

PowerLogic power-monitoring units

# ION8600

Technical data sheet

# 2007



# ION8600

## Functions and characteristics

PE66039



PowerLogic® ION8600.

Used to monitor electric energy provider networks, service entrances and substations, ION8600 meters are ideal for independent power producers and cogeneration applications that need to accurately measure energy bi-directionally in both generation and stand-by modes. These meters give utilities the tools to manage complex energy supply contracts that include commitments to power quality. Integrate them with our ION Enterprise® operations software or other energy management and SCADA systems through multiple communication channels and protocols, including MV-90.

### Applications

- Tariff metering
- Co-generation and IPP monitoring
- Compliance monitoring
- Power quality analysis
- Demand and power factor control
- Load curtailment
- Equipment monitoring and control
- Energy pulsing and totalisation
- Instrument transformer correction

### Main characteristics

#### IEC 62053-22 Class 0,2S metering

For interconnection points on medium, high, and ultra-high voltage networks in compliance with IEC 62053-22 Class 0,2S

#### Power quality compliance monitoring

Monitor compliance with international quality-of-supply standards (EN50160, IEC61000-4-7, IEC61000-4-15, CBEMA/ITIC)

#### Digital fault recording

Simultaneous capture of voltage and current channels for sub-cycle disturbance transients

#### Complete communications

Multi-port, multi-protocol access serial ports, infrared data port, internal modem, Itron software support, optional IRIG-B port; supports concurrent Ethernet, serial, and modem communications

#### Multiple tariffs and time-of-use

Apply tariffs, seasonal rate schedules to measure energy and demand values for time periods with specific billing requirements

#### Multiple setpoints for alarm and control functions

A total of 65 setpoints are configurable for 1-second or ½ - cycle operation.

#### Power quality summary

Consolidation of all the power quality characteristics into a single trendable index

#### Integrate with software

Easily integrate with ION Enterprise operations software or other energy management systems; MV90, CNP, Modbus

#### Transformer/line loss compensation

Determine technical system losses in real time

#### Instrument transformer correction

Save money and improve accuracy by correcting for less accurate transformers

#### Alarm notification via email

High-priority alarms, data logs sent directly to the user's PC. Instant notification of power quality events by email

### Part numbers

| ION8600 meters |        |
|----------------|--------|
| ION8600A       | M8600A |
| ION8600B       | M8600B |
| ION8600C       | M8600C |

See page 6 for complete part number descriptions.

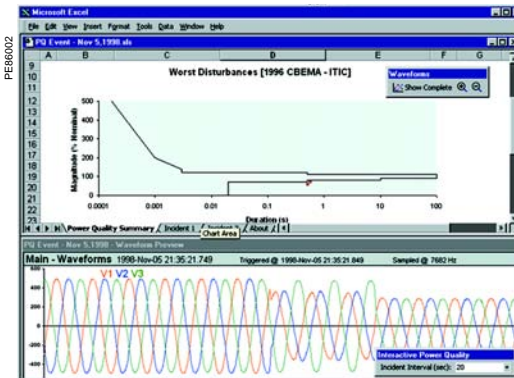
### Options

See page 6.



PowerLogic® ION8600 socket meter.

- 1 Blades
- 2 Optical port
- 3 Main display status bar
- 4 Watt LED
- 5 Navigation, ALT/Enter buttons
- 6 VAR LED
- 7 Form factor label
- 8 Demand reset switch



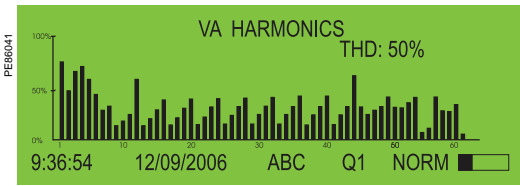
Disturbance waveform capture and power quality report

