






 GENERI, s.r.o. Uničovská 50 787 01 ŠUMPERK Czech Republic tel.: +420583221500, fax: +420583214183	OPERATING INSTRUCTIONS		Page: 1 of 3
	EX SURGE PROTECTION DEVICES – INTRINSICALLY SAFE		N740009/4
	TYPE: X.FV./JB (0 - aluminium, 1 - polyester, 2 - stainless steel)		Valid from: 20.4.2016

GENERAL

These operating instructions conform to the following:

- Technical requirements for equipment and protective systems intended for use in potentially explosive atmospheres (2014/34/EU).
- Technical requirements for products from the point of their electromagnetic compatibility (2014/30/EU).

SAFETY INSTRUCTIONS AND UNSUITABLE USE
Do not leave these operation instructions inside the box!

- Surge protection devices X.FV./JB are to be connected only to intrinsically safe circuits!
- Surge protection devices X.FV./JB must not be operated in hazardous areas of zone 0 (EN 60 079-10-1) and zone 20 (EN 60 079-10-2)!
- Avoid any mechanical damage of the box when manipulating!
- Surge protection devices X.FV./JB are **not intended for untrained personnel**. Installation, commissioning and any service must be performed by authorized personnel with the appropriate training and in accordance with safety rules.
- Operate surge protection devices X.FV./JB in accordance with mentioned **operating conditions, technical and rating data**.
- Do not replace original inbuilt components with components that are in contradiction to **accompanying documentation** (e.g. replacement of surge module by another type).
- Storage, transport, installation, inspection, preventive maintenance, repairs and services of the surge protections should follow hereinafter specified instruction.
- Operate boxes X.X./JB in hazardous areas only according to the **intrinsic safety of circuit, where they are connected to:**

ia	II 2G II 2D	ZONE 1, 2 ZONE 21, 22
ib	II 2G II 2D	ZONE 1, 2 ZONE 21, 22
ic	II 3G II 3D	ZONE 2 ZONE 22

- Gas group IIA, IIB, IIC resp. dust group IIIA, IIIB, IIIC must be taken into account when operate surge protection devices in hazardous gas / dust areas.
- Intrinsic safety of whole circuit must be assessed acc. to EN 60 079-25 and EN 60 079-14.**

1. USE

Explosion-proof surge protection devices X.FV./JB are determined for installation in intrinsically safe circuits in hazardous areas with danger of explosion of flammable gases and vapours and combustible dusts. They are designed for protection of data, measuring and communications lines and interfaces against the pulse overvoltage.

2. OPERATING CONDITIONS

2.1. External influences acc. to IEC 60 364-5-51-cat.A: ENVIRONMENT

Code	External influence description	Data
AA	Ambient temperature (max. range) *	-55°C to +70°C
AB	Atmospheric humidity	up to +30°C: 100% up to +40°C: 70%
AD6	Presence of water	Waves
AE6	Presence of foreign solid bodies or dust	Heavy dust
AF4	Presence of corrosive or polluting substances	Continuous
AG3	Mechanical shock	High severity (7J)
AH	Vibrations	see Art.6 - Revision

* Concrete temperature range depends on used components and it is always mentioned on name plate, if the equipment is produced for ambient temperature range different than standard range -20°C to +40°C.

2.2. External influences acc. to IEC 60 364-5-51-cat.B: USE

Code	External influence description	Data
BE3	Explosion risk	see Point 2.4
BA5	Abilities of persons	skilled
BC3	Contact of persons with earth potential	frequent

2.3. Not mentioned external influences are in accordance with IEC 60 364-5-51 normal.

2.4. Use in areas and environments according to regulations

Areas	Name of standard	Standard
ZONE 1 ZONE 2	Explosive atmospheres - Part 10-1: Classification of areas - Explosive gas atmospheres	EN 60 079-10-1
ZONE 21 ZONE 22	Explosive atmospheres - Part 10-2: Classification of areas - Combustible dust atmospheres	EN 60 079-10-2

2.5. Operating position: vertical

3. TECHNICAL DATA

3.1. General

Name	Data	Standard, note
Type of protection	Ex ia mb IIC T6 Gb Ex ia IIIC T85°C Db	EN 60079-0 EN 60079-11
Ingress protection	IP 66	EN 60 529
Group and category	II 2G II 2D	2014/34/EU
Certification	FTZÚ 03 ATEX 0226	FTZÚ NB 1026
Electromagnetic compatibility	Suppressing EMI Not radiating EMI	see art. 3.2
Material	X.FV0/JB	Al - die cast DIN 1725 (AlSi12)
	X.FV1/JB	Glass fibre reinforced polyester (GRP) with addition of graphite Black, RAL 9011 or equivalent
	X.FV2/JB	stainless steel plate 1.4301 / 304 DIN / ASTM
Surface finish (X.FV0/JB)	Powder baking coating	grey RAL 7001
Combustibility of (X.FV1/JB)	Inflammable with difficulties and self-extinguishing	UL - S94.V - 0 (also halogen-free)
Eternal PE (X.FV0/JB, X.FV2/JB)	Min. 4 mm ² Cu	Bolt M8, nut and spring washer

