

ITE® Molded Case Circuit Breakers

LMD Frame
Information and
Instruction Guide



General Information

General

LMD-Frame Sentron Series Circuit Breakers are used in individual enclosures, switchboards and panelboards. They are available as thermal magnetic with interchangeable trip units (Type LMD6 and HLMD6), thermal magnetic with non-interchangeable trip units (Type LMXD6 and HLMXD6), instantaneous magnetic only (motor circuit protectors, Type LMXD6-ETI) and molded case switches (Type LMXD6).

Pressure wire connectors, suitable for use with aluminum or copper wire are available for all LMD-Frame circuit breakers. Rear connection stud assemblies are also available for both 2 and 3 pole constructions. This assembly permits cable or bus connections to be terminated behind the circuit breaker rather than to terminal connectors mounted on the breaker terminal pads. UL listed field addable accessories such as shunt trips, undervoltage devices, auxiliary switches and bell alarm switches are also available. The installation of all accessories should be done only by qualified personnel. Information concerning all accessories can be found on pages 17-20 and 35.

Thermal Magnetic

LMD6, LMXD6[Ⓢ] HLMD6 and HLMXD6[Ⓢ] type circuit breakers provide complete overload and short circuit protection by use of a time delay thermal trip element and an instantaneous magnetic trip device. Nominal instantaneous trip values are externally adjustable with the 8 trip points as shown below.

Instantaneous Adjustment Trip Range

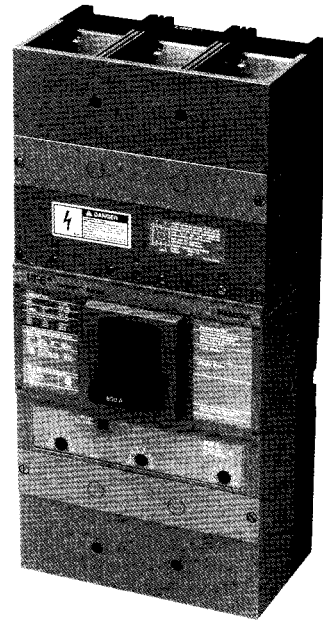
Nominal Instantaneous Values

Ampere Ratings	± 25%							± 20% Tolerance High
	Tolerance Low	2	3	4	5	6	7	
500-600	3000	3430	3860	4290	4710	5140	5570	6000
700-800	3200	3500	3700	4200	4700	6400	7300	8000

Circuit Breakers are calibrated at the factory, under controlled temperature conditions for applications at 40°C (104°F) ambient to meet requirements as outlined in UL 489 (Molded Case Circuit Breakers and Circuit Breaker Enclosures) Standard. The cover on the trip unit is sealed to prevent access to the trip elements. Alterations of the calibration of these elements should not be attempted. Removal of the special sealed line cover voids any warranties related to this product as well as voiding of the UL listing. Product catalog number information can be located on pages 34 thru 36.

Molded Case Switch

A molded case switch is available in the LMXD6 type circuit breaker. This device employs the same operating mechanism as the thermal magnetic and magnetic only circuit breakers. A preset instantaneous function is factory installed to allow the switch to trip and protect itself at a high fault level. This level is approximately 8000 amperes. No overload or low fault



current protection is provided. This switch must be protected by a fuse or a molded case circuit breaker of equal ampere rating. When protected by a fuse or circuit breaker, the switch is suitable for use on a circuit capable of delivering not more than:

65,000A	RMS Symmetrical	@ 240 Volts AC
50,000A	RMS Symmetrical	@ 480 Volts AC
25,000A	RMS Symmetrical	@ 600 Volts AC

Interrupting Ratings – Symmetrical RMS Amperes (kA) Based on UL 489 Standards

The interrupting ratings of the LMD-Frame circuit breakers are based on circuits adjusted to the short circuit (at specified voltage) before insertion of the circuit breaker.

Also shown is IEC 947-2 interruption rating information.

Interrupting Ratings Based on UL 489 Standards UL File #10848

Breaker Type	RMS Symmetrical Amperes (kA)										
	UL A.I.R.					IEC A.I.R.					
	Volts AC			Volts DC		Volts AC (50/60 Hz)					
	240	480	600	250	500	220/240		380/415		500	
						(Icu)	(Ics)	(Icu)	(Ics)	(Icu)	(Ics)
LMD6, LMXD6	65	50	25	30 (2-P)	25 (3-P)	65	33	40	20	30	15
HLMD6, HLMXD6	100	65	50	30 (2-P)	50 (3-P)	100	50	65	33	42	21

[Ⓢ]Types LMXD6 and HLMXD6 are UL listed for reverse connection applications.

