

# OSA

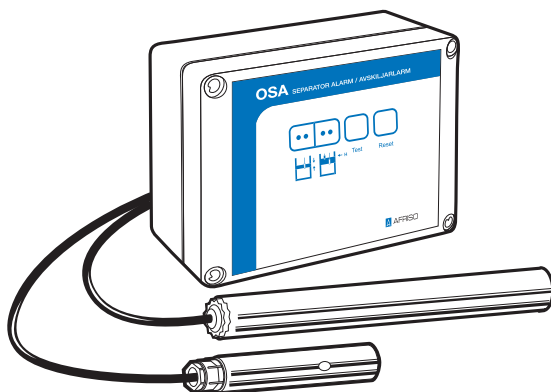
Oil- petrol- grease alarm  
type ema signal OSA

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**Retain these instructions for future use.**

Edition 1.6 - 22-12-22



Level Alarm Unit type OSA  
Capacitance Oil Alarm Probe type ES4  
Thermistor High Level Alarm Probe type R6

## Afriso Ema AB

Kilvägen 2 • SE-232 37 Arlöv  
Sweden

Phone +46-(0)40-92 20 50

Fax +46-(0)40-19 33 58

[www.afriso.se](http://www.afriso.se)

**CE**  
**2460**



## Description

### System parts

Electronic unit type ema signal type OSA for connection to capacitance probe ES4 and thermistor probe R6.

### Application (description)

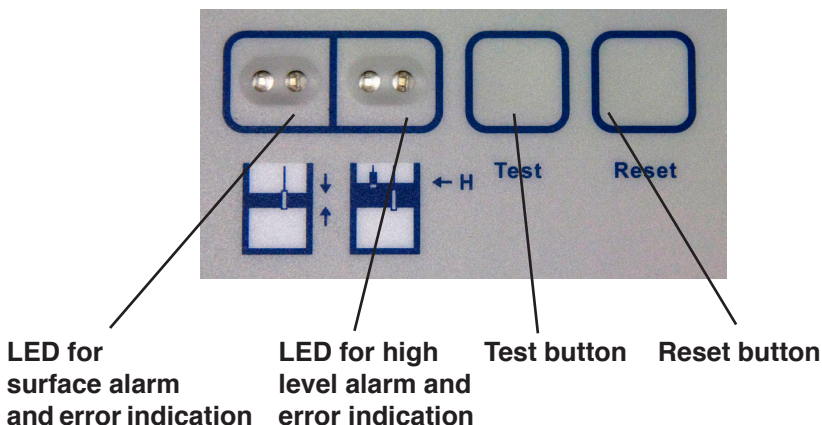
The ema Signal type OSA Alarm Unit is intended for wall mounting and designed for use with capacitance probe type ES4 to provide an oil level alarm in oil and grease separators. The OSA Alarm Unit can also be connected to a thermistor probe type R6 to provide a high level liquid alarm in the event of a blockage in the outlet of the separator.

On start-up the OSA automatically checks to determine if one or two sensors are connected. With the jumper link in position 1 the unit will not give a sensor fault alarm when the thermistor probe type R6 is omitted.

### Function


The sensing probe circuits are intrinsically safe. The OSA has a selectable jumper link on the printed circuit board (only accessible with the front cover removed) which provides selection for the number of sensing probes. It has two positions, 1 = capacitance probe type ES4 only, 2 = ES4 probe and thermistor sensing probe type R6.

### Front buttons and led indicators



## Technical data

### ema Signal OSA Alarm Unit specification:

|                    |  |
|--------------------|--|
| ATEX number        | EN IEC 60079-0 (2018)<br>EN 60079-11 (2012)  |
| Certificate number | SP 04ATEX3620X   |
| Intrinsically safe |  II (1) G [Ex ia Ga] II B |

Sensor output galvanically isolated from earth.

|  |  |
|--|--|
| Intrinsically parameters<br>sensor output P1, P2 | $C_0$ : 0,85 $\mu$ F, $L_0$ : 5,0 mH<br>$I_0$ : 170 mA, $U_0$ : 24,9 V<br>$P_0$ : 1,1 W          |
| Power Supply, Connector K1                       | 230 V, 50 Hz   |
| Relay outputs, contact data<br>Connector R1, R2  | 250 V.a.c. (max voltage $U_m$ )<br>Marking a.c: 250V, 4A, 100 VA<br>Marking d.c: 24V, 1.5A, 20 W |
| Ambient temperature<br>electronic unit           | $\pm 0$ - +40°C  |
| Protection                                       | IP 65  |


Please note: The above intrinsically safe parameters ( $C_0$  and  $L_0$ ) apply under the following conditions.

