

**CEAG ZB-S**

# Mounting and Operating Instructions CEAG Central Battery System ZB-S

Target group, part 1: Qualified electrician acc. to EN 50110-1  
Target group, part 2: Electrical instructed persons



**EATON**

*Powering Business Worldwide*

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## Important Notes

### 1 General Information

#### 1.1 Description of Symbols

Important safety notes are marked with symbols in these instructions. These stated notes have to be observed essentially.

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**⚠ WARNING!  
DANGER!  
RISK OF INJURY OR DEATH!**

---

Signifies notes which, when not observed, can cause impairment of health, (steady) injury or death.

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**⚠ ATTENTION!  
DAMAGE TO PROPERTY!**

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Signifies notes which, when not observed, can cause damage to property and even the collapse of the system.

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**NOTE**

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Includes important hints and advice that is important for failure-free operation.

#### 1.2 Information regarding these Instructions

These operating instructions show the safe and proper handling with the system. The stated safety notes and instructions as well as the local accident prevention- and safety regulations have to be observed.

Before working with the system, the instructions have to be read carefully, especially the chapter „Safety Instructions“.

The figures and circuit diagrams contained in these assembly and operating instructions are in part intended only to illustrate the products which are described. In all cases where

- dimensionally accurate work is required, or
- accurate drawings or circuit diagrams that reflect the specifics of the site are required,

the drawings and plans that have been created specially for the lighting system must be followed.

#### 1.3 Further Applicable Documents

In the systems, components from other manufacturers are mounted. These purchasing-components are checked according to danger evaluation by the manufacturer. They declare the compliance of the construction with the European and national regulations.

#### 1.4 Liability and Guarantee

All information and notes in these instructions are compiled according to the valid regulations, the state of the art, our long-standing knowledge and experience.

Keep the instructions near to the system, accessible for every person working with the system and at all times.

Read the instructions carefully before working on and with the system!

CEAG Notlichtsysteme GmbH can accept no liability and/or give no warranty in respect of any defects that may occur with the supply and installation of CEAG emergency lighting systems and luminaires on the basis of other standards and regulations which are mandatory in complete installation packages in conjunction with CEAG products.

You must also comply with all statutes, standards and directives of the country in which the system is installed and operated.

CEAG will give no warranty or accept any liability for damage or consequential damage caused as a result of

- improper use,
- failure to comply with regulations and codes of conduct for the safe operation of the system,
- unauthorised or inexpert modifications to the connections and settings of the system, or to the programming of the system,
- operating proscribed or unsuitable devices or groups of devices in the ZB-S system.

#### 1.5 Copyright Protection

All information from the contents, text, drawings, pictures and further representations are protected with regards to copyright.

#### 1.6 Spare Parts

Only use original spare parts from the manufacturer

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**⚠ ATTENTION!**

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Wrong or faulty spare parts can cause damage, failure or collapse of the system.

When using unapproved spare parts, all guarantee, service, damage and liability claims are forfeited.

#### 1.7 Recycling

Packing materials are not refuse, they are valuable materials and should be re-used or recycled.



CEAG has been awarded the Recycling Certificate of INTERSEROH GmbH. The contract number is 85405. It guarantees that the packaging materials which it covers are properly recycled and that all the requirements of the German Packaging Code are complied with.

INTERSEROH collection points are required to dispose of CEAG packaging free of charge.

Batteries and electronic components contain materials that can damage health and the environment if not properly disposed of. Dispose of old batteries and electronic components in accordance with national guidelines and regulations.

## 2 Safety

The central battery system is designed and built in conformity with the latest technical rules at the time of its development and production, so it is safe to operate. Danger may be presented by the device, if it will be used for other than the intended purpose and by unskilled personnel.

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### **WARNING!**

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When planning a lighting system with a ZB-S system you first establish whether the proposed electrical installations satisfy local environmental conditions.

Special environmental conditions (e. g. areas subject to explosion hazards or areas with an aggressive atmosphere) call for special equipments and installations.

Only operate the system and parts connected to it when they are in a technically perfect condition, and comply with

- the safety and hazard information given in these assembly and operating instructions,
- the work and safety instructions issued by the operator of the system,
- the installation and operating data given in „3 Technical data“ and in the CEAG Catalogue.

Faults that can affect the operation or safety of the system must be reported immediately to the company officers and remediated.

### 2.1 Inteded Use

The ZB-S and US-S Central Battery Systems are exclusively designed to monitor and control a lighting system with general and emergency lighting. Their operation is program controlled. They must be programmed and set up by engineers with specialist knowledge of the legal and technical requirements governing the assembly and operation of lighting systems.

Only use luminaires if they constructed by CEAG or fit with the normative and technical guidelines of the emergency lighting. Corresponding details for the conformity you can download on our website ([www.ceag.de](http://www.ceag.de)).

The operating safety can only be guaranteed by intended use of the systems.

The ZB-S systems complies with the requirements of the EN 62034 and is classified as type PERC.

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### **ATTENTION!**

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Every use beyond or different than the intended purpose is prohibited, and therefore not in accordance with regulations!

### 2.2 Contents of Operating Instructions

Every person, ordered to work with the system, has to read the instructions carefully to understand them before work begins. This takes also place when the person has already worked with a similar kind of battery or was instructed by the manufacturer.

### 2.3 Changes and Modifications to the System

To avoid danger and to assure optimum performance, changes and modifications to the system are not allowed, except when the manufacturer has approved them.

Any work involved in extensions, conversions or repairs and which is not described in this manual must be carried out by specially trained technical and service personnel (of the manufacturer CEAG or of CEAG-authorized distribution and service contractors)!

## 2 Safety

### 2.4 Responsibility of the Operator

Keep the instructions near to the system, accessible for every person working with the system and at all times. The System must be in a proper and safe condition when using it. System has to be checked for intactness before using it.

Adhere to the information of the instructions completely!

### 2.5 Personnel Requirements

Only authorised and skilled personnel are allowed to work on and with the system. The personnel must have received instructions regarding the existing danger.

Skilled personnel refers to those with expert training, with knowledge and experience as well as knowledge of the relevant regulations. He should be able to evaluate his work and recognize the presence of danger.

Personnel without the necessary knowledge must

- have received qualified and proper training,
- get their tasks and activities by full description for complete understanding
- carry out the activities under the supervision and control of skilled and qualified personnel.

### 2.6 Operational Safety

Observing the stated safety instructions and regulations can avoid damage to property and people when working with the system.

However the following organisational measurements must be specified in writing and be kept:

- Duties of information and reporting (start, duration, end of the work)
- Safety measures while the work is being carried out: e. g. standby lighting, power supply isolation and lock-out (e. g. removing the fuses, key-operated switch, safety signage)
- Safety equipment for the personnel carrying out the work on the plant (s. chapter 2.7)
- Safety equipment providing protection from hazards caused by adjacent plant (e. g. safety grilles, barriers, making safe of roads)

Attend to the ESD-protection during working at the system!

The applicable work and safety regulations are set out in these assembly and operating instructions, and in

- the management's internal organisational instructions (example see above)
- and the general and specialist technical guidelines and accident prevention regulations.

### 2.7 Personal Protective Equipment

When working on and with the system it is necessary to wear:



#### Protective Clothes

Close fitting protective clothes (low tensile strength, no wide arms, no rings and further jewelry, etc).



#### Safety Boots

Boots electrostatic conductive acc. to EN 345 and to protect against heavy falling parts.

### 3 Technical Data

#### 3.1 Data Sheet for ZB-S/26

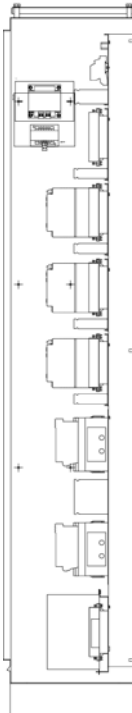
Type of system: .....ZB-S 26  
 Construction: .....Sheet steel cabinet with partial viewing window in the door  
 Height: .....2050 mm  
 Width: .....800 mm  
 Depth: .....400 mm  
 Weight without battery: .....approx. 180 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 20  
 External painting : .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top  
 (prepunched roof sheeting)  
 .....at the bottom  
 (open bottom with propping tracks on the side)  
 Hinge: .....right

Mains rated voltage: .....400V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Battery capacity (C10; 1.8V/Z; +20°C): .....23.3 - 245 Ah  
 Type of battery: .....Lead acid battery,  
 10 years service life at +20°C acc. to IEC 486  
 Duration of emergency lighting: .....1 h, 1,5 h, 2 h, 3 h, 8 h  
 Recharging time: .....12 h acc. to DIN EN 50171  
 Ambient temperature operation: .....-5°C up to +35°C  
 Opt. ambient temperature battery: .....+20°C  
 (please attend to the attached operating and installation instructions)

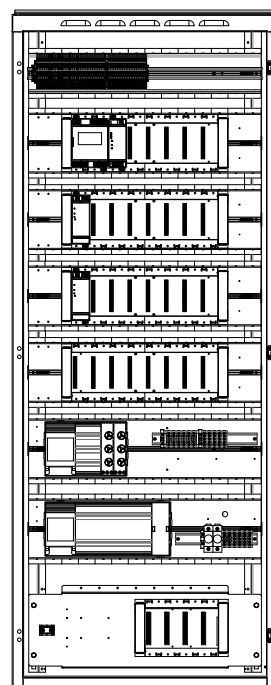
Mains feed in (max. 50mm<sup>2</sup>): .....Q1  
 Internal device fuse: .....F1; F2  
 (Attention! The device fuses are not suitable for disconnecting the sub-distributor and must not be disconnected under load.)  
 Battery feed in (max. 50mm<sup>2</sup>): .....Q2  
 Max. 80 circuits (max. 4 mm<sup>2</sup>): .....X1.1, X2.1, X3.1, X4.1  
 Marshalling mains (max. 16mm<sup>2</sup>): .....F10 - F15  
 Marshalling battery (max. 16mm<sup>2</sup>): .....F30 - F35, F50 - F55  
 Addresses optional places DLS-3Ph, TLS (max. 2,5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>): .....X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>): .....X1.1.S3-S4  
 Connection to potential-free signal contacts (max.4mm<sup>2</sup>): .....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>): .....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>): .....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>): .....X1.1.+24V Out--24V Out  
 Connection to 24V analog input (max.4mm<sup>2</sup>): .....X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

\* Max. 2.5mm<sup>2</sup> flexible with wiring sle  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with tv terminal.

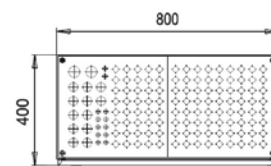
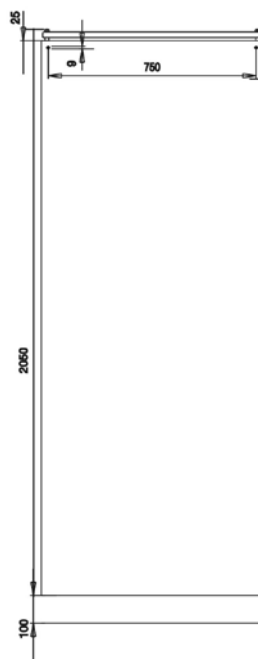
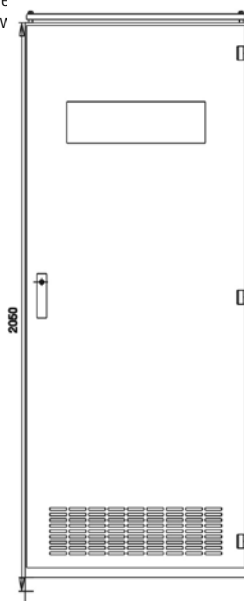
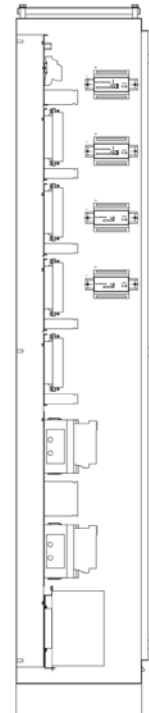
interior side view, left



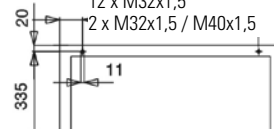
front view, open



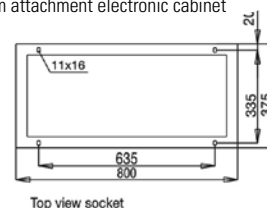
interior side view, right



prepunched roof sheeting for  
 12 x M16x1,5  
 112 x M20x1,5 / M25x1,5  
 12 x M32x1,5  
 2 x M32x1,5 / M40x1,5



Cable entry from the bottom (l x w): 720 x 295 mm  
 Bottom attachment electronic cabinet



## 2 Safety

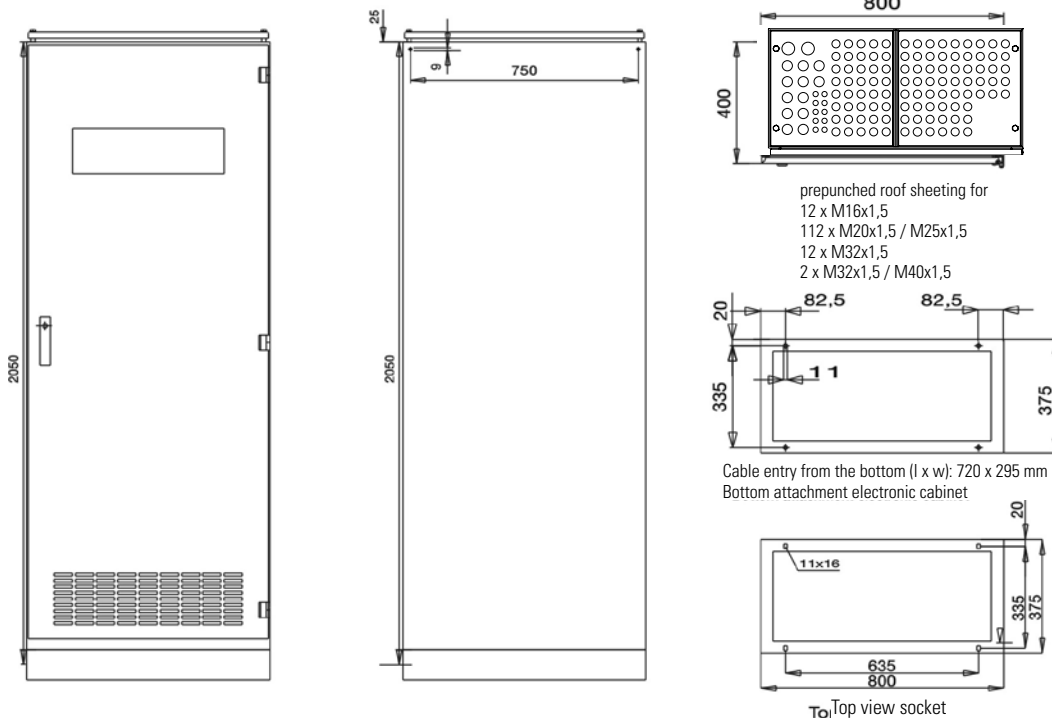
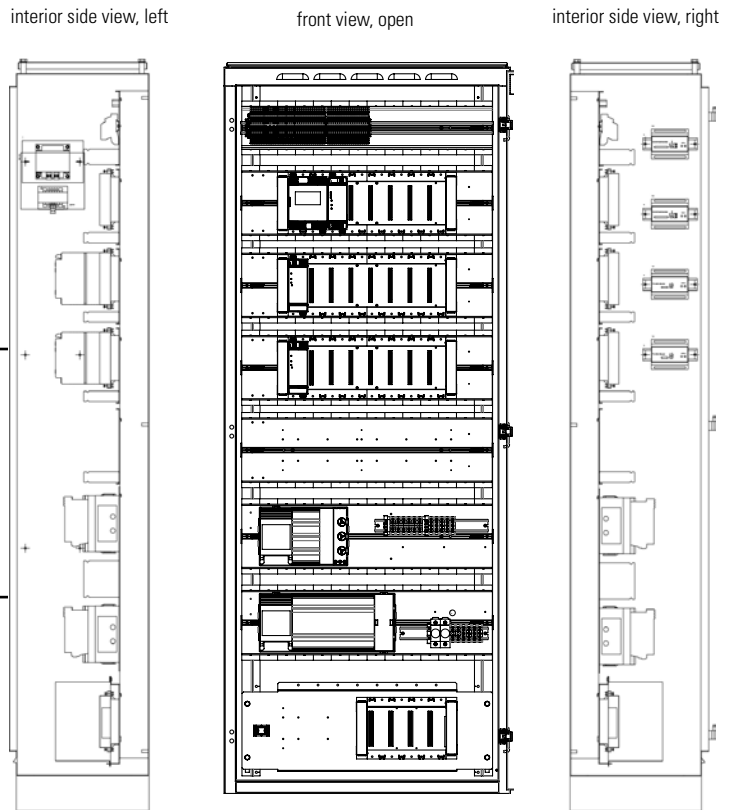
### 3.2 Data Sheet for ZB-S/18

Type of system: .....ZB-S 18  
 Construction: .....Sheet steel cabinet with partial viewing window in the door  
 Height: .....2050 mm  
 Width: .....800 mm  
 Depth: .....400 mm  
 Weight without battery: .....approx. 170 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 20  
 External painting: .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top  
 (prepunched roof sheeting)  
 at the bottom  
 (open bottom with propping tracks on the side)  
 Hinge: .....right

Mains rated voltage: .....400/230V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Battery capacity (C10; 1.8V/Z; +20°C): .....23.3 - 245 Ah  
 Type of battery: .....Lead acid battery,  
 10 years service life at +20°C acc. to IEC 486  
 Duration of emergency lighting: .....1 h, 1.5 h, 2 h, 3 h, 8 h  
 Recharging time: .....12 h acc. to DIN EN 50171  
 Ambient temperature operation: .....-5°C up to +35°C  
 Opt. ambient temperature battery: .....+20°C  
 (please attend to the attached operating and installation instructions)

Mains feed in (max. 50mm<sup>2</sup>): .....Q1  
 Battery feed in (max. 50mm<sup>2</sup>): .....Q2  
 Internal device fuse: .....F1; F2  
*Attention! The device fuses are not suitable for disconnecting the sub-distributor and must not be disconnected under load.*  
 Max. 68 circuits (max. 4mm<sup>2</sup>)\*: .....X1.1, X2.1, X3.1  
 Marshalling mains (max. 16mm<sup>2</sup>): .....F10 - F15  
 Marshalling battery (max. 16mm<sup>2</sup>): .....F30 - F35, F50 - F55  
 Addresses optional places DLS-3Ph, TLS (max. 2.5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts (max. 4mm<sup>2</sup>\*\*): .....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out--24V Out  
 Connection to 24V analog input(max.4mm<sup>2</sup>\*\*): X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.





## 2 Safety

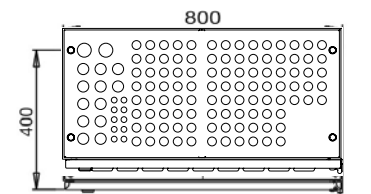
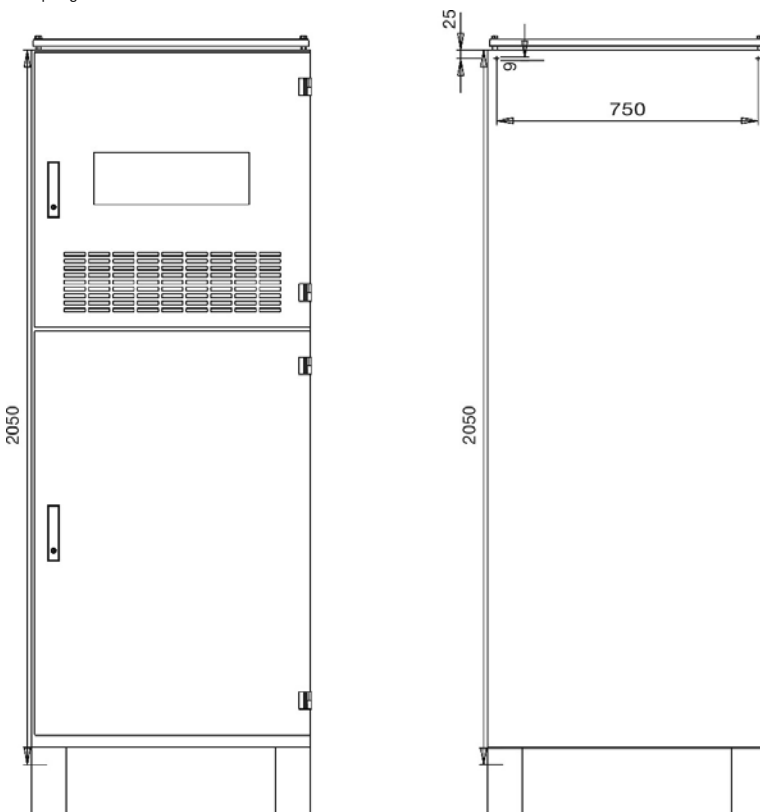
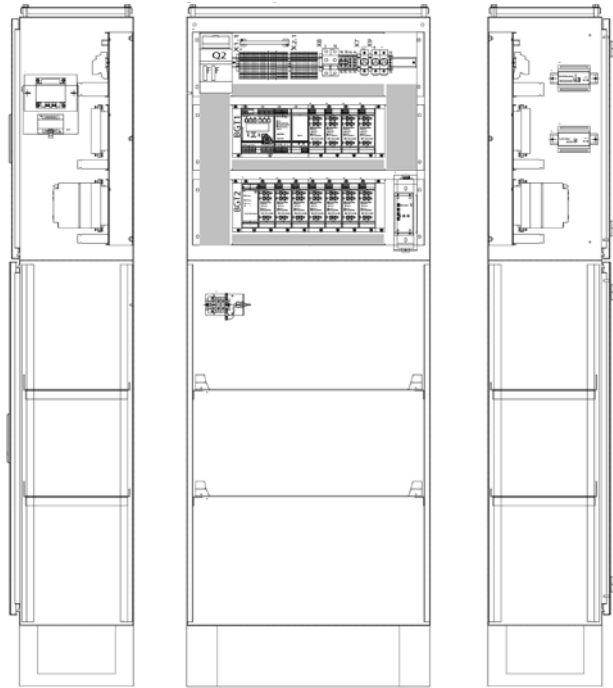
### 3.4 Data Sheet for ZB-S/10C

Type of system: .....ZB-S 10C  
 Construction: .....Sheet steel compact cabinet with divided door  
**Height**: .....**2050 mm**  
 Width: .....800 mm  
 Depth: .....400 mm  
 Weight without battery: .....approx. 155 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 20  
 External painting: .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top (prepunched roof sheeting)  
 Cabinet construction: .....one-piece, not divisible  
 Hinge: .....right

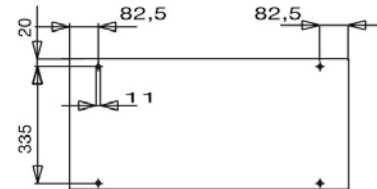
Mains rated voltage: .....230V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Battery capacity (C10; 1.8 V/Z; +20°C): .....5.5 - 53.7 Ah  
 Type of battery: .....Lead acid battery, 10 years service life at  
 +20°C acc. to IEC 486  
 Duration of emergency lighting: .....1 h, 1,5 h, 2 h, 3 h, 8 h  
 Recharging time: .....12 h acc. to DIN EN 50171  
 Ambient temperature operation: .....-5°C up to +35°C  
 Opt. ambient operation battery: .....+20°C  
 (please attend to the attached operating and installation instructions)

Mains feed in (max. 16mm<sup>2</sup>): .....X8  
 Battery feed in (max. 16mm<sup>2</sup>): .....Q2  
 Max. 40 circuits (max. 4mm<sup>2</sup>)\*: .....X1.1, X2.1  
 Marshalling mains (max. 35mm<sup>2</sup>): .....X7  
 Marshalling battery (max. 35mm<sup>2</sup>): .....X9  
 Addresses optional places DLS-3Ph, TLS (max. 2.5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts  
 (max. 4mm<sup>2</sup>\*\*): .....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out--24V Out  
 Connection to 24V analog input (max. 4mm<sup>2</sup>\*\*): X1.1.Z11, Z12, Z21, Z22, Z31, Z32,  
 Z41, Z42

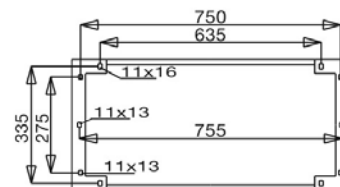
\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



prepunched roof sheeting for  
 12 x M16x1,5  
 112 x M20x1,5 / M25x1,5  
 12 x M32x1,5  
 2 x M32x1,5 / M40x1,5



Bottom attachment electronic cabinet



Bottom attachment socket

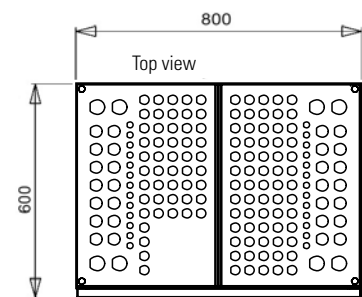
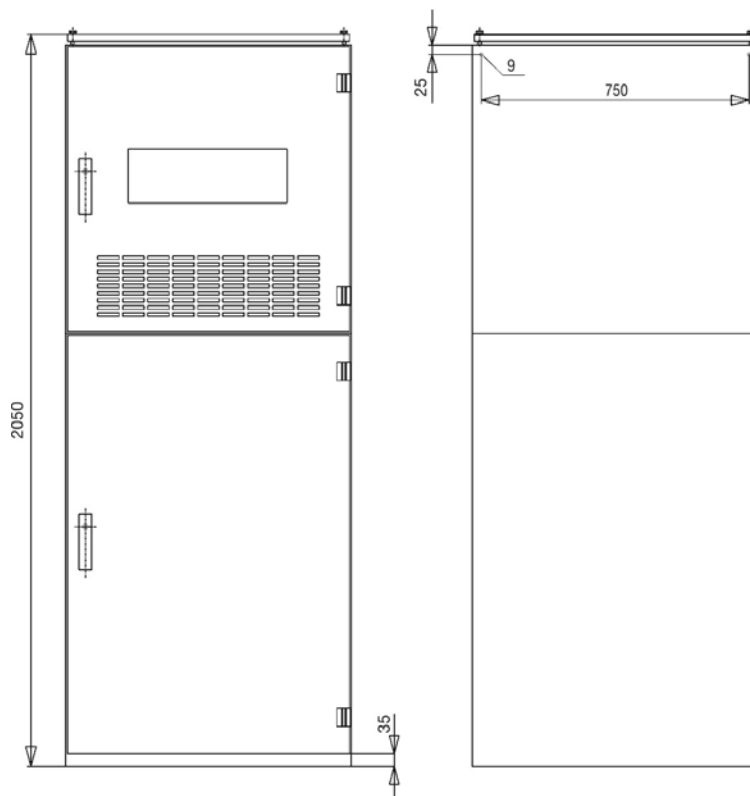
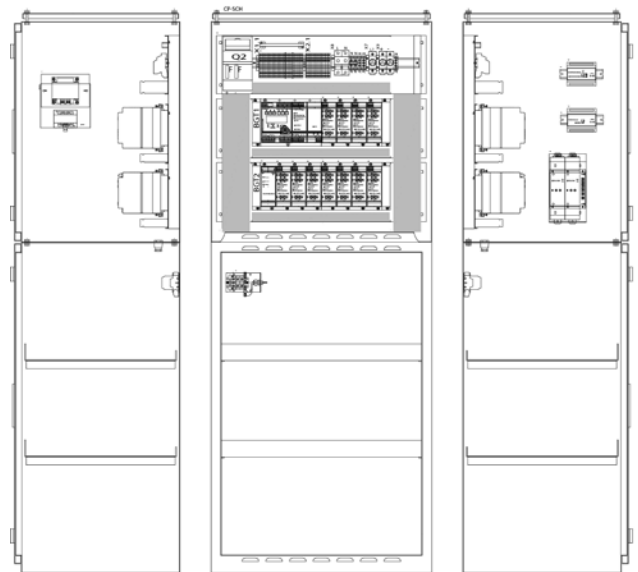
### 3.5 Data Sheet for ZB-S/10C6

Type of system: .....ZB-S 10C6  
 Construction: .....Sheet steel compact cabinet with divided door  
 Height: .....2050 mm  
 Width: .....800 mm  
 Depth: .....600 mm  
 Weight without battery: .....approx. 205 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 20  
 External painting: .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top (prepunched flange plates)  
 Cabinet construction: .....two parts, screwed together, divisible  
 Hinge: .....right

Mains rated voltage: .....230V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Battery capacity (C10; 1.8 V/Z; +20°C): .....5.5-89.4 Ah  
 Type of battery: .....Lead acid battery, 10 years service life at +20°C acc. to IEC 486  
 Duration of emergency lighting: .....1 h, 1,5 h, 2 h, 3 h, 8 h  
 Recharging time: .....12 h acc. to DIN EN 50171  
 Ambient temperature operation: .....-5°C up to +35°C  
 Opt. ambient temperature battery: .....+20°C  
 (please attend to the attached operating and installation instructions)

Mains feed in (max. 16mm<sup>2</sup>): .....X8  
 Battery feed in (max. 16mm<sup>2</sup>): .....Q2  
 Max. 40 circuits (max. 4mm<sup>2</sup>)\*: .....X1.1, X2.1  
 Marshalling mains (max. 35mm<sup>2</sup>): .....X7  
 Marshalling battery (max. 35mm<sup>2</sup>): .....X9  
 Addresses optional places DLS-3Ph, TLS (max. 2.5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts (max.4mm<sup>2</sup>\*\*): .....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out--24V Out  
 Connection to 24V analog input (max.4mm<sup>2</sup>\*\*): X1.1.Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



Prepunched roof sheeting for:  
 26 x M16 x 1,5  
 114 x M20 x 1,5 / M25 x 1,5  
 28 x M32 x 1,5  
 8 x M32 x 1,5 / M40 x 1,5

## 2 Safety

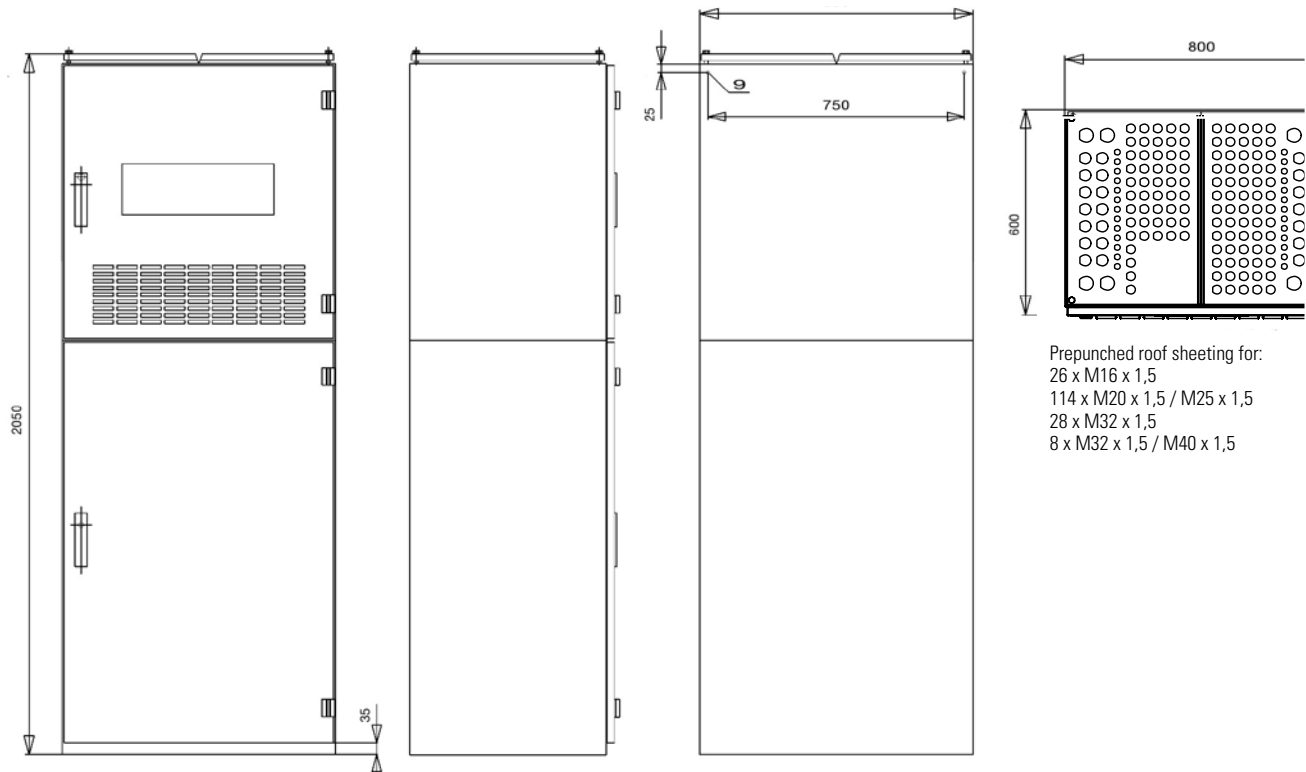
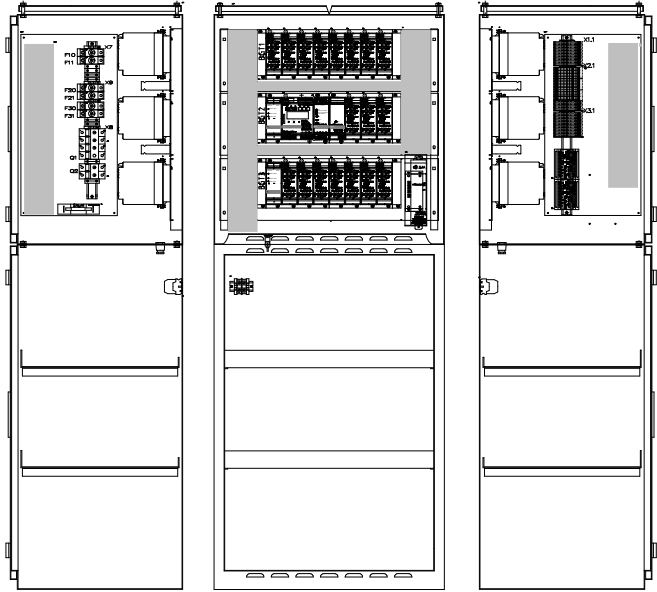
### 3.6 Data Sheet for ZB-S/18C6

Type of system: .....ZB-S 18C6  
 Construction: .....Sheet steel compact cabinet with divided door  
 Height: .....2050 mm  
 Width: .....800 mm  
 Depth: .....600 mm  
 Weight without battery: .....approx. 205 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 20  
 External painting: .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top (prepunched flange plates)  
 Cabinet construction: .....two parts, screwed together, divisible  
 Hinge: .....right

Mains rated voltage: .....4000V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Battery capacity (C10; 1.8 V/Z; +20°C): .....5.5-89.4 Ah  
 Type of battery: .....Lead acid battery, 10 years service life at +20°C acc. to IEC 486  
 Duration of emergency lighting: .....1 h, 1.5 h, 2 h, 3 h, 8 h  
 Recharging time: .....12 h acc. to DIN EN 50171  
 Ambient temperature operation: .....-5°C up to +35°C  
 Opt. ambient temperature battery: .....+20°C  
 (please attend to the attached operating and installation instructions)

Mains feed in (max. 16mm<sup>2</sup>): .....Q1  
 Battery feed in (max. 16mm<sup>2</sup>): .....Q2  
 Max. 40 circuits (max. 4mm<sup>2</sup>)\*: .....X1.1, X2.1, X3.1  
 Marshalling mains (max. 35mm<sup>2</sup>): .....X7, F10-F11  
 Marshalling battery (max. 35mm<sup>2</sup>): .....X9, F20-F21, F30-F31  
 Addresses optional places DLS-3Ph, TLS (max. 2.5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts (max. 4mm<sup>2</sup>\*\*): .....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out--24V Out  
 Connection to 24V analog input (max. 4mm<sup>2</sup>\*\*): X1.1.Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



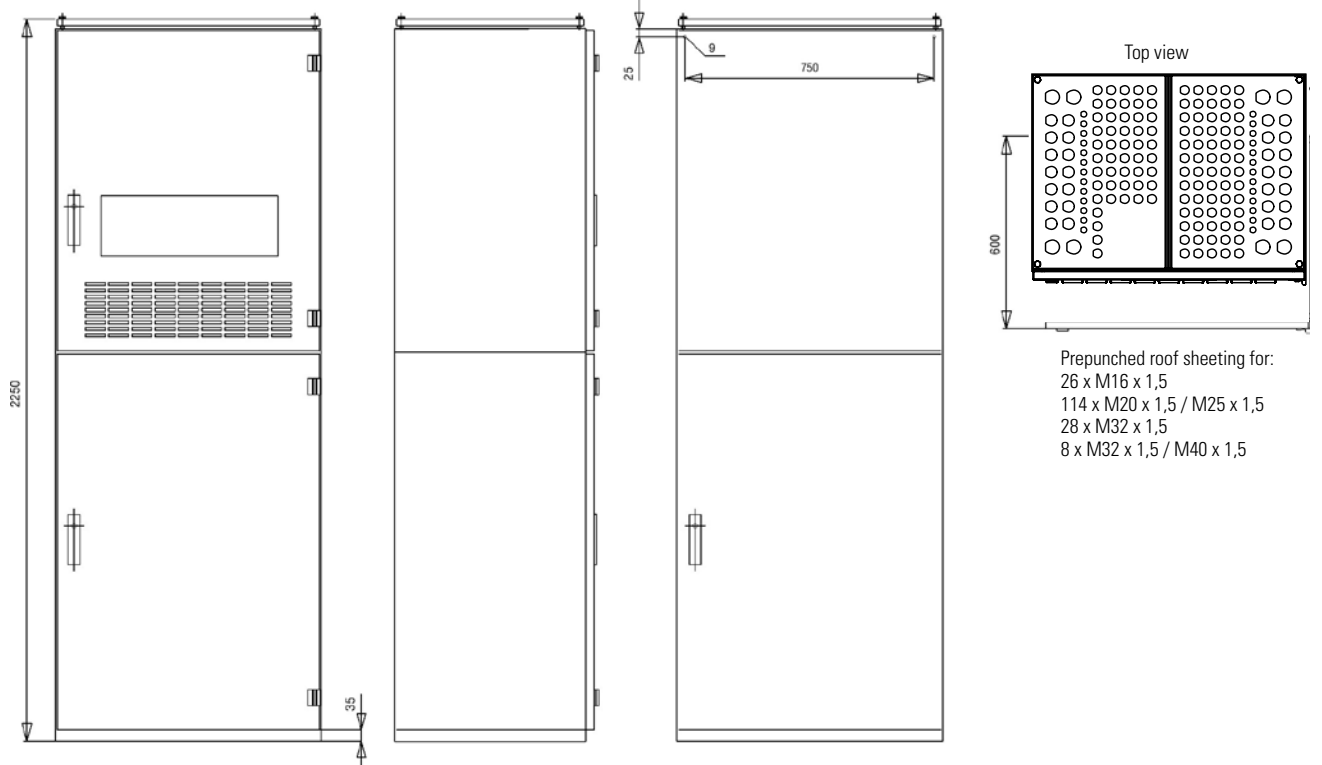
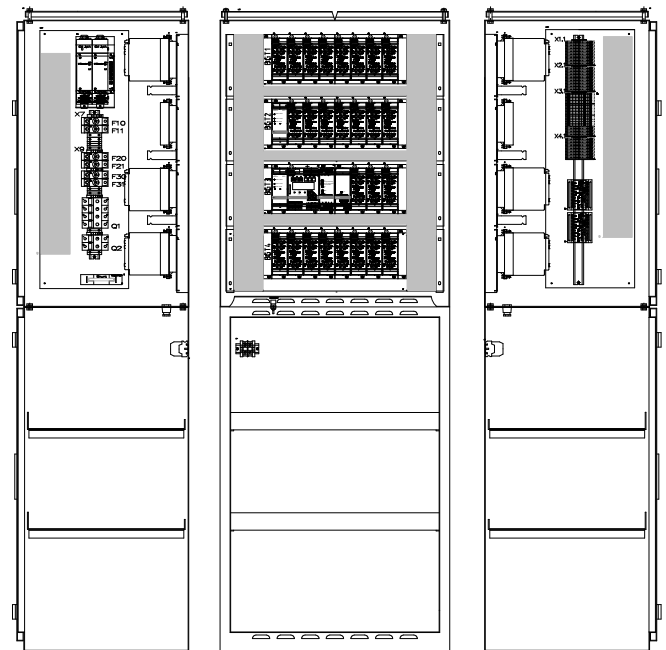
### 3.7 Data Sheet for ZB-S/26C6

Type of system: .....ZB-S 26C6  
 Construction: .....Sheet steel compact cabinet with divided door  
 Height: .....2250 mm  
 Width: .....800 mm  
 Depth: .....600 mm  
 Weight without battery: .....approx. 250 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 20  
 External painting: .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top (prepunched roof sheeting)  
 Cabinet construction: .....two parts, divisible  
 Hinge: .....right

Mains rated voltage: .....400V/230V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Battery capacity (C10; 1.8 V/Z; +20°C): .....5.5-89.4 Ah  
 Type of battery: .....Lead acid battery, 10 years service life at +20°C acc. to IEC 486  
 Duration emergency lighting: .....1 h, 1.5 h, 2 h, 3 h, 8 h  
 Recharging time: .....12 h acc. to DIN EN 50171  
 Ambient temperature operation: .....-5°C up to +35°C  
 Opt. ambient temperature battery: .....+20°C  
 (please attend to the attached operating and installation instructions)

Mains feed in (max. 16mm<sup>2</sup>): .....Q1  
 Battery feed in (max. 16mm<sup>2</sup>): .....Q2  
 Max. 56 circuits (max. 4mm<sup>2</sup>)\*: .....X1.1, X2.1, X3.1, X4.1  
 Marshalling mains (max. 35mm<sup>2</sup>): .....X7, F10-F11  
 Marshalling battery (max. 35mm<sup>2</sup>): .....X9; F20-F21, F30-F31  
 Addresses optional places DLS-3Ph, TLS (max. 2.5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts (max. 4mm<sup>2</sup>\*\*): .....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out-24V Out  
 Connection to 24V analog input (max. 4mm<sup>2</sup>\*\*): X1.1.Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



## 2 Safety

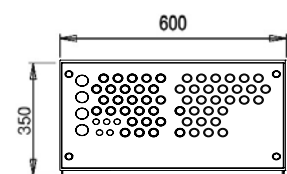
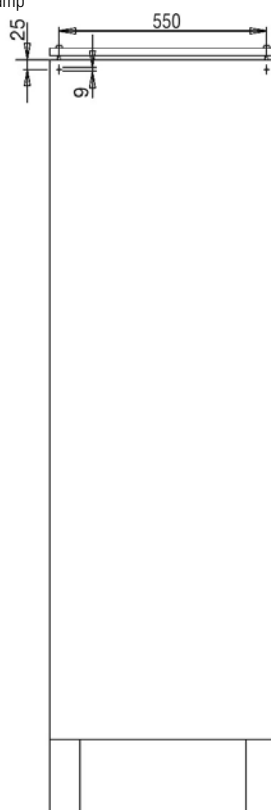
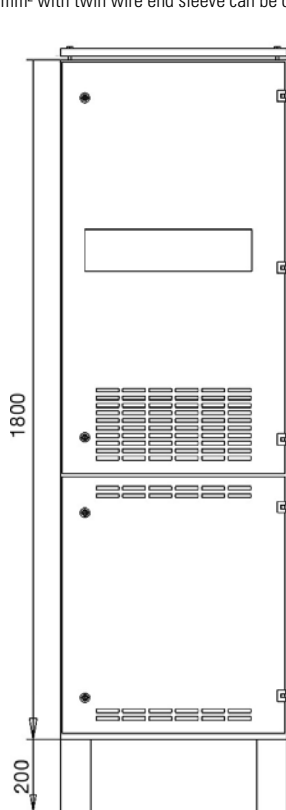
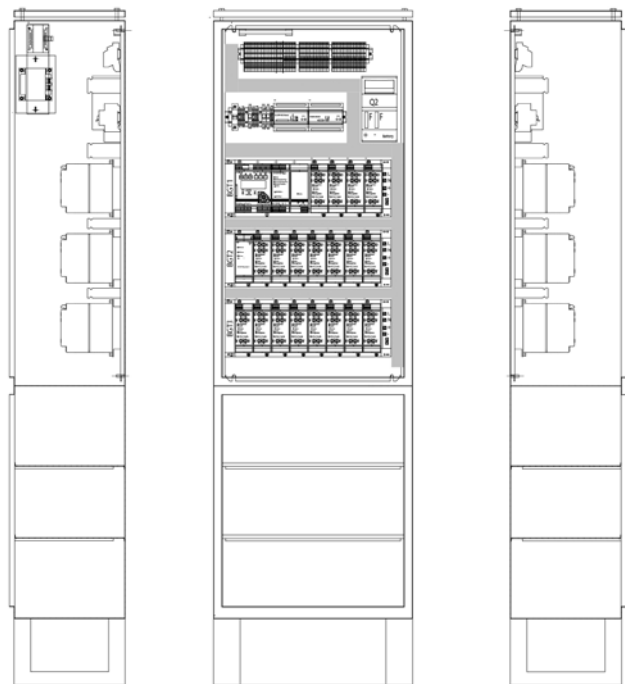
### 3.8 Data Sheet for ZB-S/18C3

Type of system: .....ZB-S 18C3  
 Construction: .....Sheet steel compact cabinet with divided door  
 Height: .....1800 mm  
 Width: .....600 mm  
 Depth: .....350 mm  
 Weight without battery: .....approx. 120 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 20  
 External painting: .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top (prepunched roof sheeting)  
 Cabinet construction: .....one-piece, not divisible  
 Hinge: .....right

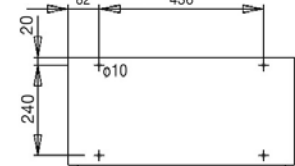
Mains rated voltage: .....230V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Battery capacity (C10; 1.8 V/Z; +20°C): .....5.5-23.3 Ah  
 Type of battery: .....Lead acid battery, 10 years service life at +20°C acc. to IEC 486  
 Duration emergency lighting: .....1 h, 1.5 h, 2 h, 3 h, 8 h  
 Recharging time: .....12 h acc. to DIN EN 50171  
 Ambient temperature operation: .....-5°C up to +35°C  
 Opt. ambient temperature battery: .....+20°C  
 (please attend to the attached operating and installation instructions)

Mains feed in (max. 16mm<sup>2</sup>): .....X8  
 Battery feed in (max. 16mm<sup>2</sup>): .....Q2  
 Max. 56 circuits (max. 4mm<sup>2</sup>)\*: .....X1.1, X2.1, X3.1  
 Marshalling mains (max. 16mm<sup>2</sup>): .....X7  
 Marshalling battery (max. 16mm<sup>2</sup>): .....X9  
 Addresses optional places DLS-3Ph, TLS (max. 2.5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts (max. 4mm<sup>2</sup>\*\*): .....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out-24V Out  
 Connection to 24V analog input (max. 4mm<sup>2</sup>\*\*): X1.1.Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

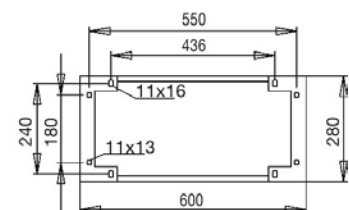
\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



Cable entry from the prepunched cable fitting flange plate:  
 4 x M32  
 65 x M20/M25  
 5 x M16



Bottom attachment cabinet



Bottom attachment socket

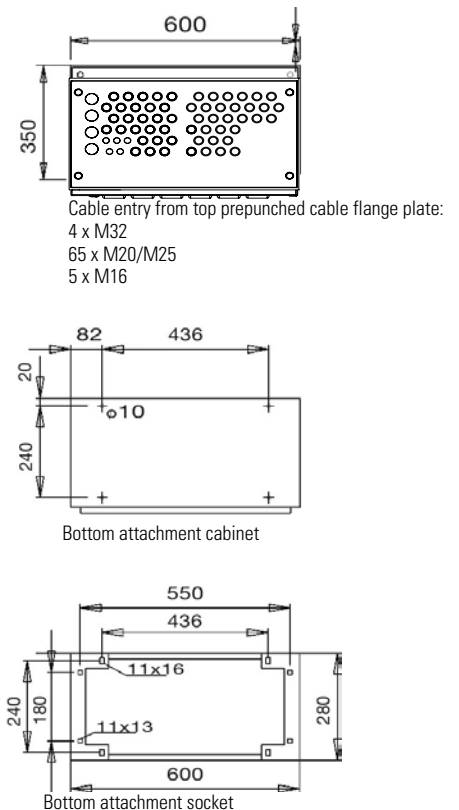
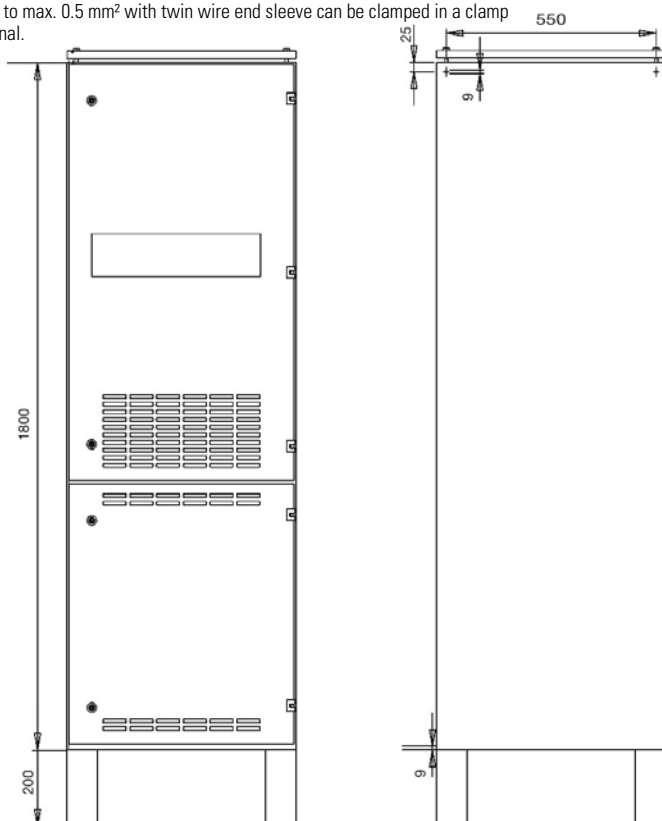
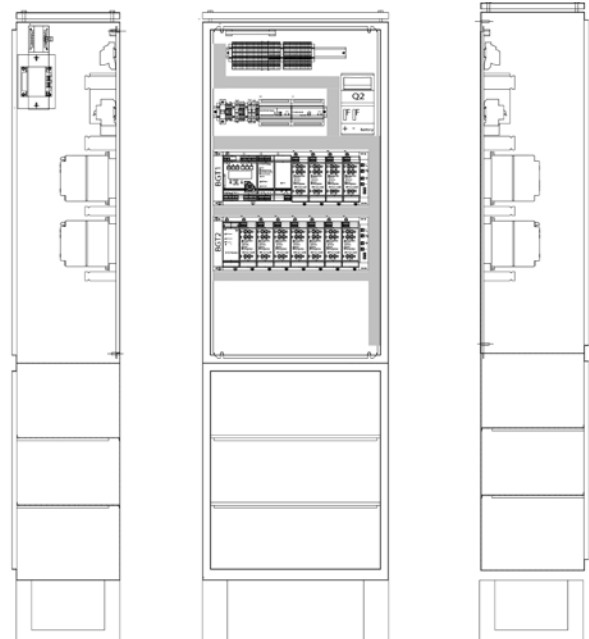
### 3.9 Data Sheet for ZB-S/10C3

