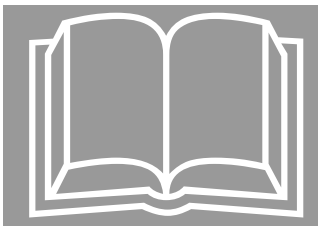
FEBRUARY 23, 2011

UNITEC®

UT-ID 1.2.0-40



Reverse Phase Relay (613BY) Line Monitors

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PUBLICATION CATALOGING DATA

First Issue: September 15, 2009
Revision: February 23, 2011
Master Index Control Number:
Part Number: UT-ID 1.2.0-40

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Description

Otis part numbers 613BY16 through 20 (SSAC DLM Series) 3-phase power quality monitors are obsolete. These parts were used on Otis mod controllers and vintage systems.

Replacements for these reverse phase relays have been identified, which take the same mounting space and can be directly installed to the mounting plate or a 35 mm DIN rail. These devices are auto ranging and designed to monitor incoming line voltage for high and low voltage, voltage unbalance, phase loss, and phase reversal. Protection extends to regenerated voltages (overhauling loads). A single LED indicator illuminates steady green when voltages and phasing are acceptable. Both Delta and Wye systems can be monitored and no neutral connection is required.

When current stock of the obsolete vendor parts is used up, substitution to the new parts will begin. Table 1 shows the replacement part numbers versus the original parts.

Additionally, the 613BY22–24 relays may be used to replace the vintage 6204A reverse phase relays depicted in Figure 1. To replace one of these vintage relays, use your application voltage to select a suitable replacement from Table 1.

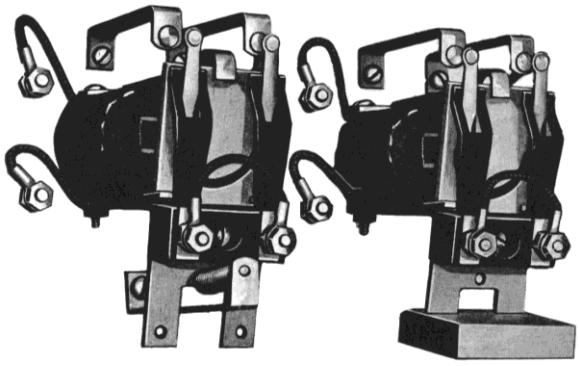

Figure 1: 6204A Reverse Phase Relays

Table 1: 3-Phase Reverse Phase Relay Part Numbers

Obsolete Part No.	New Part No.	Nominal Line Voltage	Line Voltage Maximum	Calibration Frequency
~~613BY16~~	613BY22 (see **NOTE**)	95–140 VAC	143 VAC	50/60 Hz
~~613BY17~~	613BY23	200–480 VAC	550 VAC	50/60 Hz
~~613BY18~~				
~~613BY19~~				
~~613BY20~~	613BY24	500–600 VAC	600 VAC	50/60 Hz

NOTE: 613BY22 is used with socket AAA618AF15.

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Installation and Adjustment

Before beginning installation, **remove power and strictly follow your company's lockout and tagout, test, and verify procedures**.

Remove existing phase monitor input lines and label as L1, L2, and L3. Similarly, remove the signal lines and label as C (Common) and N.O. (Normally Open).

PLR Series Phase Monitor (613BY22)

1. Mount relay socket (p/n AAA618AF15) on a 35 mm DIN rail in the location of relay to be replaced. See Figure 2.
2. Connect supply lines to relay socket as follows:
   - Line labeled L1 to pin 3
   - Line labeled L2 to pin 4
   - Line labeled L3 to pin 5
   - Wire labeled C to pin 1, and
   - Wire labeled N.O. to pin 8.
3. Insert phase monitor into socket.
4. Turn the adjustment knob fully counterclockwise and apply three-phase power. The LED should be ON.
5. Increase adjustment (clockwise) until the LED changes state (turns off). For the most accurate adjustment, set line voltage under full load conditions. Examples of full load conditions include:
   - Hydraulic system while full car is rising
   - Geared traction system while full car is rising
   - Geared traction system while lowering an empty car
6. Decrease adjustment (counterclockwise) until LED glows again.
7. Continue to turn this knob (counter clockwise) an additional 10% of full scale beyond the point of change. This additional adjustment enables the phase monitor to avoid nuisance tripping, which may result from small variations in system conditions when the phase monitor is set exactly to the point of state change.

