

etc-12Q.series

Retrofit Tripping System for MasterPact™ Circuit Breakers

Section I Installation Manual



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**CERTIFICATE AND DECLARATION OF CONFORMITY
FOR CE MARKING**

Company Contact Details

RESA Power
19500 TX-249
Houston, TX 77070

**RESA Power declares that the *etc-12Q.series* is classified within
the following EU directive:**

Electromagnetic Compatibility 2004/108/EC

**and further conforms with the following EU Harmonized
Standards:**

EN 61000-6 2:2005
EN 61000-6-4: 2007

Dated 22 February 2011

Note: this equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

The *etc-12Q.series* trip unit has been designed and qualified in accordance with IEC/EN 60947-2 edition 4.0 (2006) and with the guidance of the LOVAG test instructions LTI IEC/EN 60947-2, ED 4.0, October 2009. This process broadly follows the same philosophy as ANSI/IEEE C37.59-2007, *Requirements for Conversion of Power Switchgear*, with referenced standards ANSI/IEEE C37.13-2008, C37.50-1989 (R2000) and IEEE C37.20.1-2002 requirements used as applicable.

The replacement trip element is intended to be installed on *MasterPact M/MP™* breakers that were designed by *Schneider Electric* ®. The *etc-12Q.series* has been Power Lab tested on 800/1600/2000/3000 Amp frame sizes. The *MasterPact™* breaker element itself was tested by the OEM to both IEC, UL and ANSI/IEEE standards. Conversion with the *etc-12Q.series* maintains all original primary and secondary contacts, operating mechanism and interlocking systems. Since this conversion makes no changes to the legacy breaker element, the original certification reports for this product are still in effect.

High current testing was conducted at the DNV-KEMA PowerTest Laboratory in Chalfont, PA, USA; complying with EAWR (2007) clause #83.

This device has been tested to with and conforms to the following standards:

EN 61326-1: 2006
EN 55011: 2007
EN 6100-4-2: 2009
EN 6100-4-3: 2006 +A1: 2008
EN 6100-4-8: 1994

Introduction:

The *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 *Q-series* is designed to provide basic LSIG type protective functions. Advanced features such as *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 *etc-12 Q-series* trip unit to replace *Schneider / Merlin Gerin / Square D STR-28D™*, *STR38S™* or *STR-58U™* control units on the following *MasterPact™* breakers:

<i>MP08 H1</i>	<i>MP08 H2</i>	<i>MC08 N1</i>
<i>MP12 H1</i>	<i>MP12 H2</i>	<i>MC16 N1</i>
<i>MP16 H1</i>	<i>MP16 H2</i>	
<i>MP20 H1</i>	<i>MP20 H2</i>	
<i>MP25 H1</i>	<i>MP25 H2</i>	
<i>MP30 H1</i>	<i>MP30 H2</i>	
<i>MP40 H1</i>	<i>MP40 H2</i>	
<i>MP50 H1</i>	<i>MP50 H2</i>	
<i>MP63 H1</i>	<i>MP63 H2</i>	

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. The *etc-12Q-series* is compatible with residual "Type T" ground fault protection. If the application requires a direct-sense, "Type W" scheme, the *etc-12Q-series* must be specially configured at the factory. Refer to the *etc-12Q-series* Section II manual for more information.

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-12Q.series* 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-28D / STR-38S / STR-58U* trip unit.

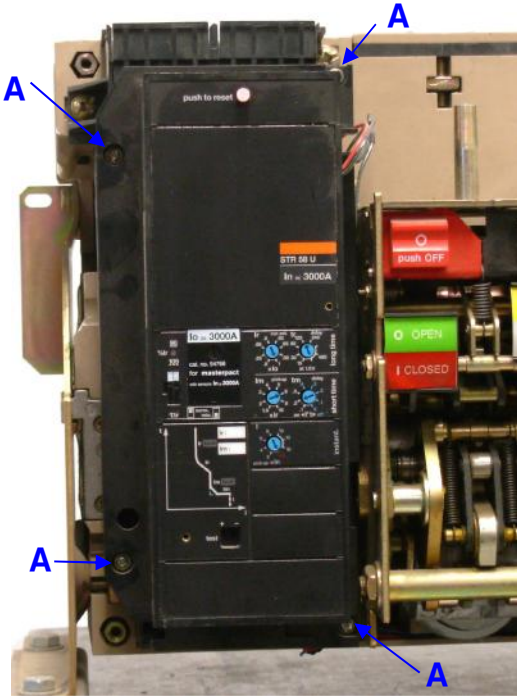


FIGURE 2, VIEW OF ORIGINAL STR-58U TRIP UNIT

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.

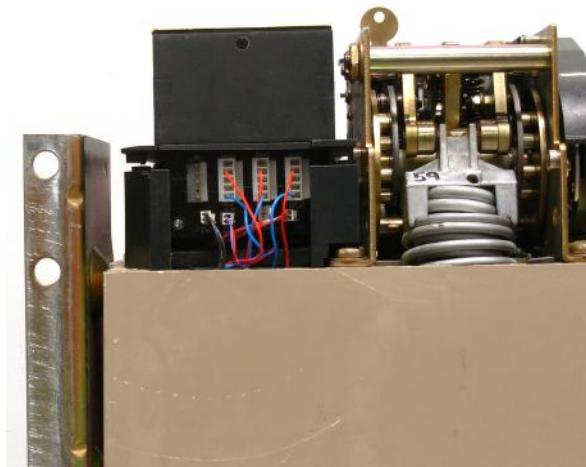


FIGURE 3, VIEW OF BOTTOM OF BREAKER SHOWING ORIGINAL WIRING HARNESS PLUGGED INTO Q-SERIES

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).
- Making Current Release (DINF)

3.6. Install the *etc-12Q.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*.

STR-28D, STR-38S and STR-58U trip units and MasterPact breakers are products of the Square D / Schneider Electric / Merlin Gerin Corporations.

Specifications in this manual may change without notice

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