

Level detection for oil-water separators

RAC 531 A - Owners manual (translation)



SAFETY PRECAUTIONS

- Installation, initial start-up and maintenance may only be performed by trained personnel!
- The device may only be connected to supply power which complies with the specifications included in the technical data and on the serial 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!
- The applicable installation and maintenance regulations for Ex devices must be observed!
- No changes or modifications may be made to the device.
- The connecting cables of the sensors may only be used in areas where there is no risk of electrostatic charging.

DESCRIPTION

The RAC 531 A monitoring system is used for oil/light liquid separators. It is used to monitor the level of the oil layer that accumulates inside the separator.

An oil probe type NivOil OP (BVS 07 ATEX E 091 X) is connected to the RAC 531 A sensor supply unit. The probe detects the layer of oil/light liquid floating on the water.

The device signals the respective alarm new/old and OK status with three LEDs and has built-in cable break and short-circuit monitoring. RAC 531 A has an inbuilt horn. It can be deactivated with a jumper if required.

CE mark: The device fulfils the legal requirements of the applicable EU-guidelines

TECHNICAL DATA

Control unit RAC 531 A

Operating voltage	230V AC 50...60Hz
Safety-related	
maximum voltage	Um = 250V AC
Power consumption	2W / 2.5VA
Wall-mounted housing	120x80x55mm
Protection class	IP65, according EN 60529
Ambient temperature	-20°C...+60°C
EU type examination certificate	BVS12 ATEX E 019
ATEX signal circuit limits	The maximum permissible values (U_0 , I_0 , P_0 and C_0 , L_0) of the intrinsically safe measuring circuits were taken from the type examination certificate/type plate for each channel and in conjunction with the NivOil probes.
Ex marking	Ⓔ II (1)G [Ex ia Ga] IIB/IIA (associated electrical equipment)
Probe input	1 input, only for oil probe NivOil OP (BVS 07 ATEX E 091 X)
Monitoring	The probe is monitored for cable breaks and short circuits



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TECHNICAL DATA (continuation)

Display and signals	Green LED -> Normal monitoring status, no alarm Yellow LED -> alarm not acknowledged Red LED -> ongoing alarm still active
Operating	Through 1 push button for diagnostic test and alarm reset
Output	1 relay output, 230 V AC, 3A, potential free changeover contact

Intrinsically safe circuit

Version	RAC531 A	
Terminals	Terminal (+), terminal (-)	
Voltage U_0	17.22V	
Current I_0	152mA	
Power P_0	651mW	
Max. external capacity C_0	IIB	2.06 μ F
	IIA	8.5 μ F
Max. external inductance L_0	IIB	6.23mH
	IIA	12.5mH
Max. Inductance/resistance ratio L_0/R_0	IIB	218.7 μ H/ Ω
	IIA	437.4 μ H/ Ω
Characteristic curve	linear	

Oil Probe (NivOil OP)

For connection to the RAC 531 A control unit!

Probe material	PE-EL with stainless steel sensor
Cable	Standard with 10m oil/petrol resistant cable 2x1mm ² Maximum permissible cable length: 300m [$C_{Leitung} \leq 200nF/km$ und [$L_{Leitung} \leq 1mH/km$]

Please use our CET 03 cable conduit for cable extension

Cable colour	blue
Dimensions	approx. $\varnothing 32 \times 250$ mm incl. cable support sleeve with 5cm marks for height adjustment
Protection class	IP68
Measuring principle	capacitive, high frequency
Ambient temperature	-20 °C...+60 °C
EU Type Examination Certificate	BVS 07 ATEX E 091 X
Ex maximum values	
Maximum input voltage U_i	17.9V DC
Maximum input current I_i	157mA
Maximum power input P_i	695mW
Maximum internal capacity C_i	60nF (no mixed parameters)
Maximum internal inductance L_i	0.3mH (no mixed parameters)
Ex marking	Ex II 1G Ex ia IIB T4 Ga (intrinsically safe electrical equipment)
Interconnection	Sensor supply unit (RAC 531) with oil probe (NivOil OP)



Special conditions for safe application

The connecting cable of the oil sensor must be routed through the partition wall between areas with category 1G requirements and less hazardous areas in such a way that protection class IP67 in accordance with EN 60529 is guaranteed.

