OPTISWITCH5300 C VF534(*). CC/O****Z/L*****

Vibrating Level Switch

CSA 2883849
CL I Div 1, GP ABCD; CL II Div 1, GP EFG; CL III
Ex ia IIC T6 ... T1 Ga
CL I Zone 0, 0/1, 1 AEx ia IIC T6 ... T1 Ga
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Please note:
These safety instructions are part of the operating instructions:

- 43756 - OPTISWITCH5300 - Relay
- 43757 - OPTISWITCH5300 - Transistor (NPN/PNP)
- 43758 - OPTISWITCH5300 - Two-wire
- 51937 - Certificate of Conformity CSA 2883849

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1  Area of applicability
These safety instructions apply to the vibrating level switches OPTISWITCH5300C VF534(*)
CC/O****Z/L***** according to Certificate of Conformity CSA 15.xxxxx (certificate number on the
type label) and to all instruments with the number of the safety instruction (51936) on the type label.

2  General information
The OPTISWITCH5300C VF534(*) CC/O****Z/L***** are used for monitoring or control of levels in
hazardous areas, also when combustible liquids, gases, mist or vapours are present.
The OPTISWITCH5300C VF534(*) CC/O****Z/L***** are suitable for use in hazardous atmospheres
of all combustible materials.
If the OPTISWITCH5300C VF534(*) CC/O****Z/L***** are installed and operated in hazardous
areas, the general Ex installation regulations of the Canadian Electrical Code (Canada), National
Electrical Code 500/505 (USA) as well as these safety instructions must be observed.
The installation of explosion-endangered systems must always be carried out by qualified personnel.

Class I Zone 0 applications
The OPTISWITCH5300C VF534(*) CC/O****Z/L***** are installed in areas requiring EPL-Ga instru-
ments.

Class I, Zone 0/1 applications
The electronics housing is installed in Zone 0/1 / Division 1 applications. The process connection
elements are installed in the separating wall, which separates areas requiring instruments of type
EPL-Ga or EPL-Gb. The sensor with the mechanical fixing element is installed in hazardous areas
requiring instruments of type EPL-Ga.

EPL-Gb instrument
The OPTISWITCH5300C VF534(*) CC/O****Z/L***** are installed in hazardous areas requiring a
EPL-Gb instrument.

3  Technical data

Electrical data
The OPTISWITCH5300C VF534(*) CC/O****Z/L***** have intrinsically safe circuits. These intrinsi-
cally safe circuits are connected to terminals which are located in an "Ex i" connection compart-
ment.

Supply and signal circuit
Terminals 1[+], 2[-] In ignition protection type intrinsic safety Ex ia IIIC/IIB
Only for connection to a certified, intrinsically safe circuit.
Maximum values:
  • $U_i = 30 \text{ V}$
  • $I_i = 131 \text{ mA}$
  • $P_i = 983 \text{ mW}$
  • $C_i =$ negligibly small
  • $L_i =$ negligibly small

The intrinsically safe circuits are electrically separated from parts which can be grounded.
The metallic parts of OPTISWITCH5300C VF534(*) CC/O****Z/L***** are electrically connected
with the earth terminals.
The intrinsically safe power supply and signal circuit must correspond to protection class ia.
For Zone 0/1 / Division 1 applications OPTISWITCH5300C VF534(*) .CC/O****Z/L***** is preferably connected to appropriate instruments with electrically isolated, intrinsically safe circuits.

For Zone 1/Division 1 applications, the intrinsically safe power supply and signal circuit can correspond to protection class ia or ib. For connection to a circuit with protection class ib, the ignition protection type identification is Ex ib IIC T6.

4 Application conditions

Permissible ambient temperatures

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

Class I Zone 0 applications

<table>
<thead>
<tr>
<th>Temperature class</th>
<th>Permissible ambient temperature on the sensor and electronics</th>
</tr>
</thead>
<tbody>
<tr>
<td>T5</td>
<td>-20 ... +45 °C</td>
</tr>
<tr>
<td>T4, T3, T2, T1</td>
<td>-20 ... +60 °C</td>
</tr>
</tbody>
</table>

Under explosive atmosphere on the sensor and temperatures according to temperature classes T5 ... T1 only pressures from 0.8 to 1.1 bar are permitted.

The prerequisites for operation in the absence of explosive mixtures can be found in the manufacturer specifications.

