



WSDOT Test Method T 422

Test Method for NEMA Type Traffic Controller Cabinet and 300 Series (Type 170/2070) Traffic Controller Cabinet Transient Line Voltage Test (Spike Test)

1. Scope

The purpose of this test method is to evaluate Traffic Controller Cabinet operation when subjected to Line Voltage Transients of $300 V_{ac} \pm 5\%$ ($285 V_{ac}$ to $315 V_{ac}$). This test method only applies to NEMA type Traffic Controller Cabinets and 300 Series (Type 170/2070) Traffic Controller Cabinets.

2. Reference Documents

- Caltrans Transportation Electrical Equipment Specifications
- FHWA-IP-78-16, Type 170 Traffic Signal Controller System Hardware Specification
- NEMA Standards Publication TS-1, Traffic Control Systems
- NEMA Standards Publication TS-2, Traffic Controller Assemblies with NTCIP Requirements

3. Safety

This test is conducted with $300 V_{ac}$ line transients produced by the Transient Voltage Generator. Safety glasses shall be worn to provide eye protection in the event of an arc flash.

Exercise proper electrical cord handling to reduce the risk of electrical shock.

4. Apparatus

Beckman Model 3020, Berkeley Varitronics Model 3021, or device capable of generating line Voltage transients of $300 V_{ac}$.

5. Procedure

5.1 Setup

Ensure the Transient Voltage Generator Output Control is in the “AC OFF” position and the Traffic Controller Cabinet Main is in the “OFF” position. Connect the Transient Voltage Generator to a 120 V_{ac}, 60 Hz power source (standard wall outlet). On the Transient Voltage Generator, set the Meter Control to “Generator Output”, Phase Control to “Auto”, Noise Power to “On”, and Noise Output Level to minimum. Connect the Traffic Controller Cabinet to the Transient Voltage Generator.

5.2 Test Execution

Set the Transient Voltage Generator Output Control to “POS Pulse”. Power up the traffic Controller Cabinet. Program the controller to cycle on minimum recall. Ensure the Traffic Controller Cabinet is operating normally.

On the Transient Voltage Generator, adjust the Output Level to 300 V_{ac}, ±5% (285 V_{ac} to 315 V_{ac}). Allow the Traffic Controller Cabinet to run in this configuration for ten minutes. Ensure the Traffic Controller Cabinet is operating normally during these ten minutes.

After the ten minutes has elapsed, adjust the Output Level to minimum on the Transient Voltage Generator. Switch the Output Control to “AC OFF”, wait a moment, then switch to “NEG Pulse”. Ensure that the Traffic Controller Cabinet resumes normal operation.

On the Transient Voltage Generator, adjust the Output Level to 300 V_{ac}, ±5% (285 V_{ac} to 315 V_{ac}). Allow the Traffic Controller to run in this configuration for ten minutes. Ensure the Traffic Controller Cabinet is operating normally during these ten minutes.

After the ten minutes has elapsed, adjust the Output Level to minimum on the Transient Voltage Generator. Switch the Output Control to “AC OFF”. Switch the Traffic Controller Cabinet Main to the “OFF” position.

5.3 Test Completion

Disconnect the Traffic Controller Cabinet from the Transient Voltage Generator. Disconnect the Transient Voltage Generator from the 120 V_{ac}, 60 Hz power source (standard wall outlet). Return all test equipment to their proper storage location.

6. Report

During Test Execution the Traffic Controller Cabinet must conduct normal operation throughout all test conditions. During phase cycling, the Traffic Controller Cabinet shall not skip intervals, it shall not place false calls or produce false indications while in dwell, it shall not disrupt normal sequences in any manner, and it shall not change timings. Any of these conditions is considered a fail.

Record any deficiency that does not meet the above minimum requirements. The overall test result shall be recorded as a “Pass” or “Fail” for test T 422 in MATS.

Performance Exam Checklist

Test Method for NEMA Type Traffic Controller Cabinet and 300 Series (Type 170/2070) Traffic Controller Cabinet Transient Line Voltage Test (Spike Test) Method T 422 Checklist

Participant Name: _____ Exam Date: _____

Record the symbols "P" for passing or "F" for failing on each step of the checklist.

Procedure Element	Trial 1	Trial 2
1. Setup	_____	_____
2. Test Execution	_____	_____
3. Test Completion	_____	_____
4. Report	_____	_____

Comments: First Attempt: Pass _____ Fail _____ Second Attempt: Pass _____ Fail _____

Examiner Signature: _____ WAQTC #: _____

