



Measurement Instruments

Sonel experience and reliability



Modern technologies for you

SONEL S.A. is a Polish manufacturer of high-quality measuring instruments for power utilities, industries and telecommunications sectors, and has been a pioneer over two decades. The company's founders were electrical engineers - who had good knowledge of the market needs for specialized test equipment. The company debuted on the Warsaw Stock Exchange in June 2008. Our products are being exported to more than 50 countries, and we are well recognized in most demanding altitudes, Humidity & Temperatures from different countries.

SONEL Instruments India Pvt Ltd operational from Chennai and Mumbai covering the nation, with 50+ distributors nationwide. We are proud to have supplied almost all Transmission and distribution companies across the nation. The strength of our operation lies in the technology and the quality of our products and our reliable partners and customers.

Mission

The mission of SONEL is to become a modern, innovative, and globally competitive company supplying high-quality products and services which meet the expectations and requirements of demanding customers. Our main goal is to manufacture ergonomic, specialized measuring instruments which improve electrical safety and work conditions. The mission of SONEL S.A. is also implementation of a natural process of expansion and dissemination of technological development in harmony with the environment.

Quality and safety

Our products have achieved a high position on the market thanks to the continuous development of the technologies and functions of the products we offer and their adaptation.

To market requirements: This has been confirmed by the following certification: **Quality Management System ISO 9001:2015**, **Environmental Management System ISO 14001:2015**, and **Occupational Health and Safety Management System ISO 45001:2018**.

Manufactured instruments are compliant with standards **EN 61557**, **EN 61010** as well as the **electromagnetic compatibility directive**, which allows us to bear the full responsibility that comes with the CE mark that we place on our products.



Insulation Quality Analyzer

SONEL MIC SERIES

CAT IV
1000 V
CAT IV
600 V
IP67
HEAVY DUTY

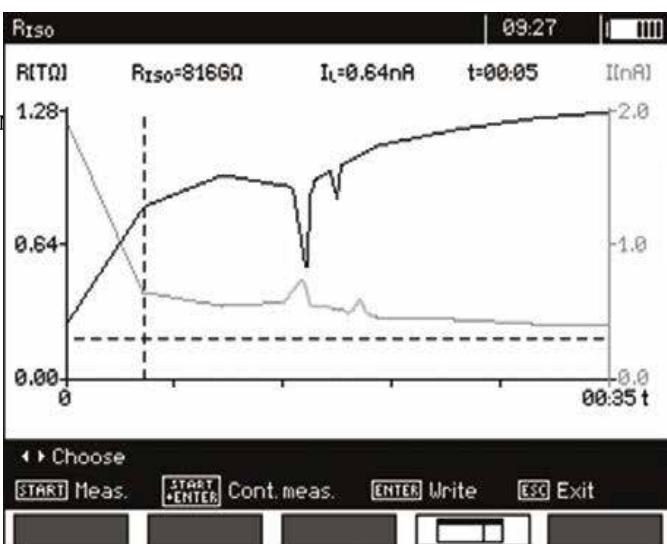


Key Features

- » Insulation Resistance meter can work in high induction noise level switchyards of 765kV.
- » 5kV & 10kV meter has short circuit current up to 6mA and noise rejection current up to 8mA.
- » 15kV meter has short circuit current up to 7mA and noise rejection current up to 10mA.
- » Insulation resistance meter has the housing protection rating of IP 67.
- » Meter has graphical representation function of insulation resistance and current leakage characteristics.
- » Data transfer through Bluetooth operation/ USB / OR-1.
- » 15kV meter has efficient converter with a power of ~150 W, that enables insulation burnout allowing for pinpointing the location of fault cable and wires.
- » 15kV meter has a partial discharge indicator. It has control through remote mode Sonel mobile application,
- » 10KV & 15KV instrument is having 10KV @ 6mA.

Comparison of Insulation Resistance Meters

Parameters	MIC-15k1	MIC-10k1	MIC-5050	MIC-5005	MIC-5001	MIC-2511	MIC-2501	MIC-30	MIC-10	MIC-5	MIC RS
Measurement voltage [V]	50...15 000	50...10 000	50...5000	50...5000	50...5000	50...2500	100...2500	50...1000	50,100,250,500,1000	250,500	500 & 1000
Measuring range [Ω]	50 k...40 T	10 k...40 T	20 k...20 T	20 k...15 T	50 k...5 T	20 k...2 T	50 k...2 T	50 k...100 G	50 k...10 G	250 k...1.999 G	500k ...2G
Short-circuit current I_{sc}	1.2/3/5/7 mA	1.2/3/6 mA	1.2/3/6 mA	1.2/3 mA	1.5 mA	<2 mA	1 mA	1 mA	1 mA	<1.4 mA	2mA
PI / DAR	√	√	√	√	√	√	√	√	-	-	-
Voltage measurement	0...600 V	0...750 V	0...750 V	0...600 V	0...750 V	0...1500 V	0...750 V	0...600 V	0...600 V	0...600 V	-
Capacitance measurement	√	√	√	√	-	√	-	√	√	-	√
Memory (number of records)	990 autosave	10 000	10 000	990	990	9999	990	990	-	-	-
Data transmission	USB, Bluetooth	USB, Bluetooth	USB, Bluetooth	USB, Bluetooth	USB	USB, Bluetooth	USB	Bluetooth	-	-	-
Weight [kg]	6.6	6.1	6.1	6	1.0	1.3	1.0	0.6	0.6	0.3	0.8



Insulation Resistance Meters

SONEL MIC-2511



CAT III
1000 V
CAT IV
600 V
IP65
Li-Ion BATTERY

Multi-function meter of electrical system parameter

SONEL MPI SERIES



	IP51		WORK IN IT MAINS		BLUETOOTH		WiFi
CAT III	CAT IV	CAT II	Li-Ion BATTERY				
500 V	300 V	1000 V DC					

Key features

- » Earth Fault loop impedance measurement as per IS 732 (3.64), NEC 2023 (3.4.28)
- » Earth fault loop impedance measurement can be done without RCD tripping.
- » Fault loop impedance measurement can be done between L-N & L-L >The product is having a facility with MCB selection & 2/3 value of Loop impedance measurement with respect to IS 732 (MM-6.2.3.6.1) & NEC 2023 (4.5.3)
- » The product is having a facility of PASS/FAIL indication of earth fault Impedance value in accordance with NEC 2023 (4.5.4-Table)
- » Earth Resistance & Soil resistivity measurement can be done as per IS 3043 (Section 41.1 & 40.3.1.2) & NEC 2023
- » Individual Earth pit resistance measurement can be done without disconnection as per IS 3043 Section 41.1.7.
- » The product is having facilities to test EV charging station as per IS 17017 (12.5, 6.3.2.1, 6.3.1.3) & NEC 2023
- » Double clamp earth loop resistance measurement can be done without auxiliary earth electrodes.
- » The tripping time and tripping current measurement can be done as per the NEC 2023 (9.2) & IS 732 (6.2.3.6) for all types of RCD's (AC, A, B, F, EV) (10mA, 30mA, 100mA, 300mA, 500mA & 1000mA) (General, Selective & time delay)
- » The touch voltage measurement can be measured up to 99.9V, when the voltage exceeds SOV, the product will give you the warning alarm as per NEC 2023(4.4.5)
- » Continuity of conductors (IS 732-6.2.3.2), Insulation resistance of the electrical installation (IS 732- 6.2.3.3). Floor and wall resistance/impedance (IS 732- 6.2.3.5), Phase sequence test (IS 732- 6.2.3.9), Voltage drop test (IS 732-6.2.3.1).

Comparison of multi-function meters

Display	7" LCD touchscreen	LCD graphic	LCD graphic	LCD graphic	segmented LCD	segmented LCD
Fault loop impedance resolution [Ω]	0...1999	0...1999	0...1999	0...1999	0...1999	0...1999
Residual current device measurements	AC, A, F, B, B+, EV <input type="checkbox"/> G <input type="checkbox"/> S	AC, A, F, B, B+ <input type="checkbox"/> G <input type="checkbox"/> S	AC, A, F, B, B+ <input type="checkbox"/> G <input type="checkbox"/> S	AC, A, F, B, B+ <input type="checkbox"/> G <input type="checkbox"/> S	AC, A <input type="checkbox"/> G <input type="checkbox"/> S	AC, A <input type="checkbox"/> G <input type="checkbox"/> S
Measurement of insulation resistance	√	√	√	√	√	—
Measurement voltages [V]	MPI-536 10 50,100,250,500,1000 MPI-536 1500,2500	50,100,250,500,1000	50,100,250,500,1000,2500	50,100,250,500,1000	100,250,500	—
Measuring range [Ω]	5G / 5G / 5G / 10G	10G	10G	3G	600M	—
Continuity testing with current ≥ 200mA	√	√	√	√	√	√
Low-voltage resistance measurement	√	√	√	√	√	√
Earth resistance measurement	3p, 4p, 3p+clamps, double-clamp	3p, 4p, 3p+clamps, double-clamp	3p	3p	3p / —	—
Capability of setting limit for every function	√	√	—	—	—	—
Quick check of PE connection	√	√	√	√	√	√
Voltage measurement [V]	0...500	0...500	0...500	0...500	0...500	0...500
Frequency measurement [Hz]	√	√	√	√	√	√
Alternating current measurement [A]	optionally 0...3000	optionally 0...3000	—	optionally 0...400	—	—
Power and cosφ measurement	✓/✓/-/-	✓	—	✓	—	—
Measurement of U harmonics: I up to the 40th	✓/✓/-/-	✓	—	—	—	—
THD measurement for U and I	✓/✓/-/-	✓	—	—	—	—
Phase sequence check [V]	95...500	95...500	95...500	95...500	100...440	—
Memory (records)	unlimited	10 000 for every measurement type	990	990	990	990
Power supply	rechargeable battery	rechargeable battery / batteries	rechargeable battery / batteries	batteries / rechargeable battery	batteries / rechargeable batteries	batteries / rechargeable batteries
Built-in quick charger	✓	✓	✓	✓	—	—
Data transmission	USB, Bluetooth, Wi-Fi	USB, Bluetooth	USB	USB	Bluetooth	Bluetooth
Dimensions [mm]	288 x 223 x 75	288 x 223 x 75	288 x 223 x 75	288 x 223 x 75	220x98x58	220x98x58
Weight [kg]	2.5	2.2	2.2	2.2	0.8	0.6

