

# METRAClip 72 and 75 Clip-On Multimeters

3-349-250-03  
2/3.10

- **Clip-on current measurement:**  
A AC RMS and DC  
(automatic or manual switching)
- **Multimeter functions:**  
V (AC RMS and DC)  
 $\Omega$  Resistance and continuity testing:  
Indication if a programmable threshold is fallen short of  
→ Diode test
- **Additional measurements:**  
METRAClip 72: Frequency (Hz),  
power (W), power factor,  
phase sequence (2-wire connection)  
Inrush function:  
tracking of rapid current changes  
METRAClip 75: Temperature in °C or °F  
with type K thermocouple (accessory)
- **Compact and user-friendly**  
One-hand operation and illuminated digital display
- **Extremely safe** thanks to CAT III 600 V



## Applications

- Measurement of starting current for electric motors
- Measurement of motor temperature rise with temperature sensors
- Measurement of direct current, e.g. automotive batteries

## Features

### Display Memory (data hold)

The momentary measured value can be “frozen” at the display.

### Data Logging (max., min., peak)

Measured values can be stored for long-term observation of measured quantities. At the same time, maximum, minimum and peak values are acquired for the duration of the selected recording time.

### Safety Features

- If the V-LIVE function is activated, signals with a value of greater 45 V are indicated acoustically.
- Visual indication is provided in the event that the measuring range is exceeded.
- An intermittent acoustic signal warns the user of voltages which are equal to or greater than the safety voltage of 600 V<sub>DC</sub> or RMS.

### Automatic Shutdown

The device is shut down automatically in the event that none of the keys or the rotary switch are activated for a duration of 10 minutes. Automatic shutdown can be deactivated.

### Inrush Current (METRAClip 72 only)

Measurement of motor starting current characteristics based upon the relationship between amplitude and time.

## Applicable Regulations and Standards

IEC 61010-1/EN 61010-1/ VDE 0411-1	Safety requirements for electrical equipment for measurement, control and laboratory use
IEC 61010-2-032/ EN 61010-2-032/ VDE 0411-2-032	Special requirements for clip-on ammeters
DIN EN 61326 VDE 0843, part 20	Electrical equipment for control technology and laboratory use – EMC requirements

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## Characteristic Values

### LCD panel

Display	7-segment characters
Number of places	4-place, 4000 digits
Refresh rate	400 ms (2.5 x/s)

### Key

rdg.	Measured value (reading)
d	Digits

### Current Measurement via Clip-On Ammeter, A AC/DC

Measuring Range	Resolution	Intrinsic uncertainty under Reference Conditions	Overload Capacity	
			Value	Time
0.20 ... 39.99 A <sub>RMS</sub>	10 mA	1.5% rdg. + 10 d		
40.0 ... 399.9 A <sub>RMS</sub>	100 mA	1.5% rdg. + 2 d		
400 ... 600 A <sub>pp</sub>	1 A			

AC frequency range: 45 to 65 Hz (reference range)

### Voltage, V AC/DC

Measuring Range	Resolution	Intrinsic uncertainty under Reference Conditions	Overload Capacity	
			Value	Time
0.2 ... 39.99 V <sub>RMS</sub>	10 mV	1.0% rdg. + 5 d	600 V AC/DC	Cont.
40.0 ... 399.9 V <sub>RMS</sub>	100 mV	1.0% rdg. + 2 d		
400 ... 900 V <sub>pp</sub>	1 V			

AC frequency range: 45 to 65 Hz (reference range)

Input impedance: 1 MΩ

### Continuity Testing Ω (acoustic, programmable threshold up to 40 Ω)

Measuring Range	Resolution	Intrinsic uncertainty under Reference Conditions*	Overload Capacity	
			Value	Time
0.0 ... 399.9 Ω	0.1 Ω	1.0% rdg. + 2 d	500 V AC/750 V DC/V <sub>pp</sub>	Cont.

