

## Single-phase Portable Working Standard for Testing of Electricity Meters



The CheckMeter 2.1 Portable Working Standard is a single-phase portable electronic meter test unit of accuracy class 0.2%, used for testing single phase electricity meters on site.

The unit can be used with an active error compensated clamp-on CT 100A (range: 10 mA ... 100 A / cable Ø: 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

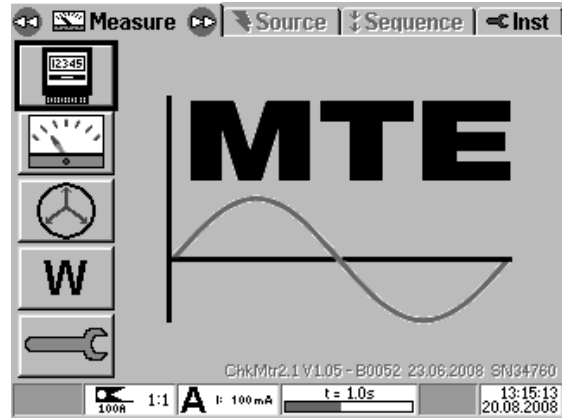
- Active, reactive and apparent energy measurement with integrated error calculator
- Impulse output for energy (galvanic isolated)
- Registration of active, reactive and apparent energy for register testing
- Active, reactive and apparent power measurements
- Current and voltage measurements
- Phase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

### Options

- Software CALSOFT for memory readout, online data logging, presentation and printout of results and customer data.
- 1 clamp-on CT 1000A (Measuring range: 10 mA ... 120 A, cable Ø: 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:	Power may be taken from the auxiliary supply or the measuring circuit at: 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. 650 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

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, N
Current	10 mA ... 100 A	Clamp-on CT 100A
	100 mA ... 120 A	Clamp-on CT 1000A

### Measurement Accuracy

Voltage / Current	Range	Class 0.2
Voltage (L, 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)	Class 0.2
Active (P), Apparent (S) Power / Energy	Clamp-on CT100A	100 mA ... 100 A
		10 mA ... 100 mA
	Clamp-on CT1000A	10 A ... 120 A
		1 A ... 10 A
Reactive (Q) Power / Energy	Clamp-on CT100A	100 mA ... 100 A
		10 mA ... 100 mA
	Clamp-on CT1000A	10 A ... 120 A
		1 A ... 10 A

Temperature coefficient (TC):	Range	Class 0.2
	0° C ... +40°C	0.02
	-10° C ... +50°C	0.05

Frequency / Phase Angle / Power Factor	Range	≤ ± 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

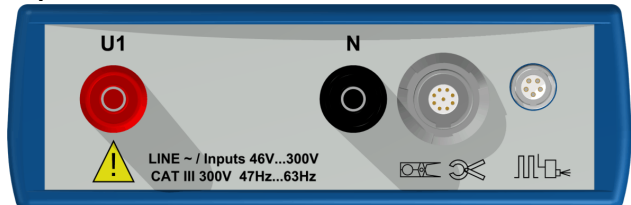
### Notes

- 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 %)
- Fundamental frequency in the range 45 ... 66 Hz
- S: x.x, P,Q: x.x / PF (related to apparent power), 3- and 4-wire networks

### Pulse Input / Output

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:	C = 120'000'000 / In The meter constant depends on the 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
Output frequency:	Example: Clamp-on CT 100A (In = 10 A) C = 120'000'000 / 10 = 12'000'000 [imp/kWh] C' = C / 3'600'000 [imp/W(s,vars, Vas)] fo = C' * PΣ(QΣ, SΣ) fmax = 120'000'000 / (10 * 3'600'000) * 10 * 300 = 10'000 [imp/s]

### Top view



### Bottom view