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NOTE: When properly adjusted and operating in an average system, a voltage unbalance of 10% or more is required for phase loss detection.

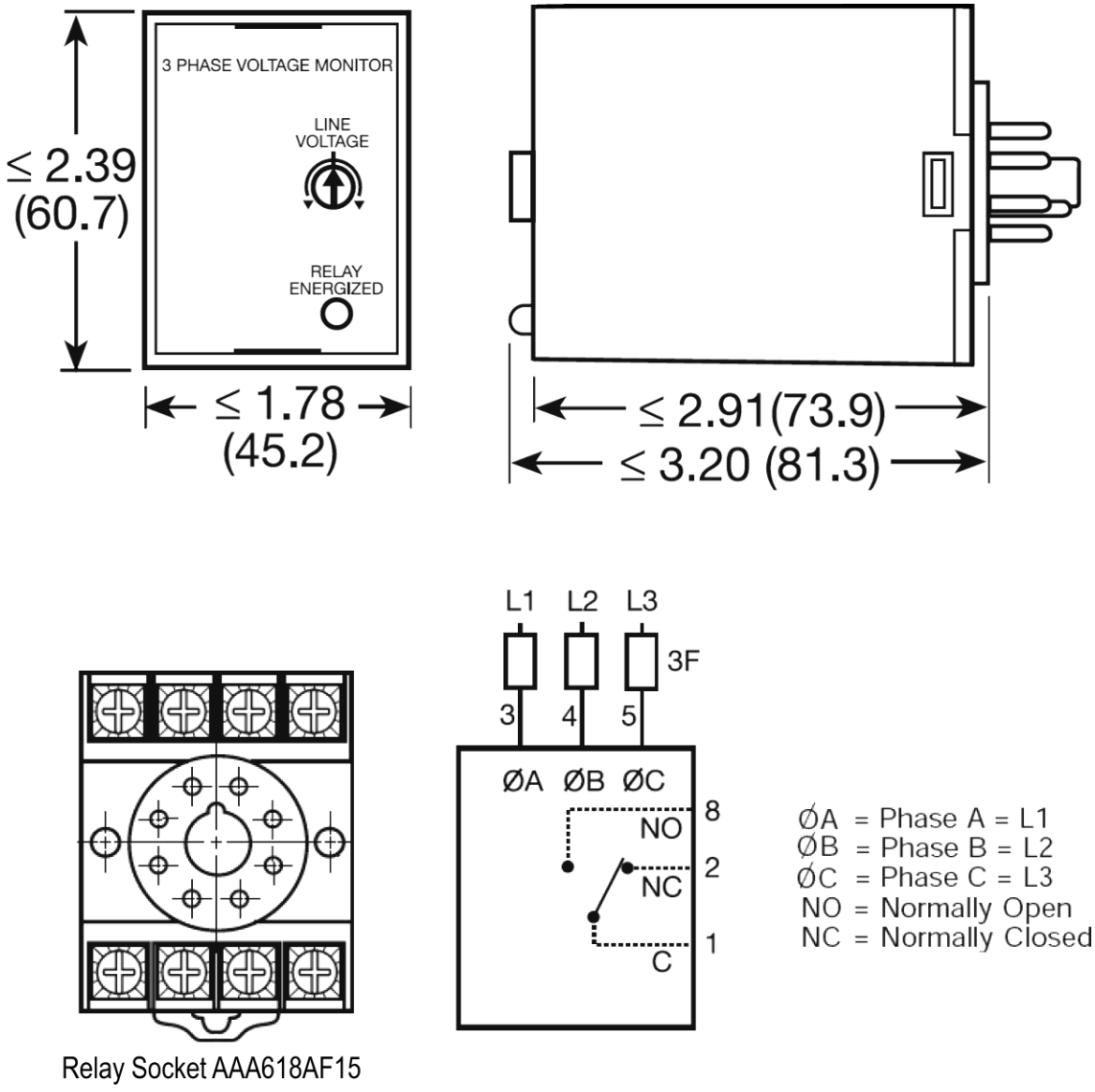

Figure 2: 613BY22 Reverse Phase Relay and Relay Socket

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DLMU/DLMH Series Phase Monitor (613BY23 and 613BY24)

1. Mount phase monitor either on a 35 mm DIN rail or by the mounting holes shown in Figure 3, mount in the location of relay to be replaced.

2. Connect supply lines to the phase monitor as follows:
   - Wire labeled L1 to terminal marked L1
   - Wire labeled L2 to terminal marked L2
   - Wire labeled L3 to terminal marked L3
   - Wire labeled C to terminal marked C, and
   - Wire labeled N.O. to terminal marked N.O. as seen in Figure 2.

NOTE: Terminal covers are included. There are four adjustable potentiometers for setup purposes. See detailed adjustment procedure as follows.

- The **Line Voltage** adjustment can be found on the front of the unit in the lower right corner. Set the **Line Voltage** adjustment to the average between actual system low and high voltages during the day. Readjust if necessary. The device allows for an approximate ±12% swing around the adjusted set point. This unit is auto ranging, and will select in which range to operate; this adjustment is for choosing a more accurate voltage within the automatically selected range.
- The **% Voltage Unbalance** adjustment can be found on the front of the unit in the upper left corner. Set the **% Voltage Unbalance** adjustment to 2% initially. If tripping or failure to operate occurs, which cannot be corrected by the **Line Voltage** setting, then increase the **% Voltage Unbalance** setting to 3%. The heating of a three-phase motor increases significantly under voltage unbalance conditions. If the device only operates at greater than 3%, then the cause of the unbalance (such as uneven distribution of building loads) should be corrected.
- The **Trip Delay** adjustment can be found on the front of the unit in the lower left corner. Set the **Trip Delay** adjustment to the minimum of 1 second.
- The **Restart Delay** adjustment can be found on the front of the unit in the upper right corner. Set the **Restart Delay** adjustment to the minimum of 0.6 seconds.

