OPTISOUND 3010 C, 3020 C

Safety instructions

Ultrasonic Level Transmitter

PTB 05 ATEX 2062 X

Intrinsic safety
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Supplementary documentation:
- Operating Instructions OPTISOUND 3010 C, 3020 C
- EG-type approval certificate PTB 05 ATEX 2062 X, 2. Supplement (Document ID: 59017)
<table>
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<tr>
<th>Language</th>
<th>Text</th>
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</thead>
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<tr>
<td>DE</td>
<td>Sicherheitshinweise für den Einsatz in explosionsgefährdeten Bereichen</td>
</tr>
<tr>
<td>EN</td>
<td>Safety instructions for the use in hazardous areas</td>
</tr>
<tr>
<td>FR</td>
<td>Consignes de sécurité pour une application en atmosphères explosibles</td>
</tr>
<tr>
<td>IT</td>
<td>Normative di sicurezza per l’impiego in luoghi con pericolo di esplosione</td>
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<td>ES</td>
<td>Instrucciones de seguridad para el empleo en áreas con riesgo de explosión</td>
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<tr>
<td>PT</td>
<td>Normas de segurança para utilização em zonas sujeitas a explosão</td>
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<td>NL</td>
<td>Veiligheidsaanwijzingen voor gebruik op plaatsen waar ontploffingsgevaar kan heersen</td>
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<td>SV</td>
<td>Säkerhetsanvisningar för användning i explosiionsfarliga områden</td>
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<tr>
<td>DA</td>
<td>Sikkerhedsforskrifter til anvendelse i explosionsfarlig atmosfære</td>
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<tr>
<td>FI</td>
<td>Turvallisuusohjeet räjähdyssvaarallisissa tiloissa käyttöä varten</td>
</tr>
<tr>
<td>EL</td>
<td>Υποδείξεις ασφαλείας για τη χρησιμοποίηση σε περιοχές που υπάρχει κίνδυνος έκρηξης</td>
</tr>
</tbody>
</table>

Die vorliegenden Sicherheitshinweise sind in den Sprachen deutsch, englisch, französisch und spanisch verfügbar. Weitere EU-Landessprachen stellt der Hersteller nach Anforderungen zur Verfügung.

The present safety instructions are available in German, English, French and Spanish. Further EU languages will be provided by the manufacturer upon request.

Les présentes consignes de sécurité sont disponibles dans les langues allemand, anglais, français et espagnol. Le fabricant met d'autres langues de l'Union Européenne à disposition en fonction des demandes.

Las presentes instrucciones de seguridad están disponibles en los idiomas alemán, inglés, francés y español. El fabricante pone a disposición según demanda otros idiomas nacionales de la UE.
1 Area of applicability
These safety instructions apply to the ultrasonic sensor OPTISOUND 30*0 C VF3*4.C***H***X according to EG type approval certificate PTB 05 ATEX 2062 X with the 2. supplement (certificate number on the type label) and for all instruments with the number of the safety instruction (45494) on the type label.

2 General information
The ultrasonic level measuring instrument OPTISOUND 30*0 C VF3*4.C***H***X is used to detect the distance between product surface and transducer by means of ultrasonic waves in the kHz range. The electronics uses the running time of the signals reflected by the product surface to calculate the distance to the product surface.

The OPTISOUND 30*0 C VF3*4.C***H***X consist of an electronics housing, a process connection element and a sensor (the transducer). As an option the indication and adjustment module can also be integrated.

The measured products can also be combustible liquids, gases, mist or vapour.

The OPTISOUND 30*0 C VF3*4.C***H***X are suitable for use in hazardous atmospheres of all combustible materials of explosion group IIA, IIB and IIC for applications requiring instruments of category 1G, category 1/2G or category 2G.

If the OPTISOUND 30*0 C VF3*4.C***H***X are installed and operated in hazardous areas, the general Ex installation regulations EN 60079-14 as well as these safety instructions must be observed.

The operating instructions as well as the installation regulations or standards that apply for explosion protection of electrical systems must generally be observed.

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

Category 1G instrument (EPL Ga instrument)
The OPTISOUND 30*0 C VF3*4.C***H***X are installed in hazardous areas requiring instruments of category 1G.

Category 1/2G instrument (EPL Ga/Gb instrument)
The electronics housing is installed in hazardous areas requiring instruments of category 2G. The process connection element is installed in the separating wall, which separates areas requiring instruments of category 2G or 1G. The transducer with the mechanical fixing element is installed in hazardous areas requiring instruments of category 1G.

Category 2G instrument (EPL Gb instrument)
The OPTISOUND 30*0 C VF3*4.C***H***X are installed in hazardous areas requiring instruments of category 2G.

Ignition protection label:
II 1G, 1/2G, 2G Ex ia IIC T6 … T1 Ga, Ga/Gb, Gb
3     Technical data

Electrical data

Type of protection intrinsic safety Ex i

Power supply and signal circuit: (terminals 1[+], 2[-] in "Ex-i" electronics compartment; with double chamber housing version in connection compartment)

In type of protection intrinsic safety Ex ia IIC/IIB

Only for connection to a certified, intrinsically safe circuit.

Maximum values:

- $U_i = 30 \text{ V}$
- $I_i = 131 \text{ mA}$
- $P_i = 983 \text{ mW}$

The effective internal capacitance $C_i$ is negligibly small.

The effective internal inductance $L_i$ is negligibly small.

