AMPI

Multifunctional meter for electrical installations

MODELS
502, 506, 520, 525, 530-IT, 540 & 540-PV

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amperis

AMPI-502

Multifunctional meter for electrical installations

Features

- Measuring the short circuit loop
- Type AC and A earth leakage protection test
- Low voltage measurement of continuity and resistance of circuits
- Management of measurement data using open

Measured parameters

- Measuring the short circuit loop

- Measurement of the short-circuit impedance in 220/380 V, 230/400 V, 240/415 V networks and at a frequency of 45...65 Hz, - working voltage range: 180 ... 460 V
- Indication of the short-circuit loop resistance R and the short-circuit loop reactance X
- Measuring the short circuit impedance with a 15 mA current without differential tripping
- Maximum measuring current: 7.6 A (at 230 V), 13.3 A (at 400 V)

- Testing of AC and A-type earth leakage protection

- Testing of general and selective differential protections for differential currents of 10, 30, 100, 300, 500 mA.
- Measurement of I_A and triggering time t_A for the currents 0.5IΔn, 1IΔn, 2IΔn, 5IΔn
- E_R e and UB measurement without differential tripping
- Extended AUTO function with RCD measurement, with the possibility of measuring ZL-PE with a small current
- I_A and t_A measurement with RCD triggering

- Low voltage measurement of continuity and resistance of circuits s

- Resistance measurement with a current of ±200 mA according to IEC 61557-4
- Autocalibration of test leads - any length of test probe can be used
- Low-current resistance measurement with an acoustic signal

Technical specifications

Measurement of short-circuit loop impedance Z_{L-PE}, Z_{L-N}, Z_{L-L}

Measurement using the 7.6/13.3 A current range - from of according to IEC 61557-3: 0.13...1999 Ω

Range	Resolution	Basic error
0,00...19,99 Ω	0,01 Ω	±(5% v.m. + 3 digits)
20,0...199,9 Ω	0,1 Ω	
200...1999 Ω	1 Ω	

Z_{L-PE} short circuit impedance measurement in RCD mode

Measured using a 15 mA current range of in accordance with IEC 61557: 0.50...1999 Ω

Range	Resolution	Accuracy
0,00...19,99 Ω	0,01 Ω	±(6% v.m. + 10 digits)
20,0...199,9 Ω	0,1 Ω	±(6% v.m. + 5 digits)
200...1999 Ω	1 Ω	

MEASUREMENTS OF RCD CIRCUIT BREAKER PARAMETERS (VOLTAGE RANGE 180...270 V)

RCD trip test and time measurement according to IEC 61557-3: 0.13....1999 Ω of triggering t_A (for the t_A function)

Switch type	Setting the multiplication factor	Measuring range	Resolution	Basic error
General type	0,5 IΔn	0...300 ms	1 ms	±(2% v.m. + 2 digits)
	1 IΔn			
	2 IΔn	0...150 ms		
	5 IΔn	0...40 ms		
Selective	0,5 IΔn	0...500 ms		
	1 IΔn			
	2 IΔn	0...200 ms		
	5 IΔn	0...150 ms		

Measurement of the I_A differential cut-off current for the sinusoidal waveform test current

Current selected	Measuring range	Resolution	Test current	Basic error
10 mA	3,0...10,0 mA	0,1 mA	0,3 IΔn...1,0 IΔn	±5% IΔn
30 mA	9,0...30,0 mA			
100 mA	30...100 mA	1 mA		
300 mA	90...300 mA			
500 mA	150...500 mA			

- The start of the measurement of the positive or negative half-periods of the generated current.

I_A trip current measurement for unidirectional pulsed residual current

Current selected	Measuring range	Resolution	Test current	Basic error
10 mA	4,0...20,0 mA	0,1 mA	0,35 IΔn ...2,0 IΔn	±10% IΔn
30 mA	12,0...42,0 mA		0,35 IΔn ...1,4 IΔn	
100 mA	40...140 mA	1 mA		
300 mA	120...420 mA			

- Measurement of positive or negative half-periods of the generated leakage current

Electrical safety	
Insulation type according to PN-EN 61010-1 and IEC 61557	double
Measurement category according to PN-EN 61010-1	IV 300V
Degree of protection of the housing according to PN-EN 60529	IP67

Other technical data	
Dimensions	220 x 98 x 58 mm
Weight	approx. 1 kg
Automatic shutdown time	300, 600, 900 seconds
Number of Z and differential measurements (for Ni-Cadmium batteries)	>5000 (2 per minute)
The equipment meets the requirements of the standard	EN 61326-1 EN 61326-2-2

AMPI-506

Multifunctional meter for electrical installations

Measured parameters

- Measuring the short circuit loop

- Measurement of short circuit impedance in 220/380 V, 230/400 V, 240/415 V networks and at a frequency of 45...65 Hz - Operating voltage range: 180 ... 460 V
- Indication of the short-circuit loop resistance R and the short-circuit loop reactance X
- Measuring the short circuit impedance with a 15 mA current without differential tripping
- Maximum measuring current: 7.6 A (at 230 V), 13.3 A (at 400 V)

- Type AC and A earth leakage protection test

- Testing of general and selective differential protections for differential currents of 10, 15, 30, 100, 300, 500 mA.
- Measurement of IA and triggering time t_A for the currents 0.5 IΔn, 1 IΔn, 2 IΔn, 5 IΔn
- ER and UB measurement without differential tripping
- Extended AUTO function with RCD measurement, with the possibility of measuring Z_{L-PE} with a small current
- I_A and t_A measurement with RCD triggering

- Insulation resistance measurements

- Measuring voltages: 100 V, 250 V, 500 V

- Low voltage measurement of continuity and resistance of circuits

- Resistance measurement with a current of ±200 mA according to IEC 61557-4
- Autocalibration of test leads - any length of test probe can be used
- Low-current resistance measurement with an acoustic signal

- Indications of the phase sequence

Additional functions

- Check the correctness of the PE conductor connection using the contact electrode.
- Measurement of mains voltage (0...500 V) and frequency
- 990 result memory, wireless data transmission data to the PC
- Illuminated keyboard

