

# Earth testers

## MI 3290 Earth Analyser



MI 3290 Earth Analyser is a portable, battery or mains powered test instrument with excellent IP protection (IP 54 open case), intended for measurement of earth resistance, specific earth resistance and earth potential of various energetic and non-energetic objects. The user can choose between different methods from classic 3 wire earth resistance measurement up to one or four clamp method for measurement of pylons. He has a choice of measurement methods with different frequency methods: single frequency or frequency sweep from 55 Hz to 15 kHz, HF method with 25 kHz and pulse method simulating the lightning strike. High electrical noise immunity makes this instrument best suited for industrial environment. Instrument is available in multiple sets which are a combination of different accessories and measurement functions.

NEW

High Voltage Insulation / Continuity / Earth

### MEASURING FUNCTIONS

- Earth Resistance 2,3,4 -pole;
- Selective Earth Resist (1 x clamp);
- Earth Resistance (2 x iron clamps);
- Specific Earth Resistance (Wenner and Schlumberger method);
- HF-Earth Resistance (25 kHz, acc. to IEEE\_Std 81);
- Earth Resistance of mono pylons with 10 m flex clamp;
- Earth Resistance of multi-leg pylons with up to four flex clamps;
- Current measurement (Iron, flex clamps);
- Low Ohm measurement 7 mA and 200 mA;
- Earth Potential;
- Step and contact measurements;
- Impulse Earth measurement 10/350  $\mu$ s.

### KEY FEATURES

- Possibility of performing all types of earth measurements with a single instrument.
- Analysis of earth impedance as a function of the frequency due to a wide measurement frequency band (55 Hz ... 15 kHz).

- Earth measurements on pylons with protective earth cable connected.
- Measurement on mono towers and 4-leg tower.
- A wide variety of measuring clamps: from iron clamps to flex clamps with 10 m length.
- HF-Earth resistance measurement (acc. to IEEE\_Std 81).
- Sweep mode Z(f) on screen.
- 3.4" colour LCD display with touch screen.
- Floating Mains (universal 90 ... 260 V AC) or battery powered (built in fast charger).
- High degree of protection: IP 65 case closed, IP 54 case open.
- Checkbox - different self-check methods.
- DC resistance measurements.
- Impulse impedance measurement for simulating the lightning strike.
- Support for single or automated measurements.
- PC SW for measurement pre and post processing: preparation of the test structure, result download, tree-view, table view and graphical view, storing and printing.

### APPLICATION

#### Measurement of protective earthing of:

- Mono and multi-leg pylons with protective earth cable connected
- MV to LV transformer stations;
- Ski lifts, radio towers;
- Solar Power plants, wind and water turbine;
- Industrial areas.

### STANDARDS

#### Functionality

- EN 61557 - 5
- IEEE 80 - 2000
- IEEE 81 - 2012
- IEEE 142
- IEEE 367 - 2012

#### Electromagnetic compatibility

- EN 61326

#### Safety

- EN 61010 - 1
- EN 61010 - 2 - 030 c
- EN 61010 - 2 - 032
- EN 61010 - 031

## ORDERING INFORMATION







Standard set for all models of MI 3290

### All model versions include following accessory:

- Instrument MI 3290
- Current earth spike 90 cm, 2 pcs
- Potential earth spike 50 cm, 2 pcs
- Connection lead black 2m
- Test lead red 5 m
- Test lead blue 5 m
- Test lead black on reel 50 m
- Test lead green on reel 50 m
- Test lead blue on reel 50 m
- Shielded test lead 75 m on reel
- G clamp
- Set of test probes, crocodile clip and 2m test lead, 4 pcs
- Bag for accessories

## SET SPECIFICATION

				
Licence key	GX	GL	GF	GP
<b>Measurement methods</b>				
Ground Z 2-pole	•	•	•	•
Ground Z 3-pole	•	•	•	•
Ground Z 4-pole	•	•	•	•
Single/multi/sweep frequency	•	•	•	•
Wenner 4-pole	•	•	•	•
Schlumberger 4-pole	•	•	•	•
Selective (iron clamp)	•	•		
Stakeless 2-clamps	•	•		
Transient Impulse Impedance	•	•		
HF 25 kHz Impedance	•	•		
Step / Touch	•		•	
Voltage potential	•		•	
Low Impedance 4-point	•		•	
Low Resistance 200 mA	•		•	
Tower Passive one rod / Flex clamps	•			•
Tower FOP / 1xFlex clamp	GX1			•
Tower FOP / 4xFlex clamp	GX4			Option
Mono Tower FOP / Flex clamp	•			•
<b>Measurement accessory</b>				
Current earth spike, 90 cm, 2 pcs	•	•	•	•
Potential earth spike, 50 cm 2 pcs				
G clamp				
Shielded test lead on reel, 75m				
Test lead on reel 50 m, 3 pcs (black, green, blue)				
Test lead, 5m, 2 pcs (blue, red)				
Set of test probes, crocodile clip and 2m test lead, 4 pcs				
Flex clamp 5 m with 15 m shielded cable,	4 pcs (GX4) 1 pce (GX1)			1 pce
Iron clamp, 2 pcs	•	•		
Kelvin clamp with 2,5 m cable, 2 pcs	•		•	
Step Contact Meter Measuring Set	•		•	