| Selection guide  |                         | ION8600A                             | ION8600C            |
|--|-------------------------|--------------------------------------|---------------------|
| <b>General</b>   |                         |                                      |                     |
| Use on LV and HV systems   |                         | ■                                    | ■                   |
| Current accuracy   |                         | 0.1 % reading                        | 0.1 % reading       |
| Voltage accuracy   |                         | 0.1 % reading                        | 0.1 % reading       |
| Energy and power accuracy  |                         | 0.2 %                                | 0.2 %               |
| Nbr of samples/cycle or sample frequency                                 |                         | 256                                  | 256                 |
| <b>Instantaneous rms values</b>  |                         |                                      |                     |
| Current, voltage, frequency  |                         | ■                                    | ■                   |
| Active, reactive, apparent power   | Total and per phase     | ■                                    | ■                   |
| Power factor   | Total and per phase     | ■                                    | ■                   |
| Current measurement range (autoranging)                                  |                         | 0.01 - 20A                           | 0.01 - 20A          |
| <b>Energy values</b>   |                         |                                      |                     |
| Active, reactive, apparent energy  |                         | ■                                    | ■                   |
| Settable accumulation modes  |                         | ■                                    | ■                   |
| <b>Demand values</b>   |                         |                                      |                     |
| Current  | Present and max. values | ■                                    | ■                   |
| Active, reactive, apparent power   | Present and max. values | ■                                    | ■                   |
| Predicted active, reactive, apparent power                               |                         | ■                                    | ■                   |
| Synchronisation of the measurement window                                |                         | ■                                    | ■                   |
| Demand modes   |                         | Block, sliding                       | ■                   |
| <b>Power quality measurements</b>  |                         |                                      |                     |
| Harmonic distortion  | Current and voltage     | ■                                    | ■                   |
| Individual harmonics   | Via front panel         | 63                                   | 31                  |
|  | Via ION Enterprise      | 127                                  | 127                 |
| Waveform capture   |                         | ■ <sup>(1)</sup>                     | ■                   |
| Detection of voltage swells and dips                                     |                         | ■                                    | ■                   |
| Adaptive waveform capture  |                         | ■                                    | ■                   |
| Detection and capture of transients                                      |                         | ■ <sup>(1)</sup>                     | -                   |
| Flicker  |                         | ■ <sup>(1)</sup>                     | -                   |
| High speed data recording (down to 10 ms)                                |                         | ■                                    | -                   |
| EN50160 compliance checking  |                         | ■                                    | ■                   |
| Programmable (logic and math functions)                                  |                         | ■                                    | ■                   |
| <b>Data recording</b>  |                         |                                      |                     |
| Min/max of instantaneous values  |                         | ■                                    | ■                   |
| Data logs  |                         | ■                                    | ■                   |
| Event logs   |                         | ■                                    | ■                   |
| Trending/forecasting   |                         | ■                                    | ■                   |
| Alarms (optional automatic alarm setting)                                |                         | ■                                    | ■                   |
| Alarm notification via email (Meterm@il)                                 |                         | ■                                    | ■                   |
| SER (Sequence of event recording)  |                         | ■                                    | ■                   |
| Time stamping  |                         | ■                                    | ■                   |
| GPS synchronisation  |                         | ■                                    | ■                   |
| Memory (in Mbytes)   |                         | 10 <sup>(1)</sup> , 5 <sup>(2)</sup> | 2                   |
| <b>Display and I/O</b>   |                         |                                      |                     |
| Front panel display  |                         | ■                                    | ■                   |
| Wiring self-test   |                         | ■                                    | ■                   |
| Pulse output (front panel LED, internal digital out form C)              |                         | 2, 4                                 | 2, 4                |
| Digital or analogue inputs <sup>(3)</sup> (max)                          |                         | 16                                   | 16                  |
| Digital or analogue outputs <sup>(3)</sup> (max, including pulse output) |                         | 16                                   | 16                  |
| Direct connection voltage  |                         | 277V <sup>(4)</sup>                  | 277V <sup>(4)</sup> |
| <b>Communication</b>   |                         |                                      |                     |
| RS 485 / RS 232 port   |                         | 1                                    | 1                   |
| RS 485 port  |                         | 1                                    | 1                   |
| Infrared port  |                         | 1                                    | 1                   |
| Modbus protocol  |                         | ■                                    | ■                   |
| Ethernet port (Modbus/TCP/IP protocol)                                   |                         | 1                                    | 1                   |
| Ethernet gateway (EtherGate)   |                         | 1                                    | 1                   |
| HTML web page server (WebMeter)  |                         | ■                                    | ■                   |
| Internal modem   |                         | 1                                    | 1                   |
| Modem gateway (ModemGate)  |                         | ■                                    | ■                   |
| IRIG-B port  |                         | 1                                    | 1                   |
| DNP 3.0 through serial, modem, and I/R ports                             |                         | ■                                    | ■                   |

(1) Feature set 'A' only. (2) Feature set 'B' only.

(3) With optional I/O Expander.

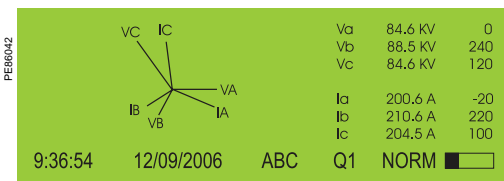
(4) For 9S, 39S, 36S, and 76S only. For 35S system up to 480V line-to-line.



PowerLogic ION8600 front panel harmonic display.

