EasyLogic™ PM1000H series

Technical Datasheet

The EasyLogic™ PM1000H basic power and energy meters

Offering all the measurement capabilities required to monitor the electrical installation in a single 96 x 96 mm unit, with 8 segment alphanumeric bright, large 14.2 mm high LED display (PM1125H) or with 128 * 32 pixels LCD display (PM1225H) options.

PB120503

PB120602

PM1125H

PM1225H

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EasyLogic™ PM1225H power meter LCD display

PB120504

EasyLogic™ PM1125H front view LED display

PB120605

EasyLogic™ PM1000H power meter rear view

EasyLogic™ PM1125H/PM1225H meters are ideal replacements for multiple analog meters for stand-alone metering in custom panels, switch boards, switch-gear, genset panels, motor control centres, power factor improvement panels and OEM panel board.

- Application
  - Cost management applications
    - Measurement of basic electrical parameters in control panels, motor control panels, power distribution boards, OEM's, Building management systems, panel instrumentation
    - Aggregation of energy consumption and cost allocation per area, per usage, per shift and per time within the same facility
  - Network management applications
    - Power quality analysis (THD %)
    - Demand measurement
    - Measurement of Power factor
    - Phase angle between the voltage and current
    - % unbalance among voltage and current
    - Modbus RTU protocol RS-485 communication port for integration with energy management systemMain characteristics
- Main characteristics
  - Easy to install: Mounts using two retainer clips, no tools required. Compact meter with 49 mm meter depth behind the panel, connectable up to 480 V +10% AC volts L-L without voltage transformers for installation complaint with measurement category III, and double insulated.
  - Easy to operate: Intuitive navigation with self-guided menus and Heart beat LED indicates normal functioning of meters while it conveys the communication status when connected to RS-485 network.
  - LED display: Intuitive navigation with self-guided, four buttons, 8 segment alphanumeric LEDs of height ~14.2 mm (0.55 in), and three lines of concurrent values with Kilo & Mega value indicators.
  - LCD display: Elegant single row, bright back lit graphical LCD display 132 * 32 pixels, Fast in-line view, three parameters name and value at one glance.
  - Power and energy: measurement, display and recording of three power and corresponding energy parameters simultaneously - W/Wh, VA/ VAh and VAR/ VARh.
  - Demand: measurement of Peak, present and last demand values of either W, VA or VAR parameters with selectable demand parameter, demand interval and demand technique.
  - Accuracy:
    - Class 1.0 for active energy as per the test limits given in IEC 62053-21
    - Class 0.5 for active energy as per the test limits given in IEC 62053-22
    - Class 2.0 for reactive energy as per the test limits given in IEC 62053-23
    - Tested in accordance with IEC 62052-11 for energy test requirements
    - EMI/ EMC tests: As per IEC 61326-1
  - CT nominal: 5 A or 1 A I-nominal (field settable). CT reversal auto correction for energy consumption.
  - Password: Field configurable password for securing set up information and prevents tampering of integrated values.
  - Cyber security: Option for disabling RS-485 port through front panel keys against unauthorized access. This feature can also be used for maintenance and troubleshooting of complex communication network.
  - LED & LCD display: 4 digits for instantaneous parameters and 5+3 digits for energy parameters with auto scaling and auto range capability.
  - Analog load bar in LED display type: The colour-coded analog load bar at the front side indicates the percentage of load through 12 LED's with the option to select full scale based on connected load.
  - Suppression current: To disregard the measurement of induced and panel auxiliary load current in the circuit (settable from 5 to 99 mA).
  - Protective cover: Tamper-proof terminal screws do not detach from housing.
  - Control power options: Universal range 44 to 300V LN AC/DC or Low voltage DC control power option of 9 to 36V DC.
  - Smart line indicators in LCD display meter: Helps check the presence of

