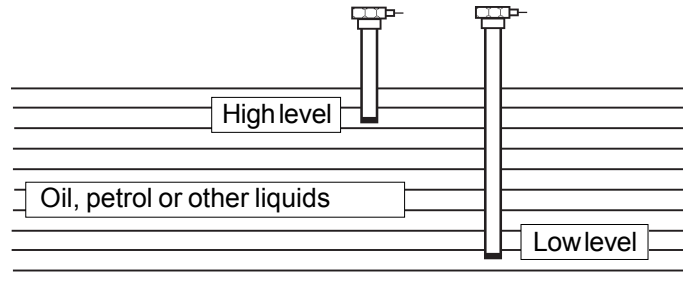




Kilvägen 2  
232 37 Arlöv  
Tel 040-92 20 50  
Fax 040-19 33 58  
info@afriso.se

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



## User - Manual



**Level monitoring systems  
Type ES31, ES32, ES31K, ES32K**

### **ES3 :**

**Control unit for level monitoring ES3 & ES3K**

**For use together with type approved thermistor probes**

- × Read the instructions before installation!
- × Observe all safety instructions!
- × Keep the instructions for future!

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## 1 DECLARATION OF CONFORMITY

### 1.1 Declaration of conformity for control unit ema Signal ES3



Declaration of conformity

level control unit type ES3 230 V, 50 Hz for thermistor probes

This is to certify that the above named product fully complies with the requirements of the normative sections of the following harmonized European standards.

Emission according to EN 50081-1

Immunity according to EN 50082-2

Signed:  Urban Nilsson

Position: Technical Manager

Date : 2006-10-12

## 2 DESCRIPTION

### 2.1 System components

Electronic unit ES3 is a universal control unit to be connected to type approved thermistor probes.

The version ES3K has a built-in muteable audible alarm.

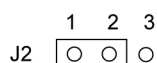
### 2.2 Description

The electronic unit ES31 is designed for wall mounting. When the unit is connected to a thermistor it may be configured to either a high level alarm (e.g as an overfill prevention) or a low level alarm (e.g as a tank leak indication)

## 2.3 Function

The sensor output is intrinsically safe.

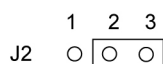
The unit is fitted with a link on the PCB (inaccessible from the outside) for changing between high level and low level signals.



**High level signal:** link fitted between **1** and **2** on **J2**

Red LED on : The sensor is cold either through being immersed in oil, petrol or other liquids or due to an open or short circuit in the sensor leads. The output relay is de-energized.

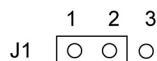
Green LED on : The sensor is uncovered. The output relay is energized.



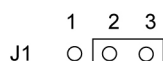
**Low level signal:** link fitted between **2** and **3** on **J2**

Red LED on : The sensor is either uncovered, or there is an open or short circuit in the sensor leads. The output relay is de-energized.

Green LED on : The sensor is cold through being immersed in oil. The output relay is de-energized.



The unit may be configured either as a type ES31 for "cold products" (-25°C to +50°C e.g. petrol or diesel), or as type ES32 for "hot products" (+20°C to +80°C e.g. crude oil).



The selection of the "cold" or "warm" ranges is achieved via links on the PCB. The **cold range** (-25°C - +50°C) is selected by linking pins **1** and **2** on connector block **J1**.

The **warm range** (+20°C to +50°C) is selected by linking pins **2** and **3** on connector block **J1**.

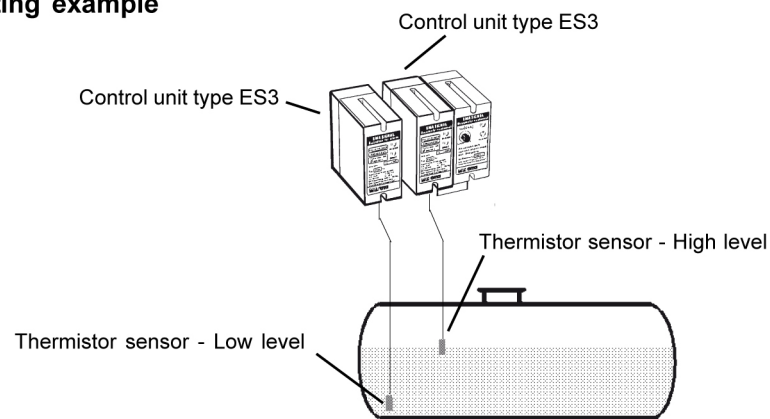
The ES3 is fitted with a label indicating the temperature range for which the unit has been set.

All internal links for the ES31 and ES32, for overfill prevention are factory set.

## 2.4 Specification

Intrinsically safe	$\text{Ex}$ II (1) G [EEx ia] II B
I.S Parameters	$C_0$ : 0,80 $\mu\text{F}$ $L_0$ : 5,0 mH $I_0$ : 170 mA $U_0$ : 25,0 V $P_0$ : 1,1 W
Supply	230 V, 50 Hz
Relay output	$U_{\text{max}}$ 230 V $I_{\text{max}}$ 4 A max 100 VA
Ambient teomperature	$\pm 0 - +50^\circ\text{C}$
Housing	IP 40

## 2.5 Mounting example



## 3 INSTALLATION ES3

### 3.1 General

The installataion must be carried out by authorized personel.

The unit is designed for wall-mounting.

The unit must be mounted in the safe area (non Ex).

### 3.2 Mounting

The ES3 units's housing has a protection rating of IP40 and must only be mounted in dry rooms. If moisture is present, the unit must be mounted in an weatherproof enclosure with a protection rating of at least IP 55.

