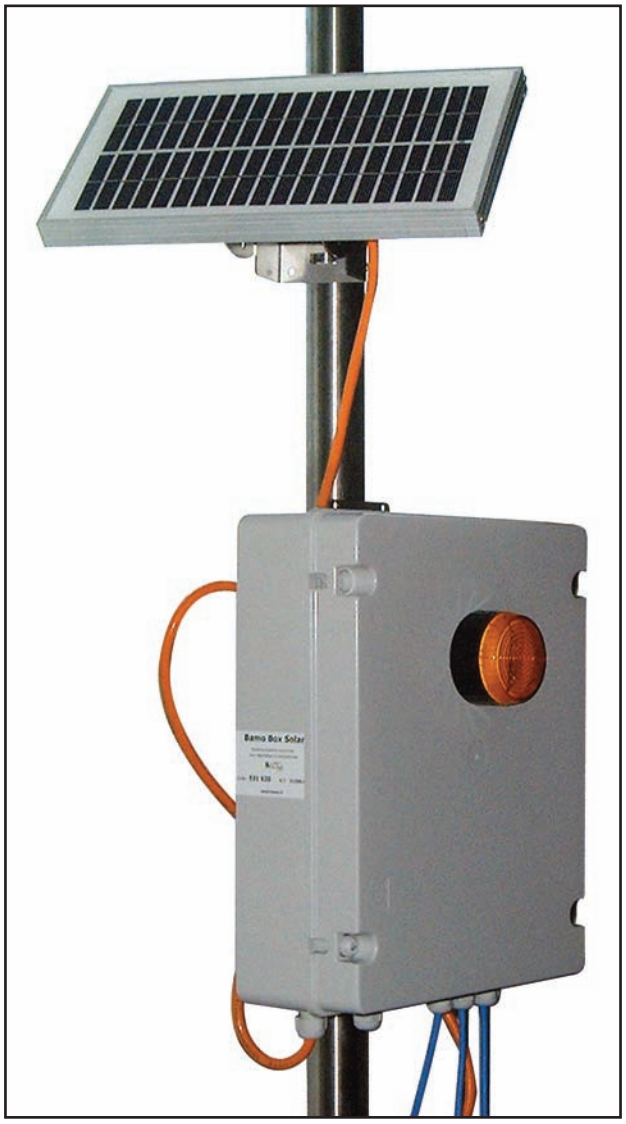
BBS

Autonomous separator alarm system



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Autonomous separator alarm system
BAMOBOX SOLAR (BBS)
05-11-2010 531 M1 03 B

MES
531-03/1

Safety precautions

- *Fitting, wiring, initial start-up and maintenance operations must be done by trained technicians.*
- *All European and local rules for electrical instruments must be respected.*
- *The device must be connected only to a power supply in conformity with the specifications mentioned on the information plate on the housing.*
- *The device must be disconnected from all sources of power during installation and maintenance work.*
- *The device may only be operated under the conditions specified in the operating instructions.*
- *Respect all recommendations, for installation and mounting of Ex devices, from standards EN60079-14 and EN600079 CENELEC.*
- *The device should not be modified or completed with anything.*
- *All cables to connect the sensors must be out of any place where electrostatic risk exists.*

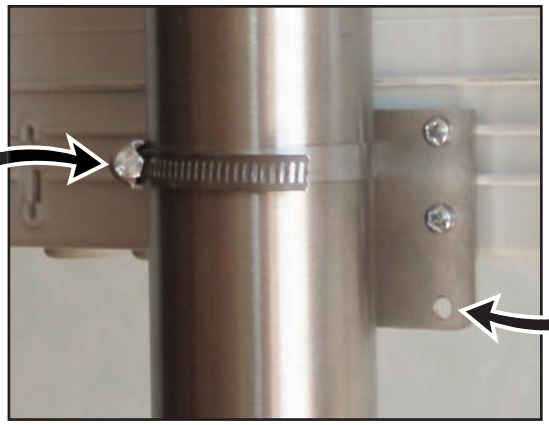
CAUTION: It is necessary to follow the specific technical information corresponding to the mounting, fitting and starting up of the NivOiL systems.

The unit BAMOBOX BBS must be fitted outside the explosive area

1 BBS CABINET

1.1 Mounting

Fit the cabinet using the two stainless steel collars for pole mounting *(pole diameter from 47 to 67 mm)*.
For a wall mounting use the plates to fit the cabinet on the wall.

