DESCRIPTION
The EV300 Series power and energy panel meter is an affordable, user-friendly three-phase metering solution for monitoring power, voltage, current, and bi-directional energy. Certified to utility revenue grade accuracy standards, its standard panel mount design, Modbus-RTU communications, and array of I/O and alarm options make this economical meter a valuable tool in any industrial or commercial environment.

FEATURES
+ Utility Revenue Grade: ANSI C12.20 0.5 Class & IEC 62053-22 0.5s Class
+ Communicate via Modbus-RTU through the built-in RS485 port
+ Pulse, analogue transducer, & alarm-triggered output options available
+ Field-configurable 5A or 1A CT input
+ Two form factors: Standard panel mount meter or built into an AcuPanel pre-wired enclosure
KEY FEATURES

Revenue Grade Certification
+ Ideal for applications that require exceptional accuracy, the EV300 meets utility revenue grade accuracy standards across 50Hz and 60Hz systems. Certified for ANSI C12.20 Class 0.5 and IEC 62053-22 Class 0.5s, it takes true RMS measurements to deliver superior results.

Bi-Directional Energy Metering
+ Critical in renewable energy applications, such as solar or wind, the EV300 can measure the flow of energy in two directions in order to capture both consumption and generation.

Multiple I/O Options
+ With a variety of I/O combinations to choose from, the EV300 can be configured to monitor switches, deliver energy information to a data acquisition server, interface with a PLC, or trigger critical alarms.
+ Digital Input: Monitor switch status
+ Digital Output: Sent energy data to a data acquisition server
+ Analogue Output: 4-20mA transducer type output
+ Relay Output: Over/under limit triggered tripping relay to control load on/off

Standard Modbus-RTU Communications
+ The EV300 includes a built-in RS485 port for communicating over Modbus-RTU in industrial environments. Daisy-chain multiple meters together for efficient data collection.

Built-In Power Supply
+ 24Vdc provides direct power supply to digital input. Reduce the cost, complication, and space of installing an additional low voltage power supply in the panel.

Voltage
+ Supports any voltage system with a rating between 10V to 230V/400V and can be used with or without a potential transformer.

Current
+ The field-configurable 5A and 1A CT input will suit any industrial current transformer.

Frequency
+ Worldwide compliance: The automatic frequency detection feature adapts to 50Hz or 60Hz systems without sacrificing accuracy.

APPLICATIONS
+ Building Automation and Control Systems
+ Energy Management Systems
+ Industrial Facility Metering
+ Commercial Buildings
+ Tenant Submetering
SPECIFICATIONS

Metering

<table>
<thead>
<tr>
<th>PARAMETERS</th>
<th>ACCURACY</th>
<th>RESOLUTION</th>
<th>RANGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage</td>
<td>0.5%</td>
<td>0.1V</td>
<td>10V~500kV</td>
</tr>
<tr>
<td>Current</td>
<td>0.5%</td>
<td>0.001A</td>
<td>0~99990A</td>
</tr>
<tr>
<td>Power</td>
<td>0.5%</td>
<td>1W</td>
<td>-9999MW~9999MW</td>
</tr>
<tr>
<td>Reactive Power</td>
<td>0.5%</td>
<td>1var</td>
<td>-9999Mvar~9999Mvar</td>
</tr>
<tr>
<td>Apparent Power</td>
<td>0.5%</td>
<td>1VA</td>
<td>0~9999MVA</td>
</tr>
<tr>
<td>Power Factor</td>
<td>0.5%</td>
<td>0.001</td>
<td>-1.000~1.000</td>
</tr>
<tr>
<td>Frequency</td>
<td>0.2%</td>
<td>0.01Hz</td>
<td>45~65Hz</td>
</tr>
<tr>
<td>Energy</td>
<td>0.5%</td>
<td>0.1kWh</td>
<td>0~99999999.9kWh</td>
</tr>
<tr>
<td>Reactive Energy</td>
<td>0.5%</td>
<td>0.1kvarh</td>
<td>0~99999999.9kvarh</td>
</tr>
<tr>
<td>Temperature Coefficient</td>
<td></td>
<td>&lt;100 ppm/°C (0~50°C)</td>
<td></td>
</tr>
</tbody>
</table>

