Instructions according to IEC 60079-0 IECEx TUN 08.0007X

Evaluation Unit type VAPORIX-Control … Stand: 05.2016

I Range of application

The evaluation unit is a part of an automatic monitoring device to check the function of the vapour recovery systems at filling stations.

II Standards

The evaluation unit is designed in accordance with the following IEC standards

IEC 60079-0:2011-06, Edition 6.0	Equipment – General requirements
IEC 60079-11:2011-06, Edition 6.0	Equipment protection by intrinsic safety "i"

III Instructions for safety

III.a Use

The evaluation unit serves as associated apparatus and is not for use in potentially explosive atmospheres. The intrinsically safe electric circuits of the evaluation unit may be routed to zone 0 and can be used for gas groups IIA and IIB.

The approval is valid for the evaluation unit

VAPORIX-Control	Evaluation unit in a top hat rail enclosure
VAPORIX-Control Basic	Evaluation unit in a top hat rail enclosure without RS-485 communication
VAPORIX-Control II	Evaluation unit in a built-on enclosure

III.b Assembling and dismantling

The assembling and dismantling shall only take place de-energised!

The housing of the top hat rail enclosure must not be opened!

The evaluation unit type VAPORIX-Control II operated in a built-on enclosure. Then the potential equalization terminal must be present. If the board should assemble on a different holder/enclosure, the potential equalization must safely bonded to at least one of the three PA connections.

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III.c Installation

All wiring operations must solely be carried out with the power disconnected. Special rules and regulations, including IEC 60079-14 and local installation regulations, must be observed.

The evaluation unit in a top hat rail enclosure is suitable for DIN rail and wall mounting. The evaluation unit in a built-on enclosure must be installed in an enclosure with a degree of protection of at least IP20. The evaluation unit must be installed outside potentially explosive atmospheres. If the evaluation unit is installed outdoors, the degree of protection provided by enclosure must be at least IP54.

When wiring the sensor (VAPORIX-Flow) to the evaluation unit (preferably with a blue-coloured cable), the inductance and capacitance approved in clause V must not be exceeded.

Terminal designation:

Connection	Terminal	Pins
Power supply	230V~	PE, N and L
Sensor circuits	B resp. A	1 to 8 appropriate
Pulse input	Pulse	-B+ resp. –A+
Control outputs	Out B resp. Out A	-2+ resp. -1+ appropriate
Voltage outputs	5V	- and +
Two-wire RS-485	RS485	G, B and A
Four-wire RS-485	RS485-4	(Cradle connector)
RS-232 interface	Service	(Sub D jack)

Table III.c1: Terminal designation on the evaluation unit VAPORIX-Control

Connection	Terminal	Pins
Power supply	230V~	PE, N and L
Sensor circuits	B resp. A	1 to 8 appropriate
Pulse input	Pulse	-B+ resp. –A+
Control outputs	Out B resp. Out A	-2+ resp. -1+ appropriate
Voltage outputs	5V	- and +
RS-232 interface	Service	(Sub D jack)

Table III.c2: Terminal designation on the evaluation unit VAPORIX-Control Basic

Connection	Terminal	Pins
Power supply	24V=	- and +
Sensor circuits	A resp. B	1 to 8 appropriate
RS-422	RS422	(Cradle connector)
RS-485	RS485	A, B and G
Potential equalization	PA	PA

Tabelle III.c3: Terminal designation on the evaluation unit VAPORIX-Control II

The evaluation unit VAPORIX-Control II must bonded into the potential equalization of the potential explosive area.

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III.d Adjustment

No safety-related adjustments are required to operate the evaluation unit.

III.e Putting into service

Before putting into service, all equipment must be checked to ensure it is properly connected and installed. The power supply, as well as connected equipment, must be checked.

III.f Maintenance, overhaul and repair

In general, the evaluation unit is maintenance-free. In case of a defect it must be send back to the manufacturer FAFNIR, or one of his representatives.

The evaluation units VAPORIX-Control and VAPORIX-Control Basic have conformance with the dielectric strength requirements as set out in IEC 60079-11, clause 6.3.13 between the intrinsic safety sensor circuits and the power supply, the communication terminals resp. the outputs.

The evaluation unit VAPORIX-Control II has conformance with the dielectric strength requirements as set out in IEC 60079-11, clause 6.3.13 between the intrinsic safety sensor circuits and the communication terminals. Between the intrinsic safety sensor circuits and the power supply is non-conformance.

