ZERA

MT3xx Series

Moving Test – MT320

Portable Reference Meter

Precise Measurement of Accuracy Class 0.05

ZERA

MT3xx Series

System Concept

The MT320 is a portable Reference Meter based on newest technology in power and energy measurement. Various measuring features combined with its easy operation concept provide the greatest possible flexibility for a comprehensive testing of metering installations on site.
Its stable housing made of double isolated plastic already reveals the high quality of the system.
The MT320 system is distinguished by its exemplary combination of functionality and design. The equipment is offering optimal ergonomics and functionality combined with an excellent menu guided operation via built-in soft-keys and a 6.4" LCD-display.

Features

- Excellent user-guidance
- Many configuration possibilities by adding various measuring adapters
- Unique long-term and temperature stability of the measuring module
- Current measurement up to 120 A with error compensated Clip-on CTs
- Internal memory to store measurement results and customer data
- Windows based data management software MTVis for evaluation of the test results
- External system control via PC with windows based control software
- Current measurement up to 10000 A by using a required current sensor
- No additional error for reactive measurement
- Accuracy class 0.05

Functions

- Testing of electricity meter installations with 2-wire, 3-wire and 4-wire circuits
- Testing of energy and power registers
- Power and energy measurement of active, reactive and apparent energy
- 4 quadrant measurement
- Frequency-, phase angle- and power factor measurement
- Harmonic waveform analysis for voltage and current up to the 40th THD
- Distortion factor measurement
- Vector diagram display
- Waveform sampling
- Rotary field display
- Determination of the operating burden on instrument transformers for CT and PT
- Operation without mains power supply possible
- * Ratio test by simultaneous measurement of both primary and secondary currents in CT connected metering systems
- * Selective power measurement
- * External thermal-printer for presentation of the measuring results at customer site
- * Energy dosage

* optional function, not serially

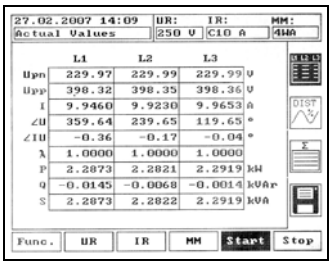
Data Management

After measurement the stored data can be sent to an external PC.
The data management software MTVis provides the ability to transfer data from the internal memory to an external PC where the data can be represented.
The stored data can be summarized to a measuring report or be exported for further applications.

Actual Values Measurement

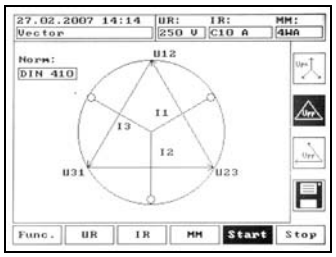
All instantaneous values are displayed simultaneously in a summary:

- RMS values of all voltage and current phases
- All phase angles between voltage and current
- Phase angles between the voltages
- Currents for all 3 phases
- Active, reactive and apparent power
- Frequency and phase rotation
- Power factor (cos φ)



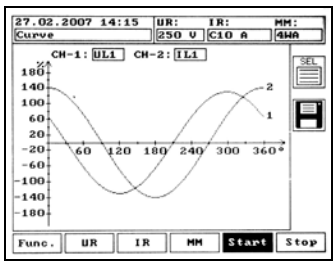
Vector Display

The vector diagram display makes it very easy to detect wiring faults in the voltage and current circuits of a meter installation.



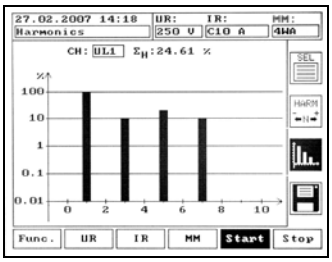
Curve Display

The curve display for voltage and current serves for analysing the signal quality. Two channels can be measured and displayed simultaneously. The measured waveform can be stored in the internal memory of the system according to the customer information data.



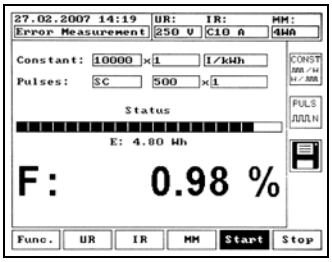
Harmonic Measurement

The MT320 can measure harmonics in voltage and current up to the 40th THD (conform to the voltage quality norm DIN EN 50160) which is possible by the high scanning rate of the working standard. The measured harmonic spectrum can be displayed in a chart or in a diagram.



