



# OPERATING INSTRUCTIONS

## EXPLOSION-PROOF JUNCTION BOXES

TYPE: **X.X.** (0 - aluminium, 1 - polyester, 2 - stainless steel)

Valid from: **8.6.2023**

### 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 operating instructions inside the box during operation!*

- Avoid any **mechanical damage** of the box when manipulating!
- Explosion-proof boxes X.X. **are not intended for untrained personnel**. Installation, commissioning and any service must be performed by skilled electricians and in accordance with safety regulations.
- Do not open the boxes X.X. **when they are energized!**
- Operate boxes X.X. in accordance with below mentioned operating conditions, technical and rating label data.
- **Do not operate** the boxes X.X. **in hazardous areas zone 0** (EN 60 079-10-1) and **zone 20** (EN 60 079-10-2)!
- Do not replace terminals with other types and do not increase their quantity!
- Only boxes of type X20X1 and X.X2 can be used in the underground mines with occurrence of methane (group I)!
- Vector sum of alternate current in the cable that entries through the metal cable gland into a box has to be equal to zero in every moment. It concerns especially to cast iron and steel cable glands (for instance flange glands type 50P-... and 70P-...). In this case do not use one-core cable supplied by alternate voltage! There is danger of excessive warming of metal parts of cable gland by the electromagnetic induction.
- **Rating data are valid for Cu wires**. If it is required connection of Al wires, it must be mentioned in the customer's technical specification. Aluminium wires terminate either by Al-Cu pressing terminal lug, or connect them into terminal and apply special Alu-paste. The pressing Al-Cu terminal lugs and Alu-paste are part of delivery.
- Storage, transport, assembly, installation, inspection, preventive maintenance, repairs and services are to follow instructions provided hereinafter.

### 1. USE

Explosion-proof junction boxes X.X. are to be installed in environments with the risk of explosion of inflammable gases, vapours, dust and explosives, respectively in the underground mines with occurrence of methane.

### 2. OPERATING CONDITIONS

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

Code	Description of external influence	Specification
AA	Ambient temperature (maximal range) *	-60°C to +90°C
AB	Atmospheric humidity	To 30°C ... 100% To 40°C ... 70%
AD5	Presence of water	Jets
AE6	Presence of foreign solid bodies or dust	Heavy dust
AF4	Presence of corrosive or polluting substances	Continuous
AG3	Mechanical shock	High severity 7 J (gr. II) 20 J (gr. I)
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 temperature range -20°C to +40°C.

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

Code	Description of external influence	Specification
BE3	Explosion risk	see point 2.4
BA5	Capability 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
Potentially explosive atmospheres	Explosive atmospheres - Explosion prevention and protection - Part 2: Basic concepts and methodology for mining	EN 1127-2
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 or horizontal (acc. to type)

### 3. TECHNICAL DATA

3.1 General

Name	Specification	Standard, note
Type of protection <sup>1)</sup>	<b>Ex eb IIC T* Gb</b> <b>Ex tb IIIC T°C Db</b> <b>Ex eb I Mb</b> (X20X1, X.X2)	EN 60 079-0 EN 60 079-7 EN 60 079-31
Ingress protection <sup>1)</sup>	<b>min. IP 65</b>	EN 60 529
Group and category <sup>1)</sup>	<b>II 2G, II 2D,</b> <b>I M2</b> (X20X1, X.X2)	2014/34/EU
Certification	<b>FTZÚ 07ATEX0069</b>	FTZÚ NB 1026, CZ
Electromagnetic compatibility	<b>Resistant to EMI</b> <b>Not radiating EMI</b>	Acc. to EN 61 439-1 it is not necessary to verify
Material	X.X0	Al - die cast DIN 1725 (AlSi12)
	X.X1	Glass fibre reinforced polyester (GRP) with addition of graphite Black, RAL 9011 or equivalent
	X.X2	stainless steel plate 1.4301 / 304 DIN / ASTM
Surface finish (X.X0)	Powder baking coating	grey RAL 7001
Combustibility (X.X1)	Hardly inflammable and self-extinguishing	UL – S94.V – 0 (also halogen-free)
External PE (X.X0, X.X2)	16 mm <sup>2</sup>	2x screw M5 + clamping plate

1) Concrete data see rating plate.

