Safety instructions
VEGACAL 62, 63, 64, 65, 66

Dust ignition protection by enclosure
Two-wire 4 … 20 mA/HART
For connection to controller

CE 0044

Document ID: 55730

Contents

Supplementary documentation:

- Operating Instructions VEGACAL 62, 63, 64, 65, 66
- EU-type approval certificate TÜV 17 ATEX 199562 X (Document ID: 55731)
- EU declaration of conformity (Document ID: 44389)

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DE	Sicherheitshinweise für den Einsatz in explosionsgefährdeten Bereichen
EN	Safety instructions for the use in hazardous areas
FR	Consignes de sécurité pour une application en atmosphères explosibles
IT	Normative di sicurezza per l'impiego in luoghi con pericolo di esplosione
ES	Instrucciones de seguridad para el empleo en áreas con riesgo de explosión
PT	Normas de segurança para utilização em zonas sujeitas a explosão
NL	Veiligheidsaanwijzingen voor gebruik op plaatsen waar ontploffingsgevaar kan heersen
SV	Säkerhetsanvisningar för användning i explosiionsfarliga områden
DA	Sikkerhedsforskrifter til anvendelse i explosionsfarlig atmosfare
FI	Turvallisuusohjeet räjähdysvaarallisisssa tiloissa käyttöä varten
EL	Υποδείξεις ασΦαλείας για τη χρησιμοποίηση σε περιοχές που υπάρχει κίνδυνος έκρηξης

DE	Die vorliegenden Sicherheitshinweise sind im Download unter www.vega.com standardmäßig in den Sprachen deutsch, englisch, französisch und spanisch verfügbar. Weitere EU-Landessprachen stellt VEGA nach Anforderungen zur Verfügung.
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1 Area of applicability

These safety instructions apply to the level sensors VEGACAL of type series:

- VEGACAL CL62.GX/CK***H/X****
- VEGACAL CL63.GX/CK***H/X****
- VEGACAL CL64.GX/CK***H/X****
- VEGACAL CL65.GX/CK***H/X****
- VEGACAL CL66.GX/CK***H/X****

with the electronics versions

- H - Two-wire 4 … 20 mA/HART
- X - for connection to controller

according to EU type approval certificate TÜV 17 ATEX 199562 X (certificate number on the type label) and for all instruments with safety instruction 55730.

The classification as well as the respective standards are stated in the EU type approval certificate:

- EN IEC 60079-0: 2018
- EN 60079-11: 2012
- EN 60079-31: 2014

Type of protection marking:

- II 1/2D, II 2D Ex ia/tb, ia tb IIIC T65 °C … T150 °C Da/Db, Db
- II 1/2D, II 2D Ex ia/tb, ia tb IIIC T65 °C … T200 °C Da/Db, Db

The above mentioned versions can have further approvals apart from ignition protection type "protection by enclosure t".

The additional approvals are **not** subject of the assessment and evaluation acc. to the EU Type approval certificate TÜV 17 ATEX 199562 X.

	Approval area			**Approvals**		
VEGACAL CL6*.	**ATEX**	**IECEx**	**Combination** [1)]	**Ex t**	**+ Ex ia**	**+ Ex d**
CK	x			x	x	
GX	x			x		

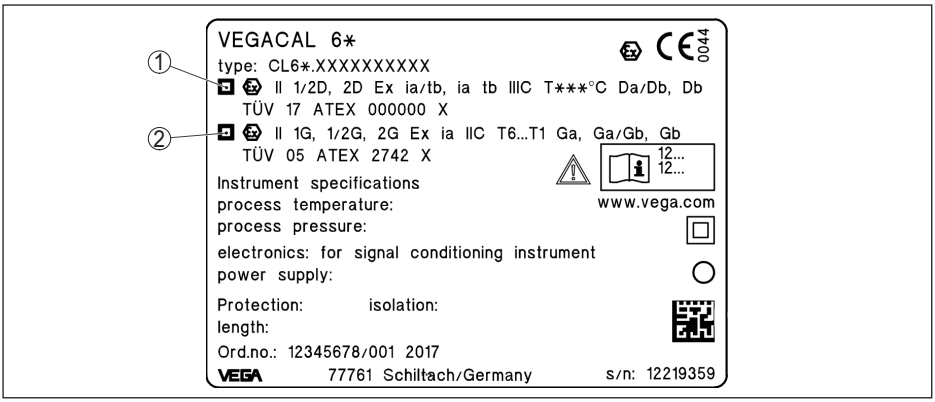
In the following, all above mentioned versions are called VEGACAL CL62/3/4/5/6. If parts of these safety instructions refer only to certain versions, then these will be mentioned explicitly with their type code.

