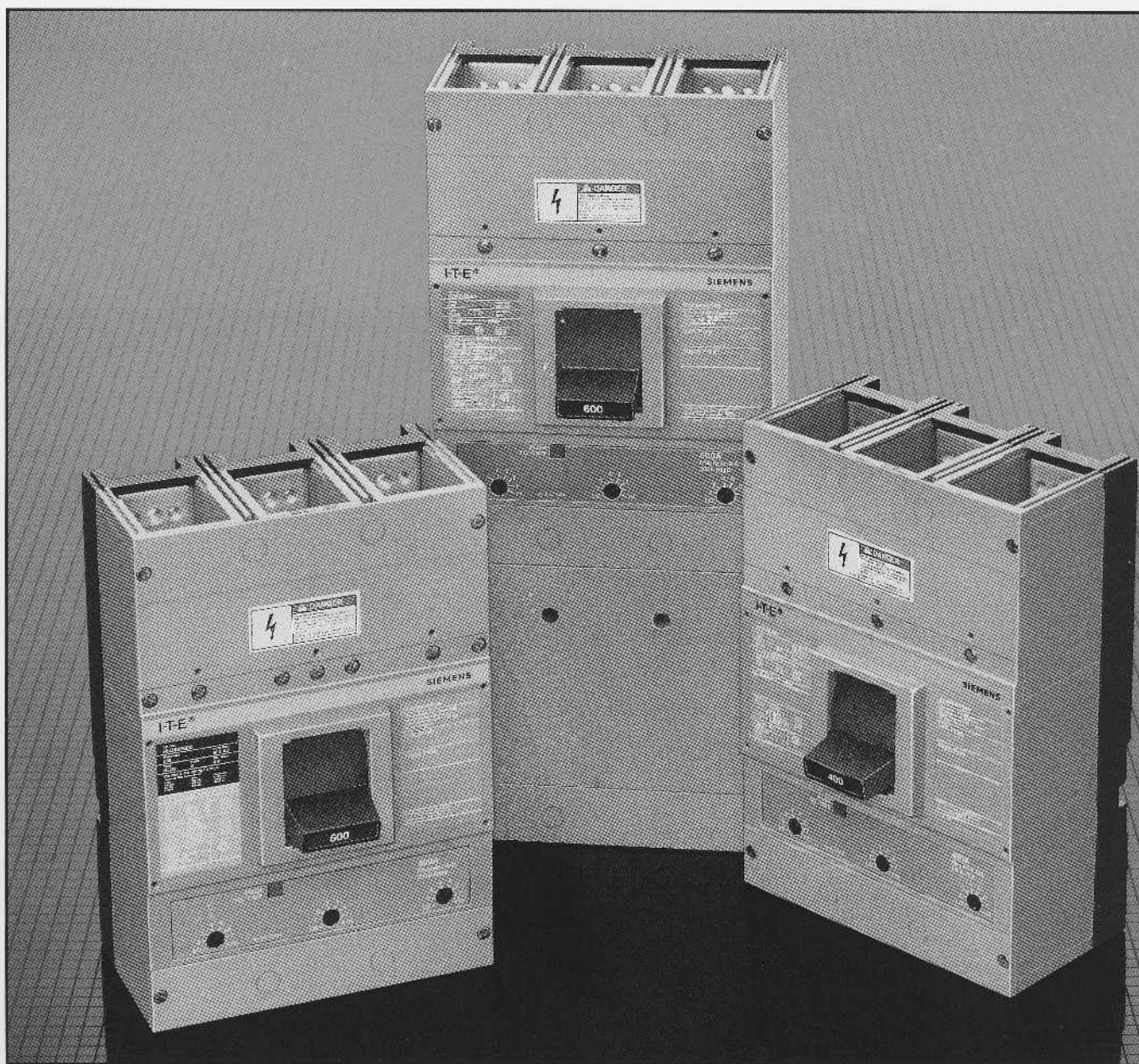


# SIEMENS

## Molded Case Circuit Breakers

JD & LD Frame  
Information and  
Instruction Guide



# Information and Instructions

## General Information

### General

JD and LD-Frame Sentron™ Series Circuit breakers, as shown on pages 5 and 6, are for use in individual enclosures, switchboards and panelboards. They are available as thermal magnetic with interchangeable trip units (types JD6(-A), HJD6(-A), HHJD6, LD6(-A), HLD6(-A), HHLD6), thermal magnetic with non-interchangeable trip units (types JXD2(-A), JXD6(-A), HJXD6(-A), HHJXD6, LXD6(-A), HLXD6(-A), HHLXD6), current limiting with non-interchangeable trip units (types CJD6 and CLD6) instantaneous magnetic trip only (motor circuit protectors – types JXD6-ETI, LXD6-ETI, CJD6-ETI, CLD6-ETI) and molded case switches (types JXD2, JXD6, LXD6, CJD6, CLD6). For 100 percent applications see pages 46 thru 50.

CJD6 and CLD6 circuit breakers combine thermal magnetic construction for overload protection and an additional set of "blow-apart" contacts in conjunction with the Sentron Series standard "blow-apart" contacts. This arrangement provides for current limiting protection under high fault interrupting conditions as outlined in the National Electric Code, Article 240-11<sup>①</sup> and UL 489<sup>②</sup> standards. CJD6 and CLD6 circuit breakers are fuseless and therefore require no blown fuses to be located and replaced should a high current fault occur. The common trip feature of the circuit breaker is completely retained so that all poles of the circuit breaker open when caused to trip due to an overload or short circuit.

Pressure wire connectors, suitable for use with aluminum or copper wire, are available for all JD and LD-Frame circuit breakers. Rear connection studs or plug-in connector assemblies are also available (2 and 3-pole). The latter mounting arrangement permits removal of the circuit breaker from a circuit without removing wiring leads. Special features such as a shunt trip, auxiliary and alarm switches and undervoltage trip devices are available for field adaptation. The installation and removal of these devices is to be accomplished by qualified personnel only. These devices are mounted internally and Underwriters Laboratories listed, page 53. Information concerning these special devices is found on pages 26-29 and 51.

