

Voltage and Current Measurement

Characteristics

- Three-line digital display simultaneously shows measurements of all 3 phases
- Displays 15-minute averaged measurements (bimetallic function)
- Peak value storage and display (drag-pointer function)
- Automatic sequencing of displayed parameters
- User selectable standard current transformer ratios

Description

In 3-phase A.C. power systems, typically four analog measuring instruments are used: three for phase currents, and one for voltage through a phase-selector switch. The **M610** combines these measurement functions into a single compact instrument, which cyclically displays currents and voltages of all 3 phases simultaneously. This 96x96 panel-mounting instrument saves panel space and reduces wiring and assembly labor.

The **M610** measures and displays line-neutral and line-line voltages. The instantaneous, 15-minute averaged, and peak values of the measured phase currents are displayed sequentially. The sequencing of displayed parameters is done either automatically or manually on demand. When the instrument is switched on, the same parameter is displayed as at the time it was switched off earlier. When stepping on to the next parameter display, the character "n" appears on the lower left of the display. If the "F" key-switch is kept pressed longer, after 2 seconds the character "r" is indicated and the display steps to the next sequenced parameter. Keeping the "F" key-switch pressed even longer, the character "c" is displayed and the peak and average values are re-set.

Standard current transformers can be connected directly to the **M610**, because the required shunts are already installed in the instrument. 35 standard current transformer ratios are pre-programmed



in the instrument, and any of these can be selected by the user.

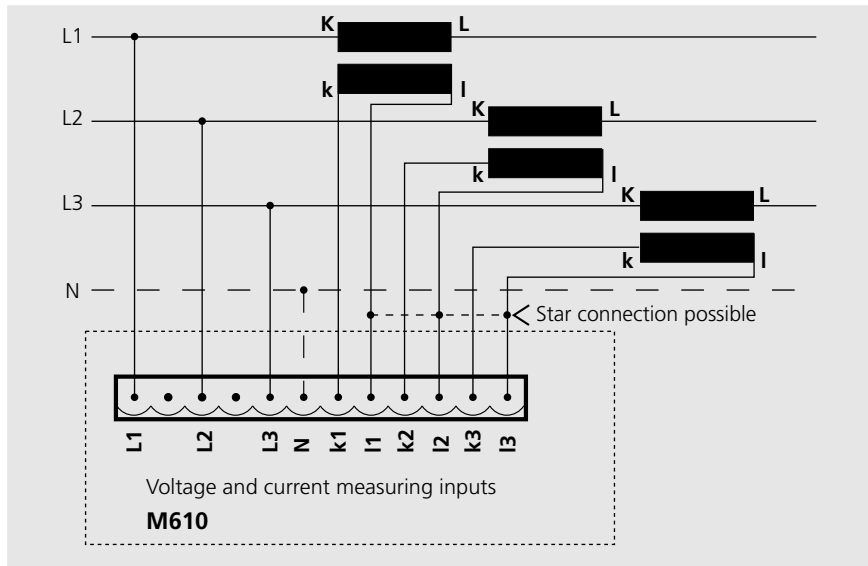
To select the desired current transformer ratio, the "F" key-switch is kept pressed when the instrument is switched on. Keeping it pressed further causes the transformers ratios to be displayed, one after another. When the desired ratio is displayed, de-energisation of the **M610** will cause that value of ratio to be set. This setting is stored in non-volatile memory, protected against power interruption. The phase currents are displayed as instantaneous and 15-minute averaged values, the latter being equivalent to the bimetallic function of analog meters. The peak values of measurements are also stored and displayed, similar in function to drag-pointer type peak value registration in analog meters.

The **M610** derives its operating power from the voltage measuring inputs, thereby keeping instrument wiring to a minimum. For medium voltage systems, 100V versions of the instrument are available, which display the primary side voltage, with appropriate scaling.

Technical Features

- Measurement of line-neutral and line-line voltages
- Measurement of individual phase currents through standard current transformers with 1A or 5A outputs
- Current transformer ratio user selectable from 35 pre-programmed standard ratios
- Phase voltages and currents sequentially displayed: automatically at 10 second intervals, or manually
- Large 3-line, 4-digit, 7-segment red LED digital display
- Measurement mode indicated by LED annunciator lamps
- Easy to install and operate
- Plug-in spring clamp connectors
- Compact: 77 mm depth
- Peak value storage and display
- 15-minute averaged measurements (bimetallic function)
- Reduces installation and wiring costs
- DIN 43700 standard panel mounting enclosure

Connection Diagram



Models and Ordering Data

M610

Voltage	Current	Order No.
400VAc	5A	08200200
400VAc	1A	08200201

100VAc to be supplied by voltage transformers, as well as only voltage or current monitors on request

Accessories:

DIN rail mounting adaptor EN 50022-35 x 7.5	95300026
IP 65 protective cover	91900552

Measuring Ranges

Voltage	0 to 600VAc (or 0.8 bis 1.1 x UN)
Current	0 to 5Aac through 0.01Ω Shunt 0 to 1Aac through 0.05Ω Shunt

The following current transformer values are stored in the instrument and can be set by the user:

Primary current (Aac)

1 / 2.5 / 5 / 10 / 15 / 20 / 25 / 30 / 40 / 50 / 60 / 75 / 80 / 100 / 125 / 150 / 200 / 250 / 300 / 400 / 500 / 600 / 750 / 800 / 1000 / 1200 / 1250 / 1500 / 1600 / 1800 / 2000 / 2500 / 3000 / 4000

Ordering Guide

Standard secondary current: 5A

- Optionally, 1A secondary current compatible instruments may be ordered.
- Please specify power system or instrument supply voltage (Instrument supply from phases L1-L2)
- Specify primary voltage for 100V operation through voltage transformer

Technical Data

Nominal voltage	400 / 100VAc; (between L1 and L2)
Voltage range	0.8 to 1.1 x nominal voltage
Frequency Range	50 / 60Hz
Power consumption	Approx. 3VA
Input impedance	Voltage inputs: 2MΩ, Current inputs (Shunts) 0.01Ω or 0.05Ω
Accuracy	Class 1
Temperature effect	< 0.01% / K
Ambient temperature	+5 °C to +50 °C
Storage temperature	-20 °C to +70 °C
Creep and air paths	Group III per DIN VDE 0110-1 Pollution level 2
Protection class	Front IP 20, Terminals IP 00 per DIN VDE 0470-1 (11/92)
Display range	0 to 9999
Digits	7- Segment red LED, 14mm height
Connections	Plug-in spring-clamp connectors
Wire cross section	2.5mm ² , fine stranded wire; max. 7mm stripped
Weight	Approx. 330g

Dimensional Diagram

