# Neuron kWh Energy Meter

Neuron kWh Energy Meter enables you to monitor and track the energy consumption of your assets. The sensor measures AC currents accumulated as ampere-hour and comes in several ranges from 10A to 500A RMS. With the highly customizable Neuron App, this sensor can calculate consumed kilowatt-hour (kWh) on all variations of power grid voltages.
Integrated battery ensures up to 10 years of battery life. All measurements are easily accessible from web,app or API.

## Features

- Integrated long life battery - up to 10 years lifetime
- Continuous measurement and instant alarm
- Adjustment of parameters such as measurement frequency on request
- Define your own alarm levels in the Neuron app
- Receive alerts as push notifications, emails or SMS
- Easily connect the sensor to the system with the QR-code on the sensor. Ensures immediate and accurate registration in the app on your phone/PC/tablet
- The sensor transmits data to your nearby Neuron Gateway which then again communicates with the Neuron Cloud

## Essentials

| Measuring Range | 10A | 20A | 50A | 100A | 150A | 250A | 500A |
|---|---|---|---|---|---|---|---|
| Measuring Frequency | Every 10 sec | | | | | | |
| Report Frequency | Every 2 min, or immediately after measurement if trigger for critical data transmission is reached | | | | | | |
| Expected Operating Time* | Up to 10 years | | | | | | |

*Depends on ambient temperature

## Typical Applications

- Energy monitoring
- HVAC & heating
- Refrigeration
- Industrial motors
- Fans
- Lighting

## Neuron System Benefits

Sensor - Gateway - Cloud - App

- **Robust sensors**
  Suitable for rough environments

- **Wireless**
  Wireless sensor with integrated battery

- **Long lifetime**
  Typical 10 years battery life

- **Quick installation**
  Wireless, installed and operational in minutes

- **Collect and deliver data**
  Data delivery through API and app

- **Broad offering**
  More than 50 different sensor types available

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# General Description

The Neuron kWh Energy Meter comes with a split-core current transducer allowing for easy installation around existing wire without the need to disconnect the electrical system. This makes it an ideal choice for retrofitting or upgrading existing systems.

The sensor is typically used for industrial and commercial applications, such as energy monitoring.

Neuron kWh Energy Meter provides accurate and reliable measurement of ampere-hour and can be used for various tasks like monitoring energy consumption, detecting load changes and identifying potential problems in the electrical system. The measured ampere-hour can be highly customized in the Neuron App to calculate consumed kilowatt-hours depending on your power grid voltage.

# Principle of Operation

The current transducer has a magnetic core that surrounds the conductor carrying the current to be measured. When the current flows through the conductor, it generates a magnetic field around it. This magnetic field induces a current in a coil that is wrapped around the core. The induced current is proportional to the current flowing through the conductor, and it can be used to determine the current value.

The output signal of the transducer is the induced current, which is used to drive the input of the Neuron wireless transmitter. The custom Neuron hardware digitizes this 0-10V output signal and transmits it through a nearby Neuron Gateway to the Neuron Cloud.

Every 10 second the sensor measures the current and calculate the accumulated ampere-hour consumption, which is reported every 2 minutes to the Neuron Cloud. This value can be configured to calculate kilowatt-hour depending on the power grid voltage.

The symbol ⚠ on the product label refers to this data sheet for important information regarding intended use, requirements for the operating environment etc. If the equipment is used in a manner not specified by El-Watch, the protection provided by the equipment may be impaired.

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# Technical Specification
## Operational Specification

| Measuring Range*** | 10A | 20A | 50A | 100A | 150A | 250A | 500A |
|---|---|---|---|---|---|---|---|
| Resolution | 0.1kWh | | | | | | |
| Accuracy | 2% of Full Scale | | | | | | |
| Measuring Frequency | Every 10 sec | | | | | | |
| Report Frequency* | Reports every 2 min. | | | | | | |
| Operating Environment | Ambient temperature: -20 - 50 °C Relative humidity: 0-85% (non condensing) Altitude < 2000m above sea level Pollution degree: 2 | | | | | | |
| IP Grade | IP 40, indoor use | | | | | | |
| Cleaning | Wipe clean with a damp cloth | | | | | | |
| Radio Frequency | 863-870 MHz / 902-928 MHz | | | | | | |
| Battery Type | Li-SOCI2, 3.6V | | | | | | |
| Expected Operating Time** | Up to 10 years | | | | | | |

\*    Adjustable on request
\*\*   Depends on ambient temperature
\*\*\*  Current outside the measuring range may permanently damage the device

