

IB-5713

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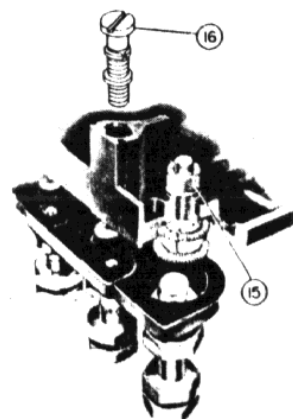
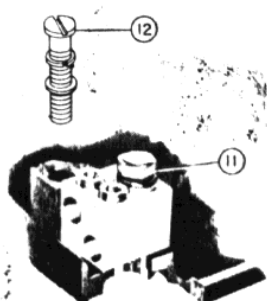
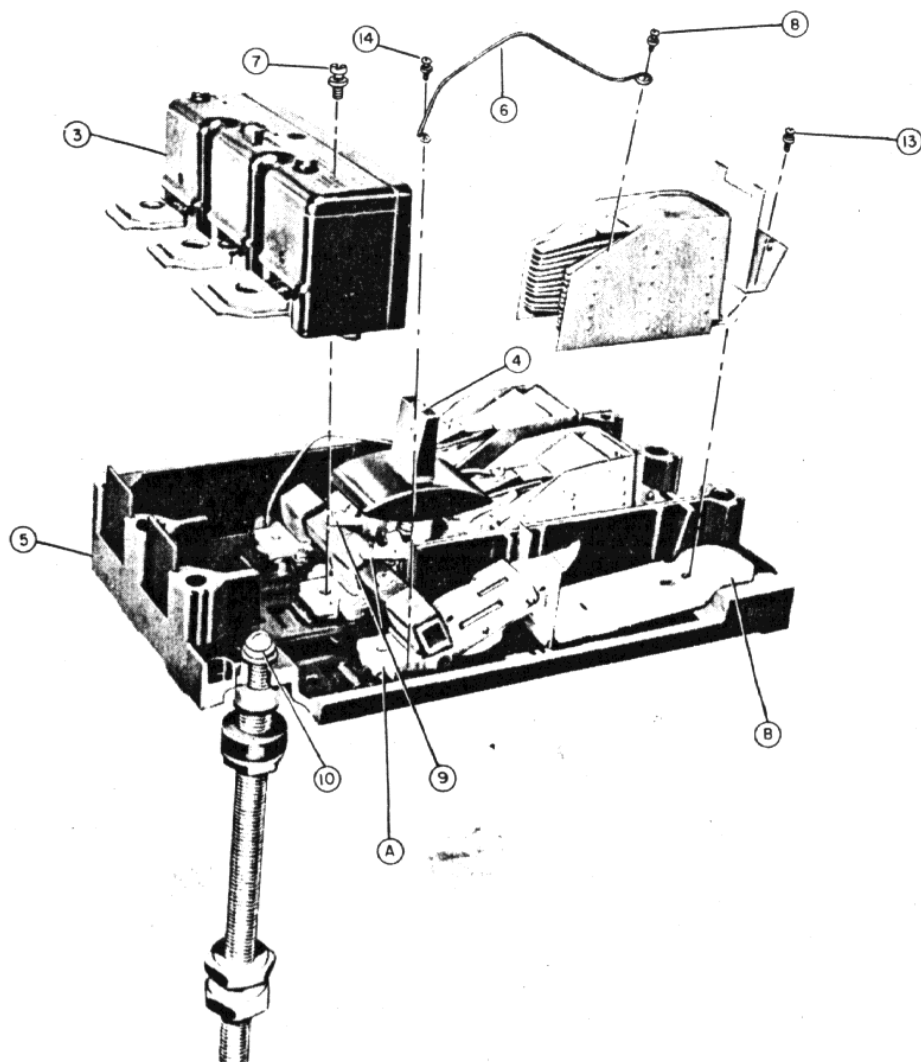
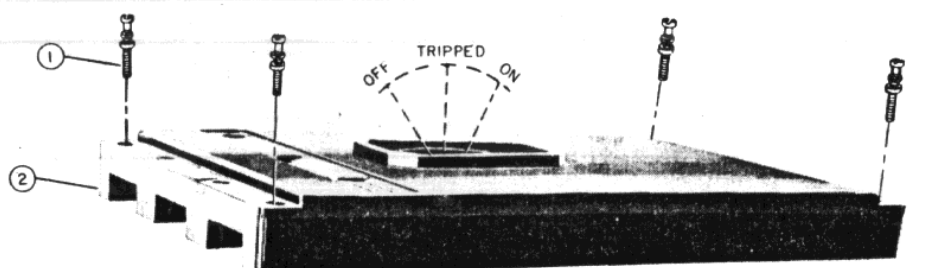
MOLDED CASE CIRCUIT BREAKERS

