AC-PRO Retrofit Kit

Retrofit Kit Instructions for Sylvania SSPB-800/1600/3200 Low Voltage Breaker

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LIMITED WARRANTY

Utility Relay Company warrants that every AC-PRO and ZERO-Hertz trip unit and related retrofit kit components (herein collectively referred to as "product") shall be free from defects in material and workmanship, and will perform as described in Utility Relay Company's sales literature and Instruction Manuals, under normal use and service for a period of (2) two years from date of invoice.

Should any warranty claim arise within the warranty period, contact Utility Relay Company at 888-289-2864 and do the following:

1. **Provide a complete description of the problem with the trip unit or retrofit kit component.**
2. **Provide the Serial Number located on the back of the trip unit from the warranted retrofit kit.**
3. **Obtain a Returned Materials Authorization number (RMA) and return shipping instructions.**
4. **Promptly return the defective material to Utility Relay Company.**

Warranty Disclaimer and Liability Limitation

Utility Relay Company will repair or replacement the trip unit and/or retrofit component(s) at no cost to the customer. The customer is liable and shall pay for shipment of defective products back to Utility Relay Company.

Excluded from this warranty and not warranted by Utility Relay Company in any fashion, either expressed or implied are:

1. **Any product which has been disassembled (except to replace batteries), repaired, tampered with, altered, changed, or modified by persons other than Utility Relay Company's own authorized service personnel unless repair by others is made with the written consent of Utility Relay Company.**
2. **Defects or damage to the Product resulting from wear, tear, misuse, negligence, improper storage, improper testing, impacts, or use with non-approved accessories.**
3. **Products used for any other purpose other than originally intended by Utility Relay Company.**

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Sylvania
SSPB-800/1600/3200

1.0 General

All possible contingencies which may arise during the installation, operation or maintenance, and all details and variations of this equipment not necessarily covered by these instructions.

1.1 Inspection

Carefully inspect the retrofit kit on arrival. If any damage is found, file a claim with the carrier and contact Utility Relay Co. LTD for replacement parts.

Verify that this is the correct kit for the circuit breaker being retrofitted.

Check the contents of the retrofit kit package against the kit bill of material to make sure that all the required parts are included.

Thoroughly read and understand these installation instructions as well as the AC-PRO trip unit instruction manual before proceeding with the retrofit.

2.0 Initial Breaker Tests

Before starting the retrofit, perform a visual/mechanical inspection and an electrical test of the breaker to determine its condition.

Refer to the breaker manufacturer's instruction manual and accepted test standards such as the NETA Maintenance Specifications to verify that the breaker is in acceptable mechanical and electrical operating condition.

As a minimum, perform the following:

a) Close and trip operation of the breaker.
b) Measure contact resistance of each pole.
c) Measure insulation resistance from pole to pole, from pole to frame and across open contacts.
d) Check contact compression.
e) Check for sufficient finger cluster spring tension at the rear stabs.

Rectify any abnormalities found. Clean and lubricate the breaker as required.

3.0 Remove Existing Trip Unit

1) Remove the existing trip unit and wiring.

2) Remove the existing actuator only if it will be replaced.

3) Remove the three existing CTs only if they will be replaced.

The retaining shaft that runs horizontally through the breaker frame as well as the six finger clusters must be temporarily removed to gain access to the CTs.

4.0 Actuator

The existing actuator can be re-used or a replacement actuator can be installed.

Skip this section if the existing actuator will be re-used.

4.1 Install New Actuator

The new actuator will be mounted in approximately the same location as the existing actuator.

The breaker will automatically reset the new actuator in the same way it reset the existing actuator after a trip.

See Figure 3 for the following:

1) **Using the dimensions shown in Figure 4, drill two (2) 9/32 holes in the existing actuator/trip unit bracket.**

2) **Replace the 5” rod with a 4” rod on the actuator.**

   Use care since the plunger is spring loaded.

   Do not replace the reset knob or the plastic tip.

3) **Adjust the position of the actuator rod so it is flush with the actuator plunger.**

   Lock the actuator rod in position by tightening the 10-32 set screw with an Allen wrench.