General Information

Instantaneous Trip

ETI motor circuit interrupter, type LMXD6 (adjustable instantaneous magnetic trip only) are designed for use in welding circuits, motor circuits and combination starters as a disconnecting means and for short circuit protection. They should be used in conjunction with motor-running, over-current protection devices, and should permit the motor to start without nuisance tripping from motor in-rush current. The circuit breaker should have a continuous current rating established in accordance with requirements outlined within the NEC.

The instantaneous settings indicated in the following table are based on information found in Article 430 of the NEC. Use of this information does not infer conformance with the NEC and/or local coding authority.

Table established using 1100% of FLC. Maximum setting should be no greater than 1300% for non-E motor design and no greater than 1700% for E motor design. (This table for AC motors only)

Base on NEC Requirements Settings No Greater Than 1300% of FLC

FLC	Cat. No.	ADJ.	Amps
215-238	LMXD62L800 LMXD63L800	LOW	2800
238-261		2	3100
261-284		3	3400
284-308		4	3700
308-369		5	4000
369-423		6	4800
423-462		7	5500
462-490		HIGH	6000
246-269	LMXD62A800 LMXD63A800	LOW	3200
269-284		2	3500
284-323		3	3700
323-362		4	4200
362-492		5	4700
492-562		6	6400
562-616		7	7300
616-660		HIGH	8000

Use of this table should always be done in accordance to the NEC requirements to allow for short circuit protection as well as the ability to overcome motor current in-rush during the starting period.

Circuit Breaker Operation

With the mechanism latched and the contacts open, the operating handle will be in the OFF position. Moving the handle to the ON position closes the contacts and establishes a circuit through the breaker. Under overload or short circuit conditions sufficient to automatically trip or open the breaker, the operating handle moves to a position between ON and OFF. To relatch the circuit breaker after automatic operation, move the operating handle to the extreme OFF position. The circuit breaker is now ready for reclosing.

The overcenter toggle mechanism is trip free of the operating handle. The circuit breaker, therefore, cannot be held closed by means of the handle should a tripping condition exist. After automatic operation, the handle assumes an intermediate position between ON and OFF, displaying a clear indication of tripping.

Maintenance

Experience has shown that properly applied molded case circuit breakers normally do not require maintenance. However, some industrial users may choose to establish an inspection and maintenance procedure to be carried out on a regular basis. For detailed information, consult applicable NEMA publications or your local Siemens sales office.

SPECIAL NOTE:

LMXD6, HLMXD6 circuit breakers are not UL listed as interchangeable trips—DO NOT REMOVE TRIP UNIT and replace with another. Removal of trip unit voids UL listing.