High-current fault loop impedance meter

SONEL MZC SERIES

CAT IV

600 V

IP67



Key features

- » Measurement of very low short circuit loop impedances (with resolution 0,1 mΩ) with a current of 130 A at 230 V; maximum 300 A at 690 V (500 V in MZC-320S),
- » Measurement with a current of 24 A at 230 V, maximum 37 A at 690 V (maximum 27 A at 500 V in MZC-320S) with resolution 0,01 Ω,
- » Measurements in installations with rated voltages: 110/190 V, 115/200 V, 127/220 V, 220/380 V, 230/400 V, 240/415 V, 290/500 V and 400/690 V (MZC-330S only) 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 300 A),

Comparison of fault loop impedance meter



	MZC-330S	MZC-320S	MZC-310S	MZC-306	MZC-304	MZC-20E
Rated voltage [V]	110/190	110/190		110/190		
	115/200	115/200		115/200		
	127/220	127/220		127/220		
	220/380	220/380	220/380	220/380	220/380	220/380
	230/400	230/400	230/400	230/400	230/400	230/400
	240/415	240/415		240/415		
	290/500	290/500		290/500		
400/690				400/690		
Operating voltage range [V]	100...750	100...550	187...440	100...750	180...460	180...440
Display range [Ω]	0...1999	0...1999	0...199.9	0...1999	0...1999	0...200
Maximum resolution [Ω]	0.001	0.001	0.001	0.01	0.01	0.01
Maximum resolution for measurement with 15 mA current [Ω]	—	—	—	0.01	0.01	0.01
Max. measurement current [A]	130/280	130/280	160/280	12.2...36.7	7.6/13.3	15.3/26.7
Measuring range according to EN 61557 [Ω]	0.0072...1999	0.0072...1999	0.0072...199.9	0.13...1999	0.13...1999	0.24...200

RCD METER

SONEL MRP-201

CAT III

600 V

CAT IV

300 V



Testing RCD breakers of AC, A and B types

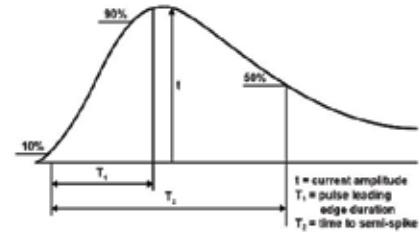
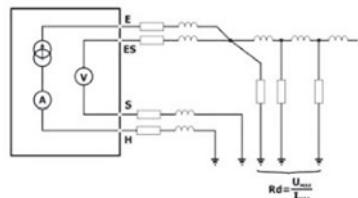
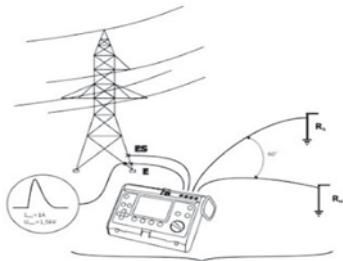
- » Testing of general, short delay and selective RCDs for the rated current value=10, 30, 100, 300, 500 mA,
- » Measurement of triggering current I_A and trip time t_A for currents 0,5 $I_{\Delta n}$, 1 $I_{\Delta n}$, 2 $I_{\Delta n}$
- » Simultaneous measurement of triggering current I_A and trip time t_A
- » Measurement of R_E and U_B without RCD tripping,
- » AUTO RCD test function (automatic measurement of subsequent selected parameters without triggering),
- » Automatic measurement for all current ranges for RCDs of type AC, A and B.

RCD type	Rated current multiplication factor	Range	Resolution	Accuracy
General or short delay	0.5 $I_{\Delta n}$	0...300 ms		
	1 $I_{\Delta n}$			
	2 $I_{\Delta n}$	0...150 ms		
	5 $I_{\Delta n}$	0...40 ms		
Selective	0.5 $I_{\Delta n}$	0...500 ms		
	1 $I_{\Delta n}$			
	2 $I_{\Delta n}$	0...200 ms		
	5 $I_{\Delta n}$	0...150 ms		
Selected rated RCD current	Range	Resolution	Measuring current	Accuracy
10 mA	3.0...10.0 mA	0.1 mA		
30 mA	9.0...30.0 mA			
100 mA	30...100 mA		0.3 $I_{\Delta n}$...1.0 $I_{\Delta n}$	±5% $I_{\Delta n}$
300 mA	90...300 mA		1 mA	
500 mA	150...500 mA			

- » Start of the measurement from the positive or negative half sine period of the test current.
- » Test current flow time at f = 50,0 Hz max. 7510 ms.

Earthing resistance and soil resistivity meters

SONEL MRU SERIES



Set of instruments for earth measurements.



	MRU-200-GPS MRU-200	MRU-120HD	MRU-120	MRU-30	MRU-21	MRU-11	MRU-10
Earth resistance measurement according to 3-pole method	√	√	√	√	√	√	√
Earth resistance measurement according to 4-lead method	√	√	√	√	—	—	—
Measurement current in measurements of earthing resistance [mA]	200	200	200	20	20	20	20
Maximum resolution [Ω]	0.001	0.01	0.01	0.01	0.01	0.01	0.01
Earth resistance measurement according to 3-pole method with additional clamp	√	√	√	√	—	—	—
Earth impedance measurement according to impulse method	√	—	—	—	—	—	—
Earth resistance measurement according to two-clamp method	√	√	√	√	—	—	—
Leakage current measurement with hard clamp	√	—	—	√	—	—	—
Leakage current measurement with flexible coil	√	—	—	—	—	—	—
Measurement of resistance of earth connection and equipotential bonding according to standard EN 61557-4	√	√	√	√	√	—	—
Soil resistivity measurement	√	√	√	√	—	√	—
Earth resistance measurement according to 2-lead method	—	—	—	√	√	—	√
Power supply	rechargeable battery / batteries	rechargeable battery	rechargeable battery / batteries	rechargeable battery	rechargeable battery / batteries	rechargeable batteries / batteries	rechargeable batteries / batteries
Memory (records)	990	990	990	990	990	—	—
Resistance measurement of auxiliary electrodes	√	√	√	√	√	√	√
Dimensions [mm]	288 x 223 x 75	390 x 310 x 180	288 x 223 x 75	200 x 180 x 74	288 x 223 x 75	221 x 102 x 62	221 x 102 x 62
Weight [kg]	2	4	2	1.1	1.4	0.7	0.7

Photo Voltaic Devices

SONEL PVM-1020 / IRM-1



Key features

PVM-1020

- » It can be used for category 1 measurements according to IEC 62446-1.
- » Allows the measurement of the U-I curve for category 2 according to IEC 62446-1.
- » AUTO mode for performing a sequence of measurements after one press of the START button.
- » It converts measured parameters into STC conditions according to IEC 60891 by cooperation with the IRM-1 solar radiation and temperature meter.
- » reSYNC function – automatic completion of results with environmental parameters and their conversion to STC conditions after restoring connection with IRM-1.
- » The built-in LoRa radio interface ensures cooperation with the IRM-1 meter over long distances.

SONEL PVM-1530 KIT

PVM-1530

- » It can be used for category 1 measurements according to IEC 62446-1.
- » Allows the measurement of the U-I curve for category 2 according to IEC 62446-1.
- » AUTO mode for performing a sequence of measurements after one press of the START button.
- » It converts measured parameters into STC conditions according to IEC 60891 by cooperation with the IRM-1 solar radiation and temperature meter.
- » reSYNC function – automatic completion of results with environmental parameters and their conversion to STC conditions after restoring connection with IRM-1.
- » The built-in LoRa radio interface ensures cooperation with the IRM-1 meter over long distances.
- » Built-in Bluetooth and Wi-Fi for communication with external devices.
- » Large, structured memory of measurements.
- » Large touchscreen for good visibility in bright sunlight.
- » Interoperate with the cloud and other Sonel meters to create a complete measurement system for PV installations.



