

AVO®415

TRMS Digital Multimeter with VFD Measurement

Megger

VSD's or in harsh environments like cement plants, food processing, chemical processing, steel factory and mining.

Specifications

Accuracy is specified for 1 year after calibration, at operating temperatures of 18 °C to 28 °C, with relative humidity at 0 % to 90 %. Accuracy specifications take the form of: $\pm([\% \text{ of Reading}] + [\text{Counts}])$

Maximum voltage between any terminal and earth ground 1000 V

F1 Fuse Protection for A inputs 10 A, 1000 V, 30 kA

F2 Fuse Protection for mA input 800 mA, 1000 V, 30 kA

Battery Type 9 V Alkaline, NEDA 1604A/IEC 6LR61)

Display 6000 counts, backlit liquid crystal

Altitude 2000 m maximum.

Operating temperature 5 °C to +40 °C (41 °F to 104 °F)

Storage temperature -20 °C to +60 °C (-4 °F to 140 °F)

Operating humidity Max 80% up to 31 °C (87 °F) decreasing linearly to 50% at 40 °C (104 °F).

Storage humidity 50% at 40 °C (104 °F)

Size (H x W x D) 180 mm x 82 mm x 55 mm

Weight 397 g without battery
427 g with battery

Safety IEC 61010-1: Pollution Degree 2
IEC 61010-2-033: CAT IV 600 V,
CAT III 1000 V

EMC IEC 61326-1:
Portable Electromagnetic
Environment,
CISPR 11: Group 1, Class A,
IEC 61326-2-2 Enclosure
Double moulded, IP67 rating

Shock (drop test) 6.5 feet (2 meters)

Continuity check Audible signal will sound if the
resistance is less than 50 Ω (approx.),
test current <0.35 mA

Diode test Test current of 0.9 mA maximum,
open circuit voltage
3.2 V DC typical

PEAK Captures peaks > 1 ms

Temperature sensor Requires type K thermocouple

Input impedance > 10 M Ω V DC and >10 M Ω V AC

Crest factor ≤ 3 at full scale up to 500 V,
decreasing linearly to

≤ 1.5 at 1000 V.

AC response

True RMS

AC True RMS

The term stands for "Root-Mean-Square," which represents the method of calculation of the voltage or current value. Average responding multimeters are calibrated to read correctly only on sine waves, and they will read inaccurately on non-sine wave or distorted signals. True rms meters read accurately on either type of signal.

ACV bandwidth 45 Hz to 1 kHz

Overrange indication OL is displayed

Auto power OFF 15 minutes (approximately) with
disable feature

Polarity Automatic (no indication for
positive); Minus (-) sign for negative

Low battery indication " " Battery low warning.

Measurement Rate 2 times per second

AC voltage 45 Hz to 1 kHz

Range	Resolution	Accuracy $\pm(\% \text{ of reading} + \text{digits})$
60.00 mV	0.01 mV	$\pm(0.9\% + 9)$
600.0 mV	0.1 mV	$\pm(0.8\% + 3)$
6.000 V	0.001 V	
60.00 V	0.01 V	
600.0 V	0.1 V	
1000 V	1 V	$\pm(0.8\% + 8)$

All AC voltage ranges are specified from 5% of range to 100% of range.

AC voltage bandwidth: 45 Hz to 1 kHz (Sine);
50/60 Hz (All wave).

VFD

50 to 700 V	0.1 V/1 V	$\pm(0.4\% + 3 \text{ digits})$
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DC voltage

Range	Resolution	Accuracy
60.00 mV	0.01 mV	$\pm(0.9\% + 9 \text{ digits})$
600.0 mV	0.1 mV	$\pm(0.5\% + 5 \text{ digits})$
6.000 V	0.001 V	
60.00 V	0.01 V	$\pm(0.6\% + 6 \text{ digits})$
600.0 V	0.1 V	
1000 V	1 V	

AVO®415**TRMS Digital Multimeter
with VFD Measurement****Megger****AC current 45 Hz to 1 kHz**

Range	Resolution	Accuracy
600.0 µA	0.1 µA	±(1.5% + 3 digits)
6000 µA	1 µA	
60.00 mA	0.01 mA	
600.0 mA	0.1 mA	
6.000 A	0.001 A	±(2.0% + 3 digits)
10.00 A	0.01 A	

10 A: 30 sec max with reduced accuracy.

All AC current ranges are specified from 5% of range to 100% of range.

