

What's **new** in molded case circuit breakers:

The Siemens GG circuit breaker is a compact, industrial design thermal magnetic breaker with valuable features for the global markets. These features include a design that meets multi-national standards, is suitable for DIN rail or base mounting without the need for adapters, and includes UL listed field installable accessories. The GG also has an over center toggle mechanism that is trip free and uses repulsion contact arm construction. Therefore, should a short circuit or tripping condition occur, the contacts are forced apart and the breaker cannot be held closed by means of the handle.



The New Siemens QR Circuit Breaker

Implemented in load centers, panelboards, switchboards, meter centers, and modular metering, the new QR breaker is the same form-factor/mounting as QJ breaker for easy retrofit.

Design enhancements include:

- Trip unit ratings from 100A to 250A.
- Field installable internal accessories – shunt trip, aux switch or shunt/aux combo.
- Two accessory pockets in 3-pole breakers. One accessory pocket in 2-pole breakers.
- High in-rush current capability (450%).
- Push-to-trip button.



BOD and NGB, HGB, LGB handle ties are now released for use where single pole breakers are using shared neutrals and must be locked out simultaneously.

The **Dual Function Circuit Breaker** combines GFCI and AFCI, protecting against both Arc Faults and Ground Faults. This, along with the new Self-Test & Lockout feature, makes it the first in class in electrical safety for homeowners.

- Faster Installation
- Cost savings
- Smaller Device
- Self Test & Lockout feature as required by UL 943 effective June 2015



The development of **VL Circuit Breaker enclosures** for the 150A and 250A breakers demonstrates a significant enhancement of the Siemens product offering. The fundamental objective of this family of enclosures is to reduce installation cost of the breaker, as well as reducing the space required for low amperage breaker enclosures.

Ordering

In the FD through RD frames, you may order molded case circuit breakers three basic ways:

- As separately ordered frames, trip units and lugs
- As frame, trip unit and lugs ordered as one catalog number and shipped unassembled or assembled
- As Frame and Trip Unit shipped assembled and with the trip unit made non-removable, in compliance with UL 489 requirements that to be reverse fed the circuit breaker must not have an interchangeable trip unit.

These two options are described in the following:

Components Ordered Separately

To get the components for a 3-pole, 400 Amp standard interrupting circuit breaker, you would order the frame (JD63F400), the trip unit (JD63T400) and six lugs (TA2J6500). This option is normally useful only if you stock and use large volumes of product and wish to reduce your inventory cost. You may stock, for example, a smaller number of frames (JD63F400) and a variety of trip units (JD63T300, JD63T350, etc.) and assemble breakers as you need them.

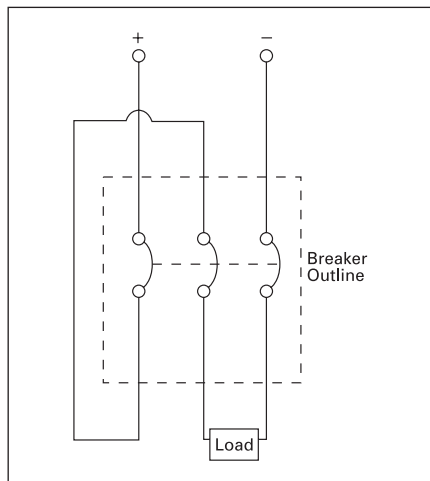
Frame, Trip Unit and Lugs Ordered Together

If you order the catalog number JD63B400, you will receive a frame, a trip unit and 6 lugs in separate packages. By suffixing this number with "L" (e.g. JD63B400L), you will receive frame, trip unit and lugs assembled in one container. Pursuant to UL 489, a product ordered thus will have the markings "LINE" and "LOAD", and may not be "reverse fed" (with power flowing from the "OFF" end of the breaker toward the "ON" end).

Non-Interchangeable Trip Breakers

If you place an "X" after the frame size designator (e.g. JXD63B400), you will receive a frame and trip unit assembled, with the trip unit made non-removable. If you suffix an "L" to this catalog number (e.g. JXD63B400L), you will receive the breaker, non-removable trip unit and lugs assembled. Unless you anticipate a specific need to change the breaker's ampere rating in the future, this is the preferred ordering method, as the products are assembled to Siemens' specifications in our factories. These breakers are suitable for use reverse fed according to UL 489, since the trip unit is not removable.

The smaller frames (QJ, ED and below) do not have removable trip units, and consequently are shipped only as assembled products. To add lugs, see the ordering instructions on each product's catalog page.