The oil probe (NivOil OP) and the connecting cable may only be used in areas where electrostatic discharges cannot occur.

The technical information on the use of the oil probe (NivOil OP) in connection with aggressive/corrosive media must be observed.

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MOUNTING

Always install the RAC 531 control unit outside the potentially explosive areas ("safe area")

Mount the probe:

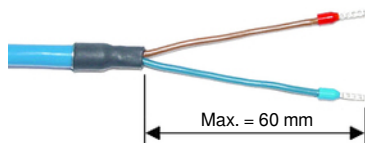
The connecting cable of the oil probe must be routed through the partition wall between areas with category 1G requirements and less hazardous areas in such a way that the level of protection IP67 in accordance with EN 60529 is guaranteed.

Mount the oil probe so that the tip of the sensor section is at the height of the desired alarm point. The probe tube has three circumferential markings at a distance of 5cm, 10cm and 15cm from the tip of the probe (= switching point). They are used to easily set the desired alarm point.

Wire the probe:

- Observe the regulations for laying cables in potentially explosive atmospheres!
- The intrinsically safe input circuits must not be grounded!
- When extending the probe cable, shielded cable (min. 2x 1mm²) should be used, the maximum cable length is 300m.

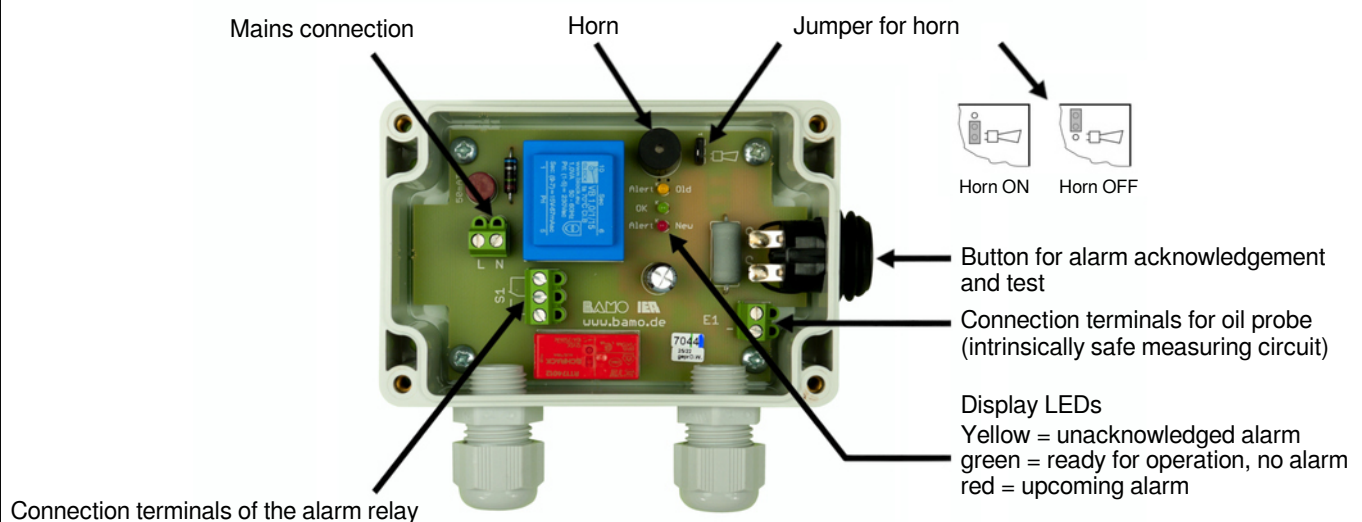
Please note!



