

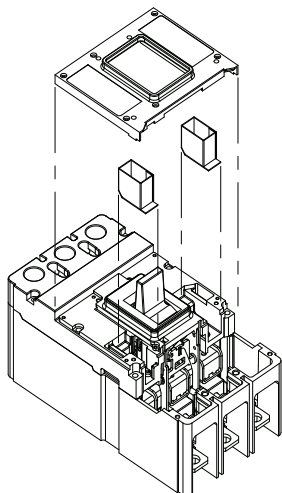
Instruction Leaflet for Electronic Trip Units for LG-Frame Circuit Breakers and Motor Circuit Protectors

Warning

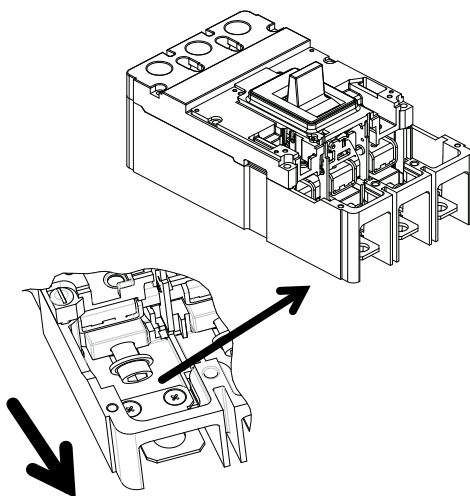


DO NOT ATTEMPT TO INSTALL OR PERFORM MAINTENANCE ON EQUIPMENT WHILE IT IS ENERGIZED. DEATH OR SEVERE PERSONAL INJURY CAN RESULT FROM CONTACT WITH ENERGIZED EQUIPMENT. ALWAYS VERIFY THAT NO VOLTAGE IS PRESENT BEFORE PROCEEDING.