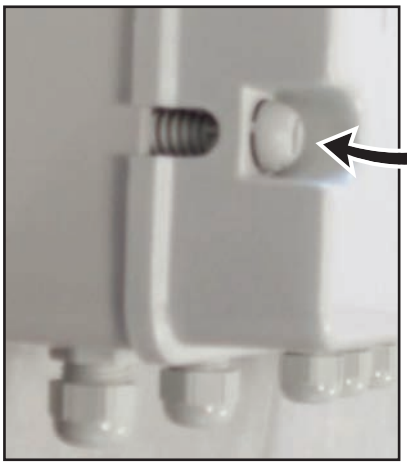


Stainless steel collar for pole mounting (diam. 47 to 67 mm)

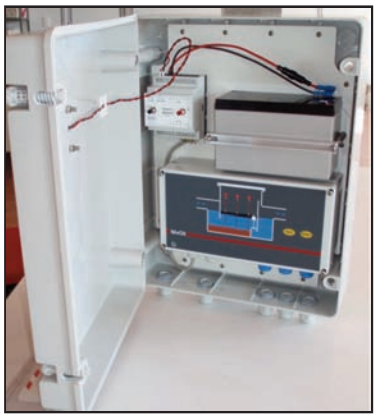
Drilling Ø 5 mm (Ø 4 mm screw) for wall mounting (2 plates)

1.2 Opening the cabinet

The lid turns around the hinge on the left side; unscrew, without taking them out, the screw on the left side.
Unscrew and take off the screws on the right side. Disengage the lid from the right side and rotate it toward the left.



The screw is still in place and the hinge is free to rotate

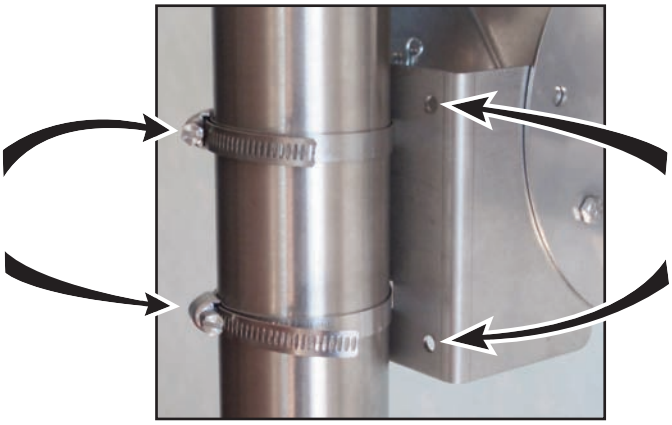


Open the lid toward the left

2 SOLAR PANEL

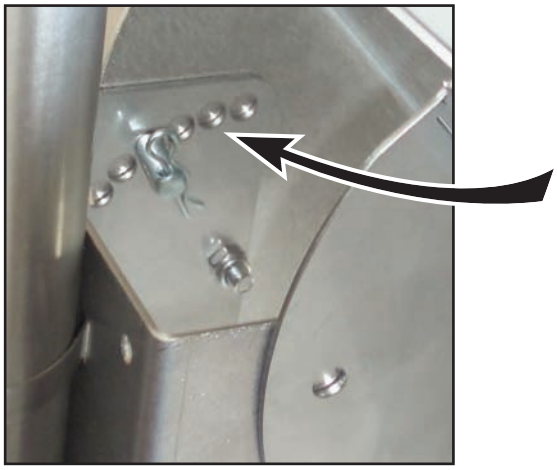
2.1 Mounting

Fit the solar panel on the pole *(diameter 47 to 67 mm)* with its stainless steel collars.
For a wall mounting, or horizontal surface, use the plates to fit the cabinet on the wall. There are 4 Drillings Ø 5 mm *(Ø 4 mm screws)* on the base plate.
The cable length to connect the solar panel to the BAMOBOX BBS is 2.5 m long, as a standard length.



2.2 Positioning the solar panel

When the stainless steel collars are not yet tightly screwed, position the solar panel facing south. Screw tightly the collars.
Adjust incline close to an angle of 60° (from horizontal) by choosing the convenient Drilling and block the position with the stop bolt.