2 Different ignition protection types

The VEGACAL CL62/3/4/5/6 can be either used in explosive dust atmospheres or in explosive gas atmospheres.

The operator must specify the selected ignition protection type before installation. The selected ignition protection must be determined by marking it firmly on the identification label of the type plate.

[1)] Approval area "Combination": Combination of approval Ex ia acc. to ATEX, IECEx, FM and CSA.



1 Ignition protection type "Protection by enclosure Ex t"
2 Ignition protection type "Intrinsic safety Ex i"

3 Important specification in the type code

VEGACAL CL6*(*).aabccefgh*

Position		Feature	Description
a	Approval	CK	ATEX II 1G, 1/2G, 2G Ex ia IIC T6 + II 1/2D, 2D Ex ia/tb, ia tb IIIC T***°C Da/Db, Db
		GX	ATEX II 1/2D, 2D Ex ia/tb, ia tb IIIC T***°C Da/Db, Db
e	Electronics	H	Two-wire 4 … 20 mA/HART
		X	For connection to a controller
f	Housing / Protection	A	Aluminium single chamber / IP66/IP68 (0.2 bar)
		D	Aluminium double chamber / IP66/IP68 (0.2 bar)
		V	Stainless steel single chamber (precision casting) / IP66/IP68 (0.2 bar)
		W	Stainless steel double chamber (precision casting) / IP66/IP68 (0.2 bar)
g	Cable entry / Cable gland / Plug connection	M	M20 x 1.5 / with / without
		N	½ NPT / without / without

Position		Feature	Description
h	Display and adjustment module PLICSCOM	X	without
		A	mounted
		F	without; lid with inspection window
		B	Laterally mounted
		K	mounted; with Bluetooth, magnetic pen operation
		L	laterally mounted; with Bluetooth, magnetic pen operation
		U	mounted; with Bluetooth (US version), battery, magnetic pen operation
		S	laterally mounted; with Bluetooth (US version), battery, magnetic pen operation

4 General information

The capacitive probes VEGACAL are used for gauge measurement of liquids and bulk solids (depending on the type).

The VEGACAL consist of an electronic housing, a probe and process fittings.

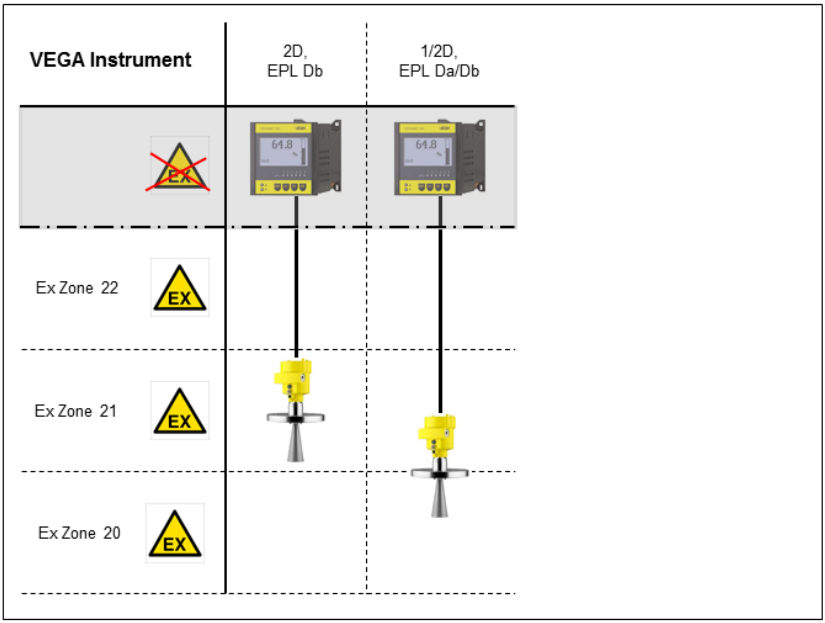
The display and adjustment module PLICSCOM can be mounted optionally.

