PM5000 Series
Functions and characteristics

PB111777

PowerLogic™ PM5000 Series meter

PB111784

PowerLogic™ PM5563 remote dispaly

Commercial reference numbers	
PM5100	METSEPM5100
PM5110	METSEPM5110
PM5111	METSEPM5111
PM5310	METSEPM5310
PM5320	METSEPM5320
PM5330	METSEPM5330
PM5331	METSEPM5331
PM5340	METSEPM5340
PM5341	METSEPM5341
PM5560	METSEPM5560
PM5561	METSEPM5561
PM5563	METSEPM5563
PM5563RD	METSEPM5563RD
PM5RD	METSEPM5RD
PM5563RD	METSEPM556RD

PowerLogic™ PM5100, PM5300 and PM5500 series

The PowerLogic™ PM5000 power meter is the ideal fit for cost management applications. It provides the measurement capabilities needed to allocate energy usage, perform tenant metering and sub-billing, pin-point energy savings, optimize equipment efficiency and utilization, and perform a high level assessment of the power quality of the electrical network.
In a single 96 x 96 mm unit, with a graphical display, (plus optional remote display) all three phases, neutral and ground can be monitored simultaneously.
The bright, anti-glare display features large characters and powerful backlighting for easy reading even in extreme lighting conditions and viewing angles. Easy to understand menus, text in 8 selectable languages, icons and graphics create a friendly environment to learn about your electrical network. Ethernet gateway and enhanced cyber security.
Highly accurate devices with global billing certifications.

Applications

Cost management: Cost saving opportunities become clear once you understand how and when your facility uses electricity. The PowerLogic™ PM5000 series meters are ideal for:
■ **Sub billing / tenant metering:** allows a landlord, property management firm, condominium association, homeowners association, or other multi-tenant property to bill tenants for individual measured utility (electricity) usage. MID approved meters for billing applications across Europe.
■ **Cost allocation:** allocate energy costs between different departments (HVAC, indoor and outdoor lighting, refrigeration, etc), different parts of an industrial process or different cost centres. Cost allocation systems can help you save money by making changes to your operation, better maintaining your equipment, taking advantage of pricing fluctuations, and managing your demand.

Network management: Improving reliability of the electrical network is key for success in any business. Monitoring values such as voltage levels, harmonic distortion and voltage unbalance will help you to ensure proper operation and maintenance of your electrical network and equipment. PowerLogic™ PM5000 series meters are the perfect tool for:
■ **Basic Power Quality monitoring:** power quality phenomena can cause undesirable effects such as heating in transformers, capacitors, motors, generators and misoperation of electronic equipment and protection devices.
■ **Min/ Max monitoring (with timestamp):** understanding when electrical parameters, such as voltage, current and power demand, reach maximum and minimum values will give you the insight to correctly maintain your electrical network and assure equipment will not be damaged.
■ **Alarming:** alarms help you to be aware of any abnormal behavior on the electrical network in the moment it happens.
■ **WAGES monitoring:** take advantage of the input metering on PM5000 meters to integrate measurements from 3rd party devices such as water, air, gas, electricity or steam, meters.

Main characteristics

Easy to install
Mounts using two clips, in standard cut out for DIN 96 x 96mm, no tools required. Compact meter with 72mm (77mm for PM5500) depth connectable up to 690 VL-L without voltage transformers for installations compliant with category III. Optional remote display (PM5563). Ethernet gateway functionality via RS-485 port.

Easy to operate
Intuitive navigation with self-guided, language selectable menus, six lines, four concurrent values. Two LEDs on the meter face help the user confirm normal operation with a green LED - heartbeat/communications indicator, and the amber LED - customizable either for alarms or energy pulse outputs. Onboard web pages (PM5500) show real-time and logged information, and verify communications.

Easy circuit breaker monitoring and control
The PM5300 provides two relay outputs (high performance Form A type) with capability to command most of the circuit breaker coils directly. For Digital Inputs, monitored switches can be wired directly to the meter without external power supply. PM5500 series have 4 status inputs (digital) and 2 digital output (solid state) to use for

Accurate energy measurement for precise cost allocation:

	PM5100	PM5300	PM5500
IEC 62053-22 (Active Energy)	Class 0.5S	Class 0.5S	Class 0.2S
IEC 62053-23 (Reactive Energy)	Class 2	Class 2	Class 1

PM5000 Series
Functions and characteristics (cont.)

PB111777

PowerLogic™ PM5500 meter

PB111772

PowerLogic™ PM5300 meter

PB111768

PowerLogic™ PM5100 meter

MID Certified according to MID Directive, Annex "B" + Annex "D" for legal metrology relevant to active electrical energy meters (see Annex MI-003 of MID). Can be used for fiscal (legal) metrology.

Direct metering of neutral current
The PM5500 has a fourth CT for measuring neutral current. In demanding IT applications, where loads are non-linear (i.e. switching power supplies on computers/servers), measuring neutral current is essential to avoid overload and resulting outage. In addition, the PM5500 provides a calculated ground current value, not available in meters with 3 CTs.

Power Quality analysis
The PM5000 offers Total Harmonic Distortion (THD/thd), Total Demand Distortion (TDD) measurements and individual harmonics (odd) magnitudes and angles for voltage and current:

	PM5100	PM5300	PM5500
Individual Harmonics	magnitudes up to 15th	magnitudes up to 31st	magnitudes & angles up to 63rd

These types of power quality parameters help to identify the source of harmonics that can harm transformers, capacitors, generators, motors and electronic equipment.

Load management
Peak demands with time stamping are provided. Predicted demand values can be used in combination with alarms for basic load shedding applications.

Alarming with time stamping
A different combination of set point driven alarms and digital alarms with 1s time stamping are available in the PM5000 family:

	PM5100	PM5300	PM5500
Set point driven alarms	**29**	**29**	**29**
Unary	**4**	**4**	**4**
Digital	**–**	**2**	**4**
Boolean / Logic	**–**	**–**	**10**
Custom defined	**–**	**–**	**5**

Alarms can be visualized as Active (the ones that have picked up and did not drop out yet) or Historical (the ones that happened in the past). Alarms can be programmed and combined to trigger digital outputs and mechanical relays (PM5300).
The PM5000 series keeps an alarm log with the active and historical alarms with date and time stamping. SMTP protocol for receiving alarm conditions via email and text. SNTP protocol for date/time network synchronization.

Load timer
A load timer can be set to count load running hours based on a minimum current withdraw, adjustable to monitor and advise maintenance requirements on the load.