1

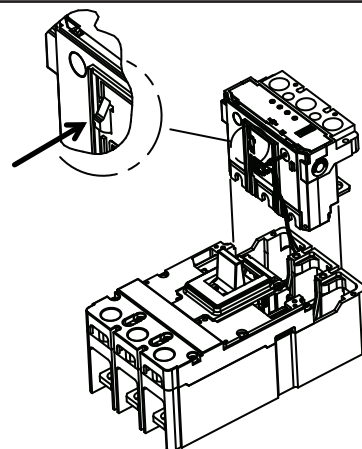


2



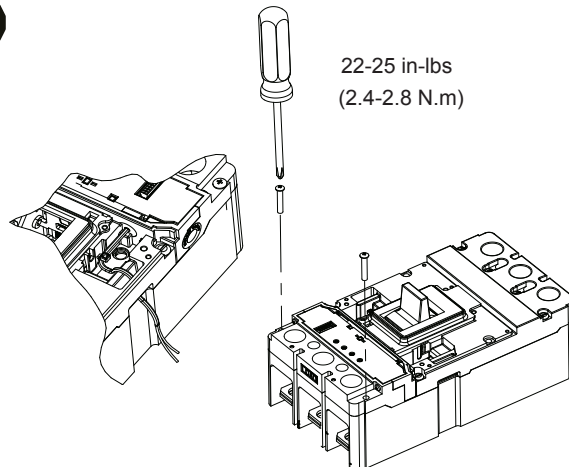
3

Push to
Click

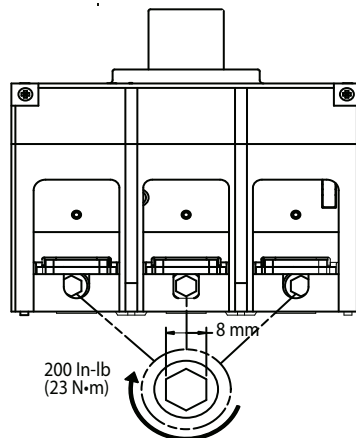


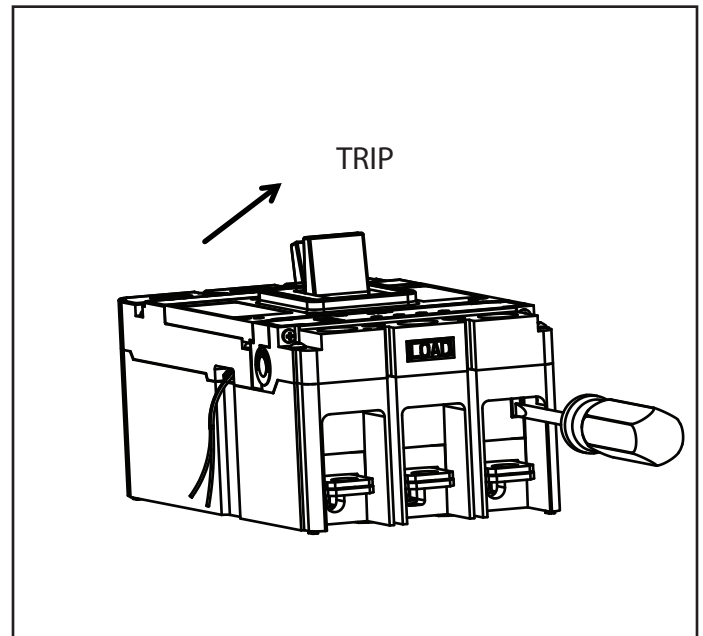
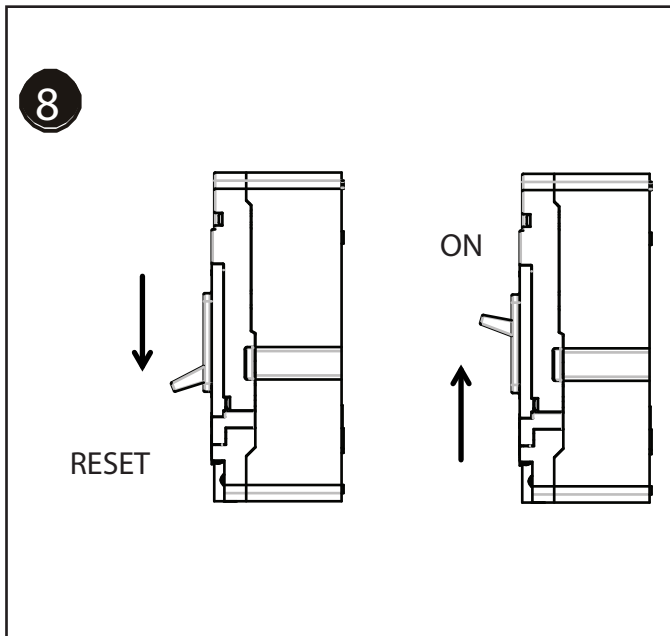
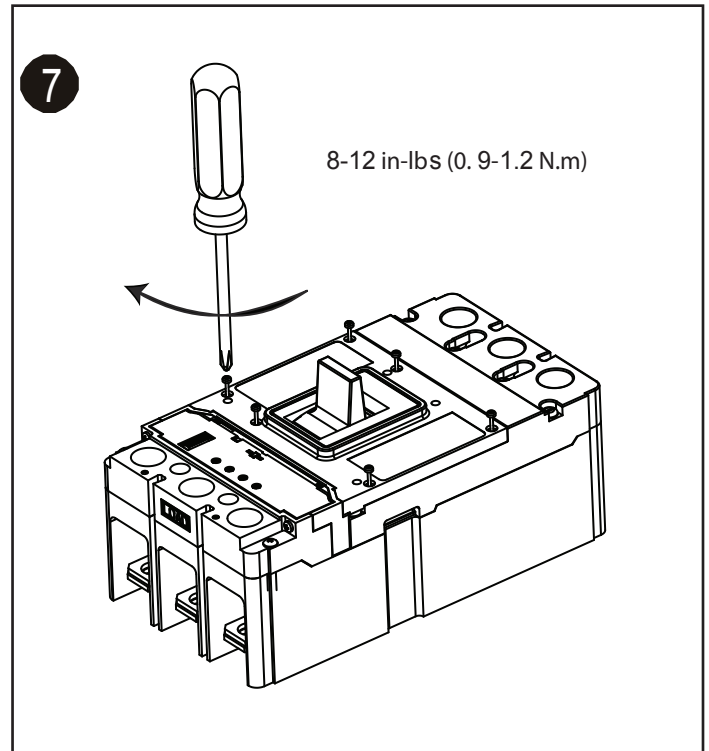
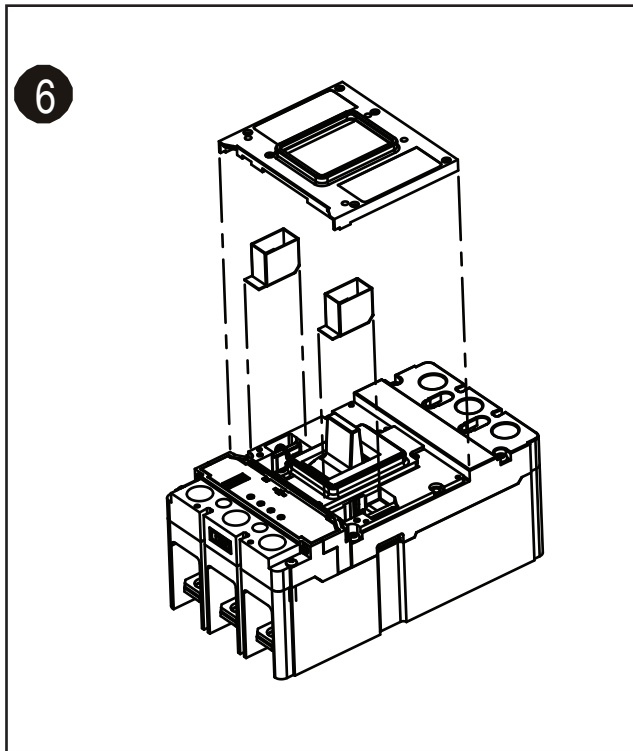
4

