

M72 - ISO410

MULTIFUNCTION INSTRUMENT FOR MEASURING INSULATION AND CONTINUITY OF PROTECTIVE CONDUCTORS

Models M72 and ISO410 are innovative instruments for carrying out insulation resistance measurements on civil and industrial electric systems in compliance with standard IEC/EN61557-1 but with a great flexibility for use in compliance with standards such as IEC/EN60204-1 (electric machines) or IEC/EN60439-1 (ANS electric panels). Model ISO410, differently from M72, allows storing each measurement result in its own internal memory and downloading the saved data onto the PC with the aid of the dedicated software. ISO410 also allows carrying out measurements by using a remote switch (optional accessory PR400), which makes it much easier to carry out more measurements one after the other. Model M72 is provided with a powerful multi-meter function for measuring quantities in true RMS value (TRMS), which is useful when solving any kind of electric problem.

FUNCTIONS	M72	ISO410
Continuity with 200mA	•	•
Insulation with 250, 500VDC	•	•
Insulation with 50, 100, 250, 500, 1000VDC		•
Insulation measuring range	0.01MΩ-2GΩ	0.01MΩ-2GΩ
Automatic discharge of tested item	•	•
Measuring probe self-calibration	•	•
Limit setting on measurement		•
Phase sequence indication	•	
DC/AC TRMS voltage	•	
DC/AC TRMS current	•	
Resistance and continuity test	•	
Data HOLD, MAX/MIN/AVG	•	
Voltage and current PEAK measurement	•	
Leakage current measurement (with optional clamp HT96U)	•	
Activation of measurements (with optional remote probe PR400)		•
Help on line on the display		•
Storage of results		•
Optical/USB interface for connection to PC		•
Safety	EN61010-1	EN61010-1
Measurement category	CAT III 550V	CAT III 265V
Power supply	4x1.5V bat.type AA	6x1.5V bat.type AA
Dimensions (LxWxH):	240x100x45	222x162x57
Weight (batteries included)	450g	1Kg

ACCESSORIES	Code
Set of 2 cables with test leads + 2 alligator clips (only M72)	KIT0075
Set of 3 cables + 3 alligator clips + 1 test leads (only ISO410)	UNIVERSALKIT
Carrying bag (only M72)	BORSA75
Carrying bag (only ISO410)	BORSA75N
ISO9000 calibration certificate	
User manual on CD-ROM	
Quick reference guide	
Optional	
PC Windows software + optical / USB cable (only ISO410)	TOPVIEW2006
Clamp 1-100-1000A/1V AC, diameter 54mm (only M72)	HT96U
Clamp 400A AC, diameter 30mm (only M72)	HT4003
Clamp 200A/1V AC, diameter 40mm (only M72)	HT4005K
Clamp 10-100A/1V DC, diameter 32mm (only M72)	HT4004N
Adapter for connection of HT96U, HT4004N, HT4005K clamps (only M72)	NOCANBA
Switch probe (only ISO410)	PR400
Hands-free kit (only ISO410)	SP-0400
Magnetic adapter for connection to screw heads	606-IECN
Safety flexible alligator clip	6007-IEC#

Optional accessories



PR400
Switch probe



M72
HV000072



ISO410
HV000410



1. TECHNICAL SPECIFICATIONS – DMM FUNCTIONS

Accuracy is indicated as \pm (% readings + no. of digits) at 23°C \pm 5°C, relative humidity HR <70%

DC VOLTAGE (Autorange)

Range	Resolution	Accuracy	Input impedance	Overload protection
1.0mV \div 999.9mV	0.1mV	$\pm(0.5\%rdg + 2\text{ dgt})$	1M Ω	605Vrms max
1.000V \div 9.999V	1mV			
10.00V \div 99.99V	10mV			
100.0V \div 605.0V	100mV			

AC VOLTAGE TRMS (Autorange)

Range	Resolution	Accuracy (30 \div 70Hz)	Accuracy (70 \div 400Hz)	Input Impedance	Crest factor
1.0mV \div 999.9mV	0.1mV	$\pm(1.0\%rdg + 2\text{ dgt})$	$\pm(2.0\%rdg+2\text{ dgt})$	1M Ω	3
1.000V \div 9.999V	1mV				1.5
10.00V \div 99.99V	10mV				
100.0V \div 605.0V	100mV				

AC/DC VOLTAGE: MAX / MIN / AVG / PEAK

Function	Range	Resolution	Accuracy	Response time
MAX, MIN, AVG	1.0mV \div 999.9mV	0.1mV	$\pm(5.0\%rdg + 10\text{ dgt})$	500ms
	1.000V \div 9.999V	1mV		
	10.00V \div 99.99V	10mV		
	100.0V \div 605.0V	100mV		
PEAK	10.0mV \div 999.9mV	0.1mV		1ms
	1.000V \div 9.999V	1mV		
	10.00V \div 99.99V	10mV		
	100.0V \div 605.0V	100mV		

DC/AC CURRENT TRMS (with external clamp)

Range	Resolution	DC Accuracy	Accuracy (30 \div 70Hz)	Accuracy (70 \div 400Hz)	Crest factor	Overload protection
1.0mV \div 999.9mV	0.1mV	$\pm(0.5\%rdg+2\text{ dgt})$	$\pm(1.0\%rdg+2\text{ dgt})$	$\pm(2.0\%rdg+2\text{ dgt})$	3	605Vrms max
1.000V \div 1.200V	1mV				1.5	

Note: accuracy indicated don't consider clamp accuracy. Please refer also to transducers clamp user's manual.

