

## IEC Poly Phase Meter

A new standard for  
Smart Energy Meters



Designed for residential and small commercial energy consumers, the IEC Poly Phase Meter sets a new standard for revenue-grade smart energy meters.



Safe, accurate, and reliable, the meter incorporates a full suite of operating features with an integrated, software-controlled disconnect switch, a comprehensive information display, and robust, bidirectional power line signaling technology. Each meter, which is automatically managed by an NES<sup>1</sup> Data Concentrator, can also act as a repeater to reach other meters. This lets it create a power line-based meshed network of meters that exactly matches the real topology of a utility's low-voltage distribution network.

### Features

#### Integrated Disconnect / Reconnect Switch

- Integrated 100A switch can be locally or remotely controlled.
- Supports customer move-in/move-out management, load limiting, and pre-paid metering.

#### Load Profile

- Up to 16 channels of remotely configurable load profile data can be captured at programmable intervals ranging from 5 minutes to once a day.
- Load profile storage capacity is a function of the number of channels and the log interval. For example, 3-channel, 15-minute data can be retained for 3 months, and 3-channel, 1-hour data can be retained for 12 months, when using the recommended memory configuration.
- Meters support viewing load profile data on the meter display

#### Demand Metering

- Optional demand metering allows billing based on maximum demand.
- Includes support for block or rolling demand calculations, configurable demand intervals and logging 2 coincident parameters.
- Supports local or remote demand reset.

#### Multipurpose Expansion Port (MEP)

- Optional MEP lets partners attach secure hardware extensions to the meter for communication with devices like in-home displays, or gas and water meters.
- Powered MEP option can provide up to 1 Watt of power to external devices.
- Lets utilities expand meter capabilities when needed.

#### Time-of-use Metering

- Remotely configurable time-of-use metering leading to peak load reduction supports 4 tariff tiers with up to 10 tier switches per day.
- Rich calendar functionality with day schedules for each season, adjustable time zones, and support for daylight savings time.
- Support for changing the calendar through a pending time-of-use calendar.

#### Power Quality Analysis

- Long and short outage detection with configurable time threshold.
- Voltage sag and swell detection with configurable voltage and duration thresholds.
- THD event detection with analysis up to 10th harmonic to reveal unusual conditions.

#### Advanced Power Line Communication

- Includes standards-based, power line communications technology — the world's most widely deployed signalling technology.
- Includes an automatic repeating function.
- Communicates with an NES Data Concentrator

#### Tamper Detection

- Cover tamper is detected, logged, and communicated.
- Measurement technology is resistant to tamper attempts with DC magnetic fields. However, magnetic tamper can be optionally detected.
- When used together, alarms, measurements, and tamper events can detect most fraud and tamper attempts.

#### Prepay Metering

- Energy credit-based prepay functionality including varying deductions per time-of-use scheduling, configurable emergency credit, and audible low credit alarm.

#### Micro-generation Support

- Measures forward, reverse, and net active energy.
- Measures kvarh import and export.

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- Measures 4-quadrant kvarh when demand metering is included.

### Other Standard Features

- MID Class B active power, Class 2 reactive power.
- -40 °C to +70 °C operating temperature range.
- One-, two-, and three-phase operation
- Event log with circular buffer to store 200 events when using the recommended memory configuration
- Capacity to perform self-reads (automatic periodic readings of measurement data). The meter can store up to 36 self-read records when using the recommended memory configuration.
- Large-character, auto-scrolling, eight-digit LCD display.
- Two pulse output LEDs to represent active and reactive energy.
- Optical port for use with NES Provisioning Tool.
- Ability to have memory configurations with additional storage for load profiling, the event log, and meter self-reads.

## Specifications

### Certificates

IEC 62052-11 [2003]; IEC 62053-21 [2003]; IEC 62053-23 [2003]; IEC 62052-21 [2004]; IEC 62054-21 [2004]; IEC 61010-1 [2001]; EN 50065-1 [2001]; EN 50470-3 [2006]. Complies with: DIN 43857; DIN 43864; ANSI C12.18 [2006] (communications protocol); ANSI C12.19 [1997] (data structure); IEC 62053-31 (class A for S0 pulse output); IEC 62056-21 [2002] (physical and electrical requirements only); DIN EN 13757-2 [2002]; DIN EN 13757-3 [2002].

