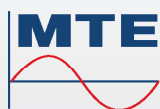


Manufactured by:



# CheckSystem 2.3

**Three-phase test system with class 0.2 reference standard and integrated three-phase current source up to 16 A**

The CheckSystem 2.3 portable test system consists of an integrated three-phase current source and a three-phase electronic reference standard of accuracy class 0.2. Characteristic features of the CheckSystem 2.3 are its wide measuring range, high accuracy and high tolerance to unwanted external influences. The CheckSystem 2.3 allows the monitoring of meter installations as well as analysis of the local mains conditions.

## Advantages

- Easy verification of meters under precise load conditions, using the built-in, compact, current source
- Automatic operation using predefined load points without the need for an external PC
- Internal memory for storage of measurement results and customer data
- Display of vector diagram and phase sequence for analysis of the supply conditions
- User-friendly system for data input and operation of source and reference meter
- The system may be used either as a stand-alone reference standard meter, or together with the integrated power source

## Functions

- Independent generation of single or three phase current loading conditions for verification of meters using the incoming supply voltage
- Active, reactive and apparent energy measurement for three phase, 3- or 4-wire systems, with integrated error calculator and pulse output



- Vector diagram, harmonics spectrum, wave form and rotary field display for analysis of the mains conditions
- Voltage measurement
- Current measurement directly or with clamp-on CT's
- Active, reactive and apparent power measurement
- Phase angle, power factor and frequency measurement

## Options

- Software CALSOFT for memory readout, online data logging, presentation and printout of results and customer data and for automatic test sequences.
- Set of 3 clamp-on CT 100A (active error compensated)

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Technical Specifications	CheckSystem 2.3 (class 0.2)
General	
Auxiliary supply:	Power may be taken from the auxiliary supply or the circuit at: 88 VACmin ... 264 VACmax / 47 ... 63 Hz 123 VDCmin ... 372 VDCmax Protection: up to 440VACmax
Voltages Operation	10 V ... 300 V
Synchronisation	10 V ... 300 V
Power consumption:	max 150 VA
Housing:	Hard Plastic
Dimensions:	W 273 x H 247 x D 178 mm
Weight:	approx. 6.2 kg (excl. accessories)
Operation temperature:	-10° ... + 50°C
	-20° ... + 60°C
	≤ 85% at Ta ≤ 21°C
	≤ 95% at Ta ≤ 25°C, 30 days/ year spread

Safety	CE Certified
Isolation protection:	IEC 61010-1:2001
Measurement Category:	300V CAT III
Degree of Protection:	IP-65 (housing closed)
	IP-30 (housing open)

Current Source		
Current Range	1 mA ... 16 A	
Output power	15 VA (per phase)	
	Internal Ranges	Smax/Umax
	1 mA ... 6mA	10 mVA / 1.67 V
	6 mA ... 60 mA	100 mVA / 1.67 V
	60 mA ... 0.6 A	1 VA / 1.67 V
	0.6 A ... 6 A	10 VA / 1.67 V
	6 A ... 16 A	15 VA / 0.94 V
Resolution	0.2 % of end of internal range	
Accuracy	≤ 0.2 % of end of internal range	
Distortion Factor	≤ 0.8 %	
Stability	≤ 0.03 % (30 min.)	
	≤ 0.1 % (1 h)	
Load Regulation	≤ 0.01 % (from 0 % ... 100 % load)	
Power Factor of Load	1 – 0.1 ind.	
Bandwidth	30 Hz ... 1 kHz (-3 dB)	
Phase Angle	Range	Accuracy Resolution
	-180°...+180°	± 0.2° 0.1°
Frequency	Range	Accuracy Resolution
Mode Line (sync. to input voltage)	40 Hz-70 Hz	
Mode NUM	40 Hz-70 Hz	± 0.01 Hz 0.01 Hz

Reference Standard - Measurement Range		
Measuring Quantity	Range	Input / Sensor
Voltage (phase - neutral)	10 V ... 300 V	U1, U2, U3, N
	1 mA ... 16 A	I1, I2, I3
	10 mA ... 100 A	Clamp-on CT 100A

Reference Standard - Measurement Accuracy		≤ ± E [%] <sup>12</sup>
Voltage / Current		Class 0.2
Measuring Quantity	Range	
Voltage (U1, U2, U3, N)	46 V ... 300 V	0.2
	10 V ... 46 V	1.0
Current direct (I1, I2, I3)	10 mA ... 16 A	0.2
	1 mA ... 10 mA	0.2
Current clamp-on CT 100A	100 mA ... 100 A	0.2
	10 mA ... 100 mA	1.0

Power / Energy	Voltage: 46 V ... 300 V (L-N)	≤ ± E [%] <sup>123</sup>
Measuring Quantity	Range	Class 0.2
<b>Active (P), Apparent (S) Power / Energy</b>		
Direct (I1, I2, I3)	10 mA ... 16 mA 1 mA ... 10 mA	0.2 0.2
Clamp-on CT100A	100 mA ... 100 A 10 mA ... 100 mA	0.2 1.0
<b>Reactive (Q) Power / Energy</b>		
Direct (I1, I2, I3)	10 mA ... 16 A 1 mA ... 10 mA	0.4 0.4
Clamp-on CT100A	100 mA ... 100 A 10 mA ... 100 mA	0.4 1.0

Influence of external magnetic ≤ 0.07% / 0.5 mT<sup>3</sup>  
fields (45 Hz ... 66Hz)

Temperature Coefficient (TC)	Range	≤ ± TC [%/°C] <sup>3</sup>
	0°C ... +40°C	0.02
	-10°C ... +50°C	0.05

Frequency / Phase Angle / Power Factor		≤ ± E
Measuring Quantity	Range	
Frequency	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
- x.x :Related to the measuring range final value (full scale, FS),  
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	REDEL 8-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 selected internal current range (In).
	Internal current ranges In [A]
Direct (I1, I2, I3)	0.006 0.06 0.6 6 16
Clamp-on CT 100A	0.1 1 10 100
	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' * PS(QS, SS) fmax = 40'000'000 / (10 * 3'600'000) * 3 * 10 * 300 = 10'000 [imp/s]