

A 1632 eMobility Analyser

The A 1632 eMobility Analyser is a special accessory designed for diagnostic testing of Electric Vehicle Supply Equipment (EVSE) together with supported METREL installation testers. It supports verification of electrical safety and functional testing of Type 1 and/or Type 2 EVSE as well as testing of mode 2 and mode 3 electrical vehicle (EV) charging cables and communication monitoring between the charging station and the EV. Fully supported professional station-based and cable-based report creation with MESM software.



MEASURING FUNCTIONS

Safety testing

- EVSE safety testing according to EN 60364-6 (Visual inspections, Continuity, Insulation, ZLine, ZLoop, RCD, Functional).
- EV cable safety testing according to VDE 0701-0702 (Resistance of PE conductor, Insulation, Leakage current).
- Functional testing according to VDE 0122-1.

Functional testing

EV simulation

- Setting CP and PP states for appropriate EVSE mode.
- Setting CP and PP states for appropriate cable mode.

Diagnostic testing

- CP signal monitoring between EVSE and EV simulator.
- CP signal monitoring between Cable and EV simulator.

Monitor testing

- CP signal monitoring between EVSE and EV.
- CP signal monitoring on EV cable.

Mode 2 EV cable testing

KEY FEATURES

- Electrical safety testing of EVSE.
- Functional testing of EVSE.
- Simulation of electrical vehicle's CP and PP circuits.
- Simulation of errors on CP circuit and input mains.
- Electrical safety testing of Mode 2 cables with integrated IC CPD.
- Diagnostic test for verification of proper operation of CP circuit.
- Accessible inputs/outputs for connection of safety testers.
- Monitoring of communication between EV charging station and EV.
- Bluetooth communication with Metrel safety testers.

A 1507 Controlled 3-phase switch Adapter

The A 1507 Controlled 3-phase switch adapter is an accessory intended for automating the process of electrical safety testing of three phase circuits. In combination with Auto Sequences and one of Metrel's electrical installation safety testers MI 3155 EurotestXD or MI 3152 EurotestXC it is possible to automate the process of 3-phase system testing even further.



KEY FEATURES

- Banana socket outputs for connection to a 3-phase system;
- Motor driven through Bluetooth communication with Metrel's electrical safety testers;
- Automatic **ON/OFF**.

APPLICATION

On-site automated testing of:

- 3-phase systems via the added crocodile clips and probes;
- 3-phase sockets with the use of additional adapters.

Supported measurements:

- Voltage and 3-phase sequence;
- Insulation resistances;
- Continuity of protective conductor;
- Resistance to earth;
- Resistance N-PE;
- RCD testing;
- Line impedances;
- Loop impedances.

SUPPORTED INSTRUMENTS

- MI 3152 EurotestXC;
- MI 3152H EurotestXC 2.5kV;
- MI 3155 EurotestXD.

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 **METREL**[®]

MI 3325 MultiServicerXD

The MI 3325 MultiServicerXD is a top-of-the-line multi-functional instrument covering diverse industrial applications, where robustness and reliability are a must. In Metrel range of the instruments it is introduced as a successor of MI 3321 MultiServicerXA. The new platform integrated in the MI 3325 features in support for colour touch screen technology, advanced memory organizer including large SD-card storage media and state of the art AUTOSEQUENCE®s.



MEASURING FUNCTIONS

- Continuity (2W & 4W), 0.2A, 10A, 25A + Voltage drop @ 10A;
- HV AC, HV AC programmable 100V - 5000V;
- Insulation Resistance (Riso, Riso-S) 250V, 500V, 1000V;
- Sub-Leakage Current, (Isub, Isub-S) 110V a.c., 230V a.c.;
- Differential Leakage current;
- PE leakage current;
- Touch leakage current;
- Functional test (power P/S/Q, voltage, current, cos fi, frequency, ThdU, ThdI, PF);
- RCD testing (RCD Uc, RCD t, RCD I);
- Polarity;
- Clamp current;
- Voltage, Frequency, Phase rotation;
- Varistor test;
- Z loop – Fault loop impedance and prospective fault current (Ipsc, Ulpe, Uc(P));
- Zs rcd – Fault loop impedance and prospective fault current in system with RCD (Ipsc, pe, Uc(P));
- Z line – Line impedance and prospective short-circuit current (Ipsc, UlIn);
- Voltage Drop;
- Discharging time.

KEY FEATURES

- Touch screen: high resolution colour touch screen, 4.3" TFT.
- Double manipulation: touch screen or (external keyboard) enable the

user to control the instrument in any manner they like.

