RELAYS

MARKET AND CUSTOM SOLUTIONS FOR VEHICLE POWER RELAYS

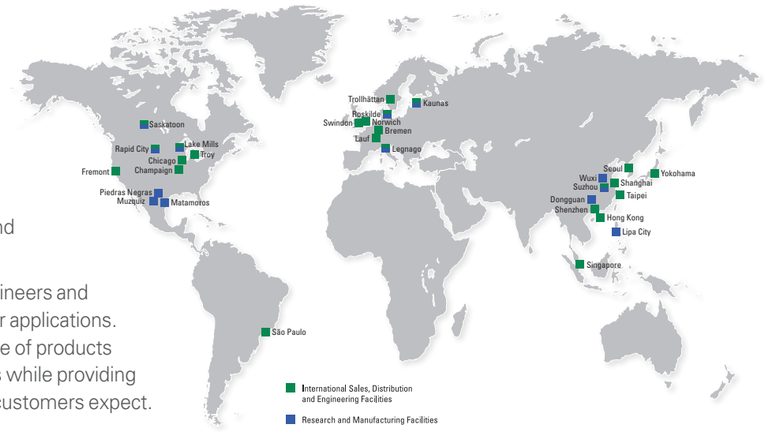
Littelfuse®

Expertise Applied | Answers Delivered

Local Resources for a **GLOBAL** Market

Littelfuse products help protect, control and distribute vehicle electrical power in OEM and aftermarket applications for industries such as heavy-duty truck, construction and agriculture. We offer a broad and reliable selection of fuses, fuse blocks, power distribution modules, high-current switches, relays and solenoids to fit your requirements.

For decades, we have helped OEMs, engineers and end-users select the right product for their applications. Today, Littelfuse offers the broadest range of products for protection, sensing, and control needs while providing exceptional service and support that our customers expect.



Over 90 Years of Electrical Power Expertise

1927 — **Founded** Littelfuse

1955 — **Technology**: High-Current 2484 Switches

1986 — **Technology**: MINI® Fuses

2006 — **Technology**: Next Generation High-Current Switch

2009 — **Technology**: High Current FLEC PDM

2010 — **Acquisition**: TERRA POWER SYSTEMS

2013 — **Technology**: Integrated CAN/LIN Power Control Center

2014 — **Acquisition**: Cole Hersee

2015 — **Technology**: Power Conversion Liftgate Battery Charger

2016 — **Acquisition**: menber's

Our Market Focus **INDUSTRIES** and Applications

Truck & Bus

- On-Highway
- Severe Duty
- Transit Buses
- Vocational

Construction

- Loaders
- Skid Steers
- Excavators
- Cranes

Agriculture

- Tractors
- Harvesters
- Lawn Turf
- Loaders

Material Handling

- Fork Lifts
- Telehandlers
- Aerial Work Platform
- Pallet Jacks

Municipality

- Emergency
- Waste Trucks
- Fire & Rescue
- Utility

Marine & Recreational

- Boats & Marine
- Golf Carts
- Recreation Vehicles
- ATV & Snowmobiles

Why Choose Littelfuse

Littelfuse is the global leader in circuit protection solutions with the broadest spectrum of electrical power technologies. Our Commercial Vehicle Products portfolio provides a total solution to protect, control and distribute vehicle electrical power.

Single Source for Vehicle Electrical Products

Littelfuse offers an extensive commercial vehicle product line and if an off-the-shelf product does not fit your needs we can work with you to develop a customized solution that fits your application.

Product Development and Testing Expertise

Our global team of engineers design innovative solutions, provide customer support and perform product testing to ensure you have the best solution that meets all requirements and regulations.

Global Support Team

Littelfuse has a world-wide team of specialist prepared to support your application needs from conceptual development to continuous quality assurance for the lifetime of your program.

Littelfuse.com/Relays

Selecting a Relay

The important criteria you need to know when selecting a relay product for your application.

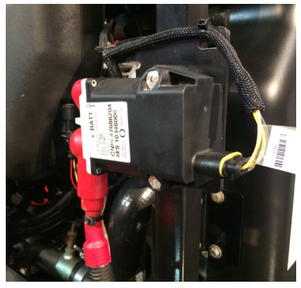
Why Should You Use a Relay?

The main job of a relay is to enable remote switching within an electrical system. A relay allows switching of a high current circuit by a low current signal.

This allows the relay to be placed close to the power source, or load to be switched, so that expensive high current cabling is minimized, while still giving easy access to the operator to turn the relay on or off.

Application Considerations

What is your application? Knowing your application will be key to selecting the right solution.



Load Type

Is it going to be switching a load on and off frequently so it needs high switching cycle life? Or will it be used to turn on a load and keep it on for a long time, and it needs to be very efficient with minimal losses?
It is important to understand how the relay will be used.