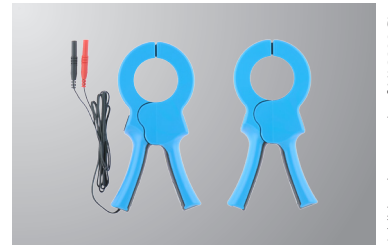
Additional accessories of MI 3290 GX4

### MI 3290 GX1

- Licence GX
- Iron clamp with 3,5 m test lead
- Iron clamp A 1019
- Flex clamp 5 m with 15 m shielded cable
- Kelvin clamp with 2,5 m cable, 2 pcs
- Voltmeter MI 3295M with 2 wire test lead
- Soft carrying bag
- Step voltage test plate, 2 pcs
- NiMH battery cells, type AA, 6 pcs
- Power supply adapter
- Bag for accessories

### MI 3290 GX4

- MI 3290 GX1
- Flex clamp 5 m with 15 m shielded cable, 3 pcs
- Bag for accessories



Additional accessories of MI 3290 GL

### MI 3290 GL

- Licence GL
- Iron clamp A 1018-EA with 3,5 m test lead
- Iron clamp A 1019



Additional accessories of MI 3290 GF

### MI 3290 GF

- Licence GF
- Kelvin clamp with 2,5 m cable, 2 pcs
- Voltmeter MI 3295M with 2 wire test lead
- Soft carrying bag
- Step voltage test plate, 2 pcs
- NiMH battery cells, type AA, 6 pcs
- Power supply adapter






















Additional accessories of MI 3290 GP

### MI 3290 GP

- Licence GP
- Flex clamp 5 m with 15 m shielded cable
- Bag for accessories

## OPTIONAL ACCESSORY

Photo	Order No.	Acc. description	Description
	A 1018	Current clamp (low range, leakage)	High accuracy current clamp 1000 A / 1 A with jaw opening 52 mm and fixed 1.5 m cable for both load and low range / leakage current measurement and for earth resistance measurement as well.
	A 1019	Current clamp	Current clamp 1000 A / 1 A with jaw opening 52 mm for general current measurements and in combination with A 1018 for earth resistance measurement without breaking the loop.
	A 1487	Flex clamp 5 m with 15 m shielded cable	Flexible current clamp with circumference of 5m and connection cable of 15m.
	A 1081 M	Bag for accessories	Bag for accessories, with Metrel logo.
	A 1509	Test lead 50m black on cable reel	Test lead on a cable reel, black, 50 m, extendable.
	A 1510	Test lead 50m green on cable reel	Test lead on a cable reel, green, 50 m, extendable.
	A 1525	Test lead 50m blue on cable reel	Test lead on a cable reel, blue, 50 m, extendable.
	A 1526	Test lead 5m blue	Test lead, blue, 5 m, banana plug on both sides.
	A 1527	Test lead 5m red	Test lead, red, 5 m, banana plug on both sides.
	A 1528	Professional current earth spike 50cm	Professional earth spike, 50 cm, with banana socket.
	A 1529	Professional current earth spike 90cm	Professional earth spike, 90 cm, with banana socket.
	A 1530	G clamp	Professional G clamp for perfect contacting, with banana socket.
	MI 3295M Set	Step Contact Meter Measuring Set	Additional MI 3295M Set for simultaneous measurements of step voltage and contact voltage on different test points. Set includes instrument MI 3295M, test lead, 2 x 3 m, soft carrying bag, soft carrying neck belt, NiMH battery, type AA, 6 pcs, Power supply adapter.
	P 1201	MI 3290 GL licence key	A licence key for Grounding and Lightning functionality of Earth Analyser.
	P 1202	MI 3290 GP licence key	A licence key for Grounding of Pylons functionality of Earth Analyser.
	P 1203	MI 3290 GF licence key	A licence key for Grounding and voltage Funnel functionality of Earth Analyser.
	P 1204	MI 3290 GX licence key	A licence key for full functionality of Earth Analyser.
	S 1072	Continuity test lead, with crocodile clip, 2 x 2.5 m, 2 pcs	Kelvin test probes with crocodile clips and protection shield as lightweight alternative to clips within the standard set.
	S 2053	Step voltage plates	Light replacement for 25kg Step voltage probes A 1353.

