

Errata to
ANSI/NETA MTS-2023
Standard for Maintenance Testing Specifications for
Electrical Power Equipment and Systems

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Of the

InterNational Electrical Testing Association

Correction sheet

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Section 7. INSPECTIONS AND TEST PROCEDURES

7.23 Communication

- *RESERVED* -

Content moved from section 7.24.1 to Section 7.23.

Updated Text:

7.23 Communication

A. Visual and Mechanical Inspection

1. Record model numbers, style numbers, serial numbers, firmware revisions, software revisions, and rated control voltage.
2. Inspect the physical and mechanical condition of equipment and wiring.
3. Verify operation of light-emitting diodes, displays, and targets.
4. Verify equipment is clean.
5. Check tightness of all connections.
6. Verify appropriate grounding equipment and circuits.
7. Verify backup batteries are healthy and connected.
8. Check with setting engineer for applicable firmware updates and product recalls.
9. Verify settings and application configurations are in accordance with engineered settings.
10. Verify devices display the correct date and time.
11. Reset and clear events, maintenance data, statistical data, and alarms from the devices after any tests.
12. Download or document settings and logic from the devices.

B. Electrical Tests

1. Perform metering tests on all analog inputs and verify metering values on the human machine interface (HMI) and at remote terminals.
2. Verify operation of all enabled digital inputs.
3. Verify operation of all digital outputs by operating the controlled device.
4. Verify all communication links are operational and function test failovers of redundant communication links.

5. Verify operation of all internal logic functions including tagging, lockouts, and local/remote control.
6. Verify alarm and status points.
7. Verify deadband and zero deadband settings and operation.
8. Reset and clear events, maintenance data, statistical data, and alarms from the devices after completion of tests.

C. Test Values – Visual and Mechanical

1. Light-emitting diodes, displays, and targets should illuminate.
2. Equipment should be clean and operational.
3. Settings and logic should agree with the most recent engineered setting files.
4. Verify equipment displays the correct date and time and events are accurately timestamp.

D. Test Values – Electrical

1. Metering readings shall be in accordance with manufacturer's published tolerances.
2. Inputs shall operate as per the design.
3. Outputs shall operate as per the design.
4. Communication links shall be operational and failover times shall be in accordance with the manufacturer's published data.
5. Internal logic functions shall operate as per the design.
6. Alarms and statuses shall be as per the design.
7. Deadbands shall operate in accordance with manufacturer's published data.
8. Indications and statistical data should operate in accordance with manufacturer's published data.

Section 7. INSPECTIONS AND TEST PROCEDURES**7.24.1 Automatic Circuit Reclosers and Line Sectionalizers,
Automatic Circuit Reclosers, Oil/Vacuum**

Content moved from Section 7.24.2 to Section 7.24.1.

Updated Text:

**7.24.1 Automatic Circuit Reclosers and Line Sectionalizers,
Automatic Circuit Reclosers, Oil/Vacuum****A. Visual and Mechanical Inspection**

1. Inspect physical and mechanical condition.
2. Inspect anchorage, alignment, and grounding.
- *3. Prior to cleaning the unit, perform as-found tests.
4. Clean the unit.
5. Perform all mechanical operation and contact alignment maintenance and tests on both the recloser and its operating mechanism in accordance with manufacturer's published data.
6. Inspect bolted electrical connections for high resistance using one or more of the following methods:
 1. Use of a low-resistance ohmmeter in accordance with Section 7.24.1.B.1.
 2. Verify tightness of accessible bolted electrical connections by calibrated torque wrench method in accordance with manufacturer's published data or Table 100.12.
 3. Perform a thermographic survey in accordance with Section 9.
7. Inspect for correct insulating liquid level.
8. Perform as-left tests.