Load Ratings Requirements

What is the application voltage? What are the continuous and peak currents?
What kind and size of wire will be used to connect the power terminals?
Understanding your application electrical load requirements will help with your relay selection

Mounting Locations

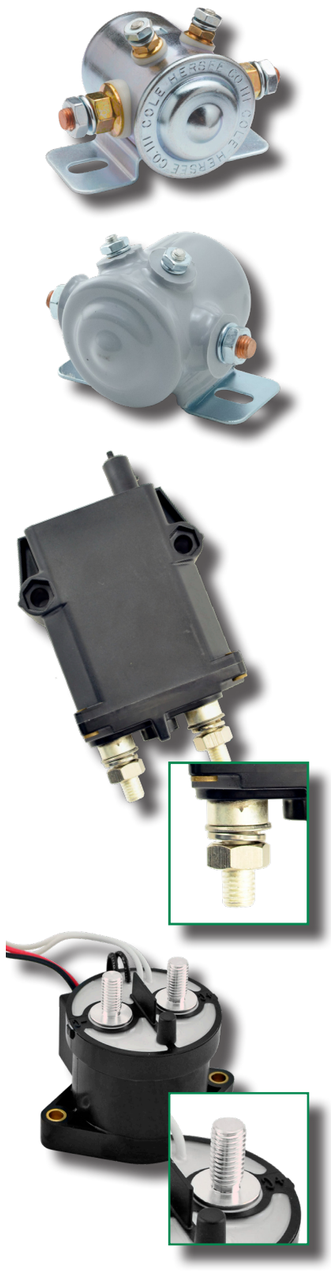
Where will the unit be mounted? Will it be protected in an enclosure like a charging station or 5G base station or exposed to the elements in an engine bay or on a frame rail?
Identifying the required mounting location is important as it will affect the selection of the relay for maximum life.

Circuit Protection

Do I need to consider circuit protection with the relay? How will I integrate them so I have an efficient installation?
Protecting a relay's main power wires that run to secondary power distribution is a frequently overlooked aspect of high current relay applications.

Electrical Considerations

It is important to understand the specific application electrical requirements before selecting the most appropriate relay. Electrical considerations like voltage, amperage, coil type, high current terminals, smart connectivity, and others help drive relay selection to best match the application



Voltage

The voltage of a relay has two separate voltage ratings. One rating for the coil and one rating for the main contacts. In many cases, they are the same but also can be very different. In High Voltage relays, they tend to be very different, with relay contacts rated at 1000V to handle the high voltage required whilst being operated by coils of 12V-96V.

Amperage

There are several different current ratings that need to be considered when picking a relay.

Continuous Carry Current - The current that the relay can carry essentially forever without the temperature rising above a set value.

Inrush Current or Starting Current - A short duration current value that is the maximum the switch can withstand without raising the temperature over that same value (10-60 secs). Examples include starting event, incandescent light in-rush, Inductive load start up, etc. It is very important to match the in-rush current rating of the relay to the application, especially in applications with inductive or capacitive loads.

Coil Types:

Monostable relays (also sometimes referred to as normally open) turn on when the coil is ON and turn OFF when the coil is OFF. They have one position (usually OFF) that they return to when the coil is turned OFF. This type of relay is usually designed to control a specific load that is turned ON and OFF as needed in the vehicle.

Bi-stable (or latching relays) are relays that are designed to stay in either the ON or OFF positions with no power applied. Once they receive an activation signal to change state from OFF to ON (or ON to OFF) they do not consume any power.

Coil Terminals

These smaller terminals connect the solenoid coil of the relay to the control input. In sealed relays, frequently these are in a sealed connector.

High Current Terminals

In high current relays, the most common style of main terminals are studs or screws. These usually range from M6 to M12, with the size usually corresponding to the relay rating (larger studs for larger currents). Tin or Silver plated terminals help prevent bad contact by limiting corrosion. It is beneficial to always try to use stainless steel hardware as this eliminates the issue of galvanic corrosion

Smart Connectivity

Relays can incorporate many smart features to control the switching. Examples include delay timers, voltage sensors, or bussed connection via CAN or LIN communications.

Application Environment Considerations

It is important to match the environmental requirements to the application. Where is the relay to be mounted on the vehicle? Will it be in the battery box, under the hood, in the cab or out placed on the frame rail? Each has their own unique challenges.

Ingress Protection (IP)

Rating that describes the level of liquids and solids protection the switch has. Generally, the higher the number in either digit that follows the IP, the better the ingress protection. Ingress of contaminants can lead to corrosion. Road salt corrosion is becoming an increasingly common problem. In the event corrosion leads to a short-circuit resulting in a fire, a battery switch can be activated to prevent further damage to the vehicle or injury to occupants. On an unattended vehicle, chaffed or damaged wires can short-circuit causing a thermal event that can destroy the equipment, vehicles around it, or the building where it is parked.

Shock & Vibration

Relay specifications are often tied to international agency standards such as SAE or ISO. This ensures that the relay was tested to specifications that are appropriate for use on a vehicle. Industrial relays, even ones with good quality, are not designed for use on vehicles.

