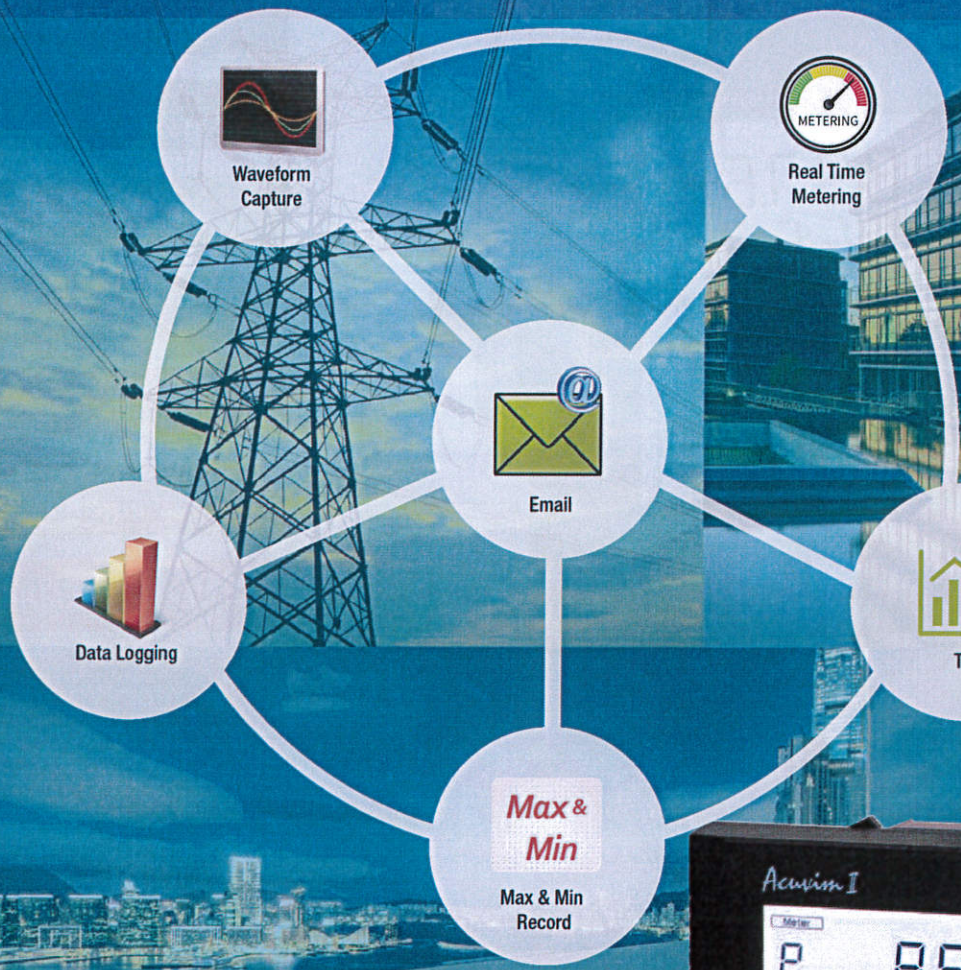
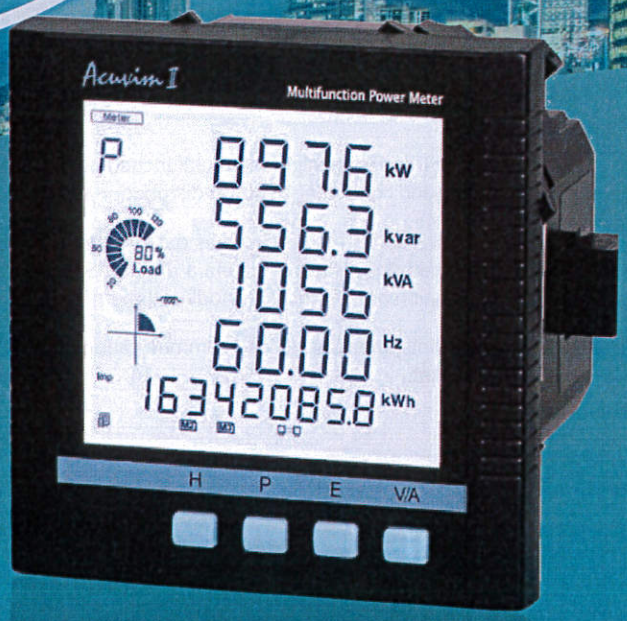
# Acuvim II Series

