7597K8**	—
	2PDT	ON	ON	OFF	7530	0.469 (11.91)	0.563 (14.30)	**7530K1**	**7530K3**	**7530K2**	—
10A 250 Vac, 15A 125 Vac, 1/4 hp 125–250 Vac	2PDT	ON	ON	ON	7555	0.469 (11.91)	0.563 (14.30)	**7555K12**	**7555K11**	**7555K13**	—
15A, 125 Vac 10A, 250 Vac 3/4 hp, 250 Vac 1/2 hp, 125 Vac	2PST	ON	NONE	OFF	C	0.344 (8.74) 0.469 (11.91)	0.563 (14.30) 0.563 (14.30)	**7561K5** **7561K4**	**7560K6** **7560K5**	**7561K7** **7561K6**	—
15A, 125 Vac 10A, 250 Vac 3/4 hp, 125–250 Vac	2PDT	ON	OFF	ON	D	0.344 (8.74) 0.469 (11.91)	0.563 (14.30) 0.563 (14.30)	**7563K5** **7563K4**	**7562K5** **7562K4**	**7563K7** **7563K6**	—
15A, 125 Vac 10A, 250 Vac 3/4 hp, 250 Vac	2PDT	ON	NONE	ON	D	0.469 (11.91)	0.563 (14.30)	**7565K5**	**7564K6**	**7565K7**	—
15A, 125 Vac 10A, 250 Vac 1/2 hp, 250 Vac	2PST	OFF	NONE	MOM. ON	C	0.469 (11.91)	0.563 (14.30)	**7566K4**	**7566K5**	**7566K7**	—
	2PDT	ON MOM. ON ON	OFF OFF NONE	MOM. ON MOM. ON MOM. ON	D	0.469 (11.91)	0.563 (14.30)	**7568K3** ① **7569K1** **7570K4**	**7568K2** ① **7569K2** **7570K5**	**7568K4** ① **7569K3** **7570K7**	—
	2PDT	MOM. ON	OFF	MOM. ON	D	0.469 (11.91)	0.688 (17.48)	**7569K38**	**7569K36**	**7569K40**	—
20A, 125 Vac 10A, 250 Vac 3/4 hp, 250 Vac 1/2 hp, 125 Vac	2PST	ON	NONE	OFF	C	0.469 (11.91)	0.688 (17.48)	**7630K38**	**7630K36**	**7630K40**	—
	2PDT	ON	NONE	ON	D	0.469 (11.91)	0.688 (17.48)	**7632K38**	**7632K36**	**7632K40**	—
Section A 10A 250 Vac; 15A 125 Vac, 3/4 hp 250 Vac, 4.2A L 125 Vac; Section B 10A 250 Vac, 15A 125 Vac, 1/4 hp 250 Vac	2PDT	OFF	1 ON	2 ON	7571	0.469 (11.91)	0.563 (14.30)	**7571K2**	**7571K4**	**7571K6**	—
20A, 125 Vac 10A, 250 Vac 1 hp, 120–240 Vac	2PST	ON	NONE	OFF	C	0.469 (11.91)	0.688 (17.48)	**7803K11**	**7803K31**	**7803K21** ②	**7803K41**
	2PDT	ON ON MOM. ON	OFF NONE OFF	ON ON MOM. ON	D	0.469 (11.91)	0.688 (17.48)	**7803K12** **7803K13** **7803K17** ②	**7803K32** **7803K33** **7803K37** ②	**7803K22** ③ **7803K23** ③ **7803K27** ②	**7803K42** **7803K43** **7803K47** ②

Note:

① Also 1/2 hp at 125–250 Vac Rating.
② Not CSA Certified.
③ Also 7.5A, 277 Vac, 3/4 hp, 120–240–277 Vac.

AC Rated toggle switches—Three-Pole

Rating	Poles and throw	Circuit with lever in … UP Position	CENTER Position	DOWN Position (Keyway)	Base circuit see Page 222	Bushing length "A" inches (mm)	Lever length "B" inches (mm)	Catalog number Solder lugs	Screw terminals	0.250 in Spade terminals	Combi-Term
15A, 125 Vac 10A, 250 Vac 3/4 hp, 250 Vac 1 hp, 3 Ph 125–600 Vac 1 hp, 1 and 2 Ph 125–480 Vac	3PST	ON	NONE	OFF	E	0.469 (11.91)	0.688 (17.48)	**7700K1**	**7700K2**	**7700K3**	—
	3PDT	ON ON	OFF NONE	ON ON	F	0.469 (11.91)	0.688 (17.48)	**7701K1** **7702K1**	**7701K2** **7702K2**	**7701K3** **7702K3**	— —
15A, 125 Vac 10A, 250 Vac 3/4 hp, 250 Vac	3PDT	MOM. ON MOM. ON	OFF NONE	ON ON	F	0.469 (11.91)	0.688 (17.48)	**7704K1** **7705K1**	**7704K2** **7705K2**	**7704K3** **7705K3**	— —
20A, 125 Vac 10A, 250 Vac 1 hp, 120 Vac 1, 2 and 3 Ph	3PDT	ON	OFF	ON	F	0.469 (11.91)	0.688 (17.48)	**7804K12** ②③	**7804K32** ②	**7804K22** ②	**7804K42** ②

AC Rated toggle switches—Four-Pole

Rating	Poles and throw	Circuit with Lever in … UP Position	CENTER Position	DOWN Position (Keyway)	Base circuit see Page 222	Bushing length "A" inches (mm)	Lever length "B" inches (mm)	Catalog Number Solder lugs	Screw terminals	0.250 in Spade terminals	Combi-Term
15A, 125 Vac 10A, 250 Vac 3/4 hp, 250 Vac	4PST	ON	NONE	OFF	E	0.469 (11.91)	0.688 (17.48)	**7691K14**	**7690K8**	—	—
	4PDT	ON ON	OFF NONE	ON ON	F	0.469 (11.91)	0.688 (17.48)	**7693K2** **7695K5**	**7692K13** **7694K4**	— —	— —
20A, 125 Vac 10A, 250 Vac 3/4 hp, 250 Vac 1/2 hp, 125 Vac	4PST	ON	NONE	OFF	E	0.469 (11.91)	0.688 (17.48)	**7933K38**	**7933K36**	**7933K40**	—
	4PDT	ON ON	OFF NONE	ON ON	F	0.469 (11.91)	0.688 (17.48)	**7934K38** **7935K38**	**7934K36** **7935K36**	**7934K40** **7935K40**	— —
20A, 125 Vac 10A, 250 Vac 1 hp, 125–240 Vac 2 and 3 Ph	4PDT	ON	OFF	ON	F	0.469 (11.91)	0.688 (17.48)	**7805K12** ②	**7805K32** ②	**7805K22** ②	**7805K42** ②

Note:

① Also 1/2 hp at 125–250 Vac Rating.
② Not CSA Certified.
③ Also 7.5A, 277 Vac, 3/4 hp, 120–240–277 Vac.
④ 1 hp at 240–480 Vac single- or two-phase and 240–600 Vac three-phase.

AC rated sealed ① toggle switches—Single-Pole

Rating	Poles and throw	Circuit with lever in … UP Position	CENTER Position	DOWN Position (Keyway)	Base circuit see Page 222	Bushing length "A" inches (mm)	Lever length "B" inches (mm)	Catalog number Solder lugs	Screw terminals	0.250 in Spade terminals
10A, 250 Vac 1/2 hp, 250 Vac	1PST	OFF	NONE	MOM. ON	A	0.469 (11.91)	0.563 (14.30)	—	**7506K20**	**7506K21**
	1PDT	MOM. ON	OFF	MOM. ON	B	0.469 (11.91)	0.563 (14.30)	—	**7509K20**	**7509K21**
		ON	NONE	MOM. ON				—	**7510K20**	**7510K21**
		ON	OFF	MOM. ON				—	**7508K20**	**7508K21**
15A, 125 Vac 10A, 250 Vac 3/4 hp, 250 Vac 1/2 hp, 125V–250 Vac	1PST	ON	NONE	OFF	A	0.469 (11.91)	0.563 (14.30)	**7501K22**	**7500K20** ②	**7501K21**
15A, 125 Vac 10A, 250 Vac 1/2 hp, 125 Vac 3/4 hp, 250 Vac	1PDT	ON	OFF	ON	B	0.469 (11.91)	0.563 (14.30)	—	**7502K20**	**7503K21**
	1PDT	ON	NONE	ON	B	0.469 (11.91)	0.563 (14.30)	—	**7504K20** ②	**7505K21**

AC rated sealed ① toggle switches—Two-Pole

Rating	Poles and throw	Circuit with lever in … UP Position	CENTER Position	DOWN Position (Keyway)	Base circuit see Page 222	Bushing length "A" inches (mm)	Lever length "B" inches (mm)	Catalog number Solder lugs	Screw terminals	0.250 in Spade terminals
15A, 125 Vac 10A, 250 Vac 3/4 hp, 250 Vac 1/2 hp, 125 Vac	2PST	ON	NONE	OFF	C	0.469 (11.91)	0.563 (14.30)	—	**7560K20**	**7561K21**
15A, 125 Vac 10A, 250 Vac 3/4 hp, 125–250 Vac	2PDT	ON	OFF	ON	D	0.469 (11.91)	0.563 (14.30)	—	**7562K20**	**7563K21**
15A, 125 Vac 10A, 250 Vac 3/4 hp, 250 Vac	2PDT	ON	NONE	ON	D	0.469 (11.91)	0.563 (14.30)	—	**7564K20**	**7565K21**
15A, 125 Vac 10A, 250 Vac 1/2 hp, 250 Vac	2PST	OFF	NONE	MOM. ON	C	0.469 (11.91)	0.563 (14.30)	—	**7566K20**	**7566K21**
	2PDT	OFF	OFF	MOM. ON	D	0.469 (11.91)	0.563 (14.30)	—	**7568K20** ②	**7568K21** ②
		OFF	OFF	MOM. ON				—	**7569K20**	**7569K21**
		NONE	NONE	MOM. ON				—	**7570K20**	**7570K21**

AC Rated special circuit toggle switches—Two-Pole

Rating	Poles and throw	Circuit with lever in … UP Position	CENTER Position	DOWN Position (Keyway)	Base circuit see Page 222	Bushing length "A" inches (mm)	Lever length "B" inches (mm)	Catalog number Solder lugs	Screw terminals	0.250 in Spade terminals
15A, 125 Vac 10A, 250 Vac 3/4 hp, 125–250 Vac	2PDT	2-3, 5-6	OFF	2-6, 5-3	D	0.469 (11.91)	0.563 (14.30)	**7563K24**	**7562K23**	**7563K25**
15A, 125 Vac 10A, 250 Vac 3/4 hp, 250 Vac	2PDT	2-3, 5-6	NONE	2-6, 5-3	D	0.469 (11.91)	0.563 (14.30)	**7565K24**	**7564K23**	**7565K25**

Note:

① Seal is lever seal only and is dust and splash resistant. Panel seal is available, Part Number **32-341**.
② Also 1/2 hp at 125–250 Vac Rating.

Technical data and specifications

General purpose toggles—ac rated

Description	Specification
Ratings	See Product Selection tables; Switch ratings at 125 Vac also apply to 28 Vdc
Contact mechanism	Slow-make/slow-brake butt contact
Terminal types	Screw terminals—brass designed to accept #6-32x 3/16 binding head (Cat. No. 811-2) screws Furnished unassembled Solder lug terminals—tintillate-plated brass Spade terminals—combi-term—brass
Base material	Thermoset molding material
Mounting means	Threaded bushing—0.468 in (11.89 mm) dia., 32 threads/in Keyway—0.068 x 0.035 in (1.73 x 0.89 mm) deep, provides anti-rotation feature Hardware supplied—1 hexagon locknut (Cat. No. 15-192) and 1 bright nickel-plated knurled facenut (Cat. No. 15-124F1), except 7700–7705, which have bright nickel hexagon facenut (Cat. No. 15-966-2) Furnished unassembled
Finish	Bright nickel-plated toggle lever and bushing
Dielectric withstand	1000V rms minimum
Operating temperature range	0° to 150°F (–17.8° to 65.6°C)

Contact material

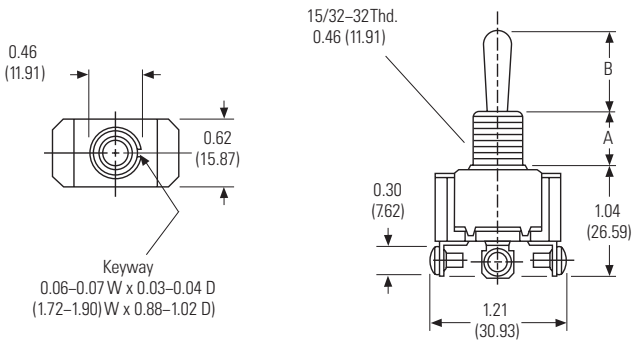
Ampere	Movable	Stationary
7500, 7600, 7700 and 7900 Series Switches		
3 to 6	Silver-plated copper	Silver-plated copper
10 to 20	Silver-plated copper with silver buttons	Silver-plated copper with silver buttons
20 to 30	Silver-plated copper with cad oxide buttons	Copper with cad oxide buttons
7800 Series Switches		
3 to 6	Silver-plated copper	Silver-plated copper
10 to 20	Copper with silver buttons	Copper with silver buttons

