



# Safety instructions

## VEGATRENN 151, 152

Appropriate instrument

Zone 2

CSA 70076776 (023257\_0\_000)



Document ID: 54322



# VEGA

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Supplementary documentation:

- Operating Instructions VEGATRENN 151, 152
- Certificate of Conformity CSA 70076776 (023257\_0\_000) (Document ID: 54323)

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## 1 Area of applicability

These safety instructions apply to the single-channel and dual-channel Ex-separators VEGATRENN 151/152 according to the Certificate of Conformity CSA 70076776 (023257\_0\_000) (certificate number on the type label) and to all instruments with the number of the safety instruction (54322) on the type label.

### Object and type

#### The single channel separators VEGATRENN 151.\*\*\*\*\*

|                              | Feature | Description   |
|------------------------------|---------|---|
| Scope                        | C       | Canada / USA  |
| Approval                     | C       | Associated Equipment for CLI, DIV1, GP ABCD<br>Associated Equipment for CLII, DIV 2, GP EFG and CLIII<br>[Ex ia Ga/Da] IIC/IIIC, CLI, Zone 0/20, [AEx ia Ga/Da] IIC/IIIC              |
|                              | A       | CL I, DIV2, GP ABCD T4; Ex nA IIC T4 GC<br>CL I, Zone 2, AEx nA IIC T4 GC   |
|                              | *       | More possible markings in case the version is separately certified according to an additional certificate. The detailed encoding of the type code is part of the safety instructions. |
| Version                      | X       | Single channel for 4 ... 20 mA/HART sensors   |
| SIL qualification            | X       | without   |
|                              | S       | with, incl. Safety Manual   |
| Housing / Protection         | K       | Plastic / IP 20   |
|                              | U       | Protective housing plastic / IP66/IP67  |
| Terminal blocks / Connection | X       | 2.5 mm <sup>2</sup> detachable terminal blocks 1x black / 2x black  |
|                              | B       | 2.5 mm <sup>2</sup> detachable terminal blocks 1x blue / 2x black   |
| Certificates                 | M       | Yes, quality and test plans delivered   |
|                              | X       | No  |

#### The double channel separators VEGATRENN 152.\*\*\*\*\*

|       | Feature | Description  |
|-------|---------|--------------|
| Scope | C       | Canada / USA |

|                              | Feature | Description   |
|------------------------------|---------|---|
| Approval                     | C       | Associated Equipment for CLI, DIV1, GP ABCD<br>Associated Equipment for CLII, DIV 2, GP EFG and CLIII<br>[Ex ia Ga/Da] IIC/IIIC, CLI, Zone 0/20, [AEx ia Ga/Da] IIC/IIIC              |
|                              | A       | CL I, DIV2, GP ABCD T4; Ex nA IIC T4 GC<br>CL I, Zone 2, AEx nA IIC T4 GC   |
|                              | *       | More possible markings in case the version is separately certified according to an additional certificate. The detailed encoding of the type code is part of the safety instructions. |
| Version                      | X       | Double channel for 4 ... 20 mA/HART sensors   |
| SIL qualification            | X       | without   |
|                              | S       | with, incl. Safety Manual   |
| Housing / Protection         | K       | Plastic / IP 20   |
|                              | U       | Protective housing plastic / IP66/IP67  |
| Terminal blocks / Connection | X       | 2.5 mm <sup>2</sup> detachable terminal blocks 2x black / 2x black  |
|                              | B       | 2.5 mm <sup>2</sup> detachable terminal blocks 2x blue / 2x black   |
| Certificates                 | M       | Yes, quality and test plans delivered   |
|                              | X       | No  |

## 2 General information

The single channel separators VEGATRENN 151 and the double channel separators VEGATRENN 152 are used for galvanic separation, intrinsically safe power supply as well as signal transmission of Ex approved 4 ... 20 mA sensors in hazardous areas.

The separator is ideal in conjunction with signal conditioning instruments, having no own Ex-approval and have to allow bidirectional HART transmission.

The instruments are used for separation of intrinsically safe and non-intrinsically safe circuits.

The VEGATRENN 151, 152 is a passive safety barrier, the intrinsically safe current of a sensor in Ex area must be detected and made available to a non-intrinsically safe, passive output.

Since the VEGATRENN 151, 152 has no internal voltage supply, only voltage limitations are required. Possible undervoltages on the sensor side must be monitored by the sensor.

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.

