Technical Documentation

Overvoltage Protection

Type BA 350-2/4

Version: 1
Edition: 2022-03
Art. no.: 350078

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1 Introduction

This manual describes how to correctly install the overvoltage protection unit BA 350–2/4.

The BA 350–2/4 is used for the protection of overvoltage in an intrinsically safe circuit. This overvoltage protection unit can be used for VISY-X, COMS, LS300, 76 and TORRIX.

The BA 350 is available in two versions:

a) BA 350-2 – Two pole version

b) BA 350-4 – Four pole version

This overvoltage protection unit can be ordered using the article numbers

903313 (2 pole) and 903314 (4 pole).

2 Scope of delivery

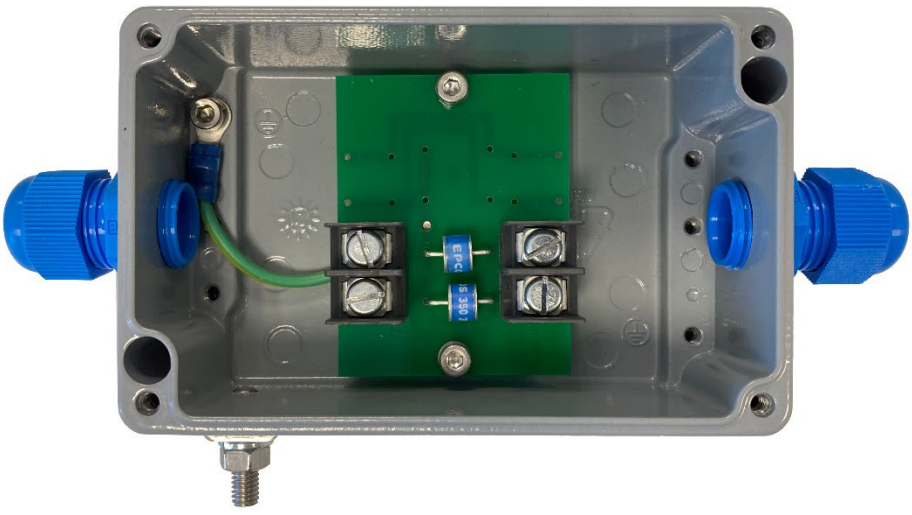
	**BA 350 – 2/4** • Overvoltage protection unit

3 Installation

Disconnect the VISY-Command/Transducer/PLC from the power supply before starting the connection and protect it against reconnection, as well as determine the absence of voltage on all poles. For demonstration purpose the BA 350-2 is taken for the below installation procedure.