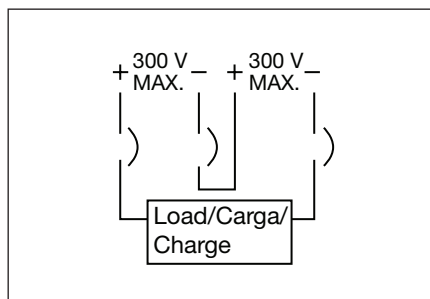


500V DC Wiring Configuration

Connecting Breakers for DC Application

Most Siemens thermal magnetic trip MCCBs are applicable on direct current (dc) systems. Generally, for 250 V dc systems a two pole breaker is used, with one pole on each leg of the supply circuit. For three pole breakers applied on 500 V undergrounded DC systems, it is important to connect the power supply "zig-zag" through the breaker as shown in the figure below. This assures that the Voltage between phases on the breaker terminals is uniformly distributed.

See below for an alternative connection diagram. For a list of Sentron breakers with the DC ratings, please refer to pages 7-11 to 7-16.



Molded Case Circuit Breakers

Federal Specification Classification

Reference

W-C-375C/GEN

Class	Interrupting Rating		Poles	Range of Current Trip [®]	Breaker Type (All Circuit Breakers Meet or Exceed the Indicated Class Level)
	Symmetrical Amperes ^①	Volts AC 60HZ			
10a ^②	5,000	120/240	1 or 2	15–100	QP, BQ, QT, BL
10b	5,000	240	2 or 3	15–100	QP, BQ, BQD, CQD, BL
11a	7,500	120	1	15–100	QP, BQ, BQD, CQD, BL
11b	7,500	240	2 or 3	15–100	QP, BQ, BQD, CQD, BL
12a ^②	10,000	120/240	1 or 2	15–100	QP, BQ, QT, ED2, BL
12b	10,000	240	2 or 3	15–225	QP, BQ, QJ2, ED2, BQD, CQD, BL
12c	10,000	277	1	15–100	BQD, CQD, NGG, NGB, NEG, NEB
13a	14,000	277	1	15–100	ED4, BQD, CQD, NGG, NGB, NEG, NEB
13b	14,000	277/480	1, 2, or 3	15–100	ED4, BQD, CQD
14a	22,000	120/240	1 or 2	15–100	QPH, BQH, BLH
14b	22,000	240	2 or 3	70–400	QJH2, QJ2-H, BQH, BQD, CQD, BLH
15a	65,000	120/240	1 or 2	15–100	HQP, HBQ, ED4, HED4, NGG, NGB
15b	65,000	240	2 or 3	15–225	ED6, ED4, FXD6, FD6, HED4, BQD, CQD, HQJ2H, NGG, NGB, NEG, NEB
16a	100,000	480	2 or 3	15–225	CFD6, CED6
16b	100,000	600	2 or 3	15–600	CED6, CFD6, CJD6, SCJD6, CLD6, SCLD6
17a	200,000	600	2 or 3	70–2000	—
18a	18,000 14,000 14,000	240 480 600	2 or 3	15–125	ED6, HED6, HHED6
19a	22,000 18,000 14,000	240 480 600	2 or 3	70–225	FXD6, FD6, CFD6, HFD6
20a	25,000 22,000 22,000	240 480 600	2 or 3	70–225	FXD6-A, FD6-A, CFD6, HFD6
21a	42,000 30,000 22,000	240 480 600	2 or 3	70–800	HFD6, CFD6, JXD6(A), JD6(A), SJD6(A), HJD(A), HJXD6(A), HHJD6, SHJD6(A), CJD6, SCJD6, LXD6(A), LD6(A), SLD6(A), HLD6(A), HLXD6(A), HHL6(A), SHLD6(A), SHLD6(A), CLD6, SCLD6, LMD6, LMXD6, HLMD6, HLMXD6, MD6, MXD6, SMD6, HMD6, HMXD6, SHMD6, CMD6, SCMD6
22a	65,000 25,000 18,000	240 480 600	2 or 3	15–125	CED6, ED6, HED6, HHED6, FXD6-A, FD6-A
23a	65,000 35,000 25,000	240 480 600	2 or 3	70–1200	HHED6, FXD6-A, FD6-A, HFD6, HHFD6, CFD6, JD6(A), JXD6(A), SJD6(A), HJD6(A), HJXD6(A), SHJD6(A), HHJD6, HHJXD6, CJD6, SCJD6, LXD6(A), LD6(A), SLD6(A), HLD6(A), HLXD6(A), SHLD6(A), HHL6(A), HHLXD6, CLD6, SCLD6, LMD6, LMXD6, HLMD6, HLMXD6, MD6, MXD6, SMD6, HMD6, HMXD6, SHMD6, CMD6, SCMD6, ND6, NXD6, SND6, HND6, HNXD6, SHND6, CND6, SCND6
24a	65,000 50,000 42,000	240 480 600	2 or 3	1200–2000	PD6, PXD6, HPD6, HPXD6, CPD6, RD6, RXD6, HRD6, HRXD6, SPD6, SHPD6
25a	125,000 80,000 60,000	240 480 600	2 or 3	600–4000	HHL6, CLD6, CMD6, CND6, SCLD6, SCMD6, SCND6, CPD6