Class I, Zone 0/1 applications

<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 ... +49 °C</td>
<td>-20 ... +60 °C</td>
</tr>
<tr>
<td>T5</td>
<td>-50 ... +64 °C</td>
<td>-20 ... +60 °C</td>
</tr>
<tr>
<td>T4, T3, T2, T1</td>
<td>-50 ... +70 °C</td>
<td>-20 ... +60 °C</td>
</tr>
</tbody>
</table>

If the sensors of OPTISWITCH5300C VF534(*) .CC/O****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.

Zone 1/Division 1 applications

<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 ... +49 °C</td>
<td>-196 ... +85 °C</td>
</tr>
<tr>
<td>T5</td>
<td>-50 ... +64 °C</td>
<td>-196 ... +100 °C</td>
</tr>
<tr>
<td>T4</td>
<td>-50 ... +70 °C</td>
<td>-196 ... +135 °C</td>
</tr>
<tr>
<td>T3</td>
<td>-50 ... +70 °C</td>
<td>-196 ... +200 °C</td>
</tr>
<tr>
<td>T2</td>
<td>-50 ... +70 °C</td>
<td>-196 ... +300 °C</td>
</tr>
<tr>
<td>T1</td>
<td>-50 ... +70 °C</td>
<td>-196 ... +450 °C</td>
</tr>
</tbody>
</table>

If the sensors of OPTISWITCH5300C VF534(*) .CC/O****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 OPTISWITCH5300C VF534(∗).CC/O****Z/L***** in versions with electrostatically chargeable plastic parts, such as e.g. plastic housing, metal housing with inspection window, with plastic coated sensors 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
- Do not mount in areas with flowing, non-conductive products

6 Installation
The OPTISWITCH5300C VF534(∗).CC/O****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 OPTISWITCH5300C VF534(∗).CC/O****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 Potential equalisation
OPTISWITCH5300C VF534(∗).CC/O****Z/L***** must be electrostatically connected to the local potential equalisation (transfer resistance ≤ 1 MΩ) e. g. via the ground terminal.
9 Use of an overvoltage arrester

If necessary, the OPTISWITCH5300C VF534(*) CC/O****Z/L***** can be connected to an overvoltage arrester, e.g. type B62-36G from VEGA.

If the OPTISWITCH5300C VF534(*) CC/O****Z/L***** are in Class I, Zone 0/1 applications, overvoltage protection measures according to IEC 60079-14 chapter 12.3 are not required.

When used as EPL-Ga instrument, a suitable overvoltage arrester, e.g. type B62-36G of VEGA must be connected as far as this is required for protection against surges.

10 Material resistance

OPTISWITCH5300C VF534(*) CC/O****Z/L***** should only be used in media against which the wetted materials are sufficiently resistant.

11 Installation Control Diagram

[Diagram showing installation control diagram]

NOTES:
1. The intrinsic Safety Entity concept allows the interconnection of two approved inherently safe devices with entity parameters not specifically examined in combination as a system when
2. Dual-light conductor shall be used when installed in Class I and Class II environments.
3. Control equipment connected to the Associated Apparatus shall not generate or produce more than 250 Vrms or 1000V.
4. Installation should be in accordance with ANSI/NFPA 76/Installation of Inherently Safety Systems for Hazardous Classifications, and the National Electrical Code (NEC) 76 Sections 504 and 505.
5. The configuration of associated Apparatus shall be approved under entity concept.
6. Associated Apparatus manufacturer’s installation drawings shall be followed when installing this equipment.
7. The configuration of Field Device shall be approved under entity concept.
8. The Field Device manufacturer’s installation drawings shall be followed when installing this equipment.
9. The OPTISWITCH schematic are Approved for Class I, Zone 0, applications. If connecting A00004 Associated Apparatus to XGK-60 FIELD Device to the OPTISWITCH, the circuit is only suitable for Class I, Zone 0, and is not suitable for Class I, Zone 1 or Class I, Division 1 hazardous classified locations.
10. No revision to drawing, without prior Agency Approval.
11. Warning substitution of components may result in unsuitability for hazardous locations.
12. If the intrinsic protection is unknown, the following values may be used: ICI=50mA, ICI=200mA, ICI=300mA. 
13. The OPTISWITCH schematic is Approved for Class I, Zone 0, applications. If connecting A00004 associated Apparatus to XGK-60 FIELD Device to the OPTISWITCH, the circuit is only suitable for Class I, Zone 0, or Class I, Zone 1, or Class I, Zone 2, and is not suitable for Class I, Zone 0, or Class I, Division 1, hazardous classified locations.
14. Proper operation for common electronics is not recommended. Manufacturer’s suggested operating voltage is 12 VDC nominal.
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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