



1. ELECTRICAL SPECIFICATIONS

Accuracy is indicated as $\pm [\%rdg + (\text{numbers of digits} \times \text{resolution})]$ at $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, $<80\%HR$

DC VOLTAGE

| Range | Resolution | Accuracy | Input impedance | Overload protection |
|----------|------------|------------------------|------------------------|---------------------|
| 50.000mV | 0.001mV | $\pm(0.05\%rdg+30dgt)$ | 10M Ω // <100pF | 1000VDC/ACrms |
| 500.00mV | 0.01mV | $\pm(0.05\%rdg+5dgt)$ | | |
| 5.0000V | 0.0001V | | | |
| 50.000V | 0.001V | | | |
| 500.00V | 0.01V | | | |
| 1000.0V | 0.1V | | | |

AC TRMS VOLTAGE

| Range | Resolution | Accuracy (**) (Sinusoidal waveform) | Input impedance | Overload protection |
|-------------|------------|--|------------------------|---------------------|
| 50.000mV | 0.001mV | $\pm(0.7\%rdg+20dgt)$ (40Hz \div 70Hz) | 10M Ω // <100pF | 1000VDC/ACrms |
| 500.00mV | 0.01mV | $\pm(1.5\%rdg+40dgt)$ (71Hz \div 10kHz) | | |
| 5.0000V | 0.0001V | $\pm(0.5\%rdg+20dgt)$ (40Hz \div 70Hz) | | |
| 50.000V | 0.001V | $\pm(1.5\%rdg+40dgt)$ (71Hz \div 1kHz) | | |
| 500.00V | 0.01V | $\pm(1.5\%rdg+40dgt)$ (71Hz \div 1kHz) | | |
| 1000.0V (*) | 0.1V | $\pm(3.0\%rdg+80dgt)$ (1.001kHz \div 10kHz) | | |

Frequency range: 40Hz \div 10kHz ;

(**) For values <5% of each range add 20dgt to the accuracy

(*) Frequency range of this range: 40Hz \div 1kHz

For non-sinusoidal voltages, consider the following crest factors (CF):

1.4 \leq FC < 2.0 \rightarrow Add 1.0% reading to accuracy

2.0 \leq FC < 2.5 \rightarrow Add 2.5% reading to accuracy

2.5 \leq FC \leq 3.0 \rightarrow Add 4.0% reading to accuracy

Accuracy in AC+DC mode: AC accuracy + DC accuracy + 1.0%reading

Accuracy in HFR mode: AC accuracy + 1.0%reading (40Hz \div 400Hz)

Cutting frequency in HFR mode: 800Hz (-3dB) ; Characteristic attenuation: approx. -24dB

DC CURRENT

| Range | Resolution | Accuracy | Max. meas. time | Overload protection |
|----------|------------|-------------------------|------------------|---------------------|
| 50.000mA | 0.001mA | $\pm(0.05\%rdg + 5dgt)$ | 1 min (input A) | max 440mA |
| 1.0000A | 0.0001A | | 10min (input mA) | |

AC TRMS CURRENT

| Range | Resolution | Accuracy | Max. meas. time | Overload protection |
|----------|------------|--|-------------------------------------|---------------------|
| 50.000mA | 0.001mA | $\pm(1.0\%rdg + 20dgt)$ (40Hz \div 70Hz) | 1 min (input A) 10min (input mA) | max 440mA |
| 1.0000A | 0.0001A | $\pm(2.0\%rdg + 20dgt)$ (71Hz \div 10kHz) | | |

(*) For values <5% of each range add 20dgt to the accuracy ; Frequency range: 40Hz \div 10kHz

Input impedance: 0.1 Ω (input A), 13 Ω (input mA)

For non-sinusoidal currents, consider the same conditions of TRMS AC Voltage



RESISTANCE

| Range | Resolution | Accuracy | Output current | Overload protection |
|--------------|------------|------------------|----------------|---------------------|
| 500.00Ω | 0.01Ω | ±(0.2%rdg+30dgt) | 1mA | 1000VDC/ACrms |
| 5.0000kΩ | 0.0001kΩ | ±(0.2%rdg+10dgt) | 100μA | |
| 50.000kΩ | 0.001kΩ | | 10μA | |
| 500.00kΩ | 0.01kΩ | ±(0.5%rdg+10dgt) | 1μA | |
| 5.0000MΩ | 0.0001MΩ | ±(1.0%rdg+10dgt) | 100nA | |
| 50.000MΩ (*) | 0.001MΩ | ±(2.0%rdg+10dgt) | 10nA | |