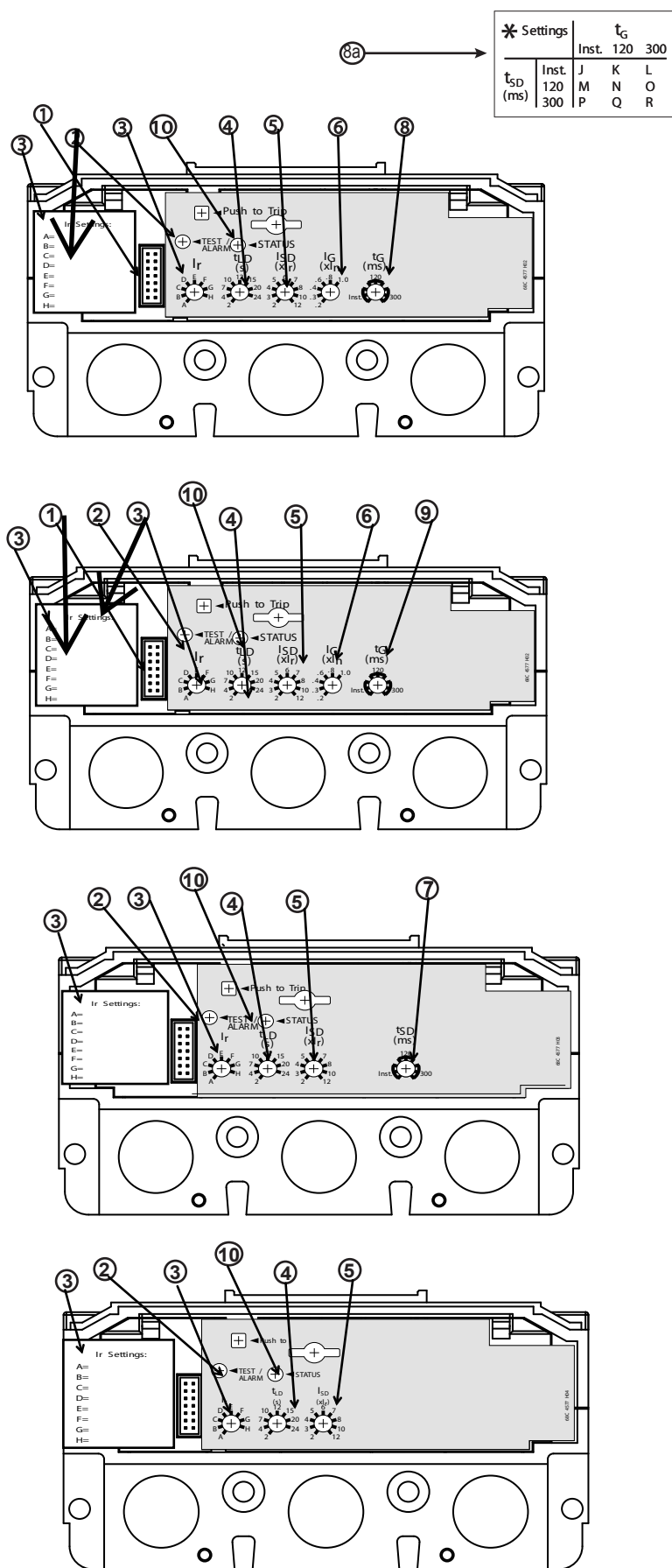
22-25 in-lbs
(2.4-2.8 N.m)