Dimensions

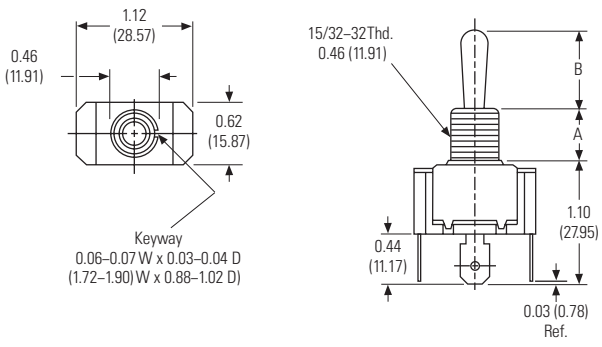
Approximate dimensions in inches (mm)

7500, 7600, 7700 and 7900 Series

1PST Maintained and momentary (screw terminals)



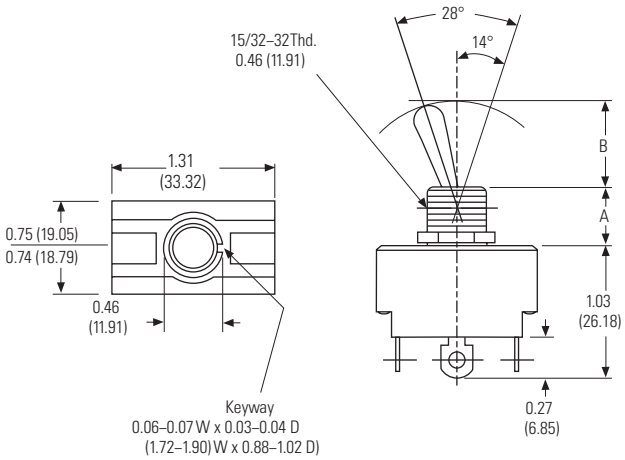
1PDT Maintained and momentary (spade terminals)



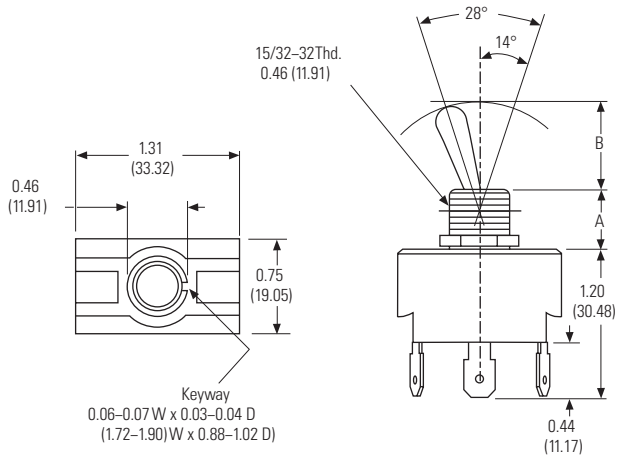
Approximate dimensions in inches (mm)

7500, 7600, 7700 and 7900 Series, continued

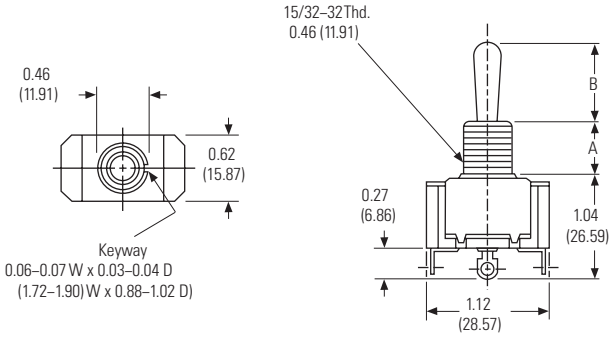
2PDT Maintained (Solder lugs)



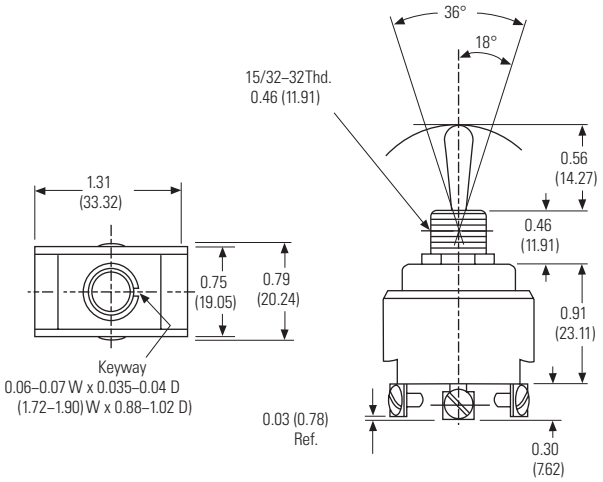
2PDT Maintained (Spade terminals)



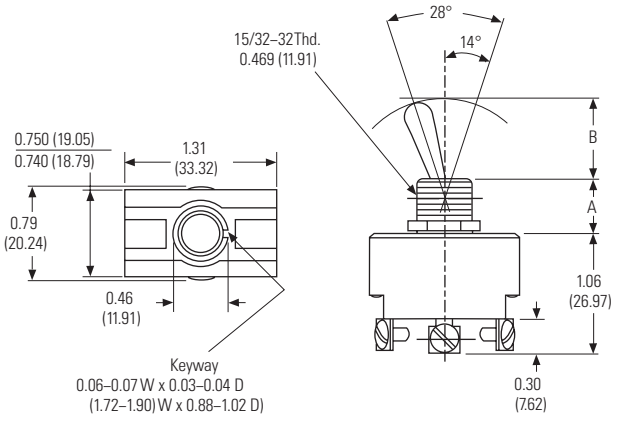
1PDT Maintained and momentary (Solder lugs)



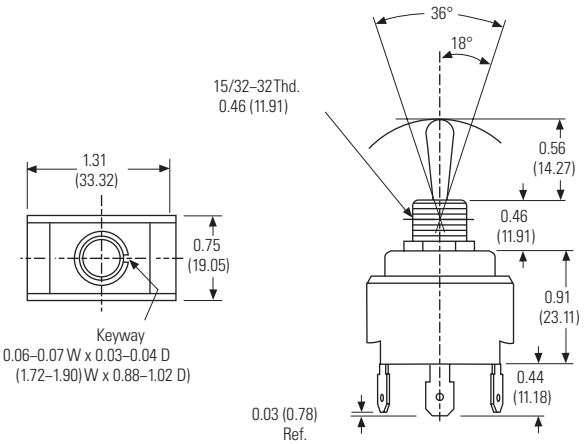
2PDT Momentary (Screw terminals)



2PDT Maintained (Screw terminals)



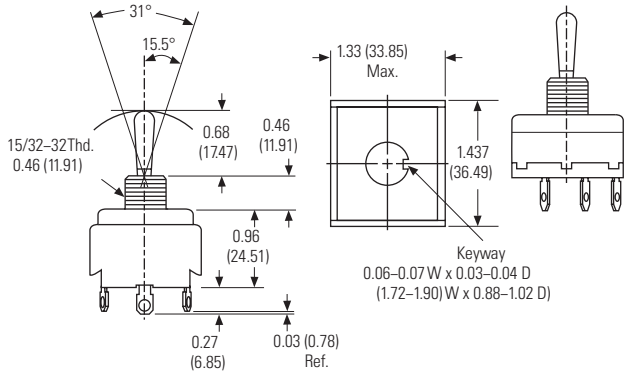
2PDT Momentary (Spade terminals)



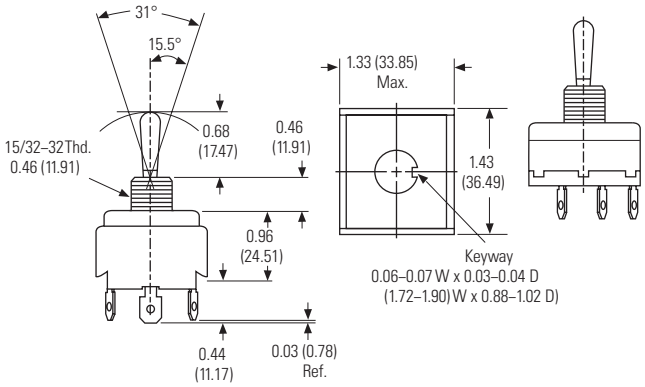
Approximate dimensions in inches (mm))

7500, 7600, 7700 and 7900 Series, continued

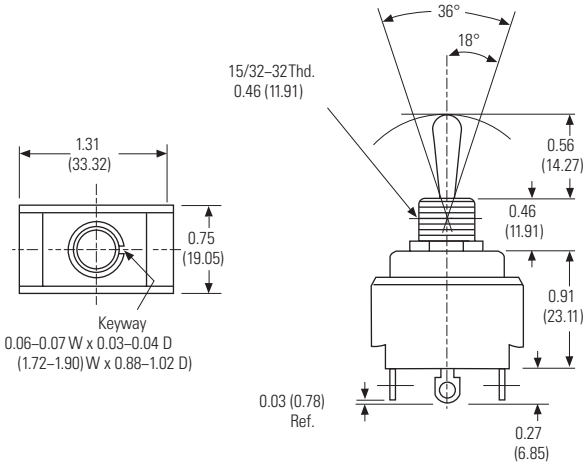
3PDT Maintained and momentary (Solder lugs)



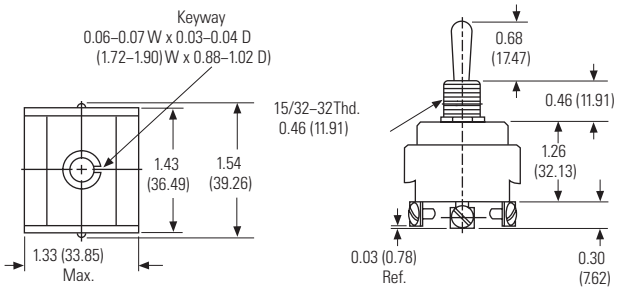
3PDT Maintained and momentary (Spade terminals)



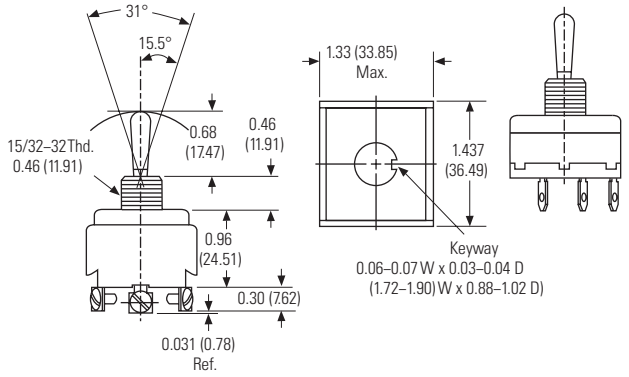
2PDT Momentary (Solder lugs)



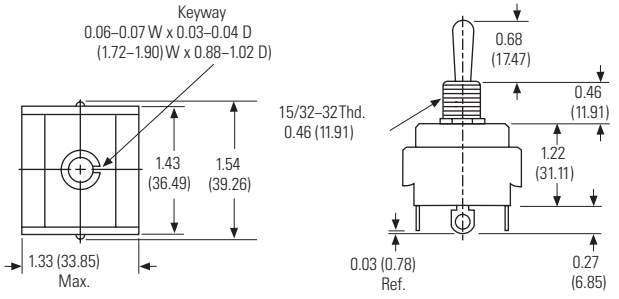
4PDT Maintained and momentary (Screw terminals)



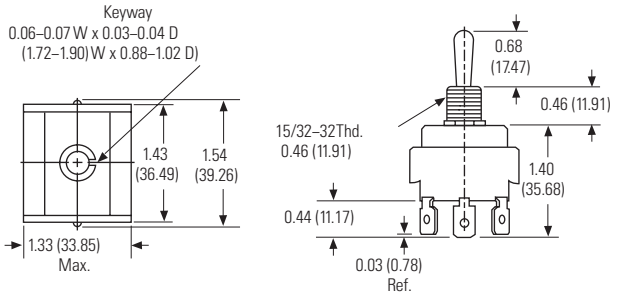
3PDT Maintained and momentary (Screw terminals)



4PDT Maintained and momentary (Solder lugs)



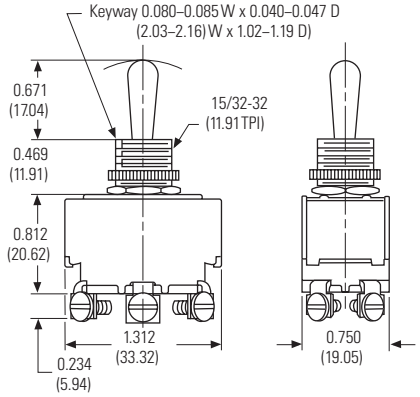
4PDT Maintained and momentary (Spade terminals)