### Thermal Magnetic

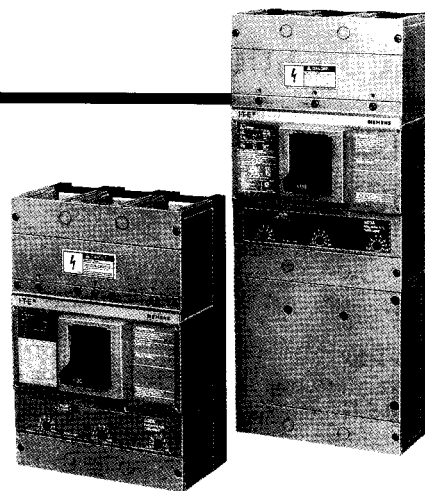
JXD2(-A), JD6(-A), JXD6(-A), HJD6(-A), HJXD6(-A), HHJD6, HHJXD6, CJD6, LD6(-A), LXD6(-A), HLD6(-A), HLXD6(-A), HHLD6, HHLXD6, CLD6 type circuit breakers provide complete overload and short circuit protection when applied within their design parameters. Overload and short circuit tripout is accomplished by time-delay thermal trip elements and instantaneous magnetic trip devices. Nominal instantaneous trip values are externally adjustable with eight trip points as shown at the top of the next column.

<sup>①</sup> National Electric Code (240-11)

"A current limiting overcurrent protective device, which, when interrupting currents in its current limiting range, will reduce the current flowing in the faulted circuit to a magnitude substantially less than that obtainable in the same circuit, if the device were replaced with a solid conductor having comparable impedance."

<sup>②</sup> Underwriters Laboratories (UL 489, Par. 2.5)

"A circuit breaker that does not employ a fusible element and that when operating within its current limiting range, limits the let-through  $I^2t$  to a value less than the  $I^2t$  of a 1/2 cycle wave of the symmetrical prospective current."



Breaker Ampere Rating	Nominal Instantaneous Values							
	Low	2	3	4	5	6	7	High
200-300	1250	1430	1610	1790	1960	2140	2320	2500
350-450	2000	2290	2570	2860	3140	3430	3710	4000
500-600	3000	3430	3860	4290	4710	5140	5570	6000

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 Standard for molded case circuit breakers. 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 the Underwriters Laboratories, Inc. listing for that specific circuit breaker. Catalog information is located on pages 46-50.

### Molded Case Switch

A molded case switch is available in the JXD2, JXD6, LXD6, CJD6, CLD6 type circuit breakers. This device employs the same operating mechanism as the thermal magnetic and magnetic only units. A preset instantaneous function is factory installed to allow the switch to trip and protect itself at a high fault condition. No overload or low fault current protection is provided. This protection must be supplied by separate overcurrent devices. Catalog information is located on pages 46-50.

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

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

Breaker Type	RMS Symmetrical Amperes (kA)									
	UL A.I.R. kA					IEC A.I.R. kA				
	Volts AC			Volts DC		Volts AC (50/60 Hz)				
	240	480	600	250	500	220/240 (lcs)	380/415 (lcs)	500 (lcs)	500 (lcs)	500 (lcs)
JXD2(-A)	65	—	—	30(2-P)	—	—	—	—	—	—
JD6(-A), JXD6(-A) LD6(-A), LXD6(-A)	65	35	25	30(2-P)	25(3-P)	65	33	40	20	30
HJD6(-A) HLD6(-A) HJXD6(-A) HHLXD6(-A)	100	65	35	30(2-P)	35(3-P)	100	50	65	33	42
HHJD6, HHLD6	200	100	50	—	—	200	100	100	50	65
CJD6 CLD6	200	150	100	30(2-P)	50(3-P)	200*	150*	—	—	—

\*Meets IEC 157-P1 Interruption levels

# Information and Instructions

## Operation and Maintenance

### Instantaneous Trip

ETI motor circuit interrupters, types JXD6-ETI, LXD6-ETI, CJD6-ETI, CLD6-ETI (adjustable instantaneous magnetic trip only) are designed for use in welding circuits, motor circuits and combination starters where short circuit protection only is required. When used in combination starters, they serve in conjunction with motor protective relays to offer complete protection. The relays guard against motor overloads and the circuit breaker provides short circuit protection. Catalog information is located on page 50.

### Instantaneous Trip Adjustments

Motor Full Load Amperes	ETI Trip Setting <sup>①</sup>		Ampere Rating
	Adjustment	Amperes	
95-110	Low	1250	400 Low JXD62L400 JXD63L400 CJD62L400 CJD63L400
110-124	2	1430	
124-138	3	1610	
138-151	4	1790	
151-165	5	1960	
165-178	6	2140	
178-192	7	2320	
192-227	High	2500	400 Standard JXD62H400 JXD63H400 CJD62H400 CJD63H400
154-176	Low	2000	
176-198	2	2290	
198-220	3	2570	
220-242	4	2860	
242-264	5	3140	
264-285	6	3430	
285-308	7	3710	600 Low LXD62L600 LXD63L600 CLD62L600 CLD63L600
308-326	High	4000	
155-176	Low	2000	
176-198	2	2290	
198-220	3	2570	
220-242	4	2860	
242-264	5	3140	
264-285	6	3430	600 Standard LXD62H600 LXD63H600 CLD62H600 CLD63H600
285-308	7	3710	
308-326	High	4000	
231-264	Low	3000	
264-292	2	3430	
292-330	3	3800	
330-362	4	4290	
362-395	5	4710	
395-428	6	5140	
428-462	7	5570	
462-490	High	6000	

① All values calibrated within guidelines of UL 489.

The instantaneous settings indicated are based on 11 times full load motor current – use of this table must take into consideration that any setting should be done in accordance with applicable sections of the NEC to assure proper short circuit protection as well as the ability to allow the motor to start without nuisance tripping.

### 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:

JXD2(-A), JXD6(-A), HJXD6(-A), LXD6(-A), HLXD6(-A), CJD6, CLD6 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.

