

RØI RED PHASE INSTRUMENTS

MODEL 679 POLYPHASE METER TESTER



1.0 APPLICATION.

The Model 679 is a fully digital meter tester, with a microprocessor to carry out all measurements and also calculate meter errors to 0.1% or 0.05% accuracy.

The optional Model 3028 clipon C.T.s have basic phase and ratio accuracy of 0.2%, which allows accurate testing of direct connected polyphase and single phase meters without disconnecting the meter wiring or interrupting supply to the customer.

The Model 679 has nominal 10A inputs for testing C.T. operated meters. Because it needs only low current 10A inputs (inputs up to 118A being taken care of with the clipon) the Model 679 is small, light and modestly priced. The Model 679 has an accuracy of typically 0.1%; refer to accuracy section for full details. It is also available with the option of enhanced accuracy to 0.05%.

Incorporated in this instrument is a powerful microprocessor board, and a large back-lit LCD display which has 16 lines of text.

This meter tester is excellent for utilities with limited budgets and also for utilities faced with serious system loss problems and energy shortages.

Red Phase Instruments also make a number of instruments for field testing metering C.T.s and P.T.s to ensure that the total metering installation is accurate.

RED PHASE INSTRUMENTS AUSTRALIA PTY LTD ACN 005 176 670
10 Ceylon Street, Nunawading, Victoria, 3131, Australia
Tel: + 61 3 9877 6988 Fax: + 61 3 9878 8508
Email: sales@redphase.com.au

2.0 OUTSTANDING FEATURES:

- 2.1. Powerful software - high productivity.
- 2.2. Especially good for fraud detection.
- 2.3. Good accuracy at low cost.
- 2.4. Easy to learn and easy to use.
- 2.5. Small and compact.
- 2.6. Ideal for testing both C.T. and direct connected meters on customer load.
- 2.7. Can be fitted on the front panel with a switch to change over from customer testing to phantom load testing, so that the connections to the meter need not be disturbed.

3.0 OTHER FEATURES ARE:

3.1. The Model 679 is intended mainly for testing on customer load, and can test both C.T. and direct connected meters. However the Model 679 can be used with the many types of Red Phase Instrument phantom loads. For testing C.T. meters, either on customer load or with the phantom load, the meter current is measured by the 10A input of the Model 679. Above 10A the clipon C.T. is used both for customer load and phantom load tests.

3.2. This unit can be used with 3 Model 3028 high accuracy clipon C.T.s. They give combined phase and ratio errors of less than 0.2% from 1A to 118A. This is much less error than standard clipon C.T.s, and makes them suitable for accurate meter testing.

3.4. With clipon C.T.s the customer does not have his supply disconnected during testing direct connected meters, which is most important for good customer relations. The testing of direct connected meters is very quick and easy, so productivity is high.

3.6. With clipon C.T.s it is easy to test at the meter and at the power pole, checking if any hidden wiring between the two is diverting power. This is a useful way of ensuring both that customers are billed correctly and that energy wastage is minimised.

3.7. The microprocessor automatically calculates the test result, using the standard Model 3001 hand-switch supplied with the Model 679. The large LCD display shows test results, and it also shows currents, voltages, power factor and other parameters. Red Phase have photocell pick-ups that can be used to test disc meters and solid state meters.

3.8. The Model 679 has a switched mode power supply which will operate from 55V to 260V. The microprocessor auto-ranges the measured

voltage inputs. The nominal ranges are:
60V/120V/240V star.
120V/ 240V delta.

These ranges cover all standard European type systems.

These voltages can be changed on request for different systems.

3.9. The Model 679 will test both disc and solid state kWh and kVarh meters.

4.0 FOR SYSTEM LOSS PREVENTION PROGRAMS, PLEASE NOTE SOME POINTS:

4.1. You can use Phantom Loads with the Model 679, but the extra cost, weight and testing time is not worthwhile in the early stages of your system loss program.

In the early stages you must be quick and productive and achieve reasonable accuracy. Measuring to 0.1% with customer load only is sufficient for the practical field testing of meters and also detecting fraud.

4.2. The basic Model 679 is supplied with a hand-switch to test disc meters. This covers 99% of the essential meter testing workload in Asia. A hand-switch is supplied with the meter tester. We also have photocell and LED pick-ups which work with the model 679, so that any type of meter can be tested.

4.3. The price of the Model 679 includes a hand-switch, all test leads, a transit case and an operating manual.

5.0 MODEL 679 SPECIFICATION.

5.1. SUPPLY VOLTAGES.

The Model 679 has a wide range switched mode power supply which operates from 55V to 260V. The power supply wires are brought out separately in the voltage test lead.

5.2. MEASURED VOLTAGE RANGES.

The Model 679 auto-ranges under microprocessor control. The nominal measuring ranges are:

3 phase, 3 wire star: 60V/120V/240V.
(Maximum 260V safe working voltage).

3 phase, 3 wire delta: 120V/240V
(Maximum 260V safe working voltage).

Single phase: 120V/240V.

5.3. CURRENT MEASURING RANGES. (FOR TESTING C.T. METERS)

The "CURRENT" socket on the front panel is used with the current test lead for connecting to

C.T. meters.

Measuring range:
0.1A to 10A for specified accuracy.

Thermal limit:
10A.

5.4. TEMPERATURE RANGE:

The operating temperature range is –5deg C to 45deg C for specified accuracy.
The storage range is –10deg C to 50deg C.

5.5. HI-POT & INSULATION TEST:

All current and voltage inputs to ground are rated at 2kV, 50Hz for 2 minutes. Insulation of any inputs to ground is rated at 2Mohm at 500VDC for 1 minute.