SONEL MZC-340-PV



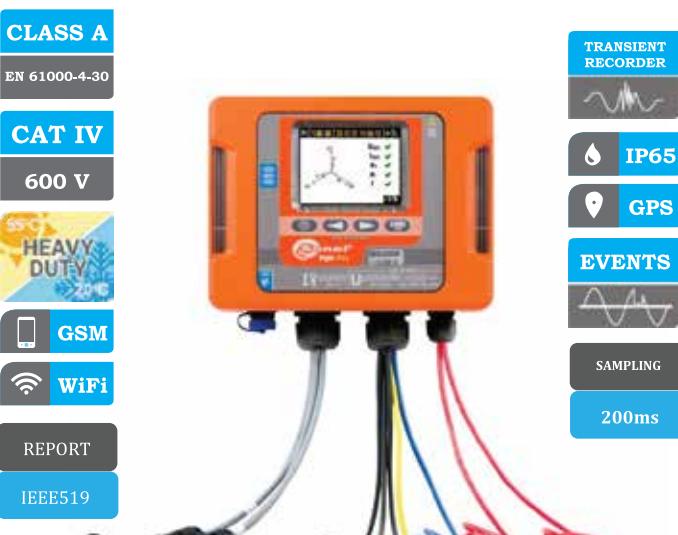
MZC-340-PV

- » Measurement of very low short circuit loop impedances (with resolution 0,1 mΩ) with a current of 130 A at 230 V; maximum 300 A at 850 V.
- » Measurements in installations with rated voltages: 220/380 V, 230/400 V, 240/415 V, 290/500 V, 400/690 V, 460/800 V (from 200 V up to 900 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.
- » 4p (four-pole) method, test leads do not require calibration (measurement with current up to 300 A).
- » Measurement of resistance (RS) and reactance (XS) components.



Power quality analyzers

SONEL PQM-711 / PQM-710



PQM-711/710 have an independent powersource, making them particularly suited for measurements with voltage transducers.

Key features

- » Removable microSD voltages L1, L2, L3, N-PE (five measurement inputs - mean, minimum and maximum values, instant values within the range up to 1000 V, interoperability with voltage transformers,
- » Currents L1, L2, L3, N (four measurement inputs) - mean, minimum and maximum values, direct current measurement within the range up to 6 kA (depending on applied current clamp), interoperability with current transformers,
- » Crest factors for current (CFI) and voltage (CFU),
- » Frequency within the range of 40 Hz – 70 Hz,
- » Active power (P), reactive power (Q), distortion power (D), apparent power (S) with identification of the nature of reactive power (capacitive, inductive),
- » Calculation of reactive power using the:
- » Budeanu method,
- » IEEE 1459,
- » Active energy (EP), reactive energy (Eq), apparent energy (ES),
- » Power factor (PF), $\cos\phi$, $\tg\phi$,
- » K factor (transformer overload due to harmonics),
- » Harmonics up to the 50th in voltage and current,
- » Inter harmonics measured as groups,
- » Total harmonic distortion THD for current and voltage,
- » short-term (PST) and long-term (PLT) light flicker index (in compliance with IEC 61000-4-15 class A),
- » Unbalance of voltages and currents,
- » Registration of overvoltage's, voltage dips and breaks along with oscilloscopes,
- » Event logging for current along with oscilloscopes (up to 1 s) as well as 10 ms RMS charts with maximum registration time of 30 s,
- » Registration of current and voltage oscilloscopes after every averaging period,
- » Measurement of control signals up to 3000 Hz,
- » Measurement of transients up to ± 8000 V with maximum sampling frequency of 10 MHz. The minimum transient time that can be registered is 650 ns (only PQM-711),
- » Sampling frequency: 10.24 kHz,
- » F-1A1, F-2A1, F-3A1 clamp: 0...1500 A AC (10 000 Ap-p)
- » F-1A, F-2A, F-3A clamp: 0...3000 A AC (10 000 Ap-p)
- » F-1A6, F-2A6, F-3A6 clamp: 0...6000 A AC (10 000 Ap-p)
- » C-4A clamp: 0...1000 A AC (3600 Ap-p)
- » C-5A clamp: 0...1000 A AC/DC (3600 Ap-p)
- » C-6A clamp: 0...10 A AC (36 Ap-p)
- » C-7A clamp: 0...100 A AC(360 Ap-p)

Measured parameters:

- » Voltages L1, L2, L3, N-PE (five measurement inputs) mean, minimum and maximum values within the range up to 760 V, interoperability with voltage transformers,
- » Currents L1, L2, L3, N (four measurement inputs) - mean, minimum and maximum values, current measurement within the range up to 6 kA (depending on applied current clamp), interoperability with current transformers,
- » Crest factors for current (CFI) and voltage (CFU),
- » Frequency within the range of 40 Hz – 70 Hz,
- » Active power (P), reactive power (Q), distortion power (D), apparent power (S) with identification of the nature of reactive power (capacitive, inductive),
- » Power registration: Budeanu method, IEEE 1459,
- » Active energy (EP), reactive energy (Eq), apparent energy (ES),
- » Power factor (PF), $\cos\phi$, $\tg\phi$,
- » Harmonics up to the 50th in voltage and current,
- » Total harmonic distortion THD for current and voltage,
- » Short-term (PST) and long-term (PLT) light flicker index (in compliance with IEC 61000-4-15 class S),
- » Unbalance of voltages (in compliance with IEC 61000-4-30 class S) and currents,
- » Event logging for current and voltage along with oscilloscopes and half-period RMS charts,
- » Inrush current,
- » Energy cost calculator,
- » Testing the efficiency of PV inverters,
- » Sampling frequency: 10.24 kHz,
- » All parameters are registered in compliance with class S acc. to standard IEC 61000-4-30.

Power quality analyzers

SONEL PQM-707



The instrument is intended for operation in networks:

- » With rated frequency 50/60 Hz,
- » With rated voltages: 58/100 V, 64/110 V; 110/190 V; 115/200 V; 120/208V, 127/220 V; 133/230 V, 220/380 V; 230/400 V; 240/415 V; 254/440 V; 290/500 V, 400/690 V,
- » With direct current.

Low resistance meters

SONEL MMR SERIES



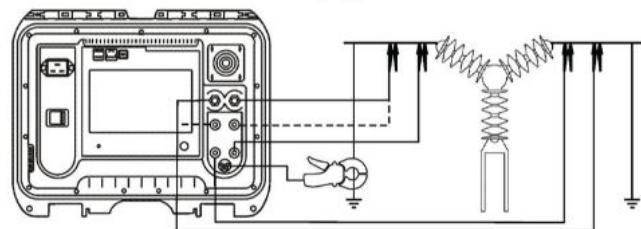
ANSI **IEC** **IP67** **TOUCH SCREEN**
37.09 **62271-100**

Key features

- » Measurements of resistive objects with current up to 100/200 A
- » Measurements of induction objects up to 10 A
- » Measurements of objects earthed on both sides (i.e. main joints of HV switches)
- » Measurement with one- or both-way current flow
- » High immunity to outside interference
- » Measurements temperature of windings
- » Automatic compensation temperature of objects measured.
- » a state-of-the-art interface with a touch screen and expanded memory work with a printer and a 2D barcode reader.
- » Wi-Fi, USB, and LAN communication

Applications

MMR-6xxx micrometers series are devices with a state of art design with unprecedented approach to measuring small resistances. The instruments allow to measure resistive objects with a high current and have a unique measurement class module for inductive current objects up to 10 A.



Comparison of low resistance meter



Parameter	MMR-6700	MMR-6500	MMR-650	MMR-640	MMR-620/630
Current Measurement	100 / 200A	100 A	10 A	10 A	10 A
Measurement Range	0.....1999.9Ω	0.....1999.9Ω	0.....1999.9Ω	0.....1999.9Ω	0.....1999.9Ω
Accuracy	± (0.25 % + 2 digits)				
Display	800 x 480 px	LED Display			
Operating Temperature	-10°C...+50°C	-10°C...+50°C	-10°C...+50°C	-10°C...+50°C	0...+40°C
Battery Charging Time	3.5 hours approx	3.5 hours approx	3.5 hours approx	3.5 hours approx	2.5 hours approx
IP Rating	IP 67	IP 67	IP 67	IP 67	IP 54
Weight	approx. 8.7 kg	approx. 8.2 kg	approx. 3.5 kg	approx. 3.5 kg	1.7 kg approx
Dimensions	401 x 307 x 175 mm	401 x 307 x 175 mm	318 x 257 x 152 mm	318 x 257 x 152 mm	295 x 222 x 95 mm
Communication	USB, LAN, WIFI	USB, LAN, WIFI	USB, LAN, WIFI	USB	RS 232

Thermal Imager

SONEL HIGH-END THERMAL CAMERA



Key features

- » Images files saved in JPG format (complete image data)
- » Recording of IR videos (on SD memory card or computer hard disk)
- » built-in reports module
- » MIF image combining mode.
- » Extensive image analysis tools
- » built-in camera for capturing images within the visible lightspectrum.
- » built-in: GPS, digital compass, LED flashlight, laser pointer, laser range finder
- » Interfaces: USB type C, Wi-Fi, Gigabit Ethernet, micro-HDMI, SD memory card slot, Bluetooth
- » Digital zoom
- » Interchangeable lenses that do not require calibration by the manufacturer.



Imagers have built-in tools for analysis and generating reports on-site.

