Safety instructions
VEGASWING 66

Flameproof enclosures
Relay
Transistor (NPN/PNP)
Two-wire

CE 0044

Document ID: 44366

VEGA

Contents

Supplementary documentation:

- Operating Instructions VEGASWING 66
- EU type approval certificate BVS 12 ATEX E 154 X (Document ID: 44367)
- EU declaration of conformity (Document ID: 44621)

Editing status: 2022-05-18

44366-EN-230126

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.
EN	These safety instructions are available as a standard feature in the download area under www.vega.com in the languages German, English, French and Spanish. Further EU languages will be made available by VEGA upon request.
FR	Les présentes consignes de sécurité sont disponibles au téléchargement sous www.vega.com en standard en allemand, en anglais, en francais et en espagnol. VEGA met à disposition d'autres langues de l'Union Européenne selon les exigences.
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1 Area of applicability

These safety instructions apply to the level sensors VEGASWING 66 of type series:

- SG66.AE****R/S/T/I/Z/L**

with the electronics versions

- Z - Two-wire
- L - Two-wire with SIL qualification
- T - Transistor (NPN/PNP)
- I - Transistor (NPN/PNP) with SIL qualification
- R - Relay (2 x SPDT)
- S - Relay (2 x SPDT) with SIL qualification

According to EU type approval certificate BVS 12 ATEX E 154 X (certificate number on the type label) and for all instruments with safety instruction 44366.

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

- EN IEC 60079-0: 2018
- EN 60079-1: 2014
- EN 60079-26: 2015
- IEC 60079-26: 2021

Type of protection marking:

- II 1/2G Ex db IIC T6…T1 Ga/Gb
- or
- II 2G Ex db IIC T6 … T1 Gb

2 Important specification in the type code

VEGASWING SG66(*).abcdefghi*

Position		Feature	Description
a	Scope	A	ATEX / Europe
b	Approval	E	ATEX II 1/2G, 2G Ex db IIC T6 Ga/Gb, Gb
		Z	ATEX II 1/2G, 2G Ex db IIC T6 Ga/Gb, Gb + overfill protection (WHG)
c	Version / Material	K	Compact version / Inconel 718 (2.4668), Alloy C22 (2.4602)
		R	with tube extension / 316L and Inconel 718 (2.4668), Alloy C22 (2.4602)
		H	with tube extension / Alloy C22 (2.4602) and Inconel 718 (2.4668)
de	Process fitting / Material	**	Process fittings acc. to industry standard
f	Second line of defense / Process temperature	A	with / -196 … +450 °C
g	Electronics	Z	Two-wire (8/16 mA) 9.6 … 35 V DC
		L	Two-wire (8/16 mA) 9.6 … 35 V DC with SIL qualification
		R	Relay (2 x SPDT) 20 … 72 V DC/20 … 253 V AC (5 A)
		T	Transistor (NPN/PNP) 9.5 … 55 V DC
		S	Relay (2 x SPDT) 20 … 72 V DC/20 … 253 V AC (5 A) with SIL qualification
		I	Transistor (NPN/PNP) 9,5 … 55 V DC with SIL qualification

Position		Feature	Description
h	Housing / Protection	A	Aluminium single chamber / IP66/IP68 (0.2 bar)
		V	Stainless steel single chamber (precision casting) / IP66/IP68 (0.2 bar)
		*	Further Housing / Proctection with special colour
i	Cable entry / Connection	D	M20 x 1.5 / Blind plug
		N	½ NPT / Blind plug
		*	Further suitable Cable entry / Connection

In the following, all above mentioned versions are called VEGASWING 66. If parts of these safety instructions refer only to certain versions, then these will be mentioned explicitly with their type code.

3 General information

The VEGASWING 66 are used for level measurement in hazardous areas.

The VEGASWING 66 are suitable for applications in hazardous atmospheres of all combustible materials of explosion groups IIA, IIB and IIC.

The VEGASWING 66 are suitable for applications requiring category 1/2G (EPL Ga/Gb) or 2G (EPL Gb) instruments.