3 ALARM SYSTEM FOR OIL-WATER SEPARATOR: NIVOIL®

3.1 Mounting the sensors

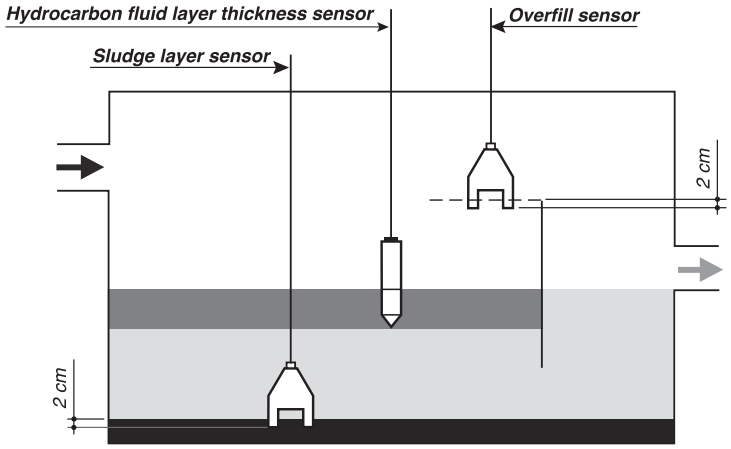
The unit BAMOBOX BBS must be fitted outside the explosive area

Cables coming from the Ex area and going to the safe area, must pass through pressure glands or wall-ducts IP67 protection according the standard EN 60529.

Hydrocarbon fluid layer thickness sensor: Fit the sensor such as the sensor tip corresponds to the bottom of the greater layer thickness to detect. The graduated stem (5, 10 and 15 cm marks) makes the adjustment easier.

Overfilling sensor: Fit the sensor such as the ends of U probe are 2 cm under the alarming level.

Sludge layer sensor: Fit the sensor such as the ends of U probe are 2 cm under the alarming level.

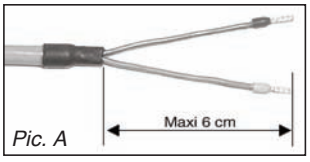


Caution: The sensor may be not subject to move due to turbulences.
Do not knock the probe during mounting and maintenance operation.

3.2 Cable extension

When necessary, it is possible to extend the distance between the sensor and the alarm unit, with an extension, respecting the following recommendations:

The **maximal length** of an extension is **300 m**.
Use our cable, *(Reference SK-PVC-2x1)*, for 1 sensor ATEX classified.
Prepare the cable ends as on *(Pic. A)*
The easier way to extend the cable accordingly with **ATEX rules**, is to use the **CET02 cable coupling**, *(Reference NivOiL-JT)*, suitable to ATEX **zone 0** category **1**.
This device *(Pic. B)*, is delivered with 2 WAGO connectors *(Pic. C)* for fast coupling.



Pic. A

Pic. B

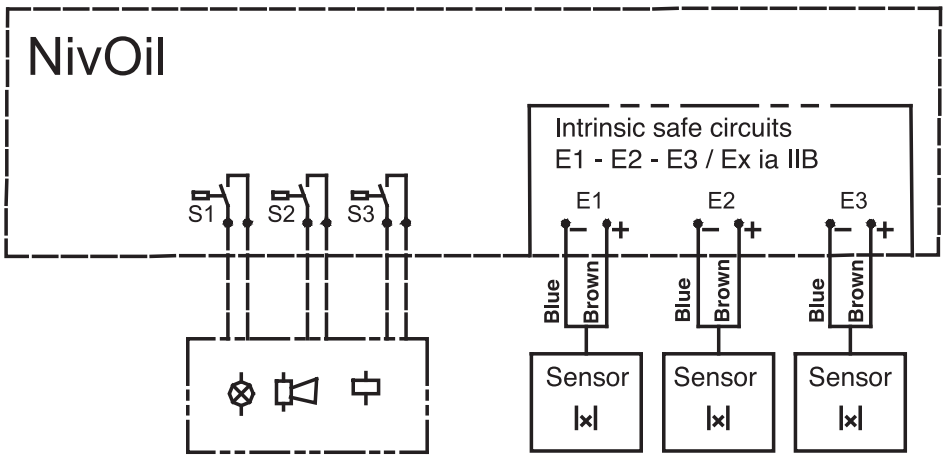

Pic. C

Cable cross section: up to **4 mm²**
Protection: **IP 65** *(not for a continuous immersion)*

The shield must not be connected.
Both ends must be pressed to the limit and pressure cable glands well tightened.