IV Equipment marking

1	Manufacturer:	FAFNIR GmbH, Hamburg	
2	Type designation:	VAPORIX-Control …	
3	Certificate number:	IECEx TUN 08.0007X	
4	Ex marking:	[Ex ia Ga] IIB	
5	Technical data:	VAPORIX-Control VAPORIX-Control Basic	VAPORIX-Control II
		$U_o \leq$ 23.9 V	$U_o \leq$ 22.2 V
		$I_o \leq$ 325 mA	$I_o \leq$ 371 mA
		$P_o \leq$ 1.9 W	$P_o \leq$ 2.1 W
		$L_o \leq$ 380 µH	$L_o \leq$ 440 µH
		$C_o \leq$ 480 nF	$C_o \leq$ 510 nF
		$T_a \leq$ +65 °C	$C_i <$ 200 nF
			$L_i <$ 10 µH
			$T_a \leq$ +65 °C

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V Technical data

The power supply for the evaluation unit, depending on model is

Connection power supply		VAPORIX-Control VAPORIX-Control Basic	VAPORIX-Control II
Voltage	U	115 V_{AC} ± 10 % resp. 230 V_{AC} ± 10 %	24 V_{DC} ± 5 %
Frequency	F	50 Hz … 60 Hz	-
Power input	P	~ 18 VA	< 9 W
Safety-related maximum voltage	U_m	134 V @ U = 115 V_{AC} 253 V @ U = 230 V_{AC}	253 V

The evaluation unit VAPORIX-Control II may only connected to mains electricity supply systems with a prospective current shall not exceed 1.5 kA a. c.

The sensor circuits in type of protection 'intrinsic safety' (ia) with a linear output characteristic. The output values of each sensor circuit are

Connection sensor circuit		VAPORIX-Control VAPORIX-Control Basic	VAPORIX-Control II
Output voltage	U_o	≤ 23.9 V	≤ 22.2 V
Output current	I_o	≤ 325 mA	≤ 371 mA
Output power	P_o	≤ 1.9 W	≤ 2.1 W
Inner capacitance	C_i	-	< 200 nF
Inner inductance	L_i	-	< 10 µF

The permissible outer inductance and capacitance is

IIB		VAPORIX-Control / VAPORIX-Control Basic				VAPORIX-Control II			
L_o	≤	**380 µH**	200 µH	100 µH	50 µH	**440 µH**	200 µH	100 µH	50 µH
C_o	≤	**480 nF**	620 nF	800 nF	940 nF	**510 nF**	680 nF	880 nF	1,1 µF

The maximum values of the parameter pairings may simultaneously be used as concentrated capacitances (minus C_i) and concentrated inductances (minus L_i)

Values in bold letters are also to be found in the equipment marking.

The intrinsically safe sensor circuits of evaluation units, type VAPORIX-Control and VAPORIX-Control Basic are safely galvanically isolated from the supply circuit up to a peak value of the nominal voltage of 375 V.

If connection available, the intrinsically safe sensor circuits are safely galvanically isolated from the pulse inputs, the control outputs, the communication interfaces, and the voltage output up to a peak value of the nominal voltage of 190 V.

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As a reference, the corresponding pulse output of the fuel dispenser computer must be connected to the pulse input (Pulse). The permissible voltage signal is between

$U = 5\ V \ldots 30\ V$

The control outputs (Out) can loaded with following electrical values

$U = 30\ V$
$I = 200\ mA$

The signal voltage of the communication interfaces (RS-422, RS-485, RS-485-4 and Service) is

$U \leq 12\ V$

The safety-related maximum voltage of the pulse inputs, the control outputs and the communication interfaces is

$U_m = 134\ V$

The voltage output supplies the following electrical values

$U = 5\ V$
$I \leq 50\ mA$

The evaluation unit may be used in the following ambient temperature range

$T_a = -20\ °C \ldots +65\ °C$

The evaluation unit achieves a degree of protection provided by enclosure of

VAPORIX-Control	IP20
VAPORIX-Control Basic	IP20
VAPORIX-Control II	IP00

VI Specific conditions of use

1. The evaluation unit type VAPORIX-Control II must installed in an enclosure with a degree of protection provided by enclosure according to IEC 60529 of at least IP20.
2. The potential equalization terminal (PA) on the evaluation unit type VAPORIX-Control II must bonded to the potential equalization system of the potential explosive area.

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