4 Application area

Category 1/2G (EPL Ga/Gb instruments)
The VEGASWING 66 with mechanical fixing element are installed in hazardous areas of zone 1 requiring instruments of category 2G (EPL Gb). The mechanical fixing element, process connection element is installed in the separating wall, which separates areas requiring instruments of category 2G (EPL Gb) or 1G (EPL Ga). The sensor measuring system is installed in hazardous areas of zone 0 requiring instruments of category 1G (EPL Ga).

Category 2G (EPL Gb instruments)
The VEGASWING 66 with the mechanical fixing element are installed in hazardous areas of zone 1 requiring category 2G (EPL Gb) instruments.

VEGA Instrument	2G (EPL Gb)	1/2G (EPL Ga/Gb)
Ex Zone 2 		
Ex Zone 1 		
Ex Zone 0 		

5 Specific conditions of use ("X" identification)

The following overview is listing all special properties of VEGASWING 66, which make a labelling with the symbol "X" behind the certificate number necessary.

Electrostatic charging (ESD)
You can find the details in chapter " *Electrostatic charging (ESD)*" of these safety instructions.

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

Impact and friction sparks
The VEGASWING 66 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.

Non-grounded, metallic parts
The resistance between aluminium housing to metal measuring point identification plate is $> 10^9$ Ohm.

The measuring point identification label must be connected to the earth connection using the accessories supplied. To ensure that this connection is always present, it must be checked at regular intervals.

The capacitance of the metal measuring point identification label (not grounded) was measured as follows:

Measurement loop identification label	Capacitance
45 x 23 mm (standard)	21 pF
100 x 30 mm	52 pF
73 x 47 mm	61 pF

Media resistance
The wetted materials must be resistant against the measured media.

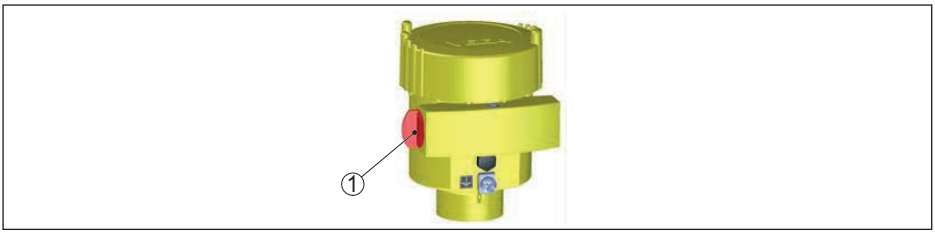
The min. fatigue strength of the vibrating element is 8.6×10^{11} load changes with a max. amplitude of 34 µm. The lifetime is minimum 20 years.

All VEGASWING 66 contain a separation element according to EN 60079-0. This partition wall is made of stainless steel with a thickness of ≥ 1 mm.

Mechanical fixing
VEGASWING 66 must be mounted in such a way that it is effectively secured against oscillation.

Removing and replacing the red threaded/dust cover
The red thread or/dust covers screwed in when the instrument is shipped (depending on the version) must be removed before setup. The openings must be closed before setup by a way approved for the ignition protection type. Approved and suitable cable glands or blind plugs must be installed according to the supplied documents.

Before setting up VEGASWING 66 you have to check if all other openings are closed in a way appoved for the ignition protection type.



1 *Red thread or dust cover must be removed before setup. The opening must be closed before setup by a way approved for the ignition protection type.*

