

Safety instructions

VEGATOR 141, 142

Installation in Zone 2
with output intrinsic safety "i"



Document ID: 48797



VEGA

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Supplementary documentation:

- Operating Instructions VEGATOR 141, 142
- Certificate of Conformity IECEX TUN 14.0031X (Document ID: 48798)

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1 Area of applicability

These safety instructions apply to the devices:

- VEGATOR 141
- VEGATOR 142

According to Certificate of Conformity IECEx TUN 14.0031X (certificate number on the type label) and for all instruments with safety instruction 48797.

The classification as well as the respective standards are stated in the above certificates:

Type of protection marking:

- Ex ec nC [ja Ga] IIC T4 Gc
- Ex ec nC [ja IIIC Da] IIC T4 Gc
- Ex ec nC [ja I Ma] IIC T4 Gc
- [Ex ia Ma] I
- [Ex ia Ga] IIC
- [Ex ia Da] IIIC

2 Device configuration/-properties

The detailed device configurations can be retrieved using the serial number search on our homepage.

Move to "www.vega.com" and enter in the search field the serial number of your instrument.

Alternatively, you can find all via your smartphone:

- Download the VEGA Tools app from the "*Apple App Store*", "*Google Play Store*" or "*Baidu Store*"
- Scan the DataMatrix code on the type label of the instrument or
- Enter the serial number manually in the app

3 General information

The controllers VEGATOR 141, 142 are used for intrinsically safe power supply of two-wire transmitters, the reliable galvanic separation of this circuits from all other circuits and the processing of the measured data transmitted analogously. The VEGATOR 141, 142 is a controller for level detection for continuously measuring 4 ... 20 mA sensors.

It processes the measured values of a sensor and delivers a switching signal according to the adjusted switching threshold. Hence simple control tasks can be solved.

Typical applications are monitoring functions such as overfill and dry run protections or gauge monitoring tasks. The 4 ... 20 mA input signals and relay outputs are used for control and monitoring of levels. The single channel controllers VEGATOR 141.**X****, VEGATOR 141.**S**** (with additional fail safe relay in the output) are for connection of a 4 ... 20 mA sensor and the double channel controller VEGATOR 142 for connection of two 4 ... 20 mA sensors.

The current is adjusted with the potentiometer on which the output status changes. The switching point can be changed with the potentiometer in the range between 4 and 20 mA, in mid position, the output switches at approx. 12 mA. With VEGATOR 142, one potentiometer is available for each channel.

Controllers VEGATOR 141, 142 must be mounted and operated outside hazardous areas and inside hazardous areas zone 2.

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-protected systems must always be carried out by qualified personnel.

4 Application area, use in gas and dust atmospheres

Category 3G

The VEGATOR 141, 142 must be mounted and operated outside hazardous areas and inside hazardous areas zone 2.

5 Special operating conditions

The following overview is listing all special properties of VEGATOR 141, 142, 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.

Zone 2 applications

The device must be installed in a protective housing or a switching cabinet with IP54 according to IEC 60079-0.

The device may only be used in an area with a minimum pollution level of 2 or better, as defined in IEC 60664-1.

6 Safe operating mode

General operating conditions

- Do not operate the instrument outside the electrical, thermal and mechanical specifications of the manufacturer

Connection conditions

- The connection cable of VEGATOR 141, 142 has to be wired fix and in such a way that damages can be excluded
- If the temperature at the entry parts exceeds 70 °C, temperature-resistant connection cables must be used

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 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 Certificate of Conformity 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 inte-

grated in the type test. This applies also to the components already mentioned in the technical description.

Mounting

Keep in mind for instrument mounting

- Mechanical damage on the instrument must be avoided
- Mechanical friction must be avoided

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

Intrinsic safety "i"

- Observe the valid regulations for the interconnection of intrinsically safe circuits.
- The instrument is only suitable for connection to certified, intrinsically safe instruments
- If the intrinsically safe circuit is lead into dust-explosive areas of zone 20 or 21, please make sure that the instruments which are connected to these circuits meet the requirements of EPL Da or EPL Db and are certified respectively

8 Electrical data

The VEGATOR 141, 142 include non-intrinsically safe circuits and one intrinsically safe circuit.