Overview

	KT-560	KT-650	KT-670	KT-1K <small>NEW</small>
Detector type	384 x 288 / 17 µm	640 x 480 / 17 µm	1024 x 768 / 12 µm	
Spectral range		7.5~14 µm		
Sensitivity	45 mK	40 mK	35 mK	≤30 mK
Lens (field of view / focal length / instantaneous field of view / min. focus distance)				
• standard	24.9° x 18.7° / 15 mm / 1.13 mrad / 0.4 m	24.6° x 18.5° / 25 mm / 0.68 mrad / 0.3 m	24.6° x 18.5° / 28 mm / 0.43 mrad / 0.3 m	
• wide angle	48.1° x 35.9° / 7.78 mm / 2.19 mrad / 0.15 m	45.4° x 34.8° / 13 mm / 1.31 mrad / 0.15 m		-
• telephoto	11.2° x 8.4° / 33 mm / 0.52 mrad / 2 m	11.3° x 8.5° / 55 mm / 0.31 mrad / 1.5 m		-
• ultra-telephoto	7.3° x 5.5° / 50.7 mm / 0.34 mrad / 4 m	7.3° x 5.5° / 85 mm / 0.2 mrad / 4 m		-
• macro	23.3 mm x 17.5 mm / 67 mm / - / 60.7 µm	23.3 mm x 17.5 mm / 67 mm / - / 37.5 µm		-
• high temp	24.9° x 18.7° / - / -	24.6° x 18.5° / - / -	24.6° x 18.5° / - / -	24.6° x 18.5° / - / -
Display		5", 1280 x 720 high brightness, LCD touchscreen	1280 x 960 LCOS	
Viewfinder			IR / Visual / Infraredfusion MIF / PiP	
Image mode				
Zoom	1...10		1...35	
Temperature range		Range 1: -40°C...150°C Range 2: 100°C...800°C Optional: 700°C...2000°C		
Accuracy	±2°C or 2% of reading			±1°C or ±1% of reading
Image analysis mode	12 points, 12 lines, 12 areas. Temperature readings: min, max, average. Isotherms. Temperature alarm. Smart stroke	16 points, 16 lines, 16 areas. Temperature readings: min, max, average. Isotherms. Temperature alarm. Smart stroke		30 points, 30 lines, 30 areas. Temperature indication: min, max, average. Isotherm. Temperature alarm. Smart stroke.
Palettes	8	10		12
Super-resolution	4x, 768 x 576		4x, 1280 x 960	2048 x 1536
Panoramic images	-		✓	
Emissivity coefficient		Set from 0.01 to 1.00		
Measurement correction		Auto-adjustable distance, relative humidity, ambient temperature (reflected)		
Image file format		JPG		
Notes on IR images		Additional visual photos, voice, text recognition, text typing		
Reports module		PDF reports		
Video file format		MP4 (without temp. information), IRGD (including temp. information)		
Built-in functions		Visual camera 13 MPix, LED flashlight, GPS, laser pointer, laser rangefinder, microphone, speaker, digital compass, light sensor.		
Wireless communication		Wi-Fi, Bluetooth		
Storage		Built-in memory (64 GB), SD card, cloud service		
Interfaces		SD card slot (max. 64 GB), LAN 1 Gb/s, micro-HDMI, USB type C (data transfer only), tripod		
Power supply		Li-ion battery (4 h of continuous operation), built-in charger, AC adapter 110-230 V, 50/60 Hz		Li-ion battery (3 h of continuous operation), built-in charger, AC adapter 110-230 V, 50/60 Hz
Operating temperature range		-20°C...+50°C		
Storage temperature		-40°C...+70°C		
Humidity		≤95%		
Resistance to shocks / vibrations		30g 11 ms (IEC 60068-2-27)		
Housing		IP54		
Weight	approx. 1.4 kg (with battery)			approx. 1.5 kg (with battery)

Thermal imagers

SONEL KT- SERIES



Key features

- » High sensitivity of detectors and a wide temperature range
- » Panoramic photos
- » Comprehensive image analysis tools
- » Intuitive user interface
- » IR video recording (on the SD card or computer disc)
- » built-in report module
- » Different imaging modes: IR, Visual, PIP, MIF
- » built-in visual camera: 5 Mpix
- » built-in: LED torch, laser pointer
- » Interfaces: Micro USB 2.0, Wi-Fi, micro-HDMI, microSD slot

More to see, less to hold

A large display combined with innovative data processing electronics is placed in compact housing, thus ensuring a perfect balance between high performance and small dimensions – the best choice for everyday use. Moreover, due to the centrally located navigation button supported by a menu on the touchscreen, this model ensures simple and intuitive operation.



KT Series have user-friendly interface that makes it possible to use them even without special training.

	KT-128	KT-256	KT-256 F	KT-510	KT-520	KT-525	KT-530	KT-550
Detector resolution	120 x 90		256 x 192		320 x 240	384 x 288	480 x 360	640 x 480
Display		2.4", 240 x 320 LCD			4.3", 800 x 480 High Brightness LCD Touchscreen			
Thermal sensitivity	60mK		45mK		≤45mK			≤40mK
Focus	Fixed		Auto		Manual / Auto			
IFOV (standard)	7.6 mrad	3.75 mrad	1.71 mrad	1.70 mrad	1.36 mrad	1.13 mrad	0.91 mrad	0.68 mrad
Lens (field of view/ focal length)	50° x 38° / 2.28mm	56° x 48° / 3.2mm	25° x 19° / 7mm		25° x 19° / 10.5mm		25° x 19° / 17.7mm	
Temperature Range	Range 1 : -20°C to +150°C Range 2 : 100°C to 400°C	Range 1 : -20°C to +150°C Range 2 : 100°C to 550°C			Range 1 : -40°C to +150°C Range 2 : 0°C to 650°C			

Technical specification

Infrared thermometers

SONEL DIT-SERIES

	DIT-130	DIT-200	DIT-500
D:S (distance to spot) ratio	13:1	20:1	50:1
Spectral sensitivity		8~14 μm	
Temperature range(IR)	-32°C...380°C	-50°C...1000°C	-50°C...1600°C
Accuracy(IR)	±5°C (-32°C...-20°C) 1.5% + 2°C (-20°C...200°C) 2% + 2°C (200°C...380°C)	±3.5°C (-50°C...20°C) 1.0% + 1°C (20°C...300°C) 1.5% (300°C...1000°C)	±2.5°C (-50°C...20°C) 1.0% + 1°C (20°C...400°C) 1.5% + 2°C (400°C...800°C) 2.5% (800°C...1600°C)
Temperature range(K type probe)		-50°C...1370°C	
Accuracy(K type probe)	1.5% + 3°C (-50°C...999.9°C) 1.5% + 2°C (1000°C...1370°C)	2% (-50°C...0°C) 0.5% + 1.5°C (0°C...1370°C)	1.5% + 3°C (-50°C...999.9°C) 1.5% + 2°C (1000°C...1370°C)
Response time	<1 s		150 ms
Laser pointer	single	multi-point	dual
Output power		<1 mW	
Wavelength	630~670 nm		
Class	2(lI)		
Internal memory	20 measurements	-	100 measurements
Data transfer to PC	-	-	√



Reflectometers

SONEL TDR-420 / TDR-410



Key features

- » Fault location in power and telecommunication cables
- » Two independent cursors to indicate two fault locations and the distance between them (TDR-420)
- » trace hold and compare feature allows displaying and comparing two traces (TDR-420)
- » Fault location in coaxial cables
- » Fault location in infrastructure cables
- » Detection of breaks, short-circuits, damage caused by moisture and other changes in cable impedance.
- » Graphic presentation of cable faults with an indication of the distance to the fault on the display



Tracing of underground cables, cables in metal ducts & building installation, shielded cables, conductive water and heating pipelines

IP67

IP54

TDR-420

Advanced reflectometry measurements in all fields

TDR-410

Basic cable faults measurements

measuring ranges	7 m, 15 m, 30 m, 60 m, 120 m, 250 m, 500 m, 1 km, 2 km, 3 km, 6 km 20, 45, 90, 180, 360, 750, 1500, 3000, 6000, 10000, 20000 [ft]	7 m, 15 m, 30 m, 60 m, 120 m, 250 m, 500 m, 1 km, 2 km, 3 km, 4 km 20, 45, 90, 180, 360, 750, 1500, 3000, 6000, 10000, 14000 [ft]
accuracy	1% of selected range	
resolution	approx. 1% of range	
minimum cable length	4 m	
velocity of propagation	within 10...99% or 15...148.5 m/μs	within 1...99% or 1...148 m/μs
output impulse	5 V _{p-p} for an open circuit	
output impedance	25, 50, 75, 100, 125, 200 Ω	25, 50, 75, 100 Ω
impulse width	3 ns...3 μs (depending on the range)	
scanning type	up to 3 scans/s or a single scan (ONCE mode)	2 scans/s or a single scan
tone generator	810 – 1100 Hz	
operating time on a full battery	up to 8 hours of continuous scanning	up to 30 hours of continuous scanning
power supply	4 x alkaline batteries 1.5 V AA type or 4 x NiMH AA rechargeable batteries	4 x alkaline batteries 1.5 V AA type
auto-off function	1, 3, 5, 10, 15 minutes or deactivated	1, 2, 3, 5 minutes or deactivated
display	colour 3.5" LCD TFT, 320 x 240 pixels	graphical, backlit, 128 x 64 pixels
overvoltage protection	400 V DC / 250 V AC	
operating temperature	-20...+70°C	-10...+50°C

Wire tracer

SONEL LKZ-720

BUILT-IN FLASHLIGHT
 CAT III
 600 V
 IP40
 IP67



Location of conductors and cables, both live and inactive:

- » Detection of conductors in ceilings, walls, and floors,
- » Location of breaks in conductors,
- » Tracing the route of installations throughout the entire building,
- » Identification of sockets and switches in the building's installation
- » Location of faults between conductors,
- » Tracing the route of shielded cables,
- » Tracing the route of conductors in metal pipes,
- » Fuse identification in a switch gear
- » Cable tracking,
- » Tracking of the route of conducting pipes of the water or central heating system,
- » Contactless detection of live conductors.