JXD2(-A), JXD6(-A), HJXD6(-A), LXD6(-A), HLXD6(-A), type circuit breakers are UL listed for reverse connection applications.

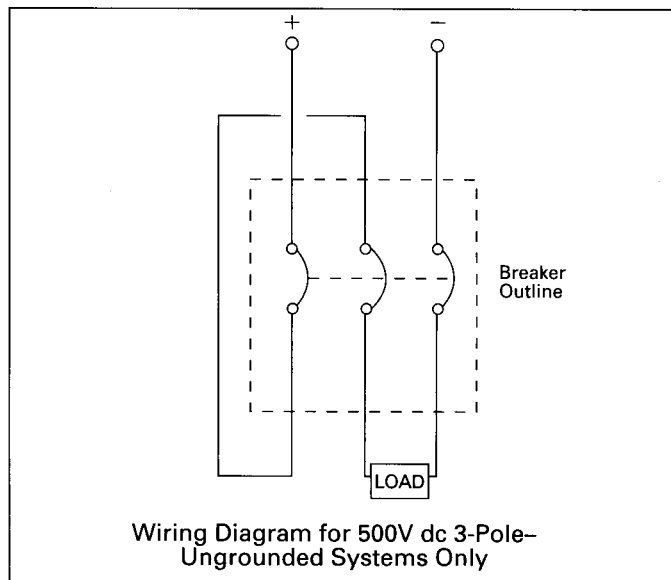
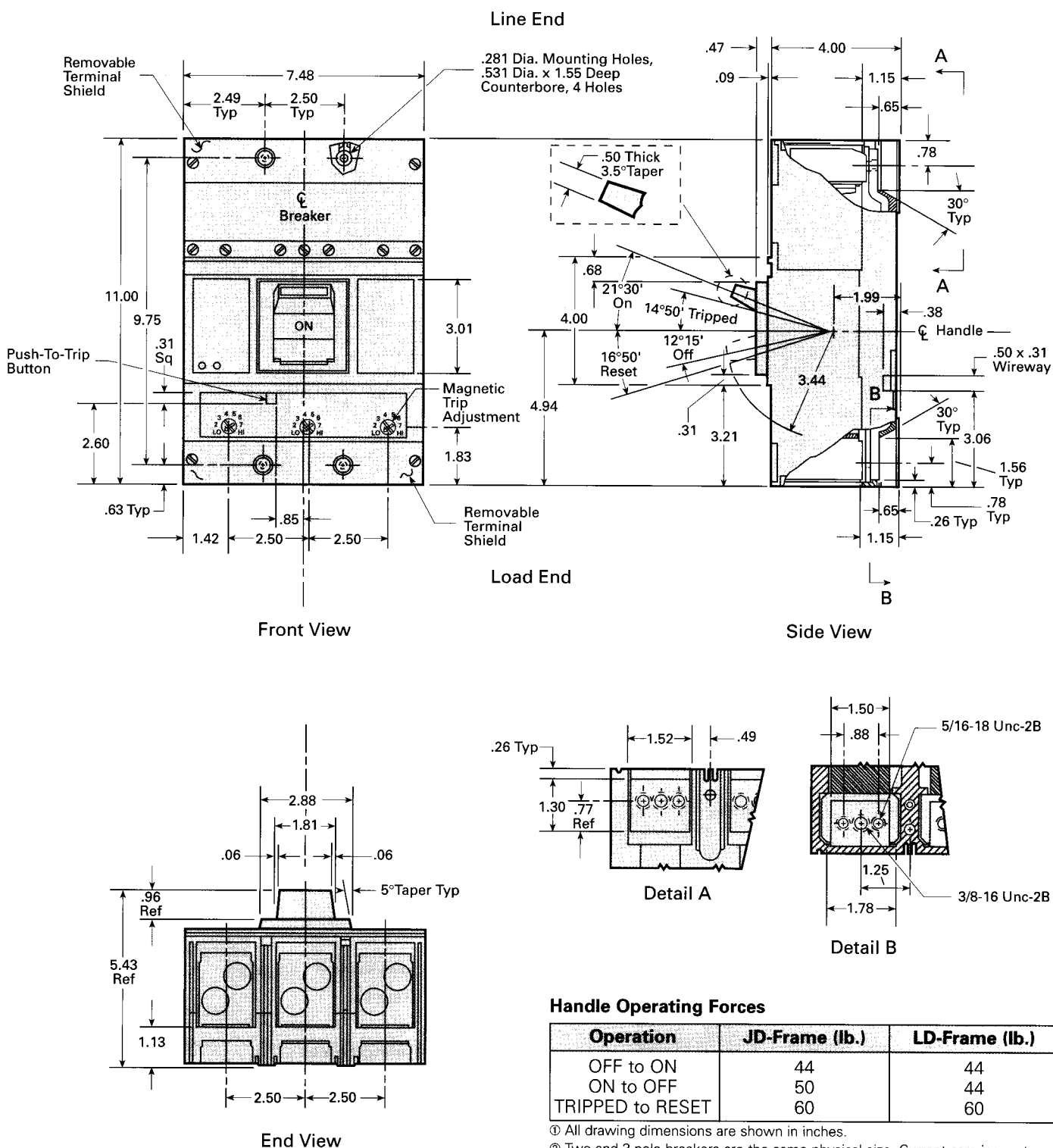


Figure 1

# JD and LD-Frame Outline Drawings<sup>①</sup>—2 and 3 Pole<sup>②</sup>

Types JXD2(-A), JD6(-A), JXD6(-A), HJD6(-A), HJXD6(-A), HHJD6, HHJXD6, LD6(-A), LXD6(-A), HLD6(-A), HLXD6(-A), HHLD6, HHLXD6, JXD6-ETI, LXD6-ETI