The VEGACAL are suitable for use in areas with combustible, dust generating bulk solids of group IIIA, IIIB and IIIC. These sensors are suitable for applications requiring category 1/2D (EPL Da/Db) or 2D (EPL Db) instruments.

5 Application area

Category 1/2D (EPL Da/Db instruments)
The electronics housing is installed in hazardous areas of zone 21 requiring instruments of category 2D (EPL Db). The process connection element is installed in the separating wall, which separates areas requiring instruments of category 2D (EPL Db) or 1D (EPL Da). The probe with the mechanical fixing element is installed in hazardous areas of zone 20 requiring instruments of category 1D (EPL Da).

Category 2D (EPL Db instruments)
The electronic housing and the probe with the mechanical fixing element are installed in hazardous areas of zone 21, in areas requiring instruments of category 2D (EPL Db).



Note: Sensor image, exemplary

6 Specific conditions of use ("X" identification)

The following overview is listing all special properties of VEGACAL CL62/3/4/5/6, which make a labelling with the symbol "X" behind the certificate number necessary.

Ambient temperature
You can find the details in chapter " *Thermal data*" of these safety instructions.

Impact and friction sparks
The VEGACAL CL62/3/4/5/6 in light metal versions (e.g. aluminium, titanium, zircon) must be mounted in such a way that sparks from impact and friction between light metals and steel (except stainless steel, if the presence of rust particles can be excluded) cannot occur.

The respective parts of the capacitive probes must be effectively secured against swinging and resonating.

When used as Da/Db or Da/Dc instrument
For versions with standard process fittings, the installation must be made in such a way that at least protection rating IP67 acc. to IEC/EN 60529 is reached on the process fittings.

7 Important information for mounting and maintenance

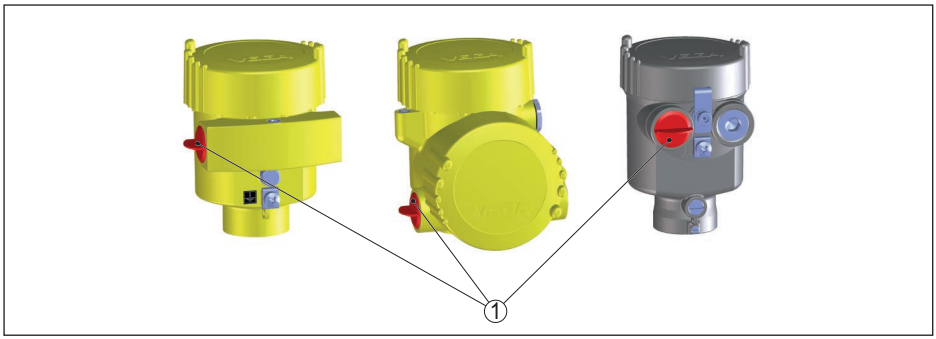
General instructions
The following requirements must be fulfilled for mounting, electrical installation, setup and maintenance of the instrument:

- The staff must be qualified according the respective tasks
- The staff must be trained in explosion protection

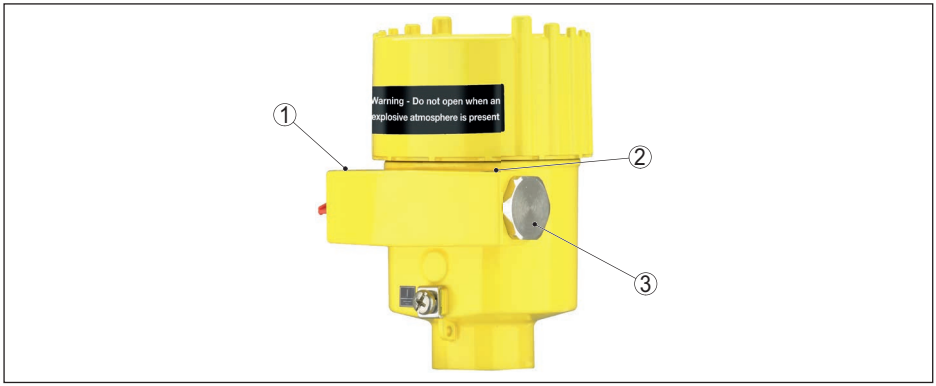
- The staff must be familiar with the respectively valid regulations, e.g. planning and installation acc. to IEC/EN 60079-14
- Make sure when working on the instrument (mounting, installation, maintenance) that there is no explosive atmosphere present, the supply circuits should be voltage-free, if possible.
- The instrument has to be mounted according to the manufacturer specifications, the EU type approval certificate and the valid regulations and standards
- Modifications on the instrument can influence the explosion protection and hence the safety, therefore repairs are not permitted to be conducted by the end user
- Modifications must only be carried out by employees authorized by VEGA company
- Use only approved spare parts
- Components for installation and connection not included in the approval documents are only permitted if these correspond technically to the latest standard mentioned on the cover sheet. They must be suitable for the application conditions and have a separate certificate. The special conditions of the components must be noted and if necessary, the components must be integrated in the type test. This applies also to the components already mentioned in the technical description.
- Vessel installations and probable flow must be taken into account