Temperature

Different locations on the vehicle will put different thermal loading on the relay. Most automotive relays are rated from -40°C to 85°C for operation and some go as high as 125°C. Picking a relay that has appropriate temperature ratings for your application is very important.

SOLID STATE (SSR) vs. ELECTROMECHANICAL (EM) Relays

Solid state relays very different than electromechanical relays as there is no mechanical make or break of the electrical flow to create an arc. SSRs control the flow of electricity by enabling or disabling electron flow through the semi-conductor. This means that an SSR does not arc when opening or closing the circuit. However, most SSRs are monodirectional devices so they cannot control current in the reverse direction. SSRs are also typically are more expensive than similarly rated electromechanical relays.

KEY TERMS AND DEFINITIONS

Amp/Amperage – The strength of an electric current in Amperes (the basic unit of electrical current in the International System of Units).

Bi-Stable – The relay contacts remain in their present switch position when the excitation current is switched off.

Busbar – In electric power distribution, a busbar (also bus bar) is a metallic strip or bar, typically housed inside switchgear, panel boards, and busway enclosures for local power distribution.

Circuit – The path over which an electrical charge flows.

Connectorized – Products that have an existing, integrally molded, female or male market available connector.

Continuous Rating – The rating meant to indicate what the device can handle forever with no interruption. It is usually measured as the amperage that a device can handle for one hour without exceeding the maximum allowed temperature rise at the terminals.

Harsh Environments – Shock or vibration ratings in addition to IP or Ingress Protection ratings a product can be rated to.

High Current – Nominal current range above 60A, 32 VDC

Inrush Rating – The short duration rating of the switch. This rating is meant to reflect the ability of the switch to withstand a short term, high current event like starting. A large diesel engine starting in cold weather can draw close to 2000A for about 30 seconds.

IP Rating – IP Rating - Formally known as an International Protection rating, but often referred to as Ingress Protection, this rating determines the resistance of a device to environmental contaminants

Low Current – Nominal current range below 60A, 32 VDC

Mechanically Latched – When a relays uses a locking mechanisms to hold contacts in the last position until they receive electrical stimuli to change.

Magnetically Latched – When a relay requires one pulse of coil power to move contacts into one state, and then requires another pulse that is redirected to move the contacts back to the other state. The magnet will be held in the closed position by the permanent magenet until the second pulse.

PCBA – (Printed Circuit Board Assembly) is the board obtained after all printing solder paste on the PCB and then mounting various components like resistors, ICs (Integrated Circuits), capacitors and any other components like transformers depending on the application and desired characteristics of the board.

Short Circuit – An abnormal low resistance path between two polarities, or polar opposite, circuits. It can be accompanied by overheating, an explosion, or fire. A short-circuit is also likely to cause damage to components or equipment in that circuit.

Terminals – A reusable interface creating a point where external circuits can be connected. Terminals can be connected at the end of a wire and consist of either connectors or fasteners.

Common Applications

AGRICULTURE

- Tractors
- Harvestors

CONSTRUCTION

- Excavators
- Loaders

MATERIAL HANDLING

- Fork Lifts
- Telehandlers
- Pallet Jacks

Heavy Duty Time Delay Bi- Stable Relay

Products Designed for Your Industry Leading Equipment

DC

High Current Performance

250A continuous current rating, 2000A for 5 sec. intermittent rating, 12V/24V so there is no need to stock two relays.

Sealed Relay

IP67/IP69K waterproof sealed.

Bi-Stable Relay

Bi-stable relay has two states, mechanically latches in the ON or OFF state, Monostable relay does not latch rather reverts back to initial state, Beneficial in battery disconnect applications as consumes no power in ON or OFF states and less waste heat vs monostable.

Reliability and Safety

Disconnects battery from the vehicle electrical system, Prevents battery drain, Prevents thermal events in accidents.

Programmable Time Delay

User programmable time delay cut off from 1 second to 1 hour via toggle switch and LED blinking. Benefits: Selective Catalytic Reduction (SCR) is common in heavy duty diesel engine vehicles (emissions control technology system that injects a Diesel Exhaust Fluid (DEF) which helps reduce emissions, Programmable Time Delay allows the DEF to get pumped out of the engine (exhaust manifold) area, back into a tank to prevent corrosion before the relay disconnects main power from the battery, Allows any remote control devices to be charged, Lets vehicle electronic units store data and make after-run procedures.

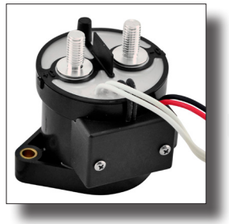
Remote Control

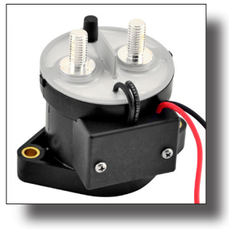
Remote operation via built-in TE Superseal 1.5 Series 4-pin connector, Thermally protected to prevent overheating of the coil.

