

SIEMENS

I-T-E[®] Molded Case Circuit Breakers

MD & ND-Frame
Information and
Instruction Guide



DANGER



Hazardous voltages are present inside the enclosures or panels in which the circuit breakers are installed. Serious injury, electrocution, and/or equipment damage will result if circuit breakers are improperly applied or precaution is not used.

De-energize all incoming power prior to installation of circuit breakers or associated accessories.

Only qualified personnel should work on or around this equipment.

Position of circuit breaker handles shown in this booklet is for illustration purposes only. Circuit breakers are to be installed in OFF or TRIPPED position only.



I-T-E® MD and ND-Frame Circuit Breakers 2 and 3-Pole, 500-1200 Amperes

Types MD6, MXD6, ND6, NXD6, HMD6, HMXD6, HND6,
HNXD6, CMD6, CND6, MXD6-ETI, CMD6-ETI

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These instructions do not purport to cover all details or variations in equipment, nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the local Siemens sales office. The contents of this instruction manual shall not become part of or modify any prior or existing agreement, commitment or relationship. The sales contract contains the entire obligation of Siemens. The warranty contained in the contract between the parties is the sole warranty of Siemens. Any statements continued herein do not create new warranties or modify the existing warranty.

Information and Instructions

General Information

General

MD and ND-Frame Sentron™ Series circuit breakers, as shown on page 5, are for use in individual enclosures, switchboards, and power and distribution panel boards. They are available as thermal magnetic, with interchangeable trip units (types MD6, MXD6, ND6, NXD6-standard interruption level, HMD6, HMXD6, HND6, HNXD6-high interruption level, and CMD6, CND6 current limiting), instantaneous magnetic trip only (motor circuit protectors – types MXD6-ETI and CMD6-ETI) and molded case switches (types MXD6, NXD6, CMD6, CND6).

CMD6, CND6 type Sentron™ Series circuit breakers combine thermal magnetic construction for overload protection in conjunction with the MD and ND-Frame's standard "blow-apart" contacts. This arrangement provides for current limiting protection under high fault interrupting conditions as outlined in the National Electrical Code®, Article 240-11^① and UL 489^② standards. CMD6, CND6 type circuit breakers are fuseless and therefore eliminate the requirement of locating and replacing blown fuses 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 MD and ND-Frame circuit breakers. Rear connection studs or plug-in connector assemblies are also available (2 and 3-pole). The latter mounting arrangement permits the removal of the circuit breaker from its leads without physically coming in contact with either the line or load terminals. UL listed special features such as a shunt trip, auxiliary and alarm switches and undervoltage trip devices are available for internal mounting. The installation and or removal of these devices is to be accomplished by qualified personnel only. Information concerning them can be found on pages 25-27.

Thermal Magnetic

MD6, MXD6, ND6, NXD6, HMD6, HMXD6, HND6, HNXD6, CMD6, and CND6 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 8 trip points as shown below.

Ampere Rating	Nominal Instantaneous Values			
	Low	2	3	4
500-600	3000	3430	3860	4280
700-800	4000	4570	5740	5710
900-1200	5000	5715	6430	7145

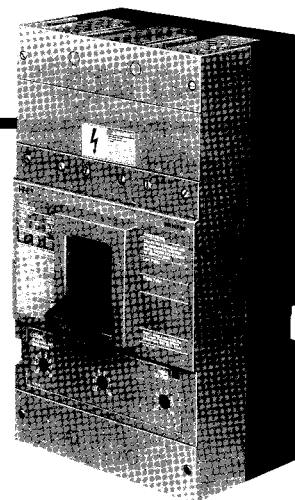
Ampere Rating	Nominal Instantaneous Values			
	5	6	7	High
500-600	4710	5140	5570	6000
700-800	6280	6850	7420	8000
900-1200	7860	8575	9290	10,000

① National Electrical 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."

② 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."



Circuit breakers are calibrated at the factory, under controlled temperature conditions for applications in a 40°C (104°F) ambient.

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 seals will void the UL listing for that specific trip unit. Catalog numbers for ordering and informational purposes can be found on pages 44-46.

Instantaneous Trip

ETI motor circuit interrupters (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; the circuit breaker provides short circuit protection.

ETI is available for MD-Frame only, breaker types MXD6-ETI and CMD6-ETI. The available instantaneous adjustments are as follows.

Motor Full Load Amperes	ETI Trip Settings		Breaker Ampere Rating
	Adjustment	Amperes	
231-264	Low	3000	800 Low
264-292	2	3430	
292-330	3	3860	
330-362	4	4280	
362-395	5	4710	
395-428	6	5140	
428-462	7	5570	800 Stand.
462-490	High	6000	
308-352	Low	4000	
352-442	2	4570	
442-447	3	5740	
447-483	4	5810	
483-527	5	6280	800 High
527-571	6	6850	
571-616	7	7420	
616-660	High	8000	
385-440	Low	5000	
440-495	2	5715	
495-550	3	6430	
550-605	4	7145	800 High
605-660	5	7860	
660-715	6	8575	
715-800	7	9290	
	High	10000	

Information and Instructions

Operation and Maintenance

Molded Case Switch

A molded case switch is available in the MXD6, CMD6, NXD6 and CND6 type circuit breakers. This device employs the same operating mechanism as the thermal magnetic and magnetic only units. A preset instantaneous function has been factory installed to allow the switch to trip and protect itself against high fault conditions. No overload or low fault protection is provided. This protection must be supplied by separate overcurrent devices. Catalog information is located on pages 44 and 46.

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

Interrupting ratings of the MD and ND-Frame circuit breakers are based on circuit and test conditions outlined in UL 489.

Breaker Type	RMS Symmetrical Amperes (kA)						
	UL A.I.R.					IEC A.I.R. ①	
	Volts AC			Volts DC		Volts AC (50-60Hz)	
	240	480	600	250	500 ②	220/240	380/415
MD6, MXD6, ND6, NDX6	65	50	25	30 (2-P)	25 (3-P)	65 (3-P)	50 (3-P)
HMD6, HMXD6, HND6, HNXD6	100	65	50	30 (2-P)	50 (3-P)	100 (3-P)	65 (3-P)
CMD6, CND6 ③	200	100	65	30 (2-P)	50 (3-P)	200 (3-P)	100 (3-P)

① Meets requirements of IEC 157-1 (P1).

② For 500V dc applications the customer's power supply and load must be wired as shown (Figure 1).

③ CMD6 and CND6 type circuit breakers are current limiting at 240V ac 480V ac.

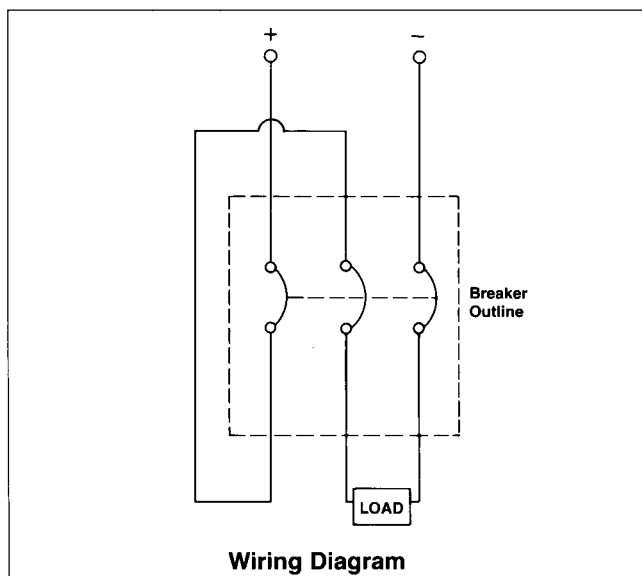


Figure 1

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:

CMD6 and CND6 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.

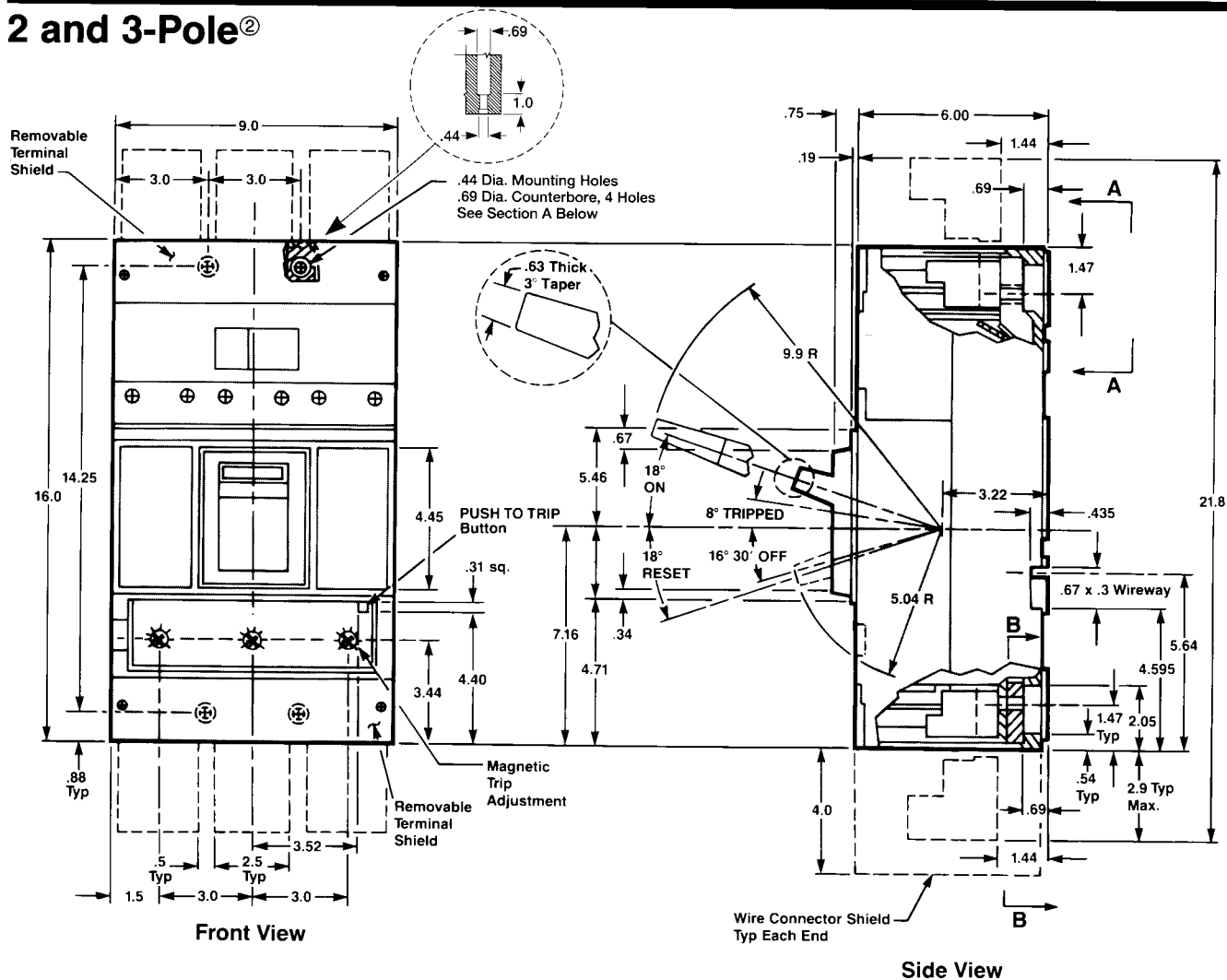
NOTE:

Present UL Standard 489 allows the following tolerances for instantaneous adjustment response.

Thermal-Magnetic Breakers	
Instantaneous Adjustment	
Low	High
±25%	±20%
Instantaneous Only Breakers	
Each Adjustment	
-20%	+30%

I-T-E MD and ND-Frame Outline Drawings^①

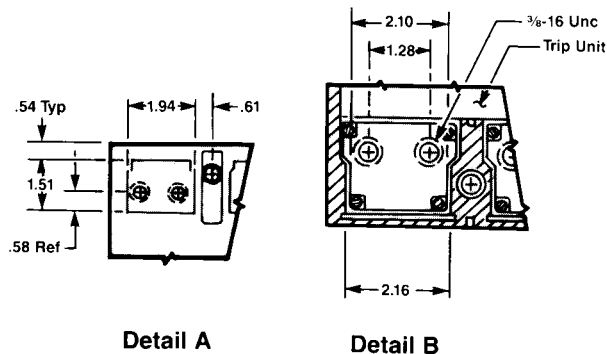
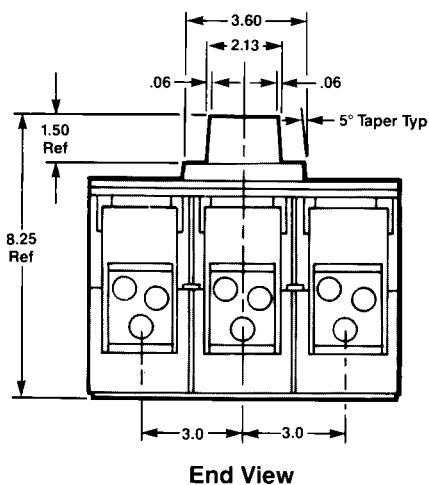
2 and 3-Pole^②




Handle Operating Forces

Operation	Lb. wo/Ext.	Lb. w/Ext.
OFF to ON	75	40
ON to OFF	85	46
TRIPPED to RESET	130	70

- 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.



I-T-E Pressure Wire Connectors



⚠ DANGER

Hazardous Voltage.
Will cause severe injury or death.

Turn off and lock out all power supplying this device before installing or servicing.



SAFETY INSTRUCTIONS

General

NOTE: This instruction outlines the recommended installation procedures for TA4N8500, TA4P8500, TA2N8750 and TA3N8750.

- A. Move breaker handle to OFF position, or depress PUSH TO TRIP button. Breaker must be in OFF or TRIPPED position before continuing.
- B. Remove terminal shield (1) (Figure 2) (two #6-32 screws.)
- C. Mount breaker securely. See circuit breaker instructions for proper installation procedures.
- D. Mount pressure wire connectors (2) to terminal pads (3) with mounting screws (4) (Figure 1). Recommended torque is 228 in. lb.

NOTE: Steps C and D may be completed in any convenient order.

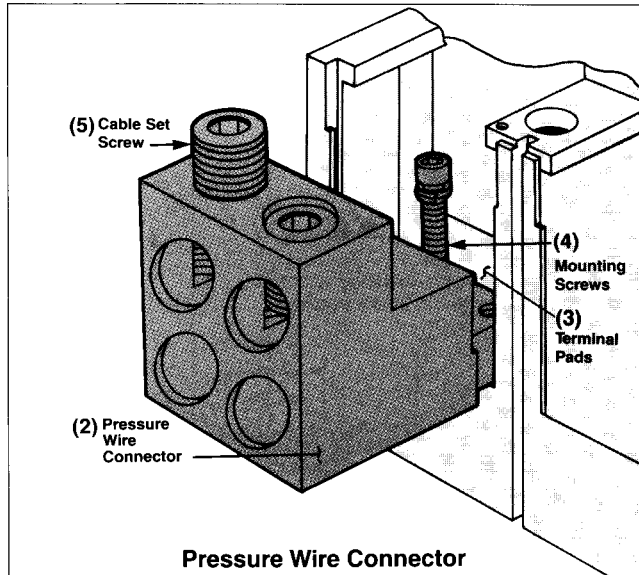


Figure 1

- E. Attach power cables to connectors and tighten set screws (5) (Figure 1) to specifications per Table 1.

NOTE: Cables must extend straight for at least 4 inches from face of connector to clear shield.

- F. Mount removable terminal shield (6) (Figure 2) to end of circuit breaker. Shield should be flush with end of circuit breaker.

- G. Re-assemble terminal shield.

NOTE: When terminal cover is properly installed, wire connector shield should be held securely.

NOTE: End barrier NDTs is supplied with kits 2TA4P8500, 2TA4N8500, 3TA4P8500, 3TA4N8500, 2TA3P8750, 3TA3P8750, 2TA2N8750, 3TA2N8750. Barrier can be purchased as a separate item for use with other terminal connectors.

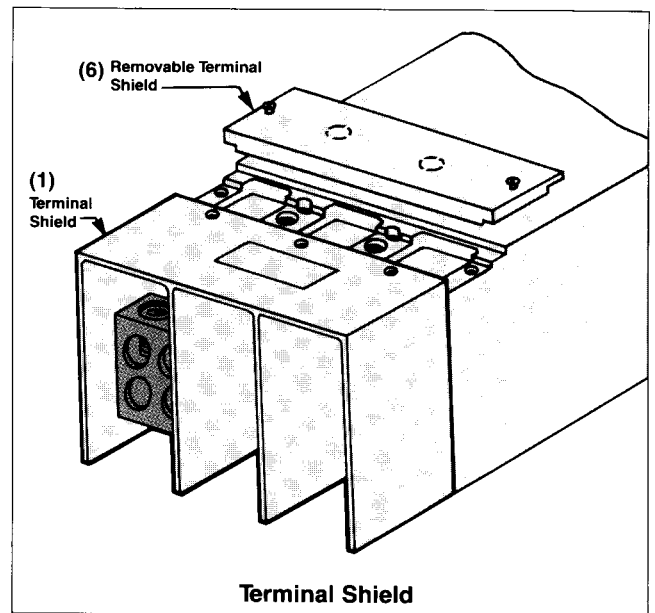

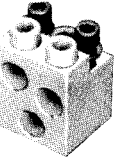
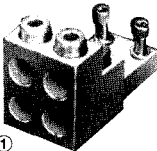

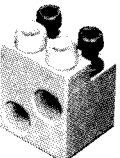


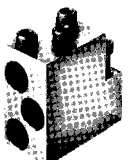


Figure 2

I-T-E Pressure Wire Connectors

Table 1 – Connector Selection Chart

Connector ^② 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. lb.	MD6, MXD6, SMD6 HMD6, HMXD6, SHMD6, CMD6, SCMD6
TA3K500 	700-800	(1-3) #1 AWG-500 kcmil (Cu/Al)	375 in. lb.	MD6, MXD6, SMD6 HMD6, HMXD6, SHMD6, CMD6, SCMD6, MD6-ETI, CMD6-ETI
TA4P8500 ^① 	800-1200	(4) 250-500 kcmil (Cu/Al)	375 in. lb.	ND6, NXD6, SND6 HND6, HNXD6, SHND6, CND6, SCND6
TA4N8500 	800-1200	(4) 250-500 kcmil (Cu/Al)	375 in. lb.	ND6, NXD6, SND6 HND6, HNXD6, SHND6, CND6, SCND6
TC2K500 	500-600	(1-2) #1 AWG-500 kcmil (Cu)	375 in. lb.	MD6, MXD6, SMD6 HMD6, HMXD6, SHMD6, CMD6, SCMD6
TC3K350 	700-800	(1-3) #1 AWG-350 kcmil (Cu)	375 in. lb.	MD6, MXD6, SMD6 HMD6, HMXD6, SHMD6, CMD6, SCMD6
TA2N8750 	700-800	(2) 600-750 kcmil (Cu/Al)	375 in. lb.	MD6, MXD6, SMD6 HMD6, HMXD6, SHMD6, CMD6, SCMD6
TA3N8750 	700-1200	(3) 250-400 kcmil (Cu/Al) (3) 500-700 kcmil (Cu/Al)	375 in. lb.	ND6, NXD6, SND6 HND6, HNXD6, SHND6, CND6, SCND6

① Connectors supplied in kits only.

② All connector bodies will fit on all MD and ND-Frame circuit breakers regardless of trip unit ampere rating.

I-T-E Compression Connectors (CCM800, CCN1200)

⚠ DANGER

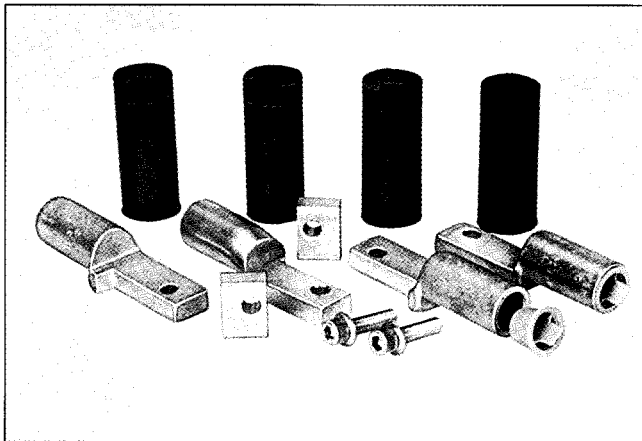
Hazardous Voltage.
Will cause severe injury or death.

Turn off and lock out all power supplying this device before installing or servicing.

⚠ SAFETY INSTRUCTIONS

General

NOTE: This instruction sheet outlines the recommended installation procedure. Use of lugs may result in reduced wire bending space. The installer should verify that adequate wire bending space is still provided for the installation, in accordance with applicable codes.



Compression Connector Kit – CCN1200

Installation of Compression Connector

- A. Turn off power supplying device before installing compression lugs.
- B. Remove any existing wire connectors from circuit breaker.
- C. Install circuit breaker.
- D. Preform cables to final configuration and strip insulation back $1\frac{3}{16}$ in. on each conductor. Use an appropriate insulation stripping tool to avoid damaging the conductor (Figure 1).
- E. Clean aluminum conductor surfaces thoroughly with a wire brush or other suitable means, to remove oxides and other contaminants from the conductor.

NOTE: Copper wires and the compression connector should not be cleaned abrasively.

- F. Remove cap from compression connector and insert cable fully into barrel (1) (Figure 1) of connector.
- G. Insure that connector tang(s) (2) (Figure 1) are in their proper orientation prior to crimping. This helps avoid twisting of cables during installation.

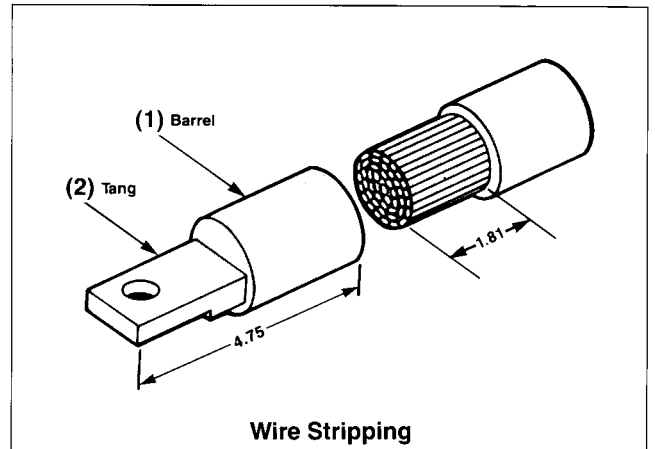


Figure 1

- H. Select an appropriate tool and die combination from Table 1 and make the required number of crimps within the boundaries stamped on the connector barrel. Refer to Figure 2 for sequence of multiple crimps.

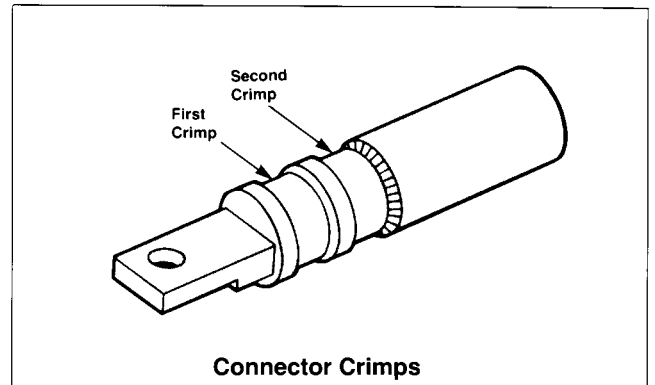


Figure 2

- I. Remove any inhibitor compound expelled during the crimping operation from the connector body and the cable insulation.
- J. Slip insulating cover over connector tang and then over connector barrel so that only the connector tang is exposed (Figure 3).

WARNING: Short spacings will result if Step J is not followed.

I-T-E Compression Connectors (CCM800, CCN1200)

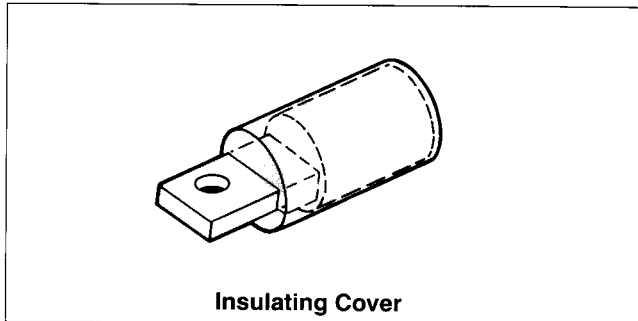


Figure 3

K. Position connector tang on top of the circuit breaker terminal pad and secure with $\frac{3}{8}$ -16 \times 1 $\frac{1}{2}$ in. socket head cap screw and conical spring washer. Conical spring washer is to be installed with convex side of washer toward underside of screw head (Figure 4). Torque screw to 228 in. lb.

NOTE: When using this kit for ampacities less than 1200A or where only one or two connectors are to be mounted to the terminal pad, insert spacers provided in kit between spring washer and compression lug. (Figures 4a, 4b, 4c and 4d).

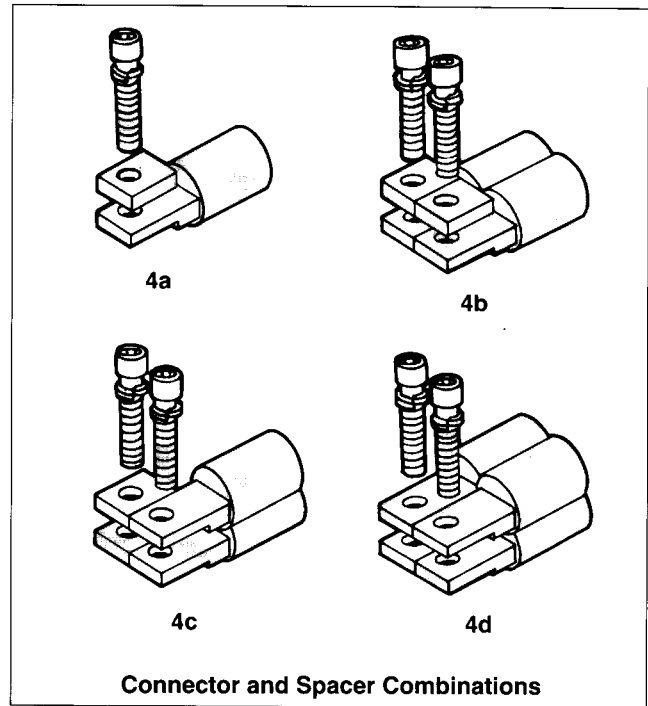
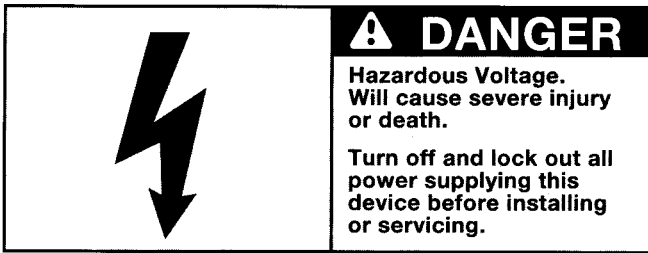


Figure 4

Catalog Information

Catalog Number	Compression Connector Kits
CCM800K2	1 set of terminals for line or load end of 2-pole MD frame circuit breaker
CCM800K3	1 set of terminals for line or load end of 3-pole MD frame circuit breaker
CCN1200K2	1 set of terminals for line or load end of 2-pole ND frame circuit breaker
CCN1200K3	1 set of terminals for line or load end of 3-pole ND frame circuit breaker

I-T-E Trip Unit



⚠ SAFETY INSTRUCTIONS

General

The MD6 trip units are available in 500, 600, 700 and 800 ampere ratings. The ND6 trip units are available in 900, 1000 and 1200 ampere ratings.

These devices have adjustable magnetic trip settings. The 500 ampere trip units have a magnetic adjustment range from 3000 to 6000 amperes. The 600, 700 and 800 ampere trip units have a magnetic adjustment range from 4000 to 8000 amperes. The 900, 1000, and 1200 ampere trip units have a range from 5000 to 10000 amperes. Ranges for dc operation are 15 percent higher.

