Edison Fuses – Selection Guide

Part Numbering System

HCLR 1-5 = HCLR 1.5 Amp Fuse

Ampere Rating
(note: "–" is used in place of a decimal point)

Fuse Series

Line Overview

The Edison family of fuses, fuse blocks and fuse holders is divided into two classes:

1. Current Limiting: Class CC, Class J, Class RK
2. General Purpose: Class M Midget and Small Dimension

The fuse selection guide below is a general summary of the specifications included for each fuse type. This selection guide does not include the many variables that can exist for specific situations such as local codes, unusual temperature, or other operating conditions. When selecting fuses, be sure to comply with any applicable PUBLIC SAFETY standards that apply to Overcurrent Protection Devices (OPD).

Edison Fuses Selection Guide and General Specifications

Description	Current Limiting Class J	Current Limiting Class RK5		Current Limiting Class RK1		Current Limiting Class CC		
Fuse Type	Time-Delay	Time-Delay				Fast-Acting	Time-Delay	
Part Number	JDL	ECNR	ECSR	LENRK	LESRK	HCLR	HCTR	EDCC
Voltage Rating	600 VAC	250 VAC	600 VAC	250 VAC	600 VAC	600 VAC	600 VAC	600 VAC
Ampere Rating	1 to 600	1 to 600	3 to 600	10 to 600	5 to 600	0.5 to 30	0.25 to 30	0.5 to 30
Interrupting Rating	200,000 RMS Symmetrical Amps							
Current Limiting	Class J	Class RK5		Class RK1		Class CC		
Agency Approvals	UL Listed, Class J, Guide JDDZ, File E162363 CSA Certified HRCI-J per C22.2, No. 248.8, File 700489	UL Listed, Class RK, Guide JDDZ, File E162363 CSA Certified HRCI-R per C22.2, No. 248.12, File 700489 (LENRK CSA File 053787)				UL Listed to 248.4, Class CC, Guide JDDZ, File E162363, CSA certified HRCI-MISC per C22.2 No. 248.4, File 700489		
Dimensions	See product specification pages.	See product specification pages.				ferrule (in): 13/32, length (in): 1-1/2		

Edison Fuses Selection Guide and General Specifications

Description	General Purpose - Midget				General Purpose - Small Dimension Electronic							
Fuse Type	Fast-Acting		Time-Delay		Fast-Acting Ceramic	Fast-Acting Glass		Medium Time-Delay Glass	Time-Delay Ceramic	Time-Delay Glass	Fast-Acting Glass	Time-Delay Glass
Part Number	MCL	MOL	MEQ	MEN	ABC	AGC	GMA	GMC	MDA	MDL	S500	S506
Voltage Rating	600 VAC	250 VAC	500 VAC	250 VAC	250 VAC (0.5 to 20A) 125VAC: (25 to 30A) 125VDC	250VAC: (0.1 to 10A) 32VAC: (15 to 30A)	250VAC (0.063 - 3A) 125VAC (4 - 15A)	250VAC (0.5 - 3A) 125VAC (4 - 10A)	250VAC 125VDC (20A)	250VAC: (0.0625 to 8A) 32VAC: (10 to 20A)	250VAC	250VAC
Ampere Rating	0.5 to 50	0.5 to 30	0.25 to 30	0.5 to 30	0.5 to 30	0.10 to 30	0.063 to 15	0.5 to 10	0.5 to 20	0.0625 to 20	0.32 to 10	0.25 to 6.3
Interrupting Rating	100,000 RMS Amps	10,000 RMS Amps			See specifications table on product pages							
Current Limiting	N/A				N/A							
Agency Approvals	UL Listed to 248.14, File E162443, CSA Cert. C22.2 Part 59.2, LR 700489				UL Listed standard 248-14 UL Listed Guide and File nos. (ABC 0.25-20 A): (AGC 1/100-10 A) JDYX and E19180 UL Recognition Guide and File nos. (ABC 20-30A):(AGC 11-30) JDYX2 and E19180 CSA Certification Record No: 053787 C 000 and Class No: 1422 01 and 1422 30		Designed to UL/CSA 248-14 UL Listed, Guide JDYX, File E19180 63mA-6A UL Recognition, Guide JDYX2, File E19180, 7A-15A CSA Certified, File 053787_C_000, 63mA-6A Class 1422-01,		UL Listed standard 248-14 UL Listed Card: MDA 2/10-20A , MDL 1/16-8A (Guide JDYX, File E19180 UL Recognized Card: MDA 25-30A MDL 9-30A (Guide JDYX2, File E19180) CSA Certification Card: MDA 2/10-15A (Class No. 1422-01)		UL Recognized Guide JDYX2, File E19180 Semko Approval VDE Approval BSI Approval IMQ Approval RoHS compliant
Dimensions	ferrule (in): 13/32 length (in): 1-1/2				1/4" x 1-1/4", (6.3mm x 32mm)		0.197" x 0.788" (5mm x 20mm)		1/4" x 1-1/4", (6.3mm x 32mm)		0.197" x 0.788" (5mm x 20mm)	

