Electrical installation solutions for buildings
Energy efficiency

Index
M4M network analyzers 8/2
DMTME multimeters 8/10
CUS 485 TCP/IP converter 8/12
Energy meters selection table 8/16
A-series EQ meters 8/18
B-series EQ meters 8/26
C-series EQ meters 8/33
Interfaces for EQ meters 8/37
EQmatic 8/38
CMS – Circuit Monitoring System 8/40
CMS – Control Units 8/46
CMS – Sensors and Accessories 8/48
String monitoring CMS-660 8/53
Analogue and digital instruments selection table 8/56
Modular digital instruments 8/57
Front panel digital instruments 8/59
Analogue instruments selection table 8/60
Modular analogue instruments 8/61
Scales for modular analogue ammeters 8/63
Front-panel analogue instruments 8/64
Scales for front-panel analogue instrument 8/69
Voltmetric and current switches 8/74
E 233 hour counters 8/75
HMT hour counters 8/76
TMD temperature control units 8/77
Current transformers selection table 8/78
CT measurement current transformers with through primary 8/82
CTA measurement current transformers with wound primary 8/87
CTO split core measurement current transformers 8/88
TRF M measurement modular current transformers 8/89
SNT current transformer for d.c. applications 8/90
## Energy efficiency

Network analyzers – M4M 20 and M4M 30

### Technical features

<table>
<thead>
<tr>
<th>Type</th>
<th>M4M 20 - Class 0,5S</th>
<th>M4M 30 - Class 0,5S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Auxiliary power supply</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage range</td>
<td>[V] 48 - 240 VAC/VDC ±15%</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>[Hz] 50-60</td>
<td></td>
</tr>
<tr>
<td>Power Consumption</td>
<td>[VA] 10 VA max</td>
<td></td>
</tr>
<tr>
<td>Installation category</td>
<td>CAT III 300V class per IEC 61010-1 edition 3</td>
<td></td>
</tr>
<tr>
<td>Protection fuse</td>
<td>T1 A - 277 VAC</td>
<td></td>
</tr>
<tr>
<td><strong>Measurement accuracy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement type</td>
<td>True RMS up to the 40th harmonic</td>
<td></td>
</tr>
<tr>
<td>IEC 61557-12</td>
<td>IEC 61557-12 PMD/5/K70/0,5</td>
<td></td>
</tr>
<tr>
<td>Active energy</td>
<td>Class 0,5 acc. to IEC 61557-12 [*]</td>
<td>Class 0,5S acc. to IEC 62053-22</td>
</tr>
<tr>
<td>Reactive energy</td>
<td>Class 2 acc. to IEC 61557-12</td>
<td>Class 2S acc. to IEC 62053-23</td>
</tr>
<tr>
<td>Active power</td>
<td>Class 0,5 acc. to IEC 61557-12</td>
<td></td>
</tr>
<tr>
<td>Reactive power</td>
<td>Class 2 acc. to IEC 61557-12</td>
<td>Class 1 acc. to IEC 61557-12</td>
</tr>
<tr>
<td>Apparent power</td>
<td>Class 0,5 acc. to IEC 61557-12</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>Class 0,2 acc. to IEC 61557-12</td>
<td></td>
</tr>
<tr>
<td>Current</td>
<td>Class 0,2 acc. to IEC 61557-12</td>
<td></td>
</tr>
<tr>
<td>Neutral current</td>
<td>Calculated</td>
<td>Class 0,2 acc. to IEC 61557-12</td>
</tr>
<tr>
<td>Frequency</td>
<td>Class 0,1 acc. to IEC 61557-12</td>
<td></td>
</tr>
<tr>
<td>Unbalances (Current, Voltage)</td>
<td>Class 0,2 acc. to IEC 61557-12</td>
<td></td>
</tr>
<tr>
<td>Harmonics, THD (Current, voltage)</td>
<td>Class 1 acc. to IEC 61557-12</td>
<td></td>
</tr>
<tr>
<td><strong>Voltage measurement inputs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measurement range</td>
<td>[V] 50 - 400 VAC (L-N) 87 - 690 VAC (L-L)</td>
<td></td>
</tr>
<tr>
<td>Measurement category</td>
<td>400V~ (CAT III)</td>
<td></td>
</tr>
<tr>
<td>Rated frequency</td>
<td>[Hz] 50/60 Hz</td>
<td></td>
</tr>
<tr>
<td>Max. VT secondary (indirect connection)</td>
<td>[V] 400 VAC (L-N)</td>
<td></td>
</tr>
<tr>
<td>Max over voltage</td>
<td>[V] 800 VAC (L-L)</td>
<td></td>
</tr>
<tr>
<td>Protection fuse</td>
<td>T1 A - 277 VAC</td>
<td></td>
</tr>
</tbody>
</table>

*Accuracy referred to insertion with .../5A CT or Rogowski coils, according to product version. Derating for .../1A CT.
## Energy efficiency
Network analyzers – M4M 20 and M4M 30

<table>
<thead>
<tr>
<th>Technical features</th>
<th>M4M 20 - Class 0.5S</th>
<th>M4M 30 - Class 0.5S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Current measurement inputs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of current inputs</td>
<td>3 (L1, L2, L3)</td>
<td>4 (L1, L2, L3, N)</td>
</tr>
<tr>
<td><strong>Indirect insertion with CT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT rated secondary current</td>
<td>5 A (Class 0.5S)</td>
<td>1 A (Class 1)</td>
</tr>
<tr>
<td>Measurement range without accuracy derating</td>
<td>50 mA - 6 A</td>
<td></td>
</tr>
<tr>
<td>Starting current</td>
<td>5 mA</td>
<td></td>
</tr>
<tr>
<td>Burden</td>
<td>0.024 VA at 6 A</td>
<td></td>
</tr>
<tr>
<td><strong>Indirect insertion with Rogowski coils</strong></td>
<td>M4M 20 Rogowski</td>
<td>M4M 30 Rogowski</td>
</tr>
<tr>
<td>Rated current</td>
<td>10,000 A</td>
<td></td>
</tr>
<tr>
<td>Measurement range without accuracy derating</td>
<td>100 A - 12 kA</td>
<td></td>
</tr>
<tr>
<td>Starting current</td>
<td>[A]</td>
<td>10 A</td>
</tr>
<tr>
<td><strong>I/O</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Digital Output</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage (min - max)</td>
<td>5 - 240 VAC/DC</td>
<td></td>
</tr>
<tr>
<td>Current (min - max)</td>
<td>2 - 100 mA</td>
<td></td>
</tr>
<tr>
<td>Max ON state drop voltage</td>
<td>1.5 V</td>
<td></td>
</tr>
<tr>
<td>Max R value at Min voltage conditions (5 V)</td>
<td>1750 Ohm</td>
<td></td>
</tr>
<tr>
<td>Min R value at Max voltage conditions (240 V)</td>
<td>2400 Ohm</td>
<td></td>
</tr>
<tr>
<td>Pulse duration [ms]</td>
<td>20 ms ON, 20 ms OFF</td>
<td></td>
</tr>
<tr>
<td>Pulse frequency</td>
<td>25 Hz</td>
<td></td>
</tr>
<tr>
<td>Alarm activation delay [s]</td>
<td>1 - 900 s (programmable)</td>
<td></td>
</tr>
<tr>
<td>Alarm return hysteresis</td>
<td>0 - 40% (programmable)</td>
<td></td>
</tr>
<tr>
<td><strong>Digital Input</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximum voltage</td>
<td>240 VAC/DC</td>
<td></td>
</tr>
<tr>
<td>Max voltage for OFF state on input</td>
<td>20 VAC/DC</td>
<td></td>
</tr>
<tr>
<td>Min voltage for ON state on input</td>
<td>45 VAC/DC</td>
<td></td>
</tr>
<tr>
<td><strong>Analogue Output</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programmable electrical span</td>
<td>Span [0 - 20 mA or 4 - 20 mA]</td>
<td></td>
</tr>
<tr>
<td>Load</td>
<td>Typical 250 Ohm, max 500 Ohm</td>
<td></td>
</tr>
</tbody>
</table>
### Technical features

#### Type

<table>
<thead>
<tr>
<th>Type</th>
<th>M4M 20 - Class 0,5S</th>
<th>M4M 30 - Class 0,5S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mechanical characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall dimensions</td>
<td>96 mm × 96 mm × 77 mm</td>
<td>(Depth inside the switchboard: 57 mm)</td>
</tr>
<tr>
<td>Front: IP54</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terminals: IP20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Weight [g]</td>
<td>400</td>
<td></td>
</tr>
<tr>
<td><strong>Terminal characteristics</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage inputs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal cross section: 2.5 mm²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid/stranded wire: 0.2 - 2.5 mm² (AWG 24 - 12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pitch: 7.62 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poles: 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current inputs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal cross section: 2.5 mm²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid/stranded wire: 0.2 - 2.5 mm² (AWG 24 - 12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pitch: 5.08 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poles: 6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Screw flanges for fixing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS-485 Serial port</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal cross section: 2.5 mm²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid/stranded wire: 0.2 - 2.5 mm² (AWG 24 - 12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pitch: 5.08 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poles: 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I/O</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal cross section: 2.5 mm²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Solid/stranded wire: 0.2 - 2.5 mm² (AWG 24 - 12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pitch: 5.08 mm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poles: 5 (Programmable I/O)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poles: 3 (Programmable I/O only on M4M 30 I/O)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poles: 3 (Analogue outputs, only on M4M 30 I/O)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rogowski current probes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Only with ABB Rogowski probes:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- R4M-200 2CSG202150R1101 (200 mm diameter)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- R4M-80 2CSG202160R1101 (80 mm diameter)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Climatic conditions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-25 to 70 °C (K70 acc. to IEC 61557-12)</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40 to 85 °C (K70 acc. to IEC 61557-12)</td>
<td></td>
</tr>
<tr>
<td>Relative humidity</td>
<td>Max 93% (non-condensing) at 40°C</td>
<td></td>
</tr>
<tr>
<td>Pollution degree</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Altitude</td>
<td>&lt; 2,000 m</td>
<td></td>
</tr>
<tr>
<td><strong>User Interface</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Access to device</td>
<td>5 pushbuttons</td>
<td>Touchscreen</td>
</tr>
<tr>
<td>Display type</td>
<td>Graphic color display</td>
<td></td>
</tr>
<tr>
<td>Display dimensions</td>
<td>70 x 52 mm (3.5&quot;)</td>
<td></td>
</tr>
</tbody>
</table>
Energy efficiency
Network analyzers – M4M 20 and M4M 30

<table>
<thead>
<tr>
<th>Technical features</th>
<th>M4M 20 - Class 0,5S</th>
<th>M4M 30 - Class 0,5S</th>
</tr>
</thead>
</table>

**Type**
M4M 20 - Class 0,5S
M4M 30 - Class 0,5S

**Communication protocol**

<table>
<thead>
<tr>
<th>Modbus RTU</th>
<th>M4M 20 Modbus, M4M 20 I/O, M4M 20 Rogowski</th>
<th>M4M 30 Modbus, M4M 30 I/O, M4M 30 Rogowski</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication interface</td>
<td>RS485 with optical isolation</td>
<td>RS485 with optical isolation</td>
</tr>
<tr>
<td>Baud rate</td>
<td>9.6, 19.2, 38.4, 57.6, 115.2 kbps</td>
<td></td>
</tr>
<tr>
<td>Parity number</td>
<td>Odd, Even, None</td>
<td>odd, Even, None</td>
</tr>
<tr>
<td>Stop bit</td>
<td>1, 2</td>
<td>1, 2</td>
</tr>
<tr>
<td>Address</td>
<td>1-247</td>
<td>1-247</td>
</tr>
<tr>
<td>Connector</td>
<td>3 pole terminal</td>
<td>3 pole terminal</td>
</tr>
</tbody>
</table>

**Profibus DP-V0**

<table>
<thead>
<tr>
<th>M4M 20 Profibus</th>
<th>M4M 30 Profibus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol</td>
<td>Profibus with slave DP-V0 function in compliance with IEC 61158 regulations</td>
</tr>
<tr>
<td>Communication interface</td>
<td>RS485 with optical isolation</td>
</tr>
<tr>
<td>Address</td>
<td>0-126</td>
</tr>
<tr>
<td>Connector</td>
<td>DB 9 female connector (do not use connectors with 90° cable outlet)</td>
</tr>
<tr>
<td>LED indicators</td>
<td>Green for communication status</td>
</tr>
</tbody>
</table>

**Modbus TCP/IP**

<table>
<thead>
<tr>
<th>M4M 20 Ethernet</th>
<th>M4M 30 Ethernet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol</td>
<td>Modbus TCP/IP</td>
</tr>
<tr>
<td>Communication interface</td>
<td>RJ45</td>
</tr>
</tbody>
</table>

**BACnet**

<table>
<thead>
<tr>
<th>M4M 20 Bacnet</th>
<th>M4M 30 Bacnet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protocol</td>
<td>BACnet/IP</td>
</tr>
<tr>
<td>Communication interface</td>
<td>RJ45</td>
</tr>
</tbody>
</table>

**Bluetooth**

| Type | BLE (Bluetooth Low Energy) |

**Real-time clock**

| - | ~ 0.4 seconds per day |
| - | ~ 3 days without aux supply |

**Standards**

<table>
<thead>
<tr>
<th>Power metering and monitoring devices (PMD)</th>
<th>IEC 61557-12 (IEC 62053-22, IEC 62053-23)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electrical safety</td>
<td>IEC 61010-1</td>
</tr>
<tr>
<td>EMC</td>
<td>IEC 61326-1 (IEC 61000-3-2, IEC 61000-3-3, IEC 61000-4-2, IEC 61000-4-3, IEC 61000-4-4, IEC 61000-4-5, IEC 61000-4-6, IEC 61000-4-8, IEC 61000-4-11)</td>
</tr>
</tbody>
</table>
## Energy efficiency

Network analyzers – M4M 20 and M4M 30

### Technical features

<table>
<thead>
<tr>
<th>Feature</th>
<th>M4M 20 - Class 0.5S</th>
<th>M4M 30 - Class 0.5S</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M4M 20 - Class 0.5S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M4M 30 - Class 0.5S</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Real-time</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRMS current</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>TRMS Voltage</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Frequency</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Active, Reactive and Apparent Power</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Power Factor</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Operating timer, countdown timer</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>Energy</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active, Reactive and Apparent Energy</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>4 quadrants Energy (Import/Export)</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Tariffs</td>
<td>/</td>
<td></td>
</tr>
<tr>
<td><strong>Power Quality</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>THD (I, VLN, VLL)</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Individual Harmonics</td>
<td>/</td>
<td>40th</td>
</tr>
<tr>
<td>Unbalances (I, VLN, VLL)</td>
<td>/</td>
<td>●</td>
</tr>
<tr>
<td>Neutral current</td>
<td>Calculated</td>
<td>Measured</td>
</tr>
<tr>
<td>Phasors (I, VLN)</td>
<td>/</td>
<td>●</td>
</tr>
<tr>
<td>Waveforms (I, VLN, VLL)</td>
<td>/</td>
<td>●</td>
</tr>
<tr>
<td><strong>Data recording and logs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single alarms</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Warnings, alarms and errors log</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Complex alarms with logics</td>
<td>/</td>
<td>4</td>
</tr>
<tr>
<td>Demand values (average)</td>
<td>Basic</td>
<td>Advanced</td>
</tr>
<tr>
<td>Min/Max Demand values</td>
<td>Basic</td>
<td>Advanced</td>
</tr>
<tr>
<td>Energy Trending logs</td>
<td>/</td>
<td>●</td>
</tr>
<tr>
<td>RTC</td>
<td>/</td>
<td>●</td>
</tr>
<tr>
<td><strong>HMI</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graphs visualization</td>
<td>Basic</td>
<td>Advanced</td>
</tr>
<tr>
<td>Notifications</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Homepage and favourite page</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Password protection</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td><strong>Connectivity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automatic integration in ABB Ability™ EDCS</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Bluetooth Low Energy</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Communication Protocols</td>
<td>Modbus RTU, Modbus TCP/IP, Profibus DP-V0, BACnet/IP</td>
<td>Modbus RTU, Modbus TCP/IP, Profibus DP-V0, BACnet/IP</td>
</tr>
<tr>
<td>RJ45 Daisy Chain (Ethernet version)</td>
<td>/</td>
<td>●</td>
</tr>
</tbody>
</table>
Energy efficiency
Network analyzers – M4M 20 and M4M 30

M4M 20
M4M 20 is ABB’s network analyzer range that provides complete and accurate electrical parameters monitoring and basic power quality analysis. Equipped with graphic color display for advanced visualization of the measured parameters and Bluetooth module for smart commissioning.

<table>
<thead>
<tr>
<th>Communication protocol</th>
<th>I/O</th>
<th>Bbn</th>
<th>EAN</th>
<th>Type</th>
<th>Order code</th>
<th>Weight per piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLE</td>
<td>2 Digital out.</td>
<td>511519</td>
<td>M4M 20</td>
<td>2CSG2511151R4051</td>
<td>0.400</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BLE, Modbus RTU</td>
<td>2 Digital out.</td>
<td>511410</td>
<td>M4M 20 Modbus</td>
<td>2CSG251141R4051</td>
<td>0.400</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BLE, Modbus TCP/IP</td>
<td>2 Digital out.</td>
<td>044710</td>
<td>M4M 20 Ethernet</td>
<td>2CSG204471R4051</td>
<td>0.400</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BLE, Profibus DP-V0</td>
<td>2 Digital out.</td>
<td>511311</td>
<td>M4M 20 Profibus</td>
<td>2CSG251131R4051</td>
<td>0.400</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BLE, BACnet/IP</td>
<td>2 Digital out.</td>
<td>368311</td>
<td>M4M 20 BACnet</td>
<td>2CSG236831R4051</td>
<td>0.400</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BLE, Modbus RTU</td>
<td>2 Progr. I/O, 2 Digital out., 2 Analogue out.</td>
<td>511618</td>
<td>M4M 20 I/O</td>
<td>2CSG251161R4051</td>
<td>0.400</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

M4M 20 - Rogowski version
M4M 20 is also available as compatible with ABB's R4M Rogowski coils for current measurement, increasing the flexibility of network analyzers offer and allowing retrofit in any existing installations. M4M 20 Rogowski together with R4M Rogowski coils ensures the integration of basic power quality metering in any existing system with 0 downtime.

<table>
<thead>
<tr>
<th>Communication protocol</th>
<th>I/O</th>
<th>Bbn</th>
<th>EAN</th>
<th>Type</th>
<th>Order code</th>
<th>Weight per piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLE, Modbus RTU</td>
<td>2 Digital Outputs</td>
<td>070818</td>
<td>M4M 20 Rogowski</td>
<td>2CSG207081R4051</td>
<td>0.400</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Energy efficiency
Network analyzers – M4M 20 and M4M 30

M4M 30
M4M 30 is ABB’s network analyzer range that allows complete power quality analysis and energy efficiency evaluations. Equipped with touchscreen color display for simplified access to the device and with Bluetooth module for smart commissioning.

<table>
<thead>
<tr>
<th>Communication protocol</th>
<th>I/O</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLE, Modbus RTU</td>
<td>4 Progr. I/O</td>
<td>747611</td>
<td>M4M 30 Modbus</td>
<td>2CSG274761R4051</td>
<td>0.400</td>
</tr>
<tr>
<td>BLE, Modbus TCP/IP</td>
<td>4 Progr. I/O</td>
<td>746812</td>
<td>M4M 30 Ethernet</td>
<td>2CSG274681R4051</td>
<td>0.400</td>
</tr>
<tr>
<td>BLE, profibus DP-V0</td>
<td>4 Progr. I/O</td>
<td>367918</td>
<td>M4M 30 profibus</td>
<td>2CSG236791R4051</td>
<td>0.400</td>
</tr>
<tr>
<td>BLE, BACnet/IP</td>
<td>4 Progr. I/O</td>
<td>024514</td>
<td>M4M 30 Bacnet</td>
<td>2CSG202451R4051</td>
<td>0.400</td>
</tr>
<tr>
<td>BLE, Modbus RTU</td>
<td>6 Progr. I/O, 2 Analogue out.</td>
<td>024712</td>
<td>M4M 30 I/O</td>
<td>2CSG202471R4051</td>
<td>0.400</td>
</tr>
</tbody>
</table>

M4M 30 - Rogowski version
M4M 30 is also available as compatible with ABB’s R4M Rogowski coils for current measurement, increasing the flexibility of network analyzers and allowing retrofit in any existing installations. M4M 30 Rogowski together with R4M coils ensure integration of complete PQ analysis in any existing system with 0 downtime.

<table>
<thead>
<tr>
<th>Communication protocol</th>
<th>I/O</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLE, Modbus RTU</td>
<td>4 Progr. I/O</td>
<td>024613</td>
<td>M4M 30 Rogowski</td>
<td>2CSG202461R4051</td>
<td>0.400</td>
</tr>
</tbody>
</table>

R4M ROGOWSKI COILS
R4M Rogowski coils are flexible current transformer based on Rogowski technology, ideal to retrofit existing installations up to 12kA. Available in two different sizes (80mm or 200mm diameters), R4M coils are directly equipped with pre-wired removable terminals that perfectly fit M4M 20 Rogowski (3 Rogowski coil inputs) and M4M 30 Rogowski (4 Rogowski coil inputs), with no need for external integrators.

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>021605</td>
<td>R4M-80</td>
<td>2CSG202160R1101</td>
<td>0.150</td>
</tr>
<tr>
<td>200</td>
<td>021506</td>
<td>R4M-200</td>
<td>2CSG202150R1101</td>
<td>0.250</td>
</tr>
</tbody>
</table>
Notes
## Energy efficiency

**DMTME multimeters**

<table>
<thead>
<tr>
<th>1.3 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Auxiliary supply</strong></td>
</tr>
<tr>
<td>[V rms]</td>
</tr>
<tr>
<td>[V rms]</td>
</tr>
<tr>
<td><strong>Frequency</strong> [Hz]</td>
</tr>
<tr>
<td><strong>Power consumption</strong> [VA]</td>
</tr>
<tr>
<td><strong>Fuse protection</strong></td>
</tr>
<tr>
<td><strong>Voltage measuring inputs</strong></td>
</tr>
<tr>
<td><strong>Range</strong> [V rms]</td>
</tr>
<tr>
<td><strong>Max. non destructive</strong> [V rms]</td>
</tr>
<tr>
<td><strong>Impedance (L-N)</strong> [MΩ]</td>
</tr>
<tr>
<td><strong>Current measuring inputs (only external CTs .../5 A)</strong></td>
</tr>
<tr>
<td><strong>Range</strong> [A rms]</td>
</tr>
<tr>
<td><strong>Overload</strong></td>
</tr>
<tr>
<td><strong>Measurement accuracy</strong></td>
</tr>
<tr>
<td>Voltage</td>
</tr>
<tr>
<td>Current</td>
</tr>
<tr>
<td>Active power</td>
</tr>
<tr>
<td>Frequency</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Energy metering</strong></td>
</tr>
<tr>
<td>Maximum metered value for single phase</td>
</tr>
<tr>
<td>Maximum metered value for three phase</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
</tr>
<tr>
<td><strong>Max. power consumption</strong> [VA]</td>
</tr>
<tr>
<td><strong>Digital outputs</strong></td>
</tr>
<tr>
<td>Pulse duration</td>
</tr>
<tr>
<td>Vmax on contact</td>
</tr>
<tr>
<td>Wmax dissipation</td>
</tr>
<tr>
<td>Max frequency</td>
</tr>
<tr>
<td>Imax contact</td>
</tr>
<tr>
<td>Insulation</td>
</tr>
<tr>
<td><strong>Programmable parameters</strong></td>
</tr>
<tr>
<td>KV transformer ratio Vprim/Vsec</td>
</tr>
<tr>
<td>kCT transformer ratio Iprim/Isec</td>
</tr>
<tr>
<td><strong>Free hour counter</strong></td>
</tr>
<tr>
<td><strong>Countdown</strong></td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
</tr>
<tr>
<td><strong>Storage temperature</strong></td>
</tr>
<tr>
<td><strong>Relative humidity</strong></td>
</tr>
<tr>
<td><strong>Overall dimensions</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
DMTME multimeters

The instruments DMTME are digital multimeters that allow the measurement, in TRMS mode, of the principal electrical parameters in three-phase and single-phase 110/230/400 Vac networks, including the max/min/average detection of the main electrical parameters and the active and reactive energy count. The multiple measured variables are displayed locally on four red 7-segment LED displays providing easy readability and simultaneous display of the measures of the electrical parameters of the phases individually and of the whole network.

The instruments DMTME combine, in a single instrument, the functions of multiple devices: voltmeter, ammeter, power factor meter, wattmeter, varmeter, frequency meter, active and reactive energy meters; it allows remarkable financial savings thanks to the reduction of space taken up in the panel and also of time required for cabling, along with the advantage of providing clear readings on a single device.

The DMTME-I-485, DMTME-I-485-96 and DMTME-I-485-72 models are additionally equipped with two digital outputs, fully programmable as either pulse outputs for remote metering of energy consumption, or as alarm outputs. The output relay can be set as NO or NC. Communication over Modbus RTU protocol is possible through the RS485 serial port. All versions come complete with Mini CD containing the instruction manual, technical documentation, Modbus communication protocol and the DMTME-SW tool, intended to be a first-hand PC-based application for the remote visualization of the measures.

DMTME modular multimeters

Auxiliary supply 230 V a.c. and 110 V a.c.