PM1000H technical specifications

General	
Use on LV & MV systems with Potential transformer (PT or VT)/ Current transformer (CT) ratio programmable at site	
Digital panel meters for measurement of basic electrical parameters	
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, per-phase
Frequency	Any available line
Real (active), reactive, and apparent power	Total and per-phase
True power factor	Average and per-phase signed
% Unbalance	Maximum % unbalance among phases for Volts & Amps
Revolution per minute (RPM)	RPM of alternator or generator when number of poles set for 2, 4, 6, 8, 12, 14 or 16 (any one pole)
Energy values stored in non-volatile memory	
Delivered & Received or Forward & Reverse or Import & Export energy (4 quadrant) - Accumulated or Integrated active (Real - Wh), reactive (VARh), apparent (VAh).	
Interdependent energy (Wh) counter with non-resettable feature.	
Energy values can be set for overflow units (e.g., in kilo or mega scale)	
Quadrant based registers for Reactive energy	
Time counters such as meter ON Hrs, load RUN Hrs and power outage counters	
Old registers facilitate retrieval of last cleared energy values and load Run Hrs. Set up counters for tracking number of edits carried out since from installation	
Display	
LED display: Bright red colour, 8 segment alphanumeric LED, ~ 14.2 mm (0.55 in) height, 3 rows with 4 digits per row, auto range, auto scale	
LCD display: Elegant single row, bright back lit graphical LCD display 132 (Horizontal) * 32 (Vertical) pixels. Fast in-line view, three parameters name and value at	
Communication	
RS-485 serial channel connection Industry standard Modbus RTU protocol	
Native Plug and Play support for Schneider Electric energy management system software - EcoStruxure Power Monitoring Expert, EcoStruxure Power SCADA Operation along with ION Setup programming support	
Diagnostics	
Diagnostic page indicates the healthiness of communication system, device serial number, device model number OS & RS version, communication status, All LED segment check in LED display. In LCD display meter - alternate pixels ON/ OFF test. LCD contrast level, set back-lit time out in the range of 1 to 99 seconds	
Page lock	
Page lock and unlock features. Once the commonly referred page is enabled for lock feature, then the display returns to locked page in 4 minutes of inactive time	
Favourite page	
Number and type of parameters can be chosen and arranged in Favourite page according to the user's requirement	
Electrical characteristics	
Type of measurement	True RMS, 4 quadrant power and energy, 32 samples/ cycle
Measurement accuracy	
Current, per-phase & average	± 0.5 % of reading
Voltage, L-N, L-L, per-phase & average	± 0.5 % of reading
Power (active and apparent)	± 1.0 % for Class 1.0, ± 0.5% for Class 0.5
Power (reactive)	± 2.0 % for Class 1.0 & Class 0.5
Power factor, per-phase & average	± 0.01 of reading
Frequency	± 0.05 % for F-nominal 50/ 60 Hz ± 2
	± 0.2 % for Frequency range from 30 to 48 Hz, 52 to 58 Hz and 62 to 70 Hz
Active or real energy	Class 1.0 (± 1.0 %) Class 0.5 (± 0.5%)
Apparent energy	± 1.0 % & ± 0.5 %
Reactive energy	Class 2.0 (± 2.0 %)
THD %	± 5 % of reading
Input-voltage	
VT (PT) connection	Selectable from No VT (direct), 1 VT, 2 VT to 3 VT
VT (PT) primary	100 V L-L to 999 kV L-L max
U (V) nominal (secondary)	Up to 277 V L-N/ 480 V L-L (selectable VT secondary from 100, 110, 115, 120 to 415 V L-L)
Operating voltage range with accuracy	80-480 V L-L ± 10 % Category III
Measured Voltage with full range	35 to 600 V L-L
Permanent overload (withstand)	750 V L-L, continuous
Impedance	≥5 MΩ
Frequency range	50/ 60 Hz ± 2
VA burden	≤0.2 VA at 240 V L-N at 50 Hz
Frequency – measurement	
Nominal operating range	50/60 Hz ± 2 (± 0.05 % accuracy)
Extended operating range	30 to 48 Hz, 52 to 58 Hz and 62 to 70 Hz (± 0.2 % accuracy)
Voltage input	80 to 480 V L-L ± 10 %

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PM1000H technical specifications (continued)