Technical specifications

Measurement of short-circuit loop impedance Z_{L-PE}, Z_{L-N}, Z_{L-L}

Measurement using the 7.6/13.3 A current range - from of according to IEC 61557-3: 0.13...1999 Ω

Range	Resolution	Accuracy
0,00...19,99 Ω	0,01 Ω	±(5% v.m. + 3 digits)
20,0...199,9 Ω	0,1 Ω	
200...1999 Ω	1 Ω	

Z_{L-PE} short circuit impedance measurement in RCD mode

Measured using a 15 mA current range of In accordance with IEC 61557: 0.50...1999 Ω

Range	Resolution	Accuracy
0,00...19,99 Ω	0,01 Ω	±(6% v.m. + 10 digits)
20,0...199,9 Ω	0,1 Ω	±(6% v.m. + 5 digits)
200...1999 Ω	1 Ω	

Insulation resistance measurement

Measuring range according to IEC 61557-2

- **U_{ISO} = 100 V: 100 kΩ...99,9 MΩ**
- **U_{ISO} = 250 V: 250 kΩ...199,9 MΩ**
- **U_{ISO} = 500 V: 500 kΩ...599,9 MΩ**

Range para U_{ISO} = 100 V	Resolution	Accuracy
0...1999 kΩ	1 kΩ	±(5% v.m. + 8 digits)
2,00...19,99 MΩ	0,01 MΩ	
20,0...99,9 MΩ	0,1 MΩ	

Range para U_{ISO} = 250 V	Resolution	Accuracy
0...1999 kΩ	1 kΩ	±(5% v.m. + 8 digits)
2,00...19,99 MΩ	0,01 MΩ	
20,0...199,9 MΩ	0,1 MΩ	

Range pour U_{ISO} = 500 V	Resolution	Accuracy
0...1999 kΩ	1 kΩ	±(5% v.m. + 8 digits)
2,00...19,99 MΩ	0,01 MΩ	
20,0...599,9 MΩ	0,1 MΩ	

MEASUREMENT OF RCD CIRCUIT BREAKER PARAMETERS (VOLTAGE RANGE 180...270 V)

Disconnection test of the RCDs and measurement of the tripping time t_A (for the t_A measurement function)

Type of RCD	Setting the multiplication factor	Masuring range	Resolution	Basic error
General type	0,5 IΔn	0...300 ms	1 ms	±(2% v.m. + 2 digits)
	1 IΔn			
	2 IΔn	0...150 ms		
	5 IΔn	0...40 ms		
Selective	0,5 IΔn	0...500 ms		
	1 IΔn			
	2 IΔn	0...200 ms		
	5 IΔn	0...150 ms		

Measurement of the trigger current of the RCD I_A for pulsed differential current unidirectional

Rated current	Measuring range	Resolution	Current measurement	Basic error
10 mA	3,0...10,0 mA	0,1 mA	0,3 IΔn...1,0 IΔn	±5% IΔn
15 mA	4,5...15,0 mA			
30 mA	9,0...30,0 mA			
100 mA	30...100 mA	1 mA		
300 mA	90...300 mA			
300 mA	150...500 mA			

• Start of measurement from the positive or negative half-period of the forced current

Indications of the phase sequence

- Indication of phase sequence: conforming, non-conforming
- Mains voltage range: 100...440 V
- Display of phase-to-phase voltage values

"v.m" - valor medido

Safety and working conditions	
Measurement category according to EN 61010	IV 300 V (III 600 V)
Income protection	IP67
Insulation type according to EN 61010-1 and IEC 61557	double
Dimensions	220 x 98 x 58 mm
Weight	aprox. 0,8 kg

Memory and communication	
Memory of measured results	990
Data transmission	Bluetooth

Other information	
Memory of measured results	EN 61326-1
Data transmission	EN 61326-2-2

AMPI-520

Multifunctional meter for electrical installations

- The MPI-520 multifunction meter is dedicated to performing diagnostics according to IEC 61557.

Features

- The AMPI-520 digital meter is designed to measure impedance in short circuit loops without tripping the differential protection, it also measures RCD parameters, grounding resistance, continuity and phase sequence control.
- In addition, it measures voltage, current, frequency and AC power.

Measured parameters

- Measuring the short circuit loop

- impedance measurement with 23 A (44 A phase to phase), short circuit resistance R =10Ω, zw
- Measuring range: 95...440V, frequency 45...65 Hz,

- Short circuit loop measurement with a resolution of 0.01 Ω, without triggering the ground leakage protection (I Δn ≥30mA).

- Automatic short circuit calculation, phase-to-neutral and phase-to-phase voltage detection,
- UNI-Schuko connector for automatic measurement, AGT adapter for measurements on three-phase networks.

- Testing of differential, general and selective protections for 10, 30, 100, 300, 500 and 1000 mA differential current.

- Insulation resistance measurement

- with application of the test voltages: 250 V, 500 V, 1000 V,
- average range up to 3GΩ,
- UNI-Schuko connector for insulation measurement,
- automatic discharge after measurement,
- Automatic measurement of all resistances in 3, 4 or 5 wire cables using the optional AUTO-ISO adapter,
- acoustic signals at 5 s intervals to obtain the insulation characteristic curve,
- safety surge protection.

- Measuring the resistance of the earth

- Bi-directional continuity test on PE cables using 200 mA.

- uto-calibration of test leads.

- Checking the sequence of phases.

- Battery charge indication.

- Automatic shut-off function.

- USB interface.

