CEAG ZB-S

Mounting and Operating Instructions
Central Battery System ZB-S with STAR-Technology

Target group, part 1: Qualified electrician acc. to DIN VDE 0105, part1
Target group. part 2: Electrical instucted persons

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.

⚠ WARNING!
DANGER!
RISK OF INJURY OR DEATH!

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

⚠ ATTENTION!
DAMAGE TO PROPERTY!

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

NOTE

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 intallation 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

⚠ ATTENTION!

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 maybe presented by the device, if it will be used for other than the intended purpose and by unskilled personnel.

⚠ WARNING!

When planning a lighting system with a ZB-S system you first establish wether 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.

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

⚠ ATTENTION!

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-authorised distribution and service contractors)!

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

- he 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

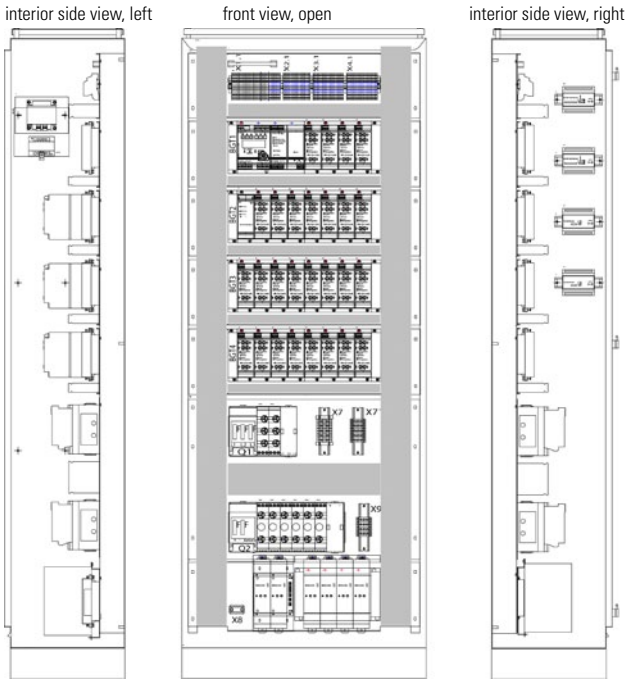
Type of system:	ZB-S 26
Construction:	Sheet steel cabinet with partial viewing window in the door
Height:	2050 mm
Width:	800 mm
Depth:	400 mm
Weight without battery:	approx. 180 kg
Insulation class:	I
Degree of protection:	IP 21
External painting :	Structure powder laquer RAL 7035 light grey
Cable entry:	at the top (prepunched roof sheeting) at the bottom (open bottom with propping tracks on the side)
Hinge:	right

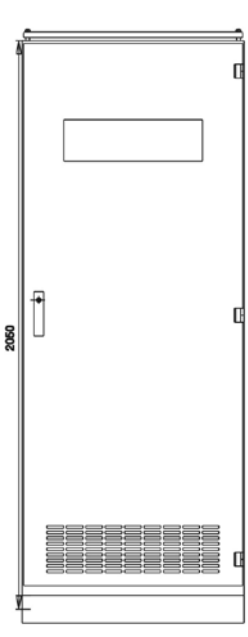
Mains rated voltage:	400V AC, 50/60 Hz
Battery rated voltage:	216V DC
Battery capacity (C10; 1.8V/Z; +20°C):	23.3 - 245 Ah
Type of battery:	Lead acid battery, 10 years service life at +20°C acc. to IEC 486
Duration of emergency lighting:	1 h or 3 h
Recharging time:	12 h acc. to DIN EN 50171
Ambient temperature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

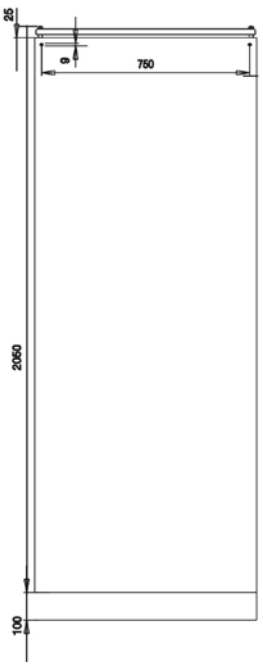
(please attend to the attachted operating and installation instructions)

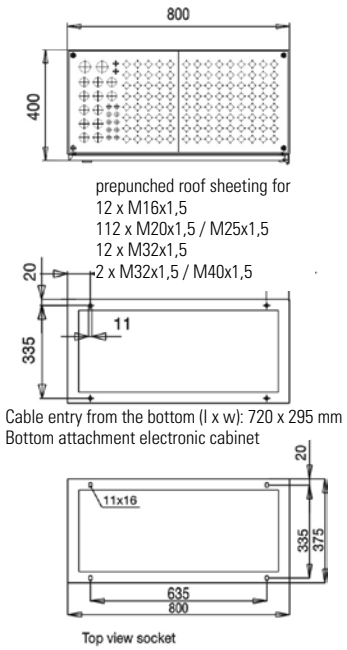
Mains feed in (max. 50mm²):	Q1
Battery feed in (max. 50mm²):	Q2
Max. 80 circuits (max. 4 mm²)*:	X1.1, X2.1, X3.1, X4.1
Marshalling mains (max. 16mm²):	F10 - F15
Marshalling battery (max. 16mm²):	F30 - F35, F50 - F55
Addresses optional places DLS-3Ph, TLS (max. 2,5mm²):	customised
Connection to ext. control switch (max. 4mm²)**:	X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**:	X1.1.S3-S4
Connection to potential-free signal contacts (max.4mm²)**:	X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**:	X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**:	X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**:	X1.1.+24V Out--24V Out
Connection to 24V analog input (max.4mm²)**:	X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.