## Handle Operating Forces

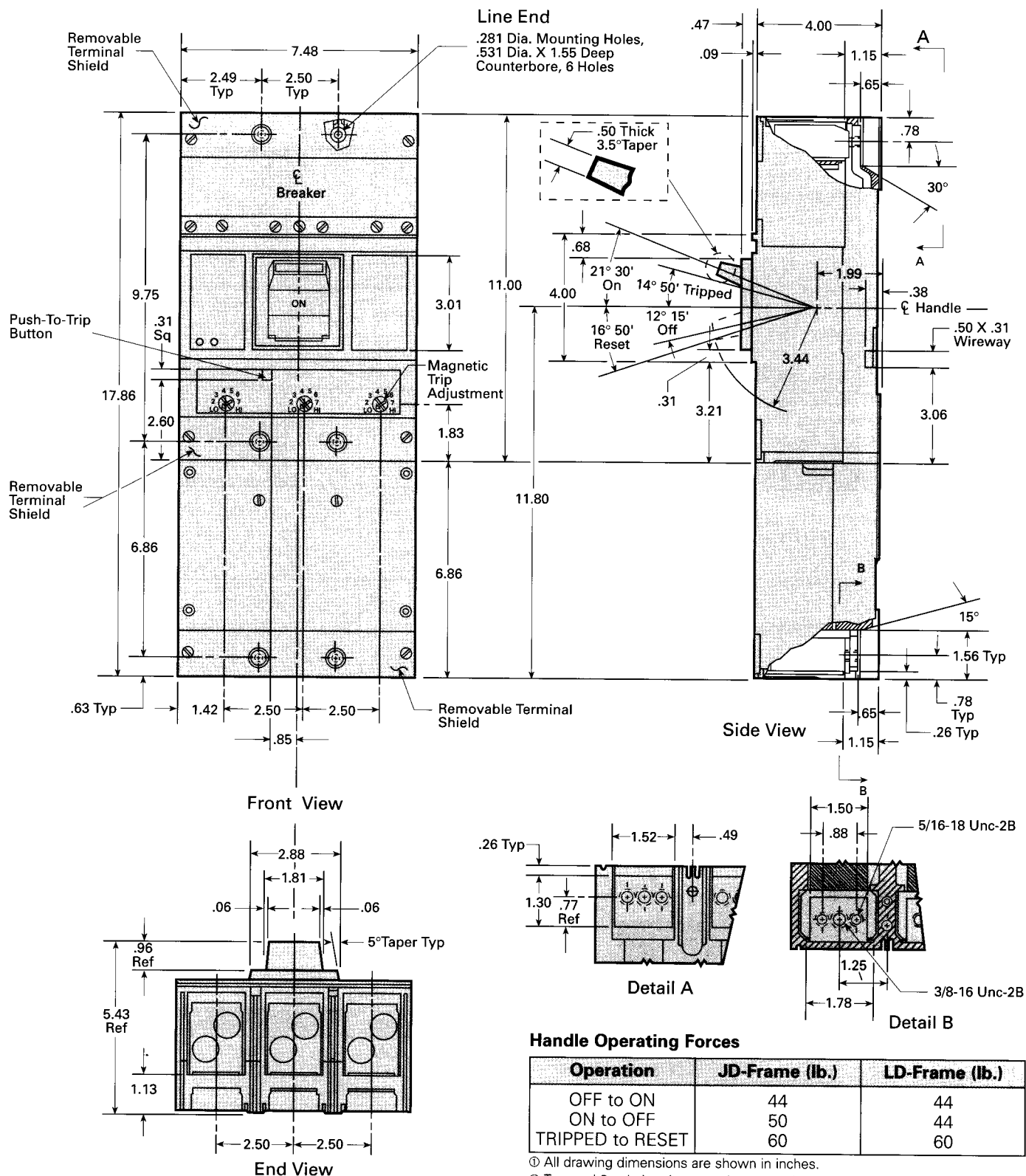
Operation	JD-Frame (lb.)	LD-Frame (lb.)
OFF to ON	44	44
ON to OFF	50	44
TRIPPED to RESET	60	60

① All drawing dimensions are shown in inches.

② Two and 3-pole breakers are the same physical size. Current carrying parts are omitted from the center in 2-pole breakers.

# JD and LD-Frame Outline Drawings<sup>①</sup>—2 and 3 Pole<sup>②</sup>

Types CJD6, CLD6, CJD6-ETI, CLD6-ETI



# 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.**

- A. Tighten mounting screws **(1)** to securely attach connector. See table for torque values.
- B. Tighten set screws **(2)** securely to prevent overheating of conductor and connector. See table for torque values.

