

AVO410

Digital Multimeter



- **6000 count backlit digital display**
- **True RMS reading on AC mode**
- **1000 V DC / 750 V AC ranges**
- **10 A AC / DC ranges**
- **Resistance, frequency and capacitance ranges**
- **CAT IV 600 V**

DESCRIPTION

The Megger AVO410 digital multimeter has been designed for the contracting electrician and has the additional features that also make the instrument suitable for wide range of applications and users.

The instrument offers AC and DC voltage and current measurements as well as resistance, frequency and capacitance ranges. True RMS readings on the AC functions are standard on the AVO410 and the instrument features a CATIV 600 V safety rating meaning the instrument is suitable for industrial applications.

The slim, compact case has a tough rubberised holster that provides that extra degree of protection from the extreme conditions found in industrial environments. The style of the case and positioning of the function switch and buttons means the unit sits comfortably in the palm for single handed use.

Continuous references to the user guide have been avoided by the AVO410 utilising simplified functions.

The display features a back light that allows measurements to be made in poorly lit areas.

The AVO410 test leads are supplied with silicon cable and have GS38 compliant shrouded tips on the prods.

Auto-ranging

When first selected, all functions are auto-ranging. A range button on the AVO410 allows multiple manual range selection on each function; a feature that is generally welcomed by many users.

Minimum / Maximum measurements

The instrument has a MIN MAX function that allows the user to switch between minimum and maximum measurements. The display does not have to be continually monitored to capture a momentary increase or fall in readings.

Data hold

This function allows a displayed result to be frozen on the display which avoids having to remember a measurement value. The hold function can be nested within the MIN MAX feature which stops the AVO410 continuously updating the minimum and maximum measurement values.

Voltage measurements

Both AC and DC voltage measurements up to 750 V and 1000 V respectively are possible with the AVO410, the AC reading being a true RMS value.

Current measurements

For current measurements up to 10 A, a separate fused terminal is provided to protect both user and instrument from excess current.

Continuity / diode testing

The continuity function features a buzzer and provides the user both optical and audio indication of identifying and confirming continuity between two points. This function also allows forward and reverse bias testing of diode and semiconductor junctions.

RS232

The RS232 feature has been disabled.

Resistance, capacitance and frequency

Resistance can be measured directly on the ohms range from 0 to 60 M Ω with capacitance measurements from 0 to 6.000 mF. In addition, frequency measurements from 0 to 60 MHz are possible.

SPECIFICATIONS

| | |
|---|---|
| Display | 6000 counts updates 1.5/sec. |
| Polarity | Automatic, positive implied, negative indicated |
| Over-range indication | "OL" or "-OL" |
| Battery indicator | Displayed when the battery voltage drops below operating voltage |
| Auto power down | Approx 10 minutes |
| Operating ambient | Non-condensing ≤10 °C, 11 °C ~ 30 °C (≤80% R.H) 31 °C ~ 40 °C (≤75% R.H), 41 °C ~ 50 °C (≤45% R.H) |
| Storage temperature range and humidity | -20 °C to 60 °C, 0 to 80% R.H. when battery removed from meter |
| Temperature co-efficient | 0.15 x (Spec.Acc'y) / °C, <18 °C or >28 °C |
| Safety | The instrument complies with IEC61010 CAT IV 600 V |
| Power supply | Standard 9 V battery PP3, NEDA 1604, IEC6F22, JIS006P |
| Battery life | Alkaline 300 hours |
| Dimensions | 76 mm x 158 mm x 38 mm without holster 82 mm x 164 mm x 44 mm with holster |
| Weight | 522 g |

ELECTRICAL SPECIFICATIONS

DC/AC volts

| Range | DC accuracy | AC accuracy |
|-----------------------|--------------------|--|
| 600.0 mV | ±(0.5% + 2 digits) | 50 Hz/60 Hz sine wave only for 600.0 mV range, ±(0.9% + 5 digits) 50 Hz ~ 500 Hz * |
| 6.000 | ±(0.5% + 2 digits) | 50 Hz/60 Hz sine wave only for 600.0 mV range, ±(0.9% + 5 digits) 50 Hz ~ 500 Hz * |
| 60.00 V | ±(0.5% + 2 digits) | 50 Hz/60 Hz sine wave only for 600.0 mV range, ±(0.9% + 5 digits) 50 Hz ~ 500 Hz * |
| 600 V | ±(0.5% + 2 digits) | 50 Hz/60 Hz sine wave only for 600.0 mV range, ±(0.9% + 5 digits) 50 Hz ~ 500 Hz * |
| DC 1000 V AC 750 V | ±(0.5% + 2 digits) | 50 Hz/60 Hz sine wave only for 600.0 mV range, ±(0.9% + 5 digits) 50 Hz ~ 500 Hz * |

* The basic accuracy is specified for a sine wave below 4000 counts. Over 4000 counts, add 0.6% to the accuracy. For non-sine waves below 2000 counts, refer to the following for accuracy: ±1.5% addition error for C.F from 1.4 to 3

| | |
|--|--|
| Protection | 1000 V DC or AC |
| Input impedance | 10 MΩ // less than 100 pF |
| Common mode rejection ratio / normal mode rejection ratio | (Common mode rejection ratio/ normal mode rejection ratio) VAC: CMRR >60 dB at DC, 50 Hz/60 Hz VDC: CMRR >100 dB at DC, 50 Hz/60 Hz NMRR: >50 dB at DC, 50 Hz/60 Hz |

| | |
|---------------------------|--|
| AC conversion type | AC conversions are AC coupled True RMS responding, calibrated to the sine wave input. |
|---------------------------|--|

| | |
|---------------------|-----------------|
| Crest factor | C.F. = Peak/rms |
|---------------------|-----------------|