Type of system: .....ZB-S 10C3  
 Construction: .....Sheet steel cabinet  
 with partial viewing window in the door  
 Height: .....1800 mm  
 Width: .....600 mm  
 Depth: .....350 mm  
 Weight without battery: .....approx. 115 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 20  
 External painting: .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top (prepunched roof sheeting)  
 Cabinet construction: .....one-piece, not divisible  
 Hinge: .....right

Mains rated voltage: .....230V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Battery capacity (C10; 1.8 V/Z; +20°C): .....5.5-23.3 Ah  
 Type of battery: .....Lead acid battery,  
 10 years service life at +20°C acc. to IEC 486  
 Duration of emergency lighting: .....1 h, 1.5 h, 2 h, 3 h, 8 h  
 Recharging time: .....12 h acc. to DIN EN 50171  
 Ambient temperature operation: .....-5°C up to +35°C  
 Opt. ambient temperature battery: .....+20°C  
 (please attend to the attached operating and installation instructions)

Mains feed in (max. 16mm<sup>2</sup>): .....X8  
 Battery feed in (max. 16mm<sup>2</sup>): .....Q2  
 Max. 40 circuits (max. 4mm<sup>2</sup>)\*: .....X1.1, X2.1  
 Marshalling mains (max. 16mm<sup>2</sup>): .....X7  
 Marshalling battery (max. 16mm<sup>2</sup>): .....X9  
 Addresses optional places DLS-3Ph, TLS (max. 2.5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts  
 (max. 4mm<sup>2</sup>\*\*): .....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out-24V Out  
 Connection to 24V analog input (max. 4mm<sup>2</sup>\*\*): X1.1.Z11, Z12, Z21, Z22, Z31, Z32, Z41,  
 Z42

\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



## 2 Safety

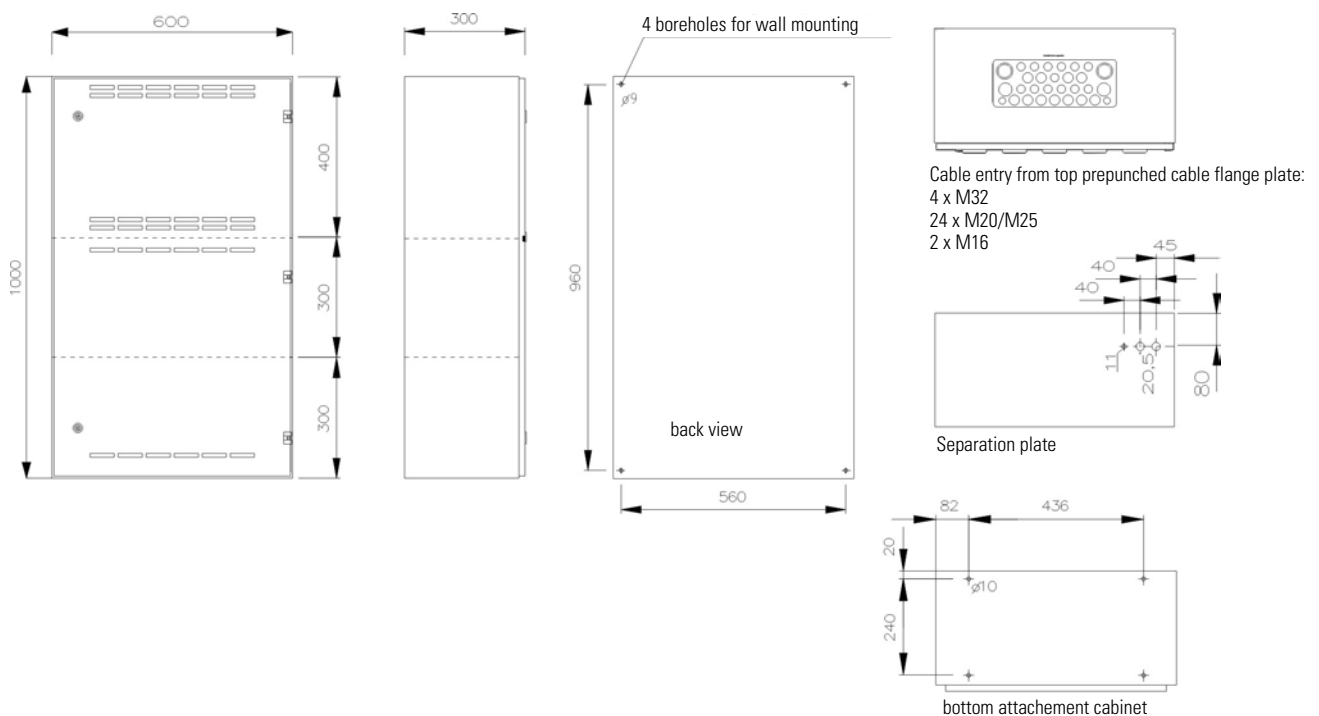
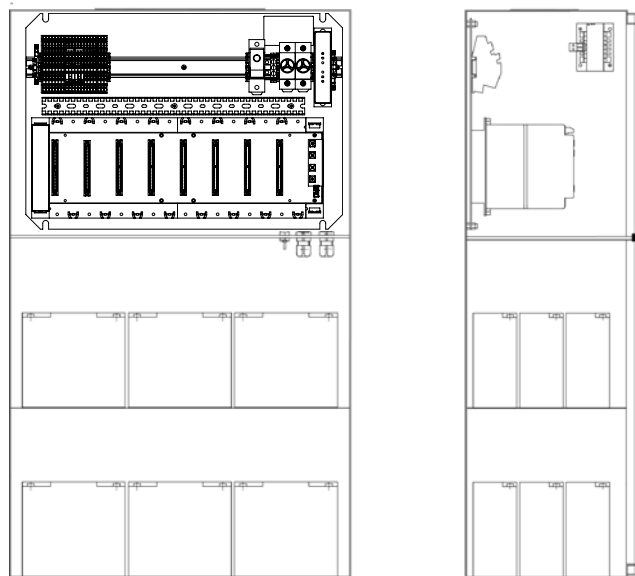
### 3.10 Data Sheet for ZB-S/2C3

Type of system: .....ZB-S 2C3  
 Construction: .....Sheet steel cabinet with sheet steel door  
 Height: .....1000 mm  
 Width: .....600 mm  
 Depth: .....300 mm  
 Weight without battery: .....approx. 50 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 20  
 External painting: .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top (prepunched roof sheeting)  
 Cabinet construction: .....one-piece, not divisible  
 Hinge: .....right

Mains rated voltage: .....230V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Battery capacity (C10; 1.8 V/Z; +20°C): .....5.5 - 18 Ah  
 Type of battery: .....Lead acid battery,  
 10 years service life at +20°C acc. to IEC 486  
 Duration of emergency lighting: .....1 h, 1,5 h, 2 h, 3 h, 8 h  
 Recharging time: .....12 h acc. to DIN EN 50171  
 Ambient temperature operation: .....-5°C up to +35°C  
 Opt. ambient temperature battery: .....+20°C  
 (please attend to the attached operating and installation instructions)

Mains feed in (max. 16mm<sup>2</sup>): .....X8  
 Battery feed in (max. 16mm<sup>2</sup>): .....X9  
 Max. 12 circuits (max. 4mm<sup>2</sup>)\*: .....X1.1  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts  
 (max. 4mm<sup>2</sup>)\*: .....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.CG.S.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V --24V Out  
 Connection to 24V analog input (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out --24V Out  
 Addresses of optional slots DLS-3Ph, TLS  
 (max. 4mm<sup>2</sup>)\*: .....X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41

\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



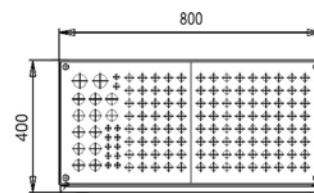
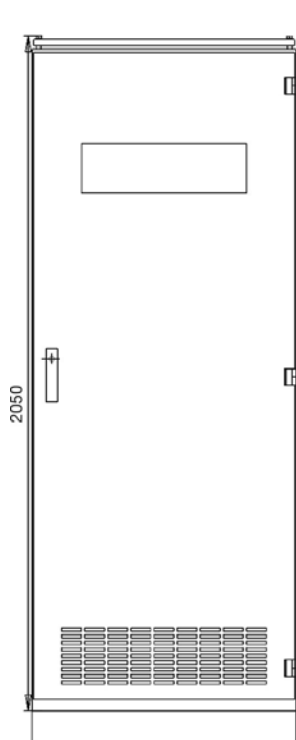
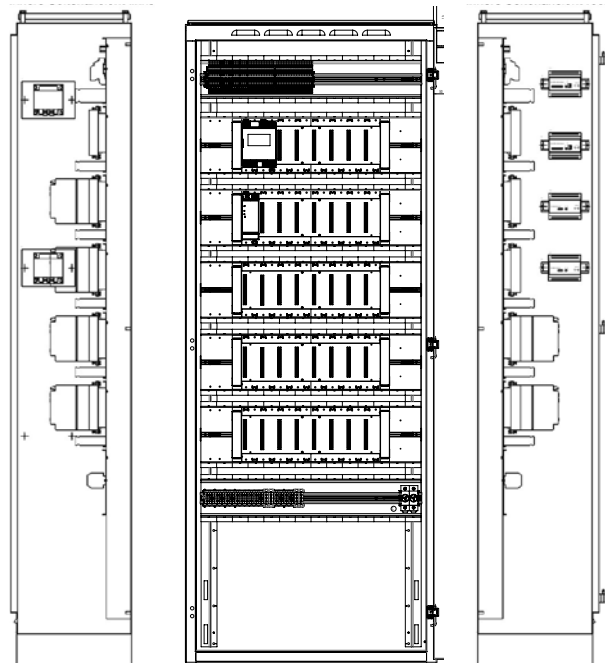
### 3.11 Data Sheet for US-S/36

Type of system: .....US-S/36  
 Construction: .....Sheet steel cabinet with partial viewing window in the door  
 Height: .....2050 mm  
 Width: .....800 mm  
 Depth: .....400 mm  
 Weight without battery: .....approx. 170 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 20  
 External painting: .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top (prepunched roof sheeting)  
 .....at the bottom (open bottom)  
 Hinge: .....right

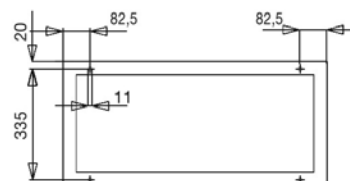
Mains rated voltage: .....400V/230V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Battery capacity:  
 Type of battery:  
 Duration of emergency lighting:  
 Recharging time:  
 Ambient temperature operation: .....-5°C up to +35°C

Mains feed in (max. 35mm<sup>2</sup>): .....X8  
 Battery feed in (max. 35mm<sup>2</sup>): .....X8  
 Internal device fuse .....F1; F2  
 (Attention! The device fuses are not suitable for disconnecting the sub-distributor and must not be disconnected under load.)  
 Max. 80 circuits (max. 4mm<sup>2</sup>)\*: .....X1.1, X2.1, X3.1, X4.1, X5.1  
 Addresses optional places DLS-3Ph, TLS (max. 2,5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>)\*: X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>)\*: X1.1.S3-S4  
 Connection to potential-free signal contacts (max. 4mm<sup>2</sup>)\*: .....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>)\*: .....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>)\*: .....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>)\*: X1.1.+24V Out--24V Out  
 Connection to 24V analog input (max. 4mm<sup>2</sup>)\*: X1.1.Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

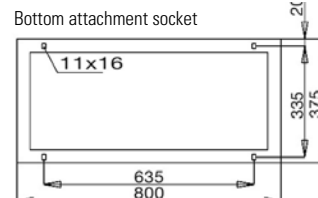
\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



prepunched roof sheeting for :  
 26 x M16x1,5  
 112 x M20x1,5 / M25x1,5  
 12 x M32x1,5  
 2 x M32x1,5 / M40x1,5



Cable entry from the bottom (l x w): 750 x 295 mm  
 Bottom attachment



## 2 Safety

### 3.12 Data Sheet for US-S/28

Type of system:	US-S/28
Construction:	Sheet steel cabinet with partial viewing window in the door
Height:	2050 mm
Width:	800 mm
Depth:	400 mm
Weight without battery:	approx. 165 kg
Insulation class:	I
Degree of protection:	IP 20
External painting:	Structure powder laquer RAL 7035 light grey
Cable entry:	at the top (prepunched roof sheeting) at the bottom (open bottom)
Hinge:	right

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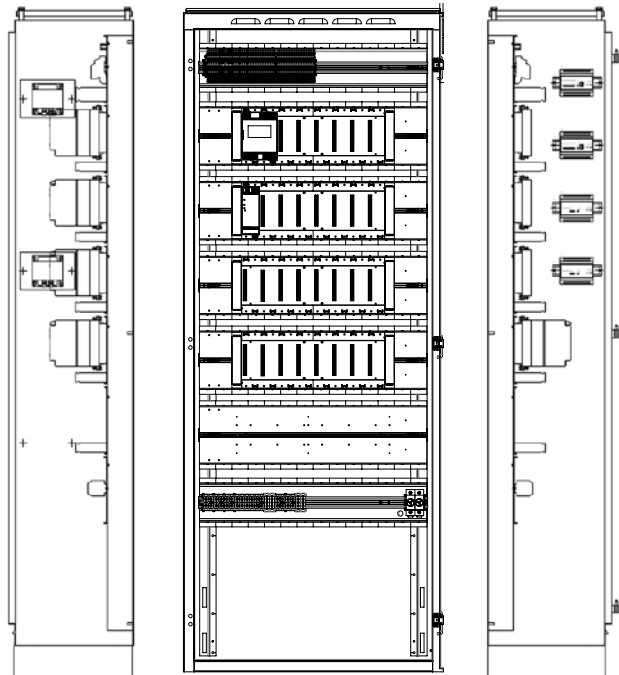
Mains rated voltage:	400V AC, 50/60 Hz
Battery rated voltage:	216V DC
Battery capacity:	
Type of battery:	
Duration of emergency lighting:	
Recharging time:	
Ambient temperature operation:	-5°C up to +35°C

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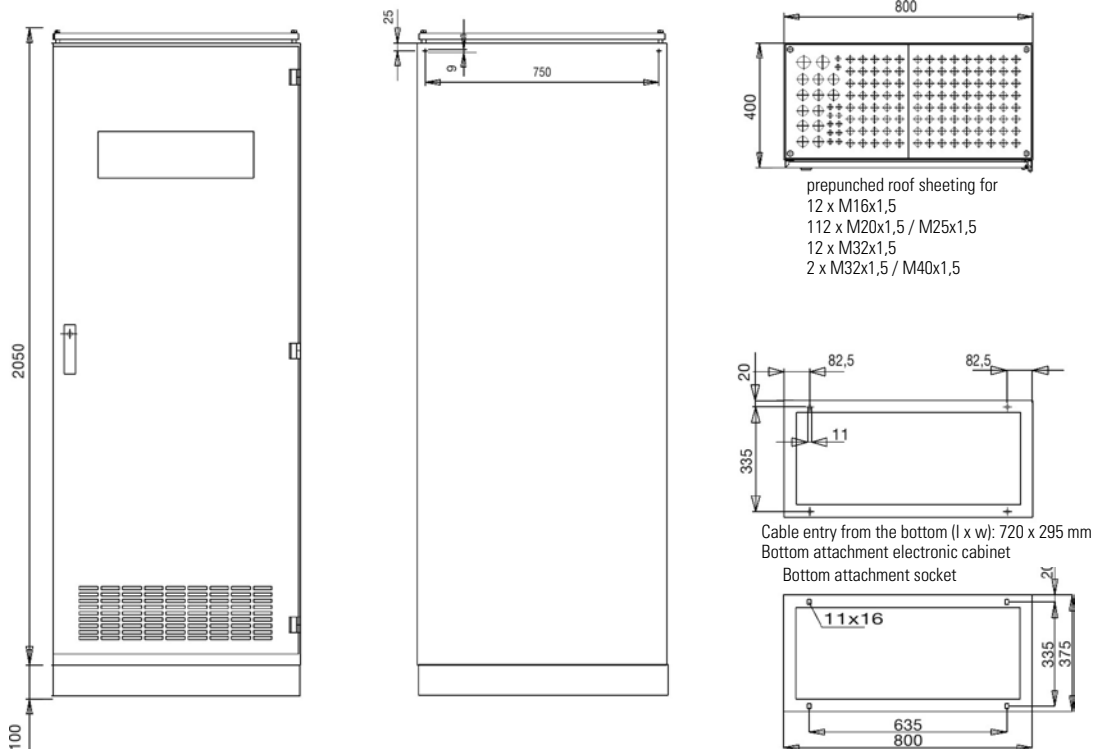
Mains feed in (max. 35mm <sup>2</sup> ):	X8
Battery feed in (max. 35mm <sup>2</sup> ):	X8
Internal device fuse:	F1; F2

(Attention! The device fuses are not suitable for disconnecting the sub-distributor and must not be disconnected under load.)

Max. 80 circuits (max. 4mm <sup>2</sup> )*:	X1.1, X2.1, X3.1, X4.1, X5.1
Addresses optional places DLS-3Ph, TLS (max. 2.5mm <sup>2</sup> ):	customised
Connection to ext. control switch (max. 4mm <sup>2</sup> **):	X1.1.S1-S2
Connection to 24V current loop (max. 4mm <sup>2</sup> **):	X1.1.S3-S4
Connection to potential-free signal contacts (max. 4mm <sup>2</sup> **):	X1.1.C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm <sup>2</sup> **):	X1.1.A-B
Connection to RS485 Bus (max. 4mm <sup>2</sup> **):	X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm <sup>2</sup> **):	X1.1.+24V Out--24V Out
Connection to 24V analog input (max. 4mm <sup>2</sup> **):	X1.1.Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42



- \* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.
- \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



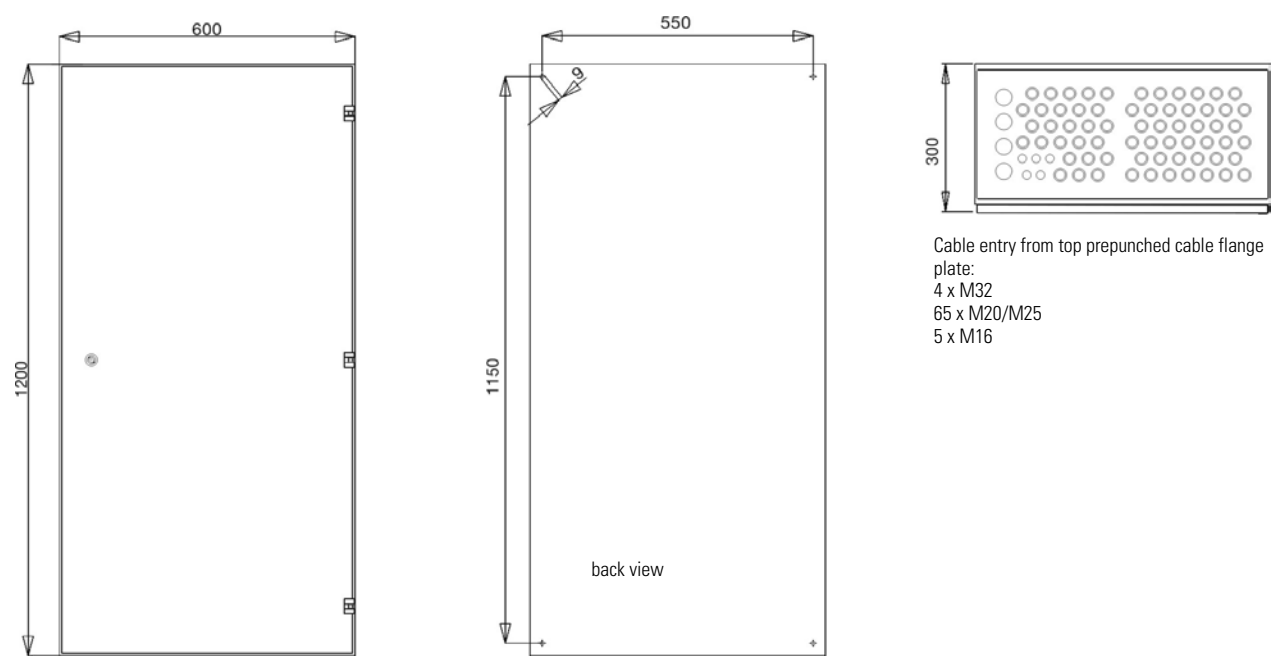
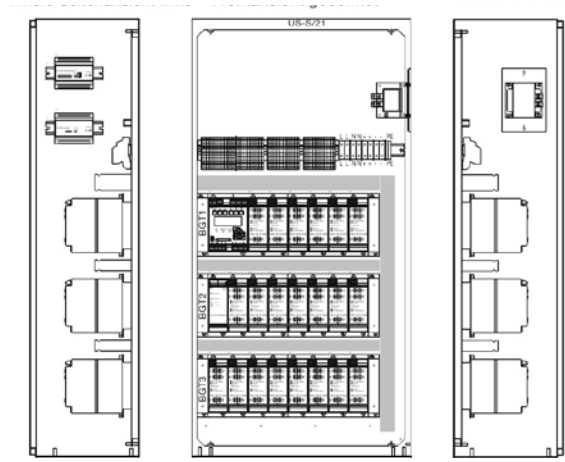
### 3.13 Data Sheet for US-S/21

Type of system: .....US-S/21  
 Construction: .....Sheet steel wall mounting cabinet with a door made of sheet  
 Height: .....1200 mm  
 Width: .....600 mm  
 Depth: .....300 mm  
 Weight without battery: .....approx. 110 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 54  
 External painting: .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top (prepunched roof sheeting)  
 Hinge: .....right

Mains rated voltage: .....230V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Battery capacity:  
 Type of battery:  
 Duration of emergency lighting:  
 Recharging time:  
 Ambient temperature operation: .....-5°C up to +35°C

Mains feed in (max. 35mm<sup>2</sup>): .....X8  
 Battery feed in (max. 35mm<sup>2</sup>): .....X8  
 Max. 50 circuits (max. 4mm<sup>2</sup>)\*: .....X1.1, X2.1, X3.1  
 Addresses optional places DLS-3Ph, TLS (max. 2.5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts (max. 4mm<sup>2</sup>\*\*): .....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out-24V Out  
 Connection to 24V analog input (max. 4mm<sup>2</sup>\*\*): X1.1.Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



## 2 Safety

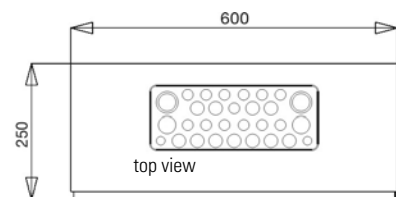
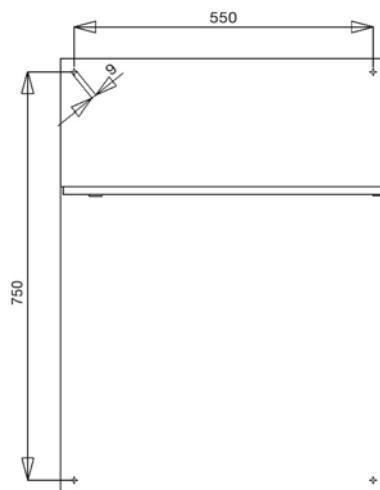
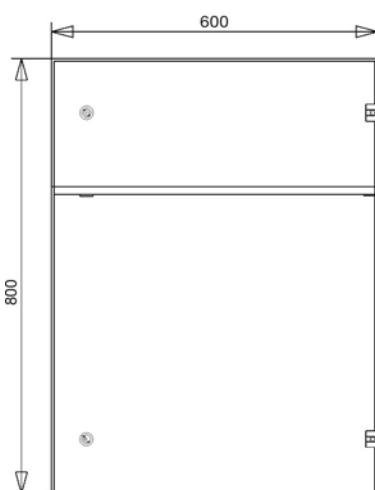
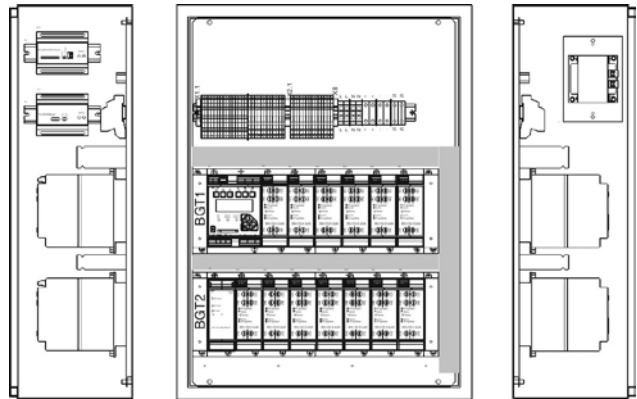
### 3.14 Data Sheet for US-S/13

Type of system: .....US-S/13  
 Construction: .....Sheet steel wall mounting cabinet with a door made of sheet  
 Height: .....800 mm  
 Width: .....600 mm  
 Depth: .....250 mm  
 Weight without battery: .....approx. 75 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 54  
 External painting: .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top (prepunched roof sheeting)  
 Hinge: .....right

Mains rated voltage: .....230V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Battery capacity: .....  
 Type of battery: .....  
 Duration of emergency lighting: .....  
 Recharging time: .....  
 Ambient temperature operation: .....-5°C up to +35°C

Mains feed in (max. 16mm<sup>2</sup>): .....X8  
 Battery feed in (max. 16mm<sup>2</sup>): .....X8  
 Max. 24 circuits (max. 4mm<sup>2</sup>)\*: .....X1.1, X2.1  
 Addresses optional places DLS-3Ph, TLS (max. 2.5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts (max. 4mm<sup>2</sup>\*\*): .....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out-24V Out  
 Connection to 24V analog input (max. 4mm<sup>2</sup>\*\*): X1.1.Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



Cable entry from the top  
 1 x prepunched flange plate for:  
 Max. 2 x M16  
 Max. 13 x M20  
 Max. 11 x M25  
 Max. 2 x M32  
 Max. 2 x M32 (M40)

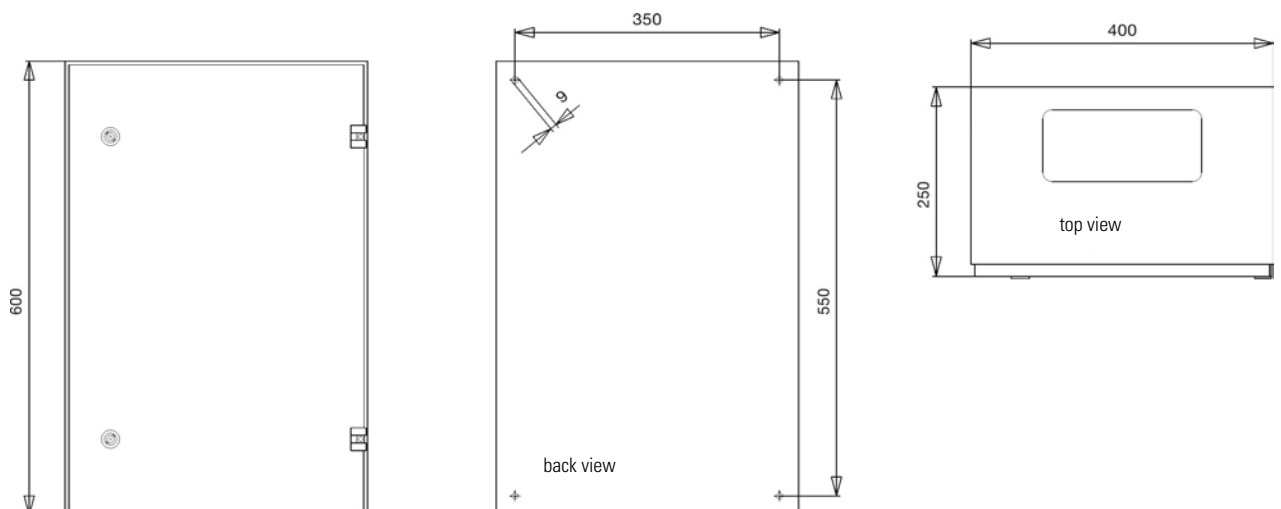
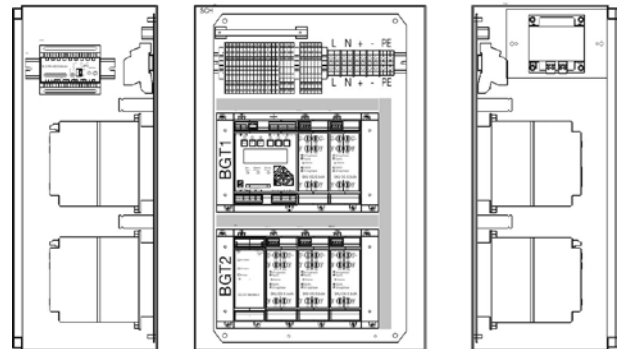
### 3.15 Data Sheet for US-S/5

Type of system: .....US-S/5  
 Construction: .....Sheet steel wall mounting cabinet with a door made of sheet  
 Height: .....600 mm  
 Width: .....400 mm  
 Depth: .....250 mm  
 Weight without battery: .....approx. 42 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 54  
 External painting: .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top (prepunched flange plate)  
 Hinge: .....right

Mains rated voltage: .....230V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Battery capacity:  
 Type of battery:  
 Duration of emergency lighting:  
 Recharging time:  
 Ambient temperature operation: .....-5°C up to +35°C

Mains feed in (max. 16mm<sup>2</sup>): .....X8  
 Battery feed in (max. 16mm<sup>2</sup>): .....X8  
 Max. 20 circuits (max. 4mm<sup>2</sup>)\*: .....X1.1, X2.1  
 Addresses optional places DLS-3Ph, TLS (max. 2,5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts (max. 4mm<sup>2</sup>\*\*): .....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out-24V Out  
 Connection to 24V analog input (max. 4mm<sup>2</sup>\*\*): X1.1.Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



## 2 Safety

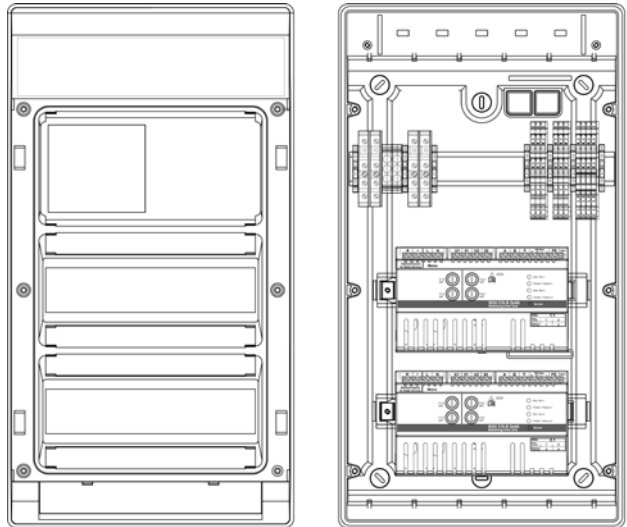
### 3.16 Data Sheet for US-S/SOU2

Type of system: .....US-S/SOU2  
 Construction: .....Surface-mounted plastic distributor  
 housing of thermoplastic with transparent  
 viewing door  
 Height: .....458 mm  
 Width: .....295 mm  
 Depth: .....129 mm  
 Weight : .....approx. 8,8 kg  
 Insulation class: .....II  
 Degree of protection: .....IP 65  
 Colour : .....Grey (RAL 7032)  
 Cable entry : .....from above (with integral elastic sealing  
 membranes for cable infeed, with cable  
 infeed shield)  
 Hinge : .....left

Mains rated voltage : .....230V AC, 50 or 60 Hz  
 Battery rated voltage : .....216V DC  
 Ambient temperature operation : .....-5° C up to +35° C

Mains feed in (max. 16mm<sup>2</sup>) : .....X1.1  
 Battery feed in (max. 16mm<sup>2</sup>) : .....X1.5  
 Max. 4 circuits (max.4 mm<sup>2</sup>)\*: .....X1.4  
 Connection to RS485 Bus (max. 4 mm<sup>2</sup>)\*: .....X1.2RS485.A-B  
 Connection to 24V analog output (max. 4 mm<sup>2</sup>)\*: .....X1.3+24V Out--24V Out

\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp  
 spring terminal.



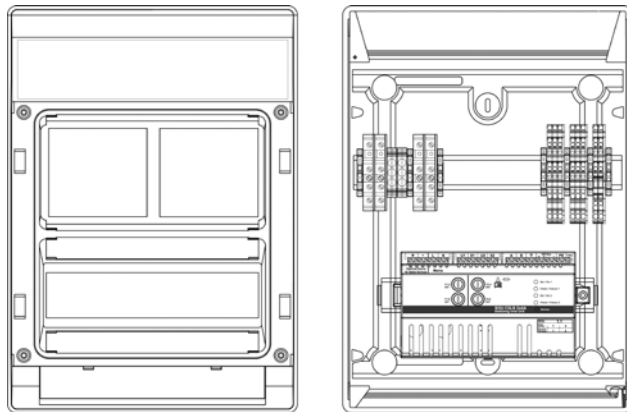
### 3.17 Data Sheet for US-S/SOU1

Type of system: .....US-S/SOU1  
 Construction: .....Surface-mounted plastic distributor  
 housing of thermoplastic with transparent  
 viewing door  
 Height: .....458 mm  
 Width: .....295 mm  
 Depth: .....129 mm  
 Weight : .....approx. 7,5 kg  
 Insulation class: .....II  
 Degree of protection: .....IP 65  
 Colour : .....Grey (RAL 7032)  
 Cable entry : .....from above  
 (with integral elastic sealing membranes  
 for cable infeed, with cable infeed shield)  
 Hinge : .....left

Mains rated voltage : .....230V AC, 50 or 60 Hz  
 Battery rated voltage : .....216V DC  
 Ambient temperature operation : .....-5° C up to +35° C

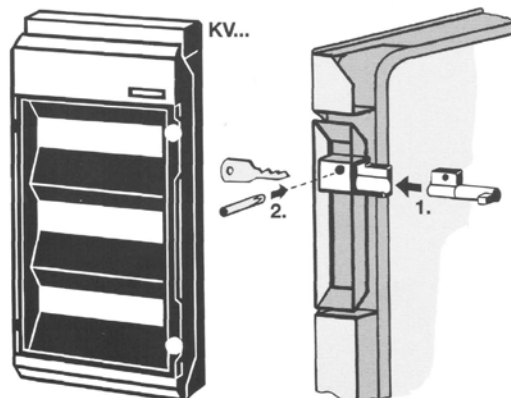
Mains feed in (max. 16mm<sup>2</sup>) : .....X1.1  
 Battery feed in (max. 16mm<sup>2</sup>) : .....X1.5  
 Max. 2 circuits (max.4 mm<sup>2</sup>)\*: .....X1.4  
 Connection to RS485 Bus (max. 4 mm<sup>2</sup>)\*: .....X1.2RS485.A-B  
 Connection to 24V analog output (max. 4 mm<sup>2</sup>)\*: .....X1.3+24V Out--24V Out

\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp  
 spring terminal.



### Mounting instructions: Small sub station

1. Lock without key to be inserted from the rear into the handle of the door fastening.
2. Notch pin with the notch at the front to be pushed through the drilling at the door handle into the drilling of the lock. Final fixation with tool.



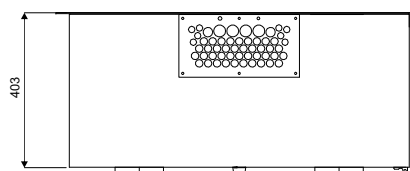
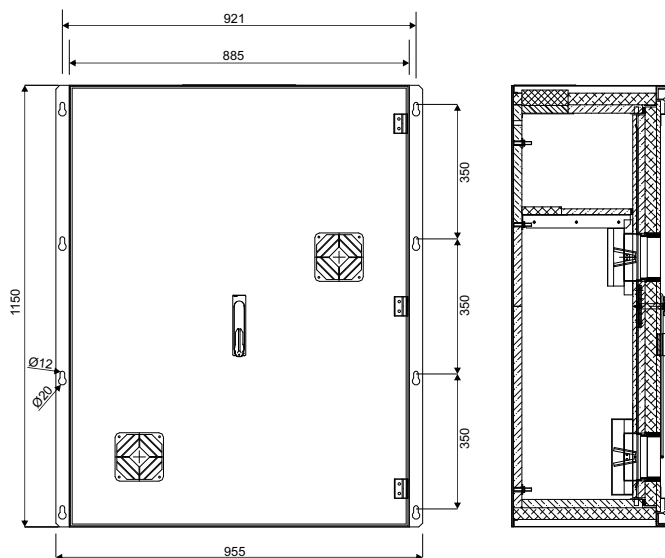
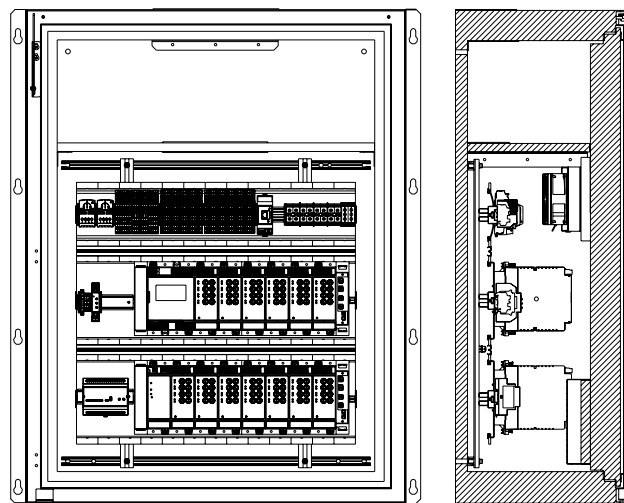
### 3.18 Data Sheet for ESF-E30/13-S

Type of system: ..... ESF-E30/13S  
 Construction: ..... Sheet steel wall mounting cabinet with a door made of sheet incl. cross point closing and a double-bit key cylinder  
 Permission: ..... ABZ Z-86.2-1  
 Height: ..... 1150 mm  
 Width: ..... 885 mm  
 Depth: ..... 405 mm  
 Weight without battery: ..... approx. 235 kg  
 Insulation class: ..... I  
 Degree of protection: ..... IP42/ IP 54 with optional case  
 External painting: ..... Structure powder laquer RAL 7035 light grey  
 Cable entry: ..... at the top (prepunched cable entry plate)  
 Hinge: ..... right

Mains rated voltage: ..... 230V AC, 50/60 Hz  
 Battery rated voltage: ..... 216V DC  
 Battery capacity:  
 Type of battery:  
 Duration of emergency lighting:  
 Recharging time:  
 Ambient temperature operation: ..... -5°C up to +35°C  
 Sound level pressure: ..... 46dB

Mains feed in (max. 16mm<sup>2</sup>): ..... X8  
 Battery feed in (max. 16mm<sup>2</sup>): ..... X8  
 Max. 26 circuits (max. 4mm<sup>2</sup>)\*: ..... X1.1, X2.1  
 Addresses optional places DLS-3Ph, TLS (max. 2.5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts (max. 4mm<sup>2</sup>\*\*): ..... X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*): ..... X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*): ..... X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out-24V Out  
 Connection to 24V analog input (max. 4mm<sup>2</sup>\*\*): X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



- Cable entry with prepunched flange plate:
- 4 Stück M32
  - 8 Stück M18
  - 2 Stück M25
  - 40 Stück M20

## 2 Safety

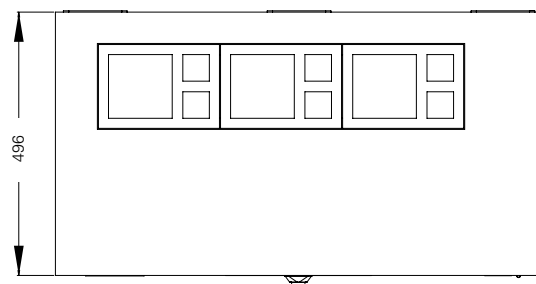
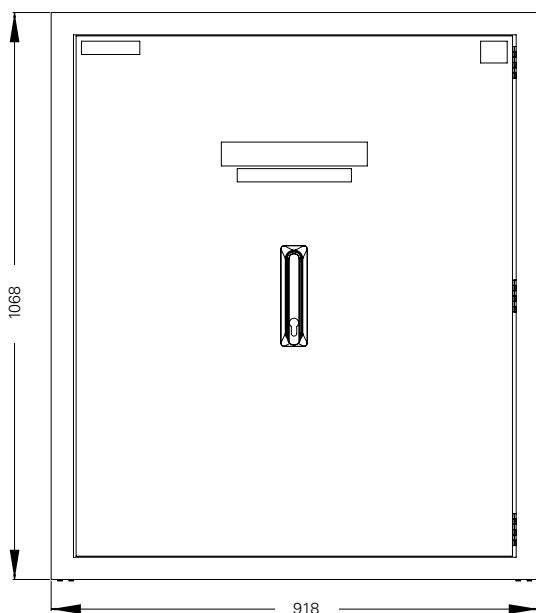
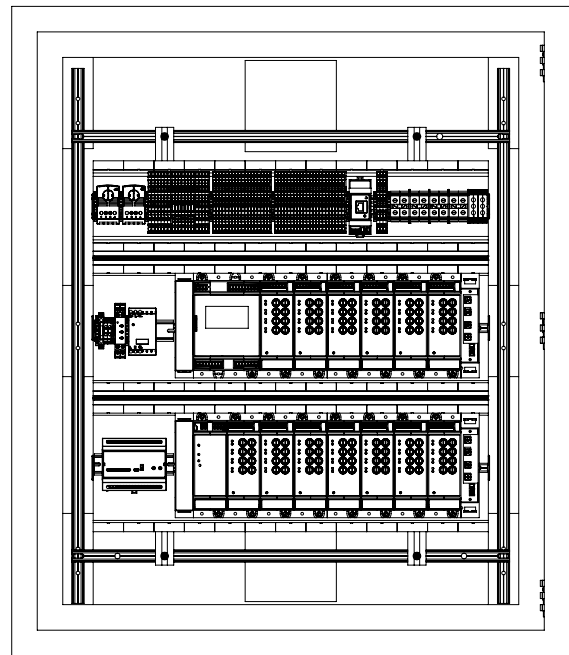
### 3.19 Data Sheet for US-S ESF30 13-P

Type of system: .....US-S ESF30 13-P  
 Construction: .....Wall-mounted cabinet  
 Permission:.....ABZ Z-86.1-46  
 Height:.....1278 mm  
 Width:.....918 mm  
 Depth:.....496 mm  
 Weight without battery:.....approx. 205 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 42  
 External painting: .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top (cable bundle entry)  
 Hinge: .....right

Mains rated voltage: .....230V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Ambient temperature operation: .....-5°C up to +35°C  
 Sound level pressure: .....55dB

Mains feed in (max. 16mm<sup>2</sup>): .....X8  
 Battery feed in (max. 16mm<sup>2</sup>): .....X8  
 Max. circuits (max.4mm<sup>2</sup>)\*: .....X1.1, X2.1  
 Addresses optional places DLS-3Ph, TLS (max. 2.5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts  
 (max. 4mm<sup>2</sup>\*\*): .....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*): .....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out-24V Out  
 Connection to 24V analog input (max. 4mm<sup>2</sup>\*\*): X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41,  
 Z42

- \* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.
- \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



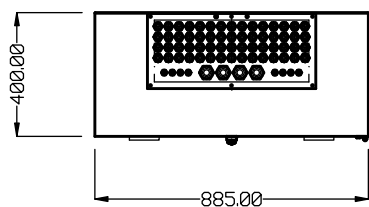
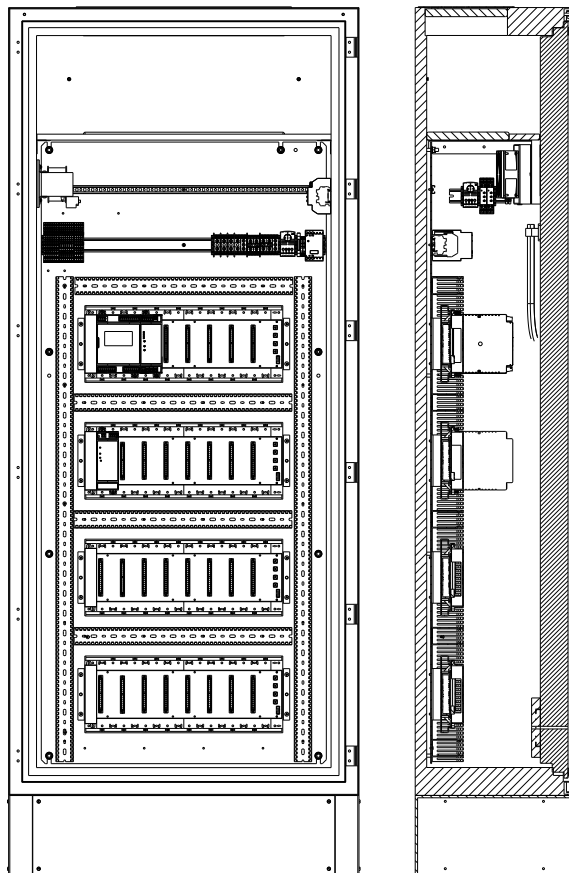
### 3.20 Data Sheet for ESF-E30/28-S

Type of system: .....ESF-E30/28S  
 Construction: .....Sheet steel wall mounting cabinet with a door made of sheet incl. cross point closing and a double-bit key cylinder  
 Permission:.....ABZ Z-86.2-1  
 Height:.....2190 mm  
 Width:.....885 mm  
 Depth:.....405 mm  
 Weight without battery:.....approx. 390 kg  
 Insulation class: .....I  
 Degree of protection:.....IP42/ IP 54 with optional case  
 External painting:.....Structure powder laquer RAL 7035 light grey  
 Cable entry:.....at the top (prepunched cable entry plate)  
 Hinge:.....right

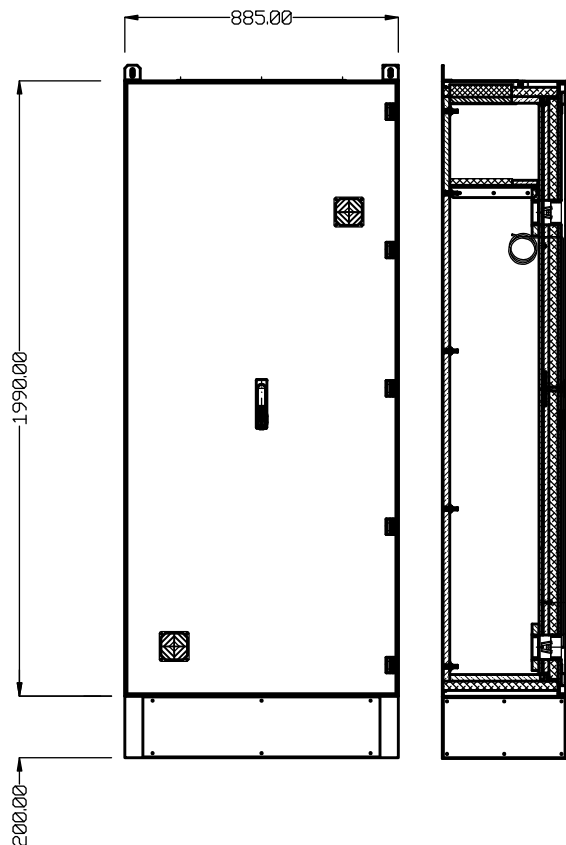
Mains rated voltage:.....400/230V AC, 50/60 Hz  
 Battery rated voltage:.....216V DC  
 Battery capacity :  
 Type of battery:  
 Duration of emergency lighting:  
 Recharging time:  
 Ambient temperature operation:.....-5°C up to +35°C  
 Sound level pressure:.....60dB

Mains feed in (max. 16mm<sup>2</sup>):.....X8  
 Battery feed in (max. 16mm<sup>2</sup>):.....X8  
 Max. 56 circuits (max. 4mm<sup>2</sup>)\*:.....X1.1, X2.1, X3.1, X4.1  
 Addresses optional places DLS-3Ph, TLS (max. 2.5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts (max.4mm<sup>2</sup>\*\*):.....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*):.....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*):.....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out--24V Out  
 Connection to 24V analog input (max. 4mm<sup>2</sup>\*\*): X1.1.Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.  
 \*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



Cable entry plate prepared for:  
 60 pieces M25  
 8 pieces M16  
 4 pieces M40



## 2 Safety

### 3.21 Data Sheet for ESF-E30 28-P

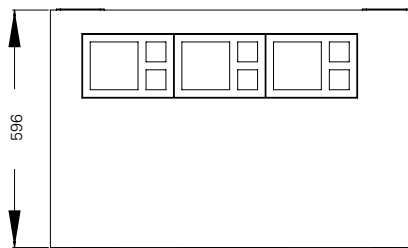
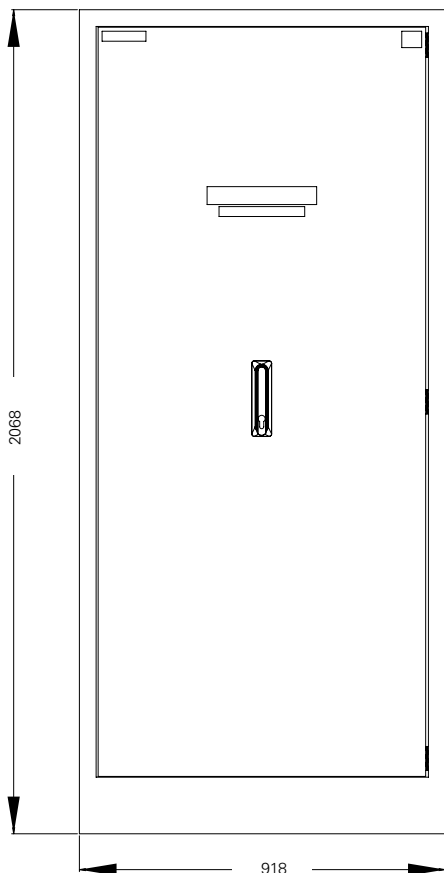
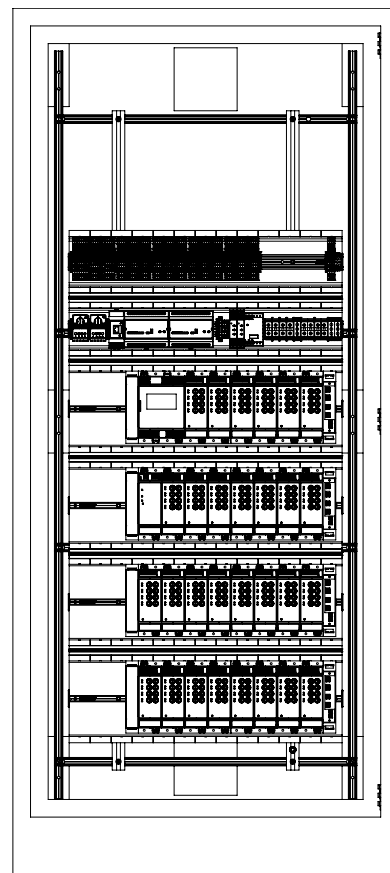
Type of system: .....US-S ESF-E30 28-P  
 Construction: .....Wall-mounted cabinet  
 Permission:.....ABZ Z-86.1-46  
 Height:.....2053 mm  
 Width:.....918 mm  
 Depth:.....604 mm  
 Weight without battery:.....approx. 420 kg  
 Insulation class: .....I  
 Degree of protection: .....IP 42  
 External painting: .....Structure powder laquer RAL 7035 light grey  
 Cable entry: .....at the top (cable bundle entry)  
 Hinge: .....right

Mains rated voltage:.....230V AC, 50/60 Hz  
 Battery rated voltage: .....216V DC  
 Ambient temperature operation: .....-5°C up to +30°C  
 Sound level pressure: .....55dB

Mains feed in (max. 16mm<sup>2</sup>):.....X8  
 Battery feed in (max. 16mm<sup>2</sup>):.....X8  
 Max. circuits (max. 4mm<sup>2</sup>)\*:.....X1.1, X2.1, X3.1, X4x1  
 Addresses optional places DLS-3Ph, TLS (max. 2.5mm<sup>2</sup>): customised  
 Connection to ext. control switch (max. 4mm<sup>2</sup>\*\*): X1.1.S1-S2  
 Connection to 24V current loop (max. 4mm<sup>2</sup>\*\*): X1.1.S3-S4  
 Connection to potential-free signal contacts  
 (max. 4mm<sup>2</sup>\*\*):.....X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54  
 Connection to CG-S Bus (max. 4mm<sup>2</sup>\*\*):.....X1.1.A-B  
 Connection to RS485 Bus (max. 4mm<sup>2</sup>\*\*):.....X1.1.RS485.A-B  
 Connection to 24V analog output (max. 4mm<sup>2</sup>\*\*): X1.1.+24V Out~24V Out  
 Connection to 24V analog input (max. 4mm<sup>2</sup>\*\*): X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

\* Max. 2.5mm<sup>2</sup> flexible with wiring sleeve. The final circuits get wired customised.