B. Electrical Tests

1. Perform resistance measurements through bolted connections with a low-resistance ohmmeter in accordance with Section 7.24.1.A.6.1.
2. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with recloser closed and across each pole with the recloser open. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1.
3. Perform a contact/pole-resistance test.
- *4. Perform insulation-resistance tests on all control wiring with respect to ground. The applied potential shall be 500 volts dc for 300-volt rated cable and 1000 volts dc for 600-volt rated cable. Test duration shall be one minute. For units with solid-state components, follow manufacturer's recommendation.
5. Remove a sample of insulating liquid in accordance with ASTM D923. Sample shall be tested in accordance with the referenced standard.
 1. Dielectric breakdown voltage: ASTM D1816
 2. Color: ASTM D1500
 3. Visual condition: ASTM D1524
- *6. Perform minimum pickup voltage tests on trip and close coils in accordance with Table 100.20.
- *7. Perform power-factor or dissipation-factor tests on each pole with the recloser open and each phase with the recloser closed.
- *8. Perform power-factor or dissipation-factor tests on each bushing equipped with a power-factor/capacitance tap. In the absence of a power-factor/capacitance tap, perform hot-collar tests. These tests should be in accordance with the test equipment manufacturer's published data.
9. Perform vacuum bottle integrity test (dielectric withstand voltage) across each vacuum bottle with the recloser in the open position in strict accordance with manufacturer's published data.
10. Perform dielectric withstand voltage test on each phase with the recloser closed and the poles not under test grounded. Test voltage should be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.19.

11. Verify operation of heaters.
12. Test all protective functions in accordance with Section 7.9.
13. Test all metering and instrumentation in accordance with Section 7.11.
14. Test instrument transformers in accordance with Section 7.10.

C. Test Values – Visual and Mechanical

1. Mechanical operation and contact alignment should be in accordance with manufacturer's published data. (7.24.1.A.5)
2. Compare bolted connection resistance values to values of similar connections. Investigate values which deviate from those of similar bolted connections by more than 50 percent of the lowest value. (7.24.1.A.6.1)
3. Bolt-torque levels should be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.12. (7.24.1.A.6.2)
4. Results of the thermographic survey shall be in accordance with Section 9. (7.24.1.A.6.3)
5. Insulating liquid level should be in accordance with manufacturer's recommended tolerances. (7.24.1.A.7)

D. Test Values – Electrical

1. Compare bolted connection resistance values to values of similar connections. Investigate values which deviate from those of similar bolted connections by more than 50 percent of the lowest value.
2. Insulation-resistance values should be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1. Values of insulation resistance less than this table or manufacturer's recommendations should be investigated.
3. Microhm or dc millivolt drop values should not exceed the high levels of the normal range as indicated in the manufacturer's published data. If manufacturer's data is not available, investigate values that deviate from adjacent poles or similar reclosers by more than 50 percent of the lowest value.
4. Insulation-resistance values of control wiring should be comparable to previously obtained results but not less than two megohms.
5. Insulating liquid test results should be in accordance with Table 100.4.

6. Minimum pickup for trip and close coils should conform with manufacturer's published data. In the absence of manufacturer's published data refer to Table 100.20.
7. Power-factor or dissipation-factor values and tank loss index shall be compared to manufacturer's published data. In the absence of manufacturer's published data, the comparison shall be made to test data from similar circuit reclosers or sectionalizers or data from test equipment manufacturers.
8. Power-factor or dissipation-factor and capacitance values should be within ten percent of nameplate rating for bushings. Hot collar tests are evaluated on a milliamperes/milliwatt loss basis, and the results should be compared to values of similar bushings.
9. If no evidence of distress or insulation failure is observed by the end of the total time of voltage application during the vacuum bottle integrity test, the test specimen is considered to have passed the test
10. If no evidence of distress or insulation failure is observed by the end of the total time of voltage application during the dielectric withstand voltage test, the test specimen is considered to have passed the test.
11. Heaters should be operational.
12. Protective device function test results shall be in accordance with Section 7.9.
13. Metering and instrumentation test results shall be in accordance with Section 7.11.
14. Instrument transformer test results shall be in accordance with Section 7.10.