### Electrical characteristics

|                               |   |   |
|-------------------------------|---|---|
| Type of measurement           | True rms up to the 63 <sup>rd</sup> harmonic<br>Up to 1024 samples per cycle<br>Up to 51 kHz for transient events |   |
| Measurement accuracy          | Current and voltage   | 0.1 % Reading   |
|                               | Power   | IEC 62053-22 (0,2S)   |
|                               | Frequency   | ±0.01 Hz  |
|                               | Power factor  | 0.5%  |
|                               | Energy  | IEC 62053-22 (0.2 %)  |
| Data update rate              | 0.5 cycle or 1 second (depending on value)  |   |
| Input-voltage characteristics | Measured voltage  | 57V to 277V autoranging (9S)<br>120V to 480V autoranging (35S)  |
|                               | Impedance   | 5 MΩ /phase (phase-Uref/Ground)   |
|                               | Inputs  | V1, V2, V3, VREF  |
| Input-current characteristics | Rated nominal current   | 5 A and/or 10 A (Standard 5 A and 10 A)<br>1 A, 2 A, 5 A, and/or 10 A (1A to 10A option)  |
|                               | Measurement range   | 0.005 - 20 A autoranging (standard range)<br>0.001 - 10 A autoranging (optional range)  |
|                               | Permissible overload  | 500A rms for 1 second, non-recurring (standard)<br>200A rms for 1 second, non-recurring (optional)  |
|                               | Impedance   | 0.002 Ω per phase (Standard IEC 5 A and 10 A)<br>0.015 Ω per phase (Optional IEC 1 A to 10 A)   |
|                               | Burden  | Low current switchboard: 0.025VA per phase at 1A;<br>Standard switchboard - 0.20VA per phase at 5A;<br>All socket mounts - 0.05VA per phase at 5A |
| Power supply                  | Standard power supply, 120-277 VAC  | 120-277 VLN RMS (-15%/+20%) 47-63 Hz or<br>120-480 VLN RMS (-15%/+20%) 47-63 Hz (35S)   |
|                               | Standard (low voltage) power supply, 57-70 VAC  | 57-70 (-15%/+20%) VLN RMS, 47-63 Hz<br>35S unavailable  |
|                               | Auxiliary power cable assembly, 65-120 VAC  | AC: 65-120 (+/- 15%) VLN RMS, 47-63 Hz<br>DC: 80-160 (+/- 20%) VDC  |
|                               | Auxiliary power cable assembly, 160-277 VAC   | AC: 160-277 (+/- 20%) VLN RMS, 47-63 Hz<br>DC: 200-350 (+/- 20%) VDC  |
|                               | Ride-through time, 120-277 VAC (Standard power supply)  | Min 100 ms (6 cycles at 60 Hz at 96 VAC),<br>200 ms (12 cycles at 60 Hz at 120 VAC),<br>800 ms (48 cycles at 60 Hz at 240 VAC)                    |
|                               | Ride-through time, 57-70 VAC (Standard low voltage power supply)  | Min 100 ms or 6 cycles 60 Hz at 46 VAC  |
| Input/outputs                 | Digital outputs (Form C)  | 4 Solid state relay outputs (200 V AC/V DC)<br>100 mA AC/DC   |
|                               | Digital outputs (Form A)  | 4 Solid state relay outputs (with optional I/O Expander)  |
|                               | Digital inputs  | 4 Solid state digital inputs (supported through optional I/O Expander)  |



ION8600 front panel phasor display and table.

### Mechanical characteristics

|                                     |             |                    |
|-------------------------------------|-------------|--------------------|
| Weight                              | 7.0 kg      |                    |
| IP degree of protection (IEC 60529) | IP51        |                    |
| Dimensions                          | Socket      | 178 x 237 mm       |
|                                     | Switchboard | 285 x 228 x 163 mm |

### Environmental conditions

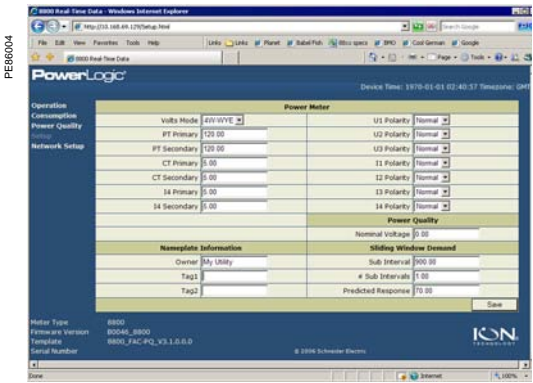
|                         |                                     |
|-------------------------|-------------------------------------|
| Operating temperature   | -20 °C to 60 °C                     |
| Display operating range | -10 °C to +60 °C                    |
| Storage temperature     | -25 °C to +70 °C                    |
| Humidity rating         | 5 to 95 % RH non-condensing         |
| Pollution degree        | 2                                   |
| Installation category   | Cat III (at 2000 m above sea level) |
| Dielectric withstand    | 2.5kV, 50Hz, 1 min                  |

