

PEARL Inspect & Test Standards			
LOW VOLTAGE TRANSFORMERS DRY-TYPE (600V AC Max. Primary)	Revision		
	Standard	Number	Date
	1410-I	3	6-2009

This standard is designed to verify that a low voltage dry type transformer (600Vac maximum voltage on the primary) 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.

NOTE: This guideline does not pertain to control power or instrumentation transformers.

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 6: Transformer Insulation Resistance Test Value
- 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) 1000 Vdc minimum

One of the following pieces of test equipment is required to perform the transformer ratio verification testing requirements of this standard:

1. Turns-To-Turns Ratio Test Set
2. AC Voltage Supply and Voltmeter (+/- 0.5%)
3. Self-contained Transformer Test Set

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II EVALUATION

The following procedures shall be used to determine the condition a low voltage dry type transformer (600Vac maximum voltage on the primary) under this standard.

1 INSPECTION

1.1 Frame/Enclosure

- 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 the overall exterior for missing screws, bolts, nuts, fasteners, retainers and keepers.
- 1.1.4 Inspect for unused openings.
- 1.1.5 Inspect for improper covers.
- 1.1.6 Inspect for rust and corrosion.
- 1.1.7 Inspect for proper alignment of all panels.
- 1.1.8 Record results on an approved PEARL Evaluation Form.

1.2 Phase and Neutral Bus

- 1.2.1 Inspect for signs of corrosion.
- 1.2.2 Inspect for signs of overheating.
- 1.2.3 Inspect all connections for missing hardware.
- 1.2.4 Check for a continuous current-carrying path.
- 1.2.5 Record results on an approved PEARL Evaluation Form.

1.3 Grounding Bus

- 1.3.1 Inspect for signs of corrosion.
- 1.3.2 Inspect for signs of overheating.
- 1.3.3 Inspect ground for missing hardware.
- 1.3.4 Check for a continuous current-carrying path.
- 1.3.5 Record results on an approved PEARL Evaluation Form.

1.4 Bus Support

- 1.4.1 Inspect for signs of overheating.
- 1.4.2 Inspect for signs of deterioration.
- 1.4.3 Inspect for chips, cracks and broken insulators.
- 1.4.4 Record results on an approved PEARL Evaluation Form.

1.5 Tap Board

- 1.5.1 Inspect for signs of overheating.
- 1.5.2 Inspect for signs of deterioration.
- 1.5.3 Inspect for tracking and corona damage.
- 1.5.4 Inspect for signs of corrosion.
- 1.5.5 Inspect all connections for missing hardware.
- 1.5.6 Record results on an approved PEARL Evaluation Form.

1.6 Windings

- 1.6.1 Inspect for cracked insulation.
- 1.6.2 Inspect for signs of overheating.
- 1.6.3 Record results on an approved PEARL Evaluation Form.

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- 1.7 Core**
 - 1.7.1** Inspect for signs of corrosion.
 - 1.7.2** Inspect for signs of overheating.
 - 1.7.3** Record results on an approved PEARL Evaluation Form.

2 TESTING

2.1 Insulation Resistance

- 2.1.1** Connect all primary terminals together.
- 2.1.2** Connect all secondary terminals together.
- 2.1.3** Primary to secondary and ground test
 - 2.1.3.1** Perform an insulation resistance test at test voltage specified in Table 6 of Section 6000. The test duration shall be for 1 minute.
 - 2.1.3.2** Correct for temperature, if necessary (Table 11).
 - 2.1.3.3** Record results on an approved PEARL Evaluation Form.
- 2.1.4** Secondary to primary and ground test
 - 2.1.4.1** Perform an insulation resistance test at test voltage specified in Table 6 of Section 6000. The test duration shall be for 1 minute.
 - 2.1.4.2** Correct for temperature, if necessary (Table 11).
 - 2.1.4.3** Record results on an approved PEARL Evaluation Form.
- 2.1.5** Primary to secondary test
 - 2.1.5.1** Perform an insulation resistance test at test voltage specified in Table 6 of Section 6000. The test duration shall be for 1 minute.
 - 2.1.5.2** Correct for temperature, if necessary (Table 11).
 - 2.1.5.3** Record results on an approved PEARL Evaluation Form.
- 2.1.6** Compare test results to manufacturer's recommendations or Table 6 of Section 6000.

2.2 Transformer Turns Ratio Verification

- 2.2.1** Perform a 'turns ratio test' on each phase from primary to secondary on all taps.
- 2.2.2** Record results on appropriate PEARL Evaluation Form.
- 2.2.3** Compare test results to manufacturer's recommendations or industrial standards.

2.3 Core Ground

- 2.3.1** Perform a core ground test on each phase.
- 2.3.2** Record results on appropriate PEARL Evaluation Form.
- 2.3.3** Compare test results to manufacturer's recommendations or industrial standards.

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.

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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.