AIUNEO | aiut brand

Operation manual

APULSE x3F6

Smart Gas Meter
Data Logger

Document version:
2025/02/03

www.aiuneo.com www.aiut.com
AIUT Sp. z o.o. ul. Wyczółkowskiego 113, 44-109 Gliwice, Poland
Tel.: (+48 32) 77 54 000 Fax: (+48 32) 77 54 001

APULSE x3F6
OPERATION MANUAL

CONTENTS

PRECAUTIONS

Please read the user manual and familiarize yourself with the benefits of our device. Failure to follow the instructions outlined in this document may result in the loss of warranty.

Before first use, check the device for any visible damage. Do not use the device if it is damaged. In case of any issues, contact customer support. Familiarize yourself with and follow this manual as well as any other documents provided with the device. Keep this documentation for future reference or for the use of a future owner.

SAFETY INSTRUCTIONS

The following safety information and warnings are intended to minimize the risk of injuries and material damage in your environment. Nevertheless, it is important to take preventive measures and exercise appropriate caution during the installation, maintenance, cleaning, and use of the device.

- Keep the device away from fire, extreme temperatures, and chemicals.
- Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the device.
- Never rub the enclosure surface of APULSE x3F6 using a dry cloth because of the danger of electrostatic discharge
- Please exercise special caution during the battery replacement process to avoid short-circuiting and always follow the instructions provided in this document.
- The product must be used in accordance with the manufacturer's instructions and with the tools recommended by the manufacturer.
- When replacement parts are required, make sure that only replacement parts specified by the manufacturer are used.
- Every item removed from the multipack must be properly secured (e.g. with bubble wrap) for further transport
- Scraping, rubbing, or dropping the device may result in its damage.
- Any abnormal functioning of the device should be reported to the manufacturer.

ENVIRONMENT

- Do not throw away the device with the normal household waste at the end of its life, but hand it in at an official collection point for recycling. By doing this you help to preserve the environment (Fig. 1).
- Always remove the battery before you discard or hand in the device at an official collection point. Dispose of the battery at an official collection point for batteries (Fig.2).


Fig. 1


Fig. 2

CERTIFICATES

The product meets the essential requirements of the following EU directives:

- ATEX (directive 2014/34/EU)
- RED (directive 2014/53/UE)
- RoHS (directives 2011/65/UE and 2015/863)

The product was designed and is manufactured by a company holding the following certifications

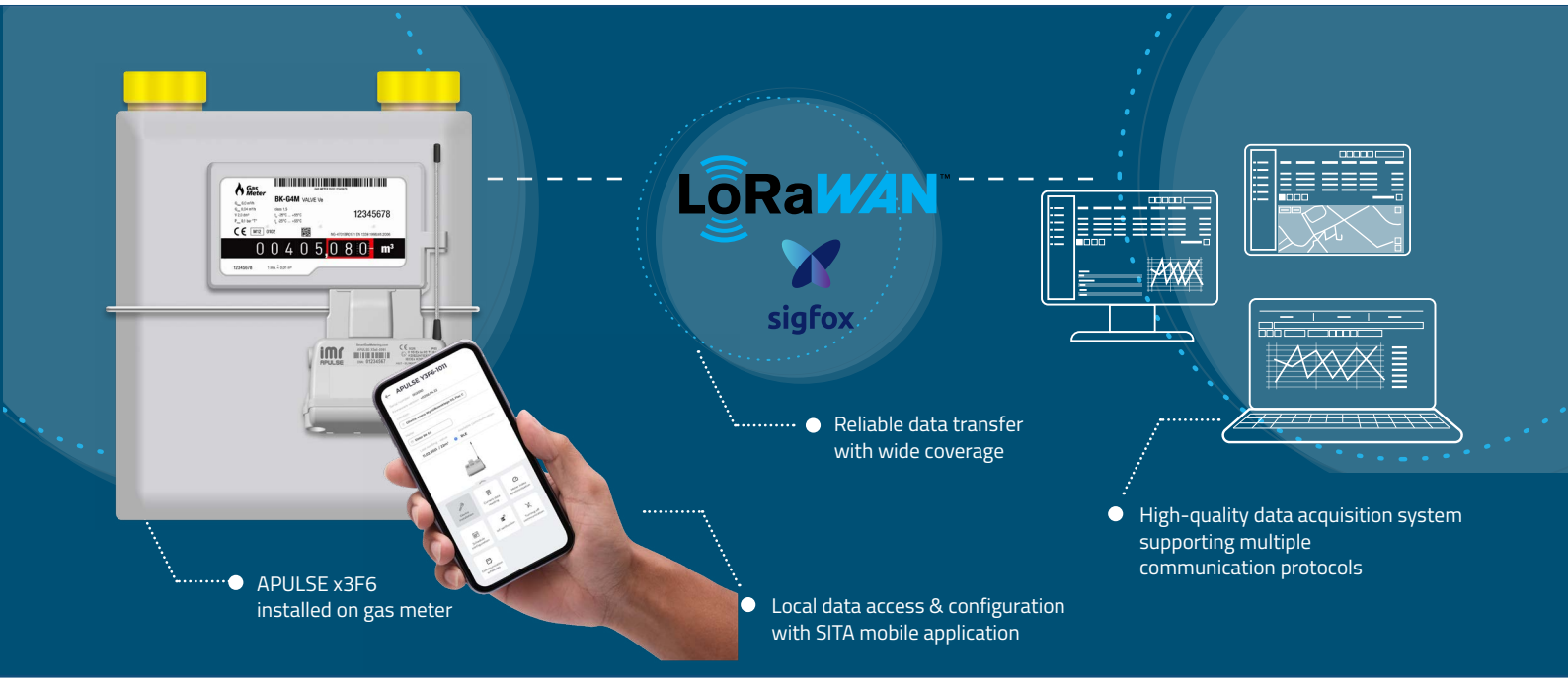
- ISO 9001:2015
- ISO/IEC 27001:2022
- ISO 45001:2018
- ISO 14001:2015
- PN EN ISO/IEC 80079-34:2011