<table>
<thead>
<tr>
<th>RS485 serial port</th>
<th>Program. digital output</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>975700</td>
<td>DMTME</td>
<td>2CSM170040R1021</td>
<td>0.450</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>■</td>
<td>975809</td>
<td>DMTME-I-485</td>
<td>2CSM180050R1021</td>
<td>0.450</td>
<td>1</td>
</tr>
</tbody>
</table>

DMTME-96 panel multimeters

Auxiliary supply 230 V a.c. and 110 V a.c. Dimensions 96x96 mm

<table>
<thead>
<tr>
<th>RS485 serial port</th>
<th>Program. digital output</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>■</td>
<td>046752</td>
<td>DMTME-96</td>
<td>2CSG1133030R4022</td>
<td>0.450</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>■</td>
<td>046851</td>
<td>DMTME-I-485-96</td>
<td>2CSG163030R4022</td>
<td>0.450</td>
<td>1</td>
</tr>
</tbody>
</table>

DMTME-72 panel multimeters

Auxiliary supply 230 V a.c. and 400 V a.c. Dimensions 72x72 mm

<table>
<thead>
<tr>
<th>RS485 serial port</th>
<th>Program. digital output</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>■</td>
<td>046554</td>
<td>DMTME-72</td>
<td>2CSG132030R4022</td>
<td>0.450</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>■</td>
<td>046653</td>
<td>DMTME-I-485-72</td>
<td>2CSG162030R4022</td>
<td>0.450</td>
<td>1</td>
</tr>
</tbody>
</table>
Energy efficiency
CUS 485 TCP/IP converter

<table>
<thead>
<tr>
<th>Technical features CUS 485 TCP/IP</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage [V]</td>
<td>220-240 a.c. ±15%</td>
</tr>
<tr>
<td>Power consumption [VA]</td>
<td>4 max</td>
</tr>
<tr>
<td>Ethernet</td>
<td>100 base-T, RJ45 connector, TCP/IP protocol</td>
</tr>
<tr>
<td>RS485 serial port</td>
<td>standard, baudrate from 4800 to 19200 bps</td>
</tr>
<tr>
<td>Display, buttons</td>
<td>3 LED (1 green: ON, 1 red: LINK, 1 yellow: DATA) programming button</td>
</tr>
<tr>
<td>Mechanical features</td>
<td>protection degree: IP52 front - IP20 case and terminals - weight: 0.40 kg, connections with screw terminal for cable max. 2.5 mm², self extinguishing plastic case, DIN rail mounting, 3 modules-17.5 mm each</td>
</tr>
<tr>
<td>Environmental features</td>
<td>operating temperature: -10 +60 °C, humidity &lt;90% storage temperature: -25 +70 °C</td>
</tr>
<tr>
<td>Standards</td>
<td>IEC EN 50081-2</td>
</tr>
<tr>
<td></td>
<td>IEC EN 50082-1</td>
</tr>
<tr>
<td></td>
<td>IEC EN 61010-1</td>
</tr>
</tbody>
</table>

CUS 485 TCP/IP converter

The CUS 485 TCP/IP converter allows the conversion of an RS485 serial communication port into a TCP/IP ethernet bus.

The CUS 485 TCP/IP converter acts as a bridge between Modbus/TCP/IP and Modbus/ASCII/RTU.

The serial port is linked to a device using Modbus/ASCII or Modbus/RTU communication or to a network of devices, while the ethernet port is linked to server/PC or PLC systems.

Server commands are sended via ethernet to CUS 485 TCP/IP that convert and send the commands to the slave device.

<table>
<thead>
<tr>
<th>Version</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price</th>
<th>Weight</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>serial converter - LAN TCP/IP network</td>
<td>585633</td>
<td>CUS 485 TCP/IP</td>
<td>2CSG258563R4051</td>
<td>0.5</td>
<td>1</td>
</tr>
</tbody>
</table>
Energy meters
The details make the difference
Energy efficiency
Energy meters. The details make the difference.

A series
Key applications
• Facility management installations
• Critical power
• Production lines
• System solutions
• Power quality
• Etc.

Key performance
Single phase or three phase
Direct connected up to 80 A or transformer current- and/or voltage transformers (CTVT)
Active energy measurement
• Class B (Cl. 1) or
• Class C (Cl. 0,5 S) on CTVT connected meters
Wide voltage range
• 100 - 690 V phase to phase
• 57,7 - 400 V phase to neutral
Alarm functions
MID (Module B and D)
Reactive energy measurement
Import/export measurement of energy
Optional communication
• via M-Bus or
• RS-485 (For Modbus RTU or EQ bus)
4 tariffs controlled by inputs,
• communication or
• built-in clock
Previous values by
• day or
• week or
• month
Demand measurement (per period)
• 3 maximum
• 1 minimum
Load profiles
• 8 channels independently configurable
• 40 000 values total
Harmonics measurement up to 16th harmonic
• Current
• Voltage
• and evaluation of THD
Pulse outputs (S0 compatible)

Instrumentation
The A series meters support reading of instrument values. A large number of electrical properties can be read. Depending on version of the meter the following data is available:
• Active power
• Apparent power
• Reactive power
• Current
• Voltage
• Frequency
• Power factor
• Harmonics (Current and Voltage)
• Total harmonic distortion

B series
Key applications
• Cost transfer/billing
• Solar power
• EV chargers
• Elevators/escalators
• Lighting
• Installation beside machines
• Etc.

Key performance
Single phase or three phase
Direct connected up to 65 A or CT connected (three phase types)
Active energy measurement
• Class B (Cl. 1) or
• Class C (Cl. 0,5 S) on CT connected meters
Alarm functions
MID (Module B and D)
Reactive energy measurement
Import/export measurement of energy
• Optional communication via
  • M-Bus or
  • RS-485 (For Modbus RTU or EQ bus)
4 tariffs controlled by
• input or
• communication
Pulse outputs (S0 compatible)

Instrumentation
The B series meters support reading of instrument values. A large number of electrical properties can be read:
• Power factor
• Active power
• Current
• Voltage

C series
Key applications
• HVAC applications
• Stand-alone applications
• Domestic applications
• Camping and Marinas
• Etc.

Key performance
Single phase or three phase
Very compact
• 1 & 3 modules.
Direct connected up to 40 A
Active energy measurement
Accuracy class 1
Alarm functions
MID (Module B and F) as option
Pulse output (S0 compatible)

Instrumentation
The C series meters support reading of instrument values. A number of electrical properties can be read:
• Power factor
• Active power
• Current
• Voltage
Energy efficiency
Selection guide EQ meters.

How do I select the best meter for my application?
There are many versions of EQ meters in order to meet your requests. The EQ program comprises meters with different functionalities such as tariffs, communication interfaces or advanced clock functions. Spend a little time to evaluate the functions and imagine how they could add extra value to your metering. For example, the input counter (from Silver level) on an EQ meter can be used to count products produced by a machine and be read out together with the energy consumption of the same machine. In one easy go you can allocate energy to any produced product from one source. Another useful function is previous values (from Gold level). If you charge users in intervals the meter can secure the data even in the event of a broken communication link. You can collect the correct interval data later and also make it visible for your counterpart immediately on the meters display in case of any discussions.

<table>
<thead>
<tr>
<th>Function</th>
<th>Single phase</th>
<th>Three phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct connected</td>
<td>C11 B21 A41</td>
<td>C13 B23 B24</td>
</tr>
<tr>
<td>Transformer connected</td>
<td></td>
<td>C13 B23 B24</td>
</tr>
<tr>
<td>2 element metering</td>
<td></td>
<td>C13 B23 B24</td>
</tr>
<tr>
<td>3 element metering</td>
<td></td>
<td>C13 B23 B24</td>
</tr>
<tr>
<td>Accuracy 1 %, Class 1, Class B</td>
<td>C11 B21 A41</td>
<td>C13 B23 B24</td>
</tr>
<tr>
<td>Accuracy 0.5 %, Class 0.5 S, Class C</td>
<td></td>
<td>C13 B23 B24</td>
</tr>
<tr>
<td>Active energy</td>
<td>C11 B21 A41</td>
<td>C13 B23 B24</td>
</tr>
<tr>
<td>Reactive energy</td>
<td>C11 B21 A41</td>
<td>C13 B23 B24</td>
</tr>
<tr>
<td>Apparent energy</td>
<td>C11 B21 A41</td>
<td>C13 B23 B24</td>
</tr>
<tr>
<td>Import/Export energy</td>
<td>C11 B21 A41</td>
<td>C13 B23 B24</td>
</tr>
<tr>
<td>Tariff registers, 1-4</td>
<td>C11 B21 A41</td>
<td>C13 B23 B24</td>
</tr>
<tr>
<td>Instrument values</td>
<td>C11 B21 A41</td>
<td>C13 B23 B24</td>
</tr>
<tr>
<td>Alarm function</td>
<td>C11 B21 A41</td>
<td>C13 B23 B24</td>
</tr>
<tr>
<td>Harmonics, 2th-16th and THD</td>
<td>C11 B21 A41</td>
<td>C13 B23 B24</td>
</tr>
<tr>
<td>Previous values - day, week, month</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max and min demand</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load profiles - 8 channels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse output</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I/O board - 2 In, 2 out</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Configurable I/O - 4 I/O channels</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tariffs controlled by input</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tariffs controlled by communication</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tariffs controlled by clock</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MID approved, verified</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>IEC approved</td>
<td>optional</td>
<td>optional</td>
</tr>
<tr>
<td>Communication - Infrared (M-Bus)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication - M-Bus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication - RS-485 Modbus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication - RS-485 EQ bus</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| = Steel                                | = Silver     | = Platinum   | Optional = Available on some order codes |
| = Bronze                               | = Gold       | = Not available |
## Energy efficiency

Energy meters selection table

<table>
<thead>
<tr>
<th></th>
<th>EQ meters C11</th>
<th>EQ meters C13</th>
<th>EQ meters B21</th>
<th>EQ meters B23</th>
<th>EQ meters B24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall dimensions</td>
<td>1 DIN module</td>
<td>3 DIN modules</td>
<td>2 DIN modules</td>
<td>4 DIN modules</td>
<td></td>
</tr>
<tr>
<td>Display</td>
<td>LCD</td>
<td>Backlit LCD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating voltage</td>
<td>230 V AC</td>
<td>3x230/400 V AC</td>
<td>220...240 V AC</td>
<td>3x220/380...415 V AC</td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>50 / 60 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max current</td>
<td>40 A</td>
<td>65 A</td>
<td>6 A</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CTVT connection</td>
<td>Direct</td>
<td>Direct</td>
<td>Direct</td>
<td>Direct</td>
<td>CT</td>
</tr>
<tr>
<td>Active energy</td>
<td>standard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reactive energy</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td>Optional</td>
</tr>
<tr>
<td>Apparent energy</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td>Optional</td>
</tr>
<tr>
<td>Accuracy</td>
<td>Cl. 1 (B)</td>
<td></td>
<td>Cl. 1 (B), Cl. 0.5 S (C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Up to 4 tariffs</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td>Optional</td>
</tr>
<tr>
<td>Max/min demand</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Previous values</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Load profiles</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Alarm function</td>
<td>standard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harmonic analysis</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Event log</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td>Standard feature</td>
</tr>
<tr>
<td>Active power</td>
<td>instrument parameters (standard)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power factor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>-</td>
<td>-</td>
<td></td>
<td></td>
<td>instrument parameters</td>
</tr>
<tr>
<td>Pulse output</td>
<td>standard</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I/O</td>
<td>1 Output*</td>
<td>1 Output* or 2 outputs/2 inputs (optional)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Built-in serial communication</td>
<td>-</td>
<td>-</td>
<td>IR / M-Bus (optional) / RS-485 (optional)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protocols</td>
<td>-</td>
<td>-</td>
<td></td>
<td>M-Bus, Modbus RTU, EQ bus</td>
<td></td>
</tr>
</tbody>
</table>

*) The pulse output can be assigned as an output if it is not used for pulses
**) For 16.7 Hz meters
<table>
<thead>
<tr>
<th>EQ meters A41</th>
<th>EQ meters A42</th>
<th>EQ meters A43</th>
<th>EQ meters A44</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 DIN modules</td>
<td>7 DIN modules</td>
<td>Backlit Pixel (LCD)</td>
<td></td>
</tr>
<tr>
<td>57.7...288 V AC</td>
<td>57.7...288 V AC or 100...288** V AC</td>
<td>3x57.7/100 ... 288/500 or 3x57.7/100 ... 400/690</td>
<td></td>
</tr>
<tr>
<td>50 / 60 Hz (or 16.7 / 50 / 60 Hz)</td>
<td>50 / 60 Hz</td>
<td>50 / 60 Hz</td>
<td></td>
</tr>
<tr>
<td>80 A</td>
<td>6 A</td>
<td>80 A</td>
<td>6 A</td>
</tr>
<tr>
<td>Direct</td>
<td>CTVT</td>
<td>Direct</td>
<td>CTVT</td>
</tr>
<tr>
<td>Cl. 1 (B)</td>
<td>Cl. 1 (B), Cl. 0,5 S (C)</td>
<td>Cl. 1 (B)</td>
<td>Cl. 1 (B), Cl. 0,5 S (C)</td>
</tr>
<tr>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
<td>Optional</td>
</tr>
<tr>
<td>Standard feature</td>
<td>Power quality (optional)</td>
<td>Standard feature</td>
<td></td>
</tr>
<tr>
<td>Instrumentation parameters (standard)</td>
<td></td>
<td>Instrumentation parameters (optional)</td>
<td></td>
</tr>
<tr>
<td>Standard feature</td>
<td></td>
<td>Standard feature</td>
<td></td>
</tr>
<tr>
<td>1 output or 2 outputs/2 inputs (optional) or 4 configurable inputs and outputs (optional)</td>
<td>IR / M-Bus (optional) / RS-485 (optional)</td>
<td>M-Bus, Modbus, EQ bus</td>
<td></td>
</tr>
</tbody>
</table>
Energy efficiency
EQ meters A series

<table>
<thead>
<tr>
<th>Technical features</th>
<th>A41</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage/current inputs</td>
<td></td>
</tr>
<tr>
<td>Nominal voltage</td>
<td>230 V AC</td>
</tr>
<tr>
<td>Voltage range</td>
<td>57.7 - 288 V AC (-20% - +15%)</td>
</tr>
<tr>
<td>Power dissipation voltage circuits</td>
<td>1.5 VA (0.6 W) total at 230 V AC</td>
</tr>
<tr>
<td>Power dissipation current circuits</td>
<td>0.006 VA (0.006 W) at ( I_{\text{ref}} ) and ( I_b )</td>
</tr>
<tr>
<td>Base current ( I_b )</td>
<td>5 A</td>
</tr>
<tr>
<td>Rated current ( I_r )</td>
<td>-</td>
</tr>
<tr>
<td>Reference current ( I_{\text{ref}} )</td>
<td>5 A</td>
</tr>
<tr>
<td>Transitional current ( I_t )</td>
<td>0.5 A</td>
</tr>
<tr>
<td>Maximum current ( I_{\text{max}} )</td>
<td>80 A</td>
</tr>
<tr>
<td>Minimum current ( I_{\text{min}} )</td>
<td>0.25 A</td>
</tr>
<tr>
<td>Starting current ( I_{\text{st}} )</td>
<td>&lt; 20 mA</td>
</tr>
<tr>
<td>Terminal wire area</td>
<td>1 - 25 mm²</td>
</tr>
<tr>
<td>Recommended tightening torque</td>
<td>2 Nm</td>
</tr>
<tr>
<td>Communication</td>
<td></td>
</tr>
<tr>
<td>Terminal wire area</td>
<td>0.5 - 1 mm²</td>
</tr>
<tr>
<td>Recommended tightening torque</td>
<td>0.25 Nm</td>
</tr>
<tr>
<td>Transformer ratios</td>
<td></td>
</tr>
<tr>
<td>Configurable current ratio (CT)</td>
<td>-</td>
</tr>
<tr>
<td>Configurable voltage ratio (VT)</td>
<td>-</td>
</tr>
<tr>
<td>Pulse indicator (LED)</td>
<td></td>
</tr>
<tr>
<td>Pulse frequency</td>
<td>1000 imp/kWh</td>
</tr>
<tr>
<td>Pulse length</td>
<td>40 ms</td>
</tr>
<tr>
<td>Frequency</td>
<td>50 or 60 Hz ± 5%</td>
</tr>
<tr>
<td>Accuracy Class</td>
<td>B (Cl.1) and Reactive Cl. 2</td>
</tr>
<tr>
<td>Active energy</td>
<td>1%</td>
</tr>
<tr>
<td>Display of energy</td>
<td>Pixel oriented display (LCD)</td>
</tr>
<tr>
<td>Environmental</td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-40°C - +70°C</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-40°C - +85°C</td>
</tr>
<tr>
<td>Humidity</td>
<td>75% yearly average, 95% on 30 days/year</td>
</tr>
<tr>
<td>Resistance to fire and heat</td>
<td>Terminal 960°C, cover 650°C (IEC 60695-2-1)</td>
</tr>
<tr>
<td>Resistance to water and dust</td>
<td>IP20 on terminal block without protective enclosure and IP51 in protective enclosure, according to IEC 60529.</td>
</tr>
<tr>
<td>Mechanical environment</td>
<td>Class M2 in accordance with the Measuring Instrument Directive (MID), (2014/32/EU).</td>
</tr>
<tr>
<td>Electromagnetic environment</td>
<td>Class E2 in accordance with the Measuring Instrument Directive (MID), (2014/32/EU).</td>
</tr>
</tbody>
</table>

*) For 690 V AC meters:
Power dissipation voltage circuits 2.2 VA (1.0 W) total at 230 V AC
Power dissipation current circuits 0.001 VA (0.001 W) per phase at \( I_{\text{ref}} \) and \( I_b \)
<table>
<thead>
<tr>
<th>A42</th>
<th>A43</th>
<th>A44</th>
</tr>
</thead>
<tbody>
<tr>
<td>3x230/400 V AC</td>
<td>3x57.7/100 ... 288/500 V AC (-20% - +15%)</td>
<td>3x57.7/100 ... 288/500 or 3x100/173 ... 400/690 V AC (-20% - +15%)</td>
</tr>
<tr>
<td>57.7 - 288 or 100 ... 288 V AC (-20% - +15%)</td>
<td>1.8 VA (0.8 W) total at 230 V AC</td>
<td>0.001 VA (0.001 W) at $I_{ref}$ and $I_n^*$</td>
</tr>
<tr>
<td>0.001 VA (0.001 W) at $I_{ref}$ and $I_n^*$</td>
<td>0.006 VA (0.006 W) per phase at $I_{ref}$</td>
<td>0.001 VA (0.001 W) at $I_{ref}$ and $I_n^*$</td>
</tr>
<tr>
<td>-</td>
<td>5 A</td>
<td>-</td>
</tr>
<tr>
<td>1 A</td>
<td>-</td>
<td>1 A</td>
</tr>
<tr>
<td>1 A</td>
<td>5 A</td>
<td>1 A</td>
</tr>
<tr>
<td>0.05 A</td>
<td>0.5 A</td>
<td>0.05 A</td>
</tr>
<tr>
<td>6 A</td>
<td>80 A</td>
<td>6 A</td>
</tr>
<tr>
<td>0.02 A</td>
<td>0.25 A</td>
<td>0.01 A</td>
</tr>
<tr>
<td>&lt; 1 mA</td>
<td>&lt; 20 mA</td>
<td>&lt; 1 mA</td>
</tr>
<tr>
<td>0.5 - 10 mm²</td>
<td>1 - 25 mm²</td>
<td>0.5 - 10 mm²</td>
</tr>
<tr>
<td>1.2 Nm</td>
<td>2 Nm</td>
<td>1.2 Nm</td>
</tr>
<tr>
<td>0.5 - 1 mm²</td>
<td>-</td>
<td>1/9 - 9999/1</td>
</tr>
<tr>
<td>0.25 Nm</td>
<td>-</td>
<td>1/999 - 999999/1</td>
</tr>
<tr>
<td>5000 imp/kWh</td>
<td>1000 imp/kWh</td>
<td>5000 imp/kWh</td>
</tr>
<tr>
<td>40 ms</td>
<td>50 or 60 Hz ± 5 % (or 16.7 Hz optional)</td>
<td>50 or 60 Hz ± 5 %</td>
</tr>
<tr>
<td>B (Cl.1), C (Cl.0.5 S) and Reactive Cl. 2</td>
<td>A (Cl.2), B (Cl.1) and Reactive Cl. 2</td>
<td>B (Cl.1), C (Cl.0.5 S) and Reactive Cl. 2</td>
</tr>
<tr>
<td>0.5%, 1%</td>
<td>1%</td>
<td>0.5%, 1%</td>
</tr>
</tbody>
</table>

-40°C - +70°C
-40°C - +85°C
75% yearly average, 95% on 30 days/year
Terminal 960°C, cover 650°C (IEC 60695-2-1)
IP20 on terminal block without protective enclosure and IP51 in protective enclosure, according to IEC 60529.


Class E2 in accordance with the Measuring Instrument Directive (MID), (2014/32/EU).
The A series meters ranges from single phase to three phase meters and from basic up to advanced functionality without any comparison. The A series meters are mounted on a DIN rail and are suitable for installation in distribution boards and small enclosures such as consumer units. With the main terminals in accordance with DIN 43857 and accessible from the below the meters, the A series is suitable for many applications.

The low rated or base currents of these products ensures high dynamic performance with superior accuracy even at low currents. The meters support a wide voltage range as well as a wide temperature range. The display is pixel-oriented and can display up to four quantities at the same time. Navigating the meter is easily done via the push-buttons below the display. To configure the meter settings, the set button must be accessed and this button is protected against unauthorized use when the “glass lid” on the front of the meter is closed and sealed. The exceptional low power consumption of the meters makes them economical in the long run - an important feature specially for large meter populations.

Data from the A series meters can be collected via pulse output or serial communication. The pulse output is a solid state relay that generates pulses proportionally to the measured energy. The meters can also be equipped with built-in serial communication interfaces for M-Bus or Modbus RTU (RS-485). Meters with RS-485 interface can also be set to communicate over the new EQ bus with the gateway G13. All meters in the A series come with an infrared port for communication with an external Serial Communication Adapter (SCA) such as the KNX adapter.

A series supports following instrumentation values dependent on version of meter:
• Active energy
• Current
• Voltage
• Power factor
• Reactive power
• Total harmonic distortion
• Apparent power
• Frequency
• Harmonics

A series meters with a functionality level of Gold or Platinum have an internal clock for advanced functionality:
• Event log
• Previous values
• Load profile
• Maximum and minimum demand

The tariffs are controlled via inputs, via communication or via an internal clock in Gold and Platinum versions.

The A series support up to four I/O’s. It can be two inputs and two outputs in a fixed configuration or four I/O points that are freely configured to input or output. Inputs can be used for counting pulses from e.g. a water meter, or reading status from external devices. Outputs can be used as pulse outputs or controlling external apparatus like a contactor or an alarm (connected via an external relay). The I/O’s need an external voltage supply.

The A series meters are type approved according to IEC and they are both type approved and verified according to MID. MID is the Measuring Instruments Directive 2014/32/EU from the European Commission. MID type approval and verification is mandatory for meters in billing applications within EU and EEA. The type approval is according to standards that covers all relevant technical aspects of the meter. These include climate conditions, electromagnetic compatibility (EMC), electrical requirements, mechanical requirements and accuracy.
## Technical features

### A series

<table>
<thead>
<tr>
<th>Outputs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type</strong></td>
<td>Transistor or MOSFET</td>
</tr>
<tr>
<td><strong>Current</strong></td>
<td>2 - 100 mA</td>
</tr>
<tr>
<td><strong>Voltage</strong></td>
<td>5 - 240 V AC/DC. For meters with only 1 output, 5 - 40 V DC.</td>
</tr>
<tr>
<td><strong>Pulse output frequency</strong></td>
<td>Programmable: 1 - 999999 imp/kWh</td>
</tr>
<tr>
<td><strong>Pulse length</strong></td>
<td>Programmable: 10 - 990 ms</td>
</tr>
<tr>
<td><strong>Terminal wire area</strong></td>
<td>0.5 - 1 mm²</td>
</tr>
<tr>
<td><strong>Recommended tightening torque</strong></td>
<td>0.25 Nm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inputs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OFF</strong></td>
<td>0 - 240 V AC/DC</td>
</tr>
<tr>
<td><strong>Voltage</strong></td>
<td>0 - 5 V AC/DC</td>
</tr>
<tr>
<td><strong>ON</strong></td>
<td>57 - 240 V AC/24 - 240 V DC</td>
</tr>
<tr>
<td><strong>Min. pulse length</strong></td>
<td>30 ms</td>
</tr>
<tr>
<td><strong>Terminal wire area</strong></td>
<td>0.5 - 1 mm²</td>
</tr>
<tr>
<td><strong>Recommended tightening torque</strong></td>
<td>0.25 Nm</td>
</tr>
</tbody>
</table>

### EMC compatibility

- **Impulse voltage test**: 6 kV 1.2/50 μs (IEC 60060-1)
- **Surge voltage test**: 4 kV 1.2/50 μs (IEC 61000-4-5)
- **Fast transient burn test**: 4 kV (IEC 61000-4-4)
- **Immunity to electromagnetic HF-fields**: 80 MHz - 2 GHz at 10 V/m (IEC 61000-4-3)
- **Immunity to conducted disturbance**: 150 kHz - 80 MHz, (IEC 61000-4-6)
- **Immunity to disturbance with harmonics**: 2kHz - 150kHz
- **Radio frequency emission**: EN 55022, class B (CISPR22)
- **Electrostatic discharge**: 15 kV (IEC 61000-4-2)
- **Standards**: EC 62052-11, IEC 62053-21 class 1 & 2, IEC 62053-22 class 0,5 S, IEC 62053-23 class 2, IEC 62054-21, GB/T 17215.211-2006, GBT 17215.321-2008 class 1 & 2, GB/T 17215.322-2008 class 0,5 S, GB 4208-2008, EN 50470-1, EN 50470-3 category A, B & C EQ meters.