Input

CURRENT INPUTS (Each Channel)

Nominal Current Options | 5A/1A
Metering Range          | 0~6A / 0~2A
Pickup Current          | 5mA / 1mA
Withstand               | 20Arms continuous
                        | 100Arms for 1 second, non-recurring
Burden                  | 0.05VA (Typical) @ 5Arms
Accuracy                | 0.5% Full Scale

VOLTAGE INPUTS (Each Channel)

Nominal Full Scale       | 230Vac L-N, 400Vac L-L (+20%)
Withstand                | 1500Vac Continuous
                        | 2500Vac, 50/60Hz for 1 Minute
Input Impedance          | 2MΩ per Phase
Metering Frequency       | 45Hz~65Hz
Pickup Voltage           | 10Vac
Accuracy                 | 0.5% Full Scale

ENERGY ACCURACY

Active                   | Class 0.5s (According to IEC 62053-22)
                        | Class 0.5 (According to ANSI C12.20)
Reactive                 | Class 2 (According to IEC 62053-23)

Communications

RS-485
Half-duplex, Optically Isolated
1200 to 57600bps

PROTOCOLS
Modbus-RTU

Control Power

Universal

AC/DC CONTROL POWER
Operating Range           | 100~240Vac, 50/60Hz; 100~300Vdc
Burden                   | 2W
Frequency                | 50/60Hz
Withstand                | 2500Vac, 50/60Hz for 1 minute
Installation Category III (Distribution)

I/O Options

DIGITAL INPUT (Switch Status)

Optical Isolated Voltage  | 2500Vac RMS
Input Type                | Wet
Input Resistance          | 4kΩ (Typical)
Input Voltage Range       | 16~30Vdc
Input Current (Max)       | 7.5mA

DIGITAL OUTPUT (DO) (Photo-MOS)

Voltage Range             | 0~250Vac/dc
Load Current              | 100mA (Max)
Output Frequency          | 25Hz, 50% Duty Ratio (20ms ON, 20ms OFF)
Isolation Voltage         | 2500Vac

RELAY OUTPUT (RO)

Switching Voltage (Max)   | 250Vac; 30Vdc
Load Current              | 5A(R), 2A(L)
Set Time                  | 10ns (Max)
Contact Resistance        | 30mΩ (Max)
Isolation Voltage         | 2500Vac
Mechanical Life            | 1.5x10^7

ALARM OUTPUT

Alarm Parameters          | V1, V2, V3, V12, V23, V31, I1, I2, I3,
                          | Vavg, Vlavg, Iavg, In, P, Q, S, F and PF
Output Type               | RO/DO

ANALOGUE OUTPUT (AO)

Output Range              | 4~20mA/0~20mA
Resolution                | 12-bit
Output Capability         | Max Load: 750Ω
Accuracy                  | 0.50%
Temperature Drift         | 50ppm/°C Typical
Isolation Voltage         | 500Vdc
Open Circuit Voltage      | 15V

POWER SUPPLY FOR DI (24 Vdc)

Output Voltage             | 24Vdc
Output Current             | 42mA
Load (Max)                 | 6 Dis
FUNCTION LIST