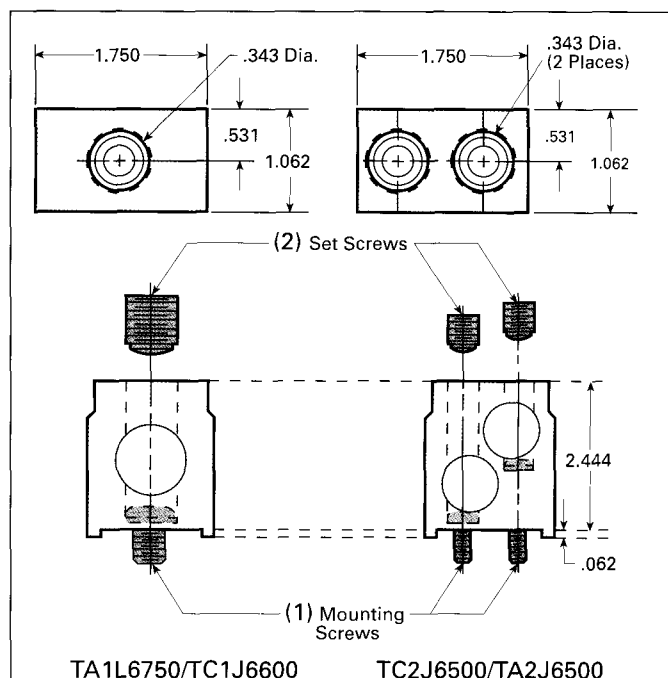


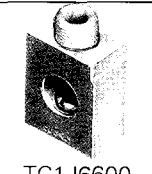
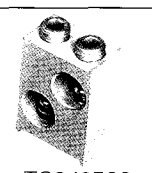
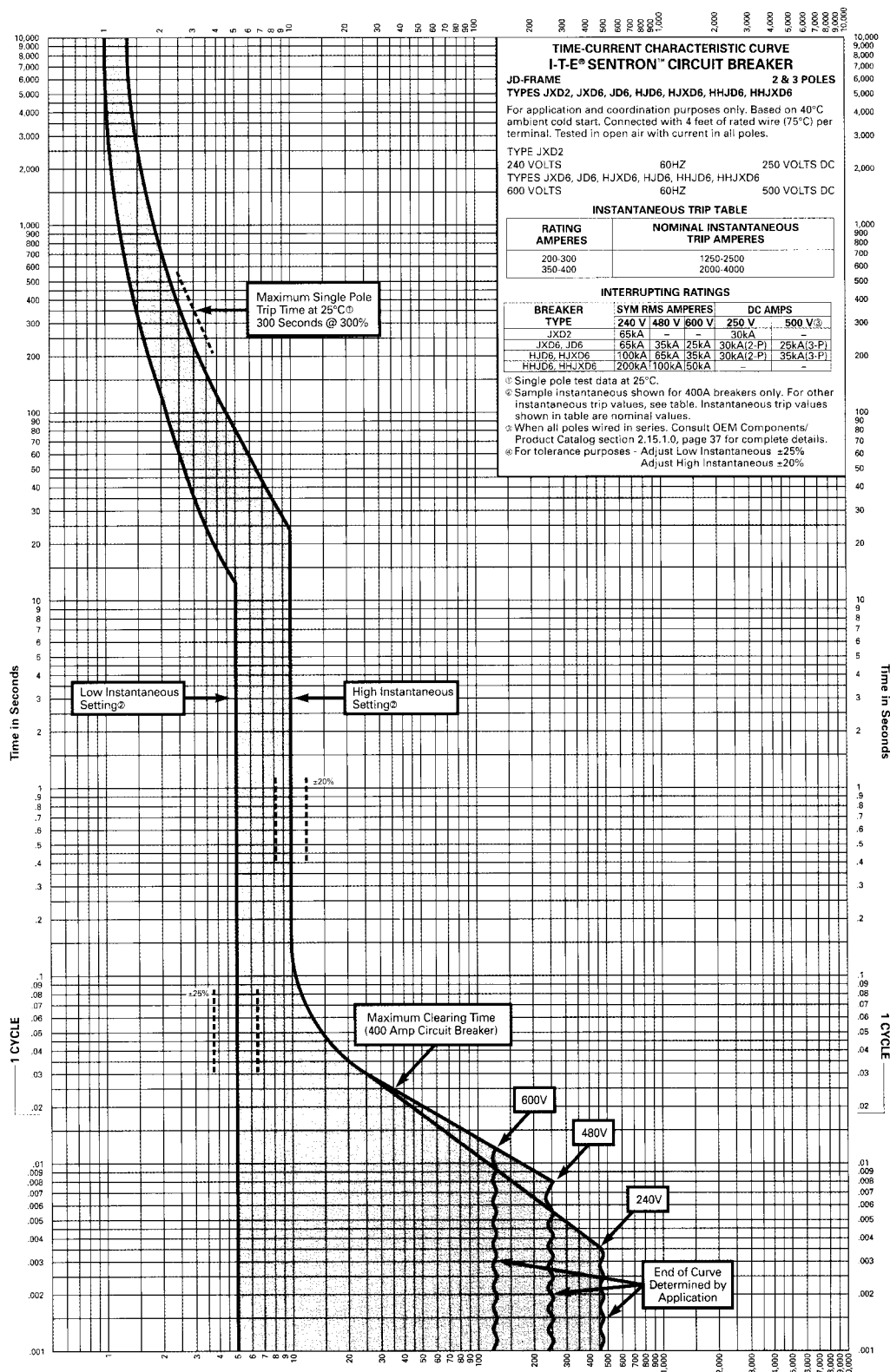


Figure 1

Connector Catalog Numbers	Circuit Breaker Ampere Rating	Connector Wire Range	Set Screw Torque (in-lbs.)	Mounting Screw Torque (in-lbs.)	For Use With Frames
 TA2J6500	200-600	(1-2) #3/0-500 kcmil (Cu) (1-2) #4/0-500 kcmil (Al)	300 300	132	JD-LD
 TA1L6750	250-600	(1) #500-750 kcmil (Al) (1) #500-600 kcmil (Cu)	500 500	228	JD-LD
 TC1J6600	200-600	(1) #3/0-600 kcmil (Cu)	500	228	JD-LD
 TC2J6500	200-600	(1-2) #3/0-500 kcmil (Cu)	300	132	JD-LD