The 900, 1000 and 1200 ampere ND6 trip units cannot be installed in the MD frames. All trip unit ratings can be installed in the ND frame. See breaker frame label or consult Siemens Energy and Automation, Inc. sales office for complete catalog number information.

Mounting Procedure For Trip Unit

- A. Remove terminal shield (1) from load side of breaker frame. Two #8-32 screws (Figure 2).
- B. Remove load cover (2) from breaker frame. Six #10-32 x 3/4 in. screws (3) and two #10-32 x 1 3/8 in. screws (4).
- C. Lower trip unit (5) into place as shown in Figure 2. The two hooks (6) (Figures 1 and 2) on the trip unit must fit over pins (7) on frame. Breaker handle may be removed to ease assembly.

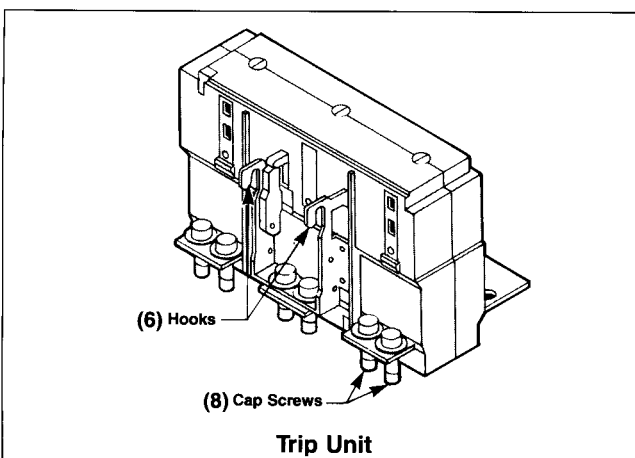


Figure 1

- D. Secure trip unit to frame. Tighten six 5/16-18 socket head cap screws (8) (Figure 1) to 140 in. lb.
- E. Replace load cover. The six #10-32 x 3/4 in. screws must be installed toward the line side of the circuit breaker. The two #10-32 x 1 3/8 in. screws are installed on the load end. Tighten all load cover screws to 25 in. lb. Replace handle if removed; note tab (9) on front of handle must be toward line end.
- F. Check operation of circuit breaker. Reset breaker by moving handle toward load side of device until it catches. Then move handle in opposite direction until the breaker turns on. The handle will indicate ON. Depress PUSH TO TRIP button. The breaker should trip, and the handle will move between the ON and OFF positions.

NOTE: If the breaker does not operate as noted, check all installation procedures and repeat this step. If the load cover is not properly secured, the breaker will not operate.

- G. Add load lugs or connecting straps per instructions furnished with these kits.
- H. Replace terminal shield. Tighten two #8-32 screws until cover sits flush with the end of the breaker.

NOTE: Wire connector shield must be in place when required, prior to installing terminal shield.

- I. Attach rating label supplied with the trip unit, to the recessed area on top of the handle.

NOTE: Make sure rating label agrees with ampere rating of trip unit installed.

- J. Move handle to reset position, handle will indicate OFF. Circuit breaker is now ready for use.

Replacement Procedure For Trip Unit

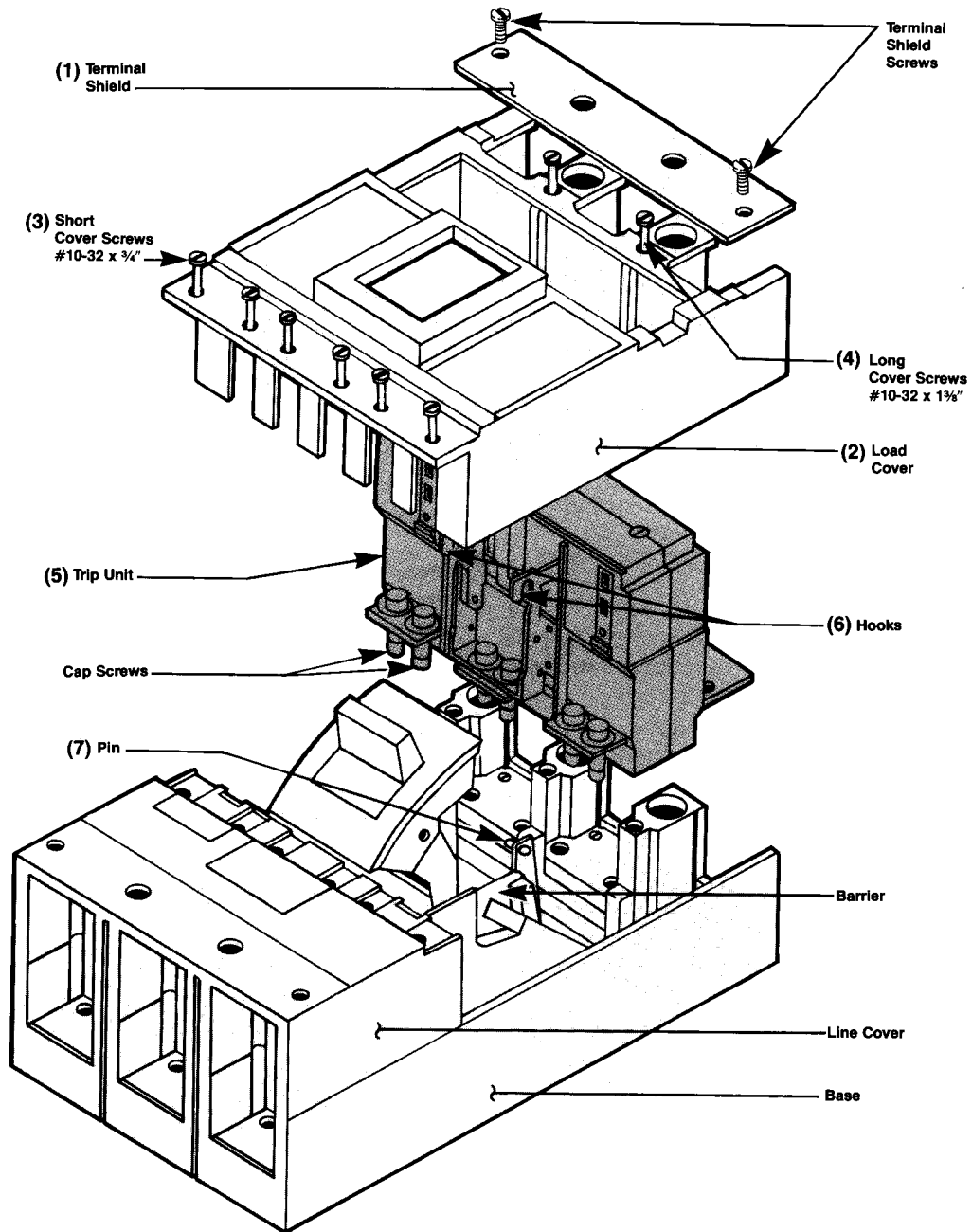
NOTE: Circuit breaker must be in tripped position before cover is removed. To trip the breaker depress the red PUSH TO TRIP button.

- A. Remove terminal shield from load side of breaker. Two #8-32 screws (Figure 2).
- B. Remove load cover from breaker. Six #10-32 x 3/4 in. screws and two #10-32 x 1 3/8 in. screws.
- C. Remove lugs or load side connection screws.
- D. Remove trip unit. Six 5/16-18 socket head cap screws.

NOTE: These screws will remain captive with trip unit.

- E. Add new trip unit as outlined in Steps C through J of "Mounting Procedure for Trip Unit."

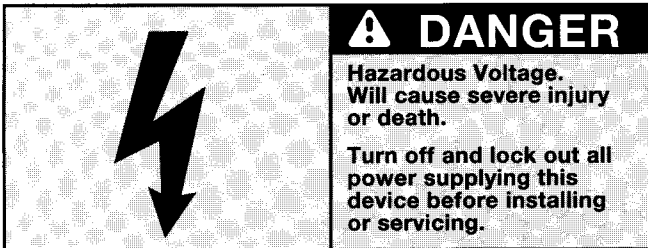
Installation Diagram



Mounting Trip Unit

Figure 2

I-T-E Handle Blocking Device (MN6BL)



SAFETY INSTRUCTIONS

General

The handle blocking device, MN6BL, is provided to permit blocking the toggle handle of an MD and ND-Frame circuit breaker in the OFF position. The device can be field modified to permit blocking of the handle in the ON position.

Installation of Handle Blocking Device

- A. Turn power off supplying circuit breaker.
- B. Turn circuit breaker off.
- C. Loosen the two screws (1) (#10-32 \times $\frac{3}{8}$ in.) so that the blocking device can be positioned and fully seated over the toggle handle, as shown in Figure 1.

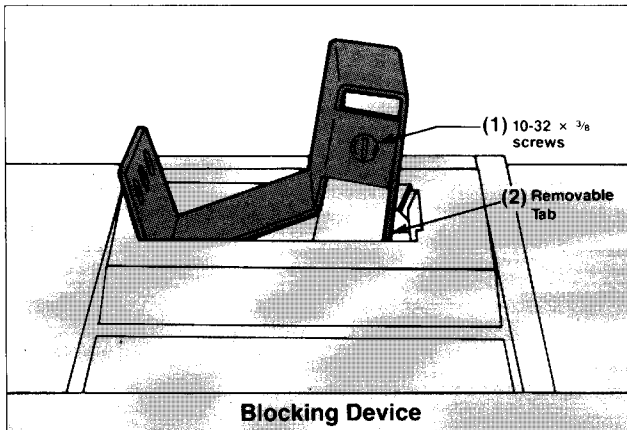


Figure 1

- D. With a screwdriver, turn the screws so they enter the blind holes molded in each side of the toggle handle. Tighten the two screws evenly so that when they engage the bottom of the blind holes, they project an equal distance of .094 in. (Figure 2) above the tapped surface. Do not over torque. Maximum torque 2 in. lb.

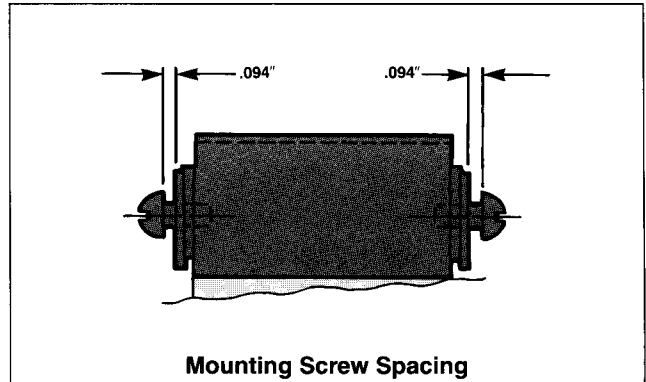


Figure 2

Modification and Use for Blocking the Handle ON

The lip of the blocking device (2) (Figure 1) is undercut so that a short section can be removed. To modify the device for blocking a handle ON, snap off this removable tab and discard.

- A. Turn power off supplying circuit breaker.
- B. Turn circuit breaker on.
- C. Follow installation procedures, Steps C and D, of "Installation Handle Blocking Device."

I-T-E Handle Padlocking Device (MN6HPL)

⚠ DANGER

Hazardous Voltage.
Will cause severe injury or death.

Turn off and lock out all power supplying this device before installing or servicing.

⚠ SAFETY INSTRUCTIONS

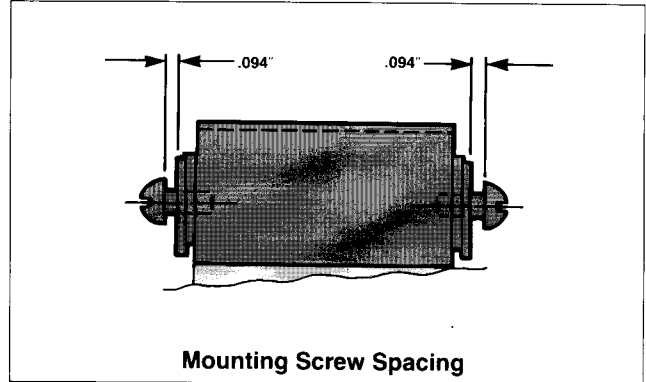


Figure 2

General

The padlocking device, MN6HPL, consists of the handle blocking device (3) and an additional component (4) that permits padlock securement of the circuit breaker handle in the OFF position (Figure 3). Field modification of the handle blocking device will also permit padlock securement of the circuit breaker handle in the ON position.

Installation of Handle Blocking Device

- A. Turn power off supplying circuit breaker.
- B. Turn circuit breaker off.
- C. Loosen the two screws (1) (#10-32 × 3/8 in.) so that the blocking device can be positioned and fully seated over the toggle handle, as shown in Figure 1.

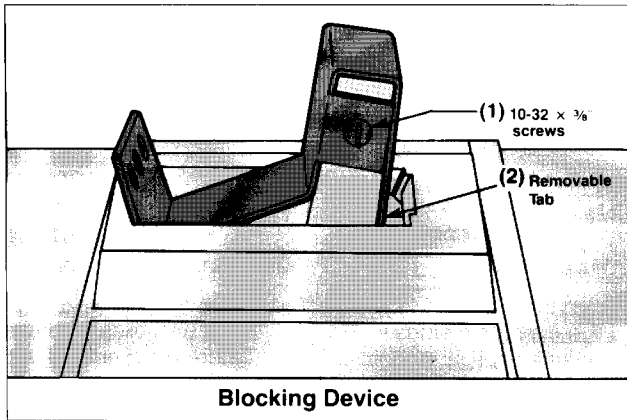


Figure 1

- D. With a screwdriver, turn the screws so they enter the blind holes molded in each side of the toggle handle. Tighten the two screws evenly so that when they engage the bottom of the blind holes, they project an equal distance of .094 in. (Figure 2) above the tapped surface. Do not over torque. Maximum torque 2 in. lb.

Installation of Handle Padlocking Device

To install the padlocking device, first complete the applicable Handle Blocking Installation Instructions.

- A. Slide the retaining slots of the padlocking component (4) over the handle blocking device retaining screws. Position the padlocking component at the angle shown in Figure 3.

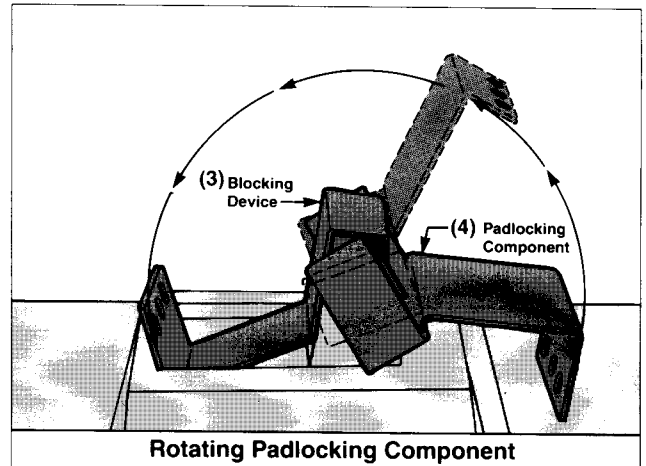


Figure 3

- B. Rotate the padlocking component until it is positioned over the handle blocking device, as shown in Figure 4. Install up to three padlocks, as required.

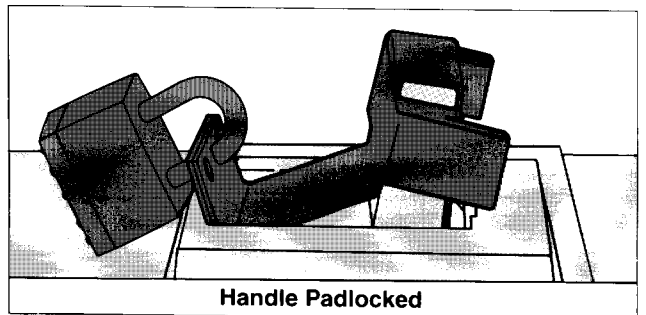



Figure 4

I-T-E Plug-In Adapters – MD Frame

	<p>⚠ DANGER</p> <p>Hazardous Voltage. Will cause severe injury or death.</p> <p>Turn off and lock out all power supplying this device before installing or servicing.</p>
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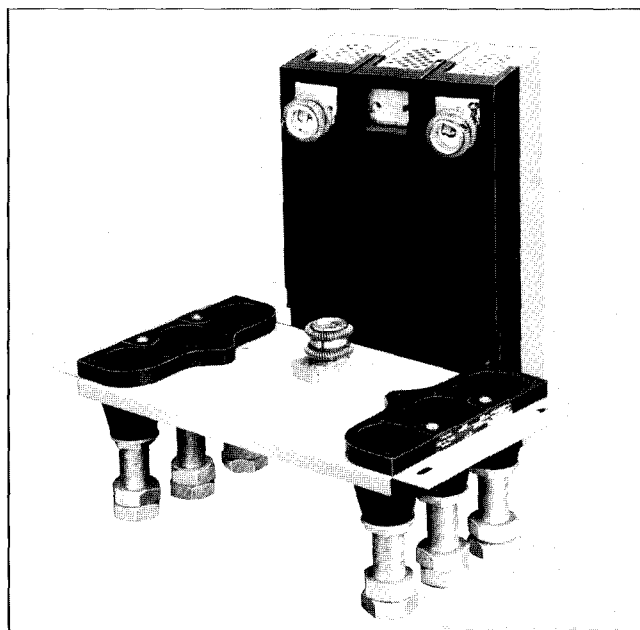
⚠ SAFETY INSTRUCTIONS

NOTE: Plug-in adapters are for use only with MD-Frame.

General

A complete plug-in installation requires one line end adapter assembly (consisting of mounting block, tulip connectors and associated hardware), one load end adapter assembly and one switchboard mounting plate. The switchboard mounting plate is optional and can be replaced by other mounting means to suit customers' requirements.

No. of Poles	Line End Adapter	Load End Adapter	Switchboard Mtg. Pan
2	PC5662	PC5662	PL9698
3	PC5663	PC5663	PL9698



Plug-in Adapters and Mounting Blocks (shown with breaker)

Mounting Preparation (Figures 1 and 2)

- A. If the switchboard mounting plate (1) is to be used, provide required drilling as shown in Figure 1.
- B. If other mounting means are to be used, provide the cut-outs and drilling required to mount the adapter blocks as shown in Figure 2.

Switchboard Mounting Plate (If used Figure 3)

- A. Place switchboard mounting plate (1) in position at location previously prepared in Step A above. Secure in place with $\frac{5}{16}$ in. hardware (furnished by customer).

Mounting Block (Figure 3)

- A. Align mounting block (2) with cutouts in switchboard mounting plate (or customer's mounting means as previously prepared in Step B above) and secure in place with $\frac{3}{8}$ in. flatwashers (3), lockwashers (4), and $\frac{3}{8}$ -16 in. hex nuts (5) furnished. Tighten to 216 in.-lb.

Breaker Preparation (Figure 4)

- A. Loosen four breaker terminal shield screws (6) and remove both line and load side terminal shields (7).

Caution: Make certain that breaker operating handle is in OFF position before proceeding with the next step.

Remove pressure wire connectors from breaker if present.

- B. Place tulip clip assembly (8) on back of breaker in recess provided in base molding. Secure in place with $\frac{5}{16}$ in. flatwashers (9), lockwashers (10) and $\frac{5}{16}$ -18 in. hex head bolts (11) furnished. Tighten these bolts to 72 in.-lb. to assure a good electrical connection. Repeat this procedure for the remaining tulip clip assemblies.
- C. Insert end shields (12) into slots provided at line and load end of breaker.
- D. Affix accessory warning label (13) to top of circuit breaker.

Final Assembly (Figure 5)

- A. Make bus connection to mounting block studs. *Use Only Copper Bus Bars.* Use hex nuts (14) furnished to secure this connection. Tighten to 2400 in.-lb. (Figure 5).
- B. Align breaker with mounting blocks and force female tulip clips over male studs in mounting block until breaker base bottoms against mounting block. Secure breaker in place with $\frac{3}{8}$ -16 x $1\frac{1}{2}$ in. mounting screws (15), lockwashers (16), and flatwashers (17) furnished. Tighten to 216 in.-lb.
- C. Replace breaker terminal shields (7) and secure with four breaker terminal shield screws (6). Tighten to 12 in.-lb.
- D. If installation requires use of front panel trim, provide cut-out for breaker escutcheon as shown in Figure 6.

Installation Diagrams

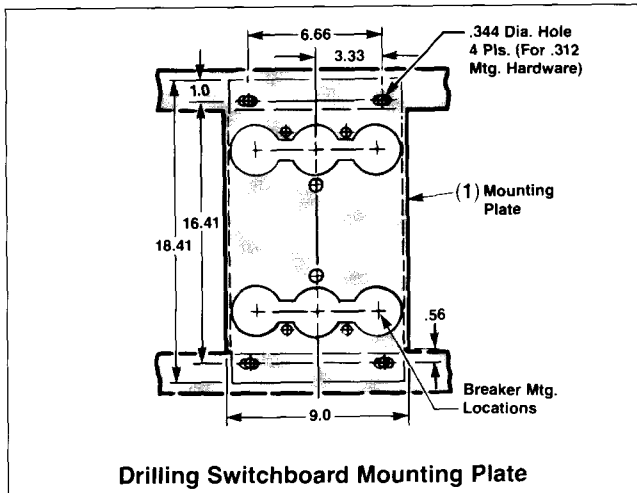


Figure 1

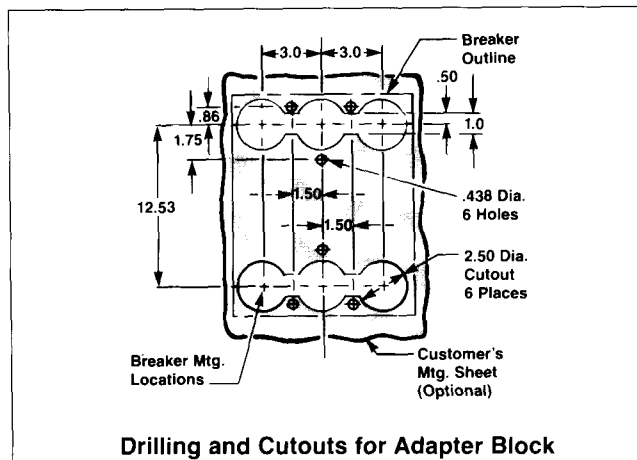


Figure 2

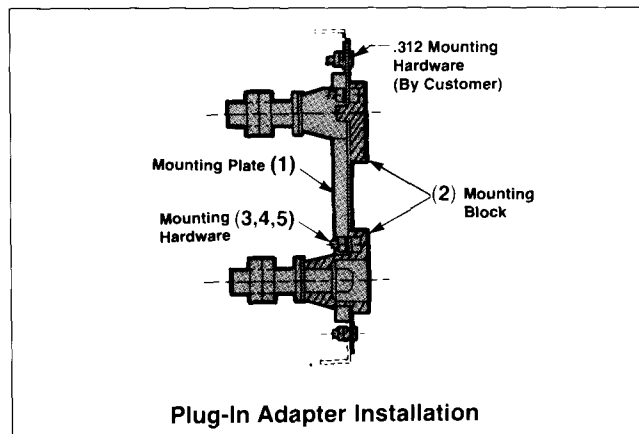


Figure 3

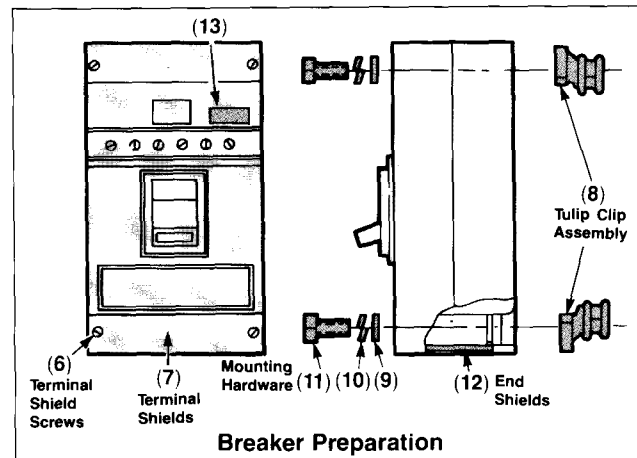


Figure 4

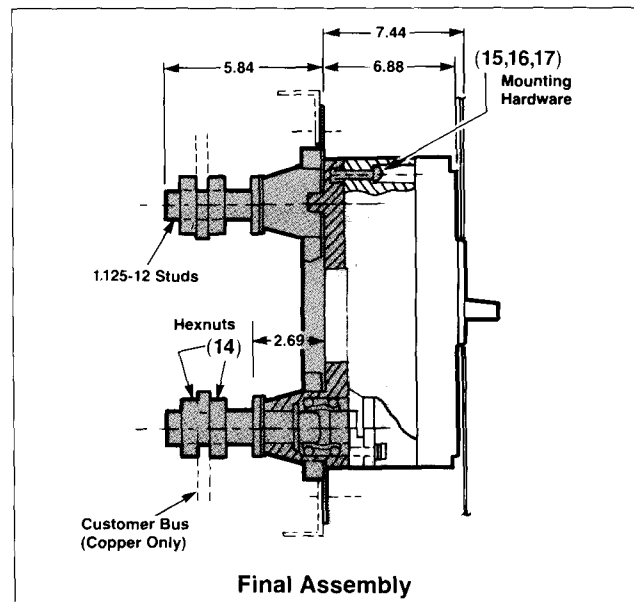


Figure 5

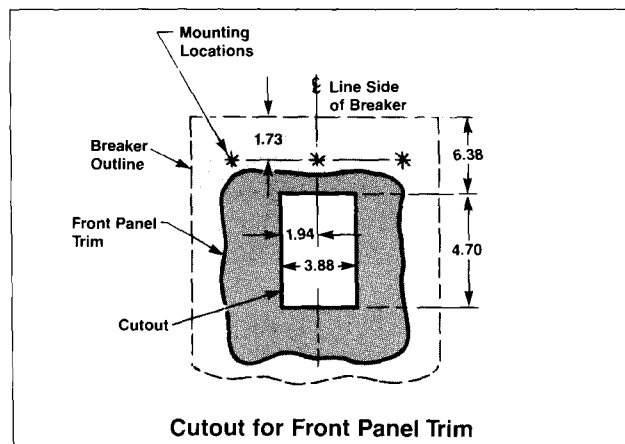


Figure 6

I-T-E Plug-In Adapters – ND Frame

⚠ DANGER

Hazardous Voltage.
Will cause severe injury or death.

Turn off and lock out all power supplying this device before installing or servicing.

SAFETY INSTRUCTIONS

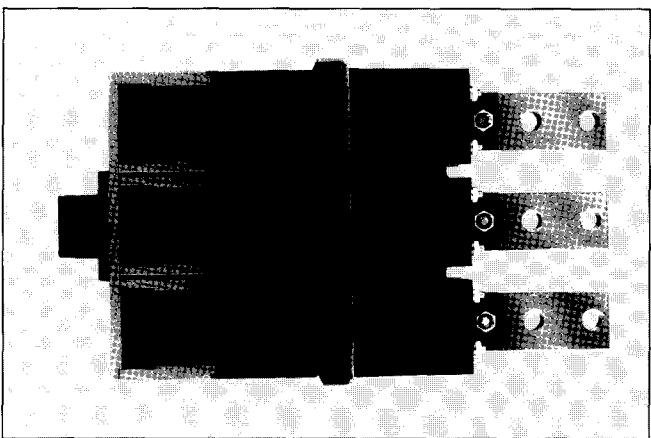
NOTES: These instructions outline the recommended installation procedure. The term circuit breaker used in these instructions includes motor circuit interrupters and molded case switches.

Application Information			
No. of Poles	Vertical Bus	Horizontal Bus	Mounting Plate
2	PC5664	PC5665	PL9699
3	PC5666	PC5667	PL9699

All adapters are suitable for line or load end use.

General

A complete plug-in installation requires an adapter for both the line and the load ends of the circuit breaker, associated hardware and one switchboard mounting plate. The switchboard mounting plate is optional and can be replaced by other mounting means to suit specific requirements.



Mounting Preparation: Figures 1 and 2

- A. Turn off and lock out all power supplying this device before installing or servicing.
- B. If the switchboard mounting plate (1) is to be used, provide required drilling as shown in Figure 1.
- C. If other mounting means are to be used, provide the cutouts and drilling required to mount the adapter blocks as shown in Figure 2.