Applicable Standards

UL489 — Molded Case Circuit Breakers and Circuit Breaker Enclosures.

UL486A — Wire Connectors and Solderless Lugs for use with copper wire

UL486B — Wire Connectors and Solderless Lugs for use with aluminum wire

UL943 — Ground Fault Interrupters (for personnel protectors)

UL1087 — Molded Case Switches

UL50 — Cabinets and Boxes

UL869 — Service Equipment

NEMA AB-1 — Molded Case Circuit Breakers and Molded Case Switches

CSA-C22.2 No. 5, C22.2 No. 14

Note:

- (A) Molded case circuit breakers are designed and tested in accordance to applicable portions of UL489 and meet application requirements of the National Electric Code. Unless marked otherwise, circuit breakers are 80% duty rated.
 (B) Molded case circuit breakers are to be connected with 60 or

75°C wire for circuit breakers having a rated ampacity of 100 amperes or less. Circuit breakers having a rated ampacity greater than 100 amperes shall only be cabled with 75°C cable unless otherwise indicated on the circuit breaker label. Exceptions to this rule are outlined in the article 110-14 C(1)(2) of the 2005 National Electric Code.

- ① Interrupting ratings are not limited to the values or groups of values listed. However, the values listed are minimum values for the class specified.
 ② Single-unit or duplex construction must be specified.
 ③ Use minimum frame size for ampere rating.

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MOLDED CASE
CIRCUIT BREAKERS

Sentron Molded Case Circuit Breakers

If used on 250A frame and above means non-interchangeable trip breaker with factory assembled frame and trip. Solid state trip and current limiting (S or C in first character) are non-interchangeable only, and the "X" is omitted.



Trip Unit Type

- Omitted – Thermal-Magnetic
- S — Sensitrip® Electronic Trip

Sentron Series Type/Interrupting Range

- Omitted – Standard Rating
- H — High IC Rating
- HH — Extra High IC Rating
- C — Highest IC Rating and Current Limiting

Frame Identifier

- E — Type ED
- F — Type FD
- J — Type JD
- L — Type LD
- LM — Type LMD
- M — Type MD
- N — Type ND
- P — Type PD
- R — Type RD

Maximum Voltage

- 2 — 240 Vac
- 4 — 480 Vac
- 6 — 600 Vac

Number of Poles

- 1
- 2
- 3
- 9 used to indicate the max. functions for an electronic trip circuit breaker (always 3 poles)

(Specific Application Type)

- B — Standard 40°C Breaker
- M — Calibrated for 50°C Application
- F — Frame Only
- T — 40°C Trip Unit Only
- W — 50°C Trip Unit Only
- S — Molded Case Switch
- L — Low Instantaneous Range ETI Breaker
- A — Standard Range ETI Breaker
- H — High Instantaneous Range ETI Breaker

Maximum Continuous Current Rating

- ED Frame — 015, 020, 025, 030, 035, 040, 045, 050, 060, 070, 080, 090, 100, 110, 125
- FD Frame — 070, 080, 090, 100, 110, 125, 150, 175, 200, 225, 250
- JD Frame — 200, 225, 250, 300, 350, 400
- LD Frame — 250, 300, 350, 400, 450, 500, 600
- LMD Frame — 500, 600, 700, 800
- MD Frame — 500, 600, 700, 800
- ND Frame — 900, 100 (1000A), 120 (1200A)
- PD Frame — 120 (1200A), 140 (1400A), 160 (1600A)
- RD Frame — 160 (1600A), 180 (1800A), 200 (2000A)

Suffix

- L — where applicable indicates a breaker shipped with line/loads lugs installed
- A — used with a switch to show automatic self protection
- Y — 400 Hertz
- H — 100% rated
- P — Load side lugs only
- NAV — Navel Ratings

NOTE:

- Position omitted if not used.

