Safety instructions
VEGASWING 66

FM16US0038X

Explosionproof/Flameproof (XP)

Document ID: 50279

Contents

Supplementary documentation:

- Operating Instructions VEGASWING 66
- Certificate of Conformity FM16US0038X (Document ID: 50281)

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1 Area of applicability

These safety instructions apply to the vibrating level switches VEGASWING SG66(*).FE/FQ with integrated electronics Z (4 … 20 mA), T (NPN/PNP), R (2 x SPDT), L (4 … 20 mA with SIL qualification), I (NPN/PNP with SIL qualification), S (2 x SPDT with SIL qualification), according to Certificate of Conformity FM16US0038X and for all instruments with the number of the safety instruction (50279) on the type label.

2 General information

The vibrating level switches VEGASWING SG66(*).FE/FQ are used for monitoring or control of level measurement in hazardous areas.

The measured products can also be combustible liquids, gases, mist or vapours (Division and Zone applications).

The VEGASWING SG66(*).FE/FQ consist of an "Ex-d" electronics housing with integrated electronic module, a process connection element and a sensor.

The VEGASWING SG66(*).FE/FQ are suitable for use in hazardous atmospheres of all combustible materials of explosion groups A, B, C and D for applications requiring Class I, Division 1 instruments (National Electrical Code® (ANSI/NFPA 70 (NEC®), Article 500) or of explosion groups IIC, IIB or IIA for applications requiring Class I, Zone 0/1, 1 AEx d IIC, Ga/Gb, Gb instruments (National Electrical Code® [ANSI/NFPA 70, NEC®] Aricle 505).

If the VEGASWING SG66(*).FE/FQ are installed and operated in hazardous areas, the general Ex installation regulations as well as these safety instructions must be observed.

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

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

The equipment is not intended to be used as personal protective equipment. To prevent injury, read the manual before use.

Operating temperature range (* Referance section 4 "Application condtions")
-50 … +60 °C

Maximum working pressure range (* Referance section 4 "Application condtions")
FM3810: 2005, ISA-61010-1: 2012

-0.1 … 16 Mpa (-14.5 … 2.320 psig)

Environmental designation
ANSI/IEC 60529: 2004, NEMA 250: 2008

IP 66, IP 68, Type 4X, Type 6P

Hazardous location designation
FM3600: 2011, FM3615: 2006, ANSI/ISA-60079-0: 2013, ANSI/ISA-60079-1: 2013, ANSI/ISA-60079-26: 2011

Explosionproof for use in Class I, Division 1, Groups A, B, C and D

Flameproof for use in Class I, Zone 0/1, 1 AEx d IIC Ga/Gb, Gb

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3 Technical data

VEGASWING SG66(*).FE/FQ with integrated electronics Z (4 … 20 mA), T (NPN/PNP), R (2 x SPDT), L (4 … 20 mA with SIL qualification), I (NPN/PNP with SIL-qualification), S (2 x SPDT with SIL-qualification)

Electrical data
VEGASWING SG66(*).FE/FQ with integrated electronics R (2 x SPDT) or S (2 x SPDT with SIL qualification), version with single chamber housing A or V

Voltage supply: (terminals 1[+], 2[-])	U_i = 20 … 253 V AC, 50/60 Hz
	U_i = 20 … 72 V DC
	U_m = 253 V AC
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

VEGASWING SG66(*).FE/FQ with integrated electronics T (NPN/PNP) or I (NPN/PNP with SIL qualification), version with single chamber housing A or V

Voltage supply: (terminals 1[+], 4[-])	U_i = 9.6 … 55 V DC
	U_m = 253 V AC
Power consumption:	max. 2 W
Load current, transistor output (NPN/PNP): (terminals 2, 3)	max. 400 mA, 55 V DC

VEGASWING SG66(*).FE/FQ with integrated electronics Z (4 … 20 mA) or L (4 … 20 mA with SIL qualification), version with single chamber housing A or V

Power supply and signal circuit: (terminal 1[+], 2[-])	U_i = 9.6 … 35 V DC
	U_m = 253 V AC

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

4 Application conditions

VEGASWING SG66(*).FE/FQ with integrated electronics Z (4 … 20 mA), T (NPN/PNP), R (2 x SPDT), L (4 … 20 mA with SIL qualification), I (NPN/PNP with SIL-qualification), S (2 x SPDT with SIL-qualification)
For installations where the instrument forms part of a boundary into a Class I Zone 0 location the process pressure of the media must be between 0.08 … 0.11 Mpa (0.8 … 1.1 bar). The application conditions when operating in the absence of explosive mixtures can be found in the manufacturer's operating instruction information.