### Mechanical

<table>
<thead>
<tr>
<th>Material</th>
<th>Polycarbonate in transparent front glass, bottom case, upper case and terminal cover, Glass reinforced polycarbonate in terminal block.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td></td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>A41 / A42 70 mm, A43 / A44 123 mm</td>
</tr>
<tr>
<td><strong>Height</strong></td>
<td>A41 / A42 97 mm, A43 / A44 97 mm</td>
</tr>
<tr>
<td><strong>Depth</strong></td>
<td>A41 / A42 65 mm, A43 / A44 65 mm</td>
</tr>
<tr>
<td><strong>DIN modules</strong></td>
<td>4, 7</td>
</tr>
</tbody>
</table>
Energy efficiency
EQ meters A series


---

**EQ meters single phase electricity meter, 4 DIN with IR port, 80 A**

**Class B (Cl. 1) with functionality level Steel. Active energy**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>57.7...288 V AC, Pulse output</td>
<td>705547</td>
<td>A41 111 - 100</td>
<td>2CMA170554R1000</td>
<td>0.230</td>
<td>1</td>
</tr>
<tr>
<td>57.7...288 V AC, Pulse output, RS-485</td>
<td>705004</td>
<td>A41 112 - 100</td>
<td>2CMA170500R1000</td>
<td>0.230</td>
<td>1</td>
</tr>
<tr>
<td>57.7...288 V AC, Pulse output, M-Bus</td>
<td>002400</td>
<td>A41 113 - 100</td>
<td>2CMA100240R1000</td>
<td>0.230</td>
<td>1</td>
</tr>
</tbody>
</table>

**Class 1 (Reactive Class 2) with functionality level Silver. Active and reactive energy, import/export, tariffs 1-4, tariff controll via inputs and communication.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>57.7...288 V AC, 2 output, 2 input, RS-485</td>
<td>705035</td>
<td>A41 312 - 100</td>
<td>2CMA170503R1000</td>
<td>0.230</td>
<td>1</td>
</tr>
<tr>
<td>57.7...288 V AC, 2 output, 2 input. M-Bus</td>
<td>705042</td>
<td>A41 313 - 100</td>
<td>2CMA170504R1000</td>
<td>0.230</td>
<td>1</td>
</tr>
</tbody>
</table>

**Class B (Cl. 1) (Reactive Cl. 2) with functionality level Gold. Active and reactive energy, import/export, tariffs 1-4, tariff controlled via inputs, communication or clock, previous values, max and min demand.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>57.7...288 V AC, 2 output, 2 input, RS-485</td>
<td>705059</td>
<td>A41 412 - 100</td>
<td>2CMA170505R1000</td>
<td>0.230</td>
<td>1</td>
</tr>
</tbody>
</table>

**EQ meters single phase electricity meter, 4 DIN with IR port, 6 A**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>57.7...288 V AC, Pulse output</td>
<td>70554</td>
<td>A42 111 - 100</td>
<td>2CMA170555R1000</td>
<td>0.200</td>
<td>1</td>
</tr>
<tr>
<td>57.7...288 V AC, Pulse output, RS-485</td>
<td>705103</td>
<td>A42 112 - 100</td>
<td>2CMA170510R1000</td>
<td>0.200</td>
<td>1</td>
</tr>
<tr>
<td>57.7...288 V AC, Pulse output, M-Bus</td>
<td>002424</td>
<td>A42 113 - 100</td>
<td>2CMA100242R1000</td>
<td>0.200</td>
<td>1</td>
</tr>
</tbody>
</table>

**Class B (Cl. 1) with functionality level Steel. Active energy**

**Class B (Cl. 1) (Reactive Cl. 2) with functionality level Silver. Active and reactive energy, import/export, tariffs 1-4, tariff controlled via inputs and communication.**

**Class C (Cl. 0.5 S) (Reactive Cl. 2) with functionality level Platinum. Active and reactive energy, import/export, tariffs 1-4, tariff controlled via inputs, communication or clock, previous values, max and min demand, advanced load profiles, harmonics and THD. Versions for 16.7, 50 or 60 Hz.**

*) The meters are not tested and approved for placement on rolling stock.

**EQ meters three phase electricity meter, 7 DIN with IR port, 80 A**

**Class B (Cl. 1) with functionality level Steel. Active energy**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>EAN</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 57.7/100...288/500 V AC, Pulse output</td>
<td>705202</td>
<td>A43 111 - 100</td>
<td>2CMA170520R1000</td>
<td>0.440</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 x 57.7/100...288/500 V AC, Pulse output, RS-485</td>
<td>002448</td>
<td>A43 112 - 100</td>
<td>2CMA100244R1000</td>
<td>0.440</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 x 57.7/100...288/500 V AC, Pulse output, M-Bus</td>
<td>002455</td>
<td>A43 113 - 100</td>
<td>2CMA100245R1000</td>
<td>0.440</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Class B (Cl. 1) (Reactive Cl. 2) with functionality level Bronze. Active and reactive energy, import/export.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>EAN</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 57.7/100...288/500 V AC, Pulse output, RS-485</td>
<td>705226</td>
<td>A43 212 - 100</td>
<td>2CMA170522R1000</td>
<td>0.440</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 x 57.7/100...288/500 V AC, Pulse output, M-Bus</td>
<td>705233</td>
<td>A43 213 - 100</td>
<td>2CMA100523R1000</td>
<td>0.440</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Class B (Cl. 1) (Reactive Cl. 2) with functionality level Silver. Active and reactive energy, import/export, tariffs 1-4, tariff controll via inputs and communication.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>EAN</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 57.7/100...288/500 V AC, 2 output, 2 input, RS-485</td>
<td>705257</td>
<td>A43 312 - 100</td>
<td>2CMA170525R1000</td>
<td>0.440</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 x 57.7/100...288/500 V AC, 2 output, 2 Input, M-Bus</td>
<td>705264</td>
<td>A43 313 - 100</td>
<td>2CMA100526R1000</td>
<td>0.440</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Class B (Cl. 1) (Reactive Cl. 2) with functionality level Platinum. Active and reactive energy, import/export, tariffs 1-4, tariff controlled via inputs, communication or clock, previous values, max and min demand, advanced load profiles, harmonics and THD.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>EAN</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 57.7/100...288/500 V AC, Configurable 4 I/O channels, RS-485</td>
<td>705318</td>
<td>A43 512 - 100</td>
<td>2CMA170531R1000</td>
<td>0.440</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 x 57.7/100...288/500 V AC, Configurable 4 I/O channels, M-Bus</td>
<td>705325</td>
<td>A43 513 - 100</td>
<td>2CMA100532R1000</td>
<td>0.440</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### EQ meters three phase electricity meter, 7 DIN with IR port, 6 A

**Class B (Cl. 1) with functionality level Steel. Active energy**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>Order details</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 57.7/100...288/500 V AC, Pulse output</td>
<td>705332</td>
<td>A44 111 - 100</td>
<td>2CMA170533R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 x 57.7/100...288/500 V AC, Pulse output, RS-485</td>
<td>002486</td>
<td>A44 112 - 100</td>
<td>2CMA100248R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 x 57.7/100...288/500 V AC, Pulse output, M-Bus</td>
<td>002493</td>
<td>A44 113 - 100</td>
<td>2CMA100249R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Class B (Cl. 1) (Reactive Cl. 2) with functionality level Bronze. Active and reactive energy, import/export.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>Order details</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 57.7/100...288/500 V AC, Pulse output</td>
<td>000130</td>
<td>A44 211 - 100</td>
<td>2CMA100013R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 x 57.7/100...288/500 V AC, Pulse output, RS-485</td>
<td>705349</td>
<td>A44 212 - 100</td>
<td>2CMA170534R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 x 57.7/100...288/500 V AC, Pulse output, M-Bus</td>
<td>705356</td>
<td>A44 213 - 100</td>
<td>2CMA170535R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Class B (Cl. 1) (Reactive Cl. 2) with functionality level Silver. Active and reactive energy, import/export, tariffs 1-4, tariff controll via inputs and communication.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>Order details</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 57.7/100...288/500 V AC, 2 output, 2 input</td>
<td>705363</td>
<td>A44 311 - 100</td>
<td>2CMA170536R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Class C (Cl. 0.5 S) (Reactive Cl. 2) with functionality level Silver. Active and reactive energy, import/export, tariffs 1-4, tariff controlled via inputs, communication or clock, previous values, max and min demand.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>Order details</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 57.7/100...288/500 V AC, 2 output, 2 input, RS-485</td>
<td>705370</td>
<td>A44 352 - 100</td>
<td>2CMA170537R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 x 57.7/100...288/500 V AC, 2 output, 2 input, M-Bus</td>
<td>705387</td>
<td>A44 353 - 100</td>
<td>2CMA170538R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Class C (Cl. 0.5 S) (Reactive Cl. 2) with functionality level Gold. Active and reactive energy, import/export, tariffs 1-4, tariff controlled via inputs, communication or clock, previous values, max and min demand, advanced load profiles, harmonics and THD.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>Order details</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 57.7/100...288/500 V AC, Configurable 4 I/O channels, RS-485</td>
<td>705457</td>
<td>A44 452 - 100</td>
<td>2CMA170540R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Class C (Cl. 0.5 S) (Reactive Cl. 2) with functionality level Platinum. Active and reactive energy, import/export, tariffs 1-4, tariff controlled via inputs, communication or clock, previous values, max and min demand, advanced load profiles, harmonics and THD.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>Order details</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 57.7/100...288/500 V AC, Configurable 4 I/O channels, M-Bus</td>
<td>705457</td>
<td>A44 452 - 100</td>
<td>2CMA170540R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Class C (Cl. 0.5 S) (Reactive Cl. 2) with functionality level Platinum. Active and reactive energy, import/export, tariffs 1-4, tariff controlled via inputs, communication or clock, previous values, max and min demand, advanced load profiles, harmonics and THD.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>Order details</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 57.7/100...288/500 V AC, Configurable 4 I/O channels, RS-485</td>
<td>705455</td>
<td>A44 552 - 100</td>
<td>2CMA170545R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 x 57.7/100...288/500 V AC, Configurable 4 I/O channels, M-Bus</td>
<td>705462</td>
<td>A44 553 - 100</td>
<td>2CMA170546R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 x 57.7/100...400/690 V AC, 1 input + 1 output, RS-485</td>
<td>705493</td>
<td>A44 552 - 110</td>
<td>2CMA170549R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 x 57.7/100...400/690 V AC, 1 input + 1 output, M-Bus</td>
<td>705486</td>
<td>A44 553 - 110</td>
<td>2CMA170548R1000</td>
<td>0.350</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


### Technical features

**Voltage/current inputs**

- **Nominal voltage**: 230 V AC
- **Voltage range**: 220...240 V AC (-20% - +15%)
- **Power dissipation voltage circuits**: 1.1 VA (0.5 W) total at 230 V AC
- **Power dissipation current circuits**: 0.012 VA (0.012 W) at \( I_{\text{ref}} \) and \( I_b \)
- **Base current \( I_b \)**: 5 A
- **Rated current \( I_n \)**: -
- **Reference current \( I_{\text{ref}} \)**: 5 A
- **Transitional current \( I_\text{tr} \)**: 0.5 A
- **Maximum current \( I_{\text{max}} \)**: 65 A
- **Minimum current \( I_{\text{min}} \)**: 0.25 A
- **Starting current \( I_s \)**: < 20 mA
- **Terminal wire area**: 1 - 25 mm²
- **Recommended tightening torque**: 2 Nm

**Communication**

- **Terminal wire area**: 0.5 - 1 mm²
- **Recommended tightening torque**: 0.25 Nm

**Transformer ratios**

- **Configurable current ratio (CT)**: -

**Pulse indicator (LED)**

- **Pulse frequency**: 1000 imp/kWh
- **Pulse length**: 40 ms

**General data**

- **Frequency**: 50 or 60 Hz ± 5%
- **Accuracy Class**: B (Cl. 1) and Reactive Cl. 2
- **Active energy**: 1%
- **Display of energy**: 6 digit LCD

**Environmental**

- **Operating temperature**: -40°C - +70°C
- **Storage temperature**: -40°C - +85°C
- **Humidity**: 75% yearly average, 95% on 30 days/year
- **Resistance to fire and heat**: Terminal 960 °C, cover 650°C (IEC 60695-2-1)
- **Resistance to water and dust**: IP20 on terminal block without protective enclosure and IP51 in protective enclosure, according to IEC 60529.
- **Mechanical environment**: Class M2 in accordance with the Measuring Instrument Directive (MID), (2014/32/EU).
- **Electromagnetic environment**: Class E2 in accordance with the Measuring Instrument Directive (MID), (2014/32/EU).
### Technical features

<table>
<thead>
<tr>
<th></th>
<th>B23</th>
<th>B24</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Voltage/current inputs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nominal voltage</strong></td>
<td>230 V AC</td>
<td>3x230/400 V AC</td>
</tr>
<tr>
<td><strong>Voltage range</strong></td>
<td>220...240 VAC (-20% - +15%)</td>
<td>3x220/380...240/415 VAC (-20% - +15%)</td>
</tr>
<tr>
<td><strong>Power dissipation voltage circuits</strong></td>
<td>1.1 VA (0.5 W) total at 230 V AC</td>
<td>1.7 VA (0.8 W) total at 230 V AC</td>
</tr>
<tr>
<td><strong>Power dissipation current circuits</strong></td>
<td>0.012 VA (0.012 W) at I&lt;sub&gt;ref&lt;/sub&gt; and I&lt;sub&gt;b&lt;/sub&gt;</td>
<td>0.007 VA (0.0005 W) per phase at I&lt;sub&gt;ref&lt;/sub&gt; and I&lt;sub&gt;b&lt;/sub&gt;</td>
</tr>
<tr>
<td></td>
<td>0.007 VA (0.007 W) per phase at I&lt;sub&gt;ref&lt;/sub&gt; and I&lt;sub&gt;b&lt;/sub&gt;</td>
<td></td>
</tr>
<tr>
<td><strong>Base current I&lt;sub&gt;b&lt;/sub&gt;</strong></td>
<td>5 A</td>
<td>1 A</td>
</tr>
<tr>
<td><strong>Rated current I&lt;sub&gt;n&lt;/sub&gt;</strong></td>
<td>1 A</td>
<td>0.05 A</td>
</tr>
<tr>
<td><strong>Reference current I&lt;sub&gt;ref&lt;/sub&gt;</strong></td>
<td>5 A</td>
<td>6 A</td>
</tr>
<tr>
<td><strong>Transitional current I&lt;sub&gt;tr&lt;/sub&gt;</strong></td>
<td>0.5 A</td>
<td>0.02 A</td>
</tr>
<tr>
<td></td>
<td>&lt; 1 mA</td>
<td>&lt; 1 mA</td>
</tr>
<tr>
<td><strong>Maximum current I&lt;sub&gt;max&lt;/sub&gt;</strong></td>
<td>65 A</td>
<td>6 A</td>
</tr>
<tr>
<td><strong>Minimum current I&lt;sub&gt;min&lt;/sub&gt;</strong></td>
<td>0.25 A</td>
<td>0.02 A</td>
</tr>
<tr>
<td><strong>Starting current I&lt;sub&gt;st&lt;/sub&gt;</strong></td>
<td>&lt; 20 mA</td>
<td>&lt; 1 mA</td>
</tr>
<tr>
<td><strong>Terminal wire area</strong></td>
<td>1 - 25 mm²</td>
<td>0.5 - 10 mm²</td>
</tr>
<tr>
<td><strong>Recommended tightening torque</strong></td>
<td>2 Nm</td>
<td>1.2 Nm</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Terminal wire area</strong></td>
<td></td>
<td>0.5 - 1 mm²</td>
</tr>
<tr>
<td><strong>Recommended tightening torque</strong></td>
<td>0.25 Nm</td>
<td>1.2 Nm</td>
</tr>
<tr>
<td><strong>Transformer ratios</strong></td>
<td></td>
<td>1/9 - 9999/1</td>
</tr>
<tr>
<td><strong>Pulse indicator (LED)</strong></td>
<td></td>
<td>5000 imp/kWh</td>
</tr>
<tr>
<td><strong>Pulse frequency</strong></td>
<td>1000 imp/kWh</td>
<td>5000 imp/kWh</td>
</tr>
<tr>
<td><strong>Pulse length</strong></td>
<td>40 ms</td>
<td>40 ms</td>
</tr>
<tr>
<td><strong>General data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>50 or 60 Hz ± 5%</td>
<td>50 or 60 Hz ± 5%</td>
</tr>
<tr>
<td><strong>Accuracy Class</strong></td>
<td>B (Cl. 1) or C (Cl. 0.5 S) and Reactive Cl. 2</td>
<td>B (Cl. 1) or C (Cl. 0.5 S) and Reactive Cl. 2</td>
</tr>
<tr>
<td></td>
<td>0.5%, 1%</td>
<td>0.5%, 1%</td>
</tr>
<tr>
<td><strong>Display of energy</strong></td>
<td>6 digit LCD</td>
<td>7 digit LCD</td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Operating temperature</strong></td>
<td>-40°C - +70°C</td>
<td>-40°C - +85°C</td>
</tr>
<tr>
<td><strong>Storage temperature</strong></td>
<td>-40°C - +85°C</td>
<td>-40°C - +85°C</td>
</tr>
<tr>
<td><strong>Humidity</strong></td>
<td>75% yearly average, 95% on 30 days/year</td>
<td>75% yearly average, 95% on 30 days/year</td>
</tr>
<tr>
<td><strong>Resistance to fire and heat</strong></td>
<td>Terminal 960 °C, cover 650°C (IEC 60695-2-1)</td>
<td>IP20 on terminal block without protective enclosure and IP51 in protective enclosure, according to IEC 60529.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Resistance to water and dust</strong></td>
<td>IP20 on terminal block without protective enclosure and IP51 in protective enclosure, according to IEC 60529.</td>
<td>IP20 on terminal block without protective enclosure and IP51 in protective enclosure, according to IEC 60529.</td>
</tr>
</tbody>
</table>

*IP20 on terminal block without protective enclosure and IP51 in protective enclosure, according to IEC 60529.*
The EQ meters, B series is a range of meters for single phase and three phase metering. The B series meters are mounted on a DIN rail and are suitable for installation in distribution boards and small enclosures such as consumer units. The B series are suitable in applications where there is a need for reliable energy measurements and where space is limited.

The low rated or base currents of these products ensures high dynamic performance with superior accuracy even at low currents. The B series meters are meters for many applications and installations. Navigating the meter is easily done via the push-buttons below the display. To configure the meter settings, the set button must be accessed and this button is protected against unauthorized use when the “glass lid” on the front of the meter is closed and sealed. The exceptional low power consumption of the meters, less than 0.9 VA and 1.6 VA, makes them economical in the long run - an important feature specially for large meter populations.

Data from the B series meters can be collected via pulse output or serial communication. The pulse output is a solid state relay that generates pulses proportionally to the measured energy. The meters can also be equipped with built-in serial communication interfaces for M-Bus or Modbus RTU (RS-485). Meters with RS-485 interface can also be set to communicate over the new EQ bus with the new gateway G13. All meters in the B series come with an infrared port for communication with an external Serial Communication Adapter (SCA) such as the KNX adapter.

The B series meters support reading of instrument values. A large number of electrical properties can be read. Depending on version of the meter the following data is available:

- Active power
- Apparent power
- Reactive power
- Current
- Voltage
- Frequency
- Power factor

Up to 4 tariffs are controlled via inputs or communication.

The B series support two inputs and two outputs in a fixed configuration. Inputs can be used for counting pulses from e.g. a water meter, or reading status from external devices. Outputs can be used as pulse outputs or controlling external apparatus like a contactor or an alarm (connected via an external relay).

The B series meters are type approved according to IEC and they are both type approved and verified according to MID. MID is the Measuring Instruments Directive 2014/32/EU from the European Commission. MID type approval and verification is mandatory for meters in billing applications within EU and EEA. The type approval is according to standards that covers all relevant technical aspects of the meter. These include climate conditions, electromagnetic compatibility (EMC), electrical requirements, mechanical requirements and accuracy.
## Technical features

<table>
<thead>
<tr>
<th>Outputs</th>
<th>B series</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Transistor or MOSFET</td>
</tr>
<tr>
<td>Current</td>
<td>2 - 100 mA</td>
</tr>
<tr>
<td>Voltage</td>
<td>5 - 240 V AC/DC. For meters with only 1 output 5 - 40 VDC.</td>
</tr>
<tr>
<td>Pulse output frequency</td>
<td>Programmable 1 - 999999 imp/kWh</td>
</tr>
<tr>
<td>Pulse length</td>
<td>Programmable 10 - 990 ms</td>
</tr>
<tr>
<td>Terminal wire area</td>
<td>0.5 - 1 mm²</td>
</tr>
<tr>
<td>Recommended tightening torque</td>
<td>0.25 Nm</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Inputs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>0 - 240 V AC/DC</td>
</tr>
<tr>
<td>OFF</td>
<td>0 - 5 V AC/DC</td>
</tr>
<tr>
<td>ON</td>
<td>57 - 240 V AC/24 - 240 V DC</td>
</tr>
<tr>
<td>Min. pulse length</td>
<td>30 ms</td>
</tr>
<tr>
<td>Terminal wire area</td>
<td>0.5 - 1 mm²</td>
</tr>
<tr>
<td>Recommended tightening torque</td>
<td>0.25 Nm</td>
</tr>
</tbody>
</table>

### EMC compatibility

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impulse voltage test</td>
<td>6 kV 1.2/50μs (IEC 60060-1)</td>
</tr>
<tr>
<td>Surge voltage test</td>
<td>4 kV 1.2/50μs (IEC 61000-4-5)</td>
</tr>
<tr>
<td>Fast transient burn test</td>
<td>4kV (IEC 61000-4-4)</td>
</tr>
<tr>
<td>Immunity to electromagnetic HF-fields</td>
<td>80 MHz - 2 GHz (IEC 61000-4-6)</td>
</tr>
<tr>
<td>Immunity to conducted disturbance</td>
<td>150kHz - 80MHz (IEC 61000-4-6)</td>
</tr>
<tr>
<td>Immunity to disturbance with harmonics</td>
<td>2kHz - 150kHz</td>
</tr>
<tr>
<td>Radio frequency emission</td>
<td>EN 55022, class B (CISPR22)</td>
</tr>
<tr>
<td>Electrostatic discharge</td>
<td>15 kV (IEC 61000-4-2)</td>
</tr>
</tbody>
</table>

### Mechanical

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEC 62052-11, IEC 62053-21 class 1 &amp; 2, IEC 62053-22 class 0.5 S, IEC 62053-23 class 2, IEC 62054-21, GB/T 17215.211-2006, GB/T 17215.312-2008 class 1 &amp; 2, GB/T 17215.322-2008 class 0.5 S, GB 4208-2008, EN 50470-1, EN 50470-3 category A, B &amp; C</td>
<td></td>
</tr>
</tbody>
</table>

### Materials


### Dimensions

<table>
<thead>
<tr>
<th>B21</th>
<th>B23/B24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>35 mm</td>
</tr>
<tr>
<td>Height</td>
<td>97 mm</td>
</tr>
<tr>
<td>Depth</td>
<td>65 mm</td>
</tr>
</tbody>
</table>

| DIN modules | 2 | 4 |

EQ meters single phase electricity meter, 2 DIN with IR port, 65 A
For direct connection up to 65 A. Class B (Cl. 1) with functionality level Steel. Active energy

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn</th>
<th>Order details</th>
<th>Price</th>
<th>Weight</th>
<th>Pack</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7392696</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td>1 piece</td>
<td>1 piece</td>
<td>unit</td>
</tr>
<tr>
<td>1 x 230 V AC, Pulse output</td>
<td>001496</td>
<td>B21 111 - 100</td>
<td>2CMA100149R1000</td>
<td>0.140</td>
<td>1</td>
</tr>
<tr>
<td>1 x 230 V AC, Pulse output, RS-485</td>
<td>001502</td>
<td>B21 112 - 100</td>
<td>2CMA100150R1000</td>
<td>0.150</td>
<td>1</td>
</tr>
<tr>
<td>1 x 230 V AC, Pulse output, M-Bus</td>
<td>001519</td>
<td>B21 113 - 100</td>
<td>2CMA100151R1000</td>
<td>0.150</td>
<td>1</td>
</tr>
</tbody>
</table>

For direct connection up to 65 A. Class B (Cl. 1) (Reactive Cl. 2) with functionality level Silver. Active and reactive energy, import/export, tariffs 1-4, tariff control via inputs and communication.

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn</th>
<th>Order details</th>
<th>Price</th>
<th>Weight</th>
<th>Pack</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>7392696</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td>1 piece</td>
<td>1 piece</td>
<td>unit</td>
</tr>
<tr>
<td>1 x 230 V AC, 2 output, 2 input</td>
<td>001540</td>
<td>B21 311 - 100</td>
<td>2CMA100154R1000</td>
<td>0.140</td>
<td>1</td>
</tr>
<tr>
<td>1 x 230 V AC, 2 output, 2 input, RS-485</td>
<td>001557</td>
<td>B21 312 - 100</td>
<td>2CMA100155R1000</td>
<td>0.150</td>
<td>1</td>
</tr>
<tr>
<td>1 x 230 V AC, 2 output, 2 input, M-Bus</td>
<td>001564</td>
<td>B21 313 - 100</td>
<td>2CMA100156R1000</td>
<td>0.150</td>
<td>1</td>
</tr>
</tbody>
</table>

**EQ meters three phase electricity meter, 4 DIN with IR port, 65 A**

**Class B (Cl. 1) with functionality level Steel.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 230/400 V AC, Pulse output</td>
<td>001632</td>
<td>B23 111 - 100</td>
<td>2CMA100163R1000</td>
<td>0.310</td>
<td>1</td>
</tr>
<tr>
<td>3 x 230/400 V AC, Pulse output, RS-485</td>
<td>001649</td>
<td>B23 112 - 100</td>
<td>2CMA100164R1000</td>
<td>0.320</td>
<td>1</td>
</tr>
<tr>
<td>3 x 230/400 V AC, Pulse output, M-Bus</td>
<td>001656</td>
<td>B23 113 - 100</td>
<td>2CMA100165R1000</td>
<td>0.330</td>
<td>1</td>
</tr>
</tbody>
</table>

**Class B (Cl. 1) (Reactive Cl. 2) with functionality level Bronze.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 230/400 V AC, Pulse output, RS-485</td>
<td>001663</td>
<td>B23 212 - 100</td>
<td>2CMA100166R1000</td>
<td>0.320</td>
<td>1</td>
</tr>
</tbody>
</table>

**Class B (Cl. 1) (Reactive Cl. 2) with functionality level Silver.**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 230/400 V AC, 2 output, 2 input</td>
<td>001687</td>
<td>B23 311 - 100</td>
<td>2CMA100168R1000</td>
<td>0.330</td>
<td>1</td>
</tr>
<tr>
<td>3 x 230/400 V AC, 2 output, 2 input, RS-485</td>
<td>001694</td>
<td>B23 312 - 100</td>
<td>2CMA100169R1000</td>
<td>0.340</td>
<td>1</td>
</tr>
<tr>
<td>3 x 230/400 V AC, 2 output, 2 input, M-Bus</td>
<td>001700</td>
<td>B23 313 - 100</td>
<td>2CMA100170R1000</td>
<td>0.350</td>
<td>1</td>
</tr>
</tbody>
</table>

EQ meters three phase electricity meter, 4 DIN with IR port, 6 A

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 230/400 V AC, Pulse output</td>
<td>001779</td>
<td>B24 111 -100</td>
<td>2CMA100177R1000</td>
<td>0.250</td>
<td>1</td>
</tr>
<tr>
<td>3 x 230/400 V AC, Pulse output, RS-485</td>
<td>001786</td>
<td>B24 112 -100</td>
<td>2CMA100178R1000</td>
<td>0.250</td>
<td>1</td>
</tr>
<tr>
<td>3 x 230/400 V AC, Pulse output, M-Bus</td>
<td>001793</td>
<td>B24 113 -100</td>
<td>2CMA100179R1000</td>
<td>0.270</td>
<td>1</td>
</tr>
</tbody>
</table>

Class B (Cl. 1) (Reactive Cl. 2) with functionality level Bronze. Active and reactive energy, import/export.