\*\* Two strands to max. 0.5 mm<sup>2</sup> with twin wire end sleeve can be clamped in a clamp spring terminal.



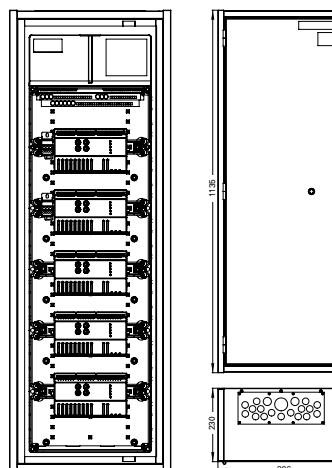
### 3.22 Data Sheet for US-S ESF30 SOU5

Anlagentyp	US-S ESF30 SOU5
Bauart	Faserplatten Wandschrank Kleinverteiler
Bauhöhe/ Baubreite/ Bautiefe	1135 mm/ 396 mm/ 230 mm
Gewicht	ca. 81 kg
Schutzklasse	I
Schutzart	IP65
Lackierung aussen	Strukturpulverlack RAL 7035 lichtgrau
Kabeleinführung	oben
Türanschlag	links

Bemessungsspannung	230V AC, 50/60 Hz
Batterieanschlussspannung	216V DC
Umgebungstemperatur Betrieb Elek.	-5°C bis +35°C

(beachten Sie bitte die beiliegenden Bedienungs- und Installationsanweisungen)

Netzeinspeisung	10 qmm
Max. 10 Stromkreisabgänge	4 mm <sup>2</sup>



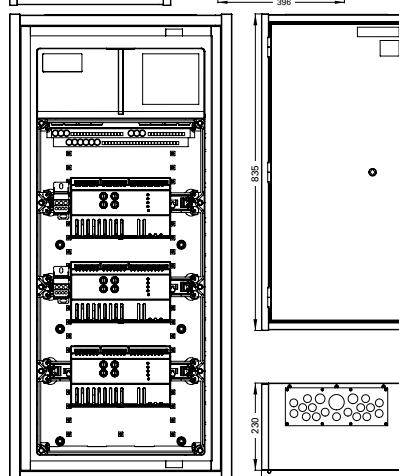
### 3.23 Data Sheet for US-S ESF30 SOU3

Anlagentyp	US-S ESF30 SOU3
Bauart	Faserplatten Wandschrank Kleinverteiler
Bauhöhe/Baubreite/ Bautiefe	835 mm/ 396 mm/ 230 mm
Gewicht	ca. 61 kg
Schutzklasse	I
Schutzart	IP65
Lackierung aussen	Strukturpulverlack RAL 7035 lichtgrau
Kabeleinführung	oben
Türanschlag	links

Bemessungsspannung	230V AC, 50/60 Hz
Batterieanschlussspannung	216V DC
Umgebungstemperatur Betrieb Elek.	-5°C bis +35°C

(beachten Sie bitte die beiliegenden Bedienungs- und Installationsanweisungen)

Netzeinspeisung	10 qmm
Max. 6 Stromkreisabgänge	4 mm <sup>2</sup>



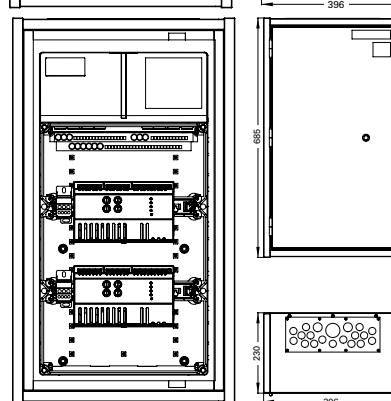
### 3.24 Data Sheet for US-S ESF30 SOU2

Anlagentyp	US-S ESF30 SOU2
Bauart	Faserplatten Wandschrank Kleinverteiler
Bauhöhe/ Baubreite/ Bautiefe	685 mm/ 396 mm/ 230 mm
Gewicht	ca. 51 kg
Schutzklasse	I
Schutzart	IP65
Lackierung aussen	Strukturpulverlack RAL 7035 lichtgrau
Kabeleinführung	oben
Türanschlag	links

Bemessungsspannung	230V AC, 50/60 Hz
Batterieanschlussspannung	216V DC
Umgebungstemperatur Betrieb Elek.	-5°C bis +35°C

(beachten Sie bitte die beiliegenden Bedienungs- und Installationsanweisungen)

Netzeinspeisung	10 qmm
Max. 4 Stromkreisabgänge	4 mm <sup>2</sup>



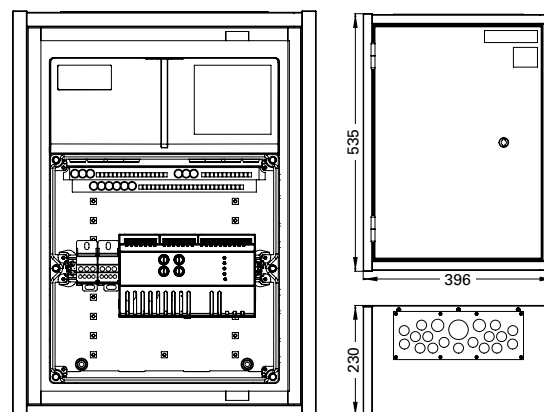
### 3.25 Data sheet for US-S ESF30 SOU1

Anlagentyp	US-S ESF30 SOU1
Bauart	Faserplatten Wandschrank Kleinverteiler
Bauhöhe/ Baubreite/ Bautiefe	535 mm/ 396 mm/ 230 mm
Gewicht	ca. 34 kg
Schutzklasse	I
Schutzart	IP65
Lackierung aussen	Strukturpulverlack RAL 7035 lichtgrau
Kabeleinführung	oben
Türanschlag	links

Bemessungsspannung	230V AC, 50/60 Hz
Batterieanschlussspannung	216V DC
Umgebungstemperatur Betrieb Elek.	-5°C bis +35°C

(beachten Sie bitte die beiliegenden Bedienungs- und Installationsanweisungen)

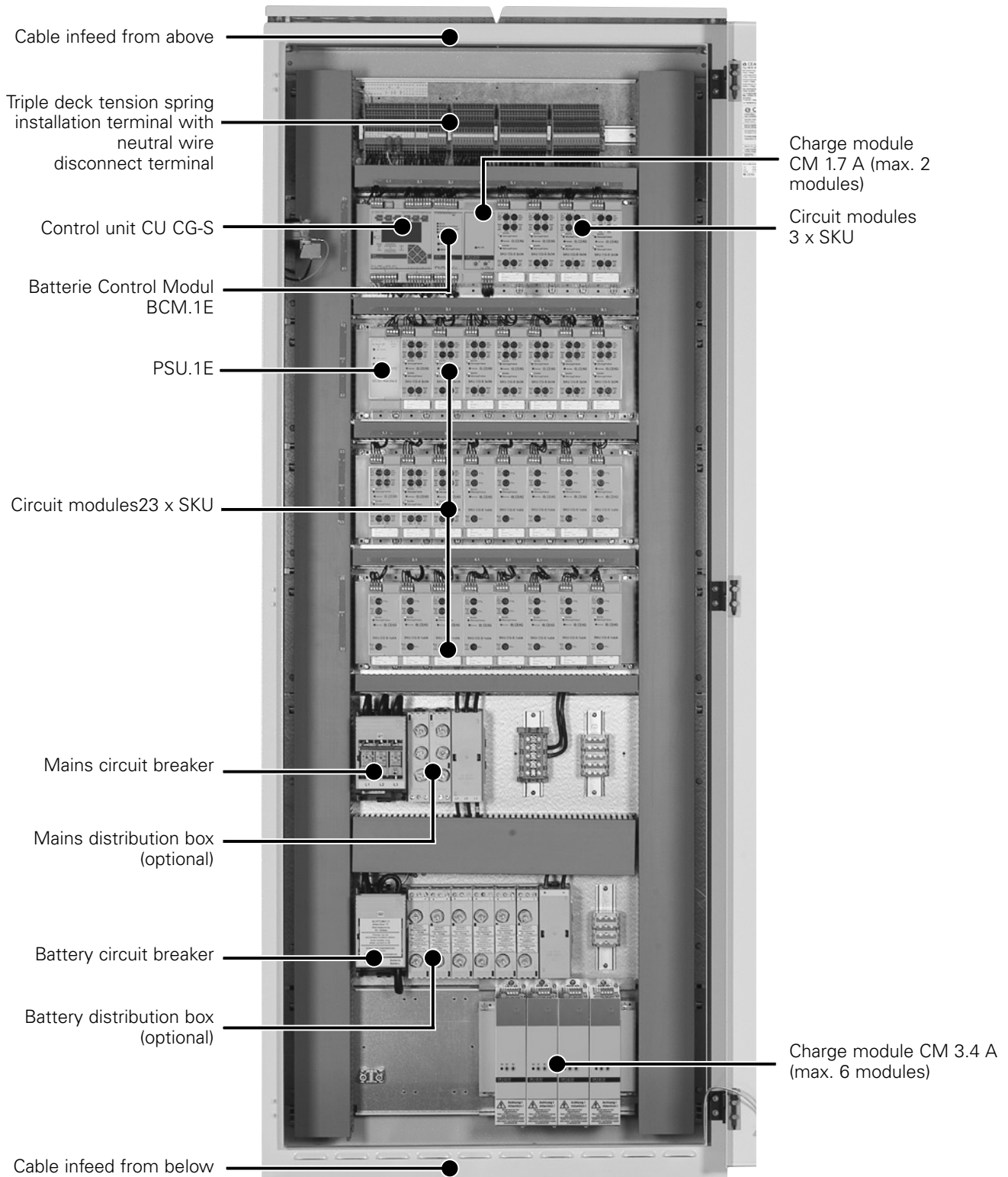
Netzeinspeisung	10 qmm
Max. 4 Stromkreisabgänge	4 mm <sup>2</sup>



## 4 Construction and Function

### 4 Construction and Function

#### 4.1 Example of Control Cabinet-Construction (ZB-S/26)



## 4.2 Product Description

The Central Battery System ZB-S with the new START technology is a logical successor to the wellproven Central Battery System ZB 96. STAR stands for:

SWITCHING TECHNOLOGY ADVANCED REVISION

The main benefits of this technology include the fact that within a final circuit, the switching modes

- Non-maintained light (Emergency lighting is switched on when the main lighting fails or when a function test or operating duration test is initiated manually or automatically)
- Maintained light and (Emergency lighting is always on)
- Switched maintained light (as non-maintained light with emergency lighting controlled by switch queries, e. g. from external DLS-modules) can be implemented in hybrid mode for each emergency luminaire.
  - each safety and EXIT luminaire can be programmed without an extra data cable,
  - the switching modes can be later modified without the need to interfere in the existing luminaire installation.

The functions of the emergency luminaires are defined with a user-friendly parameter setup system.

The use of CG-S type ballasts/modules is a requirement.

All settings are stored in a nonvolatile memory and so are not lost even in a total shutdown situation (230V mains and battery supply).

Parameter settings and the names of circuits, luminaires and DLS/TLS-modules as well as test log entries can also be stored on a memory card. As well as archiving, this also allows (optional) external parameter setting and transfer to control modules of the ZB-S system.

Maintenance-free and closed batteries according to EN 60896-2 supply the power needed to operate the emergency lighting if the 230V mains supply should fail. During normal operation, the ZB-S system monitors the charge status of the batteries and charges them up gently if required.

The system ZB-S is designed and manufactured in compliance with the following EC directives:

- Low-voltage Directive 2006/95/EG
- Directive 2004/108/EG on electromagnetic compatibility

National (DIN-), European (EN-) and international (IEC-) standards which the system complies will be found in the system's CE Certificate of Conformity.

## 4.3 Operation Modes

Different system configurations are used depending on the requirements of the site. These standardised configurations have names like

### ZB-S/26 or ZB-S/18

for operation with up to 26 or 18 SKU CG-S modules (resp CG) with 80 or 68 circuit terminals. Up to 6 substations US-S can be supplied with battery or mains power (up to 6 substations 1-phase, up to 2 substations 3-phase).

### ZB-S/LAD

These are designed as charging and monitoring units for the mains and battery supply to a large number of substations US-S. Up to 4 circuits can be supplied and controlled.

### ZB-S/10C, ZB-S/10C6, ZB-S/18C6, ZB-S/26C6, ZB-S/10C3, ZB-S/18C3, ZB-S 2C3

for operation with up to 10 or 18 SKU CG-S modules (resp. CG) with 40, 56 and 60 circuit terminals.

### US-S/36, US-S/28, US-S/21, US-S/13, US-S/5

for operation with up to 5, 13, 21, 28 or 36 SKU CG-S modules (resp. CG) with 20, 24, 26, 52 and 80 circuit terminals. These substations do not have the charging technology of the connected battery standby supply; the battery and mains supply is provided by the ZB-S system.

### US-S/SOU2, US-S/SOU1

for operation with max. 1 or 2 circuit switching modules SOU CG-S with 4 or 2 circuit terminals. With these substations the CU CG-S control unit is not required. Battery supply is via the ZB-S system, mains supply is via the sub-distributor of the general power supply (rental current feed).

### ESF-30/13S, ESF-E30/28S

Mains distribution board with circuit integrity of 30 minutes in case of fire for operation with up to 13 or 28 SKU CG-S modules with 40 or 60 circuit terminals.

### US-S ESF30 13-P, US-S ESF30 28-P

Mains distribution board with circuit integrity of 30 minutes in case of fire for operation with up to 13 or 28 SKU CG-S modules with 40 or 60 circuit terminals.

### US-S ESF30 SOU5, US-S ESF30 SOU3, US-S ESF30 SOU2, US-S ESF30 SOU1

Mains distribution board with circuit integrity of 30 minutes in case of fire for operation with 5, 3, 2 or 1 SOU CG-S 2 x 4 A modules with 10, 6, 4, or 2 circuits.

All devices and substations are constructed modularly. The technologies of charging, changing-over and of monitoring form a unit working independent from each other, so that interactions can be excluded.

Due to the modular construction and the pre-configured modules a flexible and high quality handling is ensured. The objective of the emergency lighting system is to supply the connected emergency luminaires when the main lighting fails. Another important function of the system is to secure the function standby of all connected emergency and EXIT luminaires by an automatic monitoring.

## 4 Construction and Function

### 4.4 Overview over the Components

#### 4.4.1 Control Module ZB-S

The terminal blocks on the module simplify assembly and dismantling; the connections are taken out to a 3-tier installation-terminal with tension spring-connection. (s. fig on page 28)

##### Free programmable control

with a nonvolatile programm memory for programming and user-specific parameter setting.

##### Internal log book recording

the CU CG-S control module stores the test log (max. 360,000 entries) according to the specifications of DIN VDE 0108.

An external reporting with a memory card is possible.

##### Operation

- Directly on the device

CU CG-S controller using

- sealed keypad and
- graphic display (4 x 20 characters, with adjustable backlit, contrast and brightness) (Compare chapter 8).

- Local switch

operation of combined main/emergency lighting can be achieved with DLS/3Ph and TLS bus modules.

- Service connector

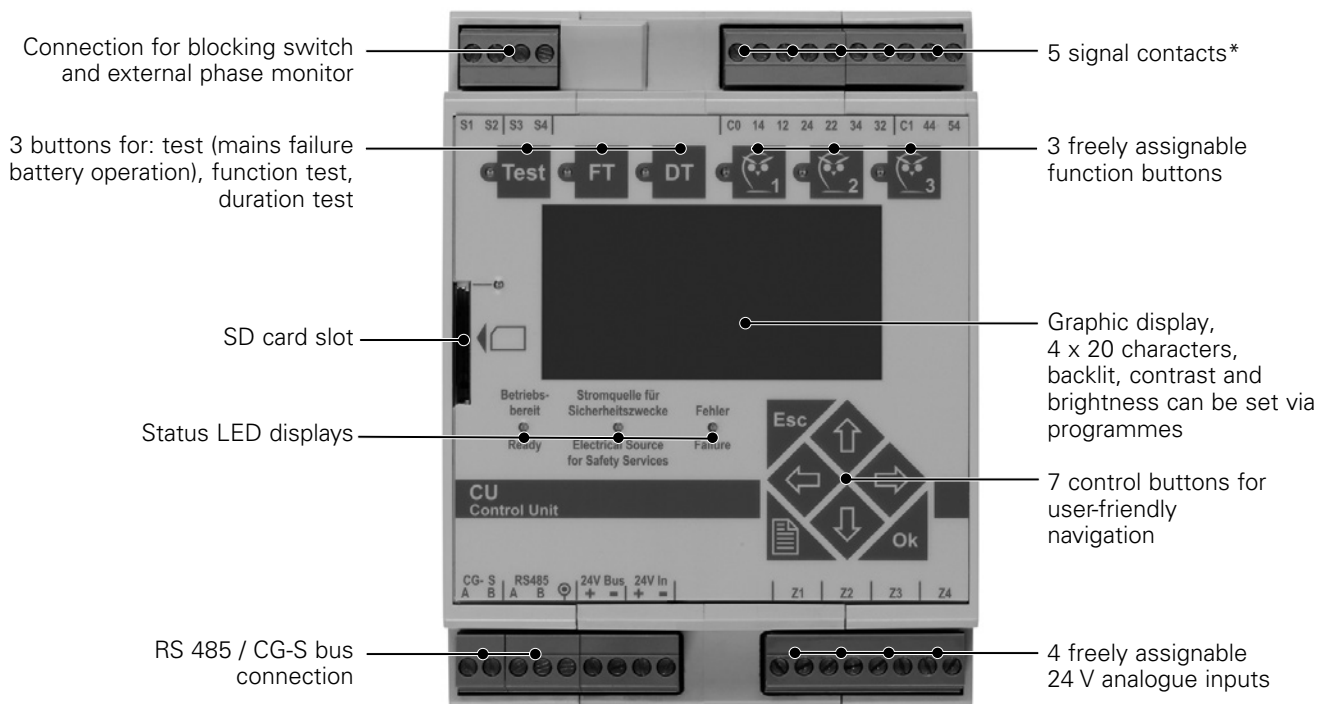
for CEAG service engineers at the front of the device

##### Configuration

- At the front of the device using keys and graphic display. There are considerable possibilities for user defined settings via a menu controlled parameterisation (compare chapter 8).

- Via data exchange via memory card, e. g. for a transfer of the settings between similar cabinets.

- External configuration of the control module is possible with



#### NOTE:

Please misinterpret a short light up of the yellow LED "Electrical Source of Safety Services" not as failure, or as a relevant battery discharging. The short light up of this LED is the effect of an automatic battery circuit test with is realized in constant intervals.

#### \*Connection for zero-potential signal contacts, 24 V 0.5 A:

3 relays with common potential, 1 x switching contact each. One or several from 11 different messages can be assigned to each zero-potential contact. Freely programmable, DIN VDE specification as presetting can be called up at any time.

2 relays with common potential, 1 x open contact each with fixed assignment.

Contact 44 switches an external buzzer on. Contact 54 is for control of a technical switching cabinet ventilation if required.

- a usual personal computer (PC) and
- CEAG-software for the system ZB-S.

### Communication and control

- Data exchange

with installed CG-S components and CG-S-compatible ballasts (using the cables of the final circuits)

- RS485 bus

allows data to be exchanged with external modules (DLS/3PH-bus-modules or TLS-bus-modules, (RS485 port on the control module, up to 25 devices).

- External CG-S bus port

(CEAG bus protocol) for data exchange with BMS.

### Data Exchange and Storage

- Internal:

with non-volatile memory in the CU CG-S control module

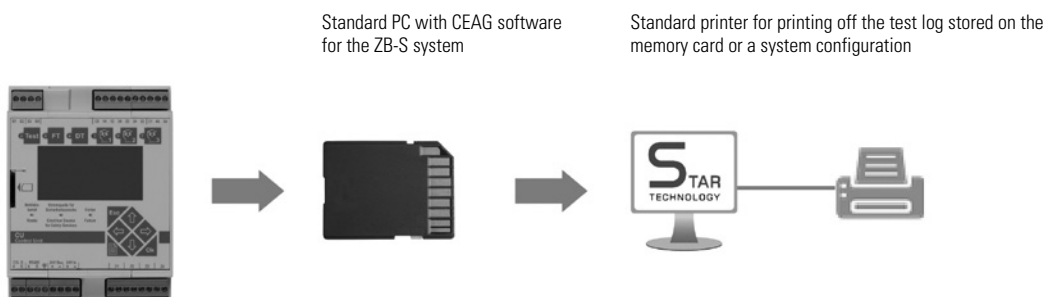
- External:

with a memory card reader, type of the uses memory card:

SD-card / CEAG part no. 400 71 347 911 (preprogrammed)

- SD-adapter

enables data exchange and saving with usual PC under the CEAG-Software for the system ZB-S



### Connections

- 3-tier-installation terminal with tension spring all connections are taken out to a 3-tier-installation terminal with tension spring, see page 28: detail view and Appendix A: „Connection Assignment“
- Pluggable screw terminal block at the device enables a simple assembly and disassembly.
- Bus cables 4 x 2 x 0,8 mm, type: JY(ST)Y, Twistet Pair screened (minimum requirement).
- Connection for zero-potential signal contacts, 24 V 0.5 A:

3 relays with common potential, 1 x switching contact each. One or several from 11 different messages can be assigned to each zero-potential contact. Freely programmable, DIN VDE 0100, Section 718 specification

## 4 Construction and Function

as presetting can be called up at any time.


2 relays with common potential, 1 x open contact each with fixed assignment.

Contact 44 switches an external buzzer on. Contact 54 is for control of a technical switching cabinet ventilation if required.

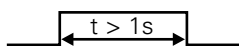
### Control inputs

The 24V analog inputs Z1 ... Z4 are to control the external control panels, a programmable trip of operational functions (e.g. bloc / release system, manual reset, etc.) is given.

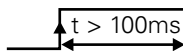
### Optional inputs Z1 - Z4

	Z1	Z2	Z3	Z4	Comments:
No function			-		Factory settings
Switch		Level triggered (by use of a switch) 24VDC = ON 0V = OFF			Used as a switch and switches the circuit or the luminaires with "S" function.
Switch inverted					
Manual reset					To reset the circuit arrangement "manual reset".
Deep discharge receipt					To acknowledge a deep discharge protection.
Start functiontest					Start a function test.
Start durationtest					Start a duration test.
Cancel FT/DT		Edge triggered (by use of a push switch) LOW → HIGH 			Cancel function test / duration test.
Block device					Block function of mains/emergency lighting during shut-downs.
Switch-off maintained light					Switch off all luminaires /circuits, which are programmed as maintained light.
Switch-on non-maintained light					Switch on all luminaires /circuits, which are programmed as non-maintained light.
Ventilator monitor					
Ext. ISO monitor		Level triggered (by use of a switch) 24VDC = OK 0V = Failure			Sets a sum failure at the potential-free relay contacts of the control module to the CG IV relay module and the CGVision, as long as 0V is present.
Ext. Battery monitor					
Ext. Monitor					
Optional Input					All luminaires on
Optional Input		Level triggered (by use of a push switch) 24VDC = active			AE Szenario aktive
Optional Input					AE Failure

Level trigger:



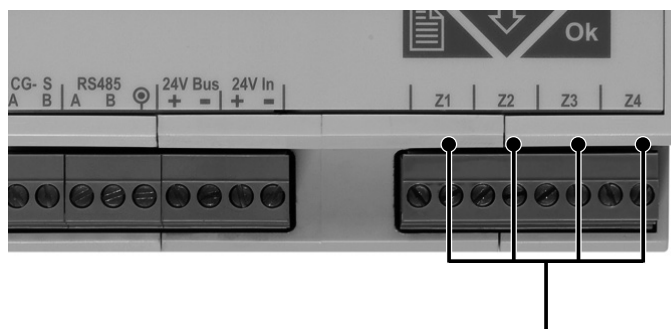
Edge trigger:



### Z1 to Z4, connection for analogue inputs:

4 freely assignable 24 V analogue inputs, can be programmed either inverted or non-inverted for e.g.:

- Start / abort function test
- Start / abort duration test
- Block/release system
- Manual reset
- Switch on / off maintained mode
- Switch on safety lighting as corridor lighting
- Control unit ZB-S components and options



## 4.4.2 PSU.1E

The PSU.1E (Power Supply Unit) module supplies the ZB-S central battery system with a 24V and a 6V DC voltage. The integrated deep discharge protection switches off the safety lighting in three stages first, then the device-internal modules and then the PSU. A passive ventilation system ensures that no wear and tear due to contamination can occur as with a technical safe ventilation system. Due to the parallel connection of the PSU.1E modules a 100% function is guaranteed even in case of failure. The PSU.1E module is powered by the 216V battery and the 250V AC module.

### IMPORTANT NOTE

The PSU is not suitable for use in E30 systems of type ZB-S

#### Light-emitting diodes

- 24 V external The LED lights up when the external 24V DC is present at the terminal 24V DC OUT.
- 24 V internal The LED lights up when the internal 24V DC voltage is present at the ZB-S system.
- 6 V internal The LED lights up when the internal 6V supply voltage is present.
- Failure All critical module parameters are permanently monitored and faults are indicated by the LED at an early stage so that the module can be replaced before failure.

The „Service PIN“ button is located behind the hole.

To switch on the PSU.1E please keep the service pin pressed for >3 seconds

#### Additional Features:

- 24 V external
  - 20 W continuous output
  - outgoing circuit over frontline plug
  - voltage galvanic separated
- 24 V internal
- 100 W continuous output
  - 140 W top performance (20 msec.)
  - supply of max. 26 SKU of type 2 x 3A and 1 x 6A as well as 13 SKU of type 4 x 1,5A
- Parallel switching of several converters possible! Please attend that the converter has to be installed side by side.
- Supply via AC/AC converter for an external mains supply is possible!

### 4.4.2.1 AC-Module

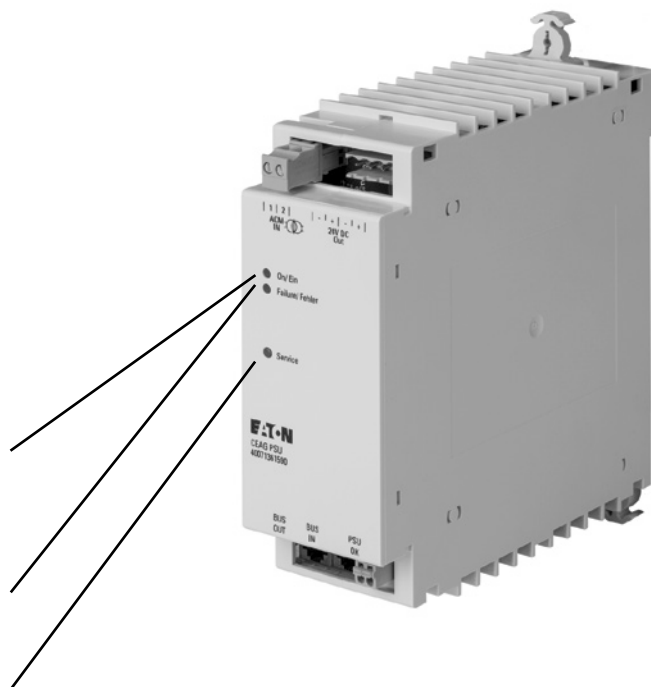
This optional unit supplies the central battery system with an AC-voltage

galvanically isolated, in mains operation.

Connection to terminals 1~ 2 IN to PSU.1E.

### ⚠ ATTENTION!

Only the AC-module has to be connected to this terminals.



## 4 Construction and Function

### 4.4.3 Batterie Control Modul BCM.1E

#### Indicators

- ON LED

The LED lights up when the BCM.1E is in operation. If the LED does not light up then the BCM.1E is faulty or there is no mains supply or a function test has been triggered.

- Boost Charge LED

The Boost Charge LED lights up during boost charging, e. g. following a mains failure or operating duration test.

- Charge Fault LED

The light emitting diode charge fault lights up when the BCM.1E, the charge booster CM 1.7 A and CM 3.4 A or the batteries are faulty. Further error messages can be queried via the control unit. With faults of the CM 1.7 and 3.4 A modules, error display relates to the module address.

- ISO-Failure LED

The Light emitting diode ISO-Failure lights up when an isolation fault exists in the battery circuit.

#### Connection terminals

The terminals are of the push-lock type.

The terminals can be unplugged to assist installation.

- Potential-free signal contacts

Potential-free signals can be relayed with terminals

„11-12“, „21-22“, „31-32“ (connection max. 0,5 A/24 V AC/DC).

The contact 11/12 is closed in the event of fault.

The contact 21/22 is closed in the event of an insulation failure.

The contact 31/32 is closed during boost charging.

- Temperature sensor

An external temperature sensor must be connected to terminals F+ and F-. The temperature sensor must be connected using a screened 2-core cable. A conductor size of 0.5 mm<sup>2</sup> is adequate for cable runs < 50 m as the measuring current is very low.

- measurement of battery current

Battery current is measured via a measuring shunt via terminals I+, I-.

- CCB bus connection terminals for charging boosters CM 1.7 A and CM 3.4 A



The Charge Control Bus (terminals CCB +, CCB-) controls and monitors the charging boosters CM 1.7 A and CM 3.4 A.

- Terminals +- BST

2.5 A boosters are controlled via the terminals.

- Terminals +- 24V

The BCM.1E module is supplied via the PSU.1E via the terminals.

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#### ⚠ ATTENTION!

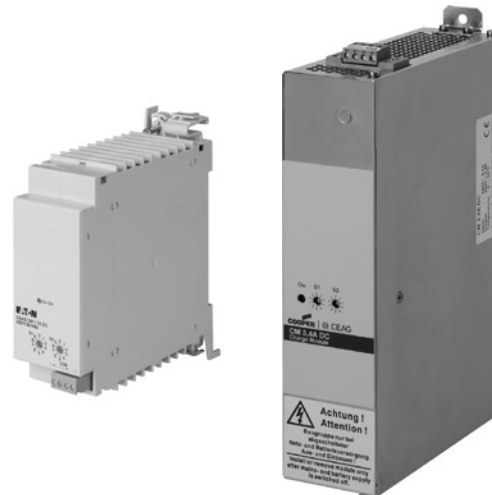
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The CCB bus is not designed as a SELV system. The bus components must be handled as if mains supply (240V) is applied.

### 4.4.4 Charging module CM 1.7 A and CM 3.4 A

A suitable number of charge modules should be planned for complying with the legislative recharging duration for the planned battery sets.

The CM modules have their own calibrated charge control and also function independently of the BCM.1E. With integrated fan monitoring.



### 4.4.5 Circuit change-over modules overview (SKUs)

#### SKU CG-S 4x1,5A

<b>Input</b>	
Nominal voltage AC	220-240 V
Nominal voltage DC	184-275 V
Rated frequency	50/60 Hz
<b>Outputs</b>	
Nominal current	1,5 A
Short circuit current	1500 A
Switching cycles	10000
cos phi capacitive	0,5 - 1,0
<b>Environmental conditions</b>	
Ambient temperature	+55° C
Protection class	IP20
Degree of pollution	2
Distance ventilation slots	75 mm
Number of circuits	4
Rated current per circuit	1.5 A
Fuse protections per circuit	2.5 A
max. inrush peak current	60 A
max. cable diameter	2.5 mm <sup>2</sup>
with STAR-Technology	
Dimensions and weights approx. 0.83 kg	
H x W X D (in mm)	170 x 55 x 155
Module width	1 TE (1 and 55 mm)
Item no.	400 71 347 840

#### SKU CG-S 1x6A

<b>Input</b>	
Nominal voltage AC	220-240 V
Nominal voltage DC	184-275 V
Rated frequency	50/60 Hz
<b>Outputs</b>	
Nominal current	6 A
Short circuit current	1500 A
Switching cycles	10000
cos phi capacitive	0,5 - 1,0
<b>Environmental conditions</b>	
Ambient temperature	+55° C
Protection class	IP20
Degree of pollution	2
Distance ventilation slots	75 mm
Number of circuits	1
Rated current per circuit	6 A
Fuse protections per circuit	10 A
max. inrush peak current	250 A
max. cable diameter	2.5 mm <sup>2</sup>
with STAR-Technology	
Dimensions and weights approx. 0.49 kg	
H x W X D (in mm)	170 x 55 x 155
Module width	1 TE (1 and 55 mm)
Item no.	400 71 347 345

#### SKU CG-S 2x3A

<b>Input</b>	
Nominal voltage AC	220-240 V
Nominal voltage DC	184-275 V
Rated frequency	50/60 Hz
<b>Outputs</b>	
Nominal current	3 A
Short circuit current	1500 A
Switching cycles	10000
cos phi capacitive	0,5 - 1,0
<b>Environmental conditions</b>	
Ambient temperature	+55° C
Protection class	IP20
Degree of pollution	2
Distance ventilation slots	75 mm
Number of circuits	2
Rated current per circuit	3 A
Fuse protections per circuit	5 A
max. inrush peak current	250 A
max. cable diameter	2.5 mm <sup>2</sup>
with STAR-Technology	
Dimensions and weights approx. 0.66 kg	
H x W X D (in mm)	170 x 55 x 155
Module width	1 TE (1 and 55 mm)
Item no.	400 71 347 051

#### SKU CG 2x3A

<b>Input</b>	
Nominal voltage AC	220-240 V
Nominal voltage DC	184-275 V
Rated frequency	50/60 Hz
<b>Outputs</b>	
Nominal current	3 A
Short circuit current	1500 A
Switching cycles	10000
cos phi capacitive	0,5 - 1,0
<b>Environmental conditions</b>	
Ambient temperature	+55° C
Protection class	IP20
Degree of pollution	2
Distance ventilation slots	75 mm
Number of circuits	2
Rated current per circuit	3 A
Fuse protections per circuit	5 A
max. inrush peak current	120 A
max. cable diameter	2.5 mm <sup>2</sup>
without switching function for CG-S-EVGs	
Dimensions and weights approx. 0.61 kg	
H x W X D (in mm)	170 x 55 x 155
Module width	1 TE (1 and 55 mm)
Item no.	400 71 347 290

## 4 Construction and Function

### SKU CG 1x6A

#### Input

Nominal voltage AC	220-240 V
Nominal voltage DC	184-275 V
Rated frequency	50/60 Hz

#### Outputs

Nominal current	6 A
Short circuit current	1500 A
Switching cycles	10000
cos phi capacitive	0,5 - 1,0

#### Environmental conditions

Ambient temperature	+55° C
Protection class	IP20
Degree of pollution	2
Distance ventilation slots	75 mm
Number of circuits	1
Rated current per circuit	6 A
Fuse protections per circuit	10 A
max. inrush peak current	180 A
max. cable diameter	2.5 mm <sup>2</sup>
without switching function for CG-S-EVGs	
Dimensions and weights approx. 0.47 kg	
H x W X D (in mm)	170 x 55 x 155
Module width	1 TE (1 and 55 mm)
Item no.	400 71 347 346

### Inverter SWR 150

#### Input

Nominal voltage AC	220-240 V
Nominal voltage DC	184-275 V
Rated frequency	50 Hz

#### Outputs

Nominal current	0,65 A
Short circuit current	1500 A
Switching cycles	10000
cos phi inductive	0,5 - 1,0

#### Environmental conditions

Ambient temperature	+55° C
Protection class	IP20
Degree of pollution	2
Distance ventilation slots	75 mm
Number of circuits	1
Rated current	150 VA
Fuse protections	1.6 AT
max. cable diameter	2.5 mm <sup>2</sup>
monitored circuit	
Dimensions and weights	0.75 kg
H x W X D (in mm)	170 x 55 x 155
module width	1 TE (1 and 55 mm)
Item no.	400 71 347 960

### SOU CG-S 2x4A

#### Input

Nominal voltage AC	220-240 V
Nominal voltage DC	184-275 V
Rated frequency	50/60 Hz

#### Outputs

Nominal current	4 A
Short circuit current	1500 A
Switching cycles	10000
cos phi capacitive	0,5 - 1,0

#### Environmental conditions

Ambient temperature	+55° C
Protection class	IP20
Degree of pollution	2
Distance ventilation slots	75 mm
Number of circuits	2
Rated current per circuit	4 A
Fuse protections per circuit	8 A
max. inrush peak current	250 A
Connection terminals	
Solid:	0.2...4.0 mm <sup>2</sup>
Stranded:	0.2...2.5 mm <sup>2</sup>
with STAR-Technology	
Dimensions and weights approx. 0.63 kg	
H x W X D (in mm)	109 x 178 x 60
Module width	10 TE (10 and 17,8 mm)
Item no.	400 71 360 430

**⚠ ATTENTION!**

Only fuses approved by CEAG Notlichtsysteme GmbH are permitted to use.



**SKU CG-S 4x1,5A**

**Fuses ①**

On the front panel of the change-over module there are

- per circuit
- 2 output fuses 2,5 AT / 250 V.

The nominal current should not exceed 3 A per circuit!  
Fuse dimensions: 6.3 mm x 32 mm, sand filled.  
Order no.: 400 71 070 716 / 10 qty./unit

**Indicators**

• **ON LED ②**

The LED lights up when the voltage is present at the output terminals.

• **Fault LED ③**

The LED lights up when one or more luminaires are faulty.

**Operation elements**

• **Service-PIN ④**

Beside the „Service“ label there is a button which must be operated when the system's basic program is loaded. The basic programming occurs factory made.¹)

**Additional features**

• **Mixed operation of**

maintained light, non-maintained light and switched maintained light in one circuit by using of CEAG EVGs/modules with CG-S marking can be programmed without any additional data cable.

- **Individual monitoring of** up to 20 luminaires per circuit.

• **Easy access to fuses**

• **Connected rating per circuit** 330 W

• **Inrush current per circuit**

60 A per circuit / 240 A per module

Example: For two circuits => 120 A per circuit

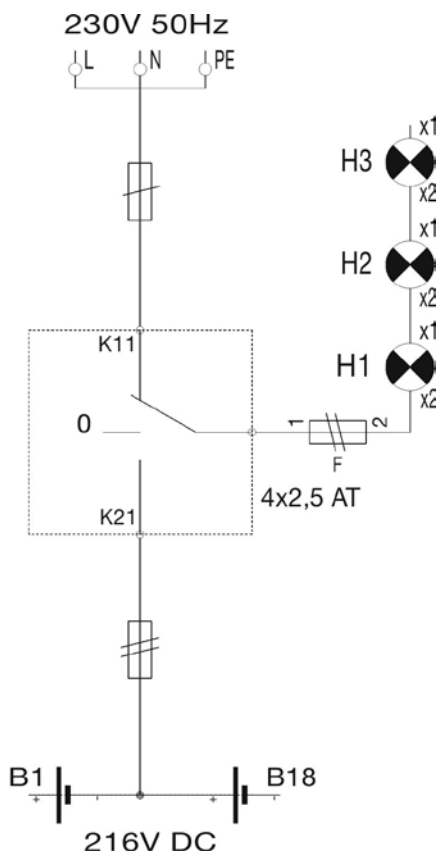
For four circuits => 60 A per circuit

- **Typical change-over time** AC on DC = 450 ms

**Components for circuit change-over module**

**SKU CG-S 4x1,5A**

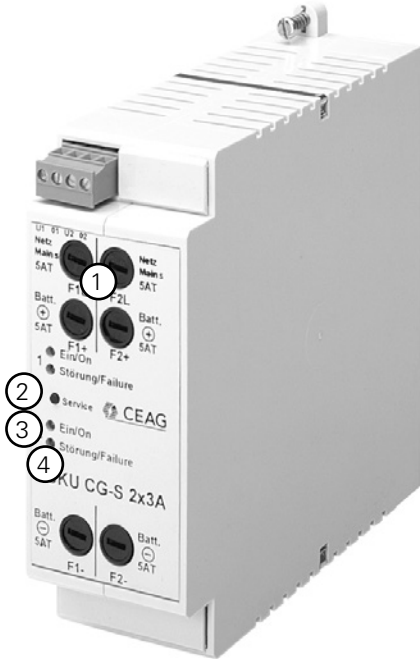
- (4 circuits each 1,5 A rated current)
- The current module is connected to the controller via the BUS.
- At the device configuration an address is allocated via the controller. This occurs factory made.
- All functions as switching mode, monitoring function can be programmed via the controller.
- Will the circuit change over module be refitted or replaced the programming must be changed.



## 4 Construction and Function

### ⚠ ATTENTION!

Only fuses approved by CEAG Notlichtsysteme GmbH are permitted to use.



### SKU CG-S 2x3A

#### Fuses ①

On the front panel of the change-over module there are

- per circuit
- 3 output fuses 5 AT / 250 V.

The nominal current should not exceed 3 A per circuit!  
Fuse dimensions: 6.3 mm x 32 mm, sand filled.  
Order no.: 400 71 689 047 / 10 qty./unit

#### Operation elements ②

- **Service-PIN**

Beside the „Service“ label there is a button which must be operated when the system's basic program is loaded. The basic programming occurs factory made.<sup>1)</sup>

#### Indicators

- **ON LED ③**

The LED lights up when the voltage is present at the output terminals.

- **Fault LED ④**

The LED lights up, when one or more luminaires are faulty.

#### Additional Features

- **Mixed operation of**

maintained light, non-maintained light and switched maintained light in one circuit by using of CEAG EVGs/modules with CG-S marking can be programmed without any additional data cable.

- **Individual monitoring of**

up to 20 luminaires per circuit

- **Individual switchin each circuit**

- **Separate fusing for mains and battery operation**

- **Among unipolar earth connection**

in AC operation fault free DC operation can continue

- **Easy access to fuses**

- **Separate savings for** mains and battery operation

- **Connected rating per circuit** 660 W

- **Inrush current per circuit** 250 A/ms

- **Typical change-over time** AC on DC = 450 ms

#### Components for circuit change-over module

##### SKU 2 x 3 A CG-S

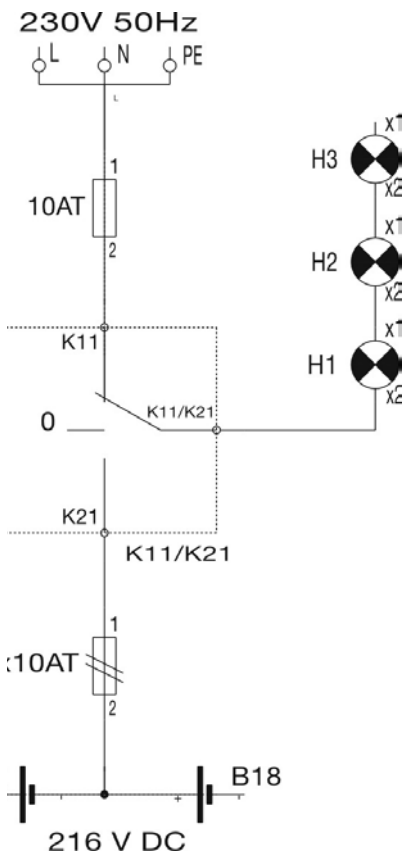
- (2 circuits each 3 A rated current)

- The current module is connected to the controller via the BUS.

- At the device configuration an address is allocated via the controller. This occurs factory made.

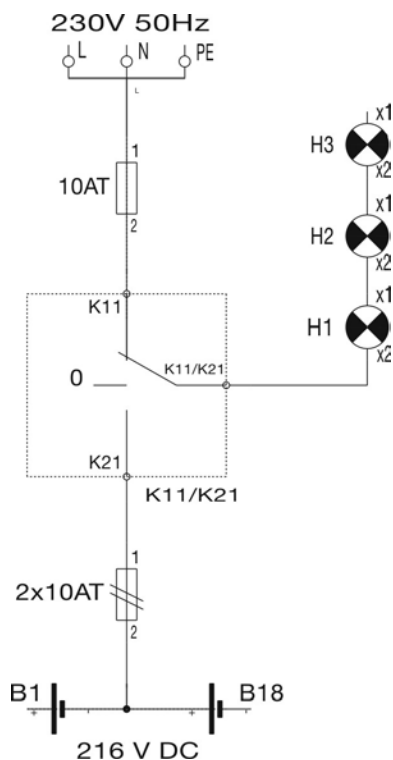
- All functions as switching mode, monitoring function can be programmed via the controller.

- Will the circuit change over module be refitted or replaced the programming must be changed.



**⚠ ATTENTION!**

Only fuses approved by CEAG Notlichtsysteme GmbH are permitted to use.

**⚠ ATTENTION!**

By replacement of a SKU with older version against a SKU with innovator version, note that (because of increased rated current values) accordingly higher fuses are used per circuit (faulted circuit impedance acc. to DIN VDE 0100)!

**SKU CG-S 1x6A****Fuses ①**

On the front panel of the change-over module there are

- 3 output fuses 10 AT / 250 V.  
The nominal current should not exceed 6 A!  
Fuse dimensions: 6.3 mm x 32 mm, sand filled.  
Order no.: 400 71 070 715 / 10 qty./unit

**Indicators****• ON LED ②**

The LED lights up when the voltage is present at the output terminals.

**• Fault LED ③**

The LED lights up when one or more luminaires are faulty.

**Operation elements****• Service-PIN ④**

Beside the „Service“ label there is a button which must be operated when the system's basic program is loaded. The basic programming occurs factory made.1)

**Additional Features****• Mixed operation of**

maintained light, non-maintained light and switched maintained light in one circuit by using of CEAG EVGs/modules with CG-S marking can be programmed without any additional data cable.

- **Individual monitoring of** up to 20 luminaires per circuit
- **Separate fusing for mains and battery operation**
- **Among unipolar earth connection** in AC operation fault free DC operation can continue
- **Easy access fo fuses**
- **Separate savings for** mains and battery operation
- **Connected rating per circuit** 1320W
- **Inrush current per circuit** 250A/ms

<sup>1)</sup>When the Service Pin is operated the module status is shown as a plain-language readout on the display of the CU CG-S control module. Repeated operation of the SKU's Service Pin takes the operator through the following menu structure of the CU CG-S control module.

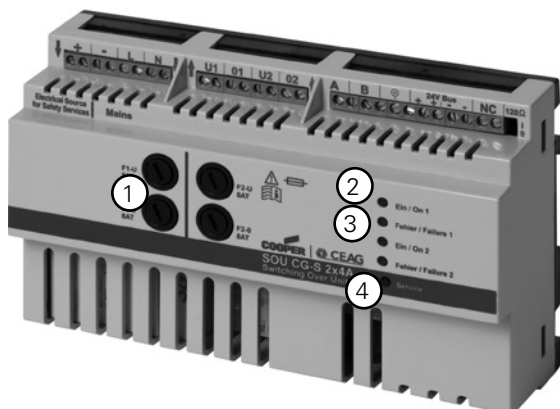
**NOTE**

- The new SKU modules for the system ZB-S have the ability, also during breakdown of the controller CU CG-S, to achieve the following switching functions:
  - Mains emergency operation (by breakdown CU CG-S)
  - DC-operation (by power failure)
  - back to the mains emergency operation (return of the mains supply). Admittedly, will be no switching functions performed (e. g. by DLS module) during the breakdown of controller!
- By disconnected saving of the mains and battery circuits is a fault-free DC-operation possible, also when the AC-mains-supply breakdown by earth fault or short-circuit.
- The SKU modules for ZB-S system are Pin-compatible with the modules of the ZB96 system and EURO ZB.1 system.

## 4 Construction and Function

### ⚠ ATTENTION!

Only fuses approved by CEAG Notlichtsysteme GmbH are permitted to use.



### SOU CG-S 2x4 A

#### Fuses ①

#### On the front panel of the change-over module there are

- 2 output fuses 8 AT / 250 V.

The nominal current should not exceed 4 A!  
Fuse dimensions: 6,3 mm x 32 mm, sand filled.  
Order no.: 400 71 360 484 / 10 qty./unit

#### Indicators

##### • ON LED ②

The LED lights up when the voltage is present at the output terminals.

##### • Failure LED ③

The LED lights up when one or more luminaires are faulty.

#### Operation elements

##### • Service-PIN ④

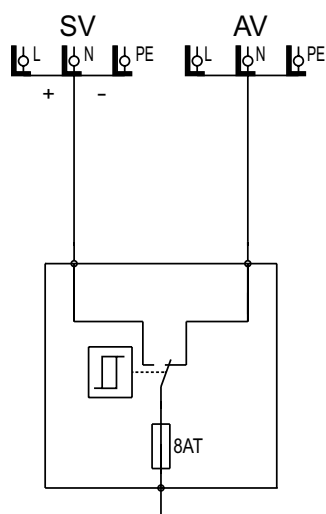
Beside the „Service“ label there is a button which must be operated when the system's basic program is loaded. The basic programming occurs factory made.

#### Additional Features

##### • Mixed operation of

maintained light, non-maintained light and switched maintained light in one circuit by using of CEAG EVGs/ modules with V-CG-S marking can be programmed without any additional data cable.

- **Individual monitoring of** up to 20 luminaires per circuit
- **Separate rental current feed**
- **Easy access fo fuses**
- **Connected rating per circuit 860W**
- **Inrush current per circuit 250A/ms**



### NOTE

- The new SOU modules for the system ZB-S have the ability, also during breakdown of the controller CU CG-S, to achieve the following switching functions:
  - Mains emergency operation (by breakdown CU CG-S)
  - DC-operation (by power failure)
  - back to the mains emergency operation (return of the mains supply). Admittely, will be no switching functions performed (e. g. by DLS module) during the breakdown of controller!



## 4 Construction and Function

### 4.4.6 Inverter SWR 150

#### Sinus-inverter

The sinus-inverter supplies and monitors emergency luminaires with conventional ballasts and lamps. The SWR has a rotary encoder switch to adapt the output frequency due to luminous flux reduction in battery mode in the region of 50Hz (100% luminous flux) to 140Hz (25% luminous flux).