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 21
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 or 3 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

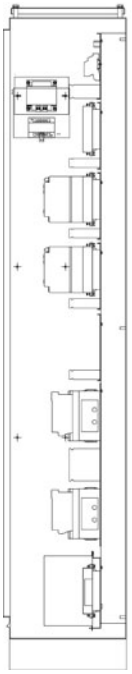
(please attend to the attached operating and installation instructions)

Mains feed in (max. 50mm²):	Q1
Battery feed in (max. 50mm²):	Q2
Max. 68 circuits (max. 4mm²)*:	X1.1, X2.1, X3.1
Marshalling mains (max. 16mm²):	F10 - F15
Marshalling battery (max. 16mm²):	F30 - F35, F50 - F55
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²):	customised
Connection to ext. control switch (max. 4mm²)**:	X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**:	X1.1.S3-S4
Connection to potential-free signal contacts (max.4mm²)**:	X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**:	X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**:	X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**:	X1.1.+24V Out--24V Out
Connection to 24V analog input(max.4mm²)**:	X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

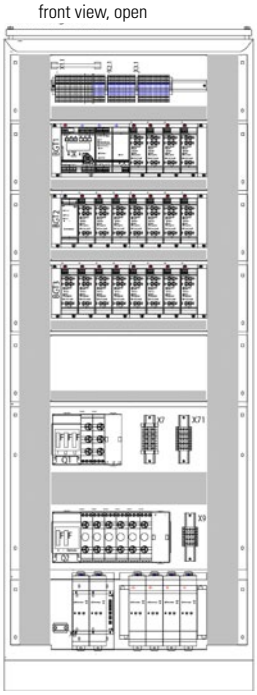
* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.

** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.

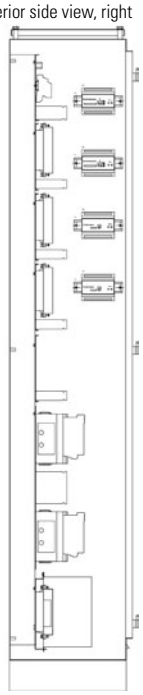
interior side view, left

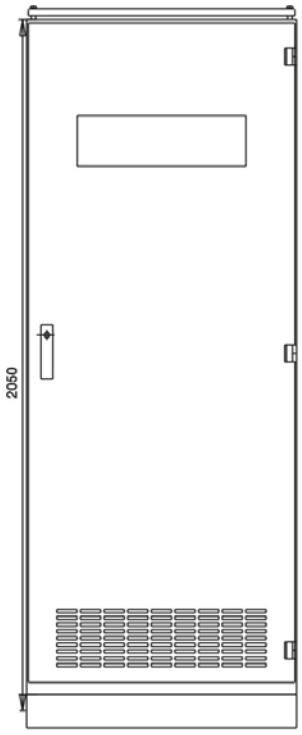


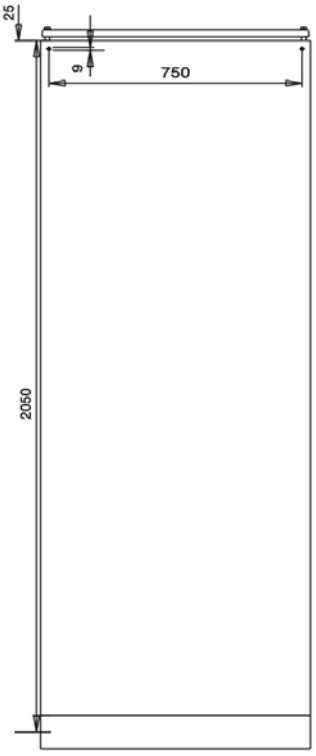
front view, open

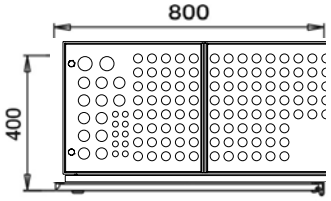


interior side view, right

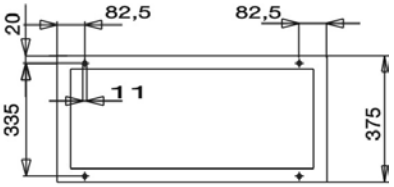




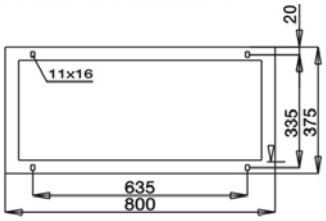




prepunched roof sheeting for
12 x M16x1,5
112 x M20x1,5 / M25x1,5
12 x M32x1,5
2 x M32x1,5 / M40x1,5