Input-current	
CT connect	Solo or multi-phase current measurement by installing CT (s) in either of A1, A2, A3, A12, A23, A13, A123 phase(s)
CT primary	1 A to 32767 Amps, programmable
CT secondary	1 A or 5 Amps I-nominal (field settable)
Operating current range with accuracy	10 mA to 6 A[+1]
Measured Amps with full range	5 mA to 10 A
Suppression current	5 to 99 mA (to disregard negligible load)
Permanent overload (withstand)	Continuous 10 A, 10 s/hr 50 A, 1s/hr 500 A
Impedance	0.3 mΩ
Frequency range	50/60 Hz ± 2
VA burden	≤0.1 VA at 5 A, 50 Hz
AC - control power	
Operating range	48 to 277 V DC ± 10 % or LVDC option of 9 to 36 V DC
Burden	≤4 VA at 240 V L-N, 50 Hz
Frequency	50/60 Hz nominal (45 to 65 Hz operating range)
Ride-through time	200 ms at 240 V L-N, 50Hz
DC - control power	
Operating range	48 to 277 V DC ± 10 %
Burden	≤2 W at 240 V DC
Ride-through time	120 ms at 240 V DC
Display update	
Instantaneous/ RMS parameters	1 s
Demand parameters	5 s
THD % (voltage and current)	5 s
Power system	
Phase labelling	Configurable to 123, ABC, rst, pqr or ryb
Wiring configuration	13 wiring schemes (5 on front screen) 1ph, 2 w, L-N 1ph, 2 w, L-L 1ph, 3 w, L-L with N (2phase) 3ph, 3 w, Delta, Ungrounded 3ph, 3 w, Delta, Corner Grounded[+2] 3ph, 3 w, Wye, Ungrounded[+2] 3ph, 3 w, Wye Grounded[+2] 3ph, 3 w, Wye, Resistance Grounded[+2] 3ph, 4 w, Open Delta, Center-Tapped[+2] 3ph, 4 w, Delta, Center-Tapped[+2] 3ph, 4 w, Wye, Ungrounded[+2] 3ph, 4 w, Wye Grounded 3ph, 4 w, Wye, Resistance Grounded[+2]
Mechanical characteristics	
Weight	~ 300 g (10.6 oz)
IP degree of protection	IP 51 front side, IP 54 with gasket (optional accessory), IP 30-meter body, tested as per IEC 60529
Material	Polycarbonate meets UL 94V-0 flammability rating
Dimensions W x H x D	96 x 96 x 49 mm (3.78 x 3.78 x 1.93 in) (D = depth of the meter from housing mounting flange) 13 mm (0.51 in) protrusion of meter from housing flange
Mounting position	vertical
Panel thickness	5 mm (0.196 in) maximum
Environmental characteristics	
Operating temperature	- 10 to +60° C (14 to140° F)
Storage temperature	- 20 to +70° C (-4 to 158° F)
Humidity rating	5 % to 95 % RH non-condensing
Pollution degree	2
Attitude	≤2000 metres (6562 ft), Category III
Product life	>7 years
Insulation category	Double insulation for user accessible parts

[+1] Additional error of ± 2 % between 10 mA to 50 mA, ± 1% between 50 mA to 100 mA)
[+2] Through communication

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PM1000H technical specifications (continued)

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 edition-3
US and Canada	cULus as per UL61010-1 and CAN/CSA-C22.2 IEC 61010-1 edition-3, for 480 V AC L-L
Measurement Category (Voltage inputs)	CAT III up to 480 V L-L
Overvoltage Category (Control power)	CAT III up to 300 V L-N
Dielectric	As per IEC/UL 61010-1 edition-3
Protective Class	II, Double insulated for user accessible parts
Green premium	EOL, REACH , PEP, RoHS complied
Communication	
RS-485 port	Modbus RTU: 2-Wires, 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
Isolation	2.5 kV RMS, double insulated
Protection features	User configurable password (selectable from 0000 to 9999) protected for set-up and clearing of energy, and other integrated data
Display language	English
Technical publication	Printed installation guide (QSG) supplied with meter in multi-language (EN, ES, FR, DE, PT, RU, TR, ZH) and user guide in soft format
Human machine interface	
Display type	LED display: 8 segment Alpha-numeric LED, ~ 14.2 mm (0.55 in) height, 3 rows with 4 digits per row, 1 column of 12 LEDs to indicate percentage of load connected in system. 4 digits for instantaneous parameters with auto scaling and auto range LCD display: Fast in-line view, three parameters name and value at one glance. 3+1 digits for instantaneous parameters and 5+3 digits for energy parameters with auto scale and auto range scaling and auto range
Keypad	4 buttons for navigation at the front, combination of 2 buttons for performing set-up, lock/unlock pages and viewing diagnostic pages
CAL LED (pulse LED)	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)