GENERAL INFORMATION

The APULSE x3F6 is a versatile wireless data logger designed for seamless installation on a wide range of gas meters. It gathers detailed consumption profiles and monitors unauthorized activities, such as the illegal removal of the device or exposure to external magnetic fields.

The device transmits recorded data using LoRa or Sigfox technologies and the readings can then be processed by external data systems. Its integrated Bluetooth module also facilitates convenient on-site data access, device configuration, and diagnostics via a dedicated SITA mobile app.
The device supports fixed and walk-by operation modes, delivering reliable and timely readings even in challenging IoT communication environments.
Walk-by readings are conducted using WMBus technology via the ARANGE 7076 device, which connects via Bluetooth to a smartphone or tablet with an installed SITA application.

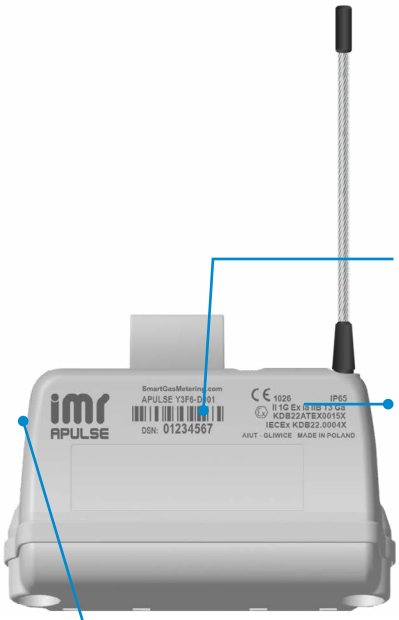
The installation process of APULSE x3F6 is quick and intuitive, requiring only a few minutes to attach the device to a gas meter using specialized adapters and secure it with plastic seals.



MANUFACTURER

Designed and manufactured in Poland by:
AIUNEO
AIUT Sp. z o.o.
Poland, 44-109 Gliwice, ul. Wyczółkowskiego 113
www.aiut.com ▪ www.aiuneo.com
tel.: +48 32 775 40 00, e-mail: biuro@aiut.com

DEVICE STRUCTURE



ANTENNA
Embedded, wired radio antenna

OVERPRINT/LABEL

CERTIFICATES

MAGNET BUTTON
The spot where a magnet should be applied to wake up the device.

UPPER PART OF THE COVER

RUBBER GASKET

BATTERY COMPARTMENT

PIN CONNECTOR
for active adapters

SECURITY SEALS
Protection against unauthorized use

ORDER NUMBER

APULSE x3F6-vz**

x	**interface for local communication**
X	version with connector
Y	version with built-in pulse sensor
v	**type of battery***
z	**additional hardware versions***

*Details about the available device versions and type of battery can be found in the Device Versions section.

