

<b>PEARL Reconditioning Standards</b>			
<b>LOW VOLTAGE RESIDENTIAL RIVETED MOLDED CASE CIRCUIT BREAKERS</b>	Revision		
	Section	Number	Date
	<b>1213</b>	3	2-11-03

The term "reconditioning" is defined as "the process of returning electrical equipment to safe and reliable operating condition based upon the design of the original manufacturer at the time of manufacturing."

## **I TEST EQUIPMENT**

The following test equipment is required to perform the testing requirements of this reconditioning standard:

1. Insulation Resistance Test Set (Megohmmeter) 1000 Vdc minimum
2. High Current Test Set

One of the following pieces of test equipment is required to perform the contact resistance testing requirements of this reconditioning standard:

1. Digital Low Resistance Ohmmeter (DLRO - 10 amp unit is sufficient)
2. DC Current Source and a Millivoltmeter

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## II RECONDITION EVALUATION

These steps are used to determine what will be required to recondition this product under this standard.

### 1 INSPECTION

#### 1.1 Case

- 1.1.1 Ensure that the nameplate/label data is legible.
- 1.1.2 Ensure that the third party listing service label is legible.
- 1.1.3 Inspect the case for cracks, chips and unused holes.
- 1.1.4 Inspect case for signs of overheating.
- 1.1.5 Inspect for missing parts.
- 1.1.6 Record results on appropriate PEARL Inspection and Test Form.

#### 1.2 Lugs and Clips

- 1.2.1 Inspect for tightness.
- 1.2.2 Inspect for signs of overheating.
- 1.2.3 Inspect plating.
- 1.2.4 Inspect for signs of crossed threads and stripped threads.
- 1.2.5 Record results on appropriate PEARL Inspection and Test Form.

#### 1.3 Operating Mechanism

- 1.3.1 Manually operate circuit breaker a minimum of three (3) times while checking for proper operation of the quick-make and quick-break feature.
- 1.3.2 Record results on appropriate PEARL Inspection and Test Form.

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## 2 TESTING

### 2.1 Insulation Resistance

2.1.1 Perform an insulation resistance test at test values specified in Table 2 of Section 6000 as follows:

2.1.1.1 Line to load

2.1.1.2 Circuit breaker in the closed position

2.1.1.2.1 Phase to phase

2.1.1.2.2 Phase to ground

2.1.2 Correct for temperature, if necessary (Table 11).

2.1.3 Record results on appropriate PEARL Inspection and Test Form.

2.1.4 Compare test results to manufacturer's recommendations or Table 2 of Section 6000.

### 2.2 Contact Resistance

2.2.1 Perform a contact resistance, millivolt drop test or watt-loss test from line to load on each phase of a closed circuit breaker.

2.2.2 Record results on appropriate PEARL Inspection and Test Form.

2.2.3 Compare test results to manufacturer's recommendations.

2.2.4 A PEARL recognized method is comparing the test results of each pole. Results should be within 50% for any of the poles. Any industrial standard used shall provide at least the same integrity as the PEARL recognized standard of comparing the test results of each pole and ensuring that they are within 50% of each other. In the case of a single pole devices test results shall be compared to an identical recondition device.

### 2.3 Time Overcurrent (Thermal) Trip Test

2.3.1 Perform a time overcurrent trip test (recommend using 300% of rating) to the circuit breaker, if applicable.

2.3.2 Use specific length and size of wire that meet or exceeds manufacturer's guidelines or NEC standards.

2.3.3 Record results on appropriate PEARL Inspection and Test Form.

2.3.4 Compare results to manufacturer's recommendations or Table 3 of Section 6000.

### 2.4 Instantaneous Overcurrent (Magnetic) Trip Test

2.4.1 Perform an instantaneous overcurrent trip test to the circuit breaker, if applicable.

2.4.2 Record results on appropriate PEARL Inspection and Test Form.

2.4.2 Compare results to manufacturer's recommendations or Table 4 of Section 6000.

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### **III RECONDITION PROCEDURES**

The following procedures are in a recommended order and are required to recondition this product. PEARL recognizes that, based upon actual product design and/or as found condition, some of these procedures may not be applicable. The testing requirement must be completed before the product can be labeled as a PEARL reconditioned product.

#### **1 RECONDITIONING**

##### **1.1 Cleaning**

**1.1.1** Clean all parts of contamination and corrosion.

**1.1.2** Degrease primary stabs and lugs.

##### **1.2 Operating Mechanism**

**1.2.1** Manually operate circuit breaker a minimum of three (3) times while checking for proper operation of the quick-make and quick-break feature.

**1.2.2** Record results on appropriate PEARL Inspection and Test Form.

##### **1.3 Final Assembly**

**1.3.1** Ensure that the nameplate/label data is complete, correct and legible.

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## 2 TESTING

### 2.1. Insulation Resistance

- 2.1.1** Perform an insulation resistance at test values specified in Table 2 of Section 6000 as follows:
- 2.1.1.1** Circuit breaker in the open position
    - 2.1.1.1.1** Line to load
  - 2.1.1.2** Circuit breaker in the closed position
    - 2.1.1.2.1** Phase to phase
    - 2.1.1.2.2** Phase to ground
- 2.1.2** Correct for temperature, if necessary (Table 11).
- 2.1.3** Record results on appropriate PEARL Inspection and Test Form.
- 2.1.4** Compare results to manufacturer's recommendations or Table 2 of Section 6000.
- 2.1.5** The test results must be within the guidelines recommended in order for the product to become a PEARL labeled product.

### 2.2 Contact Resistance

- 2.2.1** Perform a contact resistance, millivolt drop test or watt-loss test from line to load on each phase of a closed circuit breaker.
- 2.2.2** Record results on appropriate PEARL Inspection and Test Form.
- 2.2.3** Compare test results to manufacturer's recommendations.
- 2.2.4** A PEARL recognized method is comparing the test results of each pole. Results should be within 50% for any of the poles. Any industrial standard used shall provide at least the same integrity as the PEARL recognized standard of comparing the test results of each pole and ensuring that they are within 50% of each other. In the case of a single pole devices test results shall be compared to an identical recondition device.
- 2.2.5** The test results must be within the guidelines recommended in order for the product to become a PEARL labeled product.

### 2.3 Time Overcurrent (Thermal) Trip Test

- 2.3.1** Perform a time overcurrent trip test (recommend using 300% of rating) to the circuit breaker, if applicable.
- 2.3.2** Use specific length and size of wire that meet or exceeds manufacturer's guidelines or NEC standards.
- 2.3.3** Record results on appropriate PEARL Inspection and Test Form.
- 2.3.4** Compare results to manufacturer's recommendations or Table 3 of Section 6000.
- 2.3.5** The test results must be within the guidelines recommended in order for the product to become a PEARL labeled product.

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**2.4 Instantaneous Overcurrent (Magnetic) Trip Test**

- 2.4.1** Perform an instantaneous overcurrent trip test to the circuit breaker, if applicable.
- 2.4.2** Record results on appropriate PEARL Inspection and Test Form.
- 2.4.3** Compare results to manufacturer's recommendations or Table 4 of Section 6000.
- 2.4.4** The test results must be within the guidelines recommended in order for the product to become a PEARL labeled product.

**IV PEARL CERTIFICATION**

This product has now been reconditioned under the PEARL Reconditioning Standard. The PEARL label and/or seal may be placed on it.