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



Top view socket

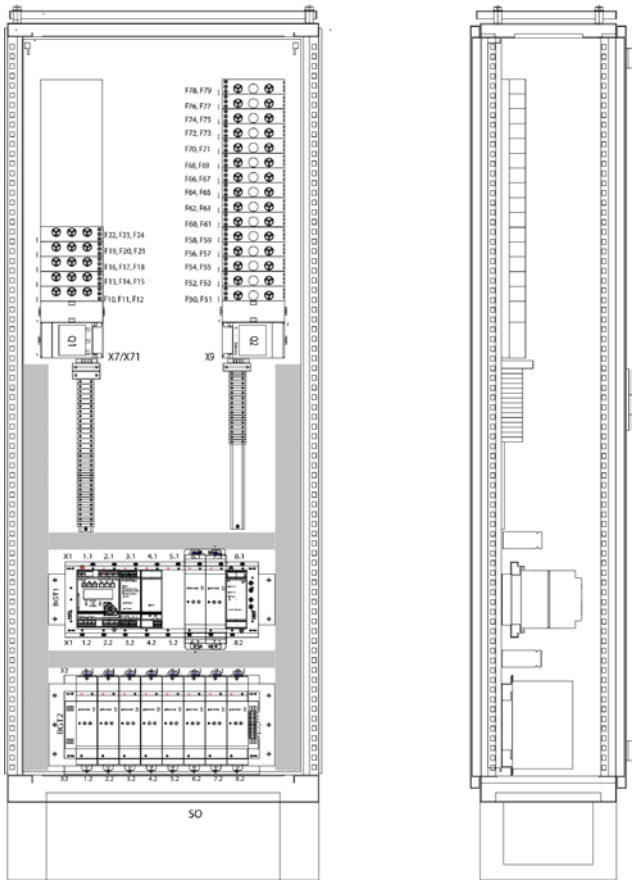
3.3 Data Sheet for ZB-S/LAD

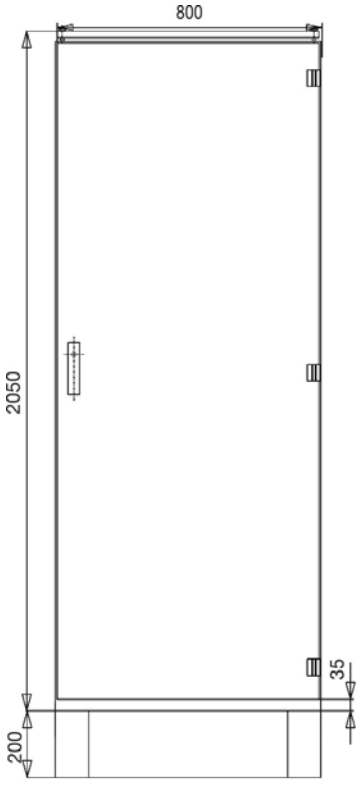
Type of system: ..... ZB-S LAD (Cable entry from top)
Construction: ..... Sheet steel cabinet with a door made of sheet
Height: ..... 2050 mm
Width: ..... 800 mm
Depth: ..... 400 mm
Weight without battery: ..... approx. 170 kg
Insulation class: I
Degree of protection: ..... IP 21
External painting: ..... 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

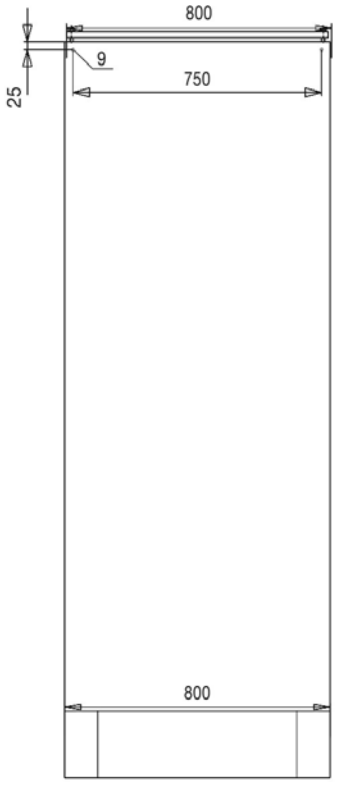
Mains rated voltage: ..... 400/230V AC, 50/60 Hz
Battery rated voltage: ..... 216V DC
Battery capacity (C10; 1.8V/Z; +20°C): ..... 23.3 - 308 Ah
Type of battery: ..... Lead acid battery,
10 years service life at +20°C acc. to IEC 486
Duration of emergency lighting: ..... 1 h or 3 h
Recharging time: ..... 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)

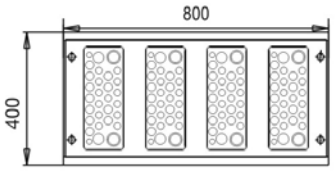
Mains feed in (max. 50mm²): Q1, X7
Battery feed in (max. 50mm²): Q2, X9
Max. 4 circuits (max. 4mm²)*: X11
Marshalling mains (max. 16mm²): ..... F10 - F24, X71
Marshalling battery (max. 16mm²): ..... F50 - F79, X9
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²): customised
Connection to ext. control switch (max. 4mm²)**: X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**: X1.1.S3-S4
Connection to potential-free signal contacts
(max.4mm²)**: X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**: X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**: X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**: X1.1.+24V Out--24V Out
Connection to 24V analog input (max.4mm²)**: X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

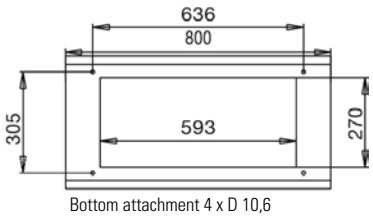
* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.