4) **Attach the actuator AND bracket BR-256-1 to bracket BR-115 using one (1) 10-32 X 3/8 R.H. screw and two (2) 10-32 X 1/2 R.H. screws and lock washers. See Figure 3 for correct orientation.**

5) **Slide the BR-255-1 trip paddle onto the actuator rod and use the 3/16 X 1 1/2 clevis pin to attach it to the BR-256-1 bracket.**

6) **Adjust the location of the existing bell crank arm and the BR-257 adjustable link on the rear hex trip bar so the adjustable link is aligned with the right side of the BR-255-1 trip paddle.**

   Attach the BR-257 adjustable link to the bottom of the BR-255-1 trip paddle using the 3/16 X 1 1/4 clevis pin.

7) **Slide the Silicone rubber washer and PVC washer on the actuator rod and thread the HW-9903-3 1/4-20 clamp-on-collar onto the actuator rod.**

4.2 Adjust New Actuator

1) **With the actuator RESET and the breaker OPEN:**

   - **Adjust the length of the adjustable link until the BR-255-1 trip paddle is approximately vertical.**
   - **Tighten the 1/4-20 clamp-on-collar on the actuator rod until the silicone rubber washer is about 50% compressed.**
   - **Lock the 1/4-20 clamp-on-collar in place.**

2) **Verify smooth trip and reset operation. Use a fresh 9 Volt battery to trip the actuator (Red wire is +).**

IMPORTANT:	**THE ACTUATOR MUST BE FIRMLY RESET WEN THE BREAKER TRIPS.** **THE SET SCREW IN THE PLUNGER MUST BE TIGHTENED TO ENSURE THAT THE ACTUATOR ROD REMAINS IN PROPER ADJUSTMENT.** **THE CLAMP-ON-COLLAR MUST BE LOCKED ON THE ACTUATOR ROD.**

5.0 AC-PRO Installation

5.1 1600 and 3200 Amp Frame

See Figure 1 for the following:

1) **Attach the BR-001 bracket to the back of the trip unit as shown in Figure 1.**

2) **Hold the trip unit/bracket assembly against the inside of the breaker frame.**

   Mark the location of two mounting holes and drill two (2) 3/16 holes where marked.

3) **Attach the trip unit/bracket assembly using two (2) 10-32 X 3/4 R.H. screws, lock washers and hex nuts.**

5.2 800 Amp Frame

See Figure 2 for the following:

1) **Attach the BR-001 bracket to the back of the trip unit as shown in Figure 2.**

2) **Hold the trip unit/bracket assembly against the bottom of the breaker frame upper front channel.**

   Mark the location of two mounting holes and drill two (2) 3/16 holes where marked.

3) **Attach the trip unit/bracket assembly using two (2) 10-32 X 3/4 R.H. screws, lock washers and hex nuts.**

6.0 Install New CTs

If the existing CTs will not be re-used, install the new CTs as follows:

1) **Install a new CT on each of the line side stabs.**

2) **Replace the finger clusters and retaining shaft that was previously removed.**

7.0 Wiring

Use the wiring harness provided to make the connections to the CTs and the actuator. See Figure 6 for the wiring diagram.

The wiring harness plugs into the top of the AC-PRO. Be sure to tighten the two plug retaining screws after the wiring is complete.

Shorten the wires and tubing as required and use the cable ties and holders provided to make a clean installation. Make sure the wires will not be pinched, cut or chaffed by any moving parts or sharp edges.

7.1 Color Codes and Connections

The wiring harness connector color code and connections are as follows from left to right:

Terminal #	Wire Color	Use
1	Red (R)	Actuator “+”
2	Black (B)	Actuator “-“
3	Blue (L)	Phase “A” “Dot”
4	White (W)	Phase “A” Tap
5	Yellow (Y)	Phase “B” “Dot”
6	White (W)	Phase “B” Tap
7	Brown (N)	Phase “C” “Dot”
8	White (W)	Phase “C” Tap
9	Green (G)	Neutral “Dot” (4W & GF only)
10	White (W)	Neutral Tap (4W & GF only)

7.2 Current Transformer Connections

Each set of CT wires in the wiring harness is housed inside an individual PVC tube for added physical protection and to simplify the wiring process.

New CTs:
Connect to the #10-32 lugs using the ring tongue terminals provided. Make sure that the same tap is used on all three CTs.