High Performance and accuracy
IEC 61557-12 Performance measuring and monitoring devices (PMD)
Defines the performance expectation based on classes. It defines the allowable error in the class for real and reactive power and energy, frequency, current, voltage, power factor, voltage unbalance, voltage and current harmonics (odds), voltage THD, current THD, as well as ratings for temperature, relative humidity, altitude, start-up current and safety. It makes compliant meters readings comparable - they will measure the same values when connected to the same load.

Meets IEC 61557-12 PMD/[SD|SS]/K70/0.5 for PM5100 and PM5300

Meets IEC 61557-12 PMD/[SD|SS]/K70/0.2 for PM5500

Legal billing compliance
MID compliance is compulsory for billing applications across Europe.
In addition to billing applications, for facility managers responsible for energy cost MID means same level of quality as a billing meter.

MID ready compliance, EN50470-1/3 – Class C

PM5000 Series
Functions and characteristics (cont.)

General		PM5100	PM5300	PM5500
Use on LV and MV systems			■	
Basic metering with THD and min/max readings			■	
Instantaneous rms values				
Current	per phase, neutral and ground (PM5500)		■	
Voltage	Total, per phase L-L and L-N		■	
Frequency			■	
Real, reactive, and apparent power	Total and per phase		Signed, Four Quadrant	
True Power Factor	Total and per phase		Signed, Four Quadrant	
Displacement PF	Total and per phase		Signed, Four Quadrant	
% Unbalanced I, VL-N, VL-L			■	
Direct monitoring of neutral current				■
Energy values*				
Accumulated Active, Reactive and Apparent Energy			Received/Delivered; Net and absolute; Time Counters	
Demand values*				
Current average			Present, Last, Predicted, Peak, and Peak Date Time	
Active power			Present, Last, Predicted, Peak, and Peak Date Time	
Reactive power			Present, Last, Predicted, Peak, and Peak Date Time	
Apparent power			Present, Last, Predicted, Peak, and Peak Date Time	
Peak demand with time stamping D/T for current and			■	
Demand calculation	Sliding, fixed and rolling block, thermal methods		■	
Synchronization of the measurement window to input, communication command or internal clock			■	
Settable Demand intervals			■	
Demand calculation for Pulse input (WAGES)				■
Other measurements*				
I/O timer			■	
Operating timer			■	
Load timer			■	
Alarm counters and alarm logs			■	
Power quality measurements				
THD, thd (Total Harmonic Distortion) I, VLN, VLL per phase			I,VLN, VLL	
TDD (Total Demand Distortion)			■	
Individual harmonics (odds)		15th	31st	63rd
Neutral Current metering with ground current calculation				■
Data recording				
Min/max of instantaneous values, plus phase identification*			■	
Alarms with 1s timestamping*			■	
Data logging			2 selectable parameters from kWh, kVAh, kVARh with configurable interval and duration (e.g. 2 parameters for 60 days at 15 minutes interval)	Up to 14 selectable parameters with configurable interval and duration (e.g. 6 parameters for 90 days at 15 minutes interval)
Memory capacity			256 kB	1.1 MB
Min/max log		■	■	■
Maintenance, alarm and event logs			■	■
Customizable data logs				■
Inputs / Outputs / Mechanical Relays				
Digital inputs			2	4
Digital outputs		1 (kWh only)	2 (configurable)	
Form A Relay outputs			2	
Timestamp resolution in seconds			1	
Whetting voltage			■	

**Stored in non-volatile memory*

PM5000 Series
Functions and characteristics (cont.)

Electrical characteristics			PM5100	PM5300	PM5500
Type of measurement: True rms on three-phase (3P, 3P + N), zero blind			64 samples per cycle		128 samples per cycle
Measurement accuracy	Active Energy		0.5%		0.2%
	Reactive Energy		2%		1%
	Active Power		0.5%		0.2%
	Apparent Power		0.5%		
	Current, Phase		0.5%		0.15%
	Voltage, L-N		0.5%		0.1%
	Frequency		0.05%		
Measurement accuracy compliance	Measurement accuracy		IEC 61557-12 PMD/[SD|SS]/K70/0.5		IEC 61557-12 PMD/[SD|SS]/ K70/0.2
	Active energy accuracy		IEC 62053-22 Class 0.2 S ANSI C12.20 Class 0.5		IEC 62053-22 Class 0.2 S ANSI C12.20 Class 0.2
	Reactive energy accuracy		IEC 62053-23 Class 2		
Input-voltage (up to 1.0 MV AC max, with voltage transformer)	Nominal Measured Voltage range		20 V L-N / 35 V L-L to 400 V L-N /690 V L-L absolute range 35 V L-L to 760 V L-L		20 V L-N / 20 V L-L to 400 V L-N /690 V L-L absolute range 20 V L-L to 828 V L-L
	Impedance		5 M Ω		
	F nom		50 or 60 Hz ±2%		50 or 60 Hz ±10%
Input-current	I nom		1 A or 5 A		
	Measured Amps with over range and Crest Factor		Starting current: 5mA Operating range: 50mA to 8.5A		Starting current: 5m A Operating range: 50 mA to 10 A
	Withstand		Continuous 20A, 10s/hr 50A, 1s/hr 500A		
	Impedance		< 0.3 mΩ		
	F nom		50 or 60 Hz ±2%		50 or 60 Hz ±10%
	Burden		<0.026VA at 8.5A		< 0.024 VA at 10 A
AC control power	Operating range		100-415 VAC +/- 10% CAT III 300V class per IEC 61010		100-480 V AC ±10% CAT III 600V class per IEC 61010
	Burden		<5 W,11 VA at 415V L-L		<5W/16.0 VA at 480 V AC
	Frequency		45 to 65 Hz		
	Ride-through time		80 mS typical at 120V AC and maximum burden. 100 mS typical at 230 V AC and maximum burden 100 mS typical at 415 V AC and maximum burden		35 ms typical at 120 V L-N and maximum burden 129 ms typical at 230 V L-N and maximum burden
DC control power	Operating range		125-250 V DC ±20%		
	Burden		4W max at 125V DC		typical 3.1W at 125 V DC, max. 5W
	Ride-through time		50 mS typical at 125 V DC and maximum burden		
Outputs	Relay	Max output frequency		0.5 Hz maximum (1 second ON / 1 second OFF - minimum times)	
		Switching current		250 V AC at 8.0 Amps, 25 k cycles, resistive 30 V DC at 2.0 Amps, 75 k cycles, resistive 30 V DC at 5.0 Amps, 12.5 k cycles, resistive	
		Isolation		2.5 kV rms	
	Digital outputs		1	2	2
		Max load voltage	40 V DC		30 V AC / 60 V DC
		Max load current	20 mA		125 mA
		On Resistance	50 Ω max		8 Ω
		Meter constant	from 1 to 9,999,999 pulses per kWh k_h (Configurable for delivered or received or delivered+received energy for kWh or kVARh or kVAh)		
		Pulse width for Digital Output	50% duty cycle		
		Pulse frequency for Digital Output	25 Hz max.		
		Leakage current	0.03 micro Amps		1 micro Amps
		Isolation	5 kV rms		2.5 kV rms
	Optical outputs				
		Pulse width (LED)	200 micro seconds		
		Pulse frequency	50 Hz. max.		2.5 kHz. max
		Meter constant	from 1 to 9,999,999 pulses per kWh k_h (Configurable for delivered or received or delivered+received energy for kWh or kVARh or kVAh)		

PM5000 Series
Functions and characteristics (cont.)