## High Performance Meters




FEATURES

- Revenue Grade with Data Logging
- Waveform Capture
- Modbus, BACnet, SNMP
- Level 2 DNP3 and IEC61850 2nd Edition
- MV90 Support
- 8GB Datalogging and event storage
- COMtrade Waveform format
- Free Cloud Metering Data Storage + Analytics

Modbus BTL DNP3 MV90 COMPATIBLE Wi Fi

CE cULus TÜV CERT ISO9001 Certified

ACCUENERGY

# Acuvim II Series High Performance Meters

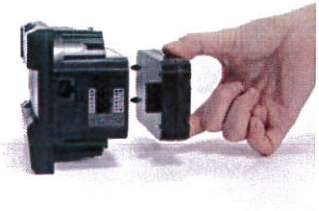

- 100ms Refresh
- 0.2 Class
- 400 Parameters
- DNP 3.0
- BACnet
- 8 GB Memory
- NEMA3/NEMA4X
- 5 Year Warranty

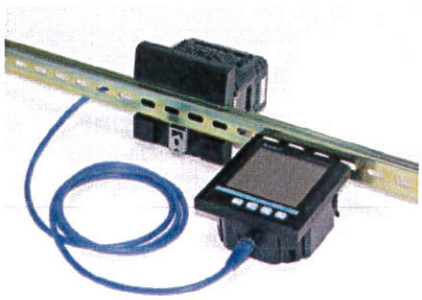
## DESCRIPTION

The Acuvim II series are high-end multifunction power and energy meters manufactured by Accuenergy. They are the ideal choice for the monitoring and controlling of power distribution systems.

The Acuvim II series may be used as data gathering devices for intelligent power distribution systems or plant automation systems. All monitored data is available via a digital RS485 communication port running Modbus RTU and DNP 3.0 protocols, additional communication options include: Modbus, Ethernet, Profibus DP, and BACnet.