6 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

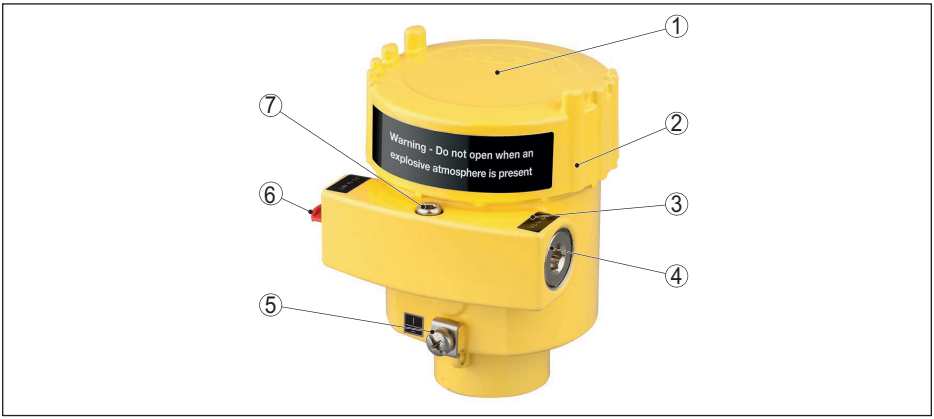
Cable and wire entries

- The VEGASWING 66 must be connected via suitable cable gland or conduit systems that are in conformity with the requirements of the type of protection and the IP protection and provided with a separate type approval certificate. When connecting VEGASWING 66 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 > 60 °C, the cables must be suitable for the higher application conditions of at least 92 °C
- The connection cable of VEGASWING 66 has to be wired fix and in such a way that damages can be excluded.

Single chamber housing



1 Lid, optionally with inspection window
2 Electronics compartment
3 Label: Thread type
4 Screw plug
5 External ground terminal
6 Red threaded or dust protection cap
Transport protection, replace with installation
7 Locking screws of the lid for lid locking

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.

Maintenance

To ensure the functionality of the device, periodic visual inspection is recommended for:

- Secure mounting
- No mechanical damages or corrosion
- Worn or otherwise damaged cables
- No loose connections of the line connections, equipotential bonding connections
- Correct and clearly marked cable connections

The parts of the VEGASWING 66 being in contact with flammable media during operation must be included in the periodic overpressure test of the plant.

Flameproof enclosure "d"

- The terminals for connecting the operating voltage or signal circuits are integrated in the connection compartment with type of protection flameproof enclosure "d"
- The thread gaps between housing and cover as well as between threaded fitting and container are flameproof joints
- It is not allowed to repair the flameproof joints.
- Cable, wire entries and closing screws must be certified acc. to ignition protection type Flameproof enclosures "d". Cable, wire entries and closing screws of simple design must not be used.
- Separately certified cable and wire entries can determine the permissible ambient temperature range or the temperature classes
- Only one threaded adapter is allowed per thread, when using a closing screw, threaded adapters are not allowed

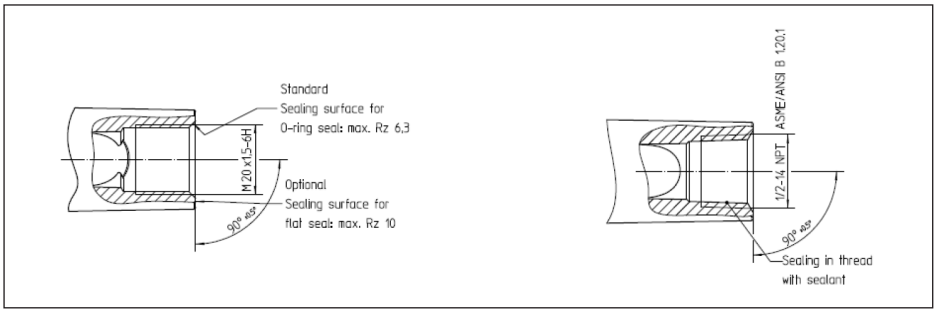
Cable glands, threaded openings

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
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

The specified torques are test torques and can only be regarded as reference values. The manufacturer's mounting instructions provided 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



7 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 VEGASWING 66
- 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

8 Instructions for zone 0, zone 0/1 applications

In hazardous areas, the instrument, sensor measuring system in zone 0 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 %

The operator must ensure that the medium temperature in zone 0 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 sensor which during operation are in contact with flammable products, must be integrated in the periodic overpressure test of the plant.

If no explosive mixtures or additional application conditions are certified resp. supplementary measures such as e.g. according to ISO/EN 1127-1 taken, then the instruments can be also operated according to the manufacturer specification outside atmospheric conditions.