DCNEV250 Series High Voltage DC Contactor Relays

Highly Reliable System with Stable Contact Resistance in Harsh Environments

High current and high voltage DC contactor relays for electric vehicle applications such as battery isolation, DC power control, circuit protection, and other switch controls. DC Contactors can also be used in charging stations, uninterruptible power supplies, and other electronic control systems. Contactors are available with polarized and non-polarized contacts to best suit the electrical systems application.





Available Coil Voltage Ratings:
12-24V DC Nominal, 9-36V DC Working
72V DC Nominal, 48-95V DC Working
48-72V DC Nominal, 32-95V DC Working

Available Auxiliary Circuit:
A True Position Indication

High Continuous Current Capacity 250A

Utilizing a magnetic arc blowout design in combination with an inert gas filled contact chamber allows making/ breaking at higher voltages

PART NUMBERS BULK	DESCRIPTION	PART NUMBERS BULK	DESCRIPTION
DCNEV250-M	High Voltage DC Contactor Relay Bottom Mount with Polar Load Terminals	DCNEV250-FAN	High Voltage DC Contactor Relay Bottom Mount with Auxiliary Circuit & Non-Polar Load Terminals
DCNEV250-MN	High Voltage DC Contactor Relay Bottom Mount with Non-Polar Load Terminals	DCNEV250-FB	High Voltage DC Contactor Relay Bottom Mount with Auxiliary Circuit with Polar Load Terminals
DCNEV250-MA	High Voltage DC Contactor Relay Bottom Mount with Auxiliary Circuit with Polar Load Terminals	DCNEV250-FN	High Voltage DC Contactor Relay Bottom Mount with Non-Polar Load Terminals
DCNEV250-MAN	High Voltage DC Contactor Relay Bottom Mount with Auxiliary Circuit & Non-Polar Load Terminals	DCNEV250-G	High Voltage DC Contactor Relay Bottom Mount with Polar Load Terminals
DCNEV250-MP	High Voltage DC Contactor Relay Bottom Mount with Potted PCB with Polar Load Terminals	DCNEV250-GA	High Voltage DC Contactor Relay Bottom Mount with Auxiliary Circuit with Polar Load Terminals
DCNEV250-MB	High Voltage DC Contactor Relay Bottom Mount with Auxiliary Circuit with Polar Load Terminals	DCNEV250-GAN	High Voltage DC Contactor Relay Bottom Mount with Auxiliary Circuit & Non-Polar Load Terminals
DCNEV250-F	High Voltage DC Contactor Relay Bottom Mount with Polar Load Terminals	DCNEV250-GB	High Voltage DC Contactor Relay Bottom Mount with Auxiliary Circuit with Polar Load Terminals
DCNEV250-FA	High Voltage DC Contactor Relay Bottom Mount with Auxiliary Circuit with Polar Load Terminals	DCNEV250-GN	High Voltage DC Contactor Relay Bottom Mount with Non-Polar Load Terminals

DC High Voltage Contactor Relays

Resin Design Relays

PART NUMBER SYSTEM

DCNEVT150 + **-CS** = **DCNEVT150-CS**

Series Name | PN Suffix | Part Number

P = Polarized NP = Non-Polarized

30A-50A

Series Name	DCNSEV30	
Amperage	30A Continuous Carry	
Nom. Coil Voltage	12V DC	24V DC
Voltage Rating	900V DC	900V DC
Mounting Type	Bottom	Bottom
Auxiliary Circuit	N	N
Terminals	P	P
Part Number Suffix	**-B**	**-C**

DCNLEV50																									
50A Continuous Carry																									
12V DC								24V DC								48V DC									
900V DC								900V DC								900V DC									
Bottom				Side				Bottom				Side				Bottom				Side					
Y		N		Y		N		Y		N		Y		N		Y		N		Y		N			
P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP
-BA	**-BAN**	**-B**	**-BN**	**-BAS**	**-BASN**	**-BS**	**-BSN**	**-CA**	**-CAN**	**-C**	**-CN**	**-CAS**	**-CASN**	**-CS**	**-CSN**	**-EA**	**-EAN**	**-E**	**-EN**	**-EAS**	**-EASN**	**-ES**	**-ESN**

100A

Series Name	DCNLEV100																							
Amperage	100A Continuous Carry								100A Continuous Carry								100A Continuous Carry							
Nom. Coil Voltage	12V DC								24V DC								48V DC							
Voltage Rating	750V DC								750V DC								750V DC							
Mounting Type	Bottom				Side				Bottom				Side				Bottom				Side			
Auxiliary Circuit	Y		N		Y		N		Y		N		Y		N		Y		N		Y		N	
Terminals	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP
Part Number Suffix	**-BA**	**-BAN**	**-B**	**-BN**	**-BAS**	**-BASN**	**-BS**	**-BSN**	**-CA**	**-CAN**	**-C**	**-CN**	**-CAS**	**-CASN**	**-CS**	**-CSN**	**-EA**	**-EAN**	**-E**	**-EN**	**-EAS**	**-EASN**	**-ES**	**-ESN**

