 <b>GENERI, s.r.o.</b> Uničovská 50 787 01 ŠUMPERK Czech Republic tel.: +420583221500, fax: +420583214183	<b>OPERATING INSTRUCTIONS</b>		Page: 1 of 3
	<b>EX CONTROL, INDICATION AND SWITCHGEAR BOX</b>		N740021/1 - 6 <sup>th</sup> issue
	TYPE: <b>X103HM</b>		Valid from: <b>11.6.2018</b>

## GENERAL

These operating instructions conform to:

- 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).

These operating instructions are not valid for boxes X103HM/d (with direct entry into flameproof enclosure)!

In some case there can be a separately certified connecting box mechanically attached to switchgear, which operating instructions shall be used in conjunction with these instructions!



## SAFETY INSTRUCTIONS AND UNSUITABLE USE

Do not leave these operating instructions inside the box during operation!

- Boxes X103HM **must not be operated** in explosive gas atmospheres **ZONE 0** (EN 60079-10-1) and in combustible dust atmospheres **ZONE 20** and **ZONE 21** (EN 6009-10-2)!
- Boxes X103HM **must not be operated** in areas with gas group **IIC** (EN 60079-10-1) and dust group **IIIC** (EN 6009-10-2)!
- **Always maintain min. 30 mm of free space around flameproof joint of the box!**
- **Renovation of grease on joint surface must be performed at least once a year.**
- Installation, operation, commissioning and any service must be made by skilled electricians in accordance with safety rules.
- Operate boxes X103HM in accordance with bellow mentioned **operating conditions, technical and rating plate data.**
- **Do not replace the original inbuilt equipment with equipment that is contradict with accompanying documentation** (e.g. replacement of the original circuit breaker 6 A with the circuit breaker 10 A).
- When **residual current devices** (RCD) are assembled, then min. 1 x per 6 months, **check their function** by test button (with keeping of appropriate safety rules).
- **Maximal surface temperature** of the box at rated conditions is **78°C** (temperature class **T6**).
- Inbuilt switching and protective devices can produce **short-term electromagnetic interference** (EMI), so they must be operated in areas where no negative influence to other equipment is.
- Storage, transport, assembly, installation, inspection, preventive maintenance, repairs and services shall be executed according to following instructions.
- After installation of enclosure apparatus at least 20% of each cross-section area must remain free.

## 1. USE

Control, indication and switchgear boxes are determined for installation in hazardous areas with danger of explosion of flammable gases and vapours, combustible dust and explosives.

## 2. OPERATING CONDITIONS

### 2.1 External influences acc.to IEC 60364-5-51- cat. A: ENVIRONMENT

Code	Description of external influence	Specification
AA	Ambient temperature Ta (maximum range)*	-20°C to +55°C
AB	Atmospheric humidity	to +30°C ... 100% to +40°C ... 70%
AD4	Presence of water	Splashes
AE4	Presence of foreign solid bodies or dust	Light dust
AF4	Presence of corrosive or polluting substances	Continuous
AG3	Mechanical shock	High severity (7J)
AH	Vibrations	See art. 6. – rev.

\* 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 60364-5-51- cat. B: USE

Code	Description of external influence	Specification
BA5	Capability of persons	skilled
BC3	Contact of persons with earth potential	frequent
BE3	Explosion risk	see point 2.4

### 2.3 Not mentioned external influences are in accordance with IEC 60364-5-51 normal.

### 2.4 Use in areas and environments according to regulations

Areas	Name of standard	Standard
<b>ZONE 1, 2 IIA, IIB</b>	Explosive atmospheres - Part 10-1: Classification of areas - Explosive gas atmospheres	EN 60 079-10-1
<b>ZONE 22 IIIA, IIIB</b>	Explosive atmospheres - Part 10-2: Classification of areas - Combustible dust atmospheres	EN 60 079-10-2