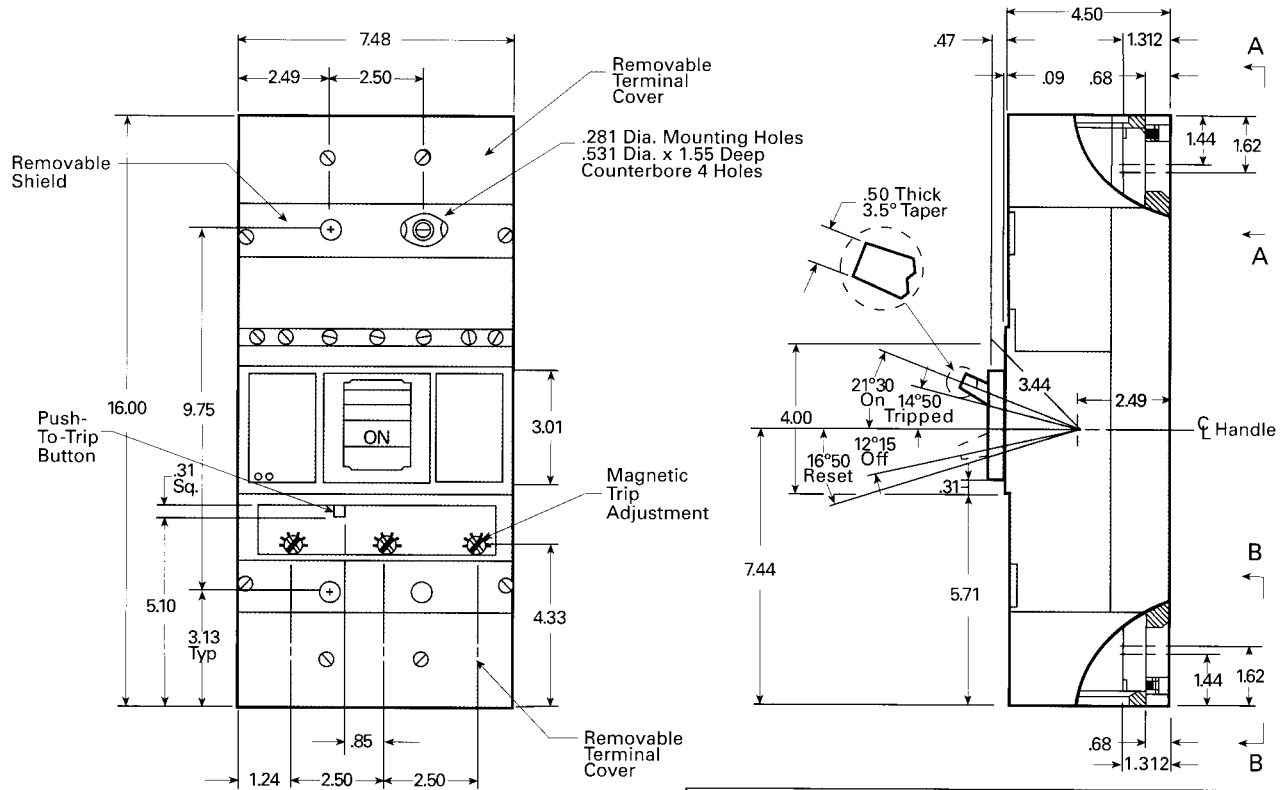
LMXD6, HLMXD6 type circuit breakers are UL listed for reverse connection applications.

Operating Forces (In Lbs.)

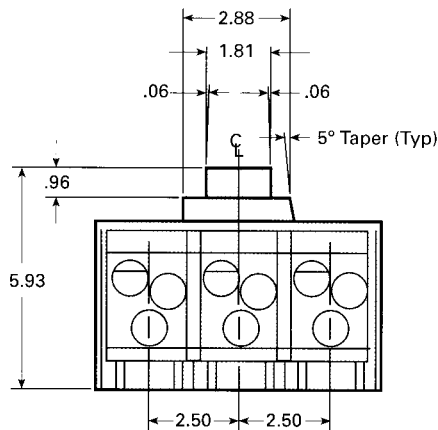
Operating Action	Pounds
OFF to ON	22
ON to OFF	36
TRIPPED to RESET	48

LMD-Frame Outline Dimension Drawings

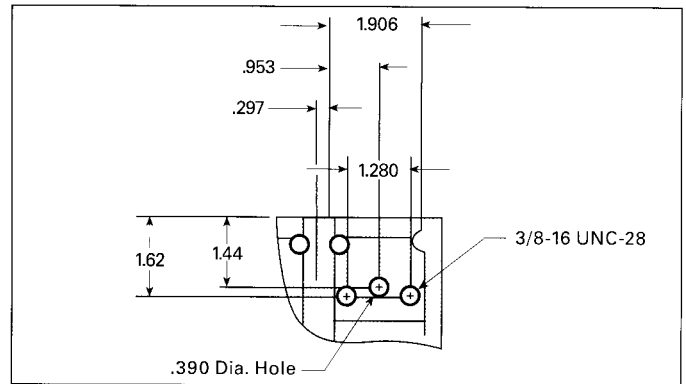
Types LMD6, LMXD6, HLMD6, HLMXD6, LMXD6-ETI, HLMXD6-ETI



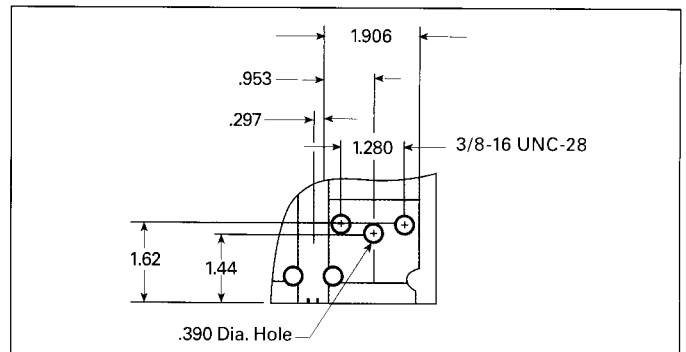
Front View



End View



Section AA (Side View)



Section BB (Side View)

NOTE: 2 and 3 pole breakers are the same physical size. Current carrying parts are omitted from the center pole for 2 pole configurations.