5







1. Test Port - A test port is built into each trip unit to allow use of a functional test kit. The test kit performs a test of the Long Delay, Short Delay Ground Fault functions.

2. Test LED - To be used with a no trip functional test. This LED is a dual function light. As previously stated, the LED is used as a no trip indicator when using the test port. In normal modes, this LED indicates a high load alarm. It will light if the continuous current is 85% of the I_r Setting and must be present for a 38 second duration.

3. I_r - Continuous Current setting. In accordance with standards requirements, the trip unit initiates a trip of the circuit breaker within 2 hours for an overload of 135% and will trip as a function of I²t for higher currents. Continuous Current Values for each Lettered Setting are indicated by the chart shown at the right.

4. t_{LD} - The number of seconds required to trip @ 6x I_r. i.e. I_r-600A, t_{LD} - 2 sec load current - 3600A (6x) The breaker will trip in 2 seconds.

5. I_{SD} - Setting in multiples of I_r. For short circuit conditions that exceed the short delay pick-up setting, the trip unit initiates a trip after a predetermined delay.

6. The I_G (xI_N) switch is the ground fault pick-up switch and is used on the LSI_G & LSG styles to set the ground fault pick-up as a percentage of I_N. (frame current) for example, a 600A frame with an I_G(xI_N) settings of 0.5 will provide a ground fault pick-up at 300A.

7. For the LSI style, the short delay time is a flat response determined by the t_{SD} switch settings of INST, 120ms, or 300ms. For the LS styles, the short delay time is an I²t function.

8. For the LSI_G style, the short delay is a flat response determined by the t_{SD}/t_G switch settings of INST, 120ms, or 300ms. This switch is a dual switch that also determines the ground fault time settings of INST, 120ms or 300ms. As an example, if the t_{SD}/t_G switch is set at position J, then both short delay time and ground fault time are at INST flat. A second example would be to set the t_{SD}/t_G switch at position L, then the short delay flat time is INST and the ground fault flat time is at 300ms. The LSI_G label (see above 8a) should be used in conjunction with the t_{SD}/t_G switch to set any one of nine possible combinations of short delay and ground fault flat times. The LSI_G label should be applied to the left side Breaker Frame Nameplate.

9. For the LSG style, the short delay time is an I²t function while the ground fault flat time is set by the t_G switch.

10. Status LED - A green status light indicates the operational status of the trip unit. If the load current exceeds approximately 20% of the maximum current rating (I_N) the breaker, the status light will blink on and off once each second.

