

## M70

### COMBINED INSTRUMENT FOR MEASURING INSULATION AND CONTINUITY OF PROTECTIVE AND EQUIPOTENTIAL CONDUCTORS

Model M70 is an innovative instrument, perfectly portable and mainly suitable for measuring insulation resistance with test voltage up to 1000VDC and continuity of protective and equipotential conductors with a current of 200mA, in compliance with the requirements of standard IEC/EN61557-1 in civil and industrial electric systems. The instrument can also be used for measuring insulation on electric panels in compliance with standard IEC/EN60439-1. Thanks to the LOCK function, insulation measurement can be carried out continuously over time, thus testing the insulation of the item being tested, by carrying out duration tests. Measurement with programmable timer between 2 and 60s is also possible. The functions also include measurement of AC/DC voltage, measurement of resistance and continuity test with buzzer, as a common digital multimeter. The wide and backlit custom display for comfortably reading measures also in poorly lit environments, the ergonomic structure with small overall dimensions, the innovative electronic selector and the extremely light weight make M70 an indispensable instrument for all industrial installers and/or testers.

#### FUNCTIONS

- Insulation with 250, 500, 1000VDC test voltage
- Measuring range up to 4G $\Omega$
- Automatic discharge of tested item
- LOCK function for continuous measurements
- Insulation with programmable timer between 2 and 60s
- Continuity of protective conductors with 200mA
- Measuring probe self-calibration
- AC/DC voltage up to 600V
- Resistance and continuity test with buzzer
- Wide backlit display
- AutoPowerOFF
- Weight: approx. 2kg

#### TECHNICAL SPECIFICATIONS

##### Insulation resistance

Test voltage:	250, 500, 1000VDC
Measuring range:	0.001M $\Omega$ $\div$ 4G $\Omega$
Resolution:	0.001M $\Omega$ $\div$ 1M $\Omega$
Basic accuracy:	$\pm(2.0\%rdg + 5dgt)$
Overload protection:	605V max rms

##### Continuity of protective conductors

Test current:	>200mADC
Measuring range:	0.01 $\Omega$ $\div$ 19.99 $\Omega$
Resolution:	0.01 $\Omega$
Basic accuracy:	$\pm(2.0\%rdg + 3dgt)$
Overload protection:	605V max rms

##### AC/DC voltage

Measuring range:	0.1V $\div$ 600V
Resolution:	0.1mV
Basic accuracy:	$\pm(0.5\%rdg + 1dgt)$
Overload protection:	600V AC rms

#### GENERAL SPECIFICATIONS

Display with backlighting:	LCD, 4 dgt, 10000 points
Power supply:	4x1.5V batteries type AA
AutoPowerOFF:	after 15 min of idleness
Safety:	IEC/EN61010-1
Measurement category:	CAT III 550V
Dimensions (LxWxH):	240x100x45mm
Weight (batteries included):	450g

#### ACCESSORIES

<b>Standard</b>
Set of 2 cables + 2 alligator clips + 1 test lead
Batteries
Carrying bag
CE declaration of conformity
User manual

M70  
HV000070





## 1. ELECTRICAL SPECIFICATIONS

Accuracy is indicated as  $\pm$  [% readings + (no. of digits\*resolution)] at 23°C  $\pm$  5°C, <60%HR

### Continuity test on protective and equalizing conductors

Range	Resolution	Accuracy	Overload protection
0.00 $\div$ 19.99 $\Omega$	0.01 $\Omega$	$\pm(2.0\%rdg + 3dgt)$	605Vrms Max

Test current: >200mA DC for R $\leq$ 5 $\Omega$  (included calibration of test leads)> 10mA DC per R>5 $\Omega$  (included calibration of test leads)