3.2 Terminals

Name	Specification	Standard, Note
Rated voltage and current	<b>See nameplate</b>	
Nominal cross section of connected wires	See nameplate	
Resistance to vibration	Complies	DIN VDE 0607 §3.4.2.3 DIN VDE 0611 no. 1 to 4
Gas-proofing of contact	Complies	SS DIN 50021/VG95210

### 4. INSTALLATION INSTRUCTIONS

4.1 Mounting of the boxes


4.1.1 Boxes X.X0, X.X1

Spacing of mounting holes is stated on the bottom of the box. Lift off the cover, insert attachment screws into holes and mount the box.

4.1.2 Boxes X.X2

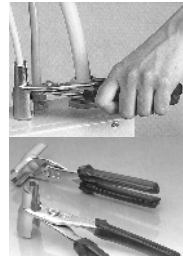
There are two various ways:

- **Directly** by screws M6 screwed up into “blind” holes in the box bottom from outwards.
- By using of the **fixing brackets** (fixed as described above) – than the box can be fixed from the front by screws M8.

 <b>GENERI, s.r.o.</b> Uničovská 50 787 01 ŠUMPERK Czech Republic tel.: +420583221500, fax: +420583214183	<b>OPERATING INSTRUCTIONS</b>	Page: <b>2 of 3</b>
	<b>EXPLOSION-PROOF JUNCTION BOXES</b>	N740002/6 – 5 <sup>th</sup> issue
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#### 4.2 Cable entries

Each cable gland can seal only a certain range of outside diameters of cables. In the case of more quantity of cable glands placed on the flange of box it is necessary to insert and tighten the cable into the cable gland subsequently from one side to the other side (for instance from the left to the right) and also to start with cable gland on the lower row and continue with the cable glands on the upon them.



For easier mounting of cable glands it is possible to deliver special tighten tongs – see picture.

To achieve a reliable ingress protection properly tightens the cable glands by specified tightening torque. **Unused holes and openings** for cable

entries must be closed by certified plugs that comply with required degree and type of protection - see art.6.

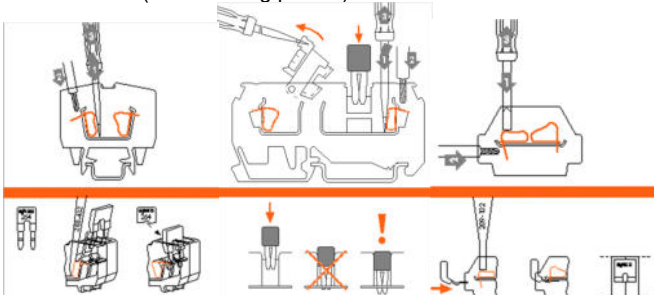
#### 4.3 Connection of wires

There are used either the spring-cage terminals or screw terminals.

##### 4.3.1 Cage spring terminals

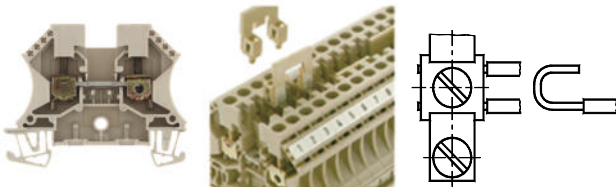
Press a cage clamp of the terminal block (1) e.g. with a suitable screwdriver (or a special WAGO screwdriver) to unfasten space for the connection of a wire. By pushing of the wire (2) and releasing the cage clamp (3) a perfect current-carrying connection is created.

At connection of two adjacent terminal block, press the jumper with power into both terminal blocks so that it does not overreach the terminal block (see following picture).



At some types of terminals with cage clamp it is necessary to use a greater one terminal when connecting a wire with a ferrule. E.g. for connection of a 2,5 mm<sup>2</sup> wire with the ferrule, it is necessary to use a terminal block 4,0 mm<sup>2</sup>.