## Physical Specification

| Materials | POLYblend 65 FS / TPU, Nylon | | | | | | |
|---|---|---|---|---|---|---|---|
| **Dimensions** | **10A** | **20A** | **50A** | **100A** | **150A** | **250A** | **500A** |
| Width (mm) | 34 | 34 | 34 | 34 | 34 | 49 | 61 |
| Depth (mm) | 49 | 49 | 49 | 49 | 58 | 52 | 58 |
| Length (mm) | 58 | 58 | 58 | 58 | 64 | 77 | 94 |
| Diameter (mm) | 16 | 16 | 16 | 16 | 17 | 24 | 36 |

## Ordering Information

| | Europe/The Middle East/Africa Part number | North America/Australia/New Zealand Part number |
|---|---|---|
| 0 – 10A | 422715 | 422722 |
| 0 – 20A | 422716 | 422723 |
| 0 – 50A | 422717 | 422724 |
| 0 – 100A | 422718 | 422725 |
| 0 – 150A | 422719 | 422726 |
| 0 – 250A | 422720 | 422727 |
| 0 – 500A | 422721 | 422728 |

## Regulatory

| Certifications | Directives/Standard |
|---|---|
| CE UKCA | RED 2014/53/EU Radio Equipment Regulations 2017 |
| FCC Industry Canada | FCC Part 15C |
| Safety | IEC 61010-1:2010 |

# Installation

Neuron sensors are ready for use out of the box and will start logging data after registering the sensor in the app. Even though Neuron sensors deliver great range and long battery life, following some simple guidelines for mounting of the sensor and gateway can greatly improve signal coverage and lifetime of the sensor.

To ensure optimal antenna performance and signal strength, the sensor should be placed elevated with some distance to fixed objects. Keep in mind that RF-signals are greatly affected by close metallic surfaces.

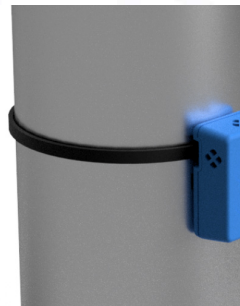For sensors with an external antenna, the antenna should be clear off the metallic surface.

You can find all you need to get started with Neuron Sensors at our support site:
support.el-watch.com »

For sensors operating in environments with greatly varying temperatures, care should be taken to avoid putting the sensor in unnecessary stress. Very high or low temperatures will affect the battery life and the signal strength of the sensor. While some sensors must be close to the source of heat or cold, other sensors have external probes which allow the sensor to be placed at a distance.

## Fastening

The small, compact blue Neuron sensors are fitted with fastening holes for use with cable ties. The sensors are also delivered with double-sided tape that may be used for fastening of the sensors.

All the black Neuron sensors, like the Neuron IR380 and Neuron Vibration, are fitted with a strong magnet at the back for easy fastening. If there is no magnetic surface, then double-sided tape is a good solution.

*Place elevated with distance to fixed objects*

*Keep antenna clear off the metallic surface*

*Sensors with IP21 Enclosure*
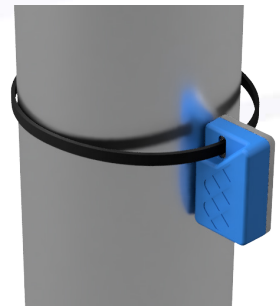
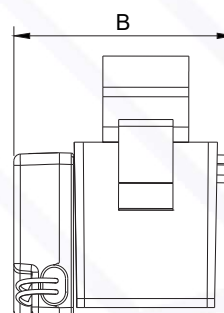*Sensors with IP67 Enclosure*

# Dimensions
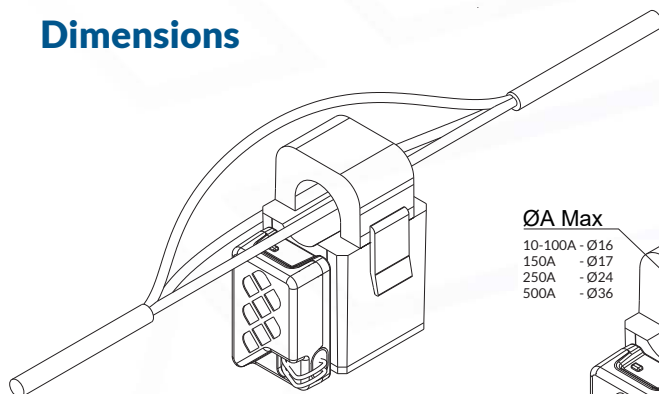
ØA Max
10-100A - Ø16
150A - Ø17
250A - Ø24
500A - Ø36
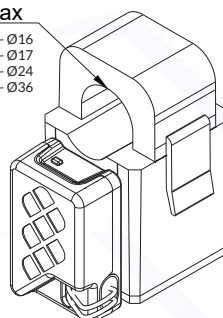
10-100A - 49 mm
150A - 58mm
250A - 52 mm
500A - 58 mm

B

10-100A - 58 mm
150A - 64mm
250A - 77 mm
500A - 94 mm

C

10-150A - 34 mm
250A - 49 mm
500A - 61mm

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