PM8000 Series
Technical Data Sheet

The PowerLogic™ PM8000 series meters are compact, cost-effective multifunction power meters that will help you ensure reliability and efficiency of your power-critical facility.

Reveal and understand complex power quality conditions. Measure, understand and act on insightful data gathered from your entire power system. Designed for key metering points throughout your energy infrastructure, the PowerLogic PM8000 series meter has the versatility to perform nearly any job you need a meter to do, wherever you need it!

Applications

Ideal for low to high voltage applications in industrial facilities, data centres, infrastructure and other critical power environments.

The solution for

Markets that can benefit from a solution that includes PowerLogic PM8000 series meters:

- Industry
- Data centres
- Infrastructure
- Healthcare
- Buildings

Benefits

- Makes understanding power quality simple to help operations personnel avoid downtime and ensure increased productivity and equipment life.
- Makes energy and power quality immediately relevant and actionable to support your operational and sustainability goals.

Competitive advantages

- Modular, flexible patented ION technology architecture enables a simple building block approach.
- Disturbance direction detection, modularity and compliance with latest power quality standards.
- Colour screen.
- Multiple communication options.

Power management solutions

Schneider Electric provides innovative power management solutions to increase your energy efficiency and cost savings, maximize electrical network reliability and availability, and optimise electrical asset performance.

Conformity of standards

- EN 50160
- EN 50470
- IEC 61000-4-30
- IEC 61010-1
- IEC 61326-1
- IEC 61557-12
- IEC 62052-11
- IEC 62053-11
- IEC 62053-22
- IEC 62053-23
- IEC 62053-24
- UL 61010-1

PowerLogic PM8000 series meter.

PowerLogic PM8000 series meter - rear view.

PowerLogic PM8000 DIN rail mounted meter.

Main characteristics

- Precision metering:
    - IEC 61557-12 PMD/SD/K70/0.2 and PMD/SS/K70/0.2 3000m (performance measuring and monitoring functions).
    - Class 0.2S accuracy IEC 62053-22, ANSI C12.20 Class 0.2 (active energy).
    - Industry leading Class 0.5S accuracy for reactive energy (IEC 62053-24).
    - Cycle-by-cycle RMS measurements updated every ½ cycle.
    - Full 'multi-utility' WAGES metering support.
    - Net metering.
    - Anti-tamper protection seals.

- PQ compliance reporting and basic PQ analysis:
    - Monitors and logs parameters in support of international PQ standards,
        - IEC 61000-4-30 Class S (test methods as per IEC 62586-2).
        - EN 50160.
    - Generates onboard PQ compliance reports accessible via onboard web pages:
        - Basic event summary and pass/fail reports, for EN 50160 for power frequency, supply voltage indication, supply voltage dips, short and long interruptions, temporary over voltages, voltage unbalance and harmonic voltage.
        - ITIC (CBEMA) and SEMI curves, with alarm categorization to support further analyses.
        - NEMA Motor Derating curve.
        - Basic meter provides EN 50160 analysis, but can be configured to provide IEEE 519.
    - Harmonic analysis:
        - THD on voltage and current, per phase, min/max, custom alarming.
        - Individual harmonic magnitudes and angles on voltage and current, up to the 63rd harmonic.
    - High resolution waveform capture: triggered manually or by alarm, captured waveforms available directly from the meter via FTP in a COMTRADE format.
    - Disturbance detection and capture: sag/swell on any current and voltage channel, alarm on disturbance event, waveform capture with per-event information.
    - Patented disturbance direction detection: provides indication of the captured disturbance occurring upstream or downstream of the meter; timestamped results provided in the event log, with degree of certainty of disturbance direction.

- Used with Schneider Electric's sophisticated software tools, provides detailed PQ reporting across entire network:
    - EN 50160 report.
    - IEC 61000-4-30 report.
    - PQ compliance summary.
    - Display of waveforms and PQ data from all connected meters.
    - Onboard web-based waveform viewer.

- Data and event logging:
    - Onboard data and event logging.
    - 512 MB of standard non-volatile memory.

PB113669

PowerLogic PM8000 series meter with remote display.

PB113671

PowerLogic I/O module.

- – No data gaps due to network outages or server downtime.
- – Min/Max log for standard values.
- – 50 user-definable data logs, recording up to 16 parameters on a cycle-by-cycle or other user definable interval.
- – Continuous logging or 'snapshot' triggered by setpoint and stopped after defined duration.
- – Trend energy, demand and other measured parameters.
- – Forecasting via web pages: average, minimum and maximum for the next four hours and next four days.
- – Advanced time-of-use capability.
- – Security / event log: alarm conditions, metering configuration changes, power outages, firmware download, and user login/logout all timestamped to ±1 millisecond.