Electrical characteristics (cont'd)		PM5100	PM5300	PM5500
Status Inputs	ON Voltage		18.5 to 36 V DC	30 V AC / 60 V DC max
	OFF Voltage		0 to 4 V DC	
	Input Resistance		110 k Ω	100 k Ω
	Maximum Frequency		2 Hz (T ON min = T OFF min = 250 ms)	25 Hz (T ON min = T OFF min = 20 ms)
	Response Time		20 ms	10 ms
	Opto Isolation		5 kV rms	2.5 kV rms
	Whetting output		24 V DC/ 8mA max	
	Input Burden		2mA @24V DC	2 mA @ 24 V AC/DC
Mechanical characteristics				
Product weight		380 g	430 g	450 g
IP degree of protection (IEC 60529)		IP52 front display, IP20 meter body		
Dimensions W x H x D [protrusion from cabinet] *		96 x 96 x 72mm (77mm for PM5500) (depth of meter from housing mounting flange) [13mm]		
Mounting position *		Vertical		
Panel thickness		6 mm maximum		
Environmental characteristics				
Operating temperature	Meter	-25 °C to 70 °C		
	Display (Display functions to -25° with reduced performance)	-25 °C to +70 °C		
Storage temp.		-40 °C to +85 °C		
Humidity range		5 to 95 % RH at 37 °C (non-condensing)		
Polution degree		2		
Altitude		2000 m CAT III / 3000 m CAT II		3000 m max. CAT III

Electromagnetic compatibility**	
Harmonic current emissions	IEC 61000-3-2
Flicker emissions	IEC 61000-3-3
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
Conducted immunity 150kHz to 80MHz	IEC 61000-4-6
Immunity to magnetic fields	IEC 61000-4-8
Immunity to voltage dips	IEC 61000-4-11
Radiated emissions	FCC part 15, EN 55022 Class B
Conducted emissions	FCC part 15, EN 55022 Class B

* PM5563 is DIN mounted

** Tests are conducted as per IEC 61557-12 (IEC 61326-1), 62052-11 and EN50470

PM5000 Series
Functions and characteristics (cont.)

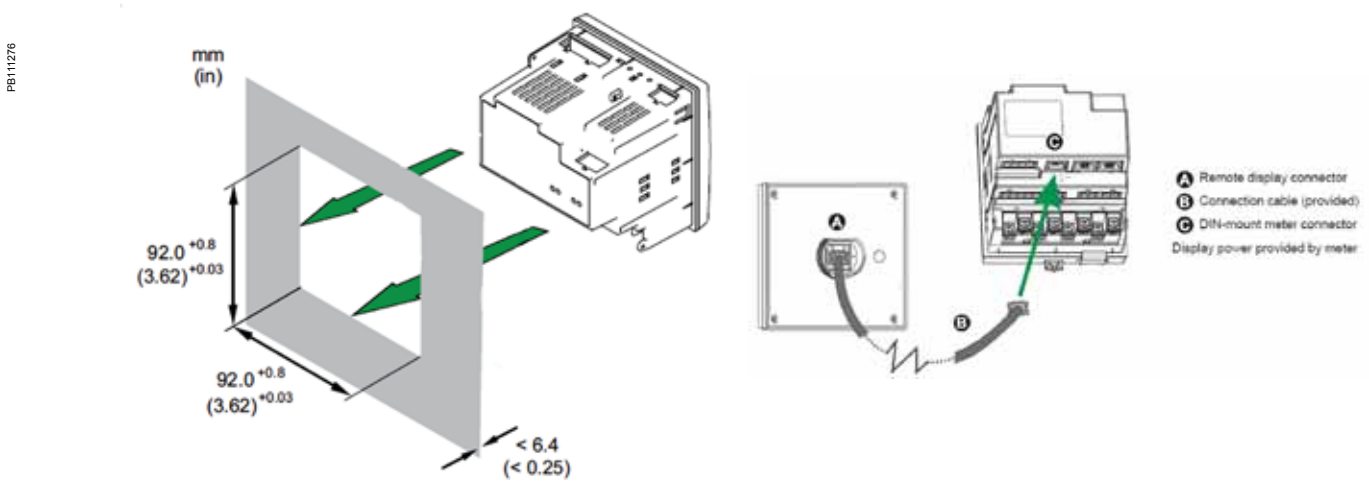
Safety	PM5100	PM5300	PM5500
Europe	CE, as per IEC 61010-1 Ed. 3, IEC 62052-11 & IEC61557-12		
U.S. and Canada	cULus as per UL61010-1 (3rd Edition)		
Measurement category (Voltage and Current inputs)	CAT III up to 400 V L-N / 690 V L-L		
Dielectric	As per IEC/UL 61010-1 Ed. 3		
Protective Class	II, Double insulated for user accessible parts		
Communication			
RS 485 port Modbus RTU, Modbus ASCII (7 or 8 bit), JBUS	2-Wire, 9600,19200 or 38400 baud, Parity - Even, Odd, None, 1 stop bit if parity Odd or Even, 2 stop bits if None; (Optional in PM51x and PM53x)		
Ethernet port: 10/100 Mbps; Modbus TCP/IP		1 Optional	2 (for daisy chain only, one IP address)
Firmware and language file update	Meter firmware update via the communication ports		
Isolation	2.5 kVrms, double insulated		
Human machine interface			
Display type	Monochrome Graphics LCD		
Resolution	128 x 128		
Backlight	White LED		
Viewable area (W x H)	67 x 62.5 mm		
Keypad	4-button		
Indicator Heartbeat / Comm activity	Green LED		
Energy pulse output / Active alarm indication (configurable)	Optical, amber LED		
Wavelength	590 to 635 nm		
Maximum pulse rate	2.5 kHz		

