EasyLogic™
PM2000 series

The EasyLogic™ PM2000 multi-function power and energy meter

Offering all the measurement capabilities required to monitor electrical installation in a single 96 x 96 mm unit, with LED or LCD display options.

Applications

Cost management applications

- Bill checking to verify that you are only charged for the energy you use
- Aggregation of energy consumption, including WAGES, and cost allocation per area, per usage, per shift or per time within the same facility
- Energy cost and usage analysis per zone, per usage or per time period to optimise energy usage

Network management applications

- Metering of electrical parameters to better understand the behaviour of your electrical distribution system
- Power quality analysis

METSEPM2110

PM2000

PM2000 series LED display meter

PM2000 LCD display

Introducing EasyLogic PM2000 series, next generation power meter which offers all the measurement capabilities required to monitor an electrical installation in a single 96 x 96 mm unit. PM2000 meters are available in LED and LCD display variants.

- PM2100 series:
  - LED display type: Intuitive navigation with self-guided, three buttons, bright red colour LEDs of 14.2 mm height. Two columns of LEDs indicate the parameter name chosen for display

- PM2200 series:
  - LCD display type: Monochrome graphical LCD of 128 x 128 resolution lets users read all three phase values simultaneously. The bright display enables easy reading even in extreme lighting conditions and viewing angles., with intuitive menus, multi-language text, icons and graphics.

- Network management:
  - Power quality analysis: THD % and individual harmonics to 15th and 31st order
  - Measurement of True PF and Displacement PF
  - Recording Min/Max values of instantaneous parameters with date & timestamp
  - Optional IO modules comprising either 2 Digital Inputs and 2 Outputs, or 2 Analog Inputs and 2 Outputs for comprehensive WAGES monitoring
  - Calculates % unbalance for voltage & current
  - Embedded 2 DI/DO or 2 AI/AO in PM2125 and PM2225 meters

- Main characteristics:
  - Easy to install: Mounts using two clips, no tools are required. Compact 54 mm depth, connectable up to 480 ±10% AC Volts L-L without voltage transformers for installations compliant with measurement category III, and double insulated.
  - Easy to operate: Intuitive navigation with self-guided menus and LED for test and calibration on site or lab. Heart-beat LED indicates normal functioning and communication status if connected to RS-485 network.
  - Product standard compliance
    - Active energy Class 1.0 as per IEC 62053-21
    - Active energy Class 0.5S as per IEC 62053-22 (partial compliance for active energy test clause only)
    - Reactive energy Class 1.0 as per IEC 62053-24 (partial compliance for reactive energy test clause only)
  - Tested in accordance with IEC 62052-11 standard for
    - 5 A, I-nominal
    - 1 A, I-nominal (field settable).

Feature selection

Commercial ref. number	Model
METSEPM2110	PM2110
METSEPM2120	PM2120
METSEPM2125CL05	PM2125[+1]
METSEPM21252AI2AO	PM2125[+1]
METSEPM2125C2DI2RO	PM2125[+1]
METSEPM2130	PM2130
METSEPM2210	PM2210
METSEPM2220	PM2220
METSEPM2225CL05	PM2225[+1]
METSEPM2225C2AI2AO	PM2225[+1]
METSEPM2225C2DI2RO	PM2225[+1]
METSEPM2230	PM2230
METSEPM2KDGTLIO22	PM2K2DIDO
METSEPM2KANLGIO22	PM2K2AIAO
METSEPM2KANLGIO11	PM2K1AIAO

See your Schneider Electric representative for complete ordering information.

[+1] *Available in China only*

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PM2000

- Main characteristics: (cont'd)

  – Power quality analysis: The PM2000 offers THD % measurements and Individual harmonics up to15th order in PM2x20 variants and up to 31st in PM2x30 variants.

  – Load management: Simultaneous display of peak, present, predicted & rising demands of all the four demand parameters (W, VA, VAR, Amps)

  – Billing: Tenant billing/utility meter cross check (where local regulations are not applicable).

  – Timer: Active load timer, Meter operation timer and Run hours timer. These features help advise maintenance requirements and scheduling.