- • Alarming and control:
  - – 50+ definable alarms to log critical event data, trigger waveform recording, or perform control function.
  - – Trigger on any condition, with 1/2-cycle and 1-second response time.
  - – Combine alarms using Boolean logic and to create alarm levels.
  - – Alarm notification via email.
  - – In conjunction with Schneider Electric's software, alarms and software alarms and alarm frequency are categorized and trended for easy evaluation of worsening/improving conditions.

Usability

- • Easy installation and setup:
  - – Panel and DIN rail mounting options, remote display option.
  - – Pluggable connectors.
  - – Free setup application simplifies meter configuration.
  - – Auto-discovery using DPWS (Device Profile Web Services).
  - – DHCP for automatic IP address configuration.

- • Front panel:
  - – Easy to read colour graphic display.
  - – Simple, intuitive menu navigation with multi-language (8) support.

- • Flexible remote communications:
  - – Multiple simultaneously operating communication ports and protocols allow interfacing with other automation systems; (e.g. waveforms, alarms, billing data, etc.) can be uploaded for viewing/analysis while other systems access real-time information.
  - – Supports Modbus, ION, DNP3, IEC 61850.
  - – Dual port Ethernet: 10/100BASE-TX; supports IPV4 and IPV6; daisy-chaining capability removes need for additional switches.
  - – Create redundant network loop using Rapid Spanning Tree Protocol (RSTP) and managed Ethernet switches.
  - – Customize TCP/IP port numbers and enable/disable individual ports.
  - – RS-485 2-wire connection, up to 115,200 baud, Modbus RTU, ION and DNP3 protocols.
  - – Ethernet to serial gateway with Modbus Master functionality, connecting to 31 downstream serial Modbus devices. Also supports Modbus Mastering over TCP/IP (Ethernet) network.
  - – Full function web server with factory and customizable pages to access real-time and PQ compliance data.
  - – Push historical data via email.
  - – Advanced security: Up to 50 configurable user accounts.

PowerLogic PM8000 series meter with I/O modules.

- Time synchronization via:
  - GPS clock (RS-485) or IRIG-B (digital input) to ±1 millisecond.
  - Network Time Protocol (NTP/SNTP).
  - Time set function from Schneider Electric software server.
  - Precision network time protocol (PTP) based on IEEE 1588.

Adaptability

- ION™ frameworks allow customisable, scalable applications, object-oriented programming, compartmentalizes functions, and increases flexibility and adaptability.
- Applications include: access and aggregate data from Modbus devices on serial port or across the network (Modbus TCP/IP), logging and/or processing data by totaling, unit conversion or other calculations, applying complex logic for alarming or control operations, data visualization via web pages.

Standard meter I/O

- 3 digital status/counter inputs.
- 1 KY (form A) energy pulse output for interfacing with other systems.

Modular I/O options

- Optional expansion modules.
- Up to 4 modules per meter.

Option modules include:

- Digital module:
  - 6 digital status/counter inputs.
  - 2 Form C relay outputs, 250 V, 8 A.
- Analogue module:
  - 4 analogue inputs (4-20 mA; 0-30 V).
  - 2 analogue outputs (4-20 mA; 0-10 V) for interfacing with building management sensors and systems.

PowerLogic PM8000 series waveform web page sample

PowerLogic PM8000 series CBEMA web page sample

PowerLogic PM8000 series PQ harmonics web page sample

Underside of PM8000 meter (DIN rail version).

Feature selection

Commercial reference number	Description
METSEPM8240	96 x 96 panel mount meter, AC/DC power.
METSEPM8210	96 x 96 panel mount meter, LV DC power.
METSEPM8243	DIN rail mount meter, AC/DC power.
METSEPM8213	DIN rail mount meter, LV DC power.
METSEPM8244	DIN rail mount meter with remote display, AC/DC power.
METSEPM8214	DIN rail mount meter with remote display, LV DC power.
METSEPM82401	MID approved panel mount meter.
METSEPM82403	RMICAN approved panel mount meter.
METSEPM82404	RMICAN sealed panel mount meter.
Accessories	**Description**
METSEPM89RD96	Remote display, 3 metre cable, mounting hardware for 30 mm hole (nut & centering pin), mounting hardware for DIN96 cutout (92 x 92 mm) adapter plate
METSEPM89M2600	Digital I/O module (6 digital inputs & 2 relay outputs)
METSEPM89M0024	Analogue I/O module (4 analogue inputs & 2 analogue outputs)
METSEPM8HWK	Replacement hardware kit (connectors, screws, retainer clips, mounting template)