Additional functions of locators:

- » 3D functions in receiver – detection of the direction of transmitted current flow.
- » Phase detection mode, three levels of transmitted signal,
- » Receiver operation with four transmitters at the same time - when detecting breaks or differentiating conductors,
- » Flashlight with bright LED diode, headphone socket in receiver,
- » Backlit screens for work in the darkness,
- » Transmission of battery charge status and transmitter settings to receiver,
- » Operation in a broad rated voltage range, up to 500 V RMS,
- » Voltage measurement of object up to 500 V RMS,
- » Software updating via USB, automatic or manual selection of transmission modes,
- » Additional accessories enabling more precise location – such as a contact or contactless probe and measurement clamp

Cable and underground infrastructure locator

SONEL LKZ SERIES:

LKD-2500
detector



Li-Ion
BATTERY



Bluetooth



IP65

LKN-2500
Transmitter



Li-Ion
BATTERY



IP67

NEW



Key features

- » The LKZ locator set consists of an LKN transmitter and LKD detector. It allows for location, identification and tracking of the route of objects buried in the ground.
- » LKN-2500 transmitter injects a locating signal into an underground object. LKD-2500 detector placed along the object traces this signal along the object.

It allows to trace:

1. Power cords and cables, control cables, telecommunications cables,
2. Underground elements of lightning protection systems, cathodic protection systems,
3. Water and sewage systems,
4. Fuel transmission systems (pipelines, gas pipelines)
5. Heating systems and pre-insulated pipes

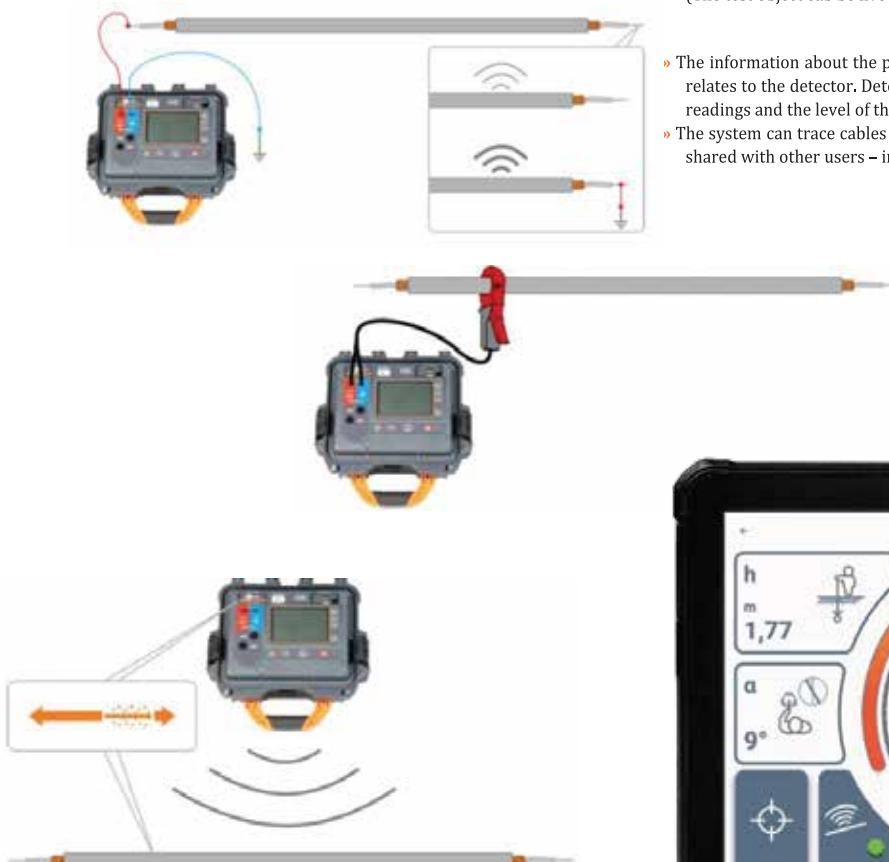
- » The sets of LKZ series are an invaluable support in earthworks carried out for various industries, including energy, installation, construction, railway, telecommunications, water and sanitary, heating, geodetic and many others.

» The system can operate in:

1. **Passive mode** (without the use of the LKN-2500 transmitter a) 50 Hz, 60 Hz (Power mode) & b) 2...65 kHz (Radio mode) and
2. **Active mode** (with the use of the LKN-2500 transmitter at the frequencies of 8 kHz, 32 kHz). The active mode allows to introduce the signal in three different methods:
 - a) **Galvanic** – injects tracing signal into the object directly, through crocodile clips and test leads,
 - b) **Clamp** – injects tracing signal into the object through an inductive clamp (The test object cab be live in this mode)
 - c) **Inductive** – injects tracing signal into the object inductively, using the instrument's internal antenna. (The test object cab be live in this mode)

- » The information about the position of the traced object is displayed on the Sonel LKZ Mobile app which relates to the detector. Determination of the object's route is possible based on observation of compass readings and the level of the detected signal.

- » The system can trace cables and record routes via the mobile application. Such files can be exported and shared with other users – including those who do not have the LKN-2500 / LKD-2500 device.



Safety tester for electrical equipment

SONEL PAT SERIES



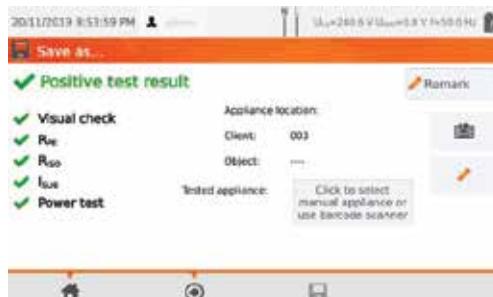
	First start-up and modification	Tests after repair	Periodical tests	Type tests / procedural tests
Equipment tested in compliance with standards	DIN VDE 0751:2001	DIN VDE 0701-0702 DIN VDE 0751:2001 EN 62353 IEC 60601 EN 50678:2020	DIN VDE 0701-0702 E-08400:1988 DIN VDE 0751:2001 British standards EN 62353 IEC 60601 EN 60974-4 EN 50699	DIN EN 60950/50116 EN 61010 DIN EN 63335/50106 EN 60745-1 IEC 60601
Laboratory instruments	●	● ●	●	●
Measuring and inspection instruments	●	● ●	●	● ●
Voltage-generating equipment	●	● ●	●	●
Electric tools	●	● ● ●	●	● ● ●
Heating equipment	●	● ●	●	● ●
Equipment with electrical drive	●	● ● ●	●	● ● ●
Lighting lamps	●	● ●	●	● ●
Multimedia and telecommunications devices	●	● ●	●	● ●
Cable reels, extension cords, connector cables	●	● ●	●	● ●
Data processing devices and office appliances	●	● ●		● ●
Electrical equipment for medical applications, components of applications	●	● ● ●	● ● ●	●
Welding equipment				

Key features

- » Resistance measurement of protective conductor with current: 200 mA, 10 A and 25 A (protection class I),
- » Insulation resistance measurement - three measurement voltages: 100 V, 250 V, 500 V
- » Measurement of equivalent leakage current,
- » Measurement of differential leakage current,
- » Measurement of touch leakage current,
- » Power measurement,
- » Measurement of electricity consumption,
- » IEC cable test,
- » Measurement of network voltage and frequency,
- » Testing of RCD parameters,
- » Current measurement with clamp,

Additional features:

- » Automatic selection of measuring range,
- » Professional software for data processing and report generation,
- » Supports barcode reader and printer,
- » Supports USB flash drive storage devices,
- » Large, easy-to-read touch display,
- » Ergonomic operation.



Acoustic parameters

Number of microphones	64
Bandwidth	2 kHz...65 kHz
Distance	0.3 m...100 m 1.0 ft...328 ft
Camera FOV	51.8° x 36.4°
Sound intensity display	Peak Point, Center Point
Acoustic image frame rate	25 fps
Signal noise ratio	70 dB
Acoustic image resolution	800 x 480
Acoustic image palettes	8
Display	800 x 480 px, 4.3" LCD, touchscreen
Digital zoom	1.0x...8.0x
Storage media	Removable 64 GB SD card
Image storage capacity	20 000 images
Video storage capacity	60 hours
Video file format	MP4
Power supply	5 V DC / 2 A (charging via USB)
Wi-Fi	802.11 b/g/n (2.4 GHz and 5 GHz)
Battery type	Dismountable and rechargeable Li-Ion battery
Battery operating time	Approx. 3.5 hours
Battery charging time	5 hours to full charge

Specifications of UV section

Image type	Monochromatic
Minimum UV sensitivity	$2.2 \times 10^{-18} \text{ W/cm}^2$
Minimum detectable discharge	1 pC from a distance of 10 meters
Spectral range	UV 240 ... 280 nm 5.5°x 4.0°
Field of vision (WxS)	Automatic and manual (UV and visible spectrum)
Sharpness setting	2 m ... ∞
Sharpness range	Non-consumable
Detector life	50 Hz

Specification of visible spectrum section

Image type	Full color
Accuracy of UV/visible image superposition	Better than 1 milliradian
Minimum sensitivity	0.1 lux
Zoom	25x optical and 12x digital
Display	Unfolding 5.7" VGA touch LCD
Type	PAL/NTSC
Video standard	Combined (UV & visible) / only UV / only visible
Imaging modes	White, red, blue
Discharge color	

Processing and communication

Video standard	H.264
Alarm	Audio, LED
Operation	Buttons and touch LCD
Audio module	Microphone input for audio notes
GPS module	√

Data storage

Memory type	SD memory card
Image file format	JPG
Video file format	AVI
Memory capacity	8000 images or >4 hours of video (for 2 GB card)
File transfer	USB, card reader

Power supply

Power consumption	10 W
Battery type	Li-Ion (2 pcs. in set)
Operating time on battery power	2 hours
Charging	External or internal charger
External power supply	9-12 V, 10 VA
Power adapter	110-240 V AC, 50/60 Hz / 12 V DC 3.8 A

Acoustic Imager

KUS 100



Features:

Sonel KUS-100 acoustic imager, with the help of a built-in microphone array, effectively detects sources of acoustic emission such as leaks of compressed agents in industrial installations or partial discharges in the power utility industry. It is a vital diagnostic tool, allowing significant savings by reducing energy losses. The imager operates in two detection modes: leakage and partial discharge. It can manually tune the detected frequencies and change the sensitivity level to avoid unwanted reflections and interference. Comfort of use is improved by touch screen and a convenient strap mounted to the housing.