### Electromagnetic compatibility

|                                   |                           |
|-----------------------------------|---------------------------|
| Electrostatic discharge           | IEC 61000-4-2             |
| Immunity to radiated fields       | IEC 61000-4-3             |
| Immunity to fast transients       | IEC 61000-4-4             |
| Immunity to surge                 | IEC 61000-4-5             |
| Immunity conducted                | IEC61000-4-6 (IEC801-6)   |
| Damped oscillatory waves immunity | IEC61000-4-12 (IEC801-12) |
| Conducted and radiated emissions  | CISPR 22 (class A)        |

### Safety

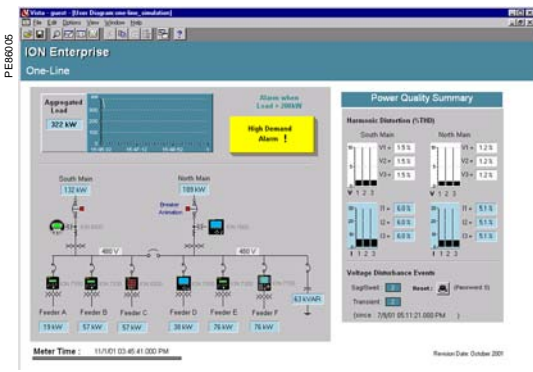
|        |                    |
|--------|--------------------|
| Europe | As per IEC62052-11 |
|--------|--------------------|



Example embedded webserver page (WebMeter) showing realtime values.

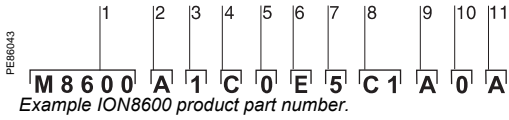
| Communication                   |   |
|---------------------------------|---|
| ANSI 12.18 Type II optical port | Up to 19200bps  |
| RS 485 port                     | Up to 57600 bauds, Modbus, direct connection to a PC or modem   |
| RS 232 / RS 485 port            | 300 - 115,200 bps (RS485 limited to 57,600 bps), ION 2.0, Modbus/RTU, DNP 3.00, GPSTRUETIME/DATUM, DLMS protocols |
| Internal modem port             | 300 bps-33.6k bps (automatic detection supported)   |
| Ethernet port                   | 10/100 BaseTX, RJ45 connector, 100 m link   |
| Fiber-optic Ethernet link       | 100 Base FX, LC duplex connector, 1300 nm, FO multimode with gradient index 62.5/125 µm or 50/125 µm, 2000 m link |
| Protocol                        | TCP/IP, Telnet, ION 2.0, Modbus RTU   |
| EtherGate                       | Up to 31 slave devices via serial portsat 10Mbytes/sec.   |
| ModemGate                       | Up to 31 slave devices, 33,600 bauds  |
| Embedded web server (WebMeter)  | 5 customisable pages, new page creation capabilities, HTML/XML compatible   |

| Firmware characteristics  |   |
|---------------------------|---|
| High-speed data recording | Up to 1/2-cycle interval burst recording, stores detailed characteristics of disturbances or outages. Trigger recording by a user-defined setpoint, or from external equipment. Can log data only during critical event to conserve memory  |
| Harmonic distortion       | Up to 127 <sup>th</sup> harmonic for all voltage and current inputs (feature set A, via ION Enterprise operations software)   |
| Dip/swell detection       | Analyse severity/potential impact of dips and swells: <ul style="list-style-type: none"> <li>- magnitude and duration data suitable for plotting on voltage tolerance curves</li> <li>- per phase triggers for waveform recording or control operations</li> </ul>  |
| Instantaneous             | High accuracy (1s) or high-speed (1/2 cycle) measurements, including true rms per phase / total for: <ul style="list-style-type: none"> <li>- voltage and current</li> <li>- active power (kW) and reactive power (kVAR)</li> <li>- apparent power (kVA)</li> <li>- power factor and frequency</li> <li>- voltage and current unbalance</li> <li>- phase reversal</li> </ul>  |
| Load profiling            | Channel assignments are user configurable: <ul style="list-style-type: none"> <li>- 800 channels via 50 data recorders (feature set A),</li> <li>- 320 channels via 20 data recorders (feature set B),</li> <li>- 32 channels via two data recorders (feature set C).</li> </ul> Configure for historical trend recording of energy, demand, voltage, current, power quality, other measured parameter. Recorders can trigger on time interval basis, calendar schedule, alarm/event condition, manually. |
| Waveform captures         | Simultaneous capture of all voltage and current channels <ul style="list-style-type: none"> <li>- sub-cycle disturbance capture</li> <li>- maximum cycles is 214,000 (16 samples/cycle x 96 cycles, 10Mbytes memory)</li> <li>- 256 samples/cycle</li> </ul>  |
| Alarms                    | Threshold alarms: <ul style="list-style-type: none"> <li>- adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm</li> <li>- user-defined priority levels</li> <li>- boolean combination of alarms is possible using the operators NAND, OR, NOR and XOR</li> </ul>   |
| Advanced security         | Up to 16 users with unique access rights. Perform resets, time syncs, or meter configurations based on user privileges.   |
| Transformer correction    | Correct for phase / magnitude inaccuracies in current transformers (CTs), potential transformers (PTs)  |
| Memory                    | 2 Mbytes (C), 4 Mbytes (B), 10 Mbytes (A)   |
| Firmware update           | Update via the communication ports  |