  – Password: Field configurable password for securing set up information and prevent tampering of integrated values.

  – Cyber security: Option for disabling RS-485 port through front panel keys against unauthorized access. It helps during installation and trouble shooting of communication network.

  – LED display: Auto scaling, 9+3 digits for energy, 4 digits for other parameters.

  – LCD display: 5 digits for energy, 5 or 6 digits for other parameters, with auto scaling.

  – Daily time snap shot: Snap shot of Avg Voltage, Avg Current, Total Active Power & Energy delivered as measured by the meter at configurable time of day in HH:MINUTES format. The static page will be refreshed with new values at a configured time next day.

  – Rate counters: 2 configurable counters display values in custom specified units based on energy recorded (e.g., $kgCO_2$ carbon emission or energy cost).

  – Energy preset feature: For retrofit application.

  – Auto reset: Monthly reset of all energies and max demand based on configurable day of the month at fixed 00 Hrs (PM2220, PM2230).

  – Suppression current: To disregard induced or negligible current flowing in the circuit, minimum value of current detection can be settable from 5 to 99 mA, default is 5 mA (all variants).

  – Retrofit register - Legacy modbus registers to read 50 parameters (meters with communication port).

  – Quadrant based VARh: Available through communication.

  – Multi-tariff energy - 4 multi tariff registers, can be activated through command, TOU or Input mode with Digital IO card. (PM2230).

  – Non-resettable energy: Separate Wh counter on display that cannot be reset to zero (PM2210/20/30).

  – Configurable favorite page: Pick and configure any 4 parameters for display from the list of - V L-L, V L-N, Amps, F, W-tot, VA-tot, VAR-tot, PF and Wh-Del, VAh-Del, VARh-Del (PM2220, PM2230).

PM2000

Rear of PM2000 closed

Rear of PM2000 open

Rear of PM2000 without I/O module

PM2000 technical specifications

General	
Use on LV and MV systems with onsite programmable PT/CT ratio.	
Basic metering with THD %, Individual Harmonics, RTC and min/max readings.	

Instantaneous rms values	
Current	Average line current of 3-phase, per-phase, and calculated neutral current.
Voltage	Average voltage of L-L, L-N parameters, and per-phase.
Frequency	Any available line.
Real, reactive, and apparent power	Total and per-phase value.
Displacement power factor	Average and per-phase signed, four quadrant.
True Power Factor	Average and per-phase signed, four quadrant.
% Unbalance	Among the phase for Amps, V L-N, V L-L.

Energy values stored in non-volatile memory	
Four quadrant measurement for Delivered (Forward or Import) and Received (Reverse or Export) energy	Accumulated energy values for Active, Reactive & Apparent Energy parameters, quadrant basis Net & Total (absolute) values.
Timer	Accumulated time counters for active load timer, meter operation timer, run hours and power outage counter.
Old Registers	Facilitates retrieval of last cleared energy values.

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.
Demand sync methods	Thermal, Timed, Command Sync, and Clocked Sync.
Demand calculation mode	Sliding, fixed and rolling block.
Demand intervals	Settable from 1 to 60 minutes, in the step of 1 minute.

Display	
PM2100 series	Bright red colour LED display, 7 segment LED, ~ 14.2 mm height, 3 rows with 4 digits per row, Auto range.
PM2200 series	Full scape, monochrome graphical LCD of 128 x 128 resolution with viewable area of 67 x 62.5 mm.
Visualization mode for signs	IEC or IEEE type in LCD display meter.

Communication	
RS-485 serial	Channel connection Industry standard Modbus RTU protocol.
Integration with software	SCADA/ DCS/ PMS/ EMS/ BAS/ BMS software.
Native Plug and Play support	Schneider Electric energy management system software - EcoStruxure™ Power Monitoring Expert, EcoStruxure PowerSCADA Operation, & ION Setup programming support.

Min/Max values	
Minimum & Maximum value recording of 3-ph average or total	For 8 parameters, viz., V L-L, V L-N, Amps, PF, Hz, W, VA, VAR with date and time stamp, resettable separately through set up mode.

