

**Possible measurements**

- **Short-circuit loop measurement:**
  - impedance measurement with 23A current (44A phase-to-phase) - short-circuit resistor R=10Ω,
  - measurement range: 95...440V, frequency 45...65Hz,
- **Short-circuit loop measurement with resolution 0,01Ω, in distribution network without triggering RCD ( $I_{sc} \geq 30mA$ ):**
  - automatic calculation of short-circuit, detection of phase voltage and phase-to-phase voltage,
  - additional UNI-Schuko plug for automatic measurement, AGT adapter for 3 phase network measurement.
- **Testing of general and selective RCD with the rated differential current of 10,30,100,300,500 and 1000mA. (Type AC, A and B).**
- **Measurement of insulation resistance:**
  - with test voltage 250V, 500V, 1000V,
  - measurement range up to 3GΩ,
  - UNI-Schuko plug for insulation measurement,
  - automatic discharging after measurement,
  - automatic measurement of all resistances in 3,4,5-wire cables using optional adapter AUTO-ISO,
  - acoustic signals in 5sec intervals for insulation resistance characteristic,
  - safety measurement - protection against overvoltage.
- **Measurement of earthing resistance.**
- **Bi-directional testing of PE wire continuity using 200mA current.**
  - Autocalibration of test leads.
- **Phase sequence testing.**
- **Memory is divided into 10 memory banks each of them containing 99 memory cells.**
- **Battery charge indicator.**
- **AUTO-OFF function.**
- **USB interface.**

# MULTIFUNCTION ELECTRICAL INSTALLATIONS METER

## MPI-520



The MPI-520 multifunction meter is dedicated to perform diagnosis of electrical installation according to IEC 61557 standards. Digital meter MPI-520 is designed to measure impedance of a short circuit loop also without triggering RCD, parameters of RCD, insulation resistance, earthing resistance, continuity and also for phase sequence testing. Furthermore it is used for measurement of AC voltage and current, frequency and power.

**Standard accessories of the meter MPI-520:**

- probe with START button with UNI-SCHUKO (WS-03)
- test lead with banana plug; 1,2m; yellow
- test lead with banana plug; 1,2m; blue
- test lead with banana plug; 1,2m; red
- test lead on a reel with banana plugs; 30m; red
- test lead on a reel with banana plugs; 15m; blue
- USB transmission cable
- pin probe with banana connector; yellow
- pin probe with banana connector; red
- pin probe with banana connector; blue
- crocodile clip K02; yellow
- crocodile clip K02; red
- earth contact test probe (rod); 0,3m
- carrying case L1
- hanging straps
- battery case LR14 (size C)
- batteries
- calibration certificate issued by calibration laboratory

**Optional accessories of the meter MPI-520:**

- |  |   |   |
|--|---|---|
| <ul style="list-style-type: none"> <li>WAADAWS03</li> <li>WAPRZ1X2YEBB</li> <li>WAPRZ1X2BUBB</li> <li>WAPRZ1X2REBB</li> <li>WAPRZ030REBBSZ</li> <li>WAPRZ015BUBBSZ</li> <li>WAPRZUSB</li> <li>WASONYE0GB1</li> <li>WASONRE0GB1</li> <li>WASONBU0GB1</li> <li>WAKROYE20K02</li> <li>WAKRORE20K02</li> <li>WASONG30</li> <li>WAFUTL1</li> <li>WAPOZSZEKPL</li> <li>WAP0J1</li> </ul> | <ul style="list-style-type: none"> <li>- test lead with banana plug 5m; red</li> <li>- test lead with banana plug 10m; red</li> <li>- test lead with banana plug 20m; red</li> <li>- cable for battery charger</li> <li>- lead for battery loading from the socket of car lighter (12V)</li> <li>- AC line splitter (AC-16)</li> <li>- triple phase socket adapter AGT-16P</li> <li>- triple phase socket adapter AGT-32P</li> <li>- triple phase socket adapter AGT-63P</li> <li>- adapter AUTO-ISO-1000C</li> <li>- RCD breaker testing adapter TWR-1 universal pin</li> <li>- probe with UNI-SCHUKO (WS-04)</li> <li>- earth contact test probe (rod); 0,8m</li> <li>- carrying case L3</li> <li>- round connector current clamps C3 (Ø=52mm)</li> <li>- Ni-MH battery package 4,8V 4,2Ah</li> <li>- crocodile clip K02; blue</li> <li>- cramp</li> <li>- test wire reel</li> <li>- power supply adaptor Z7</li> <li>- software for creation of documentation from electrical measurements "SONEL PE5"</li> <li>- software for creation drawings and diagrams "SONEL Schematic" + „SONEL PE5"</li> </ul> | <ul style="list-style-type: none"> <li>WAPRZ005REBB</li> <li>WAPRZ010REBB</li> <li>WAPRZ020REBB</li> <li>WAPRZLAD230</li> <li>WAPRZLAD12SAM</li> <li>WAADAC16</li> <li>WAADAAGT16P</li> <li>WAADAAGT32P</li> <li>WAADAAGT63P</li> <li>WAADAIS010C</li> <li>WAADATWR1J</li> <li>WAADAWS04</li> <li>WASONG80</li> <li>WAFUTL3</li> <li>WACEGC30KR</li> <li>WAAKU07</li> <li>WAKROBU20K02</li> <li>WAZACIMA1</li> <li>WAPOZSZP1</li> <li>WAZASZ7</li> <li>WAPROSONPE5</li> <li>WAPROSCHEM</li> </ul> |
|--|---|---|