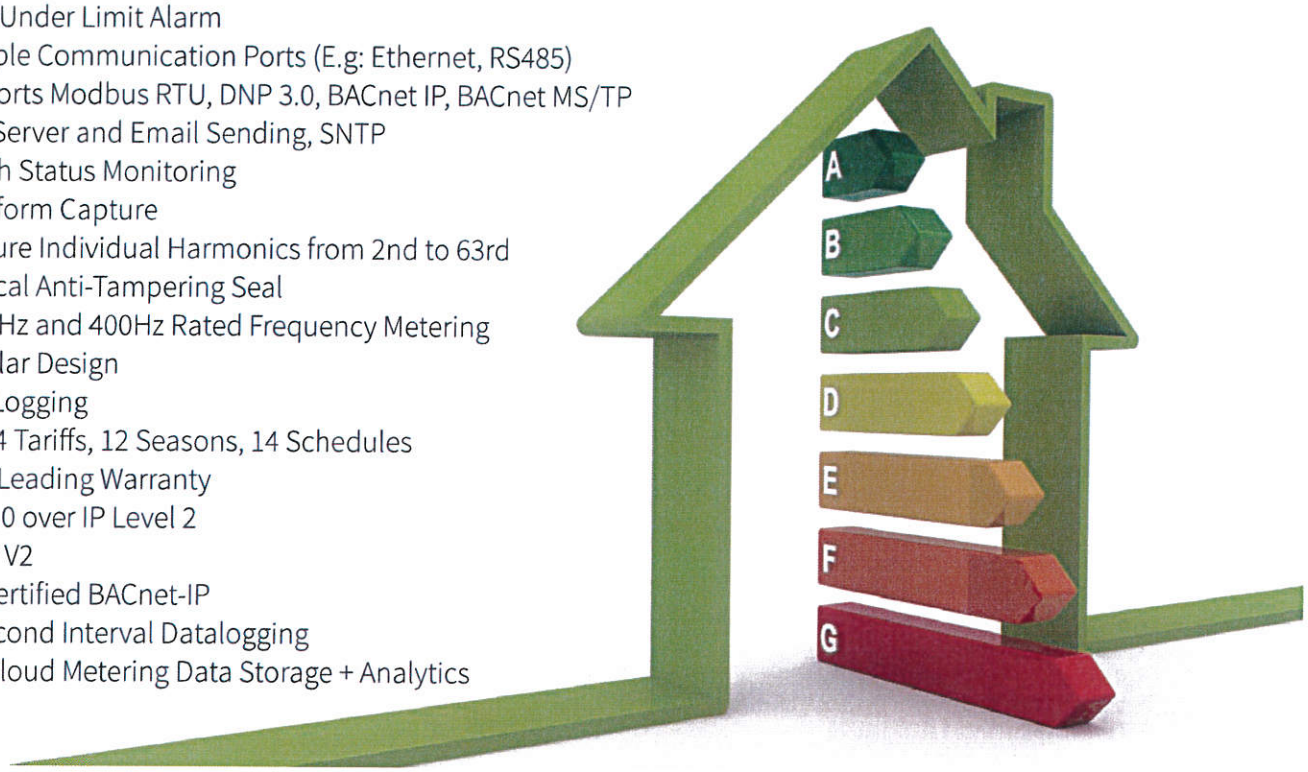
With its flexible, modular I/O and communication options, the Acuvim II series is the most versatile and cost-effective metering solution on the market.





## Top quality components are meticulously engineered into a line of products offering best-in-class capability that exceeds the toughest standards and ratings.

- 100ms Refresh, True-RMS Measuring Parameter
- ANSI C12.20 (0.2 Class) and IEC 62053-22 (0.2S Class)
- 16 MB Onboard Memory
- Power Quality Analysis
- Over/Under Limit Alarm
- Multiple Communication Ports (E.g: Ethernet, RS485)
- Supports Modbus RTU, DNP 3.0, BACnet IP, BACnet MS/TP
- Web Server and Email Sending, SNTP
- Switch Status Monitoring
- Waveform Capture
- Measure Individual Harmonics from 2nd to 63rd
- Physical Anti-Tampering Seal
- 50/60Hz and 400Hz Rated Frequency Metering
- Modular Design
- Data Logging
- TOU, 4 Tariffs, 12 Seasons, 14 Schedules
- Class Leading Warranty
- DNP3.0 over IP Level 2
- SNMP V2
- BTL Certified BACnet-IP
- 15-Second Interval Datalogging
- Free Cloud Metering Data Storage + Analytics




## APPLICATIONS

### Submeters for high performance monitoring and analysis, system integration & speciality applications.

- Metering of Distribution Feeders, Transformers, Generators, Capacitor Banks and Motors
- Medium and Low Voltage Systems
- Commercial, Industrial, Utility
- Power Quality Analysis
- Data Logging

