

Metering products family



EATON

Powering Business Worldwide

General description

Eaton metering products provide solutions needed to monitor and manage all aspects of an electrical distribution system.

When greater reliability, increased productivity, and significant cost savings are called for to remain competitive in today's market, Eaton's metering products fit the bill. These innovative meters and communications systems, along with Power Xpert® software, make it possible to successfully take control of the electrical distribution system.

Power Xpert Meters

Power Xpert Meters are the benchmark for intelligent Web-enabled top-quality metering devices for the power system. Power Xpert Meters provide measurement of the critical elements found in the power system whether that be voltage, power, current, transients, harmonics, or even time. Power Xpert Meters provide Web-enabled communications for use with the Power Xpert software. All Power Xpert Meters provide a standard communications protocol for easy integration into other systems.

Greater reliability

Eaton's metering products give the ability to receive an early warning of potential problems, eliminate unnecessary trips, isolate faults to ensure minimum downtime, and shed or equalize loads while a problem is being corrected.

Increased productivity

Equipment downtime resulting from voltage or frequency variations can be very costly to an operation. Monitoring power quality with Eaton's metering products throughout the electrical distribution system provides data to identify, isolate, and correct problems quickly and efficiently.

Reduced energy and operating costs

When we think about meters and power quality, the common thread throughout the basket of solutions is information. Collecting, monitoring, and managing data from the electrical distribution system can help reduce costs for those facilities prepared to define and analyze present electrical energy usage levels and patterns. Data provided by Eaton's metering products comprise the data for verifying utility bills for energy management and lowering operating costs. Deregulation in some geographical locations permits energy users to select a utility provider and negotiate rate structures. For large users with heavy utility bills, this may be an incentive to verify the utility bill, identify an opportunity for savings, negotiate a better utility rate, and apply the savings directly to the bottom-line. Users are also empowered to decrease energy consumption, thereby lowering peak demand charges and decreasing operating costs.

When an Eaton meter is used with Eaton trip units and relays incorporating built-in metering capabilities, the entire electrical distribution system can be cost-effectively managed.

Eaton is an industry leader offering a complete integrated solution to oversee your entire electrical distribution system. As a global manufacturer of low and medium voltage electrical distribution system equipment and components, Eaton is an experienced innovator of metering products that incorporate leading-edge technology. These innovations result from our scientific and engineering expertise, physical resources, and the ongoing R&D programs at our technology centers.

Table 1. Metering Selection Chart—Dimensions in Inches (mm)

Power Xpert 4000/6000/8000



Power Xpert 2000



Device Name

Electrical Parameters

| | | |
|------------------------------|-----------------------------------|---------------------------------|
| Volts | 0.1% of RV + 0.02% FS | 0.1% of RV |
| Amperes | 0.05% of RV + 0.01% FS | 0.1% of RV |
| Current range (% of nominal) | 0.005–20A (400%) | 0.1–200% |
| Watts | 0.1% of RV + 0.0025% FS | 0.2% of RV |
| VARs | 0.1% of RV + 0.0025% FS | 0.2% of RV |
| VA | 0.1% of RV + 0.0025% FS | 0.2% of RV |
| PF—apparent | 0.1% | 0.2% of RV |
| PF—displacement | 0.1% | — |
| Frequency | ± 0.01 Hz | ±0.03 Hz |
| THD—voltage | 127th | 40th ②③ ② ②③ |
| THD—current | 127th | 40th ②③ ② ②③ |
| Watt-hours | ±0.2% per ANSI C12.20 0.2 class ① | ±0.2% per ANSI C12.20 0.2 class |
| VAR-hours | ±0.2% per ANSI C12.20 0.2 class ① | ±0.2% per ANSI C12.20 0.2 class |
| VA-hours | ±0.2% per ANSI C12.20 0.2 class ① | ±0.2% per ANSI C12.20 0.2 class |
| Ampere—demand | 0.05% of RV + 0.01% FS | ±0.1% per ANSI C12.20 0.2 class |
| Watt—demand | ±0.2% per ANSI C12.20 0.2 class ① | ±0.2% per ANSI C12.20 0.2 class |
| VAR—demand | ±0.2% per ANSI C12.20 0.2 class ① | ±0.2% per ANSI C12.20 0.2 class |
| VA—demand | ±0.2% per ANSI C12.20 0.2 class ① | ±0.2% per ANSI C12.20 0.2 class |
| Revenue accuracy | ±0.2% per ANSI C12.20 0.2 class ① | ANSI C12.20 (0.2%) |
| Individual ampere harmonics | 85th ⑤ | 40th ③ ② ②③ |
| Individual voltage harmonics | 85th ⑤ | 40th ③ ② ②③ |
| Interharmonics | Yes ②① | — |