DC/AC current

| Range | DC accuracy | AC accuracy | Voltage burden |
|----------|---------------------|--------------------------------------|----------------|
| 600.0 μA | ± (1.0% + 2 digits) | N/A | <4 mV/μA |
| 6000 μA | ± (1.0% + 2 digits) | N/A | <4 mV/μA |
| 6.000 A | ± (1.0% + 2 digits) | ±(1.5% + 6 dgt) 50 Hz ~ 500 Hz *1 | 2 V max |
| 10.00 A | ± (1.0% + 2 digits) | ±(1.5% + 6 dgt) 50 Hz ~ 500 Hz *1 | 2 V max |

Overload protection

| | |
|-----------------|-----------------------------|
| A input | 10 A (500 V) fast blow fuse |
| μA input | 600 V rms |

*1) AC conversion type

Conversion type and additional specification are the same as DC/AC voltage.

NOTE: The DCμA input terminal is protected by 3.6 kΩ PTC (600 V rated) thermistors. The loading effect of these devices may cause measurement errors on low impedance circuits (<100 kΩ).

Note: When measuring current on the A current terminal the instrument has an internal impedance of 0.01 Ω at AC/DC A in series with circuit under test.

The loading effect may cause measurement errors on low impedance circuits.

For example: Measuring a 1 Ω impedance circuit will cause a -1 % measuring error. The error percentage of the loading effect of the meter can be expressed as the following:

AMMETER SHUNT

$$100 \times \frac{-0.01 \Omega}{Z_{\text{circuit}} + 0.01} \%$$

or

$$100 \times \frac{-E_{\text{Burden}}}{E_s} \%$$

Note: The DC μ A input terminal is protected by 3.6 k Ω PTC (600 V rated) thermistors.

The loading effect of these devices may cause measurement errors on low impedance circuits (<100 k Ω).

Resistance range

| Range | Accuracy | Overload Protection |
|---------------------|-------------------------|---------------------|
| 600.0 Ω *2 | \pm (0.7% + 2 digits) | 600 V rms |
| 6.000 K Ω | \pm (0.7% + 2 digits) | 600 V rms |
| 60.00 K Ω | \pm (0.7% + 2 digits) | 600 V rms |
| 600.0 K Ω | \pm (0.7% + 2 digits) | 600 V rms |
| 6.000 M Ω | \pm (1.0% + 2 digits) | 600 V rms |
| 60.00 M Ω *1 | \pm (1.5% + 2 digits) | 600 V rms |

Open circuit voltage -1.3 V approx.

*1 <100 digit rolling

*2 <10 digit rolling

Diode check

| Range | Resolution | Accuracy |
|-------|------------|----------------------|
| Diode | 10 mV | \pm 1.5% + digits* |

* For 0.4 V ~ 0.8 V

Max. test current 1.5 mA

Max. open circuit voltage 3 V

Overload protection 600 V rms

Continuity Built-in buzzer will sound when the resistance is less than 500 Ω approx. Response time is 100 ms approx.

Frequency measurement range

| Range | **Sensitivity | Overload protection |
|-----------|---------------|-------------------------------|
| 6000 Hz | 100 mV rms* | Frequency: 0.1% \pm 1 digit |
| 60.00 KHz | 100 mV rms* | Frequency: 0.1% \pm 1 digit |
| 600.0 KHz | 100 mV rms* | Frequency: 0.1% \pm 1 digit |
| 6.000 MHz | 250 mV rms | Frequency: 0.1% \pm 1 digit |
| 60.0 MHz | 1 V rms | Frequency: 0.1% \pm 1 digit |

Overload protection 600 V rms

* Less than 20 Hz, the sensitivity is 1.5 V rms

** Max. sensitivity <5 V ac rms

Accuracy

| Range | Accuracy |
|---------------|------------------------|
| 6.000 nF | \pm (1.9%) +8 digits |
| 60.00 nF | \pm (1.9%) +8 digits |
| 600.0 nF | \pm (1.9%) +8 digits |
| 6.000 μ F | \pm (1.9%) +8 digits |
| 60.00 μ F | \pm (1.9%) +8 digits |
| 600.0 μ F | \pm (1.9%) +8 digits |
| 6.00 mF* | \pm (1.9%) +8 digits |

Overload protection 600 V rms

* <100 digit of reading rolling

Auto power OFF (APO) If idle for more than 10 minutes

ORDERING INFORMATION

| Description | Order Code |
|--|------------|
| AVO410 digital multimeter CAT IV 600 V | 1001-613 |
| Included accessories | |
| Test leads and probes | |
| Optional accessories | |
| Pouch | 2007-366 |

UK
Archcliffe Road Dover
CT17 9EN England
T +44 (0) 1304 502101
F +44 (0) 1304 207342
UKsales@megger.com

UNITED STATES
4271 Bronze Way
Dallas TX 75237-1019 USA
T 800 723 2861 (USA only)
T +1 214 333 3201
F +1 214 331 7399
USsales@megger.com

OTHER TECHNICAL SALES OFFICES
Valley Forge USA, College Station USA,
Sydney AUSTRALIA, Danderyd SWEDEN,
Ontario CANADA, Trappes FRANCE,
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CERTIFICATION ISO
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