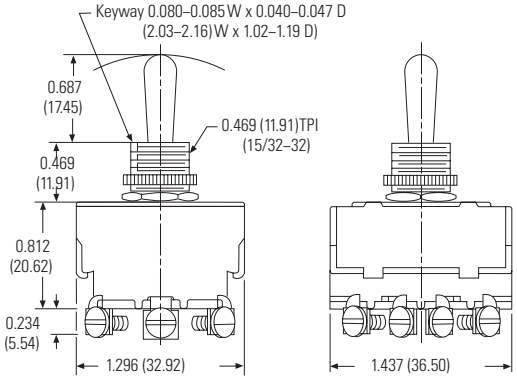
Approximate dimensions in inches (mm)

7800 Series

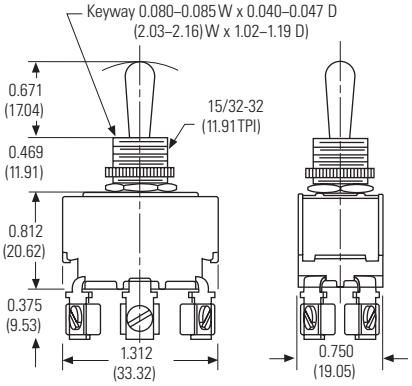
2PDT Maintained (Screw terminals)



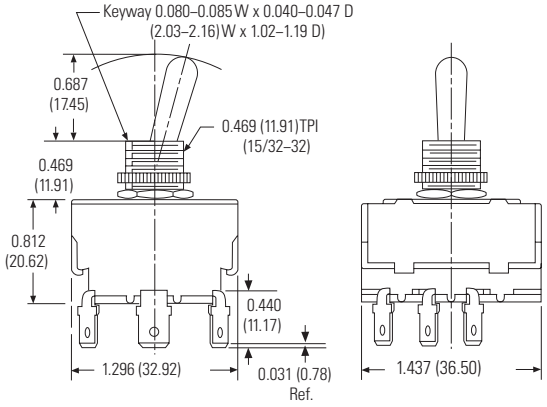
4PDT Maintained (Screw terminals)



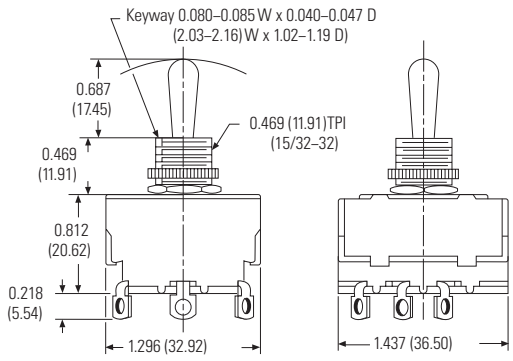
2PDT Maintained (Combi-terminals)



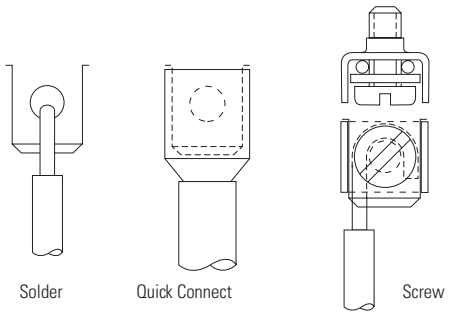
3PDT Maintained (0.25 in Spade terminals)



3PDT Maintained (Screw terminals)



Combi-Term termination options



General purpose toggles

Product description

This line of switches employs a quick-make/quick-break contact mechanism. The resultant high-speed movement eliminates the "teasing" of the switch and reduces the pitting of the contact surfaces due to arcing. Self-cleaning and wiping contact action assures positive contact on switch operation. These switches are especially suited for use in small motor applications.

Options

- Lever—11/16 in
- Lever seal
- Mounting hardware; furnished assembled
- Other lead lengths

Standards and certifications

- UL Recognized
- CSA Certified
- RoHS Compliant

Product selection

AC/DC Rated toggle switches—Single-Pole

Rating	Poles and throw	Circuit with lever in … UP Position	CENTER Position	DOWN Position	Base circuit see Page 222	Bushing length "B" inches (mm)	Lever length "A" inches (mm)	Catalog number Solder lugs	Screw terminals	Wire leads
3A, 250 Vdc	1PST	ON	NONE	OFF	A	0.344 (8.74)	0.500 (12.70)	**8280K115**	**8295K107**	**8290K115**
6A, 125 Vac/Vdc	1PST	ON	NONE	OFF	A	0.344 (8.74)	0.500 (12.70)	**8381K107**	**8396K107**	**8391K107**
3A, 250 Vdc		ON	NONE	OFF		0.469 (11.91)	0.500 (12.70)	**8381K108**	**8396K108**	**8391K108**
		MOM. ON	NONE	OFF		0.469 (11.91)	0.500 (12.70)	**8928K478**	—	—
	1PST	ON	NONE	OFF	B	0.469 (11.91)	0.500 (12.70)	**8928K479**	—	—

Product selection

AC/DC Rated toggle switches—Two-Pole

Rating	Poles and throw	Circuit with Lever in … UP Position	CENTER Position	DOWN Position	Base circuit see Page V11-T4-35	Bushing length "B" inches (mm)	Lever length "A" inches (mm)	Catalog Number Solder lugs	Screw terminals	Wire leads
7A, 125V	2PST	ON	NONE	OFF	C	0.469 (11.91)	0.500 (12.70)	**8370K107**	**8372K107**	**8371K107**
3A, 250 Vdc		MOM. ON	NONE	OFF		0.469 (11.91)	0.500 (12.70)	**8928K481** ①	**8928K482** ①	—
	2PDT	ON	NONE	ON	D	0.344 (8.74)	0.500 (12.70)	**8373K108**	**8375K108**	**8374K108**
		ON	NONE	ON		0.469 (11.91)	0.500 (12.70)	**8373K107**	**8375K107**	**8374K107**

Note:

① Rating: 6A, 125 Vac/Vdc and 3A, 250 Vdc.

Technical data and specifications

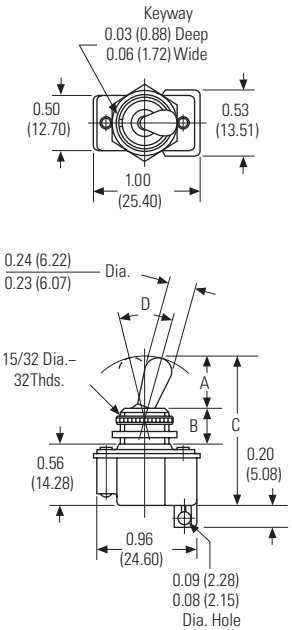
General purpose toggles—AC/DC rated

Description	Specification
Ratings	See Product Selection table; Switch ratings at 125 Vac also apply to 28 Vdc
Circuits	1PST, 1PDT, 2PST, 2PDT Maintained and momentary toggle action
Contact mechanism	Quick-make/quick-break wiping action
Contact material	Bronze silver-plated
Terminal types	Screw terminals—brass designed to accept #5-40 x 5/32 in (Cat. No. 11-26) screws Furnished unassembled Solder lug terminals—brass silver-plated with 0.085–0.090 in (2.16–2.29 mm) dia. hole Integrated wire leads—18 gauge, 6 in long and skinned 3/4 in Special wire leads lengths beyond 6 in are available at additional charge
Base material	Thermoset molding material
Mounting means	Threaded bushing—0.468 in (11.89 mm) dia., 32 threads/inch Keyway—0.068 x 0.035 in (1.73 x.89 mm) deep, provides anti-rotation feature Hardware supplied—1 hexagon locknut (Cat. No. 15-192) and 1 bright nickel-plated knurled facenut (Cat. No. 15-124F1) Furnished unassembled
Finish	Bright nickel-plated toggle lever and bushing
Operating temperature range	0° to 150°F (–17.8° to 65.6°C)

Dimensions

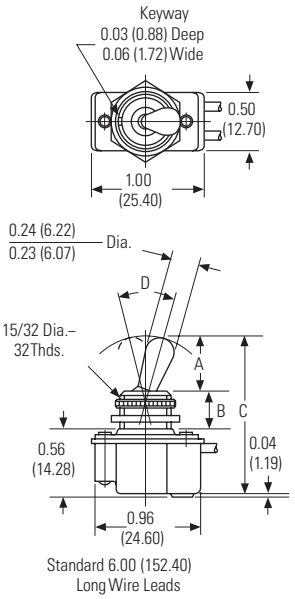
Approximate dimensions in inches (mm)

8280K115 1PST Maintained (Solder lug)



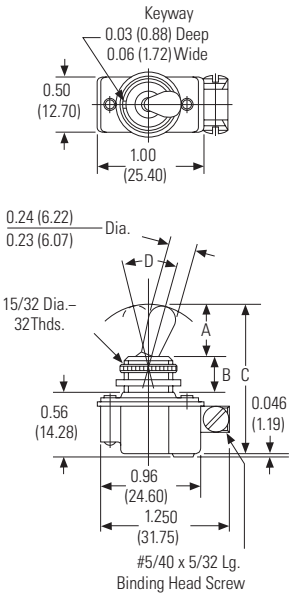
"A" Lever Dim.	"B" Bushing Dim.	"C" Overall Dim.	"D" Throw Dim.
0.500 (12.70)	0.344 (8.74)	1.411 (35.84)	29-1/2°

8290K115 1PST Maintained (Wire lead)



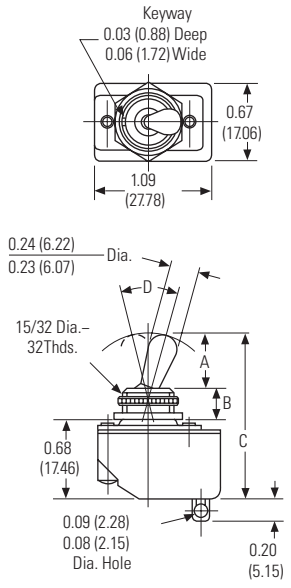
"A" Lever Dim.	"B" Bushing Dim.	"C" Overall Dim.	"D" Throw Dim.
0.500 (12.70)	0.344 (8.74)	1.406 (35.71)	29-1/2°

8295K107 1PST Maintained (Screw terminals)



"A" Lever Dim.	"B" Bushing Dim.	"C" Overall Dim.	"D" Throw Dim.
0.500 (12.70)	0.344 (8.74)	1.406 (35.71)	29-1/2°

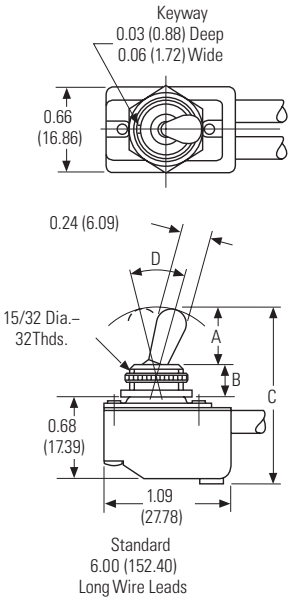
8381K107 and K108 1PST Maintained (Solder lug)



"A" Lever Dim.	"B" Bushing Dim.	"C" Overall Dim.	"D" Throw Dim.
0.500 (12.70)	0.344 (8.74)	1.531 (38.89)	29-1/2°
0.500 (12.70)	0.469 (11.91)	1.656 (42.06)	25-1/2°

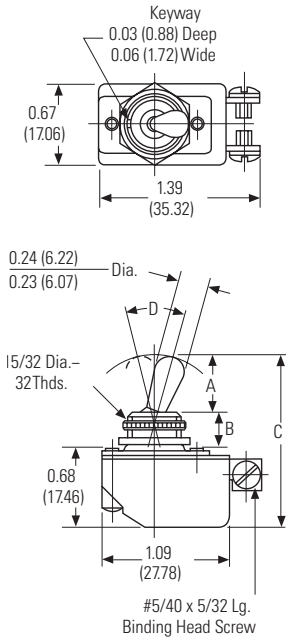
Approximate dimensions in inches (mm)

8391K107 and K108
1PST Maintained
(Wire lead)



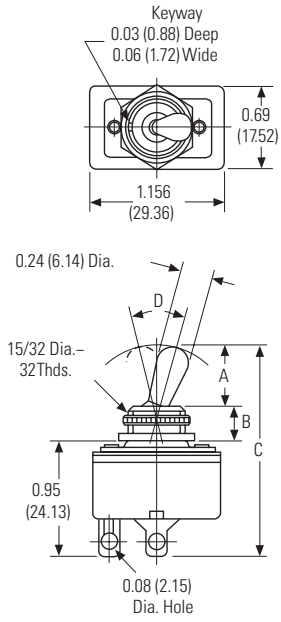
"A" Lever Dim.	"B" Bushing Dim.	"C" Overall Dim.	"D" Throw Dim.
0.500 (12.70)	0.344 (8.74)	1.531 (38.89)	29-1/2°
0.500 (12.70)	0.469 (11.91)	1.656 (42.06)	25-1/2°

8396K107 and K108
1PST Maintained
(Screw terminals)