Pressure Wire Connectors



⚠ DANGER

Hazardous Voltage.
Will cause death or severe injury.

Turn power off supplying switchboard or panel before installing.



Safety Instructions

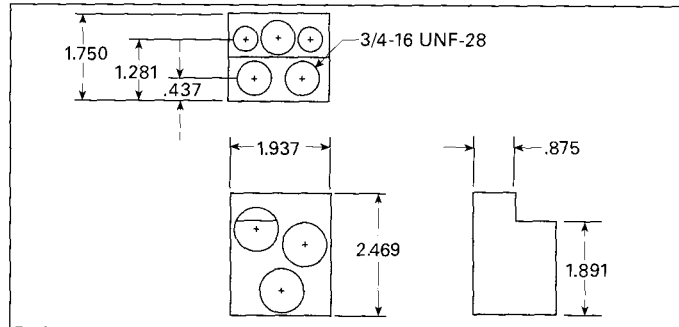
General

Each connector kit contains a solderless connector and associated hardware for making one line or load connection.

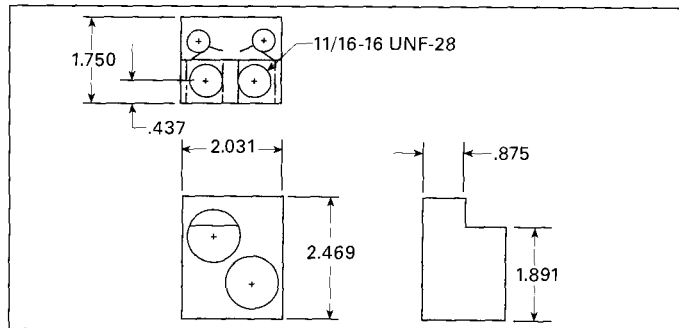
Installation

NOTE: Trip unit must be installed in circuit breaker prior to mounting load end connector.


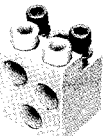

- Tighten mounting screws to securely attach connector. See table for torque values.
- Tighten set screws securely to prevent overheating of conductor and connector. See table for torque values.