## Multifunction electrical installations meter

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

Measurement using 23/40A current measurement range in accordance with IEC 61557: **0,13...1999,9Ω** (for 1,2m lead):

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

rated voltage: 95...270V (for  $Z_{L-PE}$  i  $Z_{L-N}$ ) and 95...440V (for  $Z_{L-L}$ )  
frequency: 45...65Hz

### Short-circuit loop impedance measurement $Z_{L-PE}$ **RCD**

Measurement using 15mA current measurement range in accordance with IEC 61557: **0,50...1999,9Ω**

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

rated voltage: 95...270V  
frequency: 45...65Hz

### Measurement of earthing $R_E$

Rated voltage in accordance with IEC 61557-5: 0,5...1999Ω

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

### Insulation resistance measurement

Measurement range in accordance with 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

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

- \*) limited to measurement range.  
• with UNI-Schuko additional error ±2%.

### Phase sequence

- phase sequence indicator: forward, reverse
- mains voltage range  $U_{L-L}$ : 100...440V (45...65Hz)  $U_{L-L}$ : 100...440V (45...65Hz)
- display of phase-to-phase voltages

### Measurement of the active P, passive Q and apparent S power and $\cos\phi$

- Range of voltages  $U_{in}$ : 0...440V
- Nominal frequency of the network: 45...65Hz
- frequency measurement for voltage 50...440V in range 45,0...65,0Hz (accuracy max. ± 0,1% m.v. + 1 digit)
- measurement  $\cos\phi$ : 0,00...1,00 (resolution 0,01)

### Low voltage test of the circuit and insulation continuity

Test of PE wire continuity using a ±200mA current

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

- Voltage on open terminals: 4...9V
- Test current at  $R < 2Ω$ : min. 200mA at rated battery voltage
- Autocalibration of test leads
- Measurements for both polarizations of the current

### RCD trigger and response time test $t_A$ (for $t_A$ mode) Measurement ranges

in accordance with IEC 61557: 0ms ... up to the upper bound of the displayed value

Breaker Type	Test Current Multiplier	Measurement Range	Resolution	Accuracy
Standard	0,5 * $I_{Δn}$	0...300ms	1ms	±(2% m.v. + 2 dgt)
	1 * $I_{Δn}$			
	2 * $I_{Δn}$			
Selective	5 * $I_{Δn}$	0...40ms		
	0,5 * $I_{Δn}$	0...500ms		
	1 * $I_{Δn}$	0...200ms		
	2 * $I_{Δn}$	0...150ms		
	5 * $I_{Δn}$	0...150ms		

Precision of the differential current: for 0,5 \*  $I_{Δn}$ : -8...0% for 1 \*  $I_{Δn}$ , 2 \*  $I_{Δn}$ , 5 \*  $I_{Δn}$ : 0...8%

Measurement of the RCD triggering current ( $I_A$ ) for sine waveform testing current

Selected Current	Range	Resolution	Test Current	Accuracy
10mA	3,3...10,0mA	0,1mA	0,3 x $I_{Δn}$ ...1,0 x $I_{Δn}$	± 5% $I_{Δn}$
30mA	9,0...30,0mA			
100mA	33...100mA	1mA		
300mA	90...300mA			
500mA	150...500mA			
1000mA	330...1000mA			

- It is possible to start the measurement from the positive or negative half of the forced leaking current

Measurement of the RCD triggering current ( $I_A$ ) for a unidirectional half period sine waveform test current with a 6mA direct current offset

Selected Current	Range	Resolution	Test Current	Accuracy
10mA	4,0...20,0mA	0,1mA	0,4 x $I_{Δn}$ ...2,0 x $I_{Δn}$	±10% $I_{Δn}$
30mA	12,0...42,0mA			
100mA	40...140mA	1mA		
300mA	120...420mA			
500mA	200...700mA			

- a measurement is possible for a positive or negative forced leakage current

Measurement of the RCD triggering current ( $I_A$ ) for direct testing current

Selected Current	Range	Resolution	Test Current	Accuracy
10mA	4,0...20,0mA	0,1mA	0,4 x $I_{Δn}$ ...2,0 x $I_{Δn}$	±10% $I_{Δn}$
30mA	12...60mA	1mA		
100mA	40...200mA			
300mA	120...600mA			
500mA	200...1000mA			

- a measurement is possible for a positive or negative forced leakage current

„m.v.” measured value.

### Rated operational conditions:

- operation temperature 0...+50°C

### Electric security:

- type of insulation double, according to EN 61010-1 and IEC 61557, EMC  
- measurement category IV 300V acc. to EN 61010-1  
- casing protection class acc. to PN-EN 60529 IP54

### Other technical data:

- power supply alkaline batteries LR14 (5 szt.) or battery package Ni-MH (additional option)

MPI-520 is equipment to perform complete test and verify on electrical installations according to the most common safety standards (IEC 61557, VDE 0100, BS7671).

Sonel S.A.

ul. Wokulskiego 11  
58-100 Świdnica, PL  
tel. +48 74 85 83 860  
fax +48 74 85 83 809

export@sonel.pl  
www.sonel.pl