OPTISWITCH 5300 C
VF534. IE***(*)R/S/T/I/Z/L*****

Vibrating Level Switch

IECEx BVS 15.0110
Ex db IIC T6 ... T1 Ga/Gb, Gb
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Please note:
These safety instructions are part of the operating instructions:

• 48075 - OPTISWITCH 5300 C - Relay
• 48076 - OPTISWITCH 5300 C - Transistor (NPN/PNP)
• 48074 - OPTISWITCH 5300 C - Two-wire
• 48559 - Certificate of Conformity IECEx BVS 15.0110

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1 Area of applicability

These safety instructions apply to the vibrating level switches OPTISWITCH 5300C VF534.IE**(*)R/S/T/I/Z/L***** according to EG type approval certificate Certificate of Conformity IECEx BVS 15.0110 (certificate number on the type label) and to all instruments with the number of the safety instruction (48558) on the type label.

2 General information

The OPTISWITCH 5300C VF534.IE**(*)R/S/T/I/Z/L***** are used for monitoring or control of levels in hazardous areas, also when combustible liquids, gases, mist or vapours are present.

The OPTISWITCH 5300C VF534.IE**(*)R/S/T/I/Z/L***** are suitable for use in hazardous atmospheres of all combustible materials of explosion group IIA, IIB and IIC for applications requiring instruments of type EPL-Ga/Gb or EPL-Gb.

If the OPTISWITCH 5300C VF534.IE**(*)R/S/T/I/Z/L***** are installed and operated in hazardous areas, the general Ex installation regulations IEC 60079-14 as well as these safety instructions must be observed.

The installation of explosion-endangered systems must always be carried out by qualified personnel.

EPL-Ga/Gb instrument

The electronics housing is installed in hazardous areas requiring instruments of type EPL-Gb. The process connection elements are installed in the separating wall, which separates areas requiring instruments of type EPL-Gb or EPL-Ga. The sensor with the mechanical fixing element is installed in hazardous areas requiring instruments of type EPL-Ga.

EPL-Gb instrument

The OPTISWITCH 5300C VF534.IE**(*)R/S/T/I/Z/L***** are installed in hazardous areas requiring a EPL-Gb instrument.

3 Technical data

Electrical data

OPTISWITCH 5300C VF534.IE**(*)R/S with integrated electronics module SG60HT-R/S

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage supply: (terminals 1, 2)</td>
<td>U = 20 … 253 V AC, 50/60 Hz</td>
</tr>
<tr>
<td></td>
<td>U = 20 … 72 V DC</td>
</tr>
<tr>
<td></td>
<td>Uₘ = 253 V AC</td>
</tr>
<tr>
<td>Power consumption:</td>
<td>max. 3 VA, max. 1 W</td>
</tr>
<tr>
<td>Relay circuit: contact set 1 (terminals 3,</td>
<td>Maximum values:</td>
</tr>
<tr>
<td>4, 5), contact set 2 (terminals 6, 7, 8)</td>
<td>AC max. 253 V, 5 A, 1250 VA</td>
</tr>
<tr>
<td></td>
<td>DC max. 253 V, 1 A, 40 W</td>
</tr>
</tbody>
</table>

OPTISWITCH 5300C VF534.IE**(*)T/I with integrated electronics module SG60HT-T/I

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voltage supply: (terminals 1, 4)</td>
<td>U = 9.6 … 55 V DC</td>
</tr>
<tr>
<td></td>
<td>Uₘ = 253 V AC</td>
</tr>
<tr>
<td>Power consumption:</td>
<td>max. 2 W</td>
</tr>
<tr>
<td>Load current, transistor output (NPN/</td>
<td>max. 400 mA, 55 V DC</td>
</tr>
<tr>
<td>PNP): (terminals 2, 3)</td>
<td></td>
</tr>
</tbody>
</table>
OPTISWITCH 5300C VF534.IE***(*)Z/L with integrated electronics module SG60HT-Z/L

Power supply and signal circuit: (terminal \( U_i = 9.6 \ldots 35 \text{ V DC} \))
1+, 2-)\[ \text{U}_m = 253 \text{ V AC} \]

The metallic parts of the level switches are electrically connected with the internal and the external earth terminals.