In the version with fix mounted connection cable $L_i = 0.55 \text{ µH/m}$, $C_{i \text{wire/wire}} = 150 \text{ pF/m}$ and $C_{i \text{wire/screen}} = 270 \text{ pF/m}$ must be taken into account.

Circuit of the display and adjustment module: (spring contacts in the electronics compartment; with double chamber housing version also in the connection compartment)

In type of protection intrinsic safety Ex ia IIC

Only for connection to the display and adjustment module.

With the double chamber housing version, the display and adjustment module may be mounted either in the electronics compartment or in the termination compartment.

The intrinsically safe circuits are electrically separated from parts which can be grounded.

For applications requiring category 2G equipment, 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 identification is Ex ib IIC T6 oder T5.

For applications requiring instruments of category 1G or 1/2G, the intrinsically safe power supply and signal circuit must correspond to protection class ia.

For applications requiring instruments of category 1G or 1/2G the OPTISOUND 30*0 C VF3*4.C***H***X is preferably connected to appropriate equipment with galvanically isolated, intrinsically safe circuits.

4     Application conditions

The max. permissible ambient temperatures depending on the temperature classes are specified in the following tables.

<table>
<thead>
<tr>
<th>Temperature class</th>
<th>Ambient temperature on the transducer and electronics</th>
</tr>
</thead>
<tbody>
<tr>
<td>T6</td>
<td>-20 ... +41 °C</td>
</tr>
<tr>
<td>T5</td>
<td>-20 ... +53 °C</td>
</tr>
<tr>
<td>T4, T3, T2, T1</td>
<td>-20 ... +60 °C</td>
</tr>
</tbody>
</table>

For applications requiring instruments of category 1G the process pressure of the media must be between 0.8 ... 1.1 bar. The application conditions when operating in the absence of explosive mixtures can be found in the manufacturer information.
Category 1/2G instruments

<table>
<thead>
<tr>
<th>Temperature class</th>
<th>Ambient temperature on the transducer</th>
<th>Ambient temperature on the electronics</th>
</tr>
</thead>
<tbody>
<tr>
<td>T6</td>
<td>-20 ... +58 °C</td>
<td>-40 ... +46 °C</td>
</tr>
<tr>
<td>T5, T3, T2, T1</td>
<td>-20 ... +61 °C</td>
<td>-40 ... +85 °C</td>
</tr>
<tr>
<td>T4, T3, T2, T1</td>
<td>-20 ... +60 °C</td>
<td>-40 ... +85 °C</td>
</tr>
</tbody>
</table>

For applications requiring instruments of category 1G the process pressure of the media must be between 0.8 ... 1.1 bar. If the OPTISOUND 30*0 C VF3*4.C***H***X are operated at temperatures higher than those specified in the above table, please make sure through appropriate measures and under consideration of the self-heating of 6 K of the transducer, that there is no danger of ignition from the hot surfaces. The maximum temperature on the electronics/housing should not exceed the values specified in the above table. The application conditions in areas without hazardous gas mixtures are specified in the manufacturer information.

Category 2G instruments

<table>
<thead>
<tr>
<th>Temperature class</th>
<th>Ambient temperature on the transducer</th>
<th>Ambient temperature on the electronics</th>
</tr>
</thead>
<tbody>
<tr>
<td>T6</td>
<td>-20 ... +74 °C</td>
<td>-40 ... +46 °C</td>
</tr>
<tr>
<td>T5</td>
<td>-20 ... +89 °C</td>
<td>-40 ... +61 °C</td>
</tr>
<tr>
<td>T4, T3, T2, T1</td>
<td>-20 ... +90 °C</td>
<td>-40 ... +85 °C</td>
</tr>
</tbody>
</table>

If the OPTISOUND 30*0 C VF3*4.C***H***X are operated at higher temperatures as mentioned in the above table, please make sure by appropriate measures under consideration of the self-heating of 6 K on the transducer, that the danger of ignition caused by these hot surfaces can be excluded. The max. permissible temperature on the electronics/housing should not exceed the values according to the above table. The application conditions in areas without hazardous mixtures are mentioned in the manufacturers’ instructions.

5 Protection against static electricity

The OPTISOUND 30*0 C VF3*4.C***H***X in versions with electrostatically chargeable plastic parts, such as e.g. plastic housing, metal housing with inspection window or transducers made of plastic, 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 Use of an overvoltage arrester

If the OPTISOUND 30*0 C VF3*4.C***H***X are used as category 1/2G instruments, overvoltage protection measures according to EN 60079-14 chapter 12.3 are not required.

When used as category 1G instrument, a suitable overvoltage arrester must be connected in front as protection against voltage surges according to EN 60079-14 chapter 12.3.
7    Grounding
In order to avoid the danger of electrostatic charging of the metallic parts, the OPTISOUND 30*0
C VF3*4.C***H***X must be electrostatically connected to the local potential equalisation (transfer
resistance ≤ 1 MΩ), e.g. via the ground terminal, when used as category 1G or 1/2G instruments.

8    Impact and friction sparks
When used as category 1G instruments, the OPTISOUND 30*0 C VF3*4.C***H***X aluminium ver-
sions 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.

9    Material resistance
For applications requiring instruments of category 1G or category 1/2G the OPTISOUND 30*0 C
VF3*4.C***H***X must only be used in products against which the wetted materials are sufficiently
resistant.

10   Installation
To exclude the danger of mechanical damage, the OPTISOUND 30*0 C VF3*4.C***H***X must be
installed in such a way that the transducer is protected from environmental influences.
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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