Get Your Fuses From Us!

AutomationDirect has teamed up with Edison Fuse, a subsidiary of Cooper Industries, the worldwide leader in circuit protection, to offer the Edison line of fuses and fuse holders. Cooper Industries is a $4.1B corporation with seven electrical products divisions, including two fuse brands. The Edison Fuse products are industry-standard fuses that are designed using the highest quality materials and manufacturing methods. All Edison fuses can be directly cross referenced and used as replacements for other name-brand fuses such as Littelfuse, Ferraz, Siemens, and many more. Our fuse manufacturer cross reference list is at the end of this section.

AutomationDirect carries a wide range of fuses in convenient package sizes. Just about every electrical system requires some sort of circuit protection, so while you're ordering your other components from us, don't forget the fuses!

Fuses

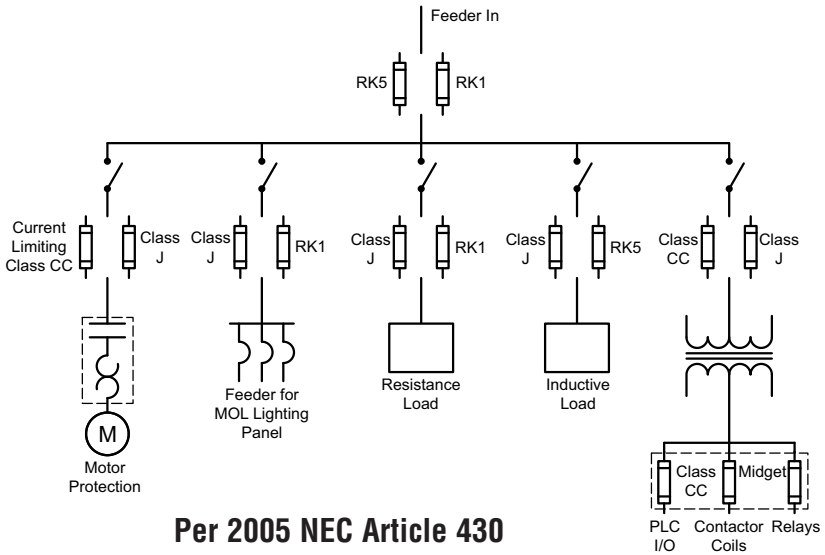
Fuse Holders

Fuse Blocks

Where to Use a Fuse

Fuses can be used for a variety of overcurrent and overload applications. They can be used to protect transformers, motors, DC power supplies, lighting circuits, contactors, relays and other industrial and commercial electrical equipment and conductors.

AutomationDirect is pleased to carry the most popular Current Limiting and General Purpose fuses for industrial control applications. The current limiting fuses, frequently used in applications for motor branch circuit protection, are available in both time-delay and fast-acting models. Because of their superior current limiting performance, these current limiting products are sometimes regarded as an upgrade to the general purpose fuses. In addition, the current limiting line is recognized for NEC branch circuit protection and Type 2 coordinated applications for IEC or NEMA starters/contactors. Where adherence to extensive current limiting codes is not required, the Class M general purpose midget fuses are a great low-cost solution for both time-delay and fast-acting protection. And, we've not forgotten the accessories you need: several fuse holders and fuse blocks are available in a variety of 1, 2, and 3-pole form factors.



Per 2005 NEC Article 430

10 Great Reasons to Use a Fuse...

Why use a fuse?