- Strip sensor and power supply cable max. 6cm long and fit with grommets or shrink tubing
- Remove the cover of the RAC 531 A
- Connect the oil probe according to the wiring diagram
- Connect the RAC 531 A to the power supply correctly
- Tighten the cover of the RAC 531 A
- Switch on the supply voltage
- RAC 531 A performs self-test (lamp test of all LEDs and the horn)
- The correct connection of the oil probe (short circuit/line break test) is checked
- A test alarm is triggered, which must be confirmed by pressing the acknowledgement button
- Successful test = continuous green light

ELECTRICAL CONNECTION

Interior view of the device



A multi-core cable (5 wires) is recommended for the mains connection and connection of the alarm relay terminals

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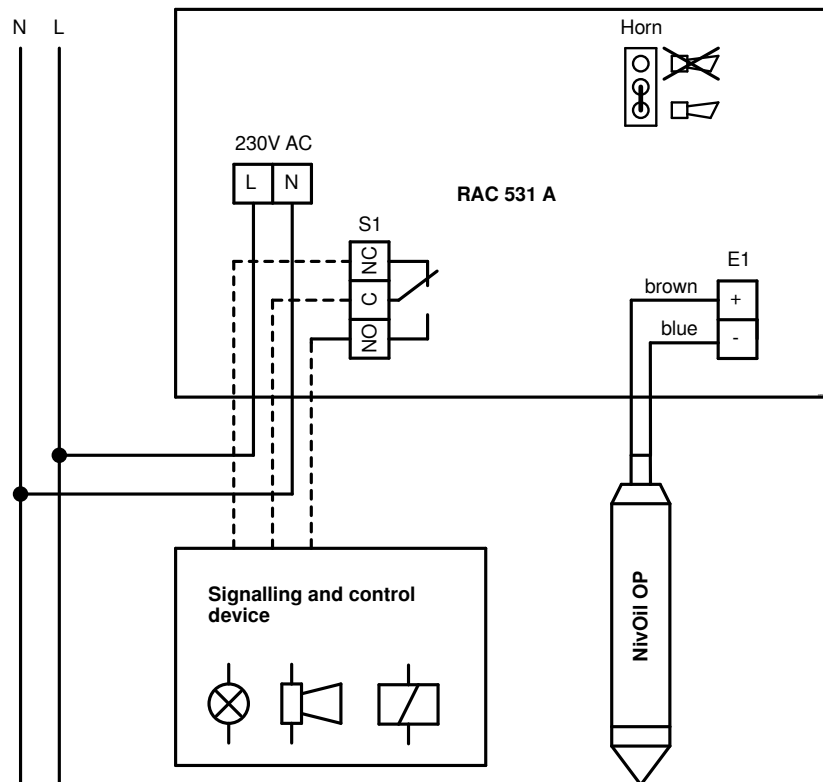
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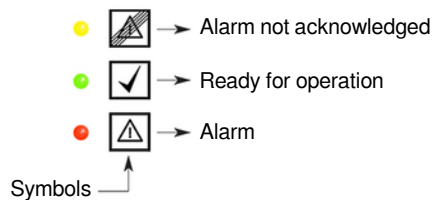
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ELECTRICAL CONNECTION (continuation)

Wiring diagram



SIGNALISATION



TEST FUNCTION

The device has an in-built test function. It can be triggered as follows: As long as the test/acknowledgement button is pressed, the yellow LED and the horn are activated (lamp test/horn test).

MAINTENANCE

When used as intended, the appliance is maintenance-free.
After an alarm has been detected, the oil probe must also be cleaned after cleaning the separator.
The oil probe can be cleaned of the adhering grease/oil film using commercially available grease-dissolving cleaners.

Precaution

There must be no electrostatic charging during cleaning! Only clean with a damp cloth!

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