4 Application conditions

Permissible ambient temperatures
The max. permissible ambient temperatures depending on the temperature class are specified in the following table.

EPL-Ga/Gb instrument

<table>
<thead>
<tr>
<th>Temperature class</th>
<th>Permissible ambient temperature on the electronics</th>
<th>Permissible ambient temperature on the sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>T6, T5, T4, T3, T2, T1</td>
<td>-50 ... +60 °C</td>
<td>-20 ... +60 °C</td>
</tr>
</tbody>
</table>

If the sensors of OPTISWITCH 5300C VF534.IE***(*)R/S/T/I/Z/L***** are operated at temperatures higher than those specified in the above table, please make sure through appropriate measures that there is no danger of ignition from the hot surfaces. The max. permissible temperature on the electronics/housing should not exceed the values specified in the above table. The application conditions when operating in the absence of explosive mixtures can be found in the operating instructions.

EPL-Gb instrument

<table>
<thead>
<tr>
<th>Temperature class</th>
<th>Permissible ambient temperature on the electronics</th>
<th>Permissible ambient temperature on the sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>T6</td>
<td>-50 ... +60 °C</td>
<td>-196 ... +85 °C</td>
</tr>
<tr>
<td>T5</td>
<td>-50 ... +60 °C</td>
<td>-196 ... +100 °C</td>
</tr>
<tr>
<td>T4</td>
<td>-50 ... +60 °C</td>
<td>-196 ... +200 °C</td>
</tr>
<tr>
<td>T3</td>
<td>-50 ... +60 °C</td>
<td>-196 ... +300 °C</td>
</tr>
<tr>
<td>T2</td>
<td>-50 ... +60 °C</td>
<td>-196 ... +450 °C</td>
</tr>
<tr>
<td>T1</td>
<td>-50 ... +60 °C</td>
<td>-196 ... +450 °C</td>
</tr>
</tbody>
</table>

If the sensors of OPTISWITCH 5300C VF534.IE***(*)R/S/T/I/Z/L***** are operated at temperatures higher than those specified in the above table, please make sure through appropriate measures that there is no danger of ignition from the hot surfaces. The max. permissible temperature on the electronics/housing should not exceed the values specified in the above table. The application conditions when operating in the absence of explosive mixtures can be found in the operating instructions.
Temperature derating for process temperatures up to +450 °C and -196 °C

5 Protection against static electricity

The OPTISWITCH 5300C VF534.IE**(*)R/S/T/I/Z/L***** in versions with electrostatically chargeable plastic parts, such as e.g. metal housing with inspection window, with plastic coated sensor or distance tube, have a caution label pointing out the safety measures that must be taken with regard to electrostatic charges during operation.

Caution: Plastic parts! Danger of electrostatic charging!

- Avoid friction
- No dry cleaning
- Construction/Installation: The OPTISWITCH 5300C VF534.IE**(*)R/S/T/I/Z/L***** must be constructed/installed in such a way that
  - electrostatic charges are ruled out during operation, maintenance and cleaning.
  - process-related electrostatic charges, e.g. by measuring media flowing past, are ruled out

6 Installation

The OPTISWITCH 5300C VF534.IE**(*)R/S/T/I/Z/L***** have to be mounted so that the sensor is effectively secured against bending or oscillating as well as contact of the sensor to the vessel wall, under consideration of the vessel installations and flow conditions in the vessel.

7 Impact and friction sparks

The OPTISWITCH 5300C VF534.IE**(*)R/S/T/I/Z/L***** must be mounted in such a way that sparks from impact and friction between aluminium and steel (except stainless steel, if the presence of rust particles can be excluded) cannot occur.

8 Grounding/Potential equalization

The "Ex-d" housing must be grounded. The external or internal ground connection terminal on the housing of OPTISWITCH 5300C VF534.IE**(*)R/S/T/I/Z/L***** serves for this purpose.