(*) Little instability for < 20 dgt
Max open voltage: approx 3.5V

CONTINUITY TEST

| Range | Buzzer | Accuracy | Open voltage | Overload protection |
|--------|--------|------------------|--------------|---------------------|
| 500.0Ω | <30Ω | ±(0.1%rdg+30dgt) | approx 3.5V | 1000VDC/ACrms |

DIODE TEST

| Range | Test current | Accuracy | Open voltage | Overload protection |
|--------|--------------|------------------|--------------|---------------------|
| 2.000V | ±1mA | ±(1.0%rdg+10dgt) | approx ±3V | 1000VDC/ACrms |

FREQUENCY AC VOLTAGE/CURRENT

| Range | Resolution | Accuracy | Overload protection |
|-----------|------------|----------|----------------------------|
| 500.00Hz | 0.01Hz | ±3dgt | 1000VDC/ACrms max 440mA |
| 5.0000kHz | 0.0001kHz | | |
| 50.000kHz | 0.001kHz | | |
| 100.00kHz | 0.01kHz | | |

Minimum frequency value: 5Hz

Sensitivity of signal for frequency measurement

| Function | Range | Sensitivity (peak to peak value) | |
|----------|----------|----------------------------------|----------------|
| | | 5Hz ÷ 10kHz | 10kHz ÷ 100kHz |
| AC mV | 50.000mV | 10mV | 100mV |
| | 500.00mV | | |
| AC V | 5.0000V | 1V | 1V |
| | 50.000V | 1V | not specified |
| | 500.00V | | |
| | 1000.0V | | |
| AC A | 50.000mA | 10mA | |
| | 1.000A | 300mA | |

GENERATED DC CURRENT – Programmable output

| Range | Resolution | Accuracy | Overload protection |
|----------------|------------|------------------|---------------------|
| 0.000÷20.000mA | 0.001mA | ±(0.05%rdg+5dgt) | max 440mA |
| 4.000÷20.000mA | | | |

Power supply: battery level > 4.5V
External power supply simulated mode: 6V ÷ 48V



GENERATED DC CURRENT – Output ramp

| Ramp type | Description | Action |
|-----------|------------------|----------------------------------|
| | Linear slow ramp | 0% → 100% → 0% in 40s |
| | Linear fast ramp | 0% → 100% → 0% in 20s |
| | Step slow ramp | 0% → 100% → 0% with steps of 15s |
| | Step fast ramp | 0% → 100% → 0% with steps of 5s |

Output voltage: 32.0VDC: Output voltage accuracy: $\pm 5.0\%$ of reading

Power supply: battery level > 4.5V

External power supply in simulation mode: 6V \div 48V

LOOP POWER (Loop current)

| Function | Range | Accuracy | Driver | Overload protection |
|-------------------|----------|-------------------------|----------------------|---------------------|
| LOOP | 50.000mA | $\pm(0.05\%rdg + 5dgt)$ | 30V / 1.25k Ω | max 440mA |
| 250 Ω HART | | | 24V / 1k Ω | |

Output voltage: 32.0VDC: Output voltage accuracy: $\pm 5.0\%$ of reading

Power supply: battery level > 4.5V

External power supply in simulation mode: 6V \div 48V



2. GENERAL SPECIFICATIONS

Display:

- LCD display, 5 digit with maximum reading 50000 counts with sign, decimal point
- Automatic polarity indication
- "OL" over range indication


Features:

- Data HOLD
- MAX/MIN/AVG for maximum, minimum and average values
- Auto Backlight for automatic activation of backlight
- AUTOTEST for automatic detection of AC or DC measurements
- AC+DC for measurement of DC component overlapped to the alternate signal
- HFR for AC voltage measurement with 800Hz cut-off frequency
- Internal memory for saving/recall data
- RANGE for manual range selection
- REL for relative measurement
- Auto Power OFF after 20 minutes of idleness

Internal memory:

- Max 100 locations

Low battery indication:

- The symbol  appears when the battery voltage is low

Environmental conditions:

- Working temperature/humidity: -10°C ÷ 30°C, <85%RH
30°C ÷ 40°C, <75%RH
40°C ÷ 50°C, <45%RH
- Storage temperature/humidity: -20°C ÷ 60°C, <80%RH

General information:

- Max height of use: 2000m
- Pollution degree: 2
- Insulation: double insulation

Power supply:

- 4 x 1.5V alkaline batteries type AA IEC LR6

Sizes:

- 207(L)x95(W)x52(H) mm

Weight (included batteries):

- 630g

Applied standards:

- Safety: IEC/EN61010-1, EN61010-2-030
- Measurement category: CAT IV 600V – CAT III 1000V

This product conforms to the prescriptions of the European directive on low voltage 2006/95/EEC and to EMC directive 2004/108/EEC