MT-1/NT9
Portable Watthour Meter Tester

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WHAT IS A MT-1/NT9?

- MT-1/NT9 is a highly accurate and compact portable single & 3-phase Wh meter tester.

- Ideal tool for testing in the field and in the meter shop.

- Compatible with most residential, commercial and industrial meter forms 1S, 2S, 3S, 4S, 6S, 8S, 9S, 12S, 14S, 15S and 16S.

- Bidirectional testing for Net Metering applications.

- THD and VARh capabilities.
DESCRIPTION OF THE SOCKET

- Input Voltage: 100 - 600VAC.

- Built-in 0.25 to 50A three current synthesizers. No phantom load needed. Simulates active and reactive loads.

- Built-in electronic standard with an accuracy of ±0.02%. Comes with a complete calibration report.

- Accuracy can be checked against a reference standard traceable to NIST.

- It weighs only 6.4 lbs!
DESCRIPTION OF THE REMOTE

- Controls the Socket operations.
- Keypad has 4 sections:
  - **CONTROL**
    - **Reset**: Halts the test.
    - **Start/Stop**: Starts or ends a test.
  - **SETUP**
    - **Mode**: Selects one of the available test set.
    - **Rev**: Selects the revolutions to be done by the meter disk.
    - **Kh**: Selects the meter’s Kh.
DESCRIPTION OF THE REMOTE

- **LOAD**
  - Activates one of 3 loads: LL, PF and HL.

- **DATA LOGGING**
  - 12 alphanumeric keys and 4 arrows for easy positioning and text edition.
  - Stores up to 100 test results which can be uploaded to your PC.
OPERATIONS SUMMARY

- First insert the socket between the base and the meter.

- Turn on then validate the Form and TA of the meter. The socket will determine the Kh of the meter.

- With a pickup, the 3 modes are **User-defined, Preset-quick** and **Preset-full**. Without a pickup, they are **Manual** and **Tracking**.

- Once the load is applied and the test started, the internal Wh standard measures the energy that passes through the meter. When the test ends, a test result is displayed on the remote that can be saved.

‡ Simulation installation. Follow the safety rules of your company.
OPERATION EXAMPLE

The meter used here is a solid-state, Form 9S, 120V, Kh 1.8, TA 2.5, CL 20. The meter will be tested at HL, PF and LL, all 3 phases simultaneously. This mode is called *Preset-quick*.

- Before removing the meter from a CT rated meter base, **make sure to short the secondary CTs** to prevent equipment damages and personal injuries.

- As shown here, the operator is pulling the 3 shunting switches to short the secondary CTs before removing the meter from its socket.

‡ Simulation installation. Follow the safety rules of your company.
OPERATION EXAMPLE (suite)

- Remove the meter according to the safety rules of your company.
OPERATION EXAMPLE (suite)

- Before inserting the socket into the meter base, move the slider-switch to the form of the meter base being used.

- The MT-1/NT9 comes with two twist tabs that can be positioned at 3, 5, 6 & 9 o’clock according to the meter base being used.

- The tabs are twist-type and do not require any tools.
OPERATION EXAMPLE (suite)

- Install the socket into the meter base.

- On ring-type meter bases, secure the socket on the meter base with the optional latch.

- For safety purposes, a deadfront design prevents the presence of voltage on the front jaws.

‡ Simulation installation. Follow the safety rules of your company.
OPERATION EXAMPLE (suite)

- Insert the meter into the front of the socket.

‡ Simulation installation. Follow the safety rules of your company.
In this example, the output pulses of the meter are sent through its optical port (metallic port).

- Install the optional magnetic adapter directly over the optical port.

- The magnetic adapter uses a strong magnet material which holds firmly over the optical port.

‡ Simulation installation. Follow the safety rules of your company.
Install the suction cup of the optical pickup directly over the magnetic adapter.

On top of the suction cup, there is a LED that flashes when the meter emits pulses.

‡ Simulation installation. Follow the safety rules of your company.
In the case of electromechanical meter, install the Metercam instead of the optical pickup.

The Metercam is a digital disk sensor. No alignment is necessary since it detects and picks up the disk itself.

The Metercam is mounted on 4 suction cups.

‡ Simulation installation. Follow the safety rules of your company.
Operation Example (suite)

- Once the handheld remote is connected to the optical pickup, switch on the MT-1/NT9.

‡ Simulation installation. Follow the safety rules of your company.
The remote self-tests then displays the Form and the TA of the meter.

The suggested Form is 9S as indicated by a small checkmark.

If the Form and the TA displayed are correct, press Enter. Otherwise use the arrow keys to change the values.
Once the remote has detected the presence of the optical pickup the following display appears.

Then a quick test is done automatically to estimate the Kh of the meter. You can accept or change the estimated Kh.
OPERATION EXAMPLE (suite)

- Once the Kh has been found, the following display appears.

- The Kh and the Form of the meter are shown on display of the remote. Voltage is applied to the meter but no load (NL).

- More details are provided in the User’s guide.
 OPERATION EXAMPLE (suite)

- To make sure that the mode is *Preset-quick*, press the Mode key and the following display will appear.

- The surrounding cursors indicate *Preset-quick* is selected.

- Press Mode again to return to the test menu.
OPERATION EXAMPLE (suite)

- Press **Start/Stop** to initiate the test. The load current will increase to HL (2.5A) on all 3 phases simultaneously (ABC).

- The meter will start to send pulses and the internal watthour standard begins to register the energy that passes through the meter.

- Here, at 17.9 sec, the watthour standard has registered 4.48Wh (voltage \( \times \) current \( \times \) 3 \( \times \) time / 3600).
OPERATION EXAMPLE (suite)

- While testing, you can check the partial results of the test by pressing **Mode** key.
- Press **Mode** again to return to the test menu.
OPERATION EXAMPLE (suite)

- The watthour measurement period ends automatically after the 3 test points (HL, PF and LL).

- The load is then removed and the test results are displayed, one for HL, one for PF and one for LL. A typical test result is shown.

- Please note that the meter remains energized even if the load is not applied.
A fourth test result is available, by pressing the arrow down key.

It shows the weighted average according to the formula $(4\text{HL} + 2\text{LL} + \text{PF})/7$.

Note that when you see the cursor symbols on the upper right end of the display, this means that you can scroll line by line.
OPERATION EXAMPLE (suite)

- Please note that if we had chosen the *Preset-full* mode in this example, the test would have continued, checking each element separately.

- A typical test result is shown for phase A.

- Using arrow keys, you can browse all the results for the test (ABC and A, B, C separately).
OPERATION EXAMPLE (suite)

- Data Logging operations take place once a successful test has been completed.

- You must press the **Reset** key to begin the Data Logging process. Press PF to start the saving procedure or LL to bypass the saving procedure.

- More details are provided in the User’s guide.
...and now for a hands-on experience, call us for a demonstration and trial!