Error Measurement

By entering all relevant parameter like meter constant and the number of pulses, the system can perform the error measurement on electricity meters. The system is able to determine the percentage error and the operator can store it according to the customer information data.
To be informed about the status of the measurement a bar graph indicates continuously the registered energy.



Optional Features

- Various mains cables for each country
- Quick connecting cable set
- Pulse converter
- Error compensated AC current clamps for 120 A measurement
- AC current clamps for 1000 A measurement
- Flexible current sensor for 10000 A measurement
- External thermal printer
- Test cable set
- Photo electric scanning head

Technical Data

MT320 Portable Reference Meter

General	
Power supply	85 … 265 V, 47 … 63 Hz
Power consumption	~ 26 VA
Temperature range, operation	-10° … + 50° C
Temperature range, storage	-15° … + 65° C
Relative humidity (not condensing)	max. 95 %
Dimensions (DxWxH)	220 x 290 x 80 mm
Weight	2.7 kg
Safety	
IP class according to DIN EN 60529	IP30
Declaration of conformity	CE conform
Protection class according to DIN EN 61140	II
Overvoltage category voltage measurement	CAT III 300 V
Overvoltage category current measurement	CAT III 300 V
Reference meter	
Measuring modes	2WA / 2WR / 2WAP 3WA / 3WR / 3WAP / 3WRCA / 3WRCB 4WA / 4WAb / 4WR / 4WRb / 4 WAP / 4 WAPb / 4WRC
Fundamental frequency	15 … 70 Hz
Bandwidth	3000 Hz
Sampling	16 bit 504 samples/period
Accuracy class for measuring of power / energy	0.05
Angle measurement accuracy 3) 4)	< 0.010° [< 0.1°]
Frequency measurement deviation	± 0.01 Hz
Voltage Measurement	
Voltage measurement	100 mV ... 300 V
Voltage range(s)	250 V, 5 V
Voltage channels input impedance (@ range)	245 kΩ @ 250 V 10 MΩ @ 5 V
Voltage measurement accuracy 5)	< 0.03 % @ 30V .. 300 V < 0.2 % @ 0.5 V .. < 30 V < 1 % @ 0.1 V .. < 0.5 V
Voltage measurement temperature drift 3)	< 5 x 10 E-6 / K
Voltage measurement stability 1)	< 50 x 10 E-6
Voltage measurement long term stability 2) 3)	< 80 x 10 E-6 / Year
Current measurement	**direct or [with MT3430]**
Current measurement	1 mA ... 12 A [5 mA … 120 A]
Current range(s)	10 A, 5 A, 2.5 A, 1 A, 0.5 A, 0.25 A, 0.1 A, 0.05 A [100 A, 50 A, 10 A, 5 A, 1 A, 0.5 A, 0.1 A, 0.05 A]
Usage of ranges	10 ... 120 %
Current channels input impedance (@ range)	~ 0.04 Ω @ 0.05 A .. 10 A
Current measurement accuracy 5)	< 0.03 % @ 10 mA ... 12 A < 0.2 % @ 5 mA ... < 10 mA [< 0.15 % @ 500 mA … 120 A] [< 0.3 % @ 100 mA … < 500 mA]
Current measurement temperature drift 4)	< 5 x 10 E-6 / K [< 50 x 10 E-6 / K]
Current measurement stability 1)	< 70 x 10 E-6 [<150 x 10 E-6]
Current measurement long term stability 2) 4)	< 80 x 10 E-6 / Year [< 600 x 10 E-6] / Year
Clamp for max. Ø	[12 mm]
Power Measurement	**direct or [with MT3430]**
Power/energy measurement accuracy 3) 5) 6)	< 0.05 % @ 10 mA … 12 A [< 0.2 % @ 500 mA … 120 A]
Power/energy measurement temperature drift 3) 4)	< 10 x 10 E-6 / K [< 65 x 10 E-6]
Power/energy measurement stability 1)	< 100 x 10 E-6 [< 200 x 10 E-6]
Power/energy measurement long term stability 2)	< 100 x 10 E-6 / Year [< 700 x 10 E-6] / Year

1: Stability over 1 hour (every minute one measurement with ti = 60 s)
2: Stability over 1 year (every month one measurement with ti = 60 s)
3: From 30 V … 300 V
4: From 10 mA … 12 A [500 mA … 120 A]
5: Related to the read value at optimum range selection
6: Related of apparent power
[ ] ≙ with AC current clamps MT3430

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Subjects to alteration.

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