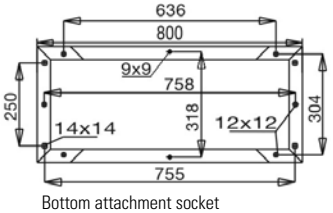








Bottom attachment 4 x D 10,6



Bottom attachment socket

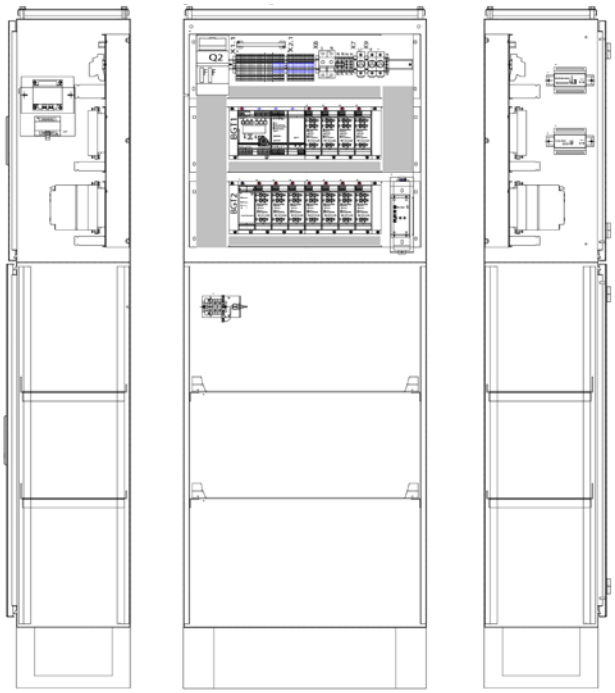
3.4 Data Sheet for ZB-S/10C

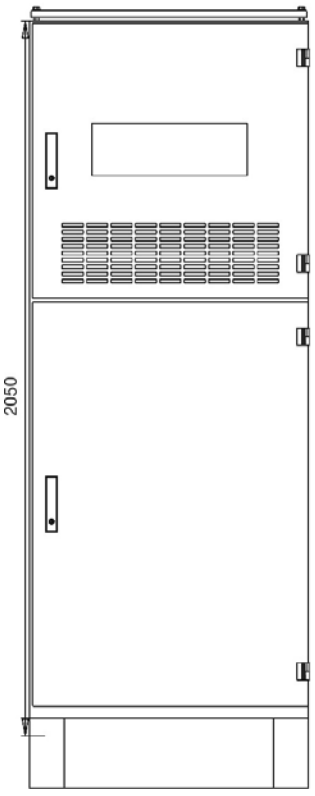
Type of system: ..... ZB-S 10C
Construction: ..... Sheet steel compact cabinet with divided door
Height: ..... 2050 mm
Width: ..... 800 mm
Depth: ..... 400 mm
Weight without battery: ..... approx. 155 kg
Insulation class: I
Degree of protection: ..... IP 21
External painting: ..... Structure powder laquer RAL 7035 light grey
Cable entry: ..... at the top (prepunched roof sheeting)
Cabinet construction: ..... one-piece, not divisible
Hinge: ..... right

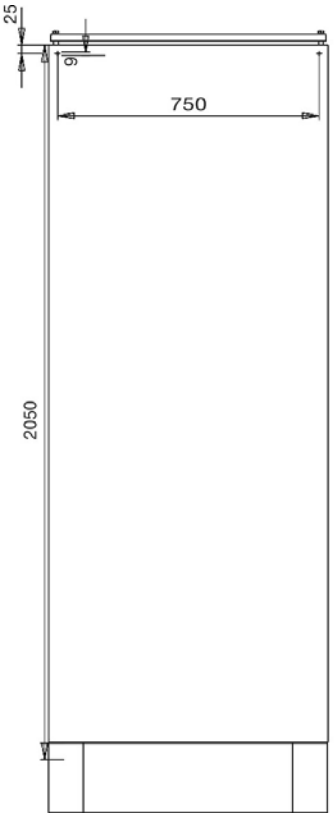
Mains rated voltage: ..... 230V AC, 50/60 Hz
Battery rated voltage: ..... 216V DC
Battery capacity (C10; 1.8 V/Z; +20°C): ..... 5.5 - 53.7 Ah
Type of battery: ..... Lead acid battery, 10 years service life at +20°C acc. to IEC 486
Duration of emergency lighting: ..... 1 h or 3 h
Recharging time: ..... 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)

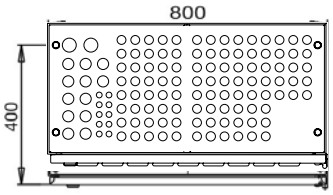
Mains feed in (max. 16mm²): X8
Battery feed in (max. 16mm²): Q2
Max. 40 circuits (max. 4mm²)*: X1.1, X2.1
Marshalling mains (max. 35mm²): X7
Marshalling battery (max. 35mm²): X9
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²): customised
Connection to ext. control switch (max. 4mm²)**: X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**: X1.1.S3-S4
Connection to potential-free signal contacts (max.4mm²)**: X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**: X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**: X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**: X1.1.+24V Out--24V Out
Connection to 24V analog input (max.4mm²)**: X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.

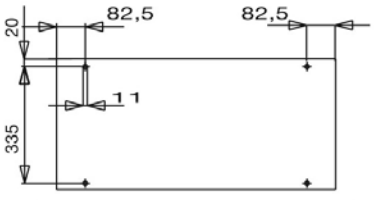




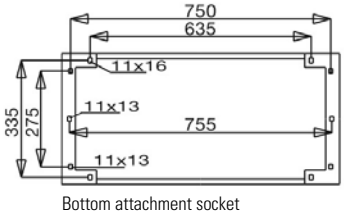




prepunched roof sheeting for
12 x M16x1,5
112 x M20x1,5 / M25x1,5
12 x M32x1,5
2 x M32x1,5 / M40x1,5