<table>
<thead>
<tr>
<th>Function</th>
<th>Parameters</th>
<th>EV387</th>
<th>EV390</th>
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<tbody>
<tr>
<td><strong>Metering</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Voltage</td>
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<td>•</td>
</tr>
<tr>
<td>Current</td>
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<td>•</td>
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<tr>
<td>Power</td>
<td>P</td>
<td>kW</td>
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</tr>
<tr>
<td>Reactive Power</td>
<td>Q</td>
<td>kvar</td>
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<tr>
<td>Apparent Power</td>
<td>S</td>
<td>kVA</td>
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<tr>
<td>Power Factor</td>
<td>PF</td>
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<tr>
<td>Frequency</td>
<td>F</td>
<td>Hz</td>
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<tr>
<td><strong>Energy</strong></td>
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<tr>
<td>Energy</td>
<td>Ep_total, Ep+, Ep-</td>
<td>kWh</td>
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<tr>
<td>Reactive Energy</td>
<td>Eq_Total, Eq+,Eq-</td>
<td>kvarh</td>
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<td>Digital Input</td>
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<td>4DI</td>
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<td><strong>RO/DO Option either/or</strong></td>
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<tr>
<td>Relay Output</td>
<td>2RO</td>
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<td>•</td>
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<tr>
<td>Digital Output</td>
<td>2DO</td>
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<td>•</td>
</tr>
<tr>
<td><strong>AO/PO Option either/or</strong></td>
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<tr>
<td>Analogue Output</td>
<td>4-20mA</td>
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<tr>
<td>Auxiliary Power</td>
<td>24Vdc</td>
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<tr>
<td><strong>Communications</strong></td>
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<tr>
<td>RS485, Modbus-RTU protocol</td>
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<tr>
<td><strong>Display</strong></td>
<td>LCD Display</td>
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<tr>
<td><strong>Dimensions</strong></td>
<td>96x96x73mm (Cut Out: 92x92mm)</td>
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I/O SELECTION TABLE

<table>
<thead>
<tr>
<th>Model</th>
<th>E0 (Base Meter)</th>
<th>E1</th>
<th>E2</th>
<th>E3</th>
<th>E4</th>
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<tbody>
<tr>
<td>Digital Input</td>
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<td>6</td>
<td>6</td>
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<tr>
<td>Analogue Output (4-20mA)</td>
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<td>-</td>
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<tr>
<td>Relay Output</td>
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<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Power Supply for DI</td>
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<td>1</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

SPECIFICATIONS

**Operating Environment**
- Operating Temperature: -25°C to 70°C, -13°F to 158°F
- Storage Temperature: -40°C to 85°C, -40°F to 176°F
- Relative Humidity: 5% to 95% Non-Condensing
- Pollution Degree: 2

**Standard Compliance & Certifications**
- **Measurement Standard**: IEC 61036 Class1, ANSI C12.16 Class10
- **Environmental Standard**: IEC 60068-2
- **Safety Standard**: IEC 61010
- **EMC Standard**: IEC 61000-4/2-3-4-5-6-8-11
- **Outlines Standard**: DIN 43700
*Note: 2CT configuration is optional only in 3 Phase 3 Wire system.
**ACCESSORIES**

**Protective Display Cover**

The Protective Display Cover is designed for Acuvim II Series energy meters and other 96mm by 96mm display panel meters. Crucial in harsh environments, it increases the IP environmental rating of a meter’s display to IP66 or NEMA 4X.

**USB RS485 Converter**

This plug-and-play USB to Serial RS485 Converter is designed to provide a convenient, reliable USB connection to the Acuvim II Series power meters and other serial devices.

**ORDERING INFORMATION**

<table>
<thead>
<tr>
<th>Model</th>
<th>- IO Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>EV387</td>
<td>E0: 2DI</td>
</tr>
<tr>
<td>EV390</td>
<td>E1: 6DI+2RO+PS</td>
</tr>
<tr>
<td></td>
<td>E2: 6DI+2DO+PS</td>
</tr>
<tr>
<td></td>
<td>E3: 6DI+2DO+2AO</td>
</tr>
<tr>
<td></td>
<td>E4: 6DI+2RO+2AO</td>
</tr>
</tbody>
</table>

Ordering Example:

- EV387 - E1
- EV390 - E3

<table>
<thead>
<tr>
<th>Accessories (Optional)</th>
</tr>
</thead>
<tbody>
<tr>
<td>96-IP66</td>
</tr>
<tr>
<td>USB-RS485</td>
</tr>
</tbody>
</table>

Ordering Example: USB-RS485