### Accuracy

For 5A basic current and up to 100A maximum current.

- Active: Class 1 certified to IEC 62053-21, Class B certified to EN 50470-3 (MID).
- Reactive: Class 2 certified to IEC 62053-23.

### Temperature, Specified Operating Range

-40° to +70° C (3K7), display fully operational from -25° to +60° C

### Temperature, Limited Operating Range

-40° to +70° C (3K7)

### Temperature, Limited Range for Storage and Transport

-40° to +70° C (3K7)

### Humidity

<=95% RH, non-condensing

### Timing

Real-time clock accurate per IEC 62052-21 / 62054-21 to +/- 0.5 seconds per day.

### Nominal Voltage

220V to 240V phase-to-neutral, 380V to 415V phase-to-phase, range is -20% to +15%.

### Frequency

50 Hz +/- 5%

### Service Types

- 3-phases, 4-wire Wye/Star.
- Meter can also operate with 2 phases of a 3-phase, 4-wire Wye/Star service or with a 1-phase, 2-wire service.

### Connection Type

Direct connection of line and load conductors.

### Current

Basic 5A; maximum 100A (amperage depends on local regulatory requirements)

### Units Measured

kW forward, reverse; kWh forward + reverse, forward - reverse, kvar import, export; kvarh import, export; RMS voltage; RMS current; power factor; frequency; rolling and block demand for energy sources and per quadrant kvarh (optional).

### Time of Use

4 tariffs with 10 possible tier switches per day; 4 seasons per perpetual calendar (set by day/month); perpetual holiday calendar for up to 15 holidays per year; perpetual daylight savings change-over; 2 separate holiday day schedules per season; 1 weekday, 1 Saturday, 1 Sunday day schedule per season.

### Data Logging Intervals

User-selectable at 5, 10, 15, 20, 30, 60 minutes, or 1 day.

### Load Disconnect Switch

With remote disconnect and enable.

|   |   |
|---|---|
| Mechanical life at maximum power, PF =1                   | 5.000 cycles                              |
| Maximum switching current                                 | 100 A                                     |
| Maximum overload current                                  | 120A<br>150A (30 min.)                    |
| Maximum switching voltage                                 | 277 VAC                                   |
| Short circuit < 3mS                                       | 3.000 A                                   |
| Maximum switching power                                   | 27kVA                                     |
| Insulation strength contact to contact<br>coil to contact | 4 kV at 50Hz,<br>1 minute<br>2 kV<br>4 kV |
| Impulse voltage   | 1.2 / 50µS,<br>IEC 62052-11               |
| Contact to contact<br>Coil to contact                     | > 4 kV<br>> 12 kV                         |

### Power Consumption

Voltage circuit < 2 W  
Apparent power < 5 VA  
Current circuit at Imax:  
< 5.0VA @ 80A,  
< 6.0VA @ 100A

### Starting Current

20 mA

### Power Quality Analysis

Sag; swell; number of over-current occurrences; number of short power outages; number of long power outages; max. and min. frequency; phase loss; total harmonic distortion.

### Optical Port

IEC 62056-21 [2002] (physical and electrical requirements); ANSI C12.18 [2006] (communications protocol).

### Verification Output

2 pulse-output LEDs representing kWh and kvarh; signaling at 1,000 impulses per kWh or kvarh.

### Control Relay (optional)

Single-pole voltage-free latching relay; maximum load rating is 250V, 5A; fully isolated.

### Pulse Output, S0 (optional)

1 reference and 1 signal terminal per IEC 62053-31 / DIN 43864.

### Puls Count and Tamper (optional)

2 pulse input channels. Counting and recording pulses from devices with voltage-free pulse transmitters; 25-millisecond minimum pulse width; pulse input circuits are not designed to power intelligent external devices; operates with most passive and opto-coupler/transistor interfaces.

### M-Bus (optional)

Up to 4 devices; isolated; short-circuit protection; encryption supported; DIN EN 13757-2 and DIN EN 13757-3 compliant.

### Multipurpose Expansion Port (optional)

Isolated powered or unpowered MEP port for adding secure hardware extensions to meter for communication with other devices like in-home displays or gas/water meters.