Corona discharge camera

SONEL UV-260



UV-260 is an innovative solution in the field of UV radiation detection!

Battery tester

BT-120



Key features

- » Sonel BT-120 tester is a measuring tool that allows you to accurately test a wide range of battery parameters to ensure optimal battery performance. Designed for both professionals and home users, BT-120 tester is a vital support for keeping batteries in excellent condition.
- » With Sonel BT-120 tester, you can rest assured that your batteries are operating at full capacity, delivering power when you need it. Find optimal power solutions for your devices with a tester that offers reliable measurements and precise information.
- » Measuring the ripple voltage down to 5 V identifies potential problems, such as cell damage or improper charging. This is crucial to maintaining battery performance.
- » The temperature measurement of the battery can be done from -10°C to 100 °C.

Specification:

Internal resistance

Display range	Resolution	Accuracy
3 mΩ	1 μΩ	±(0.8% m.v. + 10 digits)
30 mΩ	10 μΩ	
300 mΩ	100 μΩ	
3 Ω	1 mΩ	
30 Ω	10 mΩ	±(0.5% m.v. + 10 digits)
300 Ω	100 mΩ	

DC voltage

Display range	Resolution	Accuracy
5 V	0.001 V	
50 V	0.01 V	
500 V	0.1 V	±(0.5% m.v. + 5 digits)

AC voltage

Display range	Resolution	Accuracy
500 V (50/60 Hz)	0.1 V	±(0.75% m.v. + 5 digits)

DC current

Display range	Resolution	Accuracy
4 A	0.001 A	
40 A	0.01 A	
400 A	0.1 A	±(0.5% m.v. + 5 digits)

AC current

Display range	Resolution	Accuracy
4 A	0.001 A	
40 A	0.01 A	
400 A	0.1 A	±(0.75% m.v. + 10 digits)

Description

The LMW-100 is an invaluable measurement assistant for users working in the construction industry, but also for electricians. It will help you to determine:
 » The measurement grid for illuminance measurements,
 » The distance to the probes when measuring earth resistance,
 » The distance to cable damage indicated by the reflectometer.

Measurement functions

- » Single mode measurements
- » Continuous measurements
- » Automatic continuous determination of extreme values
- » Summing up the results.
- » Surface measurement
- » Volume measurement
- » Determining the distance with 2 measurements.
- » Determining the distance with 3 measurements.

Technical specifications:

- » Degree of housing protection acc. to EN 60529.....P54
- » Range0.05...100 m
- » Measurement accuracy at a distance of ≤10 m.....from ±1.5 mm
- » Unit of measurement.....meters / inches / feet
- » Memory of measurement results.....20 records
- » Operating temperature.....10...50°C
- » Storage temperature.....20...60°C
- » Operating humidity.....<95%
- » Storage humidity.....30...50%
- » Power supply.....2x AAA 1.5 V battery
- » Inactivity time for triggering Auto-Off function
- laser.....0.5 min
- device.....3 min
- » weight.....100 g
- » dimensions.....110 x 46 x 28 mm

Distance Meter

SONEL LMW-100



Features

- » The rangefinder has a range of up to 100 m. With the built-in algorithms, the device helps the user by calculating the area, cubature and - based on 2 or 3 indirect measurements- height.
- » A pocket device with a handy shape.
- » This compact device is equipped with the latest technologies to operate in challenging conditions. The rubberized housing protects the device against damage.

High Voltage VLF | DC Tester

SONEL S-36 VLF



Key features

- » The compact, robust and portable cable test set high voltage VLF and DC testers is used for testing of medium voltage cables in accordance to the standards IEEE400, IEC 0502-2, CENELEC HD 620 & 621 and DIN VDE 0276/620 & 621.
- » The test is carried out with a low strain practice with VLF (very low frequency) test voltage of preferably 0.1 Hz.
- » VLF Test enables detection of damages of the insula within shortest test time.
- » The high voltage VLF and DC testers can test cables with extruded insulation (XLPE-, PE-, EPR-insulation) as well as cables with paper-oil insulation (PILC).

Comparison of High Voltage Testers

Parameter	S-24VLF	S-36VLF	S-44VLF	S-54VLF
Output voltage	0...24 kV RMS VLF 0.1 Hz (option: 0.05 Hz + 0.02 Hz) ± 0..34 kV DC	0...36 kV RMS VLF 0.1 Hz (option: 0.05 Hz + 0.02 Hz) ± 0..52 kV DC	0...44 kV RMS VLF 0.1 Hz (option: 0.05 Hz + 0.02 Hz) ± 0..62 kV DC	0...57 kV RMS VLF 0.1 Hz (option: 0.05 Hz + 0.02 Hz) ± 0..62 kV DC
Voltage waveshapes VLF	similar sinewave, symmetrical, with True RMS measurement	similar sinewave, symmetrical, with True RMS measurement	similar sinewave, symmetrical, with True RMS measurement	similar sinewave, symmetrical, with True RMS measurement
Max. load (VLF)	up to 60 km (15 µF at 24 kV RMS, 0.02 Hz) *at a cable capacitance of approx. 0.25 µF/km	up to 60 km (15 µF at 18 kV RMS, 0.02 Hz) *at a cable capacitance of approx. 0.25 µF/km	up to 58 km (14.6µF at 19 kV RMS, 0.02 Hz) *at a cable capacitance of approx. 0.25 µF/km	up to 12.2 km (4.4µF at 18 kV RMS, 0.02 Hz) **at a cable capacitance of approx. 0.36 µF/km
Discharge - integrated automatic discharge device	max. 9000 J	max. 12500 J	max. 12500 J	max. 12500 J
Voltage measuring ranges	-40...0...40 kV accuracy ±1%	-60...0...60 kV accuracy ±1%	-70...0...70 kV accuracy ±1%	-70...0...70 kV accuracy ±1%
Current measuring ranges	±0..100 µA / 1 mA / 10 mA	±0..100 µA / 1 mA / 10 mA	±0..100 µA / 1 mA / 10 mA	±0..100 µA / 1 mA / 10 mA
Construction	in two parts: operation unit and high voltage unit	in two parts: operation unit and high voltage unit	in two parts: operation unit and high voltage unit	in two parts: operation unit and high voltage unit

Key features:

- » Robust construction, low weight
- » Integrated timer: max. 30 min
- » Discharge device: integrated
- » Internal battery charger with deep discharge protection
- » Voltage measurement direct at HV output
- » Short-circuit-proof output: electronically limited output current
- » Protective ground connection
- » Mains-independent by internal rechargeable battery
- » Modest dimensions
- » Maximum safety

High Voltage Insulation Tester | Hi-Pot Tester

SONEL S-25 DC



Parameter	S-25DC	S-50DC	S-80DC	S-110DC	S-120DC
Output voltage	• 0...25 kV DC • infinitely adjustable • negative polarity • ripple < 0.25%	• 0...50 kV DC • infinitely adjustable • negative polarity	• 0...80 kV DC • infinitely adjustable • negative polarity	• 0...110 kV DC • infinitely adjustable • negative polarity	• 0...120 kV DC • infinitely adjustable • negative polarity
Rated output current at max. output voltage	1.5 mA electronically limited	6 mA	5 mA	4 mA	3.5 mA
Discharge - integrated automatic discharge device	3000 J 9.6 µF at 25 kV	7500 J 6 µF at 50 kV	12250 J 4 µF at 75 kV 3.5 µF at 80 kV	15000 J 3 µF at 100 kV 2.5 µF at 110 kV	18750 J 2.4 µF at 125 kV 2.6 µF at 120 kV
Voltage measuring ranges	0...30 kV	0...50 kV	0...80 kV	0...110 kV	0...130 kV
Current measuring ranges	0...200 µA / 0...2 mA manual or automatic switching between ranges			0...100 µA / 1 mA / 10 mA manual switching between ranges	

Two-pole voltage testers

SONEL P-6 / P-5 / P-4 / VT-3



Product description

Sonel P-6, P-5 and P-4 are reliable, particularly durable, and safe 2-pole testers, which enable testing voltage, circuit continuity and phase sequence. They have been designed for use in extreme conditions both in industry and commercial applications. Advanced technology, a high level of safety and user-friendliness are the key features of the P-line voltage testers.

Main functions and attributes of the P-line instruments

- » Phase identification (P-6) - unique feature in voltage indicators worldwide
- » Automatic voltage tests up to 1000 V AC/DC
- » Optical indication by a LED bar (P-4) and additional LCD display (P-6, P-5)
- » Sound indication when dangerous voltage levels of 50 V AC and 120 V DC are exceeded.
- » RCD trip test with switchable load
- » Automatic continuity test upon connection to the object
- » 2-pole test of phase rotation direction
- » Single-pole indication of 100 V presence
- » Resistance measurement up to 1999 Ω (P-6, P-5)
- » HOLD function for freezing the measurement results.
- » Robust, two-component housing protecting from mechanical damage and impacts.
- » Integrated torch light and backlit display (P-6, P-5) for tests in poorly lit areas
- » IP 65 ingress protection guarantees protection against dust and water.



