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.
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 system

- **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
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current</td>
<td>Average line current of 3-phase, per-phase, and calculated neutral current</td>
</tr>
<tr>
<td>Voltage</td>
<td>Average voltage of L-L, L-N parameters, per-phase</td>
</tr>
<tr>
<td>Frequency</td>
<td>Any available line</td>
</tr>
<tr>
<td>Real (active), reactive, and apparent power</td>
<td>Total and per-phase signed</td>
</tr>
<tr>
<td>True power factor</td>
<td>Average and per-phase signed</td>
</tr>
<tr>
<td>% Unbalance</td>
<td>Maximum % unbalance among phases for Volts &amp; Amps</td>
</tr>
<tr>
<td>Revolution per minute (RPM)</td>
<td>RPM of alternator or generator when number of poles set for 2, 4, 6, 8, 12, 14 or 16 (any one pole)</td>
</tr>
</tbody>
</table>

## 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, 6 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
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of measurement</td>
<td>True RMS, 4 quadrant power and energy, 32 samples/ cycle</td>
</tr>
<tr>
<td>Measurement accuracy</td>
<td>± 0.5 % of reading</td>
</tr>
<tr>
<td>Voltage, L-N, L-L, per-phase &amp; average</td>
<td>± 0.5 % of reading</td>
</tr>
<tr>
<td>Power (active and apparent)</td>
<td>± 1.0 % for Class 1.0, ± 0.5% for Class 0.5</td>
</tr>
<tr>
<td>Power (reactive)</td>
<td>± 2.0 % for Class 1.0 &amp; Class 0.5</td>
</tr>
<tr>
<td>Power factor, per-phase &amp; average</td>
<td>± 0.01 of reading</td>
</tr>
<tr>
<td>Frequency</td>
<td>± 0.05 % for F-nominal 50/ 60 Hz ± 2</td>
</tr>
<tr>
<td></td>
<td>± 0.2 % for Frequency range from 30 to 48 Hz, 52 to 58 Hz and 62 to 70 Hz</td>
</tr>
<tr>
<td>Active or real energy</td>
<td>Class 1.0 (± 1.0 %) Class 0.5 (± 0.5%)</td>
</tr>
<tr>
<td>Apparent energy</td>
<td>± 1.0 % &amp; ± 0.5 %</td>
</tr>
<tr>
<td>Reactive energy</td>
<td>Class 2.0 (± 2.0 %)</td>
</tr>
<tr>
<td>THD %</td>
<td>± 5 % of reading</td>
</tr>
</tbody>
</table>

## Input-voltage
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>VT (PT) connection</td>
<td>Selectable from No VT (direct), 1 VT, 2 VT to 3 VT</td>
</tr>
<tr>
<td>VT (PT) primary</td>
<td>100 V L-L to 999 kV L-L max</td>
</tr>
<tr>
<td>U (V) nominal (secondary)</td>
<td>Up to 277 V L-N/ 480 V L-L (selectable VT secondary from 100, 110, 115, 120 to 415 V L-L)</td>
</tr>
<tr>
<td>Operating voltage range with accuracy</td>
<td>80-480 V L-L ± 10 % Category III</td>
</tr>
<tr>
<td>Measured Voltage with full range</td>
<td>35 to 600 V L-L</td>
</tr>
<tr>
<td>Permanent overload (withstand)</td>
<td>750 V L-L, continuous</td>
</tr>
<tr>
<td>Impedance</td>
<td>≥5 MO</td>
</tr>
<tr>
<td>Frequency range</td>
<td>50/ 60 Hz ± 2</td>
</tr>
<tr>
<td>VA burden</td>
<td>≤0.2 VA at 240 V L-N at 50 Hz</td>
</tr>
<tr>
<td>Frequency - measurement</td>
<td>±0.2 % accuracy</td>
</tr>
<tr>
<td>Nominal operating range</td>
<td>50/60 Hz ± 2 (± 0.05 % accuracy)</td>
</tr>
<tr>
<td>Extended operating range</td>
<td>30 to 48 Hz, 52 to 58 Hz and 62 to 70 Hz (± 0.2 % accuracy)</td>
</tr>
<tr>
<td>Voltage input</td>
<td>80 to 480 V L-L ± 10 %</td>
</tr>
</tbody>
</table>
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
- **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, Comer Grounded
  - 3ph, 3 w, Wye, Ungrounded
  - 3ph, 3 w, Wye, Grounded
  - 3ph, 3 w, Wye, Resistance Grounded
  - 3ph, 4 w, Delta, Center-Tapped
  - 3ph, 4 w, Delta, Center-Tapped
  - 3ph, 4 w, Wye, Ungrounded
  - 3ph, 4 w, Wye, Grounded
  - 3ph, 4 w, Wye, Resistance Grounded

**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)
- **Mounting position**: vertical
- **Panel thickness**: 5 mm (0.196 in) maximum

**Environmental Characteristics**

- **Operating temperature**: -10 to +60º C (14 to140º F)
- **Storage temperature**: -20 to +70º C (-4 to 158º F)
- **Humidity rating**: 5 % to 95 % RH non-condensing
- **Pollution degree**: 2
- **Altitude**: ≤2000 metres (6562 ft), Category III
- **Product life**: >7 years
- **Insulation category**: Double insulation for user accessible parts

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**Additional error of ± 2 % between 10 mA to 50 mA, ± 1% between 50 mA to 100 mA)**

**Through communication**
## 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
- 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 9999900 pulses/ k_h (kWh, kVAh, or kVARh)
- Comm. activity: Green LED (for indicating RS-485 interface or heart beat pulse)

### Feature set summary

<table>
<thead>
<tr>
<th>Parameter/ Meter reference</th>
<th>PM1125H</th>
<th>PM1225H</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display type</td>
<td>LED</td>
<td>LCD</td>
</tr>
<tr>
<td>Sampling rate per cycle</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>Amps: average and per-phase, calculated neutral current</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage: V L-N, V L-L, average, per-phase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power factor: average and per-phase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency: any available phase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power (W, VA, VAR) - Total and per-phase</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy (Wh, VArh, Wh): Delivered &amp; Received or Forward &amp; Reverse or Import &amp; Export</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demand parameters – selectable for W, VA, VAR (one at a time)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Old registers – retrieval of last cleared values of energy and Run Hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revolutions per minute (RPM)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phase angle: Amp Deg (V to Amps, per-phase)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Unbalance: Max unbalance Volts &amp; Amps among 3 phase (s)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life time counter: meter ON Hrs, Load Run Hrs and number of power interruptions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication: 2 wire, RS-485, Modbus RTU protocol</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Commercial reference numbers

- Commercial reference for Class 1.0 & 0.5, Universal AC/DC control power:
  - METSEPM1125HCL1
  - METSEPM1125HCL1RS
  - METSEPM1125HCL5
  - METSEPM1125HCL5RS

- Commercial reference for Class 1.0 & 0.5, LVDC (9-36 V) option:
  - METSEPM1125HCL1LVD
  - METSEPM1125HCL5LVD
  - METSEPM1125HCL5LVD
  - METSEPM1125HCL1LVD
  - METSEPM1125HCL5LVD
  - METSEPM1125HCL5LVD
PM1000H

PM1000H meter mounting

See the appropriate Installation Guide for correct installation instructions.

PM1000H meter mechanical dimensions

PM1000H LED/LCD meter displays overview

See the appropriate Installation Guide for correct installation instructions.
As standards, specifications and designs develop from time to time, please ask for confirmation of the information given in this document.

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Photos: Schneider Electric

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