Minimum and/or Maximum Values

| | | |
|-----------------------|-----------------------------------|--|
| Volts | L–L, L–N, VAUX L–L | L–L, L–N |
| Current | A, B, C, N, G | A, B, C, N |
| Power | Watt, VAR, VA | Watt, VAR, VA |
| Power factor | Apparent/displacement | Apparent |
| Frequency | Hertz | Hertz |
| THD | Amperes/volts (L–L, L–N, AUX L–L) | Amperes/volts ② ③ ② ②③ |
| Demand values | kW, kVAR, kVA, amperes | kW, kVAR, kVA, amperes |
| Trend analysis | 2/4 ②⑧/8 GB ② | 256/512 ②/768 ③ ② ②③ MB |
| Event logging | 2/4 ②⑧/8 GB ② | 100,000 alarms/events with timestamp |
| Disturbance recording | 2/4 ②⑧/8 GB ② 60 cycles per event | 768 MB, up to 64 cycles per event ② ②③ |

Other Features

| | | |
|---------------------------------|---|--|
| Storage | 2/4 ②⑧/8 GB ② | 256/512 ②/768 ③ ② ②③ MB standard |
| PG output relays | 5 maximum | Optional (2) form C, 5A or (4) form A, 120 mA |
| PG analog outputs | — | Optional (4) 4–20 mA or (4) 0–1 mA |
| Discrete contact inputs | 8 | Optional (2) or (4) |
| Analog inputs | — | — |
| Synch—input kW utility | Via status input | Via end of interval pulse with optional digital inputs |
| Auxiliary voltage ⑦ | Yes | — |
| kWh pulse initiator | Yes | Yes |
| Waveform display | Local/computer | ⑥ |
| Waveform capture, samples/cycle | Yes, 512 | Yes, up to 64 ②, up to 512 ②③ |
| Frequency distribution display | — | — |
| Display type | LCD ⑤ | Red LED |
| Display lines/character | Graphic (320 x 240 pixels) | 3 lines, 4 characters |
| Display character height | 0.22 (5.5) H x 0.16 (4.0) W | 0.56 (14.2) H |
| Communications | Serial: Modbus® RTU, Modbus ASCII ⑤ Network: Modbus TCP, Ethernet TCP/IP, HTTP, SNMP, SMTP, FTP, DNP 3.0 | Serial: Modbus RTU, Modbus ASCII, DNP 3.0 Network: Modbus TCP, BACnet/IP, Ethernet TCP/IP, HTTP, HTTPS, SNMP, SMTP Waveform FTP ② ②③ |
| Setup configuration | Via Web browser/display | Via Web browser/display |
| Dimensions | Meter: 8.82 H x 8.22 W x 6.72 D ⑧ Display: 9.02 H x 7.80 W x 2.49 D ⑧ | 4.85 (123.2) H x 4.85 (123.2) W x 4.97 (126.2) D |
| Operating temperature range | –20 to +60°C display unit, –20 to +70°C meter base unit ⑩ | –20 to +70°C |
| Reference literature | TD02601007E | TD02601017E |

- ① Under typical operating conditions.
- ② PXM 2260 only.
- ③ PXM 2270 only.
- ④ IQ 260 only.
- ⑤ Individual values reported to 85th harmonic; anti-alias filtering prevents higher frequencies from distorting readings (see IEC 61000-4-7).
- ⑥ At computer only.
- ⑦ The auxiliary voltage option adds three additional voltage input channels to Power Xpert Meters.
- ⑧ Dimensions in mm = 224.0 H x 208.8 W x 170.7 D.
- ⑨ Dimensions in mm = 229.1 H x 198.1 W x 63.2 D.
- ⑩ Using <10 VA meter sourced 24V power.
- ⑪ From 3 to 300% of FS.
- ⑫ At unity power factor and 5–300% of FS.
- ⑬ At a power factor <±0.5 and 5–300% of FS.
- ⑭ Relays programmable to operate on any measured function.
- ⑮ Optional.
- ⑯ An IPONI is required.
- ⑰ IQ 140 and IQ 150.
- ⑱ IQ 150 only.
- ⑲ F-Frame: 1.30 (33.0) H x 4.12 (104.6) W x 3.20 (81.3) D.
J-Frame: 1.28 (32.5) H x 4.12 (104.6) W x 4.04 (102.6) D.
K-Frame: 1.25 (31.8) H x 5.31 (134.9) W x 4.04 (102.6) D.
Universal: 3.00 (76.2) H x 5.31 (134.9) W x 4.36 (110.7) D.
- ⑳ PXM 6000 only.
- ㉑ PXM 8000 only.
- ㉒ PXM 2280 only.
- ㉓ PXM 2290 only.
- ㉔ IQ 250S only.

