GJL 100 A Molded Case Circuit Breaker GJL 75 A Motor Circuit Protector

Catalog 0500CT9702R409 **2009** Class 525/580



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General Characteristics

Compliance with Standards



Compliance with North American Standards

GJL circuit breakers are built and tested in accordance with Underwriters Laboratories Inc. UL 489 Standard. Circuit breakers and their accessories, except where noted, are Listed or Recognized under UL files E63335, E103740, E103955 and E113389.

Compliance with International Standards

GJL circuit breakers and their accessories comply also with the following international standards:

- IEC 947-1: general rules
- IEC 947-2: circuit breakers; In that these standards are applied in most countries, GJL circuit breakers and their accessories comply with European (EN 60947-1 and EN 60947-2) and the corresponding national standards
- France NF
- Germany VDE
- U.K. BS
- Australia AS
- Italy CEI

Compliance with the Specifications of Marine Classification Organizations

GJL circuit breakers have been approved for marine application by the American Bureau of Shipping, Bureau Veritas, Lloyd's Register of Shipping, Registro Italiano Navale, Germanischer Lloyd's and Det Norske Veritas. They comply with the following standards:

- UL 489 Supplement SA (marine use on vessels over 65 feet in length)
- US Coast Guard specifications
- IEC 92-504 and marine specifications: inclination, vibrations, insulation resistance
- IEC 803 Electromagnetic Disturbance Immunity

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GJL Circuit Breaker and Motor Circuit Protector General Characteristics

Tropicalization

GJL circuit breakers comply with NF C 63-100 standard level 2 conditions (95% relative humidity at 45°C or 80% at 55°C, hot and humid climate conditions). They also comply with the following standards:

- IEC 68-2-30 damp heat
- IEC 68-2-2 dry heat
- IEC 68-2-11 salt spray
- IEC 68-2-1 low temperatures

Pollution Degree

GJL circuit breakers are certified for operation in pollution degree III environments as defined by IEC standard 947 (industrial environments).

Environmental Protection

GJL circuit breakers take into account concerns for environmental protection. Most components are recyclable and parts are marked as specified in applicable standards.

Suitability for Isolation/Positive Contact Indication

All GJL circuit breakers are suitable for isolation as defined in the IEC 947-2 Standard:

- The isolation position corresponds to the O (OFF position)
- The operating handle cannot indicate the OFF position unless the contacts are open
- Padlocks may not be installed unless the contacts are open. Installation of a rotary handle or a motor mechanism does not alter the functionality of the position indication system. The isolation function is certified by tests guaranteeing
- · The mechanical reliability of the position indication system
- The absence of leakage currents
- · Overvoltage withstand capacity between upstream and downstream connections

Circuit Breaker Marking



Installation in Class II Switchboards

All GJL circuit breakers, even when fitted with a rotary handle or a motor mechanism, can be installed through the door of Class II IEC switchboards (as per IEC 664 Standard). Refer to circuit breaker installation instructions prior to installing circuit breaker.

Installation requires no special insulation because GJL circuit breakers provide Class II insulation between the front face and all internal circuits.

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Circuit Breakers



GJL Circuit Breaker

Table 1: GJL Circuit Breaker Ratings and Interrupting Ratings

UL 489 Listed Ratings ¹				
Number of Poles		3		
Roted Voltage			480 V	
Raled voltage	AC 50/00 HZ	600Y/347 V		
Rated Current		40°C		15–100 A
			240 Vac	100 kA
Interrupting Ratings			480 Vac	65 kA
			600Y/347 Vac	18 kA
IEC 947-2 and EN 60947-2 Ratings				
Number of Poles				3
Rated Insulation Voltage	Ui			750 V
Rated Impulse Withstand Voltage	Uimp			8 kV
Rated Operational Voltage			AC 50/60 Hz	690 V
Rated Operational Voltage	Ue		DC	250 V
Rated Current (A)	In	40°C		15–100 A
			220/240 V	100 kA
		AC 50/60 Hz	380/415 V	65 kA
Ultimate Breaking Capacity	lcu		660/690 V	6 kA
			125 V (1 pole)	10 kA
		DC	250 V (2 poles in series)	10 kA
Service Breaking Capacity	lcs	(% icu)		50
Utilization Category				А

¹ Circuit breaker is Listed under UL file E63335

Table 2: Protection Characteristics

Protection against overloads and short circuits with a built-in thermal-magnetic trip unit (fixed thresholds).

