

Metering products family



EATON

Powering Business Worldwide

General description

Eaton's 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



IQ 250/260 Series



Device Name

Electrical Parameters

Volts	0.1% of reading + 0.02% FS	0.1% of reading	0.1% of reading
Amperes	0.05% of reading + 0.01% FS	0.1% of reading	0.1% of reading
Current range (% of nominal)	0.005–20A (400%)	0.1–200%	0.1–200%
Watts	0.1% of reading + 0.0025% FS	0.2% of reading	0.2% of reading
VARS	0.1% of reading + 0.0025% FS	0.2% of reading	0.2% of reading
VA	0.1% of reading + 0.0025% FS	0.2% of reading	0.2% of reading
PF—apparent	0.1%	0.2% of reading	0.2% of reading
PF—displacement	0.1%	—	—
Frequency	± 0.01 Hz	± 0.03 Hz	± 0.03 Hz
THD—voltage	1%	40th ②③	40th ④
THD—current	1%	40th ②③	40th ④
Watt hours	ANSI C12.20 0.2 class ①	± 0.2% per ANSI C12.20 0.2 class	± 0.2% per ANSI C12.20 0.2 class
Var hours	ANSI C12.20 0.2 class ①	± 0.2% per ANSI C12.20 0.2 class	± 0.2% per ANSI C12.20 0.2 class
VA—hours	ANSI C12.20 0.2 class ①	± 0.2% per ANSI C12.20 0.2 class	± 0.2% per ANSI C12.20 0.2 class
Ampere—demand	0.05% of reading + 0.01% FS	± 0.1% per ANSI C12.20 0.2 class	± 0.1% per ANSI C12.20 0.2 class
Watt—demand	ANSI C12.20 0.2 class ①	± 0.2% per ANSI C12.20 0.2 class	± 0.2% Per ANSI C12.20 0.2 class
VAR—demand	ANSI C12.20 0.2 class ①	± 0.2% per ANSI C12.20 0.2 class	± 0.2% Per ANSI C12.20 0.2 class
VA—demand	ANSI C12.20 0.2 class ①	± 0.2% per ANSI C12.20 0.2 class	± 0.2% Per ANSI C12.20 0.2 class
Revenue accuracy	ANSI C12.20 0.2 class ①	ANSI C12.20 (0.2%)	ANSI C12.20 (0.2%)
Individual ampere harmonics	85th ⑤	40th ③	—
Individual voltage harmonics	85th ⑤	40th ③	—
Interharmonics	Yes	—	—

Minimum and/or Maximum Values

Volts	L-L, L-N, VAUX L-L	L-L, L-N	L-L, L-N
Current	A, B, C, N, G	A, B, C, N	A, B, C
Power	Watt, VAR, VA	Watt, VAR, VA	Watt, VAR, VA
Power factor	Apparent/displacement	Apparent	Apparent
Frequency	Hertz	Hertz	Hertz
THD	Amperes/volts (L-L, L-N, AUX L-L)	Amperes/volts ②③	Amperes/volts ④
Demand values	kW, kVAR, kVA, amperes	kW, kVAR, kVA, amperes	kW, kVAR, kVA, amperes
Trend analysis	Limited to size of CompactFlash®	256/5R ②/268 ③ MB	⑥
Event logging	Limited to size of CompactFlash	100,000 alarms/events with timestamp	④
Disturbance recording	CompactFlash 512 MB standard/1 GB option 60 cycles per event	—	—

Other Features

Storage	512 MB standard/1 GB option	256/512 ②/768 ③ MB standard	—
PG output relays	5 maximum	Optional (2) form C, 5A or (4) form A, 120 mA	Optional (2) form C, 5A or (4) form A, 120 mA
PG analog outputs	—	Optional (4) 4–20 mA or (4) 0–1 mA	Optional (4) 4–20 mA or (4) 0–1 mA
Discrete contact inputs	8	Optional (2) or (4)	Optional (2) or (4)
Analog inputs	—	—	—
Synch—input kW utility	Via status input	Via end of interval pulse with optional digital inputs	Via end of interval pulse with optional digital inputs
Auxiliary voltage ⑦	Yes	—	—
kWh pulse initiator	Yes	Yes	Yes
Waveform display	Local/computer	④	—
Waveform capture	Yes	—	—
Frequency distribution display	—	—	—
Display type	LCD	Red LED	Red LED
Display lines/character	Graphic (320 x 240 pixels)	3 lines, 4 characters	3 lines, 4 characters
Display character height	0.22 (5.5) H x 0.16 (4.0) W	0.56 (14.2) H	0.56 (14.2) H
Communications	Serial: Modbus® RTU, Modbus ASCII Network: Modbus TCP, Ethernet TCP/IP, HTTP, SNMP, SMTP, FTP	Serial: Modbus RTU, Modbus ASCII, DNP 3.0 Network: Modbus TCP, Ethernet TCP/IP, HTTP, HTTPS, SNMP, SMTP	Serial: Modbus RTU, Modbus ASCII, DNP 3.0 Network: Modbus TCP via Power Xpert Gateway
Setup configuration	Via Web browser/display	Via Web browser/display	Via configuration software/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	4.85 (123.2) H x 4.85 (123.2) W x 4.97 (126.2) D
Operating temperature range	–20–60°C display unit, –20–70°C meter base unit ⑧	–20–70°C	–20–70°C
Reference literature	TD02601007E	TD02601017E	TD02601016E