Maintenance Mode & INSTantaneous Features

11. PTT

630a
600A
400A

LSIG

With
Maintenance
Mode

12. The Maintenance Mode and adjustable INSTantaneous features are only available on LSI and LSIG styles. Please refer to the labeling to the left of the test kit connector. The Maintenance Mode consists of the two lowest settings of the INST switch: 2.5x and 4.0x. For example, a 400A (In) L-Frame breaker with the switch set to 2.5x would trip instantaneously when the current exceeded 1000A.

13. The adjustable INSTantaneous () Mode had five settings from 6x to 12x. For example, a 600A (In) L-Frame breaker with the (I_i) switch set to 7x would trip instantaneously with the current at or above 4200A.

14 On the regular L-Frame, the lowest labeled SDT setting is the INSTaneous for the Maintenance Mode. The lowest SDT setting labeled is 50ms.

Note: The 250A L-Frame has an adjustable INSTantaneous setting of 28X. For example, a 250A (In) L-Frame breaker with the (I_i) switch set to 28X would trip INSTantaneously with currents at or above 7000A.

630A
600A
400A

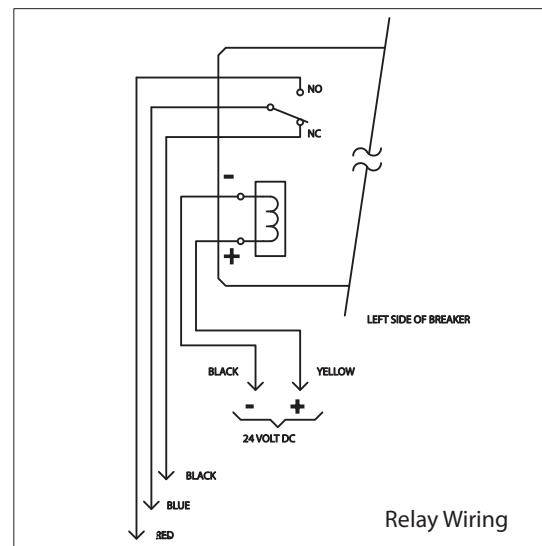
LSI

With
Maintenance
Mode

250A

LSIG

With
Maintenance
Mode



15. This feature allows enabling of the maintenance mode remotely by applying 24 vdc to the yellow (+) and black(-) wires that exit the left hand side of the breaker. The maintenance mode settings that is enabled is the 2.5x setting.

There are two indicators that can verify that the trip unit has been remotely activated/enabled into the maintenance mode feature:

a) a blue LED (MM) located on the top left side of the trip unit will light.

AND/OR

b) a relay output is provided by the three wires exiting the left hand side of the breaker:

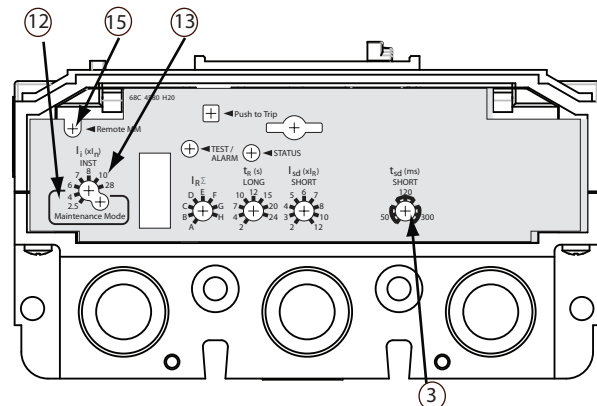
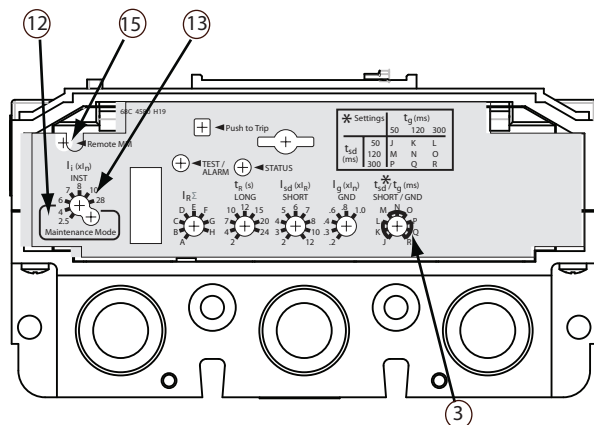
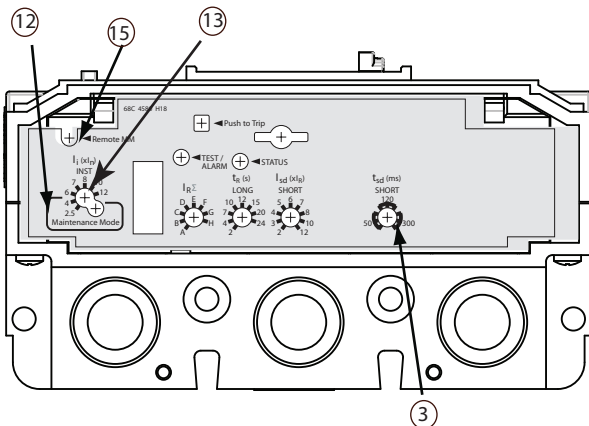
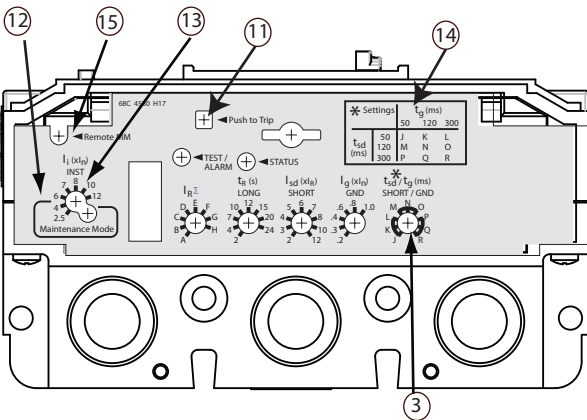
blue=C, red=NO, black=NC.

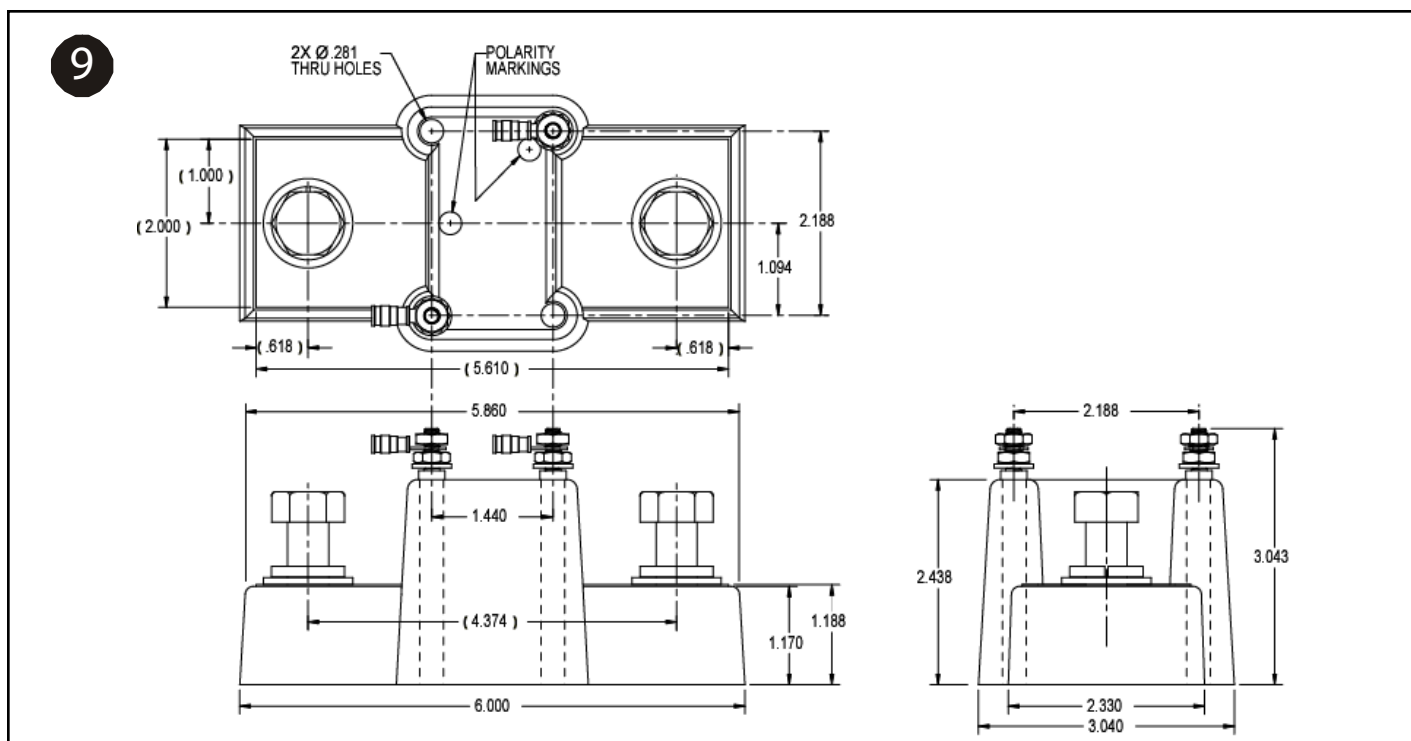
The relay will change state when the maintenance mode is remotely enabled.