Existing CTs:
Connect to the existing terminals using the ring tongue terminals provided. Make sure the same tap is used on all three CTs.

7.3 Neutral Current Transformer

A neutral CT is only required on a 4-wire system with the ground fault function on.

On a 3-wire system, a neutral CT is not required even if the ground fault function is on.

New Neutral CT:
The neutral CT and neutral wiring assembly is provided with the neutral CT kit.

Existing Neutral CT:
The Existing neutral CT will be re-used. Wire from the trip unit harness plug to the breaker secondary contacts.

7.4 Actuator Connection

New Actuator:
Route the existing red and black wires from the actuator to the “ACTUATOR” terminals on the trip unit. Trim the wires to an appropriate length.

Connect the red actuator wire to the “+” terminal on the wiring harness trip unit connector. Similarly, connect the black actuator wire to other actuator terminal on the trip unit.

Existing Neutral CT:
Route the Red and Black actuator wires from the trip unit harness to the terminal block on the existing actuator. Red is "+" and Black is "-".

8.0 Final Test

Perform a final electrical test of the breaker as in Section 1.

A primary injection test is recommended as the final test of the AC-PRO retrofit. See Section 9 “TESTING” in the AC-PRO instruction manual for complete details.

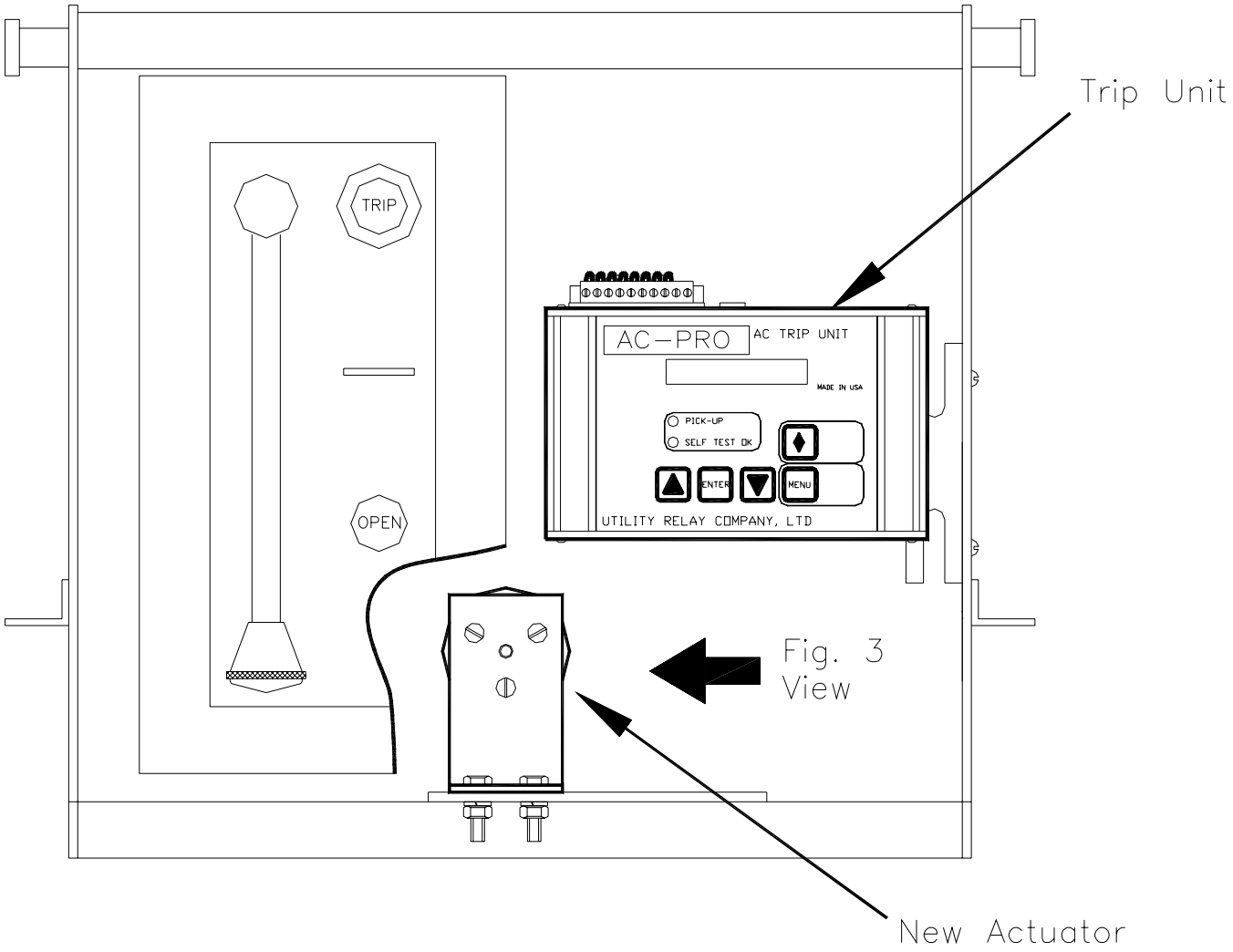


FIGURE 1
1600 Amp Frame
Front View

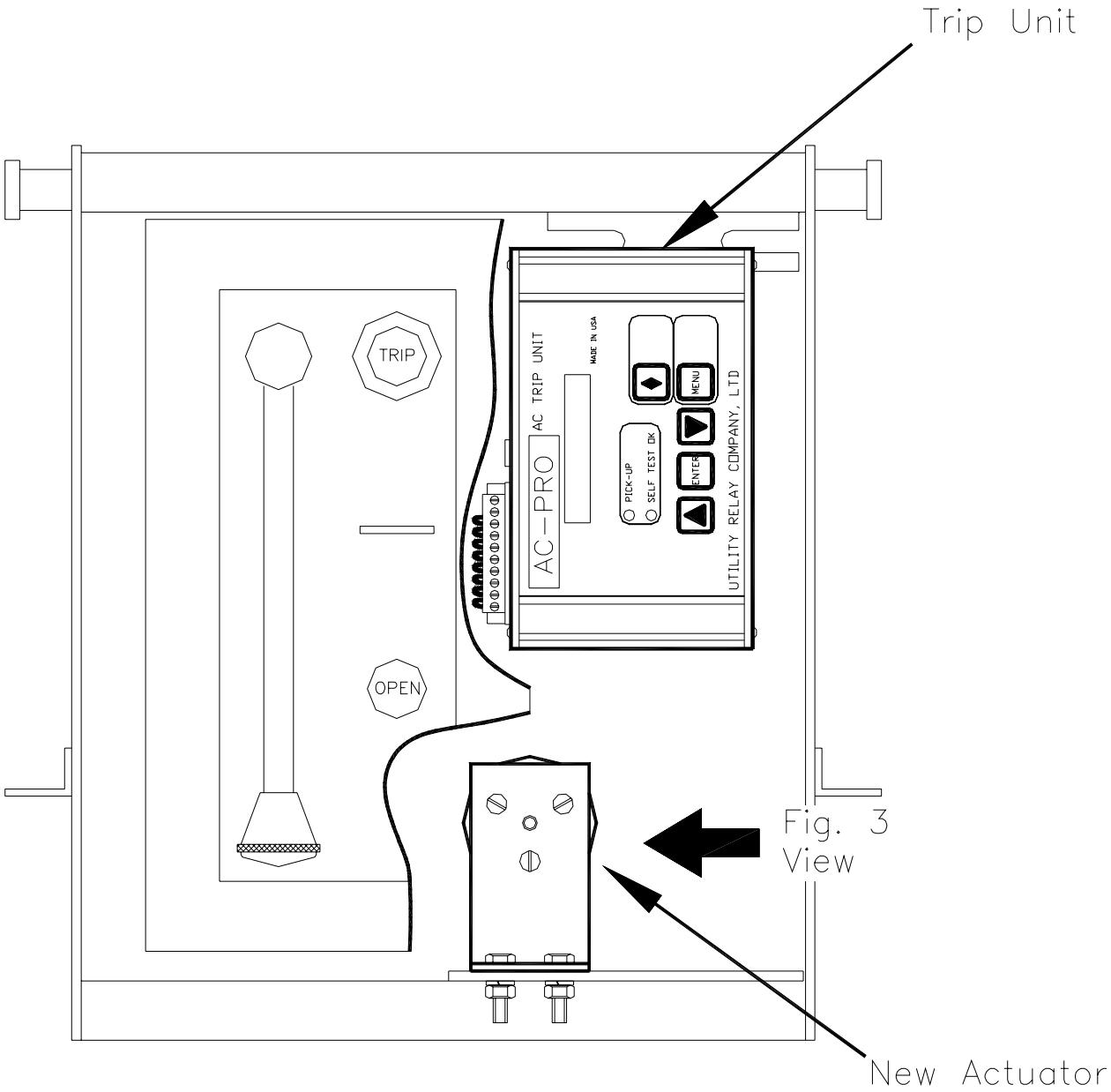
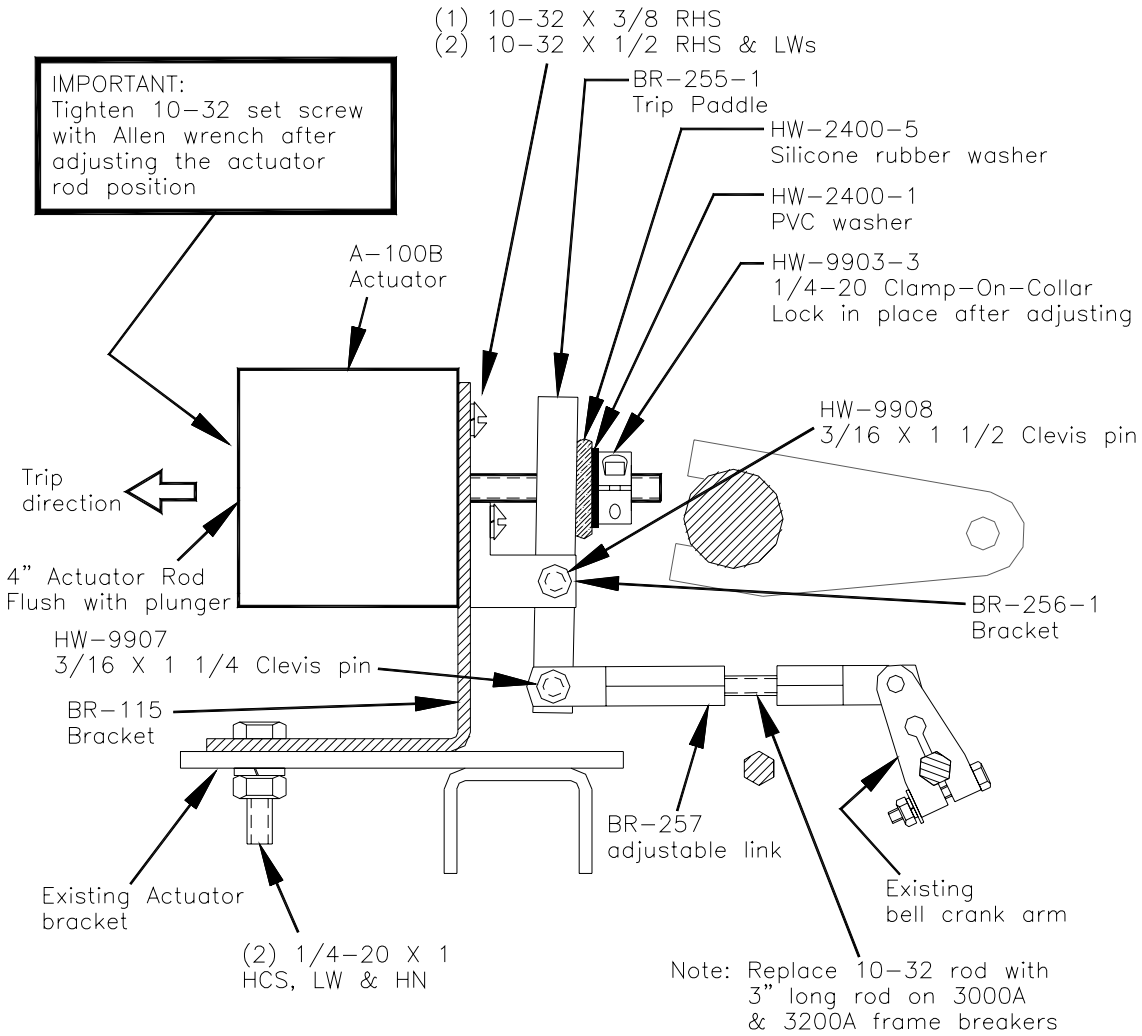