INSTRUCTIONS

ET 400 AMPERE
KL FRAME CIRCUIT BREAKERS
2 & 3 POLE, 125-400 AMPERES



I-T-E CIRCUIT BREAKER COMPANY



- 1 Cover Screw
- 2 Cover
- 3 Trip Unit
- 4 Operating Handle
- 5 Base
- 6 Arc Conductor Wire

- 7 Anchor Screw
- 8 Screw
- 9 Operating Mechanism Slots
- 10 Terminal Stud Screw
- 11 Terminal Lug Screw
- 12 Breaker Mounting Screws

- 13 Screw
- 14 Arc Wire Screw
- 15 Tulip Clip Connector Nut
- 16 Plug-In Connector Assembly Mounting Screw

ET, 2 & 3 Pole, 400 Ampere KL Frame Circuit Breaker



INSTRUCTIONS FOR ET 400 AMPERE KL FRAME CIRCUIT BREAKERS 125-400 AMPERES

GENERAL

ET KL frame circuit breakers are for use in all types of individual enclosures, in power panels, as main circuit breakers for lighting panels, and in switchboards.

Complete ET circuit breakers as listed are furnished with pressure wire connectors for front connection, or can be furnished with rear connecting studs for switchboard applications.

KL frame circuit breakers can also be furnished with plug-in connector assemblies. This arrangement permits the removal of the circuit breaker from its leads without physically coming in contact with the line or load terminals.

ET KL frame circuit breakers operate on a common trip principle so that an overcurrent on any pole will trip the circuit breaker. Overcurrent features provide thermal and adjustable instantaneous magnetic trip action to afford complete protection. The thermal overcurrent trip element is factory adjusted in controlled temperatures (25°C)* to protect the cable size for which the trip unit is intended and will operate within limits specified by the Underwriters' Laboratories. Trip units are sealed by a cover to prevent tampering and any alteration of the calibration of these elements should not be attempted. Removing the trip unit cover will void the Underwriters' approval for that particular unit.

*ETM circuit breakers, calibrated for 50°C (Maritime Application), are also covered by these instructions.

Instantaneous trip ranges are externally adjustable, with three intermediate settings between the minimum and maximum trip points listed below:

	Lo Trip	Hi Trip
125-175 Amperes Inclusive	750	1600
200-225 Amperes Inclusive	960	2000
250-300 Amperes Inclusive	1050	2250
350-400 Amperes Inclusive	1900	3500
400 Amperes (ETI only)	3200	5600

Both types of overload mechanisms are trip free of the operating handle. The circuit breakers, therefore, cannot be held closed by means of the operating handle should a tripping condition exist. The operating handle will also assume a central position which provides visible indication of tripping after each automatic operation. Should the cable size be changed, the proper trip unit for the new cable should be installed. All trip units of the same number of poles in this frame size are interchangeable regardless of capacity.

When overcurrents occur in any pole, the armature and/or bimetal acts on a tripper bar common to all poles. The tripper bar in turn releases the latching device so that the cradle of the mechanism is free to return to the central position and open the contacts.

Special accessories such as shunt trips, auxiliary switches, alarm switches and undervoltage trip devices can be furnished and are internally mounted. Information concerning these special devices is available on request.

INTERRUPTING RATINGS

The interrupting ratings of the 400 ampere KL frame circuit breakers are based on circuits adjusted to the rated current and value (at specified voltage) before the introduction of the circuit breaker.