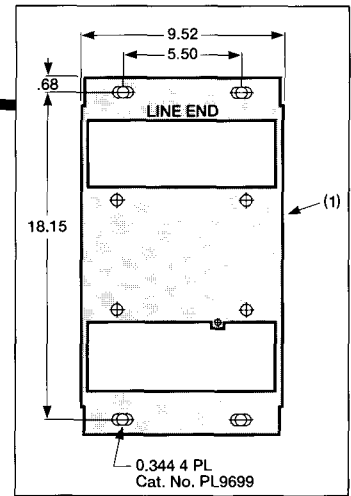


Figure 1

Switchboard Mounting Plate (if used): Figure 3

- A. Place switchboard mounting plate (1) in position at location previously prepared in Step 2 above. Secure in place with $\frac{5}{16}$ " hardware (hardware furnished by customer).

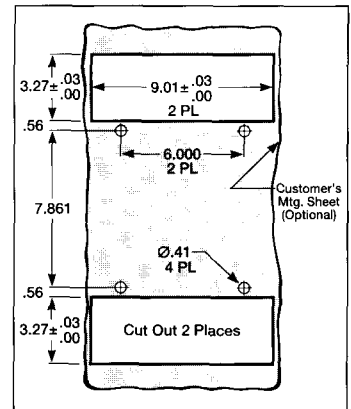


Figure 2

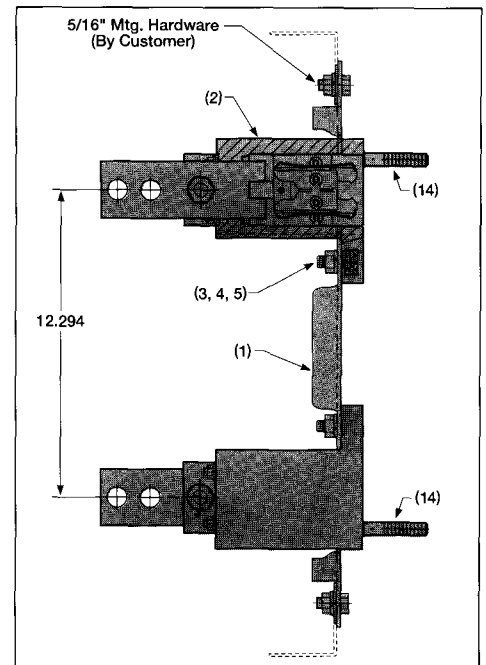


Figure 3

Mounting Block: Figure 3

- A. Align adapter assembly (2) with cutouts in switchboard mounting plate (or customer's mounting means as previously prepared in Step 3 above) and secure in place with $\frac{3}{8}$ " flat washers (3), lock washers (4), and $\frac{3}{8}$ - 16 hex. nuts (5) furnished. Tighten to 216 in. lbs. (18 ft. lbs.).

Installation Diagrams

Breaker Preparation: Figure 4

CAUTION: Make certain that breaker operating handle is in the OFF or TRIPPED position before proceeding.

- Loosen four breaker terminal shield screws (6) and remove both line and load side terminal shields (7).
- Place terminal stabs (8) on back of breaker in recess provided in base molding. Secure in place with $\frac{5}{16}$ " flat washers (9), lock washers (10) and $\frac{5}{16}$ - 18 hex. head bolts (11) furnished. Tighten these bolts to 96 in. lbs. (8 ft.lbs.) to assure a good electrical connection. Repeat this procedure for the remaining terminals.
- Insert end shields (12) into slots provided at line and load ends of breaker.
- Affix label (13) to front of circuit breaker as shown in Figure 4.

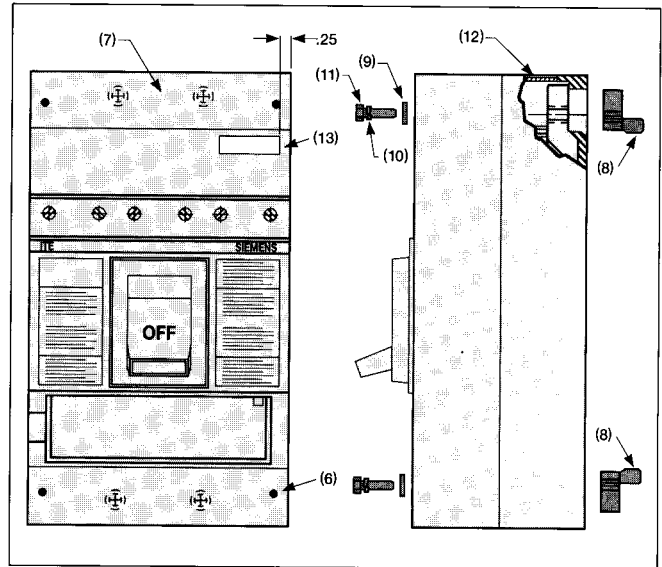


Figure 4

Final Assembly: Figure 5

- Make bus connection to the mounting block studs in accordance with panelboard specifications.
- Position breaker over the terminal block studs (14). Install each of the four slotted $\frac{3}{8}$ " - 16 x 1 $\frac{1}{4}$ " long circuit breaker mounting nuts (15). Tighten these nuts uniformly so that the breaker remains parallel with the mounting surface, forcing the circuit breaker terminal stabs into their

respective mounting block finger clusters. Torque these nuts to 216 in. lbs. (18 ft. lbs.).

- Replace breaker terminal shields (7) and secure with four breaker terminal screws (6). Tighten to 12 in. lbs. (1 ft. lb.).
- If installation requires use of front panel trim, provide cutout for breaker escutcheon as shown in Figure 6.

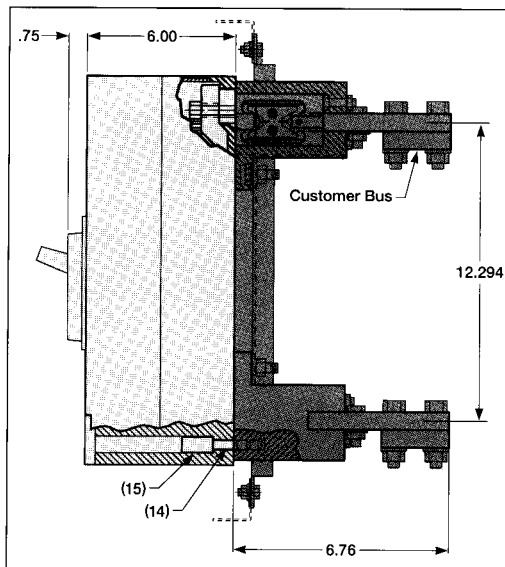


Figure 5

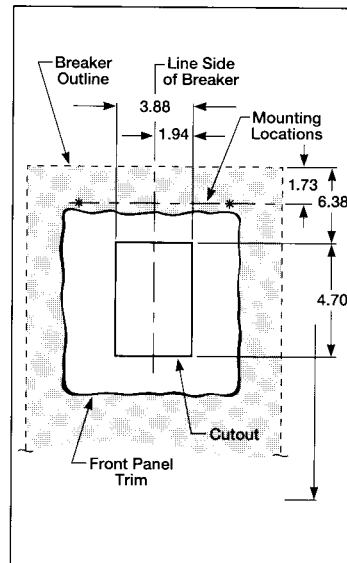


Figure 6

I-T-E Connecting Studs (RS5785, RS5786)

⚠ DANGER

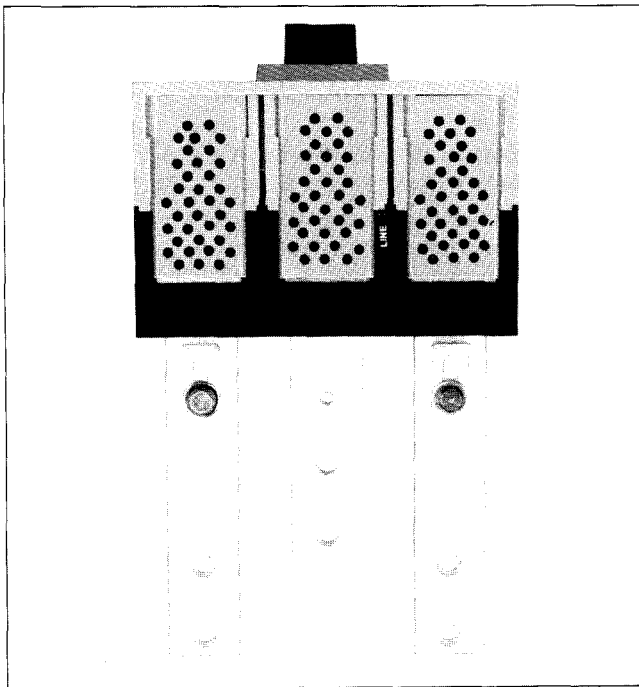
Hazardous Voltage.
Will cause severe injury or death.

Turn off and lock out all power supplying this device before installing or servicing.

SAFETY INSTRUCTIONS

General

These connecting studs can be used on 2 or 3-pole circuit breakers and on line and load terminals. Both the long stud RS5785 and the short stud RS5786, can be used on adjacent poles or alternated, as required by the installation.



Connecting Studs Attached To Breaker

Mounting Preparation

- A. Turn off and lock out all power supplying circuit breaker before installing.
- B. Drill mounting panel as shown in drilling plan, Figure 1. This user provided panel must be made from a material acceptable for supporting uninsulated live parts and have adequate strength to support the circuit breaker. Thickness should be 1/4 in. min. and 1 in. max.
- C. Figures 1 and 2 show dimensioning information which can be used to plan the circuit breaker termination interface.

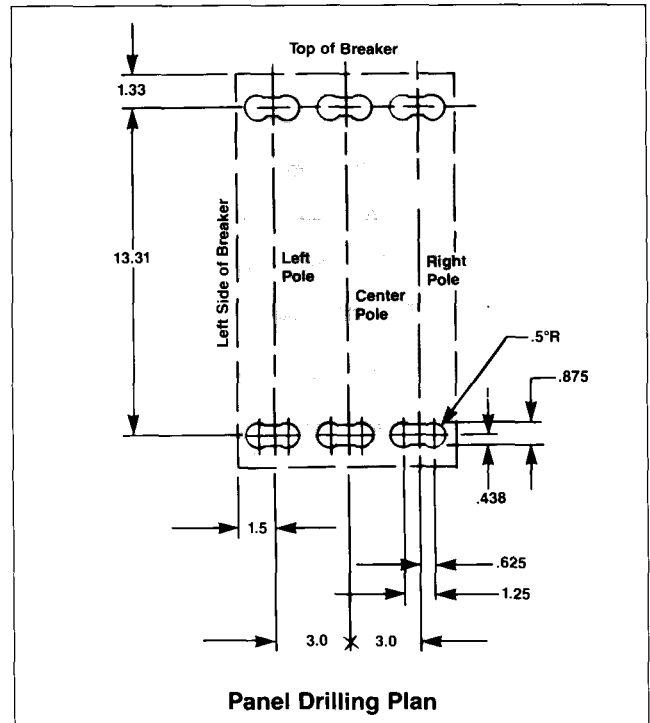


Figure 1

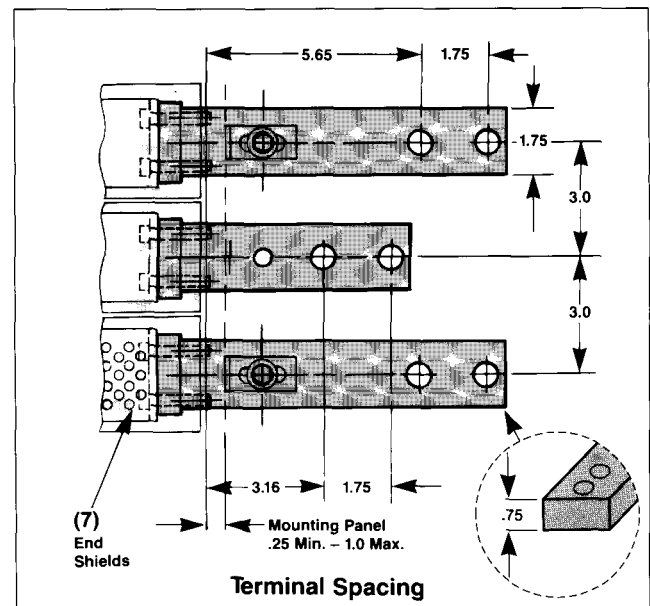


Figure 2

I-T-E Connecting Studs (RS5785, RS5786)

Circuit Breaker Preparation

- Remove terminal shield (1) from line and load side of breaker frame. Two #8-32 screws (2) each (Figure 3).
- Attach the connecting studs (3) as shown in Figure 4, to each pole of the circuit breaker with two $\frac{5}{16}$ -18 hex head cap screws, flatwashers and lockwashers (4). Torque the screws to 72 lb. in.
- Inspect the rear busbar. When properly attached they should be aligned and parallel with each other and perpendicular with the circuit breaker mounting surface.

Circuit Breaker Mounting Procedure

- Position the circuit breaker on the mounting panel, passing the attached connecting stud through the panel openings.
- Secure the circuit breaker to the panel by attaching each connecting stud with the panel clamp, (5) (Figure 4) hex head bolt, lockwasher and flatwasher (6) supplied. Torque the bolts to 96 in. lb.
- Complete the appropriate user connections to the rear connecting stud.
- After the breaker is installed, attached to the mounting panel and terminated, retorque each of the $\frac{5}{16}$ -18 hex head cap screws (4) (Figure 4) to 72 in. lb.
- Insert the end shields (7) into the slots provided at the line and load ends of the breaker (Figure 4).
- Replace the breaker terminal shields (1) on the line and load side of the circuit breaker and secure with four breaker terminal shield screws (2). Tighten to 12 in. lb.
- Affix label (this device is equipped with rear connecting studs) (8) to the front of the circuit breaker (Figure 3).
- If installation requires use of front panel trim, provide cutout for breaker escutcheon (Figure 5).

Installations Requiring Panel Premounted Studs

If it is necessary to install the straps in a panelboard prior to their attachment to the circuit breaker, the following procedure is recommended.

- Construct a strap positioning template fabricated from $\frac{1}{2}$ in. thick material, dimensioned with the hole pattern (Figure 6).
- Attach the rear connecting studs to the mounting template using the $\frac{5}{16}$ -18 hex head cap screws (4) provided (Figure 4). Note that the rear strap mounting pads are not symmetrical. The studs must be mounted with the orientation (Figure 4).
- Position the template and stud assembly on the circuit breaker mounting panel, passing the attached rear studs through the panel opening.
- Secure the assembly to the panel by attaching each connecting stud with the panel clamp (5) hex head bolt, lockwasher and flat washer (6) supplied. Torque to 96 in. lb. (Figure 4).
- Complete the appropriate user connections to the rear connecting studs.

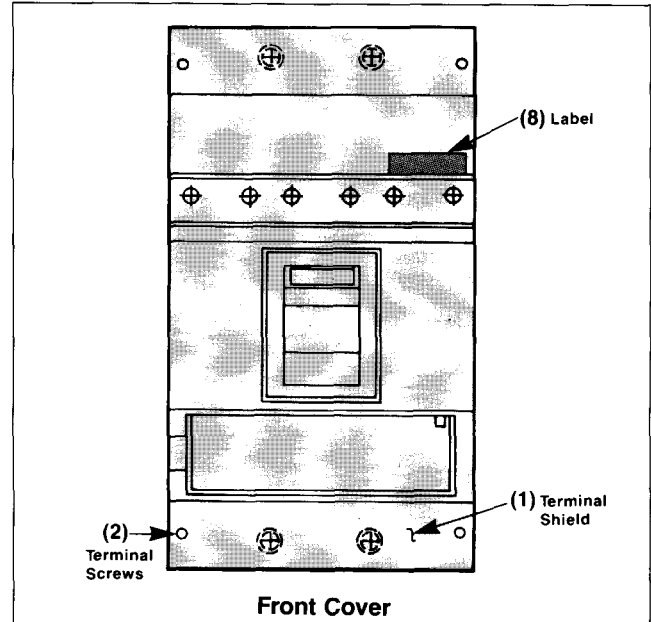


Figure 3

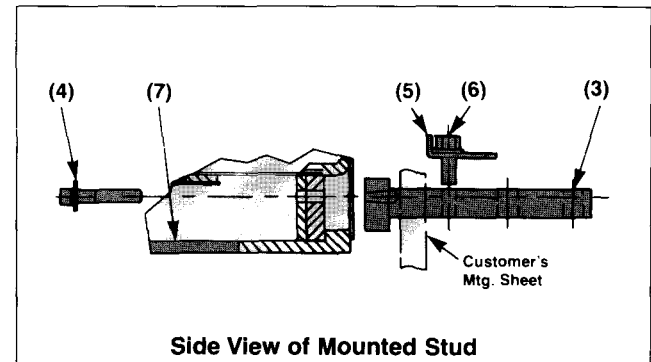


Figure 4

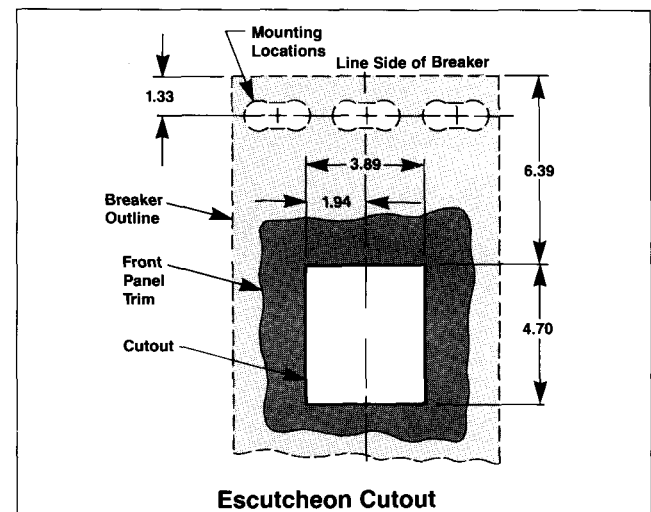


Figure 5

I-T-E Connecting Studs (RS5785, RS5786)

- F. Remove the positioning template.
- G. Mount the circuit breaker by positioning it over the rear busbar mounting pads. Attach each pole (Line and Load) of the circuit breaker to the connecting busbars with the two $\frac{5}{16}$ -18 hex head cap screws, flatwashers and lockwashers (4) (Figure 4). Torque each screw to 72 in. lb.
- H. Insert the end shields (7) into the slots provided at the line and load ends of the breaker (Figure 4).
- I. Replace the breaker terminal shields, (1) on the line and load side of the circuit breaker and secure with four breaker terminal shield screws (2). Tighten to 12 in. lb. (Figure 3).
- J. Affix label (8) (This device is equipped with rear connecting studs) to the front of the circuit breaker (Figure 3).

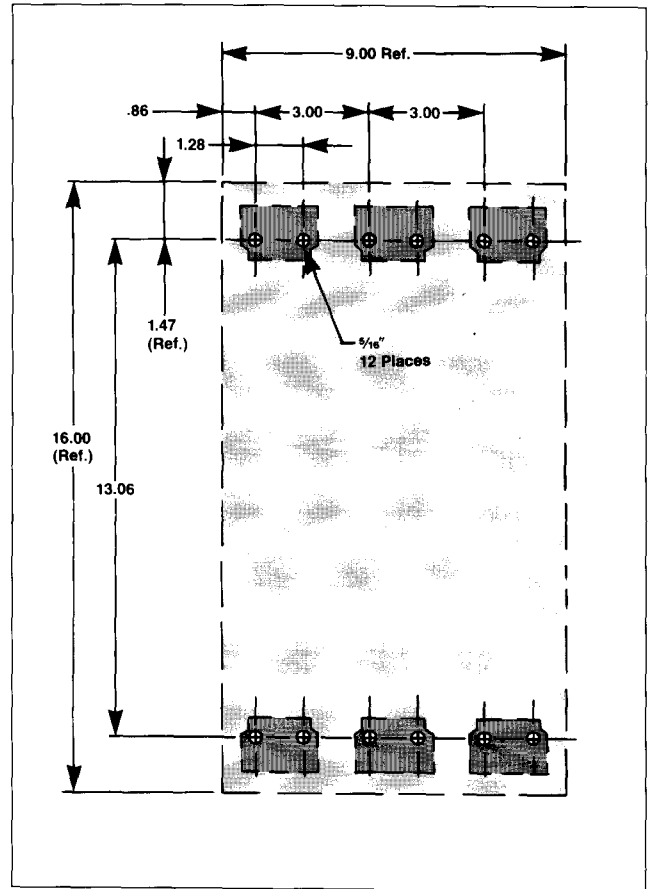
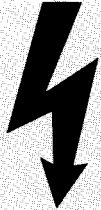


Figure 6

I-T-E Mechanical Interlock (MI5404)



⚠ DANGER

Hazardous Voltage.
Will cause severe injury or death.

Turn off and lock out all power supplying this device before installing or servicing.

⚠ SAFETY INSTRUCTIONS

Circuit Breaker Preparation

A. Turn off and lock out all power supplying circuit breaker or frame before removing cover(s) or device and while cover(s) are removed.

B. Remove terminal shield (1) from line and load side of breaker frame. Two #8-32 screws each (Figure 1).

C. Remove load cover (2) from breaker frame. Six #10-32 x 3/4 screws and two #10-32 x 1 1/8 in. screws (Figure 1).

D. If trip unit has been installed, remove both socket head cap screws from left pole. If installing a trip unit prior to lowering trip unit (3) into place as shown in Figure 1, remove from *left pole only*, the two socket head cap screws (4) and the two Belleville spring washers (5) and discard.

E. Lower trip unit into place as shown in Figure 1. The two hooks (6) on the trip unit must fit over pins on frame. Breaker handle may be removed to ease assembly.

F. Secure trip unit to frame using customer supplied 1/4 in. Allen wrench with long shaft. Tighten four, 5/16-18 socket head cap screws (7) to 140 in. lb.

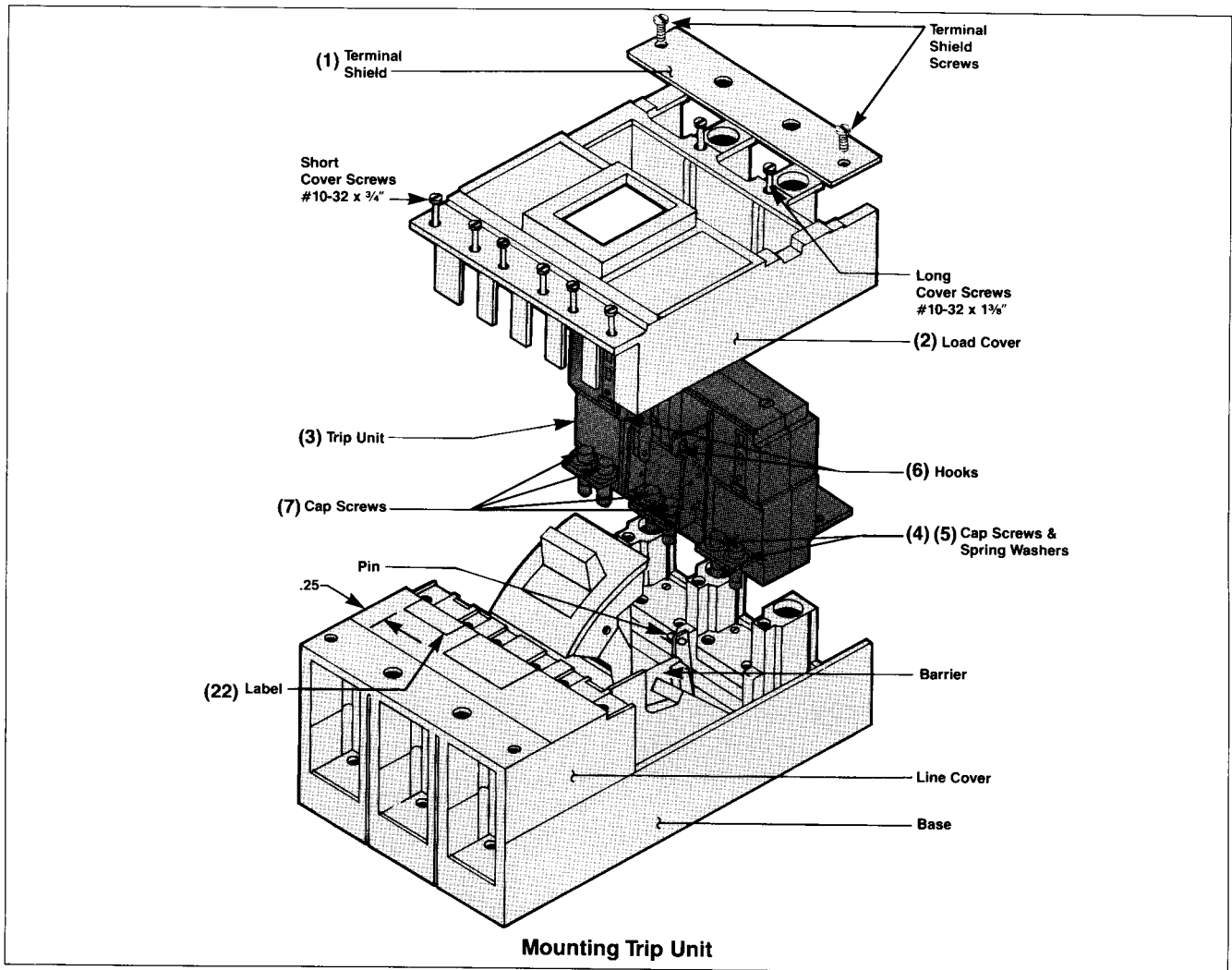
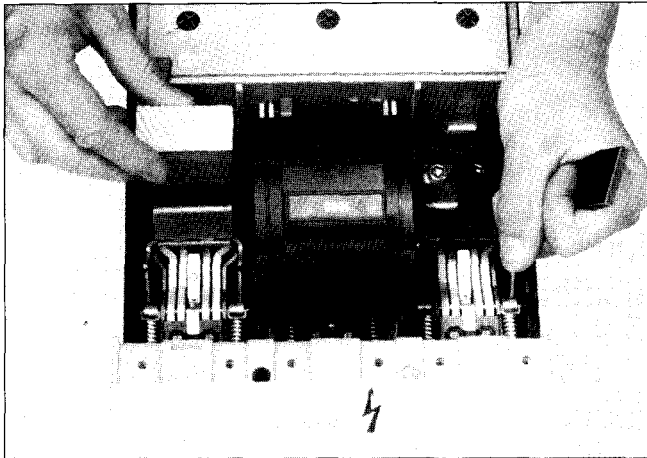


Figure 1

I-T-E Mechanical Interlock (MI5404)

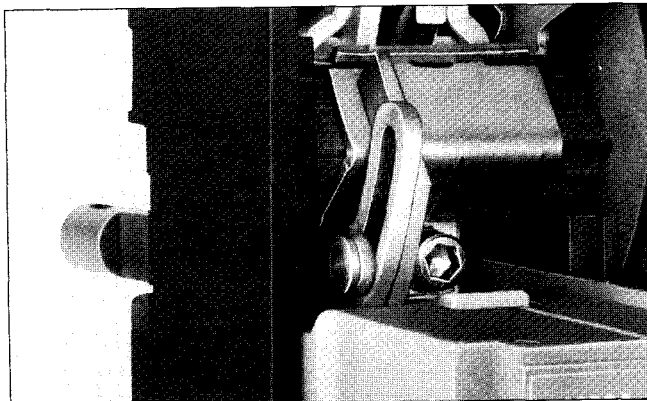
Support Tie Bar Mounting

A. With 9-in. long tie bar wrench (8) supplied (Figures 2 and 3) positioned around left pole tie bar connector (9), pull tie bar connector back in direction of arrow (away from trip unit) and drop safety wood block (10) with 1-in. dimension into gap between tie bar connector and trip unit on right pole. Wood block should come to rest snugly on the two socket head cap screws as shown in Figure 4. Remove wrench.