	PM5100		PM5300				PM5500	
Features and Options	**PM5100**	**PM5110**	**PM5310**	**PM5320**	**PM5330**	**PM5340**	**PM5560**	**PM5563**
Installation								
Fast panel mount with integrated display	■	■	■	■	■	■	■	–
Remote display (optional)	–	–	–	–	–	–	–	■
Fast installation, DIN rail mountable	–	–	–	–	–	–	–	■
Accuracy	**Cl 0.5S**	**Cl 0.5S**	**Cl 0.5S**	**Cl 0.5S**	**Cl 0.5S**	**Cl 0.5S**	**Cl 0.2S**	**Cl 0.2S**
Display								
Backlit LCD, multilingual, bar graphs, 6 lines, 4 concurrent values	■	■	■	■	■	■	■	–
Power and energy metering								
3-phase voltage, current, power, demand, energy, frequency, power factor	■	■	■	■	■	■	■	■
Multi-tariff	–	–	4	4	4	4	8	8
Power quality analysis								
THD, thd, TDD	■	■	■	■	■	■	■	■
Harmonics, individual (odd) up to	15th	15th	31st	31st	31st	31st	63rd	63rd
I/Os and relays								
I/Os	1DO	1DO	2DI/2DO	2DI/2DO	2DI/2DO	2DI/2DO	4DI/2DO	4DI/2DO
Relays	0	0	0	0	2	2	0	0
Alarms and control								
Alarms	33	33	35	35	35	35	52	52
Set point response time, seconds	1	1	1	1	1	1	1	1
Single and multicondition alarms	–	–	■	■	■	■	■	■
Boolean alarm logic	–	–	–	–	–	–	■	■
Communications								
Serial ports with modbus protocol	–	1	1	–	1	–	1	1
Ethernet port with Modbus TCP protocol	–	–	–	1	–	1	2**	2**
Ethernet-to-serial gateway	–	–	–	–	–	–	■	■
Onboard web server with web pages	–	–	–	–	–	–	■	■
MID ready compliance, EN50470-1/3, Annex B and Annex D Class C		**PM5111**			**PM5331**	**PM5341**	**PM5561**	

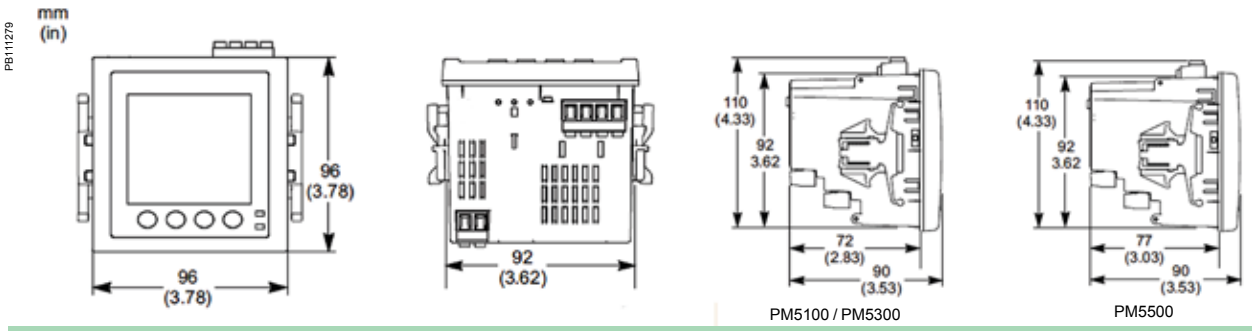
** 2 Ethernet ports for daisy chain, one IP address.

PM5000 Series
Dimensions and connection

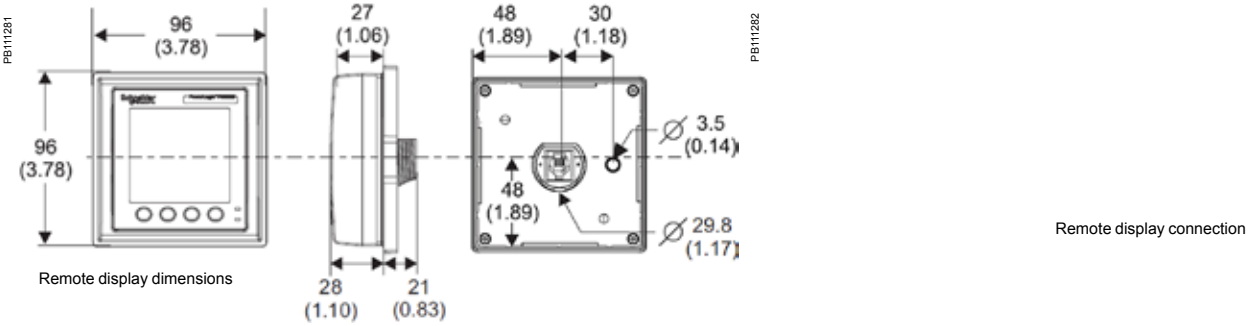
PM5000 Series meter flush mounting*



PM5000 Series meter dimensions

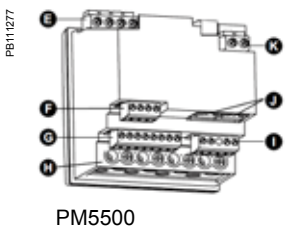


PM5000 Series remote display dimensions



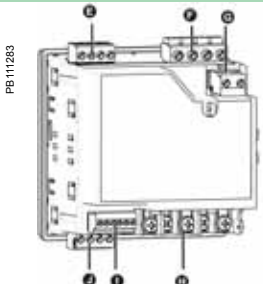
PM5000 Series meter parts

PM5000 meter parts
A Menu selection buttons
B LED indicators
C Navigation or menu selections
D Maintenance and alarm notification area



PM5500

PM5500 meter parts
E Voltage inputs
F RS-485 comms
G Digital inputs
H Current inputs
I Digital outputs
J Ethernet ports
K Control power



PM5100 / PM5300 meter parts
E Relay output (PM5300 only)
F Voltage inputs
G Control power
H Current inputs
I Status inputs/digital outputs
J Communications port: Ethernet (PM5300 only) or RS-485)

** PM5563 is DIN mounted

PM800 series
Functions and characteristics

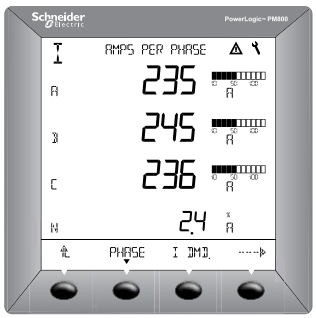
PE86134

Front view of PowerLogic PM800 series meter with integrated display.

PB101823-50

Rear view of PowerLogic PM800 series meter.

PE86229



PowerLogic PM800 series meter display screen showing bar graphs.