Alarms	
Alarming with time stamping in PM2x30 meters	A different combination of set point driven alarms and digital alarms with 1 s time stamping. The alarms can be programmed and combined to trigger digital outputs, the meter keeps an alarm logs with the active and historical alarms with date and time stamping in 40 registers.

Diagnostics	
Diagnostic page	Indicates LED/LCD status, sl number, diag pages, OS & RS version, Run Hour counter in PM2100.

Lock/ Un-Lock	
Page Lock & Unlock (PM2100 series)	Unique feature to ensures that commonly referred page is restored in 4 minutes of inactive time.

Rate 1 counter[+2]	
$kgCO_2$ emission (example)	Rate counter can be configured to display the CO_2 emission in $kgCO_2$ format based on the kWh measured either in delivered or received direction.

Rate 2 counter[+2]	
Tariff counter (example)	Rate counter can also be configured to calculate the electricity cost based on the energy consumption in customized currency format.

Configurable snap shot	
Configurable snap shot[+2]	Snap shot of Avg Voltage, Avg Current, Total Active Power & Energy delivered as measured by the meter at configurable time in Hours:Minutes format. Static page is refreshed with new values by next day at pre-configured time.

[+2] Available in PM2220/PM2230 (LCD) meters

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PM2000

Rear of PM2000 with I/O module

Rear of PM2000 with I/O module disconnected

PM2000 electrical characteristics

Electrical characteristics	
Type of measurement	True RMS 64 samples per cycle
Measurement accuracy	
Current, average & per-phase	±0.5 %
Voltage average & per-phase	±0.5 %
Frequency	±0.05 %
Power Factor, average & per-phase	±0.01
Power (W-Active, VA- Apparent)	±0.5 %
Power (VAR- Reactive)	±1.0 %
Real/ Active Energy (Wh)	Class 0.5S as per IEC 62053-22 and Class 1.0 as per IEC 62053-21 for both CT nominal of 5 A and 1 A[+3]
Reactive Energy	Class 1.0 as per IEC 62053-24
Apparent Energy	±0.5 %
THD % and Individual Harmonics- V & A	±5 % FS for THD % & Individual harmonics
Input-voltage	
VT primary	999 kV L-L max, secondary voltage depends on VT ratio
U nominal	277 V L-N/480V L-L
Measured V with full range	20-277 V L-N/35 - 480 V L-L, cat III 20-347 V L-N/35 - 600 V L-L, cat II
Permanent overload	750 V AC L-L
Impedance	=> 5 MΩ
Frequency nominal	50/60 Hz
VA burden	< 0.2 VA at 240 V AC L-N
Input-current	
CT ratings	Primary adjustable 1 A to 32768 A Secondary 1 A or 5 A I-nominal
Measured Amps with over range & Crest Factor	5 mA to 6 A
Over current withstand	Continuous 12 A, 10s/hr 50 A, 1s/hr 500 A
Impedance	< 0.3 mΩ
Frequency nominal	50/60 Hz
VA Burden	<0.024 VA at 6 A
AC control power	
Operating range	44- 277 V AC ±10% (80-277 V AC ±10% with I/O card)
Burden	<6 VA at 277 V AC L-N (<8 VA for PM2x30 and PM2x25C)
Frequency	45 to 65 Hz
Ride-through time	100 ms typical at 120 V AC and maximum burden (50 ms with Analog IO card for PM2x30) 400 ms typical at 230 V AC and maximum burden (50 ms with Analog IO card for PM2x30)
DC control power	
Operating range	48-277 V DC ±10% (100-277 V AC ±10% with I/O card)
Burden	< 2 W at 277 V DC (< 3.3 W for PM2x30 and PM2x25C)
Ride-through time	50 ms typical at 125 V DC and maximum burden
Real time clock	
RTC with battery backup	3 years (when meter is in Power OFF condition)
Displays update	
Instantaneous	1 s
Demand	15 s
Harmonics	5 s
Wiring configuration	
User programmable	1ph, 2w, L-N 1ph, 2w, L-L 1ph, 3w, L-L with N (2phase) 3ph, 3w, Delta, Ungrounded 3ph, 3w, Delta, Corner Grounded[+4] 3ph, 3w, Wye, Ungrounded[+4] 3ph, 3w, Wye Grounded[+4] 3ph, 3w, Wye, Resistance Grounded[+4] 3ph, 4w, Open Delta, Center-Tapped[+4] 3ph, 4w, Delta, Center-Tapped[+4] 3ph, 4w, Wye, Ungrounded[+4] 3ph, 4w, Wye Grounded 3ph, 4w, Wye, Resistance Grounded[+4]

