

PEARL Inspect & Test Standards			
LOW VOLTAGE MAGNETIC STARTERS OPEN	Revision		
	Standard	Number	Date
	1620-I	3	6-2009

This standard is designed to verify that an open low voltage magnetic starter 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.

The following PEARL Standards are referenced in this standard and should be followed if applicable.

PEARL Standard References

Section 1400: *Low Voltage Transformers*

Standard 1440-I – Low Voltage Transformers Instrumentation Current

Section 1700: *Protection Relays*

Standard 1750-I – Low Voltage Thermal Overload Relay

Standard 1760-I – Low Voltage Solid State Overload Relay

Standard 1765-I – Low Voltage Solid State Overload Relay Multi Function

Section 1800: *Low Voltage Contractors and Relays*

Standard 1810-I – Low Voltage AC Contactor

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I TEST EQUIPMENT

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

1. AC or DC Voltage Supply
2. AC Current Supply with means to perform timing test
3. VOM (Digital or analog volt/ohmmeter)

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II EVALUATION

The following procedures shall be used to determine the condition of an open low voltage magnetic starter under this standard.

1 INSPECTION

1.1 Starter

- 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 sole/ mounting plate for rust, corrosion or damage.
- 1.1.6 Inspect for cracks, chipped or broken plastic moldings.
- 1.1.7 Inspect wires and buss or wire jumpers for cracks, proper sizing, overheating, loose terminals, missing or damaged insulation, frayed wires, and deterioration.
- 1.1.8 Check operation of operating mechanisms.
- 1.1.9 Check rectifiers for appropriate voltage output and current draw.
- 1.1.10 Check resistors for overheating, deterioration, cracks, sizing, loose terminals, damage and resistance value.
- 1.1.11 Check voltage suppressors and other like devices for overheating, deterioration, cracks, sizing, loose terminals, and damage.
- 1.1.12 Record results on an approved PEARL Evaluation Form.

1.2 Devices

- 1.2.1 **Current Transformers** (if applicable)
 - 1.2.1.1 Current transformers will be evaluated in accordance with PEARL Inspect & Test Standards found in Section 1400.
 - 1.2.1.2 Record results on an approved PEARL Evaluation Form
- 1.2.2 **Protective Relay**
 - 1.2.2.1 Protective relay will be evaluated in accordance with PEARL Inspect & Test Standards found in Section 1700.
 - 1.2.2.2 Record results on an approved PEARL Evaluation Form.
- 1.2.3 **Contactors**
 - 1.2.3.1 Contactor will be evaluated in accordance with PEARL Inspect & Test Standards found in Section 1800.
 - 1.2.3.2 Record results on an approved PEARL Evaluation 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. 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.

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

2.2 Current Transformers (if applicable)

2.2.1 Current transformers will be evaluated in accordance with PEARL Standards found in Section 1400.

2.2.2 Record results on an approved PEARL Evaluation Form.

2.3 Protective Relay

2.3.1 Protective relay will be evaluated in accordance with PEARL Standards found in Section 1700.

2.3.2 Record results on an approved PEARL Evaluation Form.

2.4 Contactor

2.4.1 Contactor will be evaluated in accordance with PEARL Standards found in Section 1800.

2.4.2 Record results on an approved PEARL Evaluation Form.

NOTE: If the original equipment manufacturer has designed the parts to be field installed, then the devices may be replaced as necessary. Otherwise, if changes are made to the accessories then the PEARL Reconditioning Standards need to be followed.

2.5 Checks and Adjustments

2.5.1 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.

2.5.2 All checks and adjustments must be within the guidelines recommended in order for the product to become a PEARL labeled product.

2.5.3 Record results on an approved PEARL Evaluation Form.

2.6 Torque

2.6.1 Check all screw and bolt connections for the proper torque per manufacturer's recommendations or Table 1 of Section 6000.

2.6.2 Record results on an approved PEARL Evaluation Form.

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2.7 Final Operation

- 2.7.1** Ensure that all components, structures, devices and assemblies are complete and equipment is ready for service prior to beginning operations.
- 2.7.2** Manually operate the device a minimum of ten (10) times while checking for proper operation of the quick-make and quick-break feature.
- 2.7.3** All devices must operate properly in order for the product to become a PEARL labeled product.
- 2.7.4** Record results on appropriate PEARL Evaluation Form.

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.