MPI-520 standard accessories

Probe SCHUKO with power button (WS-03)	WAADAWS 03
Test lead with banana plug, 1.2 m yellow	WAPRZ1X2YEB B
Test lead with banana plug, 1.2 m blue	WAPRZ1X2BEB B
Test lead with banana plug, 1.2 m red	WAPRZ1X2REB B
Test lead reel with banana plug, 30 m, red	
Test lead reel with banana plug, 15 m, blue	WAPRZ030REEBBSZ
USB cable	WAPRZ015BUEBBSZ
Tip probe with banana plug, yellow	WAPRZUS B
Tip Probe with banana plug, Red	WASONYEOGB1
Tip probe with banana plug, blue	WASONREOGB1
Alligator clip K02 yellow	WASONBUOGB1
Alligator clip K02 blue	WAKROYE0K02
Ground rod for ground contact, 0.3 m	WAKROBU0K02
Carrying case L1	WASONG30
Straps	WAFUTL1
Battery box and LR14 (C) batteries	WAPOZSZEKPL
Batteries	WAPOJ1
Calibration certificate	

Optional accessories

Test lead with banana plug, 5 m red	WAPRZ005REBB
Test Cable with banana plug, 10 m (33 ft) Red	WAPRZ01REBB
Test Lead with banana plug, 20 m (65 ft) red	WAPRZ002REBB
Battery charger cable	WAPRZLAD230
Battery Compatible Cigarette Lighter Charger Cord (12V)	WAPRZLAD212SAM
Adapter for three-phase plug AGT-16P	WAADAAGT16P
Three-Phase Plug Adapter AGT-32P	WAADAAGT32P
AGT-63P Three Phase Plug Adaptor	WAADAAGT63P
AUTO-ISO-1000C Adaptor	WAADAAISO10C
TWR-1 adapter (universal connection) for testing earth leakage circuit-breakers	WAADATWR1J
Probe with UNI-SCHUKO (WS-04)	WAADAWS04
Grounding Dart 0,8 m	WASONG80
Carrying case L3	WAFUTL
C3 Current Clamp (Ø=52 mm), round connection	WACEGC30KR
Ni-MH battery pack, 4.8 V, 4.2 Ah	WAAKU07
Alligator clip K02, blue	WAKR0BU20K02
Clip	WAZACIMA1
Test lead reel	WAPOZSZP1
Z7 power socket adapter	WAZASZ7
Software “SONEL PE4” for creating electrical measurement documentation	WAPROSONPE4
Software for creating drawings and diagrams “SONEL Schemtaic” + “SONEL PE4”	WAPROSCHEM

Technical specifications

Short circuit loop impedance measurement Z_{L-PE}, Z_{L-N}, Z_{L-L}

Measurement using the 23/40 A current range according to the standard me IEC 61557: 0.13...1999.9Ω (for 1.2 m cables)

Range	Resolution	Accuracy
0,00...19,99 Ω	0,01 Ω	±(5% v.m. + 3 digits)
20,0...199,9 Ω	0,1 Ω	
200...1999 Ω	1 Ω	

- Voltage range: 95...270V (for Z_{L-PE} and Z_{L-N}) and 95...440V (for Z_{L-L})
- Frequency: 45...65Hz

Z_{L-PE} short circuit impedance measurement in RCD mode

Measurement with a range current of 15 mA according to the IEC 61557: 0.50...1999 Ω

Range	Resolution	Accuracy
0,00...19,99 Ω	0,01 Ω	±(6% v.m. + 10 digits)
20,0...199,9 Ω	0,1 Ω	±(6% v.m. + 5 digits)
200...1999 Ω	1 Ω	

- Voltage range: 95...270V
- Frequency: 45...65H

Earth resistance measurement R_E

Voltage range according to IEC 61557-5: 0.5...1999Ω.

Range	Resolution	Accuracy
0,00...9,99Ω	0,01 Ω	±(2% v.m. + 4 digits)
10,0...99,9Ω	0,1 Ω	±(2% v.m. + 3 digits)
100...999Ω	1 Ω	
1,00...1,99kΩ	0,01kΩ	

Insulation resistance measurement

Measuring range according to IEC 61557-2

for U_N = 50V: 50kΩ...250MΩ; for U_N = 100V: 100kΩ...500MΩ; for U_N = 250V: 250kΩ...1GΩ, for U_N = 500V: 500kΩ...2GΩ, for U_N = 1000V: 1MΩ...3GΩ

Range *	Resolution	Accuracy
0...1999kΩ	1kΩ	±(3% v.m. + 8 digits)
2,00...19,99MΩ	0,01MΩ	
20,0...199,9MΩ	0,1MΩ	
200...999MΩ	1MΩ	
1,00...3,00GΩ	0,01GΩ	±(4% v.m. + 6 digits)

* Ilimited to the measuring range. With UNI-Schuko connection, additional error ±2%.

Indications of the phase sequence

- **iindication of the sequence of phases: leading, trailing, lagging**
- **Supply voltage range U_{L-L}: 100...440V (45...65Hz) U_{L-L}: 100...440V (45...65Hz)**
- **Display of phase-to-phase voltages on the screen**

Measurement of active (P), reactive power (Q), apparent (S) and cosφ

- **U_{LN} voltage range: 0...440V**
- **nominal mains frequency: 45...65Hz**
- **frequency measurement for voltages in the range 50...440V in the range 45.0...65.0Hz (maximum accuracy ± 0.1% measured value +1 digit)**
- **cosφ measurement: 0.00...1.00 (Resolution 0.01)**

Low voltage and insulation continuity test

Testing the PE cable with a current of ±200mA

Range	Resolution	Accuracy
0,00...19,99 Ω	0,01 Ω	±(2% v.m. + 3 digits)
20,0...199,9 Ω	0,1 Ω	
200...400 Ω	1 Ω	

- Test current at R<2Ω: min. 200mA at rated voltage of nominal battery
- Auto-calibration of test leads
- Bidirectional measurement

Triggering and testing of the protection differential response time T_A (for T_A mode)

Measuring ranges according to IEC 61557: 0ms ... to upper limit of the displayed value

Type of RCD	Setting the multiplication factor	Measuring range	Resolution	Basic error
Tipo gral	0,5 IΔn	0...300 ms	1 ms	±(2% v.m. + 2 digits)
	1 IΔn			
	2 IΔn	0...150 ms		
	5 IΔn	0...40 ms		
Selective	0,5 IΔn	0...500 ms		
	1 IΔn			
	2 IΔn	0...200 ms		
	5 IΔn	0...150 ms		

Accuracy of the differential current: for 0.5*I n: -8...0% for 1*I n, 2*I n, 5*I n: 0...8% for 1*I n, 2*I n, 5*I n: 0...8%.