1. The external intrinsically safe circuit has no combined concentrated inductance ( $L_i$ ) and capacitance ( $C_i$ ) greater than 1% of the above values or.
2. The inductance and capacitance are distributed as in a cable or.
3. The external intrinsically safe circuit contains either concentrated inductance or concentrated capacitance in combination with a cable.


In other cases, with a combined capacitance ( $C_i$ ) and concentrated inductance ( $L_i$ ) in the intrinsically safe circuit, up to 50% of the value of  $L_0$  and up to 50% of the value of  $C_0$  is allowed.

### Sensor specifications

#### Capacitance probe type ES4

|  |  |
|--|--|
| ATEX number  | EN IEC 60079-0 (2018)<br>EN 60079-11 (2012)  |
| Certificate number                                       | DNV 22 ATEX 80661X   |
| Intrinsically safe                                       |  II 1 G Ex ia IIA T4 Ga |
| Sensor must be connected to barrier isolated from earth. |  |
| Electrical parameters                                    | $C_i$ : 500 nF, $L_i$ 10 $\mu$ H<br>$I_i$ : 181 mA, $U_i$ : 25,0 V<br>$P_i$ : 1,2 W                        |
| Ambient temperature<br>sensor                            | -20 - +40°C  |

#### Thermistor probe type R6

|  |   |
|--|---|
| Intrinsically safe                             |  II 1 G Ex ia IIA T3 |
| Sensor output galvanically isolated from earth |   |
| Electrical parameters                          | $C_i$ : 1 nF, $L_i$ 10 $\mu$ H<br>$I_i$ : 200 mA, $U_i$ : 30,0 V<br>$P_i$ : 1,25 W                      |
| Ambient temperature<br>sensor                  | -25 - +50°C   |

## Installation EMA Signal OSA

### Common information

Installation is only permitted by authorised and competent personnel. The OSA unit is designed for wall mounting. The unit must not be mounted in an EX zone.

All regulations and instructions for the installation and maintenance of EX certified equipment must be observed (EN60079-14, EN60079-17 CENELEC).

This manual is the basis for certification of explosion protection at level alarm OSA according to certificate SP04ATEX3620X and ES4 detector type according to certificate DNV22ATEX80661X. It is not the basis for certification of other products mentioned in the manual. Specific connection examples are not covered by certification according to SP04ATEX3620X and DNV22ATEX80661X.

### Cable connections for sensing probes and power supply:

### Mounting

The protection class is IP 65.

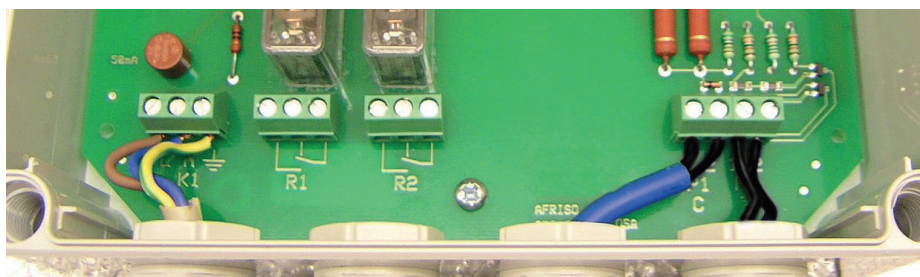
Use 4 screws to mount the unit directly on a wall.

### Connections

The cable should be mechanically protected. If sensor cables need to be extended, screened cable (2 x 1,5 mm<sup>2</sup>) should be used, Maximum length 200 m for each sensor.

The intrinsically safe circuit is not allowed to be earthed.

Connections are made in accordance with the connection notation shown below. The power supply is connected to connector block K1. The capacitance sensor probe type ES4 is connected to block P1 and the thermistor sensor probe R6 (when used) is connected to block P2. The OSA unit has two voltage-free relay contacts, R1 is the output for the oil surface alarm provided by capacitance probe type ES4 and R2 is the output for the high level liquid alarm provided by thermistor probe type R6.