OVERPRINT/LABEL

APULSE X3F6 - A001 — Order number
S/N: 01378829 — Serial number
Barcode, code 128

HARDWARE VERSIONS

1	built-in pulse sensor coupled with gas meter counter (APULSE Y3F6). Compatible with passive adapters
2	connector dedicated for adapters with built-in pulse sensor (APULSE X3F6) Coupled with active adapters

DEVICE VERSIONS

The table below provides a detailed overview of the available APULSE x3F6 versions, covering technical parameters such as battery type and hardware version. Choose the solution that best fits the characteristics of your infrastructure and operational needs.

Order number	Single battery	Double battery	Connector	Build-in pulse sensor	Accelerometer
APULSE X3F6					
APULSE X3F6 - A001-XXXX-27K1	√	-	√	-	-
APULSE X3F6 - A002-XXXX-8SKW	√	-	√	-	√
APULSE X3F6 -C012-XXXX-MM7R	-	√	√	-	-
APULSE X3F6 -C013-XXXX-Z47W	-	√	√	-	√
APULSE Y3F6					
APULSE Y3F6 - A001-XXXX-BJLP	√	-	-	√	-
APULSE Y3F6 - A002-XXXX-9XWB	√	-	-	√	√
APULSE Y3F6 - C012-XXXX-HXUD	-	√	-	√	-
APULSE Y3F6 - C013-XXXX-9EQM	-	√	-	√	√

TECHNICAL PARAMETERS

LOW POWER COMMUNICATION

LoRa communication	
Power	+14dBm
Protocol version	LoRa WAN, specification 1.0.2
Regional parameters	EU868, IN865, AU915
Activation type	OTAA and ABP
Sigfox	
Power	+14dBm
Protocol version	Radio Specification 1.5
Regional parameters	RC1 / RC2 / RC4 / RC6
IMR radio	
Power	+14dBm
WMBUS T1	
Power	+14dB
Protocol version	EN-13757:2018, OMS 4.1.2
Encryption mode	Mode 0 and mode 5 (by default)

BLUETOOTH LOW ENERGY COMMUNICATION

Standard	Bluetooth LE 5.2
Power	+8 dBm
Frequency	2,4 GHz

ENVIRONMENTAL PARAMETERS

Operating /storage temperature	-25°C do +55°C
Housing material	ABS (Terluran GP-35) or PA6 (Tarnamid T-27 GF10) or their equivalents
Ingress protection	IP65
Certificate	ATEX, IECEx, CE

POWER SUPPLY

Battery type	1 x replaceable, 3,6V, Li-SOCI2, ABAT series or 2 x replaceable, 3,6V, Li-SOCI2, ABAT series
Battery lifetime	10 years *(depending on the device's target configuration, environmental conditions, and user interaction with the device)

MECHANICAL PARAMETERS

Dimensions	APULSE X3F6: 664,08mm (161,8mm with antenna) x 84,36 mm x 31,15 mm APULSE Y3F6: 78,4mm (161,8mm with antenna) x 84,4 mm x 31,1 mm
Weight	APULSE X3F6-Axxx: 74g, APULSE X3F6-Cxxx: 90g, APULSE Y3F6-Axxx: 78g, APULSE Y3F6-Cxxx: 95g

DEVICE INSTALLATION

The installation procedure is highly intuitive and can be completed within minutes. The APULSE logger is installed on the gas meter in just a few simple steps, secured with plastic seals. The entire process is supported by the SITA mobile application, which guides you through the installation step by step and registers the APULSE device at the selected location.
The process of mechanical assembly is performed in the following way and varies depending on the used gas meter (and assigned adapter). The general procedure can be described as follows:

1. Fix adapter to the gas meter and secure it with a plastic seal
2. Fix APULSE to the adapter and secure it with plastic seals*

*The seal should be placed below the brim to prevent its accidental removal.

The installation process varies based on the gas meter type. While the APULSE x3F6 is compatible with all gas meter models, specific adapters are required. Check the full adapter list here.

DEVICE REGISTERING IN THE SYSTEM WITH SITA APPLICATION

After the mechanical assembly of the APULSE device, an action must be performed to register the device in the selected location. The operation is performed using the SITA application. The procedure involves completing the installation form in the app, where you input details about the location, gas meter parameters, and readings. The installation steps in the app may vary depending on the system settings, configuration, and specific client requirements.