IQ Analyzer 6000 Series

IQ DP-4000 Series

IQ 210/220/230 Series

IQ 100 Series

Device Name
Electrical Parameters

Volts	± 0.2% FS ⑩	± 0.3% FS	± 0.5% FS	± 0.25% of reading
Amperes	± 0.2% FS ⑩	± 0.3% FS	± 0.5% FS	± 0.25% of reading
Current range (% of nominal)	3–800%	10–250%	1–200%	0.1–200%
Watts	0.4% FS, ± reading ⑫	± 0.6% FS	± 1.0% FS	0.5% of reading ⑬
VARs	0.4% FS, ± reading ⑬	± 0.6% FS	± 1.0% FS	0.5% of reading ⑬
VA	0.4% FS, ± reading ⑫	± 0.6% FS	± 1.0% FS	0.5% of reading ⑬
PF—apparent	0.8% FS ⑩	± 1.0% FS	± 2.0% FS	0.5% of reading ⑬
PF—displacement	0.8% FS ⑩	± 1.0% FS	± 2.0% FS	—
Frequency	0.04% ⑩ or 0.01 Hz	± 0.17% FS	± 0.1% Hz	± 0.03% Hz ⑬
THD—voltage	50th	31st	—	—
THD—current	50th	31st	—	—
Watt hours	0.5% reading ⑫	± 0.6% FS	± 1.0% per ANSI C12	± 0.5% per ANSI C12.20 0.5 class ⑭
Var hours	1% reading ⑬	± 0.6% FS	± 1.0% per ANSI C12	± 0.5% per ANSI C12.20 0.5 class ⑭
VA—hours	0.5% reading ⑫	± 0.6% FS	± 1.0% per ANSI C12	± 0.5% per ANSI C12.20 0.5 class ⑭
Ampere—demand	± 0.2% FS ⑩	± 0.3%	± 0.5% per ANSI C12	± 0.5% per ANSI C12.20 0.5 class ⑬
Watt—demand	± 0.4% FS ⑩	± 0.6%	± 1.0% per ANSI C12	± 0.5% per ANSI C12.20 0.5 class ⑬
VAR—demand	± 0.4% FS ⑩	± 0.6%	± 1.0% per ANSI C12	± 0.5% per ANSI C12.20 0.5 class ⑬
VA—demand	± 0.4% FS ⑩	± 0.6%	± 1.0% per ANSI C12	± 0.5% per ANSI C12.20 0.5 class ⑬
Revenue accuracy	ANSI C12.20 (0.5%)	—	ANSI C12.1 (1%)	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	L-L, L-N
Current	A, B, C, N, G	A, B, C	A, B, C	A, B, C
Power	Watt, VAR, VA	Watt, VAR, VA	Watt, VAR, VA	Watt, VAR, VA
Power factor	Apparent/displacement	Apparent/displacement	Apparent/displacement	Apparent ⑬
Frequency	Hertz	Hertz	Hertz	Hertz ⑬
THD	Amperes/volts	Amperes/volts	—	Amperes/Volts
Demand values	All	All	All	kW, kVAR, kVA, amperes ⑬
Trend analysis	Time/date	2 alarms	⑥	⑥
Event logging	504 events w/timestamp	—	⑥	⑥
Disturbance recording	10 waveform events	—	—	—

