

# Level detection for oil-water separators

## RAC 531



### SAFETY PRECAUTIONS

- Fitting, wiring, initial start-up and maintenance operations must be done by trained technicians.
- The device be connected to (and only connected to) a power supply that complies to specifications stated on the instrument identification plate.
- 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 (to use inside or for hazardous areas), from standards EN60079-14, EN60079-17 CENELEC.
- Any modification or transformation on devices operating in hazardous area ATEX are prohibited.
- All cables to connect the probe must be out of any place where electrostatic risk exists

### DESCRIPTION

RAC 531 is designed for use on oil-water separators (oils and low density liquids). It is used to monitor the level of the oil layer that accumulates inside the separator.

The alarm unit RAC 531 is connected to a NivOil probe for hydrocarbons liquids (BVS 07 ATEX E 091 X). The sensor detects the floating layer of hydrocarbon liquids over the water.

#### Status display, LED on the front:

- Green LED → Normal monitoring status, no alarm
- Yellow LED → Alarm occurred, not yet reset
- Red LED → Alarming status

The alarm device has an auto-diagnostic of measuring loop for cable breakage or short circuit. It has a built-in buzzer; A jumper allows to disable its function.

### RAC 531, TECHNICAL FEATURES

Power supply	230 V AC ±10% ; 50/60 Hz
Consumption	~ 2 W
Housing protection	IP65, according EN 60529
Ambient temperature	-20 ... +60 °C
EC-Type Examination Certificate	BVS12 ATEX E 019
ATEX signal circuit limits	Maxima values for U <sub>o</sub> , I <sub>o</sub> , P <sub>o</sub> and C <sub>o</sub> , L <sub>o</sub> , in intrinsic safety circuit for measuring loop, are listed on the appendix 1 of certificate BVS 12 ATEX E 019.
Ex protection class	⊕ II (1)G [Ex ia Ga] IIB/IIA ((associated electrical equipment)
Input signal	1 input only for NivOil probe for hydrocarbons liquids (BVS 07 ATEX E 091 X)
Monitoring	The alarm device has an auto-diagnostic of measuring loop for broken cable and short circuit
Display and signals	Green LED → Normal monitoring status, no alarm Yellow LED → Alarm occurred, not yet reset Red LED → Alarming status
Operating	Through 1 push button for diagnostic test and alarm clearance
Output	1 relay output, 230 V AC, 3A, potential free changeover contact
Housing material	Polycarbonate, 120x80x55 mm ; IP65 ; wall mount

#### EC Conformity

The instrument meets the legal requirements of the current European Directives, RL 2006/95/EG; RL 2004/108/EG (EN61326)

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### ATEX protection

According ATEX rL 94/9/CE (ATEX 95):

- EN 60079-0 (General directive)
- EN 60079-11 (intrinsic safety)
- EN 60079-26 (group II ; class 1G)

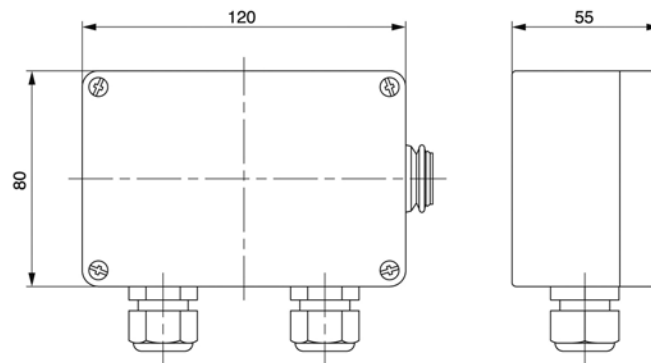
### Indication :

EC-Type Examination Certificates CE are: BVS 12 ATEX E 019 and BVS 07 ATEX E 091 X.

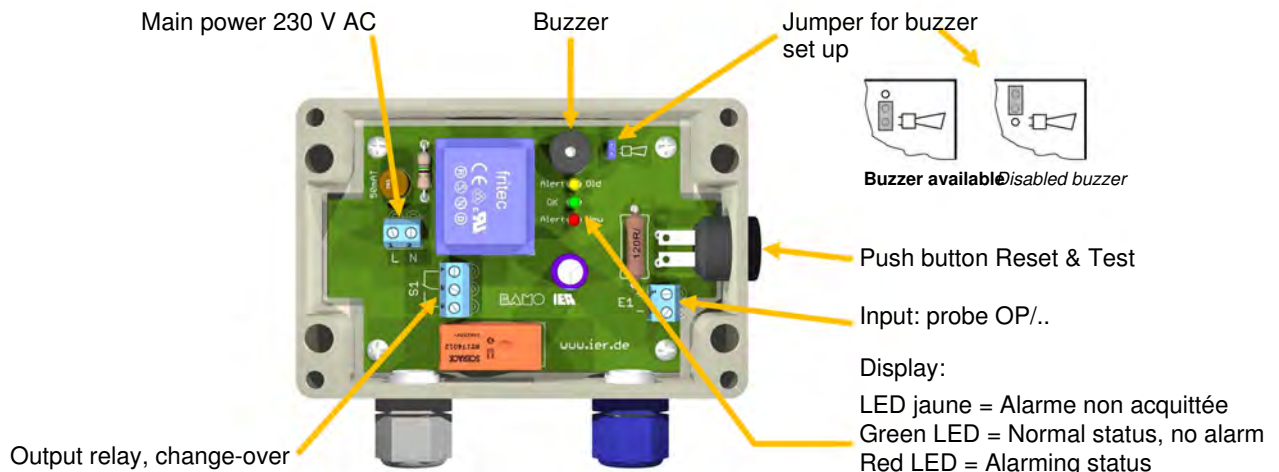
Maxima for Uo, Io, Po and Co, Lo in intrinsic safety circuit are listed on appendix 1, 2, 3 and 4 and must be respected by operator.