FIGURE 2
800 Amp Frame
Front View



Adjustment procedure:

- Assemble as shown above
- Lock 4" actuator rod in place by tightening 10–32 set screw in actuator plunger
- With actuator RESET and breaker OPEN:
  - Adjust link so BR–255–1 trip paddle is approximately vertical
  - Adjust clamp–on–collar so silicone washer is about 50% compressed
  - Lock clamp–on–collar in place
- Verify smooth trip and reset operation
  Use 9 Volt battery to trip actuator (Red is +)

FIGURE 3
Actuator/Trip Paddle Installation

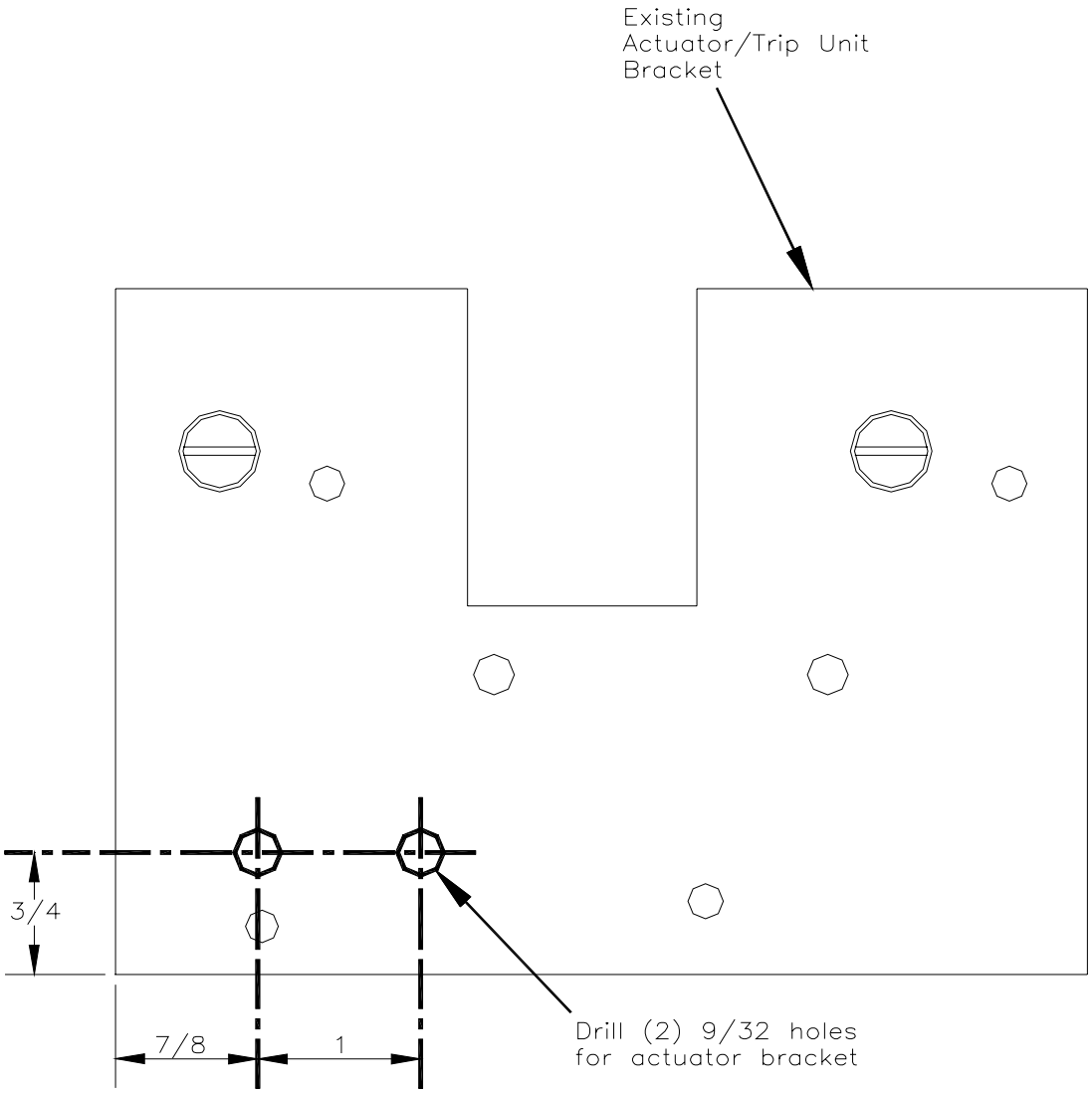
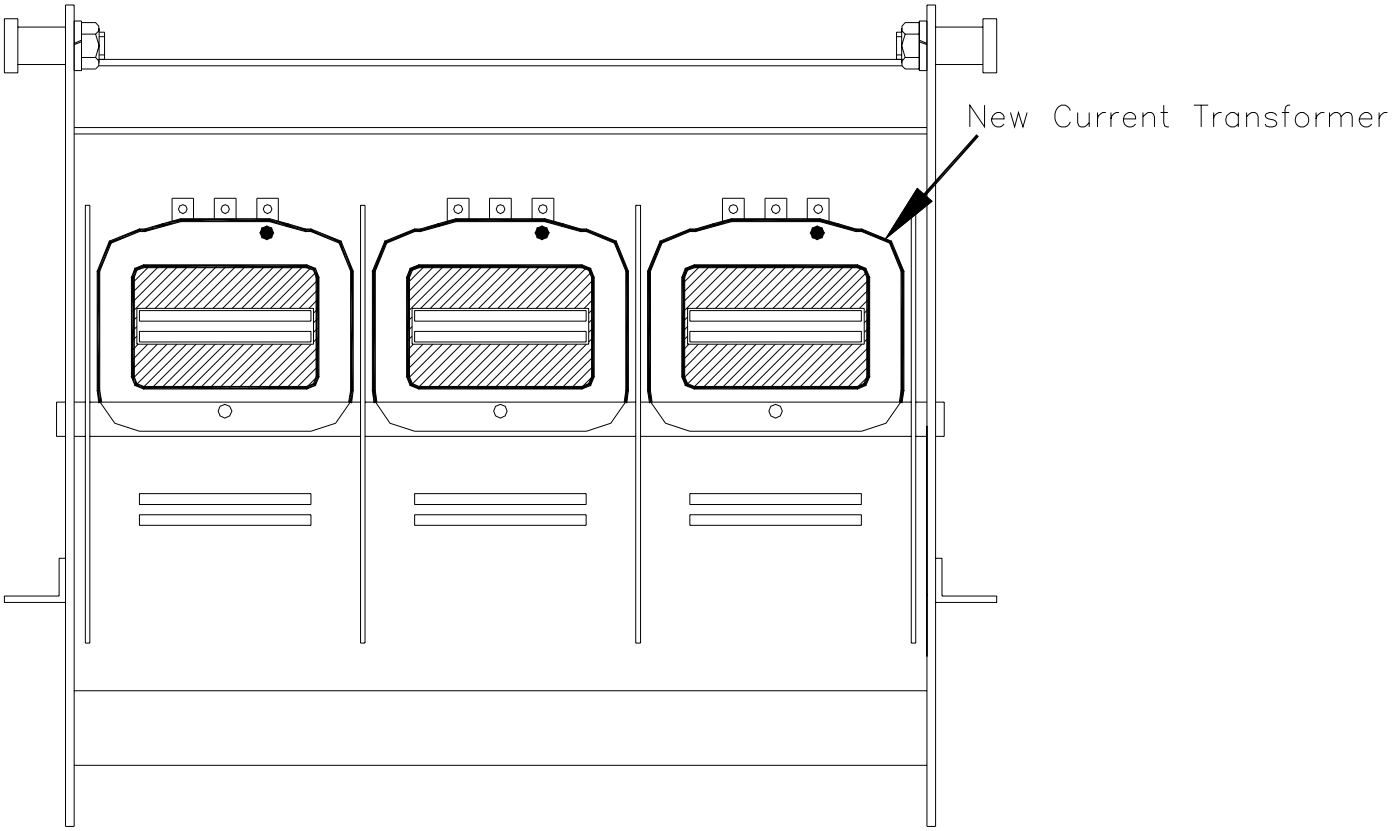