# JD-Frame Time Current Curve

Types JXD2(-A), JD6(-A), JXD6(-A), HJD6(-A), HJXD6(-A), HHJD6, HHJXD6



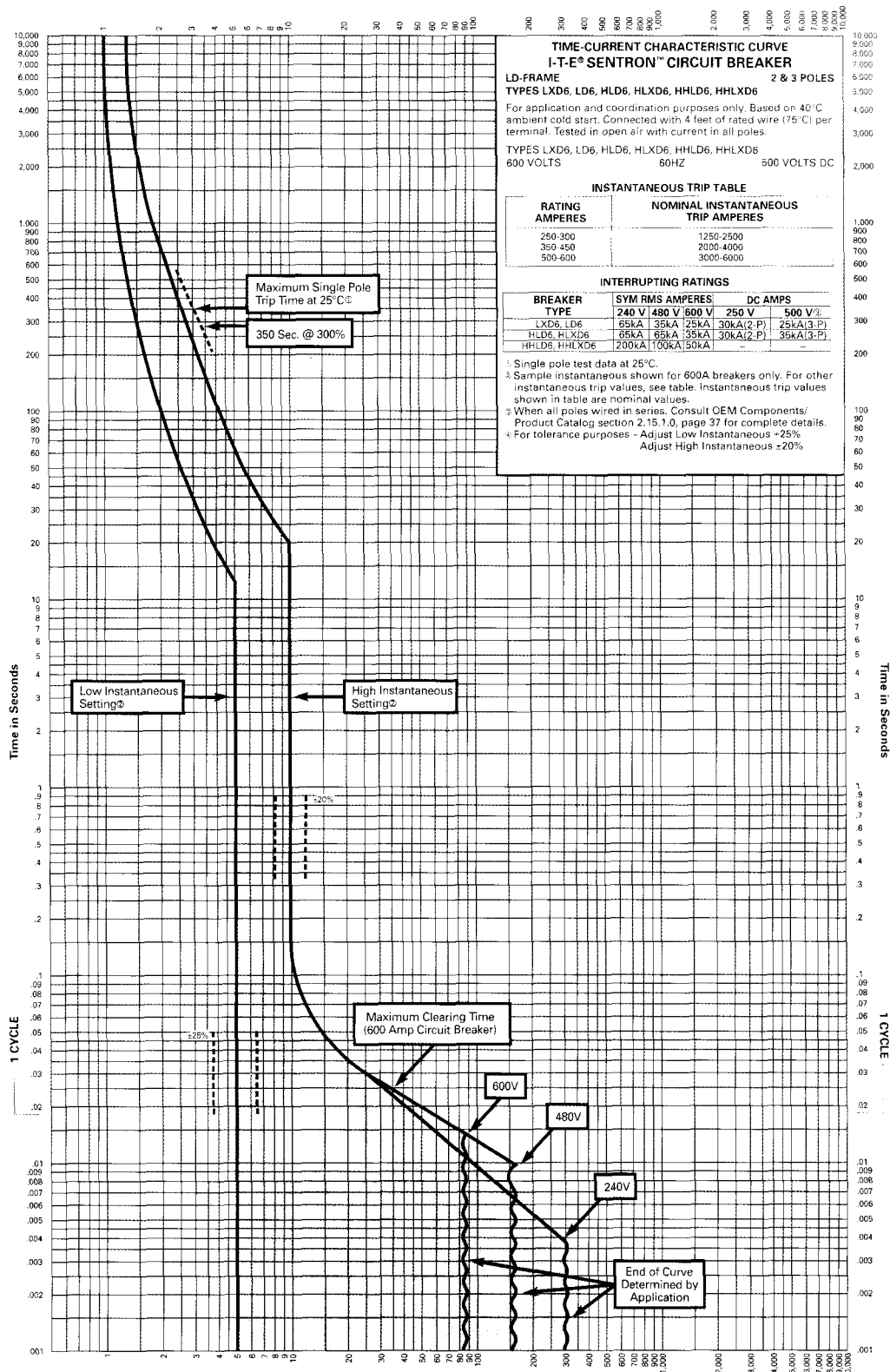
TD-7104

Multiples of Circuit Breaker Continuous Current Rating



# LD-Frame Time Current Curve

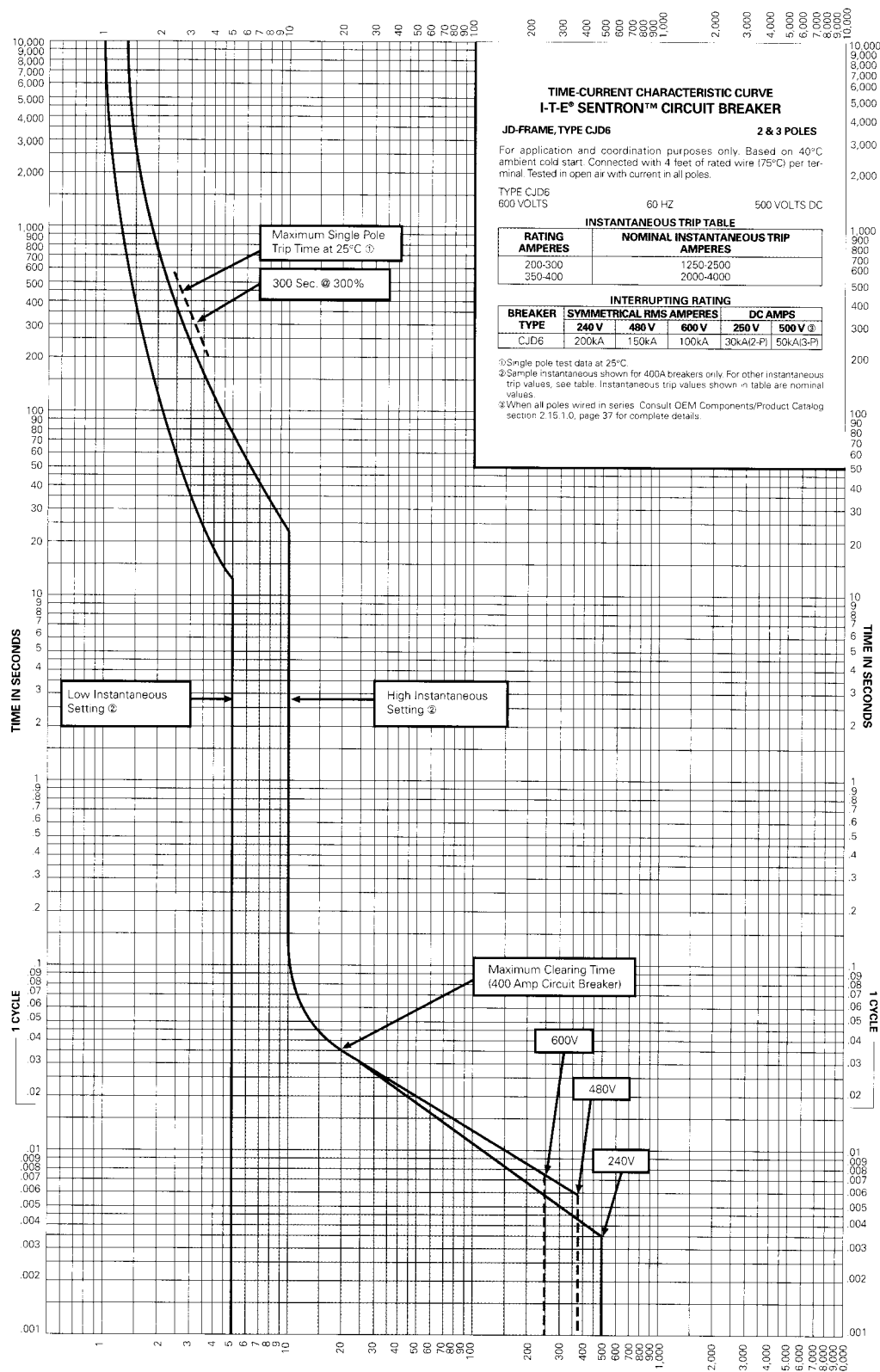
Types LXD6(-A), LD6(-A), HLXD6(-A), HLD6(-A), HHLD6, HHLXD6