DCNSEV30

DCNLEV50 Bottom Mount

DCNLEV50 Side Mount

DCNLEV100 Bottom Mount

DCNLEV100 Side Mount

DC High Voltage Contactor Relays

Resin Design Relays

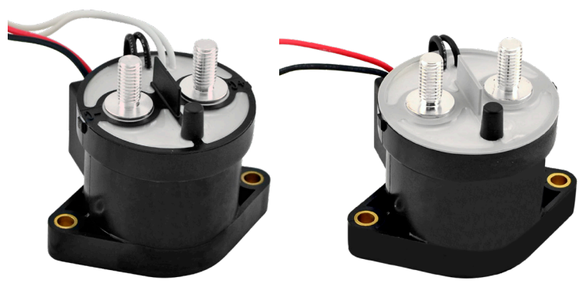
PART NUMBER SYSTEM

DCNEVT150 + **-CS** = **DCNEVT150-CS**

Series Name | PN Suffix | Part Number

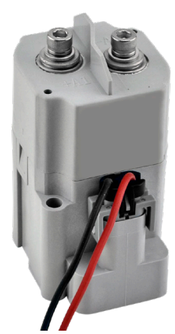
P = Polarized NP = Non-Polarized

150A-250A															
Series Name	**DCNEV150**				**DCNEV250**											
Amperage	150A Continuous Carry				250A Continuous Carry											
Nom. Coil Voltage	12V DC				12-24V DC				48-72V DC				72V DC			
Voltage Rating	900V DC				900V DC				900V DC				900V DC			
Mounting Type	Bottom				Bottom				Bottom				Bottom			
Auxiliary Circuit	Y		N		Y		N		Y		N		Y		N	
Terminals	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP	P	NP
Part Number Suffix	**-MA**	**-MAN**	**-M**	**-MN**	**-MA**	**-MAN**	**-M**	**-MN**	**-GA** **-GB**	**-GAN**	**-G**	**-GN**	**-FA** **-FB**	**-FAN**	**-F**	**-FN**



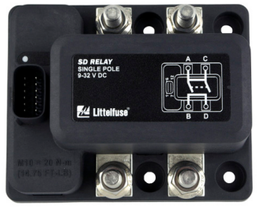
Ceramic Design Relays

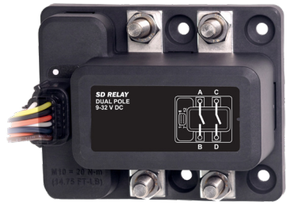
150A-500A																
Series Name	**DCNEVT150**				**DCNEVT350**				**DCNEVT400**				**DCNEVT500**			
Amperage	150A Continuous Carry				350A Continuous Carry				400A Continuous Carry				500A Continuous Carry			
Nom. Coil Voltage	12V DC		24V DC		12V DC		24V DC		12V DC		24V DC		12V DC		24V DC	
Voltage Rating	450V DC		450V DC		1800V DC		1800V DC		1800V DC		1800V DC		1800V DC		1800V DC	
Mounting Type	Bottom	Side	Bottom	Side	Bottom		Bottom		Bottom		Bottom		Bottom		Bottom	
Auxiliary Circuit	N	N	N	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Terminals	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Part Number Suffix	**-B**	**-BS**	**-C**	**-CS**	**-BA**	**-B**	**-CA**	**-C**	**-BA**	**-B**	**-CA**	**-C**	**-BA**	**-B**	**-CA**	**-C**



Bi-Stable Latching Relays

Series Name	Time Delay	SD		HD	
Part Number	08070900	880103	880107	880086	880088
Continous Current	250A	600A	300A	300A	300A
Inrush Current	800A x 30 Sec., 2000A x 5 Sec.	2000A x 30 Sec., 3000A x 1 Sec.	1000A x 30 Sec., 2000A x 1 Sec.	1500A x 10 Sec.	1500A x 10 Sec.
Voltage	12V| 24V	9-16V	12-24V	9-16V	18-32V
Ingress Protection	IP67|IP69K	IP66|IP69K	IP66|IP69K	IP67|IP69K	IP67|IP69K
Control Current	–	3A	3A	7A	7A
Connector	TE Superseal 1.5 Series 4-pin	Molex MX150	Molex MX150	Deutsch 6 Pos DTM	Deutsch 6 Pos DTM
Housing	Engineering thermoplastic	Engineering thermoplastic	Engineering thermoplastic	Engineering thermoplastic	Engineering thermoplastic
Contacts	Silver Plated Copper	Silver Plated Copper	Silver Plated Copper	Copper	Copper
Vibration	–	8G	8G	8G	8G
Ignition Protection	UNECE R10 Rev05	–	–	ISO 8846 and SAE J1171	ISO 8846 and SAE J1171