[+3] For 1 A CT nominal, additional error of ±1 % from 50 mA to 150 mA, ±2 % for current > 10 mA to < 50 mA. Partial standard compliance for Class 0.5S meter type (energy test clause only)
[+4] Through communication in PM2100 series meters

PM2000

PM2000 series mechanical characteristics

Mechanical characteristics	
Weight	~ 300 gm
IP degree of protection	IP54 front side, IP30 meter body as per IEC 60529
Material	Polycarbonate meets UL 94V-0 flammability rating
Dimensions W x H x D	96 x 96 x 54 mm maximum (depth of the meter from housing mounting flange) and 13 mm (protrusion of meter from housing flange). Meter depth with IO module is 74 mm
Mounting position	Vertical
Panel thickness	5 mm maximum
Environmental characteristics	
Operating temperature	Meter -10 to +60 °C (14 to 140 °F)
Storage temperature	Meter -25 to +70 °C (-13 to 158 °F)
Humidity rating	5 to 95% RH non condensing
Pollution degree	2
Altitude	≤ 2000 m (6562 ft) Category III
Product life	Minimum 7 years
Electromagnetic compatibility (tested as per IEC 61326-1)	
Electrostatic discharge	IEC 61000-4-2
Immunity to radiated field	IEC 61000-4-3
Immunity to fast transients	IEC 61000-4-4
Immunity to impulse waves	IEC 61000-4-5
Conducted immunity	IEC 61000-4-6
Immunity to magnetic fields	IEC 61000-4-8
Immunity to voltage dips	IEC 61000-4-11
Emissions	Emissions FCC Part 15 Class A/CE
Safety	
Europe	CE, as per IEC 61010-1 Ed-3
US and Canada	cULus as per UL61010-1 and CAN/CSA-C22.2 No. 61010-1, for 600V AC
Measurement Category (Voltage and Current inputs)	CAT III up to 480 V L-L CAT II up to 600 V L-L
Overvoltage Category (Control power)	CAT III up to 300 V L-N
Dielectric	As per IEC/UL 61010-1 Ed-3
Protective Class	II, Double insulated for user accessible parts
Green premium	EOL, REACH, PEP, RoHS complied
Other certification	RCM (Australia), EAC (Russia)
Communication	
RS-485 port	Modbus RTU: 2-Wires, with ground & shield, 4800, 9600, 19200 or 38400 baud, Parity - Even, Odd, None, 1 stop bit if parity is Odd or Even, 2 stop bits if None DLF3000: Firmware update through communication port
Pulse Output – POP	Max 40 V DC, 20 mA 20 ms ON time
	Configurable pulse weight from 1 to 9999000 pulses/k_h (kWh, kVAh, or kVARh)
Isolation	2.5 kV RMS, double insulated
Protection features	Password protected for set-up & clearing energy and Min/Max data
Display language	English, Spanish, French, Chinese, German, Portugese, Russian, Turkish. EN default, other languages selectable in communication variants of PM2200 series
Technical publication	Printed installation guide (IG) with the meter in multi language (EN,ES,FR,DE,PT, RU,TR,ZH) User guide soft copy format in EN ES, FR, ZH languages
Human machine interface	
Display type	LED display: 7 segment LED, ~ 14.2 mm height, 3 rows with 4 digits per row 2 columns of LEDs, one on each side of the LED panel to indicate the parameters under measurement LCD display: Monochrome graphical LCD of 128x128 mm resolution with viewable area of 67 x 62.5 mm
Keypad	PM2100 series: 3 buttons for navigation & combination of 2 buttons for performing set-up, Lock/unlocking of page, Diagnostic page operation PM2200 series: 4 buttons for intuitive navigation of HMI/ UI pages
CAL LED Indicator	Red colour, meter constant is configurable from 1 to 9999000 pulses/k_h (kWh, kVAh, or kVARh)
Comm. activity	Green LED (for indicating RS-485 interface or heart beat pulse)

