

PEARL Reconditioning Standards			
LOW VOLTAGE SOLID STATE OVERLOAD RELAY MULTI FUNCTION	Revision		
	Section	Number	Date
	1765	5	11-2008

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."

REFERENCES

The following references are use in this standard. Each of these references can be found in their respective listed locations.

Table References: Section 6000

- Table 2 Insulation resistance and test values for electrical apparatus.
- Table 6 Transformer Insulation Resistance Test Value
- Table 11 Insulation resistance and test temperature conversion to 20°C values.

National Electrical Code – NEC 2002 Edition

- Article 310 Conductors for General Wiring
- Table 310.17 Allowable Ampacities of Single-Insulated Conductors Rates 0 Through 2000 Volts in Free Air, Based on Ambient Air Temperatures of 30°C (86°F).

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

One or more of the following pieces of test equipment may be required to perform the testing requirements of this reconditioning standard depending on the accessories:

1. AC Current Supply with means to perform timing test
2. VOM (Digital or analog volt/ohmmeter)
3. Three phase voltage supply

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II RECONDITION EVALUATION

These steps are required to determine if the product can be reconditioned and if so, establish what must be done to recondition the product.

1 INSPECTION

1.1 Relay

- 1.1.1 Ensure that the nameplate data is legible.
- 1.1.2 Ensure that the third party listing service label is legible.
- 1.1.3 Inspect for missing screws, bolts, nuts, fasteners, retainers and keepers.
- 1.1.4 Inspect for rust and corrosion.
- 1.1.5 Inspect for cracks, chipped or broken plastic moldings.
- 1.1.6 Inspect wires for cracks, overheating, loose terminals, missing or damaged insulation and deterioration.
- 1.1.7 Check operation of trip mechanisms.
- 1.1.8 Check trip contact for continuity.
- 1.1.9 Check Reset arm
- 1.1.10 Check Interlocks
- 1.1.11 Record results on an approved PEARL Evaluation Form.

2 TESTING

2.1 Insulation Resistance

Consult manufacturer's instructions for any precautions before performing this test.

- 2.1.1 Perform an insulation resistance test at test values specified in Table 2 of Section 6000. Correct for temperature, if necessary (Table 11).

- 2.1.1.1 Phase to ground

- 2.1.1.2 Phase to phase

- 2.1.1.3 Record results on an approved PEARL Evaluation Form.

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

2.2 Time Overcurrent Trip Test – Phase Overcurrent

- 2.2.1 Perform a pickup test, if applicable.

- 2.2.2 Perform a time overcurrent trip test using 300% of rated phase current to verify the proper operation on each phase.

- 2.2.3 Use specific length and size of wire that meet or exceeds manufacturer's guidelines or NEC, Article 310, Table 310.17.

- 2.2.4 Record results on an approved PEARL Evaluation Form.

- 2.2.5 Compare results to manufacturer's overload relay curve.

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- 2.3 Time Overcurrent Trip Test – Ground Overcurrent** (if applicable)
 - 2.3.1** Perform a pickup test, if applicable.
 - 2.3.2** Perform a time overcurrent trip test using 150% of rated Ground Fault current rating to verify the proper operation on each phase.
 - 2.3.3** Record results on an approved PEARL Evaluation Form.
 - 2.3.4** Compare results to manufacturer's overload relay curve.
- 2.4 Phase Unbalance and Phase Loss** (if applicable)
 - 2.4.1** Perform a pickup test, if applicable.
 - 2.4.2** Perform percentage of unbalance as per manufactures specifications.
 - 2.4.3** Perform a pickup test, if applicable.
 - 2.4.4** Perform percentage of phase loss as per manufactures specifications.
 - 2.4.5** Record results on an approved PEARL Evaluation Form.
 - 2.4.6** Compare results to manufacturer's overload relay curve.

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III RECONDITIONING PROCEDURES

The following procedures are in a recommended order and are required to recondition this product. PEARL recognizes that, based on actual product design and 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 Relay

- 1.1.1** Clean all parts of contamination and corrosion.
- 1.1.2** Prepare the back mounting for plating or painting to manufactures original specification.
- 1.1.3** Replace any defective springs, as necessary.
- 1.1.4** Replace any defective plastic moldings, as necessary.
- 1.1.5** Repair or replace trip contacts with high resistance.
- 1.1.6** Ensure that the nameplate/label data is complete, correct and legible.
- 1.1.7** Record results on an approved PEARL Reconditioning Test Form.

1.2 Missing or Defective Components, Parts and Hardware

- 1.2.1** Replace or repair any missing or defective components, wires, parts and hardware found during the inspection phase of this standard.
- 1.2.2** Record results on an approved PEARL Reconditioning Test Report.

1.3 Torque

- 1.3.1** Check all screw and bolt connections for the proper torque per manufacturer's recommendations or industrial torque standards.
- 1.3.2** Record results on an approved PEARL Reconditioning Test Form.

2 TESTING

2.1 Insulation Resistance

Consult manufacturer's instructions for any precautions before performing this test.

- 2.1.1** Perform an insulation resistance test at test values specified in Table 2 of Section 6000. Correct for temperature, if necessary (Table 11)
 - 2.1.1.1** Phase to ground
 - 2.1.1.2** Phase to phase
- 2.1.2** Record results on an approved PEARL Reconditioning Test Form
- 2.1.3** Compare test results to manufacturer's recommendations or Table 2 of Section 6000.

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- 2.2 Time Overcurrent Trip Test – Phase Overcurrent**
 - 2.2.1 Perform a pickup test, if applicable.
 - 2.2.2 Perform a time overcurrent trip test using 300% of rated phase current to verify the proper operation on each phase.
 - 2.2.3 Use specific length and size of wire that meet or exceeds manufacturer's guidelines or NEC, Article 310, Table 310.17.
 - 2.2.4 Record results on an approved PEARL Reconditioning Test Form.
 - 2.2.4.1 Compare results to manufacturer's overload relay curve.
- 2.3 Time Overcurrent Trip Test – Ground Overcurrent (if applicable)**
 - 2.3.1 Perform a pickup test, if applicable.
 - 2.3.2 Perform a time overcurrent trip test using 150% of rated Ground Fault current rating to verify the proper operation on each phase.
 - 2.3.3 Record results on approved PEARL Reconditioning Test Form.
 - 2.3.4 Compare results to manufacturer's overload relay curve.
- 2.4 Phase Unbalance and Phase Loss (if applicable)**
 - 2.4.1 Perform a pickup test, if applicable.
 - 2.4.2 Perform percentage of unbalance as per manufactures specifications.
 - 2.4.3 Perform a pickup test, if applicable.
 - 2.4.4 Perform percentage of phase loss as per manufactures specifications.
 - 2.4.5 Record results on approved PEARL Reconditioning Test Form.
 - 2.4.6 Compare results to manufacturer's overload relay curve.

All 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 blue PEARL Reconditioning Quality Seal may now be placed on the device or its packaging.