| Display characteristics |                          |
|-------------------------|--------------------------|
| Type                    | FSTN transreflective LCD |
| Backlight               | LED                      |
| Languages               | English                  |

(1) All the communication ports may be used simultaneously.



- 1 Model.
- 2 Feature set.
- 3 Form factor.
- 4 Current Inputs.
- 5 Voltage inputs.
- 6 Power supply.
- 7 System frequency.
- 8 Communications.
- 9 Onboard inputs/outputs.
- 10 Security.
- 11 Special order.

### Part Numbers

| Item               | Code  | Description  |
|--------------------|-------|--|
| 1 Model            | M8600 | Merlin Gerin advanced tariff meter.  |
| 2 Feature Set      | A     | 10MB memory, 50 data recorders (800 channels), waveform recorders and transient detection.   |
|                    | B     | 4MB memory, 20 data recorders (320 channels), Modbus mastering.  |
|                    | C     | 2MB memory, 2 data recorders (32 channels), dip/swell detection  |
| 3 Form Factor      | 0     | Form 9S Base: 57-277 V (autoranging) 3-Element, 4-Wire   |
|                    | 1     | Form 35S Base: 120-480 V (autoranging) 2-Element, 3-Wire   |
|                    | 2     | Form 36S Base: 57-277 V (autoranging) 2 1/2-Element, 4-Wire  |
|                    | 3     | Form 39S with neutral current input (15 Terminal Base): 57-277 V (autoranging) 3-Element, 4-Wire   |
|                    | N     | Form 76S with neutral current input (15 Terminal Base): 57-277 V (autoranging) 2 1/2-Element, 4-Wire   |
|                    | 4     | Form 9 FT21 Switchboard (meter + case) with breakouts  |
|                    | 5     | Form 35 FT21 Switchboard (meter + case) with breakouts   |
|                    | 6     | Form 36 FT21 Switchboard (meter + case) with breakouts   |
|                    | 7     | Form 9 FT21 Switchboard (meter + case) with breakouts  |
|                    | 8     | Form 35 FT21 Switchboard (meter + case) with breakouts   |
|                    | 9     | Form 36 FT21 Switchboard (meter + case) with breakouts   |
| 4 Current Inputs   | C     | 5 Amp nominal, 20 Amp full scale (50 Amp fault capture, start at 0.005A, accurate from 0.05 - 20A rms)   |
|                    | E     | 1 Amp nominal, 10 Amp full scale (24 Amp fault capture, start at 0.001A, accurate from 0.01 - 20A rms)   |
| 5 Voltage Inputs   | 0     | Standard (see Form Factor above)   |
| 6 Power Supply     | E     | Form 9S, 36S, 39S, 76S (socket) and Form 9, 36 (FT21 switchboard): 120-277 VAC. Form 35S (socket) and Form 35 (FT21 switchboard): 120-480 VAC. Powered from the meter's voltage connections.                                     |
|                    | G     | Form 9S, 36S (socket) and Form 9, 36 (FT21 switchboard): 57-70 VAC. Powered from the meter's voltage connections. NOT AVAILABLE on Form 35S and Form 35 - you must select the auxiliary power pigtail.                           |
|                    | H     | Auxiliary Power Pigtail: 65-120 VAC or 80-160 VDC (power from external source)   |
|                    | J     | Auxiliary Power Pigtail: 160-277 VAC or 200-350 VDC (power from external source)   |
| 7 System Frequency | 5     | Calibrated for 50 Hz systems.  |
|                    | 6     | Calibrated for 60 Hz systems.  |
| 8 Communications   | A0    | RS 232/RS 485 port, RS 485 port, infrared port.  |
|                    | C1    | Ethernet (10BaseT), 33.6k universal internal modem (RJ11), infrared optical port. RS 232/485 port (note this port is not available with feature set C).  |
|                    | C2    | Same as C1, but with RJ31 connector for the modem.   |
|                    | E0    | Ethernet (10BaseT), RS 232/485 port, infrared optical port, RS 485 port (note this port is not available with feature set C).  |
|                    | F0    | Ethernet (10BaseFL), RS 232/485 port, infrared optical port, RS 485 port (note this port is not available with feature set C) This option is not available with FT21 switchboard form factors (form factor options 4 through 9). |
|                    | M1    | 33.6k universal internal modem (RJ11), RS 232/485 port, infrared optical port, RS 485 port (note this port is not available with feature set C).   |
| 9 Onboard I/O      | A     | None.  |
|                    | B     | 4 Form C (KYZ) digital outputs and 3 Form A digital inputs.  |
| 10 Security        | 0     | Password protected, no security lock*  |
|                    | 1     | Password protected with security lock enabled (requires removal of outer cover to configure billing parameters)  |
|                    | 3     | RMICAN (Measurement Canada approved)   |
|                    | 4     | RMICAN-SEAL (Measurement Canada approved, and factory sealed)**  |
| 11 Special Order   | A     | None   |
|                    | B     | IRIG-B GPS time synchronisation port   |
|                    | K     | Customer supplied template (frameworks) installed at the factory.**  |
|                    | L     | Customer supplied template (frameworks) and IRIG-B GPS time synchronisation port.**  |

