Test report on explosion protection

No. SILZ 21B001

Manufacturer and customer	Reed Electronics AG Gewebering 2 CH-6105 Schachen
Order	dd. November 2, 2020
Testing time	from January till March 2021
Testing location	SILZ – Engineering office Buchtalstraße 11 D-72461 Albstadt
Tester	Dipl.-Ing. (FH) Wilfried Silz
Tested products	**Reed-Chain level sensor** Type: **RCK-EX...** **Float switch** Type: **RCS-EX...**
Test specification	EN IEC 60079-0:2018 Explosive atmospheres Part 0: Equipment – General requirements EN 60079-11:2012 Explosive atmospheres Part 11: Equipment protection by intrinsic safety "i"
Task	Repeat testing due to new device variants and the new harmonized standard EN IEC 60079-0:2018 Requirements: **Ex ia IIC T6...T4 Ga** For connection box additionally **Ex ib IIIC T_a Db**
Test result	The test results show that the devices meet the test specifications. According to ENTR/G/3/DE D(2003) of the European Commission, they do not come under Directive 2014/34/EU for devices to be used in potentially explosive atmospheres because the definition in Chapter 5.7 of EN 60079-11:2012 applies. Thus, all device markings according to the test specification are not mandatory.

Description of the products

The products are used to determine levels of flammable liquids in containers. A floating body with a built-in magnet slides along a submerged tube in which there are reed contacts. Different reed contacts are magnetically switched depending on the fill level. In addition, a temperature switch can be installed that responds at a specified liquid temperature.

The RCS-EX... float switch has pre-set switching points for the liquid level. In case of RCS-EX-FLEX type, the guide tube is flexible. It is made of electrostatically dissipative plastic.

The RCK-EX... reed-chain level sensor contains a chain of resistors with evenly distributed resistances. Between every resistor a pole of a reed contact is connected. Depending on the filling level, a certain reed contact is switched on which picks up the voltage from the resistor chain.

The products are available in two connection types:

- Either with a connection box for mounting on the container. The guide tube is firmly attached to the box.
- Or with a permanently attached cable to the guide tube. The cable can also run in the container.

Technical data

Temperature range of liquid and the environment T_a	from -20 °C to +80 °C optionally up to 125 °C
Guide tube length	up to 6 m

Intrinsic safety data Ex ia IIC T6...T4 Ga and Ex ib IIIC T_a Db

Maximum applied voltage	U_i = 30 V
Maximum fed current	I_i = 300 mA
Maximum fed power	P_i acc. to tables
Internal capacity is negligible	C_i = 0
Internal inductivity is negligible	L_i = 0
Cable capacity: Conductor - Conductor	C_C = 100 pF/m
Cable inductivity: Conductor - Conductor	L_C = 1 µH/m

The connections are safely insulated from earth.

Intrinsic safety data Ex ia IIC T6 Ga
depending on the liquid and ambient temperature T_a

T_a	to 32 °C	40 °C	50 °C	60 °C	68 °C
P_i for T6	0.4 W	0.33 W	0.25 W	0.16 W	0.1 W

Intrinsic safety data Ex ia IIC T4 Ga
depending on the liquid and ambient temperature T_a

T_a	to 70 °C	80 °C	90 °C	100 °C	110 °C	120 °C	125 °C
P_i for T4	0.4 W	0.353 W	0.306 W	0.259 W	0.212 W	0.165 W	0.1 W

Intrinsic safety data Ex ib IIIC T_a Db

Regardless of P_i, there is no significant self-heating outside the container – with the terminal box and the connection cable.

Changes compared to the previous certificate

No. 713073920 dd. 18.07.2016
issued by TÜV SÜD Product Service GmbH, D-70794 Filderstadt

- According to 26.5.1.3 EN IEC 60079-0:2018, the requirement for Ex ia IIIC ... has been increased which is why Ex ib IIIC ... has been used. This is sufficient.
- According to 29.4 or 29.5 EN IEC 60079-0:2018, the equipment protection level is added to the device marking at the end: Ex ia IIC T6...T4 Ga or Ex ib IIIC T_a Db.

Standards protocols SILZ 21B001-0 and SILZ 21B001-1

In addition to EN 60079-14, the following must be observed for the safe use of the products:

1. In order to dissipate electrostatic charges, the guide tube and the connection box need contact with the earthed container.
2. Earth conductors whose potentials are not balanced with the container must not be led into the container.
3. Ignitable sparks are possible due to impacts on the aluminium connection box. This must be taken into account when installing in Zone 0.
4. In order to prevent dangerous charging of the connection box, it must not be wiped dry in areas that are potentially explosive due to gas group IIC.
5. Charging of the products by highly effective processes must be ruled out: fast moving particles along the connection box as occurs with pneumatically conveyed dust, flowing liquids or droplets. Charges are also be excluded from free electrons or ions which e.g. occur in electrostatic painting.

Test documents

Certificate No. 713073920 issued by TÜV SÜD with technical reports No. 713073920-1 and No. 713073920-2
Product data sheet RCKEx-ALDGR1.5"-EK1 5-L1 100-E44Z-T6...T3
RCS-EX-R3/8"EO-L65-E27Z-5mPVC/S-T6...T3
RCS-EX-ALDR1"-Exx-L1 60-E2 7Z-T6
Drawing RCS-EX-FLEX-**** No. 18175 A
Drawing RCK-EX No. RCK-Ex07
Drawing RCK-Ex No. RCK-Ex09
Drawing RCK-EX Part 1 No. RCK-Ex10
Drawing RCK-EX Part 2 No. RCK-Ex11
Drawing RCK-Ex-K No. RCK-Ex A
Drawing RCS-Ex-K No. 16469 A
Data sheets: Reed contacts, temperature switches, resistors, potting compounds, cables, printed circuit board, insulating tubes, nameplate materials, terminals, cable glands, connection box

SILZ – Engineering office: Buchtalstraße 11, D-72461 Albstadt, May 20, 2021

Wilfried Silz

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