#### Technical data

Slots	1
Fuse G-fuse 0.5x20 <b>1</b>	1.6 AT
Max. rated current	0.65 A
Max. connected load	150 VA
For luminaires	KVG opr incandescent lamps WG
Rated power PSU.1E	2.3W
Distortion factor	K < 5%

The maximum installed load per SWR 150 should not exceed 150 VA!

When re-fitting SWR-modules attend that the maximum SWR 150 installed battery load per system should not exceed 1,500W. Furthermore SWR 150 modules **must not** be installed in the top subrack. When using more than one SWR150 per ZB-S system a technical air ventilation has to be installed.

#### Indicators

- **ON LED** **2**

The LED lights up when the voltage is present at the output terminals.

- **Fault LED** **3**

The LED lights up when one or more luminaires are faulty.

#### Operation elements

- **Service-PIN** **4**

Beside the „Service“ label there is a button which must be operated when the system's basic program is loaded. The basic programming occurs factory made.1)

1) When the Service Pin is operated the module status is shown as a plain-language readout on the display of the CU CG-S control module. Repeated operation of the SWR's Service Pin takes the operator through the following menu structure of the CU CG-S control module.

#### Additional Features

- **Learning current value-detection**
- **Overload display:**
  - 0.8 A Fault
  - > 1.0 A Disconnection of inverter operation
- **Typifies change-over time mains / battery 450ms**
- **Monitoring of battery voltage**
- **Selected emergency lighting**
- **Monitoring of AC fuses**
- **Luminous flux adjustable from 25 to 100%**
- **Sinus-output voltage = 230 V**
- **Connection to DLS/3Ph bus-module possible**
- **Separat DLS-gate input existing**
- **AC-supply via backplane or via module-connection possible**
- **Short circuit- or overload securely**
- **Fuses easily accessible**

#### Rotary encoder switch **5**

With the rotary encoder switch the frequency of the inverter is set in the region of 50 to 140 Hz. This change of frequency causes a change of the luminous flux for luminaires in inductive switching. (s. table)

#### Please note:

If no specifications are made for setting the switches, the SWR 150 is supplied with switch position 9 (approx. 30% luminous flux). If another luminous flux condition is required, the switch position must be correspondingly changed. A high luminous flux level means correspondingly higher battery current and heat loss output and must comply with the system concept.

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#### NOTE

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- The new SKU modules for the system ZB-S have the ability, also during breakdown of the controller CU CG-S, to achieve the following switching functions:
  - Mains emergency operation (by breakdown CU CG-S)
  - DC-operation (by power failure)
  - back to the mains emergency operation (return of the mains supply). Admittely, will be no switching functions performed (e. g. by DLS module) during the breakdown of controller!

The inverter SWR 150 gets supplied by two voltage sources, during mains operation from mains and during mains failure from the battery. The mains voltage gets supplied either via backplane or per module. The second voltage source is a 216V-battery and supplies the SWR150 during mains failure, function test or duration test.

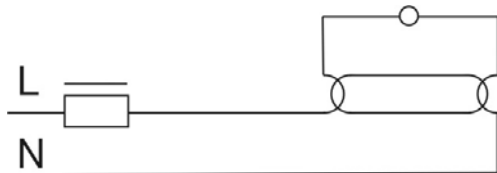
According to the switching mode the output voltage of the inverter is 230V for error-free mains and for mains failure the transformed battery voltage in the form of a sinus-AC voltage!

The frequency of the sinus-AC voltage can be adjusted in the region of 50 to 140 Hz. If luminaires with conventional ballasts are taken for safety lighting this ballast is used as a voltage divider.

Therefore, the luminous flux of the lamp can be changed depending on the adjusted frequency.

150 Hz  $\approx$  25- 35% luminous flux acc. to type of lamp (s. table)

50 Hz  $\approx$  100% luminous flux



The SWR 150 gets supplied with a maximum current deviation of +/- 5% factory set.

The setting of this current deviation has to be entered in the menu „5.3 Monitor mode“, minimum 15% - acc. to number of types of luminaires and luminous flux.

Furthermore the currents have to be measured and saved as written in „5.5 Learn currents.“ An error is detected from a battery current difference of at least 200 mA.

### IMPORTANT NOTE:

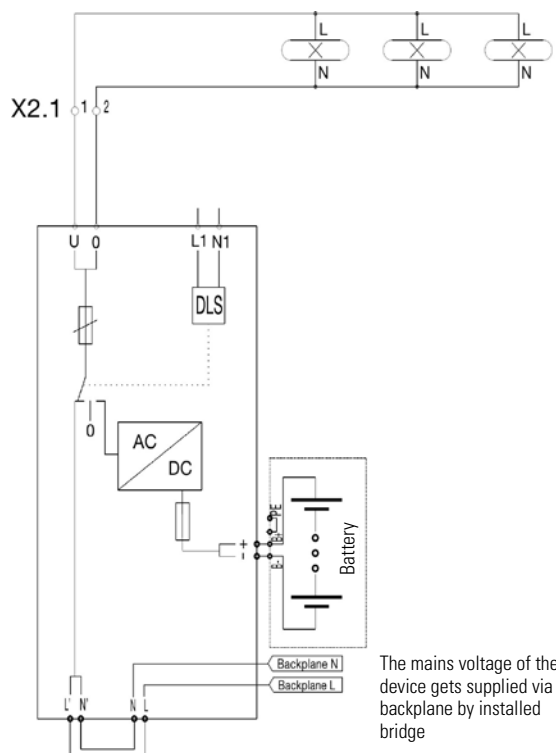
During current-value-monitoring please observe that the current input of CCG luminaires (conventional control gear) in battery mode can vary significant caused by ageing. Environmental conditions can also affect the current input of luminaires in battery mode. (e.g. ambient temperature)

In consequence it is necessary to re-calibrate the current-value-monitoring from time to time (s. menu 5.3). Otherwise a failure message is possible.

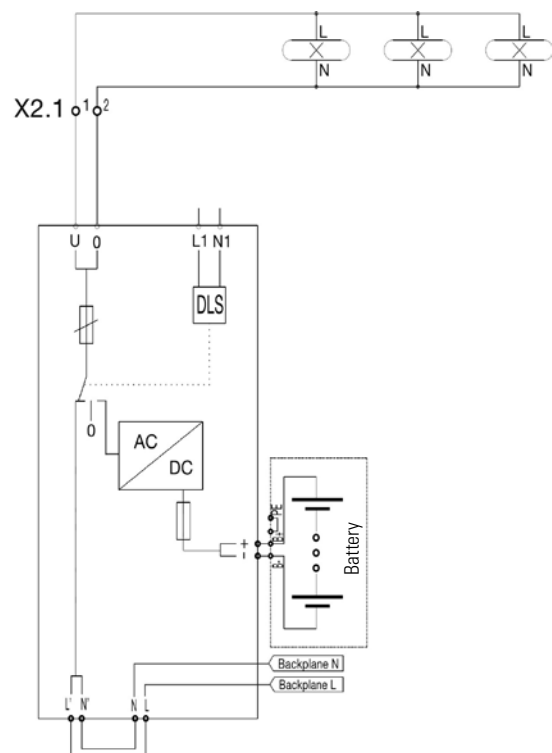
The **Safety lighting in non-maintained mode** operates for the following:

- 24 V monitoring loop S3 / S4
- DLS / 3PH-bus-module as phase monitor
- Mains failure HVS / UVS
- Function and duration test started.

The **Safety lighting in maintained mode** operates permanently being supplied by the central power supply until the deep-discharge protection of the battery is achieved, but at least until achieving the rated operating time. In this switching mode the safety lighting cannot be started.



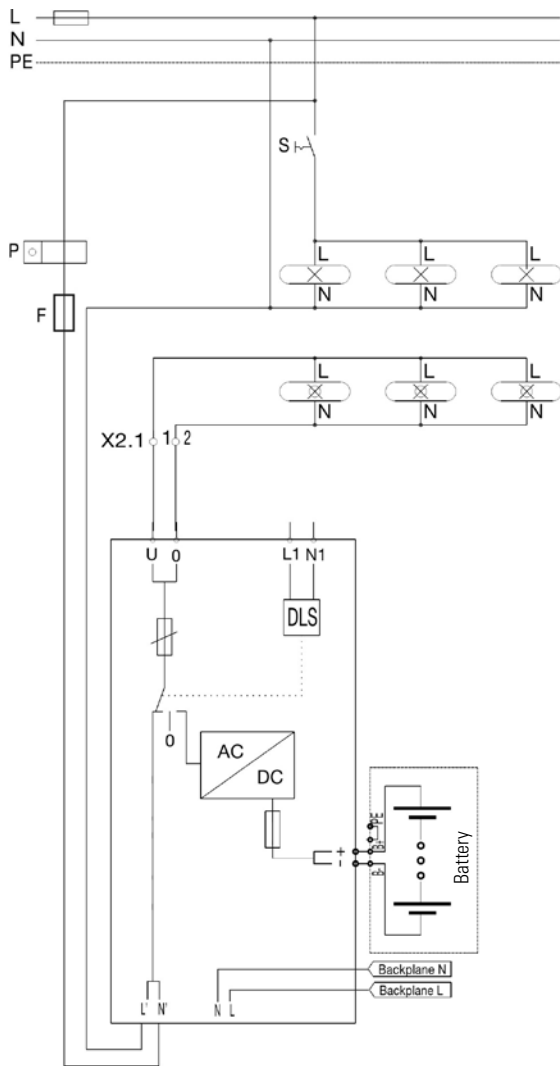
The mains voltage of the device gets supplied via backplane by installed bridge



## 4 Construction and Function

### Maintained light via external power mains supply

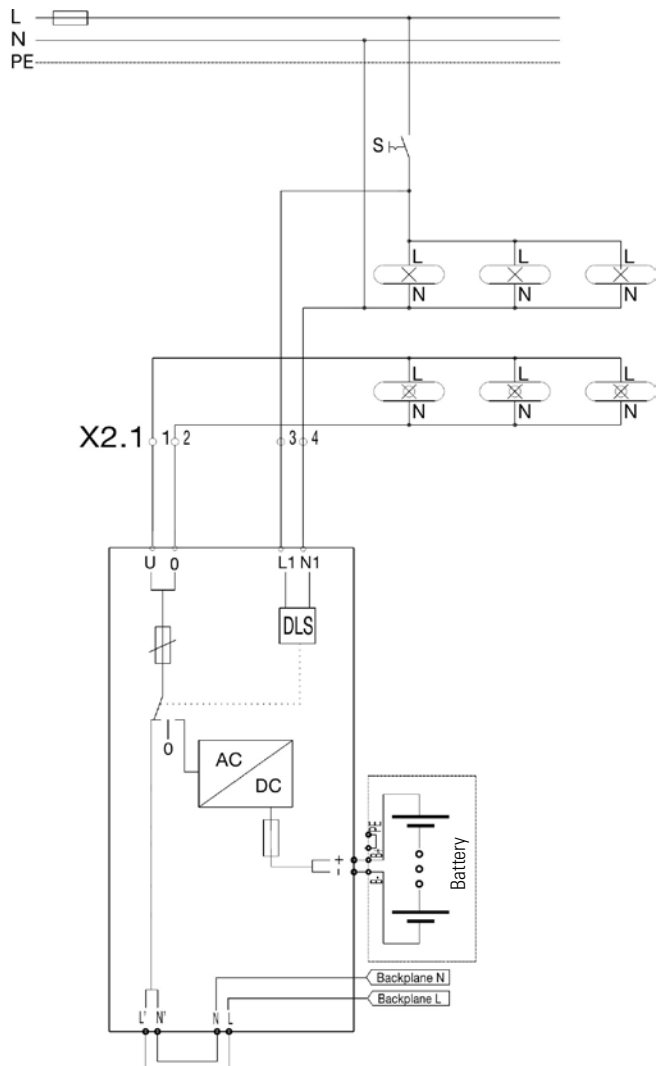
In this supply mode the safety lighting is supplied by an external phase in mains. This switching mode is used particularly for reinstallations with one electric meter per circuit. If there is a failure of the external power supply the SWR 150 switches to battery operation, automatically. The mains failure gets displayed as „mains failure UV“ at the control unit.



### Switched maintained light via maintained light switch monitoring

In this switching mode one light switch of the general lighting is scanned and assigned to the SWR 150 via programming.

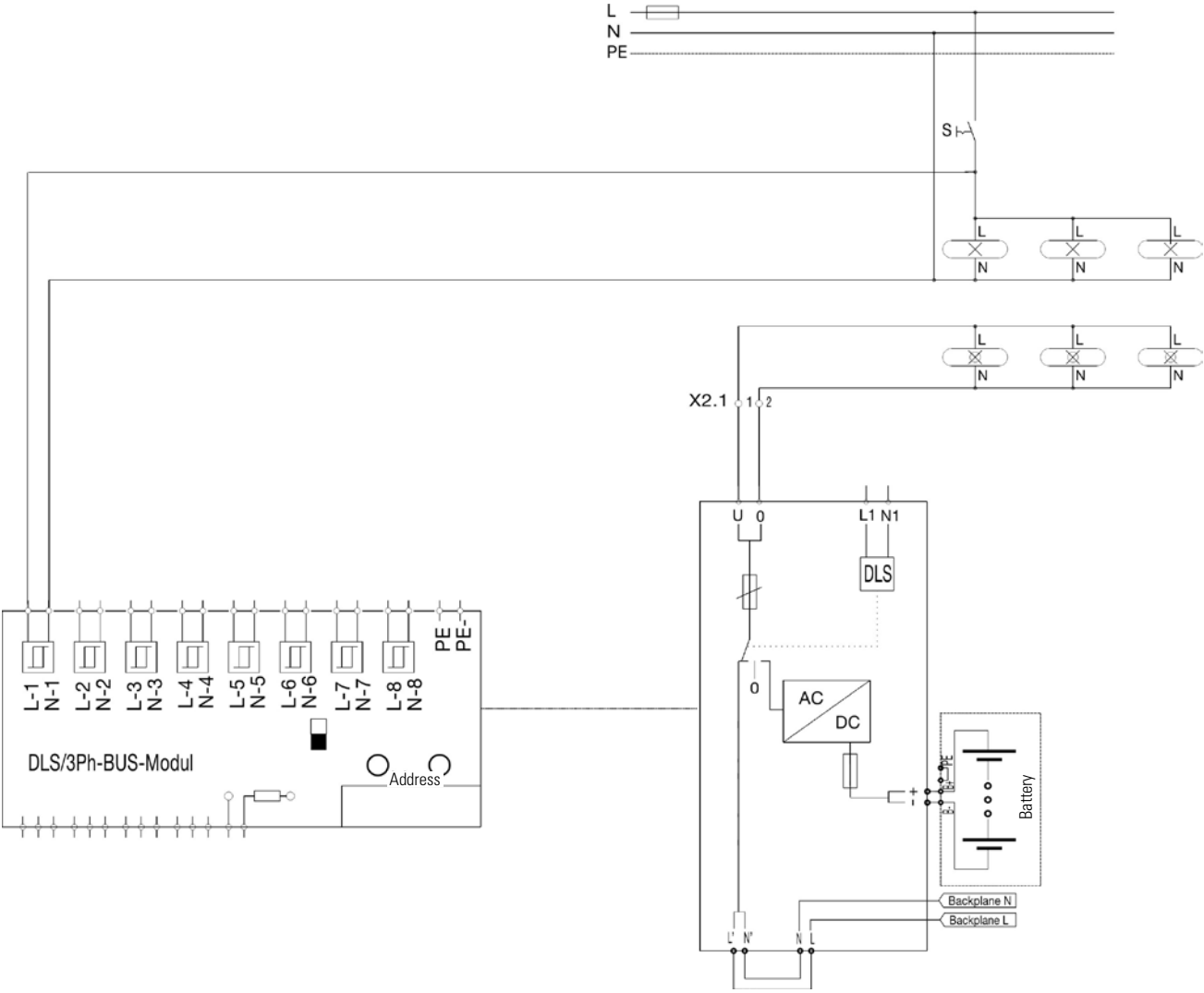
The advantage is the free assignment of the light switches to the final circuit. In dependence of the switch setting the circuit switches on.



**Switched maintained light via external DLS-bus-module**

In this switching mode one light switch of the general lighting is scanned and assigned to the SWR 150 via programming.

An advantage is the free assignment of the light switches to the final circuit.



## 4 Construction and Function

### 4.4.6.1 Determination of current consumption value from the battery

Table 1. Battery current consumption values (A) dependent upon number of luminaires and luminous flux ratio (LV%) at 20 °C ambient temperature at the luminaire.


International description		T5 	
Socket		G5	
Lamp power (W)		8W-VVG	
Luminous flux ratio (%)	100	51	35
Switch setting	0	4	9
Number of luminaires / Current consumption from the battery / Apparent power	[A] [VA]	[A] [VA]	[A] [VA]
1	0.175 / 36	0.123 / 19	0.118 / 12
2	0.258 / 72	0.150 / 37	0.090 / 24
3	–	0.213 / 56	0.120 / 36
4	–	0.246 / 74	0.157 / 48
5	–	0.276 / 92	0.192 / 60
6	–	0.322 / 110	0.220 / 71
7	–	–	0.240 / 83
8	–	–	0.260 / 94
9	–	–	0.280 / 105

Table 2. Battery current consumption values (A) dependent upon number of luminaires and luminous flux ratio (LV%) at 20 °C ambient temperature at the luminaire.

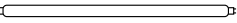
International description		T26 																					
Socket		G13																					
Lamp power (W)		58				36				18													
Luminous flux ratio (%)		100	48	32	100	75	54	32	100	87	54	36											
Switch setting		0	5	9	0	2	4	8	0	1	5	9											
Number of luminaires / Current consumption from the battery / Apparent power		[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]		
1		0.62	147	0.37	84	0.35	81	0.47	107	0.34	80	0.31	71	0.30	70	0.37	85	0.31	72	0.26	60	0.26	60
2		–	–	–	–	–	–	–	0.59	137	0.47	109	0.36	83	–	–	0.56	121	0.33	75	0.29	67	
3		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	0.47	108	0.35	82

Table 3. Battery current consumption values (A) dependent upon number of luminaires and luminous flux ratio (LV%) at 20 °C ambient temperature at the luminaire.

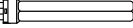
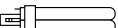
International description		TC-L 																					
Socket		2G11																					
Lamp power (W)		36					24					18											
Luminous flux ratio (%)		100	59	43	100	73	57	46	100	71	52	47	100	59	43	100	73	57	46	100	71	52	47
Switch setting		0	5	9	0	3	6	9	0	3	7	9	0	5	9	0	3	6	9	0	3	7	9
Number of luminaires / Current consumption from the battery / Apparent power		[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]
1		0.47	108	0.30	70	0.29	68	0.38	89	0.28	64	0.27	62	0.27	65	0.39	90	0.26	60	0.26	60	0.25	60
2		-	-	0.43	96	0.33	76	-	-	0.42	99	0.34	79	0.32	74	-	-	0.42	98	0.31	70	0.28	65
3		-	-	0.58	135	0.44	103	-	-	0.61	136	0.44	103	0.37	86	-	-	0.57	135	0.40	94	0.34	80
4		-	-	-	-	-	-	-	-	-	-	0.56	130	0.47	105	-	-	-	-	0.50	117	0.46	104

Table 4. Battery current consumption values (A) dependent upon number of luminaires and luminous flux ratio (LV%) at 20 °C ambient temperature at the luminaire.

International description		TC-D 																													
Socket		G24Q1. G24Q2																													
Lamp power (W)		26					18					13					10														
Luminous flux ratio (%)		100	71	61	47	100	79	63	48	100	77	63	42	100	68	52	100	71	61	47	100	79	63	48	100	77	63	42	100	68	52
Switch setting		0	3	5	9	0	2	5	9	0	2	4	9	0	4	9	0	3	5	9	0	2	5	9	0	2	4	9	0	4	9
Number of luminaires / Current consumption from the battery / Apparent power		[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]	[A]	[VA]
1		0.36	85	0.28	63	0.27	61	0.27	64	0.30	51	0.26	37	0.24	29	0.23	24	0.26	60	0.26	49	0.21	49	0.21	49	0.25	58	0.21	49	0.20	44
2		-	-	0.39	93	0.35	80	0.33	76	0.47	87	0.35	64	0.29	47	0.28	37	0.39	90	0.30	68	0.28	63	0.29	66	0.39	90	0.26	58	0.26	62
3		-	-	0.54	126	0.45	104	0.36	80	0.65	114	0.48	86	0.36	65	0.32	48	0.53	121	0.41	91	0.32	73	0.30	71	0.54	125	0.31	74	0.30	70
4		-	-	-	-	0.57	132	0.43	97	-	-	0.60	106	0.44	81	0.34	62	-	-	0.53	110	0.38	87	0.32	74	-	-	0.38	88	0.32	72
5		-	-	-	-	-	-	-	-	-	0.71	125	0.53	94	0.40	73	-	-	0.57	130	0.48	103	0.33	76	-	-	0.47	104	0.36	75	
6		-	-	-	-	-	-	-	-	-	-	0.60	108	0.44	83	-	-	-	-	0.52	120	0.38	87	-	-	0.54	121	0.40	81	-	-
7		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.59	136	0.42	94	-	-	0.59	137	0.45	94	-	-

## 4 Construction and Function

### NOTE

CEAG Notlichtsysteme GmbH attend on downwards compatibility at the development and further development of the modules for one system family (in this case SKU modules for the system ZB-S) in view of the control software for module, their use and handling.

- Please attend for safety the attributiv technical documentation of the modules by operation of the modules in actual level of development as well as by operation of modules in older levels of developments.
- In case of doubt please contact the customer service of CEAG Notlichtsysteme GmbH.
- The display at the controllers CU CG-S implement the active SKU-module of the particular type series; that means a SKU-module appears e. g. during the registration with a correct marking on the graphic display of the controller.
- Similar fact also apply for superior monitoring system, parameterisation-software and CG-modules with individual monitoring.

### 4.4.7 Event printer PD3

#### Description

The event printer PD3 can apply as an option as from controller software version F.

The device can be placed user-defined on a free storage space on the subrack (BGT). By default the storage places 7 and 8 on BGT1 are provided for. Mains supply of the printer and the communication with the controller CU CG-S occur via the (rearward) contact of the device and the subrack.

When the printer is logged in and activated via the controller software all entries which are stored for the log book are printed on the inserted paper reel.

#### Configuration

By pressing the Service-Button the protocol printer for the active plug place on the BGT is registered and activated. Further settings occur via control software of the controller CU CG-S (as from version F) over the menu «Mains settings / Setup printer».

#### Operation

- Button LF at the front panel of the device for paper feed (Line Feed).
- Replacement of paper reel and the ribbon respectively

To replace the paper reel of the printer or the ribbon the event printer PD3 must be removed from the subrack. You can find detailed information in the operation instruction attached to the device.

### NOTE:

Prior to this, the event printer must be logged out from the cabinet over the controller CU CG-S!

This happens over the menu «Setup printer» in the menu «Mains settings» with the selection «not installed».

- Activate/deactivate printer

This happens over the menu «Main settings / Setup Printer» of the controller software CU CG-S.

#### Indicators

- Light emitting diode «Druckt / busy»

The LED lights up when the printer executes a print procedure.



### 4.4.8 Relay module CG IV and CG V

CG IV



**Function of relay contacts**

	11/12	21/22	31/32	41/42	51/52
Deep-discharge protection	ON	---	---	---	---
Emergency lighting failure	---	ON	---	---	---
Charging fault	---	---	ON	---	---
Battery operation	---	---	---	ON	---
Mains operation	---	---	---	---	ON

Switching capacity of contacts: 24V/0,5A AC/DC

CG V



**Function of relay contacts**

	11/12	21/22	31/32	41/42	51/52
No operation	ON	---	---	---	---
Failure prior. 1	---	ON	---	---	---
Failure prior. 2	---	---	ON	---	---
Failure prior. 3	---	---	---	ON	---
Emergency mode	---	---	---	---	ON

Switching capacity of contacts: 24V/0,5A AC/DC

These subassemblies allow the connection of the central battery system to a central control station (ZLT) or building management system (BMS). The most important system states are transmitted via potential-free signalling contacts. There are two input channels for the remote monitoring of the central battery system. A functional test can be initiated via the input channel „FT“ and a continuous operation test (battery test) can be initiated via the input channel „BT“. Eight LEDs indicate the state of the system.

**Function of command contacts**

	+24V/0V	FT ON	+24V/0V	FT Off	+24V/0V	BT ON	+24V/0V	BT OFF
<b>Function test ON</b>		█						
<b>Function test OFF</b>			█					
<b>Battery duration test ON</b>					█			
<b>Battery duration test OFF</b>							█	

The desired function can be activated with an impulse of min. 20ms/24V.

If a FT or BT should be made once again the Function-Duration test must be reset by an impulse.

## 4 Construction and Function

### 4.4.9 F3 remote indication

#### Connection of a remote switch

Connections are made as per figure (single-line diagram) as well as field installation diagrams and drawings.

The CEAG F3 remote switch is powered via the 24-V voltage supply system of CEAG systems.

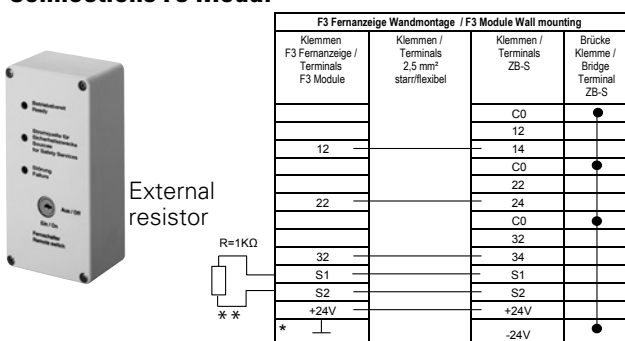
#### ⚠ ATTENTION!

Do not use an external 24-V voltage supply!

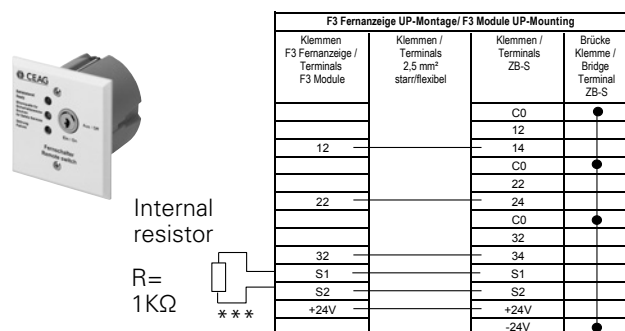
#### NOTE:

- Observe national rules and regulations governing the indicating and signalling behavior when using a remote switch or a remote indicator for emergency lighting systems.
- Observe the instructions in the Technical Documentation as provided by the manufacturer of the CEAG F3 remote indicator.

#### Connections F3 Modul

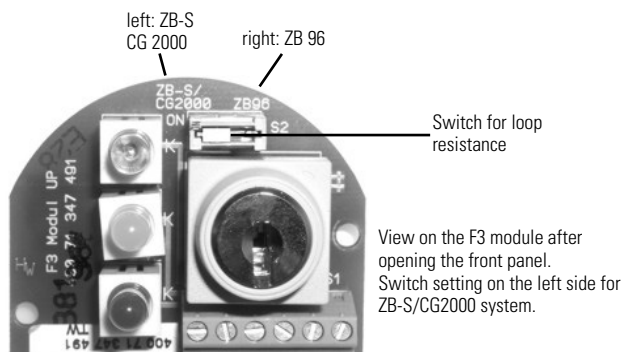


- \* Terminal without function
- \*\* Loopresistor



#### Switch for loop resistance

The F3- remote indicating unit contains a switch for loop resistance. The right figure shows the printed board which includes a marking stating the switch settings depending on the system.



### 4.4.10 External TLS-bus-module

This module monitors the switching status of buttons for up to two separate stairwell illuminations and transmits the particular switching status via a RS-485-busline to the controller of the system ZB-S.

In mains and emergency operation the circuits of stairlight and emergency light will be operated according to the settings for the controller CU CG-S! In addition to this, a supply of the switcher glow lamps of the connected buttons in mains and emergency operations occurs.

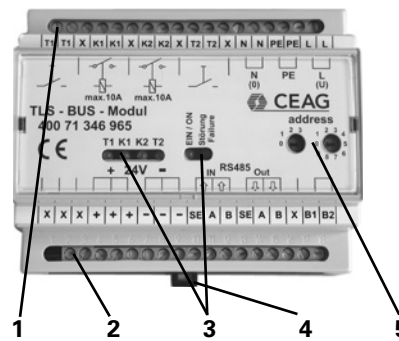
#### Technical Data

- Mains supply for the modules
  - Device: 24 V DC (19 ... max. 30 V)
  - Cable type: 4 x 2 x 0,8 mm IY(ST)Y, Twistet Pair screened (minimum standard).
  - Current consumption: max 50 mA, depending on the number of the connected glow lamps for stairwell-light switcher
- Bus connection
  - RS 485
  - Rated current:  $U_n = 24$  V DC
  - Cable type: 4 x 2 x 0,8 mm IY(ST)Y, Twistet Pair screened (minimum standard).
  - Connecting terminals A, B, SE
- 2 switching outputs
  - Rated current  $U_n = 230$  V
  - Switched current: max. 10 A (120 A/ms)

#### Application

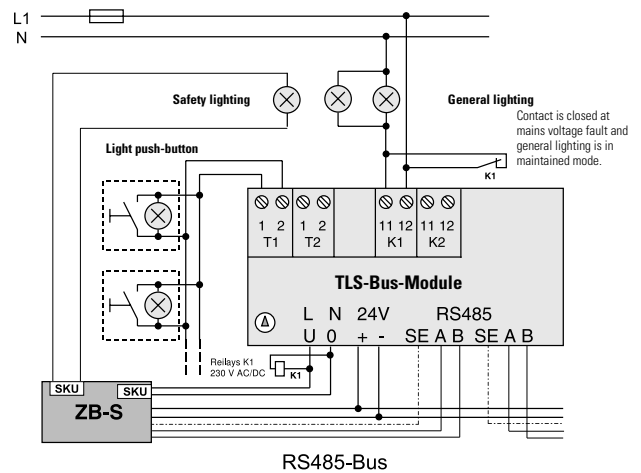
- Assembly in the subdistribution board of the monitored circuits due to the low laying effort for the illumination circuits (compare «Mounting and Connection of external bus modules»).
- Assembly in the control cabinet ZB-S (US-S) due to reasons for simplification of the maintenance (compare «Mounting and Connection of external bus modules»)
- Application-environment

Protection class /-category: IP20 / I  
 Ambient temp.: -10 ... +40°C



- Pos. 1: top connection terminal
- Pos. 2: lower connection terminal
- Pos. 3: Display-LEDs  
 LED K1 resp. K2 lights up when the circuit is connected.  
 LED T1 and T2 light up as long as the corresponding button-input is switched.  
 LED Ein/On lights up when 24 V DC supply voltage is present and the device is activated over the controller.  
 LED Störung/Failure lights up when a fault function was registered by the module
- Pos. 4: Locking device button for a module attached to a 35 mm-DIN mountingrail
- Pos. 5: Bus address

Please install the relays K1 if the general lighting must switch on when the battery is disconnected:



### 4.4.11 External 3-PM-IO module and ext. 3-PM-IO-INV module inverse

#### Description/Scope of application

The electronic monitoring module is used for light switch monitoring, in this way the general lighting and luminaires for the safety lighting can be switched together during mains operation. The module is also used for 3-phase monitoring in conjunction with EATON safety lighting systems of type ZB-S.

#### Principle of operation

The CEAG 3-PM-IO and 3-PM-IO-INV module has 8 separate input channels for monitoring 230 V AC mains voltages. Associated yellow LEDs on the front panel indicate the switch state. Using the left rotary coding switch on the front panel, the module can be switched from DLS (maintained light switch monitoring) to 3PH (three phase monitoring). In the "DLS only" position all 8 input channels are active for DLS (maintained light switch monitoring). In the "DLS 3PH" position, channels 1 - 5 are active for DLS (maintained light switch monitoring) and only the input channels 6 (L1); 7 (L2); 8 (L3) are active for 3 phase monitoring. The RS 485 interface as well as the 24 V DC power supply are supplied from the EATON-safety lighting system. The 230 V switching command at the inputs 1-8 is forwarded to the CEAG emergency

lighting system over the BUS. The safety luminaires connected to the emergency lighting system are switched on and off as per the programming.

The test button triggers a mains/emergency light fault on the respective ZB-S system after actuation and the connected emergency lighting switches on.

At the same time, the red error/fault LED lights up.

The green LED on the front panel indicated malfunction-free operation; the red LED indicates a malfunction. If several modules (max. 25) are operated in an emergency lighting system, the RS 485 bus and the 24 V supply are to be connected in series. The screen on the bus cable is to be connected to the SE terminal using a suitable clamping arrangement.

A terminating resistor (120 Ω) must be fitted at the start and end of the BUS cable. For this purpose, a jumper is to be fitted to terminals B1/B2 on the last module; this activates the built-in terminating resistor.

If the safety system is at the start of the bus cable, then the appropriate terminating resistor is to be fitted to terminals provided for this purpose.

## Technical Data

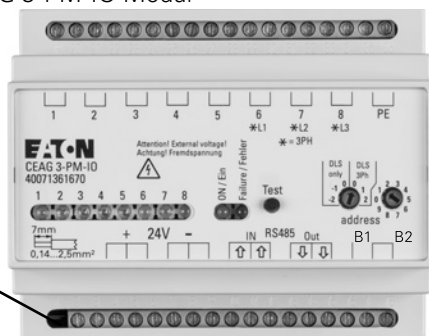
Rated voltage	24 V DC (min. 19 V, max. 30 V)
current consumption (all 8 channels connected)	20 mA ± 5 mA
Degree of protection	IP 20
Insulation class	I
Perm. ambient temperature	-10 °C .. +40 °C
Input channels	8 (potential free $U_N = 230$ V)
Terminals (Chan.1-8)	3-PM-IO: > 195 V-> ON / < 138 V-> OFF 3-PM-IO-INV: < 195 V-> ON / > 138 V-> OFF
Terminals (Chan.6-8)	3-PM-IO: > 195 V-> ON / < 138 V-> OFF 3-PM-IO-INV: < 195 V-> ON / > 138 V-> OFF
Data bus	RS 485
Address range	1-25
Weight	0,2 kg 0.2 kg
Dimensions L x W x H/mm	105 x 85 x 60
Assembly	DIN-Rail
Terminals	2.5 mm <sup>2</sup> rigid and flexible

### Addressing

Prior to operation in a EATON safety lighting system, the module address (1- 25) is to be set for this purpose the required address (1- 25) is to be set on the code switches on the module front panel using a suitable screwdriver (arrow to number, Figure 2).

fig 1 Connections CEAG 3-PM-IO Modul

Service key for testing of the communication between module – safety lighting via RS 485-BUS



Address switch 2

fig. 2  
Address switch 1

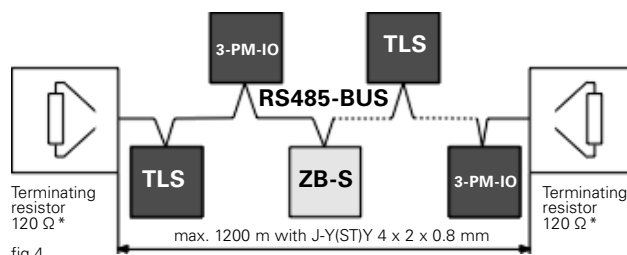


fig.4

#### Bus-structure RS485-BUS

- Double terminated bus topology/Line structure
- max. 25 modules (CEAG 3-PM-IO/TLS)
- Cross section for 24 V supply must be calculated according to the number of modules as well as line length.  $U_{min}$  for module = 19 V
- recommend cable: JY(ST)Y 4 x 2 x 0.8 mm, twisted pair, shielded
- No dead-end lines allowed.
- At interruption or short circuit of the bus line the programmed safety lighting is switched to maintained light

**i** \* In CEAG 3-PM-IO module the 120 ohms terminating resistor is integrated and can be activate through a wire fitted to terminals B1/B2.

Address switch 1	Address switch 2	Module address
0	0	not permissible
0	1	1
0	2	2
...	...	...
1	0	10
1	1	11
...	...	...
...	...	...
2	5	25
2	6	not permissible
...	...	...
3	9	not permissible

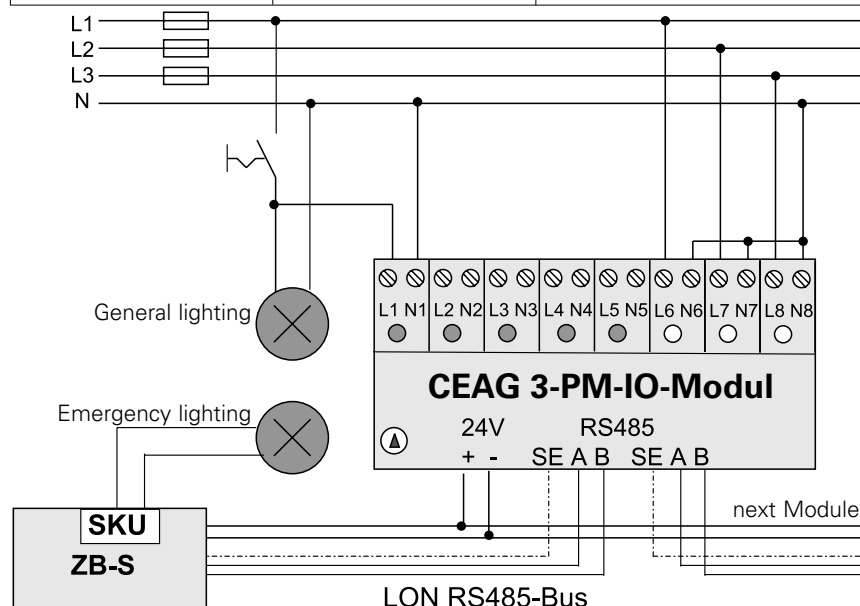
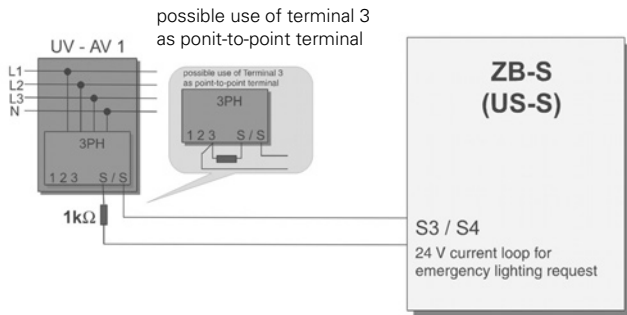


fig. 3: Wiring of the CEAG 3-PM-IO module

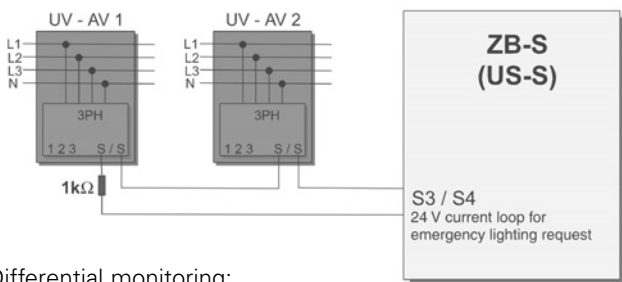
### 4.4.12 CEAG 3-PM Module with 24V current loop

The connection in the ZB-S (US-S) control cabinet is made at the 3-tier terminal block (S3 and S4) for external connections.

Schematic of a CEAG 3-PM Module with a 24V control loop for emergency lighting request with differential loop monitoring for short circuit and open circuit detection



Schematic showing the connection of several CEAG 3-phase monitors



Differential monitoring:

System (maintained light) powers on immediately in the event of a short or open circuit

Phase monitor switch closed (1 kOhm): Normal system operation:

CEAG 3-PM Module



### NOTES:

Where several sub-distribution boards must be monitored, additional devices must be connected and wired with the other devices in a 24V loop.

If a 3-phase monitor is to monitor fewer than 3 phases, then the other inputs on the monitor must be jumpered.

### 4.4.13 Completing Assembly

- Refer to the plans and drawings for installation on site and check all of the circuits that have been made.
- Check that all connections are tight.
- Clear away all unused cables, insulation and fixing materials and all tools and packaging.
- The revision marking on the final circuits should be done.



## Technical data

### 4.4.14 Webmodule

Conform to: EN 60950-1. Developed, manufactured and tested acc. to ISO 9001.

#### Technical data

Supply voltage	24 V DC
Power consumption	1 W
Current consumption	33 mA +/- 25%
Connection	RJ45
Insulation class	III
Degree of protection acc. to EN 60529	IP 20
Ambient temperature	-10 °C .. +55 °C
Connection terminal	1.5 mm <sup>2</sup>
Weight	0,55 kg
Dimensions	90 x 35 x 32 mm

#### Description / Scope of application

The webmodule CG-S for visualisation and monitoring of a ZB-S system, AT-S+ system or of a LP-STAR system (separate mounting instructions) or via local ethernet (LAN) with a customary WEB-browser (e. g. Internet Explorer™). Integrated mail-client for a comfortable and event based failure notification for up to 5 email addressees. Password protected access accounts capable of parametrisation.

#### Mounting

Pay attention to temperatures outside the permitted range during operation. The permissible ambient temperature may not exceed 55°C.

The module was designed for DIN rail mounting (2TE) to be only mounted in the cabinet. An external mounting outside the LP-STAR Unit is not permitted.



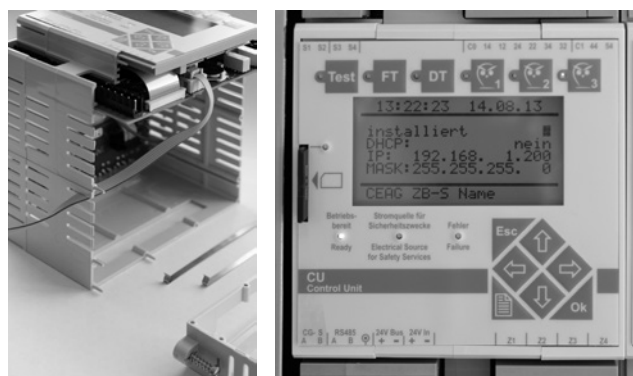
#### Electrical connection



#### Connection to the CU (ZB-S / AT-S+)

To connect the webmodules Six-pole data cable to the CU, the housing of the CU must be opened via both spring retainers.

The plug of the Six-pole data cable must be connected to the circuit board as shown in the photo below. Please note the cable leading out of the housing.

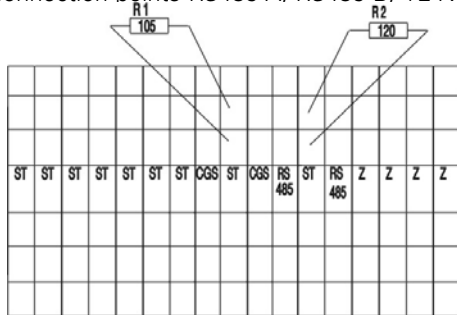


### 4.4.15 Bus-Technology according to RS 485 or CG-S-Bus

An RS485 bus is used for data communication with external bus modules (3-PM-IO Module or TLS).

A connection to a BMS can be done with the CG-S bus.

The conductors of the RS485 bus line must be connected to the connection points RS485 A, RS485 B, +24V OUT



and -24V OUT of the ZB-S connection terminals.

#### NOTE

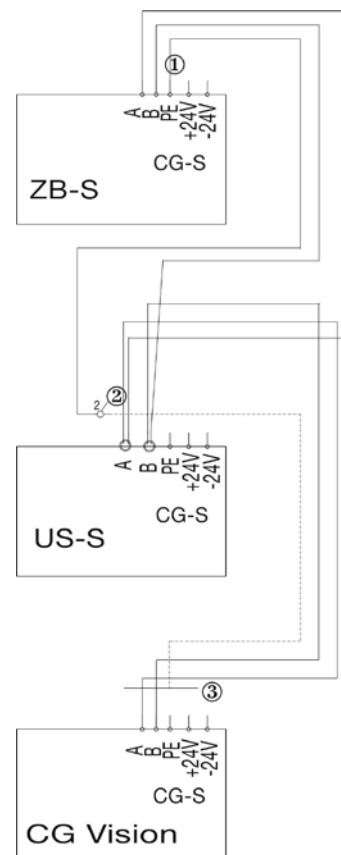
- A parallel switching of data cables is not allowed and does not lead to an extension of the acceptable cable length.
- For power supply of the modules conductors within one screening can be switched in parallel (for calculation compare the catalogue of the system ZB-S).

#### ⚠ ATTENTION!

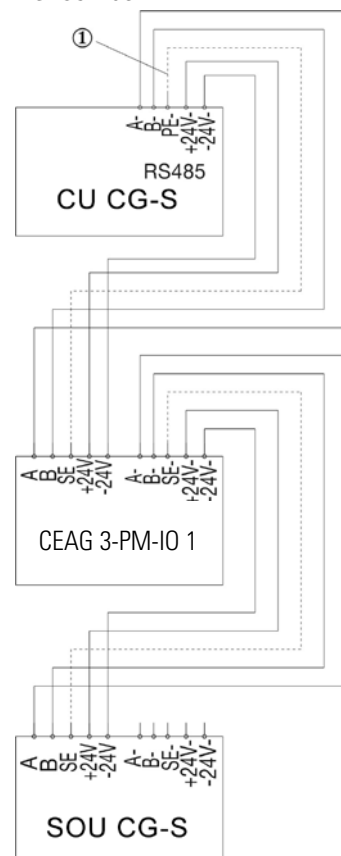
Bus Topology: linear, double terminated (no spur lines allowed). The absolutely essential terminating resistors are included in the control cabinet.

- Cable type (minimum requirement): IY(ST)Y 4 x 2 x 0.8 mm (Twisted Pair, screened) – the screen of the cables must be connected to the SE-clamps of each module and it is allowed to be earthed in the control cabinet ZB-S.
- The conductor cross-section needed for the 24V bus voltage will depend on the line length and the number of bus modules ( $U_{min} = 19\text{ V DC}$ , refer to the operating instructions for the 3-PM-IO Module and TLS-Bus-Module)
- Only one pair of conductors is allowed to be used as data line within the screen- it is not acceptable to bundle several data cables within one screened cable!
- The RS485 bus is not designed as a SELV system. The bus components must be handled as if mains supply (240 V) is applied.

CG-S-Bus



RS485-Bus



### 4.4.16 Batteries for emergency power supply

CEAG offers battery cabinet in different dimensions and mountings. In this case low-maintenance batteries according to EUROBAT come into operation with an expected service life of over 10 years by professional handling. According to their construction and performance comply this from CEAG enabled batteries with the standards of german building laws for emergency systems (EN 50272 und EN 60896-2).

Please observe strictly our operation instructions for battery cabinets 400 71 860 035 and for battery racks 400 71 860 036.

#### CEAG-standard battery cabinets

Range of capacity from 23.3 to 357.6 Ah<sup>1) 2)</sup>  
Rated voltage 216 V DC  
Dimensions (acc. to performance) different<sup>3)</sup>  
Weight (acc. to performance) different<sup>3)</sup>

#### CEAG-compact battery cabinets

Range of capacity from 5.5 to 89.4 Ah  
Rated voltage 216 V DC  
Dimensions (acc. to performance) different<sup>3)</sup>  
Weight (acc. to performance) different<sup>3)</sup>

#### CEAG-battery racks

Range of capacity 23.3 to 268.2 Ah<sup>1)</sup>  
Rated voltage 216 V DC  
Dimensions (acc. to performance) different<sup>4)</sup>  
Weight (acc. to performance) different<sup>4)</sup>

<sup>1)</sup> Battery capacities of more than 126 Ah are reachable with parallel switching of several battery sets.

<sup>2)</sup> Larger capacities on request.

<sup>3)</sup> See CEAG operation instructions for battery cabinets (400 71 860 035)

<sup>4)</sup> See CEAG operation instructions for battery racks (400 71 860 036)

### Battery charging equipment

The low-maintenance batteries supplied by CEAG are charged gently depending on temperatures as shown in the I/U charge diagram opposite. Depending on the charge in the batteries, boost charging is activated (by the charging boosters) allowing the batteries to be charged up rapidly without exceeding the gassing voltage.

The patented charge monitoring process continuously checks the charge and immediately signals faults such as battery open circuit, a faulty charging module or a high-resistance cell.

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### NOTE:

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Under normal charging conditions no gas escapes. Refilling of distilled water is not possible as the batteries are closed. Higher temperature leads to a reduction of service life. (compare operation temperatures of batteries on the previous page).

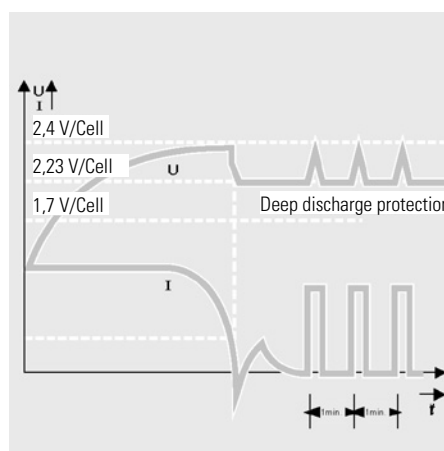
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### ⚠ ATTENTION!

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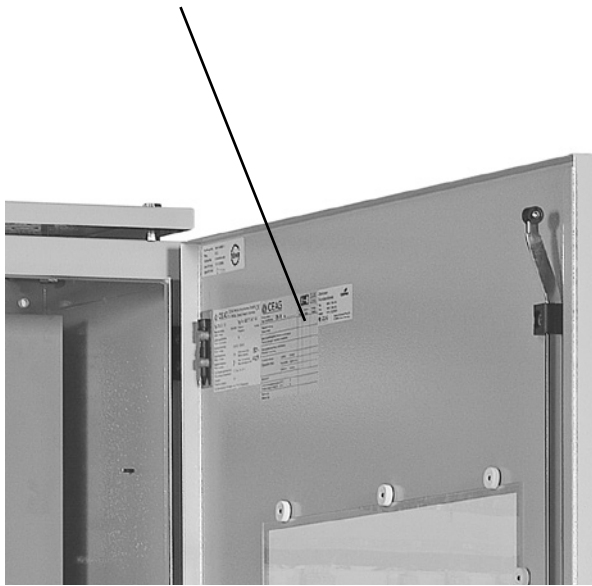
If the mains supply to the ZB-S central battery system is interrupted for more than three days, then the battery circuits must be isolated (by removing the battery fuse). This should be done by qualified electricians (see „Fuse Testing and Replacement“).

Charging Diagrams



### 4.5 Label of ZB-S

Find the label of the system inside the door.