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 230/400 V AC, Pulse output, RS-485</td>
<td>001809</td>
<td>B24 212 -100</td>
<td>2CMA100180R1000</td>
<td>0.250</td>
<td>1</td>
</tr>
</tbody>
</table>

Class C (Cl. 0.5 S) (Reactive Cl. 2) with functionality level Silver. Active and reactive energy, import/export, tariffs 1-4, tariff control via inputs and communication.

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn 7392696</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 230/400 V AC, 2 output, 2 input, RS-485</td>
<td>001830</td>
<td>B24 352 -100</td>
<td>2CMA100183R1000</td>
<td>0.270</td>
<td>1</td>
</tr>
<tr>
<td>3 x 230/400 V AC, 2 output, 2 input, M-Bus</td>
<td>001847</td>
<td>B24 353 -100</td>
<td>2CMA100184R1000</td>
<td>0.290</td>
<td>1</td>
</tr>
</tbody>
</table>
The EQ meters, C series are truly compact meters for single phase and three phase metering. The C series is mounted on a DIN rail and is suitable for installation in distribution boards and small consumer units.

Only one or three module wide, the C series is a very compact meter for single phase and three phase applications. The meters have an LCD with large digits showing energy register and instrumentation values. The meters have a wide temperature range which makes it possible to install the meters in many locations. Navigating the meters are easily done via the push-button below the display. The exceptional low power consumption of the meters, less than 0,3 W and 0,6 W at 230 V AC, makes them economical in the long run - an important feature specially for large meter populations.

The C series meters support reading of instrument values. A number of electrical properties can be read:
- Power factor
- Active power
- Current
- Voltage

The C series meters have an output that can be used as pulse output or alarm output. The alarm quantity and levels is easily configured on the meter with the push button. The output can be used for controlling external apparatus like a contactor or an alarm indicator (connected via an external relay).

The C series meters are type approved according to IEC and MID. MID is the Measuring Instruments Directive 2014/32/EU from the European Commission. The type approval is according to standards that covers all relevant technical aspects of the meter. These include climate conditions, electromagnetic compatibility (EMC), electrical requirements, mechanical requirements and accuracy.

MID versions have initial verification according to annex F of the Measuring Instruments Directive.
## Energy efficiency

### EQ meters C series

<table>
<thead>
<tr>
<th>Technical features</th>
<th>C11</th>
<th>C13</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Voltage/current inputs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal voltage</td>
<td>230 V AC</td>
<td>3x230/400 V AC</td>
</tr>
<tr>
<td>Voltage range</td>
<td>230 V AC (-20% - +15%)</td>
<td>3x230/400 V AC (-20% - +15%)</td>
</tr>
<tr>
<td>Power dissipation voltage circuits</td>
<td>7.4 VA (0.3 W) at 230 V</td>
<td>1.5 VA (0.6 W) total at 230 V</td>
</tr>
<tr>
<td>Power dissipation current circuits</td>
<td>0.04 VA (0.04 W) at I&lt;sub&gt;b&lt;/sub&gt; and I&lt;sub&gt;ref&lt;/sub&gt;</td>
<td>0.04 VA (0.04 W) per phase at I&lt;sub&gt;b&lt;/sub&gt; and I&lt;sub&gt;ref&lt;/sub&gt;</td>
</tr>
<tr>
<td>Base current I&lt;sub&gt;b&lt;/sub&gt;</td>
<td>5 A</td>
<td></td>
</tr>
<tr>
<td>Rated current I&lt;sub&gt;n&lt;/sub&gt;</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Reference current I&lt;sub&gt;ref&lt;/sub&gt;</td>
<td>5 A</td>
<td></td>
</tr>
<tr>
<td>Transitional current I&lt;sub&gt;s&lt;/sub&gt;</td>
<td>0.5 A</td>
<td></td>
</tr>
<tr>
<td>Maximum current I&lt;sub&gt;max&lt;/sub&gt;</td>
<td>40 A</td>
<td></td>
</tr>
<tr>
<td>Minimum current I&lt;sub&gt;min&lt;/sub&gt;</td>
<td>0.25 A</td>
<td></td>
</tr>
<tr>
<td>Starting current I&lt;sub&gt;st&lt;/sub&gt;</td>
<td>&lt; 20 mA</td>
<td></td>
</tr>
<tr>
<td>Terminal wire area</td>
<td>0.5 - 10 mm&lt;sup&gt;2&lt;/sup&gt;</td>
<td>0.5 - 10 mm&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Recommended tightening torque</td>
<td>0.8 Nm</td>
<td></td>
</tr>
<tr>
<td><strong>General data</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency</td>
<td>50 or 60 Hz ± 5%</td>
<td></td>
</tr>
<tr>
<td>Accuracy Class</td>
<td>B (Cl.1)</td>
<td></td>
</tr>
<tr>
<td>Active energy</td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td>Display of energy</td>
<td>6 digit LCD</td>
<td>7 digits LCD</td>
</tr>
<tr>
<td><strong>Communication</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Terminal wire area</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Recommended tightening torque</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td><strong>Pulse indicator (LED)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pulse frequency</td>
<td>1000 (imp/kWh)</td>
<td></td>
</tr>
<tr>
<td>Pulse length</td>
<td>40 ms</td>
<td></td>
</tr>
<tr>
<td><strong>Environmental</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature</td>
<td>-25°C - +70°C</td>
<td></td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-25°C - +85°C</td>
<td></td>
</tr>
<tr>
<td>Humidity</td>
<td>75% yearly average, 95% on 30 days/year</td>
<td></td>
</tr>
<tr>
<td>Resistance to fire and heat</td>
<td>Terminal 960°C, cover 650°C (IEC 60695-2-1)</td>
<td></td>
</tr>
<tr>
<td>Resistance to water and dust</td>
<td>IP20 on terminal block without protective enclosure and IP51 in protective enclosure, according to IEC 60529.</td>
<td></td>
</tr>
<tr>
<td>Mechanical environment</td>
<td>Class M2 in accordance with the Measuring Instrument Directive (MID), (2014/32/EU).</td>
<td></td>
</tr>
<tr>
<td>Electromagnetic environment</td>
<td>Class E2 in accordance with the Measuring Instrument Directive (MID), (2014/32/EU).</td>
<td></td>
</tr>
<tr>
<td>Technical features</td>
<td>C11</td>
<td>C13</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td><strong>Outputs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type</td>
<td>Transistor</td>
<td></td>
</tr>
<tr>
<td>Current</td>
<td>2 - 100 mA</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>5 - 40 V DC</td>
<td></td>
</tr>
<tr>
<td>Pulse output frequency</td>
<td>100 or 1000 (imp/kWh)</td>
<td></td>
</tr>
<tr>
<td>Pulse length</td>
<td>100 ms</td>
<td></td>
</tr>
<tr>
<td>Terminal wire area</td>
<td>0.5 - 10 mm²</td>
<td>0.5 - 6 mm²</td>
</tr>
<tr>
<td>Recommended tightening torque</td>
<td>0.8 Nm</td>
<td>0.25 Nm</td>
</tr>
<tr>
<td><strong>EMC compatibility</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impulse voltage test</td>
<td>6 kV 1.2/50 µs (IEC 60060-1)</td>
<td></td>
</tr>
<tr>
<td>Surge voltage test</td>
<td>4 kV 1.2/50 µs (IEC 61000-4-5)</td>
<td></td>
</tr>
<tr>
<td>Fast transient burn test</td>
<td>4 kV (IEC 61000-4-4)</td>
<td></td>
</tr>
<tr>
<td>Immunity to electromagnetic HF-fields</td>
<td>80 MHz - 2 GHz at 10 V/m (IEC 61000-4-3)</td>
<td></td>
</tr>
<tr>
<td>Immunity to conducted disturbance</td>
<td>150 kHz - 80 MHz, (IEC 61000-4-6)</td>
<td></td>
</tr>
<tr>
<td>Immunity to disturbance with harmonics</td>
<td>2kHz - 150kHz</td>
<td></td>
</tr>
<tr>
<td>Radio frequency emission</td>
<td>EN 55022, class B (CISPR22)</td>
<td></td>
</tr>
<tr>
<td>Electrostatic discharge</td>
<td>15 kV (IEC 61000-4-2)</td>
<td></td>
</tr>
<tr>
<td>Standards</td>
<td>IEC 62052-11, IEC 62053-21 class 1, GB/T 17215.211-2006, GBT 17215.321-2008 class 1, GB 4208-2008, EN 50470-1, EN 50470-3 category B</td>
<td></td>
</tr>
<tr>
<td><strong>Mechanical</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material</td>
<td>Glass reinforced polycarbonate</td>
<td></td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Width</td>
<td>17.5 mm</td>
<td>54 mm</td>
</tr>
<tr>
<td>Height</td>
<td>111 mm</td>
<td>122 mm</td>
</tr>
<tr>
<td>Depth</td>
<td>65 mm</td>
<td>65 mm</td>
</tr>
<tr>
<td>DIN modules</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>
Direct connected electricity meter up to 40 A. IEC approval. Alarm function. Optional - Verified and approved according to MID.

**EQ meters single phase electricity meter, 1 DIN, 40 A**

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x 230 V AC, Pulse output 1000 imp/kWh</td>
<td>7392696</td>
<td>035712</td>
<td>C11 110 - 101</td>
<td>2CMA103571R1000</td>
<td>0.070</td>
</tr>
</tbody>
</table>

**EQ meters three phase electricity meter, 3 DIN, 40 A**

For direct connection up to 40 A. Class B (Cl.1) with functionality level Steel. Alarm function. Optional - Verified and approved according to MID.

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 230/400 V AC, Pulse output 1000 imp/kWh</td>
<td>7392696</td>
<td>035743</td>
<td>C13 110 - 101</td>
<td>2CMA103574R1000</td>
<td>0.170</td>
</tr>
</tbody>
</table>

For direct connection up to 40 A. Class 1 with functionality level Steel. Active energy.

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 230/400 V AC, Pulse output 1000 imp/kWh</td>
<td></td>
<td>035750</td>
<td>C13 110 - 301</td>
<td>2CMA103575R1000</td>
<td>0.170</td>
</tr>
</tbody>
</table>
Energy efficiency
Interfaces for EQ meters

Meter Interface Module, KNX
It records consumption and measured values of the electrical energy consumption meters. Using an infra-red interface, the ABB energy meter types of the A- and B-series are incorporated. The information and data which is read can be used, for example, for cost centre accounting, energy optimisation, monitoring of installations and visualisation.

<table>
<thead>
<tr>
<th>Description</th>
<th>EAN</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>KNX meter module</td>
<td>4016779662079</td>
<td>ZS/S 1.1</td>
<td>2CDG110083R0011</td>
<td>0.100</td>
<td>1</td>
</tr>
</tbody>
</table>
Energy Analyzer, M-Bus, MDRC
Compact and web-based stand-alone devices for energy management applications. For monitoring, logging, displaying and analyzing consumption data of up to 16 or 64 electricity, gas, water or heat meters via M-Bus. Automatic detection for ABB EQ meters (A/B-Series). Access to the device via web browser. The user interface provides graphical analysis functions, e.g. dashboard, historical data, instantaneous values, benchmark functions, cost allocation according to consumer groups and more.

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn</th>
<th>Order details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4016779</td>
<td></td>
</tr>
<tr>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
</tr>
<tr>
<td>16 Devices</td>
<td>QA/S 3.16.1</td>
<td>2CDG110226R0011</td>
</tr>
<tr>
<td>64 Devices</td>
<td>QA/S 3.64.1</td>
<td>2CDG110227R0011</td>
</tr>
</tbody>
</table>

Energy Analyzer, Modbus RTU, MDRC
Compact and web-based stand-alone devices for energy management applications. For monitoring, logging, displaying and analyzing consumption data of up to 16 or 64 electricity, gas, water or heat meters via Modbus RTU. Automatic detection for ABB EQ meters (A/B-Series). Access to the device via web browser. The user interface provides graphical analysis functions, e.g. dashboard, historical data, instantaneous values, benchmark functions, cost allocation according to consumer groups and more.

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn</th>
<th>Order details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4016779</td>
<td></td>
</tr>
<tr>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
</tr>
<tr>
<td>16 Devices</td>
<td>QA/S 4.16.1</td>
<td>2CDG110228R0011</td>
</tr>
<tr>
<td>64 Devices</td>
<td>QA/S 4.64.1</td>
<td>2CDG110229R0011</td>
</tr>
</tbody>
</table>

Energy Analyzer, KNX, MDRC
NEW
Compact and web-based stand-alone device for energy management applications. For monitoring, logging, displaying and analyzing consumption data of up to 16 electricity, gas, water or heat meters via KNX TP. In addition measured values such as temperature, humidity, etc. can be processed and displayed. The alarm function allows early warning via E-mail if any value exceeds defined limits. The user interface provides graphical analysis functions, e.g. dashboard, historical data, instantaneous values, benchmark functions, cost allocation according to consumer groups and more. In order to increase energy efficiency, defined loads can be selectively switched off with the load control function if they exceed a load limit. For further processing data can be exported via E-mail or upload to FTP server. Several data sharing options allow communication with other systems.

<table>
<thead>
<tr>
<th>Description</th>
<th>Bbn</th>
<th>Order details</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4016779</td>
<td></td>
</tr>
<tr>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
</tr>
<tr>
<td>16 Devices</td>
<td>QA/S 1.16.1</td>
<td>2CDG110224R0011</td>
</tr>
</tbody>
</table>
The quality of a Circuit Monitoring System is dependent on the strengths of the individual components and how well they interact. ABB’s new CMS sets new and high standards. Compactness, technology, measurement results, user friendliness and flexibility - every component and every feature of the CMS has been fully optimized in terms of practicality and functionality.

---

**Energy efficiency**

CMS – Circuit Monitoring System overview

The control unit evaluates the measurement data picked up by the sensors, and makes it available via the provided interfaces.

Three different units are available depending on the application: CMS-700, CMS-660 and CMS-600.

---

**CMS bus interface**

Each bus interface allows up to 32 sensors connected to the Control Unit:
- CMS-700: up to 96 sensors (3×32)
- CMS-600: up to 64 sensors (2×32)
- CMS-660: up to 32 sensors (1×32)

---

Example Illustration:
Control Unit CMS-700 in combination with CMS open-core sensors
Sensors
CMS sensors can be placed anywhere in the system, without any limitation. Easy initializing is guaranteed by the unique ID assigned to each sensor via Control Unit in just a few simple steps. All measurement functions are available right after commissioning.

Serial interfaces
Depending on the selected control unit, the following communication interfaces are available: RS485 (Modbus RTU), LAN (TCP/IP and Modbus TCP), SNMP v1/v2 and v3 encrypted.

The web server integrated in the CMS-700 makes it possible to display the values via any Internet browser and to automatically export the files (via e-mail or FTP server).

Connection technology
Connecting the sensors to the Control Unit is extremely simple and requires no special tools. All sensors are connected to the Control Unit by means of a flexible flat cable and insulation displacement connectors. The positioning of sensors is fully customizable so that they sit exactly where a measurement is required.
Energy efficiency
Circuit Monitoring System

Integrate however you want thanks to multiple mounting options. Depending on the application, you can choose between two sets of sensors - one specifically designed for ABB installation devices, the other with an universal design to be installed on cables or DIN-rail.

Sensors for ABB devices

System pro M installation, SMISSLINE
The sensors of the CMS-120LA and CMS-120FH series allow easy retrofit installation on S200 MCBs, SMISSLINE devices and E90 fuseholders (1000VDC).

Installation on S800 installation devices
CMS-100S8 and CMS-200S8 series sensors can be mounted on all S800 high performance circuit breakers with cage terminals.

Universally usable sensor designs

Mounting on a DIN rail
CMS-120DR, CMS-100DR, and CMS-200DR series sensors can be mounted on all DIN rails with the aid of a DIN rail mounting.

Cable tie mounting
If space is at a real premium, CMS-120CA, CMS-100CA, and CMS-200CA series sensors can be secured directly to the cable(s) to be measured by means of cable ties.
Tangible value added for you
ABB circuit monitoring pays off twofold

Early warning system (predictive maintenance) for increasing the availability of critical consumers
Continuous monitoring of the current flow at the circuit breaker makes it possible to detect overloaded lines before they lead to a service interruption. Apart from this, monitoring individual circuits indicates whether the loads are in the desired operating mode or not. In this way, system deviations can be ascertained instantaneously. What’s more, the CMS can be used to detect unbalanced loads before they result in failure of the neutral conductor and consequently load failure.

Cost analysis to reduce and assign energy costs
The cost of energy will rise continuously. In order to cut costs, you first have to know where they arise. The Control Unit helps illustrate and analyze the instantaneous energy consumption levels. Furthermore, the calculated active energy can be used to roughly allocate the costs at the output level.
Energy efficiency
Circuit Monitoring System

Sensors overview

<table>
<thead>
<tr>
<th>Mounting method</th>
<th>System Pro M, SMISSLINE</th>
<th>S800</th>
<th>DIN rail</th>
<th>Cable tie</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>for all MCBs, RCDs, RCBOs with twin terminals</td>
<td>for MCBs (S200, SMISSLINE) and RCBOs (SMISSLINE)</td>
<td>for fuse holders E90</td>
<td>universally usable</td>
</tr>
</tbody>
</table>

Open-core sensors

AC accuracy* of ± 1.0%

The laying method influences the accuracy.

18-mm overall width

<table>
<thead>
<tr>
<th>18-mm overall width</th>
<th>CMS-120xx (80 A)</th>
<th>CMS-120PS</th>
<th>CMS-120LA</th>
<th>-</th>
<th>CMS-120DR</th>
<th>CMS-120CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>For all S800 devices with cage terminals</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Solid-core sensors

AC accuracy* of ± 0.5%

18-mm overall width

<table>
<thead>
<tr>
<th>18-mm overall width</th>
<th>CMS-100xx (80 A)</th>
<th>CMS-100PS</th>
<th>CMS-100S8</th>
<th>CMS-100DR</th>
<th>CMS-100CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMS-101xx (40 A)</td>
<td>CMS-101PS</td>
<td>CMS-101S8</td>
<td>CMS-101DR</td>
<td>CMS-101CA</td>
<td></td>
</tr>
<tr>
<td>CMS-102xx (20 A)</td>
<td>CMS-102PS</td>
<td>CMS-102S8</td>
<td>CMS-102DR</td>
<td>CMS-102CA</td>
<td></td>
</tr>
</tbody>
</table>

25-mm overall width

<table>
<thead>
<tr>
<th>25-mm overall width</th>
<th>CMS-200xx (160 A)</th>
<th>CMS-200S8</th>
<th>CMS-200DR</th>
<th>CMS-200CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMS-201xx (80 A)</td>
<td>CMS-201S8</td>
<td>CMS-201DR</td>
<td>CMS-201CA</td>
<td></td>
</tr>
<tr>
<td>CMS-202xx (40 A)</td>
<td>CMS-202S8</td>
<td>CMS-202DR</td>
<td>CMS-202CA</td>
<td></td>
</tr>
</tbody>
</table>

* All accuracy specifications refer to the relevant full scale value and apply to 25°C
## Energy efficiency

Circuit Monitoring System

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Control Unit CMS-700</th>
<th>Control Unit CMS-600</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CMS Sensors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensors</td>
<td>96 (3x32)</td>
<td>64 (2x32)</td>
</tr>
<tr>
<td><strong>Control Unit</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Integrated power supply</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Voltage measurement</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Current (External CTs are required) measurement</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Active, reactive and apparent power (External CTs are required) measurement</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Calculated values for the branches</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy (Using branch currents, mains voltage and power factor over time)</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Power (Using branch currents, mains voltage and power factor)</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Interfaces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS485</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>LAN</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Protocols</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Modbus RTU</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Modbus TCP</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>SNMP (v1, v2 and encrypted v3)</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Visualization</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Built-in web server</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Touch display</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>CSV data export</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td><strong>Approvals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IEC 61010-1</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>UL 508 / CSA C22.2 No. 14</td>
<td>•</td>
<td>•</td>
</tr>
</tbody>
</table>
Energy efficiency

Control units

### Control Unit CMS-700

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>[VAC] 80 – 277 (L1-N, +5%)</td>
</tr>
<tr>
<td>Frequency</td>
<td>[Hz] 50/60</td>
</tr>
<tr>
<td>Power input (L1-N)</td>
<td>[W] 5...40 (dep. on number of sensors)</td>
</tr>
<tr>
<td>Power input, current transformer, secondary side</td>
<td>[VA] Current circuit &lt;2 (per phase)</td>
</tr>
<tr>
<td>Voltage measurement range</td>
<td>[VAC] 80 – 277 (L1, L2, L3-N)</td>
</tr>
<tr>
<td>Measurement range, current transformer, secondary side</td>
<td>[A] nominal: 5 max.: 6</td>
</tr>
<tr>
<td>Harmonic component</td>
<td>[Hz] up to 2000</td>
</tr>
<tr>
<td>Data rate of Modbus RTU</td>
<td>[Baud] RS485 2-wire, 2400...115200</td>
</tr>
<tr>
<td>Refresh time</td>
<td>≤1 sec with max. 96 sensors</td>
</tr>
<tr>
<td>LAN</td>
<td>[Mbit/s] 100</td>
</tr>
<tr>
<td>Conductor cross-section</td>
<td>[mm²] 0.5...2.5</td>
</tr>
<tr>
<td>Mounting method</td>
<td>35 mm DIN rail (DIN 50022)</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP20</td>
</tr>
<tr>
<td>Dimensions</td>
<td>[mm] 161.5 x 87.0 x 64.9 (9 WM)</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>[°C] -25...+60</td>
</tr>
<tr>
<td>Bearing temperature</td>
<td>[°C] -40...+85</td>
</tr>
<tr>
<td>Standards</td>
<td>IEC61010-1 UL 508/ CSA C22.2 No. 14</td>
</tr>
</tbody>
</table>

#### Main circuit accuracy

- Voltage: ±1 %
- Current: ±1 %
- Harmonic component: 1 %
- Active power: ±2 %
- Apparent power: ±2 %
- Reactive power: ±2 %
- Power factor: ±0.2 %

### Control Unit CMS-600 – Modbus RTU

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply voltage</td>
<td>[VDC] 24 (±10%)</td>
</tr>
<tr>
<td>Power input</td>
<td>[W] 4 – 24 (dep. on number of sensors)</td>
</tr>
<tr>
<td>Interface</td>
<td>RS485 2-wire</td>
</tr>
<tr>
<td>Protocol</td>
<td>Modbus RTU</td>
</tr>
<tr>
<td>Data rate</td>
<td>[Baud] 2400...115200</td>
</tr>
<tr>
<td>Refresh time</td>
<td>≤1 sec with max. 64 sensors</td>
</tr>
<tr>
<td>Insulation strength</td>
<td>[VAC] 400</td>
</tr>
<tr>
<td>Screw-type terminals</td>
<td>0.5...2.5 mm², max. 0.6 Nm</td>
</tr>
<tr>
<td>Mounting method</td>
<td>35 mm DIN rail (DIN 50022) or SMISLINE TP plug base</td>
</tr>
<tr>
<td>Dimensions</td>
<td>[mm] 71.8 x 87.0 x 64.9 (4 WM)</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>[°C] -25...+70</td>
</tr>
<tr>
<td>Bearing temperature</td>
<td>[°C] -40...+85</td>
</tr>
<tr>
<td>Standards</td>
<td>IEC 61010-1 UL 508/ CSA C22.2 No. 14</td>
</tr>
</tbody>
</table>
Energy efficiency
Control units

CMS-700
The CMS-700 measures the AC and DC currents in the outgoing circuits via up to 3 x 32 sensors and calculates the energy and output data (line-side active and reactive power) of up to 96 sensors simultaneously.

Remotely monitoring of the system is made possible by a digital communication that supports different protocols: Modbus RTU, TCP or SNMP v1 and v2 and the encrypted v3. The Control Unit CMS-700 stands out thanks to its built-in web server that offers easy access not only to the measured data but also to the system parameters. The two interfaces – LAN (TCP/IP or Modbus TCP) and RS485 (Modbus RTU) – guarantee straightforward integration into any IT infrastructure. What’s more, the data can be read out by means of an encrypted SNMP protocol.

The Control Unit CMS-700 has been developed specifically to meet the requirements of critical power applications, such as those of computing centers. In addition, however, professional energy monitoring is becoming ever more important when it comes to identifying savings potentials in functional buildings such as office buildings.

CMS-600
The CMS-600 system enables you to measure AC and DC currents in up to 64 branches. For simple and fast operation, the Control Unit is equipped with an illuminated touch display that makes not only initialization but also control of the sensors extremely simple.

A 2-wire RS485 Modbus RTU interface enables users to remotely query and process the measurement data. As such, the CMS-600 Control Unit can be very easily integrated into an existing Modbus architecture. As an option, the measured values can also be visualized and processed by means of a programmable logic control (PLC).

CMS-600 is equipped with an integrated CMS software for which great care has been taken to ensure that the navigation concept is highly intuitive.

The Control Unit CMS-600 are put to use in the critical power systems of hospitals and in similar industrial applications, too. Furthermore, these devices can also be found in functional buildings such as airports, hotels, office buildings, universities/colleges and museums or in industrial photovoltaics.

