aquasant

TECHNICAL DOCUMENTATION

Control unit for liquid level sensor

AS1.3 Safety Alarm Switch

- Monitoring for leakage or overfilling
- Monitoring of electro-optical AF*- fluid sensors AF*
- Two relay outputs
- Wall installation
- Buzzer and one relay output can be acknowledged

Location

The aquasant® control unit AS1.3 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
- Surface-mounted housing
- Supply 115/230VAC 50/60 Hz
- One limit value relay output with double potential-free changeover switch
- One relay output with acknowledgement for ext. horn
- Acknowledgeable internal alarm buzzer
- 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 AS1.3 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. As an additional function, an acknowledgeable internal acoustic signalling device is available via a button. This can also be deactivated. An external horn can be operated via a potential-free changeover switch (relay). By pressing the test button, the limit value outputs (relays), the red LED and the alarm buzzer 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 AS1.3 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 α = refraction angle α). 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 bream is interrupted; a high-level indication is displayed.

Wiring

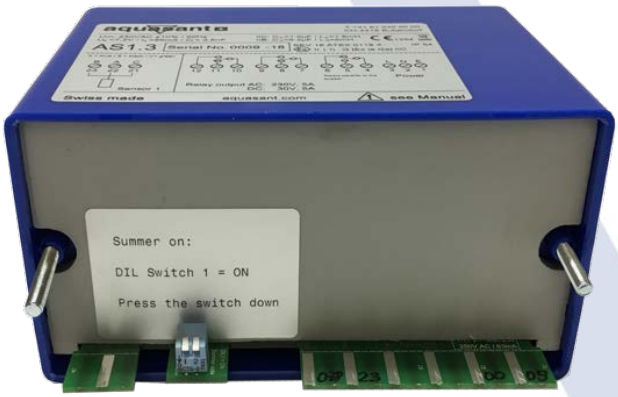
2-core cable 0.75 mm^2 EIG the cable length for Ex ia application up to max. 1000 m

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
Electronic unit in plastic PA66 surface-mounted housing, IP 54

Mounting
Surface-mounted housing for wall mounting with two holes. 6 cable bushings

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) and green (mains on) LEDs, 2 push buttons for function control and acknowledgement

Dimensions
Height x Width x Depth 132 x 71 x 137 mm

Weight
530 g

Supply voltage
115/230 VAC ± 10% 50/60 Hz

Start-up current
Current consumption min. 20 mA AC

Power consumption
P = 5 VA

Fuses
Miniature fuse 8.5 mm, time-lag T 250VAC, 63VDC, 63 mA

Hazardous area supply/Signal transmission

U_m 115/230 VAC
[Ex ia] IIC, modulated pulse supply signal
Open circuit voltage U_0 ≤7.2 V
Short-circuit current I_0 ≤89 mA
Max. internal open circuit voltage C_i = 3.6 nF

Signal wiring circuit Ex	IIC	IIB
Max. external inductance		L_0 ≤1.6 mH
	L_0 ≤5 mH	
Max outer capacity	C_0 ≤1.5uF	C_0 ≤9.2uF

Signal transmission
1 measuring circuit, modulated pulse supply signal

Signal line short-circuit
max. current consumption 160 mA

Ambient temperature
-20 °C ... +40 °C

Storage temperature
-20 °C ... +60 °C, ideally +20 °C

Response delay
1 second ±50%

Connection
Terminals 2.5 mm2

Relay output
2 relays with potential-free switch-over contact for alarm status level high.

Switching voltage relay – output
250 V AC /(30VDC)

Continuous current relay – output
alarm relay 5 A
acknowledgeable relay 10 A

Breaking capacity relay – output
alarm relay 1250 VA / (150W at 30VDC)
acknowledgeable relay 2500 VA / (300W at 30VDC)