PM2000

Rear of PM2200 with I/O module

Digital I/O module

Analog I/O module

PM2000 series electrical characteristics of IO modules

Status Inputs (Digital Inputs)	
Voltage ratings	18.5 to 36 V DC, OFF 0 to 4 V DC
Input resistance	110 kΩ
Max Frequency	2 Hz (T ON min = T OFF min = 250 ms)
Detect Time	20 ms
Update time	1 s
Isolation	2.5 kV RMS
Supported models	Available as default feature in PM2125/ PM2225 and Expandable option in PM2130/ PM2230 meter model
Application	Integration of Breaker status or other non-electrical devices like steam, water, gas meter through pulse inputs
Display support	Available on PM2230/PM2225 (LCD type). In PM2130/ PM2125 meter, data is available through communication only.
Set up and configuration	Through set-up software

Digital Outputs	
Voltage ratings	40 V DC max, 20mA max
On Resistance	50 Ω max
Meter constant	Configurable from 1 to 9999000 k_h (kWh, kVARh, kVAh)
Pulse width Pulse frequency	20 ms 25 Hz
Leakage current	1 micro Amps
Isolation	2.5 kV RMS
Supported models	Available as default feature in PM2125/ PM2225 and Expandable option in PM2130/ PM2230 meter model
Alarm conditions	14 set point driven alarms, 4 Unary alarms, 2 Digital inputs status
Application	Pulse output: configurable for energies upper / lower limit: configurable for 10 parameters with 23 set point: V L-L, V L-N, Amps, F, V-THD %, W-tot, VA-tot, VAR-tot, PF-avg, last, present & predicted parameters for 3 power demand
Display and communication	Available on PM2230/PM2225 (LCD type). In PM2130/ PM2125 meter, data is available through communication only
Set up and Configuration	Through ION set-up software utility tool

Analog inputs	
Measurement scale	4-20 mA
Input impedance	≤300 Ω
Max source impedance	>500 Ω
Update rate	1 s
Accuracy	1 % of Full scale at ambient temp 0.1 %/K for de-rating
Voltage ratings	Typical 12 V (max 30 V)
Power Consumption	<1.5 W
Isolation	2.5 kV RMS
Supported models	Available as default feature in PM2125/ PM2225 and Expandable option in PM2130/ PM2230 meter model
Application	Configurable for inputs from flow rates, RPM, fluid level, oil pressure, temperature measurement devices or transducers with option of 81 different Uni code selection. Configuration via set up software
Display and communication	Available on PM2230 (LCD type). In PM2130 meter, data is available through communication only
Set up and configuration	Through ION set-up software utility tool

Analog outputs	
Scale	4-20 mA
Load impedance	≤600 Ω
Update rate	1 s
Accuracy	1 % of Full scale at ambient temp
Voltage ratings	Typical 12 V (max 30 V)
Power Consumption	<1.5 W
Isolation	2.5 kV RMS
Supported models	Available as default feature in PM2125/ PM2225 and Expandable option in PM2130/ PM2230 meter model
Application	Analog outputs can be associated to 40 different instantaneous parameters
Display and communication	Available on PM2230 (LCD type). In PM2130 meter, data is available through communication only
Set-up & configuration	Through ION set-up software utility tool

Mechanical characteristics	
Mechanical dimension	90.5 mm W x 53 mm H x 14.67 mm D (without connector)
Weight	50 g

