

# Machine and switchboard testers

## 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. 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<sup>®</sup>s.

### MEASURING FUNCTIONS

- Continuity (2W & 4W), 0.2A, 4A, 10A, 25A + Voltage drop @ 10A;
- HV AC, HV AC programmable 100V - 5100V;
- Insulation Resistance (Riso, Riso-S) 50V, 100V, 250V, 500V, 1000V (dc);
- Sub-Leakage Current, (Isub, Isub-S) 110V a.c., 230V a.c.;
- 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, UlN);
- Functional test (power P/S/Q, voltage, current, cos fi, frequency, ThdU, ThdI, PF);
- Touch leakage current; RCD testing (RCD Uc, RCD t, RCD I);
- Differential Leakage current;
- PE leakage current;
- Polarity;
- Clamp current;
- Voltage, Frequency, Phase rotation;
- Varistor test;
- Voltage Drop;
- Discharging time.

### KEY FEATURES

- **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 AUTOSEQUENCE<sup>®</sup>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 (5.1kV @ 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<sup>®</sup>s, professional test reports and data transfer for archiving.

### APPLICATION

- Factory machinery safety testing,
- Industrial safety testing,
- Periodic safety testing,
- Production line safety testing,
- Portable appliances safety testing,
- Arc welding equipment safety testing,
- Switchgear, control gear, safety testing.

### STANDARDS

#### Functionality:

- VDE 0701-702, Code of Practice, AS/NZS 3760, IEC/EN 61439, IEC/EN 60204, IEC/EN 60974-4, EN 50191, IEC 62368-1.

#### Safety:

- EN 61010-1, EN 61010-2-030, EN 61010-031, EN 61010-2-032, EN 61557.

#### EMC

- EN 61326-1.