Securing Tie Bar Connector

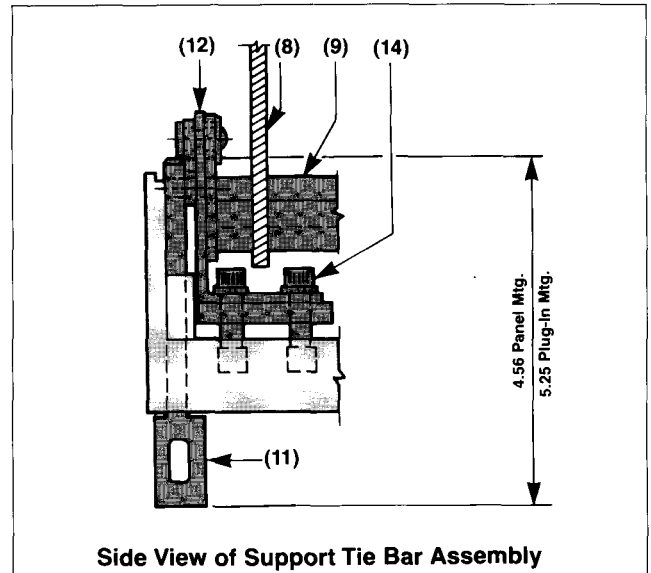
B. Two sets of plungers are provided. Select proper length of plunger (11) (Figures 2 and 3) for desired application and discard the pair of plungers not used. Position support tie bar assembly from top and insert plunger through rectangular opening in base from bottom of base. Tie bar member (12) must fit around tie bar connector (Figure 3). It may be necessary to gently tap tie bar member down to achieve snug fit.



Position of Link Assembly

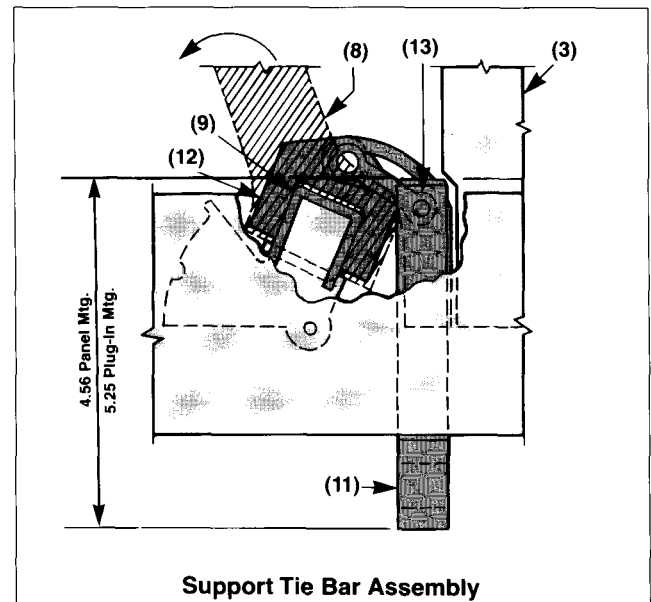
C. Plunger locator pin (13) (Figure 3) of link assembly should face toward outer edge of breaker and must engage hole in plunger. Once this engagement is achieved, tighten two 5/16-18 socket head cap screws (14) to 140 in. lb. (Figure 2).

NOTE: Plunger is installed only on left hand pole of each circuit breaker.



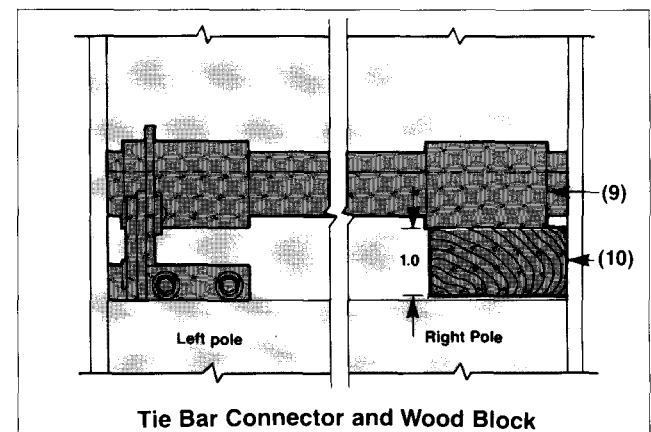
Side View of Support Tie Bar Assembly

Figure 2



Support Tie Bar Assembly

Figure 3



Tie Bar Connector and Wood Block

Figure 4

I-T-E Mechanical Interlock (MI5404)

D. Using tie bar wrench carefully positioned over tie bar connector, (so as not to damage support tie bar assembly), pull tie bar back in direction of arrow and remove wood block. With care remove tie bar wrench.

E. Replace handle if removed.

NOTE: Tab on front of handle must be aligned toward line end.

F. Replace load cover. The six #10-32 x 3/4 in. screws must be installed toward the line side of the circuit breaker. The two 10-32 x 1 1/8 in. screws are installed on the load end. Tighten all load cover screws to 25 in.-lb.

Rocker Arm Mounting

A. Drill panel as shown for panel mounting (circuit breakers on 9 or 12 in. centers), (Figure 5). For plug in mounting, see Figure 6.

B. Assemble bracket (15) to rear of 10 gage customer panel using two flat head screws (16), lockwashers (17) and nuts (18) supplied as shown in Figure 7.

C. Assemble rocker arm (19) to bracket with rocker arm pin (20).

NOTE: Heads of rocker arm pin must be on upper side of assembly and cotter pin (21) on lower side. Insert cotter pin into hole in rocker arm pin and secure by spreading ends (Figure 7).

D. Add circuit breakers (specially prepared) to customer's panel for panel mounted or plug-in adapters and circuit breakers for plug in applications. Refer to installation instruction supplied with plug-in adapters Catalog PC5662 or PC5663. Carefully position circuit breaker over 1.00 in. diameter hole in panel so as not to damage protruding plunger. For panel mounted applications use Catalog MSMN mounting screw kit (part of mechanical interlock Catalog MI5404) to fasten circuit breaker to customer's panel. Replace terminal shields. Tighten two #8-32 screws each to 12 in.-lb.

E. Assemble rocker arm pins through rocker arm and slot in plunger and insert cotter pin into hole in pin and spread ends (Figure 7).

NOTE: Heads of rocker arm pins must be on upper side of assembly and cotter pins on lower side.

F. With both circuit breakers in OFF position, interlock must move freely.

G. With one circuit breaker ON the other circuit breaker must not close.

H. Affix labels (22) to front of both circuit breakers as shown in Figure 1.

NOTE: Installation of a Mechanical Interlock system prevents use of internal accessories in the left pole of the circuit breakers.

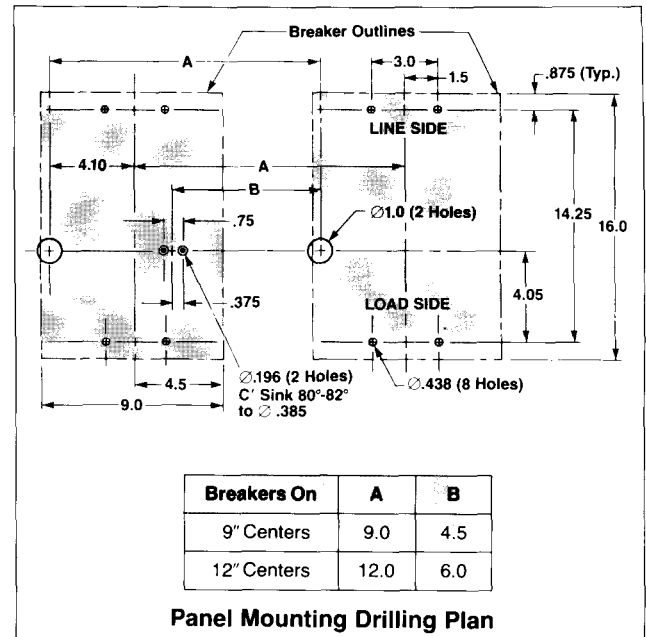


Figure 5

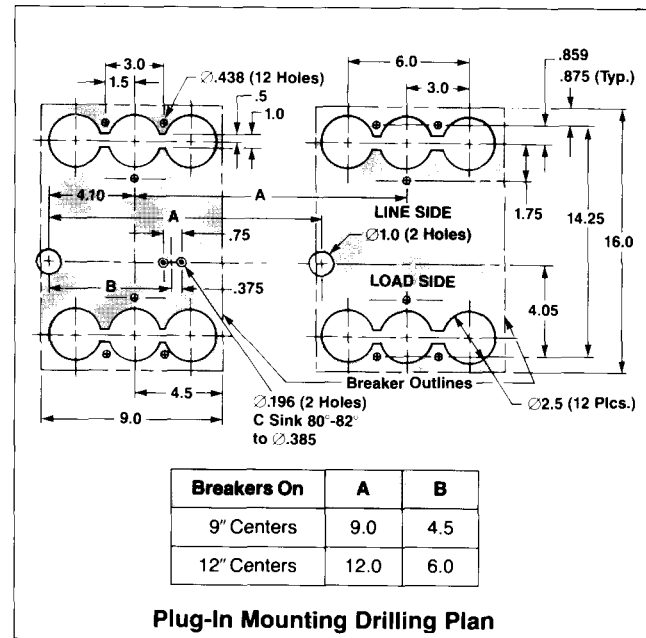


Figure 6

I-T-E Mechanical Interlock (MI5404)

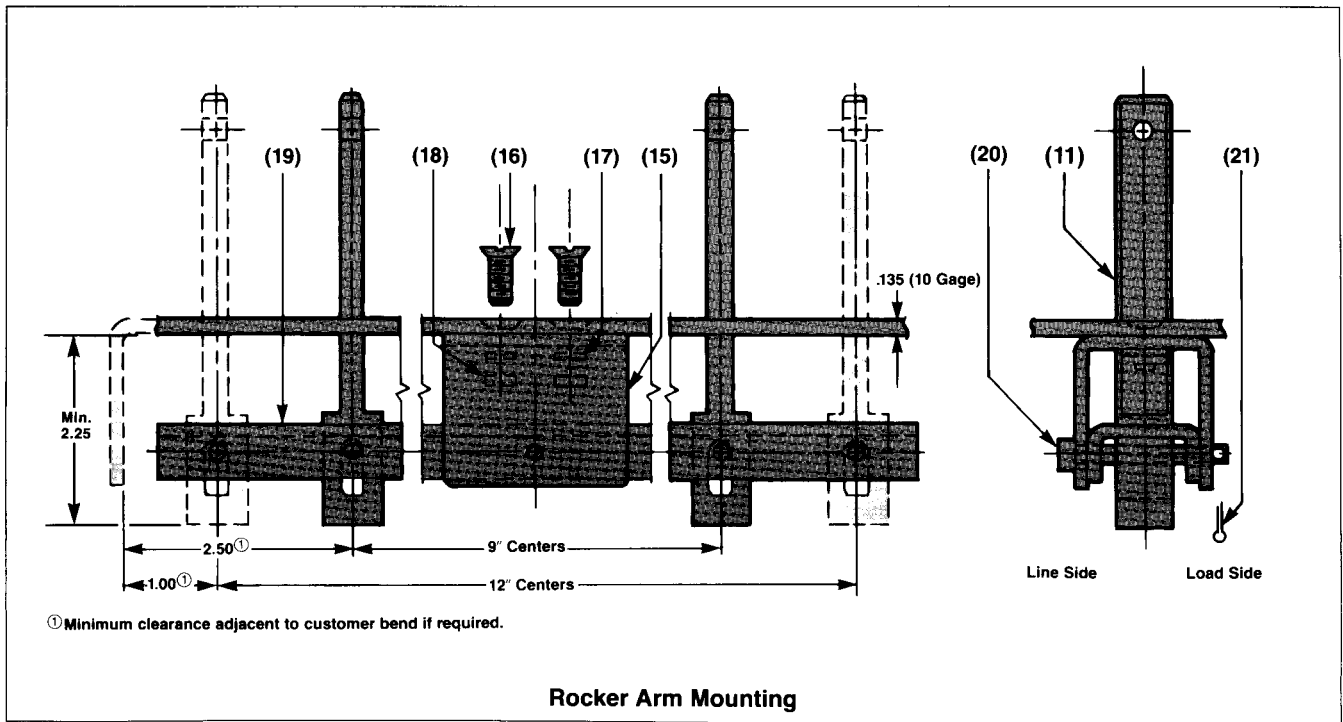


Figure 7

I-T-E Internal Accessories

⚠ DANGER

Hazardous Voltage.
Will cause severe injury or death.

Turn off and lock out all power supplying this device before installing or servicing.

SAFETY INSTRUCTIONS

Circuit Breaker Preparation

- A. Turn power off supplying device before installing kit.
- B. Make sure device is in tripped position. For circuit breakers, depress the red TRIPPED button (1) (Figure 1). On molded case switches, removing the cover will trip the mechanism.

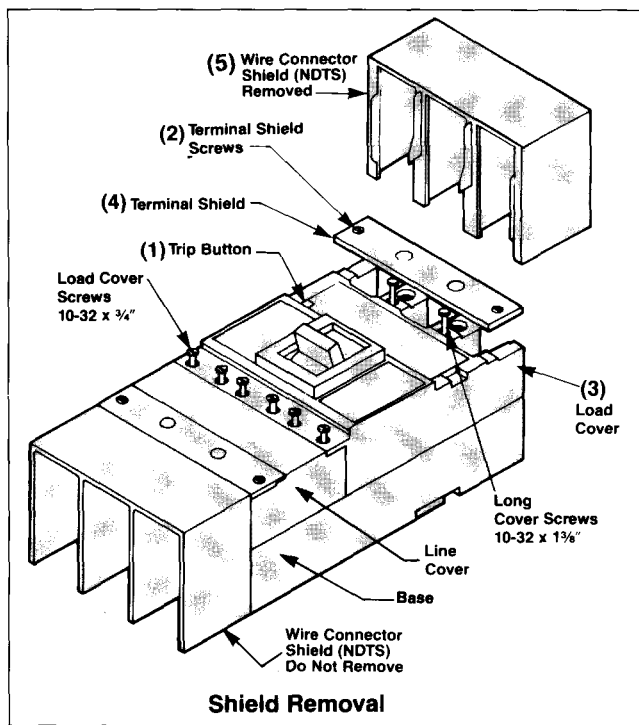
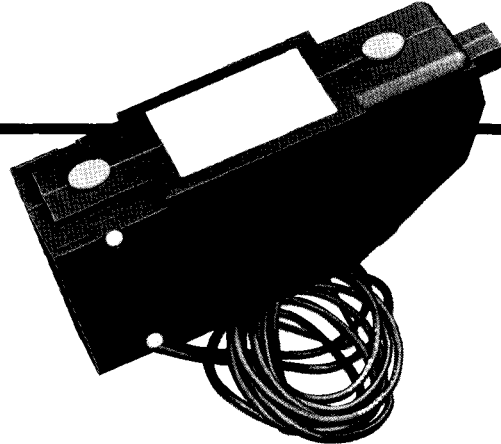


Figure 1

- C. Remove two terminal shield screws (2) on load end cover (3) (Figure 1) and remove terminal shield (4) and wire connector shield (5) (if used). Remove load end cover. Accessory units can be mounted in either right or left pole of the circuit breaker.

- D. Remove label (6) which covers openings in trip unit (Figure 3).



Accessory Mounting Instructions

- A. Feed leads through opening at bottom of accessory case for right hand or left hand mounting in breaker. Leads should always exit accessory toward outer edge of breaker. Feed accessory leads down and through .670 x .300 in. elongated opening (7) (Figure 2) to bring leads out bottom of circuit breaker.

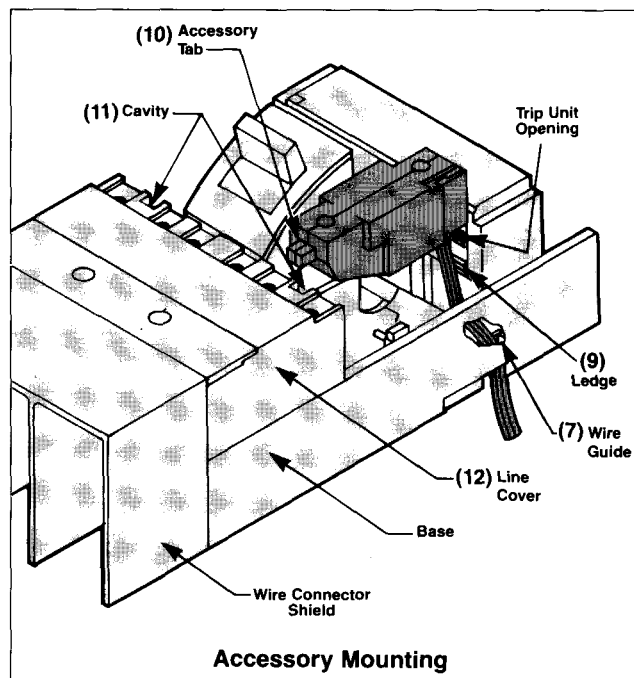


Figure 2

- B. Pull gently and evenly on accessory wire leads (2 to 9 wires) while lowering accessory onto base. Make sure all the slack is removed from leads inside breaker. Accessory is placed in circuit breaker on nosepiece (8) (Figure 3) on bottom side of accessory. Slide accessory down to rest on positioning ledge (9) (Figures 2 and 3) of trip unit.

When accessory is installed correctly, front tab of accessory (10) (Figure 2) will rest in cavity (11) of line cover (12). The inside edge of any accessory should be against the trip unit rib (13) (Figure 3) after installation.

NOTE: Do not attempt to "slide" Bell Alarm into position. Actuator (14) (Figure 3) must be inserted below top edge of center trip unit opening (15) (Figures 2 and 3) as front of accessory is lowered into cavity of line cover.

I-T-E Internal Accessories

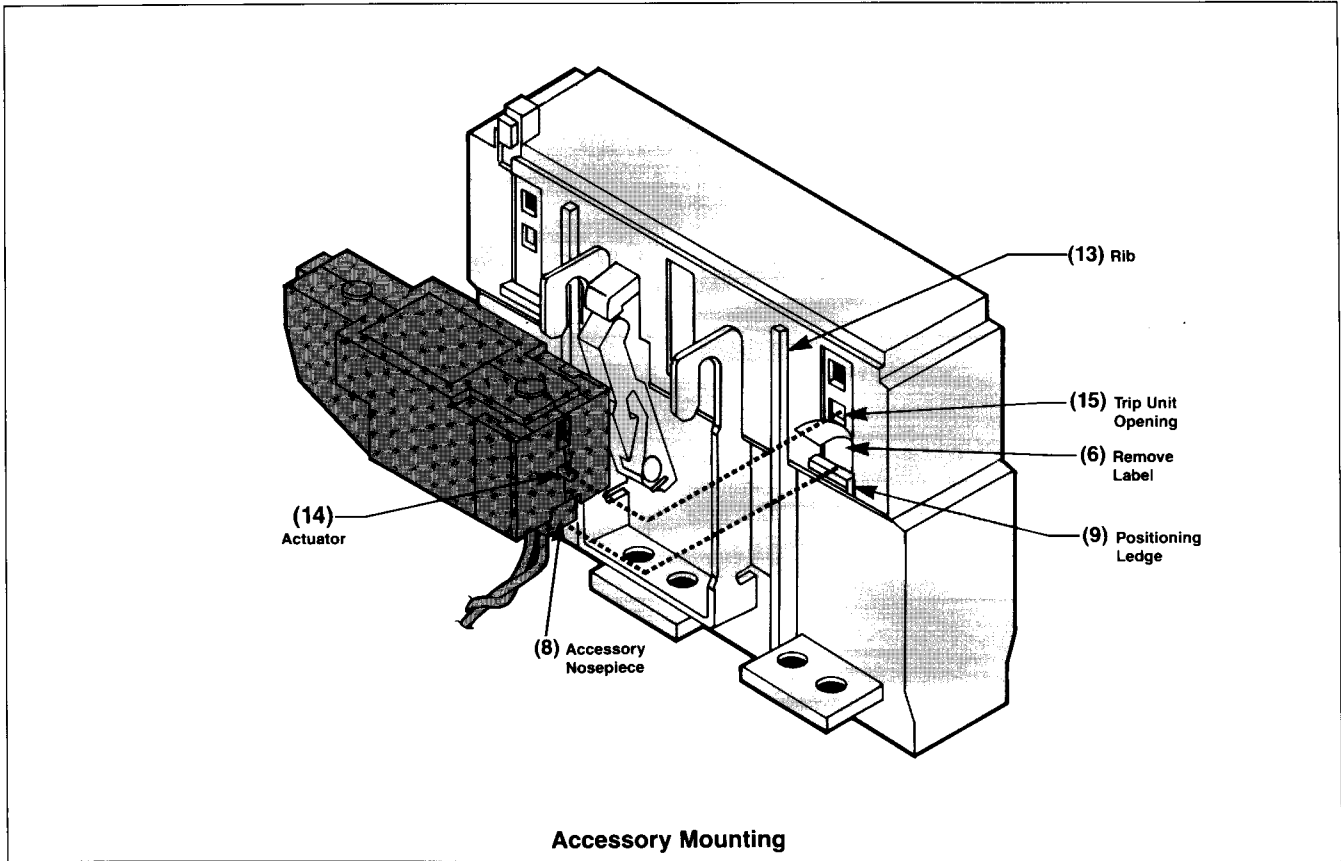


Figure 3

C. Check handle for proper fit on handle arm. Replace load end cover and cover screws. (quantity 8)

Replace All Covers and Shields

A. Add two labels to circuit breaker. Attach internal accessory ID label (16) (Figure 4) to top of circuit breaker on right hand side. Make sure it is located in the proper space on existing label. Attach wiring label (17) on side of circuit breaker cover as shown.

NOTE: This accessory is suitable to use for Ground Fault Protection when combined with Class I Ground Fault Sensing Element equipped with internal clearing switch.

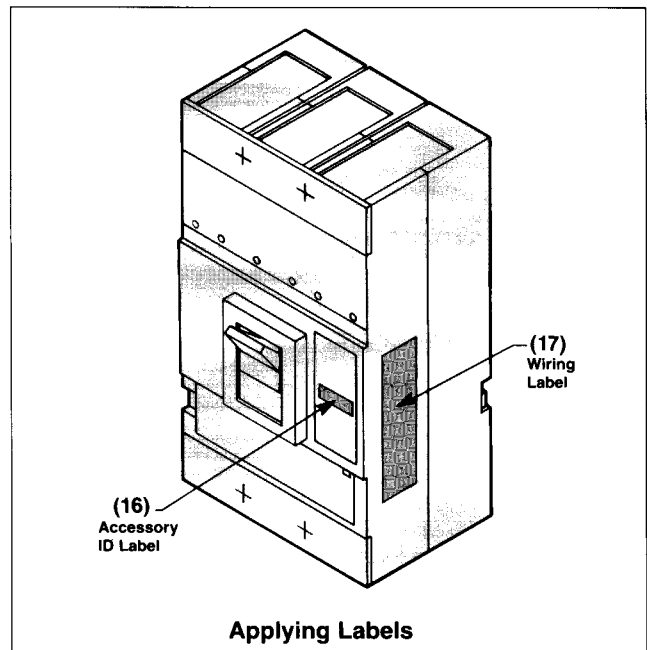


Figure 4

I-T-E Internal Accessories

Mechanical and 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.

Electrical Data For Shunt Trip

Coil Voltage	Inrush Current At Rated Voltage (Amperes)	Catalog Number
60 Cycles AC		
120	0.55	S01MN6
208	0.61	S02MN6
240	0.69	S03MN6
277	0.76	S15MN6
480	0.30	S04MN6
600	0.40	S06MN6
DC		
12	2.55	S16MN6
24	1.70	S07MN6
48	0.60	S09MN6
125	0.57	S11MN6
250	0.84	S13MN6

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 Undervoltage (UV) Trip

Coil Voltage	Sealed-In Current At Rated Voltage (Amperes)	Catalog Number
60 Cycles AC		
120	0.09	U01MN6
208	0.05	U02MN6
240	0.04	U03MN6
277	0.04	U15MN6
480	0.02	U04MN6
600	0.02	U06MN6
DC		
24	0.23	U07MN6
48	0.13	U09MN6
125	0.08	U11MN6
250	0.04	U13MN6

Bell Alarm Wire 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)

Auxiliary Switch Identification (All With Three Leads)

Wire Markings	Wire Color	Switch Terminals or Contacts
C1 or C2	White	C. – Common Terminal
B1 or B2	Red	N.C. – Normally Closed Contact (Closed when circuit breaker is tripped)
A1 or A2	Black	N.O. – Normally Open Contact (Open when circuit breaker is tripped)

Bell Alarm Mechanical and Electrical Check

- Use a buzzer or light indicator attached to switch leads A and C. With device in TRIPPED position, 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.

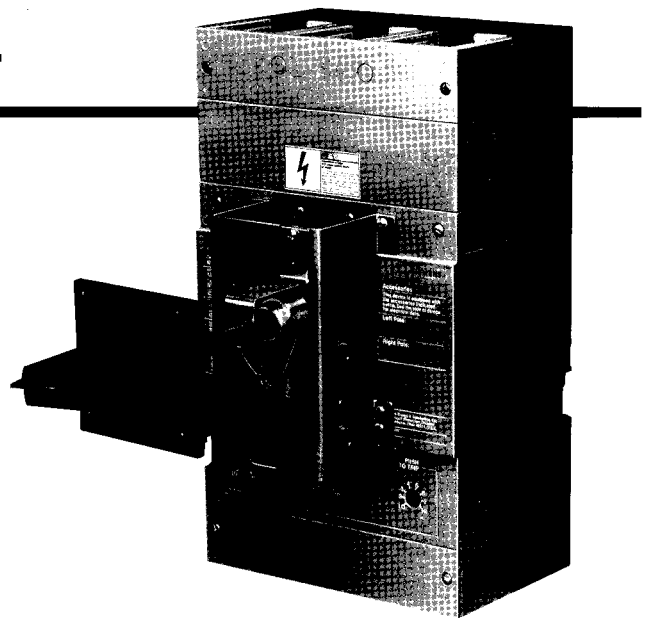
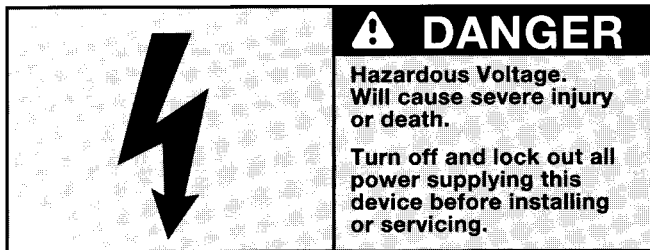
NOTE: Should the indicator not function properly during "check" procedure, inspect for incorrect installation or wiring.

Auxiliary and Bell Alarm Switch Kits

Catalog Number	Number of Auxiliary Switches	Ampere Rating of Switch				
		Volts AC			Volts DC	
		120	240	480	125	250
B00MN64	0	10	10	10	.5	.25
A01MN64B	1	10	10	10	.5	.25
A02MN64B	2	10	10	10	.5	.25
A01MN64	1	10	10	10	.5	.25
A02MN64	2	10	10	10	.5	.25

I-T-E Rotary Handle Operator

Types 1, 3R, 4, 4X, 12



Standard Depth (RHONSD) Variable Depth (RHONVD)

General

When properly installed, the rotary handle operator provides single point latching of the enclosure door. For maximum protection against unauthorized entry into the enclosure, additional latching means should be provided. The handle can be padlocked in the OFF position with up to three $\frac{5}{16}$ in. padlocks. The breaker operator can also be padlocked in the OFF position.

Drilling of Enclosure

- Turn off and lock out all power supplying the circuit breaker before installing.
- Catalog number RHONSSD standard depth shafts are for use in 11 in. deep enclosures. Refer to minimum K dimension in Figure 2. Catalog number RHONSVD variable depth shafts are used for all other enclosure depths up to 20.66 in. deep. Shafts are cut to length L as shown in Figure 2.
- Place circuit breaker mounting holes (Figure 1) in breaker mounting surface (1) and handle mounting holes in enclosure door (2) (Figure 2).

Installation of Breaker and Breaker Operator

- Loosen four breaker terminal shield screws (3), remove both terminal shields (4) from the line and load side of the circuit breaker and mount the circuit breaker to the enclosure panel using four $\frac{3}{8}$ -16 in. mounting screws, washers and nuts (5) provided in hardware kit. Tighten mounting hardware securely (Figure 4).
- Replace the breaker terminal shields on the load and line side of the circuit breaker and secure with four breaker terminal shield screws. Tighten to 12 in. lb.
- Remove the second screw (6) from each side of the circuit breaker cover (located above the circuit breaker handle) (Figure 4).
- Position the breaker operator (7) on the circuit breaker and attach at the top using the two #10-32 x 1.00 pan head screws (8) and lock washers. Torque these screws to 25 in. lb. Attach the breaker operator at the bottom using the four #10-14 x .500 phillips head thread forming screws (9). Torque to 20 in. lb. maximum (Figure 4).

