A series
Product brief

Key applications
- Applications in industry
- Applications in commercial buildings
- Object metering
- Billing applications

Meter performance
- Three phase and single phase
- Direct connected up to 80 A
- Transformer connected 1, 2 or 5 A
- Active or active and reactive energy
- Accuracy class C, B or A (Cl. 0.5 S, 1 or 2)
- Import or import and export measurement of energy
- Wide voltage range (100 – 500 V)
- Pixel-oriented display
- Up to 4 tariffs
- Up to 4 inputs and outputs
- Low power consumption
- Optional clock functionality with tariff control, previous values, max/min demand, load profiles
- Harmonics measurement up to 16th harmonic and 1 Hz evaluation

Communication
- Pulse output
- Built-in M-Bus
- Built-in RS-485 for Modbus RTU and EQ bus
- IR port for Serial Communication Adapters

Installation
- Terminal according to DIN 43857 (“Utility terminal”)
- Wide temperature range
- Sealable push buttons for configuration

Approvals
- MID type approval “annex B”
- MID initial verification “annex U”
- IEC type approval
A series
Description

The A series EQ meters are meters for single phase and three phase metering. 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.

General features
The A series meters are ideal for many applications and installations. 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 power consumption of the meter is very low, less than 0.8 VA.

Communication
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 new 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.

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
- Total harmonic distortion

Inputs and outputs
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). Outputs need an external voltage supply.

Approvals
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 2004/22/EC 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.

Tariffs
The tariffs are controlled via inputs, via communication or via an internal clock.

Event log
Gold and Platinum meters have an event log function. The event log will log overvoltage, undervoltage, phase voltage outage, negative power, total power outage and presence of harmonics.

Optional functionality
A series meters with a functionality level of Gold or Platinum have an internal clock for advanced functionality. The clock functions are briefly presented below.
A series
Description

Internal clock
The internal clock, sometimes called real time clock or RTC, has a built-in calendar and automatically keeps track of leap year and daylight savings time (DST). The DST function is optional. Backup of the clock during a power failure is provided by a supercapacitor. The time is controlled by a quartz crystal based clock. Time and date is set via push buttons or via communication. The internal clock is approved according to IEC 62052-21 and IEC 62054-21. These standards specify the requirements for time switches in electricity meter related products. The accuracy is better than 5 ppm at room temperature.

Previous values
The previous value feature is available on Gold and Platinum meters and will store all energy registers and input counter values together with a date/time stamp upon change of day, week or month. All total values are stored and in meters equipped with the tariff feature all the tariff registers will also be stored.

Maximum and minimum demand
The demand function is available on Gold and Platinum meters. In the demand function, the mean power in each interval is measured and the maximum and minimum mean values are stored together with a date/time stamp. For each set of demand values the end date/time of the period is stored. The quantities that can be stored for each interval are active, reactive and apparent power (imported power only), and the number of pulses registered on inputs.

Load profile
The load profile function is available on the Platinum meters. The load profile stores the energy consumption at pre-defined intervals. The quantities that can be stored for each interval are active and reactive energy, both imported and exported energy, and the number of pulses registered on inputs. The load profile function uses the standard time setting irrespective if the daylight savings time function is activated or not.

THD
The THD and harmonics measurement is available on the Platinum meters. The voltage and current harmonics (2-16) together with the fundamental is measured sequentially one at a time. The total harmonic distortion is evaluated and displayed in percent. The separate harmonic frequencies measured are multiples of the fundamental frequency up to the 16th harmonic. THD data as well as individual harmonics are shown on the display. THD data and data for individual harmonics can also be read out via serial communication.
A41
Single phase meter
80A, 4 DIN with IR port

Description

Ordering details

<table>
<thead>
<tr>
<th>Voltage V</th>
<th>Accuracy Class</th>
<th>I/O</th>
<th>Communication Type</th>
<th>Order Code</th>
<th>Pkg qty</th>
<th>Weight 1 pc</th>
</tr>
</thead>
<tbody>
<tr>
<td>57.7...288 V AC</td>
<td>Class B (Cl. 1)</td>
<td>Pulse output</td>
<td>-</td>
<td>A41 111 - 100</td>
<td>2CM170554H1000</td>
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<td>M-Bus</td>
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<th>Pkg qty</th>
<th>Weight 1 pc</th>
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<td>57.7...288 V AC</td>
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<td>RS-485</td>
<td>A41 212 - 100</td>
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<th>Pkg qty</th>
<th>Weight 1 pc</th>
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<td>M-Bus</td>
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<tr>
<th>Voltage V</th>
<th>Accuracy Class</th>
<th>I/O</th>
<th>Communication Type</th>
<th>Order Code</th>
<th>Pkg qty</th>
<th>Weight 1 pc</th>
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<tbody>
<tr>
<td>57.7...288 V AC</td>
<td>Class B (Cl. 1)</td>
<td>2 output, 2 input</td>
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<th>Voltage V</th>
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<th>Communication Type</th>
<th>Order Code</th>
<th>Pkg qty</th>
<th>Weight 1 pc</th>
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<tr>
<td>57.7...288 V AC</td>
<td>Class B (Cl. 1)</td>
<td>Configurable 4 I/O channels</td>
<td>RS-485</td>
<td>A41 512 - 100</td>
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<td>M-Bus</td>
<td>A41 513 - 100</td>
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Dimensions

