The CheckSystem 2.1 portable test system consists of an integrated single-phase current source and a single-phase electronic reference standard of accuracy class 0.2. Characteristic features of the CheckSystem 2.1 are its wide measuring range, high accuracy and high tolerance to unwanted external influences.

The CheckSystem 2.1 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 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-phase current loading conditions for verification of meters using the incoming supply voltage
- Active, reactive and apparent energy measurement with integrated error calculator and pulse output
- Vector diagram, harmonics spectrum and wave form display for analysis of the mains conditions
- Voltage measurement
- Current measurement directly or with UCT clamp-on CT
- 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.
- UCT120.1 clamp-on CT 120A (active error compensated)
### Technical Data CheckSystem 2.1 (class 0.2)

#### General

**Auxiliary supply:** Power may be taken from the auxiliary supply or the measuring circuit at: 88 VACmin ... 264 VACmax / 47 ... 63 Hz 125 VDCmin ... 372 VDCmax Protection: up to 440VACmax

**Voltages Operation**
- 10 V ... 300 V
- 10 V ... 300 V

**Synchronisation**
- Power consumption: max. 150 VA
- Housing: Hard Plastic
- Dimensions: W 273 x H 247 x D 178 mm
- Weight: approx. 6.5 kg
- 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 61010-1:2001
- Measurement Category: 300V CAT III
- Degree of protection: IP-65 (housing closed)
- IP-30 (housing open)

### CURRENT SOURCE

**Current Range**
- 1 mA ... 120 A

**Output power**
- 60 VA

<table>
<thead>
<tr>
<th>Internal Ranges</th>
<th>Smax / Umax</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 mA ... 12 mA</td>
<td>60 mVA / 5 V</td>
</tr>
<tr>
<td>12 mA ... 120 mA</td>
<td>600 mVA / 5 V</td>
</tr>
<tr>
<td>120 mA ... 1.2 A</td>
<td>6 VA / 5 V</td>
</tr>
<tr>
<td>1.2 A ... 12 A</td>
<td>60 VA / 5 V</td>
</tr>
<tr>
<td>12 A ... 80 A</td>
<td>60 VA / 0.75 V</td>
</tr>
<tr>
<td>80 A ... 120 A</td>
<td>60 VA / 0.5 V</td>
</tr>
</tbody>
</table>

**Resolution**
- 0.1 % 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: -180° ... +180°
- Accuracy: ± 0.2°
- Resolution: 0.1°

**Frequency**
- Range: 40 Hz ... 70 Hz
- Accuracy: ± 0.01 Hz
- Resolution: 0.01 Hz

### REFERENCE STANDARD - Measurement Range

**Measuring Quantity**
- Range
- Input / Sensor
- Voltage (phase - neutral)
  - 10 V ... 300 V
  - U, N
- Current
  - 1 mA ... 12 A
  - 1 mA ... 120 A
  - 10 mA ... 120 A

### REFERENCE STANDARD - Measurement Accuracy

**Voltage / Current**

<table>
<thead>
<tr>
<th>Measuring Quantity</th>
<th>Range</th>
<th>Class 0.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage (U, N)</td>
<td>46 V ... 300 V</td>
<td>0.2</td>
</tr>
<tr>
<td>Current direct 12 A or 120 A</td>
<td>12 mA ... 120 A</td>
<td>0.2</td>
</tr>
<tr>
<td>Current CT 120A UCT 120.1</td>
<td>100 mA ... 120 A</td>
<td>0.2</td>
</tr>
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</table>

### Notes

1 x x / Related to the measuring value
2 E(M) = FS/M * x x (e.g. 0.2 at FS = 46 V, E(10V) = 46/10 * 0.2 = 0.92 %)
3 Fundamental frequency in the range 45 ... 66 Hz

### Frequency / Phase Angle / Power Factor

<table>
<thead>
<tr>
<th>Measuring Quantity</th>
<th>Range</th>
<th>≤ ± E [%] 1 2 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power (P), Apparent (S) Power / Energy</td>
<td>Direct 12 A or 120 A</td>
<td>12 mA ... 120 A</td>
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<td>Current CT 120A UCT 120.1</td>
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### Influence of external magnetic fields (45 Hz ... 66 Hz):
- ≤ 0.07 % / 0.5 mT 3

### Temperature coefficient (TC):
- Range
- ≤ ± TC [%/°C] 3

### Frequency / 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:**
- Active, Reactive, Apparent

<table>
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<th>[imp/kWh(kvarh,kVAh)]</th>
<th>C = 120000000 / ln</th>
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<td>120'000'000 / In</td>
<td>The meter constant depends on the selected internal current range (ln).</td>
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<td>Direct 12A</td>
<td>0.012</td>
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<td>Direct 120A</td>
<td>0.12</td>
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<td>Direct CT 120A UCT 120.1</td>
<td>0.12</td>
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**C = C / 3600000 [imp/Ws(vars, Vars)]**

<table>
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<th>f0</th>
<th>fmax</th>
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<td>= C' PF(ΩL, S)</td>
<td>= 120'000'000 / (10 * 3'600'000) * 10 * 300 = 10'000 [imp/s]</td>
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**REDEL** 8-pole common input / output connector, suitable for scanning head SH 2003

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**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:**
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**Meter constant:**
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Example: Clamp-on CT 120 A (ln = 10 A)

| C = 120'000'000 / 10 |

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<tr>
<th>f0 = C' PF(ΩL, S)</th>
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<td>= 120'000'000 / (10 * 3'600'000) * 10 * 300 = 10'000 [imp/s]</td>
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**Output frequency:**

| C = C / 3600000 [imp/Ws(vars, Vars)]**

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**MTE Meter Test Equipment AG**

Subject to alterations

07.2016_R02