



Safety instructions

**MINITRAC MT31.DK*A/B/
I/L******

**MINITRAC MT32.DK*A/B/
I/L******

GYJ 13.1113X

Ex d [ia Ga] IIC T6 Gb

DIP A20/A21 Ta, T4 IP66



CE 0044



Document ID: 54591



VEGA

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Please note:

These safety instructions are part of the documentation:

- 40447 - MINITRAC 31 - 4 ... 20 mA/HART - four-wire
- 43389 - MINITRAC 31 - 4 ... 20 mA/HART - four-wire with SIL qualification
- 37430 - MINITRAC 32 - 4 ... 20 mA/HART - four-wire
- 43908 - MINITRAC 32 - 4 ... 20 mA/HART - four-wire with SIL qualification
- 45900 - NEPSI Certificate of Conformity GYJ 13.1113X

1 Area of applicability

These safety instructions apply to the radiation-based sensors MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** according to the NEPSI Certificate of Conformity GYJ 13.1113X (certificate number on the type label) and to all instruments with the number of the safety instruction (54591) on the type label.

2 General information

The MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** are suitable for use in hazardous atmospheres of all combustible materials of explosion group IIA, IIB and IIC for applications requiring instruments of zone 1/EPL-Gb.

The MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** are suitable for use in areas with combustible, dust-generating bulk solids requiring instruments of zone 20/EPL-Da or 21/EPL-Db.

If the MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** are installed and operated in hazardous areas, the general Ex installation regulations IEC 60079-14 as well as these safety instructions must be observed.

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

2.2 Zone 1/EPL-Gb instrument

The MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** is installed in hazardous areas in areas requiring instruments of zone 1/EPL-Gb.

2.3 Zone 20/EPL-Da instrument

The MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** is installed in hazardous areas, in areas requiring instruments of zone 20/EPL-Da.

2.4 Zone 21/EPL-Db instrument

The MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** is installed in hazardous areas in areas requiring instruments of zone 21/EPL-Db.

3 Technical data

3.1 Electrical data

Non-intrinsically safe circuits (in the "Ex-d" connection compartment)

MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L****

Voltage supply: (terminals 1[L1], 2[N])	U = 20 ... 253 V AC
	U = 20 ... 72 V DC
	$U_m = 253 \text{ V}$
Relay circuit: (terminals 4[NC], 5[Common], 4[NO])	Maximum values:
	253 V AC, 3 A, 500 VA
	253 V AC, 1 A, 41 W

Current input: (terminals 12[In+], 13[In-]) $I = 4 \dots 20 \text{ mA}$

Digital input: (terminals 14[+100 mA], 15[+10 mA], 16[Common])

Digital output: (terminals 17[Out+], 18[Out-])

- Max. load current: floating transistor output $400 \text{ mA}, 55 \text{ V DC}$

Multigauge Communication: (terminals 19[Serial out-], 20[Serial out+], 21[Serial in-], 22[Serial in+]) Communication circuit, only for communication with additional PROTRAC instruments.

MINITRAC MT31.DK*A/I****, MINITRAC MT32.DK*A/I****

Signal circuit: (terminals 9[+active], 10[+passive], 11[common] in the "Ex-d" connection compartment) $I = 4 \dots 20 \text{ mA}$ with superimposed HART signal

Intrinsically safe circuits (in the "Ex-i" connection compartment)

MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L****

Display and adjustment circuit: (terminals 5, 6, 7, 8 in the lateral chamber)

In ignition protection type intrinsic safety Ex ia IIC/IIIC

For connection to the intrinsically safe circuit of the associated external indicating instrument VEGADIS 61/81 (GYJ 15.1394X, GYJ 15.1396X, GYJ 15.1397X).

The rules for the interconnection of intrinsically safe circuits between MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** and the external indicating unit VEGADIS 61/81 are fulfilled, provided that the total inductance and total capacitance of the connection cable between MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** and the external indicating unit VEGADIS 61/81 $L_{\text{cable}} = 100 \mu\text{H}$ and $C_{\text{cable}} = 3.4 \mu\text{F}$ are not exceeded.

When using the delivered VEGA connection cable between MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** 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 $\geq 50 \text{ m}$.

- $L_i = 0.62 \mu\text{H/m}$
- $C_{i \text{ wire/wire}} = 132 \text{ pF/m}$
- $C_{i \text{ wire/screen}} = 208 \text{ pF/m}$
- $C_{i \text{ screen/screen}} = 192 \text{ pF/m}$

Circuit of the display and adjustment module: (spring contacts in the lateral chamber)

In ignition protection type intrinsic safety Ex ia IIC/IIIC

Only for connection to the display and adjustment module PLICSCOM or the interface converter VEGA-CONNECT.

MINITRAC MT31.DK*B/L****, MINITRAC MT32.DK*B/L****

Intrinsically safe current output: (terminals 1[+], 2[-] in the lateral chamber)

$I = 4 \dots 20$ mA with superimposed HART signal

Maximum values:

- $U_o = 22.16$ V
- $I_o = 111.90$ mA
- $P_o = 620.03$ mW

Characteristics: linear

The effective internal capacitance C_i is negligibly small.

The effective internal inductance L_i is negligibly small.

	Ex ia IIC/IIIC	Ex ia IIC/IIIC	Ex ia IIB/IIIB	Ex ia IIB/IIIB
Permissible inductance L_o	1 mH	0.5 mH	5 mH	0.5 mH
Permissible capacitance C_o	0.08 μ F	0.098 μ F	0.58 μ F	0.65 μ F

4 Application conditions

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

Zone 1/EPL-Gb instrument

Temperature class	Ambient temperature on the sensor
T6, T5, T4, T3, T2, T1	-40 ... +60 °C

Zone 20/EPL-Da or zone 21/EPL-Db instrument

The max. surface temperature is limited by a temperature fuse to +98 °C.