Fuses offer a safe and economical solution for overcurrent protection of both conductors and components. Fuses can help make your control systems meet the new UL and NEC codes.

1 Safety

Overcurrent protective devices that have tripped are often reset without first investigating the cause of the fault. Electromechanical devices may not have the reserve capacity to open safely when a second or third fault occurs. When a fuse opens it is replaced with a new fuse, so the protection level is not degraded by previous faults. Our current limiting fuses meet the new UL and NEC codes.

2 Cost effective

Fuses typically are the most cost effective means of providing overcurrent protection. This is especially true where high fault currents exist or where small components such as Control Transformers or DC power supplies need protection.

3 High interrupting rating

With most low voltage current limiting fuses ($\leq$ 600 volts) having a 200,000 amp interrupting rating, you are not paying a high premium for a high interrupting capacity. Our current limiting fuses meet the new UL and NEC codes.

4 Reliability

Fuses have no moving parts to wear out or become contaminated by dust or oil.

5 North American standards

Tri-National Standards specify fuse performance and maximum allowable fuse I^p and I^2 t let-thru values.

6 Component protection

The high current limiting action of a fuse minimizes or eliminates component damage.

7 Extended protection

Devices with low interrupting ratings are often rendered obsolete by service upgrades or increases in available fault current. New NEC and UL standards are causing the need for potentially expensive system upgrades to non-fused systems.

8 Selectivity

Fuses can be easily coordinated to provide selectivity under both overload and short circuit conditions.

9 Minimal maintenance

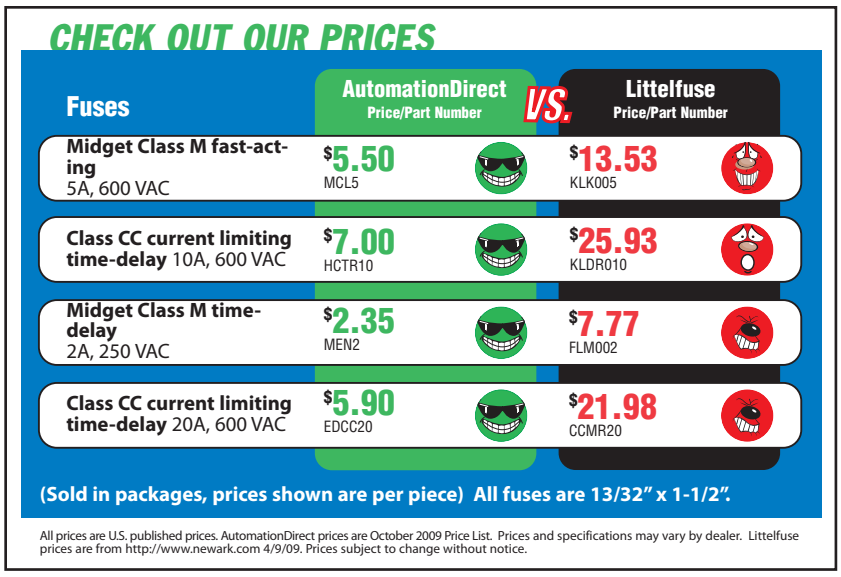
Fuses do not require periodic recalibration as do some electromechanical overcurrent protective devices.

10 Long life

As a fuse ages, the speed of response will not slow down or change. A fuse's ability to provide protection will not be adversely affected by the passing of time.

...plus the best reason of all - our prices!

AutomationDirect has secured great pricing for our fuses, fuse holders and fuse blocks, and can pass those savings on to you. Many items are priced well below industry list prices, making fuse protection a beneficial and affordable option for almost every electrical device.



All prices are U.S. published prices. AutomationDirect prices are October 2009 Price List. Prices and specifications may vary by dealer. Littelfuse prices are from http://www.newark.com 4/9/09. Prices subject to change without notice.

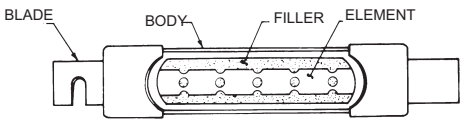
Fuse Construction and Operation

The typical fuse consists of an element which is surrounded by a filler and enclosed by the fuse body. The element is welded or soldered to the fuse contacts (blades or ferrules).