If there is a risk of dangerous potential differences inside zone 0, then suitable measures for circuits in zone 0 must be taken, e.g. according to the requirements of IEC/EN 60079-14.

Process fittings between two explosion protection areas require category 1G (EPL Ga) and less endangered areas must show a tightness in accordance with protection rating IP67 acc. to IEC/EN 60529.

9 Potential equalization/Grounding

The VEGASWING 66 have to be connected to the potential equalisation, for example via the external earth terminal on the housing.

Make sure that you connect a ground cable. For external grounding, use M5 Crimp connections(> 4 mm^2) with spring, lock washer and clamp bracket to avoid loosening and turning.

The ground cable (AWG12) should be dismantled at the end over a length of 10 mm and fastened to the M5 Crimp connection (with a suitable Crimp tool).

10 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

11 Electrical data

SWING66(*).AE** R/S****	
Voltage supply: Terminals 1, 2	U = 20 … 253 V AC, 50/60 Hz U = 20 … 72 V DC
Power consumption:	max. 3 VA, max. 1 W
Relay circuit: Contact set 1: (terminals 3, 4, 5) Contact set 2: (terminals 6, 7, 8)	Maximum values: ● AC max. 253 V, 5 A, 1250 VA ● DC max. 253 V, 1 A, 40 W

SWING66(*).AE** T/I****	
Voltage supply: Terminals 1, 2	U = 9.6 … 55 V DC
Power consumption:	max. 2 W
Load current, transistor output (NPN/PNP): Terminals 2, 3	max. 400 mA, 55 V DC

SWING66(*).AE**** Z/L**	
Supply and signal circuit: Terminals 1[+], 2[-]	U = 9.6 … 35 V DC

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

12 Thermal data

Permissible ambient temperature

Caution:
The process temperature shall not bring the enclosure of the electronics compartment above the permitted (see table below) ambient temperature range.

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

Category 1/2G instruments

Temperature class	Permissible ambient temperature on the electronics	Permissible ambient temperature on the sensor
T6, T5, T4, T3, T2, T1	-60 … +60 °C	-20 … +60 °C

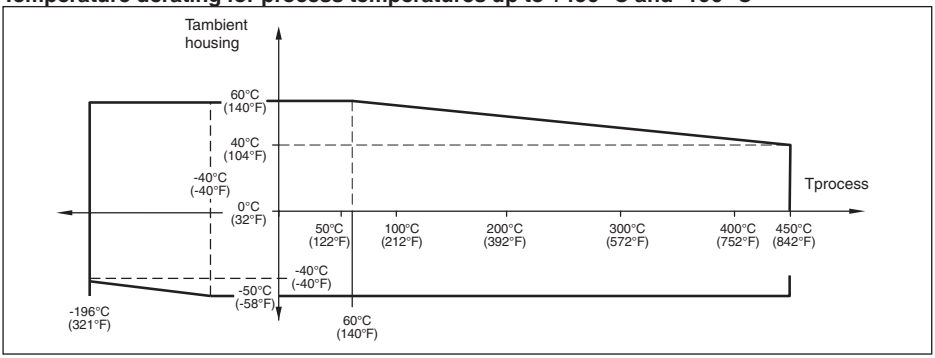
If the sensors of VEGASWING 66 are operated at temperatures higher than those specified in the above table, please make sure through appropriate measures that there is no danger of ignition from the hot surfaces. The max. permissible temperature on the electronics/housing should not exceed the values specified in the above table. The application conditions when operating in the absence of explosive mixtures can be found in the operating instructions.

Category 2G instruments

Temperature class	Permissible ambient temperature on the electronics	Permissible ambient temperature on the sensor
T6	-60 … +60 °C	-196 … +85 °C
T5	-60 … +60 °C	-196 … +100 °C
T4	-60 … +60 °C	-196 … +135 °C
T3	-60 … +60 °C	-196 … +200 °C
T2	-60 … +60 °C	-196 … +300 °C
T1	-60 … +60 °C	-196 … +450 °C

If the sensors of VEGASWING 66 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



Printing date:

44366-EN-230126

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