Illuminance meter

SONEL LXP-10A / LXP-10B / LXP-2

Basic technical specifications:

	LXP-10A The most recommended for professionals	LXP-10B For measurements of emergency lighting	LXP-2 Basic measurements of workplaces
class	A	B	B
measurement range	0.000...399.9 k lx 0.000...39.99 k fc	0.00...399.9 k lx 0.000...39.99 k fc	0.0...19.99 k lx 0.00...1999 fc
resolution (lx/fc)	up to 0.001	up to 0.01 / 0.001	up to 0.1 / 0.01
accuracy	±(2% + 5 digits)	±(5% + 5 digits)	
spectral uncertainty f_1'	<2%	<6%	
cosine matching error f_2	±3%		
number of ranges	6	5	3
sampling rate	1.3 Hz		
spectral sensitivity	CIE spectral sensitivity (CIE human eye sensitivity)		
photodetector	One silicon photodiode and spectral sensitivity filter		



Main features

- » Measurements of all types of light - also LED lighting.
- » No need to use correction factors
- » Displaying results in lux and foot-candle.
- » Measurements of emergency lighting

Advanced industrial multimeter

SONEL CMM SERIES

CAT III
1000 V
CAT IV
600 V
RECORDER
IP67
BLUETOOTH



Additional functions

- » The AC + DC function allows you to simultaneously display the value of the constant and variable component or the sum of both components during voltage measurement
- » True RMS for AC voltage and current for measuring the effective value of distorted waveforms.
- » 4~20 mA function used for, among others, measurement of the analogue control circuits of temperature, pressure, pH or flow sensors.
- » Fast and easy reading is provided by a color display with a resolution of 320 x 240 pixels, and a diagonal of 3.5", enabling reading the result under wide angle and in dark locations.
- » built-in low-pass filter, thanks to which the voltage measurements will be more accurate by eliminating the influence of interference generated by machines and electronic devices.
- » Displaying PEAK values.
- » The relative REL measurement
- » real-time clock that allows adding date and time of measurement to each stored result.
- » built-in memory for 2000 measurements
- » Possibility of quick detection of irregularities due to the registration of measurement results in graphical form of the trend, thanks to the Trend Capture function and the built-in recorder with the possibility of recording up to 10,000 samples
- » built-in Bluetooth module for sending live measurement results to Android mobile devices and - for PCs - CMM-60 Multimeter Software
- » Registration of maximum and minimum values and calculation of the average of current measurement



SONEL MULTIMETER MOBILE

Sonel Multimeter Mobile application is intended for reading measurement values in live mode, as well as for transferring and storing measurement results in the memory of mobile devices based on the Android system.



Comparison of multimeters



	CMM-60 High-end industrial meter	CMM-40 Industrial area meter	CMM-30 Meter for industry	CMM-11 Compact meter for general purpose	CMM-10 Pocket meter for basic measurements
AC/DC voltage	1000.0 V	1000.0 V	1000.0 V	600 V	600 V
AC/DC current	10.000 A	10.000 A	10.00 A	10.00 A	10.00 A
Resistance	50.000 MΩ	40.000 MΩ	60.00 MΩ	40.00 MΩ	40.00 MΩ
Frequency	10.000 MHz	100.00 MHz	10 kHz	100.0 kHz	10.000 MHz
Capacitance	10.00 mF	40.000 mF	6000 µF	4000 µF	100.0 µF
Temperature	1000.0°C	1200.0°C	760°C	-	760°C
dB	√	-	-	-	-
Duty cycle (%)/ impulse width (ms)	√/√	√/-	√/-	√/-	√/-
Continuity / diode test	√/√	√/√	√/√	√/√	√/√
4-20 mA% current loop measurement	√	√	-	-	-
Low pass filter	√	-	-	-	-
Basic features					
Display	50.000	40.000	6.000	4.000	4.000
True RMS measurement	√	√	√	√	-
automatic / manual range selection	√/√	√/√	√/√	√/√	√/√
Advanced features					
MAX / MIN / AVG measurement	√/√/√	√/√/-	√/√/√	√/√/-	-/-/-
HOLD	√	√	√	√	√
PEAK HOLD	√	√	√	-	-
Crest factor	√	-	-	-	-
AC + DC	√	√	√	-	-
Relative measurement	√	√	√	-	√
Recorder	√	√	-	-	-
Trend capture function	√	-	-	-	-
Memory	√	√	in mobile application	in mobile application	-
Bluetooth	√	-	√	√	-
Sonel Multimeter Mobile	√	-	√	√	-
Other features					
Clock	√	-	-	-	-
Easy access to fuses A / mA	-/√	-/-	√/√	√/√	√/√
Automatic shutdown	√	√	√	√	√
Battery indicator	√	√	√	√	√
Built-in flashlight	-	-	√	√	-
Beep	√	√	√	√	√



Clamp meter

SONEL CMP SERIES

HVDC
RECORDER
INRUSH CURRENT
CAT IV
600 V
CAT III
1000 V
IP40
BUILT-IN FLASHLIGHT
BLUETOOTH



Key features

- » True RMS AC voltage and current measurement for accurate and reliable readings of non-sinusoidal signals
- » Current and voltage measurements downstream the inverter, frequency converter or in the VFD system
- » High voltage DC measurement (HVDC)
- » INRUSH function for measuring current drawn by an electrical device when turned on.
- » Elimination of interference and induced voltages - Low Z
- » Recorder, possibility of continuous recording
- » Large clamp allows the measurement of conductors up to 1000 A DC and 1000 A AC
- » Temperature measurement in Fahrenheit and Celsius
- » Automatic selection of measuring ranges
- » HOLD function, allowing for freezing the result on the display.
- » built-in Bluetooth module for sending data to mobile devices with Android system.
- » Holding of MAX/MIN results
- » Auto-off function



The weight of the CMP-1015-PV is less than 500gms with battery.

Comparison of clamp multimeters



	CMP-3000	CMP-2000	CMP-1015-PV	CMP-1010	CMP-403	CMP-402	CMP-3kR	CMP-200F	CMP-200
High-end model for industry area	High-end model for industry area	High-end model for industry area	High-end model for photovoltaics and industry area	Various applications in industry	For general use	For general use	Recording currents	For general use	Leakage current

Measurement functions

AC/DC voltage	1000 V / 1000 V	750 V / 1000 V	1000 V / 1500 V	1000 V / 1000 V	1000 V / 1000 V	1000 V / 1000 V	.	1000 V / 1000 V	-/-
AC/DC current	3000 A / 1000 A	1500 A / 2000 A	1000 A / 1000 A	1000 A / 1000 A	400.0 A / 400.0 A	400.0 A / -	3000 A / -	200.0 A / -	200 A / -
Resistance	40.000 MΩ	60.00 MΩ	60.00 MΩ	60.00 MΩ	40.00 MΩ	40.00 MΩ	.	60.00 MΩ	.
Frequency	50.000 MHz	1.000 MHz	10.00 MHz	99.99 kHz	current: 999.9 Hz voltage: 99.99 kHz	current: 999.9 Hz voltage: 99.99 kHz	100.0 Hz	.	.
Capacitance	5.0000 mF	6.599 mF	100.0 mF	100.0 mF	99.99 mF	99.99 mF	.	4000 μF	.
Temperature	1000°C	1000°C	1000°C	1000°C	1000°C	1000°C	.	.	.
Non-contact voltage indication	✓	.	✓	.	✓	✓	.	✓	.
Duty cycle (%)	✓	✓	✓	✓	✓	✓	.	.	.
Continuity / diode test	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	.	✓/✓	.
Inrush current	✓	✓	✓	✓	✓	✓	.	.	.
Low Z	.	.	✓	✓	.

Basic features

True RMS measurement	✓	✓	✓	✓	✓	-	✓	✓	-
Automatic / manual range selection	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	✓/✓	-/✓
Maximum diameter of measured conductor	hard clamp: 48 mm flexible clamp: 160 mm	57 mm (conductor) 70 x 18 mm (bus bar)	48 mm	35 mm	30 mm	30 mm	flexible clamp: 160 mm	16 mm	30 mm
Input impedance	10 MΩ	10 MΩ	9 MΩ (AC) 10 MΩ (DC)	10 MΩ	10 MΩ	10 MΩ	.	10 MΩ	.

Advanced features

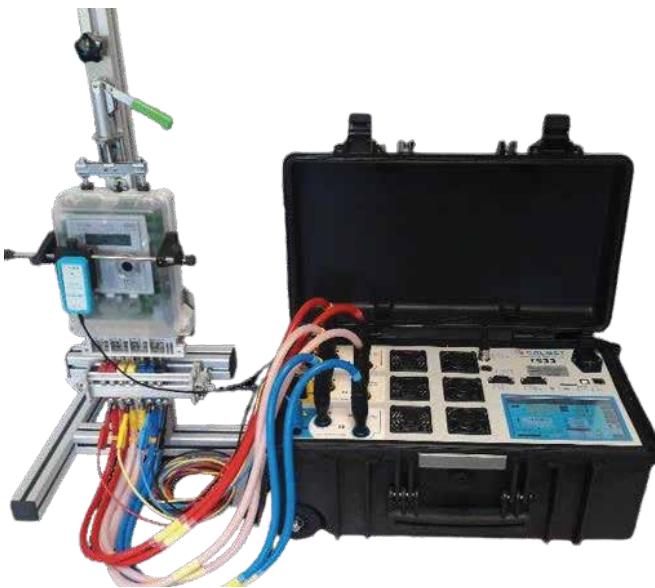
MAX / MIN / AVG measurement	✓/✓/-	✓/✓/-	✓/✓/-	-	-/-/-	-/-/-	✓/✓/-	✓/✓/-
HOLD	✓	✓	✓	✓	✓	✓	✓	✓
PEAK HOLD	.	.	✓
AC+DC	.	.	✓
Relative measurement	✓	✓	✓	✓	✓	✓	.	.