Hazards related to the control of external processes under measurement are beyond the scope of content described in the documentation.

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

Class I, Division 1 applications; Class I, Zone 0/1, Ga/Gb applications

Temperature class	Permissible ambient temperature on the electronics	Permissible ambient temperature on the sensor
T6, T5, T4, T3, T2, T1	-50 … +60 °C	-20 … +60 °C

If the sensors of the VEGASWING SG66(*).FE/FQ are operated at temperatures higher than those specified in the above table, please make sure by means of appropriate measures that there is no danger of ignition from the hot surfaces. The maximum permissible temperature on the electronics/ housing should not exceed the values specified in the above table. The application conditions during operation with no explosive mixtures present are stated in the manufacturer's operating instruction information.

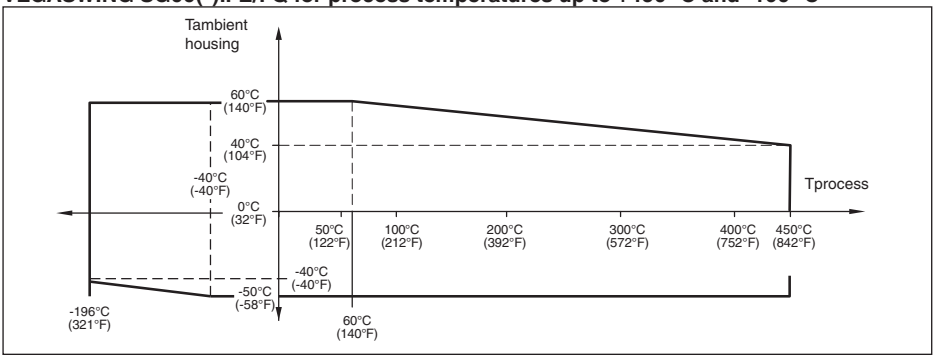
Class I, Division 1 applications; Class I, Zone 1, Gb applications

Temperature class	Permissible ambient temperature on the electronics	Permissible ambient temperature on the sensor
T6	-50 … +60 °C	-196 … +85 °C
T5	-50 … +60 °C	-196 … +100 °C
T4	-50 … +60 °C	-196 … +135 °C
T3	-50 … +60 °C	-196 … +200 °C
T2	-50 … +60 °C	-196 … +300 °C
T1	-50 … +60 °C	-196 … +450 °C

If the sensors of the VEGASWING SG66(*).FE/FQ are operated at temperatures higher than those specified in the above table, please make sure by means of appropriate measures that there is no danger of ignition from the hot surfaces. The maximum permissible temperature on the electronics/ housing should not exceed the values specified in the above table. The application conditions during operation with no explosive mixtures present are stated in the manufacturer's operating instruction information.

Temperature derating

VEGASWING SG66(*).FE/FQ for process temperatures up to +450 °C and -196 °C



The temperature ranges for operation specified in the operating instruction must not be exceeded.

5 Protection against static electricity

The VEGASWING SG66(*).FE/FQ in versions with electrostatically chargeable plastic parts, such

as e.g. plastic housing, metal housing with inspection window, with plastic coated sensors, suspension cable or suspension hose, distance tube or connection cable with the separated version, a caution label points 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

Erection/Installation: The VEGASWING SG66(*).FE/FQ must be erected/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 Use of an overvoltage arrester

If necessary, a suitable overvoltage arrester can be connected in front of the VEGASWING SG66(*). FE/FQ.