AC/DC CURRENT: MAX / MIN / AVG / PEAK (with external clamp)

Function	Range	Resolution	Accuracy	Response time	Overload protection
MAX, MIN, AVG	1.0mV \div 999.9mV	0.1mV	$\pm(5.0\%rdg+10\text{ dgt})$	500 ms	605Vrms max
	1.000V \div 1.200V	1mV			
PEAK	10.0mV \div 999.9mV	0.1mV		1ms	
	1.000V \div 3.000V	1mV			

RESISTANCE AND CONTINUITY TEST

Range	Resolution	Accuracy	Continuity test	Overload protection
0.00 Ω \div 39.99 Ω	0.01 Ω	$\pm(1.0\%rdg+5\text{ dgt})$	R \leq 40 Ω	605Vrms max for 1 minute
40.0 Ω \div 399.9 Ω	0.1 Ω			
400 Ω \div 3999 Ω	1 Ω			
4.00k Ω \div 39.99k Ω	10 Ω			

FREQUENCY (with test leads)

Range	Resolution	Accuracy	Input voltage	Overload protection
30.0 \div 199.9Hz	0.1Hz	$\pm(0.5\%rdg+2\text{ dgt})$	1.0mV \div 605V	605Vrms max
200 \div 400Hz	1Hz			

FREQUENCY (with external clamp)

Range	Resolution	Accuracy	Input voltage	Overload protection
30.0 \div 199.9Hz	0.1Hz	$\pm(0.5\%rdg+2\text{ dgt})$	1.0mV \div 1.000V	605Vrms max
200 \div 400Hz	1Hz			





2. TECHNICAL SPECIFICATIONS – VERIFY TESTS

Accuracy is indicated as \pm (% readings + no. of digits) at 23°C \pm 5°C, relative humidity HR <70%

Continuity test on protective and equalizing conductors

Range (Ω)	Resolution (Ω)	Accuracy	Overload protection
0.01 \div 19.99	0.01	$\pm(5.0\% \text{ rdg} + 3\text{dgt})$	605Vrms max
20.0 \div 99.9	0.1		

Test current: > 200mA DC for $R \leq 4\Omega$ (included calibration)
Resolution on current measurement: 1mA

Open-circuit voltage: $4V \leq V_0 \leq 24V$

Insulation Resistance

Range (M Ω)	Resolution (M Ω)	Accuracy	Overload protection
0.00 \div 19.99	0.01	$\pm(5.0\% \text{ rdg} + 2\text{dgt})$	605Vrms max
20.0 \div 199.9	0.1		
200 \div 999	1	$\pm(10.0\% \text{ rdg} + 2\text{dgt})$	

Test Voltage: 500V DC
Test voltage accuracy: $-0\% \div +10\% \text{ rdg}$
Short circuit current: <3.0mA
Nominal test current: 1mA @ 1k Ω x Vnom ; 1mA @ 500 k Ω

PHASE SEQUENCE / CONFORMITY (1 wre measurement)

Type of measure	Voltage range (V)	Frequency range (Hz)	System type
SEQUENCE	90 \div 315 (Phase – Earth)	45 \div 65	up to 315 (Phase – Earth)
CONFORMITY			up to 550V (Phase – Phase)

PHASE SEQUENCE / CONFORMITY (2 wre measurement)

Type of measure	Voltage range (V)	Frequency range (Hz)	System type
SEQUENCE	110 \div 315 (Phase – Neutral)	45 \div 65	up to 315 (Phase – Earth)
CONFORMITY			up to 550V (Phase – Phase)

Max crest factor :1.5

NOTE: the two-wire measurement can be performed also phase to phase in plants without neutral, even with one phase to earth, but always with phase to phase voltage up to 550V



3. GENERAL SPECIFICATIONS

DISPLAY:

Features:	Dual numeric, 9999 points
Display update:	2 times/sec
Visible area:	73x73 mm

POWER SUPPLY:

Batteries:	4 batteries 1.5V type LR6-AA-AM3-MN 1500
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ELECTRICAL FEATURES:

Conversion:	AC 16 Bit, TRMS
Sample frequency:	64 sample/period

MECHANICAL FEATURES:

Dimensions:	240(W) x 100(L) x 45(D) mm
Weight (included batteries):	about 630 g

WORKING ENVIRONMENTAL CONDITIONS:

Reference temperature:	23°C ± 5°C
Working temperature:	0° ÷ 40°C
Allowed relative humidity:	< 70% HR
Storage temperature:	-10 ÷ 60°C
Storage humidity:	< 70% HR

TEST VERIFIES REFERENCE STANDARDS:

Continuity test with 200mA:	IEC/EN61557-4
Insulation resistance:	IEC/EN61557-2
Phase sequence indication:	IEC/EN61557-7

GENERAL REFERENCE STANDARDS:

Safety of measuring instruments:	EN61010-1 + A2(1997)
Product type standard:	IEC61557-1, 2, 4, 7
Insulation:	class 2 (double insulation)
Pollution degree:	2
Overvoltage category:	CAT III 550V AC Phase - Ground CAT III 550V AC Phase - Phase
Use:	internal use; max altitude: 2000m
EMC:	EN61326-1 (1998) + A1 (1999)

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