### Power Wiring Terminals

3 line, 3 load, 2 neutral; maximum wire size: 35mm sq. (used cables may not fit) terminal inside diameter: 9mm.

### Control Wiring Terminals

Maximum wire size: 8mm sq. Terminal inside diameter: 3mm.

### Data Communications

CENELEC A-band power line communication channel.

### Data Security

Password protection for optical communication; authenticated, password-protected transactions and encryption for power line communication.

### Data Storage

Non-volatile memory.

### Enclosure

Outdoor (IP54), insulating encased meter of protective class 2.

### Mounting

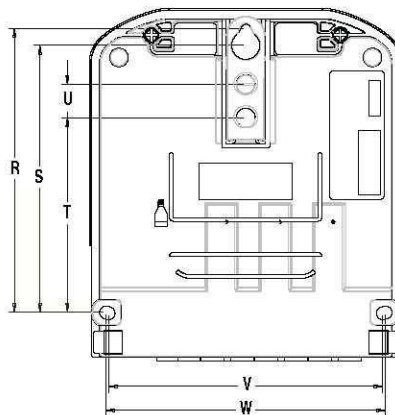
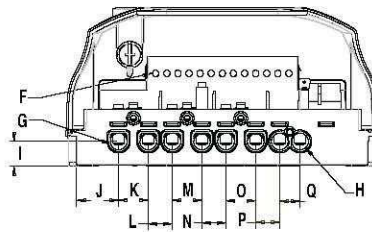
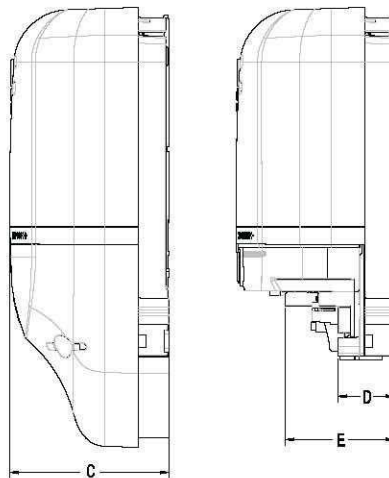
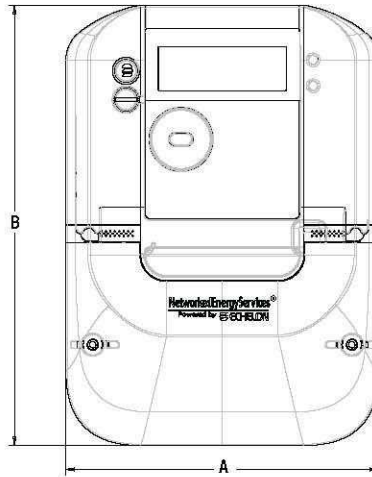
DIN 43857

### Safety Ratings

IEC 61010-1 [2001]; CE marked.

### Options

Control relay; magnetic tamper; pulse inputs; SO output; M-Bus; powered or un-powered MEP; demand metering. (Contact factory for valid option combinations.)

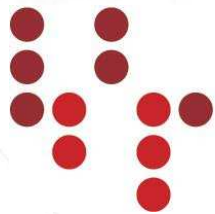


Dimensions IEC PP

|   | mm     | inches |
|---|--------|--------|
| A | 168.95 | 6.65   |
| B | 237.95 | 9.37   |
| C | 85.87  | 3.38   |
| D | 31.00  | 1.22   |
| E | 59.25  | 2.33   |
| F | 3.00   | 0.12   |
| G | 9.00   | 0.35   |
| H | 9.00   | 0.35   |
| I | 13.50  | 0.53   |
| J | 22.73  | 0.89   |
| K | 16.00  | 0.63   |
| L | 13.00  | 0.51   |
| M | 16.00  | 0.63   |
| N | 13.00  | 0.51   |
| O | 16.00  | 0.63   |
| P | 13.00  | 0.51   |
| Q | 11.00  | 0.43   |
| R | 153.35 | 6.04   |
| S | 144.35 | 5.68   |
| T | 105.35 | 4.15   |
| U | 18.00  | 0.71   |
| V | 148.10 | 5.83   |
| W | 150.95 | 5.94   |

### Ordering Information

Product: IEC Poly Phase Meter  
Model Number: 83332-31XXX



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