3.3 Connecting the sensors to the alarm unit

Connect the sensors to the control unit **NivOiL®** as shown on the drawing and in accordance with the obligations due to Ex area. The measuring loop, as an intrinsic safe circuit, must not be connected to the ground.



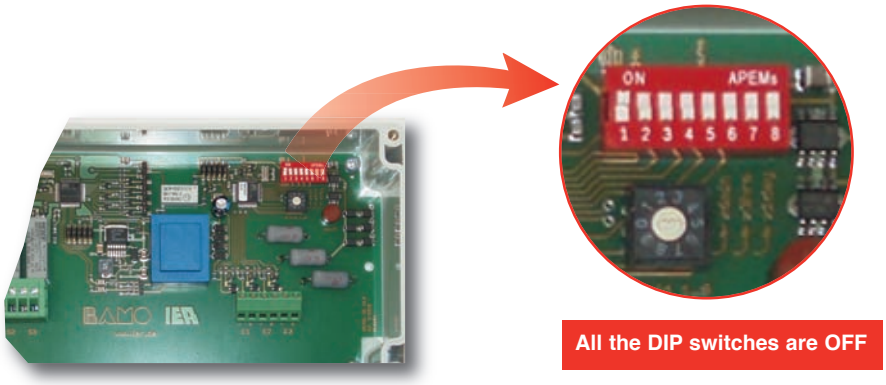
[x]: Input for any type of our sensors

The alarm unit recognizes automatically the NivOil sensor type

3.4 Set up of the alarm unit NivOiL®

For the use in a BamoBox Solar (BBS) the alarm unit **NIVOIL®** is specifically configured at the factory.

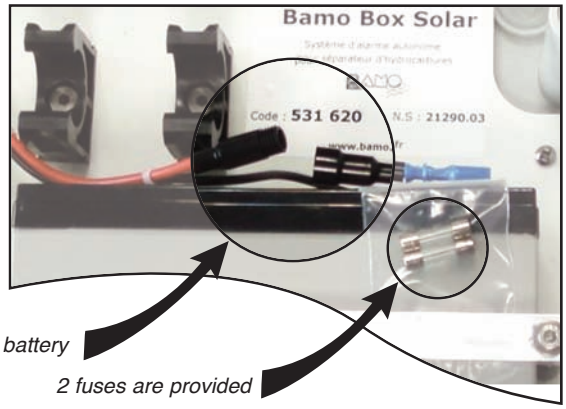
CAUTION: The factory set up must not be changed



All the DIP switches are OFF

3.5 Starting up the BAMOBOX SOLAR

Once the sensors are connected to the alarm unit **NIVOIL®** and verifying the configuration as per *§ 3.4*, insert a fuse in the fuse holder connected to the battery *(2 fuses are joined with the delivery)*.



