

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

UL-BR 17.0704X

**Isolating Amplifier type VP-...**

Edition: 10.2017

**I Range of application**

The isolating amplifier type VP-... is preferably used to supply electronic level sensors and forward the measurement data to a higher-level evaluation system.

**II Standards**

The isolating amplifier 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 isolating amplifier is used as an associated apparatus and is not suitable for use in potentially explosive atmospheres. The intrinsically safe sensor circuits may be led into zone 0 or zone 20 and can be used for all gas groups (IIA, IIB and IIC) as well as all dust groups (IIIA, IIIB and IIIC).

The certificate applies to the apparatus versions

VP-1	Isolating amplifier with eight intrinsically safe sensor circuits
VP-2	Isolating amplifier with two intrinsically safe sensor circuits
VP-4	Isolating amplifier with four intrinsically safe sensor circuits

**III.b Assembling and dismantling**

The isolating amplifier is manufactured with an open plastic enclosure for DIN rail mounting. Opening the enclosure is not permitted!

**III.c Installation**

Wiring may only be carried out without power. Special requirements, inter alia ABNT NBR IEC 60079-14 or the local installation regulations must be observed.

The isolating amplifier must be installed outside the hazardous area in an enclosure with a degree of protection of at least IP20. If the isolating amplifier is installed in the field, the enclosure protection rating must be at least IP54.

In the wiring (preferably blue cable) from the sensor to the isolating amplifier, the permissible inductance and capacitance in section V must not be exceeded.

Terminal designation:

Connection	Terminal	Pins
Auxiliary energy	Power	PE, N, L
Sensor circuits	VP-1: 1 ... 8 VP-2: 1 ... 2 VP-4: 1 ... 4	+, A, B, -
Communication	(Cradle connector)	1 ... 10

Table III.c: Terminal designation on the isolating amplifier

### III.d Adjustment

No Ex-relevant adjustments are necessary for the operation of the isolating amplifier.

### III.e Putting into service

Before putting into service, all devices must be checked for correct connection and installation. The electrical supply, including the connected devices, must be checked.

### III.f Maintenance, overhaul and repair

The isolating amplifier is generally maintenance-free. In the case of a defect, this must be returned to the manufacturer FAFNIR or one of its agents.

There is a consistency with the requirements for the dielectric strength according to ABNT NBR IEC 60079-11, section 6.3.13 between the intrinsically safe sensor circuits and the auxiliary energy as well as the communication connection.

## IV Equipment marking

1	Manufacturer:	FAFNIR GmbH, 22525 Hamburg
2	Type designation:	VP-...
3	Certificate number:	UL-BR 17.0704X
4	Ex marking:	[Ex ia Ga] IIC [Ex ia Da] IIIC
5	Technical data:	$U_o \leq 14.3 \text{ V}$ $I_o \leq 28 \text{ mA}$ $P_o \leq 98 \text{ mW}$ $L_o \leq 2 \text{ mH}$ $C_o \leq 480 \text{ nF}$ $T_a \leq +55 \text{ °C}$

## V Technical data

The auxiliary energy for the isolating amplifier is depending on the model

$$U = 24 V_{AC}/115 V_{AC}/230 V_{AC} \pm 10 \%, 50 \text{ Hz} \dots 60 \text{ Hz}$$

$$P \approx 2 \text{ VA}$$

$$U_m = 36 V@24 V_{AC} / 138 V@115 V_{AC} / 253 V@230 V_{AC}$$

The sensor circuits are designed in the type of protection "intrinsic safety" (ia), with a linear output characteristic. The output values per circuit are as follows

Output voltage	$U_o \leq 14.3 \text{ V}$
Output current	$I_o \leq 27.5 \text{ mA}$
Output power	$P_o \leq 98.1 \text{ mW}$
Inner inductance	$L_i$ negligible small
Inner capacitance	$C_i$ negligible small

The permissible external inductance and capacitance are as follows:

	IIC		IIB / IIIC	
$L_o \leq$	5 mH	<b>2 mH</b>	20 mH	10 mH
$C_o \leq$	380 nF	<b>480 nF</b>	1.5 $\mu$ F	1.8 $\mu$ F

The maximum values of the pairs of values may simultaneously be used as concentrated capacitance and concentrated inductance. The values in bold font are found in the device identification.

The signal and maximum safety voltage of the communication interface is

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

$$U_m = 134 \text{ V}$$

The isolating amplifier can be used in the following ambient temperature range:

$$T_a = -20 \text{ }^\circ\text{C} \dots +55 \text{ }^\circ\text{C}$$

The isolating amplifier achieves a degree of protection provided by the enclosure of

Degree of protection	IP00
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## VI Specific conditions of use

The isolating amplifier must be installed in an enclosure with a degree of protection of at least IP20 in accordance with ABNT NBR IEC 60529.