Measurement of the current threshold of the differential protection (I_A) for a sinusoidal test current.

Rated current	Measuring range	Resolution	Current measurement	Basic error
10 mA	3,3...10,0mA	0,1 mA	0,3 IΔn...1,0 IΔn	± 5% IDn
30 mA	9,0...30,0mA			
100 mA	33...100mA	1 mA		
300 mA	90...300mA			
500 mA	150...500mA			
1000 mA	330...1000mA			

•It is possible to start the measurement from the positive or negative half of the leakage current

Measurement of the current threshold of the differential protection for a unidirectional half-period sine waveform with a DC offset of 6mA

Rated current	Range	Resolution	Current measurement	Basic error
10 mA	4,0...20,0mA	0,1 mA	0,4 x IDn ...2,0 x IDn	±10% IDn
30 mA	12,0...42,0mA	1 mA	0,4 x IDn ...1,4 x IDn	
100 mA	40...140mA			
300 mA	120...420mA			
500 mA	200...700mA			

• The measurement of a positive or negative leakage current is possible

Measurement of the current threshold of the differential protection (I_A) for the continuous test current

Rated current	Range	Resolution	Current measurement	Basic error
10 mA	4,0...20,0mA	0,1 mA	0,4 x IDn ...2,0 x IDn	±10% IDn
30 mA	12,0...60,0mA	1 mA		
100 mA	40...200mA			
300 mA	120...600mA			
500 mA	200...1000mA			

• Positive or negative leakage current measurement is possible

"v.m." valor medido

Electrical safety	
Type of insulation	double, according to EN 61010-1 and IEC 61557
Measurement category	CAT IV 300 V according to EN 61010-1
Protection according to EN 60529	IP54

Other technical data	
Power supply	LR14 alkaline batteries (5 pieces) or a set of Ni-MH batteries (optional)

Environmental conditions	
Operating temperature range	(0...+50°C)

AMPI-525

Multifunctional meter for electrical installations

- Insulation resistance measurement with voltage up to 2500V

CAT IV 300 V

IP54

Measured parameters

- Measuring the short circuit loop

- impedance measurement with 23 A (44 A phase to phase), short circuit resistance Rzw =10 Ω
- Measuring range: 95...440 V, frequency 45 to 65 Hz

- Short circuit loop measurement with a resolution of 0.01 Ω, without tripping of ground leakage protection devices (I Δn ≥30mA)

- automatic short circuit calculation, phase and interfacial voltage detection,
- UNI-Schuko connector for automatic measurement, AGT adapter for measurements in three-phase networks.

- Testing of differential, general and selective protection for 10, 30, 100, 300, 500 and 1000 mA differential current (AC, type A and B).

- Measurement of insulation resistance:

- with application of the test voltages: 250V, 500V, 1000V, 2500V,
- medium range up to G , 10 Ω
- automatic discharge after measurement,
- Automatic measurement of all resistances in 3, 4 or 5 wire cables using the optional adapter.
- acoustic signals at 5 s intervals to obtain the insulation characteristic curve,
- safety surge protection.

- Measuring the resistance of the earth connection.

- directional continuity test of PE cables using 200 mA.
- Self-calibration of test leads.

- Measurement of the resistance to earth.

- Checking the sequence of phases.

- The memory is divided into 10 memory banks.

- Each bank contains 99 memory cells.

- Battery charge indication.

- Automatic shut-off function.

- USB interface

Technical specifications

Measurement of short-circuit loop impedance Z_{L-PE}, Z_{L-N}, Z_{L-L}

Measurement using the current range 23/40 A according to to IEC 61557: 0.13...1999.9Ω (for 1.2 m cables):

Range	Resolution	Accuracy
0,00...19,99 Ω	0,01 Ω	±(5% v.m. + 3 digits)
20,0...199,9 Ω	0,1 Ω	
200...1999 Ω	1 Ω	

- Voltage range: 95...270V (for Z_{L-PE} and Z_{L-N}) and 95...440V (for Z_{L-L})
- Frequency: 45...65Hz

Z_{L-PE} short circuit impedance measurement in RCD mode

Measured using a 15 mA current range of In accordance with IEC 61557: 0.50...1999 Ω

Range	Resolution	Accuracy
0,00...19,99 Ω	0,01 Ω	±(6% v.m. + 10 digits)
20,0...199,9 Ω	0,1 Ω	±(6% v.m. + 5 digits)
200...1999 Ω	1 Ω	

- Voltage range: 95...270V
- Frequency: 45...65Hz

Measuring the resistance to earth a R_E

Voltage range according to IEC 61557-5: 0.5...1999Ω

Range	Resolution	Accuracy
0,00...9,99Ω	0,01 Ω	±(2% v.m. + 4 digits)
10,0...99,9Ω	0,1 Ω	±(2% v.m. + 3 digits)
100...999Ω	1 Ω	
1,00...1,99kΩ	0,01kΩ	

Insulation resistance measurement

Measuring range according to IEC 61557-2

for U_N = 50V: 50kΩ...250MΩ; for U_N = 100V: 100kΩ...500MΩ; for U_N = 250V: 250kΩ...1GΩ, for U_N = 500V: 500kΩ...2GΩ, for U_N = 1000V: 1MΩ...3GΩ

Range *	Resolution	Accuracy
0...1999kΩ	1kΩ	±(3% v.m. + 8 digits)
2,00...19,99MΩ	0,01MΩ	
20,0...199,9MΩ	0,1MΩ	
200...999MΩ	1MΩ	
1,00...3,00GΩ	0,01GΩ	±(4% v.m. + 6 digits)

* limited to the measuring range. With UNI-Schuko connection, additionalerror ±2%.

