

Circuit



Fuji Electric UL 489 Rated Molded Case Circuit Breakers (MCCBs)

BW Series Fuji Molded Case Circuit Breakers are more compact (especially 100A, 125A, 250A frames) than any breakers on the market, so control panels take up less space than ever before. This product group maintains conformity to all Worldwide standards, including cULus / IEC / CE Marking / JIS (Japan) / CCC (China).

- Suitable for branch circuit protection
- 5 frame sizes, rated current of 15 to 800A, max 600V
- Standard type and high-interrupting capacities are available in identically sized breakers
- Shunt Trip, Undervoltage Release and other accessories are available
- Auxiliary Switch and Shunt Trip can be installed in the field

3P Series UL 489 Molded Case Circuit Breakers (MCCBs)

The 3P series provides branch and feeder circuit protection in industrial control panels.

- UL 489
- Up to 600 amps
- 65kA @ 240 VAC interrupting rating
- G-frame size 15 to 100 amps
- F-frame size 100 to 225 amps
- K-frame size 250 to 400 amps
- L-frame size 400 to 600 amps

starting at **\$16.50**

EATON

Eaton WMZT Series UL 489 Miniature Circuit Breakers

The WMZT series is DIN-rail mountable and can be used in branch circuit application up to 40 amps and are available with C or D trip characteristics.

- UL 489
- DIN-rail mounted
- Up to 40 amps
- 1, 2, or 3-pole available
- 10kAIC @ 277/480VAC

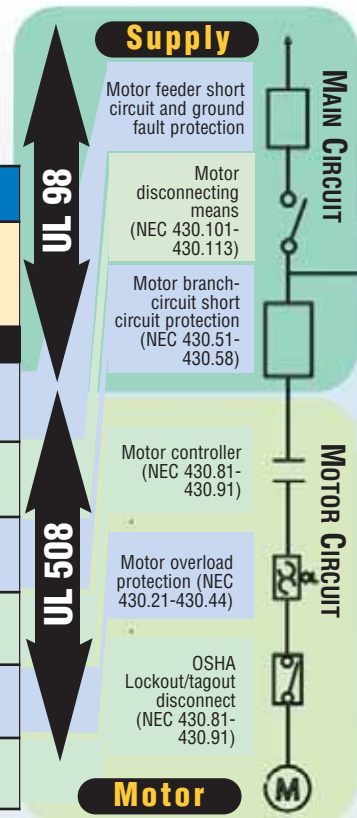
Manufactured by Eaton Corporation

starting at **\$192.00**

Which type of Circuit Protection are you looking for?

Circuit Protection Selection

	Molded Case and DIN rail mounted UL489 Circuit Breakers	Current Limiting Fuses UL 248	Disconnect Switches UL 98	Manual Motor Starters (MMS) UL 508	Load Switches UL 508	Supplementary Protectors UL 1077	General Fuses UL 248
Short circuit and ground fault protection for feeder and branch circuits	YES	YES	YES	NO	NO	NO	NO
Motor disconnecting means (NEC 430.101-430.113)	YES	YES	YES	NO	NO	NO	NO
Motor branch-circuit short circuit protection (NEC 430.51-430.58)	YES	YES	YES	NO	NO	NO	NO
Motor controller (NEC 430.81-430.91)	YES	YES	YES	NO	NO	NO	NO
Motor overload protection (NEC 430.21-430.44)	YES	YES	YES	YES	NO	NO	NO
OSHA Lockout/tagout disconnect (NEC 430.81-430.91)	YES	YES	YES	YES	YES	NO	NO





Company Information

Systems Overview

Programmable Controllers

Field I/O

Software

C-more & other HMI

Drives

Soft Starters

Motors & Gearbox

Steppers/ Servos

Motor Controls

Proximity Sensors

Photo Sensors

Limit Switches

Encoders

Current Sensors

Pressure Sensors

Temperature Sensors

Pushbuttons/ Lights

Process

Relays/ Timers

Comm.

Terminal Blocks & Wiring

Power

Circuit Protection

Enclosures

Tools

Pneumatics

Safety

Appendix

Product Index

Part # Index

Protection

FERRAZ SHAWMUT IS NOW MERSEN



Mersen UL 98 Rated Disconnect Switches

Heavy-duty fusible and non-fusible disconnects meet all the requirements of the UL 98 standard. These switches can be used as a motor disconnecting means to meet NEC® 430.109; meets NEC® 430.111 as a motor controller.

