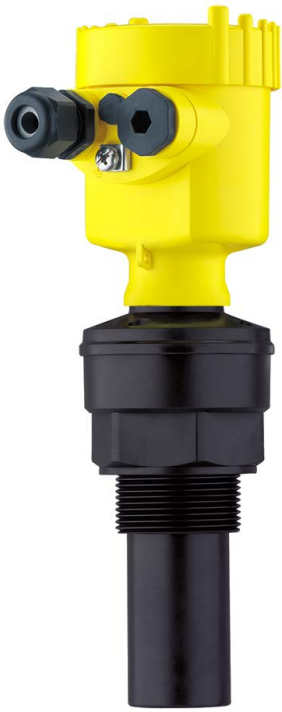
Safety instructions
VEGASON 61, 62

Intrinsic safety "i"
Profibus PA
Foundation Fieldbus



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Contents

Supplementary documentation:

- Operating Instructions VEGASON 61, 62
- EU-type approval certificate PTB 03 ATEX 2214 X (Document ID: 45132)
- EU declaration of conformity (Document ID: 44386)

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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.
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.
ES	Las indicaciones de seguridad presentes están disponibles en la zona de descarga de www.vega.com de forma estándar en los idiomas inglés, francés y español. VEGA pone a disposición otros idiomas de la UE cuando son requeridos.

1 Area of applicability

These safety instructions apply to the VEGASON 61, 62 of type series:

- VEGASON SN61(*).C***P/F****
- VEGASON SN62(*).C***P/F****

With the electronics versions:

- P - Profibus PA
- F - Foundation Fieldbus

According to EU type approval certificate PTB 03 ATEX 2214 X (certificate number on the type label) and for all instruments with safety instruction 45131.

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 60079-26: 2015

Type of protection marking:

- II 1G, 1/2G, 2G Ex ia IIC T6 … T1 Ga, Ga/Gb, Gb

2 Important specification in the type code

VEGASON SN61(*).aabcdefgh

Position		Feature	Description
aa	Approval	CX	ATEX II 1G, 1/2G, 2G Ex ia IIC T6 … T1 Ga, Gb
		CM	ATEX II 1G, 1/2G, 2G Ex ia IIC T6 … T1 GA, Gb + Ship approval
b	Version / Process temperature	A	Standard / -20 … +80 °C
c	Process fitting / Material	G	Thread G1½ PN2, DIN 3852-A-B / PVDF
		N	Thread 1½ NPT PN2, ASME B1.20.1 / PVDF
d	Electronics	P	Two-wire Profibus PA
		F	Two-wire Foundation Fieldbus
e	Housing / Protection	K	Plastic single chamber / IP66/IP67
		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)
		3	Aluminium single chamber / IP66/IP68 (1 bar)
		4	Aluminium double chamber / IP66/IP68 (1 bar)
		5	Stainless steel single chamber (precision casting) / IP66/IP68 (1 bar)
f	Cable entry / Connection	M	M20 x 1.5 / without
		N	½ NPT / without
		*	One-digit alphanumerical variable for further suitable fittings, cable entries and closing screws.

Position		Feature	Description
g	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
h	Certificates	X	without
		*	not safety relevant; one-digit alphanumeric variable for further accessories

VEGASON SN62(*).aabcdefgh

Position		Feature	Description
aa	Approval	CX	ATEX II 1G, 1/2G, 2G Ex ia IIC T6 … T1 Ga, Gb
		CM	ATEX II 1G, 1/2G, 2G Ex ia IIC T6 … T1 GA, Gb + Ship approval
b	Version / Process temperature	A	Standard / -20 … +80 °C
c	Process fitting / Material	G	Thread G2 PN2, DIN 3852-A-B / PVDF
		N	Thread 2 NPT PN2, ASME B1.20.1 / PVDF
d	Electronics	P	Two-wire Profibus PA
		F	Two-wire Foundation Fieldbus
e	Housing / Protection	K	Plastic single chamber / IP66/IP67
		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)
		3	Aluminium single chamber / IP66/IP68 (1 bar)
		4	Aluminium double chamber / IP66/IP68 (1 bar)
		5	Stainless steel single chamber (precision casting) / IP66/IP68 (1 bar)
f	Cable entry / Connection	M	M20 x 1.5 / without
		N	½ NPT / without
		*	One-digit alphanumerical variable for further suitable fittings, cable entries and closing screws.
g	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