Feature guide

Feature guide		PM8000
General		
Use on LV, MV, and HV systems		■
Current accuracy		0.1 % reading
Voltage accuracy		0.1 % reading
Active energy accuracy		0.2 Class
Number of samples/cycle or sample frequency		256
Instantaneous rms values		
Current, voltage, frequency		■
Active, reactive, apparent power	Total and per phase	■
Power factor	Total and per phase	■
Current measurement range (autoranging)		0.05 - 10 A
Energy values		
Active, reactive, apparent energy		■
Settable accumulation modes		■
Demand values		
Current	Present and max. values	■
Active, reactive, apparent power	Present and max. values	■
Predicted active, reactive, apparent power		■
Synchronization of the measurement window		■
Setting of calculation mode	Block, sliding	■
Power quality measurements		
Harmonic distortion	Current and voltage	■
Individual harmonics	Via front panel and web page	63
	Via EcoStruxure™ software	127
Waveform capture		■
Detection of voltage swells and sags		■
Fast acquisition	1/2 cycle data	■
EN 50160 compliance checking		■
Customizable data outputs (using logic and math functions)		■
Data recording		
Min/max of instantaneous values		■
Data logs		■
Event logs		■
Trending/forecasting		■
SER (Sequence of event recording)		■
Time stamping		■
GPS synchronization (+/- 1 ms)		■
Memory (in Mbytes)		512
Display and I/O		
Front panel display		■
Wiring self-test		■
Pulse output		1
Digital or analogue inputs(max)		27 digital 16 analogue
Digital or analogue outputs (max, including pulse output)		1 digital 8 relay 8 analogue
Communication		
RS-485 port		1
Ethernet port		2
Serial port (Modbus, ION, DNP3)		■
Ethernet port (Modbus/TCP, ION TCP, DNP3 TCP, DHCP, DNS, IPv4, IPv6, IEC 61850)		■
Ethernet gateway		■
Alarm notification via email		■
HTTP web server with waveform viewer		■
SNMP with custom MIB and traps for alarms		■
SMTP email		■
PTP and NTP time synchronization		■
FTP file transfer		■

PM8000 series

Technical specifications

Electrical characteristics		
Type of measurement		True rms to 256 samples per cycle
Measurement accuracy	Current & voltage	Class 0.2 as per IEC 61557-12
	Active Power	Class 0.2 as per IEC 61557-12
	Power factor	Class 0.5 as per IEC 61557-12
	Frequency	Class 0.02 as per IEC 61557-12
	Active energy	Class 0.2S IEC 62053-22 Class 0.2 IEC 61557-12, ANSI C12.20 Class 0.2
	Reactive Energy	Class 0.5S IEC 62053-24*
	MID Directive	EN 50470-1, EN 50470-1, AnnexB & AnnexD (optional model)
Display refresh rate		1/2 cycle or 1 second
Input-voltage characteristics	Specified accuracy voltage	57 - 400 V L-N / 100 - 690 V L-L
	Impedance	5 MΩ per phase
	Specified accuracy frequency - Frequency	42 to 69 Hz (50/60 Hz nominal)
	Limit range of operation - frequency	20 to 450 Hz
Input-current characteristics	Rated nominal current	1 A (0.2S), 5 A (0.2S) , 10 A (0.2 ANSI)
	Specified accuracy current range	Starting Current: 5 mA Accurate Range: 50 mA - 10 A
	Permissible overload	200 A rms for 0.5s, non-recurring
	Impedance	0.0003 Ω per phase
	Burden	0.01 VA max at 5 A
Power supply AC/DC	AC	90-415 V AC ±10 % (50/60 Hz ±10 %) 90-120 V AC +/- 10% (400 Hz)
	DC	110-415 V DC ±15 % (20-60 V DC ±10 % for PM8210
	Ride-through time	100 ms (6 cycles at 60 Hz) min., any condition 200 ms (12 cycles at 60 Hz) typ., 120 V AC 500 ms (30 cycles at 60 Hz) typ., 415 V AC
	Burden	Typical: 7.7 W / 16 VA at 230 V (50/60 Hz) Fully optioned: max. 18 W / 40 VA at 415 V (50/60 Hz).
Power supply LV DC	DC	20 to 60 V DC ±10 %
	Burden	Fully optioned: max. 17 W at 18 to 60 V DC
Input/outputs	Meter Base Only	3 form A digital inputs (30 V AC/60 V DC) 1 form A (KY) solid state digital output (30 V AC/60 V DC, 75 mA).
	Optional	Digital - 6 form A digital inputs (30 V AC / 60 V DC) wetted + 2 form C relay outputs (250 V AC, 8 A)
		Analogue - 4 analogue inputs (4-20 mA, 0-30 V DC) + 2 analogue outputs (4-20 mA, 0-10 V DC).
Mechanical characteristics		
Weight		Integrated Display Model 0.581 kg DIN rail mounted Model 0.528 kg IO modules 0.140 kg Remote display 0.300 kg
IP degree of protection		IP 54, UL type 12: Panel mount and Remote display, front. IP 30: Panel mount rear, DIN rail mount, I/O modules.
Excellent quality		ISO 9001 and ISO 14000 certified manufacturing.
Dimensions	Panel mount model	96 x 96 x 77.5 mm
	DIN model	90.5 x 90.5 x 90.8 mm
	Remote display	96 x 96 x 27 mm
	IO modules	90.5 x 90.5 x 22 mm