Legend PG = Programmable
FS = Full Scale
RV = Read Value

Auxiliary voltage (Optional) = Provides three additional voltage inputs to the meter: Va2, Vb2, Vc2.

Interharmonics = Power Xpert 6000/8000 supported.

Note: Technical data for the DP-4000 and the IQ 230 can be found at Eaton.com/meters.

IQ 250/260 Series



IQ 100 Series



IQ 35M Series



| Device Name | | | |
|--------------------------------------|--|---|---|
| Electrical Parameters | | | |
| Volts | 0.1% of RV | ±0.25% of RV | 0.4% +0.015% per °C deviation from 25°C |
| Amperes | 0.1% of RV | ±0.25% of RV | 0.4% (5–100%), 0.8%(1-5%) +0.015% per °C from 25°C |
| Current range (% of nominal) | 0.1–200% | 0.1–200% | 1–120% |
| Watts | 0.2% of RV | 0.5% of RV ⑰ | 0.5% per ANSI C12.20 and IEC 62053-22 Class 0.5S |
| VARs | 0.2% of RV | 0.5% of RV ⑰ | 2.0% per IEC 62053-23 Class 2 |
| VA | 0.2% of RV | 0.5% of RV ⑰ | Calculated: vector sum of watts and VARs |
| PF—apparent | 0.2% of RV | 0.5% of RV ⑰ | Calculated: watts/VA |
| PF—displacement | — | — | — |
| Frequency | ±0.03 Hz | ±0.03% Hz ⑰ | ±0.02 Hz |
| THD—voltage | 40th ④ | — | — |
| THD—current | 40th ④ | — | — |
| Watthours | ±0.2% per ANSI C12.20 0.2 class | ±0.5% per ANSI C12.20 0.5 class ⑱ | 0.5% per ANSI C12.20 and IEC 62053-22 Class 0.5S |
| VAR-hours | ±0.2% per ANSI C12.20 0.2 class | ±0.5% per ANSI C12.20 0.5 class ⑱ | ±2.0% per IEC 62053-22 Class 0.5S |
| VA-hours | ±0.2% per ANSI C12.20 0.2 class | ±0.5% per ANSI C12.20 0.5 class ⑱ | — |
| Ampere—demand | ±0.1% per ANSI C12.20 0.2 class | ±0.5% per ANSI C12.20 0.5 class ⑰ | — |
| Watt—demand | ±0.2% Per ANSI C12.20 0.2 class | ±0.5% per ANSI C12.20 0.5 class ⑰ | 0.5% per ANSI C12.20 and IEC 62053-22 Class 0.5S |
| VAR—demand | ±0.2% Per ANSI C12.20 0.2 class | ±0.5% per ANSI C12.20 0.5 class ⑰ | 2.0% per IEC 62053-23 Class 2 |
| VA—demand | ±0.2% Per ANSI C12.20 0.2 class | ±0.5% per ANSI C12.20 0.5 class ⑰ | Calculated: vector sum of watts and VARs |
| Revenue accuracy | ANSI C12.20 (0.2%) | ANSI C12.20 (0.5%) | 0.5% per ANSI C12.20 and IEC 62053-22 Class 0.5S |
| Individual ampere harmonics | — | — | — |
| Individual voltage harmonics | — | — | — |
| Interharmonics | — | — | — |
| Minimum and/or Maximum Values | | | |
| Volts | L–L, L–N | L–L, L–N | — |