The Ex separators of the series VEGATRENN 151/152 were tested and issued on the basis of standard

CSA Std C22.2 No. 0-10

CAN/CSA-C22.2 No. 61010-1-12

CAN/CSA-C22.2 No. 61010-2-14

CAN/CSA Std. C22.2 No. 60079-0:15

CAN/CSA Std. C22.2 No. 60079-11:14

CAN/CSA Std. C22.2 No. 60079-15:12  
 UL Std. No. 61010-1 (3<sup>rd</sup> Edition)  
 UL Std. No. 61010-2-201 (1<sup>st</sup> Edition)  
 UL 60079-0 (6<sup>th</sup> Edition 2012)  
 UL 60079-15 (4<sup>th</sup> Edition 2013)  
 UL 60079-11(6<sup>th</sup> Edition 2013)

### Hazardous locations designation

Class I, Zone 2, AEx nA IIC T4 Gc  
 Class I, Zone 0, [AEx ia Ga] IIC  
 Zone 20, [AEx ia Da] IIIC  
 Ex nA IIC T4 Gc  
 [Ex ia Ga] IIC  
 [Ex ia Da] IIIC

By additional marking as per CAN/CSA-C22.2 No. 60079-0:15, CAN/CSA-C22.2 No. 60079-11:14 and UL 60079-0:12.

Class I, Division 2, Groups A, B, C and D, T4

Associated equipment for Class I, Division 1, Groups A, B, C and D

Associated equipment for Class II, Division 2, Groups E, F, G and for Class II

## 3 Technical data

The VEGATRENN 151, 152 include non-intrinsically safe circuits and one intrinsically safe circuit.

### Non-intrinsically safe circuits

|   |  |
|---|--|
| Current output circuits<br>Channel 1: Terminals 10, 11; 12<br>Channel 2: Terminals 13, 14; 15 | U = 15 ... 35 V d.c., 4 ... 20 mA<br>U <sub>m</sub> = 253 V a.c. |
|---|--|

### Intrinsically safe circuits

|  |  |
|--|--|
| Current input circuits<br>Channel 1: Terminals 1 and 2<br>Channel 2: Terminals 4 and 5 | in type of protection "Intrinsic safety" Ex ia IIC/IIB<br>Maximum values per channel:<br>U <sub>o</sub> /V <sub>oc</sub> ≤ 18 V<br>I <sub>o</sub> /I <sub>oc</sub> ≤ 32 mA<br>P <sub>o</sub> = 569 mW<br>Characteristic line: rectangular<br>The effective internal capacitances and inductances are negligibly small. |
|--|--|

| Ex ia  | IIC     | IIB    |
|--|---------|--------|
| Max. permissible external inductance L <sub>o</sub> /L <sub>a</sub>  | 2 mH    | 5 mH   |
| Max. permissible external capacitance C <sub>o</sub> /C <sub>a</sub> | 0.15 μF | 1.3 μF |

The maximum values of the tables are also allowed to be used up to the permissible limits as concentrated capacitances and as concentrated inductances.

The values for IIC and IIB are also permissible for explosive dust atmospheres.

The intrinsically safe circuits are safe galvanically separated from the non-intrinsically safe circuits up to a peak value of the voltage of 375 V.

## Application conditions

### Permissible ambient temperatures

|   |                |
|---|----------------|
| Permissible ambient temperature at the installation location of an instrument | -20 ... +60 °C |
|---|----------------|

## 4 Installation

The single-channel separator VEGATRENN 151 and dual-channel separator VEGATRENN 152 can be installed and operated outside hazardous areas and inside hazardous areas Zone 2. The protection rating of VEGATRENN 151, 152 corresponds to IP 20.

If the separators VEGATRENN 151, 152 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:

1. The Single-channel Ex-Separator type VEGATRENN 151.\*\*\*\*\* and the dual-channel Ex-Separator type VEGATRENN 152.\*\*\*\*\* shall be installed completely inside an additional enclosure, providing a degree of protection of not less than IP 54 according to CSA/UL 60079-0 and CSA/UL 60079-15. The ambient temperature within the end use enclosure shall not exceed the limits of the permissible ambient temperature range.
2. Alternatively to the condition 1, the Single-channel Ex-Separator type VEGATRENN 151.\*\*\*\*\* and the dual-channel Ex-Separator type VEGATRENN 152.\*\*\*\*\* may be installed completely inside an additional enclosure, providing a degree of protection of not less than IP 4X according to CSA/UL 60079-0 and CSA/UL 60079-15. In this case the equipment must exclusively be mounted in locations providing adequate protection against the entry of solid foreign objects or liquids.
3. The end user shall ensure appropriate earthing upon installation.
4. Final acceptance of this equipment when installed is subject to the jurisdiction of the local inspection authority.

The degree of pollution of the area where the instrument is used must not exceed 2.

With zone 2 applications, the torque of the terminals should be between 0.4 Nm and 0.5 Nm.