# FEATURES

## Metering

- Voltage V1, V2, V3, Vlnavg, V12, V23, V31, Vllavg
- Current I1, I2, I3, In, Iavg
- Power P1, P2, P3, Psum
- Reactive Power Q1, Q2, Q3, Qsum
- Apparent Power S1, S2, S3, Ssum
- Frequency F
- Power Factor PF1, PF2, PF3, PF
- Energy Ep_imp, Ep_exp, Ep_total, Ep_net, Epa_imp, Epa_exp, Epb_imp_Epb_exp, Epc_imp, Epc_exp
- Reactive Energy Eq_imp, Eq_exp, Eq_total, Eq_net, Eqa_imp, Eqa_exp, Eqb_imp, Eqb_exp, Eqc_imp, Eqc_exp
- Apparent Energy Es, Esa, Esb, Esc
- Demand Dmd_P, Dmd_Q, Dmd_S, Dmd_I1, Dmd_I2, Dmd_I3
- Load Features
- Four Quadrant Powers

## Monitoring

- Power Quality
- Voltage Harmonics $2^{nd}$ to $63^{rd}$ and THD
- Current Harmonics $2^{nd}$ to $63^{rd}$ and THD
- 400Hz type,only support $2^{nd}$ to $15^{th}$
- Voltage Crest Factor
- THFF (TIF)
- Current K Factor
- Voltage Unbalance Factor U_unbl
- Current Unbalance Factor I_unbl
- Max/Min Statistics with Time Stamps

## Alarms

Limits can be set for up to 16 indicated parameters and can be set with a specified time interval. If any input of the indicated parameters is over or under its setting limit and persists over the specified time interval, the event will be recorded with time stamps and trigger the Alarm DO output. The 16 indicated parameters can be selected from any of the 80 parameters available.

## I/O Option Module

The E-module® technique was adopted for its flexibility and easy expansion of the I/O function of Acuvim II. A maximum of 3 modules can be used for one meter. Digital input, digital output, pulse output, relay output, analog input and analog output are provided by I/O option module.

## Anti-tampering Seal

Users can physically seal the meter similar to a utility meter in order to provide anti-tampering protection. All metrological programming and user-defined parameters are protected with a physical seal.

## High Frequency Metering

Designed for use with 400Hz aircraft systems Acuvim II series power meters effectively monitors any airborne system.

# MULTI-PLATFORM ACCESS

Built-in web server provides computer, tablet and smartphone access.

### Data Logging

Acuvim IIR/IIE/IIW offers 3 assignable historical logs where the majority of the metering parameters can be recorded. The onboard memory is up to 8 MB and each log size is adjustable. A real time clock allows for any logged events to be accurately time stamped.

With AXM-WEB2 module added, the memory size expands to industry-leading 8GB memory with 1-second interval datalogging.

### Time of Use

Users can assign up to 4 different tariffs (sharp, peak, valley and normal) to different time periods within a day according to the billing requirements. The Acuvim IIE meter will calculate and accumulate energy to different tariffs according to the meter's internal clock timing and TOU settings.

### Waveform Capture

Acuvim IIW can record 100 groups of voltage and current waveforms. It provides the waveform record of 10 cycles before and after the triggering point. It also supports a settable triggering condition.

COMtrade wavefrom file format is available from waveform capture.

### Power Quality Event Logging

When a power quality event happens, such as voltage sag and swell, etc., Acuvim IIW will record the timestamp and the triggering condition of the event. It can save up to 50, 000 power quality events.

### Automatic Frequency adaptation

Rated frequency is adjusted automatically to local frequency such as 50Hz or 60Hz. The same meter can be used in countries with different electrical frequencies.

### Flexible Current Input

Compatible with different current transformers such as 5A, 1A, 80mA, 100mA, 200mA, 333mV output CT and Rogowski coil all available from Accuenergy.