NOTE: The mounting holes are under the labels.

Installation of Shaft

- If applicable, cut variable length shaft to length required $L = K - 8.38$.
- Insert the shaft (10) into the square hole (11) in the crank (12) of the breaker operator and tighten the two $\frac{1}{4}$ -20 x .375 set screws (13) to 70 in. lb.

NOTE: Groove in shaft fits over ridge along side of hole. (Figure 4).

Installation of Handle

- Place handle into OFF position. Attach the handle (14) and gasket (15) to the enclosure door with the four square neck bolts (16), lock washers and nuts supplied. Tighten nuts to 75 in. lb. (Figure 3).

Check operation

- Close enclosure door. Confirm that handle interlocks with the guide cone (17) (Figure 4) of the shaft to hold the door closed in all handle positions except OPEN/RESET. Check proper operation of the circuit breaker ON/OFF and RESET.

To open the enclosure door when the breaker is in the ON position, rotate the screw slot (18) on the handle plate (19) counterclockwise. This procedure will defeat the interlock (Figure 3).

Padlocking

- To lock handle in the OFF position, pull the lockplate (20) from the end of handle into the grooves on the handle plate located at the interlock defeater screw and insert and attach padlock(s) through slot of lockplate (see photo).
- The breaker operator can be padlocked by inserting padlock through the lower slots used as a path for the crank arm (see photo).

Installation Diagrams

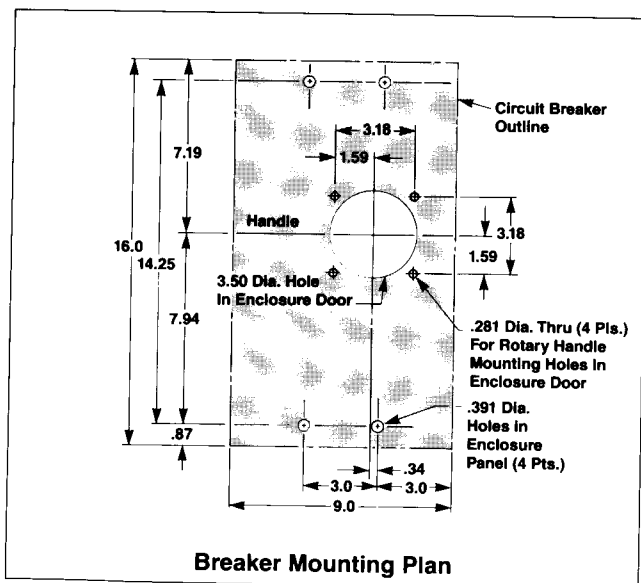


Figure 1

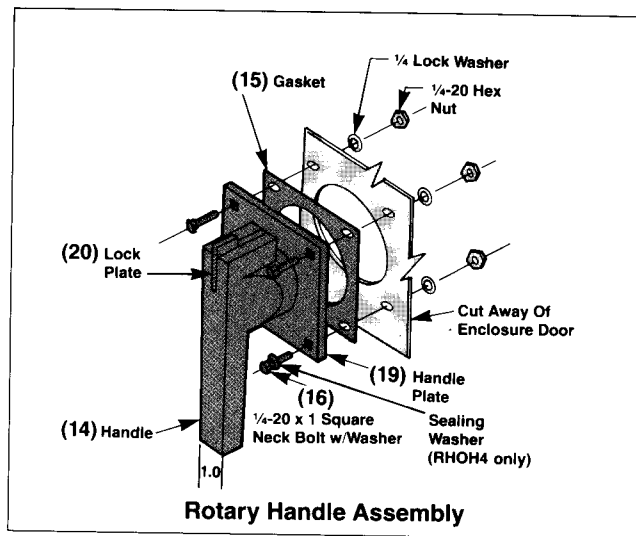


Figure 3

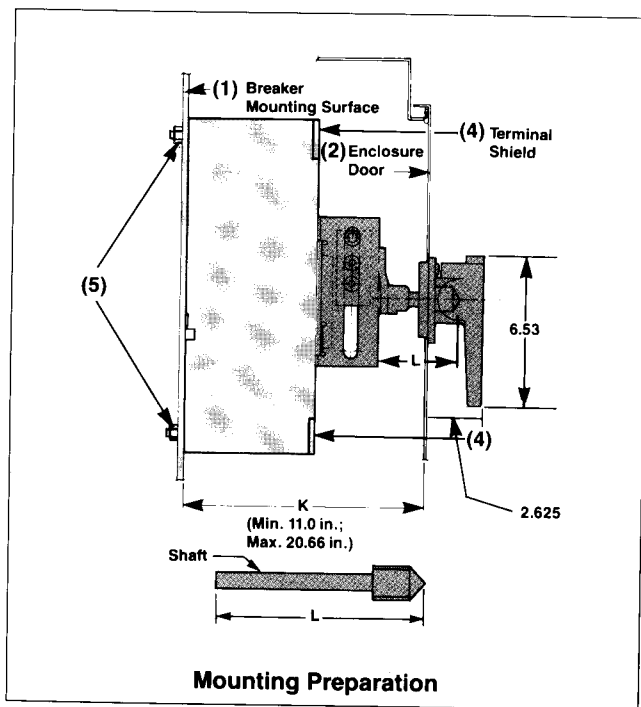


Figure 2

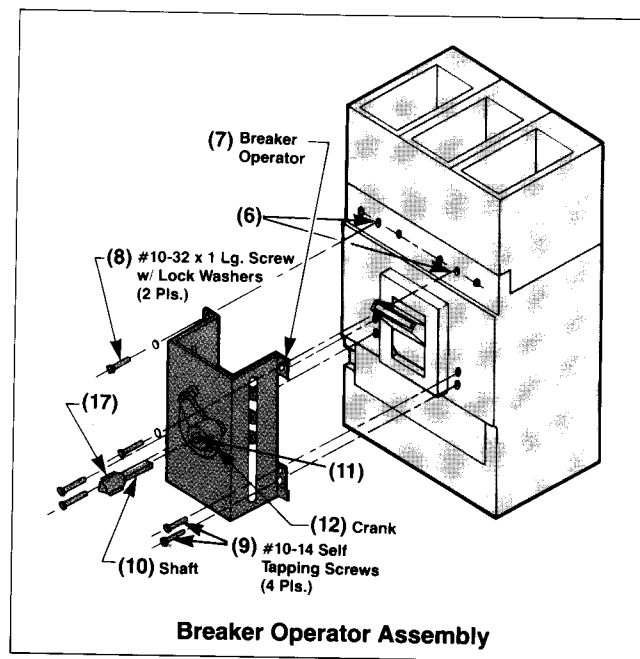



Figure 4

I-T-E Max-Flex™ Flange-Mount Handle Operator

Types 1, 3R, 4, 4X, 12

	<p>⚠ DANGER</p> <p>Hazardous Voltage. Will cause severe injury or death.</p> <p>Turn off and lock out all power supplying this device before installing or servicing.</p>
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⚠ SAFETY INSTRUCTIONS

General Information

The I-T-E Max-Flex™ Flange-Mount Handle Operator is a flexible cable control device used for the remote switching of a circuit breaker within an enclosure. The flexible cable is connected directly to the breaker at one end and to a pre-assembled switch handle operator at the other end. The remote operator handle, located on the enclosure flange, is used to perform mechanical open/close switching operations. This is accomplished through the flexible control cable.

Function

The advanced design concept of the Max-Flex Flange-Mount Handle Operator provides for greater flexibility when locating a circuit breaker within an enclosure. The circuit breaker can be mounted almost anywhere, at any angle and on almost

any convenient surface. The same flexibility applies when locating the switch handle operator on the flange section of the enclosure.

Application

The Max-Flex Operator is designed to work with I-T-E circuit breakers having current ratings through 1200 amperes. The Max-Flex unit meets all the industrial criteria such as UL and Automotive Industry Standards.

Design

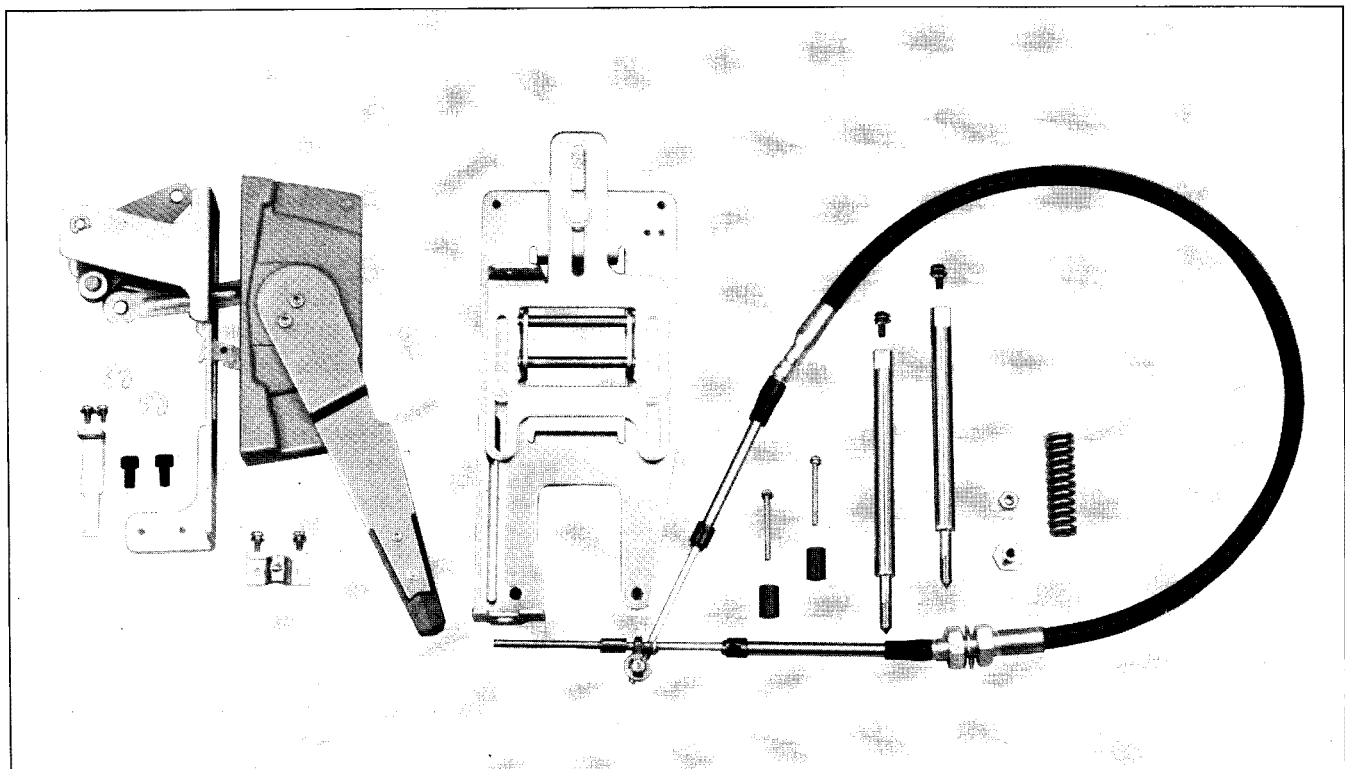
The new Max-Flex Handle Operator provides maximum flexibility in design and assembly of electrical equipment.

The cable design is flexible and rugged. The flexible cable comes in standard 4 or 5 foot lengths. However, specific lengths can be special ordered up to 20 feet.

Operation

When properly installed, the Max-Flex Handle Operator is used to perform remote switching operations from outside of the enclosure. Switching is accomplished by pushing the Max-Flex Handle Operator up for ON and down for OFF. The mechanical advantage gained with this device simplifies switching operations when compared with local switching at the breaker.

Interlocking provisions are included and described below. All switching functions are standard according to accepted practices.



Unassembled Max-Flex™ Flange-Mount Handle Operator

Assembly Instructions

MD and ND-Frame Application

A complete kit consists of handle, cable and breaker operator. The handle can be mounted on either right hand or left hand flange type enclosures. It can be locked in the OFF position with up to three padlocks. A two piece door catch is provided for applications where no interlocking door latch mechanism is provided. The breaker operator mounts to the circuit breaker and can be padlocked in the OFF position. The flexible cable connects the handle to the breaker operator. The handle operator can be used with ITE door latch mechanisms DKR2, DKR3, DKL2, and DKL3.

Mounting

- A. Turn off and lock out supply power before installing the device.
- B. Determine mounting location for the handle and circuit breaker. (See Figure 1 and Tables 1 and 2.)

Table 1 – Maximum E Dimensions (in inches) ①

Enclosure Depth	FHONC048	FHONC060
10	16	30
12	15.5	29.5
16	15	29.5
18	15.5	29.5
20	16	29
24	15.5	28.5
30	10	26
36	–	23

① Maximum E Dimension only if F = 7.62

Table 2 – F Dimensions (in inches)

Enclosure Depth	48" Cable		60" Cable	
	Up	Down	Up	Down
10	8	21.5	17.5	31.5
12	7.5	21	18	32.5
16	6.5	21	19	32
18	6	20.5	18.5	32
20	6	20	16.5	31.5
24	4	19	14	31
30	-1.5	15.5	11	28.5
36	–	–	6.5	23.5

Table 2 shows the maximum horizontal distance that the breaker can be located from the handle. Table 3 shows the maximum vertical distance the breaker can be located from the handle. Figure 2 shows the mounting range of the circuit breaker within the enclosure.

NOTE: Minimum Bend Radius for the Cable is 3½ in.

- C. Drill the mounting holes for the handle and circuit breaker and file all burrs.

Handle Installation

- A. Push rubber gasket (1) into the groove of the handle assembly (2) (Figure 3).
- B. The handle and the interlock mechanism (3) are supplied pre-assembled from the factory (Figure 3).

NOTE: For ease of assembly, move the operating handle to the ON position (toward top of enclosure).

- C. Mount the frame (4) and handle assembly to the enclosure flange (5) using two 5/16-18 x 3/4 in. button head cap screws and lockwashers. Tighten cap screws from within enclosure (Figure 3).

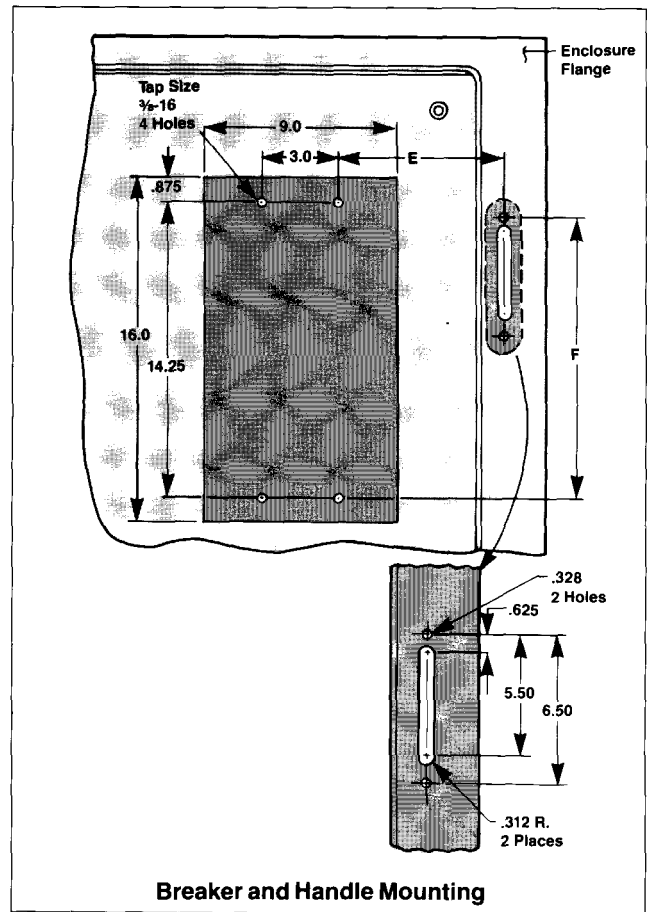


Figure 1

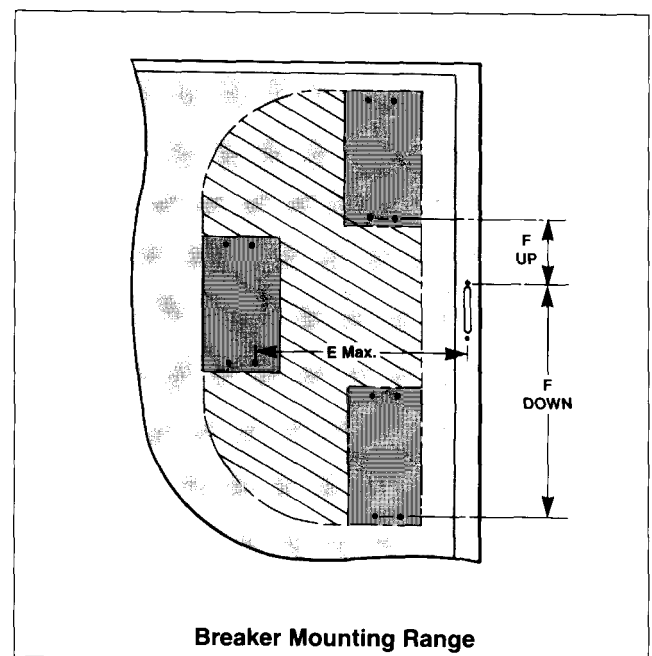
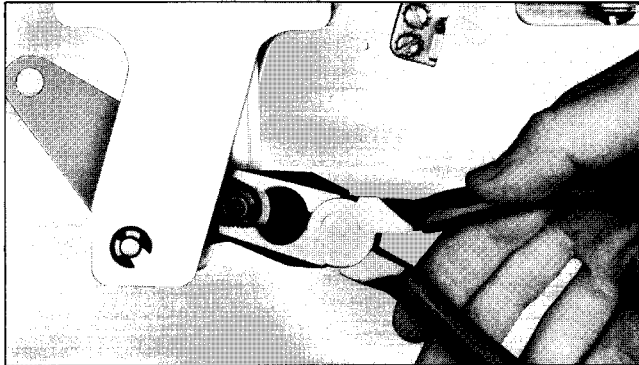


Figure 2

I-T-E Max-Flex™ Flange-Mount Handle Operator

Types 1, 3R, 4, 4X, 12

D. Place the plastic washer and connecting link onto the bellcrank pin (7). Secure the connection with the E-ring retainer supplied (8) (Figure 3).



Secure E-Ring Connection

E. Attach the interlock level extension (9) to the interlock lever using two #8-32- $\frac{3}{8}$ in. screws and #8 lockwashers. Screws mount through the threaded lever extension into the lever. Tighten to 25 in.-lb. (Figure 3).

Operating Note:

When the enclosure door is open, the operating handle cannot be moved from the OFF to ON position without deliberately defeating the interlock mechanism. In the OFF position, the interlock can be defeated by pushing the interlock lever extension downward while moving the handle to the ON position. With the enclosure door open and the handle in the ON position, the interlock can be defeated by turning the defearer screw (10) (Figure 3) on the operating handle. When the enclosure door is closed, the door latch mechanism automatically defeats the interlock.

F. If no door catch is provided with the enclosure, attach the door catch bracket and adjustable door catch to the enclosure door.

Door Catch Adjustment

A. Close the enclosure door and move the handle into the ON position. If the handle cannot be moved from the ON position, adjust the door catch downward in its slot and repeat procedure.

B. Turn handle ON and attempt to open door. The interlock should hold the door closed. If the door can be opened, readjust the door catch upward in its slot. Repeat Steps A and B to insure the door cannot be opened when the handle is in the ON position. Figure 4 shows the location of the handle and door catch when mounted in the enclosure.

Mounting Breaker and Breaker Operator

A. The breaker operator (11) is mounted to the circuit breaker using the same two lower screws (12) that are used to attach the breaker to the enclosure. In addition, two #10-32 x 1 $\frac{5}{8}$ in. screws (13) and spacers are used at the top and two $\frac{1}{4}$ -20 x $\frac{1}{2}$ in. screws (12) and spacers are used at the bottom (Figure 5).

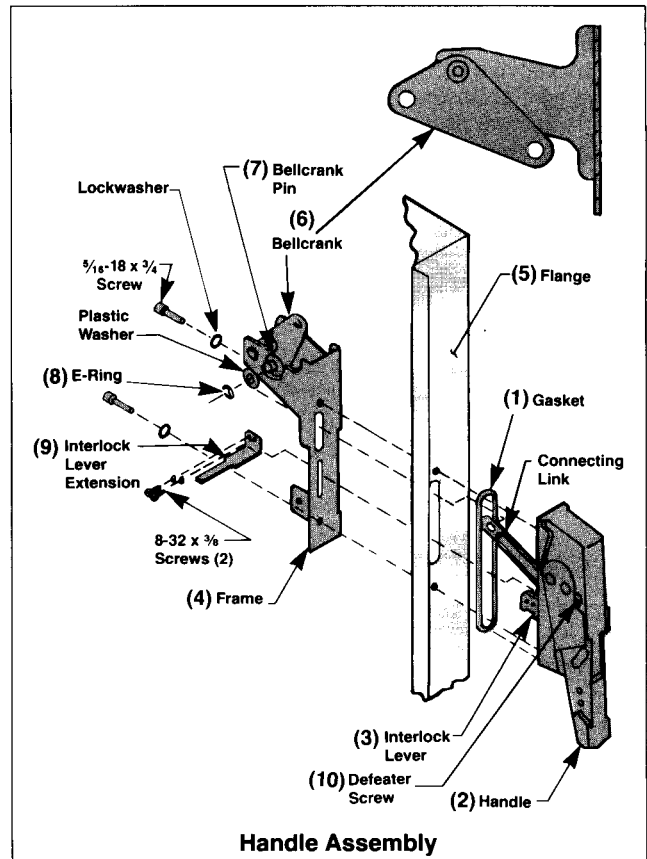


Figure 3

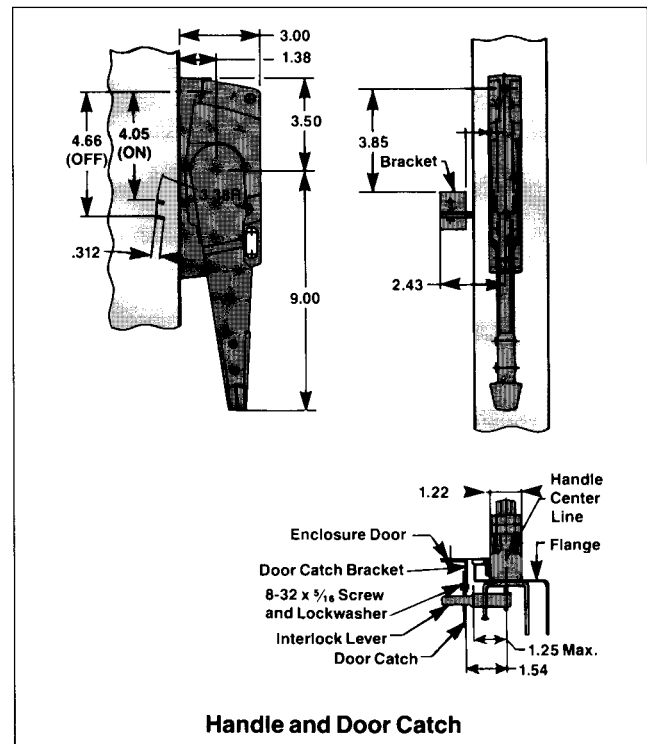


Figure 4

Assembly Instructions

B. Remove the lower terminal shield (14) from the circuit breaker and punch and drill out the two .56 in. diameter knockouts.

C. Cut slots in terminal shield as shown in Figure 5, to allow access to terminal lugs after installation of breaker operator.

Caution: Replace the terminal shield.

D. Mount circuit breaker to the enclosed panel using the four breaker mounting screws as shown in Figure 5.

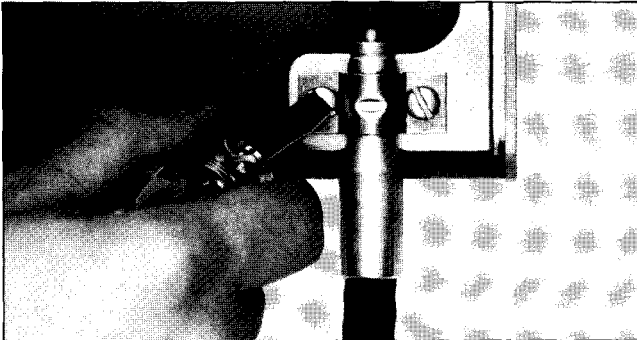
E. Attach the breaker operator using two 1/4-20 x 1/2 in. screws and lockwashers in lower holes and two spacers and #10-32 x 1 1/8 in. screws and lockwashers in upper holes.

Cable Installation

A. To attach the operating cable (15) to the frame assembly, move the operating handle to the OFF position, and attach the cable swivel (16) to the outer hole in the bellcrank. Secure the connection with an E-ring. (Figure 6)

B. Secure the cable to the frame assembly with cable retainer clip (17) using #10-32 x 3/8 in. screws and lockwashers. Tighten to 75 in. lb.

NOTE: Detent in cable retainer (17) must align with groove (18) in metal fitting of cable (Figure 6).



Tighten Detent Screws

C. Prior to attaching output end of cable to handle frame, confirm that supply power to the circuit breaker has been turned off.

D. Move circuit breaker handle to the ON position.

E. Slide the threaded cable rod (19) through the hole in the sliding plate tab (20) of the circuit breaker operating mechanism (Figures 5 and 6).

F. Move the operating handle to its maximum ON position.

G. Place the cable mounting threads (21) into the slot on the fixed plate tab (22) so that the two mounting nuts (23) are on both sides of the tab. Adjust the two mounting nuts so that the #10-32 nut on the cable rod just touches the sliding plate tab. Tighten the mounting nuts to secure the cable (Figures 5 and 6).

H. Continue holding the operating handle in the ON position and place the spring (24) over the end of the rod. Screw on the spring adjuster (25) and tighten until it begins to compress the spring. DO NOT OVERTIGHTEN THE SPRING ADJUSTMENT NUT.