### 2.5 Operating position: vertical

## 3. TECHNICAL DATA

Name	Data	Standard, note
Type of protection	<b>Ex db eb IIB T6 Gb</b> Ex tc IIIB T78°C Dc	EN 60079-0 EN 60079-1 EN 60079-7 EN 60079-31
Ingress protection	<b>IP 54</b>	EN 60 529
Group and category	<b>II 2G, II 3D</b>	2014/34/EU
Certification	<b>FTZÚ 02 ATEX 0198X</b>	<b>FTZÚ NB 1026, CZ</b>
Rated voltage and current	See name plate and wiring diagram	
Rated short-time current	Max. 10 kA	EN 61439-1
Protect. class	<b>I</b>	EN 61140
EMC	Switchboard without in-built electronic parts <b>resistant to EMI radiating short-term EMI</b>	Acc. to EN 61439-1 no other verification is required
	Switchboard with in-built electronic parts <b>resistant to EMI Not radiating short-term EMI</b>	acc. to harmonized IEC standards for EMC
Material	Al die-cast	CSN 42 4331
Surface finish	Powder baking coating	Red, RAL 3000
Internal PE	3x terminal 2 x 6 mm <sup>2</sup>	3x screw M6 + shim
External PE	<b>16 mm<sup>2</sup></b>	2x screw M5 + shim
Dimensions	<b>235 x 360 x 137 mm</b>	width x height x depth
Weight	<b>11 kg</b>	Empty enclosure



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## OPERATING INSTRUCTIONS

**EX CONTROL, INDICATION AND SWITCHGEAR BOX**

TYPE: **X103HM**

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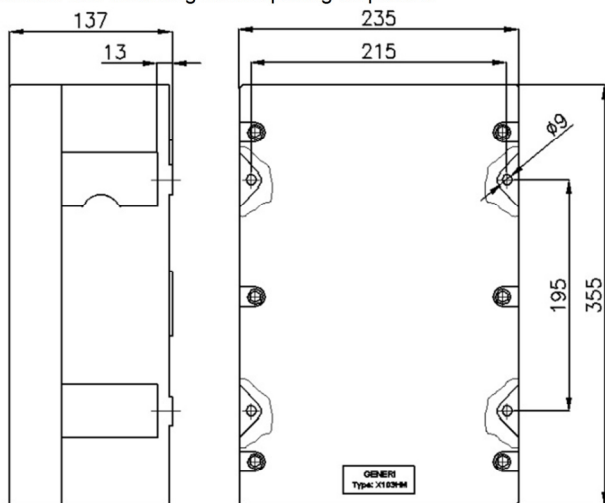
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### 4. INSTALLATION INSTRUCTIONS

#### 4.1 Mounting

There are four mounting holes d9 mm provided. Use stainless steel screws M8. Mounting holes spacing see picture.

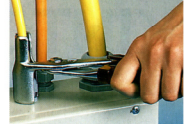


In case of the outdoor use of the box we recommend use a stainless steel hood. The hood is fixed by two upper fixing screws M8.

#### 4.2 Cable entries

There are used certified cable glands mounted on increased safety terminal part.

Each size and type of installed cable gland is able to seal only a defined range of cable diameter. In case of higher number 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 protection (IP 54), properly tighten the glands.

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

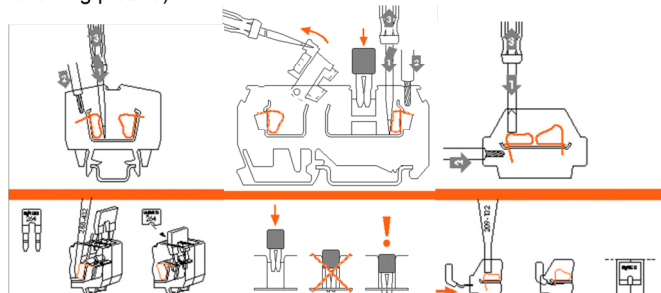
#### 4.3 Connection of wires to terminals

There are used either the cage clamp terminals or screw terminals. Their function is clear from the following pictures.

##### 4.3.1 Cage spring terminals

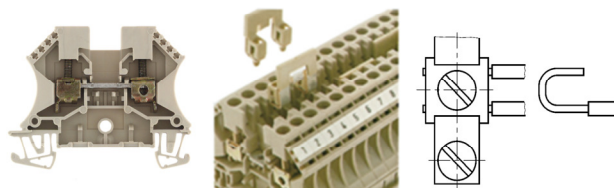
By pressing a cage clamp of the terminal block (1) e.g. with a suitable screwdriver (or a special WAGO screwdriver supplied by customer's request) you unfasten space for the connection of a wire. By pushing the wire (2) and releasing the cage clamp (3) a perfect current-carrying connection is created.

At connection of two adjacent terminal block with cage clamp by means of special blade jumper, press this 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 and properly tight the connection. If you **interconnect screw terminals** (see previous picture), 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.