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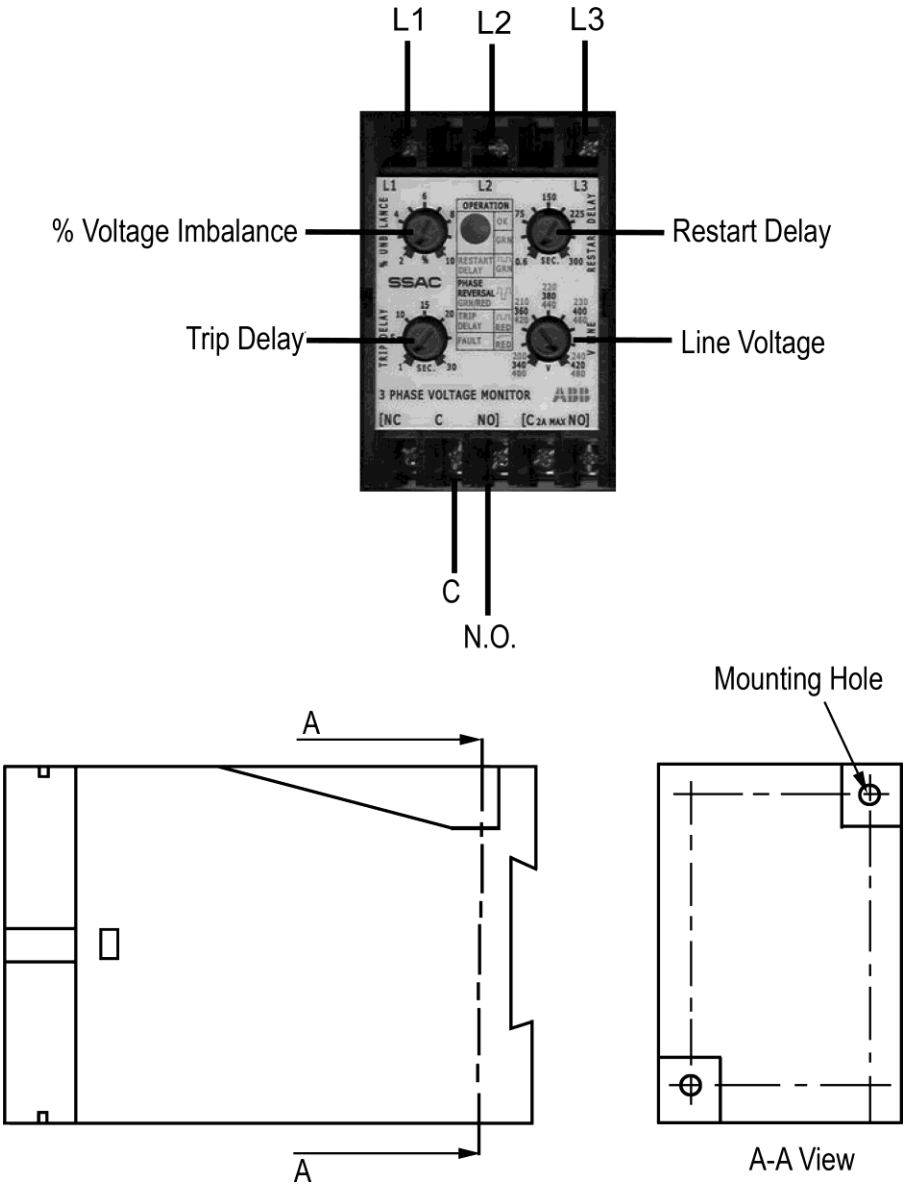

Figure 3: 613BY23 and 613BY24 Series Phase Monitor

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Troubleshooting

- If the unit fails to operate properly upon power up, **remove power, lock out and tag out, test and verify**.

- If there is a phase reversal condition, ensure incoming building lines have not been reversed, then reverse any two wires at the input terminals and reapply power.

- If the unit still does not operate properly or if there is a fault condition, check for voltage at each input and adjust **Line Voltage** to match incoming controller voltage and/or readjust **% Voltage Unbalance** settings as listed in the adjustment procedure above.

- It is possible that a unit works fine when first installed, but as building occupancy picks up and electrical loads increase, an under voltage or phase unbalance fault may be generated. Another possibility is that when power is removed for servicing and then restored, the unit (seemingly OK before) fails to operate properly. The **Line Voltage** or **% Voltage Imbalance** of this device may have been marginally set initially and needs to be readjusted to match changing building loads.

Make sure to replace the terminal covers when wiring is completed. This unit does not have a manual reset. Unit is reset upon correction of fault condition and reapplication of three-phase power.

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Appendix A: Part Numbers

The following table lists all part numbers this document mentions.

Table 2: Related Part Numbers

Description	Part Number
SSAC DLM411 Reverse Phase Relay 110-130 VAC (obsolete)	~~613BY16~~
SSAC DLM611 Reverse Phase Relay 200-240 VAC (obsolete)	~~613BY17~~
SSAC DLM811 Reverse Phase Relay 360-430 VAC (obsolete)	~~613BY18~~
SSAC DLM911 Reverse Phase Relay 400-480 VAC (obsolete)	~~613BY19~~
SSAC DLM011 Reverse PHASE RELAY 500-600 VAC (obsolete)	~~613BY20~~
Reverse PHASE RELAY 95-140 VAC	613BY22
RPR 200-480 VAC	613BY23
RPR 500-600 VAC	613BY24
Relay Socket for 613BY22	AAA618AF15

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