TA3K500 Terminal Connector

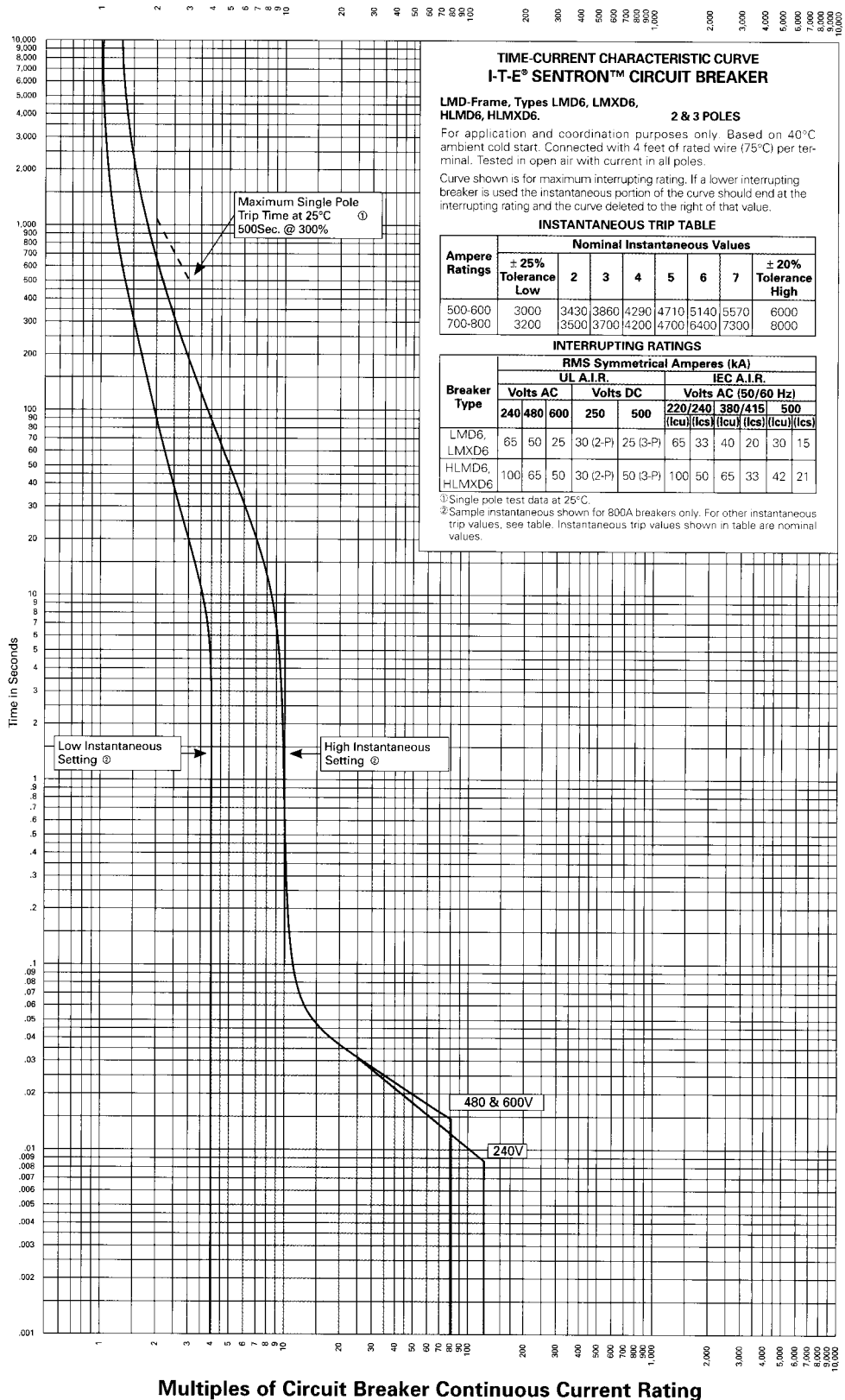


TA2N750 Terminal Connector

Connector Catalog Numbers	Circuit Breaker Ampere Rating	Connector Wire Range	Set Screw Torque	For Use With Type(s)
 TA2K500	500-600	(1-2) #1 AWG-500 kcmil (Cu/Al)	375 in-lbs.	LMD6, LMXD6, HLMD6, HLMXD6
 TA3K500	500-800	(1-3) #1 AWG-500 kcmil (Cu/Al)	375 in-lbs.	LMD6, LMXD6, HLMD6, HLMXD6
 TA2N750	500-800	(2) 600-750 kcmil (Cu/Al)	375 in-lbs.	LMD6, LMXD6, HLMD6, HLMXD6

