Technical Data **TD02601014E** Effective February 2012

Metering products family

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.

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 factory 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 Dimensions in mm = 128.3 H x 90.2 W x 171.2 D.
⑱ IQ Power Sentinel only.
⑲ Dimensions in mm = 96.0 H x 96.0 W x 46.7 D.
⑳ IQ 140 and IQ 150.
㉑ IQ 150 only.
㉒ 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
㉓ PXM 6000 only
㉔ PXM 8000 only
㉕ PXM 2280 only
㉖ PXM 2290 only
㉗ 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**.

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

Device Name	Power Xpert 4000/6000/8000	Power Xpert 2000
Electrical Parameters		
Volts	0.1% of reading + 0.02% FS	0.1% of reading
Amperes	0.05% of reading + 0.01% FS	0.1% of reading
Current range (% of nominal)	0.005–20A (400%)	0.1–200%
Watts	0.1% of reading + 0.0025% FS	0.2% of reading
VARS	0.1% of reading + 0.0025% FS	0.2% of reading
VA	0.1% of reading + 0.0025% FS	0.2% of reading
PF—apparent	0.1%	0.2% of reading
PF—displacement	0.1%	—
Frequency	± 0.01 Hz	± 0.03 Hz
THD—voltage	127th	40th ②③ ㉕ ㉖
THD—current	127th	40th ②③ ㉕ ㉖
Watthours	± 0.2% per ANSI C12.20 0.2 class ①	± 0.2% per ANSI C12.20 0.2 class
Varhours	± 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 reading + 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 ㉕ ㉖
Individual voltage harmonics	85th ⑤	40th ③ ㉕ ㉖
Interharmonics	Yes ㉓ ㉔	—
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 ②③ ㉕ ㉖
Demand values	kW, kVAR, kVA, amperes	kW, kVAR, kVA, amperes
Trend analysis	2/4 ㉓/8GB ㉔	256/512 ②/768 ③ ㉕ ㉖ MB
Event logging	2/4 ㉓/8GB ㉔	100,000 alarms/events with timestamp
Disturbance recording	2/4 ㉓/8GB ㉔ 60 cycles per event	768 MB, up to 64 cycles per event ㉕ ㉖
Other Features		
Storage	2/4 ㉓/8GB ㉔	256/512 ②/768 ③ ㉕ ㉖ 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 ㉕, up to 512 ㉖
Frequency distribution display	—	—
Display type	LCD	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 Network: Modbus TCP, Ethernet TCP/IP, HTTP, SNMP, SMTP, FTP	Serial: Modbus RTU, Modbus ASCII, DNP 3.0 Network: Modbus TCP, BACnet/IP, Ethernet TCP/IP, HTTP, HTTPS, SNMP, SMTP, Waveform FTP ㉕ ㉖
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 ⑨	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 ⑩	–20–70°C
Reference literature	TD02601007E	TD02601017E

Device Name	IQ 250/260 Series	IQ 100 Series	IQ 35M Series
Electrical Parameters			
Volts	0.1% of reading	± 0.25% of reading	0.4% +0.015% per °C deviation from 25°C
Amperes	0.1% of reading	± 0.25% of reading	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 reading	0.5% of reading ⑳	0.5% per ANSI C12.20 and IEC 62053-22 Class 0.5S
VARS	0.2% of reading	0.5% of reading ⑳	2.0% per IEC 62053-23 Class 2
VA	0.2% of reading	0.5% of reading ⑳	Calculated: vector sum of Watts and VARs
PF—apparent	0.2% of reading	0.5% of reading ⑳	Calculated: Watts / VAs
PF—displacement	—	—	—
Frequency	± 0.03 Hz	± 0.03% Hz ⑳	±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 ㉑	0.5% per ANSI C12.20 and IEC 62053-22 Class 0.5S
Varhours	± 0.2% per ANSI C12.20 0.2 class	± 0.5% per ANSI C12.20 0.5 class ㉑	±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 ㉑	—
Ampere—demand	± 0.1% per ANSI C12.20 0.2 class	± 0.5% per ANSI C12.20 0.5 class ⑳	—
Watt—demand	± 0.2% Per ANSI C12.20 0.2 class	± 0.5% per ANSI C12.20 0.5 class ⑳	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 ⑳	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 ⑳	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 ⑳	Apparent (Low Alert)
Frequency	Hertz	Hertz ⑳	Hertz (Out of Range Alert)
THD	Amperes/volts ④	Ampere/Volts	—
Demand values	kW, kVAR, kVA, amperes	kW, kVAR, kVA, amperes ⑳	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 ⑦	—	—	—
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	7.5mm
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) H x 4.2 (107) W x 2.3 (59) D
Operating temperature range	–20–70°C	–20–70°C	Meter: –30° to 70°C, Display: –10° to 50°C
Reference literature	TD02601016E	TD02601015E	TD02601018E