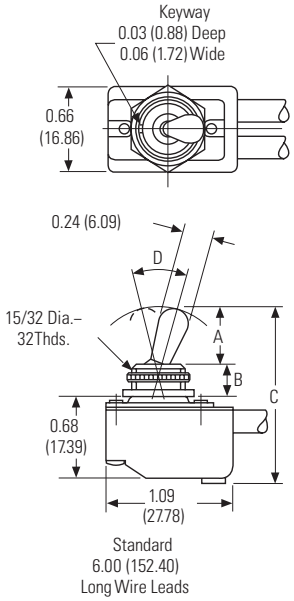
"A" Lever Dim.	"B" Bushing Dim.	"C" Overall Dim.	"D" Throw Dim.
0.500 (12.70)	0.344 (8.74)	1.531 (38.89)	29-1/2°
0.500 (12.70)	0.469 (11.91)	1.656 (42.06)	25-1/2°

8928K478
1PST Momentary
(Solder lug)



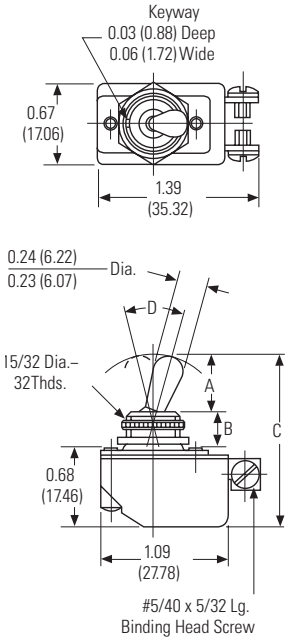
"A" Lever Dim.	"B" Bushing Dim.	"C" Overall Dim.	"D" Throw Dim.
0.500 (12.70)	0.344 (8.74)	1.980 (50.29)	29-1/2°
0.500 (12.70)	0.469 (11.91)	1.656 (42.06)	25-1/2°

8370 and 8373K107 and K108 2PST/2PDT Maintained (Solder lug)



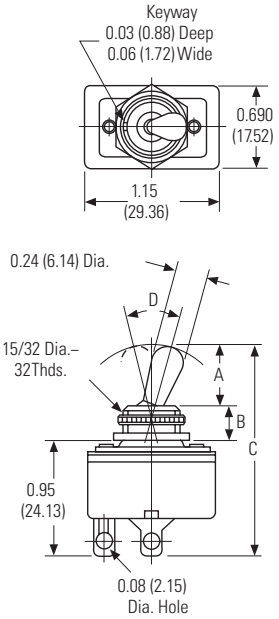
"A" Lever Dim.	"B" Bushing Dim.	"C" Overall Dim.	"D" Throw Dim.
0.500 (12.70)	0.344 (8.74)	1.694 (43.03)	29-1/2°
0.500 (12.70)	0.469 (11.91)	1.820 (46.23)	25-1/2°

8371 and 8374K107 and K108 1PST Maintained (Wire lead)



"A" Lever Dim.	"B" Bushing Dim.	"C" Overall Dim.	"D" Throw Dim.
0.500 (12.70)	0.344 (8.74)	1.484 (37.69)	29-1/2°
0.500 (12.70)	0.469 (11.91)	1.515 (38.48)	25-1/2°

8373 and 8375K107 and K108 2PST/2PDT Maintained (Screw terminals)



"A" Lever Dim.	"B" Bushing Dim.	"C" Overall Dim.	"D" Throw Dim.
0.500 (12.70)	0.344 (8.74)	1.484 (37.69)	29-1/2°
0.500 (12.70)	0.469 (11.91)	1.609 (40.87)	25-1/2°

X Series toggles

Product description

Eaton's new, competitively priced, AC rated X Series toggles offer a standard high rating for both single- and two-pole applications. The new X Series toggle line offers a wide range of switching circuits, functions and accessories. Ratings for single- and two-pole include 20A at 125 Vac and 10A at 277 Vac to handle more severe inductive, motor and lamp loads.

In addition, X Series toggles have a high standard horsepower rating of 1-1/2 hp, 125–250 Vac for two-pole applications.

The easy-to-install toggles also have an industrystandard 0.48 in diameter mounting hole. For added convenience and delivery support, select industrystandard switch circuit part numbers are available from stock. With so many features, X Series toggles can be used in a variety of applications.

Application description

- Commercial and industrial equipment
- Household appliances
- Industrial machinery and automation
- Medical equipment
- Military communications and surveillance
- Rail systems
- Signaling and communications
- Test and lab equipment
- Telecommunications, cable and broadcasting

Standards and certifications

- UL Recognized component for Canada File E2702
- RoHS Compliant

Product selection

Single-Pole [1]

Poles and throw	Circuit with lever in … UP Position	CENTER Position	DOWN Position [2]	Terminal type—Catalog number 0.250 in Spade	Screw	Solder lugs
1PST	ON	NONE	OFF	**XTD1A1A2**	**XTD1A2A2**	**XTD1A3A2**
1PST	ON [3]	NONE	OFF	**XTD1F1A2**	**XTD1F2A2**	**XTD1F3A2**
1PDT	ON	OFF	ON	**XTD2B1A**	**XTD2B2A**	**XTD2B3A**
1PDT	ON	NONE	ON	**XTD2C1A**	**XTD2C2A**	**XTD2C3A**
1PDT	ON	NONE	ON [3]	**XTD2D1A**	**XTD2D2A**	**XTD2D3A**
1PDT	ON [3]	OFF	ON [3]	**XTD2E1A**	**XTD2E2A**	**XTD2E3A**
1PDT	ON	OFF	ON [3]	**XTD2G1A**	**XTD2G2A**	**XTD2G3A**

Two-Pole [4]

Poles and throw	Circuit with Lever in … UP Position	CENTER Position	DOWN Position [2]	Terminal type—Catalog number 0.250 in Spade	Screw	Solder lugs
2PST	ON	NONE	OFF	**XTD3A1A2**	**XTD3A2A2**	**XTD3A3A2**
2PST	ON [3]	NONE	OFF	**XTD3F1A2**	**XTD3F2A2**	**XTD3F3A2**
2PDT	ON	OFF	ON	**XTD4B1A**	**XTD4B2A**	**XTD4B3A**
2PDT	ON	NONE	ON	**XTD4C1A**	**XTD4C2A**	**XTD4C3A**
2PDT	ON	NONE	ON [3]	**XTD4D1A**	**XTD4D2A**	**XTD4D3A**
2PDT	ON [3]	OFF	ON [3]	**XTD4E1A**	**XTD4E2A**	**XTD4E3A**
2PDT	ON	OFF	ON [3]	**XTD4G1A**	**XTD4G2A**	**XTD4G3A**

Note:

① Ratings: 20A at 125 Vac, 10A at 277 Vac, 3/4 hp, 125–250 Vac; recommended up to 15A at 28 Vdc.
② Keyway position.
③ Indicates momentary position.
④ Ratings: 20A at 125 Vac, 10A at 277 Vac, 1-1/2 hp, 125–250 Vac; recommended up to 15A at 28 Vdc.

Accessories

See Accessories **on Page 223.**

Technical data and specifications

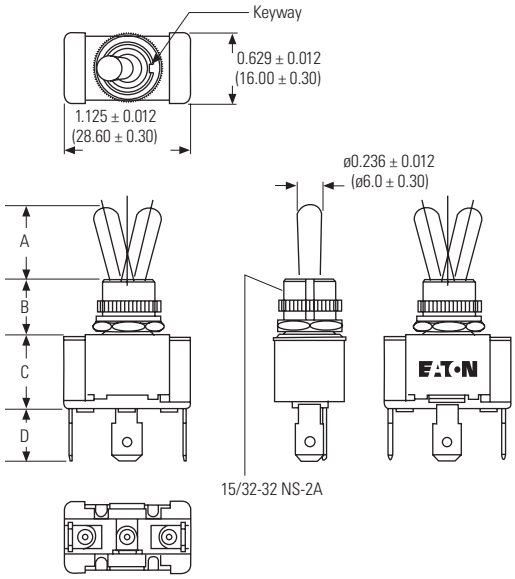
X Series Toggles

Description	Specification
Single-pole rating	20A, 125 Vac; 10A, 277 Vac; 3/4 hp 125–250 Vac; Recommended up to 15A at 28Vdc
Two-pole rating	20A, 125 Vac; 10A, 277 Vac; 1-1/2 hp 125–250 Vac; Recommended up to 15A at 28Vdc
Available circuits	1PST, 1PDT, 2PST, 2PDT
Terminal types	Brass screw, brass solder lugs, brass nickel-plated 0.250 in spade
Hardware included	Zinc nickel-plated knurl nut, zinc nickel-plated hex nut
Mounting means	Threaded bushing 12.0 +0.1, –0 mm; 16.5 +1, –1 mm
Keyway	1.8 mm located in DOWN position
Base material	Thermoset molding material
Finish	Bright nickel-plated toggle lever and bushing
Contact mechanism	Slow-make/slow-break butt contact
Contact resistance	50 ohm maximum
Dielectric strength	AC 1500V, 1 minute
Operating temperature	32° to 149°F (0° to 65°C)
Insulation resistance	DC 500V 100M ohm minute
Seal level rating	IP40
Packaging	Sealed in polybag labeled with part number

Dimensions

Approximate dimensions in inches (mm)

Single-Pole



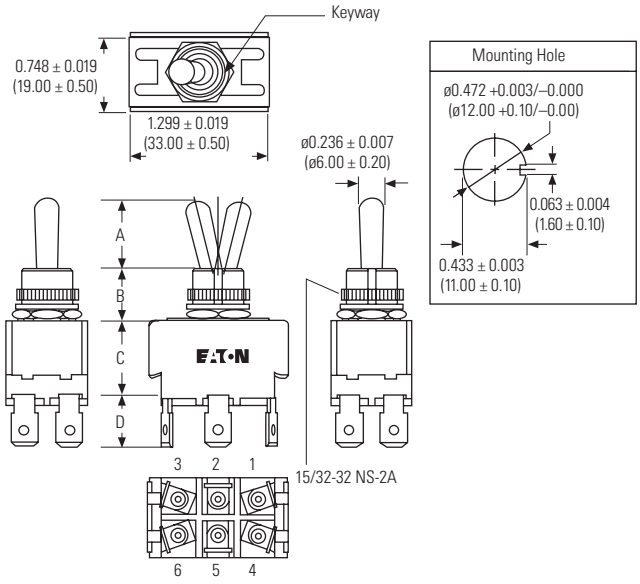
A 0.649 ± 0.039
(16.50 ± 1.00)

B 0.468 ± 0.012
(11.90 ± 0.30)

C 0.677 ± 0.019
(17.20 ± 0.50)

D 0.452 ± 0.019
(11.50 ± 0.50)

Two-Pole



A 0.649 ± 0.039
(16.50 ± 1.00)

B 0.468 ± 0.012
(11.90 ± 0.30)

C 0.740 ± 0.019
(18.80 ± 0.50)

D 0.452 ± 0.019
(11.50 ± 0.50)

Heavy duty hesitation switches

Product description

One-hole panel mount

These heavy duty toggle switches are available in either two- or three-position. The three-position switches offer a unique positive center stop feature, which assures that the lever cannot be thrown from one side through the center OFF position without stopping. This design feature is a major factor in their widespread acceptance for motor reversing and speed control applications.

The most common application for the switch is to help prevent motor damage resulting from the high current generation by counter EMF of the armature at the time of reversing. This type of device is referred to within the industry as an antiplugging, hesitation, positive stop or positive off switch. Typical applications include bench tools, coach and truck (electric lift) and X-ray equipment.

Flush mount

These three-position switches also offer the positive center stop feature where the lever cannot be thrown from one side through the center OFF position without stopping. The high ratings of this series allow it to be used with a broad range of heavy duty applications. Copper contacts and brass screw terminals are standard.

Standards and certifications

- UL Recognized (except where noted)
- CSA Certified (where noted)

Product selection

Heavy duty hesitation switches—one-hole panel mount

Rating	Poles and throw ②	Circuit with lever in … UP Position	CENTER Position	DOWN Position (Keyway)	Base circuit see Page 222	Bushing length "A" inches (mm)	Lever length "B" inches (mm)	Lever type	Catalog number Solder terminals	Screw lugs	0.250 in Spade terminals
15A, 125 Vac ① 10A, 250 Vac 3/4 hp, 250 Vac	2PDT	ON	OFF	ON	D	0.468 (11.89)	0.687 (17.45)	Bat	**7992K11**	**7992K10**	**7992K12**
15A, 125 Vac ① 10A, 250 Vac 3/4 hp, 250 Vac	3PDT	ON	OFF	ON	F	0.468 (11.89)	0.687 (17.45)	Bat	**7991K11**	**7991K10**	**7991K12**
15A, 125 Vac ① 10A, 250 Vac 3/4 hp, 250 Vac	4PDT	ON	OFF	ON	F	0.468 (11.89)	0.687 (17.45)	Bat	**7990K11**	**7990K10**	**7990K12**

Note:

① Listed rating for 125 Vac also applies at 28 Vdc.
② Supplied in a four-pole base.
③ CSA Certified.
④ Also rated 5A, 600 Vac; 1-1/2 hp, 250 Vdc; 2 hp, 240 Vac.
⑤ Also rated 2 hp, 250 Vac/Vdc.

