Smart Metering | Smart Building | Smart Energy

LoRaWAN™ TRIPHAS'O SENSOR

The TRIPHAS'O sensor allows remote reading of the electrical energy consumption of a three-phase installation in a non-intrusive way via the LoRaWAN network. In a single-phase installation, it is used for sub-metering. The sensor is specially designed to meet the energy management needs of industrial and tertiary buildings, operating with medium and high power and high energy consumption equipment.

APPLICATIONS

- Telemetry, energy management
- Real-time monitoring of power consumption at the three-phase meter
- Under metering on up to 3 single-phase circuits
- Any industrial application: Industry, shopping centres, data centres...

BENEFITS & FEATURES

- LoRaWAN™, Class C
  - ✓ Ease of implementation
  - ✓ 3U DIN rail
  - ✓ External RF antenna which can be remote
- Ascent:
  - ✓ Active, reactive power
  - ✓ Energy active, reactive,
  - ✓ Average or instantaneous power (analysis of change of consumption/maintenance regime).
  - ✓ RMS voltages and currents

The TRIPHAS'O sensor exists in two versions to meet the needs of electrical measurements :

- with current transformers (opening - non-intrusive) for low power: primary reference current: 0-60A or 0-400A.
- with Rogowski loops (opening - non-intrusive) for high power: primary reference current from 0 to 4000A

On a three-phase meter, the TRIPHAS'O sensor provides for each phase, the active and reactive energy indexes, the different powers available, the RMS voltages, the RMS currents and the current/voltage phase shift angles. It transmits the sum of the different energy indexes and different powers of the three phases L1, L2, L3.

On a single-phase installation, the TRIPHAS'O sensor provides the energy and power absorbed on each circuit (under metering).

The energy and power transfer is carried out at 10-minute intervals by default. The aim is to recreate the load curve. The interval can be reconfigured via the LoRaWAN downlink; it is possible to go down to 30s to have a transient analysis during maintenance periods for example.

The implementation of the sensor is quick and simple: the sensor is fixed on a DIN rail next to the electrical circuits. The external antenna can be mounted on a cable (not supplied) when the sensor is installed in a metal cabinet. A remote waterproof antenna kit is available as an option.

The sensor is powered from the mains 50Hz - 60Hz with 230 Volts between phase and neutral (or 400 Volts between two phases). The sensor is of class II construction.

The connections are made via spring-loaded terminal blocks.

NKE WATTECO, YOUR PARTNER IN SMART SENSORS & ACTUATORS

nke Watteco is a leading European designer and manufacturer of intelligent radio frequency sensors and actuators as well as multi-protocol remote reading and data collection solutions.

nke Watteco is a member of the LoRa® Alliance

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LoRaWAN™ TRIPHAS'O SENSOR

TECHNICAL INFORMATION

RADIO FREQUENCY	
Frequency	EU: 863-870 MHz
Transmitted power	+14 dBm
Sensitivity	-140 dBm
FIRMWARE	
Protocol - encryption	LoRaWAN™, Class C - AES128 encrypted data
Transmission	Frames at intervals of 10mn (default) up to 12h, remotely reconfigurable via the LoRaWAN network : • rms voltage, rms current, angle between voltage and current per phase • active energies, reactive energies, active powers, reactive powers, positive and negative powers in each case per phase • sum of the 3 phases Configurable alert on variation (voltage, current, angle, energy, power)
Activation method	Over-The-Air Activation (OTAA) & Activation by Personalization (ABP)
User interface	Push button and indicators for monitoring network pairing on the sensor front panel
VOLTAGE INPUT	
Power supply range	230VAC between L1 and Neutral or 400VAC between L1 and L2 (if no Neutral) -15% +10 Frequency 50 - 60Hz
Measures	Selection of circuit configuration by front panel button : • Three-phase: phases L1 to L3 with or without Neutral; phase inversion signalled by front panel indicator light. • or Single-phase: under metering of up to 3 circuits L1 to L3 referenced to Neutral Accuracy 1% - Resolution 0.1 Volt

CURRENT INPUT

Range (Amp)	**Associated sensor**	**Current measurements** (no calibration)
0 – 60	Remote opening toroid on cable 2m Conversion ratio 1/3000	For cable up to 10 mm Accuracy ± 0.9 Amp - Resolution 0.1 Amp
0 – 400	Remote opening toroid on cable 2m Conversion ratio 1/5000	For cable up to 24 mm Accuracy ± 4 Amp - Resolution 0.1 Amp
0 - 4000	Remote Rogowski loop on 1.5m cable Transformer ratio 22.5mV/kAmp	For cable max. 70 mm Accuracy ± 30 Amp - Resolution 0.1 Amp

MEASURMENT	
Voltage/current angle	Resolution 1°.
Active (reactive) energy resolution	1W.h (1 Var.h)
Active (reactive) power resolution	1 W (1 VAR)
Average power	Calculated on the interval 10mn (default) up to 60mn, remotely reconfigurable via the network.

BOX	
Dimension (mm)	IP20 waterproof 3 module housing - width 53.5mm
Fixation	Clips on 35mm DIN rail
ENVIRONMENT	
Operating temperature (°C)	-20°C to +55°C; to be installed in a protected area without humidity.
STANDARDS & REGULATIONS	
E55014-1, E55014-2, EN 61000-4-2, EN 61000-6-1, EN 61000-6-3, EN 300-220-1 V2-4-1, EN 301 489 V1-6-1, EN 60950-1 CE, RoHS	

PRODUCT REFERENCES

REFERENCE	DESCRIPTION
50-70-105	LoRaWAN™ TRIPHAS'O SENSOR + 3 TOROIDS 0 - 60A ON 2M CABLE
50-70-145	LoRaWAN™ TRIPHAS'O SENSOR + 3 CORES 0 - 400A ON 2M CABLES
50-70-146	LoRaWAN™ TRIPHAS'O SENSOR FOR ROGOWSKI LOOPS, DELIVERED WITHOUT LOOPS
50-70-147	LoRaWAN™ SET OF 3 LOOPS OF ROGOWSKI 4,000A ON 1.5M CABLES
26-43-035	WATERPROOF REMOTE ANTENNA KIT ON SUPPORT WITH 3 METERS CABLE

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