

etc-12 Q-series

Section 1 Installation Manual



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Introduction:

The Satin American *etc-12 Q-series* retrofit system is designed to replace obsolete solid state tripping systems on OEM power circuit breakers. Upgrading with the *etc-12 Q-series* allows for the utilization of modern controls and safety features without significant downtime or expense.

The *etc-12 Q-series* utilizes the same electronics as the field proven *etc-12/ etd* retrofit system. Except for changes noted in this manual, available settings, setup and operation is identical to that of the *etc-12 / etd*. These units utilize the same time current curves except for the fact that the 10% ground fault pickup is not available on the *Q-series*. The *Q-series* is designed to provide basic LSIG type protective functions. Advanced features such as *MODBUS* communications and *Zone Interlocks* must be special ordered and may not be plug-in compatible with systems supplied with original equipment. The *etc-12 Section II* manual provides detailed instructions for setting up and testing these units.

These instructions are intended to serve as guidelines to individuals with circuit breaker maintenance experience to install the *Satin American etc-12 Q-series* trip unit on

Square D MasterPact™ circuit breakers that were originally equipped with *STR-28D*, *STR38S* or *STR-58U* control units.

Kit installation requires familiarity with circuit breaker operation and maintenance, careful workmanship and compliance with all instructions.

The conversion requires removal of the existing trip unit and its replacement with the *etc-12 Q-series*. In this application, the original current sensors, flux trip actuator, and breaker wiring is utilized. The installation can be completed in approximately 15 minutes after which, the breaker must be fully performance tested.

Each kit is supplied with all of the necessary materials to upgrade the circuit breaker. In the special instance where a breaker is applied with ground fault protection on a 4-wire system, an additional neutral sensor, copper details and secondary disconnects may be required. Contact the factory before beginning a conversion of such a system.

Note that this retrofit kit is not intended to increase the interrupting capacity of a breaker. The converted breaker must be applied within its original short-circuit ratings.

WARNING!!

TO PREVENT ELECTRICAL SHOCK OR INJURY, DISCONNECT THE BREAKER FROM ALL PRIMARY AND SECONDARY POWER SOURCES AND CONFIRM THAT THE BREAKER IS OPEN AND THE CHARGING SPRINGS ARE DISCHARGED BEFORE DOING ANY WORK.

REFER TO NFPA-70E FOR COMPREHENSIVE ELECTRICAL SAFETY GUIDELINES.

IMPORTANT!!

RETROFITTED BREAKERS MUST BE PERFORMANCE TESTED BEFORE BEING RETURNED TO SERVICE. PRIMARY INJECTION TESTING IS STRONGLY RECOMMENDED. REFER TO THE TESTING SECTION IN THE SECTION II MANUAL FOR DETAILED INSTRUCTIONS.

1.0 Required Tools:

As each installation situation is unique, it is advised that a complete set of tools are available. The below list details the absolute minimum complement of tools required to complete this task.

- Assorted screwdrivers
- Crimping tools.
- Insulating tape.
- Permanent marker or wire labels.

Reference Material:

- Manufacturers Circuit Breaker Maintenance Manual
- *etc-12 / etd* section II manual

2.0 Pre-Installation:

- 2.1. Verify that the proper kit was supplied and thoroughly inspect it for damage or missing components.
- 2.2. Install supplied 9V battery into *Q-series* trip unit and power on trip unit by pressing power button. If desired, settings can be entered at this time. The display will automatically power down after about 30 seconds of inactivity.
- 2.3. Read and understand these instructions before beginning the retrofit.
- 2.4. Place the breaker on a sturdy surface, in a clean work area where there is access to all sides of the breaker.
- 2.5. Perform a detailed mechanical inspection of the breaker. At a minimum, verify that the breaker opens and closes properly. Any mechanical problems should be fixed before starting the retrofit project. Normal maintenance can be performed prior to or during kit installation.

3.0 Programmer Installation:

IMPORTANT!!