The PowerLogic PM800 series meters offers many high-performance capabilities needed to meter and monitor an electrical installation in a compact 96 x 96 mm unit. All models include an easy-to-read display that presents measurements for all three phases and neutral at the same time, an RS-485 Modbus communication port, one digital input, one KY-type digital output, total harmonic distortion (THD) metering, and alarming on critical conditions. Four models offer an incremental choice of custom logging and power quality analysis capabilities. Expand any model with field-installable option modules that offer a choice of additional digital inputs and outputs, analogue inputs and outputs, and Ethernet port.

Applications

- Panel instrumentation
- Sub-billing, cost allocation and energy management
- Remote monitoring of an electrical installation
- Power quality analysis
- Utility bill verification, utility contract optimization and load preservation.

Characteristics

Easy to install
Mounts using two clips, with no tools required. Direct connect the voltage inputs, with no need for potential transformers (PTs) up to 600 VAC.

Easy to operate
Intuitive navigation with self-guided, language-selectable menus.

System status at a glance
Large, anti-glare display with back-light provides summary screens with multiple values. Bar charts graphically represent system loading and I/O.

Custom alarming with time stamping
Over 50 alarm conditions, including over or under conditions, digital input changes, phase unbalance and more. The models PM850 and PM870 offer boolean logic that can be used to combine up to four alarms.

Power quality analysis
The PM800 series offers an incremental range of features for troubleshooting and preventing power quality related problems. All models offer THD metering. The PM810 with PM810LOG option and PM820 offer individual current and voltage harmonics readings. The PM850 and PM870 offer waveform capture (PM870 is configurable) and power quality compliance evaluation to the international EN50160 -ITI(CBEMA)/SEMI F-47 standards. The PM870 offers voltage and current disturbance (sag/swell) detection.

Extensive on-board memory
All models offer billing (energy and demand), maintenance, alarm and customizable data logs, all stored in non-volatile memory (PM810 requires PM810LOG option).

ANSI 12.20 Class 0.2S and IEC 62053-22 Class 0.5S accuracy for active energy
Accurate energy measurement for sub-billing and cost allocation.

PMD-S IEC61557-12 performance standard
Meets PMD/SD/K70/0.5 and PMD/SS/K70/0.5 requirements for combined **P**erformance **M**easuring and monitoring **D**evices (PMD).

Trend curves and short-term forecasting
The models PM850 and PM870 offer trend logging and forecasting of energy and demand readings to help compare load characteristics and manage energy costs.

Expandable I/O capabilities
Use the on-board or optional digital inputs for pulse counting, status/position monitoring, demand synchronisation or control (gating) of the conditional energy metering. Use the on-board or optional digital outputs for equipment control or interfacing, controllable by internal alarms or externally through digital input status. Use the optional analogue inputs and outputs for equipment monitoring or interfacing.

Metering of other utilities (WAGES)
All models offer five channels for demand metering of water, air, gas, electricity or steam utilities (WAGES) through the pulse counting capabilities of the digital inputs. Pulses from multiple inputs can be summed through a single channel.

Modular and upgradeable
All models offer easy-to-install option modules (memory, I/O and communications) and downloadable firmware for enhanced meter capabilities.

Remote display
The optional remote display can be mounted as far as 10 m from the metering unit. The adapter includes an additional 2- or 4-wire RS-485/RS-232 communication port.

PM800 series
Functions and characteristics (cont.)

PB101814-36

PowerLogic PM800 series meter without display.

PE86134

PowerLogic PM800 series meter with integrated display.

PB101822-68

PowerLogic PM800 series meter with remote display.

PE86135

Remote display adapter with display and cable.

PB101819-32

Remote display adaptor alone.

Part Numbers

Description	
Meter without display	
Use the base meter unit without display to comply with voltage limitations for local regulations when door mounting is not possible, or when meter voltage exceeds regulations, or when local display is not required. When the meter is used without a display, configuration of the communications port is limited to the default (address 1, 9600 baud, parity even). Requires software to read data.	
PM810 meter unit only, no display, basic instrumentation, THD, alarming, 80 kB logging (with PM810LOG)	**PM810UMG**
PM820 meter unit only, no display, basic instrumentation, THD, alarming, 80 kB logging	**PM820UMG**
PM850 meter unit only, no display, basic instrumentation, THD, alarming, 800 kB logging, waveform capture	**PM850UMG**
PM870 meter unit only, no display, basic instrumentation, THD, alarming, 800 kB logging, configurable waveform capture and disturbance detection.	**PM870UMG**
Meter with integrated display	
Use the meter with integrated display for panel mounting when door space is available and when voltage usage is within the local regulation limits.	
PM810 meter with integrated display	**PM810MG**
PM820 meter with integrated display	**PM820MG**
PM850 meter with integrated display	**PM850MG**
PM870 meter with integrated display	**PM870MG**
Meter with remote display	
Conveniently packaged kit consist of a base meter (810, 820, 850 or 870) with a remote display, remote display adapter, and remote display cable 3 m (9.ft 10 inches).	
PM810 meter with remote display	**PM810RDMG**
PM820 meter with remote display	**PM820RDMG**
PM850 meter with remote display	**PM850RDMG**
PM870 meter with remote display	**PM870RDMG**
Parts and accessories	
Remote display adapter with remote display and a 3 m (9 ft 10 inch) cable Use this combination of remote display, adapter, and 3 m cable to equip a base meter unit for use with a remote display. In addition, the display can be carried from meter to meter, enabling you to purchase one display for multiple meters. Each base unit meter must be equipped with a remote display adapter (PM8RDA).	**PM8RDMG**
Remote display adapter alone When added to the front of the base unit (PM8xxU), the adapter brings two additional communication ports: one for the remote display and one 4-wire/2-wire RS 485/RS 232.	**PM8RDA**

Part number list continued on next page.

PM800 series
Functions and characteristics (cont.)

DB119011

PowerLogic PM870 with ECC module (bottom view showing connectors and configuration switches).

DB119012

ECC module (front view)

DB119013

ECC module (side view showing LED indicators).

PB101821 6-34

PowerLogic PM8M26 module.

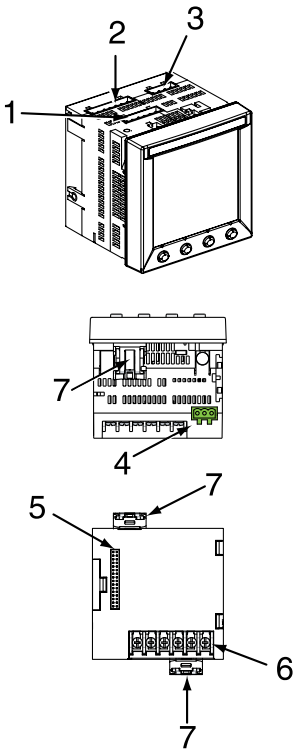
PB101824-50

PowerLogic PM800 with PM8M22 and PM8M26 modules.

