IN-PULSE
Induction pulse module

The IN-PULSE is a universal induction pulse module for remote reading of Apator Powogaz SA water meters by application of induction scanning of the counter pointer and relaying the metering data over two pulse outputs to external devices. The installation of the modules in the orientation required for each water meter type is done with or without a locating interface ring. Local configuration of the module on user request is facilitated without any restrictions over integrated NFC. The battery life can reach 12 years within the specified environmental limits.

Application

The IN-PULSE universal module is compatible with various water meter types from Apator Powogaz SA IP65-rated or IP68-rated, which feature induction pointers (Ti). The IP68 rating of the module and the induction reading technology make the module dedicated for IP68-rated water meters, enabling metering and data transmission in locations where difficult ambient conditions prevail (e.g. wet water meter vaults at risk of flooding with water). The wired communication of the induction pulse module provides versatile applications in remote reading of water meter indications for water and sewage utilities and industrial plant water distribution systems.

Key features

- Compatible with Apator Powogaz water meters designed for induction pulse modules
- Easy installation: requires no tampering with the verification marks of water meters
- No warehouse mode supported — the module is provided pre-programmed and pre-configured for immediate operation
- Possibility of installing the module while the water meter is in use
- Data configuration, reading and writing over NFC
- Easy and quick configuration with a dedicated mobile application
- Immune to external EM fields
- Detection, logging and indication of meter performance over an alarm output
- Battery life — 12 years
- Ingress protection IP68
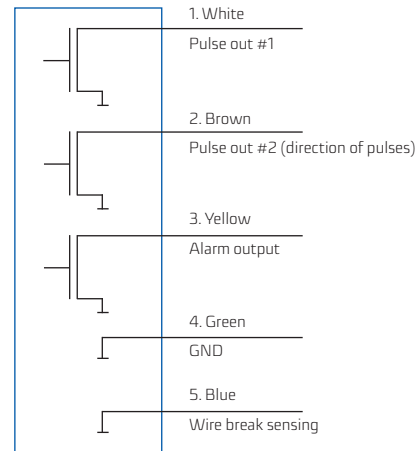
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Communication

Data configuration, reading and writing

The NFC interface enables:

- Setting the meter indication – forward flow, backflow, and balanced flow
- Setting the event detection (magnetic field proximity, device removal, and more)
- Setting the backflow event threshold:
    - reverse volume,
    - back flow.
- Date and time updates
- Setting the pulse weight, i.e. the count of water meter pointer full revolutions per single pulse output. Supported pulse weight options: 1; 2.5; 5; 10; 25; 100; 1000 r/pulse.
- Pulse output configuration
- Setting the auto calibration parameters
- Readings:
    - device identification data (FW version and SN),
    - nominal and consumed power (mAh),
    - current module counter indication,
    - active and historical event flags,
    - detailed event logger,
    - output configuration (pulse mode set; alarm output setting flags enabled; pulse weight),
    - configuration of events – the events enabled to be logged by the module and their time of automatic deletion (switching of their active status off).

Wiring connection diagram
Wire colour coding

1. White
Pulse out #1

2. Brown
Pulse out #2 (direction of pulses)

3. Yellow
Alarm output

4. Green
GND

5. Blue
Wire break sensing

Pulse output modes

The module can operate in one of 4 pulse generation options:

1. pulse per fixed revolution count – one output generates a forward flow pulse only per a fixed forward flow value; the other output generates a pulse per a fixed backflow value,
2. pulse per fixed balance volume – a pulse is generated per a fixed balance volume on both pulse outputs according to the mechanical counter reading,
3. pulse per fixed revolution count, irrespective of the direction of flow, on one pulse output with the identification of flow on the other pulse output,
4. pulse per fixed revolution count for forward flow; the other pulse output provides identification of the direction of flow (for backflow detection).

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Event – Types

The module records events according to internal algorithms. Whenever an event is detected, the module will flag it as active until the event ceases. The data of event type, time, and number of instances are stored in the module memory. The following events are indicated:

- backflow (per preset thresholds),
- low battery,
- magnetic field,
- device disconnected (the module detected is removed from the water meter),
- battery disconnected,
- maximum overtemperature (> 60°C),
- minimum undertemperature (< -15°C).