PM2000

| Feature set summary	PM2110	PM2120	PM2125C	PM2130	PM2210	PM2220	PM2225C	PM2230
Accuracy Class for Wh	1.0		0.5S		1.0		0.5S	
Accuracy Class for VARh	1.0							
Accuracy for VAh	±0.5 %							
Amps, per-phase, average and calculated neutral current	■							
Voltage, V L-N, V L-L, per-phase and average	■							
Power Factor	True PF	True PF Displacement PF[1]			True PF	True PF Displacement PF		
Frequency, any available phase	■							
Power: W, VA, VAR: per phase and total	■							
3-phase unbalance %	Current	Current Voltage[+4]			Current	Current Voltage		
Demand parameters (Present, Last, Predicted and Peak for W, VA, VAR, Amps) Date and Time stamp for peak demand	■ (no timestamp)	■			■ (no timestamp)	■		
Energy: Wh, VAh, VARh (4 quadrant) Delivered (Import or Forward), Received (Export or Reverse)	Delivered, Received	Delivered, Received Total[+4], Net[+4], Last cleared[+4]			Delivered, Received, Total, Net	Delivered, Received Total, Net, Last cleared[+3]		
Active load timer, meter operating timer, run hours and power outage counter		Through com				■		
THD %: Voltage L-N or L-L, Amps per phase	■							
Individual harmonics for Voltage, Current, per-phase[+7]		Up to 15th[+4]	Up to 31st[+4]	Up to 31st[+4]		Up to 15th	Up to 31st	Up to 31st
Min/ Max with real time clock For avg or total of V L-L, V L-N, Amps, PF, Hz, W, VA, VAR parameters with date and time stamp of occurrence		Through com				■		
RTC/battery[2]		■	■	■		■	■	■
Communication	Pulse Output	RS-485			Pulse Output	RS-485		
Expandable Analog IO module+5 PM2K2AIAO: 2 input & 2 output channels PM2K1AIAO: 1 input & 1 output channel			Embedded with 2AI/AO	■			Embedded with 2AI/AO	■
Expandable Digital IO module3 PM2K2DIDO: 2 input & 2 output channels			Embedded with 2DI/DO	■			Embedded with 2AI/AO	■
Customizable data logging up to 2 parameters. Option to select Power (W,VA,VAR) Bi-directional energy (±Wh, ±VAh, ±VARh), Demand (W, VA,VAR) with configurable interval and duration (e.g. 2 parameters for 60 days at 15 minutes interval)				■				■
Alarms: 23 set point driven alarms from 10 parameters including - V L-L, V L-N, Amps, F, V-THD %, W-Tot, VA-Tot, VAR-Tot, PF-Avg, Last DM, Present DM, Predicted DM. 4 Unary alarms - meter power UP, meter reset, meter diagnostic, phase reversal. 2 digital input status - with DI/DO card only			■	■			■	■

[+4] Through communication only
[+5] Any one IO module can be used at a time with PM2130 or PM2230 meter. The control power range for PM2130 & PM2230 meters with or without IO module (including PM2125/ PM2225 references) shall be 72 to 304 V AC L-N or 90 to 304 V DC.
[+6] Battery backup duration 3 years when meter is in continuous or accumulated Power OFF condition.
[+7] Individual harmonics, onfigurable snap shot and rate counter features not available in PM2125/ PM2225 meters

PM2000

PM2000 LCD display legend description
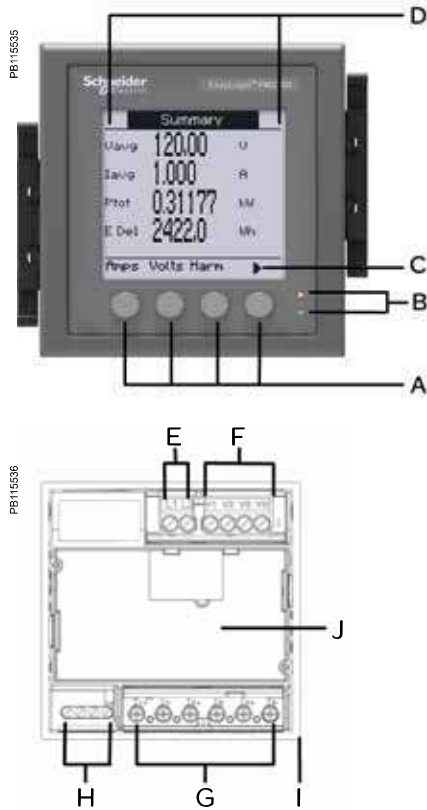
A Menu selection buttons