<table>
<thead>
<tr>
<th>Description</th>
<th>GTIN</th>
<th>Order details</th>
<th>Price</th>
<th>Weight</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 piece</td>
<td>1 piece</td>
<td>pc.</td>
</tr>
<tr>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td>kg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-----------------</td>
<td>------------</td>
<td>-----</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>CMS-700</td>
<td>7612271</td>
<td>CMS-700</td>
<td>2CCA880700R0001</td>
<td>0.329</td>
<td>1</td>
</tr>
<tr>
<td>CMS-600</td>
<td>418700</td>
<td>CMS-600</td>
<td>2CCA880000R0001</td>
<td>0.153</td>
<td>1</td>
</tr>
</tbody>
</table>
## Energy efficiency
### Sensors and Accessories

### Open core sensors 18 mm

<table>
<thead>
<tr>
<th>Sensor type</th>
<th>CMS-120xx</th>
<th>CMS-121xx</th>
<th>CMS-122xx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement range [A]</td>
<td>80</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>Measurement method</td>
<td>TRMS, AC 50 / 60 Hz, DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak value of the distorted wave-form</td>
<td>≤ 1.5</td>
<td>≤ 3</td>
<td>≤ 6</td>
</tr>
<tr>
<td>AC accuracy (TA = 25°C)*</td>
<td>≤ ± 1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC* temperature coefficient</td>
<td>≤ ± 0.04%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC accuracy (TA = 25°C)*</td>
<td>≤ ± 1.2%</td>
<td>≤ ± 1.4%</td>
<td>≤ ± 1.8%</td>
</tr>
<tr>
<td>DC* temperature coefficient</td>
<td>≤ ± 0.14%</td>
<td>≤ ± 0.24%</td>
<td>≤ ± 0.44%</td>
</tr>
<tr>
<td>Resolution [A]</td>
<td>0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal sampling rate [Hz]</td>
<td>5000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respond time (±1%) [sec]</td>
<td>Type 0.34</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. diameter of the cable [mm]</td>
<td>9.6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation</td>
<td>690 V AC / 1500 V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature [°C]</td>
<td>− 25...+70 / − 40...+85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>CMS-120PS series [mm] 17.4 x 41.0 x 26.5</td>
<td>CMS-120CA series [mm] 17.4 x 41.0 x 29.0</td>
<td>CMS-120DR series [mm] 17.4 x 41.0 x 43.2</td>
</tr>
<tr>
<td></td>
<td>CMS-120LA series [mm] 17.4 x 41.0 x 38.9</td>
<td>CMS-120FH series [mm] 17.4 x 41.0 x 38.9</td>
<td></td>
</tr>
<tr>
<td>Reference standard</td>
<td>IEC 61010-1</td>
<td>UL508 / CSA C22.2 No 14</td>
<td></td>
</tr>
</tbody>
</table>

* All accuracy specifications refer to full scale value and apply at 25° C. In the case of open-core sensors, the position of the cable affects accuracy.

### Solid-core sensors 18 mm

<table>
<thead>
<tr>
<th>Sensor type</th>
<th>CMS-100xx</th>
<th>CMS-101xx</th>
<th>CMS-102xx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement range [A]</td>
<td>80</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>Measurement method</td>
<td>TRMS, AC 50 / 60 Hz, DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak value of the distorted wave-form</td>
<td>≤ 1.5</td>
<td>≤ 3</td>
<td>≤ 6</td>
</tr>
<tr>
<td>AC accuracy (TA = 25°C)*</td>
<td>≤ ± 0.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC* temperature coefficient</td>
<td>≤ ± 0.036%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC accuracy (TA = 25°C)*</td>
<td>≤ ± 0.7%</td>
<td>≤ ± 1.0%</td>
<td>≤ ± 1.7%</td>
</tr>
<tr>
<td>DC* temperature coefficient</td>
<td>≤ ± 0.047%</td>
<td>≤ ± 0.059%</td>
<td>≤ ± 0.084%</td>
</tr>
<tr>
<td>Resolution [A]</td>
<td>0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal sampling rate [Hz]</td>
<td>5000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respond time (±1%) [sec]</td>
<td>Type 0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. diameter of the cable [mm]</td>
<td>10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation [V]</td>
<td>690 V AC / 1500 V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature [°C]</td>
<td>− 25...+70 / − 40...+85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size</td>
<td>CMS-100PS series [mm] 17.4 x 41.0 x 26.5</td>
<td>CMS-1005S series [mm] 26.5 x 45.5 x 31.8</td>
<td>CMS-100DR series [mm] 17.4 x 51.5 x 43.2</td>
</tr>
<tr>
<td></td>
<td>CMS-100CA series [mm] 17.4 x 41.0 x 29.0</td>
<td>CMS-100FH series [mm] 17.4 x 41.0 x 29.0</td>
<td></td>
</tr>
<tr>
<td>Reference standard</td>
<td>IEC 61010-1</td>
<td>UL508 / CSA C22.2 No 14</td>
<td></td>
</tr>
</tbody>
</table>

* All accuracy specifications refer to the relevant full scale value and apply at 25° C.
<table>
<thead>
<tr>
<th>Sensor type</th>
<th>CMS-200xx</th>
<th>CMS-201xx</th>
<th>CMS-202xx</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement range [A]</td>
<td>160</td>
<td>80</td>
<td>40</td>
</tr>
<tr>
<td>Measurement method</td>
<td>TRMS, AC 50 / 60 Hz, DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak value of the distorted wave-form</td>
<td>≤ 1.5</td>
<td>≤ 3</td>
<td>≤ 6</td>
</tr>
<tr>
<td>AC accuracy (TA = +25°C)*</td>
<td>≤ ± 0.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC* temperature coefficient</td>
<td>≤ ± 0.036%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC accuracy (TA = +25°C)*</td>
<td>≤ ± 0.7%</td>
<td>≤ ± 1.0%</td>
<td>≤ ± 1.7%</td>
</tr>
<tr>
<td>DC* temperature coefficient</td>
<td>≤ ± 0.047%</td>
<td>≤ ± 0.059%</td>
<td>≤ ± 0.084%</td>
</tr>
<tr>
<td>Resolution [A]</td>
<td>0.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internal sampling rate [Hz]</td>
<td>5000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Respond time (±1 %) [sec]</td>
<td>Type 0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max. diameter of the cable [mm]</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation [V]</td>
<td>690 V AC / 1500 V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating temperature [°C]</td>
<td>- 25 ... +70 / - 40 ... +85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size CMS-200S8 series [mm]</td>
<td>26.5 x 43.0 x 38.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMS-200DR series [mm]</td>
<td>25.4 x 43.0 x 43.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMS-200CA series [mm]</td>
<td>25.4 x 43.0 x 35.7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Reference standard: IEC 61010-1 | UL508 / CSA C22.2 No14

* All accuracy specifications refer to the relevant full scale value and apply at 25 °C.
Energy efficiency
Sensors and Accessories

Open-core sensors
The open-core sensors are able to measure all types of current, whether AC, DC or mixed, up to 80 A in TRMS, enabling exact and effective measurements. As each sensor is equipped with its own microprocessor for processing the signal, the measurement data is transmitted digitally to the Control Unit via bus interface, maximizing data reliability. Disturbances like those experienced with analog data now most definitely belong to the past.

With this solution a faster cabling is guaranteed, since wiring cables are directly inserted in the sensors without the aid of a screwdriver. No special tools are needed for the entire connection process.

With AC accuracy* of ≤ ±1.0 %, they can be used in a multitude of applications without any problem: System pro M, DIN rail and Cable tie.

Thanks to their U shape, the open-core sensors can be retrofitted to existing installations, without the need to disconnect the cabling or shut down the equipment, being the key for brownfield extension.

Solid-core sensors
Alternating (AC), direct (DC) or mixed (TRMS) currents – the CMS sensors monitor and measure all types of current over a measurement range of up to 160 A (TRMS). They even measure harmonic components in the signal curve. The measurements are digitally transmitted through bus interface, enabling reliability of data and removing disturbance effects.

Maximum secure insertion of wiring cables is guaranteed by this sensors solution.

Everything is built into an 18 or 25 mm wide unit to enable precise and effective measurements. This makes these CMS sensors the most compact and most powerful on the market.

Depending on the application, solid-core sensors are chosen between up to four different mounting options to making this solution as flexible as possible.

The solid-core units feature an enclosed structure and AC measurement accuracy* of ≤ ± 0.5 %, and are therefore suitable for all applications in which maximum-precision measurement is crucial.

* All accuracy specifications refer to the relevant full-scale value and apply to 25 °C.

Accessories
The Control Unit of the circuit monitoring system need a flat cable for receive branches measurements from sensors. The flat cable should be a 4-pin cable, flexible in length. Flat cable are available in several lengths in order to cover the most kind of application. Cables with the greater length are designed with the purpose of being adapted, through cutting, to the various lengths required by the applications.
### Energy efficiency

#### Sensors and Accessories

**Open-core sensors**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>ABB code</th>
<th>Weight of 1 unit (kg)</th>
<th>Unit conf. (Pcs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 A</td>
<td>Open-core sensors 18 mm for retrofit of MCBs (S200, SMISSLINE) and RCBOs (SMISSLINE)</td>
<td>2CCA880225R0001</td>
<td>0.012</td>
<td>1</td>
</tr>
<tr>
<td>40 A</td>
<td></td>
<td>2CCA880226R0001</td>
<td>0.012</td>
<td>1</td>
</tr>
<tr>
<td>20 A</td>
<td></td>
<td>2CCA880227R0001</td>
<td>0.012</td>
<td>1</td>
</tr>
<tr>
<td>80 A</td>
<td>Open-core sensors 18 mm for retrofit of E90 fuseholders 1000VDC</td>
<td>2CCA880216R0001</td>
<td>0.012</td>
<td>1</td>
</tr>
<tr>
<td>40 A</td>
<td></td>
<td>2CCA880217R0001</td>
<td>0.012</td>
<td>1</td>
</tr>
<tr>
<td>20 A</td>
<td>Open-core sensors 18 mm for pro M and SMISSLINE devices with twin terminals</td>
<td>2CCA880219R0001</td>
<td>0.012</td>
<td>1</td>
</tr>
<tr>
<td>80 A</td>
<td></td>
<td>2CCA880220R0001</td>
<td>0.012</td>
<td>1</td>
</tr>
<tr>
<td>40 A</td>
<td></td>
<td>2CCA880221R0001</td>
<td>0.012</td>
<td>1</td>
</tr>
<tr>
<td>20 A</td>
<td></td>
<td>2CCA880222R0001</td>
<td>0.012</td>
<td>1</td>
</tr>
<tr>
<td>80 A</td>
<td>Open-core sensors 18 mm for DIN-rail (universal use)</td>
<td>2CCA880240R0001</td>
<td>0.015</td>
<td>1</td>
</tr>
<tr>
<td>40 A</td>
<td></td>
<td>2CCA880241R0001</td>
<td>0.015</td>
<td>1</td>
</tr>
<tr>
<td>20 A</td>
<td></td>
<td>2CCA880242R0001</td>
<td>0.015</td>
<td>1</td>
</tr>
<tr>
<td>80 A</td>
<td>Open-core sensors 18 mm for cable tie mounting (universal use)</td>
<td>2CCA880220R0001</td>
<td>0.011</td>
<td>1</td>
</tr>
<tr>
<td>40 A</td>
<td></td>
<td>2CCA880221R0001</td>
<td>0.011</td>
<td>1</td>
</tr>
<tr>
<td>20 A</td>
<td></td>
<td>2CCA880222R0001</td>
<td>0.011</td>
<td>1</td>
</tr>
</tbody>
</table>

**Solid-core sensors**

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>ABB code</th>
<th>Weight of 1 unit (kg)</th>
<th>Unit conf. (Pcs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>80 A</td>
<td>Solid-core sensors 18 mm for S800 devices with cage terminals</td>
<td>2CCA880124R0001</td>
<td>0.014</td>
<td>1</td>
</tr>
<tr>
<td>40 A</td>
<td></td>
<td>2CCA880125R0001</td>
<td>0.014</td>
<td>1</td>
</tr>
<tr>
<td>20 A</td>
<td></td>
<td>2CCA880126R0001</td>
<td>0.014</td>
<td>1</td>
</tr>
<tr>
<td>80 A</td>
<td>Solid-core sensors 18 mm for pro M &amp; SMISSLINE installation devices with twin terminals</td>
<td>2CCA880100R0001</td>
<td>0.012</td>
<td>1</td>
</tr>
<tr>
<td>40 A</td>
<td></td>
<td>2CCA880101R0001</td>
<td>0.012</td>
<td>1</td>
</tr>
<tr>
<td>20 A</td>
<td></td>
<td>2CCA880102R0001</td>
<td>0.012</td>
<td>1</td>
</tr>
<tr>
<td>80 A</td>
<td>Solid-core sensors 18 mm for DIN rail mounting (universally usable)</td>
<td>2CCA880128R0001</td>
<td>0.015</td>
<td>1</td>
</tr>
<tr>
<td>40 A</td>
<td></td>
<td>2CCA880129R0001</td>
<td>0.015</td>
<td>1</td>
</tr>
<tr>
<td>20 A</td>
<td></td>
<td>2CCA880130R0001</td>
<td>0.015</td>
<td>1</td>
</tr>
<tr>
<td>80 A</td>
<td>Solid-core sensors 18 mm for cable tie mounting (universally usable)</td>
<td>2CCA880107R0001</td>
<td>0.011</td>
<td>1</td>
</tr>
<tr>
<td>40 A</td>
<td></td>
<td>2CCA880108R0001</td>
<td>0.011</td>
<td>1</td>
</tr>
<tr>
<td>20 A</td>
<td></td>
<td>2CCA880109R0001</td>
<td>0.011</td>
<td>1</td>
</tr>
<tr>
<td>160 A</td>
<td>Solid-core sensors 25 mm for S800 devices with cage terminals</td>
<td>2CCA880136R0001</td>
<td>0.028</td>
<td>1</td>
</tr>
<tr>
<td>80 A</td>
<td></td>
<td>2CCA880137R0001</td>
<td>0.028</td>
<td>1</td>
</tr>
<tr>
<td>40 A</td>
<td></td>
<td>2CCA880138R0001</td>
<td>0.028</td>
<td>1</td>
</tr>
</tbody>
</table>
## Energy efficiency

### Sensors and Accessories

#### Solid-core sensors

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>ABB code</th>
<th>Weight of 1 unit (kg)</th>
<th>Unit conf. (Pcs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solid-core sensors 25 mm for DIN-rail mounting</td>
<td>160 A</td>
<td>CMS-200DR 2CCA880132R0001</td>
<td>0.030</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>80 A</td>
<td>CMS-201DR 2CCA880133R0001</td>
<td>0.030</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>40 A</td>
<td>CMS-202DR 2CCA880134R0001</td>
<td>0.030</td>
<td>1</td>
</tr>
<tr>
<td>Solid-core sensors 25 mm for cable tie mounting</td>
<td>160 A</td>
<td>CMS-200CA 2CCA880117R0001</td>
<td>0.026</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>80 A</td>
<td>CMS-201CA 2CCA880118R0001</td>
<td>0.026</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>40 A</td>
<td>CMS-202CA 2CCA880119R0001</td>
<td>0.026</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Control Unit

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>ABB code</th>
<th>Weight of 1 unit (kg)</th>
<th>Unit conf. (Pcs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMS-600 Control Unit</td>
<td>CMS-600</td>
<td>2CCA880000R0001</td>
<td>0.153</td>
<td>1</td>
</tr>
<tr>
<td>CMS-700 Control Unit</td>
<td>CMS-700</td>
<td>2CCA880700R0001</td>
<td>0.329</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>ABB code</th>
<th>Weight of 1 unit (kg)</th>
<th>Unit conf. (Pcs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 m flat cable</td>
<td>CMS-800</td>
<td>2CCA880148R0001</td>
<td>0.017</td>
<td>1</td>
</tr>
<tr>
<td>5 m flat cable</td>
<td>CMS-802</td>
<td>2CCA880331R0001</td>
<td>0.045</td>
<td>1</td>
</tr>
<tr>
<td>10 m flat cable</td>
<td>CMS-803</td>
<td>2CCA880332R0001</td>
<td>0.090</td>
<td>1</td>
</tr>
<tr>
<td>30 m flat cable</td>
<td>CMS-805</td>
<td>2CCA880333R0001</td>
<td>0.270</td>
<td>1</td>
</tr>
<tr>
<td>Connector set (35 pcs)</td>
<td>CMS-820</td>
<td>2CCA880145R0001</td>
<td>0.024</td>
<td>35</td>
</tr>
</tbody>
</table>
String monitoring
CMS-660 circuit monitoring system

**Extremely flexibility**
The number (up to 32) and positioning of the sensors is fully customizable, ensuring the highest flexibility in integration to different system conditions.

**User friendliness**
Local information, thanks to the LEDs, about network and device status. Reset button to easily set the device.

**Compatibility**
RS485 port to guarantee easy integration with the plant/inverter monitoring systems.

**Up-to-date system status**
CMS-660 immediately detects unusual system status (e.g., solar shading, over-voltages, breaker trip, high temperature), facilitating maintenance of the system.

**Smart commissioning**
Thanks to the intelligent, intuitive configuration, the CMS system can be configured and put into operation in just a few minutes.

**One sensor for all currents and strings**
Direct, alternating or mixed – in a wide measuring range up to 80A, allowing the combination of two strings into one solid-core sensor.
Circuit monitoring system for PV applications
The CMS string monitoring increases the efficiency of photovoltaic systems by detecting failures on PV strings. With the easy-to-integrate system you can immediately detect unusual system status, e.g. defective strings, over-voltages, breaker trips or high temperatures, enabling you to quickly implement appropriate countermeasures.

Key features:
- Current and temperature measurement directly from the sensors
- Monitoring of two strings can be combined into one single CMS solid-core sensor
- Integration of SPD and Switch disconnector status via 2 digital inputs
- Up to 32 flexible monitoring points, placed where measurement is required
- LEDs provide local information about network and device status.
- Modbus RTU protocol guarantees easy integration into plant or inverter monitoring systems
- Connection technology is extremely simple and requires no special tools

Control unit – CMS-660

<table>
<thead>
<tr>
<th>Main technical specification</th>
<th>CMS-660</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General data</strong></td>
<td>IP20</td>
</tr>
<tr>
<td>Degree of protection</td>
<td></td>
</tr>
<tr>
<td>Operating temperature [°C]</td>
<td>− 25 .. +70 °C</td>
</tr>
<tr>
<td>Storage temperature [°C]</td>
<td>− 40 .. +85 °C</td>
</tr>
<tr>
<td>Dimensions W / H / D [mm]</td>
<td>71.8 x 87.0 x 64.9 (4 modules)</td>
</tr>
<tr>
<td>Screw-type terminals</td>
<td>0.5...2.5 mm², max 0.6 Nm</td>
</tr>
<tr>
<td>Altitude [m]</td>
<td>≤ 2000 m</td>
</tr>
<tr>
<td>Insulation strength [VAC]</td>
<td>400</td>
</tr>
<tr>
<td>Installation on DIN-rail</td>
<td>35 mm (DIN EN 50022)</td>
</tr>
<tr>
<td>Reference standards</td>
<td>IEC 61010-1 UL</td>
</tr>
<tr>
<td><strong>Supply</strong></td>
<td></td>
</tr>
<tr>
<td>Supply voltage [VDC]</td>
<td>24 (±10%)</td>
</tr>
<tr>
<td>Power Input [W]</td>
<td>0.5 - 11 (dep. on n. of sensors)</td>
</tr>
<tr>
<td><strong>Serial interface (RS-485)</strong></td>
<td></td>
</tr>
<tr>
<td>Serial transmission speed</td>
<td>2.4 ... 115.2 kbps</td>
</tr>
<tr>
<td>Cable type</td>
<td>Twisted, shielded</td>
</tr>
<tr>
<td>Communication protocol</td>
<td>Modbus RTU</td>
</tr>
<tr>
<td><strong>Measuring inputs</strong></td>
<td></td>
</tr>
<tr>
<td>Max. number of sensors</td>
<td>32</td>
</tr>
<tr>
<td>Refresh time</td>
<td>≤1 sec with max 32 sensors</td>
</tr>
<tr>
<td><strong>Digital inputs</strong></td>
<td></td>
</tr>
<tr>
<td>Connection method</td>
<td>Push-in spring connection</td>
</tr>
<tr>
<td>Cable diameter</td>
<td>max. 0.5mm²</td>
</tr>
<tr>
<td>Electrical characteristics</td>
<td>for potential-free contact</td>
</tr>
<tr>
<td><strong>Micro USB port</strong></td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Control Unit</th>
<th>Description</th>
<th>Type</th>
<th>ABB code</th>
<th>Weight of 1 unit (kg)</th>
<th>Unit conf. (Pcs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMS-660</td>
<td>CMS-660</td>
<td>2CCA880020R0001</td>
<td>0.153</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
## Energy efficiency

### Analogue and digital instruments selection table

<table>
<thead>
<tr>
<th>Measure</th>
<th>Technology</th>
<th>Mounting</th>
<th>Insertion</th>
<th>Characteristics</th>
<th>Accessories</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>Analogue</td>
<td>Direct</td>
<td>Direct</td>
<td>a.c.</td>
<td>MCV voltage switches</td>
<td>VLM page 8/45</td>
</tr>
<tr>
<td></td>
<td>72x72,</td>
<td></td>
<td>Direct</td>
<td>a.c.</td>
<td>MCV voltage switches</td>
<td>VLM-1 page 8/50</td>
</tr>
<tr>
<td></td>
<td>96x96</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Digital</td>
<td>Direct</td>
<td>a.c. and d.c.</td>
<td>MCV voltage switches</td>
<td>VLMD page 8/42</td>
<td></td>
</tr>
<tr>
<td></td>
<td>36x72</td>
<td>Direct</td>
<td></td>
<td></td>
<td>MCV voltage switches</td>
<td>VLMD P page 8/43</td>
</tr>
<tr>
<td>Current</td>
<td>Analogue</td>
<td>Direct</td>
<td></td>
<td></td>
<td>MCA current switches</td>
<td>AMT page 8/45</td>
</tr>
<tr>
<td></td>
<td>3 modules</td>
<td>Direct</td>
<td>Indirect</td>
<td>a.c. and d.c.</td>
<td>CT a.c. current transformer</td>
<td>AMT1/A page 8/46</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SNT shunt for d.c.</td>
<td>AMT1-A page 8/52</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SCL interchangeable scale</td>
<td>AMT1-A1 page 8/52</td>
</tr>
<tr>
<td></td>
<td>72x72,</td>
<td>Direct</td>
<td></td>
<td></td>
<td>MCA current switches</td>
<td>AMT1-A5 page 8/52</td>
</tr>
<tr>
<td></td>
<td>96x96</td>
<td>Indirect</td>
<td></td>
<td></td>
<td>CT a.c. current transformer</td>
<td>AMT2-A page 8/52</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SNT shunt for d.c.</td>
<td>AMT2-A1 page 8/52</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SCL interchangeable scale</td>
<td>AMT2-A2 page 8/52</td>
</tr>
<tr>
<td></td>
<td>Digital</td>
<td>Indirect</td>
<td>a.c. and d.c.</td>
<td>MCA current switches</td>
<td>AMTD page 8/42</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 modules</td>
<td>Indirect</td>
<td></td>
<td></td>
<td>CT a.c. current transformer</td>
<td>AMTD1/A page 8/52</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SNT shunt for d.c.</td>
<td>AMTD1-A page 8/52</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SCL interchangeable scale</td>
<td>AMTD1-A1 page 8/52</td>
</tr>
<tr>
<td></td>
<td>36x72</td>
<td>Indirect</td>
<td></td>
<td></td>
<td>CT a.c. current transformer</td>
<td>AMTD2-A page 8/52</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SNT shunt for d.c.</td>
<td>AMTD2-A1 page 8/52</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SCL interchangeable scale</td>
<td>AMTD2-A2 page 8/52</td>
</tr>
<tr>
<td>Frequency</td>
<td>Analogue</td>
<td>72x72,</td>
<td>Direct</td>
<td>a.c.</td>
<td>MCA current switches</td>
<td>FRZ page 8/54</td>
</tr>
<tr>
<td></td>
<td>96x96</td>
<td></td>
<td></td>
<td></td>
<td>MCA current switches</td>
<td></td>
</tr>
</tbody>
</table>
### Technical features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply [V]</td>
<td>230 V a.c.</td>
</tr>
<tr>
<td>Rated frequency [Hz]</td>
<td>50÷60</td>
</tr>
<tr>
<td>Ammeter full scale value [A]</td>
<td>5, 20, 25, 40, 60, 100, 150, 200, 250, 400, 600, 999</td>
</tr>
<tr>
<td>Voltmeter full scale value [V]</td>
<td>600</td>
</tr>
<tr>
<td>Frequency meter range [Hz]</td>
<td>35...400</td>
</tr>
<tr>
<td>Tripping delay [s]</td>
<td>1, 5, 10, 20, 30</td>
</tr>
<tr>
<td>Hysteresis [%]</td>
<td>5, 10, 20, 30 set threshold</td>
</tr>
<tr>
<td>Output pins</td>
<td>3-4</td>
</tr>
<tr>
<td>Output relay</td>
<td>NO</td>
</tr>
<tr>
<td>Rated voltage relay [V]</td>
<td>230 V a.c.</td>
</tr>
<tr>
<td>Rated current relay [A]</td>
<td>AC1 16, AC15 3</td>
</tr>
<tr>
<td>Relay configuration</td>
<td>NO relay closes in alarm status</td>
</tr>
<tr>
<td></td>
<td>NC relay opens in alarm status, positive safety</td>
</tr>
<tr>
<td>Overload [ln/Vn]</td>
<td>1, 2</td>
</tr>
<tr>
<td>Accuracy class [%]</td>
<td>±0.5 full scale ±1 digit at 25 °C</td>
</tr>
<tr>
<td>Max. signal input value for ammeters</td>
<td>5 A a.c./60 mV d.c.</td>
</tr>
<tr>
<td>Display</td>
<td>3 digit LED display</td>
</tr>
<tr>
<td>Operating temperature [°C]</td>
<td>-10...+55</td>
</tr>
<tr>
<td>Storage temperature [°C]</td>
<td>-40...+70</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP20</td>
</tr>
<tr>
<td>Power consumption [VA]</td>
<td>4</td>
</tr>
<tr>
<td>Modules</td>
<td>3</td>
</tr>
<tr>
<td>Overall dimensions front panel devices [mm]</td>
<td>36x72x61.5 (51.5 depth inside the switchboard)</td>
</tr>
<tr>
<td>Standard</td>
<td>IEC EN 61010</td>
</tr>
</tbody>
</table>
Energy efficiency
Modular digital instruments

Modular digital instruments
The wide range of modular digital instruments starts with single-phase mono-function measurement devices for measuring voltage, current.
The range is composed by a voltmeter for a.c./d.c. voltage monitoring, one ammeter for a.c. current. Ammeters measure in indirect insertion thanks to measuring accessories, like current transformer for a.c. and shunt for d.c.
The full-scale value is programmable by the user, according to the current flow on the primary windings.