The element is a calibrated conductor. Its configuration, mass and the materials employed are selected to achieve the desired electrical and thermal characteristics. The element provides the current path through the fuse. It generates heat at a rate dependent on its resistance and the load current.

The heat generated by the element is absorbed by the filler and passed through the fuse body to the surrounding air. The filler material, such as quartz sand, provides effective heat transfer and allows for the small element cross-section typical in modern fuses. The effective heat transfer allows the fuse to carry harmless overloads. The small element cross section melts quickly under short-circuit conditions. The filler also aids fuse performance by absorbing arc energy when the fuse clears an overload or short circuit.

When a sustained overload occurs, the element will generate heat at a faster rate than the heat can be passed to the filler. If



the overload persists, the element will reach its melting point and open. Increasing the applied current will heat the element faster and cause the fuse to open sooner. Thus, fuses have an inverse time current characteristic: that is, the greater the overcurrent, the less time required for the fuse to open the circuit.

This characteristic is desirable because it parallels the characteristics of conductors, motors, transformers, and other electrical apparatus. These components can carry low-level overloads for relatively long periods without damage. However, under high-current conditions, damage can occur quickly. Because of its inverse time current characteristic, a properly applied fuse can provide effective protection over a broad current range, from low-level overloads to high-level short circuits.

How to Talk Fuses

Commonly used terms

I^2t (Ampere Squared seconds): A measure of the thermal energy associated with currentflow. I^2t is equal to $(I_{RMS})^2 \times t$, where **t** is the duration of current flow in seconds.

Clearing I^2t: The total I^2t passed by a fuse as the fuse clears a fault, with **t** being equal to the time elapsed from the initiation of the fault to the instant the fault has been cleared.

Melting I^2t: The minimum I^2t required to melt the fuse element.

Ampere Rating: The continuous current carrying capability of a fuse under defined laboratory conditions. The ampere rating is marked on each fuse.

Available Fault Current: The maximum short-circuit current that can flow in an unprotected circuit

Coordination: The use of overcurrent protective devices that will isolate only that portion of an electrical system that has been overloaded or faulted.

Current-Limiting Range: The available fault currents a fuse will clear in less than ½ cycle, thus limiting the actual magnitude of current flow.

Element: A calibrated conductor inside a fuse that melts when subjected to excessive current. The element is enclosed by the fuse body and may be surrounded by an arc-quenching medium such as silica sand. The element is sometimes referred to as a link.

Fast-Acting Fuse: This is a fuse with no intentional time-delay designed into the overload range. It is sometimes referred to as a "single-element fuse" or "non-delay fuse."

Fault Current: Short-circuit current that flows partially or entirely outside the intended normal load current path of a circuit component. Values may be from hundreds to many thousands of amperes.

Ferrule: The cylindrical brass, bronze or copper mounting terminals of fuses with amp ratings up to 60 amperes. The cylindrical terminals at each end of a fuse fit into fuse clips.

Current-limiting Fuse: A fuse that meets the following three conditions:

1. Interrupts all available overcurrents within its interrupt rating.
2. Within its current limiting range, limits the clearing time at rated voltage to an interval equal to, or less than, the first major or symmetrical current loop duration.
3. Limits peak let-through current to a value less than the available peak current.

Interrupting Rating: The maximum level of fault current that the fuse has been tested to safely interrupt.