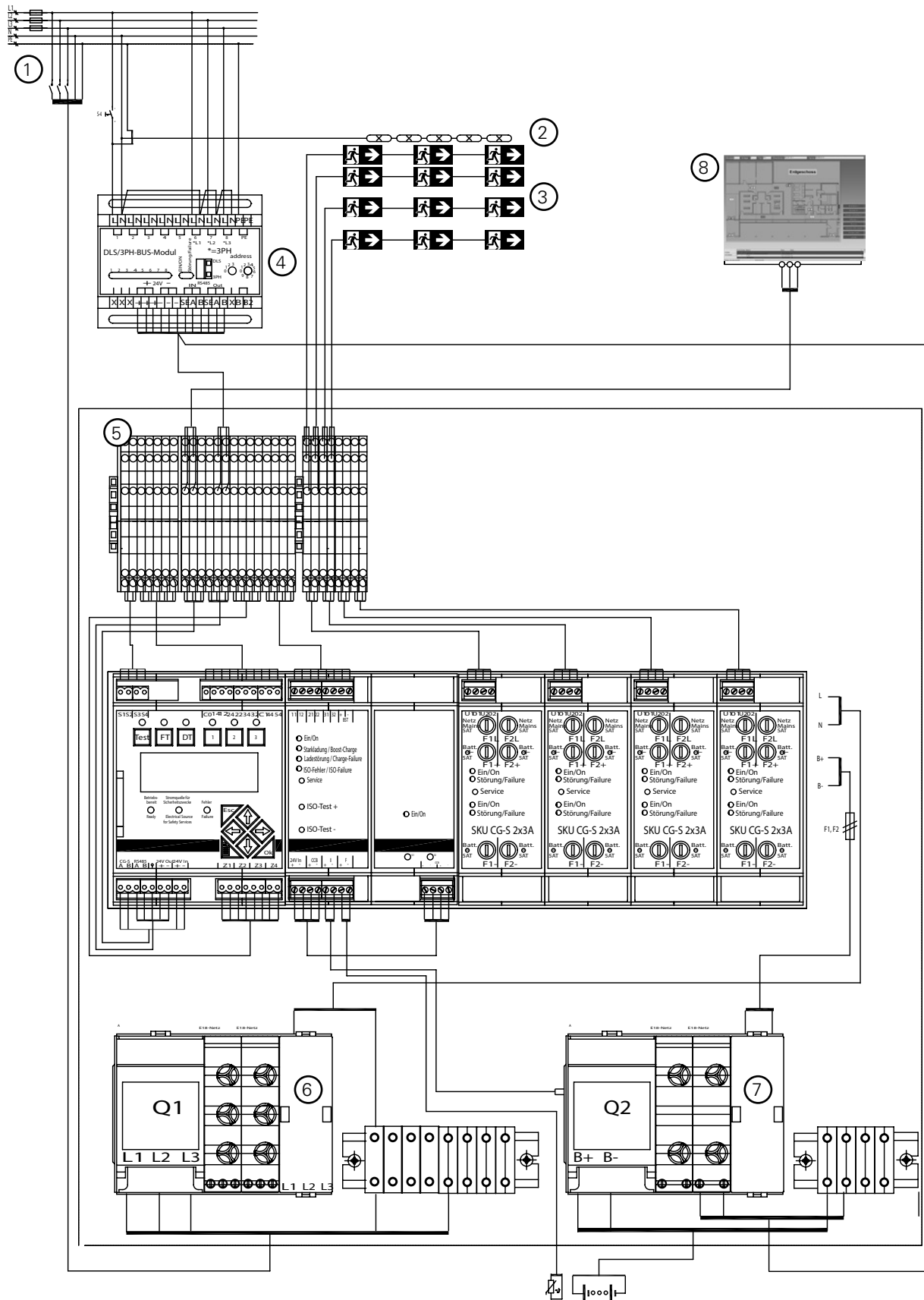
The following technical data is given on the label of the system:

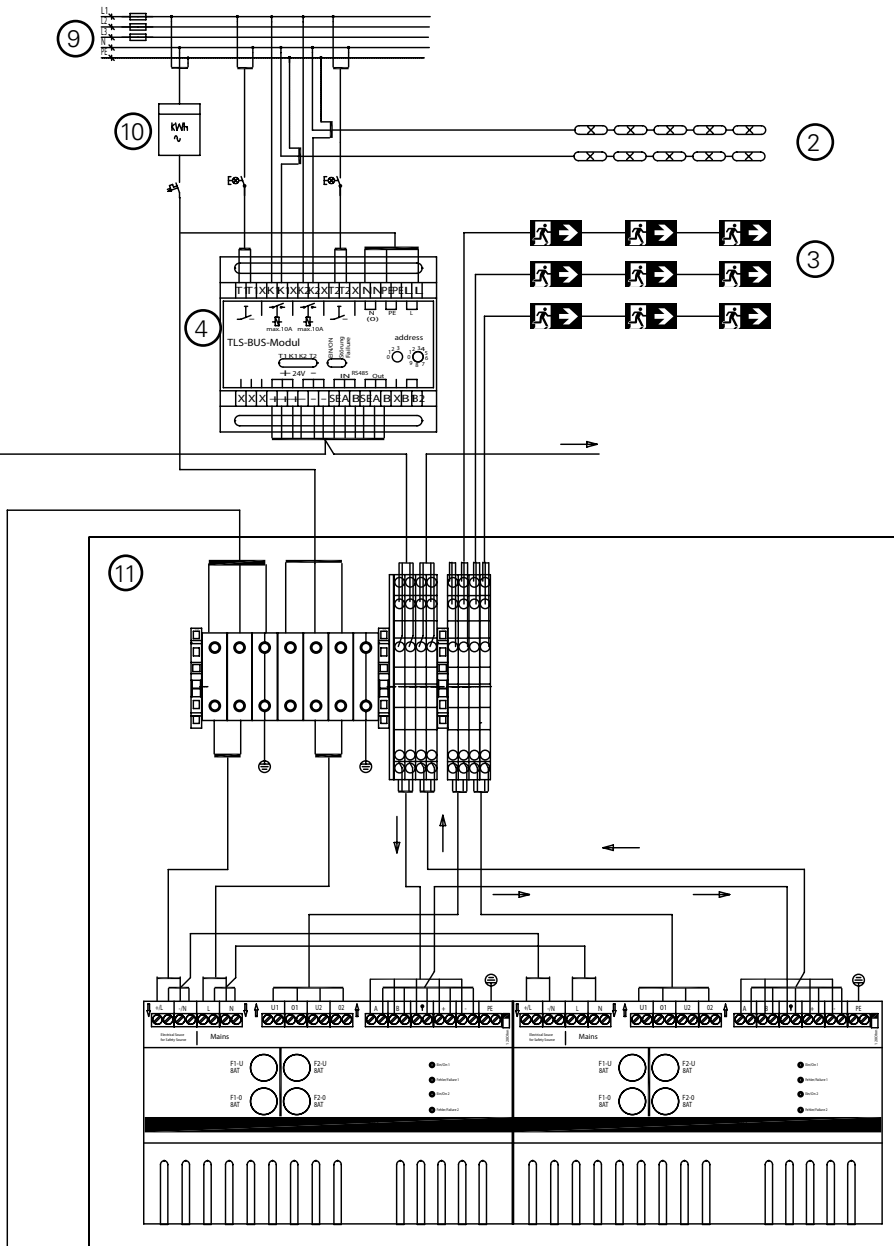
<b>COOPER Safety</b>		<i>Made in Germany</i>		
<b>Type:</b> ZB-S/10C - 40071347082				
<b>Bemessungsspannung</b> 1~230V/N/PE 50/60Hz		<b>Schutzart</b> IP 21		
<i>Rated voltage</i>		<i>Protection category</i>		
<b>Bemessungsstrom</b> A		<b>Sicherung</b> 25 A		
<i>Max. Rated current</i>		<i>Fuse</i>		
<b>Zul. Umgebungstemp.</b> -5 °C / +35 °C		<b>Lst.-NR</b> 31693		
<i>Max. ambient temperature</i>				
<b>Auftr.-Nr.</b> 202259496 / 10				
<i>Order number / Pos</i>				
<b>Prüfung</b>		<b>Funktionstest</b>		
<i>Check</i>		<i>operating test</i>		
<input checked="" type="checkbox"/> <b>Visuelle Überprüfung</b>		<input checked="" type="checkbox"/> <b>Steuerteil</b> 00 22 84 90 84 00		
<i>Visual control</i>		<i>Control unit</i>		
<input checked="" type="checkbox"/> <b>Hochspannungstest</b>		<input checked="" type="checkbox"/> <b>Ladetell</b>		
<i>High voltage test</i>		<i>Charger</i>		
<input checked="" type="checkbox"/> <b>Schutzleiterstest</b>		<input checked="" type="checkbox"/> <b>Optionen</b>		
<i>Protection earth connection point</i>		<i>Options</i>		
<b>Erhaltungsladespannung bei</b> 20 °C		<input type="checkbox"/> 245,1 V <input checked="" type="checkbox"/> 247,8 V		
<i>Float charge voltage at:</i>				
<b>Datum</b> 21.05.2012		<b>Prüfer</b> H. Lange		
<i>Date</i>		<i>Tester</i>		
<i>Stempel: HV / PE Test + Unterschrift</i>				
Zur Verwendung in Anlagen nach EN 50171 geeignet. <i>Modified for use electrical installations acc. to EN 50171</i>				

The following technical data is given on the label of the battery:

<b>COOPER Safety</b>		<i>Made in Germany</i>		
<b>108 Zellen</b>		<b>Bemessungskapazität gem. EN 60896-2</b>		<b>23,3 Ah</b>
<i>cells</i>		<i>(C10; 1,8V/Z; +20°C)</i>		
<b>Batterietype</b>		<b>P12V600</b>	<b>Sprinter P</b>	<b>Menge 18</b>
				<i>Peaces</i>
<b>Bemessungsspannung</b>	<b>216V DC</b>	<b>Bemessungsstrom</b>	<b>15,4 A</b>	
<i>Rated voltage</i>		<i>Max. Rated current:</i>		
<b>Bemessungsleistung</b>	<b>3,3 KW</b>	<b>Nennbetriebsdauer</b>	<b>1,00 h</b>	
<i>Rated power</i>		<i>Rated duration time</i>		
<b>Bem.-Temperatur</b>	<b>20C°</b>	<b>Min. Spannung nach 1,00 h</b>	<b>183,6V DC</b>	
<i>Rated temperature</i>		<i>Min. voltage after</i>		
<b>Achtung!</b>				
<b>Es dürfen nur auslaufsichere Batterien verwendet werden!</b>				
<b>Please use only leak proof batteries!</b>				
<b>Vor Inbetriebnahme der Batterien muss sichergestellt werden, dass die eingestellte Erhaltungsladespannung mit den Herstellerangaben übereinstimmen!</b>				
<b>Before start-up of the batteries must be guaranteed that float charge voltage is according to manufactures specification!</b>				
Zur Verwendung in Anlagen nach EN 50171 geeignet. <i>Modified for use electrical installations acc. to EN 50171</i>				

## 4.6 Example of Installation





- |                        |                            |                        |
|------------------------|----------------------------|------------------------|
| ① Mains supply         | ⑤ ZB-S system              | ⑨ General power supply |
| ② General lighting     | ⑥ Mains distribution box   | ⑩ Rental current meter |
| ③ Emergency luminaires | ⑦ Battery distribution box | ⑪ US-S/SOU2            |
| ④ DLS 3-Ph bus module  | ⑧ CGVision                 |                        |

### 5 Transport, Packaging and Storage

#### 5.1 Safety Notes

---

##### **▲ WARNING! RISK OF INJURY!**

---

**There is a risk of injury when transporting or loading due to falling parts.**

---

##### **▲ ATTENTION!**

---

##### **Damage to Property!**

**Batteries will be destroyed or damaged by improper transport.**

The following safety notes have to be observed:

- Never lift loads over person's head.
- Always move battery with great care and attention.
- Only use lifting accessories and hoisting devices with enough loading capacity.
- Always handle and store the ZB-S system upright (see markings and „do not tilt“ sign on the pack)
- Avoid ingress of dust and moisture during handling.
- Ensure that all transport routes
  - are clear (sufficient width and headroom for all transport movements),
  - provide enough room for persons to take evasive action if loads tip over or slip,
  - have sufficient loadbearing capacity (for the load, transport packaging and handling equipment)
  - could not overstrain the used transport equipment in regard of increase and constitution of underground.
- Use only
  - handling equipment (e. g. pallet trucks, fork trucks, etc.)
  - slinging equipment (lifting beams, chains, ropes, etc.)
  - and securing equipment (chocks, timbers, guide/tensioning/securing ropes, etc.)
  - that are in technically perfect condition and of adequate loadbearing capacity.
- Follow all information shown on the transport packaging and/or on the device/control cabinet relating to handling, transport position, slinging points.
- The equipment must be handled by persons familiar with the appropriate procedures and signals and able to carry out the handling operations properly and with due regard to safety and hazard procedures.

#### **Batteries**

For battery handling and storage please follow the battery manufacturer's directions and the instructions about the battery cabinets.

#### **5.2 Transport inspection**

Check delivery on receipt for completeness and for transport damages, immediately. If external damage is detected do not accept the delivery, except under protest.

#### **5.3 Packaging**

If no return- agreement exists for packing material separate it according to type and size for further use.

---

##### **▲ ATTENTION!**

---

**Packing material has to be recycled in an environmentally friendly way and according to the local provisions governing disposal. If necessary, commission special recycling company.**

Observe notes for handling printed on the packing material!

#### **5.4 Storage**

Keep packages closed up to mounting and observe the external marked arrangement and storage notes.

Store packages under the following conditions:

- Not to be stored outside
- Keep dry and dust-free
- The storage location should be clean and tidy
- The time of storage should be as short as possible (FIFO- method)
- It is forbidden to stack one pallet/system above the other

#### **Attend for batteries:**

When storing batteries as spare parts the information in the ‚Battery cabinets‘ / ‚Battery rack‘ installation and operating instructions must be observed.

If the mains supply to the ZB-S central battery system is interrupted for more than three days, then the battery circuits must be isolated (by removing the battery fuse). This should be done by qualified electricians.

---

##### **NOTE**

---

Please observe additionally the operation instructions for battery cabinets and/or battery racks.

## 6 Installation

### 6.1 Safety Notes

---

#### ⚠ WARNING! RISK OF INJURY!

---

**Improper mounting and installation can cause serious personal injury and/or material damage. This work must only be performed by authorised, skilled and adequate personnel who have received instructions providing information on the device and in observance of the local safety regulations.**

- Ensure there is enough free moving space.
- Ensure orderliness and cleanliness at the working place. Loose tools lying around are dangerous!
- Assure a sufficient cooling of the system!
- Observe the environmental conditions regarding the insulation class and degree of protection (acc. to the protection against a contact of conducting parts and ingress of dust, impurity or moisture)
- Ensure that the cable length in an emergency light circuit to the last luminaire in the circuit does not exceed the maximum permitted cable length.
- Special regulations for ESF-E30:  
Enclosures must be fitted to the masonry horizontally. The masonry must be designed for a circuit integrity of at least 30 minutes. The circuit integrity of the masonry must not be impaired by assembly.

The modular layout of the items of equipment illustrated in these assembly and operating instructions may differ from that supplied. Particular features of custom designs are described in the project documents that must be ordered separately.

---

#### ⚠ WARNING!

---

**Work on the general supply network and the running of load, signal and control cables and connection of the battery power supply must be carried out by qualified electricians with special knowledge of the legal and technical basics for the assembly and operation of emergency lighting systems. This takes also place for initial commissioning or recommissioning.**

**Take all necessary measures to ensure occupational health and safety!**

**As well as compliance with general trade standards and procedures, this specifically includes complying with chapters 1+2 of these instructions.**

---

#### NOTE

---

All connecting cables must be laid according to the relevant electrical engineering codes of practice and standards (e. g. standard series DIN VDE 100).

You must also comply with all standards and directives of the country in which the system is installed and operated.

Secure all the cable entry and exit openings in the control cabinet with the supplied M-type glands or rubber grommets to prevent damage to the cables and ingress of moisture.

---

#### ⚠ ATTENTION!

---

Only ballasts and luminaires that are rated for an operating voltage of 230 V AC (50 Hz) and 220 V DC may be connected to the outputs for the emergency lighting/final circuits of the ZB-S system.

Many operations require the system to be isolated first for safety reasons (or to protect components). Because the system switches over to battery operation when the mains supply is isolated, there are certain procedures which must be followed- these procedures are described below.

The controller software and its last switched status are stored in a nonvolatile memory.

---

#### ⚠ DANGER!

---

**Improper use of the batteries or battery-powered parts of the plant can cause risk of injury or danger of death from high current or arcs that can occur briefly on battery discharge. The instructions given in this manual for connecting/disconnecting the batteries must be strictly adhered to (see «Connecting the Battery Power Supply»).**

**Ensure that the battery banks are connected to the correct poles (battery cabinets/racks)!**

---

#### ⚠ ATTENTION!

---

Short circuits and incorrect polarity may damage the battery bank or installation of a ZB-S or US-S system.

Provide proper ESD-protection when working on electrical equipment (e. g. connecting control or signal cables) or electronic equipment (e. g. fitting or removing modules in the control cabinet)!

Never switch the mains or battery supply on or off under load. In both of these cases the system must first be isolated at the CU CG-S controller (or remote switch if installed).

### 6.2 Assembly

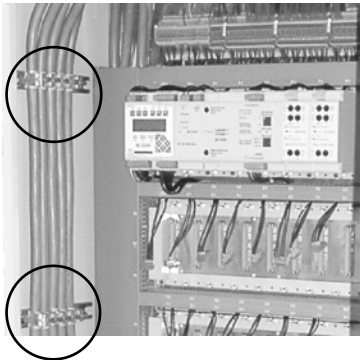
Requirements to the place of assembly:

- Assembly on a level surface of sufficient loadbearing capacity.
- The site must be horizontally levelled.
- The baseplate of the cabinet provides holes for floor anchoring or bolting to a base.

## 6 Installation

### 6.3 Installation

- Isolate all connecting cables (mains and battery power supply) and lock them out (e. g. by removing all fuses and proper securing of the mains supply distribution board and the battery bank using warning signage and/or locks).
- Run the connecting cables (mains and battery supply) to the control cabinet position with an adequate length allowance (e. g. for installation in the cable trunking inside the cabinet). This work must be carried out properly according to the relevant standards and codes of practice.
- Secure all cable entries with the M-type glands provided.
- Run all connecting cables in the cable trunking provided in the control cabinet.



#### NOTE

This figure shows the outgoing cables for the mains and battery supply of slave stations mounted on C-section rails on the cabinet wall (part no. 400 71 347 126) using appropriate cleats. Leave no connecting cables temporarily loose and unsecured!

Subsequent additions or modifications to the component layout are possible; such work on the internal layout of the cabinet is not described in this manual however as it must be carried out by specially trained CEAG engineers!

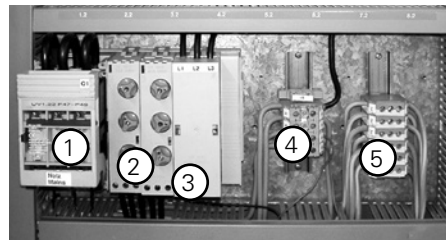
The installation and connection of the general lighting system is not described in this manual.

Lighting equipment must be assembled, run and connected according to the relevant electrical engineering standards and codes of practice. You must also comply with all standards and directives of the country in which the system is installed and operated.

### 6.4 Connection to mains

#### 6.4.1 Connection to mains supply of a ZB-S station

ZB-S systems are supplied from the mains and from the batteries in a battery rank (battery cabinet or rack).



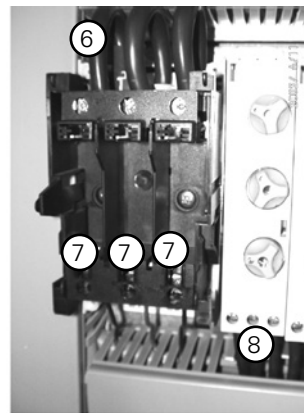
Load disconnecter (1) (terminal box and fuse box for the mains supply)

Outgoing distributor (2)

Cabinet distributor (3)

N-terminal block (4)

PE-terminal block (5)



Connections shown with load disconnecter cover removed

Connection cables for the busbar (mains) at the back (6),

Mains supply feeders for the ZB-S station (7),

Outgoing feeders for the mains supply of US-S substations (8)

#### Connecting the cables for the mains supply to the ZB-S control cabinet:

- Ensure that the system and feeders are isolated and locked out!
- Connect the earth conductors to the PE terminal block (pos. 5).
- Connect the neutral conductors to the N-terminal block (pos. 4).
- Connect the load conductors to the L-terminals (pos. 7) on the disconnecter

#### NOTE

For single-phase operation, a load-current cable only is connected, and the input terminals (pos. 7) on the disconnecter are jumpered.

### 6.4.1.1 Usage of RCDs in the incoming mains of ZB-S systems

Using RCDs in the mains lead to protect against indirect contact acc. to VDE 100 part 410, please observe the following: Fault activations can be caused by different actions:

- Activation caused by installation failures.
- Activation caused by external actions.
- Activation caused by capacitive leakages.

When designing and executing, it is important to use the right RCD. Please attend to the following when using RCDs in the network supplies of systems:

Capacitive leakage

Outgoing line lengths must be included in to the selection of RCDs.

Example 1:

ZB-S 10C3 with 17 circuits a 100m line length and a RCD with 30mA release current in the incoming mains. The total line length exceeds a value of 1500m and can cause a RCD by line-bound capacitive leakages.

RCD In = 10mA	max. line length = 500m
RCD In = 15mA	max. line length = 750m
RCD In = 30mA	max. line length = 1500m
RCD In = 300mA	max. line length = 15000m

Maximum number of user

In general the isolation resistance is 0.5M at mains voltage of 230V. That means a leakage of <math><0.5\text{mA}</math> (230V/0.5M) per user is permissible.

Example 2:

ZB-S 10C3 with 17 circuits and 10 luminaires per circuit and a RCD with 30mA in the incoming mains.  $17 \times 10 \times 0.5\text{mA} = 85\text{mA}$  leakage.

The addition of the single leakages of the connected user to the RCD exceeds a value of 30mA and can cause the RCD.

## 6.4.2 Connection to mains of substations US-S

If the US-S substations are supplied via the power supply of the corresponding ZB-S system (Pos. 2) then a branching distributor (article no. 400 71 347 160) for three 1-phase or one 3-phase current supply must be planned for connection.

Connecting the cables for the mains supply to a US-S substation:

- Ensure that the system and feeders are isolated and locked out!
- Run the feeders to/in the ZB-S control cabinet and in its trunking (pos. 8) and to/in the control cabinet of the US-S substation.
- Connect the earth conductor (PE-conductor) to the terminal block (pos. 5)
- Connect the neutral conductor to the terminal block (pos. 4)

- Connect the L conductors to the terminals on the outgoing feeder (pos. 2)

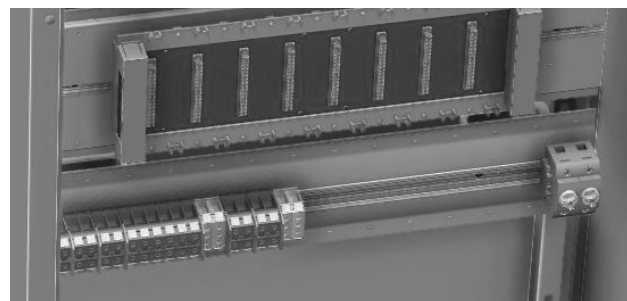
The mains supply is connected in the control cabinet of the US-S substations as described in section 6.4.1.

### NOTE

To assist operations, outgoing distributors can be pulled forward off the busbar when the lock on the upper enclosure wall is released. Once the outgoing circuits have been connected, the outgoing distributor can be pushed back in position on the busbar with slight pressure and locked in place.

### ATTENTION! RISK OF INJURY!

Additional device fuses are installed in the sub-distributors of type US-S 28 und US-S 36. The device fuses are not suitable for disconnecting the sub-distributor and must not be used under load can be disconnected.



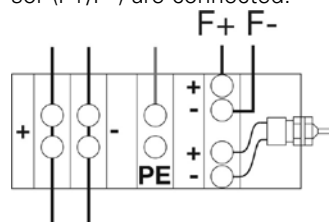
## 6.5 Connection to battery power supply

Refer to the battery manufacturer's datasheets that are enclosed with the CEAG battery banks!

Comply with the statutory requirements and regulations ruling at the site of the emergency lighting system!

### NOTES:

CEAG battery cabinets are supplied as standard with a cabinet terminal block to which the connecting cables (+/-) for the battery power supply and a temperature sensor (F+/F-) are connected.



The PE-connection protects live parts of the battery cabinet (refer to «Installation instructions for Battery cabinets and Battery racks»).

The connecting cables to the terminals of the interconnected batteries are not supplied with battery racks or cabinets. The connection terminal block is not supplied with battery racks.

- CEAG recommend the installation of the battery distribution board with disconnecter and fuses for the battery circuit (see «Installation instructions for Battery distribution board») that allows safe isolation of the terminals for the connecting leads that run to the ZB-S.
- The battery connection cables (for the ZB-S cabinet and

## 6 Installation

its US-S substations) must be run with ground fault and short circuit protection according to DIN VDE 0100 T520!

- The size of these cables must be rated to meet the anticipated currents flowing to the connected loads.
- Only one temperature sensor (F+ / F-) may be connected to the charging module LT.1 of the ZB-S cabinet. Its lead must be run separately to the battery bank. This can be a 2-core lead with a cross-section of 0.5 mm<sup>2</sup> for lengths < 50m.
- Only one temperature sensor (F+ / F-) must be connected to the battery control module. Its cable must be routed separately to the battery bank. A 2-core cable can be used for this purpose, with a cross-section of 0.5 mm<sup>2</sup> for lengths < 50 m.

---

### ⚠ WARNING!

---

**The battery power supply is a nominal 216V DC! Improper handling can lead to life-threatening shocks or burns (arcing)!**

- Ensure that the battery banks are connected with the correct polarity.
- Turn off all connected loads first («Disable system») to prevent arcing when the battery circuit is disconnected (or connection)!

---

### NOTE

---

Sequence for making the connections:

- Connect the cable labelled „+“ to the positive terminal of the battery bank.
- Connect the cable labelled „-“ to the negative terminal of the battery bank.

The battery supply is disconnected in reverse order of connection.

### 6.5.1 Connection to battery power supply for a ZB-S station

The connection cables for the battery power supply are used to supply the modules in the ZB-S (or US-S) cabinet and the emergency lighting circuits (switched across the SKU modules). They are also used to charge the connected battery banks controlled by the charging module.

Only when the controller is disabled (at the ZB-S central battery system and its US-S substations) can the connections of the battery power supply be safely isolated with the load disconnecter (Batt). The charge modules and all circuits of the SKUs are not offload until the mains supply is isolated.

Remember that the connecting cables of the battery bank (battery cabinet/rack) may still be live!

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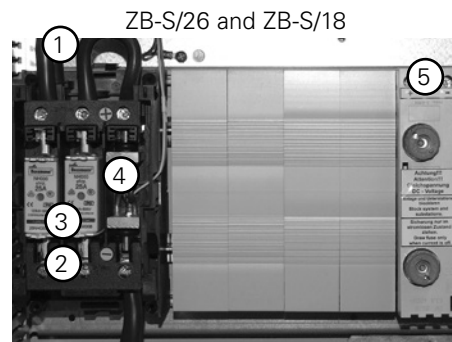
### NOTES:

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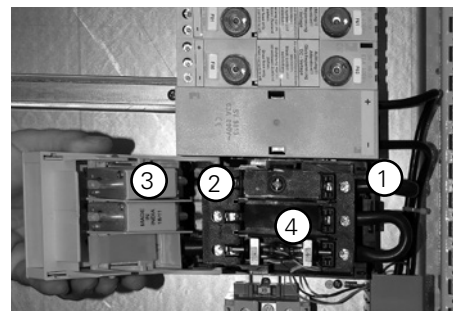
The connections (+ / -) are accessible when the moving part of the load disconnecter (Batt) is removed (remove occurs analogical).

Connecting the cables for the battery supply to the ZB-S control cabinet:

- Ensure that the system and feeders are isolated and locked out!
- Connect the positive conductor to the positive terminal on the load disconnecter.
- Connect the negative conductor to the negative terminal on the load disconnecter.



ZB-S LAD



### Open load disconnecter (Batt) showing

Pos. 1: Connection cables for the busbars(Batt) at the back

Pos. 3: Connections (+ / -) for the battery supply

Pos. 3: Fuses (Batt)

Pos. 4: Shunt for battery current measurements

Pos. 5: Terminal (+ / -) and outgoing circuits for the battery supply of US-S substations

### 6.5.2 Connecting the Battery supply of a US-S substation

US-S substations are supplied from the power supply of their associated ZB-S system. An outgoing distributor can be used for a battery power supply. The central terminal and related fuses are not used.

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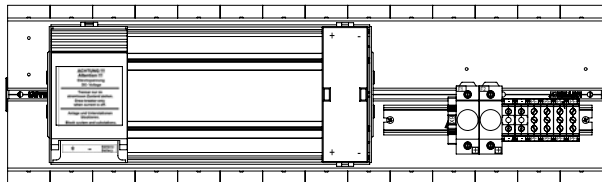
### NOTES:

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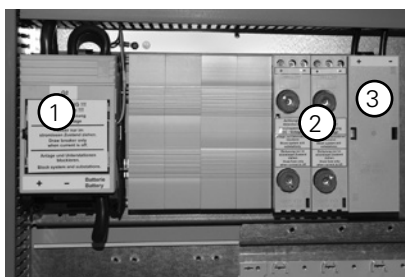
To assist operations, outgoing distributors can be pulled forward off the busbar when the lock on the lower housing is released. Once the outgoing circuits have been connected, the outgoing distributor can be pushed back in position on the busbar with slight pressure and locked in place.

**ATTENTION! RISK OF INJURY!**

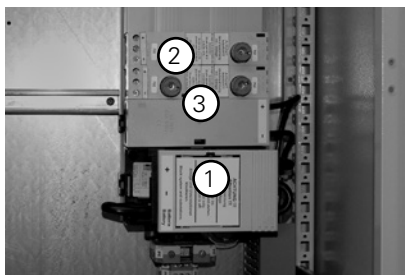
Additional device fuses are installed in the sub-distributors of type ZB-S 18 and ZB-S 26. The device fuses are not suitable for disconnecting the sub-distributor. Also the disconnection under load is not allowed.



ZB-S/26 and ZB-S/18



ZB-S LAD



Location of the load disconnect (1) for the battery supply  
Pos. 2: Outgoing distributors (Batt) and Pos. 3: Cabinet distributor (Batt)

Comply with all warning information!

**Connecting the cables for the battery supply to a US-S substation:**

- Ensure that the system and feeders are isolated and locked out!
- Run the feeders to/in the ZB-S control cabinet and in its trunking and to/in the control cabinet of the US-S substation.
- Connect the positive conductor to the positive terminal on the outgoing distributor.
- Connect the negative conductor to the negative terminal on the outgoing distributor.
- When upgrading fuse elements, the included label for designating the connections should be attached with correct polarity according to the diagram.

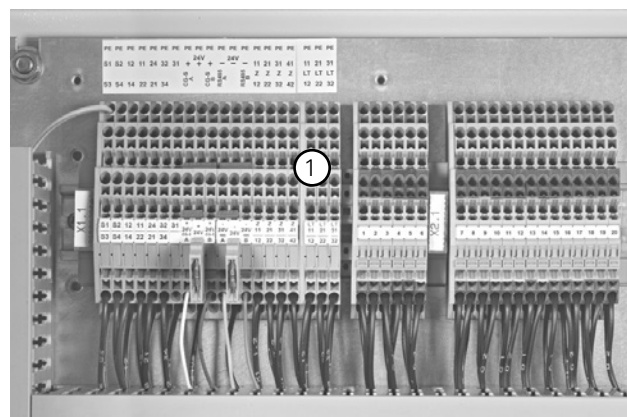
**6.6 Connection of temperature sensor**

A temperature sensor (to monitor the temperature of the battery bank) of the ZB-S central battery system is mandatory for emergency lighting systems with a central battery.

The connection to the charging module is made in the cabinet at terminals F+ and F- on the 3-tier installation terminals with tension spring-connection.

Run the temperature monitoring cable between the battery bank and the ZB-S cabinet and connect it in the cabinet to its 3-tier installation terminal with tension spring-connection.

X1.1



Location of the terminal block for connecting a temperature sensor in a ZB-S control cabinet (1)

**ATTENTION!**

For the connection of external temperature sensor an insulated cable must be used.

Connect the screen with the screen-quick-connector one-sided at the protective conductor terminal (s. 9.1.1).

**6.7 Connection and installation of internal modules**

All modules for the ZB-S (US-S) cabinet are plugged on a subrack. These sockets contact the module at its mounting position; locking pins secure the module's position. The mains or battery power required for the modules is also supplied via these sockets.

For easy fitting and removal, these modules are connected to plug-in screw terminal blocks which can be pushed on or pulled off at the front of the modules. The connecting cables of these screw terminals are connected to the terminal strip at the top of the control cabinet (matching is by number codes on the subrack and on the terminal block).

External incoming and outgoing circuits are connected via this row of terminal blocks in the top of the cabinet.

**NOTES:**

The circuit numbers used in the displays of the CU CG-S controller and the displayed switch outputs of the SKUs

## 6 Installation

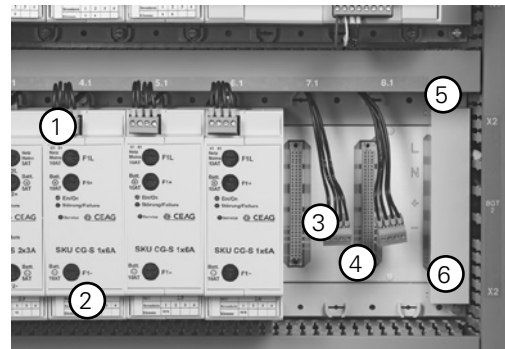
are assigned by the choice of slots on the subracks.

To ensure that replaced SKUs function correctly under the controller they must first be identified, activated and their parameters set up with controller software.

### ⚠ ATTENTION!

Never fit or remove SKU modules in the ON condition! Deactivate an SKU module at the CU CG-S controller before removing or refitting it, e. g. for testing. For dismantling or modification work the controller must be disabled to prevent activated circuits from being turned on when an SKU module is fitted.

Subrack 1 (with modules fitted) and subrack 2 (with 8 free slots)



- Pos. 1: plugin terminal block with the module connections (fitted)
- Pos. 2: lower fixing (pivoted locking pin) for the SKU module
- Pos. 3: plugin terminal block with the module connections (removed)
- Pos. 4: socket for modules
- Pos. 5: upper retaining screw for the cover (pos.6)
- Pos. 6: cover for terminals (L, N, + and – and other socket connections) of subrack 2

### 6.8 Connection of the emergency lighting

Maximum pipeline length in the final circuit based on the STAR and CG protocol – For a safe communication in the final circuit, the line impedances and pipeline length shown in the table, don't be allowed to pass nominal load.

Type	Cable cross-section (mm <sup>2</sup> )	Maximum line impedance (Ω)	*Maximum pipeline length (m)
SKU CG-S 1x6A	2,5	5,2	450
SKU CG-S 2x3A	2,5	10,4	900
SKU CG-S 4x1,5A	2,5	20,8	1800
SKU CG-S 1x6A	1,5	5,2	275
SKU CG-S 2x3A	1,5	10,4	550
SKU CG-S 4x1,5A	1,5	20,8	1800

**\*ATTENTION!** The in the table shown pipeline length don't consider the power failure and turning-off terms of the final circuit fuse at fault, but exclusive the luminaires communication with the ZB-S at mains- and batterie operation.

## 7 Commissioning and other work

### 7.1 Safety Notes

#### ⚠ WARNING! RISK OF INJURY!

**Never switch the mains or battery supply on or off under load (that means when final circuits are switched on).**

**For battery supply obtain: never disconnect or connect cables to the battery bank under load and never open or close the fuse switch for battery supply in the cabinet under load.**

### 7.2 Checking all connections

Before switching on the emergency lighting system:

- check that the complete system is isolated and lock it out. Do not restore the supply until all work has been completed.
- examine the condition of all cables and connections by reference to the drawings and plans for the emergency lighting system, and check that the installation work complies with the relevant standards and codes of engineering practice.
- check that all connections and screw fastenings are tight.
- check all cable glands for tightness and seal quality.

### 7.3 Voltage measurements

- Measurements of supply voltages and measurements on the final circuits may only be carried out by qualified electricians!
- Be aware of the particular hazards when carrying out measurements on multiple-phase power supplies!
- Only use instruments with adequate voltage and current strength!
- All measurements within internal installations may only be carried out by CEAG service engineers!

### 7.4 Insulation Testing

Check that the complete system is isolated and lock it out. Do not restore the supply until all work has been completed.

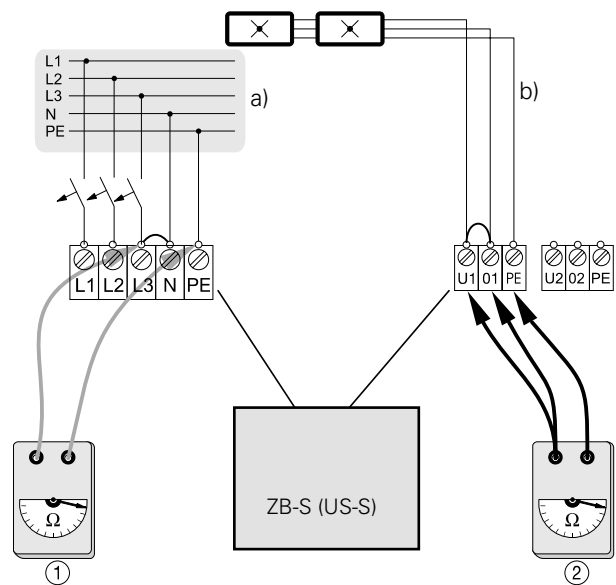
#### ⚠ DANGER!

Insulation tests may only be carried out between the PE conductor and every phase conductor L1, L2 and L3 as well as between the PE conductor and the neutral conductor N. Do circuits contain electronic equipment, the neutral conductor and the phase conductor must be connected while measuring.

Test voltage: max. 500V DC, Test current 1 mA!

Use only measuring devices which are able to meet the demands of DIN VDE 0413.

- Disconnect the connecting cables for the mains and battery supply.
- Link the connections L and N of the switch cabinet at the terminals of the mains supply or outgoing distributors.
- Carry out the insulation test as shown in below figure for
  - the connections of the mains supply (L/N) against PE for the ZB-S cabinet and its outgoing circuits
  - and similarly for the US-S substations.
- At the ZB-S (US-S) switch cabinet, link connections U1/O1 etc. at the output terminals of the final circuits of the cabinet and test the insulation for the final circuits U1/O1 or U2/O2 etc. against PE.
- On completion of the insulation tests, remove the links across terminals L/N (on the mains supply and/or outgoing circuits) and U1/O1 etc. at the terminal of the final circuits.
- Reconnect all disconnected cables and check the PE connected on the cabinet door.



a: Insulation test on the power supply (mains)

b: Insulation test on final circuits

#### NOTE

Linking L / N and U1 / O1 ( ... ) will protect active components of the electronics in the ZB-S (US-S) cabinet and of the luminaires (ballasts) from possible destruction!

## 7 Commissioning and other work

### 7.5 Checking / replacing of fuses

The fuses for the mains and the battery power supply are located in the related load disconnectors and at the battery bank respectively.

The final circuits are also fused in the SKU modules, and individual circuits are fused in other modules.

#### ⚠ WARNING!

**Do not open the load disconnector until the system (ZB-S switch cabinet and any US-S substations) has been isolated.**

#### ⚠ ATTENTION!

**Never remove the fuses from the SKU modules or the charging module LT.1 under load!**

### 7.5.1 Checking the fuses of the mains and/or battery power supply

First disable the controller of the ZB-S switch cabinet and of the US-S substations (if any).

- Open the load disconnector for the mains and/or battery supply.
- In the ZB-S cabinet and US-S substations (if any) ensure that all fuses in the load disconnector for the mains and battery power supply
  - meet the required technical specifications
  - are correctly fitted
  - and are intact.

### 7.5.2 Setting of float charge voltage of the Battery Control Module (BCM.1E)

#### SAFETY NOTE

Safety notes are marked with this symbol in the main instructions.

Please read these notes carefully before work begins!

Adjustment work at the system must only be done by skilled electricians.

#### General Information

When central battery systems are supplied without battery or the type of battery is unknown the tripple charge-voltage is set up with the factory default of 245V (means 2.27V/Z). According to the type of battery the tripple charge-voltage must be fitted at face.

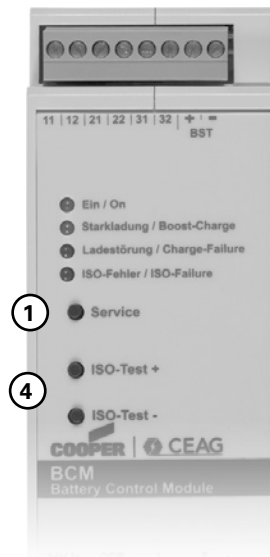
Adjust the tripple charge-voltage as follows:

1. Press and hold the service pin (1) of the BCM.1E for several seconds until the green LEDs flash alternately. The control unit display is now controlled by the BCM.1E. Make sure that no charge fault exists beforehand as

otherwise the CU CG-S activates an error display.

2. The voltage „U=“ (2), now shown in the display of the CU CG-S control unit, is the float charge voltage to be set. The current displayed, „I=+“ (3), represents the number of located CMs on the CCB bus, 1A = 1CM.
3. Now set the float charge voltage with the „ISO Test+“ and „ISO Test-“ buttons (4) according to battery manufacturer specifications.

Battery Control Module BCM.1E

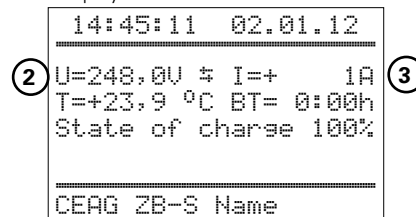


#### ⚠ CAUTION!

The float charge voltage is always set to the corresponding value at a temperature of 20° C.

4. To save the voltage, press and hold the service button (1) again until the green LEDs stop flashing. Setting mode is terminated automatically after one minute if the Iso Test buttons are no longer pressed.

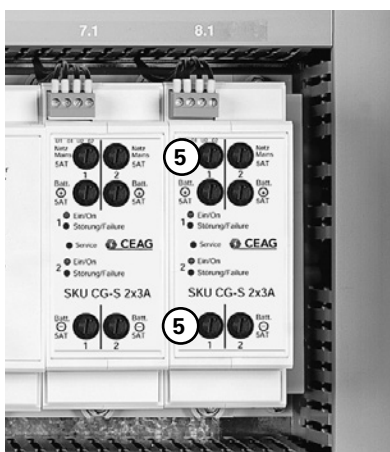
Display at the control unit CU CG-S



### 7.5.3 Checking the fuses of SKU modules

For safety reasons, all SKU modules should first be isolated by disabling the controller of the appropriate ZB-S (US-S).

To check or replace the fuses, proceed as described in section 7.5.2.



Location of the fuses (5) on an SKU module, example of an SKU module CG-S 2x3A

### ⚠ ATTENTION!

**Only fuses approved by CEAG Notlichtsysteme GmbH are permitted to use.**

## 7.6 Checking and replacing internal modules

Before checking or replacing the internal modules the emergency lighting system must be disconnected. Therefore observe:

- Block the system before isolating the emergency lighting system at the distribution board and/or battery supply. This is done with the <<Block/release device>> option in menu 2 <<Block, reset>> in the controller software.
- Now isolate the battery power supply first and then isolate the mains supply.
- Lock out the isolations while work on the system is in progress or while the system is in an unsafe condition.

### NOTE

If a battery bank supplies a number of systems then all systems must be isolated first! Start by isolating at the lower levels of the US-S substations before you isolate the ZB-S central battery system.

Before you reconnect the supply at the terminals of the battery bank for the battery supply, power on the mains supply and ensure that the system is disabled. Only now should you power on the battery supply at the battery bank.

For mounting or dismantling of modules please see chapter 6.7 „Connection and installation of internal modules“ and all warning notices!

### NOTE

On the SKU-modules you will find a Service push button that can be used for initial commissioning and for testing purposes. When it is pressed, the controller software displays addresses and characteristics of the selected module directly on the LC display of the controller.

## 7.7 Checking and replacing external modules

For mounting and dismantling of a module please see chapter 6.8 „Connection and installation of external modules“. Please observe the following:

- Set the intended address for the module with modules with address switch. Avoid assigning the same address more than once as this causes stoppages.
- To ensure that replaced external modules function correctly under the controller they must first be identified, activated and their parameters set up with the controller software.

On the modules you will find a Service push button that can be used for initial commissioning and for testing purposes. When it is pressed, the controller software displays addresses and characteristics of the selected module directly on the LC display of the controller.

## 7.8 Powering up the system

The following sequence of operations assumes that the system (ZB-S plus US-S substations) has first been isolated and locked out. It is also assumed that the parameter setup of the controller software or its switch settings have not been changed in the meantime!

- Switch on the mains supply to the ZB-S switch cabinet and its US-S substations at the load disconnecter.
- Ensure that the controller of the ZB-S cabinet and any subsystems (US-S) are blocked. Secure this plant condition against unauthorised action!
- Switch on the battery supply to the ZB-S switch cabinet and its US-S substations at the load disconnecter.
- Switch on the controllers with <<Release device>> menu option.

## 8 Operating

### 8 Operating

#### 8.1 Safety Notes

##### **▲ WARNING! RISK OF INJURY!**

**Improper mounting and installation can cause serious personal injury and/or material damage. This work must only be performed by authorised, skilled and adequate personnel who have received instructions providing information on the device and in observance of the local safety regulations.**

##### **Before work begins:**

- check its completeness and technical correctness,
- ensure there is enough free moving space.

##### **During operation:**

- When failures arise first of all switch system off and protect against reengagement.

##### **When working on and with the device it is necessary to wear:**

- Close fitting protective clothes (low tensile strength, no wide arms, no rings and further jewelry, etc.)
- Safety boots which protect against falling parts and against slipping on non-anti-slip floor.

#### 8.2 General information about operating

A ZB-S or US-S system is operated at several different levels. First, a distinction must be made between:

- operating and monitoring the system during operation (test mode or normal operation).
- and setting up the system with the requirements (parameter settings for the CU CG-S controller) for the emergency lighting circuits and the user-assignable functions and function keys of the control module.

Operating and monitoring the system during operation can be done with

- the buttons and displays/LED indicators on the modules in the switch cabinet (CU CG-S, PSU.1E, charging module, installed SKUs),
- remote indicators or CG controller
- F3 module or with a building services management system (BMS).

Setting up the system (and changing its parameter settings) can be done

- directly on the control module in the ZB-S (or US-S) switch cabinet
- or with a memory card using a standard PC running under a CEAG configuration software for the ZB-S system.

##### **NOTE**

The following descriptions are not covered by this manual as this requires detailed instructions within the technical documentation for these systems:

- Operating and monitoring the system with an F3 module, CG controller or building management system (BMS)
- Software-aided system setup using a memory card

Operating and monitoring the system, in the scope specified above, during operation (test mode or normal operation) requires a knowledge of

- the operation of the CU CG-S control module in the switch cabinet,
- the key functions and displays/LEDs on the other modules in the switch cabinet of a ZB-S or US-S system, and
- the use of certain hardware components (checking and replacing fuses or checking and replacing modules).

Otherwise please refer to the technical documentation for these components.

#### 8.3 Controls and displays on the modules

All of the modules in the switch cabinet have LEDs that indicate the operational status of the assigned functions.

Red LEDs indicate that the assigned function is in fault or that a malfunction has occurred. If no LED lights up on a module then module's supply may be interrupted.

##### **NOTE**

The CU CG-S control module has numerous diagnostic functions and operating menus for analysing and remedying malfunctions. You should use and analyse these options before attempting work on the fuses of modules or final circuits. The following instructions must be followed without fail!

Please misinterpret a short light up of the yellow LED "Electrical Source of Safety Services" not as failure, or as a relevant battery discharging. The short light up of this LED is the effect of an automatic battery circuit test with is realized in constant intervals.

##### **▲ WARNING!**

**Work on the electrical installation may only be carried out by qualified electricians with training in the lighting and emergency lighting system. When replacing fuses, use only the type and rating as indicated on the module or in its technical documentation.**

**For example, there is a danger of an arc or electric shock if a battery supply disconnecter is opened before the system (and slave stations, if fitted) has been properly disabled and isolated from the supply network. There is also danger of electric shock or short circuit when working on final circuits that have not been isolated first.**

**You should also bear in mind the possible effects on the lighting in parts of the building when you interrupt the supply to final circuits.**

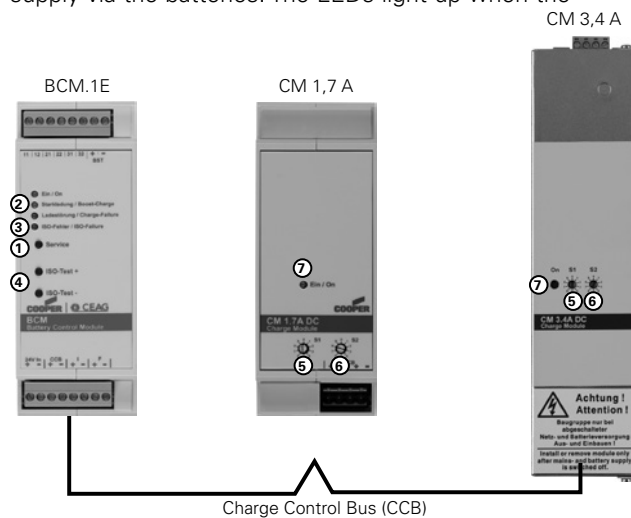
Persons operating the system must first familiarise themselves with the risks of electrical voltages in the open cabinet. The leaflet "Instruction for safe operation of the CU keyboard in normal operation" can be used for this purpose.

### 8.3.1 Control module CU CG-S

The operation of the control module is described in detail in the following pages.

### 8.3.2 PSU.1E

This module supplies the electronic controlgear in the switch cabinet with the necessary operating voltages (24V and 6 V DC). The supply is independent of the mains supply via the batteries. The LEDs light up when the



voltage supply is present.

### 8.3.3 Batterie Control Modul (BCM.1E) and charging module CM 1,7 A, CM 3,4 A

#### BCM.1E

This module controls the charging condition of batteries and their charging. Settings via the service key (1) are implemented by the factory or by trained service personnel during maintenance. The LEDs (2) signal the operating state of the BCM.1E (from above): Operational readiness (LED lights up), boost charge active. LED (3) and button (4) belong to the installed insulation monitors for ISO fault batt. + or ISO fault batt.- (according to DIN VDE 0108 Section 1)

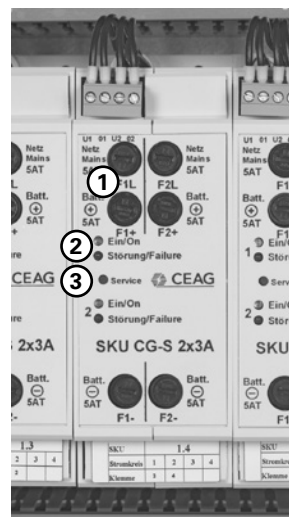
#### CM 1,7 A and CM 3,4 A

Charging of the batteries is via the charge modules. Charging modules CM 1.7A and CM 3.4A. Setting of the max. 32 addresses via rotary coding switch (5 = 10-; 6= 1-address range) is implemented by the factory. LEDs (7) signal the operating state of the charging module. Operational readiness (LED lights up).

### 8.3.4 SKU's of the final circuits

The circuit change over module supplies and monitors emergency luminaires with electronic ballasts for DC operation. The CEWA GUARD monitor checks the function of the luminaires that are connected to it. Up to 20 luminaires per circuit can be connected. Mixed operation within a circuit of maintained light, switched maintained light and non-maintained light is possible. No additional data cable for SKU type CG-S is required.