Non-intrinsically safe circuit

Supply circuit:	
Connection 16/17	$U = 24 \dots 230 \text{ V AC } (-15 \dots +10 \%)$ $U = 24 \dots 65 \text{ V DC } (-15 \dots +10 \%)$ $U_m = 253 \text{ V AC}$
Relay outputs:	
10/11/12, 13/14/15	Maximum values: $253 \text{ V AC, } 3 \text{ A}$ $50 \text{ V DC, } 1 \text{ A}$

Intrinsically safe circuit

Signal circuit:	
Connection 1/2, 4/5	Type of protection intrinsic safety Ex ia IIC, IIB, I
	Maximum values: $U_o \leq 22.4 \text{ V}$ $I_o \leq 113.5 \text{ mA}$ $P_o \leq 636 \text{ mW}$
	Characteristics: Linear
	The effective internal inductance L_i and capacity C_i are negligibly small.
	The max. values of the table can also be used as concentrated capacitances and concentrated inductances. The values for IIC and IIB are also permitted for explosive dust atmospheres.

Ex ia I	L_o [mH]	58	20	0.5	0.2	0.1
	C_o [μ F]	2	3.1	3.8	4.8	5.5

Ex ia IIC	L_o [mH]	1.9	1	0.5	0.2	0.1
	C_o [μ F]	0.058	0.076	0.097	0.13	0.156

Ex ia IIB (IIIC)	L_o [mH]	16	10	1	0.5	0.2
	C_o [μ F]	0.6	0.69	0.74	0.86	1.09

9 Thermal data

Permissible ambient temperatures

Permissible ambient temperature at the installation location of an instrument	-20 ... +60 °C (-4 ... +140 °F)
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10 Installation

Controllers VEGATOR 141, 142 must be mounted and operated outside hazardous areas and inside hazardous areas zone 2. The protection rating of VEGATOR 141, 142 corresponds to IP20.

If the controllers VEGATOR 141, 142 are not set up in dry and clean environments, they must be mounted in a housing with the required protection rating.

With zone 2 applications, the following special conditions must be noted:

According to EN/IEC 60079-7, paragraph H.2 the following applies for this instrument:

- For EPL Gc applications the controllers VEGATOR 141 and VEGATOR 142 have to be installed in a suitable enclosure according to EN/IEC 60079-7 resp. EN/IEC 60079-15 in such a way that a degree of protection of at least IP54 is achieved.
- For EPL Gc applications the controllers VEGATOR 141 and VEGATOR 142 have to be erected in such a way that a pollution degree 2 or less, according to IEC 60664-1, is achieved.
- For EPL Gc applications the controllers VEGATOR 141 and VEGATOR 142, to provide a transient protection that ensures that the rated voltage, connected to the power supply terminals, is not exceeded by more than 40 %.

- The connecting and disconnecting of non-intrinsically safe circuits is only permitted in the absence of a potentially explosive atmosphere.

With zone 2 applications, the torque of the terminals should be between 0.5 Nm and 0.6 Nm.

The wire cross-section can be used between 0.2 mm² and 2.5 mm².

Stripping length is 7 mm.

The housing used must be labelled with the following warning:

WARNING – DO NOT SEPARATE WHEN ENERGIZED

WARNING – SEPARATE ONLY IN A NON-HAZARDOUS AREA

If the intrinsically safe circuit is led into dust-explosive areas of zone 20 or 21, please make sure that the instruments connected to these circuits meet the requirements of category 1D or 2D and are certified respectively.

If the intrinsically safe circuit is led into firedamp endangered areas of group I category M1 or M2, please make sure that the instruments connected to these circuits meet the requirements of category M1 (EPL Ma instruments) or M2 (EPL Mb instruments) and are certified respectively.

Printing date:

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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.

Subject to change without prior notice

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