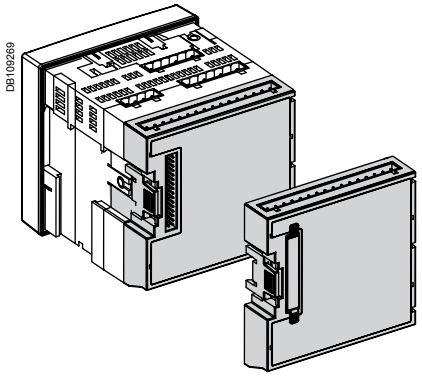
Part Numbers - continued

Description	
Optional modules	
Ethernet communication module provides a 10/100BaseTx UTP port, an RS-485 Modbus serial master port, Ethernet-to-serial line gateway functionality, and an embedded web server that is fully compliant with Transparent Ready - Level 1 (TRe1) systems. The PM8ECC supports a private host PM8ECC MIB. Use of this MIB allows the reading of Basic Metering Data, Configuration and Status of I/Os and Configuration and Status of Alarms, plus SNMP Trap generation in response to any PM8 on-board alarms.	**PM8ECC**
2 relay outputs, 2 digital inputs	**PM8M22**
2 relay outputs, 6 digital inputs	**PM8M26**
2 relay outputs, 2 digital inputs, 2 analogue outputs, 2 analogue inputs	**PM8M2222**
PM810 optional logging module for on-board data recording, uses a non-volatile, battery-backed internal clock	**PM810LOG**
RJ11 Extender kit to mount RJ11 jack in panel door (for use with PM800, CM3000, and CM4000 series meters)	**RJ11EXT**
Cable for remote display adapter 1.25 m (4 ft)	**CAB4**
Cable for remote display adapter 3 m (9 ft 10 inch)	**CAB12**
Cable for remote display adapter 9.14 m (30 ft)	**CAB30**

PM800 series
Functions and characteristics (cont.)



PowerLogic PM800 series connectors.
1. Control power.
2. Voltage inputs.
3. Digital input/output.
4. RS 485 port.
5. Option module connector.
6. Current inputs.
7. Mounting clips.



PowerLogic PM800 series meter with I/O module.

Selection guide		PM810	PM820	PM850	PM870
Performance standard					
ANSI 12.20 Class 0.2S		■	■	■	■
PMD-S IEC 61557-12 PMD/SD/K70/0.5 and PMD/SS/K70/0.5		■	■	■	■
General					
Use on LV and HV systems		■	■	■	■
Current and voltage accuracy		0.5 %/0.2%	0.5 %/0.2%	0.5 %/0.2%	0.2 %/0.2%
Active energy accuracy (5% to 200% of load)		0.2 %	0.2 %	0.2%	0.2%
Number of samples per cycle		128	128	128	128
Instantaneous rms values					
Current, voltage, frequency		■	■	■	■
Active, reactive,apparent power	Total & per phase	■	■	■	■
Power factor	Total & per phase	■	■	■	■
Energy values					
Active, reactive, apparent energy		■	■	■	■
Configurable accumulation mode		■	■	■	■
Demand values					
Current	Present & max.	■	■	■	■
Active, reactive, apparent power	Present & max.	■	■	■	■
Predicted active, reactive, apparent power		■	■	■	■
Synchronisation of the measurement window		■	■	■	■
Demand calculation mode	Block, sliding, thermal	■	■	■	■
Other measurements					
Hour counter		■	■	■	■
Power quality measurements					
Harmonic distortion	Current & voltage	■	■	■	■
Individual harmonics	Current & voltage	31 (1)	31	63	63
Waveform capture		-	-	■	■ (2)
EN50160 - ITI(CBEMA)/SEMI F-47				■ (4)	■
Sag and swell detection		-	-	-	■
Data recording					
Min/max of instantaneous values		■	■	■	■
Data logs		2 (1)	2	4	4
Event logs		-	■	■	■
Trending / forecasting		-	-	■	■
GPS synchronisation		■ (1)	■	■	■
Alarms		■	■	■	■
Time stamping		■ (1)	■	■	■
Display and I/O					
White backlit LCD display		■	■	■	■
Multilingual		■	■	■	■
Digital input (standard/optional)		1/12	1/12	1/12	1/12
Digital output (standard/optional)		1 KY/4 RY	1 KY/4 RY	1 KY/4 RY	1 KY/4 RY
Analogue inputs (standard/optional)		0/4	0/4	0/4	0/4
Analogue outputs (standard/optional)		0/4	0/4	0/4	0/4
Input metering capability (number of channels)		5	5	5	5
Communication					
RS 485 port		2-wire	2-wire	2-wire	2-wire
Modbus protocol		■	■	■	■
RS 232/RS 485, 2- or 4-wire Modbus RTU/ ASCII (with addition of PM8RDA module)		■	■	■	■
Ethernet 10/100Base Tx UTP port and RS485 Modbus serial master port with PM8ECC		■	■	■	■

Option modules selection guide

The PM800 can be fitted with 2 optional modules, unless otherwise indicated (3)

PM8ECC module

10/100BaseTx UTP port, RS-485 Modbus serial master port, Ethernet to serial line gateway, embedded web server

Input/Output modules	PM8M22	PM8M26*	PM8M2222
Relay outputs	2	2	2
Digital inputs	2	6	2
Analogue outputs 4-20 mA			2
Analogue inputs 0-5 Vdc or 4-20 mA			2

** Includes a 24 Vdc Power Supply that can be used to power the digital inputs*

(1) With PM810LOG, battery-backed internal clock and 80 kB memory. (2) Configurable. (3) Series 800 Power Meters supports up to two option modules. When PM8M2222 & PM8ECC are mounted together with control power>370 V AC temperature rating must be reduced to -25°C to 50°C. Same applies when using two PM8M2222. (4) PM850 does not include sag or swell detection.

PM800 series
Functions and characteristics (cont.)