Time Delay and High Power Relays

Series Name	05903300		05930100							05931300
Part Number	05903300	05903500	05930100	05930200	05930300	05930400	05930500	05930600	05930700	05930800	05931400
Continuous Current	200A	100A	2A	2A	2A	2A	2A	2A	2A	2A	20A
Voltage	12V	24V	24V	24V	24V	24V	24V	24V	24V	24V	12V
Time Delay Range	–	–	4 Sec	2 Sec	10 Sec	0.4 Sec	2 Sec	6 Sec	–	30 Sec	3 Min
Terminals	6.3mm x 0.8mm/M6		6.35mm x 0.8mm	6.35mm x 0.8mm	6.35mm x 0.8mm	6.35mm x 0.8mm	6.35mm x 0.8mm	6.35mm x 0.8mm	6.35mm x 0.8mm	6.35mm x 0.8mm	6.3mm x 0.8mm

Continuous Duty SPST

Series Name	Continuous Duty SPST																	
Part Number	**24080**	**24063**	**24063-08**	**24214**	**24124**	**24059**	**24059-15**	**24059-08**	**24082**	**24106**	**24106-07**	**24115**	**24117**	**24117-01**	**24213**	**24213-01**	**24213-03**	**24097**
Amps	85A	85A	65A	200A	85A	85A	85A	65A	85A	85A	85A	85A	85A	65A	200A	200A	200A	85
Diagram	1	1	1	1	4	1	1	1	4	4	4	3	1	1	1	1	1	1
Image	A	A	B	A	D	A	A	A	E	D	D	D	B	B	A	A	C	A
Insulated/ Grounded	Insulated	Insulated	Insulated	Insulated	Grounded	Insulated	Insulated	Insulated	Grounded	Grounded	Grounded	Insulated	Insulated	Insulated	Insulated	Insulated	Insulated	Insulated
Voltage	36V DC	24V DC				12V DC												6V DC
Circuitry	SPST																	

A

B

C

D

E

F

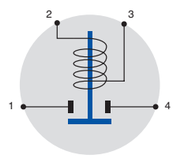


Diagram 1

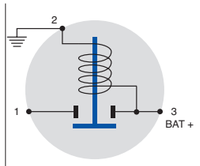


Diagram 2

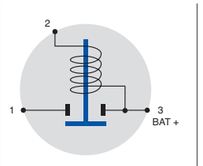


Diagram 3

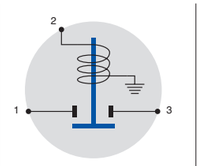


Diagram 4

Intermittent Duty SPST

Series Name	Intermittent Duty SPST								
Part Number	**24037**	**24044**	**24047**	**24060**	**24071**	**24076**	**24103**	**24008-03**	**24008**
Image	A	C	E	A	B	F	E	E	E
Diagram	1	1	2	4	1	2	3	2	2
Insulated/ Grounded	Grounded	Grounded	Insulated	Insulated	Grounded	Insulated	Grounded	Insulated	Insulated
Amps Make	750A	750A	750A	750A	750A	750A	750A	750A	120A
Amps Break	100A							65A	
Voltage	12V DC							24V DC	
Duty Cycle	On: 10 sec Off: 20 min								On: 10 sec Off: 30 min
Circuitry	SPST								

A

B

C

D

E

F

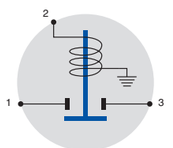


Diagram 1

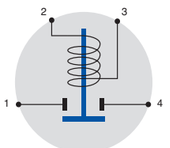


Diagram 2

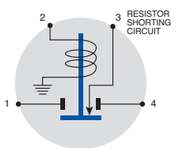


Diagram 3

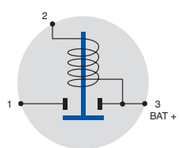


Diagram 4

Battery Master Switch Relays

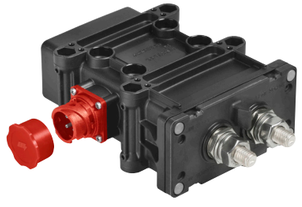
Series Name	08070000				
Part Number	**08070500**	**08070600**	**08070700**	**08070760**	**08094270**
Continuous Current	250A	250A	250A	250A	250A
Intermittent Current	1500A	1500A	1500A	1500A	1500A
Intermittent Time	On: 5 sec.Off: 10 sec.	On: 5 sec, Off: 10 sec.	On: 5 sec. Off: 10 sec.	On: 5 sec. Off: 10 sec.	On: 5 sec. Off: 10 sec.
Voltage	12V/24V	12V/24V	12V/24V	12V/24V	24V
Ingress Protection	IP67, IP69K	IP67, IP69K	IP67, IP69K	IP67, IP69K	IP65
Connector	DIN 4/4 Pigtail	DIN 4/4 Pigtail	DIN 4/4 Pigtail	DIN 4/4 Pigtail	DIN 3/4 Pigtail
Stability	Bistable	Bistable	Bistable	Bistable	Bistable
Time Delay	0/30/300 sec.	0/30/300 sec.	–	–	–
Low Voltage Disconnect	–	–	Filtered Open 60 sec.	Filtered Open 60 sec.	–
Low Voltage Disconnect Threshold	–	–	12.1V	12.1V	–
Notes	–	–	–	Complete Kit Version of 08070700	–

