

IEC POLY PHASE METER

HYDROMETER

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APPLICATION

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
- ▶ Load Profile
- ▶ Advanced Power Line Communication
- ▶ Power Quality Analysis
- ▶ Time-of-use Metering
- ▶ Demand Metering
- ▶ Prepay Metering
- ▶ Tamper Detection
- ▶ Multipurpose Expansion Port (MEP)
- ▶ Micro-generation Support

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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.

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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 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, 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: 2 kV

coil to contact: 4 kV

- **Impulse voltage:** 1.2 / 50µS to IEC 62052-11

contact to contact: > 4 kV

coil to contact: > 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

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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.

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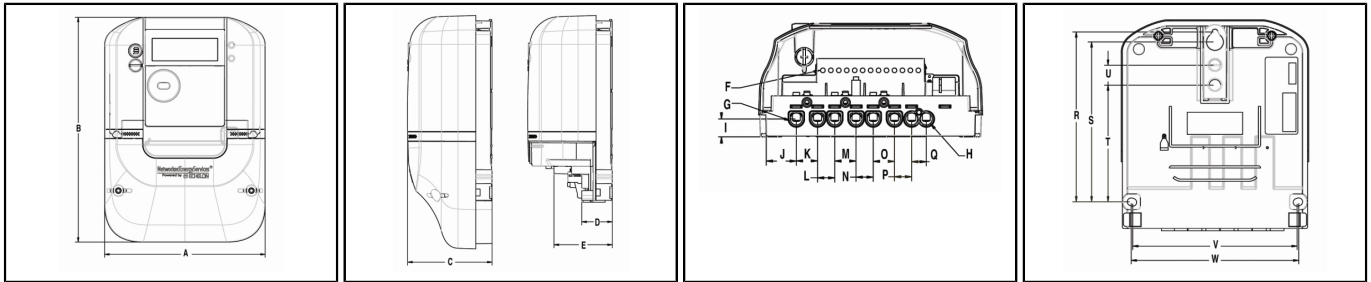
SPECIFICATIONS

OPTIONS

Control relay; magnetic tamper; pulse inputs; S0 output; M-Bus; powered or un-powered MEP; demand metering. (Contact factory for valid option combinations.)

Specifications subject to change without notice.

DIMENSIONS



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