

<i>PEARL Inspect & Test Standards</i>			
<i>LOW VOLTAGE DC CONTROL RELAY TIME DELAY</i>	<i>PROPOSED STANDARD</i>		
	<i>Standard</i>	<i>Number</i>	<i>Date</i>
	<i>1845-I</i>	<i>3</i>	<i>6-2009</i>

This standard is designed to verify that a low voltage DC control relay with time delay is in a safe and reliable operating condition based upon the design of the original manufacturer at the time of manufacturing. PEARL testing does not verify the claims of the original equipment manufacturer as to the validity of its design criteria. In the event that the device is not in this condition then this standard cannot be used and the PEARL Reconditioning Standard needs to be followed.

PEARL does not warrant, guarantee or make any representation regarding the correctness of specifications, use for any particular purpose, quality or extent of testing, accuracy, or reliability as to any equipment, products or documentation referenced herein.

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 11: Insulation resistance and test temperature conversion to 20°C values.

I TEST EQUIPMENT

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

1. Insulation Resistance Test Set (Megohmmeter) 500 Vdc minimum
2. DC Voltage Supply
3. Multimeter
4. Timer with a DC voltage applied START Circuit

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II EVALUATION

The following procedures shall be used to determine the condition of a low voltage DC control relay with time delay under this standard.

1 INSPECTION

1.1 General

- 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
- 1.1.4** Check for stripped screws
- 1.1.5** Inspect case for cracks
- 1.1.6** Inspect exterior surface for signs of;
 - 1.1.6.1** Contamination
 - 1.1.6.2** Overheating
 - 1.1.6.3** Corrosion
 - 1.1.6.4** Rust
- 1.1.7** Record results on an approved PEARL Evaluation Form.

2 TESTING

2.1 Operation

- 2.1.1** Contact Transfer
 - 2.1.1.1** Using a multimeter verify each contact state (NO or NC)
 - 2.1.1.2** Set Time Delay to Minimum setting
 - 2.1.1.3** Apply rated voltage to operating coil
 - 2.1.1.4** Using a multimeter verify the transfer of each contact after time delay has timed out.
 - 2.1.1.5** Remove rated voltage
 - 2.1.1.6** Record results on an approved PEARL Evaluation Form.
- 2.1.2** Minimum Operating Voltage
 - 2.1.2.1** Increase voltage to operating coil until relay operates
 - 2.1.2.2** Record as minimum operating voltage.
 - 2.1.2.3** Remove voltage
 - 2.1.2.4** Compare manufacturer's minimum operating voltage to test voltage found in 2.1.2.2 above.
 - 2.1.2.5** Record results on an approved PEARL Evaluation Form.
- 2.1.3** Minimum Time Delay
 - 2.1.3.1** Connect timer test circuit to relay
 - 2.1.3.2** Apply manufacturers rated voltage to operating coil
 - 2.1.3.3** Record minimum time of operation
 - 2.1.3.4** Remove voltage
 - 2.1.3.5** Compare minimum time of operation with manufacturer's specification.
 - 2.1.3.6** Record results on an approved PEARL Evaluation Form.

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- 2.1.4 Maximum Time Delay
 - 2.1.4.1 Connect timer test circuit to relay
 - 2.1.4.2 Apply manufacturers rated voltage to operating coil
 - 2.1.4.3 Record maximum time of operation
 - 2.1.4.4 Remove voltage
 - 2.1.4.5 Compare maximum time of operation with manufacturer's specification.
 - 2.1.4.6 Record results on an approved PEARL Evaluation Form.
- 2.2 **Insulation Resistance**
 - 2.2.1 Perform an insulation resistance test at test voltage specified by manufacturer or using a 500 volt dc megohmmeter.
 - 2.2.1.1 Relay De-energized
 - 2.2.1.1.1 Test across each contact
 - 2.2.1.1.2 Test between contacts on the line side
 - 2.2.1.1.3 Test between contacts on the load side
 - 2.2.1.2 Relay Energized
 - 2.2.1.2.1 Test between contacts
 - 2.2.1.3 Record results on an approved PEARL Evaluation Form.
 - 2.2.2 Compare test results to manufacturer's recommendations or a minimum of 1 megohm.
- 2.3 **Checks and Adjustments**
 - 2.3.1 Make all checks and adjustments per manufacturer's recommendations. In the absence of a manufacturer's recommendations, any check or adjustment made will be based upon procedures that will ensure the original manufacturer's design.
 - 2.3.2 All checks and adjustments must be within the guidelines recommended in order for the product to become a PEARL labeled product.
 - 2.3.3 Record results on an approved PEARL Evaluation Form.
- 2.4 **Torque**
 - 2.4.1 Check all screw and bolt connections for the proper torque per manufacturer's recommendations or Table 1 of Section 6000.
 - 2.4.2 Record results on an approved PEARL Evaluation Form.
- 2.5 **Final Operation**
 - 2.5.1 Ensure that all components, structures, devices and assemblies are complete and equipment is ready for service prior to beginning operations.
 - 2.5.2 Manually operate the device a minimum of ten (10) times while checking for proper operation of the quick-make and quick-break feature.
 - 2.5.3 All devices must operate properly in order for the product to become a PEARL labeled product.
 - 2.5.4 Record results on appropriate PEARL Evaluation Form.

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3 EVALUATION REVIEW

In order for the device to be eligible for the Inspect & Test Quality Seal, the device needs to have passed all of the preceding Inspection (1) and Testing (2) points. Any failures in the process will require that the device be “Reconditioned” at which time the PEARL Reconditioning Standard needs to be followed.

III PEARL CERTIFICATION

This product has now been inspected and tested and has passed all tests under the PEARL Inspect & Test Standard. The green PEARL Inspect & Test Quality Seal may now be placed on the device.