Feature set summary

Parameter/ Meter reference	PM1125H	PM1225H
Display type	LED	LCD
Sampling rate per cycle	32	32
Amps: average and per-phase, calculated neutral current	■	■
Voltage: V L-N, V L-L, average, per-phase	■	■
Power factor: average and per-phase	■	■
Frequency: any available phase	■	■
Power (W, VA, VAR) - Total and per-phase	■	■
Energy (Wh, VARh, VAh) - Delivered & Received or Forward & Reverse or Import &	■	■
Demand parameters – selectable for W, VA, VAR (one at a time)	■	■
Old registers – retrieval of last cleared values of energy and Run Hrs	■	■
Revolutions per minute (RPM)	■	■
Phase angle : Amp Deg (V to Amps, per-phase)	■	■
% Unbalance: Max unbalance Volts & Amps among 3 phase (s)	■	■
Life time counter - meter ON Hrs, Load Run Hrs and number of power interruptions	■	■
Communication: 2 wire, RS-485, Modbus RTU protocol	■	■
Commercial reference numbers		
Commercial reference for Class 1.0 & 0.5, Universal AC/DC control power	METSEPM1125HCL10RS METSEPM1125HCL05RD	METSEPM1225HCL1 METSEPM1225HCL5
Commercial reference for Class 1.0 & 0.5, LVDC (9-36 V) option	METSEPM1125HCL1LVD METSEPM1125HCL5LVD	METSEPM1225HCL1LVD METSEPM1225HCL5LVD

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PM1000H meter mounting

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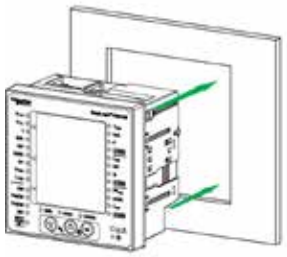

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See the appropriate **Installation Guide** for correct installation instructions.

PM1000H meter mechanical dimensions

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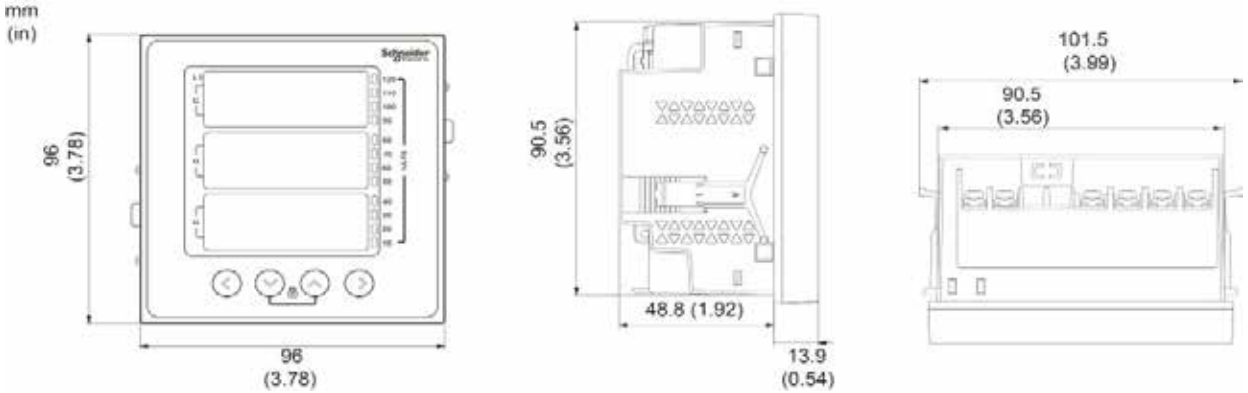

PM1000H LED/LCD meter displays overview

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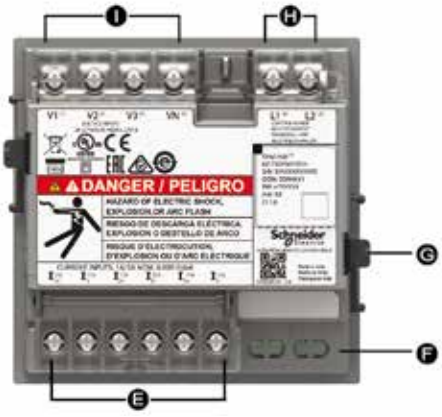

A Menu selection buttons

- Left key: To navigate left
- Down key: To navigate down
- Up key: To navigate up
- Right/OK key: To navigate right/ Enter key

B LED indicators

C Alphanumeric LED/LCD display

D Analog load bar

E Current inputs

F RS-485

G Retainer clip

H Control power

I Voltage inputs

J Line indicators

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

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