# JD-Frame Time Current Curve

## Type CJD6

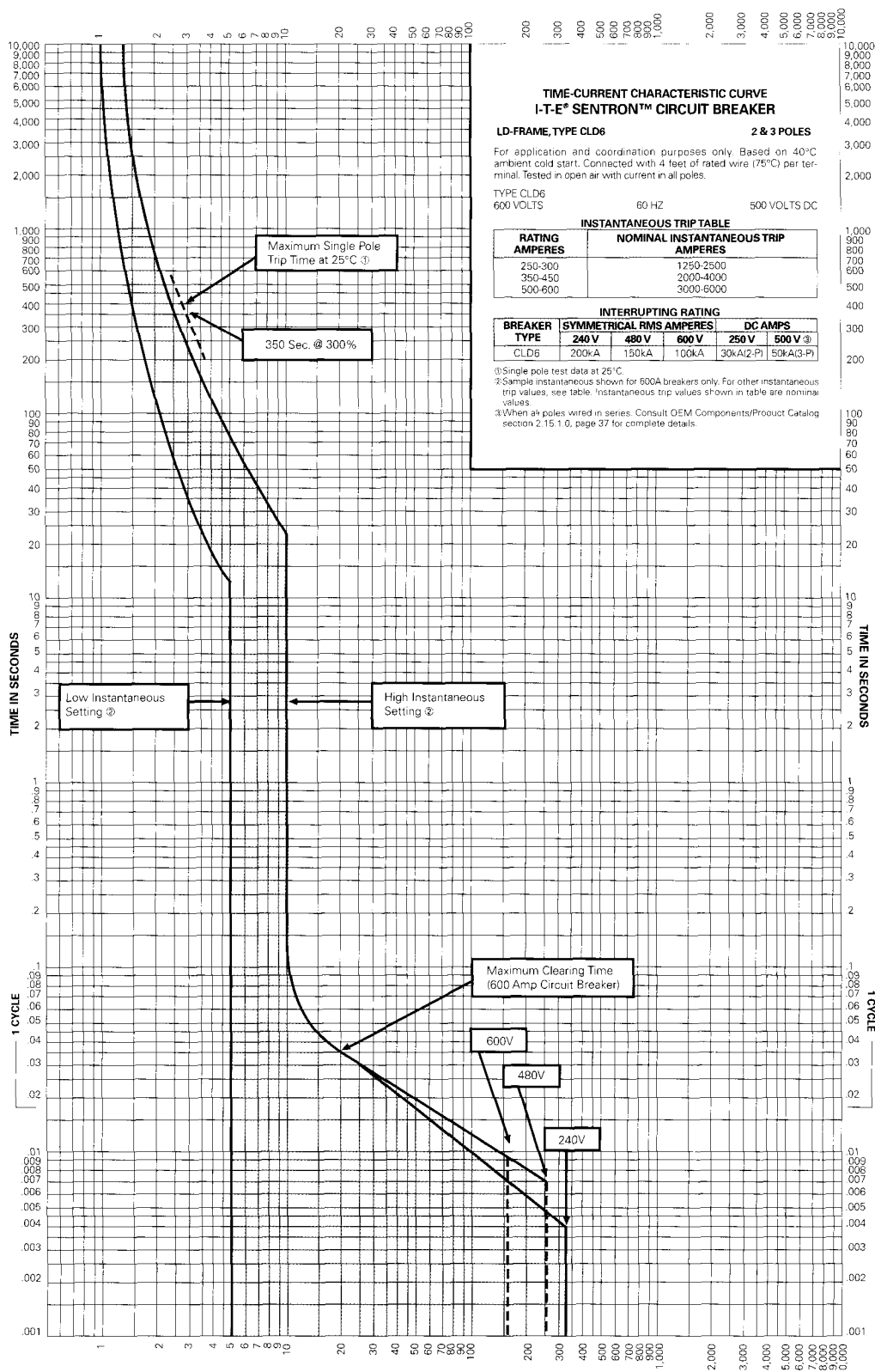


TD-7105

Multiples of Circuit Breaker Continuous Current Rating

# LD-Frame Time Current Curve

## Type CLD6



TD-7107

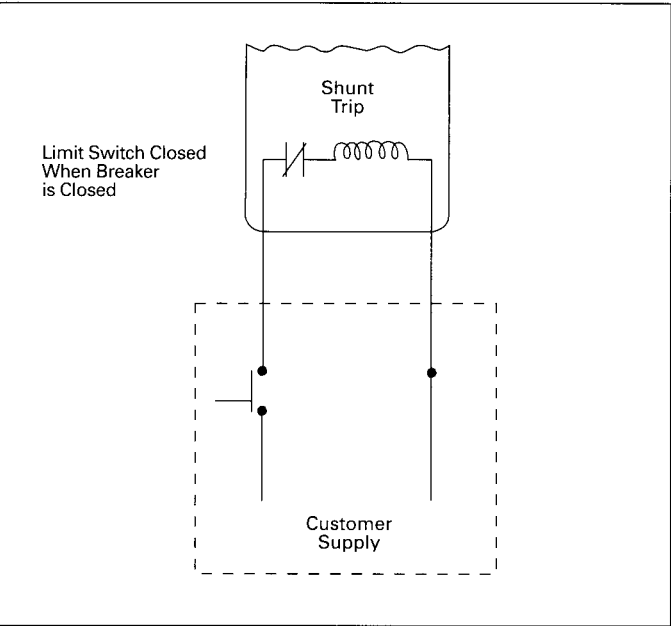
Multiples of Circuit Breaker Continuous Current Rating