Due to the metallic separation between the medium and the electronics a VEGASWING SG66(*). FE/FQ does not require lightning protection measures.

7 Grounding

The explosion proof terminal compartment of VEGASWING SG66(*).FE/FQ must be grounded.

The external/internal ground connection terminal on the housing of VEGASWING SG66(*).FE/FQ must have a low impendance connection to the potential equalization. The internal grounding terminal is the primary grounding terminal to be used, the external grounding terminal is a supplementary allowed terminal.

In order to avoid the danger of electrostatic charging of the metallic parts, the VEGASWING SG66(*).FE/FQ must be electrostatically connected to the local potential equalization (transfer resistance ≤ 1 MΩ), e.g. via the ground terminal.

8 Impact and friction sparks

The VEGASWING SG66(*).FE/FQ in light metal versions, such as aluminum/titanium, 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.

9 Material resistance

The VEGASWING SG66(*).FE/FQ must only be used in products against which the wetted materials are sufficiently resistant.

10 Installation/mounting

The VEGASWING SG66(*).FE/FQ 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.

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11 Ignition protection type explosion proof/flameproof enclosure

The terminals for connecting to the operating voltage, i.e. signal circuits, are integrated in the connection compartment according to protection type explosion proof enclosure XP, Ex "d".

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

The explosion proof connection compartment is provided with a M20 x 1.5 or ½-14 NPT thread for connection to a certified "Conduit" system or for mounting of a certified explosion proof cable entry only for Zone application. Cable entries of simple construction may not be used. When connecting to a "Conduit" system, the associated sealing facility must be located directly on the explosion proof connection compartment.

The factory-installed screw plug or blind plug (depending on the type ordered) is part of the XP "Ex-d" housing. If a non factory-installed screw plug is used, it must be suitable for the function and certified.

Before opening the lid of a XP, Ex “d” compartment or in case it is already open (i. e. 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 explosion proof connection compartment, it must be sufficiently secured against damage.

The cover of the explosion proof connection compartment must be screwed in completely before commissioning and secured by screwing out the lid locking screw all the way to the stop.

Unused openings must be sealed accordingly.

Single chamber housing with explosion proof connection compartment (XP, Ex "d")

1 *Thread protection*
2 *Locking screw of the cover*
3 *Screw plug*
4 *Marking of the thread*
5 *Explosion proof connection compartment with electronics module*
6 *Optionally with inspection window*
7 *External ground terminal*

12 Type and size of the threads for the cable entries

The explosion proof connection compartment of VEGASWING SG66(*).FE/FQ with cable entry type M has cable entries M20 x 1.5.

The explosion proof connection compartment of VEGASWING SG66(*).FE/FQ with cable entry type N has cable entries ½-14 NPT.

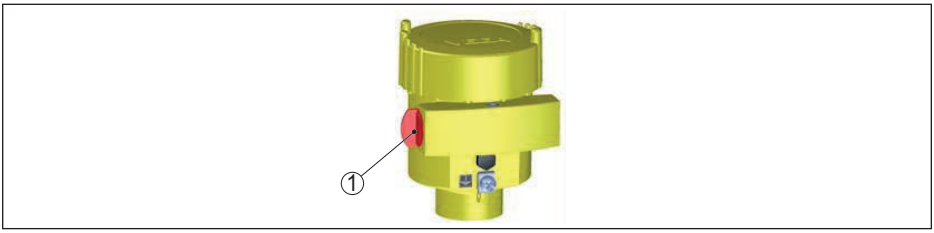
13 Removing and replacing the red thread cover

The red thread 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 XP, Ex “d”. Approved and suitable conduits or cable glands (Zone applications) or blind plugs must be installed according to the supplied documents.

Before setting up VEGASWING SG66(*).FE/FQ you have to check if all other openings are closed in a way approved for XP, Ex “d” protection.

The sealing plugs included by VEGA meet the necessary requirements.