Bottom attachment electronic cabinet



Bottom attachment socket

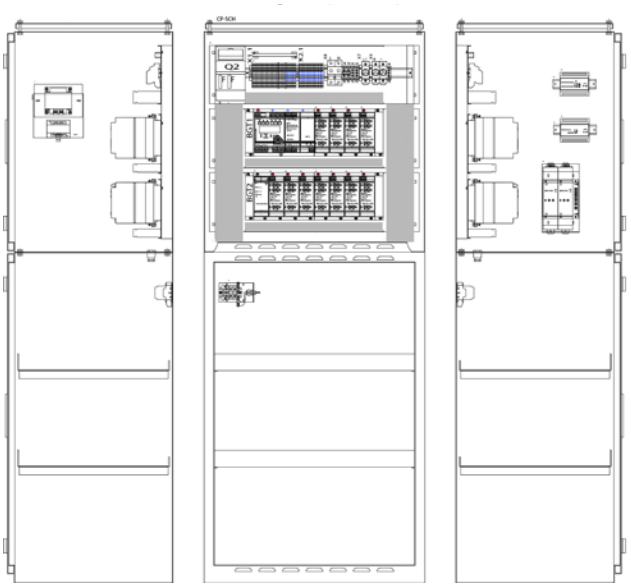
3.5 Data Sheet for ZB-S/10C6

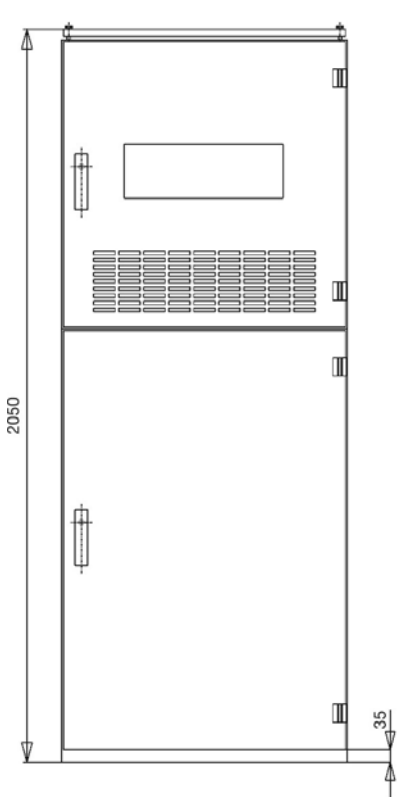
Type of system: ..... ZB-S 10C6
Construction: ..... Sheet steel compact cabinet with divided door
Height: ..... 2050 mm
Width: ..... 800 mm
Depth: ..... 600 mm
Weight without battery: ..... approx. 205 kg
Insulation class: I
Degree of protection: ..... IP 21
External painting: ..... Structure powder laquer RAL 7035 light grey
Cable entry: ..... at the top (prepunched flange plates)
Cabinet construction: ..... two parts, screwed together, divisible
Hinge: ..... right

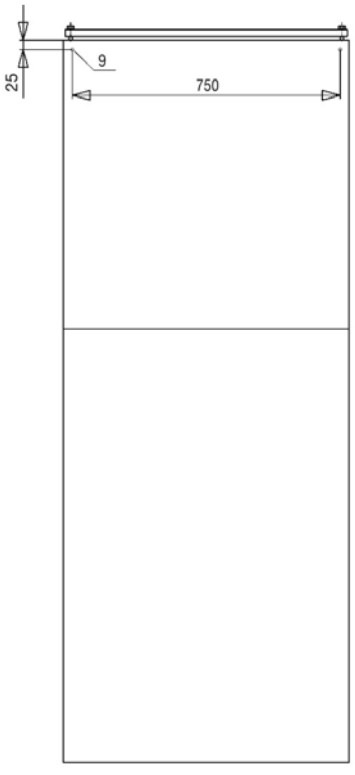
Mains rated voltage: ..... 230V AC, 50/60 Hz
Battery rated voltage: ..... 216V DC
Battery capacity (C10; 1.8 V/Z; +20°C): ..... 5.5-89.4 Ah
Type of battery: ..... Lead acid battery, 10 years service life at +20°C acc. to IEC 486
Duration of emergency lighting: ..... 1 h or 3 h
Recharging time: ..... 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)

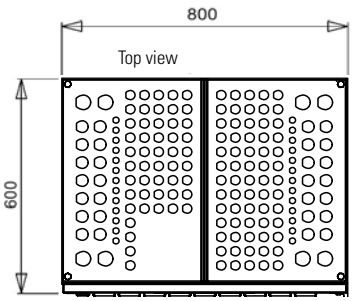
Mains feed in (max. 16mm²): X8
Battery feed in (max. 16mm²): Q2
Max. 40 circuits (max. 4mm²)*: X1.1, X2.1
Marshalling mains (max. 35mm²): X7
Marshalling battery (max. 35mm²): X9
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²): customised
Connection to ext. control switch (max. 4mm²)**: X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**: X1.1.S3-S4
Connection to potential-free signal contacts
(max.4mm²)**: X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**: X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**: X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**: X1.1.+24V Out--24V Out
Connection to 24V analog input (max.4mm²)**: X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² 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

3.6 Data Sheet for ZB-S/18C6

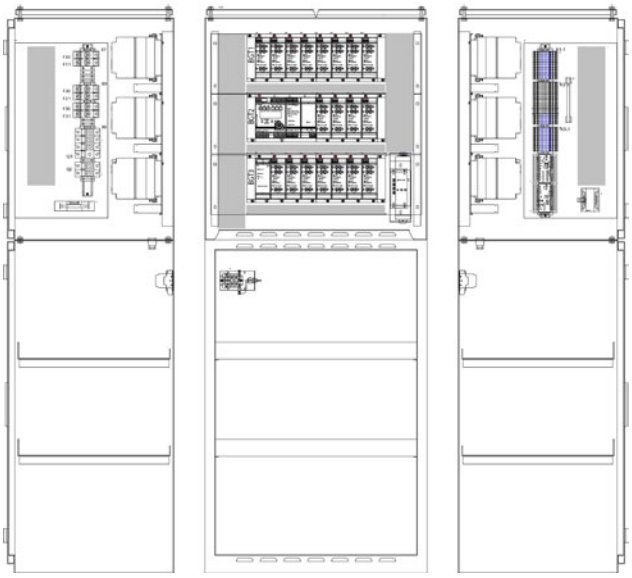
Type of system:	ZB-S 18C6
Construction:	Sheet steel compact cabinet with divided door
Height:	2050 mm
Width:	800 mm
Depth:	600 mm
Weight without battery:	approx. 205 kg
Insulation class:	I
Degree of protection:	IP 21
External painting:	Structure powder laquer RAL 7035 light grey
Cable entry:	at the top (prepunched flange plates)
Cabinet construction:	two parts, screwed together, divisible
Hinge:	right