PM8000 series

Environmental conditions	
Operating temperature	-25 ºC to 70 ºC
Remote Display Unit	-25 ºC to 60 ºC
Storage temperature	-40 ºC to 85 ºC
Humidity rating	5 % to 95 % non-condensing
Installation category	III
Operating altitude (maximum)	3000 m above sea-level

Electromagnetic compatibility	
EMC standards	IEC 62052-11 and IEC 61326-1
Immunity to electrostatic discharge	IEC 61000-4-2
Immunity to radiated fields	IEC 61000-4-3
Immunity to fast transients	IEC 61000-4-4
Immunity to surges	IEC 61000-4-5
Immunity to conducted disturbances	IEC 61000-4-6
Immunity to power frequency magnetic fields	IEC 61000-4-8
Immunity to conducted disturbances, 2-150kHz	CLC/TR 50579
Immunity to voltage dips & interruptions	IEC 61000-4-11
Immunity to ring waves	IEC 61000-4-12
Conducted and radiated emissions	EN 55022, EN 55011, FCC part 15 Class B, EN55011, EN55022 Class B, ICES-003 Class B
Surge withstand Capability (SWC)	IEEE / ANSI C37.90.1

Safety	
Safety Construction	IEC/EN 61010-1 ed.3, CAT III, 400 V L-N / 690 V L-L UL 61010-1 ed.3 and CSA-C22.2 No. 61010-1 ed.3, CAT III, 347 V L-N / 600 V L-L IEC/EN 62052-11, protective class II.

Communication	
Ethernet to serial line gateway	Communicates directly with up to 31 unit load devices.
Web server	Customisable pages, new page creation capabilities, HTML/XML compatible.
Serial port RS-485	Baud rates of 2400 to 115200, pluggable screw terminal connector.
Ethernet port(s)	2x 10/100BASE-TX, RJ45 connector (UTP).
Protocol	Modbus, ION, DNP3, IEC 61850, HTTP, FTP, SNMP, SMTP, DPWS, RSTP, NTP, NTP/SNTP, GPS, IPv4 /IPv6, DHCP protocols.

Firmware characteristics	
High-speed data recording	Down 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.
Harmonic distortion	Up to 63rd harmonic (127th via Schneider Electric software) for all voltage and current inputs.
Sag/swell detection	Analyse severity/potential impact of sags and swells: magnitude and duration data suitable for plotting on voltage tolerance curves per phase triggers for waveform recording, control.
Disturbance direction detection	Determine the location of a disturbance more quickly and accurately by determining the direction of the disturbance relative to the meter. Analysis results are captured in the event log, along with a timestamp and confidence level indicating level of certainty.
Instantaneous	High accuracy of standard speed (1s) and high-speed (1/2 cycle) measurements, including true rms per phase and total for: voltage, current, active power (kW),reactive power (kvar), apparent power (kVA), power factor, frequency, voltage and current unbalance, phase reversal.
Load profiling	Channel assignments (800 channels via 50 data recorders) configurable for any measurable parameter, including historical trend recording of energy, demand, voltage, current, power quality, or any measured parameter. Trigger recorders based on time interval, calendar schedule, alarm/event condition, or manually.
Trend curves	Historical trends and future forecasts to better manage demand, circuit loading, and other parameters. Provides average, min, max and standard deviation every hour for last 24 hours, every day for last month, every week for last 8 weeks and every month for last 12 months.
Waveform captures	Simultaneous capture of all voltage and current channels, sub-cycle disturbance capture, maximum cycles is 100,000 (16 samples/cycle x 96 cycles, 10 MB memory), max 256 samples/cycle.
Alarms	Threshold alarms: adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm, user-defined or automatic alarm threshold settings, user-defined priority levels (optional automatic alarm setting).
Advanced Time of Use (TOU)	6 seasons; 3 different day types: weekend, weekday, and holiday; up to 8 tariffs per day type.