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

Testing

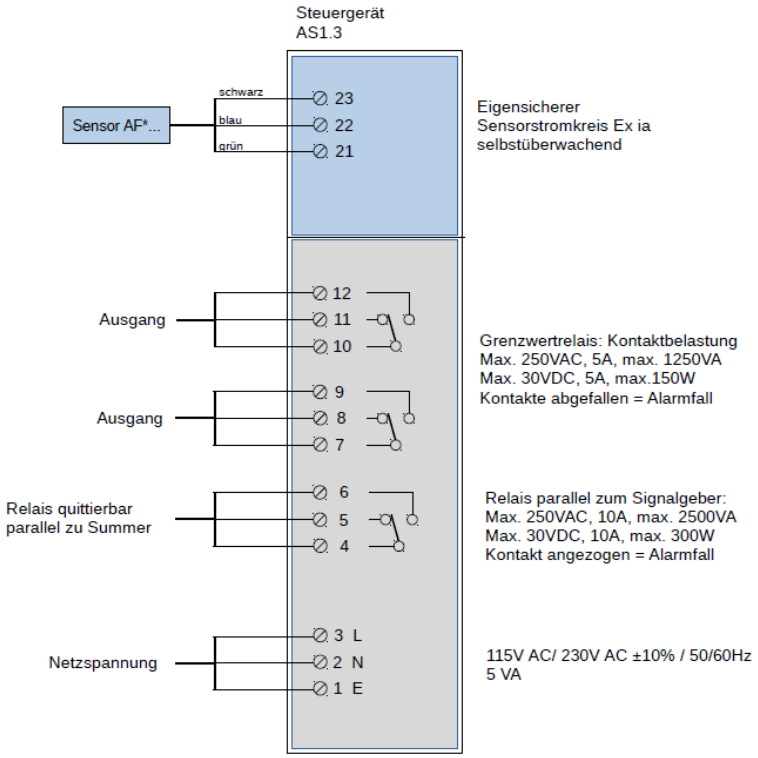
SEV 18 ATEX 0118 X
Gas II (1) G [Ex ia Ga] IIC
RL 2014/34/EU
Test report no.: 17-Ex-0016.01
The control unit must be installed outside the hazardous area.

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!

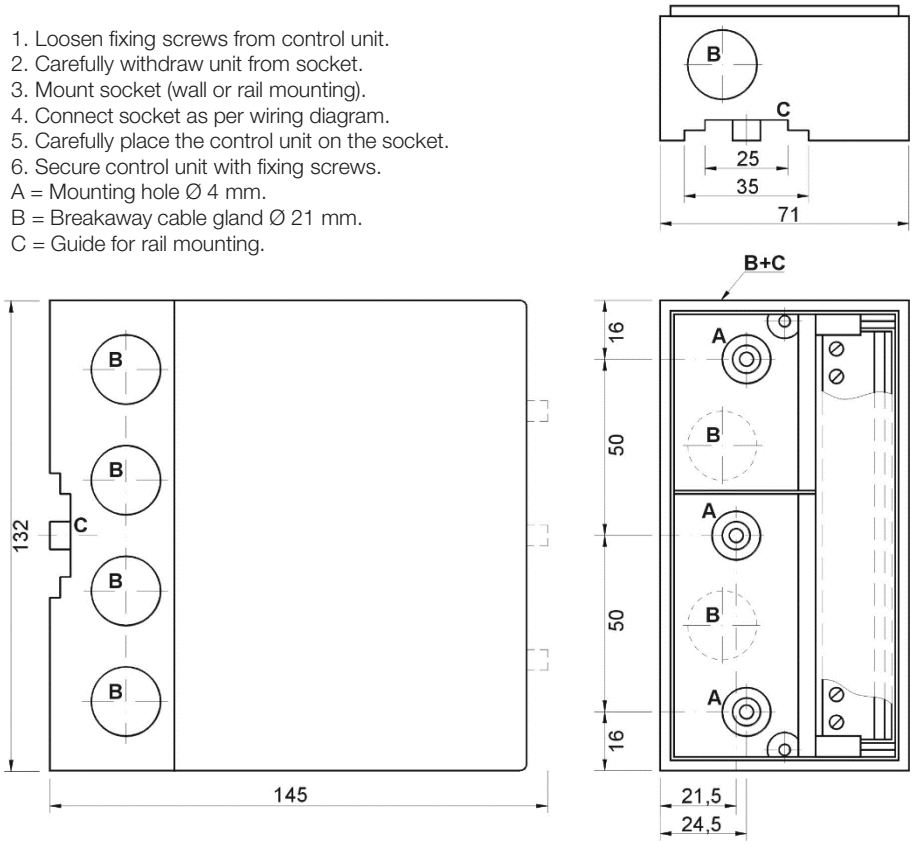
See operating manual AS1*, Chapter “Safety instructions for Ex versions”.



Socket mounting

1. Loosen fixing screws from control unit.
2. Carefully withdraw unit from socket.
3. Mount socket (wall or rail mounting).
4. Connect socket as per wiring diagram.
5. Carefully place the control unit on the socket.
6. Secure control unit with fixing screws.

A = Mounting hole Ø 4 mm.
B = Breakaway cable gland Ø 21 mm.
C = Guide for rail mounting.



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