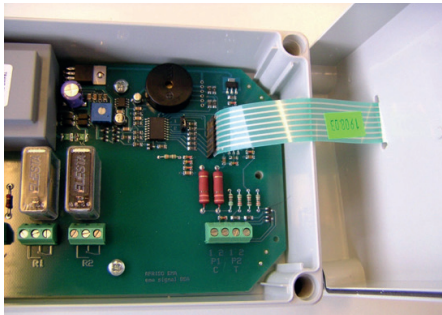


230V power supply  
L = Brown  
N = Blue  
Earth = Yellow/Green

|               |                  |
|---------------|------------------|
| Cap.probe     | Thermistor probe |
| 1 = Black (1) | 1 = Black (1)    |
| 2 = Black (2) | 2 = Black (2)    |

## Checking

Check the connections are made correctly in accordance with the connection details. Incorrect polarity of the sensor cables will result in an alarm on the OSA unit. Check the correct cable type and size has been used. Check the jumper link on the printed circuit board is in the correct position for the number of probes used. Setting 1 is for oil alarm only with an capacitance type ES4 sensor and setting 2 is used when the optional R6 thermistor sensor is also fitted for high level liquid alarm.



*Make sure that foil connection is made correctly to the pin connector on the circuit board before the lid is closed.*

## Operating information

**Normal :** No sensor alarms given. Green LED's for "surface" and "high" will be illuminated. Relays R1 and R2 will be energized.

**Oil Surface Alarm:** With an oil or grease surface alarm the red LED for "surface" will be illuminated and the internal buzzer sounds. Relay R1 will be de-energized.

**High level alarm:** When the liquid level in the separator reaches the R6 thermistor probe the red LED for "high" will be illuminated and the internal buzzer sounds. Relay R2 will be de-energized\*.

**Oil sensor alarm:** With a short circuit on the surface sensor input the red "surface" LED flashes at a rate of 1 Hz (quick flash), with an open circuit the flash rate is reduced to 1/3 Hz (slow flash). In either case the internal buzzer sounds and relay R1 will be de-energized\*.

**High level alarm:** With a short circuit on the high level sensor input the red "high" LED flashes at a rate of 1 Hz (quick flash), with an open circuit the flash rate is reduced to 1/3 Hz (slow flash). In either case the internal buzzer sounds and relay R2 will be de-energized\*.

(\* = Fail safe operation)

Pressing the RESET pushbutton mutes the internal buzzer only, the operation of relay R1 and R2 is unaffected. The buzzer will sound again after approximately 20 hours if the alarm condition has not been corrected.

## Warning!



The OSA unit will only give an alarm oil surface alarm if there is a definite oil or grease surface layer on the water in the separator chamber. Please be aware that certain solvents and chemicals can destroy or degrade the oil or surface layer which could make it impossible for the unit to provide a proper surface alarm.

The front cover of the OSA unit must not be removed when connected to a live power supply. Please isolate before removing the cover.

The OSA unit must never be installed within an EX zone. The sensor outputs are certified intrinsically safe and the ES4 and R6 sensors are suitable for mounting in an EX zone.

## Repair and modification

Repair and modification is not permitted on site. The unit must be sent to the manufacturer or supplier for attention.

## Installation capacitance probe type ES4 and thermistor probe type R6

### General information

Installation is only permitted by authorised and competent personnel and all parts of the Installation Manual must adhered to.

### Mounting

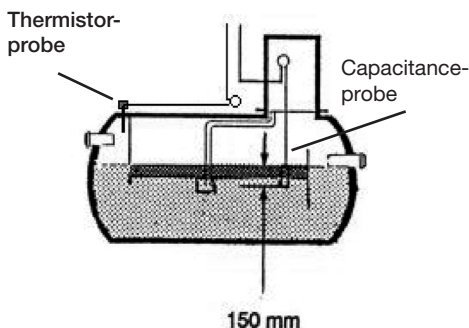
The ES4 capacitance sensor should be fixed at a height 150 mm below the constant water level in the separator, and must be immersed in water to prevent an alarm being initiated.

### Checking

Ensure the sensors are mounted at the correct heights within the separator. (If in doubt this information should be obtained from the separator manufacturer or supplier, it is not the responsibility of the alarm system manufacturer).

Make sure that the cable glands are properly tightened.

Make sure that cables are connected according to the connection scheme and that the cable polarity is correct.

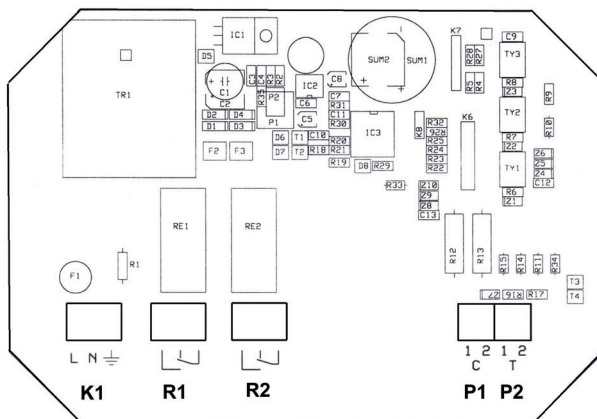


If a 1" cable gland is used for the mounting in the tank make sure that the cable is securely tightened. Make sure that the sensor is easy to lift out of the tank in order to protect the probe when emptying the tank.