UNDERWRITERS	NEMA		
	Voltage	Symmetrical	Asymmetrical
10,000 AMPERES A-C/D-C	600	22,000	25,000
	A-C 480	25,000	30,000
	240	35,000	40,000
D-C — 250 VOLTS — 20,000 AMPERES			

CIRCUIT BREAKER OPERATION

With the mechanism latched, contacts open, the operating handle (4) will be in the "OFF" position. When the operating handle is moved forward to the "ON" position, the circuit breaker is set for automatic operation. Upon automatic operation, the operating handle assumes a central position. To reset the circuit breaker after each automatic overload operation, push the handle to the extreme "OFF" position, then throw back to "ON" position.

WARNING FOR CIRCUIT BREAKER REMOVAL

THE CIRCUIT BREAKER SHOULD BE IN THE OPEN POSITION, AND IF PRACTICABLE, THE SWITCHBOARD DE-ENERGIZED BEFORE INSPECTING, CHANGING, INSTALLING, OR REMOVING THE CIRCUIT BREAKER AND/OR TRIP UNITS. IF THE BUS CANNOT BE DE-ENERGIZED, USE INSULATED HANDLE TOOLS, RUBBER GLOVES, AND A RUBBER FLOOR MAT.

To Remove a Back Connected Circuit Breaker from its Mounting, remove cover (2)



and terminal stud locknuts (10). Pull circuit breaker forward.

To Remove a Front Connected Circuit Breaker from its Mounting, remove cover (2) and terminal lug screws (11), then bend cables with their lugs clear of the circuit breaker. Remove circuit breaker mounting screws (12) and pull circuit breaker forward.

To Remove a Circuit Breaker Equipped with Plug-in Connector Assemblies from its Mounting, remove the circuit breaker mounting screws, washers, and lockwashers (12). Pull circuit breaker forward.

TRIP UNIT ADDITION

1. Remove cover screws (1) and circuit breaker cover (2).
2. Remove anchor screws and lockwashers (7).
3. Lower trip unit (3) carefully into base. Make sure latch pin on outside of trip unit engages slots (9) in mechanism. This operation can be facilitated by holding operating handle (4) away from trip unit being installed.
4. Immediately tighten trip unit anchor screw (7) (under trip unit latch) securely to circuit breaker base (5).
5. Position trip unit and secure it in place using anchor screws and lockwashers (7).
6. Replace circuit breaker cover (2) securely in position with cover screws (1).
7. Move operating handle to extreme "OFF" (reset) position. Circuit breaker is now ready for service.

TRIP UNIT REPLACEMENT

1. See WARNING FOR CIRCUIT BREAKER REMOVAL.
2. Remove cover screws (1) and circuit breaker cover (2).
3. Remove lower terminal stud locknuts (10) if back connected; terminal lug screws (11) if front

connected; or tulip clip terminal locknuts (15) if plug-in assembly connectors are used.

4. Remove trip unit anchor screws and lockwashers (7) on all but mechanism pole.

5. Release anchor screw (7) on mechanism pole while lifting trip unit. This screw is loosely retained in trip unit, and will remain with it when trip unit is removed.

6. Install new trip unit and reassemble following steps 3 to 7 inclusive under TRIP UNIT ADDITION. Be sure load terminal connectors are in place before replacing circuit breaker cover.

INSPECTION AND MAINTENANCE

Should the circuit breaker appear to be overheating, inspect for any loose or otherwise defective terminal connections.