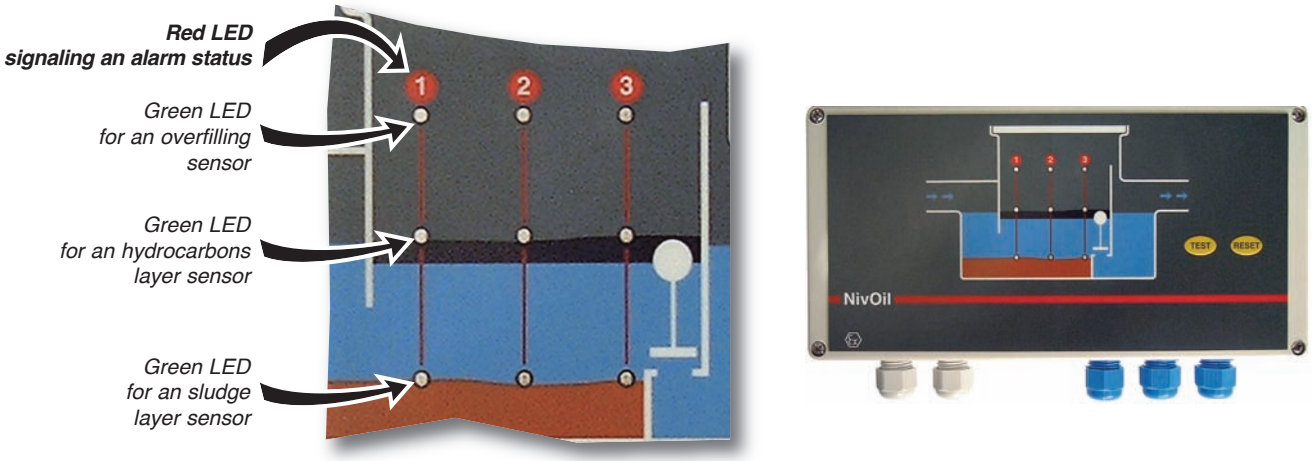
Fuse holder connected to the battery

2 fuses are provided

3.6 Use of the alarm unit NivOiL®

The 3 sensors may be connected to any input of the alarm unit NivOiL® which recognizes automatically the sensor type.

A LED indicates the sensor type on the diagram on the front board. When an input is not wired, the LED is off.



As soon as the alarm unit is powered, it begins a test of its alarming devices *(LED and buzzer)*:

- **Test of all LED**
- **Test of all sensors connection** *(short circuit and broken cable of measuring loops)*
- **Detection of sensor type**

If the result is a correct status, the corresponding green LED light on.
In case of a defect detected, the 3 LED, corresponding to this input, will be flashing *(An input without sensor: the 3 LED keep OFF)*.

During the first start-up, the alarm unit NivOiL® memorizes the type of sensor connected to each channel.
When you connect a new sensor on a free channel, the NivOiL® will identify and memorize it as soon as you switch on the power.

When a sensor is removed, the corresponding 3 LED will be flashing (default).
Proceed to a reset, pressing the RESET button at least 5 seconds to confirm the removal of the sensor.
If a sensor have been removed without a complete RESET, then all the LED of the input will be flashing to signal the defect.

When an alarm occurs on a channel, the corresponding red LED is flashing until the defect is corrected.

4 MAIN CONTROL UNIT

4.1 Description

The main control unit (MCU) is in charge of all the elements of the BAMOBOX SOLAR:

- Protecting the battery from an overload
- Protecting the battery from an excessive discharge
- Monitoring and check up each hour of the alarm unit NivOiL
- Monitoring the flashing light *(option)*
- Monitoring the modem GSM when an alarm occurs *(option)*

In order to limit the consumption of energy, the MCU *(main control unit)* switches on the **NivOiL®** each hour, for a 3 minutes survey sequence.

When no alarm is detected, the **NivOiL®** is switch back OFF until the next survey sequence.

When one or more alarms are detected during this 3 minutes survey sequence, the MCU memorizes the defect and follow this alarm sequence *(according to the existing option)*:

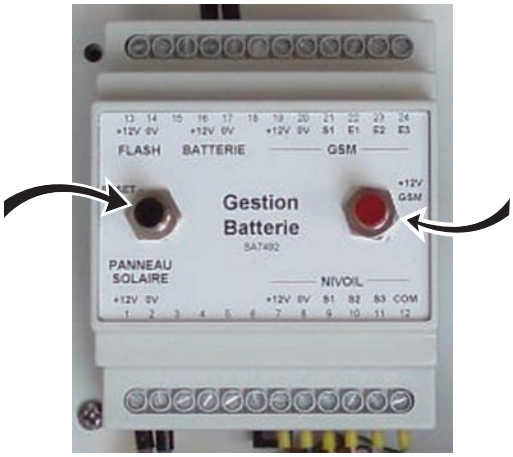
- Lighting on the flashing light *(option)*
- Sending a SMS message with the channel number in defect

When a defect is corrected, it is necessary to reset the system ("RESET" push button) to verify that the complete system is correctly operating.

4.2 Using the MCU controls

The push button RESET runs a monitoring sequence to verify all the system.

This check up is obligatory, after an alarm occurred, to verify that the complete system is correctly operating.



The push button GSM allow the power supply to the modem for its configuration *(set up of phone number and message)*.

Once the configuration ended, pushing it again, will switch off the modem; in any case, the modem is automatically switched off after 10 minutes.

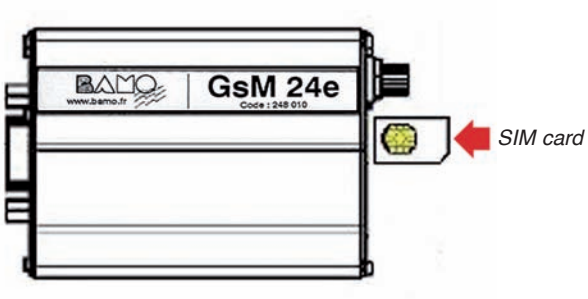
The status LED on the modem shows the power status, with or without energy.