PM8000 series

| Firmware characteristics (cont.)	
Advanced security	Up to 50 users with unique access rights. Perform resets, time sync, or meter configurations based on user privileges.
Memory	512 MB.
Firmware update	Update via the communication ports.
Display characteristics	
Integrated or Remote display	320 x 240 (1/4 VGA) Colour LCD, configurable screens , 5 buttons and 2 LED indicators (alarm and meter status).
Languages	English, French, Spanish, Russian, Portugese, German, Italian, Chinese.
Notations	IEC, IEEE.
The HMI menu includes	
Alarms	Active alarms, historic alarms (50+ alarms).
Basic Reading	Voltage, current, frequency, power summary.
Power	Power summary, demand, power factor.
Energy	Energy total, delivered, received.
Events	Timestamped verbose event log.
Power Quality	EN 50160, harmonics, phasor diagrams.
Inputs/Outputs	Digital inputs, digital outputs, analogue inputs, analogue outputs.
Nameplate	Model, serial and FW version.
Custom Screens	Build your own metrics.
Setup Menu	Meter setup, communications setup, display setup, date/time/clock setup, alarm setup, language setup, time of use setup, resets, password setup.

PM8000 series parts
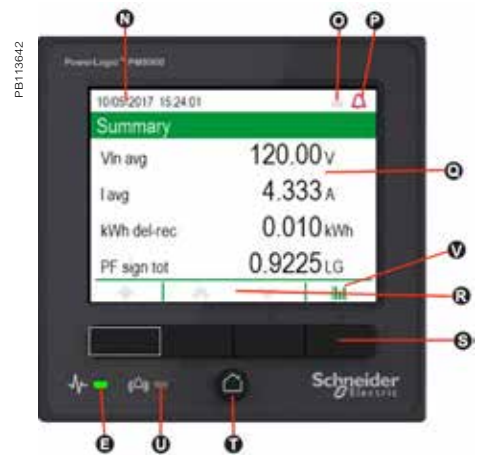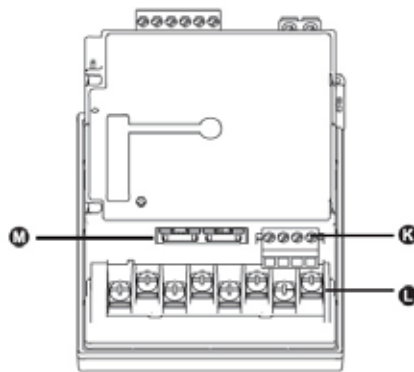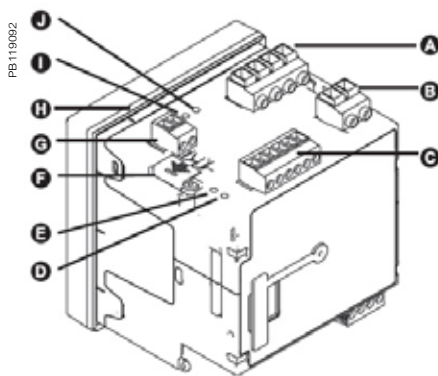
A Voltage inputs
B Control power
C Digital inputs
D Revenue lock LED (green)
E Status LED (green/red)
F Revenue lock switch
G Digital output
H Sealing gasket
I Infrared energy pulsing LED
J Energy pulsing LED
K RS-485
L Current inputs
M Ethernet (2)
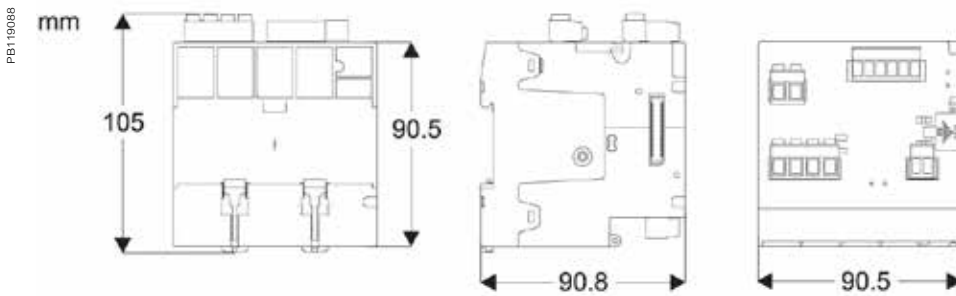**N** Date/time
O Revenue lock icon