The cable should be mechanically protected. If the OSA unit is used for oil surface AND high level alarm functions, make sure the R6 thermistor probe is mounted at the correct level in the separator tank.

## Connection for oil surface alarm only

OSA unit connected to ES4 capacitance sensor only.

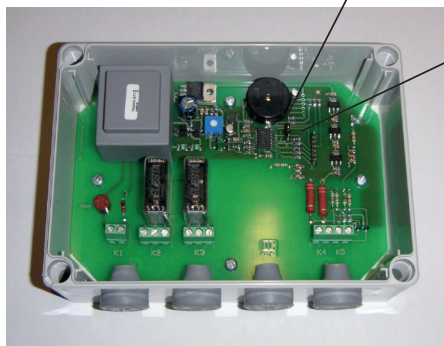
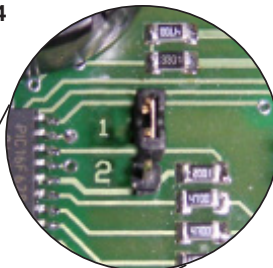


**K1: Connection power supply 230VAC**

**R1 : Voltage-free relay contact for oil surface alarm**

**P1 : Connection capacitance probe ES4**

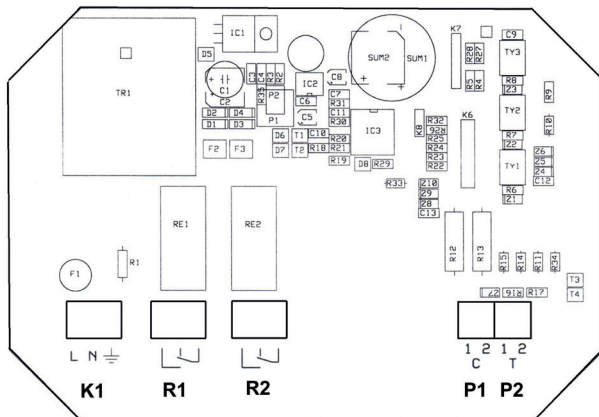
R1 is shown de-energised. (With power supply off or in the alarm condition which gives Fail Safe operation.)



**Jumper shown in pos 1  
for oil surface alarm only.  
(factory default setting)**

## Connection for oil surface and high level liquid alarms

**The unit is connected to capacitance probe ES 4 and thermistor probe RG.**



**K1: Connection power supply 230 VAC**

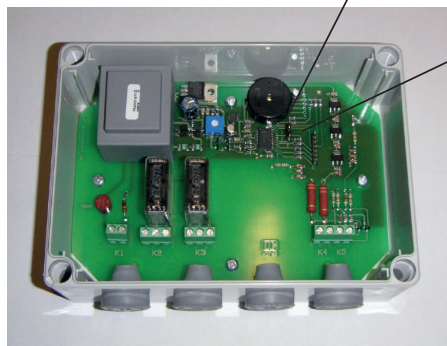
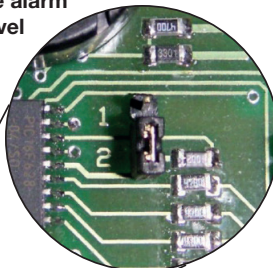
**R1 : Voltage-free relay contact for surface alarm**

**R2 : Voltage-free relay contact for high level alarm**

**P1 : Connection capacitance probe ES4**

**P2 : Connection thermistor probe R6**

R1 and R2 are shown in the de-energised state. (With power supply off or in an alarm condition, giving Fail Safe operation.)

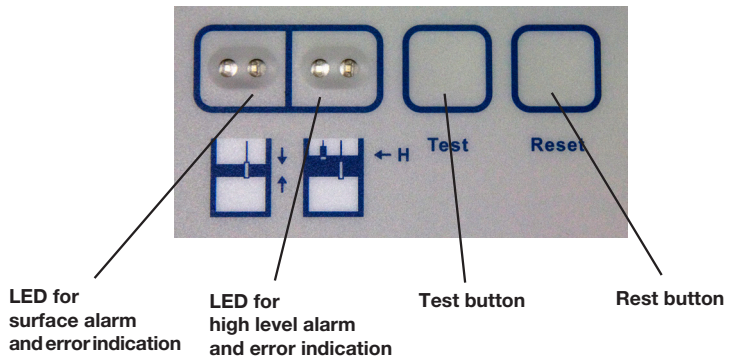


**Jumper in pos 2 for both surface and high level alarm**



## User instructions for ema Signal type OSA Alarm Unit

### Front buttons and LED indicators:



### Start Up

Connect the powersupply to the OSA unit. The unit will automatically perform a check of the sensor inputs and any alarms will be given within 30 seconds.