\* With compensation for measurement cable resistance

Open-circuit voltage: ≤ 3.2 V

Test current: 320 μA

### Resistance Measurement Ω

Measuring Range	Resolution	Intrinsic uncertainty under Reference Conditions <sup>1</sup>	Overload Capacity	
			Value	Time
0.0 ... 399.9 Ω	0.1 Ω	1.0% rdg. + 2 d	500 V AC/750 V DC/V <sub>pp</sub>	Cont.
400 ... 3999 Ω	1 Ω			
4.00 ... 39.99 kΩ <sup>2</sup>	10 Ω			

<sup>1</sup> With compensation for measurement cable resistance

<sup>2</sup> METRAClip72 only

Open-circuit voltage: ≤ 3.2 V

Test current: 400 Ω range: 320 μA  
4/40 kΩ range: 40 μA

### Semiconductor Test

Measuring Range	Resolution	Intrinsic uncertainty under Reference Conditions	Overload Capacity	
			Value	Time
0.000 ... 3.199 V	1 mV	1.0% rdg. + 2 d	500 V AC/750 V DC/V <sub>pp</sub>	Continuous

Test Current: 2 mA to 4 mA depending upon measured voltage

### Inrush Function (METRAClip72 only)

This function makes it possible to track rapid current changes of the damped sinusoidal vibration type by measuring successive RMS values which are calculated over ½, 1, 2½, 5 and 10 periods based upon the largest calculated RMS value, and are refreshed by means of a half-wave.

Applications include:

- Measurement of starting current for electric motors
- Precise specification of fuses and protective circuit breakers (relationship between amplitude and signal time)
- Stressing components with a current overload

The range of applications is limited to industrial frequencies (15 to 70 Hz).

Accuracy 8% + 10 digits

Acquisition time 10 signal freq. periods (200 ms at 50 Hz)

### Active Power W (METRAClip72 only)

Display Range	Measuring Range	Resolution	Intrinsic uncertainty under Reference Conditions
4000 W	5 ... 3999 W	1 W	2.0% rdg. + 1 d
40 kW	4.00 ... 39.99 kW	10 W	
400 kW	40.0 ... 240.0 kW *	100 W	

\* The range is limited to 240 kW for single-phase measurement (600 V x 400 A)

### Power Factor PF (METRAClip72 only)

Measuring Range	Resolution	Intrinsic uncertainty under Reference Conditions
0.20 ... 0.49	0.01	2% rdg. + 2 d
0.50 ... 1.00		5% rdg. + 2 d

### Frequency Measurement for V, A and W functions (METRAClip72 only)

Measuring Range	Resolution	Intrinsic uncertainty under Reference Conditions
10.00 ... 39.99 Hz	0.01 Hz	4% rdg. + 1 d
40.0 ... 399.9 Hz	0.1 Hz	
400 ... 3999 Hz	1 Hz	
4.00 ... 19.99 kHz	10 Hz	

Frequency measurement is performed on the voltage signal in the power function.

### Phase Sequence (METRAClip72 only)

Frequency range 47 to 53 Hz or 57 to 63 Hz

Allowable voltage range 50 to 600 V

Allowable phase shift ±10°

Allowable amplitude deviation 20%

Allowable harmonic component 10% for voltage

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## Temperature Measurement (METRAClip75 only)

Meas.	Display Range	Measuring Range	Resolution	Intrinsic Error under Reference Conditions
Internal	400° C	-10 ... +50.0° C	0.1 °C 0.2 °F	±1.5° C ±2.7° F
	400° F	+15 ... +120.0° F		
Type K Thermo- couple	400° C	-50 ... +399.9° C	1° C	1% rdg. ±1.5° C 1% rdg. ±2.7° F
	400° F	-50 ... +399.9° F		
	4000° C	+400 ... +1000.0° C	1° F	
	4000° F	+400 ... +1832.0° F		