<table>
<thead>
<tr>
<th>Version</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.c./d.c. digital voltmeter</td>
<td>620402</td>
<td>VLMD-1-2 2CSM110000R1011</td>
<td>0,300</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>a.c. digital ammeter</td>
<td>620501</td>
<td>AMTD-1 2CSM320000R1011</td>
<td>0,300</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Modular digital instruments with alarm relay
The range is widened by two additional devices with extended features: two ammeters, trip the internal relay to signal an alarm condition if the measured parameter exceeds or falls below a programmable threshold. The measured maximum and minimum peak values are stored in the non-volatile instrument's memory.
The contact type is NO, so that the contact is open when the instrument is powered off, but it is possible to obtain positive safety operation setting, directly on the instrument, the NC relay contact type.
The instrument with relay can be used to signal the exceeding or the fall below a certain threshold, but not for both functions simultaneously.

<table>
<thead>
<tr>
<th>Version</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.c. digital ammeter with alarm relay</td>
<td>747734</td>
<td>AMTD-1-R 2CSM274773R1011</td>
<td>0,300</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>d.c. digital ammeter with alarm relay</td>
<td>610731</td>
<td>AMTD-2-R</td>
<td>0,300</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
**Front-panel digital instruments**

The wide range of front-panel digital instruments starts with single-phase mono-function measurement devices for measuring voltage and current.

The range is composed by a voltmeter for a.c./d.c. voltage monitoring, and one ammeter for a.c. Ammeters measure in indirect insertion thanks to measuring accessories, like current transformer for a.c.

The full-scale value is programmable by the user, according to the current flow on the primary windings.

<table>
<thead>
<tr>
<th>Version</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.c./d.c. digital voltmeter</td>
<td>136057</td>
<td>VLMD P</td>
<td>2CSG213605R4011</td>
<td>0,300</td>
<td>1</td>
</tr>
<tr>
<td>a.c. digital ammeter</td>
<td>136156</td>
<td>AMTD-1 P</td>
<td>2CSG213615R4011</td>
<td>0,300</td>
<td>1</td>
</tr>
</tbody>
</table>

**Front-panel digital instruments with alarm relay**

The range is widened by one additional devices with extended features: one ammeters that trip the internal relay to signal an alarm condition if the measured parameter exceeds or falls below a programmable threshold. The measured maximum and minimum peak values are stored in the non-volatile instrument’s memory.

The contact type is NO, so that the contact is open when the instrument is powered off, but it is possible to obtain positive safety operation setting, directly on the instrument, the NC relay contact type.

The instrument with relay can be used to signal the exceeding or the fall below a certain threshold, but not for both functions simultaneously.

<table>
<thead>
<tr>
<th>Version</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.c. digital ammeter with alarm relay</td>
<td>136453</td>
<td>AMTD-1-R P</td>
<td>2CSG213645R4011</td>
<td>0,300</td>
<td>1</td>
</tr>
</tbody>
</table>
Energy efficiency

Analogue instruments selection table

<table>
<thead>
<tr>
<th>Instrument mounting</th>
<th>a.c / d.c.</th>
<th>Size</th>
<th>Full-scale value</th>
<th>Instrument type</th>
<th>Scale type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modular</td>
<td>a.c.</td>
<td>-</td>
<td>90°</td>
<td>AMT1/A1</td>
<td>SCL 1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>72x72 mm</td>
<td>90°</td>
<td>AMT1-A1/72</td>
<td>SCL-A1 .../72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>78°</td>
<td>AMT1-A5/72</td>
<td>SCL-A5 .../72</td>
<td></td>
</tr>
<tr>
<td>Front-panel</td>
<td>a.c.</td>
<td>96x96 mm</td>
<td>90°</td>
<td>AMT1-A1/96</td>
<td>SCL-A1 .../96</td>
</tr>
<tr>
<td></td>
<td></td>
<td>78°</td>
<td>AMT1-A5/96</td>
<td>SCL-A5 .../96</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d.c.</td>
<td>96x96 mm</td>
<td>90°</td>
<td>AMT2-A2/96</td>
<td>SCL-A2 .../96</td>
</tr>
</tbody>
</table>

Analogue instruments with scales

The range of mono-function analogue instruments, employable in single-phase networks, is composed of measurement devices performing the measure and visualization of one electrical parameter: voltage, current and frequency. The range of voltmeters, both in modular and front-panel versions, is composed by devices fully equipped with the proper scale, even when the use of a voltage transformer is required. The connection, whether it’s direct, allows the immediate visualization of the measures on the display.

The range of ammeters is composed of devices for direct and indirect connection to the network. The devices directly connected to the network are fully equipped with proper scale, while the devices that require a current transformer or a shunt, need to be combined with a separate scale to be mounted on the front of the instrument.

The wide range of scales for ammeters allows the employability of the latter even in application with high nominal current, up to 10000 A a.c.
### Technical features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage Un</td>
<td>a.c. 300, 500; d.c. 100, 300</td>
</tr>
<tr>
<td>Rated currents in a.c. Direct reading</td>
<td>full scale values 5...30</td>
</tr>
<tr>
<td>Rated currents in a.c. Indirect reading</td>
<td>full scale values 5...2500</td>
</tr>
<tr>
<td>Rated currents in d.c. Direct reading</td>
<td>full scale values 0.1...30</td>
</tr>
<tr>
<td>Rated currents in d.c. Indirect reading</td>
<td>full scale values 5...500</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60</td>
</tr>
<tr>
<td>Overload capacity [%]</td>
<td>20 compared to the voltage or to the rated current</td>
</tr>
<tr>
<td>Accuracy class [%]</td>
<td>1.5 (0.5 for frequency meters)</td>
</tr>
<tr>
<td>Ammeters power consumption [VA]</td>
<td>5 A: 0.3 VA; 10 A: 0.6 VA; 25 A: 1 VA; 30 A: 1.2 VA</td>
</tr>
<tr>
<td>Voltmeters power consumption [VA]</td>
<td>300 V: 1.5 VA; 500 V: 4 VA</td>
</tr>
<tr>
<td>Frequency meters power consumption [VA]</td>
<td>&lt;1.5 VA</td>
</tr>
<tr>
<td>Modules [No.]</td>
<td>3</td>
</tr>
<tr>
<td>Protection degree</td>
<td>IP20</td>
</tr>
<tr>
<td>Standards</td>
<td>EN 60051</td>
</tr>
</tbody>
</table>

The range of modular analogue instruments is composed by mono-function measurement devices employable in single-phase networks. It includes voltmeters, ammeters and frequency meters. In particular, the range of ammeters is composed of devices fully equipped with the appropriate scale in the range between 5 A and 30 A. In case of greater current values, the range features devices to be used together with the proper scale and CT according to the application.

### Modular analogue instruments for alternating current

Suitable for direct or indirect measurement through the appropriate accessories.

#### Voltmeters: direct connection

<table>
<thead>
<tr>
<th>Scale</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>300 V</td>
<td>007906</td>
<td>VLM1/300</td>
<td>2CSM110190R1001</td>
<td>0.200</td>
<td>1</td>
</tr>
<tr>
<td>500 V</td>
<td>000006</td>
<td>VLM1/500</td>
<td>2CSM110220R1001</td>
<td>0.200</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Ammeters: direct connection

<table>
<thead>
<tr>
<th>Scale</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 A</td>
<td>000709</td>
<td>AMT1/5</td>
<td>2CSM310030R1001</td>
<td>0.200</td>
<td>1</td>
</tr>
<tr>
<td>10 A</td>
<td>000105</td>
<td>AMT1/10</td>
<td>2CSM310040R1001</td>
<td>0.200</td>
<td>1</td>
</tr>
<tr>
<td>15 A</td>
<td>000204</td>
<td>AMT1/15</td>
<td>2CSM310050R1001</td>
<td>0.200</td>
<td>1</td>
</tr>
<tr>
<td>20 A</td>
<td>000303</td>
<td>AMT1/20</td>
<td>2CSM310060R1001</td>
<td>0.200</td>
<td>1</td>
</tr>
<tr>
<td>25 A</td>
<td>000402</td>
<td>AMT1/25</td>
<td>2CSM310070R1001</td>
<td>0.200</td>
<td>1</td>
</tr>
<tr>
<td>30 A</td>
<td>000501</td>
<td>AMT1/30</td>
<td>2CSM310080R1001</td>
<td>0.200</td>
<td>1</td>
</tr>
</tbody>
</table>
## Energy efficiency

Modular analogue instruments

<table>
<thead>
<tr>
<th>Scale</th>
<th>Order details</th>
<th>Price</th>
<th>Weight</th>
<th>Pack</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EAN</td>
<td>1 piece</td>
<td>1 piece</td>
<td>unit</td>
</tr>
<tr>
<td>A1</td>
<td>000600</td>
<td>AMT1/A1</td>
<td>2CSM320250R1001</td>
<td>0.200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scale</th>
<th>Order details</th>
<th>Price</th>
<th>Weight</th>
<th>Pack</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EAN</td>
<td>1 piece</td>
<td>1 piece</td>
<td>unit</td>
</tr>
<tr>
<td>10 mA</td>
<td>028307</td>
<td>AMT2/0.01</td>
<td>2CSM410330R1001</td>
<td>0.200</td>
</tr>
</tbody>
</table>
### Energy efficiency

Scales for modular analogue ammeters

---

**Scales for modular analogue ammeters**

<table>
<thead>
<tr>
<th>Scale</th>
<th>EAN</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1-5A</td>
<td>001201</td>
<td>SCL 1/5</td>
<td>2CSM110021R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-10A</td>
<td>001300</td>
<td>SCL 1/10</td>
<td>2CSM110032R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-20A</td>
<td>001409</td>
<td>SCL 1/20</td>
<td>2CSM110075R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-25A</td>
<td>030706</td>
<td>SCL 1/25</td>
<td>2CSM110096R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-30A</td>
<td>001508</td>
<td>SCL 1/30</td>
<td>2CSM110107R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-40A</td>
<td>030805</td>
<td>SCL 1/40</td>
<td>2CSM110128R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-50A</td>
<td>001607</td>
<td>SCL 1/50</td>
<td>2CSM110149R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-60A</td>
<td>030904</td>
<td>SCL 1/60</td>
<td>2CSM110159R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-75A</td>
<td>031000</td>
<td>SCL 1/75</td>
<td>2CSM110169R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-80A</td>
<td>001706</td>
<td>SCL 1/80</td>
<td>2CSM110179R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-100A</td>
<td>001805</td>
<td>SCL 1/100</td>
<td>2CSM110189R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-150A</td>
<td>001904</td>
<td>SCL 1/150</td>
<td>2CSM110209R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-200A</td>
<td>002000</td>
<td>SCL 1/200</td>
<td>2CSM110229R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-250A</td>
<td>031109</td>
<td>SCL 1/250</td>
<td>2CSM110249R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-300A</td>
<td>002109</td>
<td>SCL 1/300</td>
<td>2CSM110259R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-400A</td>
<td>002208</td>
<td>SCL 1/400</td>
<td>2CSM110279R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-500A</td>
<td>002307</td>
<td>SCL 1/500</td>
<td>2CSM110299R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-600A</td>
<td>031208</td>
<td>SCL 1/600</td>
<td>2CSM110309R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-800A</td>
<td>002406</td>
<td>SCL 1/800</td>
<td>2CSM110329R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-1000A</td>
<td>002505</td>
<td>SCL 1/1000</td>
<td>2CSM110339R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-1500A</td>
<td>274704</td>
<td>SCL 1/1500</td>
<td>2CSM110359R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-2000A</td>
<td>274803</td>
<td>SCL 1/2000</td>
<td>2CSM110379R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>A1-2500A</td>
<td>274902</td>
<td>SCL 1/2500</td>
<td>2CSM110389R1041</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>
## Technical features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated max. reference voltage for insulation</td>
<td>600 (a.c. meters), 300 (d.c. meters)</td>
</tr>
<tr>
<td>Test voltage</td>
<td>2000 eff. (50 Hz/1 min)</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>1.5 (0.5 for frequency meters)</td>
</tr>
<tr>
<td>Overload capacity:</td>
<td></td>
</tr>
<tr>
<td>- amperometric windings</td>
<td>up to In x 10/ sec. up to In x 2/permanent</td>
</tr>
<tr>
<td>- voltometric windings</td>
<td>up to Un x 2/ sec. up to Un x 1.2/permanent</td>
</tr>
<tr>
<td>Operating temperature</td>
<td>[°C] -10...+55</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>[°C] -40...+70</td>
</tr>
<tr>
<td>Average and max. relative humidity (DIN 40040)</td>
<td>65% (yearly average)</td>
</tr>
<tr>
<td>Vibration resistance (IEC 50-1)</td>
<td>0.08-1.8 (0.35 mm/10-55 Hz; 3 axis/6 h)</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP52 indoors</td>
</tr>
<tr>
<td>- on the terminals (IEC 144. DIN 40050)</td>
<td></td>
</tr>
<tr>
<td>- with suitable terminal covers</td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td></td>
</tr>
<tr>
<td>- cases and front edge</td>
<td>self-extinguishing thermosetting material</td>
</tr>
<tr>
<td></td>
<td>in accordance with UL94 V-0, fungus and termite</td>
</tr>
<tr>
<td></td>
<td>resistant</td>
</tr>
<tr>
<td>- pointers (DIN 43802)</td>
<td>molded aluminium</td>
</tr>
<tr>
<td>- terminals</td>
<td>brass</td>
</tr>
<tr>
<td>Assembly</td>
<td>vertical/horizontal with special screw-on brackets</td>
</tr>
<tr>
<td>Dimensions W x H x D</td>
<td>48 x 48 x 53 72 x 72 x 53 96 x 96 X 53</td>
</tr>
<tr>
<td>Applicable standards</td>
<td>IEC EN 61010-1</td>
</tr>
</tbody>
</table>

1. The overload can be greater for instruments enabled by a CT because the transformer generally keeps secondary current peaks to within 10 In.
2. Tropicalization enables the instruments to withstand up to 95% max. relative humidity (+35 °C/60 days). In accordance with DIN standard 40040, they must be protected against any penetration of humidity inside the device. Terminals, screws, washers, bolts and magnets are galvanically protected against rust, while the electrical circuits are painted with the special Multicolor PC52 varnish.
3. The pointer damping time is 1 second. The recorded values are cleared by pressing the control provided.
4. With 0.5 mm -19 mm thick panels, the screws must be attached in the fixing position nearest to the front edge of the measuring device, whereas the 20 mm - 39 mm thick panels require the screws to be fixed in the position furthest away from the front edge.
Energy efficiency
Front-panel analogue instruments

Available in both alternating current and direct current versions, the front-panel mono-
function measurement devices come in two standard sizes, 72 mm x 72 mm and
96 mm x 96 mm (special versions available on request), employable in single-phase
networks. The range is composed ammeters for a.c. and d.c. applications, and voltmeters
and frequency meters for a.c. applications. Ammeters without scale for indirect connection
must be completed with the appropriate scale, chosen according to the full-scale value.

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>V a.c.</th>
<th>EAN</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>72 D</td>
<td>50</td>
<td>544104</td>
<td>VLM-1-50/72</td>
<td>2CSG112100R4001</td>
<td>1</td>
<td>1</td>
<td>pc.</td>
</tr>
<tr>
<td>72 D</td>
<td>60</td>
<td>544203</td>
<td>VLM-1-60/72</td>
<td>2CSG112110R4001</td>
<td>1</td>
<td>1</td>
<td>pc.</td>
</tr>
<tr>
<td>72 D</td>
<td>80</td>
<td>544302</td>
<td>VLM-1-80/72</td>
<td>2CSG112120R4001</td>
<td>1</td>
<td>1</td>
<td>pc.</td>
</tr>
<tr>
<td>72 D</td>
<td>100</td>
<td>544401</td>
<td>VLM-1-100/72</td>
<td>2CSG112130R4001</td>
<td>1</td>
<td>1</td>
<td>pc.</td>
</tr>
<tr>
<td>72 D</td>
<td>150</td>
<td>544500</td>
<td>VLM-1-150/72</td>
<td>2CSG112150R4001</td>
<td>1</td>
<td>1</td>
<td>pc.</td>
</tr>
<tr>
<td>72 D</td>
<td>200</td>
<td>544609</td>
<td>VLM-1-200/72</td>
<td>2CSG112160R4001</td>
<td>1</td>
<td>1</td>
<td>pc.</td>
</tr>
<tr>
<td>72 D</td>
<td>250</td>
<td>544708</td>
<td>VLM-1-250/72</td>
<td>2CSG112180R4001</td>
<td>1</td>
<td>1</td>
<td>pc.</td>
</tr>
<tr>
<td>72 D</td>
<td>300</td>
<td>544807</td>
<td>VLM-1-300/72</td>
<td>2CSG112190R4001</td>
<td>1</td>
<td>1</td>
<td>pc.</td>
</tr>
<tr>
<td>72 D</td>
<td>400</td>
<td>544906</td>
<td>VLM-1-400/72</td>
<td>2CSG112210R4001</td>
<td>1</td>
<td>1</td>
<td>pc.</td>
</tr>
<tr>
<td>72 D</td>
<td>500</td>
<td>545002</td>
<td>VLM-1-500/72</td>
<td>2CSG112220R4001</td>
<td>1</td>
<td>1</td>
<td>pc.</td>
</tr>
<tr>
<td>72 D</td>
<td>600</td>
<td>545101</td>
<td>VLM-1-600/72</td>
<td>2CSG112230R4001</td>
<td>1</td>
<td>1</td>
<td>pc.</td>
</tr>
</tbody>
</table>
Energy efficiency

Front-panel analogue instruments

<table>
<thead>
<tr>
<th>Size mm</th>
<th>Insertion</th>
<th>Scale V.a.c.</th>
<th>VT type</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>96</td>
<td>D</td>
<td>50</td>
<td>VLM-1-50/96</td>
<td>546702</td>
<td>2CSG113100R4001</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D</td>
<td>60</td>
<td>VLM-1-60/96</td>
<td>546801</td>
<td>2CSG113110R4001</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D</td>
<td>80</td>
<td>VLM-1-80/96</td>
<td>546900</td>
<td>2CSG113120R4001</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D</td>
<td>100</td>
<td>VLM-1-100/96</td>
<td>547006</td>
<td>2CSG113130R4001</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D</td>
<td>150</td>
<td>VLM-1-150/96</td>
<td>547105</td>
<td>2CSG113150R4001</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D</td>
<td>200</td>
<td>VLM-1-200/96</td>
<td>547204</td>
<td>2CSG113160R4001</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D</td>
<td>250</td>
<td>VLM-1-250/96</td>
<td>547303</td>
<td>2CSG113180R4001</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D</td>
<td>300</td>
<td>VLM-1-300/96</td>
<td>547402</td>
<td>2CSG113190R4001</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D</td>
<td>400</td>
<td>VLM-1-400/96</td>
<td>547501</td>
<td>2CSG113210R4001</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D</td>
<td>500</td>
<td>VLM-1-500/96</td>
<td>547600</td>
<td>2CSG113220R4001</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D</td>
<td>600</td>
<td>VLM-1-600/96</td>
<td>547709</td>
<td>2CSG113230R4001</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

D: direct connection
### Energy efficiency
Front-panel analogue ammeters for alternating current

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>Insertion Scale</th>
<th>Bbn 8012542 EAN</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>72</td>
<td>D 1</td>
<td>545507</td>
<td>AMT1-A1-1/72</td>
<td>2CSG31020R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>D 5</td>
<td>545606</td>
<td>AMT1-A1-5/72</td>
<td>2CSG31030R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>D 10</td>
<td>545705</td>
<td>AMT1-A1-10/72</td>
<td>2CSG31040R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>D 15</td>
<td>545804</td>
<td>AMT1-A1-15/72</td>
<td>2CSG31050R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>D 20</td>
<td>545903</td>
<td>AMT1-A1-20/72</td>
<td>2CSG31060R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>D 25</td>
<td>546009</td>
<td>AMT1-A1-25/72</td>
<td>2CSG31070R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>D 30</td>
<td>546108</td>
<td>AMT1-A1-30/72</td>
<td>2CSG31080R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>D 40</td>
<td>546207</td>
<td>AMT1-A1-40/72</td>
<td>2CSG31090R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>D 50</td>
<td>546306</td>
<td>AMT1-A1-50/72</td>
<td>2CSG31100R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>D 60</td>
<td>546405</td>
<td>AMT1-A1-60/72</td>
<td>2CSG31110R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>I SCL-A1</td>
<td>546504</td>
<td>AMT1-A1/72</td>
<td>2CSG322250R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>72</td>
<td>I SCL-A5</td>
<td>546603</td>
<td>AMT1-A5/72</td>
<td>2CSG322260R4001</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size (mm)</th>
<th>Insertion Scale</th>
<th>Bbn 8012542 EAN</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>96</td>
<td>D 1</td>
<td>548102</td>
<td>AMT1-A1-1/96</td>
<td>2CSG313020R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D 5</td>
<td>548201</td>
<td>AMT1-A1-5/96</td>
<td>2CSG313030R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D 10</td>
<td>548300</td>
<td>AMT1-A1-10/96</td>
<td>2CSG313040R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D 15</td>
<td>548409</td>
<td>AMT1-A1-15/96</td>
<td>2CSG313050R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D 20</td>
<td>548508</td>
<td>AMT1-A1-20/96</td>
<td>2CSG313060R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D 25</td>
<td>548607</td>
<td>AMT1-A1-25/96</td>
<td>2CSG313070R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D 30</td>
<td>548706</td>
<td>AMT1-A1-30/96</td>
<td>2CSG313080R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D 40</td>
<td>548805</td>
<td>AMT1-A1-40/96</td>
<td>2CSG313090R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D 50</td>
<td>548904</td>
<td>AMT1-A1-50/96</td>
<td>2CSG313100R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>D 60</td>
<td>549000</td>
<td>AMT1-A1-60/96</td>
<td>2CSG313110R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>I SCL-A1</td>
<td>549109</td>
<td>AMT1-A1/96</td>
<td>2CSG323250R4001</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>96</td>
<td>I SCL-A5</td>
<td>549208</td>
<td>AMT1-A5/96</td>
<td>2CSG323260R4001</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

D: direct connection  
I: indirect connection with VT, CT and shunt, according to the type
## Energy efficiency

Front-panel analogue instruments

![FRZ 72](image1)

![FRZ 96](image2)

<table>
<thead>
<tr>
<th>Size</th>
<th>Insertion</th>
<th>Scale</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>72 D</td>
<td>90°</td>
<td>555704</td>
<td>FRZ-90/72</td>
<td>2CSG812310R4001</td>
<td>1</td>
<td></td>
<td>pc.</td>
</tr>
<tr>
<td>72 D</td>
<td>240°</td>
<td>555902</td>
<td>FRZ-240/72</td>
<td>2CSG812320R4001</td>
<td>1</td>
<td></td>
<td>pc.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Size</th>
<th>Insertion</th>
<th>Scale</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>mm</td>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>96 D</td>
<td>90°</td>
<td>555803</td>
<td>FRZ-90/96</td>
<td>2CSG813310R4001</td>
<td>1</td>
<td></td>
<td>pc.</td>
</tr>
<tr>
<td>96 D</td>
<td>240°</td>
<td>556008</td>
<td>FRZ-240/96</td>
<td>2CSG813320R4001</td>
<td>1</td>
<td></td>
<td>pc.</td>
</tr>
</tbody>
</table>

D: direct connection
I: indirect connection with VT, CT and shunt, according to the type
**Energy efficiency**

Scales for front-panel analogue instrument

<table>
<thead>
<tr>
<th>Scale</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>771609</td>
<td>SCL-A1-1/72</td>
<td>2CSG112010R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>771708</td>
<td>SCL-A1-5/72</td>
<td>2CSG112021R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>771807</td>
<td>SCL-A1-10/72</td>
<td>2CSG112032R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>15</td>
<td>771906</td>
<td>SCL-A1-15/72</td>
<td>2CSG112054R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>20</td>
<td>772002</td>
<td>SCL-A1-20/72</td>
<td>2CSG112075R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>25</td>
<td>772101</td>
<td>SCL-A1-25/72</td>
<td>2CSG112096R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>30</td>
<td>772200</td>
<td>SCL-A1-30/72</td>
<td>2CSG112107R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>40</td>
<td>772309</td>
<td>SCL-A1-40/72</td>
<td>2CSG112128R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>50</td>
<td>772408</td>
<td>SCL-A1-50/72</td>
<td>2CSG112149R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>60</td>
<td>772507</td>
<td>SCL-A1-60/72</td>
<td>2CSG112159R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>80</td>
<td>772606</td>
<td>SCL-A1-80/72</td>
<td>2CSG112179R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>100</td>
<td>572305</td>
<td>SCL-A1-100/72</td>
<td>2CSG112189R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>150</td>
<td>572404</td>
<td>SCL-A1-150/72</td>
<td>2CSG112209R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>200</td>
<td>572503</td>
<td>SCL-A1-200/72</td>
<td>2CSG112229R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>250</td>
<td>572602</td>
<td>SCL-A1-250/72</td>
<td>2CSG112249R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>300</td>
<td>572701</td>
<td>SCL-A1-300/72</td>
<td>2CSG112259R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>400</td>
<td>572800</td>
<td>SCL-A1-400/72</td>
<td>2CSG112279R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>500</td>
<td>572909</td>
<td>SCL-A1-500/72</td>
<td>2CSG112299R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>600</td>
<td>573005</td>
<td>SCL-A1-600/72</td>
<td>2CSG112309R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>800</td>
<td>573104</td>
<td>SCL-A1-800/72</td>
<td>2CSG112329R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>1000</td>
<td>573203</td>
<td>SCL-A1-1000/72</td>
<td>2CSG112339R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>1500</td>
<td>573302</td>
<td>SCL-A1-1500/72</td>
<td>2CSG112359R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>2000</td>
<td>573401</td>
<td>SCL-A1-2000/72</td>
<td>2CSG112379R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>2500</td>
<td>573500</td>
<td>SCL-A1-2500/72</td>
<td>2CSG112389R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>3000</td>
<td>573609</td>
<td>SCL-A1-3000/72</td>
<td>2CSG112399R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>4000</td>
<td>573708</td>
<td>SCL-A1-4000/72</td>
<td>2CSG112409R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>5000</td>
<td>573807</td>
<td>SCL-A1-5000/72</td>
<td>2CSG112419R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>6000</td>
<td>573906</td>
<td>SCL-A1-6000/72</td>
<td>2CSG112429R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>8000</td>
<td>574005</td>
<td>SCL-A1-8000/72</td>
<td>2CSG112439R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>10000</td>
<td>574101</td>
<td>SCL-A1-10000/72</td>
<td>2CSG112449R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
</tbody>
</table>
## Energy efficiency