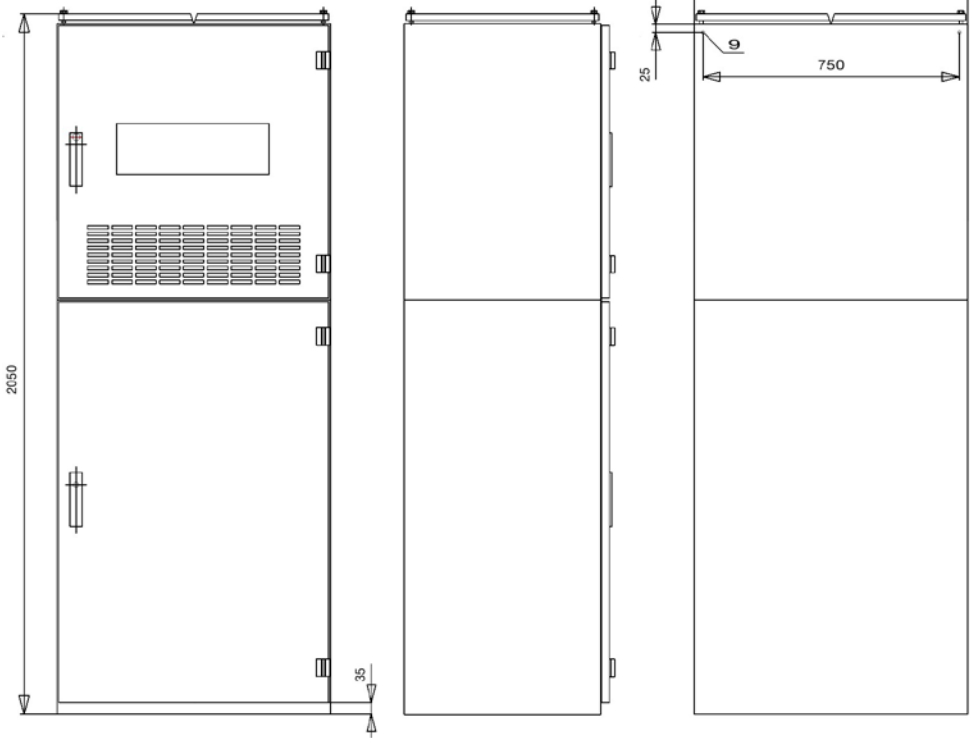
Mains rated voltage:	4000V AC, 50/60 Hz
Battery rated voltage:	216V DC
Battery capacity (C10; 1.8 V/Z; +20°C):	5.5-89.4 Ah
Type of battery:	Lead acid battery, 10 years service life at +20°C acc. to IEC 486
Duration of emergency lighting:	1 h or 3 h
Recharging time:	12 h acc. to DIN EN 50171
Ambient temperature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

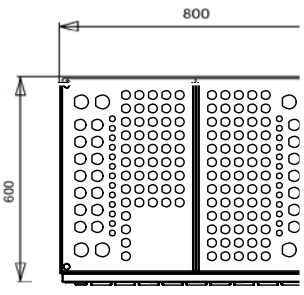
(please attend to the attached operating and installation instructions)

Mains feed in (max. 16mm²):	Q1
Battery feed in (max. 16mm²):	Q2
Max. 40 circuits (max. 4mm²)*:	X1.1, X2.1, X3.1
Marshalling mains (max. 35mm²):	X7, F10-F11
Marshalling battery (max. 35mm²):	X9, F20-F21, F30-F31
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²):	customised
Connection to ext. control switch (max. 4mm²)**:	X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**:	X1.1.S3-S4
Connection to potential-free signal contacts (max.4mm²)**:	X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**:	X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**:	X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**:	X1.1.+24V Out--24V Out
Connection to 24V analog input (max.4mm²)**:	X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² 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