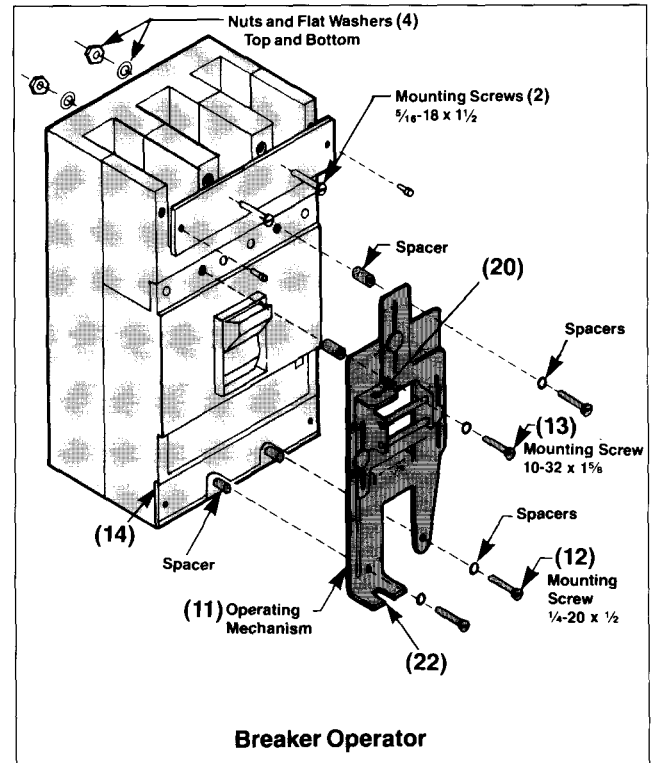


Figure 5

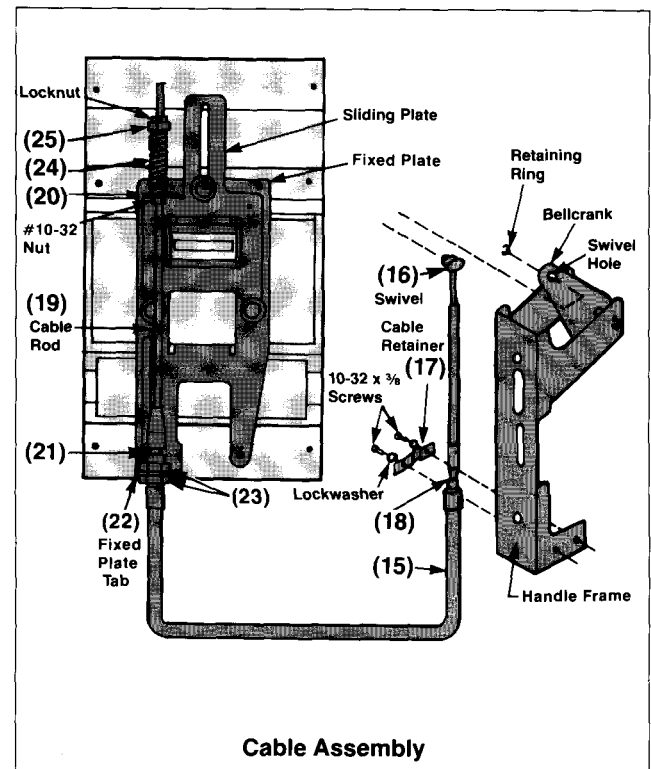
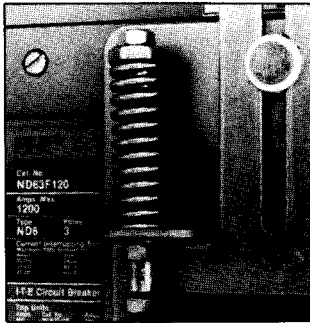


Figure 6

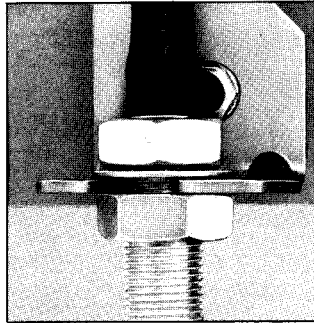
I-T-E Max-Flex™ Flange-Mount Handle Operator

Cable Adjustment

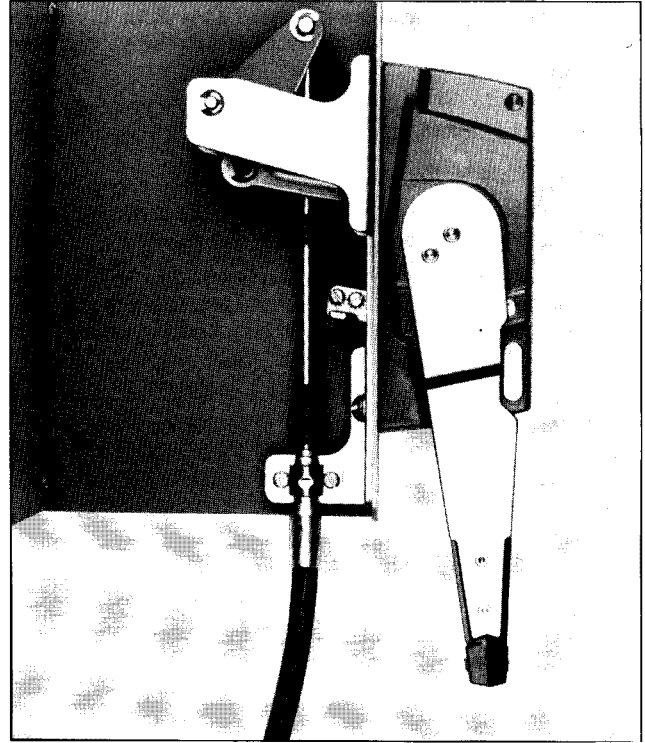
- A. Check that the circuit breaker turns OFF and ON by moving the operating handle up for ON and down for OFF. If the breaker does not switch ON, loosen the cable mounting nuts at the fixed plate tab. Hold the operating handle in the maximum ON position and move the cable toward the top of the breaker. Retighten the mounting nuts to secure.
- B. Trip the circuit breaker by pushing the PUSH TO TRIP button.
- C. Check that the circuit breaker resets by moving the operating handle from ON to OFF and back to ON. If the breaker resets, tighten the spring adjuster one additional turn. Attach lockwashers and 1/4-28 nut to the end of the cable rod and tighten to 32 in. lb.
- D. If the circuit breaker does not reset, tighten the spring adjusters one turn and repeat Steps B and C. Continue this procedure until the breaker resets then tighten the adjusters one additional turn and secure with lockwashers and nut.



Spring Adjustment



Fixed Plate Adjustment



Side View of Handle Assembly

I-T-E TELEMANTD® Electric Motor Operator

⚠ DANGER

Hazardous Voltage.
Will cause severe injury or death.

Turn off and lock out all power supplying this device before installing or servicing.

SAFETY INSTRUCTIONS

General

The motor operated mechanism is designed to open, close and reset a circuit breaker or switch by remote control. The customer must supply the circuit breaker or switch, normally ON and OFF push buttons, external wiring, a control power source, and all control logic. Consult the wiring diagram (Figure 3, page 35) for a typical control connection.

The motor operator is hinged for opening to the left or right dependent on catalog number designation. The "L" suffix means the motor operator is hinged to the left. A motor operator hinged to the right uses no suffix.

NOTE: For automatic reset operation a separate auxiliary contact must be provided by the customer. See page 34 for more details.

Operator Selection

Motor Operator	Frame	For Use With: I-T-E Circuit Breakers and Switch Types
MOMN6120 MOMN6120L MOMN6240 MOMN6240L	MD,ND	MD6, MXD6, HMD6, HMXD6, CMD6, SMD6, SHMD6, SCMD6, ND6, NXD6, HND6, HNXD6, CND6, SND6, SHND6, SCND6, MD6-ETI, CMD6-ETI

Installation

- A. Turn off and lock out all power supplying circuit breaker and motor operator before installing or servicing.
- B. Attach the circuit breaker to its mounting surface using the mounting hardware (1) supplied with the motor operator (Figure 2).
- C. Remove the four shield screws (2) and two lug shields (3) (Figure 1).
- D. Cut out the two 0.563 in. x 1.44 in. long knockouts and replace the shields.
- E. Open the motor operator cover and attach the motor operator to the circuit breaker using the spacers (4) and screws (5) provided (Figure 2).

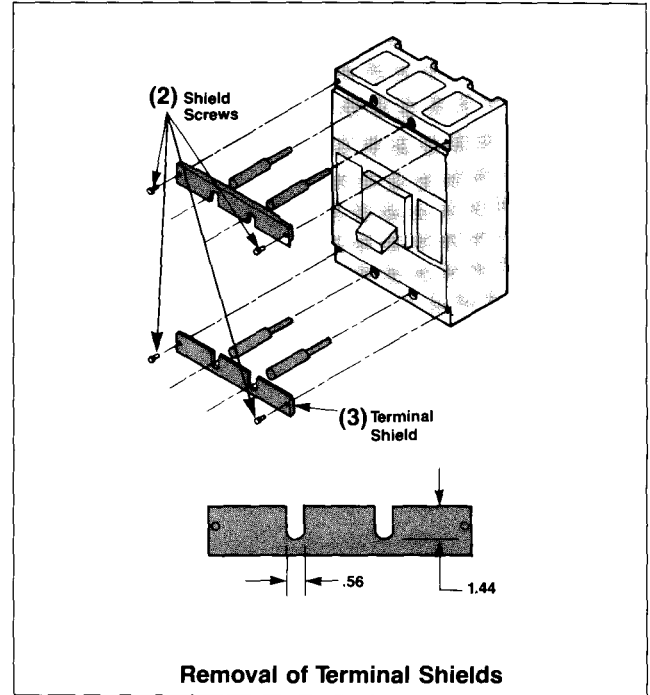


Figure 1

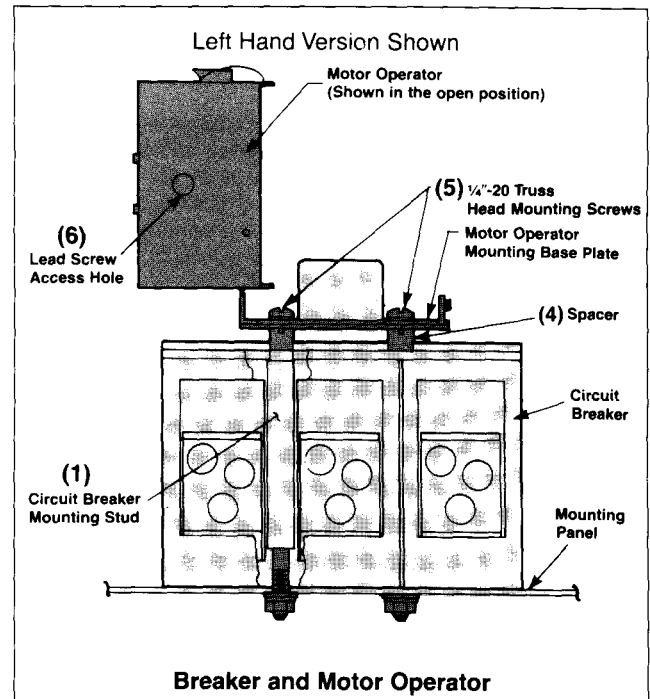


Figure 2

I-T-E TELEMANT[®] Electric Motor Operator

- F. With the circuit breaker handle in the OFF position, align the motor operator mechanism rollers (indicator to be in OFF position) and the circuit breaker handle by rotating the lead screw (6) with a screwdriver. The lead screw access hole is at the bottom of the motor operator (Figure 2).
- G. Close and latch the mechanism cover.
- H. Complete the desired control connections and electrically test the motor operator system before reenergizing the breaker power terminals in accordance with the electrical operation.

Electrical Characteristics

Catalog Numbers	Volts AC	Amperes
MOMN6120 MOMN6120L	120	22.7 Amperes In Rush 13.9 Amperes In Running
MOMN6240 MOMN6240L	240	7.2 Amperes In Rush 6.1 Amperes In Running

Electrical Operation

With the breaker and the operating mechanism in the OFF position, press the ON button to energize the motor. The action will close the breaker. When the breaker handle reaches the ON position, the motor circuit is disconnected by an internal limit switch.

With the breaker and the operating mechanism in the ON position, press the OFF button to energize the motor. The action will open the breaker. When the breaker handle reaches the OFF position, the motor circuit is disconnected by an internal limit switch.

When the circuit breaker trips automatically, there is no external indication that the breaker has tripped unless a separate Bell Alarm accessory (contact Siemens for appropriate catalog number) is provided to energize a customer furnished warning device. After the circuit breaker trips automatically, it is necessary to press the OFF button to move the breaker handle to the reset position.

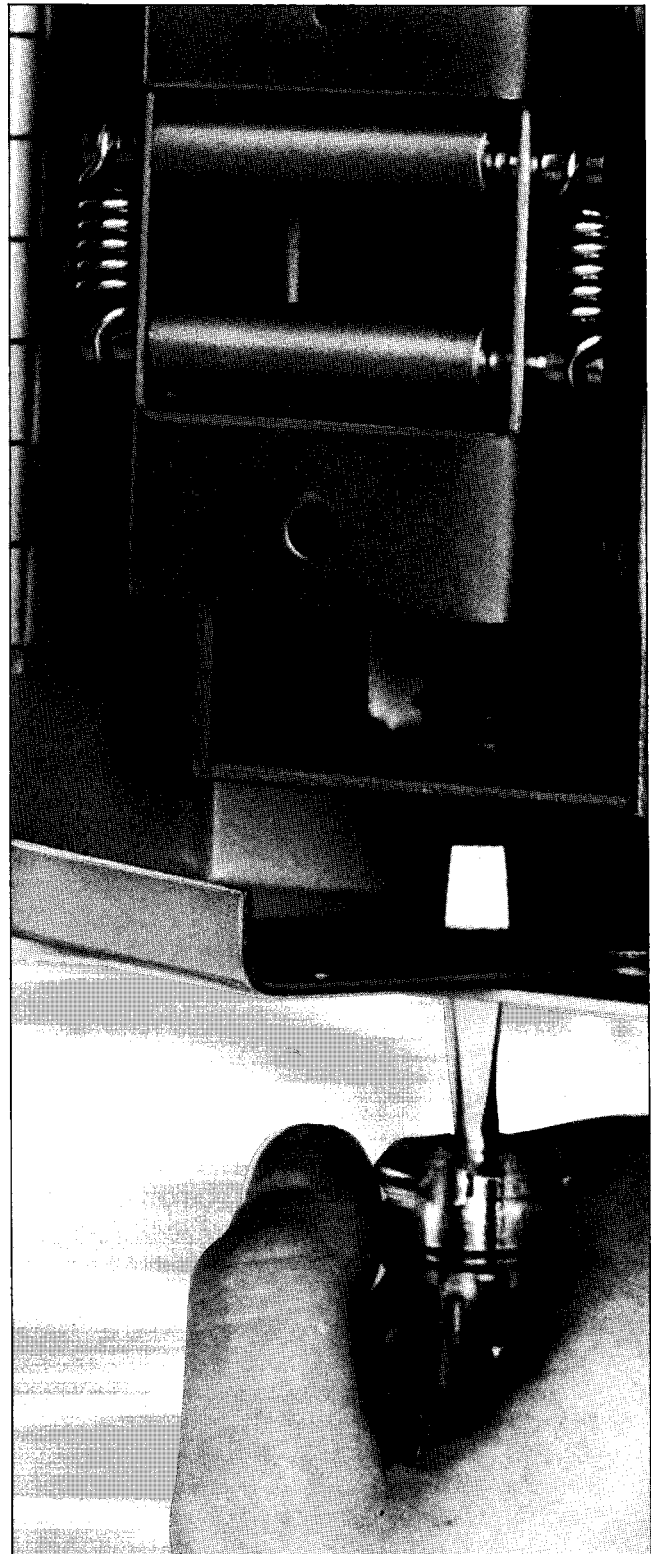
Automatic Reset

For automatic reset, an auxiliary switch (contact Siemens for appropriate catalog number) is used to return the breaker to the OFF/RESET position after it has been tripped. This auxiliary switch is mounted inside the breaker and wired in parallel with the OFF button. When the breaker trips, the auxiliary switch closes, energizing the motor circuit which moves the breaker to the OFF/RESET position.

After the motor operated mechanism has reset the breaker, the motor operator internal limit switch opens the circuit. To provide automatic reset, the ON push button must be a single pole, double throw device and it must be wired per Figure 3.

Manual Operation

Operate the two cover latches and swing the hinged motor operator cover away from the breaker to expose the breaker handle. To return to electrical operation, follow the installation instructions on page 33 deleting Steps B and C. After operation checks are complete, restore to normal operation.



Align rollers and handle

Installation Diagrams

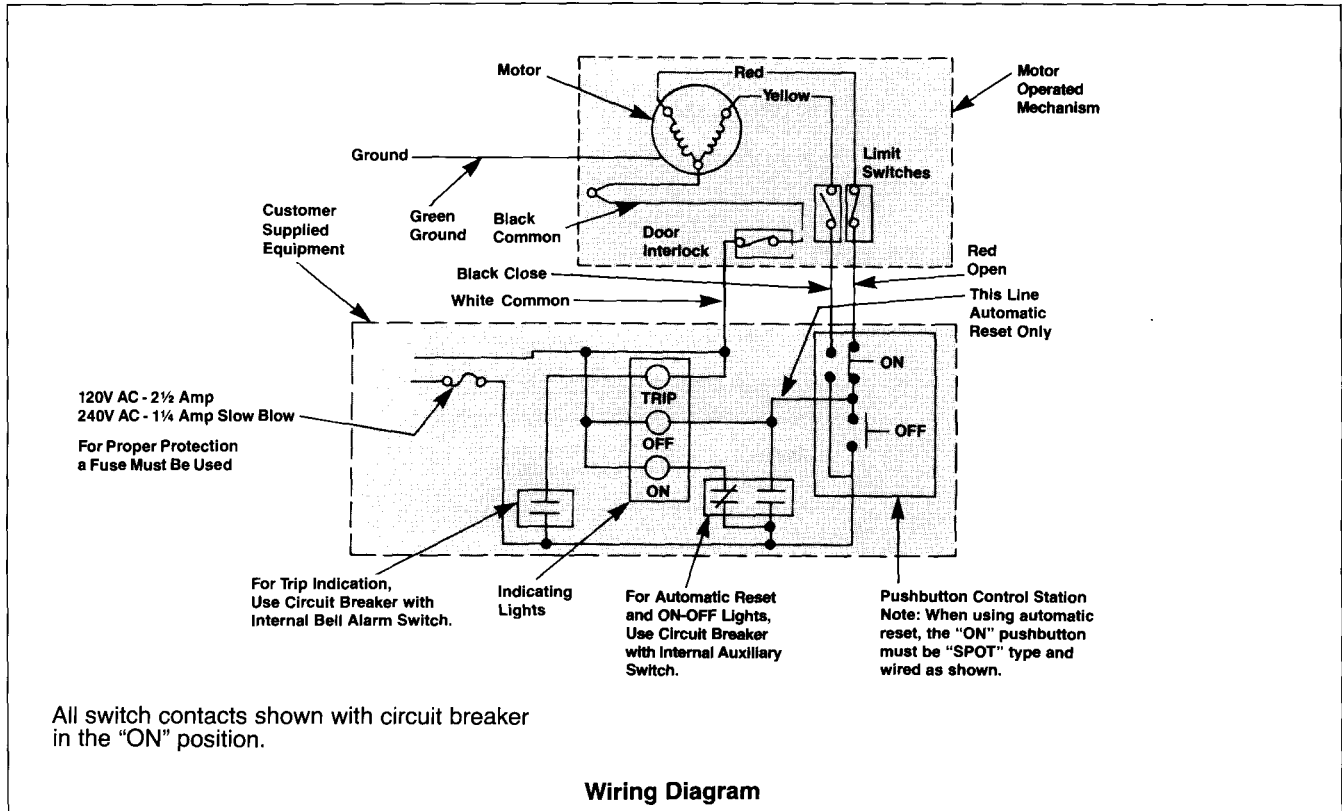


Figure 3

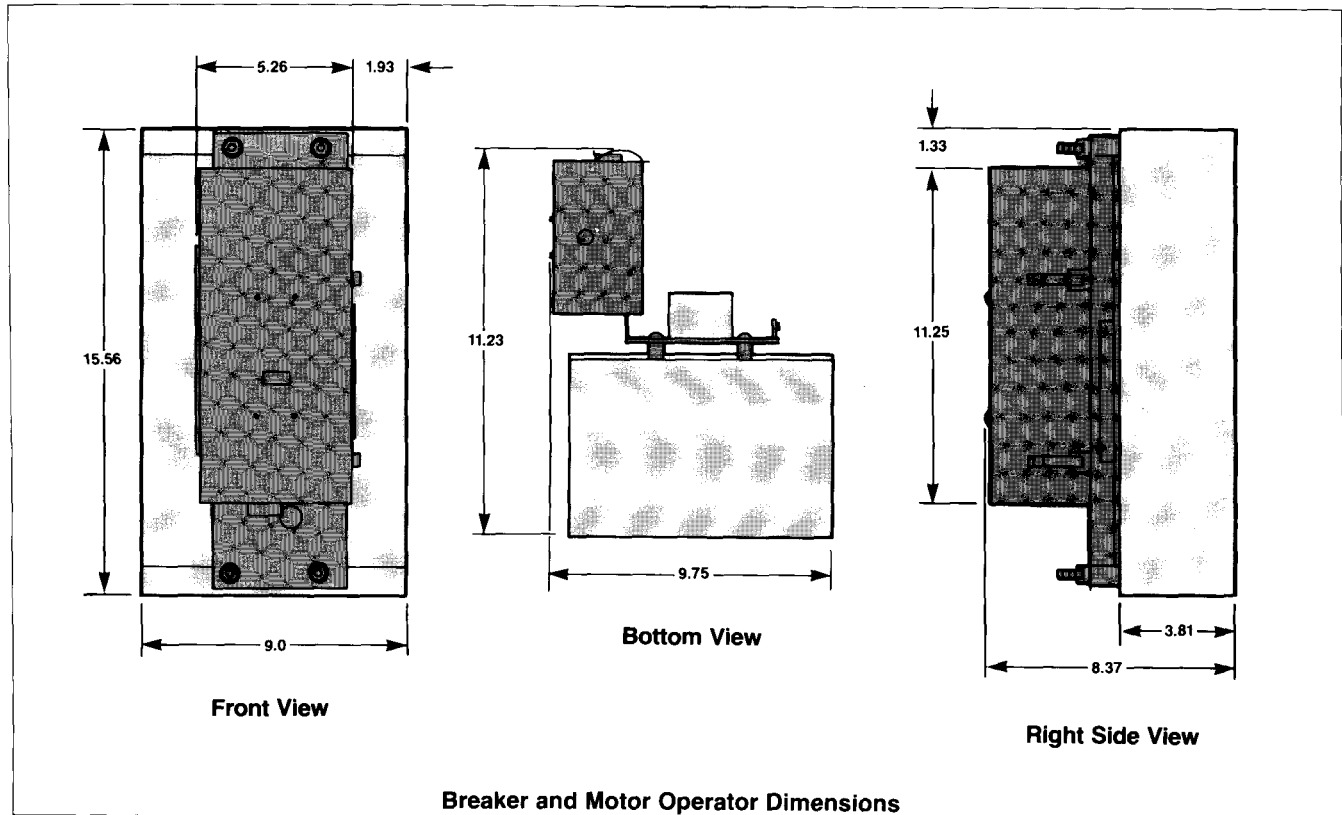
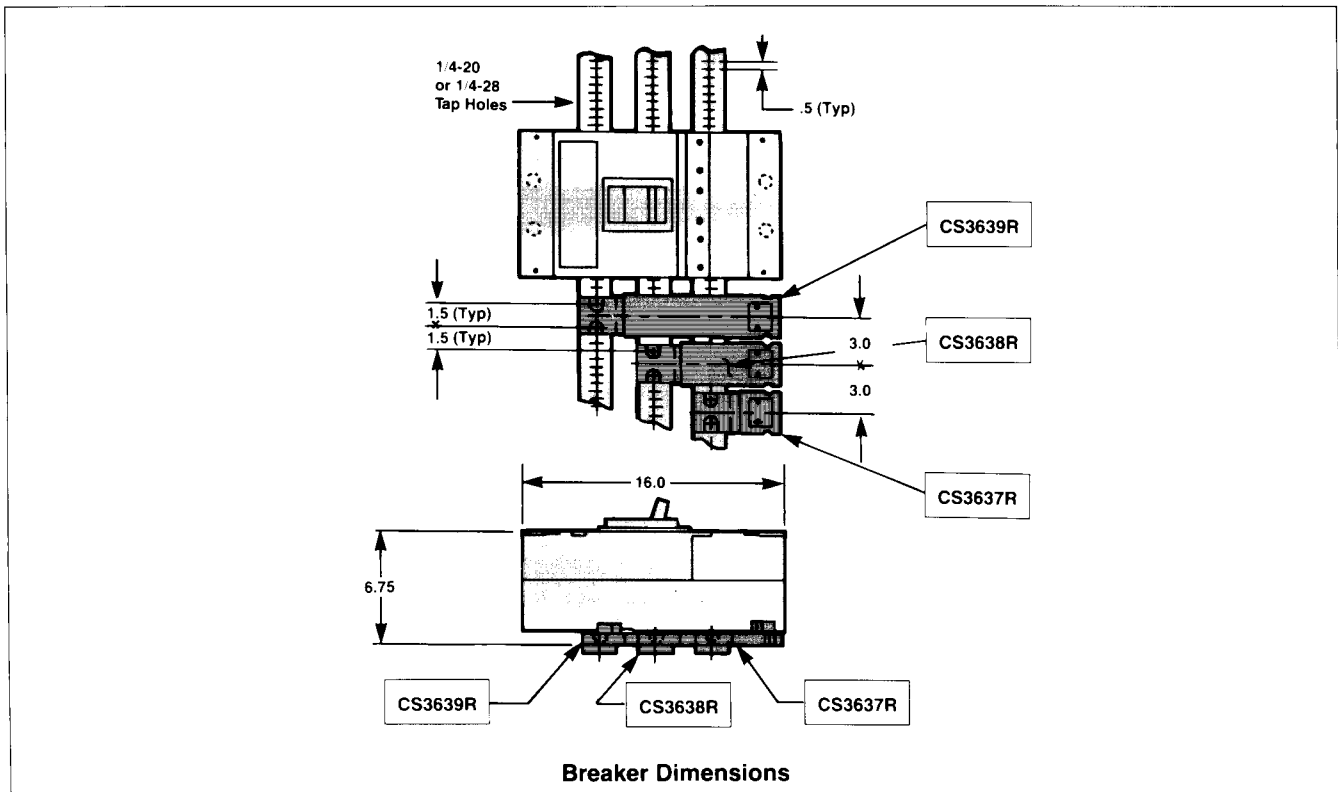
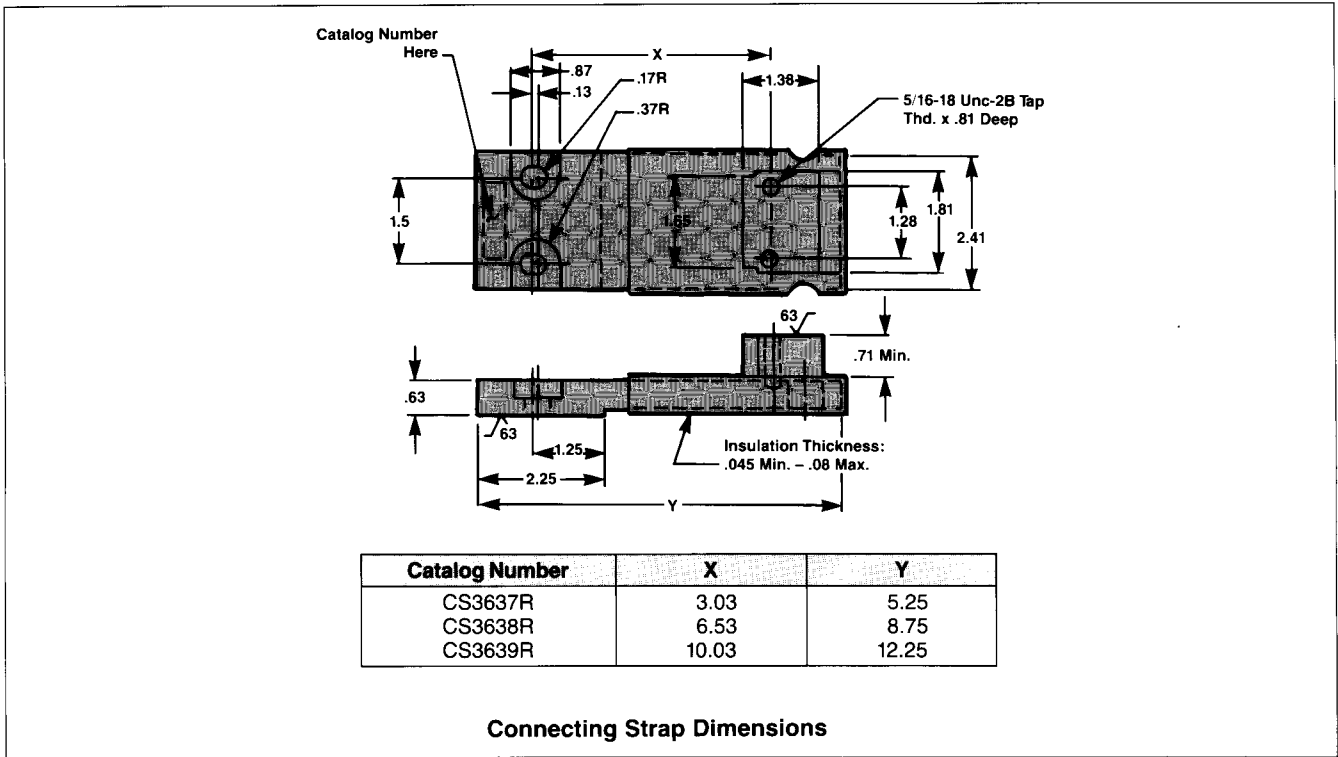


Figure 4

I-T-E Panelboard Connecting Straps^①

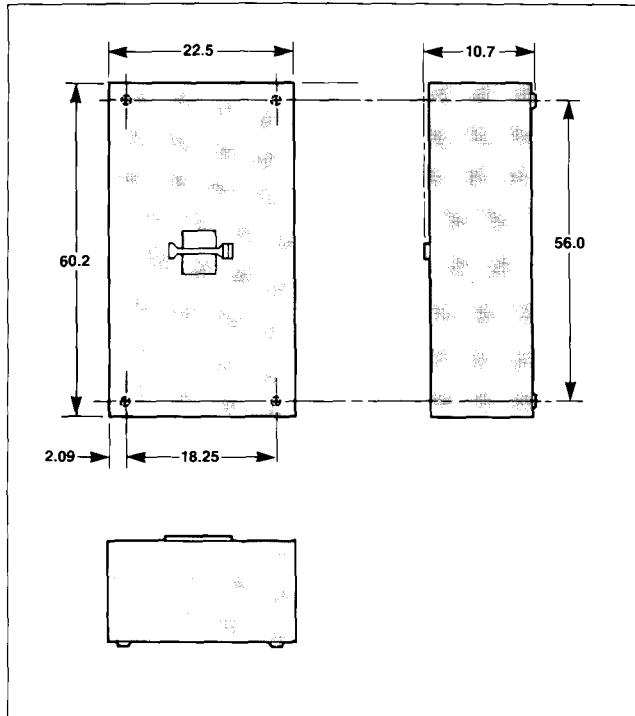


① The straps are not used in series 6 or 7 panelboards.