## TECHNICAL DATA

FUNCTION	Measuring range	Resolution	Accuracy
<b>Continuity 2W, 4W, test current (0.2A, 4A, 10A, 25A)</b>			
- R	0.00 Ω ... 19.99 Ω 20.0 Ω ... 99.9 Ω 100.0 Ω ... 999.9 Ω 200 Ω ... 999 Ω	0.01 Ω 0.1 Ω 0.1 Ω 1 Ω	±(2 % of reading + 2 D) ±(3 % of reading) ±(5 % of reading) Indicative
<b>Voltage drop (Iout = 10 A)</b>			
- ΔU	0.00 Ω ... 19.99 Ω 20.0 Ω ... 99.9 Ω	0.01 Ω 0.1 Ω	±(2 % of reading + 5 D) ±(3 % of reading)
<b>HVAC, Programmable HV AC, Output voltage, * 100 V - 2500 V, ** 2510 V - 5100 V (Floating to earth)</b>			
- Voltage (AC)	0 V ... 1999 V 2.00 kV ... 5.99 kV	1 V 10 V	±(3 % of reading) ±(3 % of reading)
- Current, apparent	0.0 mA ... 49.9 mA** / 99.9 mA*	0.1 mA	±(3 % of reading + 3 D)
- Current, resistive	0.0 mA ... 49.9 mA** / 99.9 mA*	0.1 mA	Indicative
- Current capacitive	-49.9 mA ... 49.9 mA** -99.9 mA ... 99.9 mA*	0.1 mA 0.1 mA	Indicative Indicative
- Short circuit current	> 200 mA		
- Output power	250 VA max		
<b>Insulation resistance (250 V, 500 V), Insulation resistance - S (250 V, 500 V), Riso - PAT / Riso - Welding</b>			
- Riso/Riso-s	0.08 MΩ ... 19.99 MΩ 20.0 MΩ ... 99.9 MΩ 100.0 MΩ ... 999.9 MΩ	0.01 MΩ 0.1 MΩ 0.1 MΩ	±(3 % of reading + 2 D) ±(5 % of reading) ±(10 % of reading)
- Output voltage	0 V ... 600 V	1 V	±(3 % of reading + 2 D)
<b>Insulation resistance (500 V and 1000 V) ISO installation</b>			
- Riso	0.15 MΩ ... 19.99 MΩ 20.0 MΩ ... 199.9 MΩ 200.0 MΩ ... 999 MΩ	0.01 MΩ 0.1 MΩ 1 MΩ	±(5 % of reading + 3 D) ±(5 % of reading) ±(10 % of reading)
- Output voltage	0 V ... 1200 V	1 V	±(3 % of reading + 3 D)
<b>Insulation resistance (50 V, 100 V and 250 V) ISO Installation</b>			
- Riso	0.15 MΩ ... 19.99 MΩ 20.0 MΩ ... 99.9 MΩ 100.0 MΩ ... 999.9 MΩ	0.01 MΩ 0.1 MΩ 0.1 MΩ	±(5 % of reading + 2 D) ±(10 % of reading) ±(20 % of reading)
- Output voltage	0 V ... 300 V	1 V	±(3 % of reading + 3 D)
Measuring range according to EN 61557	0.15 MOhm ... 999 MOhm		
<b>Substitute leakage (Isub, Isub-S), open circuit voltage, 110 V a.c., 230 V a.c.</b>			
- Isub	0.02 mA ... 1.99 mA	0.01 mA	±(3 % of reading + 3 D)
- Isub s	2.00 mA ... 19.99 mA	0.01 mA	±(5 % of reading)
<b>Differential Leakage current</b>			
- Idiff	0.010 mA ... 1.999 mA 2.00 mA ... 19.99 mA	0.001 mA 0.01 mA	±(3 % of reading + 10 D) ±(5 % of reading)
<b>PE leakage current</b>			
- Ipe	0.010 mA ... 1.999 mA 2.00 mA ... 19.99 mA	0.001 mA 0.01 mA	±(3 % of reading + 3 D) ±(5 % of reading)
<b>Touch leakage current</b>			
- Itou	0.010 mA ... 1.999 mA 2.00 mA ... 19.99 mA	0.001 mA 0.01 mA	±(3 % of reading + 3 D) ±(5 % of reading)
Operating range (acc. to EN 61557-16)	0.010 mA ..... 19.99 mA		
<b>Power</b>			
- P (active)	0.00 W ... 19.99 W 20.0 W ... 199.9 W 200 W ... 1999 W 2.00 kW ... 3.70 kW	0.01 W 0.1 W 1 W 10 W	±(5 % of reading + 5 D) ±(5 % of reading) ±(5 % of reading) ±(5 % of reading)
- S (apparent)	0.00 VA ... 19.99 VA 20.0 VA ... 199.9 VA 200 VA ... 1999 VA 2.00 kVA ... 3.70 kVA	0.01 VA 0.1 VA 1 VA 10 VA	±(5 % of reading + 10 D) ±(5 % of reading) ±(5 % of reading) ±(5 % of reading)
- Q (reactive)	0.00 VAR ... 19.99 VAR 20.0 VAR ... 199.9 VAR 200 VAR ... 1999 VAR 2.00 kVAR ... 3.70 kVAR	0.01 VAR 0.1 VAR 1 VAR 10 VAR	±(5 % of reading + 10 D) ±(5 % of reading) ±(5 % of reading) ±(5 % of reading)
- PF	0.00 i ... 1.00 i 0.00 c ... 1.00 c	0.01 0.01	±(5 % of reading + 5 D) ±(5 % of reading + 5 D)
- THDU	0.0 % ... 99.9 %	0.1%	±(5 % of reading + 5 D)
- THDI	0 mA ... 999 mA 1.00 A ... 16.00 A	1 mA 0.01 A	±(5 % of reading + 5 D) ±(5 % of reading)
- Cos Phi	0.00i ... 1.00i 0.00c ... 1.00c	0.01 0.01	±(5 % of reading + 5 D)
- U	0.1 V ... 199.9 V 200 V ... 264 V	0.1 1 V	±(3 % of reading + 10 D) ±(3 % of reading)
- I	0 mA ... 999 mA 1.00 A ... 16.00 A	1 mA 0.01 A	±(3 % of reading + 5 D) ±(3 % of reading)