![Dimensions Diagram]
A42
Single phase meter
6A, 4 DIN with IR port

Description

Ordering details

<table>
<thead>
<tr>
<th>Voltage V</th>
<th>Accuracy Class</th>
<th>I/O</th>
<th>Communication</th>
<th>Type</th>
<th>Order Code</th>
<th>Pkg qty</th>
<th>Weight 1 pc</th>
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</thead>
<tbody>
<tr>
<td>Steel</td>
<td>Active energy</td>
<td>Pulse output</td>
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<td>A42 111 - 100</td>
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<td>Class B (Cl. 1)</td>
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<td>A42 112 - 100</td>
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<td>M-Bus</td>
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<td>0.20</td>
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<tr>
<td>Bronze</td>
<td>Active and reactive energy, import/export.</td>
<td>Pulse output</td>
<td>RS-485</td>
<td>A42 212 - 100</td>
<td>2CMA170511R10000</td>
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<tr>
<td>Silver</td>
<td>Active and reactive energy, import/export, tariffs 1-4, tariff control via inputs and communication.</td>
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<td>2CMA170512R10000</td>
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<td>Gold</td>
<td>Active and reactive energy, import/export, tariffs 1-4, tariff controlled via inputs, communication or clock, previous values, max and min demand.</td>
<td>RS-485</td>
<td>A42 421 - 100</td>
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<td>Platinum</td>
<td>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.</td>
<td>RS-485</td>
<td>A42 552 - 100</td>
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Dimensions

[Dimensions diagram]
A43
Three phase meter
80A, 7 DIN with IR port

Description

Ordering details

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<thead>
<tr>
<th>Voltage V</th>
<th>Accuracy Class</th>
<th>I/O</th>
<th>Communication Type</th>
<th>Order Code</th>
<th>Pkg qty</th>
<th>Weight 1 pc</th>
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<tr>
<td>Steel</td>
<td></td>
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<tr>
<td>3 x 57.7/100... 288/500 V AC</td>
<td>Class B (Cl. 1)</td>
<td>Pulse output</td>
<td>-</td>
<td>A43 111 - 100</td>
<td>2CMA170520R1000</td>
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<td>RS-485</td>
<td>A43 112 - 100</td>
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<td>M-Bus</td>
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<td>Class A (Cl. 2)</td>
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<td>3 x 57.7/100... 288/500 V AC</td>
<td>Class B (Cl. 1)</td>
<td>Pulse output</td>
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<td>RS-485</td>
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<td>M-Bus</td>
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<tr>
<td>3 x 57.7/100... 288/500 V AC</td>
<td>Class B (Cl. 1)</td>
<td>2 output, 2 input</td>
<td>-</td>
<td>A43 311 - 100</td>
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<td>RS-485</td>
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<td>M-Bus</td>
<td>A43 313 - 100</td>
<td>2CMA170529R1000</td>
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<td>A43 412 - 100</td>
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<td>RS-485</td>
<td>A43 512 - 100</td>
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<td>M-Bus</td>
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Dimensions
# A44
## Three phase meter
### 6A, 7 DIN with IR port

### Description

### Ordering details

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<th>Voltage V</th>
<th>Accuracy Class</th>
<th>I/O</th>
<th>Communication</th>
<th>Type</th>
<th>Order Code</th>
<th>Pkg qty</th>
<th>Weight 1 pc</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 x 57.7/100... 288/500 V AC</td>
<td>Class B (Cl. 1)</td>
<td>Pulse output</td>
<td>-</td>
<td>A44 111 - 100</td>
<td>2CMA170533R1000</td>
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<td>Class B (Cl. 1)</td>
<td>Pulse output</td>
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### Dimensions

![Dimensions diagram]
A series

Technical data

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<th>Voltage/current inputs</th>
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<th>A42</th>
<th>A43</th>
<th>A44</th>
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<tbody>
<tr>
<td>Nominal voltage</td>
<td>230 V AC</td>
<td>3x220/400 V AC</td>
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<tr>
<td>Voltage range</td>
<td>57.7 - 288 V AC (-20% - +15%)</td>
<td>3x57.7/100 - 288/500 V AC (-20% - +15%)</td>
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</tr>
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<td>Power dissipation voltage circuits</td>
<td>0.8 VA (0.8 W) total</td>
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<tr>
<td>Power dissipation current circuits</td>
<td>0.007 VA (0.007 W) at 230 VAC and I1</td>
<td>0.001 VA (0.001 W) at 230 VAC and I1</td>
<td>0.007 VA (0.007 W) per phase at 230 VAC and I1</td>
<td>0.001 VA (0.001 W) per phase at 230 VAC and I1</td>
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<td>Base current I1</td>
<td>5 A</td>
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<td>-</td>
<td>1 A</td>
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<td>Reference current I3</td>
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<td>0.5 A</td>
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<td>80 A</td>
<td>8 A</td>
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<td>6 A</td>
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<td>Minimum current I6</td>
<td>0.25 A</td>
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<td>2 Nm</td>
<td></td>
<td>2 Nm</td>
<td>5 Nm</td>
</tr>
</tbody>
</table>