##### 4.3.2 Screw terminals



Connect wires from the side of the terminal block and properly tight the connection. If you **interconnect screw terminals**, properly tight screw jumpers.

If the PE or FE rail is installed and only one wire is to be connected to a terminal, it is necessary to bend the end of wire into a "U" shape so that the clamping plate compressing the wire is in-plane and the function of the flexible washer between the clamping plate and the screw head is not reduced.

##### 4.3.3 General requirements

**Stranded wires always provide with ferrules.** We recommend use ferrules also for copper wires without surface protection and in **aggressive atmosphere**. The termination of stranded wires only by **soft solder is not permitted!**

Only one wire can be inserted in to the connection hole of terminal and its cross-section must not exceed nominal cross section of terminal. Wire insulation must reach as close the current-carrying connection as possible. The wire must not be damaged.

We recommend regularly **treat connection points of protection wires** (or other corrosive metal surfaces) with **grease**, at least 1 a year (depending on the environment). It is not valid for stainless steel boxes.

**Unused dead wires** should be connected to unoccupied terminal (including of protective wires) or terminated in a way complying with valid regulations

**Use of Al-wires with the cross section < 16 mm<sup>2</sup> is prohibited!**

#### 5. INSTALLATION ACC. TO VALID REGULATIONS

A decision to use the 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 said 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**.

#### 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.).

The boxes of explosion proof electrical equipment X.X. can be opened only **while are not energized!**

All mechanical and electrical connections are protected from self-loosening (EN 60 079-7). Vibration tests of equipment (external effects 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. That is why, 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 type of Ex and ingress protection and certified by the notified body. 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, SERVICE

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 must not be repaired:**

- Ex terminal blocks, cable glands and plugs
- Sealing box-cover
- Stainless steel screws in the cover

**If damaged, these parts must be replaced!**

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

Service is performed right in the manufacturing plant in Šumperk.

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

Explosion-proof boxes X.X. are **stored** at the ambient temperature of +5°C to +40°C, in non-aggressive interior areas without the UV radiation and weather conditions where the quality does not deteriorate (climatic conditions 1K2, biological conditions 1B1, active chemical compounds 1C2, mechanically active substances 1S1, and mechanical conditions 1M2 according to EN 60 721-3-1).

Boxes are **packed** in protective foils and supplied in cardboard boxes (bigger boxes can be attached to pallets).

**Transport** is provided by an express transport company within 24 hours, or according to request. It is also possible to cash on delivery. Transport conditions are 2K2, 2B1, 2C2, 2S1, 2M2 by EN 60 721-3-2.

#### 9. DELIVERY TERMS

Price of goods, delivery terms, methods of payment and transport are mentioned in a purchase contract which is sent by the business department after receiving your order. If it is not specified otherwise in the contract, a standard warranty 12 months for goods is provided.

#### 10. SPARE PARTS

Used terminals are marked on the nameplate and terminals. The concrete type of terminals can be found in a special catalogue of terminals, or the box manufacturer will provide you with the information at your request after specifying the box type and serial number - see point no. 7.



**GENER I, s.r.o.**  
 Uničovská 50  
 787 01 ŠUMPERK  
 Czech Republic  
 tel.: +420583221500, fax: +420583214183

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## EXPLOSION-PROOF JUNCTION BOXES

N740002/6– 5<sup>nd</sup> issue

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### 11. PRODUCT DISPOSAL

Useless products should be disposed in accordance with valid regulations.  
**!!! All components may produce harmful exhalations during combustion!!!**

### 12. ACCOMPANYING DOCUMENTATION

- EU declaration of conformity
- These operating instructions incl. of warranty
- Delivery note

Certificates are available on [www.generi.cz](http://www.generi.cz) or upon request.



**ISO 9001**



*WE WISH YOU MAXIMUM  
 SATISFACTION WITH OUR  
 PRODUCTS AND SERVICES*

### WARRANTY

Product type:	<b>X.X0</b>	<b>X.X1</b>	<b>X.X2</b>
Mark:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<b>from:</b>		<b>to:</b>
Serial number <b>No</b>			

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:
	<b>OK</b>	