Our Fuses at a Glance

Fuse

Fuse Holders

Fuse Block

Fuse Series	Class	Voltage	Ampage Range	Description	Application
JDL	J	600V	1A to 600A	Most popular current limiting dual element time delay fuses available. Small physical size and high preformance characteristics makes the class J ideal for any space limited applications	All general purpose circuits with high inrush inductive loads including motor branch circuits and transformers. Also suited for lighting loads. Recommended for type 2 (no damage) protection of IEC style motors, starters, and contactors.
ECNR	RK5	250V	1A to 600A	The dual element time delay characteristics of these fuses typically allows them to be sized closer to the running ampacity of inductive loads to reduce cost and improve over current protection.	Use in AC power distribution system mains, feeders, and branch circuits. Recommended for high inrush inductive loads, like motors and transformers, and non inductive loads like lighting, and heating loads.
ECSR		600V	3A to 600A		
LENRK	RK1	250V	10A to 600A	These dual element time delay fuses have upto 40% more current limitation and up to 350% more I2t limitation under fault conditions than the ECNR and ECSR fuses, reducing the potential for damage.	Use in AC power distribution system mains, feeders, and branch circuits. Recommended for high inrush inductive loads, like motors and transformers, and non inductive loads like lighting, and heating loads.
LESRK		600V	5A to 600A		
HCLR	CC	600V	0.5A to 30A	Fast acting characteristics with 200kA Interrupting Rating, and compact design are an excellent choice for inductive loads as well as resistive loads	Recommended for branch circuit protection, resistive heating loads, and lighting loads
HCTR	CC	600V	0.25A to 30A	Time delay characteristics with 200kA Interrupting Rating, and compact design are an excellent choice for high inductive loads. Meets the requirements of the NEC® 430.72 and UL508	Recommended for Motor Branch protection, short circuit protection required by NEC® 430.52 and for Primary protection for control transformer loads.
EDCC	CC	600V	0.5A to 30A	Low peak design was developed specifically for motor protection, Provides excellent current limiting capabilities up to 200KA 600VAC	Recommended for small horsepower motor circuits. Can provide Type 2 coordinated protection for IEC or NEMA starters/contactors
MCL	Midget	600V	0.5A to 50A	Provides supplemental protection to end-use equipment with a 100KA interruption rating, 600VAC. Fast acting design responds quickly to both overloads and short-circuit protection	Recommended for control circuits, street lighting, HID lighting, and electronic equipment protection
MOL	Midget	250V	0.5A to 30A	Provides supplemental protection to end-use equipment with a 10,000A interruption rating, economical laminated paper tube	Recommended to use as supplemental protection for non inductive control loads and lighting circuits
MEQ	Midget	500V	0.25 to 30A	Provides supplemental protection to high inrush loads. has a 10,000A interruption rating, 500VAC. Fiber tube construction.	Recommended to use as supplemental protection for inductive control loads such as transformers and solenoids.
MEN	Midget	250V	0.5A to 30A	Provides supplemental protection to high inrush loads. has a 10,000A interruption rating, fiber tube construction. Dual element allows harmless inductive surges to pass without opening.	Recommended to use as supplemental protection for inductive control loads such as transformers and solenoids, and other high inrush electronics circuits.
ABC	1 1/4" x 1/4" Ceramic	250VAC / 125VAC	0.5A to 30A	Fast acting 1/4" x 1-1/4" ceramic tube construction. Small dimension electronic fuses.	Recommended as supplemental protection for electronic applications
AGC	1 1/4" x 1/4" Glass	250VAC / 32VAC	0.5A to 30A	Fast acting 1/4" x 1-1/4" glass tube construction. Small dimension electronic fuses.	Recommended as supplemental protection for electronic applications
GMA	5mm x 20mm Glass	250VAC / 125VAC	0.063A to 15A	Fast acting 5mm x 20mm glass tube construction. Small dimension electronics fuses.	Recommended as supplemental protection for electronic applications
GMC	5mm x 20mm Glass	250VAC / 125VAC	0.5A to 10A	Medium Time Delay 5mm x 20mm glass tube construction. Small dimension electronics fuses.	Recommended as supplemental protection for electronic applications
MDA	1 1/4" x 1/4" Ceramic	250VAC	0.5A to 20A	Time Delay 1/4" x 1-1/4" ceramic tube construction. Small dimension electronics fuses.	Recommended as supplemental protection for electronic applications
MDL	1 1/4" x 1/4" Glass	250VAC / 32VAC	0.0625A to 20A	Time Delay 1/4" x 1-1/4" glass tube construction. Small dimension electronics fuses.	Recommended as supplemental protection for electronic applications
S500	5mm x 20mm Glass	250VAC	0.32A to 10A	Fast acting 5mm x 20mm glass tube construction. Small dimension electronics fuses.	Recommended as supplemental protection for electronic applications
S506	5mm x 20mm Glass	250VAC	0.25A to 6.3A	Time Delay 5mm x 20mm glass tube construction. Small dimension electronics fuses.	Recommended as supplemental protection for electronic applications