08070000 Series

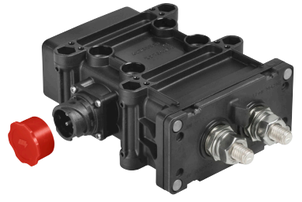
Series Name	08075062					
Part Number	**08075063**	**08075064**	**08075100**	**08075160**	**08075161**	**08075164**
Continuous Current	250A	250A	250A	500A	250A	500A
Intermittent Current	2000A	2000A	2000A	2000A	2000A	2000A
Intermittent Time	On: 5 sec. Off: 10 sec.	On: 5 sec. Off: 10 sec.	On: 5 sec. Off: 10 sec.	On: 5 sec. Off: 10 sec.	On: 5 sec. Off: 10 sec.	On: 5 sec. Off: 10 sec.
Voltage	24	24	24	24	24	24
Circuitry	SPST	SPST	SPST	SPST	SPST	SPST
Ingress Protection	IP67, IP69K	IP67, IP69K	IP67, IP69K	IP67, IP69K	IP67, IP69K	IP67, IP69K
Connector	TE SS 2/2 Pigtail	DIN 3/4 Integrated	DIN 4/4 Integrated	DIN 4/4 Integrated	DIN 6/7 Integrated	DIN 3/4 Integrated
Stability	Bistable	Bistable	Bistable	Bistable	Bistable	Bistable
Retention	Magnetic	Magnetic	Magnetic	Magnetic	Magnetic	Magnetic
Time Delay	–	–	3 min.	6 min.	30 sec./60 sec./3 min./6 min.	–
Delay Set	–	–	Fixed	Fixed	Programmable	–

08075063

08075064



08075100



08075160

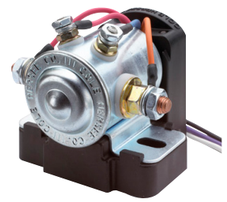
08075161

Battery Master Switch Relays

Series Name	ADR Magnetic Battery Disconnect Switch	
Part Number	08075300	08075360
Continuous Current	250A	250A
Intermittent Current	2000A	2000A
Intermittent Time	2000A for 5 sec, 1000A for 30 sec.	2000A for 5 sec, 1000A for 30 sec.
Voltage	12V/24V	12V/24V
Circuitry	SPST	
Ingress Protection	IP67, IP69K	IP67, IP69K
Mounting	Surface	Surface
Notes	Complete Kit Containing: 00227073, 00900560, 00901560	Relay Only

Battery Isolators

Series Name	Smart Battery Isolators			
Part Number	48525	48530	880051	880055
Continuous Current	85A	200A	300A	300A
Voltage	12V		16V	32V
Humidity	0 to 90% RH			
Ingress Protection	IP67	IP67	IP67/IP69K	IP67/IP69K
Shock	SAE J1455	SAE J1455	10G	10G
Vibration	10-500 Hz	10-500 Hz	8G	8G



48525

880051

ISO MINI

ISO Power

ISO MICRO

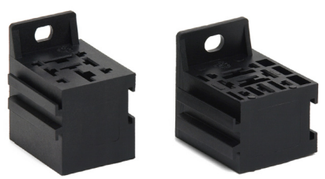
Plug In Relays

Series Name	ISO MINI										
Part Number	RA-200024-DS	RA-200124-DN	RA-400112-DN	RA-400112-NN	RC-200024-DS	RC-200124-DN	RC-200124-NN	RC-400012-DS	RC-400112-DN	RC-400112-NN	RC-400112-RN
Current	20A	20A	40A	40A	20A	20A	20A	40A	40A	40A	40A
Voltage	24V DC	24V DC	12V DC	12V DC	24V DC	24V DC	24V DC	12V DC	12V DC	12V DC	12V DC
Form	A	A	A	A	C	C	C	C	C	C	C
Mounting Bracket	None	Snap-In	Snap-In	Snap-In	None	Snap-In	Snap-In	None	Snap-In	Snap-In	Snap-In
Supression	Diode	Diode	Diode	None	Diode	Diode	None	Diode	Diode	None	Resistor

Series Name	ISO Power Relays					
Part Number	RA-700112-DN	RA-700112-NN	RA-700112-RN	RC-700112-DN	RC-700112-NN	RC-700112-RN
Current	70A	70A	70A	70A	70A	70A
Voltage	12V DC	12V DC	12V DC	12V DC	12V DC	12V DC
Form	A	A	A	C	C	C
Mounting Bracket	Snap-In	Snap-In	Snap-In	Snap-In	Snap-In	Snap-In
Supression	Diode	None	Resistor	Diode	None	Resistor

