



User manual

TRMS ELECTRONIC DIGITAL MULTIMETERS

Read all instructions carefully

- The measurement instruments in the EV3M series are TRMS electronic digital multimeters to view the main electric measurements of 3 or 4 wire three-phase systems
- The electric measurements: **voltage, current, power, power factor, frequency and neutral current** are shown on three LED displays with three digits

SAFETY WARNINGS

- During the installation and operation of the instrument, comply with the following instructions:**
- The product must be installed by a qualified expert.
 - Do not power or connect the instrument if it is damaged.
 - The appliance must be installed and operated in compliance with current electric systems standards.
 - After installation, inaccessibility to the connection terminals without appropriate tools must be guaranteed.
 - Before accessing the connection terminals, verify that the leads are not live.
 - The instrument is destined for use in environments with overvoltage category III and pollution level 2, according to the CEI EN 61010-1 standard.
 - There must be a bipolar cut-off in the power supply network.
 - A device to protect against overloads must be installed in the electrical system upstream from the instrument.

Code	Model	Description
VE333100	EV3M-D	4 DIN digital multimeter
VE334900	EV3M-R	72x72 digital multimeter

TECHNICAL CHARACTERISTICS

- Power supply: 230 V AC (-15%/+10%), 50/60Hz
- Input voltage: $V_{max} = 300V$ (phase-neutral)
- Maximum own consumption: voltage circuits: < 2.5 VA; current circuits: < 2.5 VA;
- Input current: $I_n = 5A$; (nominal) $I_{max} = 6A$ (maximum)
- Accuracy: Alternating voltage: $\pm 0.5\%$ F.S. ± 1 digit
Alternating current: $\pm 0.5\%$ F.S. ± 1 digit
- Frequency 47-63Hz ($\pm 1Hz$)
- Alternating voltage: resolution 1V
minimum display: 10V
- Alternating current: resolution 10mA
minimum display: 150mA with TA 5/5A
- Selectable TA: x/5A type (up to 10000/5A)
- Measurements taken: phase voltages (L-N); chained voltages (L-L); phase currents; phase active power; phase apparent power; phase reactive power; power factor (cos ϕ); frequency; neutral current.
- Cross-section of leads: max 6mm² pm 4DIN model;
max 2.5mm² on 72x72 model
- Display: 7-segment LED display
- Operating temperature: -10 ÷ +45 °C
- Operating humidity: 10÷90% noncondensing
- Storage temperature: -20 ÷ +60 °C
- Insulation voltage: 4kV between accessible parts (front) and all terminals
- Degree of Protection: IP20 / IP51 on the Front Panel

INSTALLATION

- The instrument must be installed exactly as shown in the figure.
- Connection for the voltage inputs is always direct, whereas an external amperometric transformer (TA) is used for the current inputs.

Attention! The current transformer secondary circuits CANNOT be earthed.

OPERATION

- Once the instrument has been installed, the pages of the various electric measurements monitored can be viewed by pressing the ▼ key to move on to the next page, ▲ to go back to the previous page, in the following order:

Page 1: PHASE VOLTAGE (L-N)

LED V(L-N) is on.
Example

field 1	230	
field 2	230	
field 3	230	

Page 2: CHAINED VOLTAGES (L-L)

LED V(L-L) is on.
Example

field 1	300	
field 2	300	
field 3	300	

Page 3: PHASE CURRENTS

LED (A) is on.
Example

field 1	10.8	
field 2	0.53	
field 3	3.00	

Page 4: PHASE ACTIVE POWER

LED (W) is on.
Example

field 1	100	
field 2	170	
field 3	120	

Press the "OK" key to view the system power as follows:

Example

field 1	P	
field 2	SYS	
field 3	390 (calculated value)	

Press "OK" again to go back to the phase measurement.

Page 5: PHASE APPARENT POWER

LED (VA) is on.
Example

field 1	100	
field 2	170	
field 3	120	

Press the "OK" key to view the system power as follows:

Example

field 1	PA	
field 2	SYS	
field 3	390 (calculated value)	

Press "OK" again to go back to the phase measurement.