| Current | A, B, C | A, B, C | — |
| Power | Watt, VAR, VA | Watt, VAR, VA | — |
| Power factor | Apparent | Apparent ⑰ | Apparent (Low Alert) |
| Frequency | Hertz | Hertz ⑰ | Hertz (Out of Range Alert) |
| THD | Amperes/volts ④ | Amperes/volts | — |
| Demand values | kW, kVAR, kVA, amperes | kW, kVAR, kVA, amperes ⑰ | kW, kVAR, kVA; maximum kW, kVAR, kVA |
| Trend analysis | ⑥ | ⑥ | — |
| Event logging | 128 KB ⑮ | ⑥ | Logging on demand interval or Modbus command ⑮ |
| Disturbance recording | — | — | — |
| Other Features | | | |
| Storage | 128 KB for logging, up to 8 parameters every 15 minutes for 30 days | — | 10 registers (16 bit) by 5760 entries ea (115 kB) ⑮ |
| PG output relays | Optional (2) form C, 5A or (4) form A, 120 mA | — | — |
| PG analog outputs | Optional (4) 4–20 mA or (4) 0–1 mA | — | — |
| Discrete contact inputs | Optional (2) or (4) | — | 2 pulse inputs with BACnet |
| Analog inputs | — | — | — |
| Synch—input kW utility | Via end of interval pulse with optional digital inputs | — | Optional demand synchronization via Modbus |
| Auxiliary voltage ⑯ | — | — | — |
| kWh pulse initiator | Yes | ⑮ | Yes |
| Waveform display | — | — | — |
| Waveform capture, samples/cycle | — | — | — |
| Frequency distribution display | — | — | — |
| Display type | Red LED | Red LED | Backlit LCD |
| Display lines/character | 3 lines, 4 characters | 3 lines, 4 characters | 2 lines by 5 characters ea (full alphanumeric top row) |
| Display character height | 0.56 (14.2) H | 0.56 (14.2) H | 7.5 mm |
| Communications | Serial: Modbus RTU, Modbus ASCII, DNP 3.0 Network: Modbus TCP via Power Xpert Gateway | Serial: Modbus RTU, Modbus ASCII ⑮ Network: Modbus TCP ⑮ | Serial: Modbus RTU ⑮, BACnet MS/TP ⑮ Network: Modbus TCP via Power Xpert Gateway |
| Setup configuration | Via configuration software/display | Via configuration software/display | Via display/configuration software |
| Dimensions | 4.85 (123.2) H x 4.85 (123.2) W x 4.97 (126.2) D | 4.85 (123.2) H x 4.85 (123.2) W x 4.97 (126.2) D | 3.60 (91.4) H x 4.20 (106.7) W x 2.30 (58.4) D |
| Operating temperature range | –20 to +70°C | –20 to +70°C | Meter: –30° to +70°C, Display: –10° to +50°C |
| Reference literature | TD02601016E | TD02601015E | TD02601018E |