Scales for front-panel analogue instrument

---

### Scales 72 x 72 mm: SCL-A5 for AMT1-A5/72 a.c. ammeters

<table>
<thead>
<tr>
<th>Scale</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.c.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>772705</td>
<td>SCL-A5-1/72</td>
<td>2C5G122010R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>772804</td>
<td>SCL-A5-5/72</td>
<td>2C5G122021R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>772903</td>
<td>SCL-A5-10/72</td>
<td>2C5G122032R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>15</td>
<td>773009</td>
<td>SCL-A5-15/72</td>
<td>2C5G122054R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>20</td>
<td>773108</td>
<td>SCL-A5-20/72</td>
<td>2C5G122075R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>25</td>
<td>773207</td>
<td>SCL-A5-25/72</td>
<td>2C5G122096R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>30</td>
<td>773306</td>
<td>SCL-A5-30/72</td>
<td>2C5G122107R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>40</td>
<td>773405</td>
<td>SCL-A5-40/72</td>
<td>2C5G122128R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>50</td>
<td>773504</td>
<td>SCL-A5-50/72</td>
<td>2C5G122149R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>60</td>
<td>773603</td>
<td>SCL-A5-60/72</td>
<td>2C5G122159R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>80</td>
<td>773702</td>
<td>SCL-A5-80/72</td>
<td>2C5G122179R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>100</td>
<td>574200</td>
<td>SCL-A5-100/72</td>
<td>2C5G122189R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>150</td>
<td>574309</td>
<td>SCL-A5-150/72</td>
<td>2C5G122209R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>200</td>
<td>574408</td>
<td>SCL-A5-200/72</td>
<td>2C5G122229R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>250</td>
<td>574507</td>
<td>SCL-A5-250/72</td>
<td>2C5G122249R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>300</td>
<td>574606</td>
<td>SCL-A5-300/72</td>
<td>2C5G122259R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>400</td>
<td>574705</td>
<td>SCL-A5-400/72</td>
<td>2C5G122279R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>500</td>
<td>574804</td>
<td>SCL-A5-500/72</td>
<td>2C5G122299R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>600</td>
<td>574903</td>
<td>SCL-A5-600/72</td>
<td>2C5G122309R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>800</td>
<td>575009</td>
<td>SCL-A5-800/72</td>
<td>2C5G122329R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>1000</td>
<td>575108</td>
<td>SCL-A5-1000/72</td>
<td>2C5G122339R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>1500</td>
<td>575207</td>
<td>SCL-A5-1500/72</td>
<td>2C5G122359R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>2000</td>
<td>575306</td>
<td>SCL-A5-2000/72</td>
<td>2C5G122379R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>2500</td>
<td>575405</td>
<td>SCL-A5-2500/72</td>
<td>2C5G122389R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>3000</td>
<td>575504</td>
<td>SCL-A5-3000/72</td>
<td>2C5G122399R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>4000</td>
<td>575603</td>
<td>SCL-A5-4000/72</td>
<td>2C5G122409R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>5000</td>
<td>575702</td>
<td>SCL-A5-5000/72</td>
<td>2C5G122419R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>6000</td>
<td>575801</td>
<td>SCL-A5-6000/72</td>
<td>2C5G122429R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>8000</td>
<td>575900</td>
<td>SCL-A5-8000/72</td>
<td>2C5G122439R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
<tr>
<td>10000</td>
<td>576006</td>
<td>SCL-A5-10000/72</td>
<td>2C5G122449R5011</td>
<td>0.010</td>
<td>10</td>
</tr>
</tbody>
</table>
## Energy efficiency
Scales for front-panel analogue instrument

<table>
<thead>
<tr>
<th>Scale</th>
<th>EAN</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>773801</td>
<td>SCL-A1-1/96</td>
<td>2CSG113010R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>773900</td>
<td>SCL-A1-5/96</td>
<td>2CSG113021R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>774006</td>
<td>SCL-A1-10/96</td>
<td>2CSG113032R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>774105</td>
<td>SCL-A1-15/96</td>
<td>2CSG113054R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>774204</td>
<td>SCL-A1-20/96</td>
<td>2CSG113075R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>774303</td>
<td>SCL-A1-25/96</td>
<td>2CSG113096R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>774402</td>
<td>SCL-A1-30/96</td>
<td>2CSG113107R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>774501</td>
<td>SCL-A1-40/96</td>
<td>2CSG113128R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>774600</td>
<td>SCL-A1-50/96</td>
<td>2CSG113149R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>774709</td>
<td>SCL-A1-60/96</td>
<td>2CSG113159R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>774808</td>
<td>SCL-A1-80/96</td>
<td>2CSG113179R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>584100</td>
<td>SCL-A1-100/96</td>
<td>2CSG113189R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>584209</td>
<td>SCL-A1-150/96</td>
<td>2CSG113209R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>584308</td>
<td>SCL-A1-200/96</td>
<td>2CSG113229R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>584407</td>
<td>SCL-A1-250/96</td>
<td>2CSG113249R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>584506</td>
<td>SCL-A1-300/96</td>
<td>2CSG113259R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>584605</td>
<td>SCL-A1-400/96</td>
<td>2CSG113279R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>584704</td>
<td>SCL-A1-500/96</td>
<td>2CSG113299R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>584803</td>
<td>SCL-A1-600/96</td>
<td>2CSG113309R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>584902</td>
<td>SCL-A1-800/96</td>
<td>2CSG113329R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>585008</td>
<td>SCL-A1-1000/96</td>
<td>2CSG113339R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>1500</td>
<td>585107</td>
<td>SCL-A1-1500/96</td>
<td>2CSG113359R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>585206</td>
<td>SCL-A1-2000/96</td>
<td>2CSG113379R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>2500</td>
<td>585305</td>
<td>SCL-A1-2500/96</td>
<td>2CSG113389R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td>585404</td>
<td>SCL-A1-3000/96</td>
<td>2CSG113399R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>4000</td>
<td>585503</td>
<td>SCL-A1-4000/96</td>
<td>2CSG113409R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>5000</td>
<td>585602</td>
<td>SCL-A1-5000/96</td>
<td>2CSG113419R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>6000</td>
<td>585701</td>
<td>SCL-A1-6000/96</td>
<td>2CSG113429R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>8000</td>
<td>585800</td>
<td>SCL-A1-8000/96</td>
<td>2CSG113439R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>10000</td>
<td>585909</td>
<td>SCL-A1-10000/96</td>
<td>2CSG113449R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>
Energy efficiency
Scales for front-panel analogue instrument

<table>
<thead>
<tr>
<th>Scale</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>774907 SCL-AS-1/96</td>
<td>2C5G123010R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>775003 SCL-AS-5/96</td>
<td>2C5G123021R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>775102 SCL-AS-10/96</td>
<td>2C5G123032R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>775201 SCL-AS-15/96</td>
<td>2C5G123054R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>775300 SCL-AS-20/96</td>
<td>2C5G123075R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>775409 SCL-AS-25/96</td>
<td>2C5G123096R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>775508 SCL-AS-30/96</td>
<td>2C5G123107R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>775607 SCL-AS-40/96</td>
<td>2C5G123128R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>775706 SCL-AS-50/96</td>
<td>2C5G123149R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>775805 SCL-AS-60/96</td>
<td>2C5G123159R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>775904 SCL-AS-80/96</td>
<td>2C5G123179R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>586005 SCL-AS-100/96</td>
<td>2C5G123189R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>586104 SCL-AS-150/96</td>
<td>2C5G123209R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>586203 SCL-AS-200/96</td>
<td>2C5G123229R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>586302 SCL-AS-250/96</td>
<td>2C5G123249R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>586401 SCL-AS-300/96</td>
<td>2C5G123259R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>586500 SCL-AS-400/96</td>
<td>2C5G123279R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>586609 SCL-AS-500/96</td>
<td>2C5G123299R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>586708 SCL-AS-600/96</td>
<td>2C5G123309R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>586807 SCL-AS-800/96</td>
<td>2C5G123329R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>586906 SCL-AS-1000/96</td>
<td>2C5G123339R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>1500</td>
<td>587002 SCL-AS-1500/96</td>
<td>2C5G123359R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>587101 SCL-AS-2000/96</td>
<td>2C5G123379R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>2500</td>
<td>587200 SCL-AS-2500/96</td>
<td>2C5G123399R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td>587309 SCL-AS-3000/96</td>
<td>2C5G123399R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>4000</td>
<td>587408 SCL-AS-4000/96</td>
<td>2C5G123409R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>5000</td>
<td>587507 SCL-AS-5000/96</td>
<td>2C5G123419R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>6000</td>
<td>587606 SCL-AS-6000/96</td>
<td>2C5G123429R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>8000</td>
<td>587705 SCL-AS-8000/96</td>
<td>2C5G123439R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>10000</td>
<td>587804 SCL-AS-10000/96</td>
<td>2C5G123449R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>
Energy efficiency
Scales for front-panel analogue instrument

<table>
<thead>
<tr>
<th>Scale (A.)</th>
<th>EAN</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>598107</td>
<td>SCL-A2-20/96</td>
<td>2CSG233075R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>598206</td>
<td>SCL-A2-100/96</td>
<td>2CSG233189R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>598305</td>
<td>SCL-A2-150/96</td>
<td>2CSG233209R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>598404</td>
<td>SCL-A2-200/96</td>
<td>2CSG233229R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>598503</td>
<td>SCL-A2-250/96</td>
<td>2CSG233249R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>598602</td>
<td>SCL-A2-300/96</td>
<td>2CSG233259R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>598701</td>
<td>SCL-A2-400/96</td>
<td>2CSG233279R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>598800</td>
<td>SCL-A2-500/96</td>
<td>2CSG233299R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>598909</td>
<td>SCL-A2-600/96</td>
<td>2CSG233309R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>599005</td>
<td>SCL-A2-800/96</td>
<td>2CSG233329R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>599104</td>
<td>SCL-A2-1000/96</td>
<td>2CSG233339R5011</td>
<td>0.010</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>
**Energy efficiency**

**Voltmetric and current switches**

### Technical features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation voltage [V]</td>
<td>600</td>
</tr>
<tr>
<td>Rated thermal current [A]</td>
<td>12</td>
</tr>
<tr>
<td>Mechanic operations [No.]</td>
<td>1000000</td>
</tr>
<tr>
<td>Power consumption [VA]</td>
<td>0.23</td>
</tr>
<tr>
<td>Modules [No.]</td>
<td>3</td>
</tr>
</tbody>
</table>

### MCV - MCA voltmetric and current switches

Cam rotary switches are suitable for mounting on EN 50022 rail. In three-phase systems they enable the use of a single measurement instrument (single-phase) for viewing the current or voltage value set through the switch itself.

#### Voltmeter switches

<table>
<thead>
<tr>
<th>Range</th>
<th>Power loss</th>
<th>Bbn</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1, L2, L3</td>
<td>0.5</td>
<td>522469</td>
<td>MCV 4</td>
<td>0.095</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>L1, L2, L3, N</td>
<td>0.5</td>
<td>522438</td>
<td>MCV 7</td>
<td>0.110</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

#### Current switches

<table>
<thead>
<tr>
<th>Range</th>
<th>Power loss</th>
<th>Bbn</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1-2-3</td>
<td>0.5</td>
<td>522452</td>
<td>MCA 4</td>
<td>0.110</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

### Front panel QCV - QCA voltage and current switches

For use in three-phase systems, to allow a single device to measure the voltage and current settings adjusted by the switches.

#### Measure

<table>
<thead>
<tr>
<th>Measure</th>
<th>Position</th>
<th>Bbn</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>4</td>
<td>527990</td>
<td>QCV-4/48</td>
<td>0.150</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Current</td>
<td>4</td>
<td>528003</td>
<td>QCA-4/48</td>
<td>0.150</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
<td>7</td>
<td>527983</td>
<td>QCV-7/48</td>
<td>0.150</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>
Energy efficiency
E 233 hour counters

Technical features

<table>
<thead>
<tr>
<th>AC equipment</th>
<th>DC equipment</th>
</tr>
</thead>
</table>
| Rated voltage | 50 Hz: 24 V, 230 V  
60 Hz: 24 V, 120 V, 240 V | DC 12 V ... 48 V |
| Voltage tolerance | ±15 % | ±10 % |
| Power consumption | 1.5 VA | ca. 20 mW (at 12 V DC) |
| Ambient temperature | –15 °C/5 °F ... +50 °C/122 °F | –10 °C/14 °F ... +50 °C/122 °F |
| Counting capacity | 99.999 h | 99.999 h |
| Reading accuracy | 0.01 h | 0.1 h |
| Operation display | fast running | LED blinking |
| Protection against electric shock | according to DIN VDE 0106 Part 100 (BGV A2) | according to DIN VDE 0106 Part 100 (BGV A2) |
| Terminal size | up to 10 mm² | up to 10 mm² |

E 233 electro-mechanical hour counters

Hour counters are used to record operating times as well as to determine idle times and off times of industrial machinery and plant, for commercial purposes or in domestic installations. No reset functionality.

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>Bbn EAN</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC 230 V/50 Hz</td>
<td>63000 4</td>
<td>E 233-230</td>
<td>2CDE100000R1601</td>
<td>0.05</td>
<td>10</td>
</tr>
<tr>
<td>AC 24 V/50 Hz</td>
<td>63010 3</td>
<td>E 233-24</td>
<td>2CDE400000R1601</td>
<td>0.05</td>
<td>10</td>
</tr>
<tr>
<td>DC 12 V ... 48 V</td>
<td>63020 2</td>
<td>E 233-12/48</td>
<td>2CDE300001R1601</td>
<td>0.05</td>
<td>10</td>
</tr>
<tr>
<td>AC 240 V/60 Hz</td>
<td>36590 1</td>
<td>E 233-240/60 Hz</td>
<td>2CDE100021R1601</td>
<td>0.05</td>
<td>10</td>
</tr>
<tr>
<td>AC 120 V/60 Hz</td>
<td>36600 7</td>
<td>E 233-240/60 Hz</td>
<td>2CDE600021R1601</td>
<td>0.05</td>
<td>10</td>
</tr>
<tr>
<td>AC 24 V/60 Hz</td>
<td>36610 6</td>
<td>E 233-24/60 Hz</td>
<td>2CDE400021R1601</td>
<td>0.05</td>
<td>10</td>
</tr>
</tbody>
</table>

(1) Bbn No. 4016779
Energy efficiency
HMT hour counters

Technical features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage Un</td>
<td>a.c. 24</td>
</tr>
<tr>
<td></td>
<td>a.c. 110</td>
</tr>
<tr>
<td></td>
<td>a.c. 230</td>
</tr>
<tr>
<td>Displayed digits (in hours)</td>
<td>99,999.9 (for HMT1 and HMT11)</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>0.5</td>
</tr>
<tr>
<td>Frequency</td>
<td>50</td>
</tr>
<tr>
<td>Power consumption</td>
<td>1.1...2.2</td>
</tr>
<tr>
<td>Modules</td>
<td>2</td>
</tr>
</tbody>
</table>

HMT electro-mechanical hour counters
Equipped with 7-digit indicator (99,999,99) and available in two modules. They cannot be reset.

<table>
<thead>
<tr>
<th>Rated voltage</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>V AC</td>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>030300</td>
<td>HMT 1/24</td>
<td>2CSM111000R1601</td>
<td>0.200</td>
<td>6</td>
</tr>
<tr>
<td>110</td>
<td>030409</td>
<td>HMT 1/110</td>
<td>2CSM121000R1601</td>
<td>0.200</td>
<td>6</td>
</tr>
<tr>
<td>230</td>
<td>030508</td>
<td>HMT 1/220</td>
<td>2CSM131000R1601</td>
<td>0.200</td>
<td>6</td>
</tr>
<tr>
<td>230</td>
<td>030607</td>
<td>HMT 11</td>
<td>2CSM133000R1601</td>
<td>0.200</td>
<td>1</td>
</tr>
</tbody>
</table>
## Energy efficiency

**TMD temperature control units**

<table>
<thead>
<tr>
<th>Technical features</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Auxiliary supply</strong></td>
<td></td>
</tr>
<tr>
<td>Alternating current [V]</td>
<td>20÷250 ±15%</td>
</tr>
<tr>
<td>Direct current [Hz]</td>
<td>115-230-400 50-60</td>
</tr>
<tr>
<td><strong>Power consumption</strong></td>
<td>4 max</td>
</tr>
<tr>
<td><strong>Input</strong></td>
<td></td>
</tr>
<tr>
<td>Sensor</td>
<td>PT100 RTD (not included)</td>
</tr>
<tr>
<td>Type</td>
<td>3 wires (2 and 4 wires types are also supported)</td>
</tr>
<tr>
<td>Error</td>
<td>1 degree every 0,39 W</td>
</tr>
<tr>
<td>Measure range [°C]</td>
<td>0...220 ± 2</td>
</tr>
<tr>
<td>Compensation [Ω]</td>
<td>20 max</td>
</tr>
<tr>
<td>Trip delay/hysteresis [s/°C]</td>
<td>5/2</td>
</tr>
<tr>
<td><strong>Output</strong></td>
<td></td>
</tr>
<tr>
<td>Number</td>
<td>4</td>
</tr>
<tr>
<td>Type</td>
<td>NO-CO-NC</td>
</tr>
<tr>
<td>Vmax [V]</td>
<td>12 d.c.</td>
</tr>
<tr>
<td>Imaxww [A]</td>
<td>8 (resistive load)</td>
</tr>
<tr>
<td>Functions</td>
<td>Alarm, trip, cooling, auto-test</td>
</tr>
<tr>
<td>Programmable functions</td>
<td>Alarm, tip, hold, fan, temp. max</td>
</tr>
<tr>
<td><strong>Display</strong></td>
<td>7 segments LED</td>
</tr>
<tr>
<td><strong>Connections</strong></td>
<td>Terminals removable screw</td>
</tr>
<tr>
<td>Max section [mm²]</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Insulation voltage</strong> [V]</td>
<td>2500/50 Hz - 1 min</td>
</tr>
<tr>
<td><strong>Protection degree</strong></td>
<td></td>
</tr>
<tr>
<td>Front</td>
<td>IP52</td>
</tr>
<tr>
<td>Rear</td>
<td>IP20</td>
</tr>
<tr>
<td><strong>Operation temperature</strong> [°C]</td>
<td>-10...+55, relative humidity max 90%</td>
</tr>
<tr>
<td><strong>Storage temperature</strong> [°C]</td>
<td>-25...+80</td>
</tr>
<tr>
<td><strong>Reference</strong></td>
<td>IEC EN 50081-2, IEC EN 50082-2, IEC EN 60255</td>
</tr>
</tbody>
</table>

### Temperature control units

TMD are used to measure and control the temperature levels and efficiency of electric machines, power transformers, motors, etc.

The temperature is measured by four PT100 type sensors. Each measuring channel has two programmable alarm thresholds which trip two output relays to remotely signal that a critical temperature has been reached.

The measured values and any alarm conditions are shown on the dual 3-digit display on the front of the device, which also has five programming keys for configuring its operation.

The control unit is also able to store in memory maximum values and a log of all trip-events.

<table>
<thead>
<tr>
<th>Temperature measured</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>560203</td>
<td>TMD-4/96</td>
<td>2C95240000R2021</td>
<td>0.8</td>
<td>1</td>
</tr>
</tbody>
</table>

---
## Energy efficiency

Current transformers selection table

### Breaker choice

<table>
<thead>
<tr>
<th>Modular</th>
<th>S200, S280, S290, S700, S750DR, S800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tmax</td>
<td>XT1, XT2, XT3, XT4, T4320</td>
</tr>
<tr>
<td>Emax</td>
<td>T5</td>
</tr>
</tbody>
</table>

### Installation choice

<table>
<thead>
<tr>
<th>Fixing system</th>
<th>DIN rail</th>
<th>DIN rail, cable or bus bar</th>
<th>Bus bar</th>
<th>DIN rail, cable or bus bar, base mounted with feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIN rail</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIN rail, cable or bus bar</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bus bar</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIN rail, cable or bus bar, base mounted with feet</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Rated current (A)</th>
<th>CTA</th>
<th>TRF M</th>
<th>CT PRO XT</th>
<th>CT30</th>
<th>CT MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Standard</td>
<td>SELV version</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>2CS- G111050R1141 CTA/20</td>
<td>2CS- M100050R1111 TRFM/40</td>
<td>2CSG225745R1101 CT PRO XT 40</td>
<td>2CSG225845R1101 CT PRO XT 40 SELV</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>2CS- G111060R1141 CTA/25</td>
<td></td>
<td>2CSG225755R1101 CT PRO XT 50</td>
<td>2CSG225855R1101 CT PRO XT 50 SELV</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>2CS- G111080R1141 CTA/40 (cl. 0.5)</td>
<td>2CS- M100080R1111 TRFM/40</td>
<td>2CSG225765R1101 CT PRO XT 60</td>
<td>2CSG225865R1101 CT PRO XT 60 SELV</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>2CS- G111090R1141 CTA/50 (cl. 0.5)</td>
<td>2CS- M100090R1111 TRFM/50 (cl. 1)</td>
<td>2CSG225775R1101 CT PRO XT 70</td>
<td>2CSG225875R1101 CT PRO XT 70 SELV</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>2CSG111100R1141 CTA/60 (cl. 0.5)</td>
<td>2CS- G111100R1111 TRFM/60 (cl. 1)</td>
<td>2CSG225785R1101 CT PRO XT 80</td>
<td>2CSG225885R1101 CT PRO XT 80 SELV</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>2CSG111110R1141 CTA/80 (cl. 0.5)</td>
<td>2CSG225795R1101 CT PRO XT 90</td>
<td>2CSG225895R1101 CT PRO XT 90 SELV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>2CSG111120R1141 CTA/100 (cl. 0.5)</td>
<td>2CS- G111120R1111 TRFM/100</td>
<td>2CSG225805R1101 CT PRO XT 100</td>
<td>2CSG225905R1101 CT PRO XT 100 SELV</td>
<td>2CS- G101100R1101 CT30/100 (cl. 3)</td>
</tr>
<tr>
<td>150</td>
<td>2CSM100100R1111 TRFM/150</td>
<td>2CSG225915R1101 CT PRO XT 150</td>
<td>2CSG225915R1101 CT PRO XT 150 SELV</td>
<td>2CS- G101110R1110 CT30/110 (cl. 3)</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>2CSG225925R1101 CT PRO XT 200</td>
<td>2CSG225935R1101 CT PRO XT 200</td>
<td>2CSG226005R1101 CT MAX 300 SELV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>2CSG226050R1101 CT PRO XT 250</td>
<td>2CSG226060R1101 CT PRO XT 250</td>
<td>2CSG226085R1101 CT PRO XT 250 SELV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>2CSG226075R1101 CT PRO XT 300</td>
<td>2CSG226095R1101 CT PRO XT 300</td>
<td>2CSG226105R1101 CT MAX 300 SELV</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T6,77</td>
<td>T6,77</td>
<td>E1.2, E2.2, E4.2</td>
<td>E2, E3, E4, E6</td>
<td>E2.2, E4.2, E6.2</td>
<td>E2.2, E4.2</td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
<td>-----------------</td>
<td>----------------</td>
<td>-----------------</td>
<td>--------------</td>
</tr>
<tr>
<td>Cable or bus bar, base mounted with feet</td>
<td>Bus bar</td>
<td>Cable or bus bar, base mounted with feet</td>
<td>Bus bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CT6</td>
<td>CT8</td>
<td>CT8V</td>
<td>CT80</td>
<td>CT12</td>
<td>CT12V</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>2CSG421130R1101 CT6/250</td>
<td>2CSG201130R1101 CT80/250</td>
<td>0.5</td>
<td></td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>2CSG421140R1101 CT6/300</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Energy efficiency

Current transformers selection table

### Breaker choice
<table>
<thead>
<tr>
<th>Modular</th>
<th>S200, S280, S290, S700, S750DR, S800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tmax</td>
<td>XT1, XT2, XT3, XT4, T4320</td>
</tr>
<tr>
<td>Emax</td>
<td>T5</td>
</tr>
</tbody>
</table>

### Installation choice

<table>
<thead>
<tr>
<th>Fixing system</th>
<th>DIN rail</th>
<th>DIN rail</th>
<th>DIN rail, cable or bus bar</th>
<th>Bus bar</th>
<th>DIN rail, cable or bus bar, base mounted with feet</th>
</tr>
</thead>
</table>

### Rated current (A)

<table>
<thead>
<tr>
<th>Current</th>
<th>CTA</th>
<th>TRF M</th>
<th>CT PRO XT</th>
<th>CT30</th>
<th>CT MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>400</td>
<td>2CSM100I40R1111</td>
<td>TRFM/400</td>
<td>2CSG2255835R1101</td>
<td>2CSG225935R1101</td>
<td>2CSG225955R1101</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>CT PRO XT 400</td>
<td>CT PRO XT 400 SELV</td>
<td>CT MAX 400</td>
</tr>
<tr>
<td>500</td>
<td></td>
<td></td>
<td></td>
<td>CT MAX 500</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td></td>
<td></td>
<td></td>
<td>CT MAX 600</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td></td>
<td></td>
<td></td>
<td>CT MAX 800</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td></td>
<td></td>
<td></td>
<td>CT MAX 1000</td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1250</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2500</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Primary choice

<table>
<thead>
<tr>
<th>CTA</th>
<th>TRF M</th>
<th>CT PRO XT</th>
<th>CT30</th>
<th>CT MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wound primary</td>
<td>Through primary</td>
<td>Split core trough primary</td>
<td>Through primary</td>
<td></td>
</tr>
<tr>
<td>Through 8</td>
<td>29</td>
<td>18</td>
<td>18</td>
<td>–</td>
</tr>
<tr>
<td>primary max</td>
<td>–</td>
<td>20x10</td>
<td>20x10</td>
<td>–</td>
</tr>
<tr>
<td>section [mm]</td>
<td>–</td>
<td>3x80x10</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>30x15; 40x10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30x15; 40x10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Breaker choice

**Modular**
- S200, S280, S290, S700, S750DR, S800
- Tmax XT1, XT2, XT3, XT4, T4320
- T5
- T6, T7

**Emax**
- E1.2, E2.2, E4.2
- E2, E3, E4, E6
- E2.2, E4.2, E6.2
- E2.2, E4.2

### Installation choice

**Fixing system**
- DIN rail
- DIN rail, cable or bus bar
- Bus bar
- DIN rail, cable or bus bar, base mounted with feet
- Cable or bus bar, base mounted with feet
- Bus bar
- Cable or bus bar, base mounted with feet

### Rated current (A)

- **CTA TRF M**
- **CT PRO XT**
- **CT30**
- **CT MAX**
- **CT6**
- **CT8**
- **CT8V**
- **CT80**
- **CT12**
- **CT12V**
- **CT120**
- **CTA TRF M**
- **CT PRO XT**
- **CT30**
- **CT MAX**
- **CT6**
- **CT8**
- **CT8V**
- **CT80**
- **CT12**
- **CT12V**
- **CT120**
- **CTA TRF M**
- **CT PRO XT**
- **CT30**
- **CT MAX**
- **CT6**
- **CT8**
- **CT8V**
- **CT80**
- **CT12**
- **CT12V**
- **CT120**
- **CTA TRF M**
- **CT PRO XT**
- **CT30**
- **CT MAX**
- **CT6**
- **CT8**
- **CT8V**
- **CT80**
- **CT12**
- **CT12V**
- **CT120**
- **CTA TRF M**
- **CT PRO XT**
- **CT30**
- **CT MAX**
- **CT6**
- **CT8**
- **CT8V**
- **CT80**
- **CT12**
- **CT12V**
- **CT120**
- **CTA TRF M**
- **CT PRO XT**
- **CT30**
- **CT MAX**
- **CT6**
- **CT8**
- **CT8V**
- **CT80**
- **CT12**
- **CT12V**
- **CT120**

### Through primary

- 50
- 60x20
- –

### Split core trough primary

- 2x30
- 80x30
- 80x30; 3x80x5
- 2x30x10
- –
- 125x30, 3x100x10, 4x100x5, 4x125x5
- 4x120x10
CT and CTA current transformers

Used to transform primary currents (max. 6000 A) into .../5 A low secondary currents indirectly supplying power to analogue and digital measurement devices. They are available both with wound and through primary. In the first case they are provided along with the bar or the primary terminal; in the second case they have a hole to insert in the bar or the cable which forms the primary.