VEGASWING SG66(*).FE/FQ - Single chamber housing with thread cover



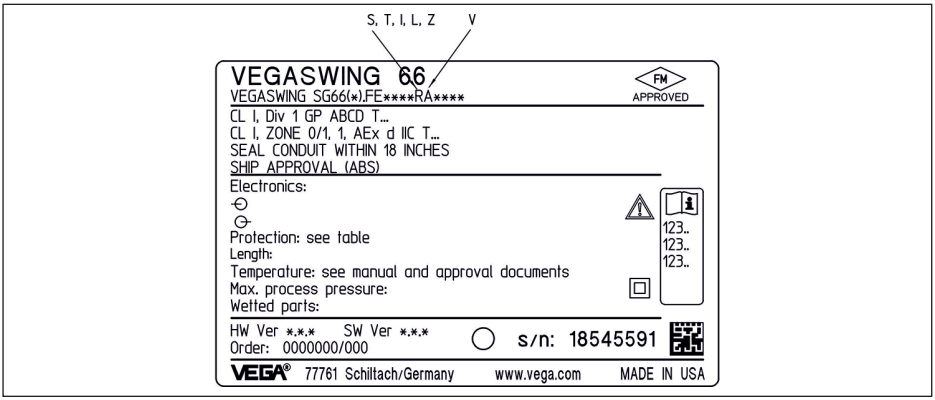
1 Red thread cover must be removed before setup. The opening must be closed before setup by a way approved for XP, Ex “d”.

14 Cautionary notes, warnings and markings

Hazardous location notes

- Installations in the US shall comply with the relevant requirements of the National Electrical Code® (ANSI/NFPA 70 (NEC®)).
- Wiring methods must conform to all local and national codes governing the installation, and wiring must be rated for at least +10 °C above the highest expected ambient temperature.
- Where the protection type allows and depends on wiring glands, the glands must be certified for the type of protection required and area classification identified on the equipment or system nameplate.
- The internal grounding terminal shall be used as the primary equipment grounding means and the external grounding terminal is only for a supplemental (secondary) bonding connection where local authorities permit or require such a connection.
- Approved seals against ingress of water or dust are required and the NPT or metric thread fittings must be sealed with tape or thread sealant in order to meet the highest level of ingress protection.
- When the equipment is supplied with plastic thread plugs in the conduit/cable gland entries; it is the end-user’s responsibility to provide cable glands, adaptors and/or blanking plugs suitable for the environment in which the equipment is installed. When installed in a hazardous (classified) location, the cable glands, adaptors and/or blanking plugs shall additionally be suitable for the hazardous (classified) location, the product certification, and acceptable to the local authority having jurisdiction for the installation.
- The end-user must consult the manufacturer for repair disclaimers, and only certified parts, such as entry plugs, mounting and cover lock screws and o-rings, supplied by the manufacturer are permitted. No substitutions with nonmanufacturer supplied parts are permitted.
- Tighten cover screws to 3 N·m (26.5 lb·in.). Overtorquing may cause enclosure breakage.

- The minimum tightening torque for M4 (No. 6) binding screw protective conductor terminals is 1.13 N·m (10 lb·in.) or greater, as specified.
- Care must be taken during installation to avoid impacts or friction that could create an ignition source.
- Use copper, copper-clad aluminum or aluminum conductors only.
- Tampering and replacement with non-factory components may adversely affect the safe use of the system.
- The VEGASWING 66 Series must be connected to limited output NEC Class 2 circuits, as outlined in the National Electrical Code® (ANSI/NFPA 70 (NEC®)), only. If the devices are connected to a redundant power supply (two separate power supplies), both must meet this requirement.
- Insertion or withdrawal of removable electrical connectors is to be accomplished only when the area is known to be free of flammable vapors.
- Do not open when an explosive atmosphere is present.
- Do not disconnect while circuit is live unless area is known to be non-hazardous.
- Explosion hazard, do not disconnect while circuit is live unless area is known to be non-hazardous.
- Explosion hazard, substitution of components may impair suitability for Class I, Division 2.
- For Group A & B applications, seal all conduits within 18 inches.
- The VEGASWING SG66(*).FE/FQ explosion proof equipment bears the following label marking:



15 IP Testing conditions

For IPX8 the testing was conducted to simulate a depth of 2 meters for 30 min.

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