Position		Feature	Description
h	Certificates	X	without
		*	not safety relevant; one-digit alphanumeric variable for further accessories

In the following, all above mentioned versions are called VEGASON 61, 62. 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 VEGASON 61, 62 in ignition protection type intrinsic safety "i" are used for detection of the distance between medium surface and sensor by means of ultrasonic in the kHz range.

The electronics uses the running time of the signals reflected by the medium surface to calculate the distance to the medium surface.

The VEGASON 61, 62 consist of an electronics housing, a process connection element and a sensor or an antenna.

The VEGASON 61, 62 are suitable for applications in hazardous atmospheres of all combustible materials of explosion groups IIA, IIB and IIC.

The VEGASON 61, 62 are suitable for applications requiring category 1G (EPL Ga), 1/2G (EPL Ga/Gb) or 2G (EPL Gb) instruments.

4 Application area

Category 1G (EPL Ga instruments)
The VEGASON 61, 62 with the mechanical fixing element are installed in hazardous areas of zone 0 requiring category 1G (EPL Ga) instruments.

Category 1/2G or 1/3G (EPL Ga/Gb or EPL Ga/Gc instruments)
The VEGASON 61, 62 with mechanical fixing element are installed in hazardous areas of zone 1 or zone 2 requiring instruments of category 2G (EPL Gb) or 3G (EPL Gc). The mechanical fixing element, process connection element is installed in the separating wall, which separates areas requiring instruments of category 2G (EPL Gb) or 3G (EPL Gc). 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 VEGASON 61, 62 with the mechanical fixing element are installed in hazardous areas of zone 1 requiring category 2G (EPL Gb) instruments.

VEGA Instrument	3G (EPL Gc)	2G (EPL Gb)	1/2G (EPL Ga/Gb)	1G (EPL Ga)
Ex Zone 2 				

VEGA Instrument	3G (EPL Gc)	2G (EPL Gb)	1/2G (EPL Ga/Gb)	1G (EPL Ga)
Ex Zone 1 				
Ex Zone 0 				

5 Specific conditions of use ("X" identification)

The following overview is listing all special properties of VEGASON 61, 62, 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 VEGASON 61, 62 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 capacitance of the metal measuring point identification plate was measured with 15 pF.

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

Mounting
Keep in mind for instrument mounting
- Mechanical damage on the instrument must be avoided
- Mechanical friction must be avoided
- 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

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 VEGASON 61, 62 being in contact with flammable media during operation must be included in the periodic overpressure test of the plant.

Intrinsic safety "i"
- Valid regulations for connection of intrinsically safe circuits, e.g. proof of intrinsic safety according to IEC/EN 60079-14 must be observed
- The instrument is only suitable for connection to certified, intrinsically safe instruments
- When connecting a circuit with protection level Ex ib, the device, the sensor meas. system of the device must no more be used in hazardous areas of zone 0.
- When connecting an intrinsically safe instruments with classification mark Ex ia to a circuit with protection level Ex ib, then the classification mark of the instrument changes to Ex ib. After the use as instrument with Ex ib power supply, the instrument must no more be used in circuits with protection level Ex ia
- When connecting an intrinsically safe instrument to an non-intrinsically safe circuit, the instrument must be no longer used in intrinsically safe circuits
- With surface temperatures > 70 °C, the cables must be suitable for the higher application conditions

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 VEGASON 61, 62

- For assessment and reduction of the explosion risk, valid standards such as for example ISO/EN 1127-1 must be taken into account

8 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.