### Communication

- Modbus RTU Protocol via RS485
- DNP3 Level 2 over IP
- IEC 61850
- Ethernet (Modbus TCP, HTTP, SMTP, SNTP, HTTPs Post, FTP)
- Profibus DP
- BACnet IP, BACnet MS/TP
- Dual RS485 Communication Ports
- Wi-Fi and Ethernet dual communication (Modbus TCP, HTTP, SMTP, SNTP, HTTPs Post, FTP
- Mesh wireless slave module 868Hz or 900Hz

### Display

- Clear and Large Character LCD Screen Display with White Backlight
- Wide Environmental Temperature Endurance
- Display Load Percentage, 4 Quadrant Powers, and Load Nature

### Outline

Small Size 96×96 DIN or 4" ANSI Round

# FUNCTION LIST

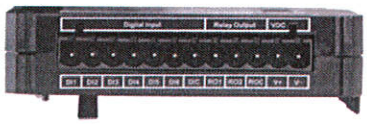
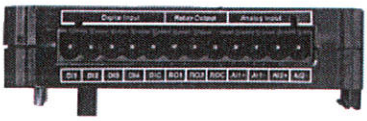
● Function; ⊙ Option; Blank NA

| CATEGORY | | ITEM | PARAMETERS | Acuvim II | Acuvim IIR | Acuvim IIE | Acuvim IIW |
|---|---|---|---|---|---|---|---|
| METERING | REAL TIME METERING | Phase Voltage | V1, V2, V3, Vlnavg | ● | ● | ● | ● |
| | | Line Voltage | V12, V23, V31, Vllavg | ● | ● | ● | ● |
| | | Current | I1, I2, I3, In, Iavg | ● | ● | ● | ● |
| | | Power | P1, P2, P3, Psum | ● | ● | ● | ● |
| | | Reactive Power | Q1, Q2, Q3, Qsum | ● | ● | ● | ● |
| | | Apparent Power | S1, S2, S3, Ssum | ● | ● | ● | ● |
| | | Power Factor | PF1, PF2, PF3, PF | ● | ● | ● | ● |
| | | Frequency | F | ● | ● | ● | ● |
| | | Load Features | Load Features | ● | ● | ● | ● |
| | | Four Quadrant Powers | Four Quadrant Powers | ● | ● | ● | ● |
| | ENERGY & DEMAND | Energy | Ep_imp, Ep_exp, Ep_total, Ep_net, Epa_imp, Epa_exp, Epb_imp, Epb_exp, Epc_imp, Epc_exp | ● | ● | ● | ● |
| | | Reactive Energy | Eq_imp, Eq_exp, Eq_total, Eq_net, Eqa_imp, Eqa_exp, Eqb_imp, Eqb_exp, Eqc_imp, Eqc_exp | ● | ● | ● | ● |
| | | Apparent Energy | Es, Esa, Esb, Esc | ● | ● | ● | ● |
| | | Demand | Dmd_P, Dmd_Q, Dmd_S, Dmd_I1, Dmd_I2, Dmd_I3 | ● | ● | ● | ● |
| TOU | TIME OF USE | Energy/max demand | TOU, 4 Tariffs, 12 Seasons, 14 Schedules | | | ● | |
| | DAYLIGHT SAVING TIME | Two Adjustable Formats | Month/Day/Hour/Minute<br>Month/Week/First few weeks/Hour/Minute | | | ● | |
| MONITORING | WAVEFORM CAPTURE | Voltage and Current Waveform | Trigger, Manual, DI change, Sag/Dips, Swell, Over Current | | | | ● |
| | POWER QUALITY | Voltage Unbalance Factor | U_unbl | ● | ● | ● | ● |
| | | Current Unbalance Factor | I_unbl | ● | ● | ● | ● |
| | | Voltage THD | THD_V1,THD_V2,THD_V3, THD_Vavg | ● | ● | ● | ● |
| | | Current THD | THD_I1, THD_I2, THD_I, THD_Iavg | ● | ● | ● | ● |
| | | Individual Harmonics | Harmonics 2nd to 63rd (50H or 60Hz)<br>Harmonics 2nd to 15th (400Hz) | ● | ● | ● | ● |
| | | Voltage Crest Factor | Crest Factor | ● | ● | ● | ● |
| | | TIF | THFF | ● | ● | ● | ● |
| | | Current K factor | K Factor | ● | ● | ● | ● |
| | STATISTICS | MAX with Time Stamp<br>MIN with Time Stamp | Each phase of V & I; Total of P, Q, S, PF & F; Demand of I1, I2, I3, P, Q&S; Each phase THD of V & I; Unbalance factor of V & I | ● | ● | ● | ● |
| OTHERS | ALARM | Over/Under Limit Alarm | V, I, P, Q, S, PF, V_THD & I_THD Each Phase and Total or Average; Unbalance Factor of V & I; Load Type; Analog Input of Each Channel; Demand of I1, I2, I3, P, Q&S; Reverse phase sequence; DI1~DI28 | ● | ● | ● | ● |
| | POWER QUALITY EVENT LOGGING | Sag/Dips, Swell | Voltage | | | | ● |
| | DATA LOGGING | Data Logging 1<br>Data Logging 2<br>Data Logging 3 | F, V1/2/3/lnavg, V12/23/13/lavg, I1/2/3/n/avg, P1/2/3/sum, Q1/2/3/sum, S1/2/3/sum, PF1/2/3, PF, U_unbl, I_unbl, Load Type, Ep_imp, Ep_exp, Ep_total, Ep_net, Eq_imp, Eq_exp, Eq_total, Eq_net, Es, Epa_imp, Epa_exp, Epb_imp,Epb_exp, Epc_imp, Epc_exp, Eqa_imp, Eqa_exp, Eqb_imp, Eqb_exp, Eqc_imp, Eqc_exp, Esa, Esb, Esc, THD_V1/2/3/avg, THD_I1/2/3/avg, Harmonics 2nd to 63rd, Crest Factor, THFF, K Factor, Sequence and Phase Angles, DI Counter, AI, AO, Dmd P/Q/S, Dmd I1/2/3 | | ● | ● | ● |
| | ONBOARD MEMORY SIZE | Memory | Bytes | — | 8MB | 8MB | 16MB |
| | | | With AXM-WEB-PUSH 4GB on all 4 models | ● | ● | ● | ● |
| | | | With AXM-WEB2, 8GB on all 4 models | ● | ● | ● | ● |
| | COMMUNICATION | RS485 Port, Half Duplex, Optical Isolated | Modbus®-RTU Protocol | ● | ● | ● | ● |
| | TIME | Real Time Clock | Year, Month, Date, Hour, Minute, Second | ● | ● | ● | ● |