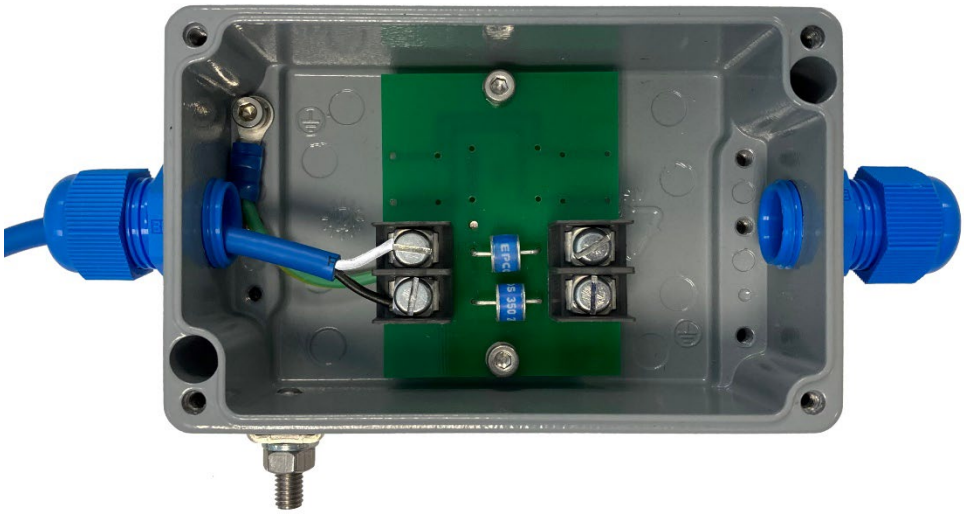
3.1 Cabling

(1) Open the BA 350-2 housing with the help of a star screwdriver



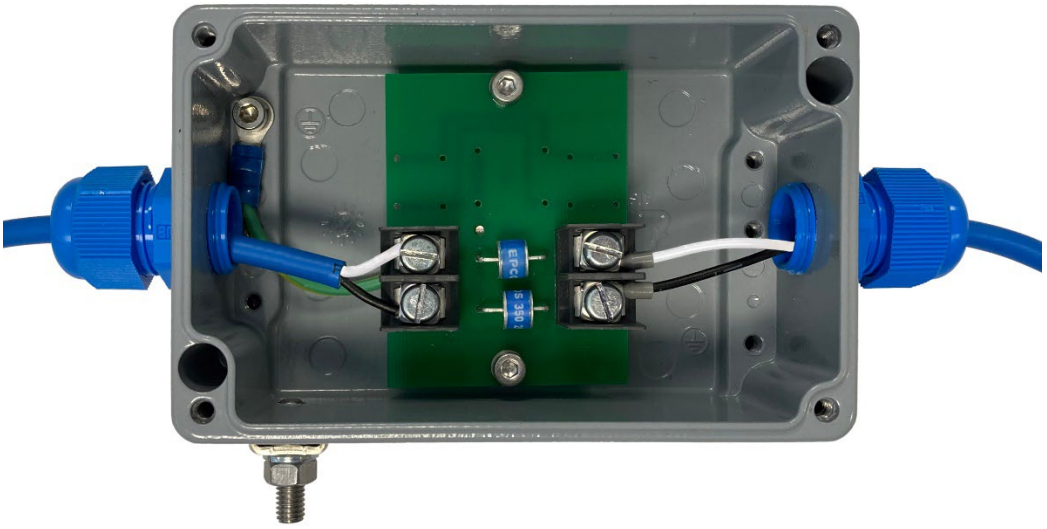
(2) Take the end of the probe cable and connect it to any one of the BA 350-2 terminal blocks, which makes it as the input. Both terminal blocks can be used either as an input or output and the polarity need not be observed. Then tighten the cable gland so that the cable is fastened.

☞ *The maximum cable diameter into the BA 350-2/4 cannot exceed the diameter of Ø 10 mm.*