## TECHNICAL SPECIFICATION

Method	Additional info	Measurement range	Uncertainty
Earth resistance 2, 3, 4 -pole	Open-terminal test voltage 20 or 40 VAC		
	Short-circuit test current > 220 mA		
	Test frequency		
	55 Hz...329 Hz	0.00 Ω ... 19.99 kΩ	±(3 % of reading + 3 digits)
	659 Hz ... 2.63 kHz	0.00 Ω ... 1.999 kΩ	±(5 % of reading + 3 digits)
	3.29 kHz ... 15 kHz	0.00 Ω ... 199.9 Ω	±(8 % of reading + 3 digits)
Selective earth resistance with iron clamp	Open-terminal test voltage 40 VAC		
	Short-circuit test current > 220 mA		
	Test frequency		
	55 Hz ... 329 Hz	0.00 Ω ... 19.99 kΩ	±(8 % of reading + 3 digits)
	659 Hz ... 1.50 kHz	0.00 Ω ... 1.999 kΩ	
Selective earth resistance of pylons with flex clamp	Open-terminal test voltage 40 VAC		
	Short-circuit test current > 220 mA		
	Test frequency		
	55 Hz...329 Hz	0.00 Ω ... 19.99 kΩ	±(8 % of reading + 3 digits)
	659 Hz ... 1,50 kHz	0.00 Ω ... 1.999 kΩ	
	Passive mode	0.00 Ω ... 19.99 kΩ	
Earth resistance with two iron clamps	Test frequency 82 Hz, 164 Hz, 329 Hz	0.00 Ω ... 9.99 Ω	±(5% of reading + 2 digits)
		10.0 Ω ... 49.9 Ω	±(10 % of reading + 2 digits)
		50.0 Ω ... 100 Ω	±(20 % of reading)
Specific earth resistance ro Wenner and Schlumberger method	Open-terminal test voltage 20 or 40 V AC Short-circuit test current >220 mA Test frequency 164 Hz	0.00 Ωm ... 19.99 kΩm	calculated value (consider uncertainty of 4 - pole measurement)
Earth Potential	Open-terminal test voltage 40 V AC Short-circuit test current >220 mA Test frequency 55 ÷ 329 Hz	Ratio	±(2 % of reading + 2 digits)
		0.001 ... 1.000	
HF-Earth Resistance 3 pole	Open-terminal test voltage 40 VAC Short-circuit test current >40 mA Test frequency 25.000 Hz	0.00 Ω ... 19.9 Ω	±(3 % of reading + 2 digits)
		20.0 Ω ... 299 Ω	
Impulse Earth Resistance	Open-terminal test voltage ~140 V peak Short-circuit test current 2 A peak Impulse waveform 10 / 350 μs	0.0 Ω ... 199 Ω	±(8 % of reading + 3 digits)
DC Resistance RLOW	Test current 200 mA	0.00 Ω ... 1.99 kΩ	±(2 % of reading + 2 digits)
DC Resistance CONT	Test current 7 mA	0.00 Ω ... 19.9 kΩ	±(3 % of reading + 2 digits)
AC Impedance	Test frequency 55 Hz ... 15 kHz	0.00 Ω ... 19.99 kΩ	±(3 % of reading + 2 digits)
Current RMS (Iron Clamp)	Nominal frequency 45 Hz ... 1.5 kHz	1.0 mA ... 7.99 A	±(2 % of reading + 3 digits)
Current RMS (Flex Clamp)	Nominal frequency 45 Hz ... 1.5 kHz	0.1 mA ... 49.9 A	±(8 % of reading + 3 digits)
Battery power supply	14,4 V DC (4.4 Ah Li-ion)		
Mains power supply	90-260 VAC, 45-65 Hz, 100 VA (300 V CAT II)		
Degree of protection	IP 65 (case closed)		
	IP 54 (case open)		
Dimensions (w x h x d)	36 x 16 x 33 cm		
Display	3.4" colour LCD display with backlight and touch screen		
Communication	USB, BT		
Memory	>1GB		

### METREL D.D.

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