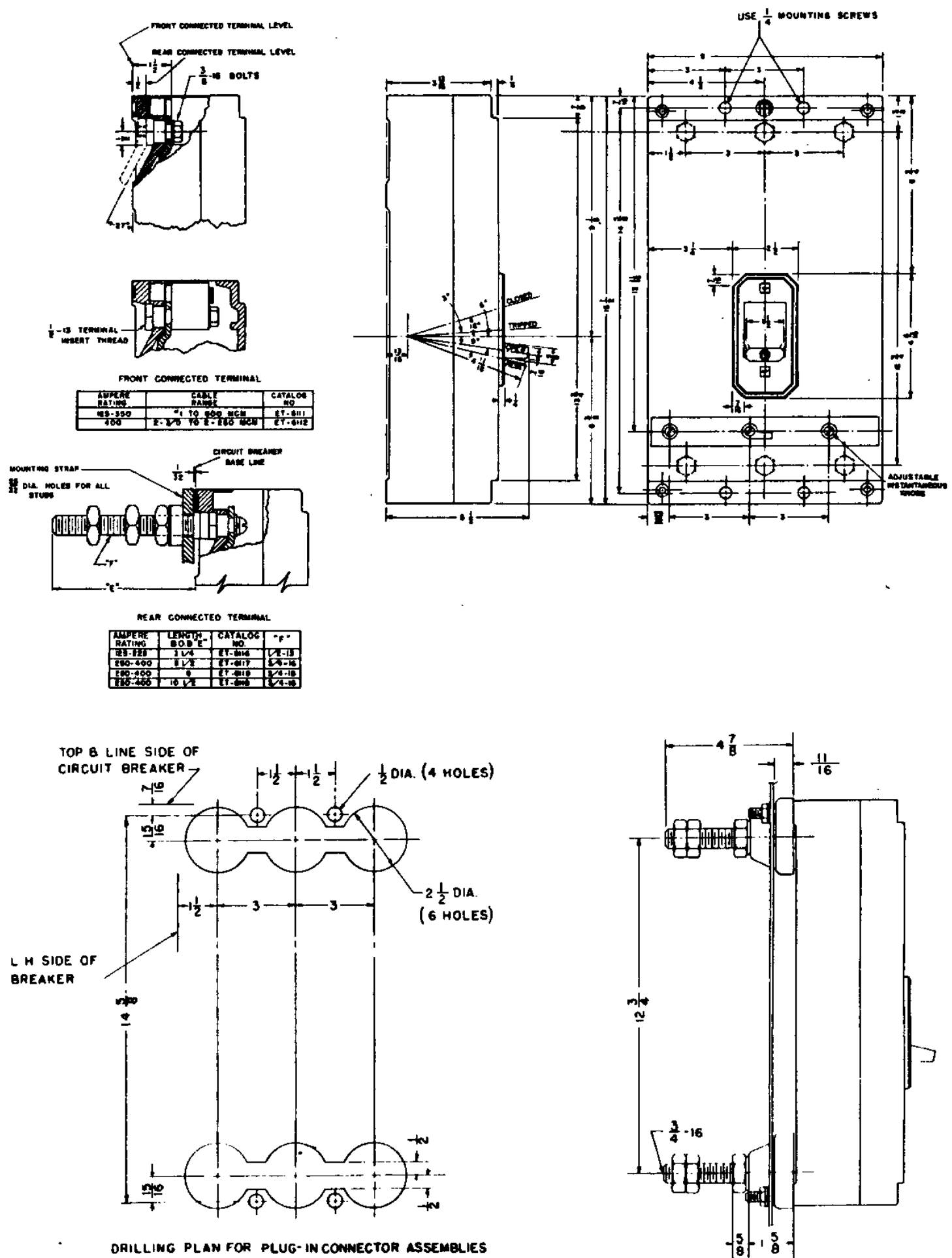
To remove the arc-quenchers for examination of the contacts, first refer to WARNING FOR CIRCUIT BREAKER REMOVAL. Remove circuit breaker cover (2), conductor wire screw (8), and arc-quencher retaining screw (13). Pull the arc-quencher out of the circuit breaker base, and draw it away from the contacts.

If necessary, the conductor wires may be bent, slightly, to give more clearance.

EXCESSIVE HEATING OF CONTACTS

Excessive heating of the contacts is caused by dirt or a high resistance film usually resulting from long periods of non-operation. Opening and closing the circuit breaker several times under load is usually sufficient to burn off the film or dislodge any dirt. This procedure should be followed at regular inspection periods. It may be assumed contacts are clean if a millivolt reading taken between points A and B indicates approximately 12.5 with 80 amperes d-c flowing.

All pivot bearing points should be lubricated at least once every twelve months. Apply a small amount of light oil to these points and wipe away any excess oil or accumulated dust.



Dwg. S-15033

ET 400 Ampere KL Frame Circuit Breakers
Dimensional Drawings