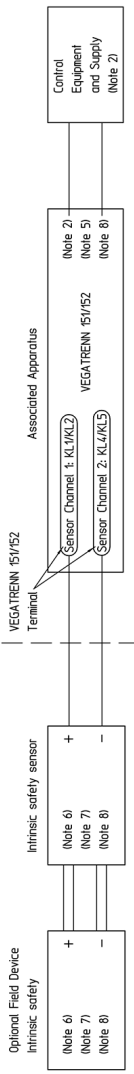
The wire cross-section can be used between 0.25 mm<sup>2</sup> and 2.5 mm<sup>2</sup>.

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.

Hazardous Location (Classified)  
Class I, Zone 0, Group IIC  
Class I, Division 1, Groups A, B, C and D  
Class II, Class III, Division 1, Groups E, F and G

CL I, Zone 2, A/Ex nA [a] Gc IIC T4 Gc  
CL I, Zone 2, A/Ex nA [a] IIC Da IIC T4 Gc

Class I, Division 2, Groups A, B, C and D, T4  
Associated equipment for Class I, Division 1, Groups A, B, C and D  
Associated equipment for Class II, Division 2, Groups E, F, G and for Class III



Current output circuits...

$U = 15 \dots 35 \text{ V d. c.}, 4 \dots 20 \text{ mA}$   
 $U_n = 253 \text{ V a. c.}$

Channel 1:  
Terminals 10, 11, 12  
Channel 2:  
Terminals 13, 14, 15

Current input circuits...

in type of protection "intrinsic Safety" Ex ia IIC, II/III C.

Maximum values per channel:

Channel 1:  
 $U_o / V_o c = 48 \text{ V}$   
Channel 2:  
 $U_o / V_o c = 32 \text{ mA}$   
Po = 569 mW  
Terminal 4 and 5

Characteristic line: rectangular  
The effective internal capacitances and inductances are negligibly small.

The capacitance Co and inductance Lo of the cables must be resized to the following values:

|  | Ex ia   | IIC    | II/III C |
|--|---------|--------|----------|
| Max. permissible external inductance Lo  | 2 mH    | 5 mH   |          |
| Max. permissible external capacitance Co | 0,15 μF | 1,3 μF |          |

#### Notes:

- The Intrinsic Safety Entity concept allows the interconnection of two intrinsically safe devices FM Approved and CSA Certified entity parameters not specifically examined in combination as a system when:  
 $U_o$  or  $V_o c < V_{max}$ ,  $I_o$  or  $I_{sc}$  or  $I < I_{max}$ ,  $C_o$  or  $C_o > C_i$  + Cable,  $L_o$  or  $L_o > L_i$  + Cable,  $P_o < P_i$ .
- Control equipment connected to the Associated Apparatus shall not use or generate more than 250 Vrms or Vdc.
- Division 1 installations should be in accordance with ANSI/ISA RP12.06.01 "Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations" and the National Electrical Code (®) (ANSI/NFPA 70) or Canadian Electrical Code.
- For Division 1 installations, the configuration of associated Apparatus shall be FM Approved/CSA Certified under Entity Concept.
- Field sensors/device manufacturer's installation drawing shall be followed when installing this equipment.
- The configuration of Field Device must be FM Approved/CSA Certified under Entity Concept.
- The Field Device manufacturer's installation drawing shall be followed when installing this equipment.
- No revision to drawing without prior Approval by FM Approvals and CSA International.

|                    |                    |                     |                         |
|--------------------|--------------------|---------------------|-------------------------|
| Paraschutzstempel: | Abzweig/Anschlüsse | Änderung / revision | Art.Nr. / revision      |
|                    |                    | Notizen/Remarks     | Benennung               |
|                    |                    |                     | Engineering/Änderungen  |
|                    |                    |                     | VEGATRENN 15/152        |
|                    |                    |                     | Art.Nr. / Art.Nr.       |
|                    |                    |                     | Zwangs-Nr. /            |
|                    |                    |                     | Draht-Nr.               |
|                    |                    |                     | Art.Nr. / Rev.          |
|                    |                    |                     | <b>GE3870</b>           |
|                    |                    |                     | <b>GE3870</b>           |
|                    |                    |                     | Art.Nr. / Rev.          |
|                    |                    |                     | Produkt / replacement L |
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|                    |                    |                     | Produkt / replacement L |

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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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VEGA Grieshaber KG  
Am Hohenstein 113  
77761 Schiltach  
Germany

Phone +49 7836 50-0  
Fax +49 7836 50-201  
E-mail: [info.de@vega.com](mailto:info.de@vega.com)  
[www.vega.com](http://www.vega.com)