MTE Meter Test Equipment

CheckMeter 2.3

Three-phase Portable Standard Meter for Testing of Electricity Meters

The CheckMeter 2.3 Portable Standard Meter is a three-phase electronic meter test unit of accuracy class 0.2%, used for testing single and three-phase electricity meters on site.

The unit can be used with a set of 3 active error compensated clamp-on CT 100A (range: 10 mA … 100 A / cable ∅: max. 11 mm).

Advantages

- Precision test equipment for AC values in the 45 Hz to 66 Hz frequency range
- LCD display ¼ VGA (240 x 320 Pixels) with graphical user interface
- Wide measuring range with auto ranging
- Display of vector diagram for analysis of mains conditions and meter connections
- Measurements of wave forms and harmonics with display
- Easy detection of circuit connection faults
- Data memory for test results and customer data
- Small dimensions and light in weight
- Serial interface (RS 232) for data transfer

Functions

- Active, reactive and apparent energy measurement for single-phase and three-phase, 3- or 4-wire, circuits with integrated error calculator
- Impulse output for energy (galvanic isolated)
- Registration of active, reactive and apparent energy for register testing
- Active, reactive and apparent power measurements
- Current and voltage measurements
- Phase angle measurements
- Power factor measurements
- Frequency measurements

Options

- Software CALSOFT for memory readout, online data logging, presentation and printout of results and customer data.
- Set of 3 clamp-on CT 1000A (Measuring range: 100 mA … 120 A, cable ∅: max. 52 mm

Main functions

Menu cards (MC)

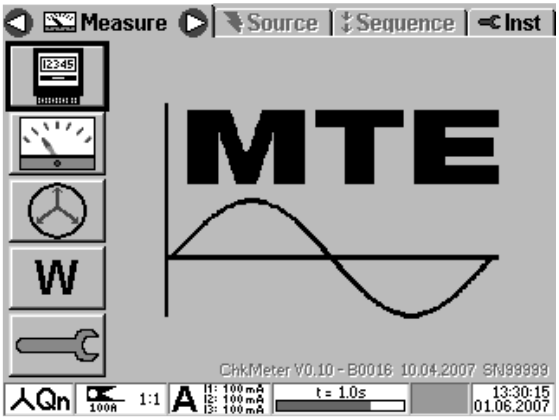
Meter Testing

Measurement of load values

Vector diagram

Energy measurement

Basic settings of the instrument



Technical Data

General

Auxiliary supply:	Powered by the measuring circuit in the operating range: 46 VACmin ... 300 VACmax / 47 … 63 Hz 65 VDCmin … 423 VDCmax Protection: up to 440VACmax
Power consumption:	max. 20 VA
Housing:	Hard Plastic
Dimensions:	W 125 x H 250 x D 40 mm
Weight:	approx. 675 g
Operation temperature:	-10 °C ... +50 °C
Storage temperature:	-20 °C ... +60 °C
Relative humidity:	≤ 85% at Ta ≤ 21 °C
	≤ 95% at Ta ≤ 25 °C, 30 days / year spread

Safety

CE certified

Isolation protection:	IEC 61010-1:2002
Measurement Category:	300V CAT III
Degree of protection:	IP-42

Measurement Range

Measuring Quantity	Range	Input / Sensor
Voltage (phase - neutral)	10 V … 300 V	U1, U2, U3, N
Current	10 mA … 100 A	Clamp-on CT 100A
	100 mA … 120 A	Clamp-on CT 1000A

Measurement Accuracy

Voltage / Current		≤ ± E [%] [1 2 4]
Measuring Quantity	Range	**Class 0.2**
Voltage (L1, L2, L3, N)	46 V … 300 V	0.2
	10V … 46 V	0.2
Current clamp-on CT 100A	100 mA … 100 A	0.2
	10 mA … 100 mA	1.0
Current clamp-on CT 1000A	10 A … 120 A	0.2
	1 A … 10 A	1.0

Power / Energy Voltage: 46 V… 300 V (L - N)		≤ ± E [%] [1 2 3]
Measuring Quantity / Input I	Range	**Class 0.2**
Active (P), Apparent (S) Power / Energy		
Clamp-on CT100A	100 mA … 100 A	0.2
	10 mA … 100 mA	1.0
Clamp-on CT1000A	10 A … 120 A	0.2
	1 A … 10 A	1.0
Reactive (Q) Power / Energy		
Clamp-on CT100A	100 mA … 100 A	0.4
	10 mA … 100 mA	1.0
Clamp-on CT1000A	10 A … 120 A	0.4
	1 A … 10 A	1.0

		≤ ± TC [%/°C] [3]
Temperature coefficient (TC):	Range	**Class 0.2**
	0 °C ... +40 °C	0.02
	-10 °C ... +50 °C	0.05

Frequency / Phase Angle / Power Factor		≤ ± E
Measuring Quantity	Range	
Frequency (f)	40 Hz … 70 Hz	0.01 Hz
Phase Angle (φ)	0.00 °… 359.99 °	0.1 °
Power Factor (PF)	-1.000… +1.000	0.002

Notes

[1] x.x :Related to the measuring value
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E(M) = FS/M * x.x (e.g. 0.2 at FS =46 v, E(10V) = 46/10 * 0.2 = 0.92 %)

[2] Fundamental frequency in the range 45 … 66 Hz

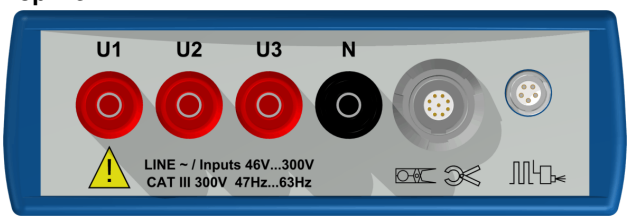
[3] S: x.x, P,Q: x.x / PF (related to apparent power), 3- and 4-wire networks

Pulse Input / Output

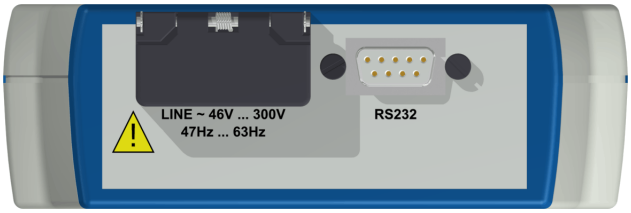
LEMO 5-pole common input / output connector, suitable for scanning head SH 2003

Input level:	4 … 12 VDC (24 VDC)			
Input frequency:	max. 200 kHz			
Input supply:	12 VDC (I < 60 mA)			
Output level:	5 V			
Pulse length:	≥ 10 µs			
Meter constant: Active, Reactive, Apparent [imp/kWh(kvarh,kVAh)]	C = 40'000'000 / In The meter constant depends on the highest selected internal current range (In).			
	Internal current ranges In [A]			
Clamp-on CT 100A	0.1	1	10	100
Clamp-on CT 1000A	1.2	12	120	
	Example: Clamp-on CT 100A (In = 10 A) C = 40'000'000 / 10 = 4'000'000 [imp/kWh]			
Output frequency:	C' = C / 3'600'000 [imp/Ws(vars, Vas)] fo = C' *PΣ(QΣ, SΣ) f_{max} = 40'000'000 / (10 * 3'600'000) * 3 * 10 * 300 = 10'000 [imp/s]			

Top view



Bottom view



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