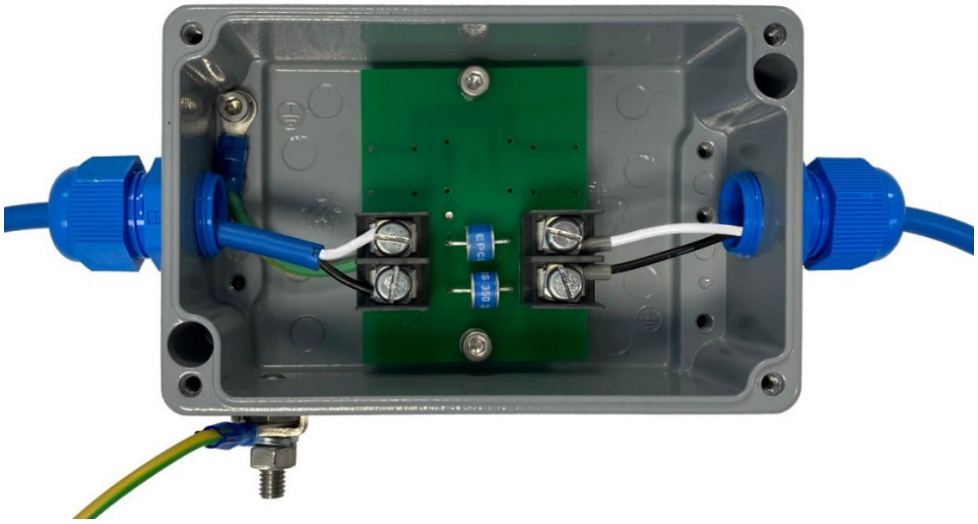


(3) Take the end of the cable coming from the VISY-Command/PLC/Higher level system and connect it to the remaining terminal block, which makes it as the output. The polarity of the output cable should match the polarity of the input cable. Then tighten the M12 connector head so that the cable is fastened.

☞ *For wireless version installation, the BA 350-2/4 should be placed between the probe and the external RF transmitter*



(4) The earthing cable must be connected between the tank ground connection and the external saddle clamp.



(5) Wall mounting of the BA 350-2 is possible, and it must be noted that the device must be installed outside zone 0.
(6) Ensure all the devices for correct connection and mounting before putting into service. The electrical power supply should also be checked.
(7) Close the housing and fix the cover with its 4 screws

(8) Reconnect the VISY-Command/Transducer/PLC to the power supply.
(9) Installation of the overvoltage protection BA 350-2 is now completed.

Instructions in accordance with directive 2014/34/EU Simple Apparatus

Overvoltage Protection type BA 350-... Edition: 01.2021

I Range of application

The overvoltage protection is for protection of overvoltage in an intrinsic safety circuit.

II Standards

The device is designed according to the following European standards

EN 60079-0:2018	Equipment – General requirements
EN 60079-11:2012	Equipment protection by intrinsic safety "i"

III Instructions for safe ...

III.a ... use

The overvoltage protection is for use of discharge overvoltage and is designed as a simple apparatus according to EN 60079-11, clause 5.7. Therefore, it can be used without an EU-type examination certificate inside potentially explosive atmospheres (zone 1 and zone 2). Additional, the use of the overvoltage protection equipment has to be asset by the raiser or operator.

General remark (see also EN 60079-11, clause 3.1.5 resp. EN 60079-14:2014, clause 3.5.5):

> Simple apparatus: electrical component or combination of components of simple construction with well-defined electrical parameters and which is compatible with the intrinsic safety of the circuit in which it is used.

The overvoltage protection is built-on a metal enclosure. The material composition of the enclosure includes according to IEC 60079-0, clause 8.3 for an EPL Gb less than 7.5 % magnesium and titan, such as AlSi 12.

These instructions are valid for the following types

BA 350-2	Two-pole overvoltage protection
BA 350-4	Two-pole overvoltage protection

III.b ... assembling and dismantling

The wiring may only take place de-energised!

The overvoltage protection is built-on a metal enclosure with a degree of protection of IP66. For the installation the housing cover hast to be removed (four screws).

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III.c … installation

The wiring may only take place de-energised. Special regulations, among other things, EN 60079-14 resp. EN 60079-25 resp. the local installation regulations should be noted.

Wall mounting of the overvoltage protection is possible.

General remark (see also EN 60079-14:2014, clause 16.3):

> The overvoltage protection device must be installed outside zone 0 but as near as technical possible to the boundary of zone 0, preferable in a distance of maximum 1 m.

Both terminal blocks can be used either as an input or output. The polarity does not to be observed. For the connection to the potential equalisation (PA) a terminal on outside of the enclosure is provided.