IQ 150S/250S Series



IQ Analyzer 6000 Series



Power Xpert Multi-Point Meter



IQ Energy Sentinel



| Device Name | IQ 150S/250S Series | IQ Analyzer 6000 Series | Power Xpert Multi-Point Meter | IQ Energy Sentinel |
|--------------------------------------|---|---|---|--|
| Electrical Parameters | | | | |
| Volts | 0.1% of RV | ±0.2% FS ⑩ | ±0.2% RV | — |
| Amperes | 0.1% of RV | ±0.2% FS ⑩ | ±0.2% RV | — |
| Current range (% of nominal) | 0.1–200% | 3–800% | — | — |
| Watts | 0.2% of RV | 0.4% FS, ± RV ⑫ | ±0.5% RV | ±1.0% FS |
| VARs | 0.2% of RV | 0.4% FS, ± RV ⑫ | ±0.5% RV | — |
| VA | 0.2% of RV | 0.4% FS, ± RV ⑫ | ±0.5% RV | — |
| PF—apparent | 0.2% of RV | 0.8% FS ⑩ | ±0.5% RV | — |
| PF—displacement | — | 0.8% FS ⑩ | — | — |
| Frequency | ± 0.03 Hz | 0.04% ⑩ or 0.01 Hz | ±0.1 Hz | — |
| THD—voltage | — | 50th | — | — |
| THD—current | — | 50th | — | — |
| Watthours | ±0.2% per ANSI C12.20 0.2 class | 0.5% RV ⑫ | ±0.5% per ANSI C12.20.0.5 class | ±1.0% FS |
| VAR-hours | ±0.2% per ANSI C12.20 0.2 class | 1% RV ⑬ | ±0.5% per ANSI C12.20.0.5 class | — |
| VA-hours | ±0.2% per ANSI C12.20 0.2 class | 0.5% RV ⑫ | ±0.5% per ANSI C12.20.0.5 class | — |
| Ampere—demand | ±0.1% per ANSI C12.20 0.2 class | ±0.2% FS ⑩ | — | — |
| Watt—demand | ±0.2% per ANSI C12.20 0.2 class | ±0.4% FS ⑩ | ±0.5% per ANSI C12.20.0.5 class | ±1.0% FS |
| VAR—demand | ±0.2% per ANSI C12.20 0.2 class | ±0.4% FS ⑩ | ±0.5% per ANSI C12.20.0.5 class | — |
| VA—demand | ±0.2% per ANSI C12.20 0.2 class | ±0.4% FS ⑩ | ±0.5% per ANSI C12.20.0.5 class | — |
| Revenue accuracy | ANSI C12.20 (0.2%) | ANSI C12.20 (0.5%) | ANSI C12.20 (0.5%) | — |
| Individual ampere harmonics | — | 50th | — | — |
| Individual voltage harmonics | — | 50th | — | — |
| Interharmonics | — | — | — | — |
| Minimum and/or Maximum Values | | | | |
| Volts | L–L, L–N | L–L, L–N | L–L, L–N | — |
| Current | A, B, C | A, B, C, N, G | A, B, C | — |
| Power | Watt, VAR, VA | Watt, VAR, VA | Watt, VAR, VA | — |
| Power factor | Apparent | Apparent/displacement | Apparent | — |
| Frequency | Hertz | Hertz | Hertz | — |
| THD | — | Amperes/volts | — | — |
| Demand values | kW, kVAR, kVA, amperes | All | Watts (delivered and received), watts Q1–Q4 VA (Q1, Q4), VA (Q2, Q3) | — |
| Trend analysis | 2 MB ⑭ | Time/date | Interval data | ⑯ |
| Event logging | 2 MB ⑭ | 504 events w/timestamp | 20 latest events and historical | ⑯ |
| Disturbance recording | — | 10 waveform events | — | — |
| Other Features | | | | |
| Storage | 2 MB ⑭ | 90 kB | 256 MB standard, 2 GB optional | — |
| PG output relays | — | (4) 10A form C ⑰ | 1 standard, 8 each module ⑱ | — |
| PG analog outputs | — | (4) 0–10 / 4–20 mA | — | — |
| Discrete contact inputs | — | (3) +30 Vdc differential | 3 standard, 8 each module ⑱ | — |
| Analog inputs | — | (1) 0–20 / 4–20 mA | — | — |
| Synch—input kW utility | — | At device or via communications ⑲ | Via communications and digital input | Via communications only |
| Auxiliary voltage ⑳ | — | — | — | — |
| kWh pulse initiator | Yes | Yes | Aggregate or main-digital output, LED output on meter modules (accuracy check) | — |
| Waveform display | — | Local ⑳/computer | — | — |
| Waveform capture, samples/cycle | — | Yes, 128 | — | — |
| Frequency distribution display | — | Local ⑳/computer | — | — |
| Display type | Red LED | Graphic LCD with LED backlight | ㉑ LCD color touchscreen | — |
| Display lines/character | 3 lines, 4 characters | 7 lines, 147 characters | 6-inch diagonal | — |
| Display character height | 0.56 (14.2) H | Up to 7 lines | Graphics | — |
| Communications | Serial: Modbus RTU, Modbus ASCII, DNP 3.0 Network: Modbus TCP, wired or wireless | Serial: INCOM ㉒ Network: via Power Xpert Gateway ㉓ | Serial: Modbus RTU ㉔ Network: Modbus TCP, BACnet/IP, Ethernet TCP/IP, HTTP, HTTPS, SNMP, SMTP, SFTP | Serial: INCOM Network: via Power Xpert Gateway |
| Setup configuration | Via configuration software/display | Via configuration software/display | Via PXMP configuration software | Via configuration software |
| Dimensions | 7.90 (200.7) H x 7.5 (190.5) W x 43.1 (78.7) D | 10.30 (261.6) H x 6.70 (170.2) W x 5.40 (137.2) D | 12.50 (317.5) H x 15.63 (397) W x 3.27 (83.1) D | ㉕ |
| Operating temperature range | –20 to +70°C | –20 to +70°C | –20 to +70°C | –25 to +70°C |
| Reference literature | TD02601019E | TD1702BTE | TD150006EN | TD1707TE |



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