

NTS-300

Network Protector Test Set



- 50 ft (15.2 m) test cable
- Two-piece design for easy portability
- Solid-state, digital timer
- Additional phase angle settings for testing protectors that incorporate solid-state relays

DESCRIPTION

The NTS-300 is a self-contained, two-piece test set designed for complete testing of General Electric and Westinghouse secondary network protectors.

The two-piece design of Model NTS-300 enables the user to transport the unit and easily lower it into a manhole.

The unit performs operational tests on 216 and 480 volt network protectors; it can also be used for troubleshooting tests on the operating mechanism and on both electromechanical and solid-state network relays.

APPLICATIONS

Numerous tests can be performed on network protectors and their associated relays. Tests associated with protectors are:

- Overall close test
- Overall trip test
- Mechanism test: verifies operating characteristics at reduced voltages in accordance with NEMA Standards Publication No. SP3-1-1962

Tests associated with electromechanical relays are:

- Master relay: reverse current trip test
- Master relay: overvoltage close test
- Phasing relay: overvoltage close test
- Desensitizing relay: time-delay test
- Desensitizing relay: instantaneous pickup test

Tests associated with the newer, solid-state relays require additional phase shifting to test closing characteristics at 0, 10 and 60° leading, and to test accurately the watt-var

characteristic at 120° leading. To perform accurate timing tests on relays with a time-delay module, a solid-state, digital timer is incorporated. Tests associated with solid-state relays are:

- Closing characteristics at 0, 10 and 60° leading
- Phasing characteristic at 0 and 10° leading (can also test at 10° lagging by reversing phase rotation on the input)
- Reverse-current trip test at 120, 180 and 240°
- Time-delay trip test
- Watt-var characteristic at 120° leading

FEATURES AND BENEFITS

Many standard features are incorporated in Model NTS-300 to simplify testing and increase accuracy. Among these are:

- **High-current output:** The 0 to 25 ampere output allows testing of high instantaneous settings and verification of trip characteristics at 120 and 240°.
- **Autoranging, solid-state, digital meters:** All-digital metering provides easy reading of trip currents, closing voltages and supply voltages. The digital display eliminates parallax, interpretation, interpolation and reading errors associated with analog scales.



Model NTS-300 testing a Westinghouse network protector

- **50 ft (15.2 m) test cable:** The test set comes with a 50 ft (15.2 m) multiconductor test cable that allows testing from outside the vault. Coded alligator clips allow quick and easy connections to the protector.
- **Solid-state, digital timer:** The digital timer provides the necessary accuracy when performing timing tests on the time-delay trip modules associated with solid-state relays or for time-delay trip test on electromechanical desensitizing relays.
- **Phase sequence indicator:** Phase sequence indication verifies the proper rotation of source voltage.
- **High resolution/high accuracy:** The high resolution of the digital meters ensures accurate readings of low currents and voltages, which allows calibration of the relays in the protector before installation.
- **Panel lamps:** Red and green panel lamps indicate closed and open position of network individual relays.
- **Instruction manuals:** Individual instructions are provided for testing General Electric and Westinghouse protectors.

SPECIFICATIONS

Input

Input Voltage (switch-selected)

216 or 480 V, 3 ϕ , 50/60 Hz

Outputs

0 to 25 A (trip current)
0 to 15 V (closing voltage)
0 to 480 V (supply voltage)

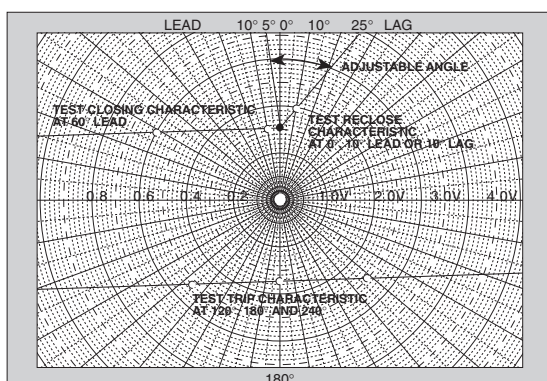
Phasing (switch-selected)

0, 10, 60, 120, 180, 240°

Instrumentation

Phase Sequence Indicator

This instrument is used to determine phase sequence or phase rotation. Consisting of five lamps, it indicates the direction of rotation and that all phases are energized.



Typical test points for trip and close characteristics on a solid-state network protective relay

Voltmeter

This 3½ digit, autoranging, solid-state instrument measures both closing voltage and supply voltage (switch-selected).

Ranges: 0.000 to 1.999/19.99/199.9/600 V

Overall Accuracy: $\pm 0.5\%$ of reading ± 1 digit

Ammeter

This 3½ digit, autoranging, solid-state instrument measures trip current.

Ranges: 00.000 to 1.999/19.99/25 A

Overall Accuracy: $\pm 0.5\%$ of reading ± 1 digit

Digital Timer

A special solid-state, digital timer is incorporated to measure the elapsed time of the test in either seconds or cycles. It features extensive noise suppression circuitry to ensure accurate and reliable operation under the most demanding field conditions.

Digital Display: 6-digit display with 0.375 in. (10 mm) numerals

Ranges (switch-selected)

0 to 99.9999 s

0 to 9999.99 s

0 to 99999.9 cycles

Accuracy

Seconds Mode: $\pm 0.005\%$ of reading ± 1 digit, whichever is greater

Cycles Mode: ± 0.5 cycle

Enclosure

Heavy-duty, two-piece, aluminum-reinforced, thermoplastic enclosures with large carrying handles and removable covers

Dimensions (each section)

23.5 H x 16 W x 15 D in.

(597 H x 406 W x 381 D mm)

Weight

Control Section: 100 lb (45 kg) approx

Meter Section: 97 lb (43.7 kg) approx

ORDERING INFORMATION

Item (Qty)	Cat. No.
Model NTS-300	NTS-300

Included Accessories

Carrying case, leads [1]	12123
Fuses	
1.5 A, 250 V [5]	950
15 A, 600 V [3]	11140
Interconnect cable [1]	10915
Lamps, 125 V, 6S6 [3]	365
Test cable, 50 ft (15.2 m) [1]	6698
Instruction manual [1]	10919

Optional Accessories

Longer test cables available on special order