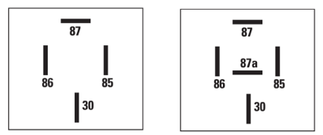
Series Name	ISO MICRO					
Part Number	02040080Z	02040090Z	MA-250012-NN	MA-250012-RS	MC-250012-NN	MC-250012-RN
Current	20A	35A	25A	25A	25A	25A
Voltage	12V DC	12V DC	12V DC	12V DC	12V DC	12V DC
Form	A	C	A	A	C	C
Mounting Bracket	—	—	—	—	—	—
Supression	Resistor	Resistor	None	Resistor	None	Resistor

Series Name	Plug In Relay Sockets	
Part Number	99025	99026
Form	A	A & C
Mounting	Intregated	



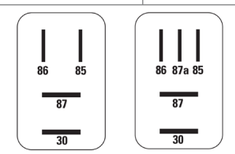
Form A Form C

ISO MINI



Form A Form C

ISO Power

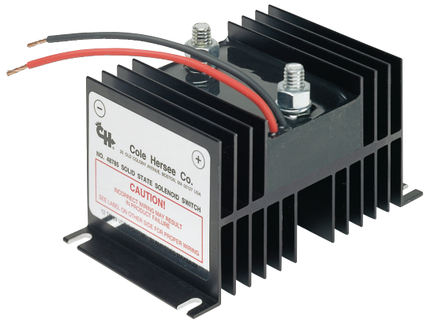


Form A Form C

ISO MICRO

Solid State Relays

Series Name	Standard Solid State Relay
Part Number	48785
Continous Current	85A
Inrush Current	85A
Voltage	12-24V
Ingress Protection	IP67
Control Current	20mA
Housing	Plated Steel
Stud Terminals	Two Copper 5/16-18 Studs
Contacts	Copper



48785

Specialty Relays

Series Name	HD Normally Open Relays	
Part Number	880159	880160
Continuous Current	300A (4/0 Input/Output Cable)	300A (4/0 Input/Output Cable)
Inrush Current	1500A x 10 Sec.	1500A x 10 Sec.
Voltage	9-16V	18-32V
Ingress Protection	IP67|IP69K	IP67|IP69K
Control Current	7A	7A
Connector	Deutsch 6 Pos DTM	Deutsch 6 Pos DTM
Stud Terminals	Two Tin-Plated Copper 3/8-16 Studs	Two Tin-Plated Copper 3/8-16 Studs
Vibration	8G	8G
Humidity	0-95% RH	0-95% RH
Ignition Protection	ISO 8846 and SAE J1171	ISO 8846 and SAE J1171

880159

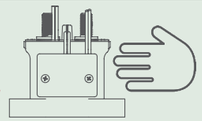
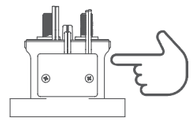
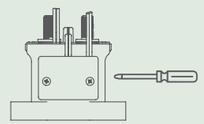
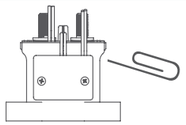
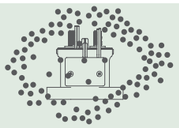
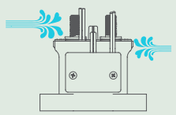
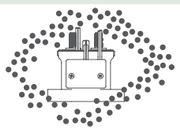
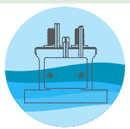
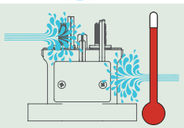
880160

Ingress Protection Explained

Harsh Environments and Ingress Protection Ratings

Environmental factors play a huge role in a product's ability to do its job and survive the lifetime of the equipment. Ingress Protection, or IP, indicates the degree of protection of a relay. IP ratings are a measure of how resistant a part is to environmental contaminants such as debris, dust, and water. IP rating selections should be based on where the relay will be mounted and what type of environment the equipment will be used in.

The numbers following IP represent levels of sealing and can range from no sealing (IP00) to protection against dust and continuous immersion in water (IP68). The table below provides a description of the protection at each level.

1st Digit - SOLID Degree of protection against solid objects		2nd Digit - LIQUID Degree of protection against water	
	**1** Protected against a solid object greater than 50mm		**1** Protected against vertically falling water drops
	**2** Protected against a solid object greater than 12.5mm		**2** Protected against vertical water drops when enclosure tilted up to 15 degree angle
	**3** Protected against a solid object greater than 2.5mm		**3** Protected against spraying water from up to a 60 degree angle
	**4** Protected against a solid object greater than 1.0mm		**4** Protected against splashing water
	**5** Dust Protected. Prevents ingress of dust sufficient to cause harm		**5** Protected against water jets
	**6** Dust tight. No ingress of dust.		**6** Protected against powerful water jets
			**7** Protected against the effects of temporary immersion in water between 15cm and 1m for 30 minutes
			**8** Protected against the effects of continuous immersion in water under conditions agreed between manufacturer and user
			**9K** Protected against close-range high pressure, high temperature spray downs

Example

IP67

Dust tight. No ingress of dust. Protected against effects of temporary submersion in water.

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