### Operating Information

**Normal:** No sensor alarms given. Green LED's for "surface" and "high" will be illuminated. Relays R1 and R2 will be energized.

**Oil surface alarm :** With an oil or grease surface alarm the red LED for "surface" will be illuminated and the internal buzzer sounds. Relay R1 will be de-energized.

**High level alarm :** When the liquid level in the separator reaches the R6 thermistor probe the red LED for "high" will be illuminated and the internal buzzer sounds. Relay R2 will be de-energized\*.

**Oil sensor alarm :** With a short circuit on the surface sensor input the red "surface" LED flashes at a rate of 1 Hz (quick flash), with an open circuit the flash rate is reduced to 1/3 Hz (slow flash). In either case the internal buzzer sounds and relay R1 will be de-energized\*.

**High level alarm :** With a short circuit on the high level sensor input the red "high" LED flashes at a rate of 1 Hz (quick flash), with an open circuit the flash rate is reduced to 1/3 Hz

(slow flash). In either case the internal buzzer sounds and relay R2 will be de-energized\*.

(\* = Fail safe operation)

Pressing the RESET pushbutton mutes the internal buzzer only, the operation of relay R1 and R2 is unaffected. The buzzer will sound again after approximately 20 hours if the alarm condition has not been corrected.

### Test function

The OSA unit has a built-in test function which as follows is used to test the alarm functions, the relay outputs and the LED indicators. The test is carried out as follows:

- Press the "TEST" pushbutton and hold for approximately 3 seconds. The following sequence will commence and the TEST pushbutton can be released -

- For 5 seconds the "surface alarm" will be given. The red "surface" LED will be illuminated and relay R1 will be de-energised.

- For the next 5 seconds the "high level" alarm will be given. The red "high" LED will be illuminated and relay R2 will be de-energised

**NOTE:** The internal buzzer will sound continuously during the 10 seconds of the test sequence. For the next 5 seconds no alarms will be given, the green LED's will be illuminated and relays R1 and R2 will be energised. After this sequence the unit will revert automatically to the normal operating condition.



## EU Declaration of Conformity

This declaration certifies that the below mentioned apparatus conforms to the essential requirement of the EMC directive 2014/30/EU, Low-Voltage directive (LVD) 2014/35/EU and ATEX directive 2014/34/EU.

**Description of the apparatus** : OSA - Separator Alarm

**Manufacturer :** Afriso Ema AB  
Kilvågen 2  
SE-232 37 Arlöv  
Sweden

The construction of appliance in accordance with the following standards :

### EMC:

|                               |   |
|-------------------------------|---|
| EN 61000-6-2 (2019)           | Electromagnetic compability, Generic standards - Immunity for industrial environments.  |
| EN 61000-6-3 (2007)/A11(2011) | Electromagnetic compability, Generic standards - Emission standard for residential, commercial and light-industrial environments. |

### LVD:

|                            |   |
|----------------------------|---|
| EN 61010-1 (2010)/A1(2019) | Safety requirements for electrical equipment for measurement, control and laboratory use. Part 1 : General requirements |
|----------------------------|---|

### ATEX:

|                       |  |
|-----------------------|--|
| EN IEC 60079-0 (2018) | Explosive atmospheres - Part 0 : General requirements                          |
| EN 60079-11 (2012)    | Explosive atmospheres - Part 11 : Equipment protection by intrinsic safety 'I' |

|                                  |   |
|----------------------------------|---|
| EC Type examination certificate: | SP 04ATEX3620X                            |
| Ex-classification                | (Ex)II (1) G [Ex ia Ga] IIB, Ta 0...+40°C |

|                            |                        |
|----------------------------|------------------------|
| Product Quality Assurance: | Presafe 18 ATEX 12341Q |
| Notification               |                        |

|               |                                |
|---------------|--------------------------------|
| Notified Body | DNV; Notified body number 2460 |
|---------------|--------------------------------|

Afriso Ema AB declares under our sole responsibility, that the equipment specified above conforms to the above mentioned Directives and Standards.

Date: 2021-05-24

Signed:

  
Jonas Ericson Nihlstop  
CEO

## Notes



**Afriso Ema AB**

Kilvägen 2 • SE-232 37 Arlöv • Sweden  
Phone +46-(0)40-92 20 50 • Fax +46-(0)40-19 33 58  
[www.afriso.se](http://www.afriso.se)