- Pre-defined AUTOSEQUENCE®s: enable the user simple and quick execution of test sequence for the chosen device.
- Support for RCD testing: all instruments support testing of A, AC, B, B+ and F RCDs.
- Testing of welding equipment (only in combination with A 1422): MultiServicerXD support testing of welding equipment in accordance with IEC/EN 60974-4.
- Functional inspections.
- Visual inspections.
- Custom inspections (visual and functional).
- Built-in help screens for referencing on site.
- Built-in fuse tables for automatic evaluation of the line / loop impedance result.
- Monitoring of all 3 voltages in real-time.
- Hi-pot: high voltage AC (5kV at 250VA).
- Continuity: 4 – wire continuity test with selectable test current (0.2 A, 4 A, 10A, 25A) enabling precise measurements.
- Communication: 4 – RS232, USB, Ethernet and Bluetooth communication ports enabling downloading, uploading and remote control over instrument.
- Multi-system testing: the instrument can be used on TT, TN, IT and 115 V supply systems.

- Automated RCD testing procedure (RCD AUTO).
- Automated Impedance testing procedure (Z AUTO).
- Measurement filtering according to the selected area group.
- Large memory: support for microSD memory cards, 8 GB card already integrated in the instrument, although that can be expanded to 32 GB.
- PC SW Metrel ES Manager: enables creation of test structures, user-defined AUTOSEQUENCE®s, professional test reports and data transfer for archiving.

THE INDUSTRIAL APPLICATIONS COVERED BY THE INSTRUMENT ARE AS FOLLOWS:

- Safety of machinery, in compliance to IEC/EN 60204 Ed.5, IEC 60204 Ed.6.
- Safety of low-voltage Switchgear and controlgear testing, in compliance to IEC/EN 61439-1 Ed.2.
- Safety of portable appliances, in compliance to VDE 0701-0702, AS/ NZS 3760, Code of Practice.
- Safety of Arc welding equipment, in compliance to IEC/EN 60974-4 Ed.2.

MACHINE TESTING ACCORDING TO IEC/EN 60204

EN 60204-1 provides requirements and recommendations relating to the electrical equipment of machines so as to promote:

- Safety of persons and property.
- Consistency of control response.
- Ease of maintenance.

EN 60204-1 applies to the application of electrical, electronic and programmable electronic equipment and systems to machines not portable by hand while working, including a group of machines working together in a co-ordinated manner. The standard applies from the point of connection of the supply to the electrical



equipment of the machine. EN 60204-1 is applicable to the electrical equipment or parts of the electrical equipment that operate with nominal supply voltages not exceeding 1000V for alternating current (ac) and not exceeding 500V for direct current (dc), and with nominal supply frequencies not exceeding 200 Hz.

The MI 3325 MultiServicer XD completely comply to the IEC/EN 60204-1 Ed.5, & IEC 60204-1 Ed.6 and it has a built in AutoSequences, which guide the user through test procedure.

SWITCHGEAR AND CONTROL GEAR TESTING ACCORDING TO IEC/EN 61439-1

The protective circuit of the switchgear and controlgear assembly is an important element of the protection system against electric shock (particularly when using the protective measures of protective neutral earthing and residual current protective devices). This ensures the automatic disconnection of the power supply in the event of a fault.

The effectiveness of the protective circuit must be verified according to IEC /EN 6143-1 as part of the design verification for the following functions:

- Protection against the consequences of a fault in the switchgear and controlgear assembly (internal faults) and
- Protection against the consequences of faults in external circuits (outgoing circuits) that are supplied through the switchgear and controlgear assembly (external faults).

In terms of protection against the consequences of an internal error, it must be verified that

- The various bodies of the switchgear and controlgear assembly are effectively coupled to the connection of the incoming external protective conductor and that
- The resistance of the circuit does not exceed 0,1 Ω.

MI 3360 OmegaPAT XA

New series of OmegaPAT XA brings 4 models of the instrument, intended for professional use in the most demanding applications. All of them support user accounts, which means that one device can be used by several electricians. Model versions cover the following fields of testing: portable appliances, welding equipment, medical devices and professional testing of PRCD devices. All instruments have an advanced built-in user interface that enables the execution of pre-defined and user-created AUTO SEQUENCES. Large memory capacity (8 GB microSD card) enables the user long term saving and archiving of data. All the instruments are specially designed for long-term testing, since their memory structure enables simple searching through the archive of devices and quick re-execution of (periodic) tests. Great emphasis was put on support for peripheral devices such as printers and barcode or QR code scanners and RFID readers (in Bluetooth and wired versions). On top of that, all instrument versions are supported by our Metrel ES Manager PC software.