Other features

Automatic power down	✓	✓	✓	✓	✓	✓	✓	✓	
Battery indicator	✓	✓	✓	✓	✓	✓	✓	✓	
Beep	✓	✓	✓	✓	✓	✓	✓	.	
Dimensions	230 x 76 x 40 mm	281 x 108 x 53 mm	273 x 96 x 48 mm	250 x 90 x 40 mm	220 x 80 x 39 mm	220 x 80 x 39 mm	150 x 65 x 35 mm	230 x 44 x 66 mm	182 x 61 x 34 mm
Weight	501 g	570 g	490 g	329 g	270 g	266 g	240 g	270 g	225 g

Three-phase Fully Automatic Test System with Reference Standard and Integrated Current and Voltage Source

TS33



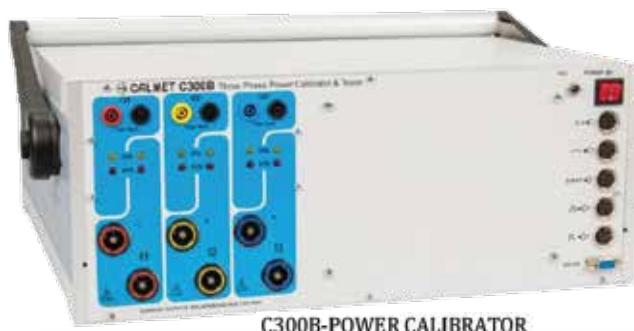
Key features

- » High performance: 3x600V, 3x120A, class up to 0,02%, 0,04% (meter) or 0,1% (source)
- » Huge output power and low weight: only 22kg (48lbs) in portable case
- » Quick measurements of power quality parameters
- » Advanced functions but easy to use,
- » Automatic tests of energy meters and PT (VT), CT transformers
- » Manual operations and fully automatic procedures for calibrating and testing
- » Professional service and support (it doesn't matter if you have a complex or trivial issue)
- » Competitive price in comparison to the best performance.
- » Automatic error calculation of calibrated or tested devices
- » Measurement up to 63rd harmonics
- » Generation up to 40th harmonics
- » Setting shapes like phase fired, triangle and burst.
- » 3-phase voltages: 0.5000-600.00V (meter) 20.00-600.00V (source)
- » 3-phase currents: 1.000mA-120.000A (meter & source)
- » Phase shift and angles between voltages: 0.00-360.00 degrees
- » Frequency range: 40-70Hz (meter) 45-65Hz (source)
- » Impulse output: up to 210kHz

TS33 Three-phase Fully Automatic Test System with Reference Standard and Integrated Current and Voltage Source uses large 7-inch LCD display with touch panel for setting and presenting measurements. TS33 can save measurement data on SD card, save a BMP screen capture, and print measurement report directly to Bluetooth printer. Analyzer can also be connected by USB, Bluetooth or LAN with PC computer or Tablet and setting by TS PC-Soft.

TS33 is a universal device and can be used as a:

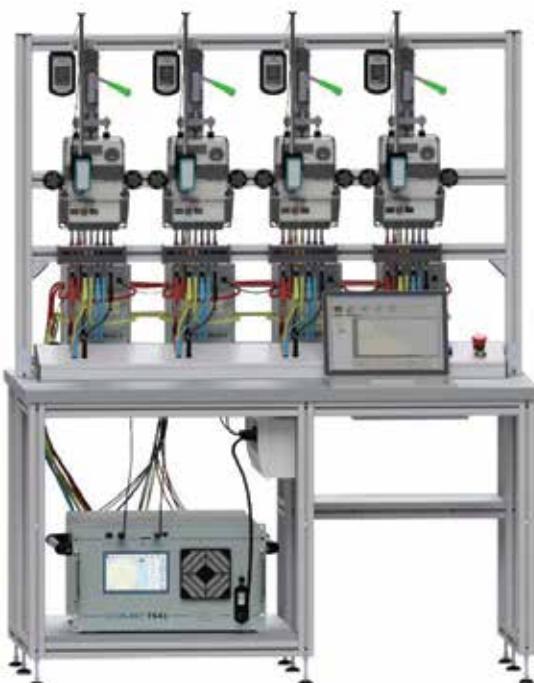
- » Three-Phase Power Network Analyzer (Basic function)
- » Energy Meter Tester (Basic function)
- » Power Calibrator (Basic function)
- » Instrument Transformer Tester (TT function)



C300B-POWER CALIBRATOR

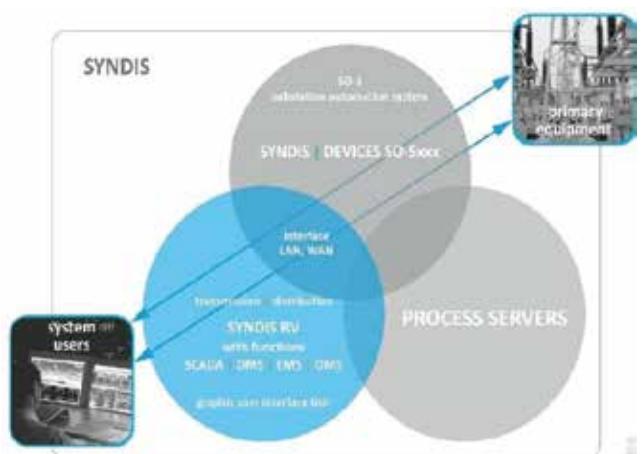
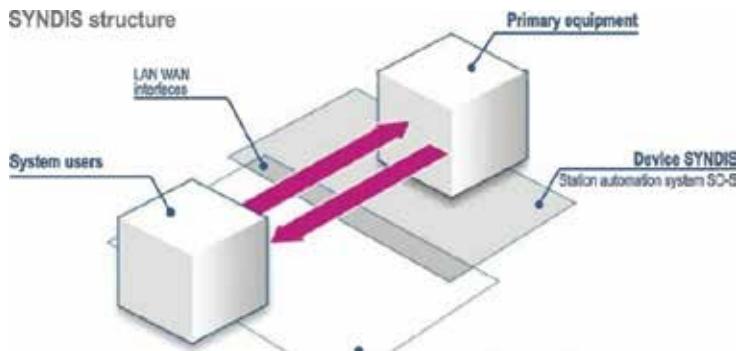


TE30-POWER QUALITY ANALYZER



TB41-TEST BENCH

Substation automation



- » SCADA modules provide connectivity to objects and the implementation of measurements, controls, and supervision. DMS/OMS/EMS modules adapt SYNDIS to the specifics of energy distribution and transmission processes.
- » The SYNDIS-SCADA system works in a client-server architecture. A key feature of this solution is the separation of the real-time process from the visualization and data processing processes.

The server collects information:

- » From field and station controllers
- » Security devices
- » Measuring transducers.
- » The information is collected in databases and made available to users through terminals connected to an intranet or Internet network.



Substation automation



Control-measuring automation



Automation devices in MV networks



Controller RTU SO-52v21



Monitoring



Disturbance Recorders



Digital substation



DALI-BOX



Server and workstations



Power supplying



For smart building

SUPPORT



At Sonel India, we take pride in offering top-notch service for all your product needs. Our state-of-the-art service center in India provides swift and reliable solutions for your valuable devices.

Comprehensive product support:

We specialize in servicing a wide range of Sonel make products. Our Engineers are trained to handle diagnostics, repairs, and maintenance with precision and expertise.

Trust in our expertise:

Experienced Professionals: Our team comprises skilled technicians with years of experience.

Quick Turnaround: We understand the value of your time; expect prompt service.

Genuine Parts: We use only authentic replacement parts for repairs.

Calibration Laboratory: Highly accurate and traceable reference standards that are used to calibrate and verify the accuracy of measurement instruments.

What's sets us apart:

Doorstep Pickup: Convenient service where we collect your device from your location.

Transparent Communication: Regular updates on the status of your device.

Affordable Pricing: Competitive rates for quality service.

We have an Annual Maintenance Contract (AMC) & Extended Warranty Period (EWP) scheme for our products and services.

The benefits of having our AMC or EWP:

- » This can extend the lifespan of the product and reduce the likelihood of unexpected breakdowns.
- » Quick response times and regular maintenance reduce the downtime associated with equipment failures.
- » Timely repairs ensure that products are operational, minimizing disruptions to business processes.
- » This can result in faster response times and quicker issue resolution.
- » Regular scheduled maintenance helps identify and address potential issues before they turn into major problems.
- » Predictable and fixed costs over the contract period help in budgeting and financial planning.
- » For software-based products, AMC services may include regular updates, patches, and upgrades.
- » This ensures that the software remains secure, efficient, and compatible with the latest technologies.
- » AMC services can help in keeping products compliant with industry regulations and standards.
- » Knowing that maintenance and support are taken care of allows businesses and individuals to focus on their core activities.
- » It provides peace of mind, knowing that the products are being professionally managed and maintained.



Empowering Excellence, Enabling Success – The heartbeat of innovation and service, our Product Service Team delivers solutions that exceed expectations.

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