Output voltage during battery operation: 220 V DC

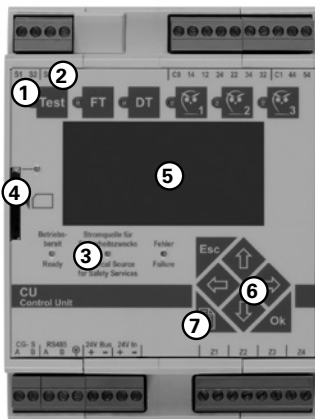


- individual circuit changing per emergency lighting circuit; not at 4x1,5 and SOU
- freely programmable for maintained light, switched maintained light or non-maintained light;
- easy access to fuses (1) at the front of the module;
- LEDs (2) for fault and run RUN/ON for each circuit;
- service button (3) for direct display of module status as a plain language readout on the module.

### 8.3.5 Data printer

This can be installed at the conductor board BGT1 and be operated via the controller software of the CU CG-S as well as logged in and logged out (e. g. assembly/disassembly for replacement of paper reel and the ribbon).

### 8.4 Operating the CU CG-S control module



LEDs (1) in the top row indicate running functions that were initiated with the Function buttons (2) aside. The 3 left-hand buttons initiate present functions of the controller software for the CU CG-S control module:

- <Test> activates a simulated mains failure for testing the emergency lighting equipments while the button is pressed. A short button press simulates a 5 second mains failure.

- <FT> activates the menu option F-Test start / cancel

The controller software performs a function test whose progress and results are output on the display (5). An F-Test tests the final circuits and the luminaires connected to them. You will find further information about this in the description of the related program function in the following section.

- <DT> activates the menu option B-Test start / cancel

The controller software performs an operating duration test whose progress and results are output on the display (5). An operating duration test tests whether the connected batteries guarantee the programmed minimum operating duration of the emergency lighting as required by statute in the event of a mains failure. Further details about the system's operating status and faults can be requested in the Test- & Status menu. The control module can be programmed to assign functions to the 3 right-hand function buttons F1 ... F3; e. g. the first button F 1 can be assigned the function manual reset.

The other LEDs (3) indicate:

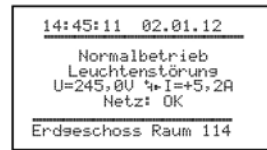
- Ready for operation
- Feed from the power source for safety purposes (battery operation with failed mains power supply or FT/BT),
- Failures that can be further analysed using the control module's menu options.

#### PLEASE NOTE

Please misinterpret a short light up of the yellow LED "Electrical Source of Safety Services" not as failure, or as a relevant battery discharging. The short light up of this LED is the effect of an automatic battery circuit test with is realized in constant intervals.

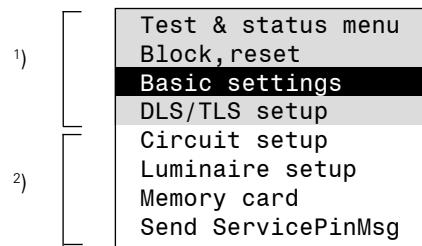
By internal dynamic measurements this LED lights for short time without mains failure or a function test resp. a duration test was set. The control keys on the keypad (6) are used to initiate the program functions on the controller software or change their parameter settings. The Main Menu of the controller software is opened from the main screen with the key (7), referred to in the the current test as <menu>. This key is also used to return to the previous menu level until the main screen appears on the graphic display (5).

Graphic display (main screen during normal operation)



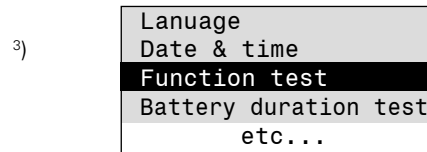
Starting point: **Main screen**

- <Menu> **Selecting the main menu:**
  - ↑ / ↓: Select Basic settings in the main menu
- Menu selection



<Menu> key: back to main screen (cancel)

<ok> key: confirm selection, show selected menu (with the Function test selection)



1) visible area of the main menu (with screen roll (scroll-) function)

2) currently non-visible area

3) highlighting of a selection

The <ok> key is used to confirm a selection. Pressing the menu key exits the corresponding menu item and the changes are not stored in the controller's nonvolatile memory; the controller software usually returns to the next higher menu.

The <ESC> key is used to cancel changes entered in a menu; the controller software returns to the next higher menu without saving the changes.

Selections within a menu of the controller software are made with the cursor keys ↑ ↓ ← → on the keypad.

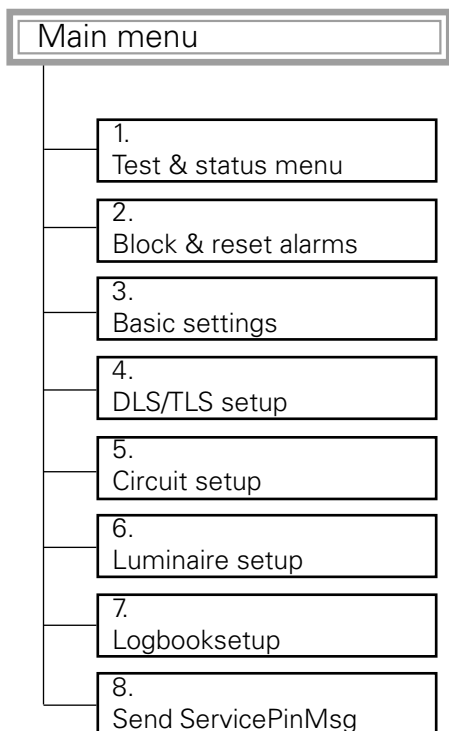
- The arrow keys ↑ ↓ are used to select a menu line (up/down) or to move between input boxes.
- The arrow keys ← → are used to select settings or to increment or decrement parameters by a certain change value. These selection options are displayed on the LC display (5) with their icon.

An action is initiated by jogging a key several times; continuous pressing of a key (for more than approx. 1 second) speeds up the jog function.

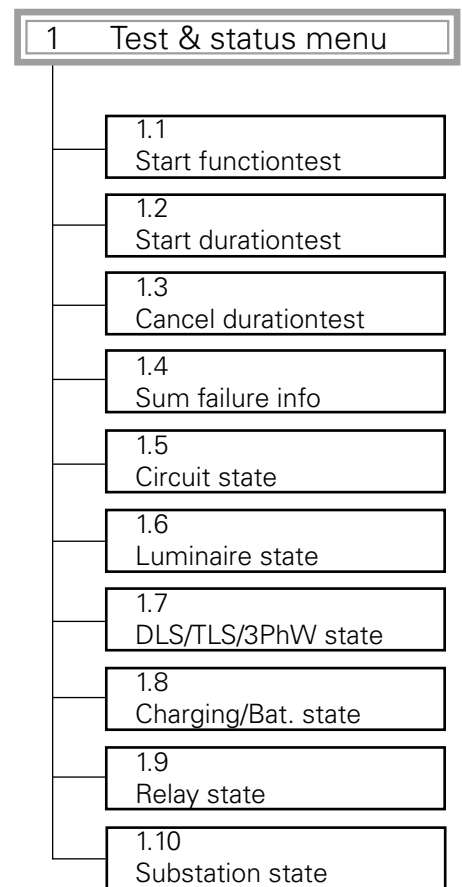
The next double page shows an overview of the basic menu structure and further information about operating the system and setting parameters.



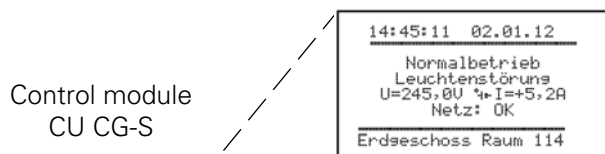
## 8 Operating



- Operation is the same for ZB-S systems and for their US-S substations.
- If password protection is activated, then only the main screen and the main menu options "1 Test and Status Menu" and "2 Block, Reset" are accessible without entering a password.
- The controller software automatically returns to the main screen if no entry is made within 180 seconds.
- The LCD display backlighting goes off if no entry is made within 180 seconds. Pressing any key switches the backlighting on again.
- The contrast and brightness (LCD backlighting) can be adjusted in the main screen when the <ok> key is pressed:
  - ☞ <ok> + ↑ / ↓: contrast adjustment
  - ☞ <ok> + ← / →: brightness adjustment
 These parameters can also be set with menu option "3.10 Display Setting" in menu "3 Basic Settings". Here the parameters can be numerically set as percentages.

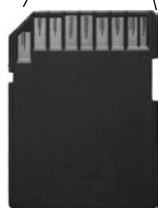


Main screen (Example)



### Displaying

- Time and date (line 0)
- Operating mode (line 1)
- present voltage and current value (line 2)
- Fault information (line 3)
- Status of mains supply at control unit (line 4)
- Device name (line 5)



Memory card for saving and data transmission of test log and parameter settings



### Keypad

ESC key <ESC>  
Menu key   
ok key <ok> and cursor keys  
↑ ↓ ← →

## **i** MULTI-MASTER MODE M3:

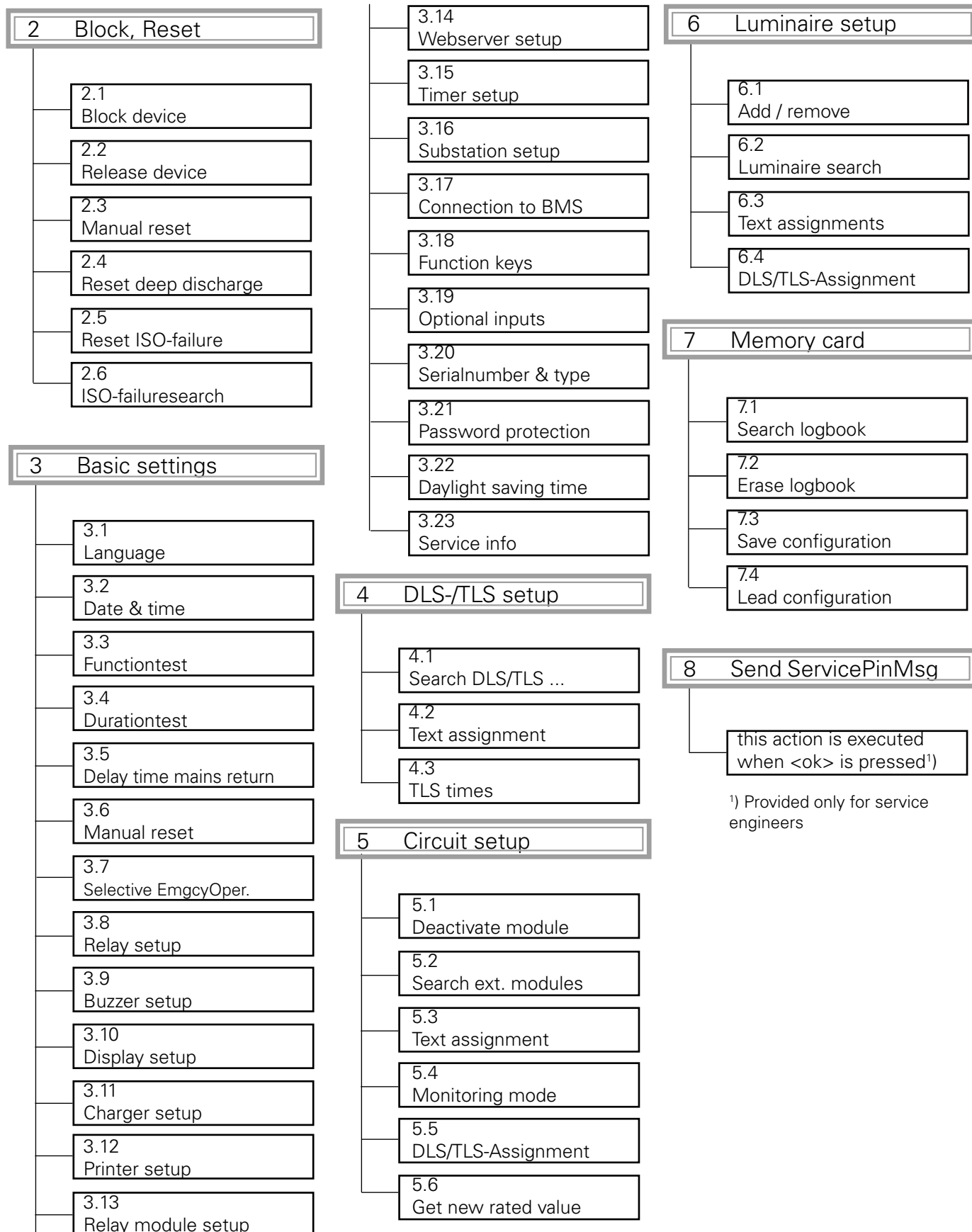
In Multi-Master Mode the following functions are possible to activate:

- Start FT
- Start/cancel DT
- Substation-status (display)
- Block/release device
- Date/Time (set)
- Automatic FT (specify)
- Automatic DT (specify)

Previously, the substation needs to be found in the menu «Main settings / Substation setup».

Before the execution of the command there is a request in the Multi Master Mode if this system-no. or all systems of one group should execute this command.

The M3 function can only be executed when all control units are interconnected over the CG-S bus and no CGVision or a CG controller is used.



## 8 Operating

### 8.4.1 Menu 1: "Test & Status Menu"

Overview:

Main menu

```
Test & status menu
Block & reset alarms
Basic settings
DLS/TLS Setup
Circuit setup
Luminaire setup
Logbooksetup
Send ServicePinMsg
```

Menu 1

```
Start functiontest
Start durationtest
Cancel durationtest
Sum failure info
Circuit state
Luminaire state
DLS/TLS/3PhW state
Charging/Bat. state
Relay state
Substation state
```

- ☞ Selection of menu options with the keys ⬇
- ☞ <ok>: confirm selection
- ☞ <Menu>: cancel and return to the previous menu (any changes entered are saved)
- ☞ <ESC>: cancel and return to the previous menu (any changes entered are not saved)
- ☞ flashing input prompt

```
Start functiontest
Start durationtest
Cancel durationtest
Sum failure info
etc.
```

☞ <ok>  
Menu 1.1: Request in view of the of station to be tested (M3-Mode, compare note M3)  
☞ <ok> initiates a function test for the connected final circuits:  
The LC display shows the main screen with the message "Function test"

A battery test run (5 min.) is performed after a short mains operation (5 min.).  
The main screen displays a fault message if a fault is detected.  
Further information can be polled in the following submenus of the Test & Status Menu (e.g. "1.4 Group fault info" etc.).

```
Start functiontest
Start durationtest
Cancel durationtest
Sum failure info
etc.
```

☞ <ok>  
Menu 1.2: Request in view of the station (M3-Mode/compare note M3)  
☞ <ok> initiates an battery duration test:  
The LC display shows the main screen with the message "Operating duration test" and the length of the test (up to the preset rated operation time). (see menu 3.20 "Serial number and type")

Cancel: <Menu> key and then select "B-Test cancel", ⬇  
If the preset limit operating duration is not achieved (see menu 3.20 "Serial number and type"), the main screen displays the message "Charge/battery failure"  
If this happens the battery set must be tested and replaced if necessary!

```
Start functiontest
Start durationtest
Cancel durationtest
Sum failure info
etc.
```

☞ <ok>  
Menu 1.3: Request in view of the station (M3-Mode/compare note M3)  
☞ <ok> initiates the abort of the running duration test/cancels an operating duration test which is in progress.  
The main screen reappears showing messages about the current operation of the system.

**Note M3**  
In the Multi-Master-Mode this operation can be effected at any station of the system:

```
this device
all devices
Device address 01 ⬇
Device name
```

Device address refers to search results in the substation setup menu 3 «Basic settings»

```
Start functiontest
Start durationtest
Cancel durationtest
Sum failure info
etc.
```

☞ <ok>  
Menu 1.4: Displays the list of fault messages.

☞ Successive polling with ⬇  
If a number of fault messages have accumulated, they can be viewed in succession on the LC display.

```
Sum failure
List: Failure 1
Failure 2
Failure 3
etc.
```

```
Start functiontest
Start durationtest
Cancel durationtest
Sum failure info
Circuit state
etc.
```

☞ <ok>  
Menu 1.5:

```
SKU 2/1 ⬇ circuit:1 ⬇
Status display
Add. information
Circuit name
```

Line 2: Possible status displays:  
Circuit blocked  
Battery operation  
Normal operation  
Function test pre-run  
Function test  
Mains emergency operation

☞ Select input field with ⬇  
☞ Select installed SKUs or the circuits set up under circuit setup with ⬇  
☞ Finish and return to Menu 3 with <Menu> or <ESC>  
Line 3: Displays the additional information, e.g. «Waiting for SKU data» or «FT-Current value 1,2A»

Overview:

Main menu

```

[Test & status menu]
Block & reset alarms
Basic settings
DLS/TLS Setup
Circuit setup
Luminaire setup
Logbooksetup
Send ServicePinMsg
    
```

```

Start functiontest
Start durationtest
Cancel durationtest
Sum failure info
Circuit state
Luminaire state
etc.
    
```

<ok>  
Menu 1.6:

```

SKU 2/1 circuit:1
...5...10...15...2
[ ] [ ]
Luminaire name
    
```

- ☞ Select input field/line with  $\uparrow\downarrow$
- ☞ Select SKU or circuit with  $\leftarrow$
- ☞ Line 3 shows the current settings of the luminaire addresses (1 ... 20) in the selected circuit:
  - Luminaire is off (Item 1)
  - Luminaire is on (Item 2)
  - Luminaire failure (Item 3)
  - no luminaire set up (Item 4)
 (see "6 Luminaire Setup")
- ☞ Select a luminaire (line 2) with  $\leftarrow$
- ☞ Line 4 shows the luminaire name (see "6.2 Text assignments")

Menu 1

```

Start functiontest
Start durationtest
Cancel durationtest
Sum failure info
Circuit state
Luminaire state
DLS/TLS/3PhW state
Charging/Bat. state
Relay state
Substation state
    
```

```

Start functiontest
Start durationtest
Cancel durationtest
Sum failure info
Circuit state
Luminaire state
DLS/TLS/3PhW state
etc.
    
```

<ok>  
Menu 1.7:

```

DLS+3Phase monit. 1
1 2 3 4 5 L1 L2 L3
[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
DLS/TLS Text
    
```

```

DLS module external 2
1 2 3 4 5 6 7 8
[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]
DLS/TLS Text
    
```

```

TLS module external 3
1 2
[ ] [ ]
DLS/TLS Text
    
```

- ☞ Submenu 1.7 depends on the device (DLS/3PhW or TLS) that is being addressed by the selection in the menu.
- ☞ Select an address with  $\leftarrow$
- ☞ Line 2/3 shows the current status of the signal outputs of the external module or a current fault message. Line 4 shows the device name (see "4 DLS/TLS Setup").
- ☞ Note: A 3-phase monitor status (L1...L3) is shown when the external DLS/3PhW module has been configured as a combined DLS/3-phase monitor.
  - Switch status/Phase Off
  - Switch status/Phase On

- ☞ Selection of menu options with the keys  $\uparrow\downarrow$
- ☞ <ok>: confirm selection
- ☞ <Menu>: cancel and return to the previous menu (any changes entered are saved)
- ☞ <ESC>: cancel and return to the previous menu (any changes entered are not saved)
- ☞ flashing input prompt

```

Start functiontest
Start durationtest
Cancel durationtest
Sum failure info
Circuit state
Luminaire state
DLS/TLS/3PhW state
Charging/Bat. state
Relay state
Substation state
    
```

<ok>  
Menu 1.8:

```

U=213.0V I=+ 0.2 A
T= +18.0°C BT:03:00h
Batt capacity: 95%
Message line
    
```

- ☞ The current charge and battery status is displayed (see screenshot opposite):
  - U: present battery voltage
  - I: present charge current / discharge current
  - T: temperature in the battery compartment (from temperature sensor installed in it)
  - BT: last attainable operating duration, in hours
- ☞ Displays the current battery capacity in line 3 based on 3.11 "Charger setup"
- ☞ Line 4 only displays messages when a malfunction occurs. Selection can be made with  $\leftarrow$  if more than one fault is present

```

Start functiontest
Start durationtest
Cancel durationtest
Sum failure info
Circuit state
Luminaire state
DLS/TLS/3PhW state
Charging/Bat. state
Relay state
Substation state
    
```

<ok>  
Menu 1.9:

```

Relay: 1
Status:
picked up
    
```

Note:  
See also menu option 3.8 "Relay assignments" in menu 3 "Basic settings"

- ☞ Line selection (line 1 / 3) with  $\uparrow\downarrow$
- ☞ Select a relay in line 1 with  $\leftarrow$
- ☞ Line 4 shows the current relay status
- ☞ Select between "dropped out" and "picked up" in line 3 (e.g. for test purposes) with  $\leftarrow$

```

Circuit state
Luminaire state
DLS/TLS/3PhW state
Charging/Bat. state
Relay state
Substation state
    
```

<ok>  
Menu 1.10:

```

Device address 1
Status message
Failure info
Device name
    
```

- ☞ Select a station in line 1 with  $\leftarrow$
- ☞ Line 2 shows the current operation status of the chosen station ZB-S by Multi Master Mode M3.

## 8 Operating

### 8.4.2 Menu 2: "Block & reset alarms"

Overview:

Main menu

Test & status menu  
**Block & reset alarms**  
 Basic settings  
 DLS/TLS Setup  
 Circuit setup  
 Luminaire setup  
 Logbooksetup  
 Send ServicePinMsg

Menu 2

Block device  
 Release device  
 Manual reset  
 Reset deep discharge  
 Reset ISO-failure  
 ISO-failuresearch

- ☞ Selection of menu options with the  $\uparrow\downarrow$  keys
- ☞ <ok>: confirm selection
- ☞ <Menu>: cancel and return to the previous menu (any changes entered are saved)
- ☞ <ESC>: cancel and return to the previous menu (any changes entered are not saved)
- ☞ flashing input prompt

Block device  
 Release device  
 Manual reset  
 Reset deep discharge

☞ <ok>

Menu 2.1:

This device  
 all devices  
 Device address 01  $\leftarrow\rightarrow$   
 Device name

☞ Selection with the buttons  $\uparrow\downarrow$  between the displayed options.

☞ Selection of a ZB-S system with  $\leftarrow\rightarrow$



Device address refers to search results in the substation setup menu 3 «Basic settings»

☞ <ok> initiates the function: All functions are cancelled; all outputs will be isolated! In case of mains failure occurs no battery operation. These must be additionally separated on all poles before maintenance work in end circuits. (see 10.3 Enabling of end circuits with maintenance work)

Block device  
 Release device  
 Manual reset  
 Reset deep discharge

☞ <ok>

Menu 2.2:

This device  
 all devices  
 Device address 01  $\leftarrow\rightarrow$   
 Device name

☞ <ok> initiates the function: The selected stations will be switched free and restart operation.

Block device  
 Release device  
 Manual reset  
 Reset deep discharge

☞ <ok>

(Menu 2.3: only directly at the station) ☞ <ok> initiates the function if this operation has been activated in the menu option «Basic settings»:

Following a mains power failure, normal operation will not be resumed automatically when mains power is restored if the "Manual reset (On)" option has been

activated (menu «Basic settings/ Manual reset»). This guarantees that the emergency lighting remains on until it is ensured that the general lighting has been switched on again, e.g. in a cinema.

Block device  
 Release device  
 Manual reset  
 Reset deep discharge

☞ <ok>

(Menu 2.4: only directly at the station) ☞ <ok> initiates the function: Following a "Deep discharge protection" message in the main screen, the message is acknowledged with this menu option.

The controller returns to normal operation provided there are no further fault messages. Following a "Deep discharge protection" message in the main screen, the batteries must be tested and replaced if necessary.

Release device  
 Manual reset  
 Reset deep discharge  
 Reset ISO-failure

☞ <ok>

(Menu 2.5: only directly at the station)

If a reset happens, the controller of the station ZB-S returns to a normal operation, if no further failure messages occur.

Manual reset  
 Reset deep discharge  
 Reset ISO-failure  
 ISO-failuresearch

☞ <ok>

Menü 2.6:

Find ISO failure  
 this device  
 all devices 01  $\leftarrow\rightarrow$   
 cancel search

If the main screen displays the message "Insulation failure" then fault locating can be initiated with this menu option.

☞ Selection of cursor position with  $\uparrow\downarrow$

☞ <ok> starts the ISO failure search

☞ <Menu>Cancel and back to menu 2



During the search all stations be switched to blocked conditions!

Divergent to SKU CG-S 2x3 A, with the SKU CG-S 4x1.5 A and SOU CG-S 2x4A only one isolation fault is registered for all circuits of the module. Limitation of the isolation fault must be implemented at the module by enabling the single circuits.

### 8.4.3 Menu 3: "Basic settings"

Overview:

Main menu

```
Test & status menu
Block & reset alarms
Basic settings
DLS/TLS Setup
Circuit setup
Luminaire setup
Logbooksetup
Send ServicePinMsg
```

```
Language
Date & time
Functiontest
Durationtest
etc....
```

<ok> The currently selected  
Menu 3.1: language is displayed )

) Setting on delivery/initial commissioning



#### NOTE

Fall back language for controller reset or after the installation of a new CU CG-S is always english

- ☞ Use the  $\uparrow\downarrow$  keys to toggle between "Language: National language" ) and "Language: english"
- ☞ Finish and return to Menu 3 with <Menu>

) Can only be selected when memory card is inserted.

Menu 3

```
Language
Date & time
Functiontest
Durationtest
Delay time mains return
Manual reset
Selective EmgcyOper.
Relay setup
Buzzer setup
Display setup
Charger setup
Printer setup
Relay module setup
Webserver setup
Timer setup
Substation setup
Connection to BMS
Function keys
Optional inputs
Serialnumber & type
Password protection
Daylight saving time
Service info
```

```
Language
Date & time
Functiontest
Durationtest
etc....
```

<ok>

Menu 3.2:

```
Date & Time
We 11.01.12 12:00
ZB-S autosync.: yes
```

Setting the system time (current date and time) for the internal clock of the CU CG-S control module.

ZB-S autosync:

program to „yes“ only at one station of a group All other stations are synchronised daily via this.



#### Important NOTE

These settings are the basis for all log book entries and (synchronised) test of the system!

If the ZB-S Systems is more than 30 days out of operation, the time should be controlled

- ☞ Select the date and time positions with  $\uparrow\downarrow$
- ☞ Change with  $\leftarrow$
- ☞ Finish with <Menu>

This request follows:

**Substation  
synchronise ?**

Menu = no      OK = yes

- ☞ Enter "OK" synchronises the clock of all connected substations in one group

- ☞ Selection of menu options with the keys  $\uparrow\downarrow$

☞ <ok>:

confirm selection

- ☞ <Menu>: cancel and return to the previous menu (any changes entered are saved)

- ☞ <ESC>: cancel and return to the previous menu (any changes entered are not saved)

- ☞ flashing input prompt

```
Language
Date & time
Functiontest
Durationtest
etc....
```

<ok>

Menu 3.3:

```
F-Test Date&Time
We 11.12.07 12:00
FT start-up time 300s  $\leftarrow$ 
Interval in days: 07
```

Setting the start (date and time) of the first function test and the intervals (1 to 14 days) of subsequent function tests (factory setting: all 7 days).

Setting the start-up time of the FT in 5s steps (factory setting: 300s)

For all luminaires with "End of line" cut off (EoL).

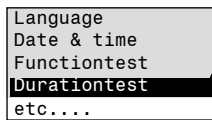
- ☞ Select the input position for date, time, intervals (in days) and FT start-up time (in 5s) with  $\uparrow\downarrow$
- ☞ Change with  $\leftarrow$
- ☞ Finish with <Menu>

This request follows:

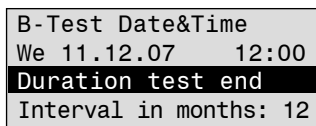
**Substation  
synchronise ?**

Menu = no      OK = yes

## 8 Operating



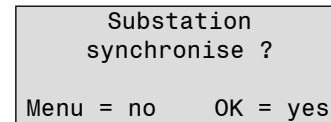
<ok>  
Menu 3.4:



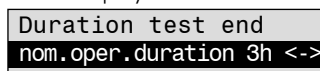
- Select the input position for date, time and interval (in months) with  $\updownarrow$
- Change with  $\leftarrow \rightarrow$
- Finish with <Menu>

This request follows:

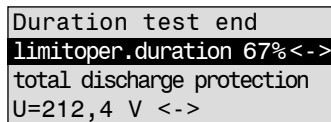
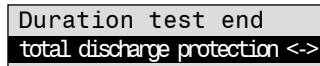
Setting the start (date and time) of the first battery duration test and the intervals (1 ... 12 months) of subsequent battery duration tests.



After moving the cursor onto the 'Duration test end' line and pressing OK, the following submenu is displayed:



The end of a duration test can be modified with arrow left, arrow right in the yellow line:



### **i** MEANINGS:

**End of duration test = nominal operating duration:** the duration test runs until the set nominal operating duration, i.e. 1 h, 2 h, 3 h or 8 h

**End of duration test = total discharge protection:** the duration test runs until total discharge protection (but to maximum of 99 h and 59 min)

**End of duration test = limit operating duration:** the duration test runs until the set percentage of nominal operating duration (i.e. 40 minutes at 1 h and 67 %)

With the limit operating duration the evaluation voltage may also be entered. When therefore battery voltage at the end of the limit operating duration is lower than the evaluation voltage, a capacity error is displayed.

If the nominal operating duration is modified in the Series number and type menu, the preset evaluation voltage also changes analog to the battery types approved by us. Other evaluation voltages may also be used via the above-specified parameters. As such, a duration test to 50% would be feasible, with a correspondingly higher evaluation voltage in accordance with the battery data sheet.

In the duration test menu the end criterion of the duration test can be set with the evaluation criterion. This also enables a duration test with 2/3 (67%) to be carried out, at the end of which a minimum battery voltage must be available.

The values can only be set on the device, not via CG-Vision or the PC software.

Overview:

Main menu

- Test & status menu
- Block & reset alarms
- Basic settings
- DLS/TLS Setup
- Circuit setup
- Luminaire setup
- Logbooksetup
- Send ServicePinMsg

```
Date & time
Functiontest
Durationtest
Delay time mains return
etc....
```

<ok>  
Menu 3.5:

```
Delay time on mains
return in
minutes          10
```

Attention:  
Master / Salve mode and CG-  
Vision together doesn't work

Setting the time (1 ... 99 minutes) which the emergency light remains on after mains supply is restored.

- ☞ Select 1 ... 99 minutes with the keys ↵
- ☞ Finish and return to Menu 3 with <Menu>

Menu 3

- Language
- Date & time
- Functiontest
- Durationtest
- Delay time mains return
- Manual reset
- Selective EmgcyOper.
- Relay setup
- Buzzer setup
- Display setup
- Charger setup
- Printer setup
- Relay module setup
- Webserver setup
- Timer setup
- Substation setup
- Connection to BMS
- Function keys
- Optional inputs
- Serialnumber & type
- Password protection
- Daylight saving time
- Service info

```
Functiontest
Durationtest
Delay time mains return
Manual reset
etc....
```

<ok>  
Menu 3.6:

```
Manual reset
deactivated      ⇅
```

Activating / deactivating the "Manual reset" option (see Menu 2.3 "Manual reset")

- ☞ Toggle between "activated" and "deactivated" with ⇅
- ☞ Finish and return to Menu 3 with <Menu>

```
Durationtest
Delay time mains return
Manual reset
Selective EmgcyOper.
etc....
```

<ok>  
Menu 3.7:

```
Selective emerg light
deactivated      ⇅
```

Activating / deactivating the "Selective emerg light" option

- ☞ Toggle between "activated" and "deactivated" with ⇅
- ☞ Finish and return to Menu 3 with <Menu>

**NOTE:**

With selective emergency light (only available in conjunction with DLS/3Ph bus modules) each individual circuit must be assigned to a DLS/3Ph bus module to activate the emergency light function. See Menu 5.4

The functions «delay on mains return », «manual reset» and «selective emergency lighting» can be combined on circuits.

- ☞ Selection of menu options with the keys ↓↑
- ☞ <ok>: confirm selection
- ☞ <Menu>: cancel and return to the previous menu (any changes entered are saved)
- ☞ <ESC>: cancel and return to the previous menu (any changes entered are not saved)
- ☞ flashing input prompt

```
Delay time mains return
Manual reset
Selective EmgcyOper.
Relay setup
etc....
```

<ok>  
Menu 3.8:

```
Relays          3
Mains operation
Mains failure   *
Mains failure MDB *
Charge fault
Circuit fault
Luminaire fault
Sum failure
Deep discharge protection
ISO failure
Function test
Battery duration test
DB-FÜB
Device failure
Invert relaycontact
Load defaults
```

Select the system or fault messages on which relays 1 to 3 change over for signalling contacts 1 to 3 ("picked up" and "dropped out" states).

These settings can be used to send information about the operational status of the system to a control centre (e.g. with CEAG F3 remote indicator).

A standard setting according to DIN VDE (see Appendix B) can be selected using the "Load defaults" option at the end of this menu.

- ☞ Select the relay number (1 to 3) with keys ↵
- ☞ Highlight the events with keys ↓↑
- ☞ Select between relay switches (★) and relay does not switch (no ★) with the <ok> key
- ☞ Finish and return to Menu 3 with <Menu>

**Note:** See also menu option 1.9 "Relay status" in menu 1 "Test & status menu".

## 8 Operating

Overview:

Main menu

```
Test & status menu
Block & reset alarms
Basic settings
DLS/TLS Setup
Circuit setup
Luminaire setup
Logbooksetup
Send ServicePinMsg
```

Menu 3

```
Language
Date & time
Functiontest
Durationtest
Delay time mains
return
Manual reset
Selective EmgcyOper.
Relay setup
Buzzer setup
Display setup
Charger setup
Printer setup
Relay module setup
Webserver setup
Timer setup
Substation setup
Connection to BMS
Function keys
Optional inputs
Serialnumber & type
Password protection
Daylight saving time
Service info
```

- ☞ Selection of menu options with the keys  $\uparrow\downarrow$
- ☞ <ok>: confirm selection
- ☞ <Menu>: cancel and return to the previous menu (any changes entered are saved)
- ☞ <ESC>: cancel and return to the previous menu (any changes entered are not saved)
- ☞ flashing input prompt

```
Manual reset
Selective EmgcyOper.
Relay setup
Buzzer setup
etc....
```

☞ <ok>  
Menu 3.9:

```
Buzzer assignment
Mains operation
Mains failure *
Mains failure UV *
Charge fault
Circuit fault
Luminaire fault
Sum failure
Deep discharge protection
ISO failure
Function test
Battery duration test
DB-FÜB
Gerätестörung
Load defaults
```

Select the system or fault messages which activate the buzzer in the switch cabinet. A standard setting according to DIN VDE (see Appendix B) can be selected using the "Load defaults" option at the end of this menu.

- ☞ Highlight the events with  $\uparrow\downarrow$
- ☞ Select buzzer "On" (\*) or buzzer "OFF" (no \*) with keys  $\leftarrow\rightarrow$
- ☞ Finish and return to Menu 3 with <Menu>

**Note:** The buzzer's maintained signal tone (after the onset of an event specified here) can be silenced by pressing any key.

```
Selective EmgcyOper.
Relay setup
Buzzer setup
Display setup
etc....
```

☞ <ok>  
Menu 3.10:

```
Display setting
Contrast 50%
Brightness on: 100%
Brightness off: 10%
```

Setting contrast and brightness (backlighting) for the LCD display of the CU CG-S control module.

- ☞ Line selection (2 to 4) with  $\uparrow\downarrow$
- ☞ Set the values (0 to 100%) with keys  $\leftarrow\rightarrow$
- ☞ Finish and return to Menu 3 with <Menu>

**Note:** "Brightness (on)" is the display setting when the display is active (press any key to activate). If no key is pressed within 180 seconds, the controller switches the display to passive (dimmed backlighting) "Brightness (off)".

The above settings may make the display unreadable (e.g. depending on the ambient lighting).

(The active display setting can be changed at any time from the main screen by pressing <ok> and a key (for contrast) or (for brightness) of the active LCD display.)

```
Relay setup
Buzzer setup
Display setup
Charger setup
etc....
```

☞ <ok>  
Menu 3.11:

```
Charger setup
installed
Number of boosters 4
Batt.capacity 80Ah
```

Entries about the switch cabinet equipment

- ☞ Select line 2, 3 and 4 with  $\uparrow\downarrow$
- ☞ Change the settings with  $\leftarrow\rightarrow$ 
  - Line 2: Toggle between "installed" / "not installed" (charging module LT.1 2,5 A or BCM)
  - Line 3: Number of boosters = 1 ... 10 (charge booster 2,5 A)
  - Line 4: Battery capacity in Ah can be selected between 5 and 999 short key press in increments of 1; long key press in increments of 10.
- ☞ Finish and return to Menu 3 with <Menu>



### Important NOTE

These details must be entered exactly or the emergency lighting system controller may fail.

**Caution:** The specification for the number of charging boosters only applies to 2.5 A charging boosters. If a BCM is mounted, only specification of the number of 2.5 A charging boosters is permitted. If no 2.5 A charging boosters are installed, the specification for „number of boosters“ must be „0“.

**Exception:** If a CM 3.4 A charging module is installed as a replacement for a 2.5 A charging booster then this must also be counted. Observe here that the address of the CM 3.4 A charging module is set to „00“.

Overview:

Main menu

- Test & status menu
- Block & reset alarms
- Basic settings
- DLS/TLS Setup
- Circuit setup
- Luminaire setup
- Logbooksetup
- Send ServicePinMsg

```
Buzzer setup
Display setup
Charger setup
Printer setup
etc....
```

<ok>  
Menu 3.12:

```
Printer setup
installed/not installed
activated/not activated
```

Is not printer existing or filed via the Service-Button the following appears:

```
Printer setup
not installed
```



A PD3 printer which is parameterised as «not installed» can be logged in (installed and activated) with the service button (at the printer) at the station. The possibilities of selection in this menu server for the activation/deactivation of the logging by the printer and for the log out (deinstallation) during the exchange/replacement of the paper and the ribbon of the printer.

Menu 3

- Language
- Date & time
- Functiontest
- Durationtest
- Delay time mains return
- Manual reset
- Selective EmgcyOper.
- Relay setup
- Buzzer setup
- Display setup
- Charger setup
- Printer setup
- Relay module setup
- Webserver setup
- Timer setup
- Substation setup
- Connection to BMS
- Function keys
- Optional inputs
- Serialnumber & type
- Password protection
- Daylight saving time
- Service info

```
Display setup
Charger setup
Printer setup
Relay module setup
etc....
```

<ok>  
Menu 3.13:

```
Relay module setup
installed
version CG IV
```

Is the Relay module located in the mode «not installed» by pushing the Service button it can be logged in at the device and can be switched into the mode «installed».

```
Charger setup
Printer setup
Relay module setup
Webserver setup
etc....
```

<ok>  
Menu 3.14:

```
installed
DHCP: ????.
IP: ????. ????. ????. ????.
MASK: ????. ????. ????. ????.
```

After connection of the power supply the webmodule needs approx. 1.5min for booting. After the booting, the red LED of the webmodule flashes slowly.

To log on the webmodule on the CU CG-S control unit, the service pin of the webmodule must be pressed for approx. 1 sec. The menu „webserver setup“ appears in the display of the control unit of the ZB-S. During the log on procedure the display shows a lot of question marks. After approx. 3-5 sec. the display shows the network settings of the webmodule: The webmodule gets automatically activated to the control unit, which is displayed by the red LED (some seconds) of the control unit and the webmodule. After 1-2 minutes the procedure is finished and the webmodule is ready to operate.

- ☞ Selection of menu options with the keys ↓
- ☞ <ok>: confirm selection
- ☞ <Menu>: cancel and return to the previous menu (any changes entered are saved)
- ☞ <ESC>: cancel and return to the previous menu (any changes entered are not saved)
- ☞ flashing input prompt

```
Printer setup
Relay module setup
Webserver setup
Timer setup
etc....
```

<ok>  
Menu 3.15:

```
Timer deactivated/activated
00:00 - 23:59
Mo Tu We Th Fr Sa Su
X X X X X X X
```

☞ Selection of Timer 1, Timer 2 or Timer 1&2 with the buttons ⇄  
If there appears a X under the token of the weekday, on this day the luminaire operates to programmed time.

```
Relay module setup
Webserver setup
Timer setup
Substation setup
etc....
```

<ok>  
Menu 3.16:

```
Search substation ...
Group no.: 07
Substation
S1/S2-mode: Slave
S1/S4-mode: -----*
```

☞ <Menu> finishes the entry and the following display appears:

```
Device adresse:01
Version Z410C
ND 00 09 73 72 96 00
Device name
```



The selection in the second menu serve for the display of the active substations. Only substations with a programmed group number will be find if not, the message «transmission failure» appears. By a selection of «S1/S2-mode: Master-yes» the wohle group can be switched into the mode «blocked» via the F3-switch of the Master controller. At the Master controller appears the display «Blocked S1/S2» – at the controllers of the substations appears the message «Blocked LON»

Setting options:

- S1/S2: Slave or Master
- S3/S4: Save or Master or---

Explanation:

- Slave: depends on master
- : does not depend on master

## 8 Operating

Overview:

Main menu

```
Test & status menu
Block & reset alarms
Basic settings
DLS/TLS Setup
Circuit setup
Luminaire setup
Logbooksetup
Send ServicePinMsg
```

```
Webserver setup
Timer setup
Substation setup
Connection to BMS
Function keys
```

<ok>

Menu 3.17:

```
Device address: 1
LON switch no
NID00 05 94 75 52 00
Device name
```

This menu is used to activate and interface the system with a master monitoring device using the CG-S bus or the M3 function.

- ☞ Line selection (1 / 2) with  $\updownarrow$
- ☞ Select a device (bus) address (1 ... 32) in line 1 with keys  $\leftarrow$  (display — : no interface)
- ☞ Select no/yes in line 2 for the option LON switch with  $\leftarrow$
- ☞ Line 4: Device name user-definable. See text assignment 4.2
- ☞ Finish and return to Menu 3 with <Menu>

Menu 3

```
Language
Date & time
Functiontest
Durationtest
Delay time mains
return
Manual reset
Selective EmgcyOper.
Relay setup
Buzzer setup
Display setup
Charger setup
Printer setup
Relay module setup
Webserver setup
Timer setup
Substation setup
Connection to BMS
Function keys
Optional inputs
Serialnumber & type
Password protection
Daylight saving time
Service info
```

```
Timer setup
Substation setup
Connection to BMS
Function keys
etc....
```

<ok>

Menu 3.18:

```
Function key 1
No function
Switch
Block device *
Simul mains fail MDB
ISO failure reset
Manual reset
Deep discharge reset
F-Test without lead
Show fault list
Turn off maintained light
Standby light on
```

This menu option can be used to assign functions to the function keys (F1...F3 on the control module); the functions are executed as soon as the relevant key is pressed.

It is advisable to assign only one function per key; the star icon goes out when a key is assigned another function.

- ☞ Select the function key (1 to 3) with keys  $\leftarrow$
- ☞ Highlight the function with  $\updownarrow$
- ☞ Select the function (\*) with <ok>
- ☞ Finish and return to Menu 3 with <Menu>

- ☞ Selection of menu options with the keys  $\updownarrow$
- ☞ <ok>: confirm selection
- ☞ <Menu>: cancel and return to the previous menu (any changes entered are saved)
- ☞ <ESC>: cancel and return to the previous menu (any changes entered are not saved)
- ☞ flashing input prompt

```
Substation setup
Connection to BMS
Function keys
Option inputs
etc....
```

<ok>

Menu 3.19:

```
Option input 1
No function
1) Switch
2) Switch inverted *
Manual reset
Deep discharge reset
F-Test start
B-Test start
B-Test cancel
Block device
Maintained off
Non-maintained on
Ventilator monitor
Ext. ISO monitor
Ext. Battery Monitor
Ext. Monitor
3) All Luminaires On
AE Scenario activ
AE Error
```

This option can be used to assign functions to the option inputs (Z1 ... Z4 on the control module); the functions are executed as soon as the relevant 24V analog inputs are triggered.

Only one function can be assigned per input; the star icon goes out when an input is assigned another function.

- ☞ Select the option input (1 to 4) with keys  $\leftarrow$
- ☞ Highlight the events with  $\updownarrow$
- ☞ Select the function (\*) with <ok>
- ☞ Finish and return to Menu 3 with <Menu>

### IMPORTANT NOTE

The "Switch", "Switch inverted", "Ventilator monitor", "Ext. ISO monitor", "Ext. Battery Monitor", "Ext. Monitor" functions require a 24 V level trigger. All other functions require an edge-triggered signal from LOW to HIGH.

Notes:

1)The "Switch" assignment allows integration into the switch assignment (see menu options 5.4 and 6.3 "Switch assignments" in menus 5 "Circuit setup" and 6 "Luminaire setup".

2)The "Switch inverted" assignment initiates the function when the analog inputs are triggered inverted.

3)For connection of the AE-CU Controller the AE-CU Relaismdoule have to be mounted in the ZB-S.

Overview:

Main menu

- Test & status menu
- Block & reset alarms
- Basic settings
- DLS/TLS Setup
- Circuit setup
- Luminaire setup
- Logbooksetup
- Send ServicePinMsg

Connection to BMS  
Function keys  
Optional inputs  
Serialnumber & type  
etc....

<ok>

Menu 3.20:

Type: ZB-S  
Nom. op. duration 3h  
Limit op. duration 100%  
Serial No:1234567/02

**NOTE**

Factory setting = 100%

A change to the limit operating duration has to be done by our customer service!

- ☞ Line selection (1- 3) with  $\updownarrow$
- ☞ Selection of the nominal operating duration (1, 2, 3 or 8h) and limit operating duration (10 to 100%) with keys  $\leftarrow$
- ☞ The nominal and limit operating duration is the basis for the operating duration test.
- ☞ Finish and return to Menu 3 with <Menu>

Menu 3

- Language
- Date & time
- Functiontest
- Durationtest
- Delay time mains return
- Manual reset
- Selective EmgcyOper.
- Relay setup
- Buzzer setup
- Display setup
- Charger setup
- Printer setup
- Relay module setup
- Webserver setup
- Timer setup
- Substation setup
- Connection to BMS
- Function keys
- Optional inputs
- Serialnumber & type
- Password protection
- Daylight saving time
- Service info

Function keys  
Optional inputs  
Serialnumber & type  
Password protection  
etc....

<ok>

Menu 3.21:

Password:  
deactivated  
Password (6 digits)

When "activated" is selected the password prompt also appears:

Password:  
activated  
Password (6 digits)  
Password: 123231

Note:

When password protection is activate this prompt is only accessible when the current password has already been entered. The prompt appears when a protected (sub) menu is called in the main menu. The password is entered with keys F1=1, F2=2, F3=3; a flashing square cursor marks the current entry point.

- ☞ Select the "deactivated" or "activated" setting with keys
- ☞ Enter the password (the digits can only be entered with keys F1, F2 or F3)
- ☞ Finish and return to Menu 3 with <Menu>

Password: 1

- ☞ Select the input point with keys

- ☞ Selection of menu options with the keys  $\updownarrow$
- ☞ <ok>: confirm selection
- ☞ <Menu>: cancel and return to the previous menu (any changes entered are saved)
- ☞ <ESC>: cancel and return to the previous menu (any changes entered are not saved)
- ☞ flashing input prompt

Optional inputs  
Serialnumber & type  
Password protection  
Daylight saving time  
Service info

<ok>

Menu 3.22:

Summertime  
(Sunday/Month)  
Start: 0 /03  
End: 0 /10

- ☞ Selection of the settings with the keys  $\leftarrow$
- ☞ Time to be set is the sunday of the month where the change over of summertime to wintertime effects.
- ☞ Choice of the input field with  $\updownarrow$
- ☞ Finish and back to menu 3 with <Menu>

Serialnumber & type  
Password protection  
Daylight saving time  
Service info

<ok>

Menu 3.23:

ATMega 128: Z480.F  
Neuron RS485: Z481.0  
Neuron FTT10A:Z410\_0  
go on with menu keys

This is a display with information about the status of the installed controller software (e.g. needed for enquiries with CEAG Customer Service)

## 8.4.4 Menu 4: "DLS/TLS setup"

Overview:

Main menu

- Test & status menu
- Block & reset alarms
- Basic settings
- DLS/TLS Setup**
- Circuit setup
- Luminaire setup
- Logbooksetup
- Send ServicePinMsg

Menu 4

- Search DLS/TLS ...
- Text assignment
- TLS times

- ☞ Selection of menu options with the keys  $\uparrow$
- ☞ <ok>: confirm selection
- ☞ <Menu>: cancel and return to the previous menu (any changes entered are saved)
- ☞ <ESC>: cancel and return to the previous menu (any changes entered are not saved)
- ☞ flashing input prompt

```
Search DLS/TLS ...
Text assignment
TLS times
3-PhW-Combinations
```

☞ Menu 4.1:  
☞ <ok>

```
Find address: No
Search result
■■■■■■■■
```

The procedure is necessary, for example when the system is first commissioned or after adding/removing DLS or TLS modules.

All addresses are searched in succession for installed DLS and TLS modules.

The icon bar ■■■■■■■■ indicates how the search is progressing.

- ☞ <ok>: The search result is accepted; the parameters will be used by the CU CG-S for the controller
- ☞ <Menu>: The search result is rejected – the old settings are retained  
When all possible addresses have been polled the procedure is closed and the system returns to menu 4 "DLS/TLS Setup" with the new parameters.
- ☞ Finish and return to Menu 4 with <Menu>

```
Find address: No
Search result
DLS+3Phase monit.
Menu=No OK=YES
```

If no external bus module is found, you will see the message

**Search result  
not installed**

If a bus module has been identified, you will see the message ...

```
Search result
DLS+3Phase monit.

Search result
DLS module external

Search result
TLS module external
```

```
Search DLS/TLS ...
Text assignment
TLS times
3-PhW-Combinations
```

☞ Menu 4.2:  
☞ <ok>

```
Text assignments
DLS+3Phase monit. No
DLS/TLS Text
```

- ☞ Line selection (line 2, 4) with  $\uparrow$
- ☞ Select a bus address with  $\leftarrow$
- The message "DLS/TLS Text" appears on line 4 as a default setting or, if already defined, a module name
- ☞ Editing DLS/TLS Text:
  - Select line 4 with  $\uparrow$
  - Select the input point with  $\leftarrow$
  - All the possible alphanumeric characters are displayed cyclically with the cursor keys  $\uparrow$ .
  - Once a name has been fully entered, confirm the entry with <ok>. The remaining characters after the current cursor position are cleared.
- ☞ Finish and return to Menu 4 with <Menu>

Notes:

You can use this menu to view assignments with external modules and assign/edit module names without changing the configuration.

These module names are stored on the memory card and displayed in the LCD display menus as operator help. Text assignments cannot be made with the CU CG-S if a memory card is not inserted!