BEFORE PROCEEDING, VERIFY THAT THE BREAKER IS OPEN AND CHARGING SPRINGS ARE DISCHARGED

- 3.1. Remove and retain the screws identified as *A* in figure 1. Remove the green *Arc chamber and terminal cover* from the breaker.



FIGURE 1, FRONT VIEW OF BREAKER

- 3.2. Remove the screws identified as *B* in figure 1. On larger frame breakers, there may be additional screws. Retain this hardware and remove the front cover of the breaker.
- 3.3. Tilt breaker on its back. Label and remove each connector that is plugged into the original *STR* control unit.

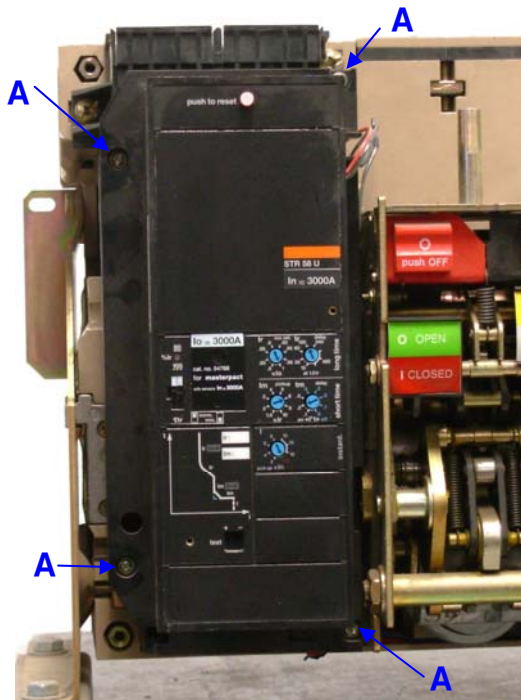


FIGURE 2, VIEW OF ORIGINAL TRIP UNIT

3.4. Remove the *STR* control unit by removing the screws identified as *A* in figure 2. Discard original mounting hardware. If there are additional wires entering the control unit, these can be cut and the wire ends appropriately insulated.

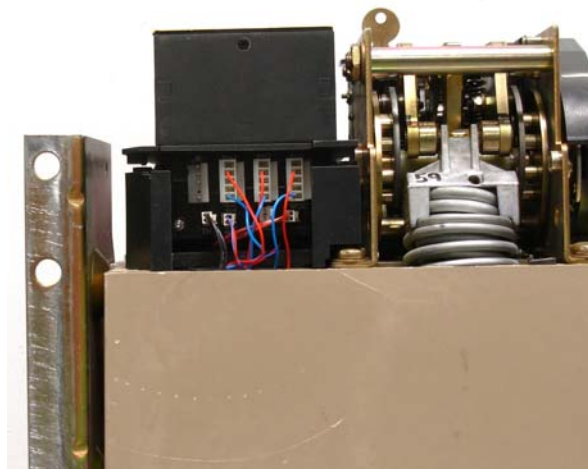


FIGURE 3, VIEW OF BOTTOM OF BREAKER SHOWING ORIGINAL WIRING HARNESS PLUGGED INTO Q-SERIES

3.5. Connect the existing breaker harnesses to the *Q-series*. To provide basic LSIG protection, the following connections are required:

- CT connections (PH1, PH2, PH3)
- Neutral CT connection (N), required only for 4th wire ground.
- Flux trip coil (MTOF).

3.6. Install the *etc-12 Q-series* using supplied hardware.

3.7. Replace front cover and *Arc chamber and terminal cover* and secure with retained hardware.

4.0 Testing:

4.1. Retrofitted breakers must be fully performance tested before being returned to service. It is strongly recommended that a newly retrofitted breaker be primary injection tested. Secondary injection may be used for regularly scheduled maintenance testing.

4.2. It is recommended that all testing be performed in *Test Mode*. Ground fault, short-time, instantaneous and phase imbalance protection bands can be temporality disabled if they interfere with other functions during test.

4.3. Refer to the *etc-12/etd Section II* manual for specific test procedures and further information regarding *Test Mode*.

Type STR trip units and MasterPact breakers are products of the Square D / Schneider Electric Corporations.