LMD-Frame Time Current Curve

Types 800A LMD6, LMxD6, HLMD6, HLMxD6

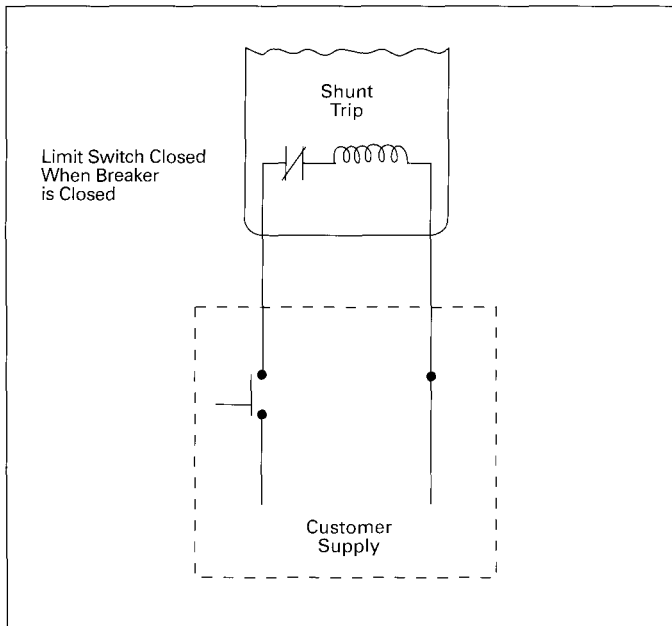


Shunt Trip and Undervoltage Trip

Electrical Check

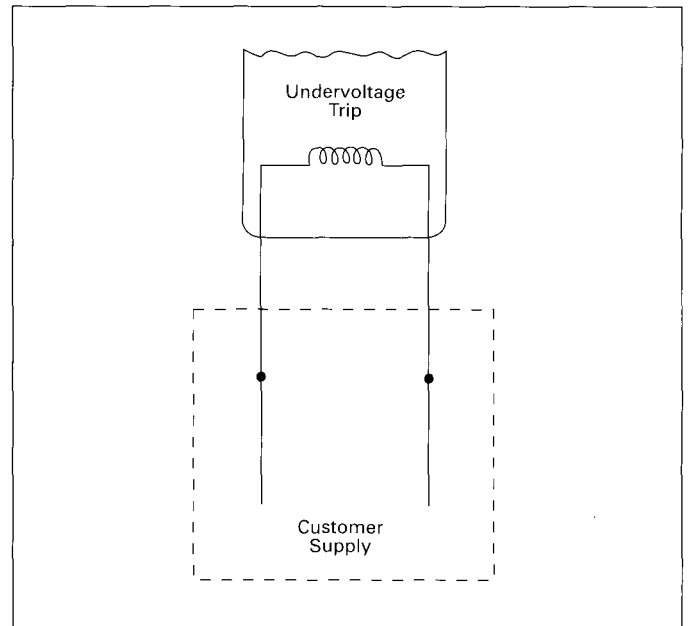
Shunt Trip

- Reset and turn circuit breaker ON.
- Attach test circuit to accessory leads. When the test voltage reaches 55 percent or more of the rated coil voltage, the circuit breaker should trip.
- With breaker TRIPPED or OFF, check to make sure coil circuit has opened.



Undervoltage Trip

- With breaker in TRIPPED position, connect test circuit to accessory leads. Energize undervoltage trip device at 85 percent of the marked rated voltage of the coil. Reset and turn breaker handle ON.
- Reduce voltage to 35 percent of rated coil voltage. Circuit breaker must trip.



Electrical Data For Shunt Trip

Coil Voltage	Inrush Current At Rated Voltage (Amperes)	Catalog Number
60 Cycles AC		
24	1.2	S17JLD6
48	0.8	S18JLD6
120	0.395	S01JLD6
208	0.265	S02JLD6
240	0.165	S03JLD6
277	0.190	S15JLD6
480	0.145	S04JLD6
600	0.080	S06JLD6
DC		
12	4.6	S16JLD6
24	2.2	S07JLD6
48	1.2	S09JLD6
125	0.5	S11JLD6
250	0.35	S13JLD6

Electrical Data For Undervoltage (UV) Trip^②

Coil Voltage	Sealed-In Current At Rated Voltage (Amperes)	Catalog Number	
		1 UV Trip Plus 1 Aux. Sw.	1 UV Trip Only
60 Cycles AC			
120	.03	U01JLD62A	U01JLD6
208	.018	U02JLD62A	U02JLD6
240	.016	U03JLD62A	U03JLD6
277	.013	U16JLD64A	U16JLD6
480	.008	U06JLD64A	U06JLD6
600 ^③	.008	N/A	U08JLD6
DC			
24	.11	U13JLD62A	U13JLD6
48	.06	U14JLD62A	U14JLD6
125	.027	U10JLD62A	U10JLD6
250 ^④	.02	U12JLD62A	U12JLD6

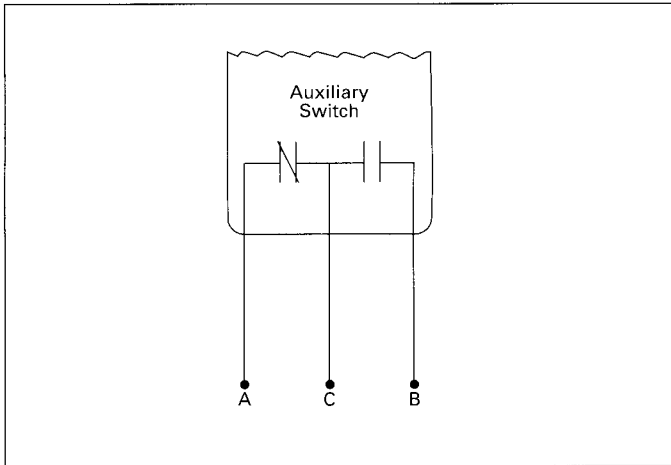
- ① Resistor to be mounted externally of circuit breaker and connected by installer.
- ② All auxiliary switch ratings are the same as auxiliary switch kit A01FD64.
- ③ Kit includes a 30k ohm, 25 watt resistor (Clarostat Cat. No. VP-25-K or equivalent).
- ④ Kit includes a 2.5k ohm, 25 watt resistor (Clarostat Cat. No. VP-25-K or equivalent).