#### 4.4 General requirements

**Stranded wires must be provided with ferrules.** We recommend use **ferrules** also for full copper wires without surface protection and in **aggressive atmosphere**. Termination of stranded wires only by **soft solder is not permitted!!!**

You can insert **only one wire** in to the connection hole of terminal and its **cross section must not exceed rated cross-section** of terminal. The **wire insulation** must reach as close the current-carrying connection as possible. The **wire must not be damaged** anyway.

**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 60079-14** and other valid regulations.

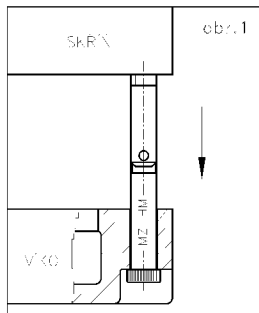
**Electrical accident protection**, in addition to said regulations, is stipulated by **IEC 60364-4-41**, **EN 61140** and other related regulations.

**Safety regulations** for operating personnel and work on electrical equipment are identified by **EN 50110-1**.

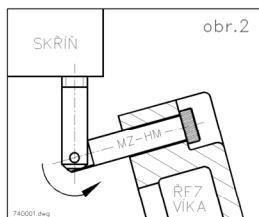
### 6. INSPECTION AND PREVENTIVE MAINTENANCE

Inspections and preventive maintenance of explosion-proof el. equipment is determined by **ČSN EN 60079-17** (unless determined otherwise by a notice, local regulations, etc.).

**To remove box cover** unscrew six hexagon socket screws M12.




If any equipment (push buttons, signal lamps, etc.) is assembled in the cover, you must use a special mounting hinges **MZ-HM** (loose part of delivery) to prevent damage of wiring. Unscrew right upper and right lower screw M12 and screw up mounting hinges MZ-HM instead of them in such a way, so that the movable part can move only on a horizontal level (not on a vertical or angular level). Do not tighten the hinges too tight in order not to damage them. Then unscrew the four remaining screws. Straighten both the hinges, pull out a little the cover behind the joint of hinges (picture 1) and overturn them slightly to the right (picture 2). When closing the box, proceed in a reverse way and properly tighten all six screws.



Before closing the cover clean the joint surface and assure that it is not damaged anyway. Then provide it with a thin layer of no solidifying grease without content of solvents (e.g. K3 acc. to ČSN 65 6911) for protecting of joint from corrosion. Cleaning of joint surfaces is permitted only with non-metal scrapers and a liquid not causing corrosion.

**Renovation of grease on joint surface must be performed at least once a year!**

At the same time it is necessary to renovate the layer of grease on all sliding surfaces of mobile parts of the instrument.

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If **humidity** occurs inside the box, we recommend spray interior of the box with a special **water-repellent spray** NC-123 EXTRA (CHEMSEARCH) that can be supplied by GENERI, s.r.o.

**All mechanical and electrical connections are protected from self-loosening.** Tests of devices on vibrations (external influence AH1, 2, 3 acc. to IEC 60364-5-51) in relation to classes of climatic conditions acc. to EN 60721-3-3 and EN 60721-3-4 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 acc. to EN 60079-17.**

**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 devices are defined in EN 60079-19.

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

Following parts **cannot be repaired**:

- glass window in the lid
- Ex terminals, cable glands and plugs, bushings
- lossless stainless steel screws in the lid
- all in-built electrical apparatus and components

**These parts must be replaced if damaged.**

In case of any **repairs and renovations**, Ex type of protection and original ingress protection must be preserved.

**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

Boxes are to be **stored** at ambient temperature from +5°C to +40°C, in non-aggressive interior rooms without UV radiation and weather conditions, where the quality does not deteriorate (climatic conditions 1K2, biological conditions 1B1, chemical active compounds 1C2, mechanically active compounds 1S1 and mechanical conditions 1M2 according to EN 60721-3-1).

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

**Transport** is ensured by express transport company within 24 hours, or according customer's wish. It is also possible to cash on delivery.

**Transport conditions** acc.to EN 60721-3-2: 2K2, 2B1, 2C2, 2S1, 2M2.

## 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

There is a wiring diagram attached with the box where all electrical components are specified.



## 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 including of warranty
- Wiring diagram inserted inside the box
- Delivery note

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

## WARRANTY

Product type: **X103HM**

Serial number from: to:  
No.:

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**

In Šumperk on:



**ISO 9001**



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