A more user-friendly input is possible using a CEAG configuration software for the ZB-S system with a PC (data are transmitted by the memory card).

```
Search DLS/TLS ...
Text assignment
TLS times
3-PhW-Combinations
```

☞ Menu 4.3:  
☞ <ok>

```
TLS:No Port:No
Time 1 min
DLS/TLS Text
```

- ☞ Line selection (line 1, 2) with  $\uparrow$
- ☞ Make changes in the input field with  $\leftarrow$
- When this menu option is selected the system displays the first TLS module number it finds; in the "Port" input field you can now select from among the possible ports of the modules with  $\leftarrow$
- In line 2 the stairwell light operation times 1 sec, 1 ... 15 min can be selected with  $\leftarrow$
- Line 3 shows the module name (s. menu 4.2).
- ☞ Finish and return to Menu 4 with <Menu>

```
Search DLS/TLS ...
Text assignment
TLS times
3-PhW-Combinations
```

☞ Menü 4.4:  
☞ <ok>

```
3-Phase monitoring 12<>
3-Phase monitoring 1 *
3-Phase monitoring 2
3-Phase monitoring 3
3-Phase monitoring 4
3-Phase monitoring 5
3-Phase monitoring 6
3-Phase monitoring 7
```

- After the search of the 3PhW and activate of the option of selective emergency lighting, at DLS/TLS-Setup appear the menu option „3-Phase monitoring combination.“
- In the first row of this menu the current Phase monitoring can be chosen which logic connected with other Phase monitorings if other 3-Phase monitorings report a mains failure.
- From the second row appear a list of 3-Phase monitoring which can logic connected with the Phase monitoring of the first row.
- By pushing the <ok> push button the favored Phase monitoring will connected.
- The connection is shown by the \* sign.

## 8.4.5 Menu 5: "Circuit setup"

Overview:

Main menu

```
Test & status menu
Block & reset alarms
Basic settings
DLS/TLS Setup
Circuit setup
Luminaire setup
Logbooksetup
Send ServicePinMsg
```

```
Deactivate module
Search ext. modules
Text assignment
Monitoring mode
DLS/TLS-Assignment
Get new rated value
```

Menu 5.1:

<ok>

```
Deactivate SKU
Subrack:No  SKU:No ↔
Type: SKU CG-S 2x3
OK key=deactivate
```

**Note:** This menu function must be run when removing SKU modules. The SKUs are assigned by their placing on the module slots of the subrack.

- ☞ Successive selection of the installed SKUs with ↔
- ☞ Numbering is consecutive; the number of the relevant subrack 1 ... 5 is shown for the operator's information
- ☞ <ok>: The displayed SKU module is deactivated.
- ☞ Finish and return to Menu 5 with <Menu>

Menu 5

```
Deactivate module
Search ext. modules
Text assignment
Monitoring mode
DLS/TLS-Assignment
Get new rated value
```

- ☞ Selection of menu options with the keys ↓
- ☞ <ok>: confirm selection
- ☞ <Menu>: cancel and return to the previous menu (any changes entered are saved)
- ☞ <ESC>: cancel and return to the previous menu (any changes entered are not saved)
- ☞ flashing input prompt

```
Deactivate module
Search ext. modules
Text assignment
Monitoring mode
DLS/TLS-Assignment
Get new rated value
```

Menu 5.2:

<ok>

```
NID07 00 00 C2 62 11
Subrack:No  SKU: No ↔
Type: SOU CG-S 2x4
Key OK=activate
```

- ☞ Selection of a module address with ↔
- ☞ <ok>: Activation of module address and search for further modules.

## 8 Operating

Overview:

Main menu

Test & status menu
Block & reset alarms
Basic settings
DLS/TLS Setup
Circuit setup
Luminaire setup
Logbooksetup
Send ServicePinMsg

Menu 5

Deactivate module
Search ext. modules
Text assignment
Monitoring mode
DLS/TLS-Assignment
Get new rated value

- ☞ Selection of menu options with the keys  $\downarrow$
- ☞ <ok>: confirm selection
- ☞ <Menu>: cancel and return to the previous menu (any changes entered are saved)
- ☞ <ESC>: cancel and return to the previous menu (any changes entered are not saved)
- ☞ flashing input prompt

Deactivate module
Search ext. modules
Text assignment
Monitoring mode
DLS/TLS-Assignment
Get new rated value

Menu 5.3:  
☞ <ok>

Text assignments
SKU1/8 $\Leftarrow$ circuit:2 $\Leftarrow$
Type: SKU CG-S 2x3
Circuit name

**Note:** This menu can be used to assign/edit circuit names without affecting the configuration. The procedure is necessary, for example when the system is first commissioned or after adding SKU modules. Circuit names are stored on the memory card and displayed in the LC display menus as operator help. Text assignments cannot be made with the CU CG-S if a memory card is not inserted! Otherwise, refer to menu option 4.2

- ☞ Select line 2 or 4 or the input fields in line 2 with  $\downarrow$
- ☞ Successive selection of subrack/SKU and circuit with  $\Leftarrow$ 
  - ☞ Changing the circuit name:
    - Select line 4 with  $\downarrow$
    - Select the input point with  $\Leftarrow$
    - All the possible alphanumeric characters are displayed cyclically with the cursor keys  $\downarrow$ .
    - Once a name has been fully entered, confirm the entry with <ok>. The remaining characters after the current cursor position are cleared.

- ☞ Finish and return to Menu 5 with <Menu>

Deactivate module
Search ext. modules
Text assignment
Monitoring mode
DLS/TLS-Assignment
Get new rated value

Menu 5.4:  
☞ <ok>

SKU1/8 $\Leftarrow$ circuit:2 $\Leftarrow$
Current value monitoring $\Leftarrow$
max. deviation
20% $\Leftarrow$ Circuit name

**Note:** The above display shows an example of the selection of "Current value monitoring" for circuit 2, SKU No. 8 on subrack 1.

- ☞ Select line 1, 2, 3 or the input fields in line 1 with  $\downarrow$
- ☞ Successive selection of SKU/output and (final) circuit with  $\Leftarrow$
- ☞ Line 4 shows the circuit name (see menu 5.2)
- ☞ Select the monitoring mode with keys  $\Leftarrow$
- ☞ Finish and return to Menu 5 with <Menu>

The following modes can be selected in line 2:

- CG monitoring
- Current value monitoring
- Reserve circuit

The "CG monitoring" option requires CG-S ballasts/modules and therefore addressable luminaires from the CEAG range.

For other luminaires, a function test with the "Current value monitoring" option can be carried out on the basis of the current flow in an entire luminaire circuit (refer to the settings in "5.5 Learn current values").

When "Current value monitoring" is selected, line 3 prompts entry of the maximum deviation (1 ... 20%) from the reference value determined in "5.5 Learn current values" at which there is still no fault message in a function test. So that the failure of the weakest luminaire in a final circuit can be detected, select:

$$\text{max. dev.} < \frac{P_{\text{min}}}{P_{\text{ges}}} \times 100 \quad (P_{\text{min}} = \text{Mains connected load of the smallest luminaire})$$

$$\quad \quad \quad (P_{\text{ges}} = \text{Mains connected load of all installed luminaires})$$

Using a SWR150-module differing to this the current value monitoring has to be set to minimum 15% - acc. to number of type of luminaire and luminous flux.

Overview:

Main menu

- Test & status menu
- Block & reset alarms
- Basic settings
- DLS/TLS Setup
- Circuit setup
- Luminaire setup
- Logbooksetup
- Send ServicePinMsg

- Deactivate module
- Search ext. modules
- Text assignment
- Monitoring mode
- DLS/TLS-Assignment**
- Get new rated value

Menu 5.5:  
☞ <ok>

SKU1/8 ⇐ circuit:2 ⇐  
per luminaire setup⇐  
Maintained light (Batt) ⇐  
Circuit name

- ☞ Select line 1, 2, 3 or the input fields in line 1 with ↓↑
- ☞ Successive selection of SKU and (final) circuit with ⇐

Line 4 displays the message "Circuit text" or a circuit name (see menu 5.3)

- ☞ Select the settings in line 2 and 3 with keys ⇐
- ☞ Finish and return to Menu 5 with <Menu>

Menu 5

- Deactivate module
- Search ext. modules
- Text assignment
- Monitoring mode
- DLS/TLS-Assignment
- Get new rated value

- ☞ Selection of menu options with the keys ↓↑
- ☞ <ok>: confirm selection
- ☞ <Menu>: cancel and return to the previous menu (any changes entered are saved)
- ☞ <ESC>: cancel and return to the previous menu (any changes entered are not saved)
- ☞ flashing input prompt

**Note:** The possible settings in line 3 depend partly on the selection made in line 2


Switch assignment	
in line 2	in line 3
Switch 1	Switch 2
Non maintained mode	none

Switch assignment	
in line 2	in line 3
Maintained light (mains)	Maintained light (Batt) TLS xx/x (Batt)
per luminaire setup	Maintained light (Batt) TLS xx/x (Batt)
Timer 1	Maintained light (Batt)
Timer 2	DLS xx/y
Timer 1&2	TLS xx/y
DLS xx/x	Maintained light (Batt) DLSxx/y
	TLS xx/y
TLS xx/x	Maintained light (Batt) DLS xx/y
	TLS xx/y

Function keys F1 ... F3 or option inputs Z1 ... Z4 in line 2 can also be declared as switches (see menus 3.12 and 3.13 in "Basic settings"). Switch assignment is not possible unless these variable elements have been assigned a switch function!

xx: Module number ( 1 ... )  
y: Inputs of the module (e.g. for switch interrogation) or Switched outputs of TLS modules  
TLS can only be assigned to complete circuits.

Switch assignment	
in line 2	in line 3
Switch 1	Switch 2
Non maintained mode	none
or 3-phase monitor	Maintained light (Batt) DLS xx/y
	TLS xx/y
Maintained light (mains)	Maintained light (Batt) TLS xx/x (Batt)
per luminaire setup	Maintained light (Batt) TLS xx/x (Batt)
	3-phase monitor
Timer 1	Maintained light (Batt)
Timer 2	DLS xx/y
Timer 1&2	TLS xx/y
	3-phase monitor
DLS xx/x	Maintained light (Batt) DLSxx/y
	TLS xx/y
	3-phase monitor
TLS xx/x	Maintained light (Batt) DLS xx/y
	TLS xx/y
	3-phase monitor

 see note at menu 3.7

- Deactivate module
- Search ext. modules
- Text assignment
- Monitoring mode
- DLS/TLS-Assignment
- Get new rated value

Menu 5.6:  
☞ <ok>

Main screen with status line:  
Learn currents

On completion of the procedure the CU CG-S control module returns to Menu 5 "Circuit setup". The procedure can be cancelled with the <ESC> or <Menu> keys.

Notes:

The "Learn current values" procedure starts when the selection is confirmed with <ok>. The time taken by the procedure depends on the number of installed circuits. A reference current value is determined and stored one after the other for all the circuits with the "Current value monitoring" mode selected (see 5.4 "Monitor mode") in battery operation. This value is now used as the basis for malfunction diagnostics (e.g. luminaire malfunction).

All the desired luminaires must be installed and fully operational!

## 8 Operating

### 8.4.6 Menu 6 "Luminaire setup"

Overview:

Main menu

Test & status menu
Block & reset alarms
Basic settings
DLS/TLS Setup
Circuit setup
<b>Luminaire setup</b>
Logbooksetup
Send ServicePinMsg

Menu 6

Add / remove
<b>Luminaire search</b>
Text assignments
DLS/TLS-Assignment

- ☞ Selection of menu options with the keys  $\uparrow\downarrow$
- ☞  $\langle\text{ok}\rangle$ : confirm selection
- ☞  $\langle\text{Menu}\rangle$ : cancel and return to the previous menu (any changes entered are saved)
- ☞  $\langle\text{ESC}\rangle$ : cancel and return to the previous menu (any changes entered are not saved)
- ☞ flashing input prompt

Add / remove
<b>Luminaire search</b>
Text assignments
DLS/TLS-Assignment

$\langle\text{ok}\rangle$

Menu 6.1:

SKU 1/8 $\leftarrow$ circuit:2 $\rightarrow$
...5...10...15...20
$\square$ - $\square$ - $\square$ - $\square$ ----- $\square$ $\square$ -
Luminaire text

Notes:

The SKUs and circuit numbers are assigned by their placing on the module slots of the subrack.

Only "present"( $\square$ ) or "not present"(-) is displayed on positions 1 to 20. Individual luminaires can also be selectively taken out of service (not present) in this way. Condition and/or switched status can be polled for CG-S luminaires in menu 1.6 "Luminaire status".

Add / remove
<b>Luminaire search</b>
Text assignments
DLS/TLS-Assignment

$\langle\text{ok}\rangle$

Menu 6.2:

all circuits
SKU 1/8 $\leftarrow$ circuit:2 $\rightarrow$
circuit name

Add / remove
<b>Luminaire search</b>
Text assignments
DLS/TLS-Assignment

$\langle\text{ok}\rangle$

Menu 6.3:

SKU 1/8 $\leftarrow$ circuit:2 $\rightarrow$
...5...10...15...20
$\square$ - $\square$ - $\square$ - $\square$ ----- $\square$ $\square$ -
Luminaire text

Notes:

You can use this menu to view luminaire assignments and assign / edit luminaire names without changing the luminaire configuration.

The procedure is necessary, for example when the system is first commissioned or after luminaires have been added or removed.

These luminaire names are stored on the memory card and displayed in the LCD display menus as operator help. Text assignments cannot be made with the CU CG-S if a memory card is not inserted! Otherwise, refer to menu option 4.2

- ☞ Select line 1 or the input fields in line 1 with  $\uparrow\downarrow$
- ☞ Successive selection of SKU/subrack and (final) circuit with  $\leftarrow\rightarrow$
- ☞ Line 3 shows the current settings for the luminaires (1 to 20) in the selected circuit:
  - $\square$  Luminaire is present (Item 1)
  - no luminaire set up (Item 2)
- ☞ Select a luminaire (line 2) with  $\leftarrow\rightarrow$  (e.g. cursor flashing on position 3)
- ☞ Line 4 displays the luminaire text (Name if previously entered). Use the  $\langle\text{ok}\rangle$  key to set or remove a luminaire at the selected position.

- ☞ Select line 1 and 2 resp. the input fields in line 2 with  $\uparrow\downarrow$
- ☞ Successive selection of SKU/subrack and (final) circuit with  $\leftarrow\rightarrow$
- ☞ All connected luminaires with address of a device will automatic be search and displayed. Please note that double addressed lumianres in one circuit will be identified as 1 address. If nessesary correct the luminaire address of the affected circuit.
- ☞ The luminaire search function indicates newly installed luminaires. A query screen is displayed with the luminaire search for selecting whether already existing luminaires should be deleted.

- ☞ Select line 1, 2, 4 or the input fields in line 1 with  $\uparrow\downarrow$
- ☞ Successive selection of SKU and (final) circuit with  $\leftarrow\rightarrow$  (e.g. (final) circuit 2, of the 8th SKU type 2x3A CG-S on subrack 1)
- ☞ Line 3 shows the current settings for the luminaires (1 to 20) in the selected circuit
  - Luminaire is present (Item 1)
  - no luminaire set up (Item 2)
- ☞ Select a luminaire (line 2) with  $\leftarrow\rightarrow$  (e.g. cursor flashing on position 3)
- ☞ Line 4 displays, for example, the message "Luminaire text" as default or a luminaire name if previously entered
- ☞ Changing the luminaire name:
  - Select line 4 with  $\leftarrow\rightarrow$
  - Select the input point with  $\leftarrow\rightarrow$
  - All the possible alphanumeric characters are displayed cyclically with the cursor keys.
  - Once a name has been fully entered, confirm the entry with  $\langle\text{ok}\rangle$ . The remaining characters after the current cursor position are cleared.

Overview:

Main menu

- Test & status menu
- Block & reset alarms
- Basic settings
- DLS/TLS Setup
- Circuit setup
- Luminaire setup
- Logbooksetup
- Send ServicePinMsg

Add / remove  
Luminaire search  
Text assignments  
DLS/TLS-Assignment

<ok>  
Menu 6.4:

```
SKU 1/8↵ circuit:2 ↵
```

- Select the input fields in line 1 with  $\uparrow\downarrow$
- Select input field with  $\leftarrow$
- The displays and input options depend on the technical characteristics of the luminaires that are used and on the settings made in menu 5 "Circuit set-up"

A switch cannot be assigned to individual luminaires unless the options "CG monitoring" (compare menu 5.4) and "per luminaire setup" (compare menu 5.5) are selected; the following display appears:

Menu 6

- Add / remove
- Luminaire search
- Text assignments
- DLS/TLS-Assignment

- Selection of menu options with the keys  $\uparrow\downarrow$
- <ok>: confirm selection
- <Menu>: cancel and return to the previous menu (any changes entered are saved)
- <ESC>: cancel and return to the previous menu (any changes entered are not saved)
- flashing input prompt

```
SKU 1/8↵ circuit:2 ↵
....5...10...15...20
Line 3
Luminaire text
```

- Line selection (line 2 and 3) with  $\uparrow\downarrow$
- Select a luminaire in line 2 with keys  $\leftarrow$  (line 4 shows "not installed" or the luminaire name)
- possible selections in line 3 with keys  $\leftarrow$  (see table below)
- If there are two switch assignments in line 3, use keys  $\uparrow\downarrow$  to toggle between these displays.
- Finish and return to Menu 6 with <Menu>

**Table of selection options in line 3 for an installed CG-S luminaire**

"no CG-S function"	The luminaire is not individually monitored and not
"Non-maintained mode"	The CG-S luminaire is individually monitored and is off in normal operation
"Maintained light"	The CG-S luminaire is individually monitored and is on in normal operation
"Poll1 / Poll2"	The CG-S luminaire is individually monitored and it is assigned a certain switch configuration. It can be assigned 2 switches: «DLS xx/y $\leftarrow$ DLS xx/y» (OR operation) It can be assigned 1 timer and a switch: «Timer 1 $\leftarrow$ DLS xx/y $\leftarrow$ » «Timer 2 $\leftarrow$ DLS xx/y $\leftarrow$ » «Timer 1&2 $\leftarrow$ DLS xx/y $\leftarrow$ »

xx: Module number (1 to 10)    y: Inputs of the module (e.g. for switch interrogation)

### 8.4.7 Menu 7 “Logbooksetup”

Overview:

Main menu

- Test & status menu
- Block & reset alarms
- Basic settings
- DLS/TLS Setup
- Circuit setup
- Luminaire setup
- Logbooksetup
- Send ServicePinMsg

Menu 7

- Search logbook
- Erase logbook
- Save configuration
- Lead configuration

Menu 8

Function is started direct from the main menu by pressing <ok>

- ☞ Selection of menu options with the keys  $\uparrow$ / $\downarrow$
- ☞ <ok>: confirm selection
- ☞ <Menu>: cancel and return to the previous menu (any changes entered are saved)
- ☞ <ESC>: cancel and return to the previous menu (any changes entered are not saved)
- ☞ flashing input prompt

- Search logbook
- Erase logbook
- Save configuration
- Lead configuration

☞ <ok>

Menu 7.1:

```
11.05.12 12:30:00
Event
Line 3
Line 4
```

Line 3 and 4 may show additional information about the event displayed in line 2:

For a luminaire fault with CG monitoring, e.g.:

Line 3: “Circuit No.”

Line 4: Address(es) of the faulty luminaire(s):

```
□□-□□□□□□-□□□□□□-□□□□□□-□□□□□□
```

In the example illustrated, luminaires 6, 13 and 14 have a fault – luminaires 3, 10 and 16 to 20 are not installed.

- ☞ Select the log book entries with  $\leftarrow$
- Line 1: displays date and time for the displayed event
- Line 2: displays a message about the nature of the event, e.g. “Luminaire fault” with additional information in lines 3 and 4
- A message is displayed if the operator gets to the end or back to the beginning of the log book entries as he scrolls through them.

☞ Finish and return to Menu 7 with <Menu>

- Search logbook
- Erase logbook
- Save configuration
- Lead configuration

☞ <ok>

Menu 7.2:

```
Clear log book?
Menu=No      OK=YES
```



**Important NOTE**

Once deleted, log book entries cannot be restored.

☞ <Menu>: **No deletion** and return to menu 7 “Memory card”

☞ <Enter>: **All log book entries on the memory card are deleted!**  
Return to menu 7 “Memory card”

- Search logbook
- Erase logbook
- Save configuration
- Lead configuration

☞ <ok>

Menu 7.3:

```
Save configuration?
Menu=No      OK=YES
```

☞ <Menu>: **No saving** and return to menu 7 “Memory card”

☞ <Enter>: **All entries on the memory card are deleted and overwritten with the current system configuration!**  
Return to menu 7 “Memory card”

- Search logbook
- Erase logbook
- Save configuration
- Lead configuration

☞ <ok>

Menu 7.4:

```
Load configuration?
Menu=No      OK=YES
```



**Important NOTE**

The current configuration is irrevocably overwritten with the new configuration!

☞ <Menu>: **The existing system configuration is retained** and return to menu 7 “Memory card”

☞ <Enter>: **The existing system configuration is overwritten with the entries on the memory card! The system is now rebooted.**  
Return to main screen

### 8.4.8 Menu 8 “Send ServicePinMsg”

☞ <ok> starts the function (direct from the main menu)

☞ <Menu> / <ESC> returns to the main menu

This function is provided for service engineers and has no relevance for normal operation.

## 9 Failures

As a basic rule:

- Stop device with the main switch when failures occur which can cause damage to persons, to property and/or to operational safety.
- Additionally disconnect device from power supply and protect against resetting.
- After troubleshooting power up the system as described in chapter 7.8.

### 9.1 Interference immunity by screening

Interference (e. g. radio interferences) can occur especially in today's highly automated industries. It can lead to malfunctions and even to the failure of entire plants. The overlaying of different types of interference increases the overall level of radiated failure, hence the need to protect all devices from electromagnetic interference (EMI). In industrial process engineering in particular, a high level of immunity is required for electrical instrumentation and control (I & C) equipment. This is why all electronic devices are subject to mandatory CE marking.

CEAG products comply with the requirements of EC Directives 2004/108/EG (EMC directive), 2006/95/EG (low voltage directive) and are entitled to carry the CE marking. If luminaires with electronic ballast comply with the EMC directives, then the interference produced by the high frequency operation of the electronic ballast is within the legal limits. Nevertheless, electronic devices may cause interference in individual cases. As a rule only HF paging systems (in the MHz range) should be used. Reliable operation cannot be guaranteed with the use of inductive paging systems (25-40kHz).

There are a number of ways in which interference can be controlled.

- Circuits should be separated from one another where possible and common returns (GND, Ground) kept as short as possible.
- Parallel cable runs should be kept as short as possible or avoided altogether.
- The use of twisted cables can reduce inductive interference by a factor of 20.
- The most important and most common method for suppressing interference is screening.

#### 9.1.1 Cable screens

Cable screens usually consist of non-magnetic materials such as copper or aluminium. The most popular screens for cables and wires are individual braided screens consisting of two interwoven sets of wires running in opposite directions.

The density and thickness of the braid is the quality characteristic of the screen. It is essential for the screen to cover as much as possible of the area of the conductor and so minimize the reciprocal of amplification. Cover should be around 95% to achieve a good screen. At 60% and below there is no guarantee of reliable immunity.




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#### NOTE:

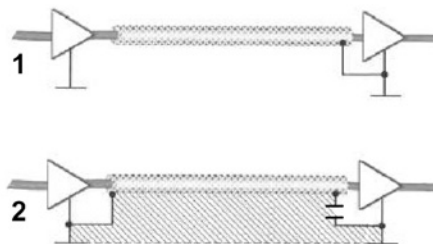
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Screen quick connectors SSA 5-10 for communication lines with a cross section dimension of 5 to 10mm.

Order no. 400 71 347 133

#### 9.1.2 Screen connection

The type of screen connection depends mainly on the anticipated interference. Grounding the screen at one end (1) is necessary to suppress electrical fields. Interference caused by a magnetic alternating field on the other hand can only be suppressed when the screen is connected at both ends (2).





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#### NOTE:

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The avoidance of ground loops contributes to the trouble-free operation of a system.

 Condenser 220nFY3 ≥ 4 KV

Ground loops with their familiar disadvantages must be avoided when connecting a screen at both ends. High voltage can be induced in large loops and this in turn causes failures. The right way to avoid ground loops is to make a starshaped ground or to take a Y3-condenser.

#### 9.1.3 The fail-safe system

Companies therefore protect their plants from induced EMI by screening their cables. Now the cable screen only has to be connected inside the control cabinet to make the connection to ground. This connection should be low-impedance and with a low inductive resistance. So-called screen quick connectors (SSA 5-10) should be used for this.

The screen quick connector SSA 5-10 gets grounded by potential connecting lines.

It is of course rare for just one cable to be routed into a control cabinet. In most cases a number of data transfer, supply and circuit cables have to be laid into the cabinet. However every opening in the cabinet that can be avoided is an avoidable cause of interference.

### 9.1.4 BCM.1E failure codes

#### Failure code request (Z571.0)

Please push the Service-Pin for a few seconds. The failures running throw by flashing from the LED  
 "Loadfailure": Example: 3 x flash, short break, 5x flash → Error code 3 and 5. The request-mode ends automatically when all error codes are shown.

#### Overview of the failure codes (Z571.0)

	Code	Source	Failure description
Old failures	2	BCM.1E	Insulation fault Minus
	3	BCM.1E	Insulation fault Plus
	4	BCM.1E	Battery voltage under Minimum
	5	BCM.1E	Battery voltage over Maximum
	6	BCM.1E	Cable- / Battery break
	7	BCM.1E	Booster disturbance
	8	BCM.1E	Load disturbance
New failures <sup>1</sup>	12	CM	Temperature rise
	13	CM	Ventilator disturbance
	14	CM	General disturbance
	15	BCM.1E	Voltage value at conservation charging
	16	BCM.1E	CCB communication failure (No answer at a CM-request)

<sup>1</sup> New failures are always in combination with the failure „Load disturbance“.

## 10 Maintenance / Checking

### 10.1 Safety Notes

#### **⚠ WARNING! RISK OF INJURY!**

**Improper maintenance work can cause serious personal injury and / or material damage. This work has to be performed only by authorised, skilled and adequate personnel who have received instructions providing information on the device and in observance of local safety regulations.**

- Before working on and with the system switch it off and protect it against reset.
- Do not touch the system until its temperature is as high as the ambient temperature.

### 10.2 General information to maintenance / checking

The carrying out of the safety inspections as required by statutes and directives has to be made regularly. The operator of the emergency lighting system is responsible for organising and supervising this work!

The following information must be specified in writing and made available at all times:

- The nature and extent of the work
- Recording of work results
- Responsibilities and permits for carrying out the work
  - which persons may carry out which operations?
  - which persons are responsible for supervising the work?
- Duties of reporting (e. g. in the case of faults or function tests)
- Organisational measures when working on the emergency lighting system. This may include:
  - Duties of information and reporting on the start, duration and end of the work
  - Safety measures while the work is being carried out: e. g. standby lighting, power supply isolation and lock-out (e. g. removing the fuses, key-operated switch, safety signage)
  - Safety equipment for the personnel carrying out the work on the plant (e. g. suitable work clothing and personal protection equipment)
  - Safety equipment providing protection from hazards caused by adjacent plant (e. g. safety grilles, barriers, making safe or roads)

Maintenance and repair work at the emergency lighting system can be done by the customer service of CEAG Notlichtsysteme GmbH at any time. (s. enclosed Customer Service Order).

Our customer service locations can be found all over Germany, see the enclosed map „Addresses: CEAG Customer Service“

In addition, we offer you a Maintenance Contract for Emergency Lighting making organisation easier to you!

This contract contains the annual checking and includes the following work:

- Mains/-battery shift-function of devices
- Visual check of electrical equipment and batteries of devices
- Mechanical check at the devices
- Checking of charging rate
- Measurement of battery voltage at load commencement and measurement of the cell voltage
- Operational test of other electronics
- Checking of lamps only for luminaires with CG-monitoring
- Checking of rated operation time (test of capacity) of the batteries


Not included in maintenance services is repair and overhaul work, in particular the replacement of defective electronics or defective light sources.

#### **NOTE**

In case of returns you need a RMA- number from us. For further information see [www.ceag.de](http://www.ceag.de)!

### 10.3 Enabling of end circuits with maintenance work

Block the system via the control unit (figure).  
(menu item 8.4.2)



Overview:

Main menu

- Test & status menu
- Block, reset
- Basic settings
- DLS/TLS Setup
- Circuit setup
- Luminaire setup
- Memory card
- Send ServicePinMsg

Menu 2

- Block device
- Release device
- Manual reset
- Deep discharge reset
- ISO failure reset
- ISO failure search

Selection of menu options with the  $\updownarrow$  keys

<ok>:

Block device

Release device

Manual reset

Deep discharge reset

<ok>

Menu 2.1:

This device

all devices

Device address 01

Device name

Selection with the buttons  $\updownarrow$  between the displayed options.

Selection of a ZB-S system with  $\leftarrow \rightarrow$

**i** Device address refers to search results in the substation setup menu 3 «Basic settings»

<ok> initiates the function: All functions are cancelled; all outputs will be isolated! In case of mains failure occurs no battery operation.

Block device

Release device

Manual reset

Deep discharge reset

<ok>

Menu 2.2:

This device

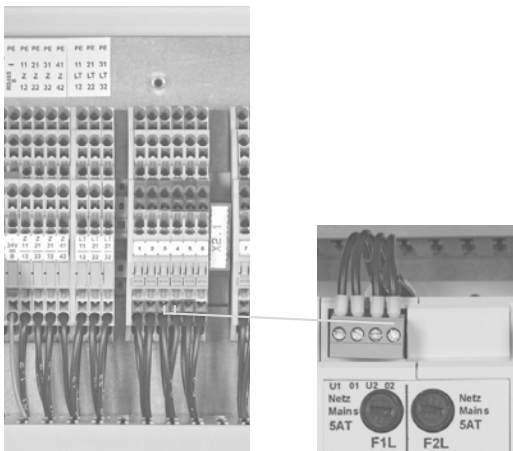
all devices

Device address 01

Device name

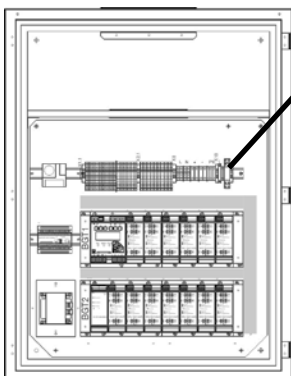
<ok> initiates the function: The selected stations will be switched free and restart operation.

Before commencing maintenance work in the end circuit this must be separated on all poles. For this, remove the end circuit fuses on the module and open the neutral conductor disconnection terminal at the output terminal.



After maintenance work is finished, reverse the steps and cancel blocking at the control unit.

### 10.4 ESF-E30 Activate fan for maintenance work



A plug-in fuse is located on the connection terminal block in the upper area of the distributor for protecting the technical ventilation. If the fan is taken out of operation during maintenance work then this fuse can be removed.

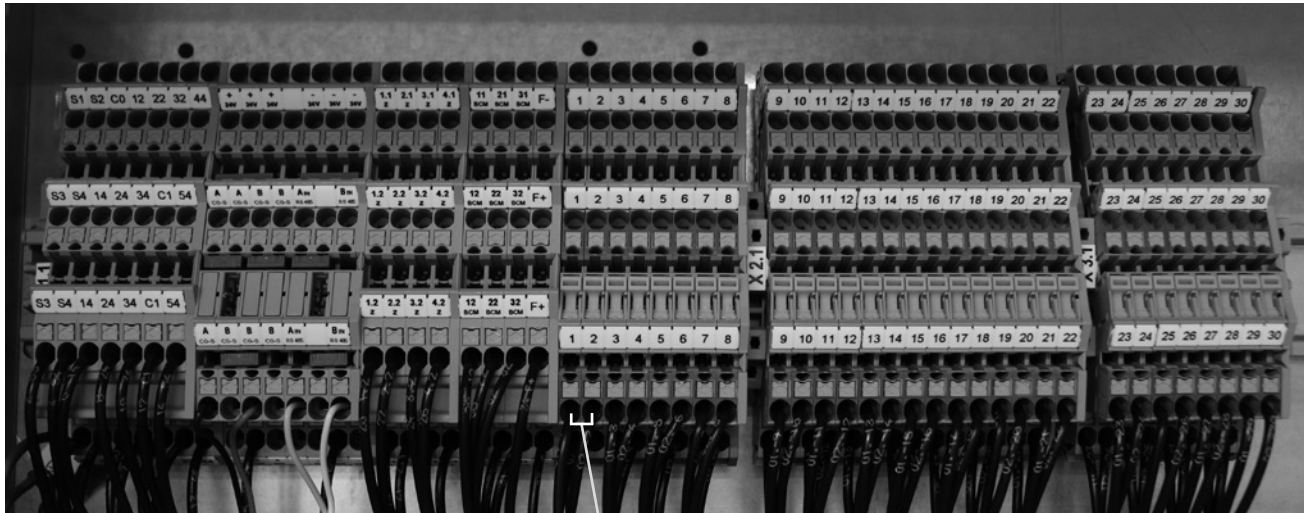
Switching off the fan by adjusting the thermostat is not permitted.



## Appendix A: Overview of terminal assignments

### Appendix A: Overview of terminal assignments

All external connections are made at the tension spring terminal blocks at the top of the switch cabinet. The terminal assignment is shown on the schedules on the front of the enclosures (for the screw push-on terminals on the module) and on the terminal blocks for the external connections.



X1.1	X2.1	X3.1	X4.1	X5.1
1.1	2.1	3.1	4.1	5.1
BGT1	X1			
1.2	2.2	3.2	4.2	5.2
1.1	2.1	3.1	4.1	5.1
BGT2	X2			
1.1	2.1	3.1	4.1	5.1
BGT3	X3			
1.1	2.1	3.1	4.1	5.1
BGT4	X4			
1.1	2.1	3.1	4.1	5.1
BGT5	X5			

#### Terminal designation chart

The assignment of the terminal blocks to subracks 1 to 5 is indicated by their arrangement from left to right



- SKU = Circuit change-over
- 1.5 = Support und board space
- Circuit = Circuit change-over circuits
- Terminal = Output terminal end circuit

**Station type:****ZB-S:****US-S:**

Terminal number	Type of cable	Destination	Terminal number	Type of cable	Destination
1			41		
2			42		
3			43		
4			44		
5			45		
6			46		
7			47		
8			48		
9			49		
10			50		
11			51		
12			52		
13			53		
14			54		
15			55		
16			56		
17			57		
18			58		
19			59		
20			60		
21			61		
22			62		
23			63		
24			64		
25			65		
26			66		
27			67		
28			68		
29			69		
30			70		
31			71		
32			72		
33			73		
34			74		
35			75		
36			76		
37			77		
38			78		
39			79		
40			80		

## Appendix B: VDE requirements for telecommunication contacts and buzzers

ZB-S default setting							Notes / Comments
Designation	Relay 1 C0/14/12	Relay 2 C0/24/22	Relay 3 C0/34/32	Relay 4 C1/44	Relay 5 C1/54	Buzzer	
Mains operation		X					Mains operation means: ZB-S not blocked and no mains failure detected at the device
Mains failure	X		X				Mains failure means: mains failure detected at the device
Mains failure UV	X						Mains failure UV means: Mains failure detected via external bus phase monitor or S3/S4 current loop
Charging fault	X						Charge fault means: <ul style="list-style-type: none"> <li>• Charger fault</li> <li>• Battery temperature sensor error</li> <li>• Booster fault</li> <li>• Battery circuit interrupted</li> <li>• Battery capacity too low (acc. to duration test)</li> <li>• Fan fault (detected via Z1-Z4)</li> <li>• Transmission fault to charger</li> <li>• Battery voltage too high</li> <li>• Battery voltage too low</li> </ul>
Circuit fault	X						Circuit fault means: <ul style="list-style-type: none"> <li>• Circuit fuse defective</li> <li>• Overload</li> <li>• Circuit ISO error (after manual ISO error search)</li> <li>• Current value &lt; nominal value (with current value monitoring)</li> </ul>
Luminaire fault	X						Luminaire fault means: Faulty luminaire
Common system fault	X						Common system fault is active with all types of faults, e.g. luminaire fault, charge fault, transmission fault, substation fault etc.
Total discharge protection	X						Total discharge protection is active when the total discharge threshold is fallen below; this can only be reset via the menu function "Reset Deep Discharge"
ISO fault	X						ISO error means: Isolation fault battery circuit
Function test		X					Function test means: test for testing the luminaires.
Continuous operation test		X					Duration test means: test for testing the battery capacity.
Device fault							Device fault means: transmission fault, substation fault, memory card fault, fault detected via Z1-Z4 for external monitor devices

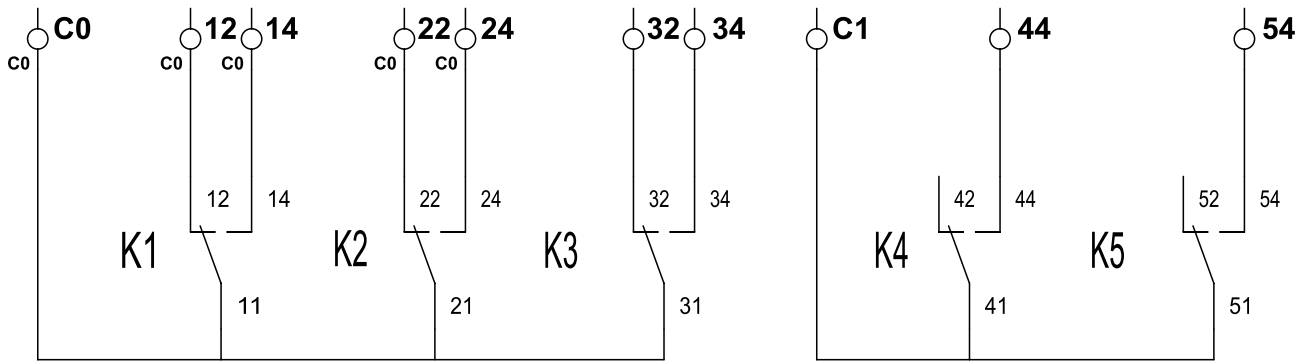
Permanently configured to external buzzer operation (analogue to internal buzzer)

Permanently configured for control of a technical cabinet ventilation. Default setting >40°C ON < 35°C OFF.

X = active, i. e. contacts C0/14 and C0/24 and C0/34 are closed

**NOTE:**

Comply with the national regulations and guidelines for indicating and signalling when using a remote switch or remote indicator for emergency lighting systems.



Contact assignment:

C0/14: NO	C0/24: NO	C0/34: NO	C1/44: NO
C0/12: NC	C0/22: NC	C0/32 : NC	C1/54: NO

Note:

NO = normally open  
NC = normally closed

The device has 5 floating signalling contacts (relay outputs) and one buzzer inside the device.

Signal contacts K1, K2, K3 can be freely parameterised, for each: 1 x changeover contact 1 x 24V; 0.5A  
Relay contacts K4 (external buzzer) and K5 (technical switching cabinet ventilation) have fixed assignments.

## Appendix C: Location plan for the luminaires

### Appendix C: Location plan for the luminaires

Date: \_\_\_\_\_ Decice address: \_\_\_\_\_

Time: \_\_\_\_\_ Name of the system: \_\_\_\_\_

<b>Luminaire 20</b>	<b>Luminaire 10</b>
Switch 1	Switch 1
Switch 2	Switch 2
<b>Luminaire 19</b>	<b>Luminaire 9</b>
Switch 1	Switch 1
Switch 2	Switch 2
<b>Luminaire 18</b>	<b>Luminaire 8</b>
Switch 1	Switch 1
Switch 2	Switch 2
<b>Luminaire 17</b>	<b>Luminaire 7</b>
Switch 1	Switch 1
Switch 2	Switch 2
<b>Luminaire 16</b>	<b>Luminaire 6</b>
Switch 1	Switch 1
Switch 2	Switch 2
<b>Luminaire 15</b>	<b>Luminaire 5</b>
Switch 1	Switch 1
Switch 2	Switch 2
<b>Luminaire 14</b>	<b>Luminaire 4</b>
Switch 1	Switch 1
Switch 2	Switch 2
<b>Luminaire 13</b>	<b>Luminaire 3</b>
Switch 1	Switch 1
Switch 2	Switch 2
<b>Luminaire 12</b>	<b>Luminaire 2</b>
Switch 1	Switch 1
Switch 2	Switch 2
<b>Luminaire 11</b>	<b>Luminaire 1</b>
Switch 1	Switch 1
Switch 2	Switch 2

Circuit name: \_\_\_\_\_

Switch 1: \_\_\_\_\_

Switch 2: \_\_\_\_\_

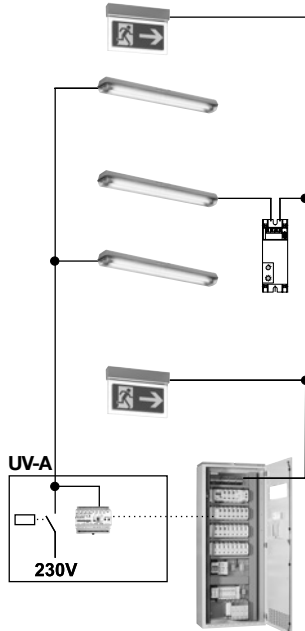
Monitoring mode: \_\_\_\_\_

Installed wattage [W]: \_\_\_\_\_

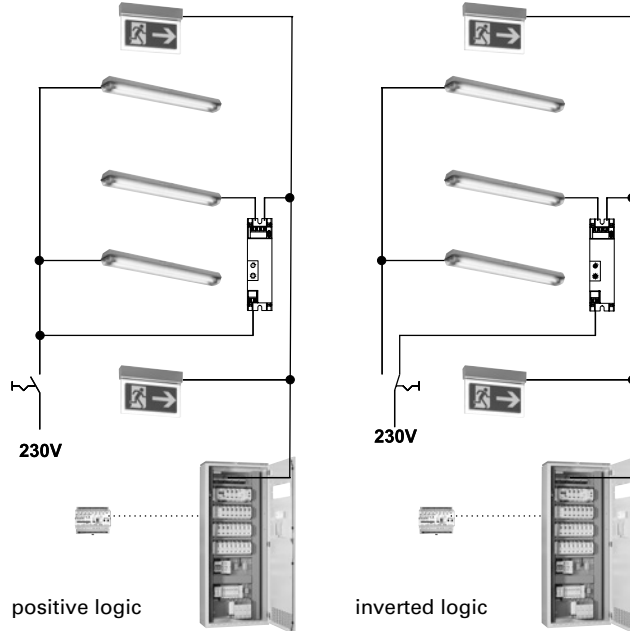
Installed load [VA]: \_\_\_\_\_

## Appendix D: Installation example monitoring modules

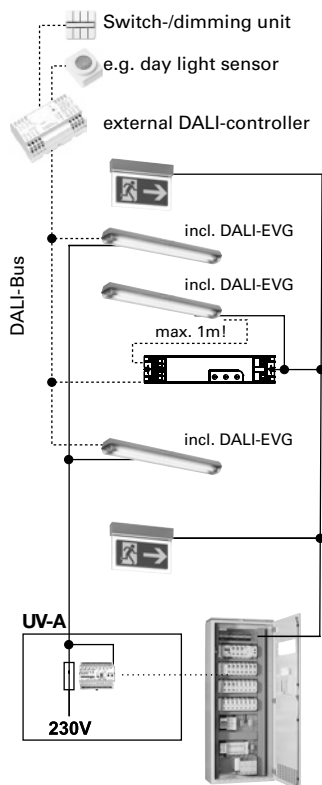
V-CG-S 4 – 400 W  
Monitoring Module



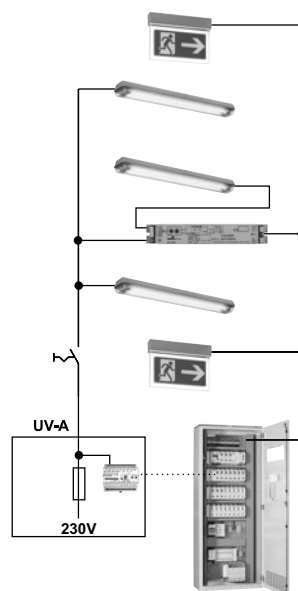
V-CG-SE 4 – 400 W  
Monitoring Module with Control Input



V-CG-SB Monitoring module  
with DALI control input



V-CG-SUW Monitoring module  
with change over unit



### IMPORTANT NOTICE!

The module is only for use with CEAG-emergency lighting systems with STAR-technology. The electronic ballast must fit for the whole DC voltage range (between 186 V to 275 V). CEAG recommends to ask the supplier of the ballast for an appropriate certification.

## Appendix E: Customer Service Order

Fax/E-Mail to: CEAG, central customer service  
Fax No. +49 (0)2921 69-624, Email: kundendienst@ceag.de

### Customer Service Order

From: \_\_\_\_\_ Request No.: \_\_\_\_\_

We hereby request the CEAG Customer Service to carry out the work indicated below:

Customer: \_\_\_\_\_

Street: \_\_\_\_\_

Postcode /Town: \_\_\_\_\_

Contact: \_\_\_\_\_

Email address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Customer No.: \_\_\_\_\_ Customer Order No.: \_\_\_\_\_

Customer signature: \_\_\_\_\_

Location/BV: \_\_\_\_\_

Street: \_\_\_\_\_

Postcode /Town: \_\_\_\_\_

Contact: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Requested data/Fixed date: \_\_\_\_\_

Repair:  Programming and training:  Maintenance:  Other (see remarks)

To be filled in by CEAG only:

Berechnen:  Kostenpauschale: \_\_\_\_\_ Kostenfrei:  Festlegung durch ZKD

CEAG-Auftragsnr.: \_\_\_\_\_ Anlagentyp: \_\_\_\_\_

Bemerkungen: \_\_\_\_\_



## General Safety instructions - batteries



### Български

#### Общи инструкции за безопасност

- Батериите не са подходящи за частна употреба.
- Монтирането трябва да се извършва от квалифицирани техници, като се вземат под внимание националните разпоредби за безопасност и предотвратяване на злополуки. При работа с батериите носете предпазни очила и предпазно облекло.
- Батериите трябва да се използват в съответствие с предназначението им, в подходящо и изправно състояние.
- Избягвайте натрупването на електростатичен заряд и изтичане/искри. Опасност от експлозия.
- Ако обвивката на батерията е повредена, изтича корозивен електролит.
- При работа с батериите, първо изключете напълно електрозахранването, уверете се, че не е възможно то да се включи отново и проверете дали уредът не е под напрежение. Не изключвайте батерията, докато е под натоварване.
- При изключване под натоварване или в случай на късо напрежение формираната дъга може да предизвика изгаряния.
- Не поставяйте чужди тела или инструменти върху батерията.
- Внимавайте за падащи части по време на транспортиране.
- Никога не вдигайте или повдигайте блок батерии/клетки за техните полюси.
- Използвайте само оригинални резервни части за подмяна.

### Česky

#### Všeobecné bezpečnostní pokyny

- Baterie nejsou určeny k soukromému využití.
- Veškerou instalaci musí provádět kvalifikovaný elektrikář seznámený s národními bezpečnostními předpisy. Při nakládání s bateriemi si nasadte ochranné brýle a oděv.
- Baterie se smí používat jen k zamýšlenému účelu a musí být v řádném a nepoškozeném stavu.
- Vyhýbejte se vytvoření elektrostatického náboje a jisker. Riziko výbuchu.
- Pokud je obal baterie poškozen, uniká korozivní elektrolyt.
- Při práci s bateriemi nejprve zcela odpojte napájení, zajistěte, aby nemohlo být znovu zapnuto, a zkontrolujte nepřítomnost napětí. Neodpojujte baterii pod napětím.
- Při odpojení pod napětím nebo v případě zkratu se může vytvořit el. oblouk způsobující popáleniny.
- Nepokládejte na baterii žádné nástroje ani jiné předměty.
- Při přenosu pamatujte na oddělitelné části.
- Nikdy nevytahujte či nezvedejte baterie/články za póly.
- K výměně používejte výhradně originální náhradní díly.

### Dansk

#### Generelle sikkerhedsinstruktioner

- Batterierne er ikke egnet til privat brug.
- En installation skal altid udføres af en kvalificeret elektriker og under hensyntagen til nationale sikkerheds- og ulykkesforebyggende regulativer. Bær beskyttelsesbriller og -beklædning under arbejdet med batterierne.
- Batterierne må kun anvendes i overensstemmelse med den påtænkte brug og i hel og ubeskadiget stand.
- Undgå opbygning af elektrostatisk ladning og afladning/gnist. Eksplosionsfare.
- Hvis batteriets kasse er beskadiget, udledes ætsende elektrolytter.
- Når der arbejdes med batterierne, så sluk først for al strøm, fastslå at den ikke kan tændes igen og tjek, at de er uden spænding. Afbryd ikke batteriet under belastning.
- Afbrydes batteriet under belastning eller ved kortslutning, kan den skabte bue give forbrændinger.
- Placér ikke fremmedlegemer på batteriet.
- Pas på løse dele under transport.
- Hejs eller løft aldrig batterier/celler op ved polerne.
- Brug kun originale reservedele ved udskiftning.

### Deutsch

#### Allgemeine Sicherheitshinweise

- Die Batterien sind nicht für den privaten Gebrauch geeignet.

- Eine Installation darf nur durch qualifizierte Elektrofachkräfte unter Berücksichtigung der nationalen Sicherheits- und Unfallverhütungsvorschriften erfolgen. Bei Arbeiten an Batterien Schutzhelm und Schutzkleidung tragen.
- Die Batterien sind bestimmungsgemäß in unbeschädigtem und einwandfreiem Zustand zu betreiben.
- Elektrostatische Auf- bzw. Entladungen/Funken sind zu vermeiden. Explosionsgefahr.
- Bei Zerstörung der Gehäuse ist der freierwerdende Elektrolyt ätzend.
- Bei Arbeiten an den Batterien sind diese zuerst komplett frei zu schalten, gegen Wiedereinschalten zu sichern und die Spannungsfreiheit festzustellen. Die Batterie nicht unter Last trennen.
- Bei Trennen unter Last oder bei Kurzschlüssen können Verbrennungen durch Lichtbögen die Folge sein.
- Keine fremden Gegenstände oder Werkzeuge auf der Batterie ablegen.
- Beim Transport mit herunter fallenden Teilen rechnen.
- Niemals Blockbatterien/Zellen an den Polen anheben oder hochziehen.
- Als Ersatz dürfen nur Originalteile verwendet werden.

### Eesti – Üldised ohutusjuhised

- Akud ei ole mõeldud erakasutuseks.
- Paigaldustööd tuleb jätta kvalifitseeritud elektrikuleks ning tuleb teha vastavalt siseriiklikele ohutuseeskirjadele ja õnnetusjuhtumite vältimise reeglitele. Akudega töötamisel kandke kaitseprille ja -riietust.
- Akusid tuleb kasutada nende ettenähtud eesmärgil korrasolevatena ja kahjustamata seisundis.
- Vätige elektrostaatilise laengu kogunemist ja vabanemist/sädemeid. Plahvatusoht.
- Kui aku korpus on kahjustatud, eraldu korrosiivset elektrolytoliit.
- Akudega töötamisel lülitage kõigepealt kogu toide täielikult välja, tagage, et seda ei saa uuesti sisse lülitada ja kontrollige toitepinge puudumist. Ärge ühendage lahti koormuse all olevat akut.
- Koormuse all oleva aku lahtiuhendamisest või lõhise korral võib tekkida elektrikaar põhjustada põletusi.
- Ärge pange aku peale mingeid võõrkehaseid ega tööriistu.
- Transportimisel võtke arvesse kukkuvatest osadest lähtuvat ohtu.
- Vältige akuplokkide/-elementide tõstmist pooltüstest.
- Vahetamiseks kasutage ainult originaalvarusid.