**Communications**

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

**Transformer ratios**

- Configurable voltage ratio (VI): 1/999 - 99999/1
- Configurable current ratio (CI): 1/9 - 99999/1

**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) or Reactive Cl. 2
- Active energy: 1%
- Display of energy: Pixel oriented

**Environmental**

- Operating temperature: -40°C to +70°C
- Storage temperature: 40°C to +85°C
- Humidity: 75% yearly average, 95% on 30 days/year
- Resistance to fire and heat: terminal 980°C, cover 680°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 MT in accordance with the Measuring Instrument Directive (MID) 2004/22/EC.
- Electromagnetic environment: Class E2 in accordance with the Measuring Instrument Directive (MID) 2004/22/EC.

**Outputs**

- Current: 2 - 100 mA
- Voltage: 5 - 240 V AC/DC.
- Pulse output frequency: Programmable: 1 - 999999 imp/kWh
- Pulse length: Programmable: 10 - 990 ms
- Terminal wire area: 0.5 - 1 mm²
- Recommended tightening torque: 0.25 Nm

**Inputs**

- Voltage: 0 - 240 V AC/DC
- OFF: 0 - 12 V AC/DC
- ON: 57-240 V AC/24 - 240 V DC
- Min. pulse length: 30 ms
- Terminal wire area: 0.5 - 1 mm²
- Recommended tightening torque: 0.25 Nm

**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 burst test: 4 kV (IEC 61000-4-4)
- Immunity to electromagnetic HF-fields: 60 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: 30Hz - 150kHz
- Radio frequency emission: EN 55022, class B (CISPR 22)
- Electrostatic discharge: 15 kV (IEC 61000-4-2)
- Standards: IEC 60652-11, IEC 60653-21 class 1 & 2, IEC 60653-23 class 0.5 S, IEC 60653-23 class 2, IEC 60654-21, GB/T 17215.211-2006, GB/T 17215.321-2008 class 1 & 2, GB/T 17215.322-2008 class 0.5 S, GB 4206-2008, EN 50470-1, EN 50470-3 category A, B & C

**Mechanical**

- Material: Polycarbonate in transparent front glass, bottom case, upper case and terminal cover, Glass reinforced polycarbonate in terminal block.

**Dimensions**

- Width: 70 mm
- Height: 97 mm
- Depth: 65 mm
- DIN modules: 4

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Footnote: *Only A44 552 - 110 and A44 553 - 110*
A series
Wiring diagram

Terminal blocks

A41

\[ \begin{array}{cccc}
1 & 3 & 4 & 6 \\
L & & & \\
\end{array} \]

A42

\[ \begin{array}{cccc}
1 & 2 & 3 & 5 \\
L_1 & P_1 & & \\
N & & & \\
S_1 & S_2 & & \\
\end{array} \]

A43

3 wire connection, 2 elements

\[ \begin{array}{cccccccc}
1 & 3 & 4 & 6 & 7 & 9 & 10 & 12 \\
L_1 & & & & & & & \\
L_2 & & & & & & & \\
L_3 & & & & & & & \\
\end{array} \]

4 wire connection, 3 elements

\[ \begin{array}{cccccccc}
1 & 3 & 4 & 6 & 7 & 9 & 10 & 12 \\
L_1 & & & & & & & \\
L_2 & & & & & & & \\
L_3 & & & & & & & \\
N & & & & & & & \\
\end{array} \]

A44

3 wire connection, 2 elements

\[ \begin{array}{cccccccc}
1 & 2 & 3 & 5 & 7 & 8 & 9 & 11 \\
P_1 & & & & & & & \\
L_1 & & & & & & & \\
L_2 & & & & & & & \\
L_3 & & & & & & & \\
\end{array} \]

4 wire connection, 3 elements

\[ \begin{array}{cccccccc}
1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 & 11 \\
P_1 & & & & & & & & & \\
L_1 & & & & & & & & & \\
L_2 & & & & & & & & & \\
L_3 & & & & & & & & & \\
N & & & & & & & & & \\
\end{array} \]

A = Please see the pictures
A series
Inputs/outputs and communication

Inputs/Outputs = Please see the pictures on page 20

2 outputs, 2 inputs

4 Configurable inputs/outputs

1 output

Communication = Please see the pictures on page 20

RS-485

M-Bus