I-T-E Enclosures

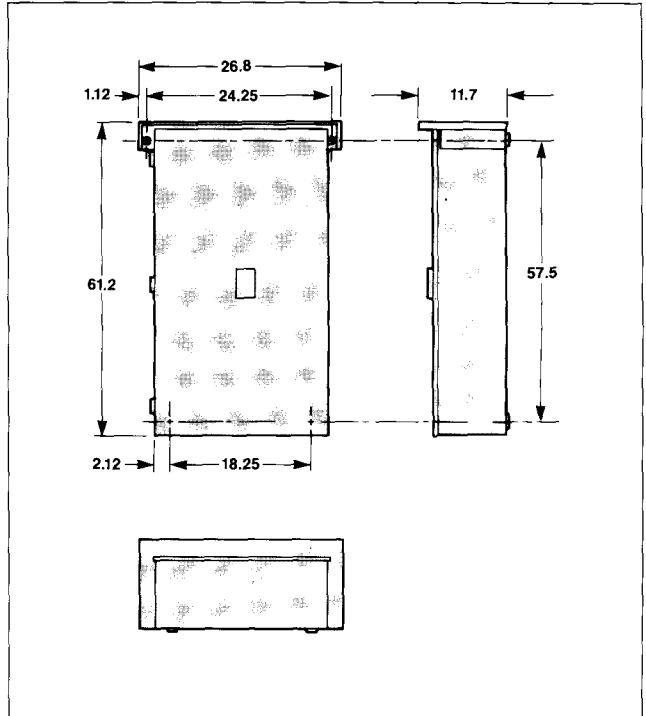
Type 1 – MND61

General purpose indoor, sheet-steel enclosure for use in normal atmosphere, listed as service-entrance equipment.



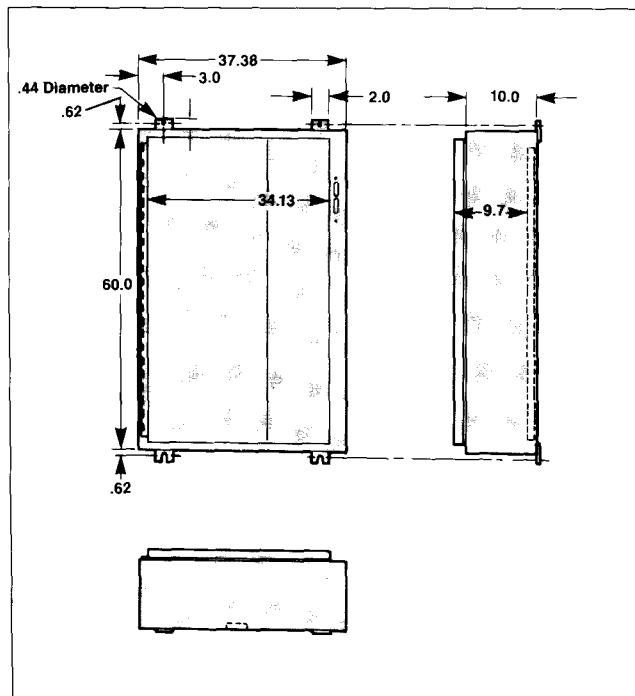
Type 3R – MND63

An outdoor, sheet-steel enclosure providing protection against driving rain, sleet or snow. Listed as service-entrance equipment.




Type 12 – MND612

A special-industry, sheet-steel enclosure for indoor use in atmosphere containing particles of lint, dust, dirt, sawdust and other foreign matter.



I-T-E Door Latch Mechanism (DKR2, DKR3, DKL2, DKL3)^①



⚠ DANGER

Hazardous Voltage.
Will cause severe injury or death.

Turn off and lock out all power supplying this device before installing or servicing.

⚠ SAFETY INSTRUCTIONS

General Information

These door latch mechanisms are for use in standard or custom built enclosures. The door latch post assemblies and the door catch are supplied with the kits. *Users must supply their own ¼ in. x ½ in. steel latch bar.* Enclosures with an overall height less than 40 in. require the two-point door latch mechanism. When the overall height is greater than 40 in., the three-point latch mechanism is used.

The door latch mechanism can be used with or without the type FHOH Flange Mount Handle Operator. These instructions apply when the door latch mechanism is mounted adjacent to and interlocks with the FHOH Handle Operator. The door handle can be padlocked to prevent unauthorized entry into the enclosure. Drawings in these installation instructions are oriented for right-hand flange installation. Left-hand flange installation drawings are mirror images of the right-hand versions. For left-hand flange installation, substitute “clockwise” for “counterclockwise” and vice versa, whenever those words appear.

Installation of the Door Latch Mechanism

A. Drill mounting holes in the enclosure door observing the minimum dimensions shown in Figure 2. See FHOH Handle Operator instructions for flange drilling pattern.

NOTE: **D** and **E** dimensions are determined by the height of the enclosure.

Refer to Figure 1 for the following steps:

- B. Place gasket (1) on handle plate (2) and attach handle plate to enclosure door with two thin wall hex nuts (3). Tighten the nuts to 100 in. lb.
- C. Insert lockout screw (4) and handle (5) through holes in the handle plate.
- D. Install latch bar post assembly (6) (screw, sealing washer, flat washer, and special hex nut (7), if used.)
- E. Attach top (8), bottom (9) and latch plate rollers (10) to latch bar with retaining pins and E-rings.

NOTE: Two-point latch does not have bottom roller.

F. Fasten the top and bottom rollers to the enclosure door with locking type flange nuts. Tighten the nuts, then loosen them ¼ turn to allow movement of the roller assemblies.

G. Place bottom spring (11) over the bottom thin wall hex nut inside the enclosure door.

H. Turn the handle ¼ turn clockwise (looking from inside the enclosure door) and attach the latch plate roller to the handle shaft, while inserting the bent leg of the spring into the hole in the latch plate. Fasten with a locking-type flange nut. Tighten the nut, then loosen ¼ turn to allow movement of the roller assemblies (Figure 1).

NOTE: Straight leg of spring must rest against pin (12) on handle plate. See inset on Figure 1.

I. Place top spring (13) over top thin wall hex nut. Attach lockout plate (14) to lockout screw using locking type flange nut. Tighten flange nut. Insert bent leg of spring into hole in lockout plate as shown in Figure 1 detail.

J. Attach the interlock defeater lever (15) to the latch bar (16) with two #10 lockwashers and #10-24 screws.

NOTE: The position of lever depends on enclosure depth (Figure 3).

K. Weld or rivet the door catch (17) to the enclosure door. User must supply the mounting hardware.

L. Attach the door latch label to the door handle on the enclosure door.

Adjusting the Mechanism

If using in conjunction with the FHOH or FHOH4 Handle Operator, perform the following steps:

- A. With the door in the open (unlatched) position, close the door, but do not turn the door handle. The lockout plate should latch the door partially closed.
- B. Turn the handle clockwise to stop. This will engage the rollers against the enclosure flange, securing the door fully closed.
- C. Check that the circuit breaker can be turned ON. If the breaker will not turn ON, adjust the interlock defeater lever downward to engage the lever on the handle operator.
- D. To open the door, insert a screwdriver into the handle screw and turn the screw and handle counterclockwise. The door will only open partially if the operating handle is in the ON position. If the door fully opens with the handle in the ON position, adjust the interlock defeater lever upward and repeat Steps C and D.

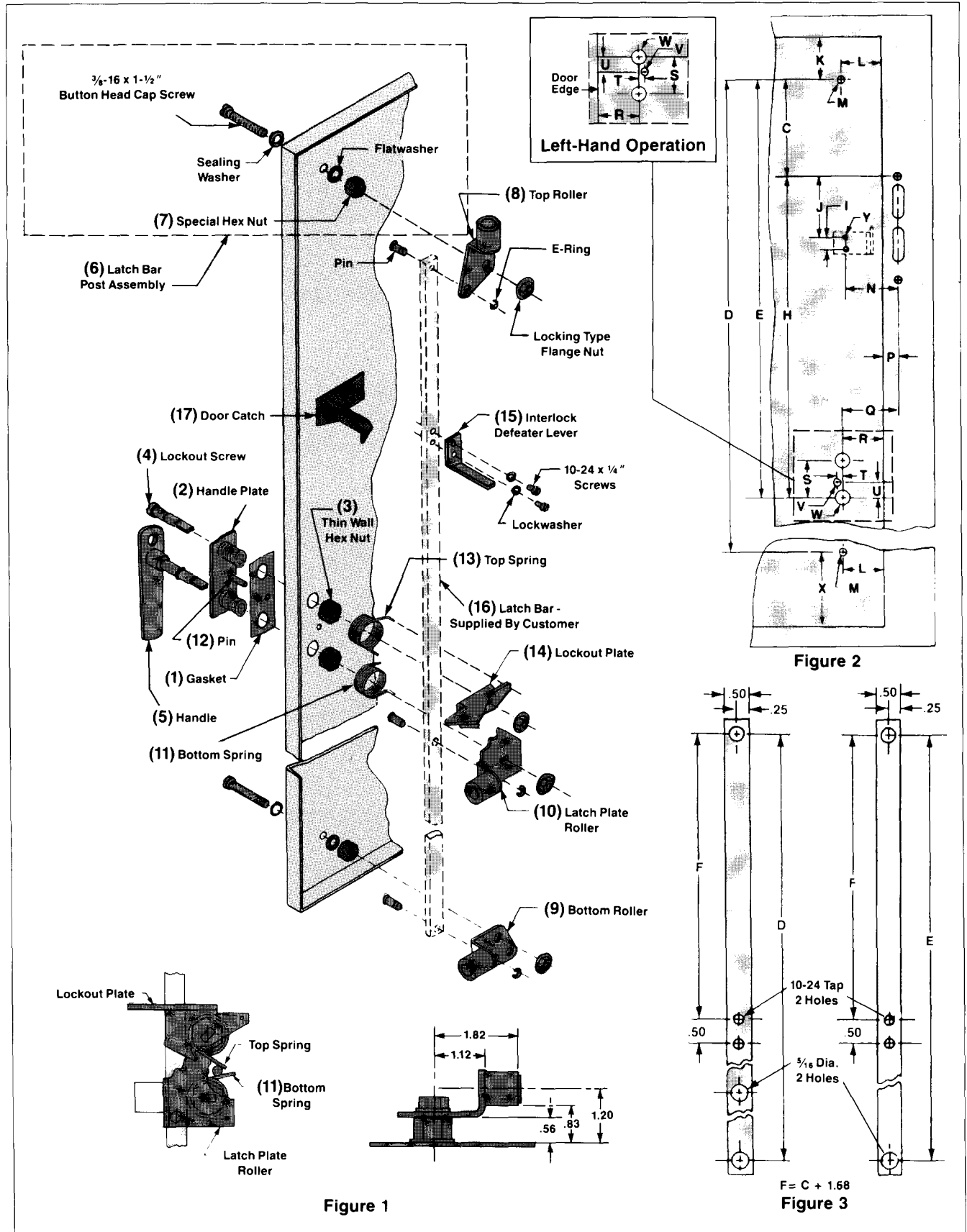
NOTE: To open the door when the handle is in the ON position, turn the latch defeater screw located on the side of the operating handle.

Minimum Dimensions (In Inches)

C	1.922	Q	2.594
H	9.375	R	1.875
I	.50	S	1.625
J	2.688	T	.250
K	1.859	U	.688
L	1.797	V	.281 Dia.
M	.391 Dia.	W	.703 Dia.
N	2.297	X	2.484
P	.719	Y	.219 Dia.

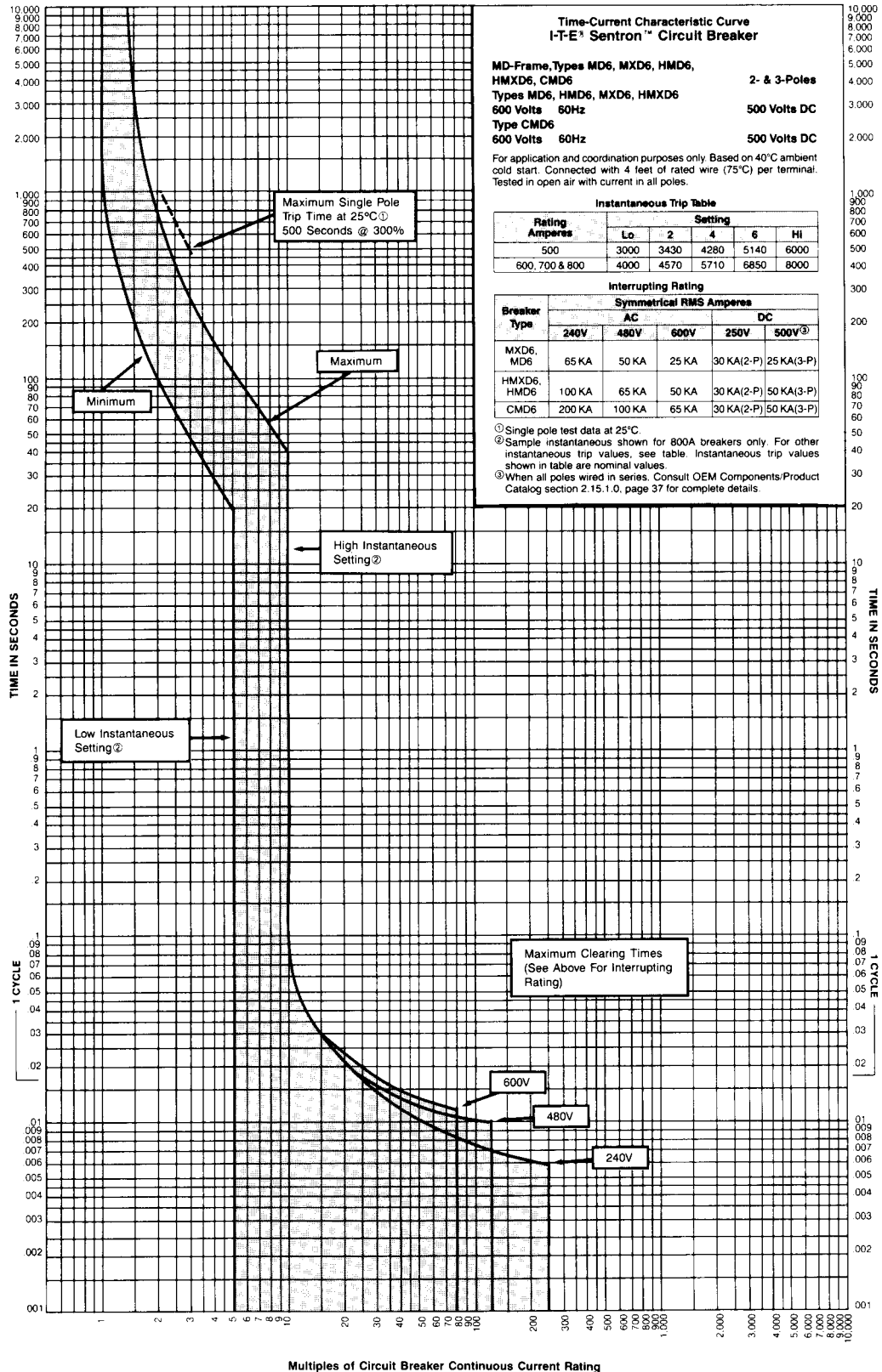
① The last letter and number designate right- or left-hand, 2 or 3 point latches.

Installation Diagrams



MD-Frame Time Current Curve

Types MD6, MXD6, HMD6, HMXD6, CMD6

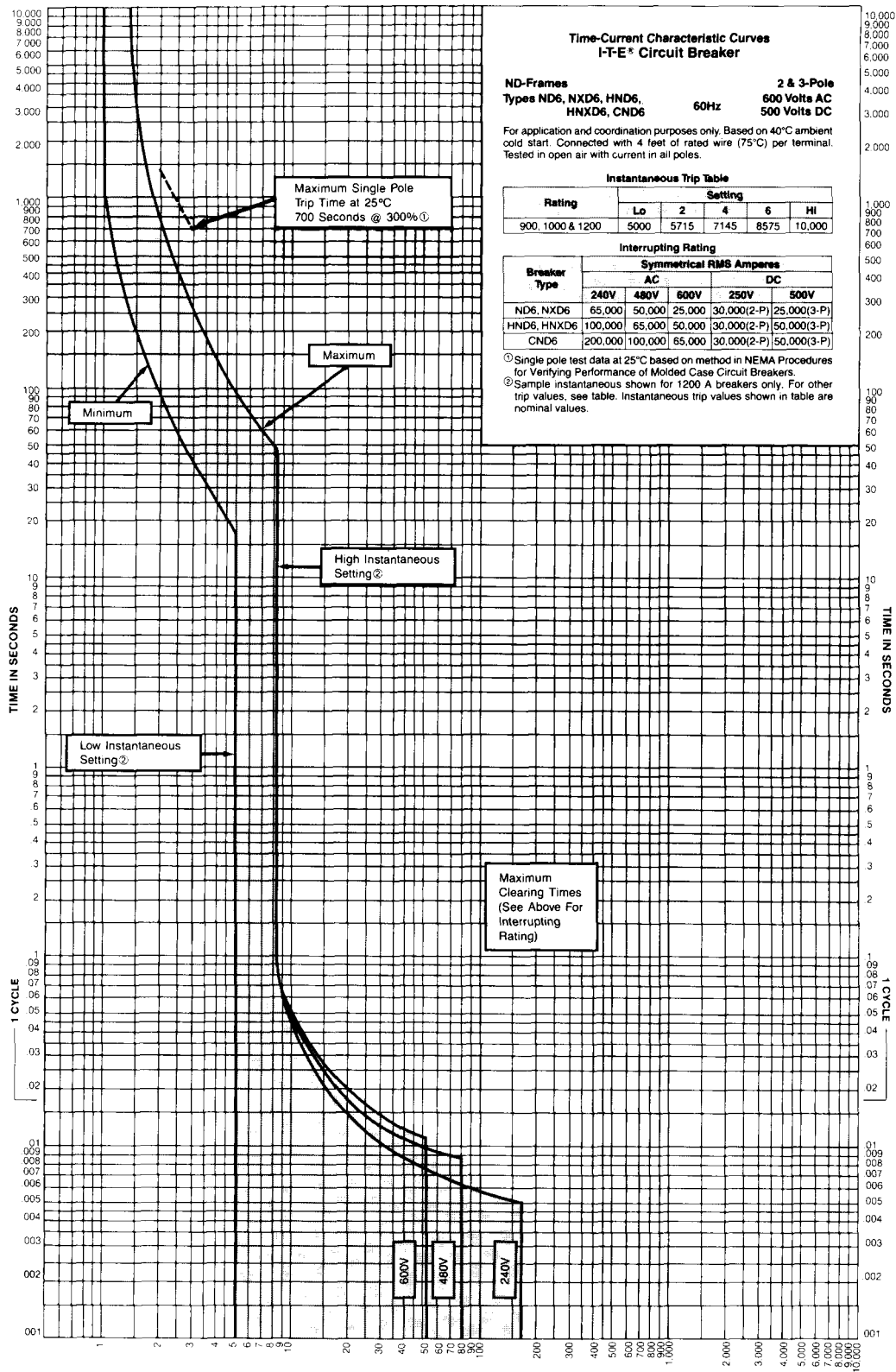


TD-7108

Multiples of Circuit Breaker Continuous Current Rating

ND-Frame Time Current Curve

Types ND6, NXD6, HND6, HNXD6, CND6

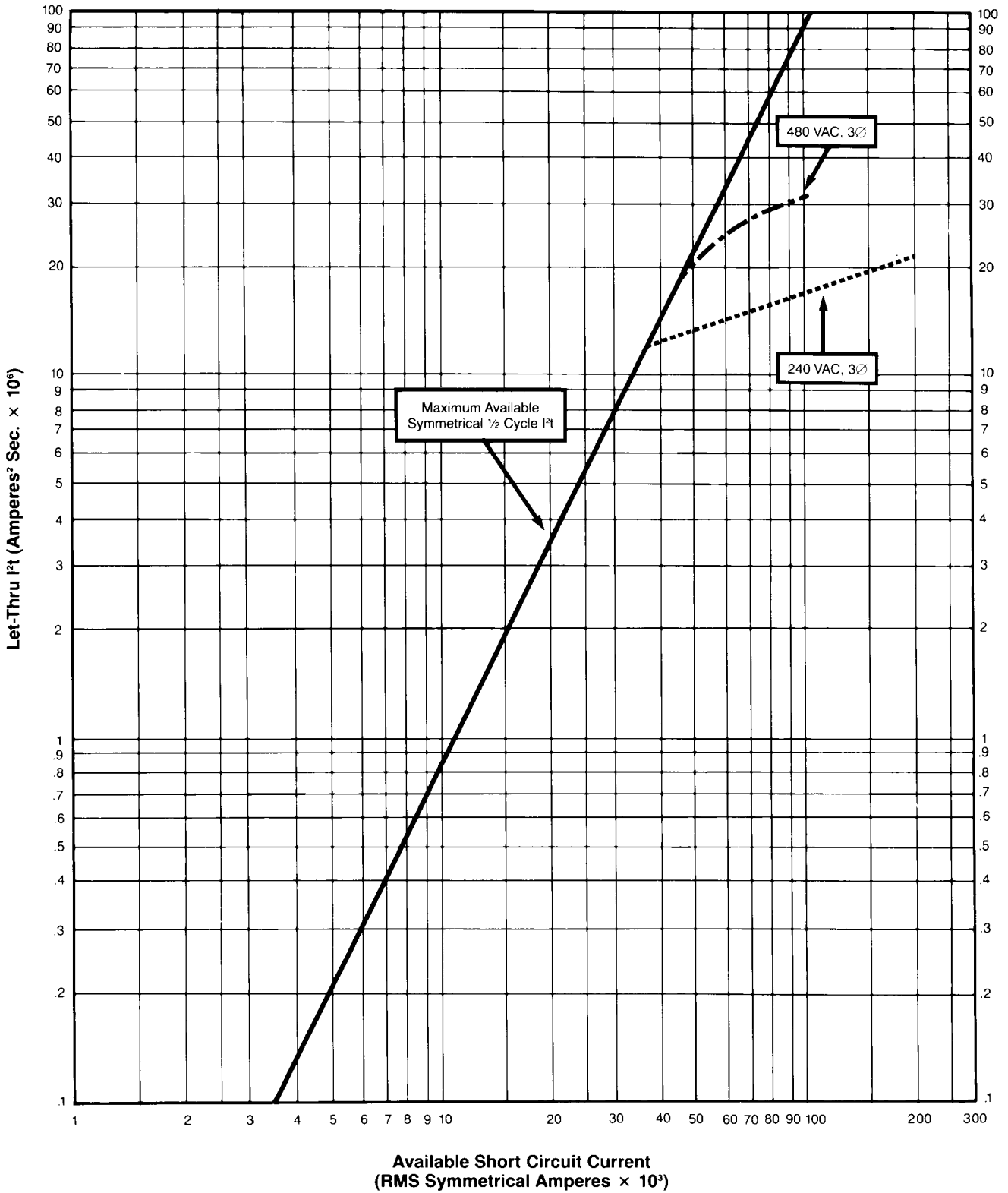


TD-7109

Multiples of Circuit Breaker Continuous Current Rating

MD and ND-Frame Peak Let-Thru I²t Curve

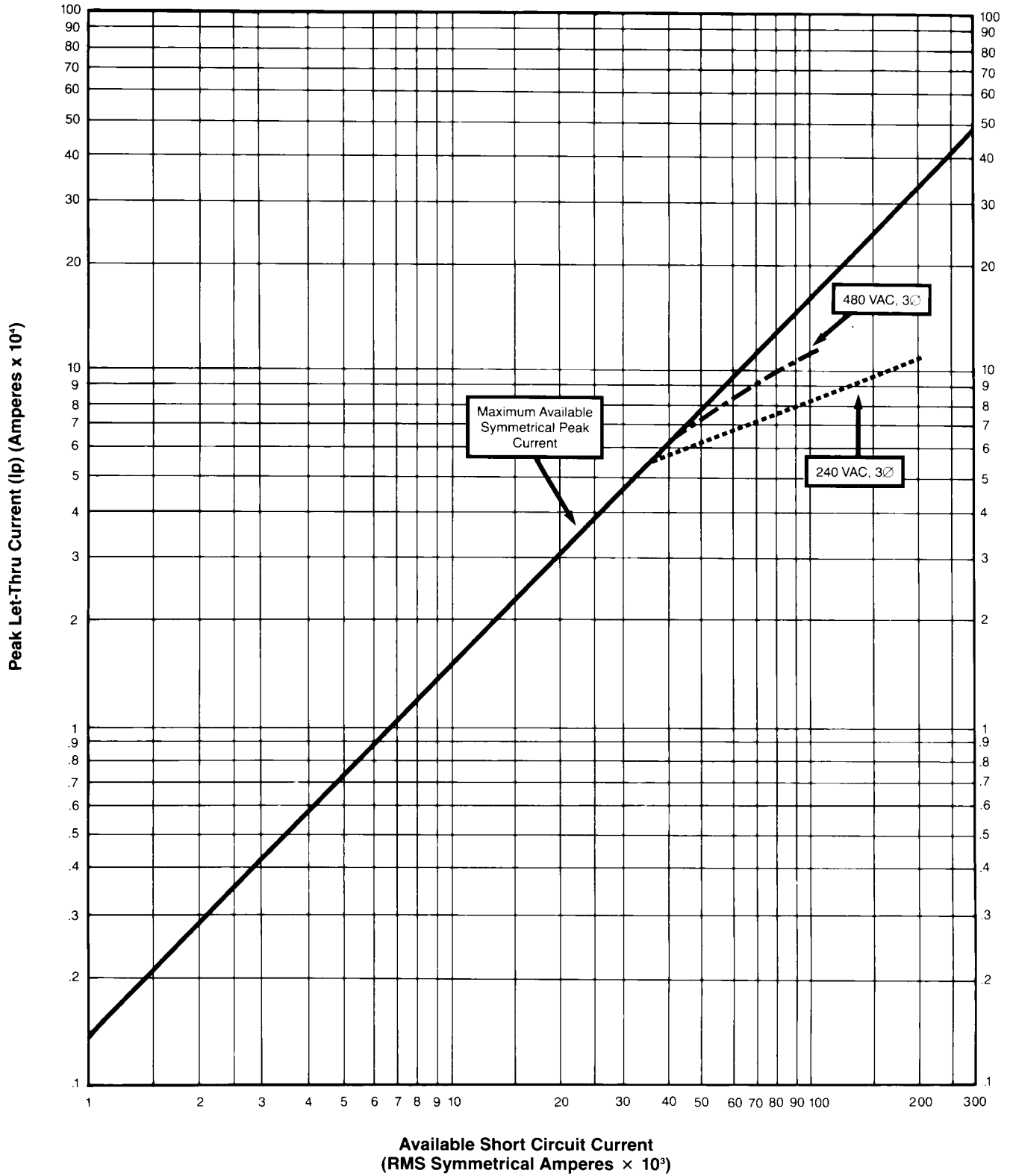
Types CMD6, CND6



TD-7108-B (CMD6)
TD-7109-B (CND6)

MD and ND-Frame Peak Let-Thru Current (I_p) Curve

Types CMD6, CND6



TD-7108-A (CMD6)
TD-7109-A (CND6)

Ordering Information

Circuit Breaker Catalog Numbers

MD6 Interchangeable Trip (Unassembled)

2-Pole ①

Ampere Rating	Instantaneous Trip Range		Complete Breaker Unenclosed Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number	UL Interrupting Ratings (kA) ④ (RMS) Symmetrical Amperes				
	Min.	Max.				240V AC	480V AC	600V AC	250V DC	500V DC
500	3000	6000	MD62B500	MD62F800	MD62T500	65	50	25	30	N/A
600	4000	8000	MD62B600	MD62F800	MD62T600	65	50	25	30	N/A
700	4000	8000	MD62B700	MD62F800	MD62T700	65	50	25	30	N/A
800	4000	8000	MD62B800	MD62F800	MD62T800	65	50	25	30	N/A
Shipping:			53 lb.	42.25 lb.	4.5 lb.					