Other Features

Storage	90 kB	15 parameters	—	—
PG output relays	(4) 10A form C ⑭	(3) 10A form C ⑭	(2) 100 mA form A ⑮	—
PG analog outputs	(4) 0–10/4–20 mA	(1) kW demand ⑭	—	—
Discrete contact inputs	(3) +30 Vdc differential	(1) kW demand ⑭	(2) +30 Vdc differential ⑮	—
Analog inputs	(1) 0–20/4–20 mA	—	(1) 4–20 mA ⑮	—
Synch—input kW utility	At device or via communications ⑯	At device or via communications ⑯	Via communications only ⑰	—
Auxiliary voltage ⑰	—	—	—	—
kWh pulse initiator	Yes	Yes ⑱	Yes ⑰	⑱
Waveform display	Local ⑱/computer	—	—	—
Waveform capture	Yes	—	—	—
Frequency distribution display	Local ⑱/computer	—	—	—
Display type	Graphic LCD with LED backlight	7 segment LED	Backlit LCD	Red LED
Display lines/character	7 lines, 147 characters	1 line, 7 characters	4 Lines, 20 characters	3 lines, 4 characters
Display character height	Up to 7 lines	1 line	1.60 (40.6) H x .09 (2.3) W	0.56 (14.2) H
Communications	Serial: INCOM ⑲ Network: via Power Xpert Gateway ⑲	Serial: INCOM ⑲ Network: via Power Xpert Gateway ⑲	Serial: INCOM ⑲, Modbus RTU ⑲ Network: via Power Xpert Gateway	Serial: Modbus RTU, Modbus ASCII ⑲ Network: Modbus TCP via Power Xpert Gateway
Setup configuration	Via configuration software/display	Via configuration software/display	Via configuration software/display	Via configuration software/display
Dimensions	10.30 (261.6) H x 6.70 (170.2) W x 5.40 (137.2) D	10.30 (261.6) H x 6.70 (170.2) W x 5.40 (137.2) D	Meter: 5.05 H x 3.55 W x 6.74 D ⑲ Display: 3.78 H x 3.78 W x 1.84 D ⑲	4.85 (123.2) H x 4.85 (123.2) W x 4.97 (126.2) D
Operating temperature range	–20–70°C	–20–70°C	0–50°C	–30–70°C
Reference literature	TD1702BTE	TD1703ATE	TD1706ATE	TD02601015E

IQ Multipoint Energy Submeter II

IQ Energy/Power Sentinel



Device Name

Electrical Parameters

Volts	± 0.5% FS	± 0.5% FS ⑫
Amperes	—	± 0.5% FS ⑫
Current range (% of nominal)	—	—
Watts	± 1.0% FS	± 1.0% FS
VARS	—	± 1.0% FS ⑫
VA	—	± 1.0% FS ⑫
PF—apparent	—	± 2.0% FS ⑫
PF—displacement	—	± 2.0% FS ⑫
Frequency	—	± 0.1% FS ⑫
THD—voltage	—	—
THD—current	—	—
Watthours	± 1.0% Per ANSI C12	± 1.0% FS
Varhours	—	—
VA—hours	—	—
Ampere—demand	—	—
Watt—demand	± 1.0% Per ANSI C12	± 1.0% FS
VAR—demand	—	—
VA—demand	—	—
Revenue accuracy	ANSI C12.1 (1%)	—
Individual ampere harmonics	—	—
Individual voltage harmonics	—	—
Interharmonics	—	—

Minimum and/or Maximum Values

Volts	—	—
Current	—	—
Power	—	—
Power factor	—	—
Frequency	—	—
THD	—	—
Demand values	—	—
Trend analysis	⑥	⑥
Event logging	⑥	⑥
Disturbance recording	—	—

Other Features

Storage	—	—
PG output relays	—	—
PG analog outputs	—	—
Discrete contact inputs	—	—
Analog inputs	—	—
Synch—input kW utility	Via communications only	Via communications only
Auxiliary voltage ⑦	—	—
kWh pulse initiator	—	—
Waveform display	—	—
Waveform capture	—	—
Frequency distribution display	—	—
Display type	—	—
Display lines/character	—	—
Display character height	—	—
Communications	Serial: INCOM Network: via Power Xpert Gateway	Serial: INCOM Network: via Power Xpert Gateway
Setup configuration	Via configuration software	Via configuration software
Dimensions	7.94 (201.7) H x 11.87 (301.5) W x 1.49 (37.8) D	⑳
Operating temperature range	–25–70°C	–25–70°C
Reference literature	TD17C02TE	TD1707TE

- 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 3–300% 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 IQ 230/230M only.
- ⑯ Optional.
- ⑰ IQ 220 and IQ 230 models only.
- ⑱ IQ 230M only.
- ⑲ An IPONI is required
- ⑳ Dimensions in mm = 128.3 H x 90.2 W x 171.2 D.
- ㉑ IQ Power Sentinel only.
- ㉒ Dimensions in mm = 96.0 H x 96.0 W x 46.7 D.
- ㉓ IQ 140 and IQ 150.
- ㉔ IQ 150 only.
- ㉕ 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

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.

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