Indications of the phase sequence

· Indication of the sequence of phases: forward, backward, reverse

· Supply voltage range U (45...65Hz)

· Phase-to-phase voltage display on the screen

Low voltage and insulation continuity test

Testing the PE cable with a current of ±200mA

Range	Resolution	Accuracy
0,00...19,99 Ω	0,01 Ω	±(2% v.m. + 3 digits)
20,0...199,9 Ω	0,1 Ω	
200...400 Ω	1 Ω	

· Voltage at open terminals: 4...9 V
· Test current at R<2 Ω: min. 200 mA at rated voltage of the battery.
· Auto-calibration of test leads
· Bidirectional measurement

Differential protection trip test and response time t_A (for mode t_A)

Measuring ranges according to IEC 61557: 0ms ... to upper limit of the displayed value

Type of RCD	Setting the multiplication factor	Measuring range	Resolution	Basic error
General type	0,5 IΔn	0...300 ms	1 ms	±(2% v.m. + 2 digits)
	1 IΔn			
	2 IΔn	0...150 ms		
	5 IΔn	0...40 ms		
Sélectif	0,5 IΔn	0...500 ms		
	1 IΔn			
	2 IΔn	0...200 ms		
	5 IΔn	0...150 ms		

Accuracy of differential current:
for 0.5*I n: -8...0% for 1*I n, 2*I n, 5*I n: 0...8%.

Measurement of the current threshold of the differential protection (I_A) for a sinusoidal test current.

Rated current	Measuring range	Resolution	Current measurement	Basic error
10 mA	3,3...10,0mA	0,1 mA	0,3 x IDn...1,0 x IDn	± 5% IDn
30 mA	9,0...30,0mA			
100 mA	33...100mA	1 mA		
300 mA	90...300mA			
500 mA	150...500mA			
1000 mA	330...1000mA			

- It is possible to start the measurement from the positive or negative half of the leakage current.

Measurement of the current threshold of the differential protection for a unidirectional half-period sine waveform with a DC offset of 6mA.

Rated current	Range	Resolution	Current measurement	Basic error
10 mA	4,0...20,0mA	0,1 mA	0,4 x IDn ...2,0 x IDn	±10% IDn
30 mA	12,0...42,0mA		0,4 x IDn ...1,4 x IDn	
100 mA	40...140mA	1 mA		
300 mA	120...420mA			
500 mA	200...700mA			

- Positive or negative leakage current measurement is possible

Measurement of the current threshold of the differential protection (I_A) for the continuous test current

Rated current	Range	Resolution	Current measurement	Basic error
10 mA	4,0...20,0mA	0,1 mA	0,4 x IDn ...2,0 x IDn	±10% IDn
30 mA	12,0...60,0mA	1 mA		
100 mA	40...200mA			
300 mA	120...600mA			
500 mA	200...1000mA			

- The measurement of a positive or negative leakage current is possible.

"v.m." measured value

Electrical safety	
Type of insulation	double, according to EN 61010-1 and IEC 61557
Measurement category	CAT IV 300 V according to EN 61010-1
Protection according to EN 60529	IP54

Other technical data	
Power supply	LR14 alkaline batteries (5 pieces) or a set of Ni-MH batteries (optional)

Condições ambientais	
Operating temperature range	(0...+50°C)

AMZC-530-IT

Multifunctional meter for electrical installations

Measured parameters

- Measuring the short circuit loop

- impedance measurement with 23 A (44 A phase to phase), resistencia de cortocircuito Rzw=10Ω,
- range of measurement: 95...440V, frequency 45...65 Hz,

- Short circuit loop measurement with a resolution of 0.01Ω, without action of differential protections (I Δn ≥30mA).

- automatic short circuit calculation, phase-to-neutral and phase-to-phase voltage detection,
- UNI-Schuko connector for automatic measurement,
- AGT adapter for measurements in three-phase networks. .

- Testing of differential, general and selective protection for differential currents of 10, 30, 100, 300, 500 and 1000 mA also in IT isolated systems.

- Measurement of insulation resistance:

- with application of the test voltages: 50 V, 100 V, 250 V, 500 V, 1000 V,
- medium range up to 10 GΩ
- UNI-Schuko connector for insulation measurement, automatic discharge after measurement,
- automatic measurement of all resistances in 3, 4 or 5 wire cables using the optional adapter
- acoustic signals at 5 s intervals to obtain the insulation characteristic curve,
- safety protection against overvoltage. .

- Measuring the resistance of the earth connection.

- Measure 3 and 4p with the technical method,
- 3p measure with the technical method + clamps,
- measure with two clamps. .

- Measurement of soil resistivity by the Wenner method.

- Measurement of light intensity.

- Quick check of the correct connection of the PE terminals by means of the contact electrode.

- Measures and records voltage, frequency, AC current, cosφ, power (active, reactive and apparent), voltage harmonics and THD calculated up to 40 harmonics.

- **Verification of the phase sequence and the motor rotation**

- **Dynamically managed, tree-like memory structure (max. 10,000 results of each type of measurement) with the possibility of describing measurement points, objects, client names.**

- **Battery powered, integrated drainer. Possibility to charge the equipment on the mains or on the car cigarette lighter (12V).**

- **Bi-directional continuity test on PE cables using 200 mA.**

- **Auto-calibration of test leads.**

- **Checking the sequence of phases.**

- **Battery charge indication.**

- **Automatic shut-off function.**

- **USB interface. .**

Technical specifications

Measurement of short-circuit loop impedance Z_{L-PE}, Z_{L-N}, Z_{L-L}

Measurement using 23/40 A current Range according to IEC 61557: 0.13...1999.9Ω (for 1.2 m cables):

Range	Resolution	Accuracy
0,00...19,99 Ω	0,01 Ω	±(5% v.m. + 3 digits)
20,0...199,9 Ω	0,1 Ω	
200...1999 Ω	1 Ω	

• voltage range: 95...270V (for Z_{L-PE} and Z_{L-N}) and 95...440V (for Z_{L-L})
• frequency: 45...65H

Z_{L-PE} short circuit impedance measurement in RCD mode

Measured using a 15 mA current range of in accordance with IEC 61557: 0.50...1999.9 Ω

Range	Resolution	Accuracy
0,00...19,99 Ω	0,01 Ω	±(6% v.m. + 10 digits)
20,0...199,9 Ω	0,1 Ω	±(6% v.m. + 5 digits)
200...1999 Ω	1 Ω	

• Voltage range: 95...270V
• frequency: 45...65Hz

Earth resistance measurement R_E

Voltage range according to IEC 61557-5: 0.5...1999Ω.