<b>RCD testing / current shape AC, A, F, B, B+ / RCD type (non-delayed, S time-delayed, PRCD, PRCD-K, PRCD-S)</b>			
- I $\Delta$ - Trip-out current	0.2 xI $\Delta$ N ... 1.1 xI $\Delta$ N (AC type); 0.2 xI $\Delta$ N ... 1.5 xI $\Delta$ N (A type, I $\Delta$ N $\geq$ 30 mA); 0.2 xI $\Delta$ N ... 2.2 xI $\Delta$ N (A type, I $\Delta$ N<30 mA); 0.2 xI $\Delta$ N ... 2.2 xI $\Delta$ N (B type)	0.05 xI $\Delta$ N	$\pm$ 0.1 xI $\Delta$ N
- U $c$ - Contact voltage	0.0 V ... 19.9 V 20.0 V ... 99.9 V	0.1 V	(-0 % / +15 %) of reading $\pm$ 10 D (-0 % / +15 %) of reading
<b>UC I<math>\Delta</math>N - Contact voltage</b>			
- U $c$ I $\Delta$	0.0 V ... 19.9 V 20.0 V ... 99.9 V	0.1 V	(-0 % / +15 %) of reading $\pm$ 10 D (-0 % / +15 %) of reading
- t $\Delta$ N - Trip-out time	0.0 ms ... 40.0 ms 0.0 ms ... max. time* * For max. time refer to user manual.	0.1 ms	$\pm$ 1 ms $\pm$ 3 ms
<b>Trip out time</b>			
- t I $\Delta$	0 ms ... 300 ms	1 ms	$\pm$ 3 ms
<b>Polarity, Test voltage (normal) &lt; 50 V / Test voltage (active) mains voltage</b> Power consumption of tested device during the active test.....< 25 VA			
<b>Clamp current (True RMS current using 1000:1 current clamp)</b>			
- I	0.00 mA ... 9.99 mA	0.01 mA	$\pm$ (5 % of reading + 10 D)
- I $\Delta$ diff	10.0 mA ... 99.9 mA	0.1 mA	$\pm$ (5 % of reading + 5 D)
- I $\Delta$ pe	100 mA ... 999 mA 1.00 A ... 9.99 A 10.0 A ... 24.9 A	1 mA 0.01 A 0.1 A	
Accuracy of current transformer is not considered. Frequency range of current clamp is not considered.			
<b>Voltage (Online terminal voltage monitor (10 ... 550 V) + Phase rotation)</b>			
- TRMS (14 ... 500 Hz) U $l$ n, U $l$ pe, U $n$ pe, U $l$ pe, U $2$ pe, U $l$ 2, U $l$ 3, U $2$ 3	0 V ... 550 V	1 V	$\pm$ (2 % of reading + 2 D)
- Frequency	0.00 Hz ... 9.99 Hz 10.0 Hz ... 499.9 Hz	0.01 Hz 0.1 Hz	$\pm$ (0.2 % of reading + 1 D)
<b>Varistor test</b>			
- DC voltage	0 V ... 1000 V	1 V	$\pm$ (3 % of reading + 3 D)
- AC voltage	0 V ... 625 V	1 V	Consider accuracy of DC voltage
<b>R low - Resistance of earth connection and equipotential bonding</b>			
- R	0.16 $\Omega$ ... 19.99 $\Omega$ 20.0 $\Omega$ ... 199.9 $\Omega$ 200 $\Omega$ ... 1999 $\Omega$	0.01 $\Omega$ 0.1 $\Omega$ 1 $\Omega$	$\pm$ (3 % of reading + 3 D) $\pm$ (5 % of reading) $\pm$ (5 % of reading)
Measuring range according to EN 61557	0.16 $\Omega$ ... 1999 $\Omega$		
- R+,R-	0.0 $\Omega$ ... 199.9 $\Omega$ 200 $\Omega$ ... 1999 $\Omega$	0.1 $\Omega$ 1 $\Omega$	$\pm$ (5 % of reading + 5 D) $\pm$ (5 % of reading + 5 D)
Open circuit voltage Measuring current Test lead compensation	6.5 Vdc ... 18 Vdc min. 200 mA into load resistance of 2 $\Omega$ up to 5 $\Omega$		
<b>Impedance Z loop, (L-PE, Test current @ 230V ... 20A (10ms))</b>			
- Z - Fault loop impedance	0.00 $\Omega$ ... 9.99 $\Omega$ 10.0 $\Omega$ ... 99.9 $\Omega$ 100 $\Omega$ ... 999 $\Omega$ 1.00 k $\Omega$ ... 9.99 k $\Omega$	0.01 $\Omega$ 0.1 $\Omega$ 1 $\Omega$ 10 $\Omega$	$\pm$ (5 % of reading + 5 D) $\pm$ (10 % of reading) $\pm$ (10 % of reading) $\pm$ (10 % of reading)
Measuring range according to EN 61557	0.12 $\Omega$ ... 9.99 k $\Omega$		
<b>Impedance Zs rcd, L-PE</b>			
- Z - Zs Rcd	0.00 $\Omega$ ... 9.99 $\Omega$ 10.0 $\Omega$ ... 99.9 $\Omega$ 100 $\Omega$ ... 999 $\Omega$ 1.00 k $\Omega$ ... 9.99 k $\Omega$	0.01 $\Omega$ 0.1 $\Omega$ 1 $\Omega$ 10 $\Omega$	$\pm$ (5 % of reading + 12 D) $\pm$ (5 % of reading + 12 D) $\pm$ (10 % of reading) $\pm$ (10 % of reading)
Measuring range according to EN 61557 is	0.46 Ohm ... 9.99 kOhm for I $t$ est = normal and 0.48 Ohm ... 9.99 kOhm for I $t$ est = low.		
- I $p$ sc - Prospective fault current	0.00 A ... 9.99 A 10.0 A ... 99.9 A 100 A ... 999 A 1.00 kA ... 9.99 kA 10.0 kA ... 23.0 kA	0.01 A 0.1 A 1 A 10 A 100 A	Consider accuracy of fault loop resistance measurement
- U $l$ pe - Voltage	0 V ... 550 V 20.0 V ... 99.9 V* * for Z - Zs Rcd function	1 V 0.1 V	$\pm$ (2 % of reading + 2 D)
<b>Impedance Z line (L-L, L-N, Test current @ 230V ... 20A (10ms))</b>			
- Z Line impedance	0.12 $\Omega$ ... 9.99 $\Omega$ 10.0 $\Omega$ ... 99.9 $\Omega$ 100 $\Omega$ ... 999 $\Omega$ 1.00 k $\Omega$ ... 9.99 k $\Omega$	0.01 $\Omega$ 0.1 $\Omega$ 1 $\Omega$ 10 $\Omega$	$\pm$ (5 % of reading + 5 D) $\pm$ (5 % of reading + 5 D) $\pm$ 10 % of reading $\pm$ 10 % of reading