Cable and wire entries

- The VEGACAL CL62/3/4/5/6 must be connected via suitable cable gland or conduit systems that are in conformity with the requirements of the flame proofing and the IP protection and provided with a separate type approval certificate. When connecting VEGACAL CL62/3/4/5/6 to conduit systems, the corresponding sealing facility must be connected directly to the housing.
- The red thread or/dust covers screwed in when the instruments are shipped (depending on the version) must be removed before setup and replaced by cable entries or closing screws suitable for the respective ignition protection type and IP protection.
- Note type and size of the thread: A label with the respective thread name is in the area of the respective thread
- Threads must have no damages
- Cable entries and closing screws should be mounted correctly and according to the safety instructions of the manufacturer to ensure the specified ignition protection type and IP protection rating. When using certified or suitable cable glands, closing screws or plug connections, it is absolutely necessary to note the corresponding certificates/documents. Supplied cable entries or closing screws meet these requirements.
- Unused openings must be closed with plugs suitable for the ignition protection type and IP protection. Supplied plugs meet these requirements.
- Cable or wire entries resp. the closing screws must be tightly screwed into the housing
- The connection cables resp. pipeline sealing facilities must be suitable for the application conditions (e.g. temperature range) of the application
- With surface temperatures > 70 °C, the cables must be suitable for the higher application conditions
- The connection cable of VEGACAL CL62/3/4/5/6 has to be wired fix and in such a way that damages can be excluded.



1 *Red threaded or dust protection cap*



1 *Label: Type and size of the thread ½-14 NPT or M20 x 1.5*
2 *Label: Type and size of the thread ½-14 NPT or M20 x 1.5*
3 *Screw plug*

Mounting

Keep in mind for instrument mounting

- Mechanical damage on the instrument must be avoided
- Mechanical friction must be avoided
- Vessel installations and probable flow must be taken into account
- Process connections separating two areas of different Ex-zones must comply to valid regulations and standards and the protection rating must be in conformity to IEC/EN 60529
- Close the housing lid (s) up to the stop before starting operating, to ensure the IP protection rating specified on the type label
- Protect the lid against unauthorized opening by unscrewing the locking screw up to the stop. With double chamber housing, you have to protect both lids.

Cable glands, threaded openings

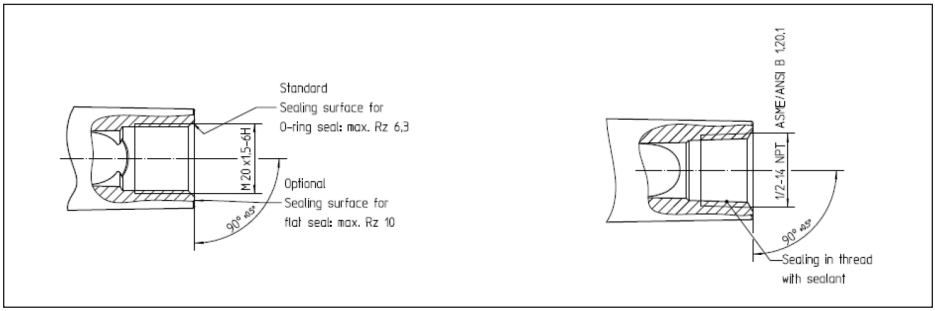
Type	Thread	Cable diameter [mm]	Torques [Nm]
Hummel EXIOS A2F 1.608.2003.50	M20 x 1.5	6 … 12 mm	8
Hummel EXIOS A2F 1.608.1203.70	½ NPT	6 … 12 mm	8