\* NOT AVAILABLE in Canada

\*\* For Special Order "K" and "L", you must also order the part number CUST-TEMP-SETUP (see ION8600 Related Items section). When the template (framework) is received, the factory will issue a 5-digit code that will be appended to the ION8600 part number



Example order code. Use this group of codes when ordering the I/O Expander.

- 1 Digital / Analog I/O.
- 2 I/O option.
- 3 Cable option.



### Part numbers (cont'd)

#### I/O Expander

|                    |              |  |
|--------------------|--------------|--|
| Digital/Analog I/O | <b>P850E</b> | Schneider Electric I/O Expander for ION8600 meters: Inputs and Outputs for energy pulsing, control, energy counting, status monitoring, and analog interface to SCADA. |
| I/O option         | <b>A</b>     | External I/O box with 8 digital inputs and 8 digital outputs (4 Form A, 4 Form C)  |
|                    | <b>B</b>     | External I/O box with 8 digital inputs and 4 digital outputs (4 Form C) and 4 analog outputs (0 to 20mA)   |
|                    | <b>C</b>     | External I/O box with 8 digital inputs and 4 digital outputs (4 Form C) and 4 analog outputs (-1mA to 1mA)   |
|                    | <b>D</b>     | External I/O box with 8 digital inputs and 4 digital outputs (4 Form C) and 4 analog outputs (two -1 to 1 mA, and two 0 to 20 mA outputs)                              |
| Cable option       | <b>0</b>     | No cable   |
|                    | <b>1</b>     | 5ft extension cable, 24-pin male to 24-pin female Molex connector (not for use with breakout panel E8, F8 & G8 form factors)   |
|                    | <b>2</b>     | 15ft extension cable, 24-pin male to 24-pin female Molex connector (not for use with breakout panel E8, F8 & G8 form factors)  |
|                    | <b>3</b>     | 6ft connector cable, 24-pin male to 14-pin male Molex connector (for breakout panel E8, F8 & G8 form factors)  |

#### A-base adapters

|                          |                              |
|--------------------------|------------------------------|
| <b>A-BASE-ADAPTER-9</b>  | Form 9S to Form 9A adapter   |
| <b>A-BASE-ADAPTER-35</b> | Form 35S to Form 35A adapter |
| <b>A-BASE-ADAPTER-39</b> | Form 39S to Form 39A adapter |
| <b>A-BASE-ADAPTER-76</b> | Form 76S to Form 76A adapter |

#### Optical communication interface

|                      |                                 |
|----------------------|---------------------------------|
| <b>OPTICAL-PROBE</b> | Optical communication interface |
|----------------------|---------------------------------|