3.2. SPD modules

Name	Data	Standard, note
SPD type	Type 2+3	Combined SPD
Coupler	Resistor, inductance	Acc. to type - see below
Rated / residual voltage	6/11, 12/17, 24/36, 48/62 V DC	Acc. to SPD type
Response time	< 1 ns	
Surge protection	10 kA (8/20 μs)	10 operations
	500 A (10/1000 μs)	400 operations
Short-circuit current	30 A	For 1s
Limit frequency	1 MHz (R type) 150 kHz (LA, LB type)	Acc. to coupler type
Wire cross-section max.	2,5 mm ² / 1,5 mm ²	Solid / stranded with ferrule
Connection	Spring-cage terminals	
Number of protected lines	1 ... 4	1 line: 2 wires + FE + PE



3.3. Coupler

Type	X.FV./R./JB	X.FV./LA./JB	X.FV./LB./JB
Coupler	Resistor	Inductance A	Inductance B
Max. current	40 mA	240 mA	1,3 A
Limit frequency	1 MHz	150 kHz	150 kHz
Internal inductance Li	-	200 µH	50 µH

3.4. Internal capacity

Internal capacity between terminals A - B, A - PE, B - PE				
Type	X.FV./06./JB	X.FV./12./JB	X.FV./24./JB	X.FV./48./JB
Rated voltage	6 V DC	12 V DC	24 V DC	48 V DC
Internal capacity Ci	7,0 nF	3,0 nF	1,5 nF	1,0 nF

4. INSTALLATION INSTRUCTIONS

4.1. Mounting

4.1.1 Mounting of X.FV0/JB, X.FV1/JB:

The spacing of mounting holes is specified on the bottom of the box. Lift off the box cover, insert attachment screws into holes and properly mount the box. When the cables are installed and surge modules are connected in, check that the sealing in the lid is not damaged and properly inserted in its position and close the box.

4.1.2 Mounting of X.FV2/JB:

There are two possibilities:

- By screws M6 that you screw up into "blind" holes in the box bottom from outwards.
- By stainless steel screws M6 from outwards of the box you screw up into the "blind" holes in the box bottom and herewith by them you fix special stainless steel flanges (all is delivered as accessories of box). The box equipped by this way you can fix from the front by screws M8 that you put into the whole in flanges.

4.2. Cable entries



Each cable gland can seal only a certain range of outside diameters of cable. Assure the cable diameter is within the sealing range of cable gland! For easier mounting of cable glands it is possible to deliver special tighten tongs - see picture. To achieve a reliable ingress protection, properly tighten the cable glands by specified tightening torque. Unused holes and openings must be closed by certified plugs that comply with required degree and type of protection - see art.6.

4.3. Connecting

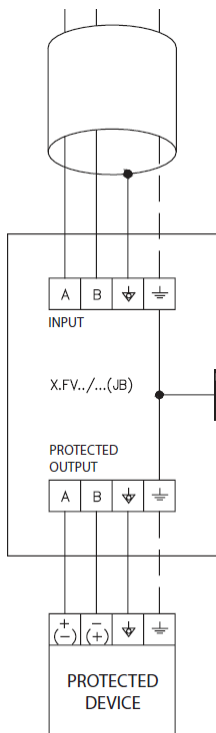
SPD modules are provided with **spring-cage terminals** for the cross-section of connecting wires up to 2.5 mm². By pressing the cage clamp for instance with a suitable screwdriver (or a special WAGO screwdriver which is delivered only if requested by the customer), you will release the opening for the connection wire. Push-in the wire into opening and release the cage clamp. Now there is a perfect current-carrying connection.

Stranded wires should always be provided with **ferrules** (applies to wires cross-section up to 1,5mm²). Note that stranded wires of cross-section 2,5mm² provided with ferrules do not fit into the used terminals!

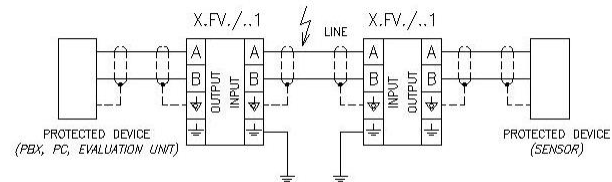
Wire insulation must reach as close as possible to the current-carrying connection. The wire must not be damaged.

Only one wire can be inserted into one opening of the terminal!

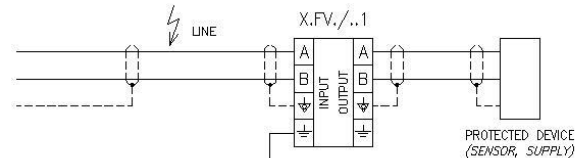
For proper function of SPD it is necessary to connect the function earth terminal of SPD by the shortest way to ground potential. Use copper wire with cross-section at least 4 mm².



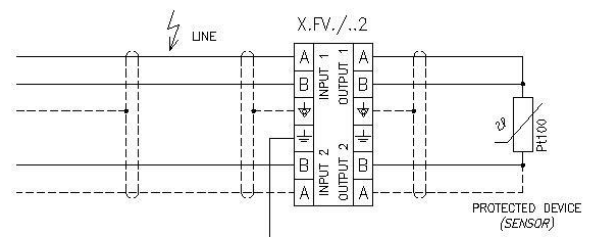
4.4. Examples of connection X.FV.