# Shunt Trip and Undervoltage Trip

## Electrical Check

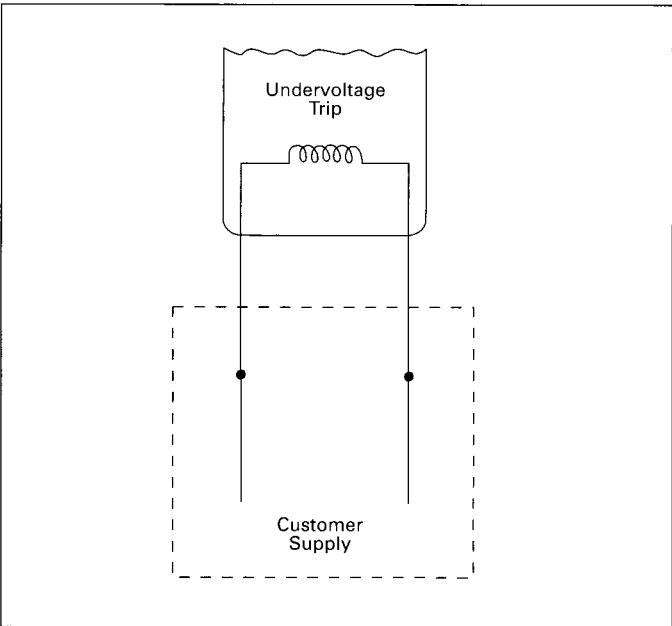
### Shunt Trip

- A. Reset and turn circuit breaker ON.
- B. 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.
- C. With breaker TRIPPED or OFF, check to make sure coil circuit has opened.



### Undervoltage Trip

- A. 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.
- B. 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		
12	Consult Sales Office	S19JLD6
24		S17JLD6
48		S18JLD6
120		S01JLD6
208		S02JLD6
240		S03JLD6
277		S15JLD6
480		S04JLD6
600		S06JLD6
DC		
12	Consult Sales Office	S16JLD6
24		S07JLD6
48		S09JLD6
125		S11JLD6
250		S13JLD6

### Electrical Data For Undervoltage (UV) Trip<sup>① ②</sup>

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	Consult Sales Office	U01JLD62A	U01JLD6
208		U02JLD62A	U02JLD6
240		U03JLD62A	U03JLD6
277		U16JLD64A	U16JLD6
480		U06JLD64A	U06JLD6
600③		N/A	U08JLD6
DC			
24	Consult Sales Office	U13JLD62A	U13JLD6
48		U14JLD62A	U14JLD6
125		U10JLD62A	U10JLD6
250④		U12JLD62A	U12JLD6

<sup>①</sup> Resistor to be mounted externally of circuit breaker and connected by installer.

<sup>②</sup> All auxiliary switch ratings are the same as auxiliary switch kit A01FD64.

<sup>③</sup> Kit includes a 30k ohm, 25 watt resistor (Clarostat Cat. No. VP-25-K or equivalent).

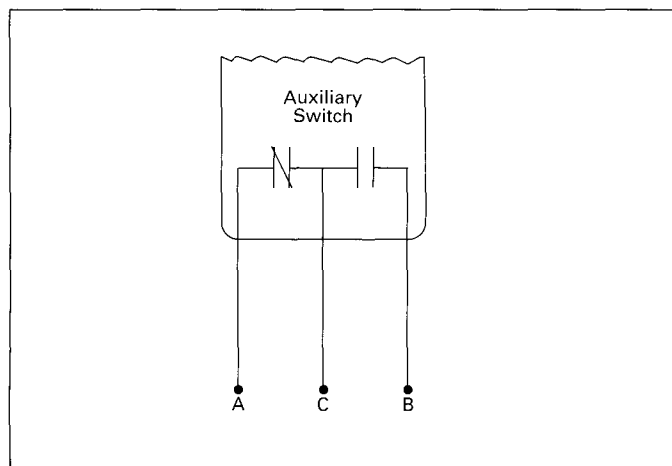
<sup>④</sup> Kit includes a 2.5k ohm, 25 watt resistor (Clarostat Cat. No. VP-25-K or equivalent).

# Auxiliary Switch and Bell Alarm Switch

## Electrical Check

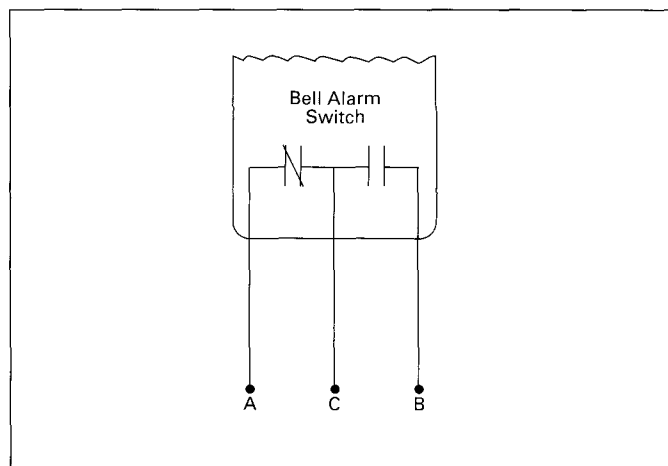
### Auxiliary Switch Kits

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	
		125	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	N.O. - Contact open when breaker is open, closed when breaker is closed.
B or B1	Red	N.C. - 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.

### Bell Alarm Identification (All With Three Leads)

Wire Markings	Wire Color	Switch Terminals or Contacts
C	White	C - Common terminal
A	Yellow	N.C. - Normally closed contact (Closed when circuit breaker is tripped.)
B	Brown	N.O. - 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.

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

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/  
sales/salesoffices.html](http://www.sea.siemens.com/sales/salesoffices.html)

For Product Information  
[www.sea.siemens.com/power/](http://www.sea.siemens.com/power/)

---