- Ipsc - Prospective fault current	0.00 A ... 0.99 A 1.0 A ... 99.9 A 100 A ... 999 A 1.00 kA ... 99.99 kA 100 kA ... 199 kA	0.01 A 0.1 A 1 A 10 A 1000 A	Consider accuracy of line resistance measurement
- UIn - Voltage	0 V ... 550 V	1 V	±(2 % of reading + 2 D)
<b>Voltage Drop (Zref 0.00 Ω ... 19.99 Ω, Test current @ 230V ... 20A (10ms))</b>			
- dU - Voltage drop	0.0 % ... 99.9 %	0.1 %	Consider accuracy of line resistance measurement (s)
<b>Discharging time</b>			
- t - Discharging time	0.0 s ... 10.0 s	0.1 s	±(5 % of reading + 2 D)
- Up - Peak voltage	0 V ... 550 V	1 V	±(5 % of reading + 3 D)
Threshold voltage: 34 V, 60 V, 120 V			
<b>General data</b>			
Power supply	110 V / 230 V AC, 50 Hz / 60 Hz		
Max. power consumption	300 VA (without load on mains test socket)		
Max. load	10 A continuous, 16 A short duration, 1.5 kW motor		
<b>Measuring categories</b>			
Mains test socket, IEC test socket	CAT II / 300V		
TC1 test socket, (C1,C2,P1,P2,P)	CAT III / 300 V		
<b>Protection classification</b>			
Degree of protection	IP 54 (Closed case), IP 40 (Open case), IP 20 (Mains socket)		
<b>Communication</b>			
Memory	Depends on microSD card size		
RS232 interfaces	Two DB9 ports (RS 232-1(PC), RS 232-2)		
INPUTS/OUTPUTS	24 Vmax (DB9 connector, 2X)		
USB 2.0	Standard USB Type B		
Bluetooth	Class 2		
Ethernet	Dynamic IP (DHCP)		
Display	Colour TFT display, 4.3 inch, 480 x 272 pixels		
Dimensions (L x W x H)	420 x 325 x 180 mm / 420 x 325 x 250 mm (with accessories)		
Weight	13.3 kg / 15.1 kg (with accessories)		

## STANDARD SET

### MI 3325

- Instrument MultiServicerXD
- HV test lead with test probe
- HV test lead with crocodile
- Mains cable
- IEC test cable
- Residual voltage test cable
- Plug test cable
- 3-wire test lead, 3 m
- Continuity test lead, 2.5 m, 2 pcs
- Test lead, red, 1.5 m
- Test probe, 4 pcs (black, red, green, blue)

- Crocodile clip, green
- Crocodile clip, blue
- Crocodile clip, black, 3 pcs
- Crocodile clip, red, 3 pcs
- Calibration certificate
- RS232 cable
- USB cable
- CD with instruction manual (full version)
- PC SW Metrel ES Manager BASIC \*
- Protective bag for accessories \*\*

\* Metrel ES Manager can be downloaded free of charge from Metrel Web server.  
\*\* Mounted on the case



Picture of MI 3325 set