

**0.1 mΩ**  
maximum  
resolution

**CAT III**  
**600 V**

**CAT IV**  
**300 V**

**IP20**



## Lightweight for high-current measurements

### Capabilities

- Measurement of very low short circuit loop impedances (with resolution 0,1 mΩ) with a current of 150 A at 230 V; maximum 280 A at 440 V.
- Measurement with a current of 23 A at 230 V, maximum 42 A at 440 V with resolution 0,01 Ω.
- Measurements in installations with rated voltages: 220/380 V and 230/400 V and frequencies 45...65 Hz.
- Ability to perform measurements in short circuit system: phase-phase, phase-PE, phase-N.
- Differentiation between the phase voltage and the inter-phase voltage while calculating the short circuit current.
- Ability to change the length of test lead (measurement with 2p method).
- 4p (four-pole) method, test leads do not require calibration (measurement with current up to 280 A).
- Measurement of resistance ( $R_s$ ) and reactance ( $X_s$ ) components.

### Additional features

- Touch voltage and touch shock voltage measurement with resistor 1 kΩ).
- AC voltage measurement in range 0...440 V.
- Frequency measurement 45.0...65.0 Hz.
- Memory of 990 measurement results, ability to transfer the data to a PC via RS-232.
- Power supply: rechargeable battery (5x LR14).



## Reaching the areas unattainable to others

In direct vicinity of transformers or in transformer stations, where the circuits are equipped with a high current protection (fuse-links with the rating of several hundred amperes, motor circuit breakers), **fault currents may reach several hundreds of kilo-amperes**. Measurement of fault loop impedance in such networks requires a **high-current meter**, which is capable of measuring  $Z_s$  values at the level of single milliohms. Our patented technical solution, which uses components not available in the commercial offer (unique fault resistor), enables us to offer the meter with perfect performance in such demanding conditions.

## Measurements without compromise

Commercially available fault loop impedance meters perform the measurements asymmetrically, i.e. using half-wave current. This solution introduces the transitional constant and DC constant, which does not always result in a linear behavior of the transformer during the tests. This in turn, affects the accuracy of the results.

MZO-310S high-current fault loop impedance meter applies **symmetrical** current for measurements, which means that it uses the full wave - thanks to the advanced design of the measuring system and fault circuit.

## Application

MZO-310S is used for measurements in low voltage systems (nominal voltage of 220/380 V or 230/400 V), where the prospective fault current may reach **55.7 kA** (measured according to EN 61557). Low weight and high convenience of the device make it perfect for tests and measurements in large and complex manufacturing plants.

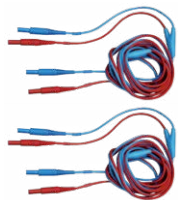


# Technical specifications

Measurement functions	Measurement range	Display range	Resolution	Accuracy ±(% m.v. + digits)
<b>Voltage</b>	0 V...440 V	0 V...440 V	1 V	±(2% m.v. + 2 digits)
<b>Frequency</b>	45.0 Hz...65.0 Hz	45.0 Hz...65.0 Hz	0.1 Hz	±(0.1% m.v. + 1 digit)
<b>Short-circuit loop parameters</b>				
4p method - high current measurement maximum current 280 A	7.2 mΩ...1999 mΩ acc. to EN 61557	0.0 mΩ...1999 mΩ	from 0.1 mΩ	±(2% m.v. + 2 digits)
2p method - standard current measurement maximum current 42 A	from 0.13 Ω...199.9 Ω acc. to EN 61557	0.00 Ω...199.9 Ω	from 0.01 Ω	from ±(2% m.v. + 3 digits)
<b>Short-circuit current readings</b>				
4p method - high current measurement network voltage 230 V, 400 V	up to 115.0 A...55.7 kA	115.0 A...400 kA	from 0.1 A	Calculated on the basis of error for fault loop
2p method - standard current measurement	from 1.150 A...1607 A acc. to EN 61557	1.150 A...40.0 kA	from 0.001 A	Calculated on the basis of error for fault loop
<b>Touch and shock voltage</b>				
4p method - high current measurement	0 V...100 V	0 V...100 V	1 V	±(10% m.v. + 2 digits)
<b>Safety and work conditions</b>				
<b>Measuring category according to EN 61010</b>			IV 300 V	
<b>Ingress protection</b>			IP20	
<b>Type of insulation according to EN 61010-1 and EN 61557</b>			double	
<b>Power supply</b>			5x LR14 alkaline battery 1.5 V	
<b>Dimensions</b>			295 x 222 x 95 mm	
<b>Weight</b>			ca. 2.2 kg	
<b>Operating temperature</b>			0...+40°C	
<b>Storage temperature</b>			-20...+60°C	
<b>Humidity</b>			20...90%	
<b>Nominal temperature</b>			+20...+25°C	
<b>Reference humidity</b>			40%...60%	
<b>Memory and communication</b>				
<b>Memory of measurement results</b>			990 results	
<b>Data transmission</b>			RS-232	
<b>Other information</b>				
<b>Quality standard – development, design and production</b>			ISO 9001	
<b>The product meets the EMC (emission for industrial environment) requirements according to standards</b>			EN 61326-1 EN 61326-2-2	



## Standard accessories



**Double-wire test lead 3 m (10 / 25 A)**

U1 / I1  
WAPRZ003DZBBU111  
U2 / I2  
WAPRZ003DZBBU212



**Test lead 1.2 m (banana plugs) black / yellow**

WAPRZ1X2BLBB  
WAPRZ1X2YEBB



**Pin probe 1 kV (banana socket) black / yellow**

WASONBLOGB1  
WASONYEOGB1



**2x Kelvin clamp, 1 kV, 25 A**

WAKROKELK06



**4x crocodile clip 1 kV 32 A black**

WAKROBL30K03



**2x high-current pin probe 1 kV (banana sockets)**

WASONSPGB1



**RS-232 serial transmission cable**

WAPRZRS232



**Unisonel hanging straps**

WAPOZSZE1



**L1 carrying case**

WAFUTL1



**5x LR14 1.5 V alkaline battery**



**Factory calibration certificate**

## Optional accessories



**Test lead 5 / 10 / 20 m (banana plugs) yellow**

WAPRZ005YEBB  
WAPRZ010YEBB  
WAPRZ020YEBB



**Foldable pin probe, 1 kV, 2 m (banana socket)**

WASONSP2M



**Pin probe 11 kV (banana socket) red**

WASONREOGB11



**Three-phase socket adapter 16 A / 32 A**

WAADAAGT16C  
WAADAAGT32C



**Three-phase socket adapter 16 A / 32 A**

WAADAAGT16P  
WAADAAGT32P



**Three-phase socket adapter 63 A**

WAADAAGT63P



**Industrial socket adapter 16 A / 32 A**

WAADAAGT16T  
WAADAAGT32T



**Test wire reel**

WAPOZSZP1



**USB/RS-232 adapter**

WAADAUSBRS232



**L2 carrying case**

WAFUTL2



**M1 hanging straps**

WAPOZSZE4



**Calibration certificate with accreditation**