

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 Echelon's robust, bidirectional power line signaling technology. Each meter, which is automatically managed by an NES 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, single-channel, 1-hour data can be retained for 180 days.

Advanced Power Line Communication

- Every NES smart meter includes Echelon's proven, standards-based, power line communications technology — the world's most widely deployed signaling technology.
- Every meter includes an automatic repeating function.
- Communicates with an NES Data Concentrator.

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.

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.

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.

Prepay Metering

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

Tamper Detection

- Cover tamper is detected, logged, and communicated. Cover tamper operates even during a power failure.
- Measurement technology is immune to magnetic tampering. However, magnetic tamper can be optionally detected.
- When used together, alarms, measurements, and tamper events can detect most fraud and tamper attempts.

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.

Micro-generation Support

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

SPECIFICATIONS

Certifications

Certified to: 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 SO 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, Limit 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-phase, 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).

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 150A (30 min.)
Maximum switching voltage	277 V AC
Short circuit < 3mS	3,000 A
Maximum switching power	27kVA
Insulation strength	4 kV at 50Hz, 1 minute
contact to contact coil to contact	2 kV 4 kV
Impulse voltage	1.2 / 50µS to IEC 62052-11
contact to contact coil to contact	> 4 kV > 12 kV

Power Consumption

Voltage circuit: < 2W; apparent power < 5VA;

Current circuit at I_{max}: < 6.0VA @100A, < 5.0VA @ 80A

Starting Current

20 mA

Units Measured

kW forward, reverse; kWh forward, reverse, 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).

Power Quality Analysis

Sag; swell; number of over-current occurrences; number of short power outages; number of long power outages; duration and time of the last 10 long power outages; maximum and minimum frequency; phase loss; total harmonic distortion.

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 changeover; 2 separate holiday day schedules per season; 1 weekday, 1 Saturday, and 1 Sunday day schedule per season.

Data Logging Intervals

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

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, SO (optional)

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

Pulse 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.

Control Wiring Terminals

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

Data Communications

CENELEC A-band power line communication channel.

Power Wiring Terminals

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

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

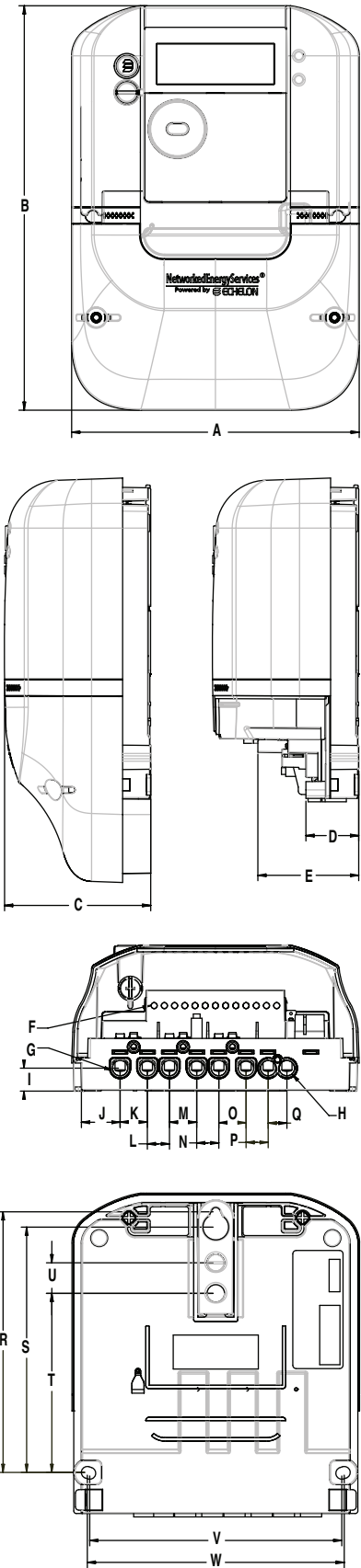
IEC 61010-1 [2001]; CE marked.

Options

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

Specifications subject to change without notice.

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
83331-3IXXX