Open voltage: 4 &lt; Vo &lt; 24VDC

### Insulation Resistance (DC voltage)

Test voltage	Range	Resolution	Accuracy	Overload protection
250V	0.001 $\div$ 0.100M $\Omega$	0.001M $\Omega$	$\pm 10dgt$	605Vrms Max
	0.101 $\div$ 3.999M $\Omega$		$\pm(2.0\%rdg + 5dgt)$	
	4.00 $\div$ 39.99M $\Omega$	0.01M $\Omega$	$\pm(5.0\%rdg + 5dgt)$	
	40.0 $\div$ 399.9M $\Omega$	0.1M $\Omega$		
	400 $\div$ 1000M $\Omega$	1M $\Omega$		
500V	0.001 $\div$ 0.250M $\Omega$	0.001M $\Omega$	$\pm 15dgt$	
	0.251 $\div$ 3.999M $\Omega$		$\pm(2.0\%rdg + 5dgt)$	
	4.00 $\div$ 39.99M $\Omega$	0.01M $\Omega$	$\pm(5.0\%rdg + 5dgt)$	
	40.0 $\div$ 399.9M $\Omega$	0.1M $\Omega$		
	400 $\div$ 2000M $\Omega$	1M $\Omega$		
1000V	0.001 $\div$ 0.250M $\Omega$	0.001M $\Omega$	$\pm 15dgt$	
	0.251 $\div$ 3.999M $\Omega$		$\pm(2.0\%rdg + 5dgt)$	
	4.00 $\div$ 39.99M $\Omega$	0.01M $\Omega$	$\pm(3.0\%rdg + 5dgt)$	
	40.0 $\div$ 399.9M $\Omega$	0.1M $\Omega$		
	400 $\div$ 1000M $\Omega$	1M $\Omega$		$\pm(5.0\%rdg + 10dgt)$
	1000 $\div$ 4000M $\Omega$			

Open voltage: &lt;1.3 x Vo

Accuracy nominal test voltage: -0%, +10%

Short circuit current: &lt;3.0mA

Nominal test current: 1mA @ 1K $\Omega$  x V (1mA @ 500K $\Omega$ )

### DC Voltage

Range	Resolution	Accuracy	Input impedance	Overload protection
0.1 $\div$ 600.0V	0.1mV	$\pm(0.5\%rdg + 1dgt)$	3M $\Omega$	605Vrms Max

### AC Voltage

Range	Resolution	Accuracy	Input impedante	Overload protection
0.1 $\div$ 600.0V	0.1mV	$\pm(0.8\%rdg + 4dgt)$	3M $\Omega$	605Vrms Max

Max crest factor:  $\sqrt{2}$ 

### Resistance and Continuity test

Range	Resolution	Accuracy	Overload protection
0.00 $\div$ 19.99 $\Omega$	0.01 $\Omega$	$\pm(2.0\%rdg + 3dgt)$	605Vrms max for 1min

Buzzer sound for resistance <2 $\Omega$




## 2. GENERAL SPECIFICATIONS

### DISPLAY:

Features:	double LCD Custom 4 digit with rdg max 9999 points sign and decimal point
Sample rate:	2times/s
Conversion:	Average value

### POWER SUPPLY:

Batteries:	4 x1.5V type LR6-AA-AM3-MN 1500 alkaline batteries
Low battery indication:	"  +" symbol at display
Life batteries:	Multimeter: about 50 hours
	Lo $\Omega$ : > 1000 test @ 1 $\Omega$
	M $\Omega$ 250: >1000 test @ 480k $\Omega$
	M $\Omega$ 500: >1000 test @ 480k $\Omega$
	M $\Omega$ 1000: >1000 test @ 480k $\Omega$

### MECHANICAL FEATURES:

Dimensions (L x W x H):	240 x 100 x 45mm
Weight (included batteries):	450g

### WORKING ENVIRONMENTAL CONDITIONS:

Reference temperature:	23°C $\pm$ 5°C
Working temperature:	0° $\div$ 50°C
Allowed relative humidity:	<70%HR
Storage temperature:	-10 $\div$ 60°C
Storage humidity:	<70%HR

### REFERENCE STANDARDS:

Continuity test with 200mA:	IEC/EN61557-4
Insulation resistance:	IEC/EN 61557-2
Insulation test on electrical switchboards:	IEC/EN60439-1
Insulation test on electrical machines:	IEC/EN60204-1

### GENERAL REFERENCE STANDARDS:

Safety of measuring instruments:	IEC/EN61010-1
Product type standard:	IEC/EN61557
Insulation:	double insulation
Pollution degree:	2
Overvoltage category:	CAT III 550V (Phase – Ground) CAT III 550V (Phase – Phase)
Max height of use:	2000m

**This instrument complies with the requirements of the European Low Voltage Directives 2006/95/EEC (LVD) and EMC 2004/108/EEC**