THE INSTALLATION PROCEDURE INCLUDES THE FOLLOWING STEPS:

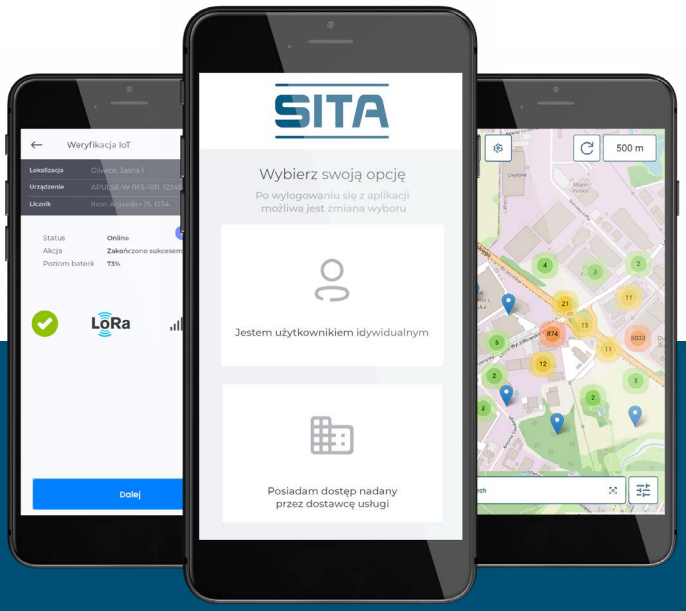
▪ BLE activation in Seal mode ▪ Switching to Run mode ▪ Time synchronization ▪ Arming the accelerometer
▪ Protocol verification ▪ Counter synchronization

For more detailed information, please refer to the SITA app documentation.

OPERATING THE DEVICE WITH THE SITA APP

SITA - CONVENIENT DATA ACCESS AND CONFIGURATION

SITA is a mobile application designed for Android devices, supporting on-site procedures such as installation and configuration of various IoT data loggers and gateways. Communication between the SITA application and the APULSE data logger is carried out using Bluetooth communication.



With the SITA application you can perform the following procedures in the APULSE x3F6:

- Reading current device configuration
- Meter index synchronization
- Synchronization of the device clock with the selected time zone
- Reading archive data from selected time period
- Configuration of schedules for automatically executed commands
- Configuration of alarms
- Device firmware update
- Verification of IoT communication
- Conducting the battery replacement procedure
- Installation & uninstallation of the device

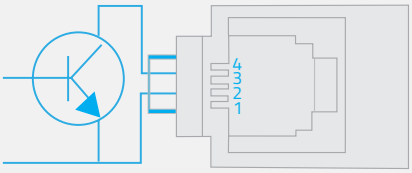
NOTE For more detailed information, please refer to the *SITA. User Guide.*

REPLICATED PULSE MEASUREMENT

Thanks to the replicated pulse output, APULSEx3F6 can be connected to 3rd party data acquisition system. It is located in a dedicated adapter and can provide meter pulse output connections to other meter pulse utilization devices, without interfering or disrupting the collection of data and having minimal drain on any power source within the AMR device.

1

1 Short-circuited with wire no. 4*
2 Ground
3 Impulse output
4 Short-circuited with wire no. 1*



*Pins internally connected in the socket

2

1. Prepare the cable and crimp the RJ11 connector to the cable using crimping tool. The wires should be inserted into the connector according to the diagram below
2. Plug the connector into the socket in the adapter as shown in the picture

PARAMETERS

Circuits	1 intrinsically safe circuit
Connector type	RJ-11 /RJ-9
Circuit type	Open collector output
Max cable length	3m
Maximum input voltage Ui	30 V
Maximum input current Ii	37 mA
Maximum input power Pi	1.1 W
Maximum internal capacitance Ci	Negligible
Maximum internal inductance Li	Negligible

DEVICE OPERATING MODES

The device is initially set to SEAL mode after production and can be activated to RUN mode by following the installation procedure using the SITA application.

SEAL MODE

APULSE x3F6 is set to SEAL mode after production to ensure safe transport and reduce battery consumption. In this mode, it only counts pulses without enabling radio communication.
BLE communication in SEAL mode can be activated in two ways:

ACTIVATING BLE MODULE USING A MAGNET

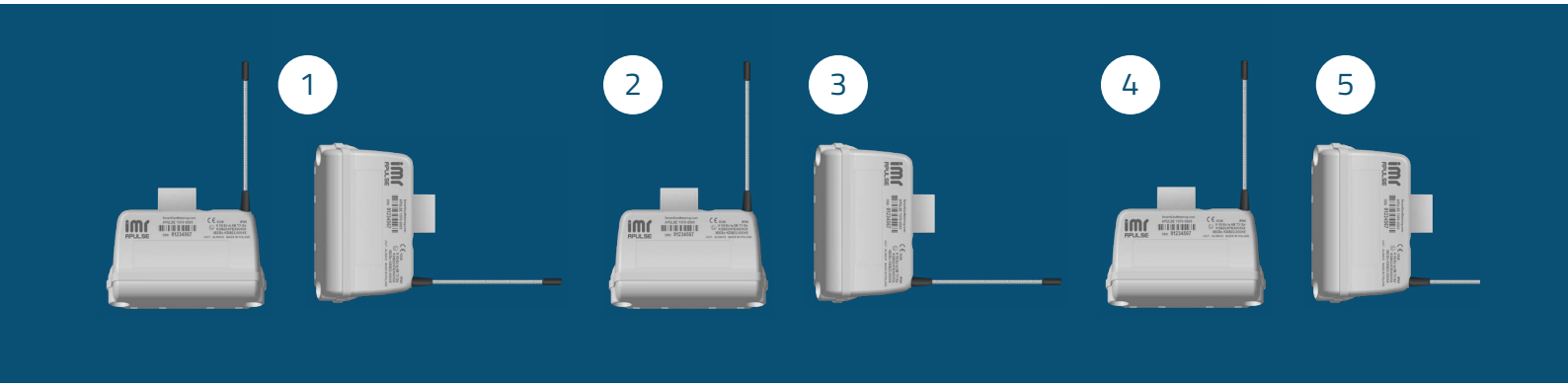
The BLE module is activated by placing a magnet near the designated area on the device housing (marked with a circle). This method is identical to the activation process in RUN mode. Details below.

ACTIVATING BLE MODULE USING GESTURES *(only for versions equipped with an accelerometer)*

The gesture procedure involves changing the device's orientation between two mutually perpendicular positions:

1. Tilt the device 90° from its original position in the selected direction (left, right, backward, or forward).
2. Within 5 seconds, return the device to its original position.
3. Within 5 seconds, tilt the device 90° again in the same direction as in Step 1.
4. Within 5 seconds, return the device to its original position.
5. Within 5 seconds, tilt the device 90° in the same direction as in Step 3.

Once the BLE communication is activated, advertising frames are sent every 1 minute for 30 minutes.



RUN MODE

In this mode, the device operates regularly, taking pulses from the meter. It periodically transfers the data over a radio network to the acquisition server (e.g. daily at the specified time). The Bluetooth 5.2 module embedded in the device sends the advertising BLE frames continuously every 1 minute.

ACTIVATING BLE MODULE IN RUN MODE

- When the device is in RUN mode, the BLE module is activated by placing a magnet near the designated area on the device housing (marked with a circle; see Fig. 1).
- A magnet with a recommended minimum strength of 5N should be used.
- Once activated, the device will send Bluetooth signals every 1 minute for 30 minutes.

Fig.1

ARCHIVE DATA

The APULSEX3F6 is equipped with a large archive (up to 10 years, depending on the configuration). The device offers two main types of archives: daily and monthly. The archives can be accessed remotely or locally using the SITA mobile application.

Daily archive

- Daily device status
- Gas day index value & timestamp
- 24 x hourly gas consumption
- Maximum hourly flow value & timestamp of the day
- Current battery level
- Current signal quality
- Current ambient temperature
- Device clock

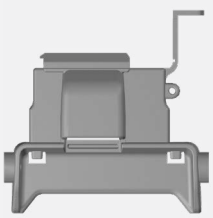
Monthly archive

- Monthly device status
- Gas month index value & timestamp
- 28 to 31 daily gas consumption (depending on the number of calendar days in the month)
- Maximum hourly flow value & timestamp of the month
- Current battery level
- Current signal quality
- Current ambient temperature
- Device clock

ADAPTERS

Adapters are designed for the mechanical installation of the APULSE x3F6 on various gas meters. Compact and robust, they are engineered to withstand harsh conditions and ensure compatibility with a wide range of popular gas meter models. They optionally feature an RJ11 replicated pulse output, allowing seamless connection to third-party data acquisition systems.