The rated current to the secondary windings is 5 A, in line with the offer of measuring devices. CT ../1 are not employable with ABB mono-function and multifunction measuring devices. The use of CT ../1 is needed in case of long wirings from CT secondary windings to the measuring device; nowadays, the wide use of communication protocols doesn’t require the instrument to be installed far from the line to measure.

The new SELV versions of the CT PRO XT and CT MAX guarantee maximum safety against overvoltage and switchboard internal overheating thanks to the innovative electronic protection circuit which automatically short-circuit the CT secondary winding in case of accidental disconnection of its secondary terminals.
Energy efficiency
CT measurement current transformers with through primary

Standard type current transformers …/5 A with through primary

<table>
<thead>
<tr>
<th>Primary rated current Iprim A</th>
<th>Accuracy class</th>
<th>Rated power VA</th>
<th>EAN</th>
<th>Type code Order code</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>3</td>
<td>2</td>
<td>257455</td>
<td>CT PRO XT 40</td>
<td>2CSG225745R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>3</td>
<td>2</td>
<td>257554</td>
<td>CT PRO XT 50</td>
<td>2CSG225755R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>3</td>
<td>2</td>
<td>257653</td>
<td>CT PRO XT 60</td>
<td>2CSG225765R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>3</td>
<td>2</td>
<td>257752</td>
<td>CT PRO XT 80</td>
<td>2CSG225775R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>1</td>
<td>3</td>
<td>257851</td>
<td>CT PRO XT 100</td>
<td>2CSG225785R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>1</td>
<td>5</td>
<td>257950</td>
<td>CT PRO XT 150</td>
<td>2CSG225795R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>1</td>
<td>5</td>
<td>258056</td>
<td>CT PRO XT 200</td>
<td>2CSG225805R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>0.5</td>
<td>5</td>
<td>258152</td>
<td>CT PRO XT 250</td>
<td>2CSG225815R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>0.5</td>
<td>5</td>
<td>258155</td>
<td>CT PRO XT 300</td>
<td>2CSG225825R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>0.5</td>
<td>5</td>
<td>258353</td>
<td>CT PRO XT 400</td>
<td>2CSG225835R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

CT PRO XT SELV …/5 A series, through primary

<table>
<thead>
<tr>
<th>Primary rated current Iprim A</th>
<th>Accuracy class</th>
<th>Rated power VA</th>
<th>EAN</th>
<th>Type code Order code</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>3</td>
<td>2</td>
<td>258452</td>
<td>CT PRO XT 40</td>
<td>2CSG225845R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>3</td>
<td>2</td>
<td>258551</td>
<td>CT PRO XT 50</td>
<td>2CSG225855R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>3</td>
<td>2</td>
<td>258650</td>
<td>CT PRO XT 60</td>
<td>2CSG225865R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>3</td>
<td>2</td>
<td>258650</td>
<td>CT PRO XT 80</td>
<td>2CSG225875R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>1</td>
<td>3</td>
<td>258858</td>
<td>CT PRO XT 100</td>
<td>2CSG225885R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>1</td>
<td>5</td>
<td>258957</td>
<td>CT PRO XT 150</td>
<td>2CSG225895R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>200</td>
<td>1</td>
<td>5</td>
<td>259053</td>
<td>CT PRO XT 200</td>
<td>2CSG225905R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>0.5</td>
<td>5</td>
<td>259152</td>
<td>CT PRO XT 250</td>
<td>2CSG225915R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>0.5</td>
<td>5</td>
<td>259251</td>
<td>CT PRO XT 300</td>
<td>2CSG225925R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>0.5</td>
<td>5</td>
<td>259350</td>
<td>CT PRO XT 400</td>
<td>2CSG225935R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

CT PRO XT series

<table>
<thead>
<tr>
<th>Through primary</th>
<th>max section [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>cable</td>
<td>18</td>
</tr>
<tr>
<td>horizontal bar</td>
<td>20x10</td>
</tr>
<tr>
<td>vertical bar</td>
<td>-</td>
</tr>
</tbody>
</table>
## Energy efficiency

CT measurement current transformers with through primary

### CT MAX .../5 A series, through primary

<table>
<thead>
<tr>
<th>Primary rated current I&lt;sub&gt;prim&lt;/sub&gt; A</th>
<th>Accuracy class</th>
<th>Rated power VA</th>
<th>EAN</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>0.5</td>
<td>4</td>
<td>259459</td>
<td>CT MAX 300</td>
<td>2CSG225945R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>0.5</td>
<td>5</td>
<td>259558</td>
<td>CT MAX 400</td>
<td>2CSG225955R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>0.5</td>
<td>6</td>
<td>259558</td>
<td>CT MAX 500</td>
<td>2CSG225965R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>0.5</td>
<td>10</td>
<td>259657</td>
<td>CT MAX 600</td>
<td>2CSG225975R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>0.5</td>
<td>10</td>
<td>259657</td>
<td>CT MAX 800</td>
<td>2CSG225985R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>0.5</td>
<td>10</td>
<td>259954</td>
<td>CT MAX 1000</td>
<td>2CSG225995R1101</td>
<td>0.32</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

### CT MAX SELV .../5 A series, through primary

<table>
<thead>
<tr>
<th>Primary rated current I&lt;sub&gt;prim&lt;/sub&gt; A</th>
<th>Accuracy class</th>
<th>Rated power VA</th>
<th>EAN</th>
<th>Type code</th>
<th>Order code</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>300</td>
<td>0.5</td>
<td>4</td>
<td>260059</td>
<td>CT MAX 300 SELV</td>
<td>2CSG226005R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>0.5</td>
<td>5</td>
<td>260158</td>
<td>CT MAX 400 SELV</td>
<td>2CSG226015R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>0.5</td>
<td>6</td>
<td>260257</td>
<td>CT MAX 500 SELV</td>
<td>2CSG226025R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>0.5</td>
<td>10</td>
<td>260356</td>
<td>CT MAX 600 SELV</td>
<td>2CSG226035R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>0.5</td>
<td>10</td>
<td>260455</td>
<td>CT MAX 800 SELV</td>
<td>2CSG226045R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>0.5</td>
<td>10</td>
<td>260554</td>
<td>CT MAX 1000 SELV</td>
<td>2CSG226055R1101</td>
<td>0.37</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

### CT MAX series

<table>
<thead>
<tr>
<th>Through primary</th>
<th>max section [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>cable</td>
<td>30</td>
</tr>
<tr>
<td>horizontal bar</td>
<td>30x15, 40x10</td>
</tr>
<tr>
<td>vertical bar</td>
<td>-</td>
</tr>
</tbody>
</table>
## Energy efficiency

CT measurement current transformers with through primary

<table>
<thead>
<tr>
<th>CT6 .../5 A series, through primary</th>
<th>Primary rated current</th>
<th>Accuracy class</th>
<th>Rated power</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price</th>
<th>Weight</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iprim A</td>
<td>VA</td>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td>piece</td>
<td>kg</td>
<td>pc.</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>0.5</td>
<td>5</td>
<td>605508</td>
<td>2CSG421130R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>0.5</td>
<td>5</td>
<td>605607</td>
<td>2CSG421140R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>0.5</td>
<td>6</td>
<td>605706</td>
<td>2CSG421150R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>0.5</td>
<td>6</td>
<td>605805</td>
<td>2CSG421160R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>0.5</td>
<td>10</td>
<td>605904</td>
<td>2CSG421170R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>0.5</td>
<td>10</td>
<td>606000</td>
<td>2CSG421180R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>0.5</td>
<td>20</td>
<td>606109</td>
<td>2CSG421190R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>0.5</td>
<td>20</td>
<td>606208</td>
<td>2CSG421200R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1500</td>
<td>0.5</td>
<td>30</td>
<td>606307</td>
<td>2CSG421220R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>0.5</td>
<td>30</td>
<td>606406</td>
<td>2CSG421230R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2500</td>
<td>0.5</td>
<td>30</td>
<td>606505</td>
<td>2CSG421240R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CT8 .../5 A series, through primary</th>
<th>Primary rated current</th>
<th>Accuracy class</th>
<th>Rated power</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price</th>
<th>Weight</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iprim A</td>
<td>VA</td>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td>piece</td>
<td>kg</td>
<td>pc.</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>0.5</td>
<td>10</td>
<td>606901</td>
<td>2CSG632170R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>0.5</td>
<td>10</td>
<td>607007</td>
<td>2CSG632180R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>0.5</td>
<td>10</td>
<td>607106</td>
<td>2CSG632190R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>0.5</td>
<td>15</td>
<td>607205</td>
<td>2CSG632200R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1500</td>
<td>0.5</td>
<td>20</td>
<td>607304</td>
<td>2CSG632220R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>0.5</td>
<td>20</td>
<td>607403</td>
<td>2CSG632230R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2500</td>
<td>0.5</td>
<td>20</td>
<td>607502</td>
<td>2CSG632240R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td>0.5</td>
<td>20</td>
<td>607601</td>
<td>2CSG632250R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CT8-V .../5 A series, through primary</th>
<th>Primary rated current</th>
<th>Accuracy class</th>
<th>Rated power</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price</th>
<th>Weight</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iprim A</td>
<td>VA</td>
<td>EAN</td>
<td>Type code</td>
<td>Order code</td>
<td>piece</td>
<td>kg</td>
<td>pc.</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>0.5</td>
<td>10</td>
<td>608905</td>
<td>2CSG633170R1101</td>
<td>0.800</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>0.5</td>
<td>10</td>
<td>609001</td>
<td>2CSG633180R1101</td>
<td>0.800</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>0.5</td>
<td>10</td>
<td>609100</td>
<td>2CSG633190R1101</td>
<td>0.800</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>0.5</td>
<td>10</td>
<td>609209</td>
<td>2CSG633200R1101</td>
<td>0.800</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1500</td>
<td>0.5</td>
<td>10</td>
<td>609308</td>
<td>2CSG633220R1101</td>
<td>0.800</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>0.5</td>
<td>20</td>
<td>609407</td>
<td>2CSG633230R1101</td>
<td>0.800</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2500</td>
<td>0.5</td>
<td>20</td>
<td>609506</td>
<td>2CSG633240R1101</td>
<td>0.800</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CT6 series

- **Through primary max section [mm]**
  - cable: 50
  - horizontal bar: 60x20
  - vertical bar: -

### CT8 series

- **Through primary max section [mm]**
  - cable: 2x30
  - horizontal bar: 80x30
  - vertical bar: -

### CT8-V series

- **Through primary max section [mm]**
  - cable: 2x35
  - horizontal bar: -
  - vertical bar: 80x30, 3x80x5
### Energy efficiency

CT measurement current transformers with through primary

#### CT12 .../5 A series, through primary

<table>
<thead>
<tr>
<th>Primary rated current Iprim A</th>
<th>Accuracy class</th>
<th>VA</th>
<th>EAN</th>
<th>Order code</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>600</td>
<td>0.5</td>
<td>10</td>
<td>607809</td>
<td>CT12/600</td>
<td>2CSG7211170R1101</td>
<td>1.600</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>0.5</td>
<td>15</td>
<td>607908</td>
<td>CT12/800</td>
<td>2CSG721180R1101</td>
<td>1.600</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>0.5</td>
<td>20</td>
<td>608004</td>
<td>CT12/1000</td>
<td>2CSG721190R1101</td>
<td>1.600</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>0.5</td>
<td>20</td>
<td>608103</td>
<td>CT12/1200</td>
<td>2CSG721200R1101</td>
<td>1.600</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1500</td>
<td>0.5</td>
<td>20</td>
<td>608202</td>
<td>CT12/1500</td>
<td>2CSG721220R1101</td>
<td>1.600</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>0.5</td>
<td>30</td>
<td>608301</td>
<td>CT12/2000</td>
<td>2CSG721230R1101</td>
<td>1.600</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2500</td>
<td>0.5</td>
<td>40</td>
<td>608400</td>
<td>CT12/2500</td>
<td>2CSG721240R1101</td>
<td>1.600</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td>0.5</td>
<td>40</td>
<td>608509</td>
<td>CT12/3000</td>
<td>2CSG721250R1101</td>
<td>1.600</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4000</td>
<td>0.5</td>
<td>50</td>
<td>608608</td>
<td>CT12/4000</td>
<td>2CSG721260R1101</td>
<td>2.000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5000</td>
<td>0.5</td>
<td>50</td>
<td>745600</td>
<td>CT12/5000</td>
<td>2CSG721270R1101</td>
<td>3.000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6000</td>
<td>0.5</td>
<td>50</td>
<td>745709</td>
<td>CT12/6000</td>
<td>2CSG721280R1101</td>
<td>3.000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>0.5</td>
<td>10</td>
<td>609605</td>
<td>CT12-V/800</td>
<td>2CSG831180R1101</td>
<td>0.700</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>0.5</td>
<td>10</td>
<td>609704</td>
<td>CT12-V/1000</td>
<td>2CSG831190R1101</td>
<td>0.700</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>0.5</td>
<td>10</td>
<td>609803</td>
<td>CT12-V/1200</td>
<td>2CSG831200R1101</td>
<td>0.700</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1250</td>
<td>0.5</td>
<td>10</td>
<td>609902</td>
<td>CT12-V/1250</td>
<td>2CSG831210R1101</td>
<td>0.700</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1500</td>
<td>0.5</td>
<td>12</td>
<td>610007</td>
<td>CT12-V/1500</td>
<td>2CSG831220R1101</td>
<td>0.700</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>0.5</td>
<td>15</td>
<td>610106</td>
<td>CT12-V/2000</td>
<td>2CSG831230R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2500</td>
<td>0.5</td>
<td>20</td>
<td>610205</td>
<td>CT12-V/2500</td>
<td>2CSG831240R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td>0.5</td>
<td>20</td>
<td>610304</td>
<td>CT12-V/3000</td>
<td>2CSG831250R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4000</td>
<td>0.5</td>
<td>20</td>
<td>745808</td>
<td>CT12-V/4000*</td>
<td>2CSG831260R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

* Air insulation class: Class B

#### CT12-V .../5 A series, through primary

<table>
<thead>
<tr>
<th>Primary rated current Iprim A</th>
<th>Accuracy class</th>
<th>VA</th>
<th>EAN</th>
<th>Order code</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>0.5</td>
<td>10</td>
<td>609605</td>
<td>CT12-V/800</td>
<td>2CSG831180R1101</td>
<td>0.700</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>0.5</td>
<td>10</td>
<td>609704</td>
<td>CT12-V/1000</td>
<td>2CSG831190R1101</td>
<td>0.700</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>0.5</td>
<td>10</td>
<td>609803</td>
<td>CT12-V/1200</td>
<td>2CSG831200R1101</td>
<td>0.700</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1250</td>
<td>0.5</td>
<td>10</td>
<td>609902</td>
<td>CT12-V/1250</td>
<td>2CSG831210R1101</td>
<td>0.700</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1500</td>
<td>0.5</td>
<td>12</td>
<td>610007</td>
<td>CT12-V/1500</td>
<td>2CSG831220R1101</td>
<td>0.700</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>0.5</td>
<td>15</td>
<td>610106</td>
<td>CT12-V/2000</td>
<td>2CSG831230R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2500</td>
<td>0.5</td>
<td>20</td>
<td>610205</td>
<td>CT12-V/2500</td>
<td>2CSG831240R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3000</td>
<td>0.5</td>
<td>20</td>
<td>610304</td>
<td>CT12-V/3000</td>
<td>2CSG831250R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>4000</td>
<td>0.5</td>
<td>20</td>
<td>745808</td>
<td>CT12-V/4000*</td>
<td>2CSG831260R1101</td>
<td>1.000</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

* Air insulation class: Class B

### CT12 series

**Through primary**

<table>
<thead>
<tr>
<th>max section [mm] up to 4000A</th>
<th>max section [mm] 5000 and 6000 A</th>
</tr>
</thead>
<tbody>
<tr>
<td>cable</td>
<td>2x50</td>
</tr>
<tr>
<td>horizontal bar</td>
<td>125x50</td>
</tr>
<tr>
<td>vertical bar</td>
<td>-</td>
</tr>
</tbody>
</table>

### CT12-V series

**Through primary**

<table>
<thead>
<tr>
<th>max section [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>cable</td>
</tr>
<tr>
<td>horizontal bar</td>
</tr>
<tr>
<td>vertical bar</td>
</tr>
</tbody>
</table>
## Energy efficiency

CTA measurement current transformers with wound primary

### Standard type current transformers .../5 A with wound primary

CTA .../5 A series, wound primary with insertion on Ø8 MA bolt

<table>
<thead>
<tr>
<th>Primary rated current Iprim A</th>
<th>Accuracy class</th>
<th>Rated power VA</th>
<th>EAN</th>
<th>Type code</th>
<th>Order code</th>
<th>Price €/piece</th>
<th>Weight kg</th>
<th>Pack unit jc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>0.5</td>
<td>5</td>
<td>661405</td>
<td>CTA/10</td>
<td>2CSG111030R1141</td>
<td>0.290</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>0.5</td>
<td>5</td>
<td>661603</td>
<td>CTA/20</td>
<td>2CSG111050R1141</td>
<td>0.290</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>0.5</td>
<td>5</td>
<td>661702</td>
<td>CTA/25</td>
<td>2CSG111060R1141</td>
<td>0.290</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>0.5</td>
<td>5</td>
<td>661801</td>
<td>CTA/40</td>
<td>2CSG111080R1141</td>
<td>0.290</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>0.5</td>
<td>5</td>
<td>661900</td>
<td>CTA/50</td>
<td>2CSG111090R1141</td>
<td>0.290</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>0.5</td>
<td>5</td>
<td>662006</td>
<td>CTA/60</td>
<td>2CSG111100R1141</td>
<td>0.290</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>0.5</td>
<td>5</td>
<td>662105</td>
<td>CTA/80</td>
<td>2CSG111110R1141</td>
<td>0.290</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>0.5</td>
<td>5</td>
<td>662204</td>
<td>CTA/100</td>
<td>2CSG111120R1141</td>
<td>0.290</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

### CTA series

<table>
<thead>
<tr>
<th>Wound primary</th>
<th>max section [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>cable</td>
<td>8</td>
</tr>
<tr>
<td>horizontal bar</td>
<td>-</td>
</tr>
<tr>
<td>vertical bar</td>
<td>-</td>
</tr>
</tbody>
</table>
Energy efficiency
CTO split core measurement current transformers

Split core measurement current transformers with through primary
Split core measurement current transformers are used in distribution panels or power centers for maintenance or system expansion. They can be installed easily and they allow to save a lot of time, avoiding bar disconnection. All transformers are complete with terminal caps and fastening accessories, both on bar and on wall.

**CT30/...5 A Split core current transformers**

<table>
<thead>
<tr>
<th>Primary rated current Iprim A</th>
<th>Accuracy class</th>
<th>Rated power</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price</th>
<th>Weight</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>3</td>
<td>1.5</td>
<td>887805</td>
<td>CT30/100</td>
<td>0.85</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>3</td>
<td>2</td>
<td>887904</td>
<td>CT30/150</td>
<td>0.85</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>0.5</td>
<td>1.5</td>
<td>888109</td>
<td>CT30/250</td>
<td>0.85</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>0.5</td>
<td>2.5</td>
<td>888000</td>
<td>CT30/400</td>
<td>0.85</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**CT80/...5 A Split core current transformers**

<table>
<thead>
<tr>
<th>Primary rated current Iprim A</th>
<th>Accuracy class</th>
<th>Rated power</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price</th>
<th>Weight</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>250</td>
<td>0.5</td>
<td>1</td>
<td>888208</td>
<td>CT80/250</td>
<td>1.1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>0.5</td>
<td>1.5</td>
<td>888307</td>
<td>CT80/400</td>
<td>1.1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>500</td>
<td>0.5</td>
<td>2.5</td>
<td>888406</td>
<td>CT80/500</td>
<td>1.1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>0.5</td>
<td>2.5</td>
<td>888505</td>
<td>CT80/600</td>
<td>1.1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>0.5</td>
<td>5</td>
<td>888703</td>
<td>CT80/1000</td>
<td>1.1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**CT120/...5 A Split core current transformers**

<table>
<thead>
<tr>
<th>Primary rated current Iprim A</th>
<th>Accuracy class</th>
<th>Rated power</th>
<th>Bbn 8012542</th>
<th>Order details</th>
<th>Price</th>
<th>Weight</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>800</td>
<td>0.5</td>
<td>3</td>
<td>889304</td>
<td>CT120/800</td>
<td>1.3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1200</td>
<td>0.5</td>
<td>6</td>
<td>889502</td>
<td>CT120/1200</td>
<td>1.3</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1500</td>
<td>0.5</td>
<td>8</td>
<td>889601</td>
<td>CT120/1500</td>
<td>1.3</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

CT30 series
Through primary

CT80 series
Through primary

CT120 series
Through primary max section (mm)
cable
horizontal bar
vertical bar 4x120x10
TRF M measurement modular current transformers

Modular current transformers with Ø 29 mm through primary, secondary .../5A
TRF M are modular current transformers with through primary for measuring instruments. Their compact size and quick DIN rail plug allow easy installation along with great measurement precision.

<table>
<thead>
<tr>
<th>Primary rated current Iprim A</th>
<th>Accuracy class</th>
<th>Rated power VA</th>
<th>Bbn EAN 8012542</th>
<th>Order details</th>
<th>Type code</th>
<th>Order code</th>
<th>Price piece</th>
<th>Weight kg</th>
<th>Pack unit pc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>3</td>
<td>1</td>
<td>046912</td>
<td>TRFM/40</td>
<td>2CSM100050R1111</td>
<td>0.250</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td></td>
<td>2</td>
<td>047018</td>
<td>TRFM/60</td>
<td>2CSM100070R1111</td>
<td>0.250</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>0.5</td>
<td>2</td>
<td>047117</td>
<td>TRFM/100</td>
<td>2CSM100090R1111</td>
<td>0.250</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>0.5</td>
<td>3</td>
<td>047216</td>
<td>TRFM/150</td>
<td>2CSM100100R1111</td>
<td>0.250</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>250</td>
<td>0.5</td>
<td>4</td>
<td>047315</td>
<td>TRFM/250</td>
<td>2CSM100120R1111</td>
<td>0.250</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>0.5</td>
<td>6</td>
<td>047407</td>
<td>TRFM/400</td>
<td>2CSM100140R1111</td>
<td>0.250</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>600</td>
<td>0.5</td>
<td>8</td>
<td>047506</td>
<td>TRFM/600</td>
<td>2CSM100160R1111</td>
<td>0.250</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Energy efficiency
SNT current transformer for d.c. applications

Technical features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage [mV]</td>
<td>60</td>
</tr>
<tr>
<td>Current rating [A]</td>
<td>from 5 to 1000</td>
</tr>
<tr>
<td>Accuracy class</td>
<td>0.5 (from 10 to 30 °C)</td>
</tr>
<tr>
<td>Max. load [Ω]</td>
<td>0.25</td>
</tr>
<tr>
<td>Overload for 5 sec.</td>
<td>from 10 to 500 A: 1xIn</td>
</tr>
<tr>
<td></td>
<td>from 600 to 1000 A: 5xIn</td>
</tr>
</tbody>
</table>

Shunts
Shunts have 60 mV voltage and must be used with a maximum load of 0.25 Ω in combination with measurement instruments in d.c.

For an appropriate operation:
- both horizontal and vertical mounting are possible (the horizontal position enables a greater heat consumption)
- the faying surface must be completely used and clean; cover with specific grease after the connection
- screws and bolts must be perfectly tight
- shunts must be sufficiently ventilated; as they are not insulated, it is a good rule to protect them against accidental contacts.

60 mV shunts

<table>
<thead>
<tr>
<th>Rated current A</th>
<th>Bbn 8012542 EAN</th>
<th>Order details</th>
<th>Price 1 piece</th>
<th>Weight 1 piece</th>
<th>Pack unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>047803 SNT 1/10</td>
<td>2CSM100030R1121</td>
<td>1.800</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>048404 SNT 1/50</td>
<td>2CSM100090R1121</td>
<td>2.200</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>048701 SNT 1/100</td>
<td>2CSM100120R1121</td>
<td>1.300</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>048800 SNT 1/150</td>
<td>2CSM100130R1121</td>
<td>1.300</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>400</td>
<td>049104 SNT 1/400</td>
<td>2CSM100160R1121</td>
<td>1.900</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>049401 SNT 1/800</td>
<td>2CSM100190R1121</td>
<td>2.200</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>049500 SNT 1/1000</td>
<td>2CSM100200R1121</td>
<td>2.200</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>