FIGURE 4
TEMPLATE: Actuator Bracket



Rear view
1600A Frame
Shown less finger clusters

FIGURE 5
1600 Amp Frame
Rear View

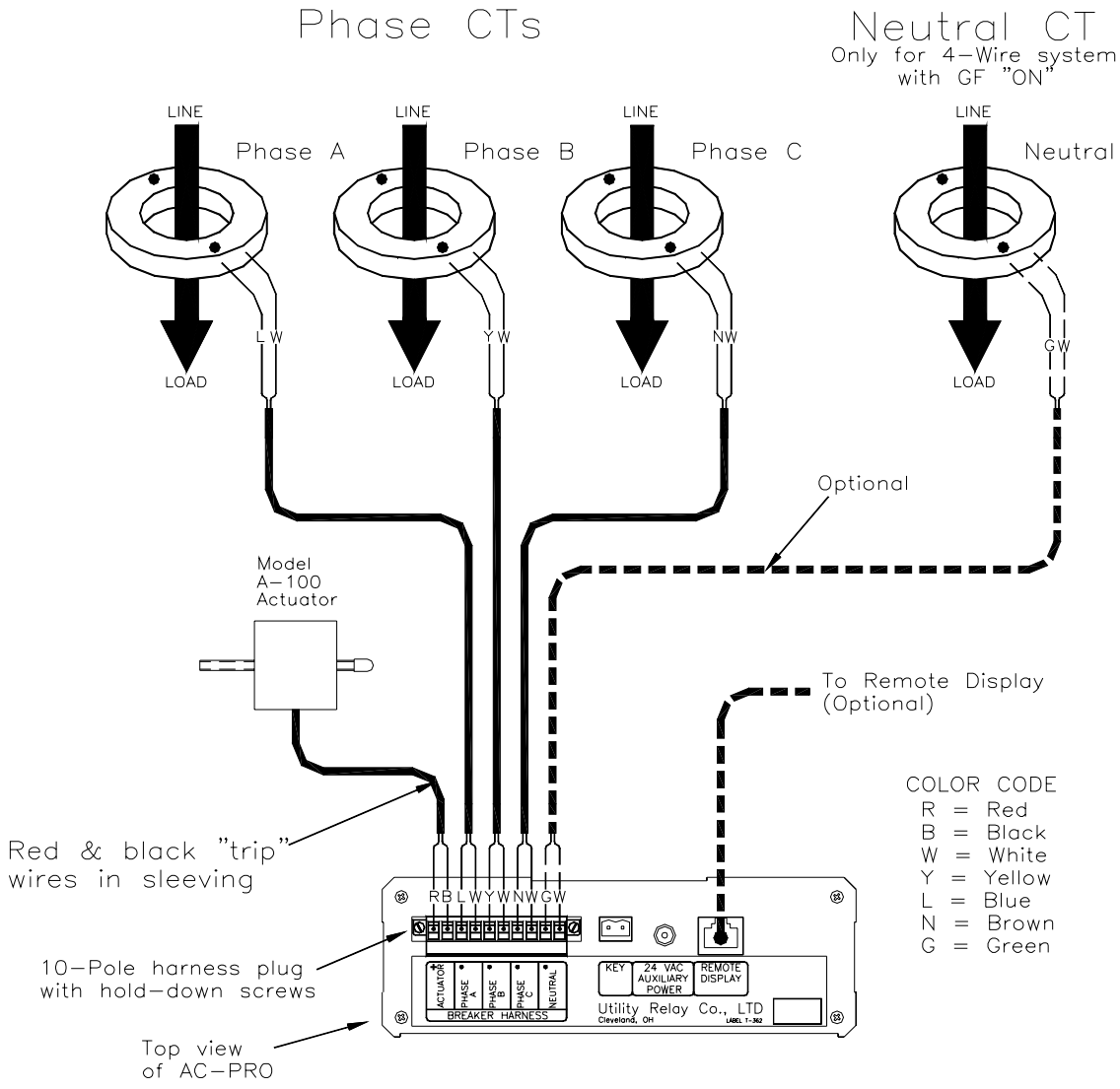


FIGURE 6
Wiring Diagram