Ratings	40°C	15 A	20 A	30 A	40 A	50 A	60 A	70 A	80 A	90 A
Dverload Protection										
Thermal		Non-Adjus	Non-Adjustable							
Short-Circuit Protection										
Magnetic		Non-Adjustable								
Hold		600	600	600	600	800	800	800	800	800
Trip		1200	1200	1200	1200	1400	1400	1400	1400	1400

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Motor Circuit Protectors



GJL Motor Circuit Protector

Table 3: GJL Motor Circuit Protector Ratings and Interrupting Ratings

UL 489 Recognized Component ¹				
Number of Poles				3
Rated Voltage				600Y/347 V
Rated Current	In	40°C		3–75 A
Interrupting Ratings	In com	pination with Telemeca	anique LC1 contactors and	LR2 overload relays
IEC 947-2 and EN 60947-2 Rating	js			
Number of Poles				3
Rated Insulation Voltage	Ui			750 V
Rated Impulse Withstand Voltage	Uimp			8 kV
Rated Operational Voltage	Ue		AC 50/60 Hz	690 V
Rated Current (A)	In	40°C		3–75 A
			220/240 V	100 kA
Ultimate Breaking Capacity	lcu	AC 50/60 Hz	380/415 V	65 kA
			660/690 V	6 kA
Service Breaking Capacity	lcs	(% icu)		50
Utilization Category				А

¹ Motor circuit protector is Recognized under UL file E113389 and Certified under CSA file LR 69561.

Table 4: Motor Circuit Protector Trip Ranges

Ampere Rating	Adjustable Trip Range
3	9–33 A
7	21–77 A
15	45–165 A
30	90–330 A
50	150–330 A
70	225–825 A

Mag-Loc[™] Feature



The Mag-Loc adjustment range limiter allows a user to limit the adjustment of the instantaneous-trip setting within the range of 3–11 times the rated current. Once the range has been set, replace the cover and install a cover seal to prevent tampering. This feature allows adjustment within a predefined, customized range of short-circuit protection.

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Installation and Connections

Refer to circuit breaker installation instructions before installing circuit breaker, accessories or wiring.

Fixed Mounting



Cable Connections

See page 13. Terminal covers are optional (see page 10).

Accessories

NOTE: Molded case circuit breakers contain factory-sealed and calibrated elements. The seal (hologram) must not be broken and the circuit breaker must not be tampered with. Molded case circuit breakers should not be field adjusted or repaired. In the case of a malfunction, the circuit breaker should be replaced or inspected at the factory or by an authorized representative.

Location

Internal accessories comply with requirements of Underwriters Laboratories Inc. UL 489 and Canadian Standards Association CSA C22.2 No. 5.1 Standards. All internal accessories are Listed for field installation per UL file E103955 and Certified under CSA file LR69561.



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GJL Circuit Breaker and Motor Circuit Protector Accessories

Connections



Each electrical accessory is fitted with numbered terminal blocks for wires, Maximum wire size for auxiliary switches, shunt trip or undervoltage release is 18–14 AWG (0.75–2.5 mm²).

Auxiliary circuits exit the device through a knock-out in the front cover.

Auxiliary and Alarm Switches

- Auxiliary switch (open/closed) indicates the position of the circuit breaker contacts and can thus be used for indications, electrical locking, relays, etc.
- Alarm switch (trip indication) indicates that the circuit breaker has tripped due to:
 - An overload;
 - A short circuit;
 - The operation of shunt trip or undervoltage trip or the push-to-trip button which resets when the circuit breaker is reset.
- All of the above auxiliary switches are also available in low-level versions capable of switching very low loads (e.g., for the control of PLCs or electronic circuits).
- Auxiliary switches comply with UL 489 and IEC 947-5 Standards.

Installation

- Auxiliary switch and alarm switch snap into cavities under the front accessory cover of the circuit breaker.
- One model serves both indication functions depending on where it is fitted in the circuit breaker.

Electrical Ratings

			Low-Level Switches				Regular Switches			
UL 489 and CSA C22.2 No. 5.1 Ratings										
Minimum Rating			1 mA-4 V				10 mA—24 V			
		240 V	5				6			
	50/60 Hz	480 V	5				6			
Martin Dation		600 V	—				3			
Maximum Rating		48 V	2.5				2.5			
	DC	125 V	0.8				0.8			
		250 V	0.3				0.3			
IEC 947 Ratings							•			
Rated Thermal Current		5				6				
Minimum Rating			1 mA—4 V				10 mA—24 V			
Utilization Category (IE	Utilization Category (IEC 947-4)			AC15	DC12	DC14	AC12	AC15	DC12	DC14
24		24 V	5 A	3 A	5 A	1 A	6 A	6 A	2.5 A	1 A
		48 V	5 A	3 A	2.5 A	0.2 A	6 A	6 A	2.5 A	0.2 A
		110 V	5 A	2.5 A	0.8 A	0.05 A	6 A	5 A	0.8 A	0.05 A
Operational Current 220/240 V 250 V 380/415 V		5 A	2 A	—	—	6 A	4 A	—	_	
		250 V	_	—	0.3 A	0.03 A	—	_	0.3 A	0.03 A
		380/415 V	5 A	1.5 A	—	—	6 A	3 A	—	_
		440 V	5 A	1.5 A	—	—	6 A	3 A	—	_
		660/690 V	—	—	—	—	6 A	0.1 A	—	_

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GJL Circuit Breaker and Motor Circuit Protector Accessories

Shunt Trip and Undervoltage Trip

A voltage release can be used to trip the circuit breaker via a control signal.

