



# Safety instructions

## VEGAMET MET391.C\*\*\*\*

TÜV 09 ATEX 555127

⊕ II (1) G [Ex ia Ga] IIC, II (1) D [Ex ia Da] IIC

⊕ I (M1) [Ex ia Ma] I



CE 0044



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Please note:

These safety instructions are part of the following documentation:

- 36032 - VEGAMET 391 Ex
- 40325 - EC type approval certificate TÜV 09 ATEX 555127

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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 explosionsfarliga områden
DA	Sikkerhedsforskrifter til anvendelse i explosionsfarlig atmosfære
FI	Turvallisuusohjeet räjähdysvaarallisissa tiloissa käyttöä varten
EL	Υποδείξεις ασφαλείας για τη χρησιμοποίηση σε περιοχές που υπάρχει κίνδυνος έκρηξης

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## 1 Area of applicability

These safety instructions apply to the signal conditioning instruments VEGAMET MET391.C\*\*\*\* according to EC type approval certificate TÜV 09 ATEX 55512 with the 1. supplement (certificate number on the type label) and to all instruments with the number of the safety instruction (40324) on the type label.

## 2 General information

The VEGAMET 391 signal conditioning instruments are accessory electrical devices used to process intrinsically safe 4 ... 20 mA/HART signals as well as to supply intrinsically safe sensors with power. They are also used to galvanically isolate intrinsically safe circuits from non-intrinsically safe circuits.

If the VEGAMET 391 is used for power supply of intrinsically safe sensors that are installed and operated in hazardous areas, the general Ex mounting instructions EN 60079-14 as well as these safety instructions have to 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.

## 3 Technical data

The VEGAMET MET391.C\*\*\*\* include non-intrinsically safe circuits and one intrinsically safe circuit.

### Non-intrinsically safe circuits

Voltage supply

- Voltage supply: (connections KI3 [25, 26])
  - $U = 20 \dots 72 \text{ V AC}$
  - $U = 20 \dots 253 \text{ V DC}$
  - $U_m = 253 \text{ V AC}$

- Voltage supply: (connections KI2 [13, 14])

Relay outputs

- Relay output 1: (connections KI2 [19,20,21])
  - Maximum values:
  - 250 V AC, 3 A, 500 VA
  - 60 V DC, 1 A, 54 W

- Relay output 2: (connections KI2 [22,23,24])

- Relay output 3: (connections KI3 [25,26,27])

- Relay output 4: (connections KI3 [28,29,30])

- Relay output 5: (connections KI3 [31,32,33])

- Relay output 6: (connections KI3 [34,35,36])

Current output: (connections KI2 [16,17])  $0/4 \dots 20 \text{ mA}$   
 $U_m = 253 \text{ V}$

## Communication circuits

- RS232 connection: (socket on the lower part of the housing) For connection to an RS232 interface  
 $U_m = 50 \text{ V}$
- Ethernet connection: (socket on the lower part of the housing) For connection to an Ethernet interface  
 $U_m = 50 \text{ V}$
- USB connection: (socket on the lower part of the housing) For connection to a USB interface  
 $U_m = 16 \text{ V}$

## Digital inputs

- Digital input 1: (connections KI1 [8,12]) Maximum values:  
Low-Level:  $U = -3 \dots +5 \text{ V DC}$   
High-Level:  $U = 11 \dots +30 \text{ V DC}$   
 $U_m = 36 \text{ V}$
- Digital input 2: (connections KI1 [9,12])
- Digital input 3: (connections KI1 [10,12])
- Digital input 4: (connections KI1 [11,12])

## Intrinsically safe circuit

Signal circuit and power supply: (connections KI1 [1,2]) Ignition protection type intrinsic safety Ex ia IIC, Ex ia IIB

Maximum values:

$$U_o = 24.2 \text{ V}$$

$$I_o = 110 \text{ mA}$$

$$P_o = 662 \text{ mW}$$

Characteristics: linear

Effective internal capacitance  $C_i = 0$  and inductance  $L_i = 0$

The permissible values for the external capacitances  $C_o$  and inductances  $L_o$  which result from the combination of  $C_o$  and  $L_o$ , can be found in the following table.

## For gas group II

	Ex ia IIC		Ex ia IIB	
Permissible external inductance $L_o$	0.2 mH	0.5 mH	0.5 mH	1 mH
Permissible external capacitance $C_o$	110 nF	82 nF	540 nF	460 nF

## For gas group I

	Ex ia I	
Permissible external inductance $L_o$	0.5 mH	10 mH
Permissible external capacitance $C_o$	1000 nF	930 nF

With additionally connected VEGACONNECT (PTB 07 ATEX 2013 X): connections KI1[3,4])

Signal circuit and power supply: (connections KI1 [1,2]) Ignition protection type intrinsic safety Ex ia IIC, Ex ia IIB

Maximum values:

$$U_o = 24.2 \text{ V}$$

$$I_o = 113 \text{ mA}$$

$$P_o = 667 \text{ mW}$$

Characteristics: linear

Effective internal capacitance  $C_i = 0$  and inductance  $L_i = 0$

The permissible values for the external capacitances  $C_o$  and inductances  $L_o$  which result from the combination of  $C_o$  and  $L_o$ , can be found in the following table.

### For gas group II

	Ex ia IIC		Ex ia IIB	
	0.2 mH	0.5 mH	0.5 mH	1 mH
Permissible external inductance $L_o$	0.2 mH	0.5 mH	0.5 mH	1 mH
Permissible external capacitance $C_o$	110 nF	81 nF	540 nF	460 nF

### For gas group I

	Ex ia I	
	0.5 mH	10 mH
Permissible external inductance $L_o$	0.5 mH	10 mH
Permissible external capacitance $C_o$	1000 nF	930 nF

The intrinsically safe signal circuit and power supply is separated from the non-intrinsically safe circuits up to a peak value of the nominal voltage of 375 V.

## Application conditions

### Ambient conditions

Ambient temperature -20 ... +60 °C (-4 ... +140 °F)

## 4 Installation

If the signal conditioning instruments VEGAMET MET391.C\*\*\*\* are not set up in dry and clean environments, they must be mounted in a housing with the required protection rating.

The signal conditioning instruments VEGAMET MET391.C\*\*\*\* must be operated outside hazardous areas. The separating wall must be installed before setup.

If the intrinsically safe circuit is fed into explosive areas of zone 0/1 or 20/21, please make sure that the instruments connected to these circuits meet the requirements of category 1G/2G or category 1D/2D and are appropriately certified.



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.

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