The unit has 2 fixing holes for mounting directly onto the wall with screws.

The unit may also be mounted onto symmetric DIN rail, type S-35 by means of a mounting clip screwed to the unit's base.

### 3.3 Wiring

All wiring between the sensor and the ES3 must comply with regulations EN 60079-14, EN 60079-20. If the sensor has an integral cable this must be connected in accordance with the wiring diagram. If the cable between the sensor and the ES3 unit has to be extended then a 1,5mm<sup>2</sup> two-core screened cable should be used. The intrinsically safe circuit is not allowed to be grounded.

Make the connections according to the wiring diagram on page 8. The power supply connection on terminal 11 and 12, where 11 is phase and 12 is neutral. The probe is connected on terminal 1 and 2, where blue cable or cable marked '2' is connected to terminal 1. The brown cable or cable marked '1' is connected to terminal 2.

### 3.4 Commissioning checks

Check that all wiring to the ES3 unit is in accordance with the wiring diagram. An open circuit or short circuit in the sensor cable will give an alarm signal when the unit is switched on.

Check that cable of the correct type and rating has been used.

Check that the correct alarm level has been selected. For high level alarms pins 1 and 2 on connector J2 on the PCB must be linked, and for low level alarms pins 2 and 3 must be linked.

Carefully plug the ES3 unit into the base ensuring that the PCB edge connector makes correct contact with and does not damage any of the terminals.

### 3.5 Operation

High level alarm:

Switch on the supply voltage to the ES3 unit. If the sensor is immersed in liquid the red LED will come on immediately, and will remain on so long as the sensor is immersed in liquid.

If the sensor is in air, then after a sensor warm-up of around 15 seconds, the red LED will go out and the green LED will light up.

If the unit is of ES3-K type with a built-in audible alarm the buzzer can be turned off by pressing the reset button.

For a low level alarm setting the operation will be the reverse of the above.

### 3.6 Warning!



The supply voltage must be switched off prior to unplugging the ES3 unit from its base.

Failure to do so may result in damage to the electronic circuitry, and will also expose the user to dangerous voltages present in the base of the unit.

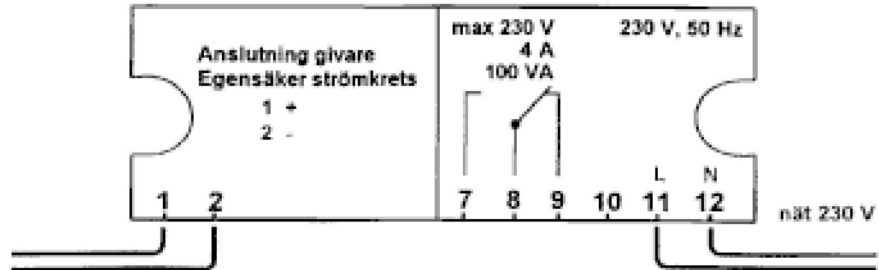
The electronic unit must be mounted in the safe area.

### 3.7 Service and maintenance

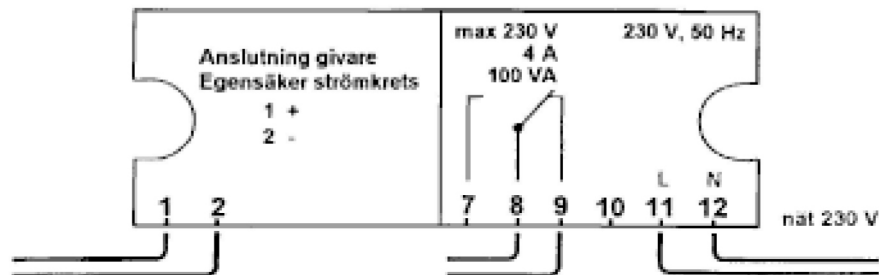
There are no user-serviceable parts, if either repairs or maintenance are required the units must be returned to the supplier.

### 3.8 System wiring diagrams

ES 31 / ES 32 without extra alarm output



ES 31 / ES 32 with voltage free output for alarm panel etc.





## 4 CERTIFICATE

### 4.1 Certificate ES3



**CERTIFICATE**  
Certificate issued by a Notified Body

**SP 03ATEX3610X**  
(17 06 15)



#### (1) EC-TYPE EXAMINATION CERTIFICATE

(2) **Equipment or Protective System intended for use in Potentially Explosive Atmospheres**  
**Directive 94/9/EC**

(3) EC-Type Examination Certificate Number: **SP 03ATEX3610X**

(4) Equipment or Protective System: Level surveillance equipment of types ES31, ES32 and ES33

(5) Applicant (manufacturer): **AFRISO EMA AB**

(6) Address: **Singelgatan 2, SE-212 28 Malmö, Sweden**

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) SP, Notified Body No. 0402 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.

The examination and test results are recorded in a confidential report No. P300337.C

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

- EN 50014:1997 + A1...A2 (SS-EN 50014 ed. 4 + A1...A2)
- EN 50020:2002 (SS-EN 50020 ed. 5)
- EN 50284:1999 (SS-EN 50284 ed. 1)

(10) If the sign "N" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC Type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

(12) The marking of the equipment or protective system shall include the following

**II (1) G [EEEx ia] HD**

Borås 9 October 2003

**SP Swedish National Testing and Research Institute**  
**Certification**

Lena Johansson  
Certification manager

Åke Månsson  
Certification officer

SP (Swedish) National Testing and Research Institute, Box 857, SE-501 15 BORÅS, Sweden, Telephone +46 30-10 03 00, Fax +46 30-10 30 02  
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