Alarms

An alarm is a special event an instance of which switches over the alarm output state (the yellow) from High to Low. The events listed below can be enabled in the configuration to switch over the alarm output.

Alarms – available events

- Magnetic field
- Device disconnected
- Back flow
- Low battery

Not unlike for regular events, the details of alarm event instance number and times are stored in the event logger.

Event logger – details

- Event code
- Number (quantity) of specific event instances
- Specific alarm type instance start (since the last time the alarm details were reset)
- Specific alarm type instance end (since the last time the alarm details were reset)
- Other alarm type-specific required parameters (e.g. for Device Disconnected: the attenuation detected on specific coils is included)

Regulatory and standard compliance

- PN-EN 60947-5-6, Specification for low-voltage switchgear and controlgear — Part 5-6: Control circuit devices and switching elements — DC interface for proximity sensors and switching amplifiers (NAMUR), included in Directive 2014/30/EU
- PN-EN 1434-2, Thermal energy meters — Part 2: Constructional requirements, included in Directive 2014/32/EU
- Classification of mechanical environment conditions: Class M1 (ref. Polish Regulation Dz.U. 18.12.2006)
- Classification of electromagnetic environment conditions: Class E2 (ref. Polish Regulation Dz.U. 02.06.2016)

Specifications

Parameter	IN-PULSE
Installation method	With or without a locating interface ring on Apator Powogaz SA water meters
Connection cable	5-wire, length: 3 m
Pulse outputs	2
Pulse width	65 ms
Contact make resistance	70 Ω max.
Short-circuit current	100 mA max.
Maximum voltage	30 V
Power supply	3.6 V A lithium battery
Battery life	12 years max.
Correct performance temperature limits	-15°C to 60°C
Ingress protection rating	IP68
Dimensions	130 x 73 x 42,7 mm
Weight	0,106 kg
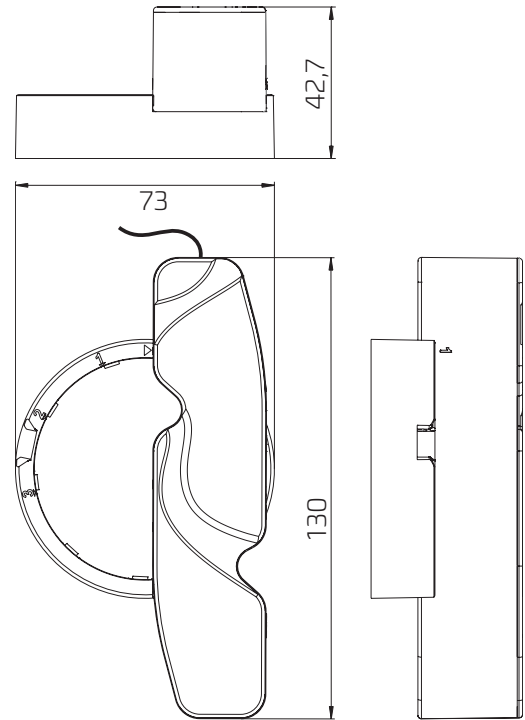
Module and accessories

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IP68-rated, for installation on the counter of water meters manufactured by Apator Powogaz, made in two IP protection levels:
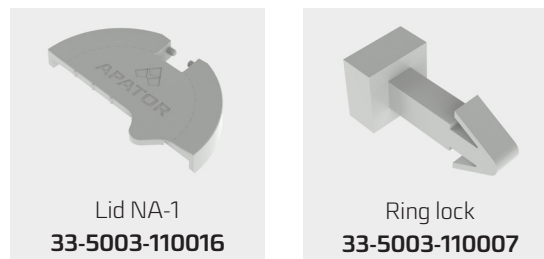
IP65	IP68
nr 30-3190-000000	nr 30-3190-00-002

Induction modules with numbers: 30-3190-000000 and 30-3190-00-002 in each set are equipped with the accessories listed below, which enable installation on an **IP65/IP68-rated water meter:**

IP65

Lid	Intermediate ring	Locking ring*
33-3160-000004	**33-3160-000001**	**33-3160-000007**