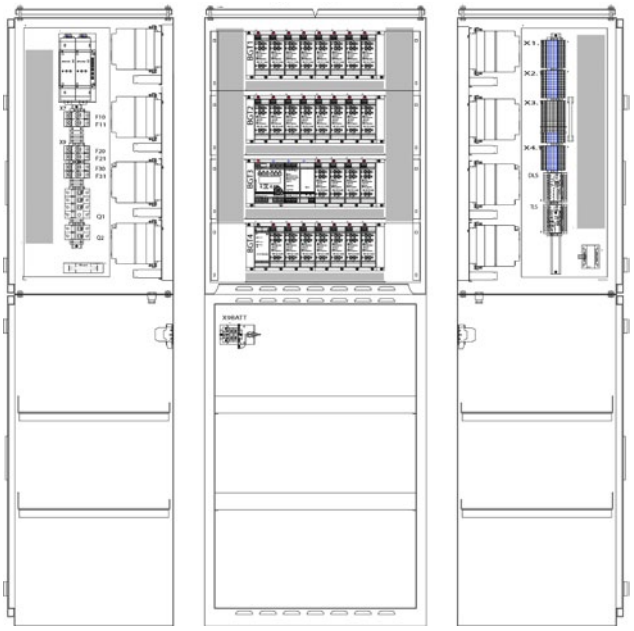
3.7 Data Sheet for ZB-S/26C6

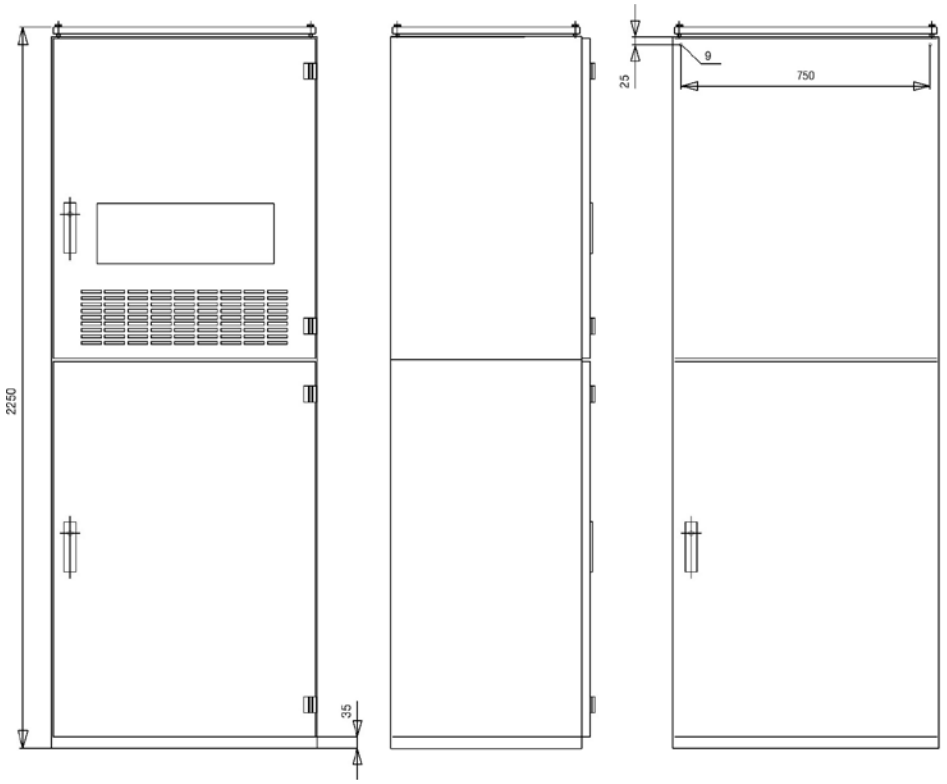
Type of system: ..... ZB-S 26C6
Construction: ..... Sheet steel compact cabinet with divided door
Height: ..... 2050 mm
Width: ..... 800 mm
Depth: ..... 600 mm
Weight without battery: ..... approx. 250 kg
Insulation class: I
Degree of protection: ..... IP 21
External painting: ..... Structure powder laquer RAL 7035 light grey
Cable entry: ..... at the top (prepunched roof sheeting)
Cabinet construction: ..... two parts, divisible
Hinge: ..... right

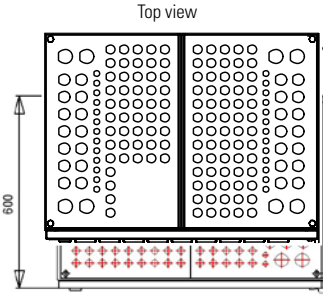
Mains rated voltage: ..... 400V/230V AC, 50/60 Hz
Battery rated voltage: ..... 216V DC
Battery capacity (C10; 1.8 V/Z; +20°C): ..... 5.5-89.4 Ah
Type of battery: ..... Lead acid battery, 10 years service life at +20°C acc. to IEC 486
Duration emergency lighting: ..... 1 h or 3 h
Recharging time: ..... 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. 16mm²): Q1
Battery feed in (max. 16mm²): Q2
Max. 56 circuits (max. 4mm²)*: X1.1, X2.1, X3.1, X4.1
Marshalling mains (max. 35mm²): X7, F10-F11
Marshalling battery (max. 35mm²): X9; F20-F21, F30-F31
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²): customised
Connection to ext. control switch (max. 4mm²)**: X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**: X1.1.S3-S4
Connection to potential-free signal contacts
(max.4mm²)**: X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**: X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**: X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**: X1.1.+24V Out--24V Out
Connection to 24V analog input (max.4mm²)**: X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² 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