Electrical characteristics			
Type of measurement			63rd harmonic, 128 samples per cycle
Measurement accuracy standard PMD-S IEC 61557-12 compliant			
	Current		0.5% from 0.5 A to 10 A
	Voltage		0.2% 10 V - 277 V
	Power Factor		+/- 0.002 from 0.500 leading to 0.500 lagging
	Active Power		0.2%
	Frequency		+/- 0.01 Hz at 45 to 67 Hz +/- 0.01 Hz at 350 to 450 Hz
	Active Energy		IEC 62053-22 Class 0.5S and ANSI C12.20 Class 0.2S
	Reactive Energy		IEC 62053-23 Class 2
Data update rate			1 s
Input-voltage characteristics	Measured voltage		0 to 600 V AC (direct L-L) 0 to 347 V AC (direct L-N) up to 3.2 MV AC (with external VT)
	Metering over-range		1.5 Un
	Impedance		5 MW
	Frequency measurement range		45 to 67 Hz and 350 to 450 Hz
Input-current characteristics	CT ratings	Primary	Adjustable from 5 A to 32767 A
		Secondary	1 A or 5 A
	Measurement input range		5 mA to 10 A AC
	Permissible overload		15 A continuous 50 A for 10 seconds per hour 500 A for 1 second per hour
	Impedance		< 0.1 W
	Load		< 0.15 VA
Control Power	AC		115 to 415 ±10 % V AC, 15 VA with options at 45 to 67 Hz or 350 to 450 Hz
	DC		125 to 250 ±20 % V DC, 10 W with options
	Ride-through time		45 ms at 120 V AC or 125 V DC
Inputs/Outputs (2)			
Standard (meter unit)	1 digital KY pulse output		6 to 220 V AC ± 10% or 3 to 250 V DC ± 10%, 100 mA max. at 25 °C, 1350 V rms isolation
	1 digital input		24 to 125 V AC/DC ±10 %, < 5 mA maximum burden, 1350 Vrms isolation
PM8M22 option	2 relay outputs (1)		6 to 240 V AC or 6 to 30 V DC 2 A rms, 5 A max. for 10 seconds per hour
	2 digital inputs		19 to 30 V DC, 5 mA max. at 24 V DC
PM8M26 option	2 relay outputs (1)		6 to 240 V AC, 6 to 30 V DC 2 A rms, 5 A max. for 10 seconds per hour
	6 digital inputs		20 to 150 V AC/DC, 2 mA max.
	24 V internal supply		20 - 34 V DC, 10 mA max. (feeds 6 digital inputs)
PM8M2222 option	2 relay outputs (1)		6 to 240 V AC, 6 to 30 V DC 2 A rms, 5 A max. for 10 seconds per hour
	2 digital inputs		20 to 150 V AC/DC, 2 mA max.
	2 analogue outputs		4 to 20 mA dc into 600 ohms maximum
	2 analogue inputs		Adjustable from 0 to 5 V DC or 4-20 mA
Switching frequency (digital I/O)	Standard	Input/output	25 Hz, 50 % duty cycle (20 ms ON/OFF)
	PM8M22	Input/output	1 Hz, 50 % duty cycle (500 ms ON/OFF)
	PM8M26 and PM8M2222	Input	25 Hz, 50 % duty cycle (20 ms ON/OFF)
		Output	1 Hz, 50 % duty cycle (500 ms ON/OFF)
Mechanical characteristics			
Weight (meter with integrated display)			0.6 kg
IP degree of protection (IEC 60529)			IP52 integrated display. Type 12 compliant remote display (with gasket). IP30 meter body
Dimensions	Without options		96 x 96 x 70 mm (mounting surface)
	With 1 option		96 x 96 x 90 mm (mounting surface)
Environmental conditions			
Operating temperature	Meter		-25 °C to +70 °C (2)
	Display		-10 °C to +50 °C
Storage temp.	Meter + display		-40 °C to +85 °C
Humidity rating			5 to 95 % RH at 40 °C (non-condensing)
Pollution degree			2
Installation category			III, for distribution systems up to 347 V L-N / 600 V AC L-L
Dielectric withstand			As per EN 61010, UL508
Altitude			3000 m max.

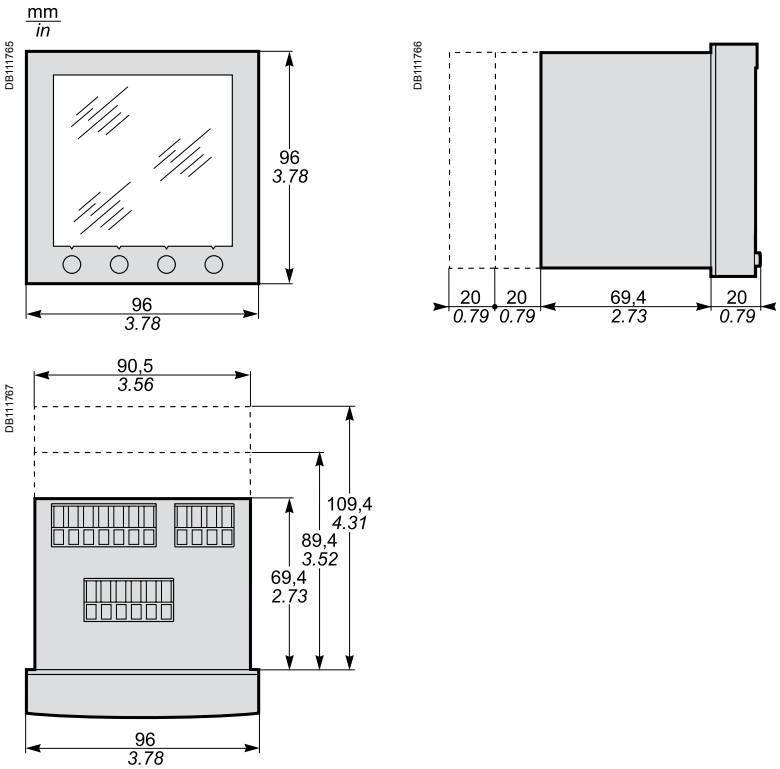
(1) Mechanical endurance: 15 million operations, Electrical endurance:25000 commutations at 2 A / 250 V AC (2) Series 800 Power Meters supports up to two option modules. When PM82222 & PM8ECC are mounted together with control

PM800 series
Functions and characteristics (cont.)