Page 6: PHASE REACTIVE POWER

LED (var) is on.
Example

field 1	38.0	
field 2	16.0	
field 3	24.0	

Press the "OK" key to view the system power as follows:

Example

field 1	Pr	
field 2	SYS	
field 3	78.0 (calculated value)	

Press "OK" again to go back to the phase measurement.

Page 7: POWER FACTOR (cos ϕ)

No LEDs on and the displays show the value of cos ϕ measured on each phase.
Example

field 1	L.86	L = inductive phase shift	
field 2	C.94	C = capacity phase shift	
field 3	L.82	L = inductive phase shift	

If you want to display the system power factor (PF), press the "OK" key:

Example

field 1	PF	
field 2	SYS	
field 3	0.80 (calculated value)	

Press "OK" again to go back to the phase measurement.

Page 8: FREQUENCY

No LEDs on and information displayed as follows:
Example

field 1	F	
field 2	50.0	
field 3	(empty)	

Page 9: NEUTRAL CURRENT

LED (A) is on.
Example

field 1	In	
field 2	1.4	
field 3	(empty)	

Measurement unit management

The "k" and "M" measurement units are associated with two LEDs which come on automatically depending on the value of the measurement taken.

Example (with TA 5000/5A)

I1=160A; I2=1000A; I3=2500A, the information displayed will be as follows:

L1	0.16	
L2	1.00	
L3	2.50	

LEDs "A" and "k" are on.

PARAMETER SETTING: TA AND 3 OR 4 WIRE SYSTEM

TA setting

The value of the TA secondary is 5A and cannot be modified. To set the capacity of the primary, proceed as follows.

With the instrument turned off, hold down the "PRG" key, then power the instrument. After approximately 3 seconds, the following information is displayed:

field 1	Pr	
field 2	ct	
field 3	05 (flashing)	

To modify field 3 use the ▲ key (increase) or ▼ key (decrease). The value can be modified in steps of 5 up to 1000A (5, 10, 15, 20, etc.) and in steps of 50 from 1000 to 10000A (1050, 1100, 1150, etc.)

Once you have selected your chosen capacity, press "OK" to confirm.

3 or 4 wire system setting (4 wires by default)

This second setting is used by the instrument to determine the neutral current (4 wire system). Setting page display:

field 1	Pr	
field 2	SYS	
field 3	04 (flashing)	

To modify field 3 use the ▲ or ▼ keys. The selectable values are 3 or 4.

If you set the value 3 (three wire system), pages 1 (three-phase voltage) and 9 (neutral current) are not displayed.

Press "OK" again to leave the programming mode and save the settings. The instrument begins to monitor the system. If you do not press "OK", the instrument leaves the programming mode after 30 seconds without saving the settings made.

Subsequently, to view the TA setting, use the ▲ or ▼ arrows on page 3 (phase currents, LED "A" on) and press "PRG" (the parameters cannot be modified on this page). To exit press "PRG" again or wait 30 seconds.

Note: THE TA MUST NOT BE EARTHED.

Incorrect TA connection

In case of incorrect connection of one or more TA, the display relating to the phase concerned by the incorrect connection flashes on the active powers page [LED (W) on].

ERROR MESSAGES

Error messages

If message **EEE** is shown (flashing) please contact Vemeter technical support.

If message **Err Par** is shown (flashing)

repeat the parameter setting procedure:

cut off power, press the "PRG" key and hold it down, then power the instrument again.

Out of scale message

HHH (flashing)

Means the current and/or voltage values are beyond the full scale value.

Voltage overload $V > V_{max} + 6\%$

Current overload $I > I_n + 20\%$ for connection via 5/5A TA (for different TAs, multiply by the transformation ratio).

If the page displayed is not related to the measurement in overload (out of scale), phase or chained voltage or phase current, the message is nonetheless shown by flashing the value of the overall measurement (if the page displayed concerns the system) or the measurements related to the phases in overload (if the page displays the phase measurements).

Note. If at least one of the phase currents is out of scale, three dashes are displayed on the neutral current page:

--- (flashing)

REFERENCE STANDARDS

Compliance with Community Directives:

2006/95/EC (Low Voltage)

2004/108/EC (Electromagnetic Compatibility)

is declared with reference to the following harmonized standards:

EN 61010-1, EN 61000-6-2 and EN 61000-6-4