MEASURING FUNCTIONS

- Visual inspections;
- Fuse test;
- Continuity / Protective earth resistance 200mA;
- Continuity / Protective earth resistance 10A, 25A (25A, M, F, models only);
- Insulation Resistance (Riso, Riso-S);
- Sub-Leakage Current, Substitute Leakage Current - S;
- Differential Leakage current;
- PE leakage current;
- Touch leakage current;
- Insulation resistance, IEC/EN 62353;
- Touch leakage current, IEC/EN 62353;
- Equipment leakage (direct, differential, alternative) IEC/EN 62353;
- Applied part leakage (direct, alternative), IEC/EN 62353;
- Insulation resistance, (optional A 1422) IEC/EN 60974-4;
- Welding circuit leakage, (optional A 1422) IEC/EN 60974-4;
- Primary leakage, (optional A 1422) IEC/EN 60974-4;
- No-load voltage, (optional A 1422) IEC/EN 60974-4;
- Power (P, S, Q, PF, THDU, THDI, CosØ, I, U,);
- PRCD test, (2 pole, 3 pole, K/ Di (varistor), S (3-pole));

KEY FEATURES

- Touch screen: high resolution colour touch screen, 4.3" TFT.
- Double manipulation: keyboard and touch screen enable the user to control the instrument in any manner they like.
- Pre-defined AUTO SEQUENCES: enable the user simple and quick execution of test sequence for the chosen device.
- Read the code and test: QR and barcode system of labelling in combination with AUTO SEQUENCES enables the user quick and simple testing of electrical devices.
- Testing groups: the instruments have built-in filters in accordance with their area of application, which enables the user simple choice of needed test sequences.
- Support for PRCD testing: support for all types of PRCDs, including 2-pole, 3-pole, K/Di (varistor), S (3 pole) and testing with the PE probe.

- Support for RCD testing: all instruments support testing of A, AC, B, B+ and F RCDs.
- Fuse testing: the instrument has a special, integrated testing module for quick testing of all types of fuses.
- Hard-wired devices: the instruments have integrated additional test terminals that enable the user simple testing of hard-wired devices.
- High-voltage testing (only MI 3360 F): the instrument enables insulation resistance measurement that has to be performed after repairs or maintenance of electrical devices.
- Testing of medical devices (only MI 3360 M): the instrument enables testing of medical devices in accordance with IEC/EN 62353.
- Testing of welding equipment (only in combination with A 1422): all models of OmegaPAT XA support testing of welding equipment in accordance with IEC/EN 60974-4.
- Large memory: support for microSD memory cards, 8 GB card already integrated in the instrument, although that can be expanded to 32 GB.
- PC SW Metrel ES Manager: enables creation of test structures, user-defined AUTO SEQUENCES, professional test reports and data transfer for archiving.
- aMESM Android SW: enables QR code scanning, and uploading of pre-prepared user-defined AUTOSEQUENCE®s.

WHY TEST PORTABLE APPLIANCES?

The need for portable and fixed appliance testing is becoming more profound, since devices such as air conditioning units, hand dryers, electrical heaters and many more similar ones have become ubiquitous. But, with frequent use come heightened risks for mechanical an electrical failures. Current legislation therefore dictates, that all devices in public use require periodic testing to determine their safety. If they are damaged, they can cause a fire or even death through electrocution.

We have prepared four different models of the MI 3360 OmegaPAT XA to cover the entire spectrum of testing applications and give the user greater flexibility.

The **MI 3360 OmegaPAT XA** is intended for testing applications, that don't require a more robust testing of continuity, such as public institutions, hotels, schools etc. where used electrical devices fall mainly in I, II and III protection classes. But, despite limited functionality the instrument supports both (optional) 3-phase adapters.



The **MI 3360 25A OmegaPAT XA** is intended for more demanding testing applications that encompass devices in environments such as construction sites, factories, electrical equipment rental services etc. where they are subjected to increased mechanical and electrical loads and therefore require more robust testing of continuity. Besides standard 200 mA, the instrument also offers 10 A and 25 A continuity testing.



The **MI 3360 M OmegaPAT XA** is intended for testing of medical devices, since all supported tests are in accordance with IEC/EN 62353. Special emphasis is given on accurate testing of leakage currents.



The **MI 3360 F OmegaPAT XA** is intended for testing of portable appliances after repair or maintenance with HV voltage tests with 1500 V or 3000 V for added assurance.