Technical data and specifications

Heavy duty hesitation switches

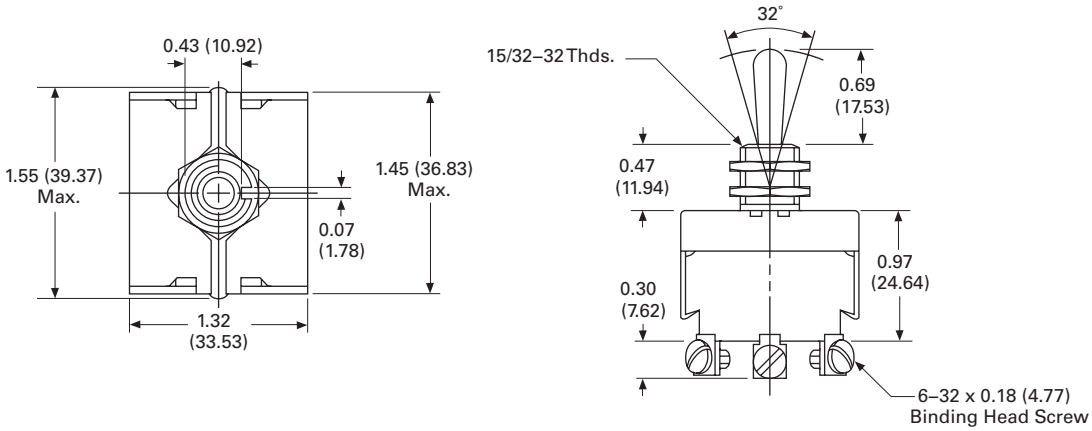
Description	Specification
Ratings	See Product Selection tables; Switch ratings at 125 Vac also apply to 28 Vdc
Circuits	2PDT, 3PDT, 4PDT; maintained action
Contact mechanism One-hole panel mount	 AC rated devices—slow-make/Slow-break butt contact AC/DC rated devices—Quick-make/quick-break wiping contacts
Contact material One-hole panel mount	 AC rated devices: Movable—silver-plated copper with fine or coin silver contact face button Stationary—copper with fine or coin silver contact face button AC/DC rated devices: Movable—copper Stationary—bronze
Terminal types	Screw terminals—brass
Mounting means One-hole panel mount	 AC rated devices: Threaded bushing—0.468 in (11.89 mm) dia., 32 threads/in Keyway—0.068 x 0.035 in (1.73 x 0.89 mm) deep, provide anti-rotation feature Hardware supplied— 1 hexagon locknut (Catalog Number 15-192) and 1 hex facenut (Catalog Number 15-966-6) Furnished unassembled
Dielectric withstand	1000V rms minimum
Operating temperature range	0° to 150°F (–17.8° to 65.6°C)

Dimensions

Approximate dimensions in inches (mm)

One-hole panel mount

7990K10—4PDT



Mounting hardware

Product description

One-hole mounting switches

All bushing mounted switches are furnished with two mounting nuts. One nut is mounted behind the panel to prevent the bushing sleeve from being distorted if the front panel is overtightened Eaton accepts no responsibility for damage to switches mounted without the backup nuts

Product selection

Mounting hardware for one-hole mounting switches—mounting nuts ①

Size	Description	Material	Thickness Dim. "A" in inches (mm)	Inside diameter Dim "B" in inches (mm)	OD or Dimension across flats Dim. "C" in inches (mm)	Dimension across corners Dim. "D" in inches (mm)	Catalog number
3/8-27	Hexagon locknut	Nickel-plated brass	0.125 (3.18)	—	0.562 (14.27)	0.625 (15.88)	**15-2526-2**
3/8-24		Bright nickel-plated brass		—			**15-1525-6**
11/32-32		Nickel-plated brass	0.063 (1.60)	—	0.473 (12.01)	0.531 (13.49)	**15-1525-2**
15/32-32	Hexagon locknut	Zinc-chromate treated	0.075 (1.91)	—	0.625 (15.88)	—	**15-192**
		Bright nickel-plated brass	0.078 (1.98)	—	0.546 (13.87)	0.625 (15.88)	**15-2525-58**
		Zinc-chromate treated	0.188 (4.76)	0.783 (19.89)	1.125 (25.80)	—	**15-2528-2**
	Hexagon facenut	Nickel-plated brass	0.078 (1.98)	—	0.562 (14.27)	0.656 (16.66)	**15-966-2**
		Semi-lustre nickel-plated brass		—		—	**19-966-6**
	Knurled facenut	Bright nickel-plated brass	0.066 (1.68)	—	0.562 (14.27)	—	**15-124F1**
		Black cupric oxide-plated brass		—		—	**15-124F5**
		Brass nickel-plated brass	0.109 (2.77)	—	0.625 (15.88)	—	**15-90**
	Chamfered dress nut	Bright nickel-plated brass	0.151 (3.84)	0.312 (7.92)	0.687 (17.45)	—	**15-994-2**
	Standard knurl nut with shoulder	Nickel-plated brass	0.109 (2.77)	—	0.593 (15.06)	—	**15-2534-14**
	Dress nut	Satin chrome-plated brass	0.125 (3.18)	—	0.562 (14.27)	—	**15-2523-4**
		Black nylon	0.187 (4.75)	0.390 (9.91)	0.640 (16.26)	—	**15-1048-3**
	Knurled dress nut	Chrome-plated brass	0.187 (4.75)	0.312 (7.92)	0.640 (16.26)	—	**15-189-5**
3/4-32	Hexagon facenut	Nickel-plated steel	0.093 (2.36)	—	0.937 (23.80)	1.078 (27.38)	**15-1043**
#8-40	Hexagon locknut with facenut	Nickel-plated steel	0.060 (1.52)	—	0.245 (6.22)	0.216 (5.49)	**15-1047**

Note:

① Hardware items are sold for use with Eaton switches only. Minimum ordering quantity on all items is 100.

Mounting Washers and Locking Ring ①

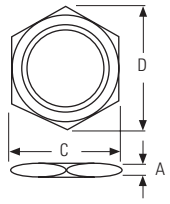
Size	Description	Material	Approximate dimensions in inches (mm) Thickness Dim. "A"	Inside diameter Dim "B"	OD or Dimension across flats Dim. "C"	Dimension across corners Dim. "D"	Catalog number
For 15/32 bushing	Locking ring	Zinc-plated steel	0.040 (1.02)	0.475 (12.07)	0.718 (18.24)	—	**29-761-5**

Dimensions

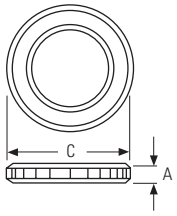
Approximate dimensions in inches (mm)

Mounting hardware

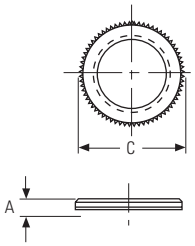
Hexagon Locknuts or Facenuts



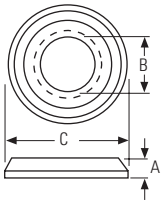
Knurled Facenut



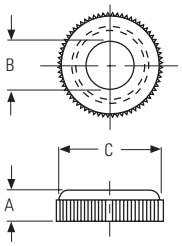
Knurled Nut with Shoulder



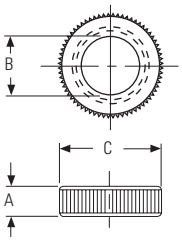
Chamfered Dress Nut Catalog No. 15-994-2



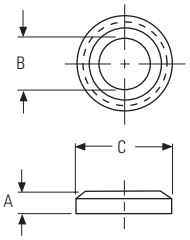
Knurled Dress Nut Catalog No. 15-189-5



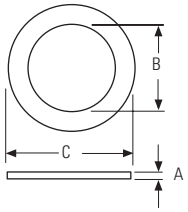
Knurled Dress Nut Catalog No. 15-1048-3



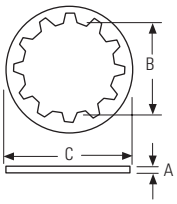
Dress Nut Catalog No. 15-2523-4



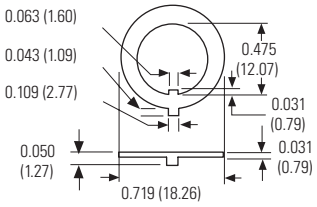
Plain Washer



Internal Tooth Lockwasher



Locking Ring



Note:

① Hardware items are sold for use with Eaton switches only.

Decorator facenuts

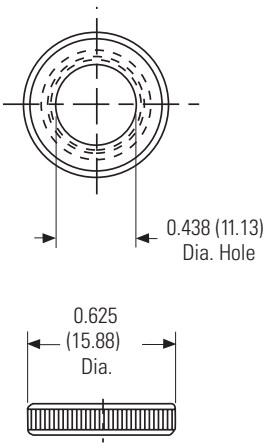
Product selection ①

Type	Color	Catalog number
Knurled facenuts	Bright black	**15-1048-3**
	Bright clear	**15-1048-7**
Beveled facenuts	Bright black	**15-1049-3**
	Bright clear	**15-1049-7**

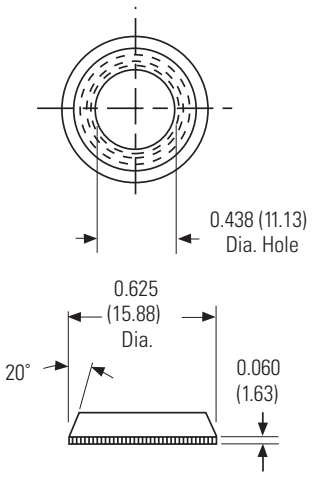
Dimensions

Approximate dimensions in inches (mm)

Catalog number 15-1048



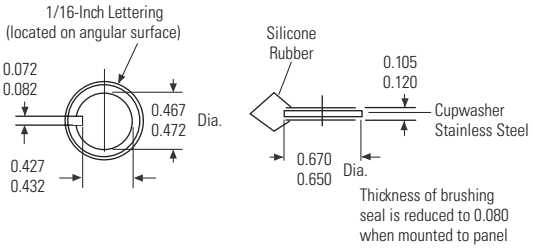
Catalog number 15-1049



Panel seal

- Prevents moisture and contaminants from entering panel enclosure
- Behind panel mounting
- Stainless-steel cup washer ensures proper seating of silicone rubber seal
- Seal withstands 20 psi water pressure
- Cat. No. 32-341

Dimensions—32-341



Replacement terminal screws

Product selection

Screw size	Catalog number ②
#5-40 x 1/8 in	**11-1117**
#5-40 x 5/32 in	**11-26**
#5-40 x 3/16 in binding head	**811-7206**
#5-40 x 1/4 in binding head	**811-14**
#6-32 x 3/16 in binding head	**811-2**
#6-32 x 1/4 in binding head	**811-161**
#6-32 x 1/4 in binding head	**811-7248**
#6-32 x 1/4 in pan head, brass	**11-1893**
#6-32 x 3/8 in binding head	**811-129**
#8-32 x 3/16 in binding head	**11-1618**
#8-32 x 1/4 in	**11-1369**
#8-32 x 1/4 in	**811-408-2**
#8-32 x 3/8 in binding head	**11-1766**
#8-32 x 3/8 in binding head	**11-6074-4**
#6-32 x 7/32 in binding head	**11-6085-2**

Toggle boot

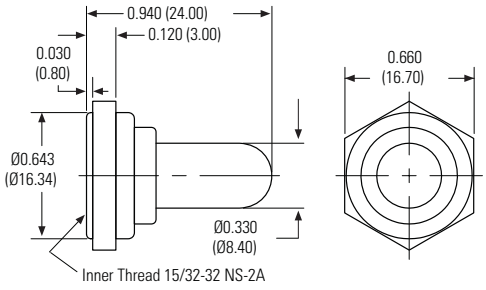
- Prevents moisture and contaminants from entering lever to bushing enclosure
- Front panel mounting
- Threaded mounting nut ensures proper assembly of silicon rubber boot
- Brass nut: 15/32-32 NS-2A
- Black color

SW1RY3030

Product selection

Mounting description	Color	Catalog number
Front panel mounting Molded in brass mounting nut (15/32-32 NS-2A) ensures proper assembly of silicon rubber boot	Black	**SW1RY3030**

Dimensions—15/32-32 NS-2A

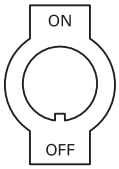
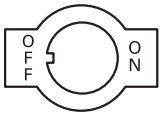
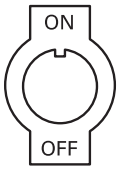
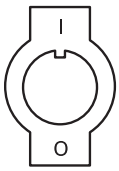


Note:

① Decorator facenuts for 15/32 in bushing switches, 15/32-32 thread.
② Hardware items are sold for use with Eaton switches only.