B Energy pulsing LED (red) Heartbeat / communications LED (green)

C Navigation or menu selections:

▲ Exit screen and go up one level

▲ Move cursor up list of options

▼ Move cursor down, display more options

◀ Move cursor one character to the left

▶ Scroll right and display more menu items

+ Show next item in list or increase the highlighted value

− Show previous item in list

D Maintenance & alarm notification area

E Control power

F Voltage inputs

G Current inputs

H RS-485 / POP

I Gasket

J I/O channel slot - optional accessory for PM2230, embedded in PM2225 meter

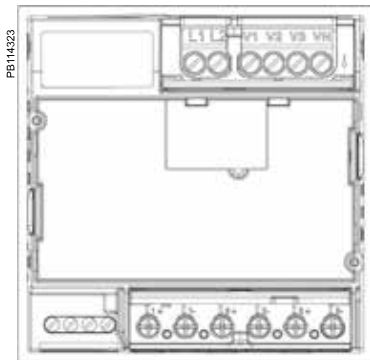## PM2000 LED display legend description
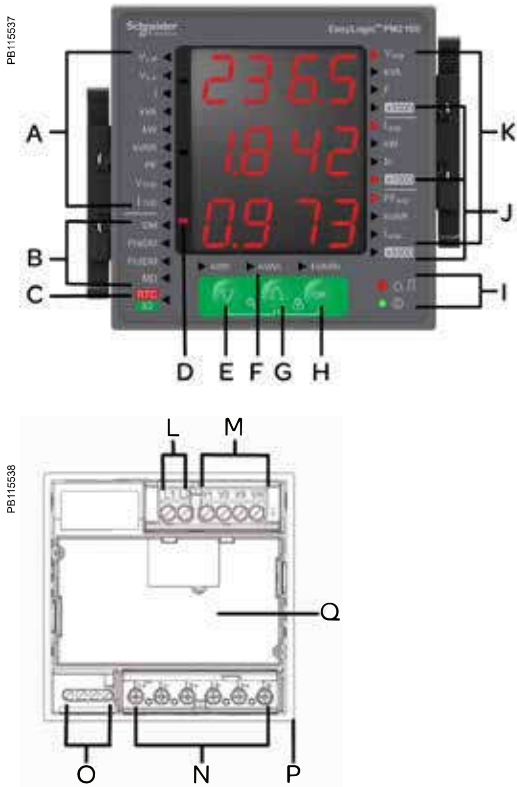
A Phase measurements (VL-N, VL-L, I, kVA, kW, kVAR, PF, V-THD %, I-THD %)

B Demand measurements (DM=Demand, PrsDM=Present demand, PrdDM=Predictor demand, MD=Maximum demand))

C RTC Date & time

D Negative indicator

E Navigation key to navigate down

F Energy readings Apparent enegry, Active energy, Reactive energy

G Navigation key to navigate up

H OK Enter key

I Energy pulsing LED (red) Heartbeat / communications LED (green)