Type	Thread	Cable diameter [mm]	Torques [Nm]
Hummel EXIOS MZ 1.6Z5.2000.51	M20 x 1.5	9 … 13 mm	8
Hummel EXIOS MZ 1.6Z5.1200.70	½ NPT	9 … 13 mm	8
Hummel HSK-M-Ex 1.640.2000.51	M20 x 1.5	5 … 9 mm	8

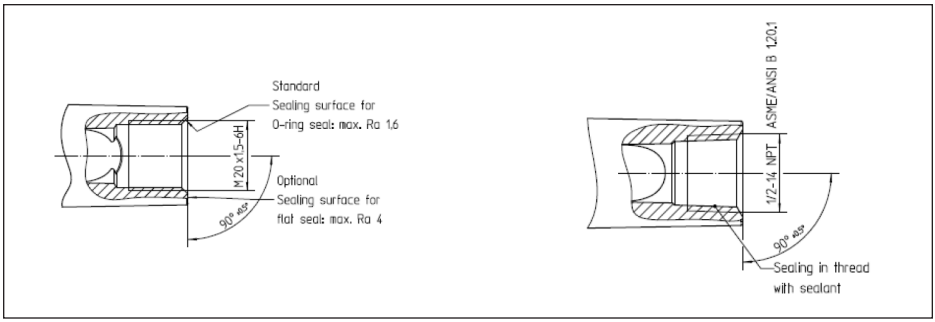
The specified tightening torques are test torques and are to be seen only as recommended values. These were determined according to the specifications of the listed valid standards. The tightening torques may devicate depending on the type and characteristic of the cables/lines. If assembly instructions of the manufacturer are provided, these must be observed.

If suitable cable glands or cable insertion possibilities not included in the scope of supply are used, these must be compatible with the threaded openings.

Aluminium housing with M20 x 1.5 thread, ½ NPT thread



Stainless-steel housing (fine cast) with M20 x 1.5 thread, ½ NPT thread



8 Safe operating mode

General operating conditions

- Do not operate the instrument outside the electrical, thermal and mechanical specifications of the manufacturer
- Use the instrument only in media against which the wetted parts are sufficiently resistant
- Note the relation between process temperature on the sensor/antenna and the permissible ambient temperature on the electronics housing. For permissible temperatures, see the respective temperature tables. See chapter " *Thermal data*".

- If necessary, a suitable overvoltage arrester can be connected in front of the VEGACAL CL62/3/4/5/6
- For assessment and reduction of the explosion risk, valid standards such as for example ISO/EN 1127-1 must be taken into account
- Lids must not be opened if there is a hazardous atmosphere. The housing lids are marked with the warning label:

WARNING - DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT

9 Instructions for zone 0/20 applications

In hazardous areas, the instrument should only be operated under atmospheric conditions:

- Temperature: -20 … +60 °C.
- Pressure: 80 … 110 kPa (0.8 … 1.1 bar)
- Air with normal oxygen content, normally 21 %

If there are no explosive mixtures or supplementary measures, e.g. according to ISO/EN 1127-1, then the instruments can be also operated according to the manufacturer specifications outside atmospheric conditions.

Process fittings between an area requiring EPL Da and less endangered areas must show a tightness in accordance with protection rating IP67 acc. to IEC/EN 60529.

The operator must ensure that the medium temperature in the EPL Da range within the process vessel is not higher than 80 % of the self-ignition temperature of the concerned medium (in °C) and does not exceed the max. permissible flange temperature depending on the temperature class. The parts of the capacitive probe which during operation are in contact with flammable products, must be integrated in the periodic overpressure test of the plant.

When used as EPL Ga/Gb or EPL Da/Db instrument, a suitable overvoltage arrester must be provided acc. to IEC/EN 60079-14 as protection against overvoltages.

10 Potential equalization/Grounding

- Integrate the instruments into the local potential equalisation, e.g. via the internal or external earth terminal
- The potential equalization terminal must be secured against loosening and twisting
- If grounding of the cable screening is necessary, this must be carried out acc. to the valid standards and regulations, e.g. acc. to IEC/EN 60079-14
- The intrinsically safe input and the intrinsically safe output circuits are ground-free. The voltage resistance against ground is min. 500 Veff.