Indicating plates

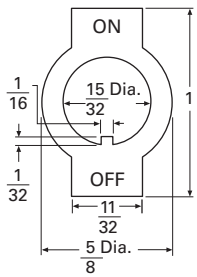
Product Selection—Indicating Plates for 15/32-Inch Bushing Mounted Switches

	Keyway location	Marking opposite keyway	Keyway side	Material	Finish	Catalog number
	Keyway on bottom	ON	OFF	0.032 in steel	Plain	**30-5632**
	Keyway on bottom	ON	OFF	0.032 in steel	Statuary bronze	**30-5632-3**
	Keyway on bottom	ON	OFF	0.032 in steel	Burnished nickel	**30-5632-4**
	Keyway on bottom	ON	OFF	0.032 in brass	Black cupric oxide ①	**30-2899-3**
	Keyway on bottom	RAD	PHO	0.032 in steel	Statuary bronze	**30-5632-7**
	Keyway on bottom	RAD	PHO	0.032 in steel	Burnished nickel	**30-5632-6**
	Keyway on bottom	RUN	START	0.032 in steel	Burnished nickel	**30-5632-11**
	Keyway on bottom	HOT	COLD	0.032 in steel	Burnished nickel	**30-5632-15**
	Keyway on bottom	HI	LOW	0.032 in steel	Burnished nickel	**30-5632-16**
	Keyway on bottom	ON	STOP	0.032 in steel	Burnished nickel	**30-5632-17**
	Keyway on bottom	FOR	REV	0.032 in steel	Burnished nickel	**30-2899-2**
	Keyway on bottom	AUTO	TEST	0.032 in steel	Burnished nickel	**30-2899-6**
	Keyway on bottom	PUSH	START	0.032 in steel	Burnished nickel	**30-2899-7**
	Keyway on bottom	RUN	TEST	0.032 in steel	Burnished nickel	**30-2899-9**
	Keyway on bottom	BLANK	BLANK	0.032 in steel	Burnished nickel	**30-5632-8**
	Keyway on side	ON	OFF	0.032 in steel	Burnished nickel	**30-5632-13**
	Keyway on side	OFF	ON	0.032 in steel	0.032 in steel	**30-2899-8**
	Keyway on top	T	B	0.032 in steel	Burnished nickel	**30-5632-12**
	Keyway on top	OFF	ON	0.032 in steel	Burnished nickel	**30-5632-14**
	Keyway on top	SET	RUN	0.032 in steel	Burnished nickel	**30-2899-10**
	Keyway on top	BLANK	RESET	0.032 in steel	Burnished nickel	**30-2899-12**
	Keyway on top	O	I	0.032 in steel	Burnished nickel	**30-5632-23**
	Keyway on top	I	O	0.032 in steel	Burnished nickel	**30-5632-19**

Dimensions

Approximate dimensions in inches

Indicating plate



Note:

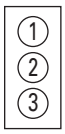
① White lettering.

Terminal identification

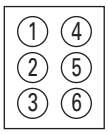
When specified on order, switches will have the terminals identified as shown in the illustration at right. Terminal markings will be ink-stamped on the side of the switch case and unused terminal positions will not be identified.

All views are rear of switch with keyway or at down as applicable. Terminal numbers 2, 2 and 5 and 5 and 8 are considered inboard terminals for single-, two- and four-pole switches respectively. All others are considered outboard.

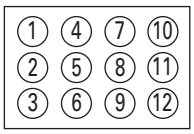
Single-pole



Two-pole



Four-pole

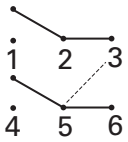
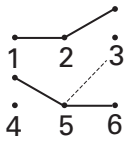
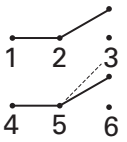


"Three independent" ON-ON-ON circuit diagram

For switch modified with "Three Independent" ON-ON-ON special circuit. External jumpers are required. User to connect wiring per instructions given below.

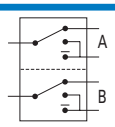
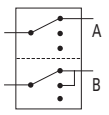
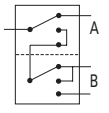
ON-ON-ON special circuit

Connection points	Single-Pole
Connect common to terminals	2
Connect circuit "A" to terminals	6
Connect circuit "B" to terminals	4
Connect circuit "C" to terminals	1

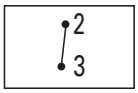
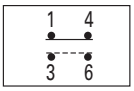
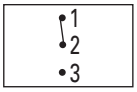
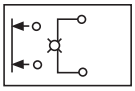
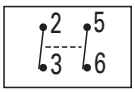
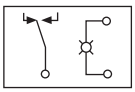
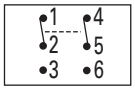
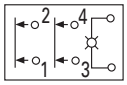
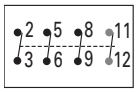
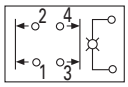
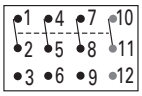
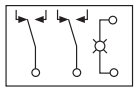
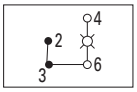
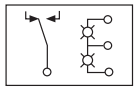
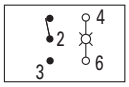
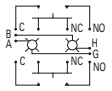
3 ON independent	No. of poles	Circuit with rocker in … UP Position	CENTER Position (Maintained)	DOWN Position (Keyway)
1 PDT	1	Circuit A	Circuit B	Circuit C
				

Circuit diagrams

Special general purpose toggle circuits

Circuit letter	Schematic
7530	
7571	
7555	

Toggle circuit diagrams

Circuit letter	Schematic	Circuit letter	Schematic
A 1PST		**I** 2 Circuit ⑤	
B 1PDT		**J** 1PST	
C 2PST		**K** 1PDT	
D 2PDT		**L** 2PST	
E 4PST ①		**M** 2PST	
F 4PDT ②		**N** ⑥ 2PDT	
G ③ 1PST		**P** 1PDT	
H ④ 1PDT		**Q** ⑦ 2 Circuit	

Legends

Toggle switch legend

Legend	Rocker switch type
●	Contact terminal—will make contact with switch lever
○	Isolated terminal—does not make contact with lever
↘●	Center terminal and switch lever
☼	Bulb
→←	Momentary contact
●	Denotes mechanical contact portion

Note:

① Poles 11 and 12 may be eliminated for three-pole devices.
② Poles 10, 11 and 12 may be eliminated for three-pole devices.
③ Dependent lamp.
④ Independent lamp.
⑤ Two circuit—indicates a special type of double-throw switch in which the two circuits being controlled may be independent of each other.
⑥ For 206 Series, an additional lamp is available.
⑦ Available in 1PDT or 2PDT.

Paddle and slide controls

Dimmers and wipers

Product description

Eaton's unique family of dimmer and wiper controls are field proven to be the market's most dependable controls. Although originally designed for the heavy truck market, applications in various other types of vehicles exist. Paddle and slide versions are available and both have the look, feel and durability associated with our controls. Bezels and actuators are molded in a soft matte finish. Illuminated and non-illuminated versions are available. Board-mounted LEDs located behind a laseretched panel provide illumination. Customized light panel lettering and custom pad printed bezels are also available. Both dimmer and wiper controls are designed to complement the NGR family of switches.

Catalog number selection

How to order—paddle and slide controls

To determine complete catalog number, start with the appropriate control type and add the appropriate code letters and/or numbers.

D P 24 5 C A D G

Control type
D: Dimmer
W: Wiper

Actuator type
P: Paddle
S: Slide

Application voltage
12: 12V
24: 24V

Amperage rating and voltage ①
3: 3A, 24V
4: 4A, 12V
5: 5A, 24V
6: 6A, 12V
8: 8A, 12V
10: 10A, 12V
W: Wiper

Bezel print style
A: Style A
B: Style B
C: Style C
D: Style D

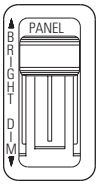
Connector type Packard no.
A: 12020398
B: 12015345
C: 174930-1
D: 12034295
E: Leads only

Connector and leads only detail
Dimmer connector
Dimmer and wiper connector
Dimmer connector
Wiper connector
Dimmer only

Circuit board ②
D: Dimmer
L: 18 sec. 3
S: 10 sec. 3

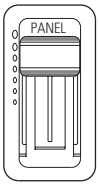
LED color
G: Green
Y: Yellow
R: Red
X: Nonilluminated

Bezel Print Style ④

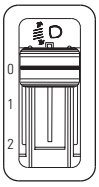


Code A

Code B



Code C



Code D

Note:

① Amperage ratings for dimmers only.
② Maximum dwell time describes the average time constant for delayed wiper activation.
③ Maximum nominal dwell.
④ Custom pad print available for bezel or button.

Technical data and specifications

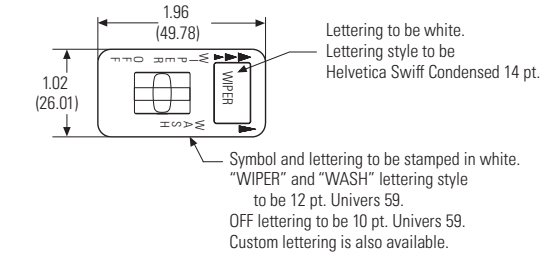
Paddle and slide controls

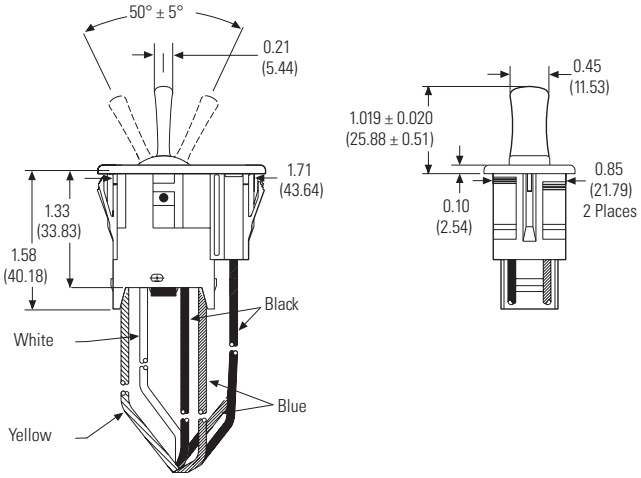
Description	Specification
Ratings (dimmer only)	4, 6, 8, 10A at 14 Vdc 3, 5A at 28 Vdc
Mechanical life	100,000 operations, maximum
Operating temperature range	–40° to 185°F (–40° to 85°C)
Base material	High-grade thermoplastic molding material
Mounting means	Snap-in mounting with plastic bezel
Mounting hole	Rectangular panel cutout: 1.734 x 0.867 in (44.00 x 22.00 mm)
Panel thickness Paddle	 0.030 to 0.190 in (0.762 x 4.80 mm)
Slide	0.030 to 0.080 in (0.762 x 2.03 mm)
Approximate weight	1.5 oz

Dimensions

Approximate dimensions in inches (mm)

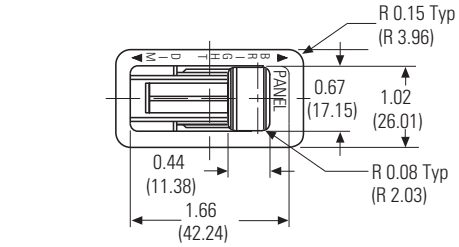
Paddle control

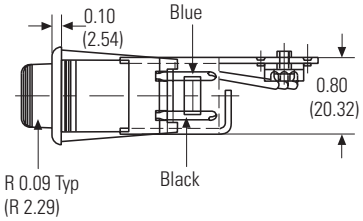


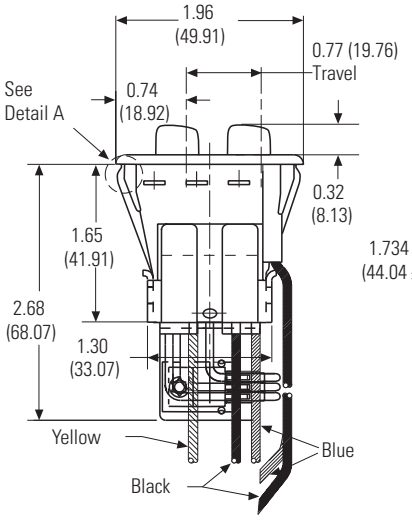


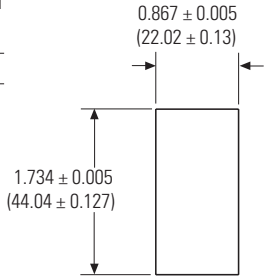
Terminal Identification:
Positive (+) (blue wire)
Negative (–) (black wire)
Load (yellow wire)
Positive (+) LED light (blue wire)
Washer (white wire) washer only
Negative (–) LED light (black wire)

Slide control

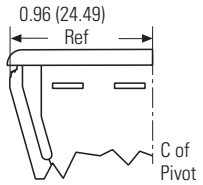








Panel Opening



Detail A
Typ 2 Plcs

Terminal Identification:
Positive (+) (blue wire)
Negative (–) (black wire)
Load (yellow wire)
Positive (+) LED light (blue wire)
Open position
Negative (–) LED light (black wire)

Rotary wiper

Product description

The rotary wiper has been designed to be a highly durable rotary wiper control for the transportation industry. The RW200 series wiper has four wiper control positions via a rotating knob: Off, Intermittent, Continuous Low Speed and Continuous High Speed. The device has a washer function that operates the washer pump and wiper while the knob is depressed.