Auxiliary Switch and Bell Alarm Switch

Electrical Check

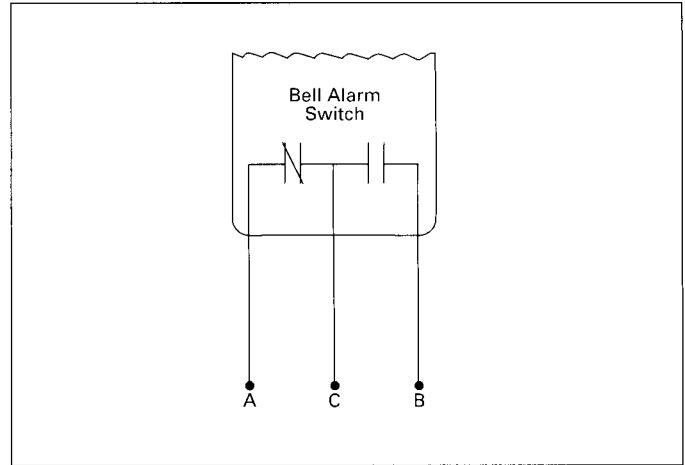
Auxiliary Switch Kits

Catalog Number	Number of Switches	Ampere Rating of Switch				
		Volts AC			Volts DC	
		120	240	480	125	250
A01JLD64	1	10	10	10	0.5	0.25
A02JLD64	2	10	10	10	0.5	0.25



Bell Alarm Switch Kits

Catalog Number	Number of Auxiliary Switches	Ampere Rating of Switch				
		Volts AC			Volts DC	
		120	240	480	125	250
B01JLD64	0	10	10	10	.5	.25
A01JLD64B	1	10	10	10	.5	.25
A02JLD64B	2	10	10	10	.5	.25



Switch Identification (All With Three Leads)

Wire Markings	Wire Color	Switch Terminals or Contacts
C or C1	White	C - Common terminal
A or A1	Black	NO - Contact open when breaker is open, closed when breaker is closed.
B or B1	Red	NC - Contact closed when breaker is open, open when breaker is closed.

Accessory units that employ a combination will have the same wiring colors or identifiers. A double auxiliary switch combination will use wiring markings A-A1, B-B1 and C-C1.

Auxiliary Switch ①

- Use a buzzer or light indicator attached to switch leads A and C. With breaker in ON position, a light or buzzing noise should be observed.
- Move handle to OFF position. Indicator light or buzzer should turn off.
- Attach test to leads B and C. Light or buzzer should turn on.
- Repeat Steps A through C using leads A1, B1 and C1.
- Move handle to ON position. Indicator light or buzzer should turn off.

① Should the indicator not function properly during "check" procedure, check for incorrect installation or wiring.

Bell Alarm Identification (All With Three Leads)

Wire Markings	Wire Color	Switch Terminals or Contacts
C	White	C - Common terminal
A	Yellow	NC - Normally closed contact (Closed when circuit breaker is tripped.)
B	Brown	NO - Normally open contact (Open when circuit breaker is tripped.)

Bell Alarm Switch ①

- Use a buzzer or light indicator attached to switch leads A and C. With breaker in ON position, trip breaker by depressing red trip button. Indicator light or buzzer should operate.
- Reset breaker to OFF. Indicator light or buzzer should turn off.
- Move breaker handle to ON. Indicator light or buzzer should remain off.

Siemens Energy & Automation, Inc.
Power Distribution & Controls Division
3333 Old Milton Parkway
Alpharetta, GA 30005

For Nearest Sales Office
1-800-964-4114 or 800-241-4453
[www.sea.siemens.com/
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