



CMM-60

Indeks: WMXXCMM60

Advanced Industrial Multimeter



Description

The CMM-60 multimeter allows you to record data thanks to the Trend Capture function of the built-in memory as well as the possibility of transferring data and analysing the results achieved in the CMM-60 Multimeter Software. The device facilitates the diagnostics of potential problems covering the operation of electromechanical devices, industrial automation, motors and distribution of electricity. Precise indications, safety during work in industrial conditions, convenience of use and early detection of irregularities in the operation of machines and devices are the main benefits of having this device in your equipment.

Technical Specification

Features of the device

- Fast and easy reading is provided by a colour display with a counting range of up to 50,000 digits, a resolution of 320x240 pixels and a diagonal of 3.5 ". Additionally, the display allows reading at a wide angle also in poor lighting conditions;

- over 14 measurement functions, including AC / DC voltage measurement, AC / DC current measurement, resistance, capacity, temperature, pulse width, fill factor, frequency
- The AC + DC function allows you to simultaneously display the value of the constant and variable component or the sum of both components during voltage measurement
- The 4~20mA function used for, among others, measurement of the control circuits of temperature, pressure, pH or flow sensors.
- True RMS for AC voltage and current allows to measure the effective value of distorted waveforms;
- Built-in low-pass filter, thanks to which the voltage measurements will be more accurate by eliminating the influence of interference generated by machines and electronic devices;
- saving the results of fast 1ms waveforms thanks to the PEAK value measurement function
- the relative REL measurement function allows, among others, elimination of resistance values of test leads
- Displaying simultaneously the result of the measurement of the constant and alternating component of the signal for quick reading of two results at the same time;
- real-time clock that allows adding date and time of measurement to each sample
- Recalling measurement results from the built-in memory for 2000 measurements with recording of the name and date of measurement;
- possibility of quick detection of irregularities due to the registration of measurement results in graphical form of the trend, thanks to the Trend Capture function and the built-in recorder with the possibility of recording up to 10.000 samples;
- Registration of maximum and minimum values and calculation of the average of current measurements
- Built-in Bluetooth module for sending live measurement results to Android mobile devices
- HELP function to quickly explain the meaning of a given measuring function and buttons
- Optional strap with a hook allows easy operation with both hands;
- Protection against water flooding and penetration of dust into the electronic system due to its extremely robust housing with IP67 protection level;
- The rotary switch has been designed for easy handling even when working in thick gloves in dangerous and difficult

conditions;

- Dedicated lithium-polymer battery allowing long-term operation of the device;
- A dedicated charger and power supply for charging the battery without removing it.

"m.v." means a standard measured value.

DC voltage measurement

Range	Resolution	Accuracy
50.000 mV ¹	0.001 mV	±(0.05% m.v. + 20 digits)
500.00 mV ¹	0.01 mV	
5.0000 V	0.0001 V	±(0.025% m.v. + 5 digits)
50.000 V	0.001 V	
500.00 V	0.01 V	±(0.05% m.v. + 5 digits)
1000.0 V	0.1 V	±(0.1% m.v. + 5 digits)

¹ Use REL mode to compensate offsets

- Internal impedance >10 MΩ VDC
- Overload protection: 1000 V DC/AC RMS

True RMS (TRMS) voltage measurement

Range	Resolution	Accuracy
50.000 mV ¹	0.001 mV	f = 50/60 Hz ±(0.3% m.v. + 25 digits)
500.00 mV ¹	0.01 mV	
5.0000 V	0.0001 V	f < 1 kHz ±(0.5% m.v. + 25 digits)

50.000 V	0.001 V	f < 5 kHz ±(3% m.v. + 25 digits)
500.00 V	0.01 V	
1000.0 V	0.1 V	

- Frequency range 50...10 000 Hz
- All AC voltage ranges are specified from 5% to 100% of the range
- Internal impedance >10 MΩ VDC
- Overload protection: 1000 V DC/AC RMS

Measurement of AC+DC voltage

Range	Resolution	Accuracy
50.000 mV	0.001 mV	f < 1 Hz: ±(1% m.v. + 25 digits)
500.00 mV	0.01 mV	
5.0000 V	0.0001 V ¹	
50.000 V	0.001 V	f < 10 kHz ±(3,5% m.v. + 25 digits)
500.00 V	0.01 V	
1000.0 V	0.1 V	

¹ Over f = 5 kHz - additional error of 1%

DC measurement

Range	Resolution	Accuracy
500.00 μA	0.01 μA	

5000.0 μ A	0.1 μ A	$\pm(0,1\%$ m.v. + 20 digits)
50.000 mA	0.001 mA	
500.00 mA	0.01 mA	$\pm(0,15\%$ m.v. + 20 digits)
10.000 A	0.001 A	$\pm(0,3\%$ m.v. + 20 digits)

- 20 A for max. 30 sec. at reduced accuracy

AC measurement (TRMS)

Range	Resolution	Accuracy
500.00 μ A	0.01 μ A	$f = 50/60$ Hz $\pm(0,6\%$ m.v. + 25 digits) $f < 1$ kHz $\pm(1,5\%$ m.v. + 25 digits) $f < 10$ kHz $\pm(3\%$ m.v. + 25 digits)
5000.0 μ A	0.1 μ A	
50.000 mA	0.001 mA	
500.00 mA	0.01 mA	
10.000 A	0.001 A	

- 20 A for max. 30 sec. at reduced accuracy
- Frequency range 50 Hz...10 kHz
- All AC voltage ranges are specified from 5% to 100% of the range