### ελληνικά

#### Γενικές οδηγίες για την ασφάλεια

- Οι μπαταρίες δεν είναι κατάλληλες για ιδιωτική χρήση.
- Η εγκατάστασή τους πρέπει να γίνεται από εξειδικευμένους ηλεκτρολόγους, λαμβάνοντας υπόψη τους εθνικούς κανονισμούς ασφαλείας και πρόληψης ατυχημάτων. Όταν εργαζόμαστε με τις μπαταρίες, φοράτε προστατευτικά γυαλιά και προστατευτική ενδυμασία.
- Πρέπει να γίνεται μόνο η προβλεπόμενη χρήση των μπαταριών, στην κατάλληλη κατάσταση τους και χωρίς να παρουσιάζουν βλάβη.
- Αποφύγετε την πρόκληση ηλεκτροστατικής φόρτισης και αποφόρτισης/σπινθήρων. Κίνδυνος έκρηξης.
- Εάν το περίβλημα της μπαταρίας έχει υποστεί βλάβη, απελευθερώνεται διαβρωτικός ηλεκτρολύτης.
- Όταν εργάζεστε με τις μπαταρίες, κλείνετε τον διακόπτη λειτουργίας, βεβαιώνετε ότι δεν μπορεί να ανοίξει ξανά και ελέγχετε εάν υπάρχει τάση σε αυτές. Μην αποσυνδέετε την μπαταρία υπό φορτίο.
- Κατά την αποσύνδεση από φορτίο ή σε περίπτωση βραχυκυκλώματος, το τόξο που σχηματίζεται μπορεί να προκαλέσει εγκαύματα.
- Μην τοποθετείτε ξένα αντικείμενα ή εργαλεία πάνω στην μπαταρία.
- Έχετε υπόψη σας τα τμήματα που ενδέχεται να πέσουν κατά τη μεταφορά.
- Μη σηκώνετε ποτέ τις μπαταρίες από τους πόλους τους.
- Χρησιμοποιείτε μόνο γνήσια ανταλλακτικά για αντικατάσταση.

### English – General safety instructions

- The batteries are not suitable for private use.
- An installation must be performed by qualified electricians taking into account the national safety and accident prevention regulations. Wear protective goggles and protective clothing when working with the batteries.
- The batteries must be used in accordance with their intended use in a proper and undamaged condition.
- Avoid the build-up of electrostatic charge and discharge/sparks. Risk of explosion.
- If the battery casing is damaged, corrosive electrolyte is discharged.
- When working with the batteries, first turn off the power completely, ensure that it cannot be turned back on, and check if they are free of voltage. Do not disconnect the battery under load.
- When disconnecting under load or in case of short circuits, the arc formed can cause burns.
- Do not deposit any foreign objects or tools on the battery.
- Be aware of falling parts during transport.
- Never hoist or lift block batteries/cells by their poles.
- Use only original spare parts for replacement.

### Español

#### Instrucciones generales de seguridad

- Las baterías no son adecuadas para el uso privado.
- Solo puede instalarlas un electricista cualificado de acuerdo con la normativa de seguridad y prevención de accidentes. Use gafas y ropa de protección cuando manipule las baterías.
- Las baterías deben utilizarse de acuerdo con su uso previsto, en buen estado y sin daños.
- Evite las cargas y descargas electrostáticas y las chispas. Riesgo de explosión.
- Si se daña la carcasa de la batería, se descargará electrolito corrosivo.
- Cuando se disponga a manipular las baterías, desconecte totalmente la corriente eléctrica, asegúrese de que no se pueden volver a conectar y compruebe que no tengan corriente. No desconecte la batería con una carga conectada.
- Al desconectarla con una carga conectada o en caso de que se produzcan cortocircuitos, el arco que se forma puede provocar quemaduras.
- No deposite objetos extraños o herramientas sobre la batería.
- Tenga cuidado con los componentes que podrían caerse durante el transporte.
- No levante las baterías de bloque/pilas por los polos.
- Use solo piezas de repuesto originales para reemplazar las antiguas.

### Français

#### Consignes générales de sécurité

- Les batteries ne conviennent pas à un usage privé.
- L'installation doit être effectuée par des électriciens qualifiés, conformément aux réglementations nationales sur la sécurité et la prévention des accidents. Portez des lunettes et vêtements de protection lorsque vous travaillez avec les batteries.
- Les batteries doivent être utilisées conformément à l'usage auquel elles sont destinées, être en bon état et ne pas être endommagées.
- Évitez l'accumulation de charges électrostatiques et les décharges/étincelles. Risque d'explosion.
- Lorsque le boîtier de la batterie est endommagé, un électrolyte corrosif se décharge.
- Lorsque vous travaillez sur les batteries, coupez tout d'abord complètement l'alimentation électrique, assurez-vous qu'elle ne peut pas être rétablie et vérifiez que la tension est nulle. Ne déconnectez pas une batterie en charge.
- En cas de déconnexion en charge ou de court-circuits, l'arc qui se forme peut provoquer des brûlures.
- Ne posez aucun objet étranger ou outil sur la batterie.
- Faites attention aux pièces pouvant tomber pendant le transport.
- Ne hissez ou ne soulevez jamais de blocs de batteries/cellules par leurs pôles.
- N'utilisez que des pièces de rechange d'origine en cas de remplacement.

### Hrvatski – Opće sigurnosne upute

- Akumulatori nisu prikladni za privatnu upotrebu.
- Instalaciju moraju provesti kvalificirani električari uzimajući u obzir nacionalne propise za sigurnost i sprečavanje nezgoda. Nosite zaštitne naočale i zaštitnu odjeću tijekom rada s akumulatorima.
- Akumulatori se moraju upotrebljavati u skladu sa svojom namjenom u ispravnom i neoštećenom stanju.

- Izbjegavajte stvaranje elektrostatickog napona i izboja/iskri. Rizik od eksplozije.
- Ako je kućište akumulatora oštećeno, izbija korozivni elektrolyt.
- Kada radite s akumulatorima, prvo u potpunosti isključite napajanje, osigurajte da se ne može uključiti i provjerite da nema napona. Nemojte isključivati akumulator pod opterećenjem.
- Ako isključujete pod opterećenjem ili u slučaju kratkih spojeva, formirani luk može uzrokovati opekotine.
- Nemojte odlagati strane predmete ili alate na akumulator.
- Pripazite na dijelove koji padaju tijekom transporta.
- Nikada ne podizite akumulatore/celije držeci za polove.
- Upotrebjavajte samo originalne rezervne dijelove za zamjenu.

### Italiano

#### Indicazioni generali sulla sicurezza

- Le batterie non sono idonee all'uso privato.
- L'installazione deve essere effettuata da un elettricista specializzato prendendo in considerazione le norme nazionali in materia di sicurezza e prevenzione degli infortuni. Indossare occhiali e indumenti protettivi quando si interviene sulle batterie.
- Le batterie devono essere utilizzate conformemente all'uso previsto in condizioni adeguate e senza danni.
- Evitare l'accumulo di cariche elettrostatiche e scricche/scintille. Pericolo di esplosione.
- Se l'involucro della batteria è danneggiato, può verificarsi la fuoriuscita di elettrolita corrosivo.
- Prima di ogni intervento sulle batterie, disattivare completamente l'alimentazione elettrica, accertarsi che non possa essere riattivata e verificare che le batterie siano prive di tensione. Non scollegare batterie sotto carico.
- Se scollegate sotto carico o in caso di cortocircuito, l'arco formato può causare ustioni.
- Non depositare corpi estranei o strumenti sulla batteria.
- Prestare attenzione alla possibile caduta di pezzi durante il trasporto.
- Mai issare o sollevare celle/batterie a blocchi dai loro poli.
- Utilizzare soltanto pezzi di ricambio originali.

### Latviski

#### Vispārējie drošības norādījumi

- Šie akumulatori nav paredzēti personīgai lietošanai.
- Uzstādīšana jāveic kvalificētiem elektrikiem, ievērojot nacionālos drošības un nelaimes gadījumu novēršanas noteikumus. Strādājot ar akumulatoriem lietojiet aizsargbrilles un aizsargapģērbu.
- Akumulatori jālieto saskaņā ar tiem paredzēto lietošanu pareizā un nebojātā stāvoklī.
- Izvairieties no elektrostatiskā lādiņa uzkrāšanās un izlādes/dzirkstelēm. Sprādziena risks.
- Ja akumulatora korpus ir bojāts, izplūst kodīgs elektrolyts.
- Ritkojoties ar akumulatoriem, vispirms pilnībā izslēdziet barošanu, nodrošiniet, ka to nevar atkal ieslēgt, un pārlicinieties, ka tie nav zem sprieguma. Neatvienojiet akumulatoru, kam pievienota slodze.
- Atvienojot akumulatoru, kam pievienota slodze, vai īsslēguma gadījumos, rodas dzirkstele, kas var izraisīt apdegumus.
- Neuzliciet uz akumulatora nekādus svešķermeņus vai instrumentus.
- Transportējot uzmanieties no krītošām daļām.
- Nekad necilājiet vai neceliet akumulatoru blokus/šūnas aiz to poliem.
- Nomaināji izmantojiet tikai oriģinālās rezerves daļas.

### Lietuviškas

#### Bendrieji saugos nurodymai

- Akumulatoriai nesikirti privačiam naudojimui.
- Įrengti turi kvalifikuoti elektrikai, atsižvelgdami į šalies saugos ir nelaimingų atsitikimų prevencijos taisykles. Dirbdami su akumulatoriais dėvėkite apsauginius akinis ir apsauginius drabužius.
- Akumulatoriai turi būti naudojami pagal numatytą paskirtį, tinkamos būklės ir nesugadinti.
- Venkite elektrostatinio krūvio susikaupimo ir išlydžio / kibirkščių. Sprogimo pavojus.
- Pažeidus akumulatoriaus korpusą išteka korozinis elektrolytas.
- Dirbdami su akumulatoriais pirmiausia visiškai išjunkite maitinimą, pasirūpinkite, kad jis negalėtų būti vėl įjungtas ir patikrinkite, ar neliko įtampos. Neatjunkiant akumulatoriaus, kurio teikiama įtampa
- Atjungiant tokioomis sąlygomis arba susidarius trumpajam jungimui atsiranda elektros lankas,

## General Safety instructions - batteries

- kuris gali nudeginti.
- Ant akumulatoriaus nedėkite jokių pašalinių daiktų ar įrankių.
- Vėždami saugokitės, kad neužkristų daiktai.
- Niekada neįkiškite akumulatorių ar maitinimo elementų už jų polių.
- Pakeitimui naudokite tik originalias atsargines dalis.

### Magyar

#### Általános biztonsági utasítások

- Az elemek nem megfelelőek magáncélú használatra.
- A felszerelést csak szakképzett villanyszerelő végezheti a helyi biztonsági és baleset-megelőzési szabályozás betartásával. Az elemekkel való munkavégzés során viseljen védőeszközöket és védőruhát.
- Az elemeket rendeltetészerűen kell használni, és azoknak megfelelő és sértetlen állapotúnak kell lenniük.
- Kerülje az elektrosztatikus töltés kialakulását és annak kislülését/szikkasztást. Robbanásveszély.
- Ha az elem burkolata megsérült, korrodáló hatású elektrolit folyadék szabadul fel.
- Ha az elemekkel munkálatokat végez, először szakítsa meg teljesen az áramellátást, biztosítsa azokat bekapcsolás ellen, és ellenőrizze, hogy feszültségmentes állapotban vannak. Ne kapcsolja szét az elemeket terhelés alatt.
- Ha terhelés alatt szétkapcsolja az elemeket, vagy rövidzárlat esetén, a kialakuló villamos ív égési sérülést okozhat.
- Ne helyezzen idegen tárgyakat vagy szerszámokat az elemekre.
- Figyeljen az esetleg leeső összetevőkre szállítás során.
- Soha ne csőrölözze vagy emelje fel a telepeket/cellákat az elektródáktól fogva.
- Csak eredeti cserealkatrészeket használjon.

### Nederlands

#### Algemene veiligheidsinstructies

- De batterijen zijn alleen geschikt voor professioneel gebruik.
- De installatie moet worden uitgevoerd door gekwalificeerde elektromonteurs met inachtneming van de nationale regelgeving voor veiligheid en het voorkomen van ongevallen. Draag bij het werken met de batterijen een beschermende bril en beschermende kleding.
- De batterijen moeten worden gebruikt waarvoor deze bedoeld zijn, op de juiste wijze en in onbeschiedigde toestand.
- Voorkom het ontstaan van elektrostatische lading en ontleding/vonken. Risico van explosie.
- Als de batterijbehuizing beschadigd raakt kunnen er bijtende stoffen uitlekken.
- Tijdens werkzaamheden aan de batterijen dienen deze te worden losgekoppeld van de installatie. Zorg er tevens voor dat deze niet zomaar onbedoeld terug ingeschakeld kunnen worden. Ontkoppel nooit de batterijen van de installatie indien er een ontladingsstroom door de batterijen loopt.
- Bij ontkoppelen tijdens gebruik of bij kortsluiting van de batterijen kan brand ontstaan.
- Plaats geen vreemde objecten of gereedschappen op de batterijen.
- Let op vallende delen tijdens transport.
- Til blockbatterijen/accu's nooit op aan de batterijpolen.
- Gebruik alleen originele onderdelen bij vervanging.

### Norsk

#### Generelle sikkerhetsinstruksjoner

- Batteriene passer ikke for privat bruk.
- En installasjon må utføres av kvalifiserte teknikere som tar hensyn til nasjonale sikkerhetsforskrifter og ulykkesforebyggende forskrifter. Bruk vernebriller og vernebriller når du arbeider med batteriene.
- Batteriene skal brukes i samsvar med tiltenkt formål, i riktig og uskadet stand.
- Unngå oppbygging av elektrostatiske lading og utlading/ignister. Fare for eksplosjon.
- Hvis batterikassen er skadet, blir etsende elektrolytt utladet.
- Ved arbeid med batteriene, skal strømmen først slås helt av, og det skal sikres at den ikke kan slås på igjen. Kontroller at de er spenningsfrie. Ikke koble fra batteriet under ladning.
- Når du kobler fra under belastning eller manglende kortslutninger, kan bueformen forårsake brannskader.
- Ikke plasser noen fremmedlegemer eller verktøyer på batteriet.
- Vær oppmerksom på fallende deler under transport.

- Aldri heise eller heis blockbatterier/celler ved polene.
- Bruk bare originale reservedeler til erstatning.

### Polski

#### Ogólne instrukcje bezpieczeństwa

- Akumulatory nie nadają się do użytku prywatnego.
- Montaż musi być przeprowadzony przez wykwalifikowanego elektryka z uwzględnieniem lokalnych przepisów bezpieczeństwa pracy i zapobiegania wypadkom. Podczas pracy przy akumulatorach należy nosić okulary ochronne oraz odzież ochronną.
- Akumulatorów należy używać wyłącznie zgodnie z ich zamierzonym przeznaczeniem, gdy są one w dobrym i nieszkodzonym stanie.
- Należy unikać gromadzenia się ładunku elektrostatycznego oraz wyładowań/iskier. Ryzyko wybuchu.
- Jeżeli obudowa akumulatora jest uszkodzona, wycieka z niej korozyjny elektrolit.
- Podczas pracy przy akumulatorach należy najpierw całkowicie wyłączyć zasilanie, upewnić się, że nie można go włączyć ponownie oraz sprawdzić, czy nie ma napięcia. Nie wolno odłączać akumulatora znajdującego się pod obciążeniem.
- Przy odłączeniu pod obciążeniem lub w przypadku wystąpienia zwarcia, powstały łuk może spowodować poparzenia.
- Nie wolno kłaść żadnych przedmiotów ani narzędzi na akumulatorze.
- Podczas transportu należy uważać na spadające elementy.
- Nie wolno podnosić ani przenosić akumulatorów blowych/ogniw za ich klemy.
- W przypadku wymiany należy używać wyłącznie oryginalnych części zamiennych.

### Português

#### Instruções gerais de segurança

- As baterias não são adequadas para uso privado.
- A instalação deve ser efetuada por um electricista qualificado e em conformidade com os regulamentos nacionais de segurança e prevenção de acidentes. Utilize óculos de proteção e vestuário de proteção ao utilizar as baterias.
- As baterias devem ser utilizadas em conformidade com o seu uso previsto e em boas condições, não apresentando danos.
- Evite a acumulação de carga eletrostática e descarga/faíscas. Risco de explosão.
- Se o invólucro da bateria estiver danificado, é libertado um eletrólito corrosivo.
- Ao utilizar as baterias, primeiro desligue a electricidade completamente, certifique-se de que não pode ser ligada e verifique se não existe tensão. Não remova a bateria sob carga.
- Ao removê-la sob carga ou em caso de curto-circuito, o arco formado pode provocar queimaduras.
- Não coloque quaisquer objetos estranhos ou ferramentas em cima da bateria.
- Tenha atenção à queda de peças durante o transporte.
- Nunca erga ou levante blocos/células de baterias através dos polos.
- Em caso de substituição, utilize apenas peças sobressalentes originais.

### Română

#### Instruții generale de siguranță

- Bateriile nu sunt destinate pentru uz personal.
- Instalarea trebuie efectuată de către un electrician calificat în conformitate cu reglementările naționale de siguranță și prevenirea accidentelor. În timpul lucrărilor la baterii, purtați ochelari de protecție și îmbrăcăminte de protecție.
- Bateriile trebuie utilizate conform destinației lor într-o stare corespunzătoare și nedeteriorată.
- Evitați producerea încărcării electrostatice și descărcarea acesteia/scântei. Risc de explozie.
- În cazul deteriorării carcasei bateriei se scurge electrolit cu efect coroziv.
- Dacă efectuați lucrări la baterii, întrerupeți mai întâi alimentarea cu curent, asigurați-vă împotriva repornirii și verificați ca să nu fie sub tensiune. Nu deconectați bateriile sub sarcină.
- În cazul deconectării sub sarcină și în caz de scurtcircuit, arcul format poate cauza arsuri.
- Nu depozitați obiecte străine sau scule pe baterii.
- Fiți atenți la obiecte care pot cădea în timpul transportului.
- Niciodată nu ridicați blocurile de baterii/celulele ținuțe de poli.
- Utilizați numai piese de schimb originale.

### Русский

#### Общие инструкции по безопасности

- Аккумуляторы не предназначены для бытового использования.
- Монтаж выполняется квалифицированными электриками с учетом государственных норм и правил ТБ и профилактики несчастных случаев. При работе с аккумуляторами пользуйтесь защитными очками и спецодеждой.
- Аккумуляторы должны использоваться только по назначению, при этом их следует поддерживать в исправном состоянии и оберегать от повреждений.
- Не допускайте накопления электростатического заряда и разрядов/искрения. Это может привести к взрыву.
- При повреждении корпуса аккумулятора из него вытекает агрессивный электролит.
- Перед началом выполнения любых работ с аккумуляторами, необходимо полностью обесточить цепь, обеспечить невозможность несанкционированной подачи питания, а также проверить отсутствие напряжения в цепи. Не отключайте аккумулятор под нагрузкой.
- При отключении под нагрузкой или в случае короткого замыкания происходит дуговой разряд, который может стать причиной ожогов.
- Не кладите на аккумулятор посторонние предметы или инструменты.
- Перемещайте аккумулятор с осторожностью, чтобы не уронить.
- Не поднимайте аккумуляторы/батареи за контакты.
- При замене вышедших из строя деталей используйте только оригинальные запчасти.

### Slovenčina

#### Splošna varnostna navodila

- Batérie nie sú vhodné na súkromné použitie.
- Inštaláciu musí vykonávať kvalifikovaný elektrikár s príslušným na vnutroštátne nariadenia o bezpečnosti a predchádzaní rizikám. Pri práci s batériami noste ochranné okuliare a oblečenie.
- Batérie sa musia používať v súlade s plánovaným používaním v riadnom a nepoškodenom stave.
- Zabráňte vytvoreniu elektrostatického výboja a iskier. Riziko výbuchu.
- Ak je puzdro batérie poškodené, uniká korozívny elektrolýt.
- Pri práci s batériami najprv úplne vypnite napájanie, zaistite, aby sa znova nezapli a skontrolujte, či sú bez napätia. Batériu neodpájajte pod napätím.
- Pri odpojení pod napätím alebo v prípade skratu môže vytvorený oblúk spôsobiť popálenie.
- Na batériu nedávajte žiadne cudzie predmety či nástroje.
- Počas prepravy dávajte pozor na padajúce predmety.
- Nikdy nedvíhajte blok batérií/články za ich póly.
- Na výmenu používajte originálne náhradné diely.

### Slovenščina

#### Pokyny týkajúce sa všeobecnej bezpečnosti

- Akumulatorji niso ustrezni za zasebno uporabo.
- Namestitve morajo opraviti kvalificirani električarji, pri čemer morajo upoštevati nacionalne predpise za varnost in preprečevanje nesreč. Med delom z akumulatorji uporabljajte zaščitna očala in rokavice.
- Akumulatorje lahko uporabljate samo v skladu z njeno predvideno uporabo v ustreznem in nepoškodovanem stanju.
- Izognite se kopičenju statičnega naboja ter praznjenju/iskrenju. Nevarnost eksplozije.
- Če je ohišje akumulatorja baterije poškodovano, se izpusti korozivni elektrolit.
- Ko delate z akumulatorji, najprej povsem izklopite napajanje, se prepričajte, da se ne da več vklopiti, in preverite, če res ni več prikljopen na napetost. Ne izklopite akumulatorja pod obremenitvijo.
- V primeru izklopa pod obremenitvijo ali kratkih stikov lahko iskra povzroči opekline.
- Na akumulator ne odlagajte nobenih tujih predmetov ali orodij.
- Med transportom pazite na padajoče predmete.
- Baterij/členki nikoli ne obesaite ali dvigujte za pole.
- Pri zamenjavi uporabljajte samo originalne rezervne dele.

### Suomalainen

#### Yleiset turvallisuusohjeet

- Akut eivät sovellu yksityiskäyttöön.
- Asennuksen saa suorittaa vain pätevä sähköasentaja ottaen huomioon kansalliset turvallisuus- ja tapaturmantorjuntamääräykset. Käytä suojaalajaa ja suojavaatteita työskennellessä akkujen kanssa.
- Akkuja on käytettävä niiden tarkoitettua käyttö-

tarkoitukseen asianmukaisessa ja vahingoittumattomassa kunnossa.

- Vältä sähkövarauksen kertymistä ja purkautumista/kipinöitä. Räjähdyksivaara.
- Syyövyttävää nestettä purkautuu jos akun kotelo on vahingoittunut.
- Kun työskentelet akkujen kanssa, sammuta sähköt ensin kokonaan ja varmista ettei niitä voi pistää takaisin päälle. Tarkista sitten ovatko ne jännitte-vapaat. Älä irrota kuormitettua akkua.
- Kun irrotat kuormitetun akun tai oikosulun tapahtuessa, muodostunut kaari voi aiheuttaa palovammoja.
- Älä sijoita mitään vieraita esineitä tai työkaluja akun päälle.
- Varo putoavia osia kuljetuksen aikana.
- Älä koskaan nosta akkuja/kennoja niiden navoista.
- Käytä vaihdossa vain alkuperäisiä varaosia.

### Svenska

#### Allmänna säkerhetsföreskrifter

- Dessa batterier lämpar sig inte för privat bruk.
- Installation skall utföras av behörig elektriker med hänsyn till de nationella säkerhets- och olycksfalls skyddsföreskrifterna. Använd skyddsglasögon och skyddskläder vid arbete med batterier.
- Batterierna måste användas i enlighet med dess avsedda bruk och i ett korrekt och oskadat skick.
- Undvik uppbyggnad av elektrostatisk laddning och urladdning/ignister. Risk för explosion.
- Om batterihöljet skadas kommer den frätande elektrolyten att urladdas.
- Medan du arbetar med batterierna, stäng först av strömmen helt, se till att den inte kan slås på igen och kontrollera att den inte har spänning. Koppla inte ur batteriet under laddning.
- När du kopplar ur under laddning eller vid kortslutning kan bogen som bildas orsaka brännskador.
- Placera inte några främmande föremål eller verktyg på batteriet.
- Var uppmärksam på fallande delar under transport.
- Hissa eller lyft aldrig blockbatterier/blockceller genom dess poler.
- Använd endast originalreservdelar vid utbyte.

### Türkçe

#### Genel güvenli k talimatları

- Bataryalar ö zel kullanılm için uygun değildir.
- Bir kurulum ulusal güvenli k ve kaza önleme yönetmelikleri dikkate alınarak vasıflı elektrikliçer tarafından yapılmalıdır. Bataryalarla çalışırken, koruyucu gözlük ve koruyucu kıyafetleri giyin.
- Bataryalar, uygun ve zarar görmemiş bir kolda tasarlanan kullanımı do ğrultusunda kullanılmalıdır.
- Elektrostatik ş arj ve deş arj/kvılcım birikmesinden kaçınin. Patlama riski.
- Batarya gövdesi zarar görmüş se, korozif elektrolit deş arj olur.
- Bataryalarla çalışırken, ilk olarak gücü tamamen kapatın, tekrar açılmayacağından emin olun ve üzerinde gerilim olmadığ ını kontrol edin. Yük altındaki bataryaların bağ lantısını kesmeyin.
- Yük altında bağ lantıyı keserken veya kısa devre durumunda, oluşan ark yanıklara neden olabilir.
- Batarya üzerine yabancı maddeleri veya aletleri koymayın.
- Taşıma esnasında düş en parçalara dikkat edin.
- Blok bataryaları/hücreleri asla kutuplarından yükseltmeyin veya kaldırmayın.
- De ğ iş im için sadece orijinal yedek parçaları kullanın.

- إرشادات عامة تخص سلاتك عند التعامل مع البطاريات
- البطاريات ليست مناسبة للاستخدام الخاص
- يجب أن يقوم كهربائي مؤهل بتثبيت البطاريات مع الأخذ في الاعتبار قواعد السلامة الوطنية ومنع الحوادث.
- يلزمك ارتداء نظارات
- ولا تلبس واقية عند التعامل مع البطاريات.
- يتعين استخدام البطاريات في حالتها سليمة غير التالفة.
- ووفقاً لأغراض الاستخدام المخصصة لها
- تجنب تراكم الشحنة الإلكترونية وستاتيكية والتفريغ / الشرر...
- مخاطر الانفجار
- إذا لحق التلف بغلاف البطارية، سيتم تفريغ المحلول.
- الكهرلاني المتكامل
- عند التعامل مع البطاريات، أبداً بإيقاف تشغيل الكهرياء بالكامل، وتأكد من عدم إمكانية إعادة تشغيلها، ثم تحقق
- مما إذا كانت خالية من
- المهدي الكهريائي. لا تفصل البطارية عند تعرضها لحمل كهريائي
- عند فصل البطارية عند تعرضها لحمل كهريائي، أو في حالة الدوائر المقصورة، قد يؤدي القوس الكهريائي الناشئ إلى نشوب حرق
- لا تتخلص من الأجسام الغريبة للبطارية أو أدواتها.
- انتبه لتفجع الحيار التي تسقط أثناء النقل.
- يحذر رفع بطاريات الإشارات الهادية/الخلايا باستخدام قطبيها
- لا تستخدم لإ قطع الحيار الأصلية لغرض الاستبدال.

## General Safety instructions - devices



### Български

#### Общи инструкции за безопасност

- Уредите не са подходящи за частна употреба.
- Монтирането трябва да се извършва от квалифицирани техници, като се вземат под внимание националните разпоредби за безопасност и предотвратяване на злополуки.
- Уредите трябва да се използват в съответствие с предназначението им, в подходящо и изправно състояние.
- Отстранете всички чужди тела от уредите, преди първото му използване.
- При работа с уредите, първо изключете напълно електрозахранването, уверете се, че не е възможно то да се включи отново и проверете дали уредът не е под напрежение. (Горното се отнася до електрическата мрежа, резервното захранване и евентуално контролно и външно напрежение.) Не изключвайте веригите, докато са под натоварване.
- Внимавайте за падащи части по време на транспортиране.
- Използвайте само оригинални резервни части за подмяна.

### Česky

#### Všeobecné bezpečnostní pokyny

- Zařízení nejsou určeny k soukromému využití.
- Veškerou instalaci musí provádět kvalifikovaný elektrikář seznámený s národními bezpečnostními předpisy.
- Zařízení se smí používat jen k zamýšlenému účelu a musí být v řádném a nepoškozeném stavu.
- Před prvním použitím ze zařízení odstraňte všechny cizí předměty.
- Při práci na zařízení nejprve zcela odpojte napájení, zajistěte, aby nemohlo být znovu zapnuto, a zkontrolujte nepřítomnost napětí. (Výše uvedený pokyn se týká napájení z rozvodné sítě, záložního napájení a případně i přívodu ovládacího a externího napětí.) Neodpojujte okruh pod napětím.
- Při přenosu pamatujte na oddělitelné části.
- K výměně používejte výhradně originální náhradní díly.

### Dansk

#### Generelle sikkerhedsinstruktioner

- Apparaterne er ikke egnet til privat brug.
- En installation skal altid udføres af en kvalificeret elektriker og under hensyntagen til nationale sikkerheds- og ulykkesforebyggende regulativer.
- Apparaterne må kun anvendes i overensstemmelse med den påtænkte brug og i hel og ubeskadiget stand.
- Fjern alle fremmedlegemer fra apparaterne inden første anvendelse.
- Når der arbejdes med apparaterne, så sluk først for al strøm, fastslå at den ikke kan tændes igen og tjek, at de er uden spænding. (Ovennævnte er gældende for strømforsyning, nødstrøm og mulig kontrol og ekstern strøm.) Afbryd ikke kredsløbene under belastning.
- Pas på løse dele under transport.
- Brug kun originale reservedele ved udskiftning.

### Deutsch

#### Allgemeine Sicherheitshinweise

- Die Geräte sind nicht für den privaten Gebrauch geeignet.
- Eine Installation darf nur durch qualifizierte Elektrofachkräfte unter Berücksichtigung der nationalen Sicherheits- und Unfallverhütungsvorschriften erfolgen.
- Die Geräte sind bestimmungsgemäß in unbeschädigtem und einwandfreiem Zustand zu betreiben.
- Alle Fremdkörper müssen vor der ersten Inbetriebnahme aus den Geräten entfernt werden.
- Bei Arbeiten an den Geräten sind diese zuerst komplett spannungsfrei zu schalten, gegen Wiedereinschalten zu sichern und die Spannungsfreiheit festzustellen. (Gilt für Netzspannung, Ersatzstromquelle und evtl. Steuer- / Fremdspannungen.) Stromkreise nicht unter Last trennen.
- Beim Transport mit herunter fallenden Teilen rechnen.
- Als Ersatz dürfen nur Originalteile verwendet werden.

### Eesti

#### Üldised ohutusjuhised

- Need seadmed ei ole mõeldud erakasutuseks.
- Paigaldustööd tuleb jätta kvalifitseeritud elektriku hooleks ning tuleb teha vastavalt siseriiklikele ohutuseeskirjadele ja õnnetusjuhtumite vältimise reeglitele.
- Seadmeid tuleb kasutada nende ettenähtud eesmärgil korrasolevatena ja kahjustamata seisundis.
- Enne esmakordset kasutamist eemaldage seadmetest kõik võõrkehad.
- Seadmetega töötamisel lülitage kõigepealt kogu toide välja, tagage, et seda ei saa uuesti sisse lülitada ja kontrollige toitepinge puudumist. (Eeltoodu kehtib nii võrgupinge, varutoite kui ka võimaliku kontrollpinge ja välise pinge suhtes.) Ärge ühendage lahti koormuse all olevat vooluringi.
- Transportimisel võtke arvesse kukkuvatest osadest lähtuvat ohtu.
- Vahetamiseks kasutage ainult originaalvaruosi.

### ελληνικά

#### Γενικές οδηγίες για την ασφάλεια

- Οι συσκευές δεν είναι κατάλληλες για ιδιωτική χρήση.
- Η εγκατάστασή τους πρέπει να γίνεται από εξειδικευμένους ηλεκτρολόγους, λαμβάνοντας υπόψη τους εθνικούς κανονισμούς ασφαλείας και πρόληψης ατυχημάτων.
- Πρέπει να γίνεται μόνο η προβλεπόμενη χρήση των συσκευών, στην κατάλληλη κατάσταση τους και χωρίς να παρουσιάζουν βλάβη.
- Πριν από την πρώτη χρήση τους, απομακρύνετε όλα τα ξένα αντικείμενα από τις συσκευές.
- Όταν εργάζεστε με τις συσκευές, κλείνετε τον διακόπτη λειτουργίας, βεβαιώνετε ότι δεν μπορεί να ανοίξει ξανά και ελέγχετε εάν υπάρχει τάση σε αυτές (το ίδιο ισχύει και για τον γενικό διακόπτη ρεύματος, την εφεδρική πηγή ισχύος και την τυχόν τάση ελέγχου και εξωτερική τάση). Μην αποσυνδέσετε τα καλώδια από φορτίο.
- Έχετε υπόψη σας τα τμήματα που ενδέχεται να πέσουν κατά τη μεταφορά.
- Χρησιμοποιείτε μόνο γνήσια ανταλλακτικά για αντικατάσταση.

### English

#### General safety instructions

- The devices are not suitable for private use.
- An installation must be performed by qualified electricians taking into account the national safety and accident prevention regulations.
- The devices must be used in accordance with their intended use in a proper and undamaged condition.
- Remove all foreign objects from the devices before their first use.
- When working with the devices, first turn off the power completely, ensure that it cannot be turned back on, and check if they are free of voltage. (The above applies to mains power, backup power and possibly control and external voltage.) Do not disconnect the circuits under load.
- Be aware of falling parts during transport.
- Use only original spare parts for replacement.

### Español

#### Instrucciones generales de seguridad

- Los dispositivos no son adecuados para el uso privado.
- Solo puede instalarlos un electricista cualificado de acuerdo con la normativa de seguridad y prevención de accidentes.
- Los dispositivos deben utilizarse de acuerdo con su uso previsto, en buen estado y sin daños.
- Retire todos los objetos que no pertenezcan a los dispositivos antes del primer uso.
- Cuando se disponga a manipular los dispositivos, desconecte totalmente la corriente eléctrica, asegúrese de que no se pueden volver a conectar y compruebe que no tengan corriente. (Lo anterior se aplica a la red eléctrica, a los grupos electrogénos de emergencia, y posiblemente, también al control y a la corriente externa.) No desconecte los circuitos con una carga conectada.
- Tenga cuidado con los componentes que podrían caerse durante el transporte.
- Use solo piezas de repuesto originales para reemplazar las antiguas.

### Français

#### Consignes générales de sécurité

- Les dispositifs ne conviennent pas à un usage privé.
- L'installation doit être effectuée par des électriciens qualifiés, conformément aux réglementations nationales sur la sécurité et la prévention des accidents.
- Les dispositifs doivent être utilisés conformément à l'usage auquel ils sont destinés, être en bon état et ne pas être endommagés.
- Retirez tous les corps étrangers des dispositifs avant leur première utilisation.
- Lorsque vous travaillez sur les dispositifs, coupez tout d'abord complètement l'alimentation électrique, assurez-vous qu'elle ne peut pas être rétablie et vérifiez que la tension est nulle. (L'énoncé précédent s'applique à l'alimentation du secteur, l'alimentation de secours et peut s'appliquer à la tension de commande et à la tension externe.) Ne déconnectez pas les circuits en charge.
- Faites attention aux pièces pouvant tomber pendant le transport.
- N'utilisez que des pièces de rechange d'origine en cas de remplacement.

### Hrvatski

#### Opće sigurnosne upute

- Uredaji nisu prikladni za privatnu upotrebu.
- Instalaciju moraju provesti kvalificirani električari uzimajući u obzir nacionalne propise za sigurnost i sprečavanje nezgoda.
- Uredaji se moraju upotrebljavati u skladu sa svojom namjenom u ispravnom i neoštećenom stanju.
- Uklonite sve strane predmete iz uređaja prije prve upotrebe.
- Kada radite s uređajima, prvo u potpunosti isključite napajanje, osigurajte da se ne može uključiti i provjerite da nema napona. (Navedeno se odnosi na glavno napajanje, pomoćno napajanje i eventualno kontrolu vanjskog napona.) Nemojte isključivati strujne krugove pod opterećenjem.
- Pripazite na dijelove koji padaju tijekom transporta.
- Upotrebljavajte samo originalne rezervne dijelove za zamjenu.

### Italiano

#### Indicazioni generali sulla sicurezza

- Le unità non sono idonee all'uso privato.
- L'installazione deve essere effettuata da un elettricista specializzato prendendo in considerazione le norme nazionali in materia di sicurezza e prevenzione degli infortuni.
- Le unità devono essere utilizzate conformemente all'uso previsto in condizioni adeguate e senza danni.
- Rimuovere tutti i corpi estranei dalle unità prima di utilizzarle per la prima volta.
- Prima di ogni intervento sulle unità, disattivare completamente l'alimentazione elettrica, accertarsi che non possa essere riattivata e verificare che le unità siano prive di tensione. (Quanto sopra vale per la tensione di rete, l'alimentazione di riserva ed eventualmente per la tensione di controllo e la tensione esterna.) Non scollegare i circuiti sotto carico.
- Prestare attenzione alla possibile caduta di pezzi durante il trasporto.
- Utilizzare soltanto pezzi di ricambio originali.

### Latviski

#### Vispārējie drošības norādījumi

- Šīs ierīces nav paredzētas personīgai lietošanai.
- Uzstādīšana jāveic kvalificētiem elektriķiem, ievērojot nacionālos drošības un nelaimes gadījumu novēršanas noteikumus.
- Ierīces jālieto saskaņā ar tām paredzēto lietošanu pareizā un nebojātā stāvoklī.
- Pirms pirmās lietošanas reizes izņemiet no ierīces visus svešķermeņus.
- Ritkojoties ar ierīcēm, vispirms pilnībā izslēdziet barošanu, nodrošiniet, ka tās nevar atkal ieslēgt, un pārlicinieties, ka tās nav zem sprieguma. (Iepriekš minētais attiecas uz barošanu no tīkla, no rezerves barošanas avota, kā arī no iespējama vadības un ārēja sprieguma.) Neatvienojiet ķēdes, kam pievienota slodze.
- Transportējot uzmanieties no kritošām daļām.
- Nomaināji izmantojiet tikai oriģinālas rezerves daļas.

## General Safety instructions - devices

### Lietuviškas

#### Bendrieji saugos nurodymai

- Įrenginiai neskirti privačiam naudojimui.
- Įrengti turi kvalifikuoti elektrikai, atsižvelgdamai į šalies saugos ir nelaimingų atsitikimų prevencijos taisykles.
- Įrenginiai turi būti naudojami pagal numatytą paskirtį, tinkamos būklės ir nesugadinti.
- Prieš naudodami pirmą kartą, nuo įrenginio pašalinkite visus pašalininius daiktus.
- Dirbdami su įrenginiais pirmiausia visiškai išjunkite maitinimą, pasirūpinkite, kad jis negalėtų būti vėl įjungtas ir patikrinkite, ar neliko įtampos. (Minėti nurodymai taikomi pagrindiniams maitinimui, atsarginiam maitinimui ir galimai valdymo bei išorinei įtampai.) Neatjunkite grandinių, kuriomis teka elektros srovė.
- Veždami saugokitės, kad neužkristų daiktai.
- Pakeitimui naudokite tik originalias atsargines dalis.

### Magyar

#### Általános biztonsági utasítások

- A készülékek nem megfelelőek magáncélú használatra.
- A felszerelést csak szakképzett villanyszerelő végezheti a biztonsági és baleset-megelőzési helyi szabályozás betartásával.
- A készülékeket rendeltetésszerűen kell használni, és azoknak megfelelő és sértetlen állapotúnak kell lenniük.
- Az élszámítás előtt távolítsa el az összes idegen tárgyat a készülékekből.
- Ha a készülékekkel munkálatokat végez, először szakítsa meg teljesen azok áramellátását, biztosítsa bekapcsolás ellen, és ellenőrizze, hogy feszültségmentes állapotban vannak. (A fenti utasítás vonatkozik a tápfeszültségre, készletléti áramellátásra és a vezérlő és külső feszültségre, ha van ilyen.) Ne kapcsolja szét az áramköröket terhelés alatt.
- Figyeljen az esetleg leeső összetevőkre szállítás során.
- Csak eredeti cserealkatrészeket használjon.

### Nederlands

#### Algemene veiligheidsinstructies

- De componenten zijn alleen geschikt voor professioneel gebruik.
- Installatie moet worden uitgevoerd door gekwalificeerde elektromonteurs met inachtneming van de nationale regelgeving voor veiligheid en het voorkomen van ongevallen.
- De apparaten moeten worden gebruikt waarvoor deze bedoeld zijn, op juiste wijze en in onbeschadigde toestand.
- Verwijder alle vreemde voorwerpen van de apparaten voordat u deze in gebruik neemt.
- Tijdens werkzaamheden aan de componenten schakelt u eerst alle stroom geheel uit en zorgt u ervoor dat deze niet weer zo maar ingeschakeld kan worden, en controleert u of deze geheel vrij van spanning zijn. (Bovenstaande geldt voor de hoofdspanning, accuspanning en eventuele externe spanning.) Ontkoppel de stroomcircuits niet als deze in gebruik zijn.
- Let op vallende delen tijdens transport.
- Gebruik alleen originele onderdelen bij vervanging.

### Norsk

#### Generelle sikkerhetsinstruksjoner

- Enhetene passer ikke for privat bruk.
- En installasjon må utføres av kvalifiserte teknikere som tar hensyn til nasjonale sikkerhetsforskrifter og ulykkesforebyggende forskrifter.
- Enhetene skal brukes i samsvar med tiltenkt formål, i riktig og uskadet stand.

- Fjern alle fremmedlegemer fra enhetene før første gangs bruk.
- Ved arbeid med enhetene, skal strømmen først slås helt av, og det skal sikres at den ikke kan slås på igjen. Kontroller at de er spenningsfrie. (Det ovennevnte gjelder nettstrøm, ekstrastrom og mulig kontroll- og ekstern spenning.) Ikke koble fra kretsene under ladning.
- Vær oppmerksom på fallende deler under transport.
- Bruk bare originale reservedeler til erstatning.

### Polski

#### Ogólne instrukcje bezpieczeństwa

- Urządzenia nie nadają się do użytku prywatnego.
- Montaż musi być przeprowadzony przez wykwalifikowanego elektryka z uwzględnieniem krajowych przepisów bezpieczeństwa pracy i zapobiegania wypadkom.
- Urządzeń należy używać wyłącznie zgodnie z ich zamierzonym przeznaczeniem, gdy są one w dobrym i nieuszkodzonym stanie.
- Przed pierwszym użyciem należy usunąć z urządzeń wszystkie obce ciała.
- Podczas pracy przy urządzeniach należy najpierw całkowicie wyłączyć zasilanie, upewnić się, że nie można go włączyć ponownie oraz sprawdzić, czy nie ma napięcia. (powyższe instrukcje dotyczą zasilania sieciowego, zasilania awaryjnego oraz napięcia sterowniczego i zewnętrznego.) Nie wolno odłączyć obwodów znajdujących się pod obciążeniem.
- Podczas transportu należy uważać na spadające elementy.
- W przypadku wymiany należy używać wyłącznie oryginalnych części zamiennych.

### Português

#### Instruções gerais de segurança

- Os dispositivos não são adequados para uso privado.
- A instalação deve ser efetuada por um electricista qualificado e em conformidade com os regulamentos nacionais de segurança e prevenção de acidentes.
- Os dispositivos devem ser utilizados em conformidade com o seu uso previsto e em boas condições, não apresentando danos.
- Remova todos os objetos estranhos dos dispositivos antes de utilizá-los pela primeira vez.
- Ao utilizar os dispositivos, primeiro desligue a eletricidade completamente, certifique-se de que não pode ser ligada e verifique se não existe tensão. (O supramencionado aplica-se à rede elétrica, à energia de reserva e à possível tensão de controlo e externa.) Não desligue os circuitos sob carga.
- Tenha atenção à queda de peças durante o transporte.
- Em caso de substituição, utilize apenas peças sobressalentes originais.

### Română

#### Instrucțiuni generale de siguranță

- Aparatele nu sunt destinate pentru uz personal.
- Instalarea trebuie efectuată de către un electrician calificat în conformitate cu reglementările naționale de siguranță și prevenirea accidentelor.
- Aparatele trebuie utilizate conform destinației lor într-o stare corespunzătoare și nedeteriorată.
- Îndepărtați toate corpurile străine din aparat înainte de prima utilizare a acestuia.
- Dacă efectuați lucrări la aparate, întrerupeți mai întâi alimentarea cu curent, asigurați-le împotriva repornirii și verificați ca să nu fie sub tensiune. (Cele de mai sus se referă la alimentarea de la rețea, alimentarea de

- rezervă, tensiunea de reglare și curenții de scurgere.) Nu întrerupeți circuitele sub sarcină.
- Fiți atenți la obiecte care pot cădea în timpul transportului.
- Utilizați numai piese de schimb originale.

### Русский

#### Общие инструкции по безопасности

- Устройства не предназначены для бытового использования.
- Монтаж выполняется квалифицированными электриками с учетом государственных норм и правил ТБ и профилактики несчастных случаев.
- Светильники должны использоваться только по назначению, при этом их следует поддерживать в исправном состоянии и оберегать от повреждений.
- Перед началом эксплуатации устройств удалите с их поверхности все посторонние объекты.
- Перед началом выполнения любых работ со светильниками, необходимо полностью обесточить их, обеспечить невозможность несанкционированной подачи питания, а также проверить отсутствие напряжения в цепи. (Подразумевается магистраль питания, резервное питание и, по возможности, напряжение в цепи управления и внешней цепи.) Не разрывайте цепи, находящиеся под нагрузкой.
- Перемещайте аккумулятор с осторожностью, чтобы не уронить.
- При замене вышедших из строя деталей используйте только оригинальные запчасти.

### Slovenčina

#### Splošna varnostna navodila

- Zariadenia nie sú vhodné na súkromné použitie.
- Inštaláciu musí vykonávať kvalifikovaný elektrikár s príslušným titulom na vnútroštátne nariadenia o bezpečnosti a predchádzaní rizikám.
- Zariadenia sa musia používať v súlade s plánovaným používaním v riadnom a nepoškodenom stave.
- Pred prvým použitím odstráňte všetky cudzie predmety zo zariadení.
- Pri práci so zariadeniami najprv úplne vypnite napájanie, zaistíte, aby sa znova nezapli a skontrolujte, či sú bez napätia. (Uvedené sa vzťahuje na sieťové napájanie, záložný zdroj a možnú kontrolu a externé napätie.) Obvody neodpájajte pod napätím.
- Počas prepravy dávajte pozor na padajúce predmety.
- Na výmenu používajte originálne náhradné diely.

### Slovenščina

#### Pokyny týkajúce sa všeobecnej bezpečnosti

- Naprave niso ustrezne za zasebno uporabo.
- Nameštitev morajo opraviti kvalificirani elektriki, pri čemer morajo upoštevati nacionalne predpise za varnost in preprečevanje nesreč.
- Napravo lahko uporabljate samo v skladu z njeno predvideno uporabo v ustreznem in nepoškodovanem stanju.
- Pred prvo uporabo naprave morate iz nje odstraniti vse tuje predmete.
- Ko delate na napravi, najprej povsem izključite napajanje, se prepričajte, da se je ne da več vklopiti, in preverite, če res ni več priključena na napetost. (Zgornje se nanaša na glavno napajanje, rezervno napajanje in tudi krmilnik ter zunanje napajanje.) Ne izklopite vezij pod napetostjo.
- Med transportom pazite na padajoče predmete.
- Pri zamenjavi uporabljajte samo originalne rezervne dele.

### Suomalainen

#### Yleiset turvallisuusohjeet

- Laitteet eivät sovellu yksityiskäyttöön.
- Asennuksen saa suorittaa vain pätevät sähköasentajat ottaen huomioon kansalliset turvallisuus- ja tapaturmantorjuntamääräykset.
- Laitteita on käytettävä niiden tarkoitettuun käyttötarkoitukseen asianmukaisessa ja vahingoittamattomassa kunnossa.
- Poista kaikki vieraat esineet laitteista ennen niiden ensimmäistä käyttökertaa.
- Kun työskentelet laitteiden kanssa, sammuta sähköt ensin kokonaan ja varmista ettei niitä voi pistää takaisin päälle. Tarkista sitten ovatko ne jännitevapaita. (Edellä mainittu koskee verkkovirtaa, varavoimaa ja mahdollisesti ohjauksännitettä ja ulkoista jännitettä.) Älä irrota kuormitettuja virtapiirejä.
- Varo putoavia osia kuljetuksen aikana.
- Käytä vaihdossa vain alkuperäisiä varaosia.

### Svenska

#### Allmänna säkerhetsföreskrifter

- Dessa enheter lämpar sig inte för privat bruk.
- Installation skall utföras av behörig elektriker med hänsyn till de nationella säkerhets- och olycksfalls skyddsföreskrifterna.
- Enheterna måste användas i enlighet med dess avsedda bruk och i ett korrekt och oskadat skick.
- Ta bort alla främmande föremål från enheterna innan de används för första gången.
- Medan du arbetar med enheterna, stäng först av strömmen helt, se till att den inte kan slås på igen och kontrollera att den inte har spänning. (Ovanstående gäller elnät, reservström och eventuellt kontroll- och extern spänning.) Koppla inte ur kretsarna under laddning.
- Var uppmärksam på fallande delar under transport.
- Använd endast originalreservdelar vid utbyte.

### Türkçe

#### Genel güvenlik talimatları

- Aygıtlar özel kullanım için uygun değildir.
- Bir kurulum ulusal güvenlik ve kaza önleme yönetmelikleri dikkate alınarak vasıflı elektrikçiler tarafından yapılmalıdır.
- Aygıtlar, uygun ve zarar görmemiş bir şekilde tasarlanan kullanımı doğrultusunda kullanılmalıdır.
- İlk kullanım öncesinde aygıttaki tüm yabancı maddeleri giderin.
- Aygıtlarda çalışırken, ilk olarak gücü tamamen kapatın, tekrar açılmayaçağın emin olun ve üzerinde gerilim olmadığınızı kontrol edin. (Yukarıdaki ana güç kaynağı, yedek güç kaynağı ve muhtemelen kontrol ve harici gerilim için uygulanır.) Yük altında devrelerin bağlantısını kesmeyin.
- Taşıma esnasında düşen parçalara dikkat edin.
- Değişim için sadece orijinal yedek parçaları kullanın.

#### الإرشادات العامة لسلامة عند استخدام الأجهزة

الأجهزة ليست مناسبة للاستخدام الخاص. يجب أن يقوم كهربائي مؤهل بتركيب البطاريات مع الأخذ في الاعتبار قواعد السلامة الوطنية ومنع الحوادث.

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عند التعامل مع الأجهزة، أولاً بإيقاف تشغيل الكهرباء بالكامل، وتأكد من عدم إمكانية إعادة تشغيلها، ثم تحقق مما إذا كانت خالية من الجهد. (ينطبق الوارد أعلاه على التيار الكهربائي والطاقة الاحتياطية، والجهد الخارجي والذي يمكن التحكم فيه.) يحدد فصل الدوائر عند تعرضها للحم الكهربي. انتبه لقطع الغيار التي تسقط أثناء النقل. لا تستخدم الإقطع الغيار الأصلية لغرض الاستبدال.

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