DOUBLE-SIDED PROTECTION



CURRENT LOOP (2-WIRES CONNECTION), POWER SUPPLY



3-WIRES OR 4-WIRES CONNECTION OF SENSORS (e.g. Pt100)

5. INSTALLATION ACC. TO VALID REGULATIONS

When the SPD X.FV./JB is included into intrinsically safe circuit, it becomes to be a part of **intrinsically safe system** that shall comply with **EN 60079-25** standard requirements.

From the point of intrinsic safety the SDP X.FV./JB is considered to be a **simple apparatus** with **well-defined parameters** - see Technical data.

A **decision about use** of given type of equipment in a specific areas must comply with above mentioned operating conditions (see point 2.), local operating regulations, **EN 60 079-14** and other valid regulations. Electrical accident protection is, in addition to mentioned regulations, stipulated by **IEC 60 364-4-41**, EN 61 140 and other related regulations.

Safety regulations for operating personnel and work on electrical equipment are identified by EN 50 110-1, also follow local standards and regulations.

6. INSPECTION AND PREVENTIVE MAINTENANCE

Inspection and preventive maintenance of explosion-proof electrical equipment is determined by EN 60 079-17 (unless determined otherwise by a notice, local regulations etc.).

All **mechanical and electrical connections** are protected from self-loosening (EN 60 079-7). **Vibration** tests of equipment (external influences AH1, 2, 3 by IEC 60 364-5-51) in relation to classes of climatic conditions by EN 60 721-3-3 and EN 60 721-3-4 are not however performed. Therefore, in case of **mobile equipment**, we recommend **carry out inspections at least 2-times a year as a detailed inspection according to EN 60 079-17.**

Cable glands and plugs can be replaced only by types with **appropriate Ex and ingress protection**. Where it is not possible to provide fixed installation of cables, it is necessary to use cable glands with a protection against pulling out (usually with clamping module) - it relates mostly to **mobile equipment**. **Other spare parts** - see article 10.

7. REPAIRS AND MAJOR INSPECTIONS, SERVICES

Repairs and major inspections of explosion-proof electrical equipment are based on EN 60 079-19.

Repairs should be carried out only **by the manufacturer** or an organization authorized by the manufacturer.

The following parts cannot be repaired:

- SPD modules with terminals
- Sealing box-cover, cable glands / plugs
- Stainless steel screws in the cover

If damaged, these parts must be replaced!

Ex and ingress protection must be preserved in case of any repairs and renovations.

In case of any problems regarding the GENERI products (such as loss of accompanying documents, technical defects etc.), just read the two data on the rating plate:

- 1) Type of equipment
- 2) Serial number

On the basis of these data it is possible to find any accompanying and technical documents of concrete product at manufacturer.

8. STORAGE, PACKING AND TRANSPORT

Surge protection devices are **stored** at the ambient temperature of +5°C to +40°C, in non-aggressive interior spaces without UV radiation and whether effects where the quality does not deteriorate (climatic conditions 1K2, biological conditions 1B1, active chemical compounds 1C2, mechanically active substances 1S1, and mechanical conditions 1M2 in accordance with EN 60 721-3-1).

Surge protection devices are **packed** in protective foils and dispatched in cardboard boxes or pallets.

Transport is provided by an express transport company within 24 hours, or depending on the customer's wish. Cash on delivery is also possible.

Transport conditions are 2K2, 2B1, 2C2, 2S1, 2M2 in accordance with EN 60 721-3-2.

9. TERMS OF DELIVERY

Price of the goods, delivery times, the payment method, and the way of transport are specified in the contract of purchase which is sent by the business department after it receives the order.

10. SPARE PARTS

Exact specification of SPD modules is listed in wiring diagram supplied with each box.

For cable glands requirements see point 6.



11. PRODUCT DISPOSAL

Useless products should be disposed in accordance with valid regulations.

!!! All components may produce harmful exhalations during combustion!!!

12. SUPPLIED DOCUMENTATION

- 📄 EU declaration of conformity
- 📄 wiring diagram inserted in the box
- 📄 these operating instructions including of warranty
- 📄 delivery note

Certificates are available on www.generi.cz or upon request.

WARRANTY

Product type:	X.FV0/JB	X.FV1/JB	X.FV2/JB
Mark::	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Serial number No.:	from:		to:

You are provided with a warranty for a period of 12 months (if it is not specified otherwise in the purchase contract) valid from the day the product was handed over. We guarantee quality of work and material. Despite this, faults unidentifiable in the manufacturing plant may occur due to storage, during transport or use. If they were caused by faulty material or production, we shall restore the product to a trouble-free state at our own costs. The warranty does not apply to defects resulting from mishandling or mechanical damage and not following instructions for assembly and maintenance.

FINAL INSPECTION

Authorized person:	Result:	Stamp and signature:
	OK	



WE WISH YOU THE MAXIMUM SATISFACTION WITH OUR PRODUCTS AND SERVICES