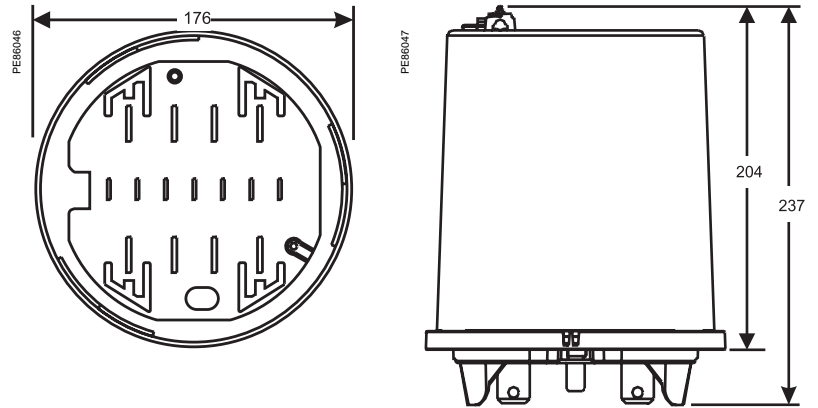
#### Connector cables

|                           |   |
|---------------------------|---|
| <b>CBL-8X00BRKOUT</b>     | 5ft Breakout Cable: 24-pin female Molex connector to one DB9 female connector for RS 232, and 2 sets of twisted pair wires for two RS 485 port connections  |
| <b>CBL-8X00IOE5FT</b>     | 5ft extension cable, mates with 24-pin male Molex connector from the meter to the 24-pin female Molex connector on the I/O Expander box (not for use with breakout panel E8, F8 & G8 form factors)  |
| <b>CBL-8X00IOE15FT</b>    | 15ft extension cable, mates with 24-pin male Molex connector from the meter to the 24-pin female Molex connector on the I/O Expander box (not for use with breakout panel E8, F8 & G8 form factors) |
| <b>CBL-8XX0-BOP-IOBOX</b> | 6ft connector cable, 24-pin male to 14-pin male Molex connector for connecting an ION8600 meter with breakout panel to an I/O Expander Box  |