IC Ex15 (active)



GAS METER TYPE

Honeywell/Elster/ Kromschroeder

BK G1.6-BK G6

Gas Souzan

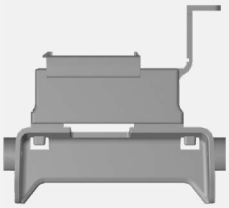
VERSIONS

Standard version - IC E015

With replicated pulse output - IC E115

EMBEDDED SENSOR - Yes

IC Lx15 (active)



GAS METER TYPE

Landis +Gyr/AMPY

Model: 750, 1010

Honeywell/ELSTER AMCO/AMPY

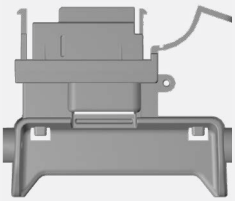
BK G1.6-BK G6

VERSIONS

With replicated pulse output - IC L115

EMBEDDED SENSOR - Yes

IC Mx15 (active)



GAS METER TYPE

Metrix UG1.6, UG2.5, 6G4, 6G5, 2G10, 2G16, 2G25, 2G40, 2G65,UG4, UGT4

Metrix Italia UG-ALU

VERSIONS

Standard version - IC M015

With replicated pulse output - IC M115

EMBEDDED SENSOR - Yes

IC Sx15 (active)

GAS METER TYPE

Itron/Actaris

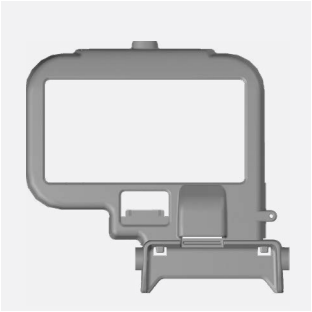
U6, U16

VERSIONS

With replicated pulse output - IC S115

EMBEDDED SENSOR - Yes

IC Rx15 (active)



GAS METER TYPE

Itron/Actaris/Schlumberger

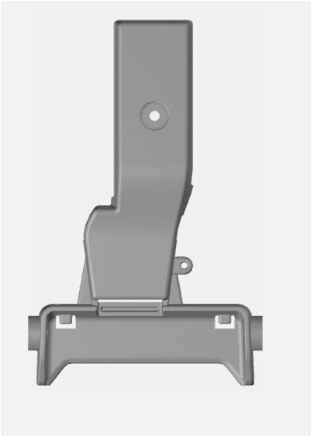
RF1, ACD

VERSIONS

With replicated pulse output - IC R115

EMBEDDED SENSOR - Yes

IC Kx15 (active)



GAS METER TYPE

Elektrometal

EM G1.6, EM G2.5, EM G4

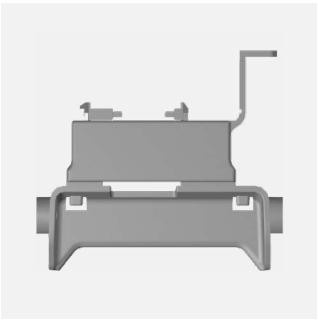
Kale Kalip

VERSIONS

With replicated pulse output - IC K115

EMBEDDED SENSOR - Yes

IC Ix13 (passive)



GAS METER TYPE

Honeywell/Elster/Kromschroeder

BK G1.6-BK G6

Gas Souzan

VERSIONS

Standard version - IC I013

EMBEDDED SENSOR - No

IC Ux15 (active)

GAS METER TYPE

Other gas meters equipped with their own pulse generator, including rotor and turbine gas meters with LF pulse output

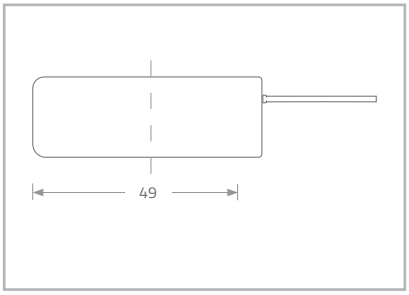
VERSIONS

With replicated pulse output - IC U115

EMBEDDED SENSOR - Yes

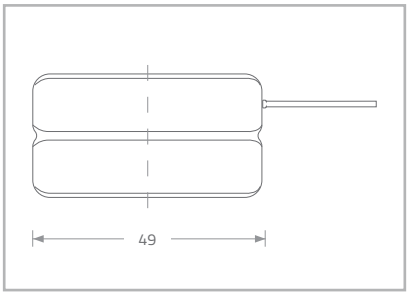
ACCESSORIES

ABAT E145-1202



Rated capacity : 2600 mAh
Rated voltage: 3,6V
Type of connection: Scotchlock connector (SL-UY)
Dimensions [mm]: 14x49

ABAT E145-2103



Rated capacity : 5200 mAh
Rated voltage: 3,6V
Type of connection: Scotchlock connector (SL-UY)
Dimensions [mm]: 49x28x14