Molded Case Circuit Breakers

LD 600A Frame Sentron Series

Selection

Type LXD6-A ^{①④}			Blue Label	
Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)				
Continuous Current Rating @ 40°C	2-Pole (3-Pole Width)		3-Pole	
	600V AC	250V DC	600V AC	500V DC
	Catalog Number		Catalog Number	
450	LXD62B450■		LXD63B450	
500	LXD62B500■		LXD63B500	
600	LXD62B600		LXD63B600	

Type LD6-A ^④			Blue Label	
Interchangeable Trip				
Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs	Frame Only	Trip Unit Only	
	Catalog Number	Catalog Number	Catalog Number	
2-Pole 600V AC, 250V DC (3-Pole Width)				
250	LD62B250■	LD62F600	JD62T250■	
300	LD62B300■		JD62T300■	
350	LD62B350■		JD62T350■	
400	LD62B400		JD62T400	
450	LD62B450■		LD62T450■	
500	LD62B500■		LD62T500■	
600	LD62B600		LD62T600	

3-Pole 600V AC, 500V DC^②				
250	LD63B250	LD63F600	JD63T250	
300	LD63B300		JD63T300	
350	LD63B350		JD63T350	
400	LD63B400		JD63T400	
450	LD63B450		LD63T450	
500	LD63B500		LD63T500	
600	LD63B600		LD63T600	

Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (KA)										
	UL 489 AIR (File E10848)					IEC 947-2					
	Volts AC (50/60Hz)			Volts DC		Volts AC (50/60Hz)					
	240	480	600	250	500 ^③	220/240		380/415		500	
					(lcu)	(lcs)	(lcu)	(lcs)	(lcu)	(lcs)	
LD6-A, LXD6-A	65	35	25	30 (2-P)	25 (3-P)	65	33	40	20	—	—
HLD6-A, HLXD6-A	100	65	35	30 (2-P)	35 (3-P)	100	50	65	33	—	—
HHL6, HHLXD6	200	100	50	—	—	—	—	—	—	—	—
CLD6-A	200	150	100	—	50 (3-P)	—	—	—	—	—	—

Instantaneous Adjustment Trip Range

Breaker Ampere Rating	Nominal Instantaneous Values							
	±20% Tolerance Low	2	3	4	5	6	7	±20% Tolerance High
250-300	1250	1430	1610	1790	1960	2140	2320	2500
350-450	2000	2290	2570	2860	3140	3430	3710	4000
500-600	3000	3430	3800	4290	4710	5140	5570	6000

■ Built to order. Allow 2-3 weeks for delivery.

① Type LXD6A circuit breakers are UL Listed for reverse fed applications.

② When wired as shown on page 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

③ See Note: A, page 7-88.

④ HACR rated.

Note: LD frame qualified to UL489 supplement SB "NAVAL". See page 7-91 for additional information.

Modifications page 7-91
Enclosures Section 6
Accessories pages 7-58 and 7-95 to 7-100

Ordering Information

Complete Breaker Unassembled with Lugs

Prices of LD6, HLD6, and HHL6 breakers include frame, trip, and both line and load lugs (TA2J6500). When ordered by these catalog numbers, the customer will receive the frame, trip and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

Complete Breaker Assembled with-out Lugs

Prices of LXD6, HLXD6, HHLXD6, and CLD6 include frame with non-interchangeable trip unit installed only. Order required lugs separately. For line and load lugs (TA2J6500) installed, add suffix "L" to catalog number (add 2 times list price of lugs for each pole).

100% Rated (3-pole only)

Types LXD6 and HLXD6 breakers are available with 100% ratings. To order add suffix "H" to catalog number, and 10% to list price. 100% rated LD breakers require the use of 90°C Cu cable sized at 75°C ampacity and lugs TC1J6600 or TC2J6500.

50°C Applications see page 7-91.

400Hz Applications see page 7-91.

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
LXD6, LD6, HLD6, HHL6 Assembled Breaker (less terminals)		
2	1	17.5
3	1	19.5
LD6, HLD6, HHL6 Frame Only		
2	1	14
3	1	15.5
LD6, HHL6 Trip Unit Only		
2	1	3.5
3	1	4
CLD6 Complete Assembled Breaker (less terminals)		
3	1	31.5

Lugs For 75°C Wire^③

Catalog Number	Cables per Lug	Wire Range
TA2J6500	1, 2	#3/0 500 kcmil Cu #4/0 500 kcmil Al
TC2J6500	2	#3/0-500 kcmil Cu
TA1L6750	1	500-750 kcmil Al
TC1J6600	1	500-600 kcmil Cu
Compression Lug		
CCL600	1	500 kcmil Cu/Al