SC series

- Non-fusible rotary disconnect switches
- Makes/breaks loads up to 800 amps
- Front operated
- Visible blade contacts
- Line-side shrouding comes standard with switch

FB series

- Fusible rotary disconnect switches
- Makes/breaks loads up to 200 amps
- Front operated
- Uses Class CC and Class J fuses
- Line side shrouding comes standard with switch
- Touch-safe fuse covers standard with switch



starting at **\$82.00**



starting at **\$18.00**

Gladiator CFS Series UL 98 and UL 508 Rated Fusible Disconnect Switches

- UL 98 version, Class CC fuse, 30A, DIN rail mount
- UL 508 version, Midget class fuse, 30A, DIN rail mount
- 1, 2 and 3-pole models
- Provide open fuse indication for faster troubleshooting and reduced downtime
- Lockout / Tagout capability and finger safe construction
- Positive visible circuit isolation via the disconnect switch
- Uses only 1/3 the space of a molded circuit breaker and 2/3 the space of a traditional fusible switch



starting at **\$22.50**



SD Series UL 508 Rated Load Switches

The SD series of load switches are used for making and breaking equipment loads. These switches can be used as a motor controller meeting NEC® 430, Part VII. Typical applications include local motor isolation.

- 35mm DIN rail mountable or direct mountable
- Loads from 16 to 125 amps
- IP20 degree of protection

starting at **\$33.00**
for 10-pack



starting at **\$6.50**
p/n TJS1-1
for single Class T

Edison Single and Dual-element Fuses

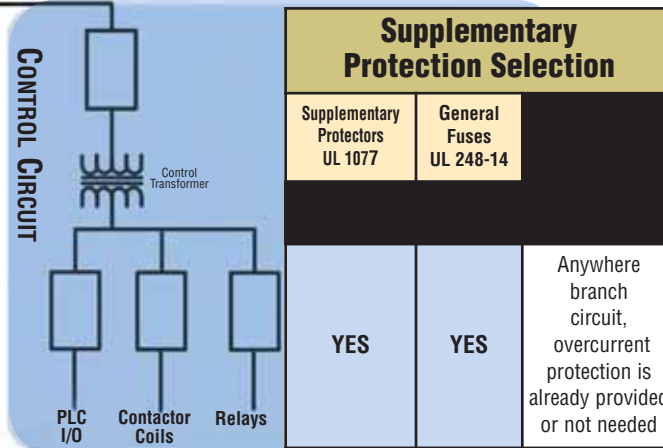
Industry standard extremely fast-acting, single element Class T and dual element time delay Class RK5, RK1, and Class J current limiting short circuit protection is available up to 600 amps.

NEW! High-speed Class J (JHL) combines electronic and motor branch circuit protection in one fuse.

These fuses are recommended for AC power distribution feeder and branch circuits; they provide ideal protection for motors and all general purpose applications including lighting, heating, inductive and non-inductive loads.

For Control Circuit - Supplementary Protection see next page

Circuit Protection (continued)



Edison Current-limiting Fuses

We carry industry standard current limiting class CC, general purpose class M (Midget) and small dimension glass and ceramic circuit protection, fuse holders and accessories. They provide ideal supplementary protection up to 30 amps to branch circuits and end of line equipment.

starting at
\$1.75
for 5-pack

starting at
\$8.00



EATON

Supplementary Protectors UL1077

Supplementary protectors are UL 1077 recognized and are used in applications where branch circuit protection is not required or is already provided.

WMZS Series

- DIN rail mountable
- Full line of auxiliary switches, alarm switches and padlock lockout accessories
- B trip curve 6 to 60 amps
- C trip curve 0.5 to 60 amps
- D trip curve 0.5 to 40 amps

Circuit Protection

from **AUTOMATIONDIRECT**.com



UL489 or UL1077?

What are your Circuit Protection Requirements?

An understanding of circuit types and circuit protection products is critical to ensure their proper application.
See NEC Sections 100, 430 and 409 for definitions.

The proper sizing of an overcurrent protection device is the responsibility of the customer and should be determined using the application standards of the NEC (National Electric Code), CEC (Canadian Electrical Code) or other applicable standards. Per fine print note of 2008 NEC Section 100 "A current in excess of rating may be accommodated by certain equipment and conductors for a given set of conditions. Therefore, the rules for overcurrent protection are specific for particular situations."