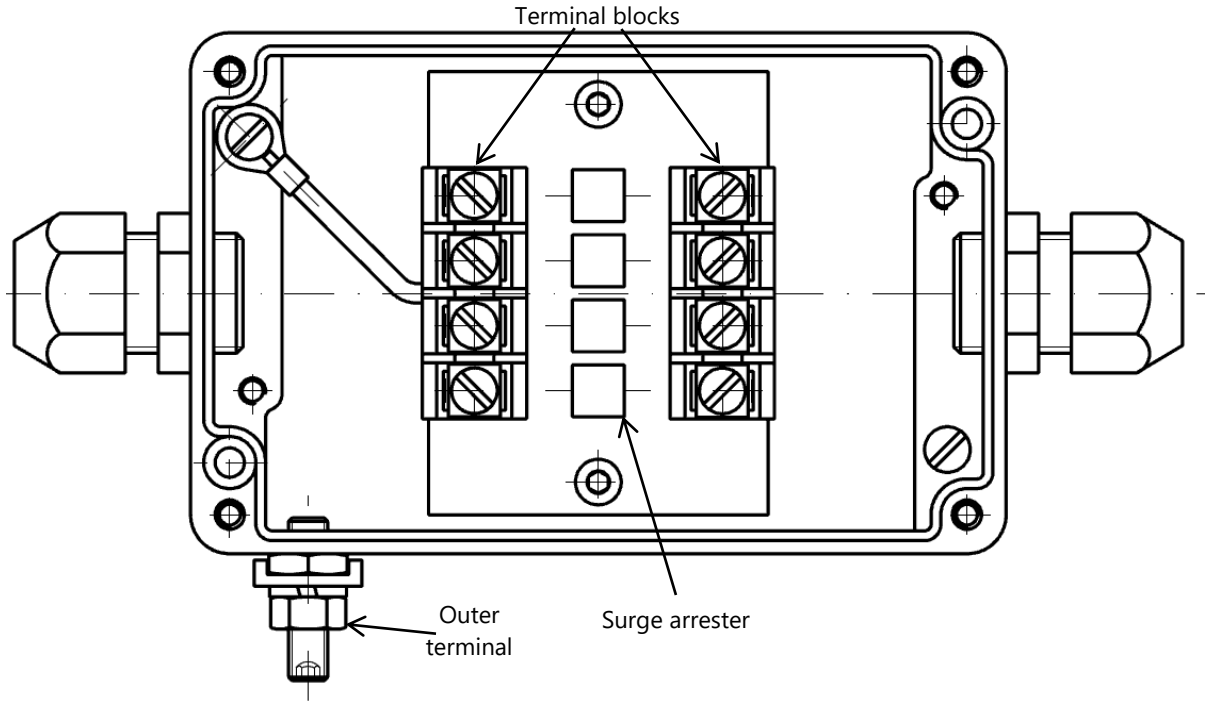

Figure 1: View into open enclosure of a BA 350-4

III.d … adjustment

For operating the overvoltage protection there is no need of safety adjustments.

III.e … putting into service

Before putting into service all devices must be checked of right connection and mounting. The electrical power supply has to be checked also from peripheral equipment.

III.f … maintenance (servicing and emergency repair)

In general, the equipment is maintenance free. Defective equipment has to send back to manufacturer FAFNIR or one of his representations.

Testing the intrinsic safety circuit with 500 V under well-controlled conditions it is necessary to disconnect the overvoltage discharge device, according to EN 60079-25:2010, clause 12, because of a non-conformance with the dielectric strength in accordance with EN 60079-11, clause 6.3.13.

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IV Equipment marking

1	Manufacturer:	FAFNIR GmbH, 22525 Hamburg
2	Type designation:	BA 350-...
5	CE marking:	CE
3	Technical data:	T_a = -40 °C ... +80 °C
		U_i < 50 V
		I_i < 1 A
		C_i ≤ 6 pF

V Technical data

The permissible input voltage is defined with

U_i < 50 V

The permissible input current (dependent on printed circuit board tracks; thickness ≥ 35 µm; width ≥ 1 mm) is defined with

I_i < 1 A

Since no power is converted into the overvoltage protection before the maximum permissible input voltage is reached, the specification of the permissible input power P_i is omitted.