Device Name	IQ 150S/250S Series	IQ Analyzer 6000 Series	IQ Multipoint Energy Submeter II	IQ Energy/Power Sentinel
Electrical Parameters				
Volts	0.1% of reading	± 0.2% FS ⑪	± 0.5% FS	± 0.5% FS ⑱
Amperes	0.1% of reading	± 0.2% FS ⑪	—	± 0.5% FS ⑱
Current range (% of nominal)	0.1–200%	3–800%	—	—
Watts	0.2% of reading	0.4% FS, ± reading ⑫	± 1.0% FS	± 1.0% FS
VARS	0.2% of reading	0.4% FS, ± reading ⑬	—	± 1.0% FS ⑱
VA	0.2% of reading	0.4% FS, ± reading ⑫	—	± 1.0% FS ⑱
PF—apparent	0.2% of reading	0.8% FS ⑪	—	± 2.0% FS ⑱
PF—displacement	—	0.8% FS ⑪	—	± 2.0% FS ⑱
Frequency	± 0.03 Hz	0.04% ⑪ or 0.01 Hz	—	± 0.1% FS ⑱
THD—voltage	—	50th	—	—
THD—current	—	50th	—	—
Watthours	± 0.2% per ANSI C12.20 0.2 class	0.5% reading ⑫	± 1.0% Per ANSI C12	± 1.0% FS
Varhours	± 0.2% per ANSI C12.20 0.2 class	1% reading ⑬	—	—
VA—hours	± 0.2% per ANSI C12.20 0.2 class	0.5% reading ⑫	—	—
Ampere—demand	± 0.1% per ANSI C12.20 0.2 class	± 0.2% FS ⑪	—	—
Watt—demand	± 0.2% Per ANSI C12.20 0.2 class	± 0.4% FS ⑪	± 1.0% Per ANSI C12	± 1.0% FS
VAR—demand	± 0.2% Per ANSI C12.20 0.2 class	± 0.4% FS ⑪	—	—
VA—demand	± 0.2% Per ANSI C12.20 0.2 class	± 0.4% FS ⑪	—	—
Revenue accuracy	ANSI C12.20 (0.2%)	ANSI C12.20 (0.5%)	ANSI C12.1 (1%)	—
Individual ampere harmonics	—	50th	—	—
Individual voltage harmonics	—	50th	—	—
Interharmonics	—	—	—	—
Minimum and/or Maximum Values				
Volts	L-L, L-N	L-L, L-N	—	—
Current	A, B, C	A, B, C, N, G	—	—
Power	Watt, VAR, VA	Watt, VAR, VA	—	—
Power factor	Apparent	Apparent/displacement	—	—
Frequency	Hertz	Hertz	—	—
THD	—	Amperes/volts	—	—
Demand values	kW, kVAR, kVA, amperes	All	—	—
Trend analysis	2 MB ㉗	Time/date	⑥	⑥
Event logging	2 MB ㉗	504 events w/timestamp	⑥	⑥
Disturbance recording	—	10 waveform events	—	—
Other Features				
Storage	2 MB ㉗	90 kB	—	—
PG output relays	—	(4) 10A form C ⑭	—	—
PG analog outputs	—	(4) 0–10/4–20 mA	—	—
Discrete contact inputs	—	(3) +30 Vdc differential	—	—
Analog inputs	—	(1) 0–20/4–20 mA	—	—
Synch—input kW utility	—	At device or via communications ⑮	Via communications only	Via communications only
Auxiliary voltage ⑦	—	—	—	—
kWh pulse initiator	Yes	Yes	—	—
Waveform display	—	Local ⑮/computer	—	—
Waveform capture, samples/cycle	—	Yes, 128	—	—
Frequency distribution display	—	Local ⑮/computer	—	—
Display type	Red LED	Graphic LCD with LED backlight	—	—
Display lines/character	3 lines, 4 characters	7 lines, 147 characters	—	—
Display character height	0.56 (14.2) H	Up to 7 lines	—	—
Communications	Serial: Modbus RTU, Modbus ASCII, DNP 3.0 Network: Modbus TCP, wired or wireless	Serial: INCOM ⑯ Network: via Power Xpert Gateway ⑯	Serial: INCOM Network: via Power Xpert Gateway	Serial: INCOM Network: via Power Xpert Gateway
Setup configuration	Via configuration software/display	Via configuration software/display	Via 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	7.94 (201.7) H x 11.87 (301.5) W x 1.49 (37.8) D	㉒
Operating temperature range	–20–70°C	–20–70°C	–25–70°C	–25–70°C
Reference literature	TD02601019E	TD1702BTE	TD17C02TE	TD1707TE

Eaton Corporation
Electrical Sector
1111 Superior Ave.
Cleveland, OH 44114
United States
877-ETN-CARE (877-386-2273)
Eaton.com

© 2012 Eaton Corporation
All Rights Reserved
Printed in USA
Publication No. TD02601014E / TN
February 2012

Eaton and Power Xpert are registered trademarks of Eaton Corporation.

All other trademarks are property of their respective owners.

Powering Business Worldwide