Range	Resolution	Accuracy
0,00...9,99Ω	0,01 Ω	±(2% v.m. + 4 digits)
10,0...99,9Ω	0,1 Ω	±(2% v.m. + 3 digits)
100...999Ω	1 Ω	
1,00...1,99kΩ	0,01kΩ	

Insulation resistance measurement

Measuring range according to IEC 61557-2

for U_N = 50V: 50kΩ...250MΩ; for U_N = 100V: 100kΩ...500MΩ; for U_N = 250V: 250kΩ...1GΩ, for U_N = 500V: 500kΩ...2GΩ, for U_N = 1000V: 1MΩ...3GΩ

Range *	Resolution	Accuracy
0...1999kΩ	1kΩ	±(3% v.m. + 8 digits)
2,00...19,99MΩ	0,01MΩ	
20,0...199,9MΩ	0,1MΩ	
200...999MΩ	1MΩ	
1,00...3,00GΩ	0,01GΩ	±(4% v.m. + 6 digits)

* limited to the measurement range. With UNI-Schuko connection, additional error ±2%. .

Sequence of phases

· indication of the sequence of phases: forward, backward, reverse

· Supply voltage range UL-L: 100...440V (45...65Hz)) UL-L: 100...440V (45...65Hz)

· Phase-to-phase voltage display on the screen

Measurement of active (P), reactive power (Q),apparent (S) and cosφ

· U_{LN} voltage range: 0...440V

· Nominal mains frequency: 45...65Hz

· Frequency measurement for voltages in the range 50...440V in the range 45.0...65.0Hz (max. accuracy ± 0.1% measured value +1 digit)

· Cosφ measurement: 0.00...1.00 (resolution 0.01)

Low voltage and insulation continuity test

Test the P_E cable using a current of ±200mA

Range	Resolution	Accuracy
0,00...19,99 Ω	0,01 Ω	±(2% v.m. + 3 digits)
20,0...199,9 Ω	0,1 Ω	
200...400 Ω	1 Ω	

· Test current at R<2Ω: min. 200mA at rated voltage of nominal battery
· Auto-calibration of test leads
· Bi-directional measurement

Test of the differential protection trip and the t_A response time (for t_A mode)

Measuring ranges according to IEC 61557: 0ms ... to upper limit of the displayed value

Type de RCD	Setting the multiplication factor	Measuring range	Resolution	Basic error
General type	0,5 IΔn	0...300 ms	1 ms	±(2% v.m. + 2 digits)
	1 IΔn			
	2 IΔn	0...150 ms		
	5 IΔn	0...40 ms		
Selectivo	0,5 IΔn	0...500 ms		
	1 IΔn			
	2 IΔn	0...200 ms		
	5 IΔn	0...150 ms		

Accuracy of differential current: for 0.5*I n: -8...0% for 1*I n, 2*I n, 5*I n: 0...8% for 1*I n, 2*I n, 5*I n: 0...8%.

Measurement of the current threshold of the protection differential (I_A) for a test current

Corriente nominal	Range de medición	Resolution	Corriente de medición	Basic error
10 mA	3,3...10,0mA	0,1 mA	0,3 x IDn...1,0 x IDn	± 5% IDn
30 mA	9,0...30,0mA			
100 mA	33...100mA	1 mA		
300 mA	90...300mA			
500 mA	150...500mA			
1000 mA	330...1000mA			

• Measurement can be started from the positive or negative half of the leakage current.

Measurement of the current threshold of the differential protection for a unidirectional half-period sine waveform with a DC offset of 6mA

Rated current	Range	Resolution	Current measurement	Basic error
10 mA	3,5...20,0mA	0,1 mA	0,35 x IDn ...2,0 x IDn	±10% IDn
30 mA	10,5...42,0mA		0,35 x IDn ...1,4 x IDn	
100 mA	35...140mA	1 mA		
300 mA	105...420mA			
500 mA	175...700mA			

• The measurement of a positive or negative leakage current is possible.

Measurement of the current threshold of the protection differential (I_A) for a test current continuous

Rated current	Range	Resolution	Current measurement	Basic error
10 mA	2,0...20,0mA	0,1 mA	0,2 x IDn ...2,0 x IDn	±10% IDn
30 mA	6...60mA	1 mA		
100 mA	20...200mA			
300 mA	60...600mA			
500 mA	100...1000mA			

• The measurement of a positive or negative leakage current is possible

ANALYSIS OF SINGLE-PHASE NETWORK PARAMETERS

- U_{LN} voltage measurement: 0...500 V.
- Test voltage frequency range: 45.0...65.0 Hz.
- Voltage frequency measurement 50...500V Range 45.0...65.0 Hz (Basic error max. +- 0.1% v.m. ± 1 digit)
- Measurement of cosφ: 0,00...1,00 (Resolution 0,01)
- Measurement and recording in single-phase system

Current measurement (True RMS)

Pinças	Range	Resolution	Basic error*
C-3, C-6	0,0...99,9 mA	0,1 mA	±(5% v.m. + 3 digits)
	100...999 mA	1 mA	
C-3,C-6	1,00...9,99 A	0,01 A	±(5% v.m. + 5 digits) (C-3, C-6)
	10,0...99,9 A	0,1 A	
	100...999 A	1 A	±(0,1% In + 2 digits) (F-1, F-2, F-3)
F-1, F-2, F-3	1,00...3,00 kA	0,01 kA	

* It is necessary to take into account the uncertainty of current clamps

Measurement of the active power P, the passive power Q, apparent S and cosφ

Range [W], [VA], [var]	Resolution [W], [VA], [var]	Basic error
0...999	1	±(7% v.m. + 3 digits)
1,00...9,99 k	0,01 k	
10,0...99,9 k	0,1 k	±(7% v.m. + 5 digits)
100...999 k	1 k	
1,00...1,50 M	0,01 M	

· Voltage range: 0...500V
· Current range: 0 ...1000 A
· Nominal network frequency

Measurement of voltage harmonics

Range	Resolution	pas de harmoniques	Basic error
0,0...500 V	0,1 (1*) V	1,2,...15	±(5% v.m. + 3 digits)
		16,...40	±(5% v.m. + 10 digits)

• En outre, l'écran affiche la valeur h02...h40 en pourcentage de h01 (jusqu'à 999%*) *) de 300V à 500V.