The permissible ambient temperature is +60 °C.

5 Protection against static electricity

The MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** in the version with chargeable plastic parts, as e.g. metal housing with inspection window or plastic detectors, is provided with a caution label referring to 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

6 Grounding

For safety reasons, the radiation-based sensors type MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** must be grounded. The external or internal ground connection terminal on the housing is used for this purpose.

7 Material resistance

The MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** must only be used in media against which the materials of the wetted parts are sufficiently resistant.

8 Mounting with external indicating unit VEGADIS 61 or VEGADIS 81

The intrinsically safe signal circuit between MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** and the external indicating unit VEGADIS 61 or VEGADIS 81 should be set up without grounding. The required insulation voltage is > 500 V AC. When using VEGA connection cable, this requirement is fulfilled. If grounding of the cable screen is required, it must be carried out according to IEC 60079-14 paragr. 12.2.2.3.

9 Ignition protection type flameproof enclosure Ex "d"

The terminals for connecting the operating voltage or signal circuits are integrated in the terminal compartment with protection type Flameproof Enclosure "d".

The thread gap between housing and cover is a flameproof gap.

The "Ex-d" 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 a "Ex-d" cable entry certified according to IEC 60079-1. Cable entries of simple construction may not be used. Please take note of section 13.1 and 13.2 of IEC 60079-1. When connecting to a "Conduit" system, the associated sealing facility must be located directly on the "Ex-d" connection compartment.

Unused openings must be sealed according to IEC 60079-1.

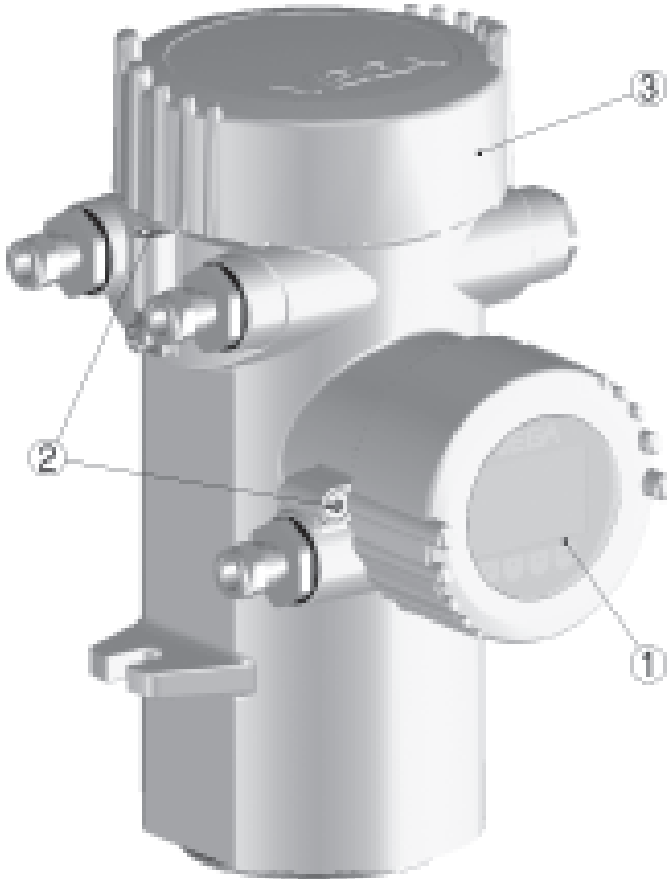
A certified "Ex-d" cable gland can optionally be supplied with the delivery. It is suitable for insertion of armoured or unarmoured cables depending on the ordered version. The instructions in the document accompanying the respective cable entry must be observed. The "Ex-d" cable entry must be screwed tightly into the housing. The supplied cable entry is suitable for the housing temperature range mentioned in the MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** specification. If a different cable entry is used, the separately certified cable entry or the temperature classes on the electronics determines the maximum permissible ambient temperature on the housing.

Before opening the lid of the "Ex-d" terminal compartment or in case it is already open (e. g. 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 "Ex-d" connection compartment, it must be sufficiently secured against damage and in conformity with IEC 60079-14.

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

Double chamber housing with "Ex-d" connection compartment



- 1 "Ex-i" connection compartment
- 2 Locking screws of the cover
- 3 "Ex-d" connection compartment

Unused openings must be sealed according to IEC 60079-1 section 11.9.

10 Flame proofing protection by housing Ex "t"

Before setup and application of the MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** as explosion-proof instruments of category 1D or 2D, the two lids have to be screwed in to the stop and secured with the respective lid lock.

Cable entries must only be replaced by the same types or suitable cable entries/glands certified according to IEC with at least IP 66.

The cable entry sent with the delivery is suitable for the housing temperature range specified in the MINITRAC MT31.DK*A/B/I/L****, MINITRAC MT32.DK*A/B/I/L**** certificate. If a different cable entry is used, the separately certified cable entry/gland determines the max. permissible ambient temperature on the housing.

11 Type and size of the threads for the "Ex-d" cable entries

The threads for mounting the "Ex-d" cable entries are of type M20 x 1.5 with MINITRAC MT31. DK*A/B/I/L*M**, MINITRAC MT32.DK*A/B/I/L*M**.

The threads for mounting the "Ex-d" cable entries are of type ½-14 NPT with MINITRAC MT31. DK*A/B/I/L*N**, MINITRAC MT32.DK*A/B/I/L*N**.



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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54591-EN-160809

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