AC current bandwidth: 45 Hz to 1 kHz (Sine);
50/60 Hz (All wave).

Amps input burden voltage (typical): mA input ~3.8 mV/A, A input ~30 mV/A.

DC current

Range	Resolution	Accuracy
600.0 µA	0.1 µA	±(1.0% + 3 digits)
6000 µA	1 µA	
60.00 mA	0.01 mA	
600.0 mA	0.1 mA	
6.000 A	0.001 A	±(1.5% + 3 digits)
10.00 A	0.01 A	

Resistance

Range	Resolution	Accuracy
600.0 Ω	0.1 Ω	±(1.0% + 2 digits)
6.000 kΩ	0.001 kΩ	±(0.8% + 2 digits)
60.00 kΩ	0.01 kΩ	
600.0 kΩ	0.1 kΩ	
6.000 MΩ	0.001 MΩ	±(1.2% + 2 digits)
60.00 MΩ	0.01 MΩ	±(1.0% + 5 digits)

Capacitance

Range	Resolution	Accuracy
99.99 nF*	0.01 nF	±(5.0% + 20 digits)
999.9 nF	0.1 nF	±(4.0% + 5 digits)
9.999 µF	0.001 µF	
99.99 µF	0.01 µF	
999.9 µF	0.1 µF	
9.999 mF	0.001 mF	±10% reading
99.99 mF	0.01 mF	

* <99.99 nF not specified

Frequency (electronic)

Range	Resolution	Accuracy
9.999 Hz	0.001 Hz	±(0.1% + 4 digits)
99.99 Hz	0.01 Hz	
999.9 Hz	0.1 Hz	
9.999 kHz	0.001 kHz	
99.99 kHz	0.01 kHz	
999.9 kHz	0.1 kHz	
9.999 MHz	0.001 MHz	

Sensitivity: 0.8 V RMS min. at 20% to 80% duty cycle and <100 kHz; 5 Vrms min at 20% to 80% duty cycle and >100 kHz.

10.00 - 1 kHz	0.01 Hz	±0.5% reading
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Sensitivity AC mV Range (>100 mV),
AC V Range (6% Range);
6000 µA / 600 mA / 10.00 A Range (6% Range);
600 µA / 60.00 mA / 6.000 A Range (> 60% Range)

Pulse width: 100 µs - 100 ms:

Frequency: 5 Hz to 150 kHz

Duty cycle

Range	Resolution	Accuracy
0.1 to 99.90%	0.01%	± (1.2% reading + 2 digits)

Pulse width: 100 µs – 100 ms,

Frequency: 5 Hz to 150 kHz

Temperature (K Type thermocouple)

Range	Resolution	Accuracy
-40 to 1000 °C	1 °C	±(3.0% + 3 °C / 5 °F digits) (Probe accuracy not included)
-40 to 1832 °F	1 °F	

NOTE : Accuracy specifications consist of two elements:

- (%reading) - This is the accuracy of the measurement circuit
- (+digits) - This is the accuracy of the analogue to digital converter.

NOTE : Accuracy is stated at 18 to 28 °C (65 to 83 °F) and less than 75% RH.

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Safety

This instrument is intended for origin of installation use and are protected by double insulation per 61010-1:2010 +A1:2019 Safety requirements for electrical equipment for measurement, control, and laboratory use to Measurement connection: CAT III 1,000 V and CAT IV 600 V; Pollution Degree 2.

The instrument also meets EN (IEC) 61010-2-033:2021 +A11:2021, particular requirements for hand-held multimeters and other meters, 61010-031:2015, Safety requirements for hand-held probe assemblies for electrical measurement and test, EN 62479: 2010 Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz); and EN 50663: 2017 Generic standard for assessment of low power electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (10 MHz - 300 GHz).

ORDERING INFORMATION

Description	Part number
AVO415 Multimeter	1015-652
Included Accessories	
1 m 4 mm non-fused, right angle connector test leads* (x2)	
4 mm exposed metal Probes* (x2)	
Exposed tip probes for CAT II probing (x2)	
Red and black crocodile clips*	
K-type multimeter adapter	
K-type thermocouple lead	
Soft case	
4 mm cap plugs (x2)	
User guide	
1x 9 V, NEDA 1604S/IEC 6F22	
*Ratings: Double insulated, CAT III 1000 V, CAT IV 600 V, 10 A max	