Mesure des harmoniques de courant

Range	Resolution	pas de harmoniques	Basic error
0,0...1000 A*	selon le Range de I	1,2,...15	±(5% v.m. + 3 digits)
		16,...40	±(5% v.m. + 10 digits)

• In addition, the display shows the value h02...h40 as a percentage of h01 (up to 999%*) *) for the C-3 clamp for C-6 - 10 A, for F-series loops up to 3000A.

THD (according to the first harmonic)

		Resolution	Basic error
THD-F voltage (h = 2...40)	0,0...999,9% for URMS ≥ 1% Unom	0,1%	±5%
THD-F ccu-rrent (h = 2...40)	0,0...999,9% for IRMS ≥ 1% Inom	0,1%	±5%

Low voltage measurement of continuity and resistance of circuits

Continuity measurement of the protective conductor with a current of ±200 mA

Range	Resolution	Basic error
0,00...19,99 Ω	0,01 Ω	±(2% v.m. + 3 digits)
20,0...199,9 Ω	0,1 Ω	
200...400 Ω	1 Ω	

· Open terminal voltage: 4..9V
· Output current at R<2Ω min. 200mA
· Auto-calibration of test leads
· Measurement of both current polarizations

Light intensity measurement

Range	Resolution	Basic error
0,1...99,9 lx	0,1 lx	±(5% v.m. + 2 digits)
100...999 lx	1 lx	
1,00...9,99 klx	0,01 klx	
10,0...19,9 klx	0,1 klx	

- Measurement in lx or fc

m.v. means measured value

Electrical safety	
Type of insulation	double, according to EN 61010-1 and IEC 61557
Measurement category	CAT IV 300 V according to EN 61010-1
Protection according to EN 60529	IP54

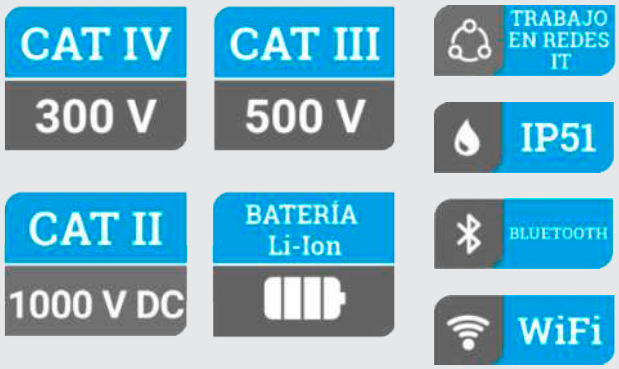
Other technical data	
Power supply	LR14 alkaline batteries (5 pieces) or a set of Ni-MH batteries (optional)

Environmental conditions	
Operating temperature range	(0...+50°C)

The MPI-530-IT provides automatic insulation resistance measurement of 3, 4 and 5-wire conductors with an additional AutoISO-1000C adapter.

AMPI-540 / 540-PV

Multifunctional meter for electrical installations



- Largest 7-inch touch screen on the market - exceptional ergonomics and ease of use
- Removable microSD card - for easy expansion of memory capacity
- Li-Ion battery - extended meter operation
- MPI-540-PV: measurement of photovoltaic systems according to EN 62446
- MPI-540-PV: PV system test report with Reports PLUS software
- Three-phase power system parameter logger - basic power quality diagnosis
- Reading of current data of network parameters - immediate evaluation of the device under study
- Parameters measured in class S of EN 61000-4-30 - high measurement accuracy
- Energy loss calculator - quick diagnosis of potential savings
- Measurement of all lightning protection parameters - one instrument instead of several
- Fast fault loop measurement with an uninterruptible RCD switch (up to several seconds) - time saving
- Self-testing - possibility to perform automatic measurements in a sequence - simplification of measurements
- Fast transfer of measurements to the report - saves time

Features

The meter has above-average functionality. It combines the measurement capabilities of several devices, while ensuring equally good accuracy.

- **The MPI-540-PV can measure photovoltaic installations in accordance with EN 62446:**
  - the continuity of the protective and equipotential connections,
  - resistance of the earth,
  - insulation resistance on the DC side,
  - open circuit voltage UOC,
  - short-circuit current ISC,
  - working currents and power in direct and alternating current,
  - the efficiency of the inverter. .
- **The MPI-540 / MPI-540-PV can record 50/60 Hz power system parameters in class S of EN 61000-4-30:**