| CATEGORY | | ITEM | PARAMETERS | Acuvim II | Acuvim IIR | Acuvim IIE | Acuvim IIW |
|---|---|---|---|---|---|---|---|
| OPTION MODULE | I/O OPTION | Switch Status (DI) | Digital Input (Wet) | ⊙ | ⊙ | ⊙ | ⊙ |
| | | Power Supply for DI | 24 Vdc | ⊙ | ⊙ | ⊙ | ⊙ |
| | | Relay Output (RO) | NO, Form A | ⊙ | ⊙ | ⊙ | ⊙ |
| | | Digital Output (DO) | Photo-MOS | ⊙ | ⊙ | ⊙ | ⊙ |
| | | Pulse Output (PO) | By Using DO | ⊙ | ⊙ | ⊙ | ⊙ |
| | | Analog Input (AI) | 0(4)~20mA, 0(1)~5V | ⊙ | ⊙ | ⊙ | ⊙ |
| | | Analog Output (AO) | 0(4)~20mA, 0(1)~5V | ⊙ | ⊙ | ⊙ | ⊙ |
| | COMMUNICATION | Ethernet | 10M/100M, Modbus-TCP, HTTP Webpage, Email | ⊙ | ⊙ | ⊙ | ⊙ |
| | | Profibus-DP | Profibus-DP/V0 | ⊙ | ⊙ | ⊙ | ⊙ |
| | | BACnet | IP or MS/TP | ⊙ | ⊙ | ⊙ | ⊙ |
| | | RS485 Module | Additional Modbus RTU | ⊙ | ⊙ | ⊙ | ⊙ |
| | | DNP 3.0 over IP | | ⊙ | ⊙ | ⊙ | ⊙ |
| | | IEC 61850 2nd Edition | | ⊙ | ⊙ | ⊙ | ⊙ |
| | 400Hz TYPE | Only support full-wave energy, support $2^{nd}$~$15^{th}$ individual harmonics | | ⊙ | ⊙ | ⊙ | |

