

PEARL Inspect & Test Standards			
LOW VOLTAGE MOLDED CASE CIRCUIT BREAKERS BUS DUCT PLUG-IN ENCLOSED	Revision		
	Standard	Number	Date
	2040-I	3	6-2009

This standard is designed to verify that a low voltage bus duct plug-in with a molded case circuit breaker 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 1: US Standard bus connection bolt torque values.
- 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 1200: *Low Voltage Circuit Breakers*
 - Standard 1211 – Low Voltage Molded Case Circuit Breaker with Thermal Magnetic Trip Unit
 - Standard 1212 – Low Voltage Molded Case Circuit Breaker with Solid State Trip Unit
 - Standard 1214 – Low Voltage Molded Case Switches
(Non-Automatic Circuit Interrupters)
 - Standard 1215 – Low Voltage Molded Case Motor Circuit Protectors

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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
2. High Current Test Set

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

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

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

1. AC Voltage Supply
2. DC Voltage Supply

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II EVALUATION

The following procedures shall be used to determine the condition of a low voltage bus duct plug-in with a molded case circuit breaker under this standard.

1 INSPECTION

1.1 Frame/Enclosure

- 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 overall frame/enclosure for missing screws, bolts, nuts, fasteners, retainers and keepers.
- 1.1.4** Inspect for rust and corrosion.
- 1.1.5** Inspect insulation structure for signs of overheating and deterioration.
- 1.1.6** Record results on an approved PEARL Evaluation Form.

1.2 Operating Mechanism

- 1.2.1** Inspect for signs of rust and corrosion.
- 1.2.2** Inspect for excessive and inappropriate lubrication.
- 1.2.3** Inspect for missing screws, bolts, nuts, fasteners, retainers and keepers.
- 1.2.4** Manually operate bus duct enclosed circuit breaker three (3) times while checking for proper operation of the quick-make and quick-break feature.
- 1.2.5** Record results on an approved PEARL Evaluation Form.

1.3 Current Carrying Components

- 1.3.1** Inspect line and load connections for signs of overheating.
- 1.3.2** Inspect line and load connections for missing and defective parts.
- 1.3.3** Inspect hinge/pivot joints for signs of overheating.
- 1.3.4** Inspect hinge/pivot joints for missing and defective parts.
- 1.3.5** Inspect any other current carrying components for signs of overheating.
- 1.3.6** Inspect any other current carrying components for missing and defective parts.
- 1.3.7** Record results on an approved PEARL Evaluation Form.

1.4 Molded Case Circuit Breakers

- 1.4.1** Molded case circuit breakers will be evaluated in accordance with PEARL Standards found in Section 1200.
- 1.4.2** Record results on an approved PEARL Evaluation Form.

1.5 Interlocks

- 1.5.1** Inspect all interlocks for proper operation.
- 1.5.2** 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 as follows:

2.1.1.1 Switch in the open position

2.1.1.1.1 Line to load

2.1.1.2 Switch in the closed position

2.1.1.2.1 Phase to phase

2.1.1.2.2 Phase to frame/enclosure

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

2.1.3 Record results on an approved PEARL Evaluation Form.

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

2.2 Molded Case Circuit Breakers

2.2.1 Molded case circuit breakers will be evaluated in accordance with PEARL Standards found in Section 1200.

2.2.2 Record results on an approved PEARL Evaluation Form.

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.

PEARL Reconditioning Standards			
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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.