MI 3144 Euro Z 800 V

The MI 3144 Euro Z 800 V is the most advanced industrial hi-precision multifunctional, portable, battery powered impedance tester, designed for live transformer testing in demanding environments. It supports a myriad of testing and measuring procedures, including the testing of automatic trip out protection in case of faults for transformers, generators, distribution boards etc. and hi-precision line and loop impedance measurements on AC and DC circuits with completely insulated voltmeter and clamps. This innovative feature enables several special measuring procedures, including partial resistance of separate contact as well as controlled fault with high current injecting method to partial ground path. Also supported is AC, A and B type earth leakage relay (ELR) testing. Moreover, the tester can be used in conjunction with our multifunctional electrical installation testers or in black box mode, controlled with an Android device (using aMESM app).



MEASURING FUNCTIONS

- Power transformer automatic trip-out protection evaluation;
- Live transformer testing (without disconnection);
- Contact resistance testing, partial voltage drops and current paths;
- Line impedance measurement up to 690 V + 16 %;
- Loop impedance measurement up to 690 V + 16 %;
- Frequency range from 16.66 Hz up to 400 Hz;
- Selectable test load (16.6 % to 100 %);
- DC load method up to 220 V;
- Selective loop measurement;
- High current clamp measurement (iron or flex clamps);
- ELR current injection test;
- ELR combination trip-out time test;
- ELR supported types AC, A, B.

KEY FEATURES

- High accuracy loop and line measurements;
- AC (16 Hz to 400 Hz) and DC

circuits supported;

- High accuracy battery resistance testing;
- Industrial RCD (i.e. MRCD or ELR) testing;
- Ground grid integrity testing by measuring the resistance between two risers;
- Touch / step voltage ground integrity testing;
- U contact measurement;
- High current injecting ground fault;
- One clamp earth resistance measurements;
- Flex and iron test clamps supported;
- CAT IV 600 V (at 3000 m) safety category;
- Portable battery (Li-ion) or mains powered;
- IP protection: IP65 (case closed) / IP54 (case opened);
- Improved thermal performance;
- Bluetooth communication;
- Black box design (remote-controlled via an Android device).

MI 2893 Power Master XT

The MI 2893 Power Master XT is a hand-held three phase power quality analyzer with a large easy-to-read graphical color display enabling the user to detect harmonics, phasors, waveforms and transient anomalies in the installation simply by connecting the device. The instrument is designed for a long term recording as well as for troubleshooting power quality problems in three-phase and single-phase power distribution systems. The handy Quick Set buttons makes the instrument more user friendly and are allowing faster data overview for troubleshooting. Advanced PC SW package PowerView3 enables detailed analysis of recorded data, direct and remote reading from the micro SD memory card, analysis of long term records and automatic creation of professional test report.



MEASURING FUNCTIONS

- Voltage and Current: TRMS, peak, crest factor (4-channel);
- Power (active, reactive, apparent);
- Power measurements fully compliant with IEEE 1459 (active, non active, fundamental, harmonic, load un-balance) and classic (vector or arithmetic) method;
- VFD (variable frequency drive, 5 Hz - 110 Hz), 400 Hz;
- Unbalance, flicker measurement;
- Harmonic and interharmonic analysis up to 50th harmonics, THD & TDD measurement;
- Energy (active, reactive, generated, consumed);
- Capturing and recording of power supply events (shut-downs, interruptions, swells, dips);
- Inrush currents monitoring and recording;
- Waveform/inrush displaying, snapshot and recording;
- Transients recording;
- Power inverter efficiency measurement;
- Power quality analysis according to EN 50160, IEEE 519;
- Recording up to 7 adjustable alarms;
- Temperature measurement;
- Power factor cos fi.

KEY FEATURES

- 4-voltage channels with wide measurement range: 0 ... 1000 Vrms (CAT III / 1000 V).
- 4-current channels with support for automatic clamp recognition and "on instrument" range selection.
- Automatic Smart Clamp detection and Smart Clamp range selection.
- Sampling frequency on transients recording > 1 Msamples/sec
- Compliance with power quality standard IEC 61000-4-30 Class A.
- Complete power quality analysis according to EN 50160 including signalling and interharmonics.
- Support for microSD memory card up to 32GB.
- Color-coded input terminals and terminal labels to suit your application region.
- Intuitive main menu and large icons that makes the equipment very easy to navigate and configure.
- Current clamp auto range selection.
- Powerful PC SW PowerView3 enables downloading, view, analysis of recorded data and professional report creation.
- Flexible clamps (without additional power supply) are included in the Euro set.
- Remote communication via Ethernet.
- (GPS clock synchronization - optional).