## Reference Conditions

Ambient temperature	+23° C ±3 K
Relative humidity	45 ... 75%
Battery voltage	8.5 V ±0.5 V
Frequency of AC components in the signal	45 ... 65 Hz
Crest factor of the utilized alternating range	$\sqrt{2}$
Conductor position	Centered
Conductor diameter	≤ 5 mm
AC magnetic field	None
Electrical field	None

## Power Supply

Battery	9 V, IEC 6LF22, 6LR61 or NEDA 1604
Service life	With alkaline manganese batteries: METRAClip72: 60 hours or approximately 20,000 measurements of 10 seconds each METRAClip75: 75 hours or approximately 25,000 measurements of 10 seconds each
Battery level indication	Blinking battery symbol: Less than 1 hour operating time remains Continuously displayed battery symbol: Battery requires replacement
Automatic shutdown	After 10 minutes

## Electrical Safety

Safety class	II (total insulation) per IEC 61010-1/ EN 61010-1/VDE 0411-1
Overvoltage category	CAT III 600 V or CAT IV 300 V
Fouling factor	2
Nominal insulation voltage	600 V

## Ambient Conditions

Operating temperature	0° C ... +50° C
Storage temperature	-40° C ... +70° C (without batteries)
Relative humidity	10 ... 90% at max. 40° C, no condensation allowed
Deployment	Indoors only
Elevation	to 2000 m

## Electromagnetic Compatibility (EMC)

(per EN 61326-1, issue 97 + A1)

Interference emission	Class B
Interference immunity	- Electrostatic discharge: 4 kV direct contact, evaluation criterion B 8 kV atmospheric, evaluation criterion B - Radiation fields: 10 V/m, evaluation criterion A - Rapid transients: 1 kV, evaluation criterion B - Conducted interference: 3 V, evaluation criterion A

## Mechanical Design

Protection	IP 40
Clip opening	Max. 26 mm dia.
Dimensions	W x H x D: 70 x 193 x 37 mm
Weight	Approx. 260 g

# METRAClip72 and 75 Clip-On Multimeters

## Standard Equipment, METRAClip72

- 1 clip-on multimeter with battery
- 2 measurement cables, each with contact protected plug and test probe, 1000 V/16 A CAT III
- 1 alligator clip
- 1 carrying pouch with holding strap
- 1 set operating instructions

## Standard Equipment, METRAClip75

- 1 clip-on multimeter with battery
- 2 measurement cables, each with contact protected plug and contact protected test probe, 1000 V/12 A CAT III
- 1 adapter for type K thermocouple
- 1 carrying pouch with holding strap
- 1 set operating instructions

### Carrying Pouch with Holding Strap



## Order Information

Description	Type	Article Number
Handy, digital RMS clip-on meter for up to 400 A AC/DC, power, voltage, resistance, continuity and more, in blister pack, includes 2 measurement cables with test probe, 9 V battery, 1 alligator clip, operating instructions, in carrying pouch	METRAClip72	M312E
Handy, digital, RMS clip-on meter for up to 400 A AC/DC, temperature, voltage, resistance, continuity and more, in blister pack, includes 2 measurement cables with test probe, 9 V battery, 1 adapter for type K thermocouple, operating instructions, in carrying pouch (especially suitable for automotive technology)	METRAClip75	M312H
<b>Accessories for METRAClip75</b>		
Standard plug-in immersion sensor, type K thermocouple, to + 1100° C	Z3431-5	GTZ3431005R0001
Plug-in surface sensor, type K thermocouple, to + 850° C	Z3431-6	GTZ3431006R0001
High temperature plug-in sensor tape, type K thermocouple, to + 450° C	Z3431-7	GTZ3431007R0001
Flexible, insulated plug-in sensor, type K thermocouple, to + 250° C	Z3431-8	GTZ3431008R0001

Please refer to our *Measuring Instruments and Testers* catalog for additional information concerning accessories.