Undervoltage Trip

- Trips the circuit breaker when the control voltage drops below a tripping threshold
- Drops out between 35% and 70% of the rated voltage
- Circuit breaker closing is possible only if the voltage exceeds 85% of the rated voltage
- Permanent type
- When an overvoltage condition exists, operation of the closing mechanism of the circuit breaker will not permit the main contacts to touch, even momentarily

Shunt Trip

- Trips the circuit breaker when the control voltage rises above 70% of its rated voltage
- Impulse type 20 ms or maintained control signals
- AC shunt trips can be operated at 55% of their rated voltage, making them suitable for ground-fault protection when combined with a Class I ground-fault sensing element.

Operation

- The circuit breaker must be reset locally after being tripped by a shunt trip or undervoltage trip
- Undervoltage or shunt-trip tripping has priority over manual closing. In the presence of a standing trip order, such an action does not result in any closing, even temporarily, of the main contacts
- Endurance—50% of the rated mechanical endurance of the circuit breaker

Installation and Connection

- Accessories are located within the circuit breaker behind the front accessory cover
- Each terminal can be connected by one stranded copper wire 8–14 AWG (0.75– 2.5 mm²).

Electrical Characteristics

			Vac ¹			Vdc
Rated Voltage			42 48 110/130 208	220/140 277 380/415 440/480	24 48	110/125 250
Consumption	Pickup (Shunt Trip)		< 10 VA		< 5 W	
Consumption	Seal-in (Undervoltage Trip)		< 5 VA		< 5 W	
Clearing Time		< 50 ms		< 50 ms		

¹ 42 Vac rating not available on undervoltage trip.





Operating Mechanisms

Class 9422 Flange-Mounted Handle Cable Operating Mechanism



The cable operator maintains:

- Suitability for isolation
- Indication of three positions O (Off), I (On) and tripped
- · Access to push-to-test button
- · The circuit breaker may be locked in the off position by one to three padlocks
- Door can be locked closed due to interlocking features of the handle operator

Installation

Handle is mounted on flange of enclosure using specified mounting dimensions while circuit breaker and operating mechanism are mounted to inside of enclosure using two screws.

Cable lengths available in 3, 5 or 10 ft. lengths to accommodate a variety of mounting locations.

Handles available in painted NEMA 1, 3, 3R, 4 (sheet steel) and 12 ratings or chrome NEMA 4, 4x.

Class 9421 — Type L Circuit Breaker Operating Mechanisms

The Type L door-mounted, variable-depth operating mechanisms are component parts kits featuring heavy-duty, all metal construction with trip indication:

- All of the operating mechanisms can be padlocked in the OFF position when the enclosure door is open.
- The handle assemblies can be locked OFF with up to three padlocks which also lock the door shut. The 3-inch handle accepts one padlock.
- A door drilling template is supplied with each kit to ease installation.
- The component parts kits are rated for installation into NEMA 1, 3, 3R, 4, and 12 enclosures.
- All NEMA 1, 3, 3R, 4, and 12 handle assemblies are painted. The handle is flat black and the base ring is silver.
- · Complete installation instructions are included with each kit.

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Locking and Interlocking Systems

Locking Systems



Padlocking systems can receive up to three padlocks with diameters ranging from 0.19 to 0.31 in. (5 to 8 mm) (padlocks are not supplied).

Terminal Covers



Terminal covers provide protection against contact with live parts. Internal interphase barriers provide additional electrical clearances between poles. Terminal covers are sealable.

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Dimensions

GJL Circuit Breaker Dimensions

Mounting on Backplate or on Rail



Mounting on DIN Rail



Electrical Clearances



(a) Terminal shields.

3.54 90 1.77

45

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80¢08

Front Panel Cutouts



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GJL Circuit Breaker and Motor Circuit Protector Dimensions

Cable Operating Handle





Dimensions: mm



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Connections

Front Connections







Mounting on DIN Rail



Wiring Diagrams

Auxiliary Switches, Shunt Trip and Undervoltage Trip



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Trip Curves

Effect of High Temperatures

When the ambient temperature is greater than 40°C, overload protection characteristics are slightly modified. When determining tripping times using time/current curves, the Ir values corresponding to the thermal setting on the circuit breaker must be reduced using the coefficients below:

45°C	50°C	55°C	60°C	65°C	705°C
0.975	0.95	0.925	0.90	0.875	0.85

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