Features

- Load Dump Protection
  - The switch will withstand a 120V load dump per SAE J1455
- Reverse Voltage Protection
  - The device will not be damaged when exposed to 12 Vdc for 5 minutes

Options

- Variable bushing length
- Variable spindle length
- Choice of connectors
- Pad printing on knob

Standards and certifications

Meets SAE standards J1455, J1944 and J1988.

Product selection

To determine complete catalog number, start with the appropriate control type and add the appropriate code letters and/or numbers.

Rotary wiper code numbers and letters

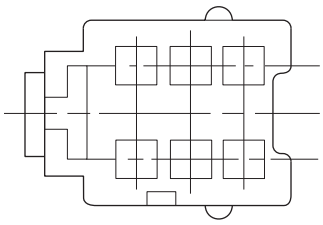
Series	Code	Voltage	Code	Packard connectors	Code	Bushing length in inches (mm)	Code	Catalog number
RW	**RW**	12 Vdc	**200**	12064752	**12A**	0.261 (6.63)	**A**	**RW20012AA**
RW	**RW**	12 Vdc	**200**	12064752	**12A**	0.424 (10.77)	**B**	**RW20012AB**
RW	**RW**	12 Vdc	**200**	12977042	**12B**	0.261 (6.63)	**A**	**RW20012BA**
RW	**RW**	12 Vdc	**200**	12977042	**12B**	0.424 (10.77)	**B**	**RW20012BB**
RW	**RW**	12 Vdc	**200**	6288538	**12C**	0.261 (6.63)	**A**	**RW20012CA**
RW	**RW**	12 Vdc	**200**	6288538	**12C**	0.424 (10.77)	**B**	**RW20012CB**
RW	**RW**	12 Vdc	**200**	6294544 and 2977048	**12D**	0.261 (6.63)	**A**	**RW20012DA**
RW	**RW**	12 Vdc	**200**	6294544 and 2977048	**12D**	0.424 (10.77)	**B**	**RW20012DB**

Technical data and specifications

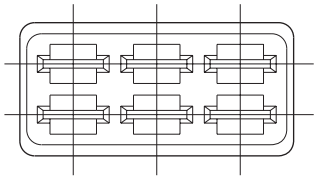
Rotary wipers

Description	Specification
Operating voltage range	9 Vdc to 16 Vdc
Continuous load rating	17A from –40° to 73°F (–40° to 23°C) Derated to 5A at 185°F (85°C)
Wiper electromechanical life	50,000 cycles
Electrical cycle life	250,000 cycles in the Intermittent position 300,000 cycles combined in the Low and High positions
Operating temperature	–40° to 185°F (–40° to 85°C)
Humidity rating	Device will operate properly at 98% humidity between –40° and 100°F (–40° and 38°C)
Mechanical shock	The switch will withstand a 3 ft drop on concrete
Vibration	The device will operate properly while being exposed to 133 hours of 1G rms vibration along all three axes, sweeping from 5 Hz to 1500 Hz at one octave per minute

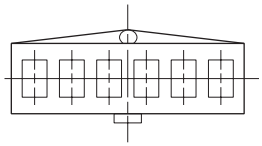
Connector drawings



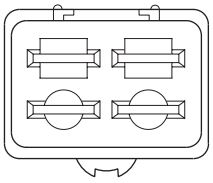
12064752



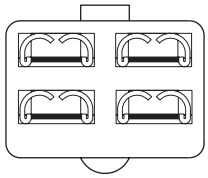
12977042



6288538



6294544



2977048

Circuit continuity

Switch position	Circuit continuity
Off	Open
Intermittent	Yellow—Red and brown
Low speed	Yellow
High speed	White
Washer	Brown
Washer	Red—Positive
Washer	Black—Negative

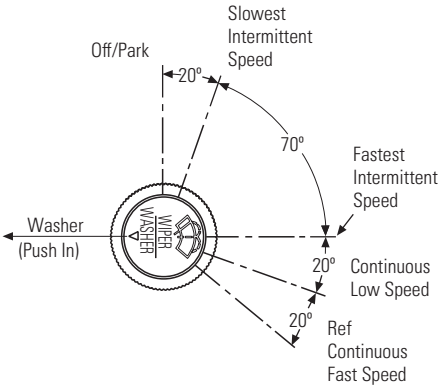
Wire terminations

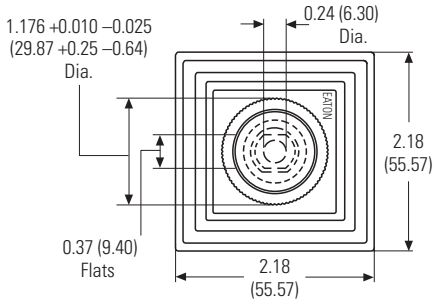
Wire color	Switch connections
Yellow	Motor low speed terminal
White	Motor high speed terminal
Blue	Motor park terminal
Black	Ground
Brown	Washer pump
Red	+12 Vdc (positive)

Dimensions

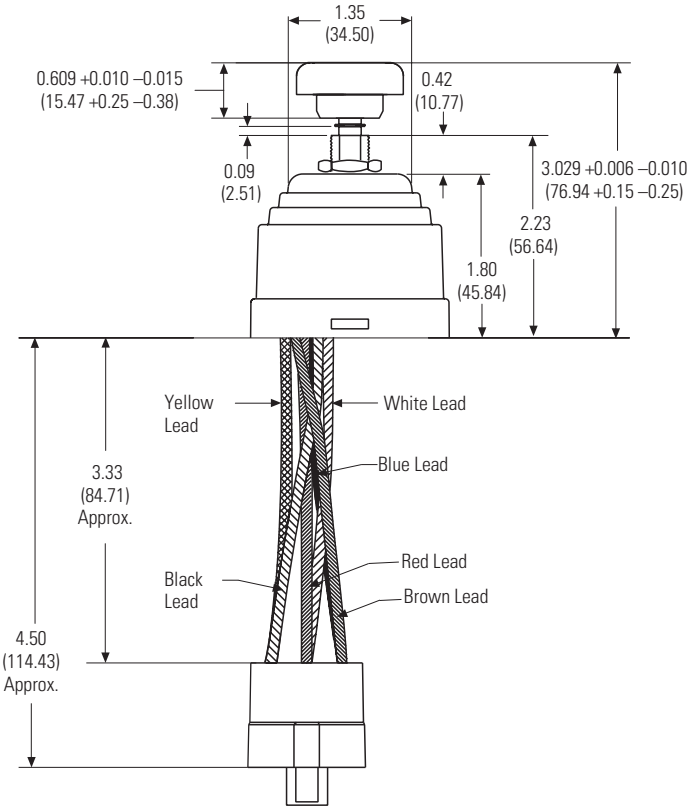
Approximate dimensions in inches (mm)

RW200 Series





View B



AC Rated

Pushbuttons

Product description

These general-purpose, AC rated, pushbutton switches offer a wide variety of configurations, button styles and termination types. The 7835 and 7836 light-duty series pushbutton switches are AC only. They feature slow-make/slow-break butttype contacts with a light operating pressure that is particularly suited to instrumentation applications.

Features

- Circuits
  - 1PST, 1PDT, 2PDT
  - Momentary action
- Terminal types
  - Screw terminals, brass (furnished unassembled)
  - 8448 Series – #6-32 x 3/16 in binding head screws **(Cat. No. 811-2)**
  - 8410/8411 Series – #5-40 x 3/16 in **(Cat. No. 811-7206)**
  - 8406/8440 Series – #5-40 x 5/32 in screws **(Cat. No. 11-26)**
- Solder lug, brass silverplated
- Hardware supplied
  - One hexagon locknut **(Cat. No. 15-192)** and one bright nickel-plated knurled facenut **(Cat. No. 15-124F1)**
  - 8411/8418 Series has a bright nickel-plated hexagon facenut **(Cat. No. 15-966-2)**
  - All hardware is furnished unassembled
  - Other mounting types are flush, nest and snap-in

Standards and certifications ①

- UL® Recognized
- CSA® Certified
- RoHS

Product selection

Non-Illuminated

Light-Duty, Momentary contact

Flush

Flush mounted

Rating	Poles and throw	Contacts	Circuit number [1]	Button construction	Color	Button extension dimensions "B" in inches (mm)	Typical max. operating force	Mounting or bushing length dimensions "A" in inches (mm)	Catalog number
Screw terminals									
1/4A, 250 Vac/Vdc	1PST	NC	A	Nylon	Black	0.468 (11.89)	0.7 lbs [2]	Flush	**8406K1**
3/4A, 125 Vac/Vdc						0.453 (11.50)	0.7 lbs [2]	Flush	**8410K1**

Snap-in

Snap-in mounted

Rating	Poles and throw	Contacts	Circuit number [1]	Button construction	Color	Button extension dimensions "B" in inches (mm)	Typical max. operating force	Mounting or bushing length dimensions "A" in Inches (mm)	Catalog number
Spade Terminals (0.250 in)									
3/4A, 125 Vac/Vdc	1PST	NC	A	Nylon	White	0.375 (9.53)	—	Snap-in	**8423K1** [3]
1/4A, 250 Vac/Vdc		NO	A	Nylon	White	0.375 (9.53)	—	Snap-in	**8424K1** [3]

Snap-in

Bushing mounted

Rating	Poles and throw	Contacts	Circuit number [1]	Button construction	Color	Button extension dimensions "B" in Inches (mm)	Typical max. operating force	Mounting or Bushing Length Dimensions "A" in Inches (mm)	Catalog number
Solder lugs									
3/4A, 125 Vac/Vdc 1/4A, 250 Vac/Vdc	1PST	NC	A	Nylon	Black	0.250 (6.35)	1.5 lbs [3]	0.250 (6.35)	**8411K5**
3/4A, 125 Vac/Vdc 1/4A, 250 Vac/Vdc	1PST	NC	A	Nylon	Black	0.406 (10.31)	1.5 lbs [3]	0.468 (11.89)	**8411K8**
5A, 12 Vdc, 3A, 125 Vac [2]	1PST	NO	A	Metal	—	0.296 (7.52)	2.5 lbs	0.468 (11.89)	**8440K2** [6]
3A, 125 Vac 1A, 250 Vac 1/10 hp, 125 Vac			A	Metal	—	0.312 (7.92)	—	0.562 (14.27)	**7835K11A** [6]
	1PST	NC	A	Nylon (snap-on)	Black	—	—	0.562 (14.27)	**7835K11C**
	1PST	NC	A	Nylon (snap-on)	Red	—	—	0.562 (14.27)	**7835K11D**
3A, 125 Vac 1A, 250 Vac 1/10 hp, 125 Vac	1PST	NO	A	Metal	—	0.312 (7.92)	—	0.562 (14.27)	**7836K11A** [6]
	1PST	NO	A	Nylon (snap-on)	Black	—	—	0.562 (14.27)	**7836K11C** [6]
	1PST	NO	A	Nylon (snap-on)	Red	—	—	0.562 (14.27)	**7836K11D** [6]
Screw terminals									
3/4A, 125 Vac/Vdc 1/4A, 250 Vac/Vdc	1PST	NC	A	Nylon	Black	0.406 (10.31)	1.5 lbs [3]	0.468 (11.89)	**8411K7**
	1PST	NO		Nylon	Black	0.375 (9.53)	1.5 lbs [3]	0.468 (11.89)	**8411K12**
5A, 12 Vdc, 3A, 125 Vac [2]	1PST	NO	A	Metal	—	0.296 (7.52)	2.5 lbs	0.468 (11.89)	**8440K3** [6]
3A, 125 Vac, 1A, 250 Vac 1/10 hp, 125 Vac	1PST	NO	A	Metal	—	0.312 (7.92)	—	0.562 (14.27)	**7836K13A**
Wire leads [2]									
3/4A, 125 Vac 1A, 250 Vac 1/10 hp, 125 Vac	1PST	NC	A	Metal	—	0.312 (7.92)	—	0.562 (14.27)	**7835K12A**
	1PST	NO	A	Metal	—	0.312 (7.92)	—	0.562 (14.27)	**7836K12A**
Spade terminals (0.250 in)									
1/4A, 250 Vac/Vdc 3/4A, 125 Vac/Vdc	1PST	NO	A	Nylon	Red	0.250 (6.35)	1.5 lbs [3]	0.250 (6.35)	**8411K13** [6]
	1PST	NC	A	Nylon	Black	0.406 (10.31)	1.5 lbs [3]	0.468 (11.89)	**8411K10**
	1PST	NO	A	Nylon	Black	0.375 (9.53)	1.5 lbs [3]	0.468 (11.89)	**8411K11** [6]
3A, 125 Vac	1PST	NC	A	Nylon	Black	0.250 (6.35)	1.5 lbs	0.250 (6.35)	**8418K1** [6]
	1PST	NO	A	Nylon	Black	0.406 (10.31)	1.5 lbs	0.468 (11.89)	**8418K12** [6]

Note:

(1) For circuit number detail, see table on **Page 228**.
(2) UL and CSA Listing not applicable.
(3) To change operating pressure, refer to your local Eaton Sales Representative.
(4) Operating pressure cannot be changed.
(5) Combination spade and solder lug terminal.
(6) Items are normally in distributor stock.
(7) Standard length is 6 in (152.40 mm), stripped 0.625 in (15.88 mm).