250A

LSI

With
Maintenance
Mode



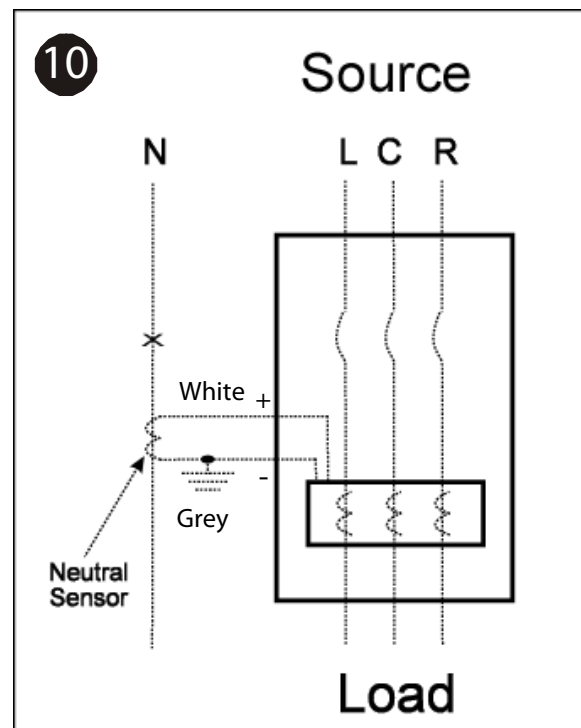


Neutral Current Sensor Installation

Ground fault trip units are supplied from the factory with pigtail lead connections for a neutral current sensor (white and grey wires). {A neutral current sensor is provided with each trip unit, if ordered.} A neutral current sensor is available, but must be ordered separately.

Series G Ground Fault Trip Units detect ground fault currents through Residual Sensing. They are not designed to use source ground or zero sequence ground fault sensing methods. If the system neutral is grounded but no phase to neutral loads are used, the neutral current sensor is not necessary. In that case, the white and grey leads on the trip unit should be cut off before installation.

If the system neutral is grounded and phase to neutral loads are used, then the neutral current sensor (see Figure 9) must be used. It should be connected to the breaker according to the diagram in Figure 10. It has the same turns ratio as the phase current sensors in the trip unit.



NOTICE

The polarity of the sensor connections is critical. Always observe the polarity markings on the installation drawings. The polarity markings are identified as white dots on the transformers. To insure correct

ground fault equipment performance, conduct field tests to comply with National Electric Code requirements under Article 230-95(C). See Section 6.2 for testing instructions.