J x 1000 indicator

K System measurements Vavg, kVA, F, Iavg, kW, In, PFavg, kVAR, Iunb

L Control power L1, L2

M Input voltage terminals V1, V2, V3, VN

N Input current terminals I1+, I1-, I2+, I2-, I3+, I3-

O RS-485 communications / POP terminals

P Gasket

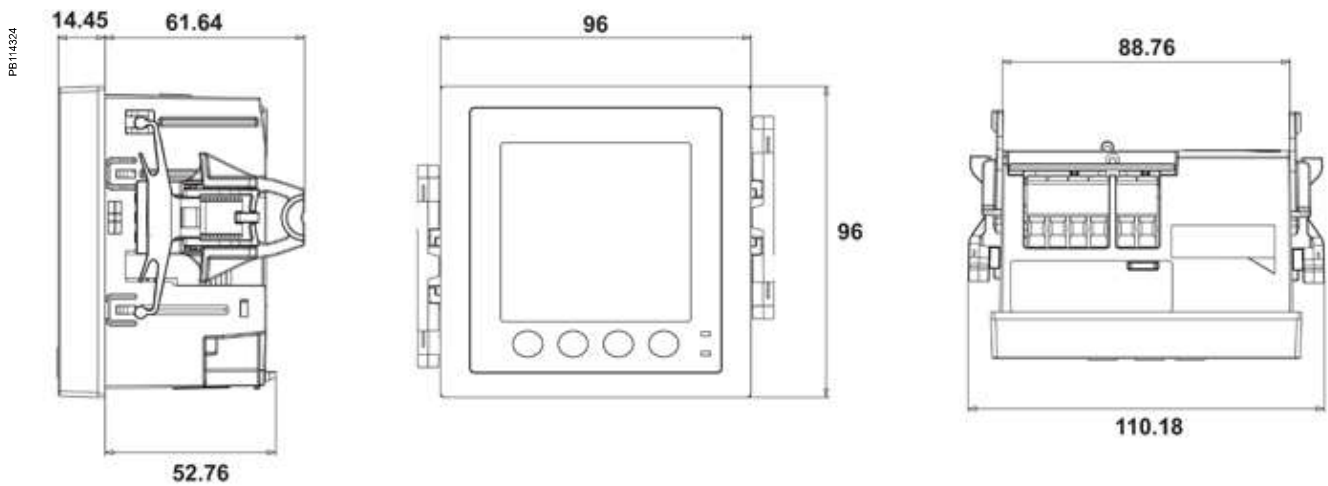Q I/O channel slot - optional accessory for PM2130, embedded feature in PM2125 meter
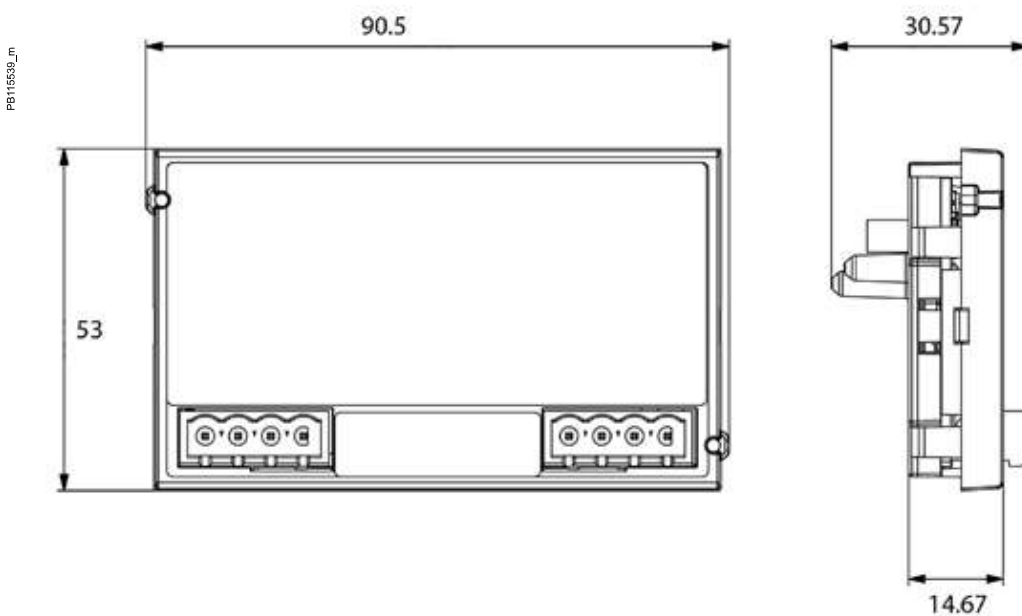
PM2000

PM2000 meter rear view   **Meter installation**

PM2000 multi-function meter mechanical dimensions

PM2000 Digital and Analog IO module mechanical dimensions

See the appropriate **Installation Guide** for correct installation instructions.