IP68

Lid NA-1	Ring lock
33-5003-110016	**33-5003-110007**
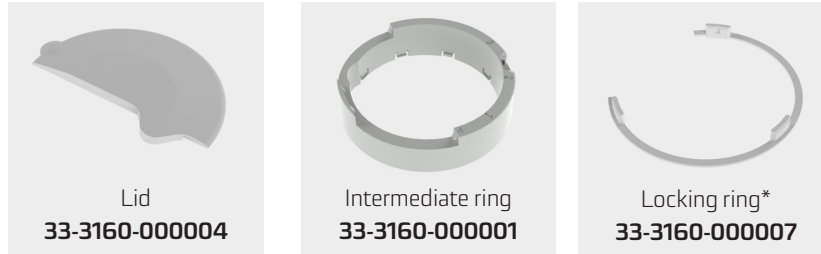
* The locking ring (33-3160-000007) is used in assembly for residential water metres (excluding JS Smart D+) and in home JS Master +/C+/D+.

Installation of the IN-PULSE module on Apator Powogaz water meters

Module w/o the interface ring, installed on IP68 home and industrial water meters.
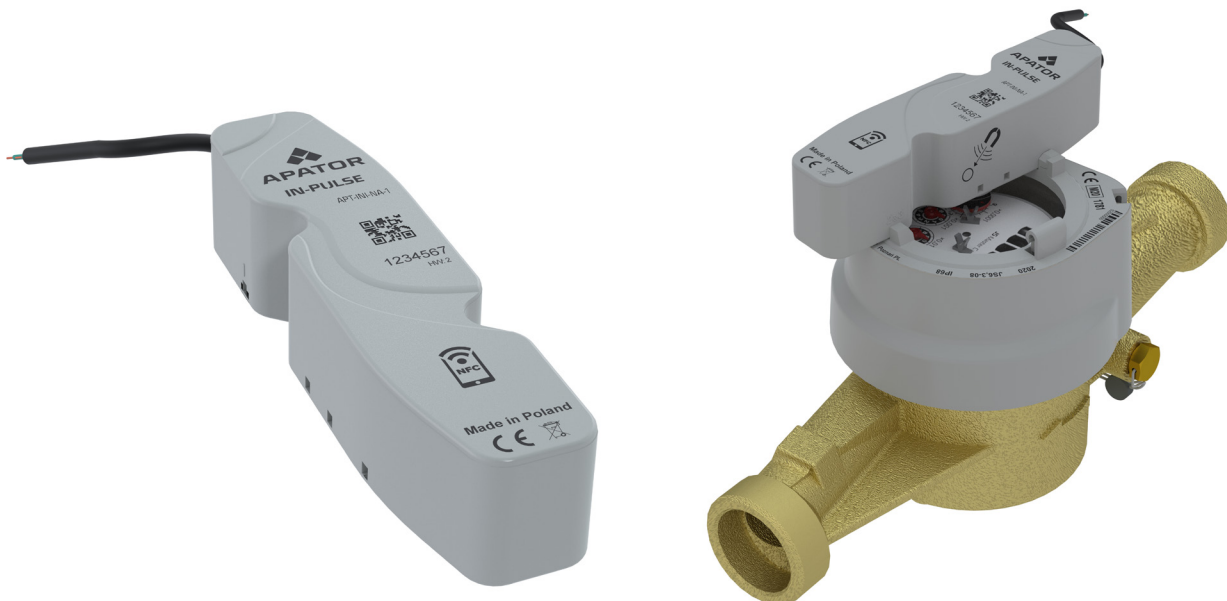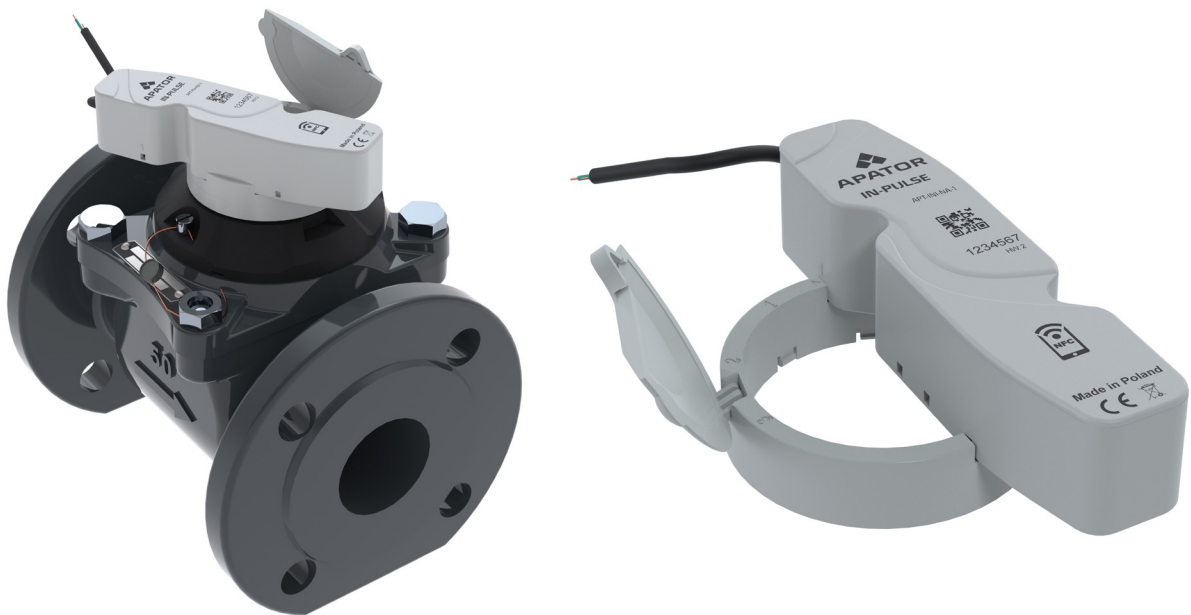