The electrical input values will not change by the overvoltage protection. Therefore, the electrical output values of the associated device are valid.

The effective internal capacitance is

C_i < 6 pF

The effective internal inductance is negligible small.

The nominal dc spark-over voltage is

U = 350 V ± 20 %

The nominal impulse discharge current is

I = 20 kA (10 × Wave 8/20 µs)

The nominal alternating discharge current is

I = 20 A (10 × @ 50 Hz, 1 s)

The insulation resistance of a surge arrester is

R > 10 GΩ

The overvoltage protection can be used in following ambient temperature range:

T_a = -40 °C ... +80 °C

VI Special conditions of use

None.

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EU-Konformitätserklärung
EU Declaration of Conformity
Déclaration UE de Conformité
Dichiarazione di Conformità UE

CE

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FAFNIR GmbH, Deutschland / Germany / Allemagne / Germania

erklärt als Hersteller in alleiniger Verantwortung, dass das Produkt
declares as manufacturer under sole responsibility that the product
déclare sous sa seule responsabilité en qualité de fabricant que le produit
dichiara sotto la sola responsabilità del produttore, che il prodotto

Überspannungsschutz / Overvoltage Protection / Protection de survoltage / Protezione da sovratensione

BA 350-...

den Vorschriften der europäischen Richtlinien
complies with the regulations of the European directives
est conforme aux réglementations des directives européennes suivantes
è conforme ai regolamenti delle direttive europee

2011/65/EU	**Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten**	**RoHS**
2011/65/EU	**Restriction of the use of certain hazardous substances in electrical and electronic equipment**	**RoHS**
2011/65/UE	**Limitation de l'utilisation de certaines substances dangereuses dans les équipements électriques et électroniques**	**RoHS**
2011/65/UE	**Restrizione dell'uso di determinate sostanze pericolose nelle apparecchiature elettriche ed elettroniche**	**RoHS**
2014/34/EU	**Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen**	**ATEX**
2014/34/EU	**Equipment and protective systems intended for use in potentially explosive atmospheres**	**ATEX**
2014/34/UE	**Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles**	**ATEX**
2014/34/UE	**Apparecchi e sistemi di protezione destinati a essere utilizzati in atmosfera potenzialmente esplosiva**	**ATEX**

durch die Anwendung folgender harmonisierter Normen entspricht
by applying the harmonised standards
par l'application des normes
applicando le norme armonizzate

RoHS / RoHS / RoHS / RoHS	**EN IEC 63000:2018**
ATEX / ATEX / ATEX / ATEX	**EN IEC 60079-0:2018**
	EN 60079-11:2012

Das Produkt ist bestimmt als Elektro- und Elektronikgerät der RoHS-
The product is determined as electrical and electronic equipment of RoHS
Le produit est déterminé comme des équipements électriques et électroniques de RoHS
Il prodotto è determinato come apparecchiatura elettrica ed elettronica di RoHS

Kategorie / Category / Catégorie / Categoria	**Überwachungs- und Kontrollinstrumenten in der Industrie / Industrial Monitoring and Control Instruments / Instruments de contrôle et de surveillance industriels / Strumenti di monitoraggio e controllo industriali**

Das Produkt entspricht den ATEX-Vorgaben gemäß EN 60079-11,
The product complies with the ATEX requirements according to EN 60079-11,
Le produit est conforme aux exigences ATEX selon la norme EN 60079-11,
Il prodotto è conforme ai requisiti ATEX secondo la norma EN 60079-11,

Abschnitt 5.7 / Clause 5.7 / Clause 5.7 / Sezione 5.7	**Einfache elektrische Betriebsmittel / Simple apparatus / Matériel simple / Apparecchio semplici**

Hamburg, 15.01.2021
Ort, Datum / Place, Date / Lieu, Date / Luogo, data

Geschäftsführer / Managing Director / Gérant / Direttore Generale: René Albrecht

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