Non-Illuminated

Medium-Duty, Momentary contact

One-Hole

One-Hole mounted

Rating	Poles and throw	Contacts	Circuit number [1]	Button construction	Color	Button extension dimensions "B" in inches (mm)	Typical max. operating force	Mounting or bushing length dimensions "A" in inches (mm)	Catalog number
Screw terminals									
15A, 125 Vac 10A, 250 Vac 1/3 hp, 125–250 Vac	1PST	NO	A	Metal	—	0.531 (13.49)	0.9 lbs	0.687 (17.45)	**8444K3**
	1PST	NO	A	Metal	—	0.250 (6.35)	0.9 lbs	0.343 (8.71)	**8444K4**
15A, 125 Vac, NO 10A, 125 Vac, NC 10A, 250 Vac, NO 5A, 250 Vac, NC 1/2 hp, 250 Vac 1/4 hp, 125 Vac	1PDT	NO, NC	B	Metal	—	0.531 (13.49)	2.0 lbs	0.687 (17.45)	**8434K2**
	1PDT	NO, NC	B	Bakelite	Black	0.531 (13.49)	2.0 lbs	0.687 (17.45)	**8435K2**
15A, 125 Vac 10A, 250 Vac	2PST	NO	C	Metal	—	0.250 (6.35)	—	0.343 (8.71)	**8448K2** [2]
Spade terminals (0.250 in)									
15A, 125 Vac 10A, 250 Vac 1/3 hp, 125–250 Vac	1PST	NO	A	Metal	—	0.531 (13.49)	0.9 lbs	0.687 (17.45)	**8444K2**
15A, 125 Vac, NO 10A, 125 Vac, NC 10A, 250 Vac, NO 5A, 250 Vac, NC 1/2 hp, 250 Vac 1/4 hp, 125 Vac	1PDT	NO, NC	B	Metal	—	0.531 (13.49)	2.0 lbs	0.687 (17.45)	**8434K1**
	1PDT	NO, NC	B	Bakelite	Black	0.531 (13.49)	2.0 lbs	0.687 (17.45)	**8435K1**
15A, 125 Vac, 10A, 250 Vac	2PST	NO	C	Metal	—	0.250 (6.35)	—	0.343 (8.71)	**8448K1** [2]

Technical data and specifications

AC rated

Description	Specification
Ratings	See Product Selection tables on **Page 237** and the table above.
Contact material 3–6A rated	 Movable, silver-plated copper Stationary, silver-plated copper
10–15A rated	Movable, silver-plated copper with fine or coin silver contact face button Stationary, copper with fine or coin silver contact face button
Wire leads	18 gauge, 6 in (152 mm) long, skinned 0.75 in (19 mm), Lengths beyond 6 in (152 mm) are additional charge
Mounting means—One-hole mount	Threaded bushing—0.468 in dia. 32 threads/inch (11.90 mm) Keyway—0.068 W x 0.035 D in (1.73 W x 0.89 D mm); provides anti-rotation feature Keyway on 7835/7836 Series is 0.080 W x 0.040 D in (2.03 W x 1.01 D mm)
Operating temperature range	0° to 150°F (–17.8° to 65.6°C)

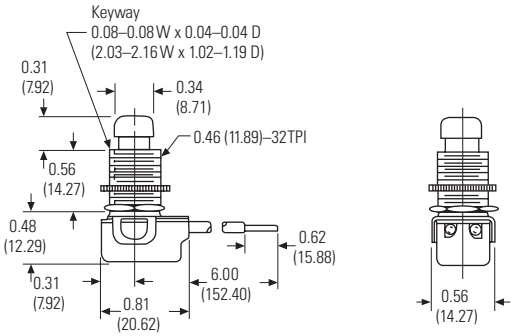
Note:

① For circuit number detail, see table on **Page 228**.
② UL and CSA Listing not applicable.

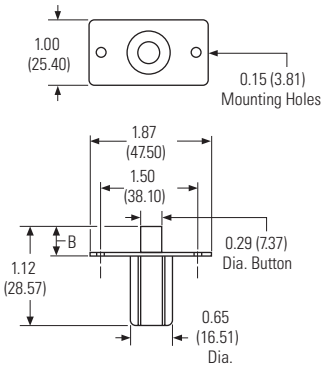
Dimensions

Approximate dimensions in inches (mm)

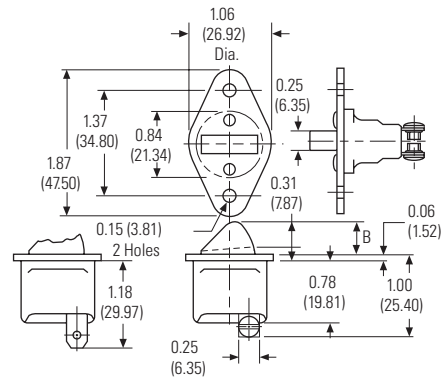
7835K12A



8410

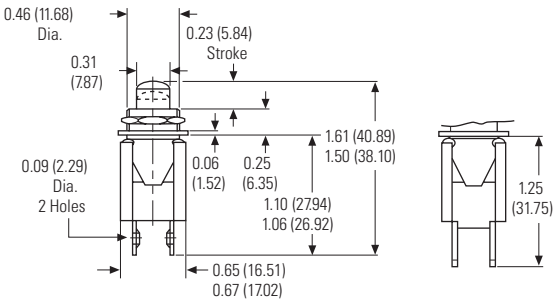


8406

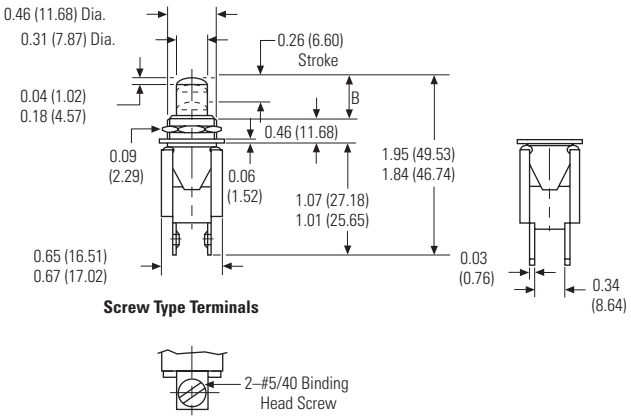


Spade Terminal **Screw Type Terminal**

8411K5 and 8411K13

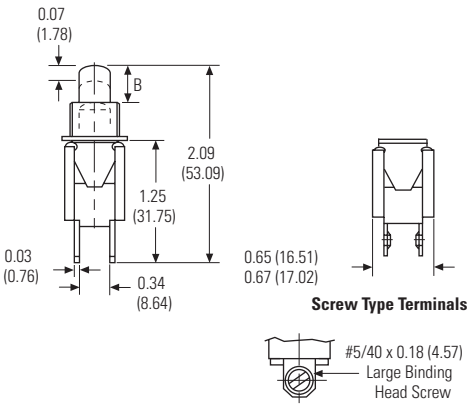


8411K7 and 8411K8



Screw Type Terminals

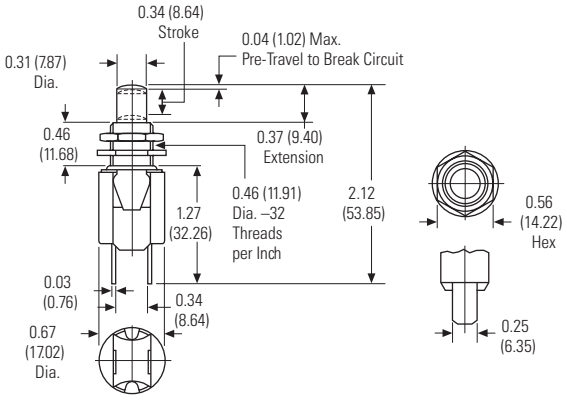
8411K11 and 8411K12



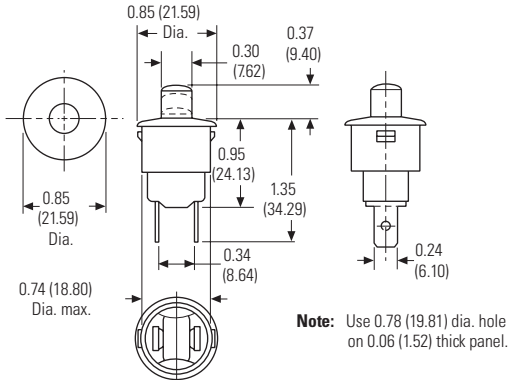
Screw Type Terminals

Approximate dimensions in inches (mm)

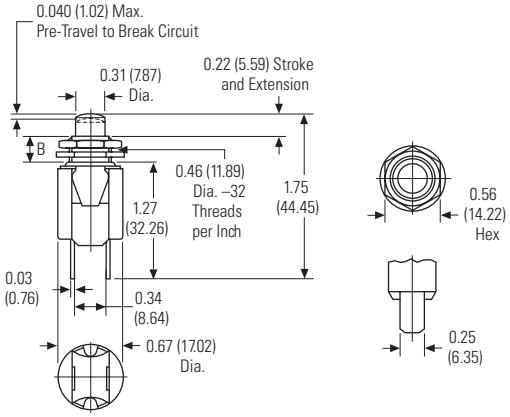
8411K10 and 8418K12



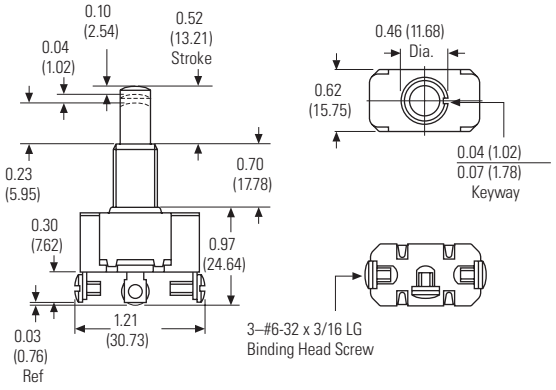
8423 and 8424



8418K1

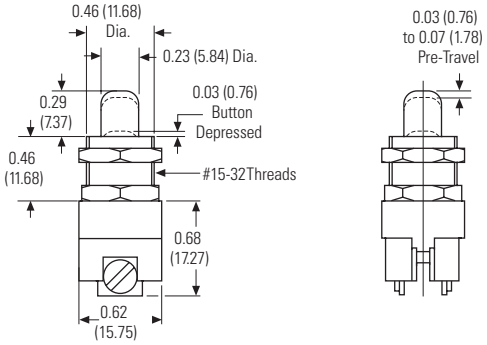


8434K2 and 8435K2

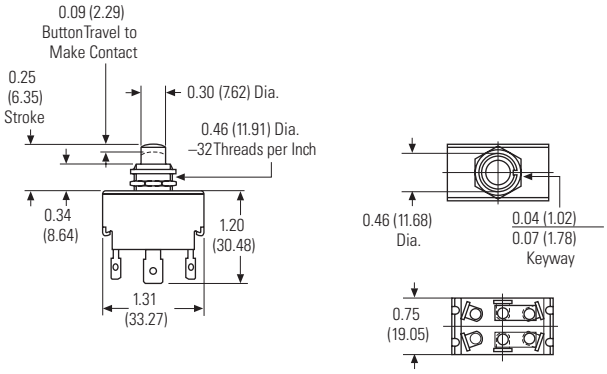


Approximate dimensions in inches (mm)

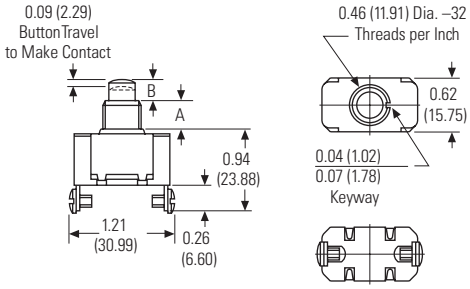
8440



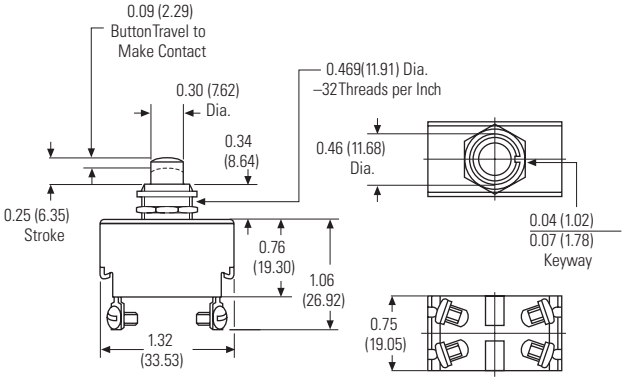
8448K1



8442 and 8444 (Screw Terminals)



8448K2



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