Securing the module to an IP68 counter cover with an installation seal.
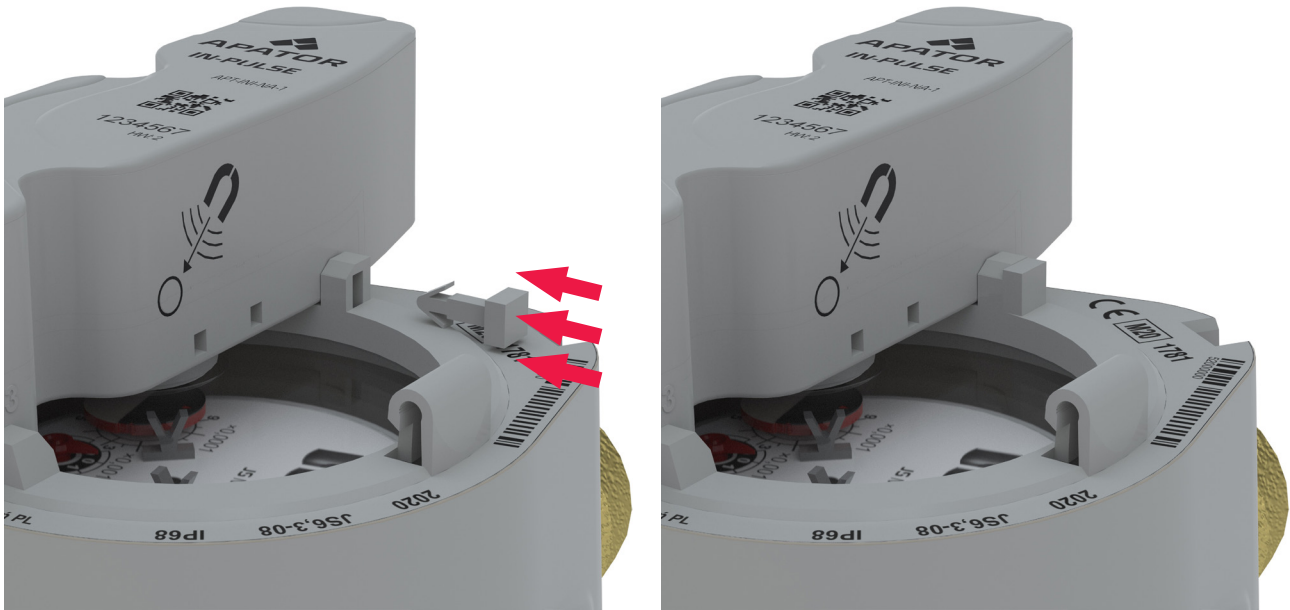
The installation seal is intended to provide a mechanical seal of the pulse module on the water meter. The seal secures against unauthorised removal of and tampering with the pulse module indications. The seal is fully weath- er-resistant.

Module with the interface ring, installed on IP65 home and industrial water meters.

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