9 Use of an overvoltage arrester

If necessary, a suitable overvoltage arrester can be connected in front of the OPTISWITCH 5300C
When used as EPL-Ga/Gb instrument, as far as necessary analogue, a suitable overvoltage ar-
rester must be connected in front as protection against voltage surges according to IEC 60079-14
chapter 12.3.

10 Material resistance

For applications requiring instruments of category EPL-Ga/Gb the OPTISWITCH 5300C VF534.
IE**(*)R/S/T/I/Z/L***** should only be used in media against which the wetted materials are suf-
ficiently resistant.

11 Ignition protection type flameproof enclosure Ex "d"

The terminals for connecting the operating voltage or signal circuits are integrated in the terminal
compartment with protection type Flameproof Enclosure "d".

The gaps between housing and cover as well as between threaded fitting and container are igni-
tion-proof gaps.

The "Ex-d" connection compartment is provided with a M20 x 1.5 or ½-14 NPT thread for con-
nection to a certified "Conduit" system or for mounting a "Ex-d" cable entry certified according to
IEC 60079-1. Cable entries of simple construction may not be used. Please take note of section
13.1 and 13.2 of IEC 60079-1. When connecting to a "Conduit" system, the associated sealing facil-
ity must be located directly on the "Ex-d" connection compartment.

A certified "Ex-d" cable gland can optionally by supplied with the delivery. It is suitable for inser-
tion of armoured or unarmoured cables depending on the ordered version. The instructions in the
document accompanying the respective cable enty must be observed. The "Ex-d" cable entry must
be screwed tightly into the housing. The supplied cable entry is suitable for the housing temper-
ature range mentioned in the OPTISWITCH 5300C VF534.IE**(*)R/S/T/I/Z/L***** specification. If a
different cable entry is used, the separately certified cable entry or the temperature classes on the
electronics determines the maximum permissible ambient temperature on the housing.

The factory-installed screw plug or blind plug (depending on the type ordered) is part of the "Ex-d"
housing. If a screw plug type other than the factory-installed screw plug or the one with article num-
ber 2.30690 is used, it must be suitable for the function and certified according to IEC 60079-1.

Before opening the lid of the "Ex-d" terminal compartment or in case it is already open (e. g. during
connection or service work), make sure that either the supply cable is completely voltage free or no
explosive atmosphere is present.

When wiring the connection line to the "Ex-d" connection compartment, it must be sufficiently
secured against damage and in conformity with IEC 60079-14.

The connection cables, the cable entries and the closing screws or the pipeline sealing facilities
must be suitable for the lowest ambient temperature.

The cover of the "Ex-d" connection compartment must be screwed in completely before commis-
sioning and secured by screwing out the lid locking screw all the way to the stop.

Unused openings must be sealed according to IEC 60079-1 paragraph 11.9.

The cover of the "Ex-d" connection compartment is provided with the warning label "Do not open
when an explosive gas atmosphere is present".
Single chamber housing with "Ex-d" connection compartment

1. Thread protection
2. Locking screw of the lid
3. Screw plug
4. Marking of the thread
5. "Ex-d" connection compartment with electronics module
6. Optionally with inspection window
7. External ground terminal

12 Type and size of the threads for the "Ex-d" cable entries

The "Ex-d" connection compartment of OPTISWITCH 5300C VF534.IE***(*)R/S/T/I/Z/L*** has cable entries M20 x 1.5.

The "Ex-d" connection compartment of OPTISWITCH 5300C VF534.IE***(*)R/S/T/I/Z/L*** has cable entries ½-14 NPT.
KROHNE product overview

- Electromagnetic flowmeters
- Variable area flowmeters
- Ultrasonic flowmeters
- Mass flowmeters
- Vortex flowmeters
- Flow controllers
- Level meters
- Temperature assemblies
- Pressure transmitters
- Analysis products
- Products and systems for the oil and gas industry

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