UL489 Branch Protection



UL1077 Supplementary Protection



What You Need to Know and Look For In Specifications

Certifications – Standards – Acceptance

UL489 Branch Protection

- UL489 Listed or Recognized
- CSA C22.2 No. 5
- International ratings available depending on breaker type

UL1077 Supplementary Protection

- UL Recognized under UL1077
- CSA 22.2 No. 285
- IEC 60947-2 or IEC 898

Function

- Opens automatically on Overload and Short Circuit when properly applied within its ratings
- Protects wire and cable against Overload and Short Circuit

- Opens automatically on Overload and Short Circuit
- Provides additional equipment protection where branch circuit protection is already provided or not required
- Not suitable for the protection of branch circuit conductors

Applications

- Branch circuit protection in control panels, panelboards, switchboards and motor control centers
- Motor overload and motor short circuit protection (UL489 Recognized motor circuit protectors) for control panels and motor control centers

- Used within appliances or other electrical equipment such as control circuits, control power transformers, relays, PLC I/O points and lighting circuits
- Ideal replacement for fuses that are applied as supplementary protection

Features

- Bolted down or DIN-rail mounted
- External handle mechanisms available
- Field mounted accessories
- Stand alone branch circuit protection
- Various levels of protection (curve type)
- High voltage and interruption levels (up to 100 kAIC @ 480V)

- DIN-Rail mounted
- Field mounted accessories
- Current limiting
- Various levels of protection (curve type)
- 10 kAIC @ 240 VAC
- 6 kAIC @ 277 VAC and 5 kAIC @ 480 VAC
- 10 kAIC @ 65 VDC

kAIC = thousands of Amps interrupt capacity

Summary

A Supplementary Protector can't Be used for Branch Circuit Protection.
Understanding the difference between Branch Circuit Protection and Supplementary Protection helps to ensure their proper use.

Fuji Molded Case Circuit Breakers – Wire Range Specifications



Wiring

- When connecting the wires, follow NEC (National Electric Code, USA) or CEC (Canadian Electrical code Part 1, Canada) instructions.
- Use copper wire rated for 75°C for connecting. UL or CSA approved wire is recommended.
- Tighten the wire connections adequately, as a very large electromagnetic force will be generated when short circuit current is generated.
- Perform additional tightening of the terminal screws periodically.

Allowable Wire Specifications for Lug Terminals	
Wire Size AWG or MCM (mm ²)	Number of Wire Strands
14 to 2 (2.1 to 33.6)	7
1 to 4/0 (42.4 to 107.2)	19
250 to 500 (127 to 250)	37

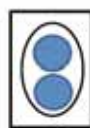


Caution

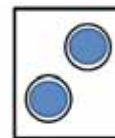
- Adhere to the allowable number of strands of wire indicated in the table on the left.
- Two wires cannot be connected together to a single connecting hole of lug terminal except BW400SAGU-3P400SB.
- Follow the number of strands of wire indicated on the table. (Wire size and number of wire strands not listed on table can not be connected)
- Do not solder the end of the wire.



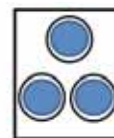
Rated current
15A to 350A



Rated current 400A
3/0 AWG x 2
19 strands each



Rated current
500A to 700A



Rated current 800A
300 MCM x 3
37 strands each

Maximum Wire Sizes and Tightening Torque			
Type	Rated Current (A)	Wire Size AWG or MCM (mm ²)	Tightening Torque
			Lug Terminal*
BW125	15	14 AWG (2.1mm ²)	51 lb.-in. (5.8 N-m)
	20	12 AWG (3.3mm ²)	
	30	10 AWG (5.3mm ²)	
	40	8 AWG (8.4mm ²)	
	50	8 AWG (8.4mm ²)	
	60	6 AWG (13.3mm ²)	
	70	4 AWG (21.1mm ²)	
	75	4 AWG (21.1mm ²)	
	80	4 AWG (21.1mm ²)	
	90	3 AWG (26.7mm ²)	
BW250	100	3 AWG (26.7mm ²)	204 lb.-in. (23 N-m)
	125	1 AWG (42.4mm ²)	
	150	1/0 AWG (53.5mm ²)	
	175	2/0 AWG (67.4mm ²)	
	200	3/0 AWG (85.0mm ²)	
	225	4/0 AWG (107.2mm ²)	
BW400	250	250 MCM (127mm ²)	385 lb.-in (43.5 N-m)
	300	350 MCM (177mm ²)	
	350	500 MCM (253mm ²)	
	400	3/0 AWGx2 (85.0mm ² x2)	282 lb-in (31.9 N-m)
BW630	500	250 MCMx2	275 lb.-in. (31.07 N-m)
	600	350 MCMx2	
BW800	700	500 MCMx2	275 lb.-in. (31.07 N-m)
	800	300 MCMx3	

*Note: Lug terminals are supplied as standard.