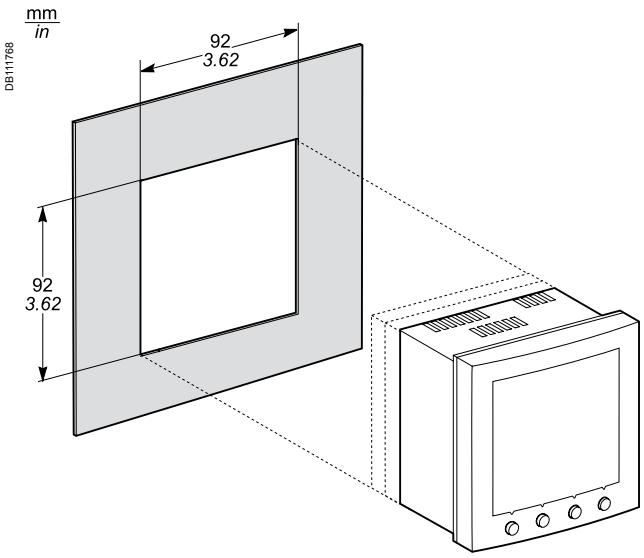
Electromagnetic compatibility		
Electrostatic discharge	Level III (IEC 61000-4-2)	
Immunity to radiated fields	Level III (IEC 61000-4-3)	
Immunity to fast transients	Level III (IEC 61000-4-4)	
Immunity to impulse waves	Level III (IEC 61000-4-5)	
Conducted immunity	Level III (IEC 61000-4-6)	
Immunity to magnetic fields	Level III (IEC 61000-4-8)	
Immunity to voltage dips	Level III (IEC 61000-4-11)	
Conducted and radiated emissions	CE industrial environment/FCC part 15 class A EN 55011	
Harmonics emissions	IEC 61000-3-2	
Flicker emissions	IEC 61000-3-3	
Surge immunity	IEC 61000-4-12	
Surge withstand capability (SWC)	ANSI C37.90.1.2002	
Safety		
Europe	CE, as per IEC 61010-1 ⧈ (1)	
U.S. and Canada	cULus (UL508 and CAN/CSA C22.2 No. 14-M95, Industrial Control Equipment)	
Onboard communications		
RS 485 port	2-wire, up to 38400 baud, Modbus	
Model-dependent characteristics		
Data Logs	PM810 with PM810LOG, PM820, PM850 and PM870: - 1 billing log - 1 customisable log PM850 and PM870 only: 2 additional custom logs	
Min./max.	Worst min. and max. with phase indication for Voltages, Currents, Voltage unbalance, and THD. Min. and max. values for power factor (True and Displacement), power (P, Q, S) and frequency	
One event log	Time stamping to 1 second	
Trend curves (PM850 and PM870 only)	Four trend curves: 1 minute, 1 hour, 1 day and 1 month. Min./max./avg. values recorded for eight parameters: - every second for one minute for the 1-minute curve - every minute for one hour for the 1-hour curve - every hour for one day for the 1-day curve - every day for one month for the 1-month curve	
Hour counter	Load running time in days, hours and minutes	
Energy per shift	Up to three user-defined intervals per day Available for all models (the PM810 requires the PM810LOG module)	
Forecasting (PM850 and PM870 only)	Forecasting of the values for the trended parameters for the next four hours and next four days	
PM850 waveform capture	Triggered manually or by alarm, 3-cycle, 128 samples/cycle on 6 user configurable channels	
PM870 enhanced waveform capture	From 185 cycles on 1 channel at 16 samples per cycle up to 3 cycles on 6 channels at 128 samples per cycle	
Alarms	Adjustable pickup and dropout setpoints and time delays, numerous activation levels possible for a given type of alarm Historical and active alarm screens with time stamping Response time: 1 second Boolean combination of four alarms is possible using the operators NAND, AND, OR, NOR and XOR on PM850 and PM870 Digital alarms: status change of digital inputs	
Memory available for logging and waveform capture (2)	80 kbytes in PM810 with PM810LOG and PM820 800 kbytes in PM850 and PM870	
Firmware update (all models)	Update via the communication ports File download available free from www.powerlogic.com	
Bar graphs (all models)	Graphical representation of system performance	
Display characteristics		
Languages	English, French, Spanish, German, Russian, Turkish and Portuguese.	
Display screen	Back-lit white LCD (6 lines total, 4 concurrent values)	
Dimensions	Display screen viewable area	73 x 69 mm
	Integrated display Overall	96 x 96 mm
	Depth meter + display	69.4 mm + 17.8 mm
	Remote display Overall	96 x 96 x 40 mm
Weight	Meter with remote display adapter	0.81 kg
	Remote display	0.23 kg

Power Meter Series 800
Dimensions and connection

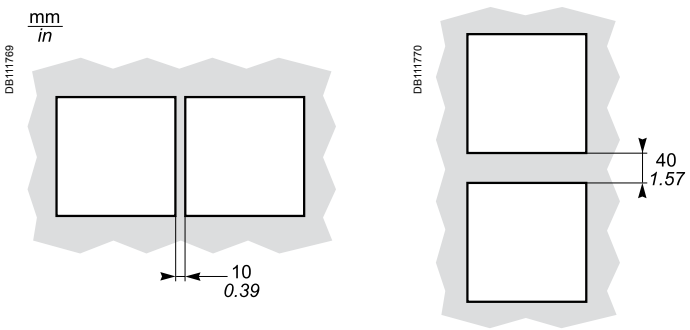
Power meter with integrated display
Dimensions



Front-panel mounting (meter with integrated display)



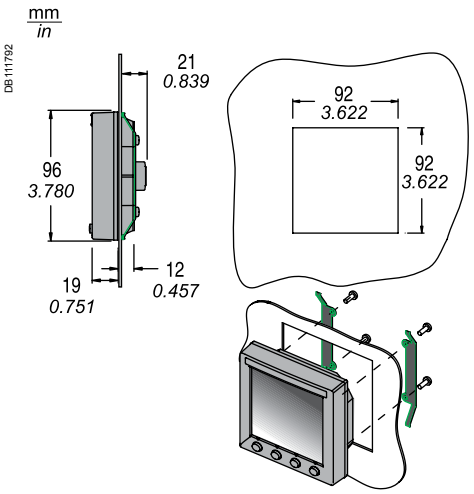
Spacing between units



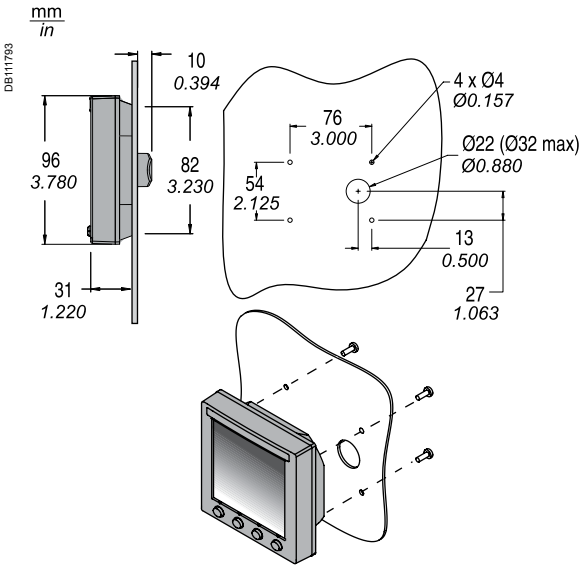
Power Meter Series 800
Dimensions and connection (cont.)

Remote display door mounting

Flush mounting



Surface mount



Mounting in a Ø102 cutout (replace analogue device: ammeter, voltmeter, etc.)