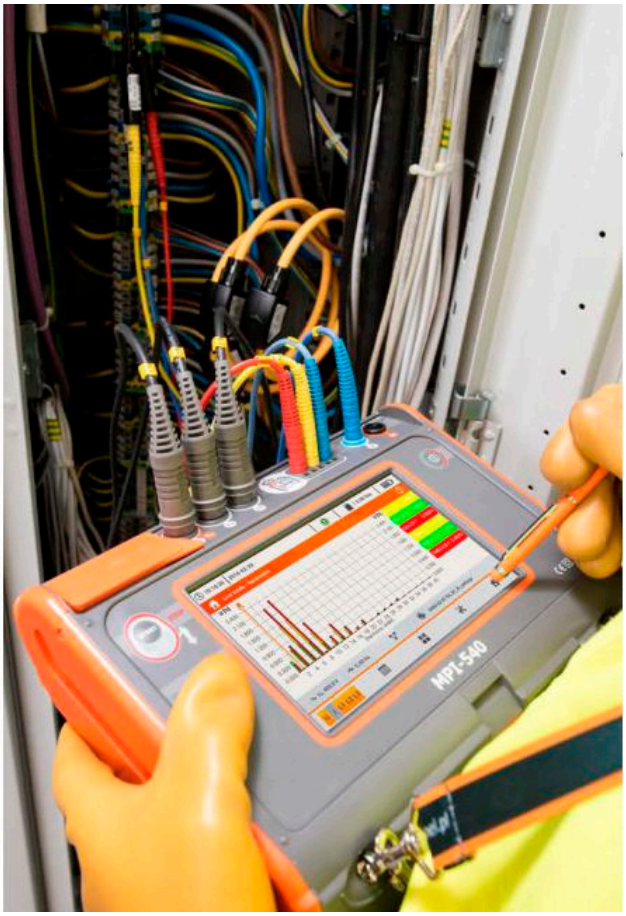
- voltages L1, L2, L3 - average values in the range up to 500 V,
- L1, L2, L3 currents - average values, current measurement in the range up to 3 kA (depending on the current clamps used),
- frequency in the range 40 Hz - 70 Hz,
- active (P), reactive (Q), apparent (S) power,
- power factor (PF), cosφ,
- harmonics (up to 40 in voltage and current),
- THD total harmonic distortion for current and voltage.

- The **MPI-540 / MPI-540-PV** can be used for all commissioning measurements of electrical installations in accordance with the relevant regulations:

  - impedance of the fault loop (also in circuits with RCDs),
  - the parameters of the RCDs,
  - insulation resistance,
  - grounding resistance (4 measurement methods + soil resistivity measurement),
  - the continuity of the protection and equipotential connections,
  - measurement of illumination,
  - phase sequence test,
  - testing the direction of rotation of a motor

Automatic safety test of the installation

MPI-540 / MPI-540-PV are used for safety monitoring of residential electrical installations, commercial and industrial applications. Measurements can be easily automated with:



- teste automático de dispositivos de corrente residual (RCD),
- medições automáticas: sequências de medição livremente configurável,
- Adaptador AutoISO-1000C para teste automático da resistência de isolamento de cabos 3, 4 e 5 condutores sem comutação

Photovoltaics under scrutiny

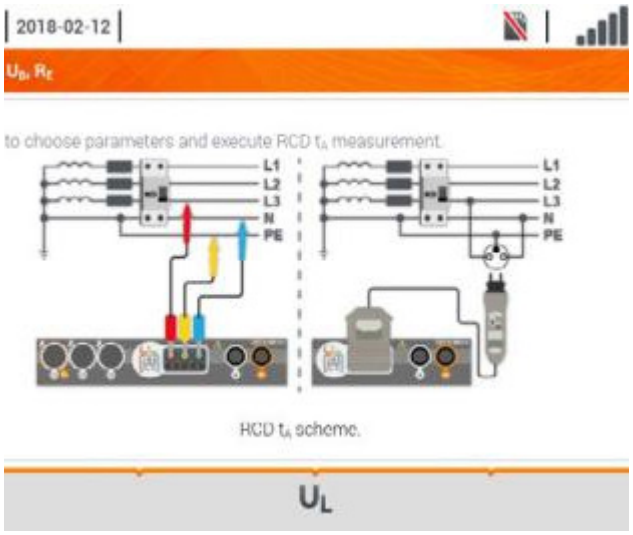
The MPI-540-PV is an extremely universal meter, designed in particular for testing photovoltaic installations. The device allows a complete set of tests on the DC and AC side, according to the guidelines of EN 62446.

When measuring PV system parameters, the instrument automatically converts them to STC (standard test conditions). Measurements of voltage, current and power on the AC and DC side of the inverter are used to verify its efficiency. The Reports PLUS software allows you to create a PV system test report with the measurement results stored in the memory. .

Three-phase network parameter recorder

The instrument has a three-phase power supply parameter recorder with a current parameter reading mode and the possibility to record power system parameters, such as voltage, current, power, harmonics, THD. The meter can read the selected parameters and display them graphically on the screen in real time. These parameters are measured independently of the recording stored on the memory card. In LIVE mode, the user can view:

- voltage and current versus time diagrams,
- phasing diagram,
- measurements of many parameters in tabular form,
- current and voltage harmonic diagram.



Easy to read

The device is equipped with a 7” TFT LCD colour touch screen with a diagonal of 800x480 pixels, which allows for convenient operation and easy reading of the settings and plotted routes. This screen size allows for more information to be displayed, available at any time of use. The interface is visible in all conditions, thanks to the appropriate size of the symbols displayed. The included stylus allows you to work with dielectric gloves.

Integrated help system

Help screens with measurement diagrams are built into the unit. This allows you to quickly and easily check how to connect a particular circuit depending on the type of measurement being made.

Increased resistance to environmental conditions

The MPI-540 /MPI-540-PV works perfectly in harsh environmental conditions. Protection against dust and water ingress is provided by the IP51 waterproof housing. It is resistant to mechanical damage and its special design allows the touch screen to be easily protected by sliding the meter cover. In addition to protection against damage, it also allows the device to be easily transported and used in different positions. .

Communication and software

One of the great strengths of the instrument is the large number of communication interfaces and the compatibility with external software. Via the USB port, removable SD memory card or wireless communication (Bluetooth*, Wi-Fi), measurement data can be sent to a computer.

In order to generate a measurement report in the field of lightning protection, it is necessary to use the Reports PLUS program.

Reader allows us to save the downloaded data in the simplest formats and to print them out. For reading and analysing the data from the recorder, we use the specific program Analysis. .

* The function will be available after the software has been updated (at no extra cost).

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PROYECTO COFINANCIADO POR EL IGAPE, XUNTA DE GALICIA Y FONDO EUROPEO DE DESARROLLO REGIONAL DEL PROGRAMA OPERATIVO 2014-2020

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