



# Control unit for liquid level sensor

## AS51-E24 Safety Alarm Switch



- Monitoring for leakage or overfilling
- Monitoring of electro-optical AF\*- fluid sensors AF\*
- One relay output
- 19" Rack installation

### Location

The aquasant® control unit AS51-E24 is used in combination with an AF\* fluid sensor. With an appropriate material choice for the fluid sensor, the control unit can monitor almost every liquid. The sensor wiring circuit can be used in hazardous areas. Liquid levels for petrol, mineral oils, acids, alkaline solutions, solvents and other chemicals can be safely monitored for high-level indication. It can also easily be used with most liquids in the food industry.

Possible applications: Containers, tanks, tankers, drain channels, clarification plants, sewage processing plants, pools, weighing tanks, pipelines, filling devices, water supply facilities, water overflows, oil separators, leakage monitoring for collecting trays, room monitoring, dry-running protection for pumps etc.



## Overview

- Overfill protection with fluid sensor
- Monitored measured value processing
- 19 "slide-in cassette 3 HE / 3 TE (European format)
- Supply 24 VAC/DC  $\pm$  10% 50/60 Hz
- One limit value relay output with double potential-free changeover switch
- With a measurement input for AF\* fluid sensor

Ex application:

SEV 18 ATEX 0118 X Ex II (1) G [Ex ia Ga] IIC

## Basic function

The AS51-E24 is a self-monitoring control unit with a fail-safe sensor wiring circuit. With a suitable AF fluid sensor, levels can be recorded, controlled and monitored for any liquid. Two potential-free changeover switches are available as an output. By pressing the test button, the limit value outputs (relays) and the red LED of the control unit can be checked for correct function.

## Measuring inputs

The measuring system consists of a fluid sensor (without on-site transmitter module VE9) with a probe head, which is connected via 3-core cable to the AS51 control unit in the non-Ex zone. A potential equalization line must be installed between the earthing of the installation room and the control room.

## Measuring principle

In the case of gaseous media at the glass cone, the IR light beam is visually totally reflected in the 90° glass cone, in accordance with the law of refraction (incidence angle  $\alpha$  = refraction angle  $\alpha$ ). Double total reflection returns the IR light beam to the receiver; the signal is evaluated as good condition.

If the sensor tip is immersed in liquid, the IR light beam is broken at the boundary layer and enters the liquid. As a result, the IR light beam is interrupted; a high-level indication is displayed.

## Wiring

3-core cable 0.75 mm<sup>2</sup> EIG the cable length for Ex ia application up to max. 1000 m

## Connection

The following aquasant® IR fluid sensors can be used for Ex-applications:

- AF1S, AF21, AF22, AF23, AF33, AF35, AF42.
- AF\* fluid sensors without VE9 on-site transmitter module

In non-hazardous areas, AF6 and AF26 fluid sensors can also be used.

## Technical data

### Design type

Electronics in Euroformat 19 "technology, IP 20

### Mounting

19"-Rack RAS51

### Function

When the limit value has been reached, the red LED lights up, the acknowledgeable acoustic signalling device sounds (can be activated), as well as one relay output (energized by alarm). A second independent alarm relay with two changeover switches drops out (de-energized during alarm).

### Operation/Display

Front panel with red (alarm) LED, one push buttons for function control

### Dimensions

Height x Width x Depth 132 x 71 x 137 mm

### Weight

170 g

### Supply voltage

24 V AC / DC  $\pm$  10%, reverse polarity protected safety extra low voltage (SELV)

### Start-up current

Current consumption min. 3VA

### Power consumption

P = 3 VA

### Fuses

Miniature fuse 8.5 mm, time-lag 400 mA

### Hazardous area supply/Signal transmission

$U_m$  115/230 VAC

[Ex ia] IIC, modulated pulse supply signal

Open circuit voltage  $U_0 \leq 7.2$  V

Short-circuit current  $I_0 \leq 89$  mA

Max. internal open circuit voltage  $C_1 = 3.6$  nF



Signal wiring circuit Ex

Max. external inductance

Max outer capacity

IIC

$L_0 \leq 1.6$  mH

$C_0 \leq 1.5$   $\mu$ F

IIB

$L_0 \leq 5$  mH

$C_0 \leq 9.2$   $\mu$ F

### Signal transmission

1 measuring circuit, modulated pulse supply signal

### Signal line short-circuit

max. current consumption 160 mA

### Ambient temperature

-20 °C ... +55 °C

### Storage temperature

-20 °C ... +60 °C, ideally +20 °C

### Response delay

1 second  $\pm$ 50%

### Connection

FI32 female connector

### Relay output

1 relays with potential-free switch-over contact for alarm status level high.

### Switching voltage relay – output

Max. 0.5 A, 48 VAC, 50 VA

### Continuous current relay – output

alarm relay 0.5 A

### Breaking capacity relay – output

50W

### Monitoring

Self-monitoring measuring system: defective probe, short-circuit/interrupted Ex supply (wire break protection), mains failure and AS\* malfunctions

### Testing

SEV 18 ATEX 0118 X

Gas II (1) G [Ex ia Ga] IIC



RL 2014/34/EU

Test report no.: 17-Ex-0016.01

The control unit must be installed outside the hazardous area.

### Fail-safe hazardous area connection:

AF\* fluid sensor

EN 61000-6-2 2005 EN 6100-6-4: 2007

EN 60079-0:12 + A11:13 EN 60079-11:12



## Terminals

It must be ensured that the total cable length does not exceed 1000 m. The control unit must be connected to the protective earth. The cable shield may only be connected on one side. When connecting the AF\* sensor, Ex regulations must be observed!

See operating manual AS\*, Chapter "Safety instructions for Ex versions".