3-Pole

500	3000	6000	MD63B500	MD63F800	MD63T500	65	50	25	N/A	25
600	4000	8000	MD63B600	MD63F800	MD63T600	65	50	25	N/A	25
700	4000	8000	MD63B700	MD63F800	MD63T700	65	50	25	N/A	25
800	4000	8000	MD63B800	MD63F800	MD63T800	65	50	25	N/A	25
Shipping:			61.5 lb.	46 lb.	6.5 lb.					

MXD6 Non-Interchangeable Trip (Assembled)

2-Pole – 3-Pole ①

Ampere Rating	Instantaneous Trip Range		2-Pole Complete Assembled Breaker Catalog Number	3-Pole Complete Assembled Breaker Catalog Number	UL Interrupting Ratings (kA) ④ (RMS) Symmetrical Amperes				
	Min.	Max.			240V AC	480V AC	600V AC	② 250V DC	③ 500V DC
500	3000	6000	MXD62B500	MXD63B500	65	50	25	30	25
600	4000	8000	MXD62B600	MXD63B600	65	50	25	30	25
700	4000	8000	MXD62B700	MXD63B700	65	50	25	30	25
800	4000	8000	MXD62B800	MXD63B800	65	50	25	30	25
800	Molded Case Switch		MXD62S800A	MXD63S800A	N/A	N/A	N/A	N/A	N/A
Shipping			53 lb.	61.5 lb.					

ND6 Interchangeable Trip (Unassembled)

2-Pole ①

Ampere Rating	Instantaneous Trip Range		Complete Breaker Unenclosed Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number	UL Interrupting Ratings (kA) ④ (RMS) Symmetrical Amperes				
	Min.	Max.				240V AC	480V AC	600V AC	250V DC	500V DC
800	4000	8000	ND62B800	ND62F120	MD62T800	65	50	25	30	N/A
900	5000	10000	ND62B900	ND62F120	ND62T900	65	50	25	30	N/A
1000	5000	10000	ND62B100	ND62F120	ND62T100	65	50	25	30	N/A
1200	5000	10000	ND62B120	ND62F120	ND62T120	65	50	25	30	N/A
Shipping:			53 lb.	42.25 lb.	4.5 lb.					

3-Pole

800	4000	8000	ND63B800	ND63F120	MD63T800	65	50	25	N/A	25
900	5000	10000	ND63B900	ND63F120	ND63T900	65	50	25	N/A	25
1000	5000	10000	ND63B100	ND63F120	ND63T100	65	50	25	N/A	25
1200	5000	10000	ND63B120	ND63F120	ND63T120	65	50	25	N/A	25
Shipping:			61.5 lb.	46 lb.	6.5 lb.					

① 2-pole available in 3-pole construction.

② DC rating based on using 2-pole circuit breaker.

③ DC rating based on using 3-pole circuit breaker and wiring connections as shown on page 4.

④ IEC interrupting ratings are listed on page 50.

NOTE: For 50°C application replace letter "B" in catalog number with the letter "M" for ordering purposes. If trip unit only is required, replace the letter "T" with the letter "W" for ordering purposes. Place the letter "H" as a suffix letter to the complete catalog number for a 100% rated circuit breaker, (e.g.: HND63B120H). Circuit breaker is a non-interchangeable trip unit device.

Ordering Information

Circuit Breaker Catalog Numbers

NXD6 Non-Interchangeable Trip (Assembled) 2-Pole – 3-Pole ①

Ampere Rating	Instantaneous Trip Range		2-Pole Complete Assembled Breaker	3-Pole Complete Assembled Breaker	UL Interrupting Ratings (kA) ④ (RMS) Symmetrical Amperes				
	Min.	Max.	Catalog Number	Catalog Number	240V AC	480V AC	600V AC	② 250V DC	③ 500V DC
900	4000	8000	NXD62B900	NXD63B900	65	50	25	30	25
1000	4000	8000	NXD62B100	NXD63B100	65	50	25	30	25
1200	4000	8000	NXD62B120	NXD63B120	65	50	25	30	25
1200	Molded Case Switch		NXD62S120A	NXD63S120A	N/A	N/A	N/A	N/A	N/A
Shipping			53 lb.	61.5 lb.					

MXD6 Instantaneous Trip (Assembled) 2-Pole ①

Ampere Rating	Instantaneous Trip Range		Complete Breaker Unenclosed	Frame Only	Trip Unit Only	UL Interrupting Ratings (kA) ④ (RMS) Symmetrical Amperes				
	Min.	Max.	Catalog Number	Catalog Number	Catalog Number	240V AC	480V AC	600V AC	250V DC	500V DC
800	3000	6000	MXD62L800	N/A	N/A	Interruption ratings are established only through combination tests with properly sized overload relays and contactors.				
	4000	8000	MXD62A800							
	5000	10000	MXD62H800							
Shipping:			53 lb.							

3-Pole

800	3000	6000	MXD63L800	N/A	N/A	Interruption ratings are established only through combination tests with properly sized overload relays and contactors.				
	4000	8000	MXD63A800							
	5000	10000	MXD63H800							
Shipping:			61.5 lb.							

HMD6 Interchangeable Trip (Unassembled) 2-Pole ①

500	3000	6000	HMD62B500	HMD62F800	MD62T500	100	65	50	30	N/A
600	4000	8000	HMD62B600	HMD62F800	MD62T600	100	65	50	30	N/A
700	4000	8000	HMD62B700	HMD62F800	MD62T700	100	65	50	30	N/A
800	4000	8000	HMD62B800	HMD62F800	MD62T800	100	65	50	30	N/A
Shipping:			53 lb.	42.25 lb.	4.5 lb.					

3-Pole

500	3000	6000	HMD63B500	HMD63F800	MD63T500	100	65	50	N/A	50
600	4000	8000	HMD63B600	HMD63F800	MD63T600	100	65	50	N/A	50
700	4000	8000	HMD63B700	HMD63F800	MD63T700	100	65	50	N/A	50
800	4000	8000	HMD63B800	HMD63F800	MD63T800	100	65	50	N/A	50
Shipping:			61.5 lb.	46 lb.	6.5 lb.					

① 2-pole available in 3-pole construction.

② DC rating based on using 2-pole circuit breaker.

③ DC rating based on using 3-pole circuit breaker and wiring connections as shown on page 4.

④ IEC interrupting ratings are listed on page 50.

NOTE: For 50°C application replace letter "B" in catalog number with the letter "M" for ordering purposes. If trip unit only is required, replace the letter "T" with the letter "W" for ordering purposes. Place the letter "H" as a suffix letter to the complete catalog number for a 100% rated circuit breaker, (e. g.: HND63B120H). Circuit breaker is a non-interchangeable trip unit device.

Ordering Information

Circuit Breaker Catalog Numbers

HMXD6 Non-Interchangeable Trip (Assembled)

2-Pole – 3-Pole ①

Ampere Rating	Instantaneous Trip Range		2-Pole Complete Assembled Breaker	3-Pole Complete Assembled Breaker	UL Interrupting Ratings (kA) ④ (RMS) Symmetrical Amperes				
	Min.	Max.	Catalog Number	Catalog Number	240V AC	480V AC	600V AC	② 250V DC	③ 500V DC
500	3000	6000	HMXD62B500	HMXD63B500	100	65	50	30	50
600	4000	8000	HMXD62B600	HMXD63B600	100	65	50	30	50
700	4000	8000	HMXD62B700	HMXD63B700	100	65	50	30	50
800	4000	8000	HMXD62B800	HMXD63B800	100	65	50	30	50
Shipping:			53 lb.	61.5 lb.					

HND6 Interchangeable Trip (Unassembled)

2-Pole ①

Ampere Rating	Instantaneous Trip Range		Complete Breaker Unenclosed	Frame Only	Trip Unit Only	UL Interrupting Ratings (kA) ④ (RMS) Symmetrical Amperes				
	Min.	Max.	Catalog Number	Catalog Number	Catalog Number	240V AC	480V AC	600V AC	250V DC	500V DC
800	4000	8000	HND62B800	HND62F120	MD62T800	100	65	50	30	N/A
900	5000	10000	HND62B900	HND62F900	ND62T900	100	65	50	30	N/A
1000	5000	10000	HND62B100	HND62F120	ND62T100	100	65	50	30	N/A
1200	5000	10000	HND62B120	HND62F120	ND62T120	100	65	50	30	N/A
Shipping:			53 lb.	42.25 lb.	4.5 lb.					

3-Pole

800	4000	8000	HND63B800	HND63F120	MD63T800	100	65	50	N/A	50
900	5000	10000	HND63B900	HND63F120	ND63T900	100	65	50	N/A	50
1000	5000	10000	HND63B100	HND63F120	ND63T100	100	65	50	N/A	50
1200	5000	10000	HND63B120	HND63F120	ND63T120	100	65	50	N/A	50
Shipping:			61.5 lb.	46 lb.	6.5 lb.					

HNXD6 Non-Interchangeable Trip (Assembled)

2-Pole – 3-Pole ①

Ampere Rating	Instantaneous Trip Range		2-Pole Complete Assembled Breaker	3-Pole Complete Assembled Breaker	UL Interrupting Ratings (kA) ④ (RMS) Symmetrical Amperes				
	Min.	Max.	Catalog Number	Catalog Number	240V AC	480V AC	600V AC	② 250V DC	③ 500V DC
900	4000	8000	HNXD62B900	HNXD63B900	100	65	50	30	50
1000	4000	8000	HNXD62B100	HNXD63B100	100	65	50	30	50
1200	4000	8000	HNXD62B120	HNXD63B120	100	65	50	30	50
Shipping:			53 lb.	61.5 lb.					

① 2-pole available in 3-pole construction.

② DC rating based on using 2-pole circuit breaker.

③ DC rating based on using 3-pole circuit breaker and wiring connections as shown on page 4.

④ IEC interrupting ratings are listed above.

NOTE: For 50°C application replace letter “B” in catalog number with the letter “M” for ordering purposes. If trip unit only is required, replace the letter “T” with the letter “W” for ordering purposes. Place the letter “H” as a suffix letter to the complete catalog number for a 100% rated circuit breaker, (e. g.: HND63B120H). Circuit breaker is a non-interchangeable trip unit device.

IEC 157-1 (P1) Interrupting Ratings (kA)

Volts AC (50/60 Hz)	Circuit Breaker Type (3-Pole Only)					
	MD6, MXD6	ND6, NXD6	HMD6, HMXD6	HND6, HNXD6	CMD6	CND6
220/240	65	65	100	100	200	200
380/415	50	50	65	65	100	100

Ordering Information

Circuit Breaker Catalog Numbers

CMD6 Non-Interchangeable Trip

2-Pole ①

Ampere Rating	Instantaneous Trip Range		Complete Breaker Unenclosed Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number	UL Interrupting Ratings (kA)② (RMS) Symmetrical Amperes			
	Min.	Max.				240V AC	480V AC	600V AC	250V DC
500	3000	6000	CMD62B500	Non-Interchangeable Trip		200	100	65	30
600	4000	8000	CMD62B600			200	100	65	30
700	4000	8000	CMD62B700			200	100	65	30
800	4000	8000	CMD62B800			200	100	65	30
800	Molded Case Switch		CMD62B800A			200	100	65	30
SHIPPING:			53 lb.						

3-Pole

500	3000	6000	CMD63B500	Non-Interchangeable Trip		200	100	65	N/A
600	4000	8000	CMD63B600			200	100	65	N/A
700	4000	8000	CMD63B700			200	100	65	N/A
800	4000	8000	CMD63B800			200	100	65	N/A
800	Molded Case Switch		CMD63S800A			200	100	65	N/A
SHIPPING:			61.5 lb.						

CND6 Non-Interchangeable Trip

2-Pole ①

900	5000	10000	CND62B900	Non-Interchangeable Trip		200	100	65	30
1000	5000	10000	CND62B100			200	100	65	30
1200	5000	10000	CND62B120			200	100	65	30
1200	Molded Case Switch		CND62S120A			200	100	65	30
SHIPPING:			53 lb.						

3-Pole

900	5000	10000	CND63B900	Non-Interchangeable Trip		200	100	65	N/A
1000	5000	10000	CND63B100			200	100	65	N/A
1200	5000	10000	CND63B120			200	100	65	N/A
1200	Molded Case Switch		CND63S120A			200	100	65	N/A
SHIPPING:			61.5 lb.						

CMD6 Instantaneous Only Trip

2-Pole ①

800	3000 4000 5000	6000 8000 10000	CMD62L800 CMD62A800 CMD62H800	N/A	N/A	Interruption ratings are established only through combination tests properly sized overload relays and contactors.			
SHIPPING:			53 lb.						

3-Pole

800	3000 4000 5000	6000 8000 10000	CMD63L800 CMD63A800 CMD63H800	N/A	N/A	Interruption ratings are established only through combination tests properly sized overload relays and contactors.			
SHIPPING:			61.5 lb.						

① 2-pole available in 3-pole construction.

② DC rating based on using 2-pole circuit breaker.

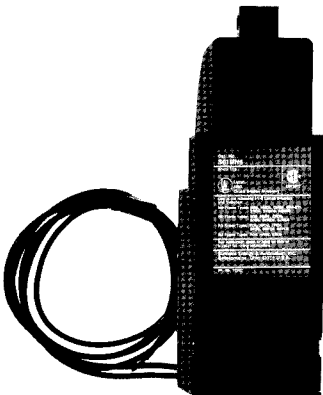

③ DC rating based on using 3-pole circuit breaker and wiring connections as shown on page 4.

④ IEC interrupting ratings are listed on page 50.

NOTE: For 50°C application replace letter "B" in catalog number with the letter "M" for ordering purposes. If trip unit only is required, replace the letter "T" with the letter "W" for ordering purposes. Place the letter "H" as a suffix letter to the complete catalog number for a 100% rated circuit breaker, (e. g.: HND63B120H). Circuit breaker is a non-interchangeable trip unit device.

Ordering Information

Internal Accessories

	Shunt Trip Combinations				
	Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch	
	AC	DC	Catalog Number	Catalog Number	
	120		S01MN6	S01MN64A	
	208		S02MN6	S02MN64A	
	240		S03MN6	S03MN64A	
	277		S15MN6	S15MN64A	
	480		S04MN6	S04MN64A	
	600		S06MN6	—	
		12	S16MN6	S16MN64A	
	24	S07MN6	S07MN64A		
	48	S09MN6	S09MN64A		
	125	S11MN6	S11MN64A		
	250	S13MN6	S13MN64A		
	Undervoltage Trip Combinations				
	Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 2 Auxiliary Switches
	AC	DC	Catalog Number	Catalog Number	Catalog Number
	120		U01MN6	U01MN64A	U01MN64AA
	208		U02MN6	U02MN64A	U02MN64AA
	240		U03MN6	U03MN64A	U03MN64AA
	277		U15MN6	U15MN64A	U15MN64AA
	480		U04MN6	U04MN64A	U04MN64AA
	600		U06MN6	—	—
		24	U07MN6	U07MN64A	U07MN64AA
	48	U09MN6	U09MN64A	U09MN64AA	
	125	U11MN6	U11MN64A	U14MN64AA	
	250	U13MN6	U13MN64A	U13MN64AA	
	Auxiliary Switch Combinations				
	Maximum Control Voltage		1 Auxiliary Switch	2 Auxiliary Switches	
	AC	DC	Catalog Number	Catalog Number	
	480		A01MN64	A02MN64	
	250	A01MN64	A02MN64		
	Alarm Switch Combinations				
	Maximum Control Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch	1 Alarm Switch and 2 Auxiliary Switches
	AC	DC	Catalog Number	Catalog Number	Catalog Number
	480		B00MN64	A01MN64B	A02MN64B
	250	B00MN64	A01MN64B	A02MN64B	

NOTE: Accessory modules can mount in either left hand or right hand poles of all circuit breakers, including solid state, except when mechanical interlock is used. This device prevents accessories from being mounted in left pole.

Ordering Information

Additional Accessories

Item	Catalog Number
Extension Handle	EX9
Mounting Screw Kit	MSMN
Pressure Wire Connectors Kits ①	
(4) 250-500 kcmil Cu/Al	(2)(3)TA4N8500
(4) 250-500 kcmil Cu/Al	(2)(3)TA4P8500
(2) 600-750 kcmil Cu/Al	(2)(3)TA2N8750
(3) 250-700 kcmil Cu/Al	(2)(3)TA3N8750
(1-2) #1 AWG-500 kcmil Cu/Al	(2)(3)TA2K500
(1-3) 300-500 kcmil Cu/Al	(2)(3)TA3K500
(1-2) #1 AWG-500 kcmil Cu	(2)(3)TC2K500
(1-3) #1 AWG-350 kcmil Cu	(2)(3)TC3K350
Compression Connectors	CCM800K2-K3 CCN1200K2-K3
Wire Connector Shield	NDTS
Handle Blocking Device	MN6BL
Padlocking Device	MN6HPL
Rear Connecting Straps (Studs)	
Short Length	RS5785
Long Length	RS5786
Plug-In Adapters (MD) (2 Required per Breaker)	
Line Side (2-Pole)	PC5662
Load Side (2-Pole)	PC5662
Line Side (3-Pole)	PC5663
Load Side (3-Pole)	PC5663
Plug-In Adapters (ND) (2 Required per Breaker)	
Vertical Bus (2-Pole)	PC5664
Vertical Bus (3-Pole)	PC5666
Horizontal Bus (2-Pole)	PC5665
Horizontal Bus (3-Pole)	PC5667
Steel Switchboard Mounting Plate Used With Plug-In Adapters	
MD	PL9698
ND	PL9699
Mechanical Interlock	
Panel Mounted	MI5404
Plug-In Mounted	MI5404
Handle Operators	
Rotary – Standard Depth	
Complete Mechanism	RHONSD
Handle Only ①	RHOH
Breaker Operator	RHONBO
Standard Length Shaft	RHONSSD

Item	Catalog Number
Handle Operators (continued)	
Rotary – Variable Depth	
Complete Mechanism	RHONVD
Handle Only ①	RHOH
Breaker Operator	RHONBO
Variable Length Shaft	RHONVD
Max-Flex™ Flange Mounted	
Complete Mechanism	FHONO48
Handle Only ②	FHOHN
Breaker Operator	FHONBO
Cable Operator ③	FHONCO48
Motor Operator	
120V AC (Hinged to the right)	MOMN6120
120V AC (Hinged to the left)	MOMN6120L
240V AC (Hinged to the right)	MOMN6240
240V AC (Hinged to the left)	MOMN6240L
Enclosures	
Type 1	MND61
Type 3R	MND63
Type 12	MND612
Door Latch Mechanism	
Left Side	DKL2, DKL3
Right Side	DKR2, DKR3
Time Current Curves	
MD6, MXD6, HMD6, HMxD6, CMD6, ND6, NXD6, HND6, HNxD6, CND6	TD-7108
TD-7109	TD-7109
Let-Thru Curves	
CMD6	
Peak Current (I_p)	TD-7108-A
I_p^2t	TD-7108-B
CND6	
Peak Current (I_p)	TD-7109-A
I_p^2t	TD-7109-B

① For 4x application use RHOH4 handle in place of RHOH.

② For 4x application use FHOHN4 handle in place of FHOHN.

③ Optional cable length of 60 in. available, order FHONCO60.

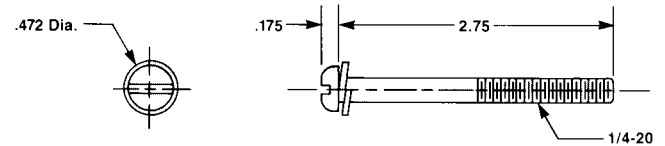
① Each kit consists of (2) connectors or (3) connectors plus NDTs end barrier.

UL Listings and File Numbers

Industry Specifications

I-T-E Item	UL-489 File Number	CSA Report Number
Breakers	E10848	LR13077
Terminal Connectors	—	—
Plug-In Connectors	E63311	—
Rear Studs	E23615	—
Add-On Internal Accessories	E69455	LR13077
Shunt Trip		
Undervoltage Trip		
Aux. Switch		
Bell Alarm Switch		
Molded Case Switch	E68312	LR42022
Enclosures	E10848	—
ETI Breakers	E10848	LR42022

National Fire Protection Assoc. (National Electric Code®).
 Federal Specification C-375B/GEN.
 Underwriters Laboratories, Inc. (UL 489).
 Canadian Standards Association (C22.2 No. 5).



Mounting Screw Information

100 Percent Rating Information

MD-Frame

MD-Frame breaker types are suitable for continuous operation at 100% of rating only if used in an enclosure or cubicle space 40.2 x 22.5 x 10.7 in.

The MD-Frame 100 percent rated breaker types MD6, HMD6 and CMD6 are marked on the breaker label as follows:

Wire Connectors

Catalog Number	Wire Range	Torque
TA4P500	(4) 250-500 MCM Cu/Al	375 in. lb.
CCM800	See instructions	

For the correct 90°C wire size use Table 8.1 in UL 489 according to the rating of the breaker.

ND-Frame

ND-Frame breaker types are suitable for continuous operation at 100% of rating only if used in an enclosure or cubicle space 60 x 22.5 x 10 in.

The ND-Frame 100 percent rated breaker types ND6, HND6 and CND6 are marked on the breaker label as follows:

Wire Connectors

Catalog Number	Wire Range	Torque
TA4P500	(4) 250-500 MCM Cu/Al	375 in. lb.
CCN800	See instructions	

For the correct 90°C wire size use Table 8.1 in UL 489 according to the rating of the breaker.

Suitable for continuous operation at 100 percent of rating only if used in a ventilated enclosure or cubicle space 60 x 22.5 x 10 in. Ventilation openings are 1.5 x 21 in. at bottom and 4.25 x 21 in. at top and should be located at least 8 in. from ends of breaker.

Breaker Label Information

Cat. No. MXD63B800		
Amps 800	Volts Max. 600 AC	
Type MXDX	Poles 3	Cal. Base 40° C
Current Interrupting Ratings Maximum RMS Symmetrical		
Amps	Volts	Frequency
65,000 A	240 AC	50/60 Hz
50,000 A	480 AC	50/60 Hz
25,000 A	600 AC	50/60 Hz
I-T-E Circuit Breaker		
Wire Connectors		
Cat. No.	Wire Range	Torque
TA2K500	(2) #1-500 MCM Cu/Al	375 in.-lb.
TC2K500	(2) #1-500 MCM Cu Only	375 in.-lb.
TC3K350	(3) #1-350 MCM Cu Only	375 in.-lb.
TA3K500	(3) 1/0-500 MCM Cu/Al	375 in.-lb.
TA2N8750	(2) 500-750 MCM Cu/Al	375 in.-lb.
CCM800	(See Instructions)	
TA3N8750	(3) 500-750 MCM Cu/Al	375 in.-lb.
TA4P8500	(4) 250-500 MCM Cu/Al	375 in.-lb.
TA4N8500	(4) 250-500 MCM Cu/Al	375 in.-lb.
Use outside poles for single phase.		
UND. LAB. INC.® LISTED CIRCUIT BREAKER 3 POLE UNIT ISSUE NO. LP9571 E10848		LR13077
PC. NO. 79972		

Cat. No. HMXD63B800		
Amps 800	Volts Max. 600 AC	
Type HMXD6	Poles 3	Cal. Base 40° C
Current Interrupting Ratings Maximum RMS Symmetrical		
Amps	Volts	Frequency
100,000 A	240 AC	50/60 Hz
65,000 A	480 AC	50/60 Hz
50,000 A	600 AC	50/60 Hz
I-T-E Circuit Breaker		
Wire Connectors		
Cat. No.	Wire Range	Torque
TA2K500	(2) #1-500 MCM Cu/Al	375 in.-lb.
TC2K500	(2) #1-500 MCM Cu Only	375 in.-lb.
TC3K350	(3) #1-350 MCM Cu Only	375 in.-lb.
TA3K500	(3) 1/0-500 MCM Cu/Al	375 in.-lb.
TA2N8750	(2) 500-750 MCM Cu/Al	375 in.-lb.
CCM800	(See Instructions)	
TA3N8750	(3) 500-750 MCM Cu/Al	375 in.-lb.
TA4P8500	(4) 250-500 MCM Cu/Al	375 in.-lb.
TA4N8500	(4) 250-500 MCM Cu/Al	375 in.-lb.
Use outside poles for single phase.		
UND. LAB. INC.® LISTED CIRCUIT BREAKER 3 POLE UNIT ISSUE NO. LP9514 E10848		LR13077
PC. NO. 79976		

Cat. No. NXD63B100		
Amps 1000	Volts Max. 600 AC	
Type NXD6	Poles 3	Cal. Base 40° C
Current Interrupting Ratings Maximum RMS Symmetrical		
Amps	Volts	Frequency
65,000 A	240 AC	50/60 Hz
50,000 A	480 AC	50/60 Hz
25,000 A	600 AC	50/60 Hz
I-T-E Circuit Breaker		
Wire Connectors		
Cat. No.	Wire Range	Torque
TA2K500	(2) #1-500 MCM Cu/Al	375 in.-lb.
TC2K500	(2) #1-500 MCM Cu Only	375 in.-lb.
TC3K350	(3) #1-350 MCM Cu Only	375 in.-lb.
TA3K500	(3) 1/0-500 MCM Cu/Al	375 in.-lb.
TA2N8750	(2) 500-750 MCM Cu/Al	375 in.-lb.
CCN1200	(See Instructions)	
TA3N8750	(3) 500-750 MCM Cu/Al	375 in.-lb.
TA4P8500	(4) 250-500 MCM Cu/Al	375 in.-lb.
TA4N8500	(4) 250-500 MCM Cu/Al	375 in.-lb.
Use outside poles for single phase.		
UND. LAB. INC.® LISTED CIRCUIT BREAKER 3 POLE UNIT ISSUE NO. MJ1604 E10848		LR13077
PC. NO. 79979		

Cat. No. HNXD63B120		
Amps 1200	Volts Max. 600 AC	
Type HNXD6	Poles 3	Cal. Base 40° C
Current Interrupting Ratings Maximum RMS Symmetrical		
Amps	Volts	Frequency
100,000 A	240 AC	50/60 Hz
65,000 A	480 AC	50/60 Hz
50,000 A	600 AC	50/60 Hz
I-T-E Circuit Breaker		
Wire Connectors		
Cat. No.	Wire Range	Torque
TA2K500	(2) #1-500 MCM Cu/Al	375 in.-lb.
TC2K500	(2) #1-500 MCM Cu Only	375 in.-lb.
TC3K350	(3) #1-350 MCM Cu Only	375 in.-lb.
TA3K500	(3) 1/0-500 MCM Cu/Al	375 in.-lb.
TA2N8750	(2) 500-750 MCM Cu/Al	375 in.-lb.
CCN1200	(See Instructions)	
TA3N8750	(3) 500-750 MCM Cu/Al	375 in.-lb.
TA4P8500	(4) 250-500 MCM Cu/Al	375 in.-lb.
TA4N8500	(4) 250-500 MCM Cu/Al	375 in.-lb.
Use outside poles for single phase.		
UND. LAB. INC.® LISTED CIRCUIT BREAKER 3 POLE UNIT ISSUE NO. LP9516 E10848		LR13077
PC. NO. 79984		

NOTE: The labels for MXD63B800 and NXD63B100 are blue and grey.
The labels for HMXD63B800 and HNXD63B100 are black and grey.

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