9 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:

- 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

10 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.

11 Electrical data

VEGASON SN6*(*).C*P/F****

Supply and signal circuit:	
Terminals 1[+], 2[-] in "Ex-i" electronics compartment, with double chamber housing version in the connection compartment	In type of protection intrinsic safety Ex ia IIC.
	For connection to a certified, intrinsically safe circuit. U_i = 17.5 V I_i = 500 mA P_i = 5.5 W
	C_i negligibly small $L_i \leq 5$ µH
	The instrument is suitable for connection to a Fieldbus system according to the FISCO model, e.g. Profibus PA or Foundation Fieldbus. or U_i = 24 V I_i = 250 mA P_i = 1.2 W
	C_i negligibly small $L_i \leq 5$ µH
	In the version with fix mounted connection cable $C_{i\ wire/wire}$ = 159 pF/m, $C_{i\ wire/screen}$ = 270 pF/m and additionally L_i = 0.55 µH/m has to be taken into account.

Display and adjustment circuit:	
Terminals 5, 6, 7, 8 in electronics compartment or plug connection; with double chamber housing version in the connection compartment	In type of protection intrinsic safety Ex ia IIC.
	For connection to the intrinsically safe circuit of the corresponding external indicating unit VEGADIS 81 in ignition protection type Intrinsic safety "i" (PTB 02 ATEX 2136 X).
	The proof for intrinsic safety of the interconnection rendered if the total inductance and total capacitance of the connection cable L_{cable} = 100 µH and C_{cable} = 2.8 µF is not exceeded
	When using the delivered VEGA connection cable between VEGASON 61, 62 and the external indicating unit VEGADIS 61/81, the following listed cable inductances L_i and cable capacitances C_i must be taken into account with a cable length ≥ 50 m. L_i = 0.62 µH/m $C_{i\ wire/wire}$ = 132 pF/m $C_{i\ wire/screen}$ = 208 pF/m $C_{i\ screen/screen}$ = 192 pF/m
	When using the supplied VEGA connection cable, then the permissible cable length is L_{zul} = 341 m.

Communication circuit:	
I^2C-BUS socket in electronics compartment; with double chamber housing version also in connection compartment	In type of protection intrinsic safety Ex ia IIC
	Only for connection to the intrinsically safe signal circuit of an interface converter VEGACONNECT (PTB 01 ATEX 2007, PTB 07 ATEX 2013 X).

Display and adjustment circuit:	
Spring contacts in the connection 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 PLICSCOM or for service purposes the interface adapter VEGACONNECT (PTB 07 ATEX 2013 X), if it is ensured that no explosive atmosphere is present. 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 circuits of VEGASON 61, 62 are galvanically separated from ground.

The metallic parts of VEGASON 61, 62 are electrically connected with the earth terminals.

12 Thermal data

The following temperature tables are valid for all housing and electronics versions.

The relationship between the permissible ambient temperature for the electronics housing depending on the area of application and the maximum surface temperatures, temperature classes, can be seen in the following tables.

Category 1G instruments

Temperature class	Ambient temperature on the transducer and electronics
T4, T3, T2, T1	-20 … +60 °C

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

Temperature class	Ambient temperature on the transducer	Ambient temperature on the electronics
T6	-20 … +60 °C	-40 … +38 °C
T5	-20 … +60 °C	-40 … +53 °C
T4, T3, T2, T1	-20 … +60 °C	-40 … +80 °C

For applications requiring instruments of category 1G the process pressure of the media must be between 0.8 … 1.1 bar. If the VEGASON 61, 62 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

Temperature class	Ambient temperature on the transducer	Ambient temperature on the electronics
T6	-20 … +74 °C	-40 … +38 °C
T5	-20 … +89 °C	-40 … +53 °C
T4, T3, T2, T1	-20 … +90 °C	-40 … +80 °C

If the VEGASON 61, 62 are operated at higher temperatures as mentioned in the above table, please make sure by appropriate measures under consideration of he 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.

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