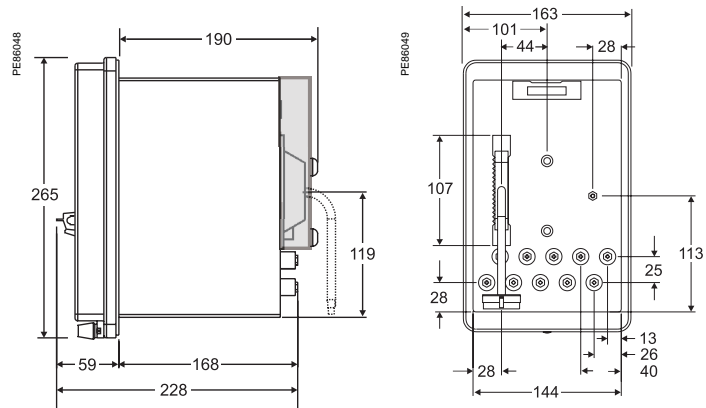
# ION8600

## Installation and connections

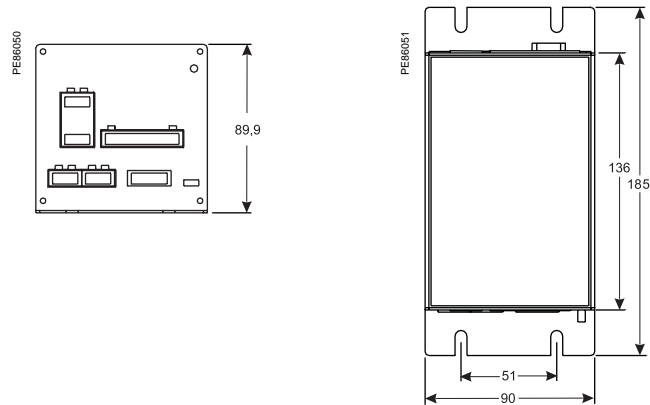
### ION8600 socket dimensions



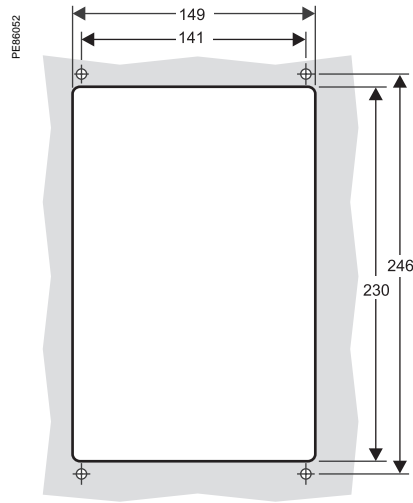
### ION8600 switchboard dimensions



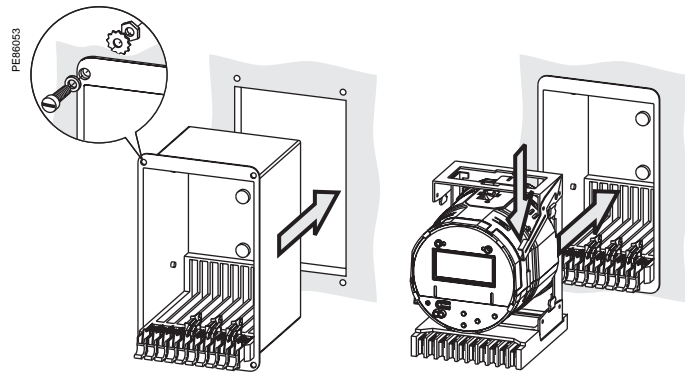
### I/O Expander dimensions



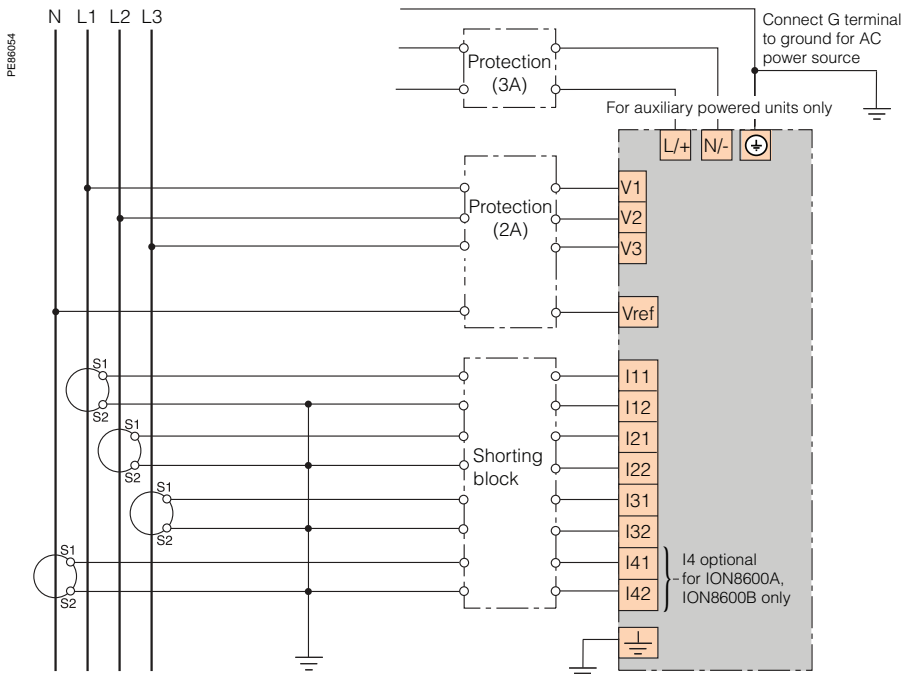
### ION8600 suggested switchboard mounting dimensions



### ION8600 switchboard mounting

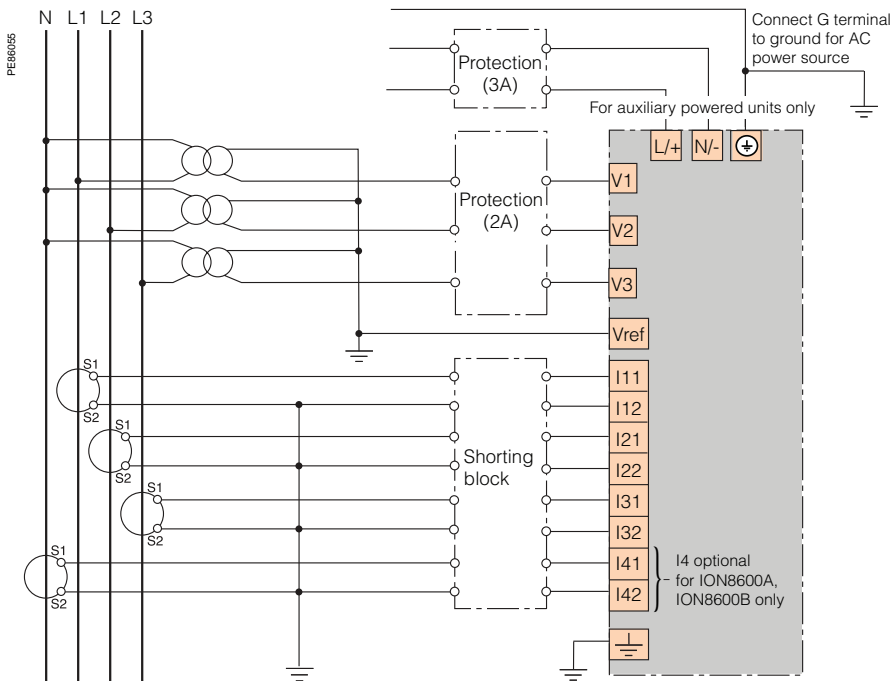


### 4-Wire 3 element direct connection



Connection representation only. Other types of connection are possible. See product installation guide for complete wiring and communication connection details.

### 4-Wire 3 element, 3 PT connection



Connection representation only. Other types of connection are possible. See product installation guide for complete wiring and communication connection details.

# Notes

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