Measurement of AC+DC

Range	Resolution	Accuracy
500.00 μ A	0.01 μ A	

5000.0 μ A	0.1 μ A	$\pm(1,0\%$ m.v. + 25 digits)
50.000 mA	0.001 mA	
500.00 mA	0.01 mA	
10.000 A	0.001 A	$\pm(1,5\%$ m.v. + 40 digits)

- Frequency range 0...1000 Hz
- 20 A for max. 30 sec. at reduced accuracy

Measurement of alternating voltage for frequency >5 kHz

Range	Resolution	Accuracy
50.000 mV	0.001 mV	$\pm(5,0\%$ m.v. + 40 digits)
500.00 mV	0.01 mV	
5.0000 V	0.0001 V	
50.000 V	0.001 V	$\pm(6,0\%$ m.v. + 40 digits)
10.000 V	0.001 V	

- Frequency band 5...100 kHz

Measurement of resistance

Range	Resolution	Accuracy
50.000 Ω ¹	0.001 Ω	$\pm(0,5\%$ m.v.+ 20 digits)
500.00 Ω ¹	0.01 Ω	

5.0000 k Ω	0.0001 k Ω	$\pm(0.05\% \text{ m.v.} + 10 \text{ digits})$
50.000 k Ω	0.001 k Ω	
500.00 k Ω	0.01 k Ω	$\pm(0.1\% \text{ m.v.} + 10 \text{ digits})$
5.0000 M Ω	0.0001 M Ω	$\pm(0.2\% \text{ m.v.} + 20 \text{ digits})$
50.000 M Ω	0.001 M Ω	$\pm(2\% \text{ m.v.} + 20 \text{ digits})$

¹ When using REL mode to compensate offsets (mode recommended in case of problems with resetting)

Measurement of capacitance

Range	Resolution	Accuracy
5.000 nF ¹	0.001 nF	$\pm(2\% \text{ m.v.} + 40 \text{ digits})$
50.00 nF ¹	0.01 nF	
500.0 μ F	0.1 nF	
5.000 μ F	0.001 μ F	
50.00 μ F	0.01 μ F	
500.0 μ F	0.1 μ F	$\pm(5\% \text{ m.v.} + 40 \text{ digits})$
10.00 mF	0.01 μ F	

¹ With a foil capacitor or better, using relative mode REL Δ for resetting the rest

Measurement of frequency - electronics

Range	Resolution	Accuracy
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50.000 Hz	0.001 Hz	±(0.01 % m.v.+ 10 digits)
500.00 Hz	0.01 Hz	
5.0000 Hz	0.0001 kHz	
50.000 Hz	0.001 kHz	
500.00 Hz	0.01 kHz	
5.0000 Hz	0.0001 MHz	
10.000 Hz	0.001 MHz	

Sensitivity:

- the minimum value of effective voltage is 0.8 V at 20% to 80% of the duty cycle and <100 kHz;
- the minimum value of effective voltage is 5 V at 20% to 80% of the duty cycle and <100 kHz;

Measurement of frequency - electricity

Range	Resolution	Accuracy
40.00 Hz...10.000 kHz	0.01 Hz...0.001kHz	0.5 % m.v.

- Sensitivity: 1 V RMS

Duty cycle measurement (filling)

Range	Resolution	Accuracy
0.10...99.90%	0.01%	±(1.2 % m.v.+ 2 digits)

- Pulse width: 100 μ s...100 ms
- Frequency: 5 Hz...150 kHz

Measurement of current loop 4-20mA%

Range	Resolution	Accuracy
-25.00...125.00%	0.01%	\pm (50 digits)

- 0 mA = -25%
- 4 mA = 0%
- 20 mA = 100%
- 24 mA = 125%

Temperature Measurement

Range	Resolution	Accuracy
-50.0...1000.0 $^{\circ}$ C	0.1 $^{\circ}$ C	\pm (1.0% m.v.+ 2.5 $^{\circ}$ C)
-58.0...1832.0 $^{\circ}$ F	0.1 $^{\circ}$ F	\pm (1% m.v.+ 4.5 $^{\circ}$ F)

- The accuracy of the temperature probe is not taken into account.

Electrical safety:

- Insulation: double, according to EN 61010 - 1 and IEC 61557
- Measurement category: IV 600 V / III 1000 V in accordance to EN 61010 - 1:2004

Other technical data:

- Power supply: rechargeable battery Li-Pol 7,2 V,
- Diode test: I = 0,9 mA, U₀ = 3,2 V DC,
- Continuity test: I < 0,35 mA, sound signal for R < 25 Ω ,
- Overrange indication: OL displayed,
- Measurement rate: 20 readings per minute,

- Input impedance: >10 M Ω (V DC), >9 M Ω (V AC),
- Display: color TFT with resolution 320x240 pixels 3,5", 50 000 counts,
- Dimensions: 220 x 97 x 58 mm,
- Weight (with batteries): 342 g,
- Fuses: mA, μ A ranges: 0,8 A/1000 V ceramic fast blow; 10 A range: 10 A/1000 V ceramic fast blow,
- Auto power-OFF: adjustable 5...60 minutes
- compliance with the requirements of the following standards: EN 61010-1, UL 61010-1:2004, CAN/CSA C22.2 No. 61010-1, UL 61010B-2-031, EN 61326-1, EN 61326-2-2
- Quality standard: ISO 9001

Nominal conditions:

- Operate temperature: +5..+40°C,
- Humidity < 80% for \leq 31°C, decreasing linearly to 50% at 40°C
- Storage temperature: -20...+60°C