5 MODEM GSM

5.1 Insert the SIM card

Before anything,
Verify that the Code PIN is not activated

Status LED on the Modem



5.2 Status LED on the Modem

The Modem status is known with the LED located on the back side (close to the SIM card) of the GSM:

L E D GSM		**Modem status**
Light ON	Stable	The MODEM is powered and ready to communicate, but it is still not recognized by the communication Network: the PIN code is not memorized or the antenna is not connected.
	Low flashing (each 2 seconds)	The MODEM is ready and operating
	Quick flashing (each second)	The MODEM is interconnected and communicating: vocal, Data or Fax.
Light OFF	OFF	The MODEM is powered off or in RESET sequence.

5.3 Modem set up with the software *GSMSet*

Do not switch on the power before ending the following routine:

- Install the software *GSMSet*
- Connect the serial cable to the PC
- Connect the serial cable to the MODEM
- Run the software *GSMSet*
- On the screen, choose the language,
- The corresponding COM port and
- Click on **"CONNECTION"** *(Connexion)*

Switch on the Modem by pressing the red push button on the main control unit

Follow the steps, through the PC:

1/ Run the AUTO CONFIGURATION *(only for the first connection)*
2/ Enter the phone number (or more than one) of operators
3/ Erase wrong numbers if any
4/ Enter an identification name of the system BAMOBOX *(code/ TAG/ Place etc.)*
5/ Enter the text that will be sent in case of an alarm, for each channel

- Click on **"DECONNEXION"** *(Disconnect)*

6 DESCRIPTION

CABINET	
Temperature:	-25...+60°C
Dimensions:	300 x 380 x 130 mm
Protection:	IP56
Weights:	5800 g
SOLAR PANEL	
Power:	5 Wc
Principle:	Polycrystalline solar multi panel
Dimensions:	365 x 195 mm
Weights:	1800 g
BATTERY	
Power:	7 Ah
Dimensions:	150 x 100 x 65 mm
FLASHING LIGHT	
Dimensions:	Ø 75 x 45 mm

7 TECHNICAL FEATURES

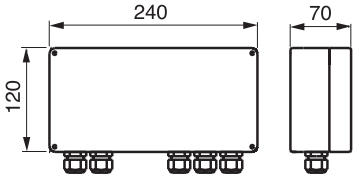
7.1 Module GsM 24e

MODES, GSM / GPRS:	- E-GSM Quad-band 850/900/1800/1900 MHz
VOICE FEATURES:	- Voice (GSM mode) - Telephony, Emergency Numbers 112 - Echo cancellation and noise reduction
DATA FEATURES:	- GPRS Class 10 (up to 4Rx / 2Tx) - TCP/IP (PPP RFC, TCP Socket, UDP Socket, SMTP, POP3, FTP) Libraries - SMS point to point MT/MO and SMS CB
INTERFACES:	- Antenna GSM: connector SMA-F - Power supply: 5.5 V DC to 32 Vdc (micro-FIT connector) - RS232 + Audio via a female 15-pin Sub-D - AT commands: GSM 07.05 and 07.07 - 3 opto-coupled inputs 3 V DC to 32 V DC / (micro-FIT connector) - SIM card reader (SIM 3V - 1,8 V) - Supply and Inputs / Output cables included
AVERAGE CONSUMPTION:	- GSM 850 / 900 MHz: 105 mA @ 12 V in communication - GSM 1800 / 1900 MHz: 80 mA @ 12 V in communication - Idle mode: 5 mA @ 12 V
ENVIRONMENTAL & MECHANICAL:	- Operating temperature: -20°C....+55°C - Storage temperature: -30°C...+85°C - IP31 aluminium case: Length 73 mm x Width 54 mm x Depth 25 mm - Weight: 92 g
APPROVALS:	- R&TTE (Radio & Telecom. Terminal Equipment) - Automotive approval: E24 10R-020250 ("E" label)
OPTIONS:	- Flash memory extension - Shock detector - Buzzer output - GSM antenna (SMA-M) - Serial Data cable - 15M/9F or Data/Audio cable -15M/9F/RJ9 - 230 V AC - 12 V DC power supply

