

**Instructions according to Portaria N° 179/2010**

UL-BR 17.0875X

**Measuring transmitter VPI with or without power supply VPI-Supply ...**

Edition: 10.2017

**I Range of application**

The associated apparatuses VPI and VPI-Supply may only be used outside the potentially explosive area. The voltage supply VPI-Supply serves as powering of the VPI transmitter. The purpose of the VPI transmitter is preferably to supply the electronic filling level sensors with power and transmits the measurement data to a higher-level analysis system.

**II Standards**

The device is designed according to the following standards

ABNT NBR IEC 60079-0:2013	Equipment – General requirements
ABNT NBR IEC 60079-11:2013	Equipment protection by intrinsic safety "i"

**III Instructions for safety****III.a Use**

The associated apparatus VPI has eight intrinsically safe sensor inputs. Each sensor is connected using four terminal clamps. Two clamps are provided for the intrinsically safe power supply whilst the other two are for the transmission of measurement data. At the same time, the VPI transmitter is used to safely isolate intrinsically safe and non-intrinsically safe circuits. All sensor connections are galvanically connected to one another.

The intrinsically safe sensor circuits of the VPI transmitter are safely galvanically isolated from the auxiliary power supply circuit up to a peak crest value of 375 V of the nominal voltage.

The non-intrinsically safe control-circuit (RS-485 interface) is linked to a 4-pole connector plug. This connector establishes the connection to a higher-level data processing system. The intrinsically safe sensor circuits of the VPI transmitter are galvanically isolated from this measuring and control circuit up to a peak crest value of 190 V of the nominal voltage.

**III.b Assembling and dismantling**

The VPI transmitter and the VPI-Supply must be installed in a case with a protection class of at least IP20. It is important to ensure that non-intrinsically safe wiring connections are located with a clearance of at least 50 mm from the VPI printed circuit board and the intrinsically safe sensor terminals. This can also be achieved using suitable separation plates for example.

**III.c Installation**

All wiring operations must be carried out with the power disconnected. The specific ABNT NBR IEC directives and local installation regulations including ABNT NBR IEC 60079-14 must be observed. The wiring from the sensor to the measuring transmitter shall be carried out using a four-wire cable (preferably blue). The terminals +, -, A, and B on the sensor must be connected to the same terminals on the transmitter.

If the VPI-Supply is not used to power the VPI transmitter, it is imperative that the sensors and the transmitter are integrated correctly into the potential equalization (PA). The PA terminal is located in the middle of the VPI printed circuit board. All sensors must be securely connected with the PA terminal of the VPI transmitter. The specific construction regulations must be observed.

**III.d Adjustment**

To operate the measuring transmitter, safety settings are not necessary.

**III.e Putting into service**

Before putting into service, all devices must be checked to determine that they are correctly connected and working properly. The power supply, including that of downstream devices, must also be checked.

**III.f Maintenance, overhaul and repair**

The device is maintenance-free. In case of a defect, please send the transmitter back to the manufacturer.

**IV Equipment marking****VPI-Supply**

- 1 Manufacturer: FAFNIR GmbH, 22525 Hamburg
- 2 Type designation: VPI-Supply
- 3 Certificate number: UL-BR 17.0875X

**VPI**

- 1 Manufacturer: FAFNIR GmbH, 22525 Hamburg
- 2 Type designation: VPI
- 3 Certificate number: UL-BR 17.0875X
- 4 Ex marking: [Ex ia Ga] IIIC
- 5 Technical data: See operational manual for electrical data.

## V Technical data

### **VPI-Supply**

The auxiliary power supply of the VPI-Supply is connected to the terminals PE, N, and L. Depending on the design of this module, the auxiliary power supply is

$$U = 24 \text{ V}_{\text{AC}}, 115 \text{ V}_{\text{AC}}, \text{ or } 230 \text{ V}_{\text{AC}} \pm 10\%; 40 \text{ Hz} \dots 60 \text{ Hz}; \sim 4 \text{ VA}.$$

The maximum safety voltage is:

$$U_m = 30 \text{ V} @ 24 \text{ V}_{\text{AC}}, \text{ resp.}$$

$$U_m = 130 \text{ V} @ 115 \text{ V}_{\text{AC}}, \text{ resp.}$$

$$U_m = 253 \text{ V} @ 230 \text{ V}_{\text{AC}}.$$

The output voltage is  $12 \text{ V}_{\text{DC}} \pm 5\%$ .

Two VPI transmitters can be connected to one VPI-Supply.

### **VPI**

The auxiliary power supply for the VPI transmitter is connected to a plug underneath the module and equals:

$$U = 12 \text{ V}_{\text{DC}} \pm 10\%; < 2 \text{ W}.$$

The maximum safety voltage is:

$$U_m = 253 \text{ V}.$$

The voltage for the communication interface is:

$$U = \pm 5 \text{ V}$$

$$U_m = 100 \text{ V}$$

The sensor circuits are designed in type of protection "intrinsic safety" (ia) with a linear output characteristic. The output values are:

$$U_o \leq 10.5 \text{ V}$$

$$I_o \leq 41.0 \text{ mA}$$

$$P_o \leq 99.8 \text{ mW}$$

Max. permissible external inductance $L_o$	IIC	IIIB
$\leq 5 \text{ mH}$	$\leq 2 \text{ mH}$	$\leq 20 \text{ mH}$
$\leq 610 \text{ nF}$	$\leq 780 \text{ nF}$	$\leq 2.5 \mu\text{F}$

capacitance $C_o$		
		$\leq 10 \text{ mH}$

			$\leq 3 \mu\text{F}$
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The terminals are numbered with the figures 1 ... 8 and the additions +, A, B, and -.

The intrinsically safe sensor circuits are safely galvanically isolated from the auxiliary power supply circuit up to a peak crest value of 375 V of the nominal voltage.

The intrinsically safe sensor circuits are safely galvanically isolated from the control circuit up to a peak crest value of 190 V of the nominal voltage.

## VI Specific conditions of use

1. The potential equalization terminal (PA) on printed circuited board of the measuring transmitter VPI must be connected to the potential compensation of the explosion hazardous location when the power supply VPI-Supply is not used.
2. The measuring transmitter VPI and the power supply VPI-Supply must be installed in an enclosure with degree of protection according to ABNT NBR IEC 60529 of at least IP20.
3. At installation of the measuring transmitter VPI with the power supply VPI-Supply the minimum clearance between these two must be 50 mm (tight string length).
4. The permissible ambient temperature range of the measuring transmitter VPI and of the voltage supply VPI-Supply is  $-20^\circ\text{C}$  to  $+60^\circ\text{C}$ .