Technical features of probes OP/.. are listed on page 4.

## RAC 531, DIMENSIONS



## ALARM UNIT



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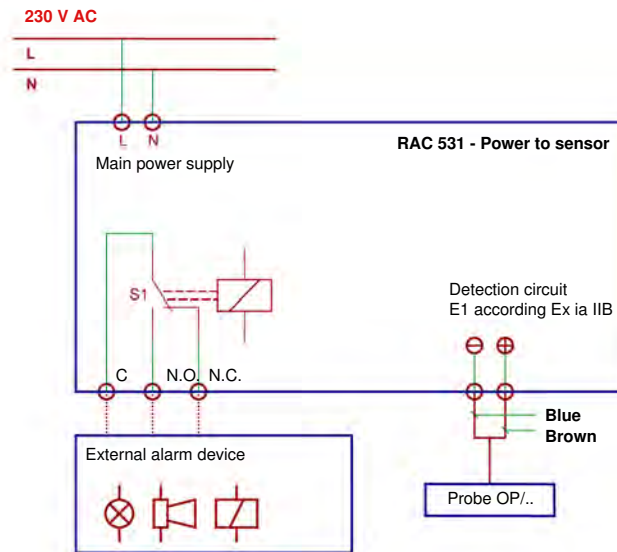
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## ELECTRICAL CONNECTION



## MOUNTING

The alarm device RAC 531 must be mounted out of the Ex area; Installation in safe area.

**The connecting cable of the oil probe shall be fed through the partition wall between areas with Category 1G requirements and less hazardous areas in such a way that protection class IP67 according to EN 60529 is ensured.**

**The oil probe and its connecting cable have to be used only in areas where there is no risk of electrostatic charging.**

**The manufacturer's technical information for using the oil probe in connection with aggressive / corrosive media has to be observed.**

Hydrocarbon probes NivOil OP/..:

install the sensor such as its tip corresponds to the bottom of the greater layer thickness to detect. The marks on the body indicate the maximum immersion (highest authorized thickness of hydrocarbon); Graduations are 5, 10 and 15 cm to make the adjustment easier.

To connect the probe NivOil OP/..:

Observe the rules for wiring in hazardous areas (EN 60079-14).

**The detection loop, as an intrinsic safe circuit, must not be connected to earth.**

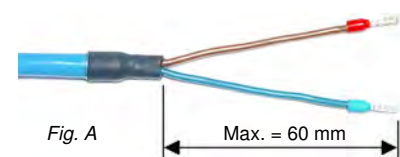
When a cable extension is needed, use a specific shielded cable (2x1 mm<sup>2</sup> as a minimum), no more than 300 m long.

1) Cable preparation: Remove the external sheath (Fig.A) fit on cable terminals.

2) Open the cover of the alarm unit RAC 531.

3) Connect the probe as per drawing.

4) Close the cabinet



## START UP

1) Switch on the power:

*The alarm unit RAC 531 begins automatically a self-test (on each LED and buzzer)*

*Integrity of detection loop, as well, is checked.*

*Then an alarm test begins.*

2) Reset the test of alarm with the push button.

*When complete test is positive, the green LED is lighting*

**Test during operation:**

The device has an integrated functional test that can be launched as follows: By pushing the test/ reset button, as long as it is pushed on, the yellow LED and buzzer are activated.

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## MAINTENANCE

Both alarm unit RAC 531 and NivOil probe do not require any maintenance in normal operation. After an alarm occurred, the hydrocarbon probe must be cleaned as the separator is drained and cleaned. The NivOil probe can be cleaned of its greasy film with a commercial cleaner or degreaser.

**PRECAUTION**  
**Cleaning operation must not provide electrostatic charge.**  
**Do not dry clean.**

## TECHNICAL FEATURES OF HYDROCARBONS PROBES OP/..

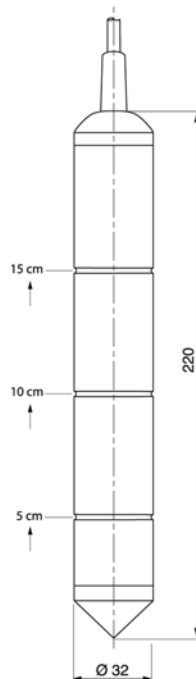
Sensor material	PE-EL with stainless steel end
Cable	Resistant to hydrocarbon liquids, 10 m long (2x1 mm <sup>2</sup> )
Cable limits	Max. 300 m [loop capacitance ≤ 200 nF/km and inductance ≤ 1 mH/km]
Cable colour	Blue
Dimensions	Sensor: Ø 32x200 mm; marks at 5, 10 & 15 cm
Protection	IP68 according EN 60529
Detection type	Capacitive detection, high frequency
Ambient temperature limits	-20 °C ... +60 °C
ATEX certificate	BVS 07 ATEX E 091 X
Intrinsic safety circuit	Maxima for Ui, li, Pi and Ci, Li in intrinsic safety circuit are listed on appendix 2 of ATEX certificate BVS 07 ATEX E 091 X / § 15.3.1 for each NivOil sensors.
Ex protection class	Ⓔ II 1G Ex ia IIB T4Ga (Intrinsic safety device)
Connection	To an alarm unit RAC 531

### Specificities:

Thickness detection cannot be performed properly in contact with existing chemical substances in the hydrocarbon fluids (such as emulsifiers, surfactants, etc.)

The probe NivOil must be in contact only with fluids compatible with polyethylene.

## PROBE OP/.. ; SENSOR DIMENSIONS



Sensor of probe end OP/..

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