7.2 Alarm system for oil-water separator

NivOiL® CU/12 – Alarm device

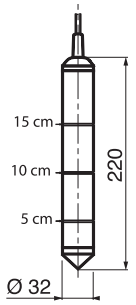
Main power supply:	10...27 V DC
Power consumption:	0.1 W / 12 V DC *(3 sensors connected and 1 control cycle per hour)*
Housing protection:	IP65, according EN 60529
Temperature limits:	-20...+60°C
Sensor inputs:	3 inputs with automatic sensor type detection for hydrocarbon fluids layer thickness, overfill level, sludge layer level
Monitoring:	The alarm device NIVOIL has an auto-diagnostic of measuring loop An alarm signal occurs in case of dysfunction due to a short circuit or a broken cable.
Display and signals:	1 function signal LED *(green)* on each channel 1 alarm signal LED *(red)* on each channel Built-in audible alarm, disabled by DIP switch configuration
Front panel:	2 push buttons for diagnostic test and alarm clearance
Outputs:	3 relay outputs, Power switch 250 V AC as a maximum / 3A, Potential free change over contacts



ATEX Certificate:	**BVS 10 ATEX E 011** / The alarm device may be mounted in Ex area, zone 2
Ex protection class:	⟨Ex⟩ **II 3 (1) G Ex nAC [ia Ga] IIB / IIA T4 Gc** *(Intrinsic safety)*
CE Marks	According to **EC** directives (72/23/EEC), Low Voltage Guidelines: **RL 2006/95/EG & RL93/68/EWG**, EMV Guidelines: **RL 89/336/EWG** (EN 61326)
ATEX	RL 94/9/EG (ATEX 95) **EN 60079-0** (General requirements) - **EN 60079-11** (Intrinsic safety) - **EN 60079-26** (Group II; category 1G)

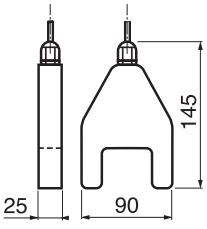
NivOiL® -OP/10 – Hydrocarbon fluid layer thickness sensor *(Only for use with an alarm device NIVOIL)*

Sensor type:	Capacitive, high frequency
Wetted parts:	Antistatic PE stem; Stainless steel end probe
Cable:	Elastomer resistant to oils and hydrocarbon fluids, blue colour; wires 2x 1mm², connections to the alarm device NIVOIL on screw connectors; 10 m long cable *(other lengths on request - maximal length is 300 m)*
Protection:	IP68 acc. EN 60529
Temperature limits:	-20...+60°C
ATEX certificate:	**BVS 07 ATEX E 091 X** / This sensor is suitable for location in zone 0
Ex protection class:	⟨Ex⟩ **II 1 G Ex ia IIB T4** *(Intrinsic safety)*



NivOiL® -HPS/10 – Overfilling sensor *(Only for use with an alarm device NIVOIL)*

Sensor type:	Ultrasonic detection type
Wetted parts:	PVC; Elastomer cable
Cable:	Elastomer resistant to oils and hydrocarbon fluids, blue colour; wires 2x 1mm² , wiring on screw connectors; 10 m long cable *(other lengths on request - maximal length is 300 m)*
Protection:	IP68 acc. EN 60529
Temperature limits:	-20...+60°C
ATEX certificate:	**BVS 09 ATEX E 021 X** / This sensor is suitable for location in zone 0
Ex protection class:	⟨Ex⟩ **II 1 G Ex ia IIB T4** *(Intrinsic safety)*



NivOiL-SP/10 – Sludge layer sensor *(Only for use with an alarm device NIVOIL)*

Sensor type:	Ultrasonic detection type
Wetted parts:	PVC; Elastomer cable
Cable:	Elastomer resistant to oils and hydrocarbon fluids, blue colour; wires 2x 1mm², wiring on screw connectors; 10 m long cable *(other lengths on request - maximal length is 300 m)*
Protection:	IP68 acc. EN 60529
Temperature limits:	-20...+60°C
ATEX certificate:	**BVS 09 ATEX E 021 X** / This sensor is suitable for location in zone 0
Ex protection class:	⟨Ex⟩ **II 1 G Ex ia IIB T4** *(Intrinsic safety)*