11 Electrostatic charging (ESD)

In case of instrument versions with electrostatically chargeable plastic parts, the danger of electrostatic charging and discharging must be taken into account!

The following parts can charge and discharge:

- Lacquered housing version or alternative special lacquering
- Plastic housing, plastic housing parts
- Metal housing with inspection window
- Plastic process fittings
- Plastic-coated process fittings and/or plastic-coated sensors
- Connection cable for separate versions

- Type label
- Isolated metallic labels (measuring point identification plate)

Take note in case of danger of electrostatic charges:

- Avoid friction on the surfaces
- Do not dry clean the surfaces

The instruments must be mounted/installed in such a way that the following can be ruled out:

- in the case of extremely flammable dusts with a minimum ignition energy of less than 3 mJ, the device must not be used in areas where intensive electrostatic charging processes can be expected
- electrostatic charges during operation, maintenance and cleaning.
- process-related electrostatic charges, e.g. by measuring media flowing past

The warning label indicates danger:

WARNING - POTENTIAL ELECTROSTATIC CHARGING HAZARD - SEE INSTRUCTIONS

12 Electrical data

VEGACAL CL62-66.CK/GX*X****

Supply and signal circuit:	
VEGACAL CL62-66.*****XA/V*** Terminal 1[+], 2[-] in electronics compartment of the single chamber housing	In type of protection intrinsic safety Ex ia IIC.
	For connection to a certified, intrinsically safe circuit.
VEGACAL CL62-66.*****XD/W*** Terminal 1[+], 2[-] in connection compartment of the double chamber housing	U_i = 30 V DC I_i = 131 mA P_i = 983 mW
	C_i = 3 nF L_i = 5 µH (only with connected electronics PLICSZEKX, otherwise negligible)
	Characteristics: Linear

VEGACAL CL62-66.CK/GX*H****

Supply and signal circuit:	
VEGACAL CL62-66.*****HA/V*** Terminal 1[+], 2[-] in electronics compartment of the single chamber housing	In type of protection intrinsic safety Ex ia IIC.
	For connection to a certified, intrinsically safe circuit.
VEGACAL CL62-66.*****HD/W*** Terminal 1[+], 2[-] in connection compartment of the double chamber housing	U_i = 30 V DC I_i = 131 mA P_i = 983 mW
	C_i negligibly small L_i = 5 µH (only with connected electronics PLICSZEKX, otherwise negligible)
	Characteristics: Linear

VEGACAL CL62-66.CK/GX*H/X****

Display and adjustment circuit:	
VEGACAL CL62-66.*****H/XA/V*** Terminals 5, 6, 7, 8 in electronics compartment of the single chamber housing VEGACAL CL62-66.*****H/XD/W*** Terminals 5, 6, 7 in connection compartment of the double chamber housing	In type of protection intrinsic safety Ex ia IIC. Only for connection to the associated VEGA display unit VEGADIS 61/81 according to BVS 05 ATEX E 023, IECEx BVS 06.0014.
VEGACAL CL62-66.*****H/XA/V*** Spring contacts in electronics compartment of the single chamber housing VEGACAL CL62-66.*****H/XD/W*** Spring contacts in electronics compartment of the double chamber housing	In type of protection intrinsic safety Ex ia IIC. Only for connection to the display and adjustment module PLICSCOM.
When using the connection cable supplied by VEGA, the following values must be also taken into consideration:	L_i = 0.62 µH/m $C_{i\ wire/wire}$ = 150 pF/m $C_{i\ wire/screen}$ = 270 pF/m

13 Thermal data

The following temperature tables apply to all housing and electronic versions and for the use of the VEGACAL CL62/3/4/5/6 as instruments of instrument category 1/2D and 2D.

Version of the probe	**Product temperature (Tp) on the sensor**	**Ambient temperature (Ta)**
with PE insulation	-40 … +80 °C	-40 … +60 °C
with PTFE insulation	-50 … +150 °C	-40 … +60 °C
with PTFE insulation and additional temperature adapter	-50 … +200 °C	-40 … +60 °C

For Ta = 60 °C and Tp = 65 °C, the maximum surface temperature of the device is T65 °C.

For product temperatures above 65 °C, the maximum surface temperature T of the device corresponds to the product temperature Tp.

Printing date:

All statements concerning scope of delivery, application, practical use and operating conditions of the sensors and processing systems correspond to the information available at the time of printing.
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