## Digital/Analog I/O

Integrate data to/from other devices with field expandable plug-in I/O modules

| AXM-IO1 | AXM-IO2 | AXM-IO3 |
|---|---|---|
|  |  |  |
| 6x digital inputs<br>24Vdc power for digital inputs<br>2x relay outputs | 4x digital inputs<br>2x digital outputs<br>2x analog outputs | 4x digital inputs<br>2x relay outputs<br>2x analog inputs |

## Communications Protocols

A standard RS-485 port and our AXM line of plug-in expansions modules support a wide array of protocols.

| | Standard | AXM-WEB2 | AXM-WEB PUSH | AXM-BMS | AXM-BIP | AXM-PROFI | AXM-RS485 | AXM-MESH |
|---|---|---|---|---|---|---|---|---|
| MODBUS-RTU | • | | | | | | • | |
| DNP 3.0 Over IP | | • | • | | | | | |
| IEC 61850 | | • | | | | | | |
| MODBUS-TCP | | • | • | | | | | |
| HTTP/HTTPs Webserver | | • | • | | • | | | |
| SMTP Email | | • | • | | | | | |
| SNMP V3 | | • | • | | | | | |
| HTTP/HTTPs Push | | • | • | | | | | |
| FTP Post | | • | • | | | | | |
| sFTP Server | | • | • | | | | | |
| Datalogging | | 8GB | 4GB | | | | | |
| BACnet-MS/TP | | | | • | | | | |
| BACnet-IP | | • | | | • | | | |
| PROFIBUS | | | | | | • | | |
| WiFi | | • | | | | | | • |
| Dual RJ45 Ports | | • | | | | | | |

## SPECIFICATIONS

| METERING | | | | |
|---|---|---|---|---|
| Parameters | | Accuracy | Resolution | Range |
| Voltage | | 0.2% | 0.1V | 10V~1000kV |
| Current | | 0.2% | 0.1mA | 5mA~50000A |
| Power | | 0.2% | 1W | -9999MW~9999MW |
| Reactive Power | | 0.2% | 1var | -9999Mvar~9999Mvar |
| Apparent Power | | 0.2% | 1VA | 0~9999MVA |
| Power Demand | | 0.2% | 1W | -9999MW~9999MW |
| Reactive Power Demand | | 0.2% | 1var | -9999Mvar~9999Mvar |
| Apparent Power Demand | | 0.2% | 1VA | 0~9999MVA |
| Power Factor | | 0.2% | 0.001 | -1.000~1.000 |
| Frequency | | 0.02% | 0.01Hz | 45.00~65.00Hz (50 or 60Hz type)<br>300.00Hz~500.00Hz (400Hz type) |
| Energy | Primary | 0.2% | 0.1kWh | 0-99999999.9kWh |
| | Secondary | 0.2% | 0.001kWh | 0-999999.999kWh |
| Reactive Energy | Primary | 0.2% | 0.1kvarh | 0-99999999.9kvarh |
| | Secondary | 0.2% | 0.001kvarh | 0-999999.999kvarh |
| Apparent Energy | Primary | 0.2% | 0.1kVAh | 0-99999999.9kVAh |
| | Secondary | 0.2% | 0.001kVAh | 0-999999.999kVAh |
| Harmonics | | 1.0% | 0.1% | |
| Phase Angle | | 2.0% | 0.1° | 0.0°~359.9° |
| Unbalance Factor | | 2.0% | 0.1% | 0.0%~100.0% |
| Running Time | | | 0.01h | 0~9999999.99h |