5.5. CLIPON C.T. MEASURING RANGES.

The Model 3028 clipon C.T. has nominal ranges of 10A and 100A, and is compensated by circuits in the 679. The measuring ranges are:

10A range: 0 to 11.8A.

100A range: 0 to 118A.

The clipon automatically auto-ranges under control of the microprocessor.

To prevent spurious switching between ranges, hysteresis is used which gives the following switch point when current is increasing:
11.8A.

When current is decreasing the switch point is:
9.5A.

Clipon C.T.s of higher current rating can be supplied with the Model 679, but they are not compensated.

5.6. SIZE AND WEIGHT.

The Model 679 is housed in a fully moulded high impact plastic case.

The size of case is 340mm X 300mm X 150mm, and weight is 5.5kg.

The Model 679 is supplied with a foam lined ABS plastic transit case which also holds the clipon

C.T.s and test leads, and the weight of the complete package is approx. 12KG.

6.0. ACCURACY.

6.1. Accuracy of real energy measurement (Wh) under the following conditions:

Voltage input 75% to 118% of nominal range.

Power factor 0.86 lead to 0.5 lag.

Current input 0.1A to 10A.

Accuracy is 0.1%.

(The optional 0.05% version has accuracy of 0.05%. All other parameter measurement accuracies remain unchanged).

6.2. Accuracy of var energy measurement (Varh) under the following conditions:

Voltage input 75% to 118% of nominal range.

Power factor +0.1 to -0.1 lag.

Current input 0.1A to 10A.

Accuracy is 0.15%.

Voltage input 75% to 118% of nominal range.

Power factor 0.5 lag.

Current input 0.1A to 10A.

Accuracy is 0.2%.

6.3. The frequency range for specified accuracy is 47Hz – 53Hz.

6.4. The temperature range for specified accuracy is 15deg C to 30deg C.

The temperature coefficient for all measurements is better than 0.0025% per deg C.

For the optional 0.05% version of the Model 679, the temperature coefficient for all measurements is better than 0.0015% per deg C.

6.4. USE OF MODEL 679 WITH MODEL 3028 CLIPON C.T.

It is possible to match a set of Model 3028 clipon C.T.s to a particular Model 679, and adjust the calibration of the Model 679 to suit. If this is done the overall error while using these clipons is kept to a minimum.

When the Model 679 is ordered with a set of 3 Model 3028 clipon C.T.s, they are matched and calibrated for that particular Model 679.

Provided the correct set of matched clipon C.T.s is used, the accuracy of the Model 679 is not degraded by the use of the clipon C.T.s.

Note that the clipon C.T. must be in good condition with the mating core faces not damaged, and not subject to influence factors that can affect the performance of the clipon C.T.

6.5. ACCURACY OF OTHER MEASUREMENTS.

The Model 679 can display measurements of various parameters as follows:
Voltage: Accuracy is +/- 0.5% of full scale in any range.
Current: Accuracy is +/- 0.5% of full scale in any range.
Power: Accuracy is +/-1% of full scale in any range.
Power factor: Accuracy is +/- 2% of full scale.
Phase angle: Accuracy is +/- 2 deg.
Frequency: Accuracy is +/- 0.1%.

7.0. SOFTWARE FEATURES.

7.1. The Model 679 software is very similar to that in our Model 465C meter tester. There is a keypad on the front panel for entering numeric information, and a 16 line back-lit LCD dot matrix display above the keyboard.

7.2. The software is comprehensive, however any operator can become familiar with it after only a few hours training and then start meter testing.

7.3. The software contains a number of menus arranged for choosing all the meter test data. Each menu appears on the screen in sequence. From each menu a choice is made by the operator using the cursor arrow keys. Numeric information is entered for such items as meter constant and test current.

7.4. At the end of the data entry the meter is ready for testing. The operator presses the hand-switch button down at the first disc spot and counts the number of revs for the test. At the end of the test the operator releases the hand-switch button. The test result is immediately calculated by the software and displayed. The previous test result is also displayed, so a direct comparison can be made if needed to verify accuracy and consistency.

7.5. Instead of a hand-switch it is possible to use photocells, LED pick-ups or test leads connected to pulsing outputs. There are slight variations in the software to cater for all these test methods.

8.0. ORDERING INFORMATION AND ACCESSORIES.

8.1. The Model 679 is supplied in standard form as follows:

CURRENT RANGES: 10A C.T. current inputs and Model 3028 clipon ranges of 11.8A and 118A maximum.

VOLTAGE RANGES: Measured voltage input ranges of:

3 X 60V/120V/240V +18%, -25%, STAR.
(Maximum 260V safe working voltage).

3 X 120V/240V +18%, -25%, DELTA.
(Maximum 260V safe working voltage).

8.2. List of items supplied as standard with Model 679.

1 X Model 679 Meter Tester.
1 X Model 3001 Hand-switch.
1 X Voltage test lead.
1 X 10A test lead.
1 X foam lined transit case.
1 X Operating Manual.
1 set of spare fuses.

8.3. List of optional accessories.

Model 3008 KYZ (3 wire) test lead for pulse output voltage free contact meters.

Model 3009 2 wire test lead for pulse output voltage free contact meters.

Model 3027 Opticon pick-up for solid state meters.

Model 3037 Photocell unit for disk and solid state meters.

465C-1 Test lead set for Australian pattern test block.

679-1 set of 3 Model 3028 Clipon C.T.s, 118A max.

679-2 REDTERM database software for downloading results to PC.

679-TM1 full technical manual for Model 679 with all circuit diagrams and board layouts. Purchase of 679-TM1 subject to non disclosure agreement.

679-SK1 service kit of extension connectors etc for repair and servicing.

679-BS1 basic spares kit with a selection of relays, I.C.s, fuses, keyswitches etc.