P Alarm icon
Q Display
R Navigation icons
　Up
　Down
　Select
　Cancel
　Edit
　More

S Navigation buttons
T Home button
U Alarm LED (red)
V Bar graph
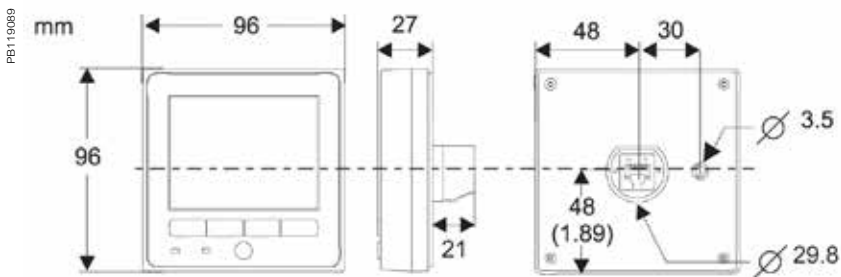
PM8000 series

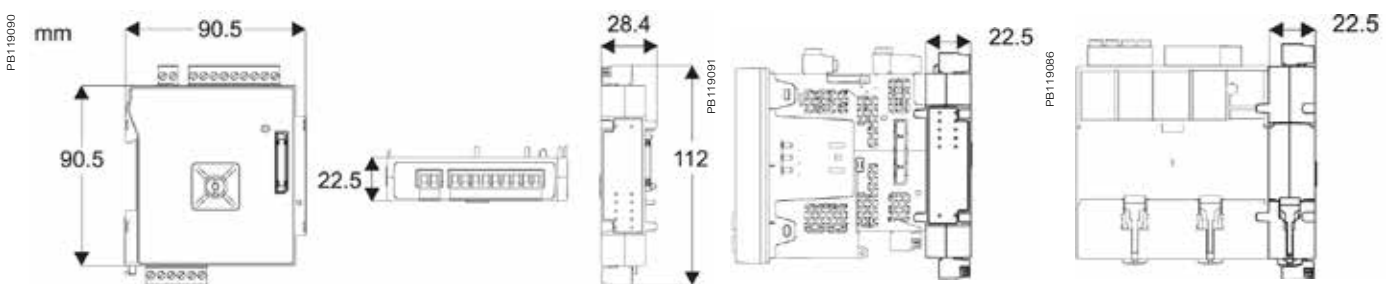## PM8000 panel mount meter dimensions
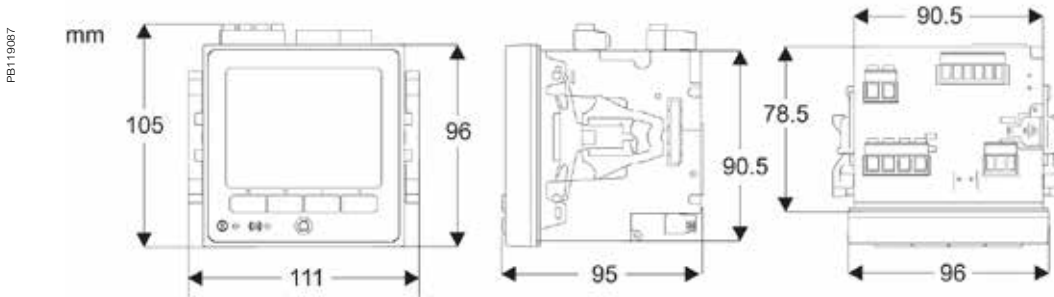
PM8000 DIN rail mount meter dimensions

PM8000 remote display dimensions

PM8000 with I/O modules dimensions

*Please see the appropriate **Installation Guide** for accurate and complete information on the installation of this product.*

As standards, specifications and designs develop from time to time, please ask for confirmation of the information given in this document.

Design: Schneider Electric
Photos: Schneider Electric

Over 75 % of Schneider Electric products
have been awarded the Green Premium ecolabel

Green
Premium™
Product

01-2018

Life Is On | Schneider