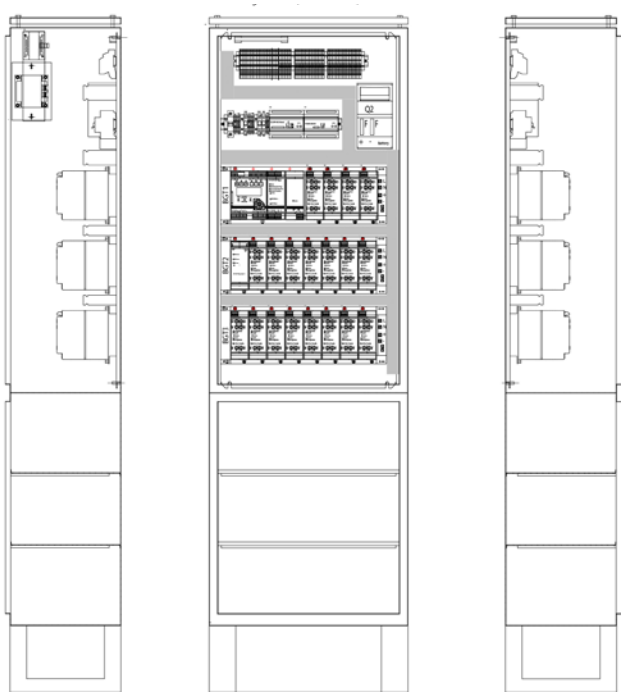
3.8 Data Sheet for ZB-S/18C3

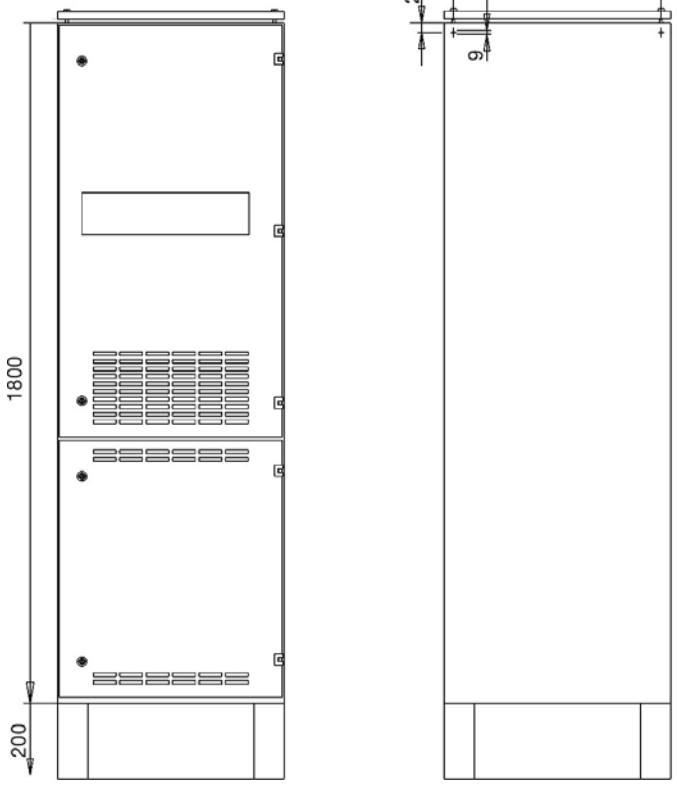
Type of system: ..... ZB-S 18C3
Construction: ..... Sheet steel compact cabinet with divided door
Height: ..... 1800 mm
Width: ..... 600 mm
Depth: ..... 350 mm
Weight without battery: ..... approx. 120 kg
Insulation class: I
Degree of protection: ..... IP 21
External painting: ..... Structure powder laquer RAL 7035 light grey
Cable entry: ..... at the top (prepunched roof sheeting)
Cabinet construction: ..... one-piece, not divisible
Hinge: ..... right

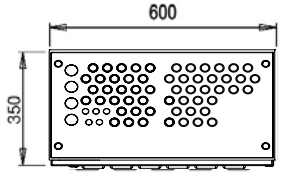
Mains rated voltage: ..... 230V AC, 50/60 Hz
Battery rated voltage: ..... 216V DC
Battery capacity (C10; 1.8 V/Z; +20°C): ..... 5.5-23.3 Ah
Type of battery: ..... Lead acid battery, 10 years service life at +20°C acc. to IEC 486
Duration emergency lighting: ..... 1 h or 3 h
Recharging time: ..... 12 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. 16mm²): X8
Battery feed in (max. 16mm²): Q2
Max. 56 circuits (max. 4mm²)*: X1.1, X2.1, X3.1
Marshalling mains (max. 35mm²): X7
Marshalling battery (max. 35mm²): X9
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²): customised
Connection to ext. control switch (max. 4mm²)**: X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**: X1.1.S3-S4
Connection to potential-free signal contacts
(max.4mm²)**: X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**: X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**: X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**: X1.1.+24V Out--24V Out
Connection to 24V analog input (max.4mm²)**: X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

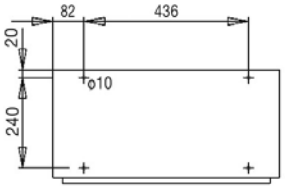
* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.



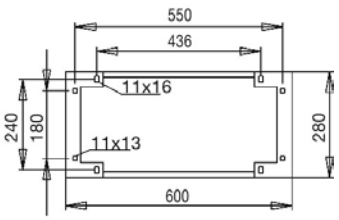




Cable entry from the prepunched cable fitting flange plate:
4 x M32
65 x M20/M25
5 x M16



Bottom attachment cabinet



Bottom attachment socket

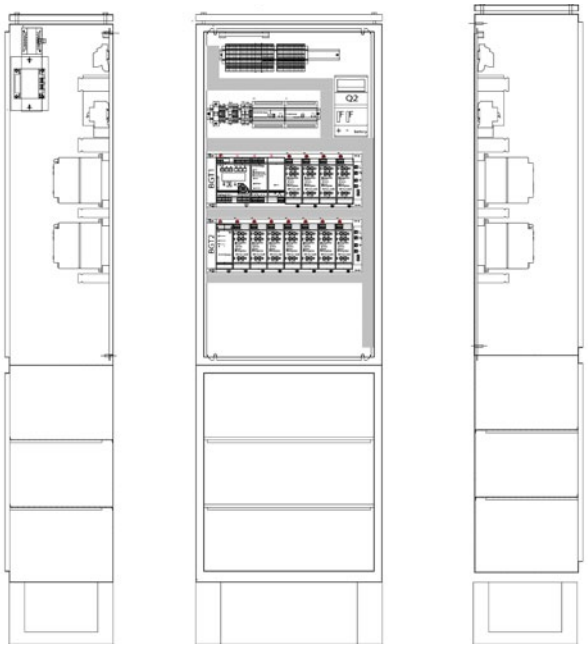
3.9 Data Sheet for ZB-S/10C3

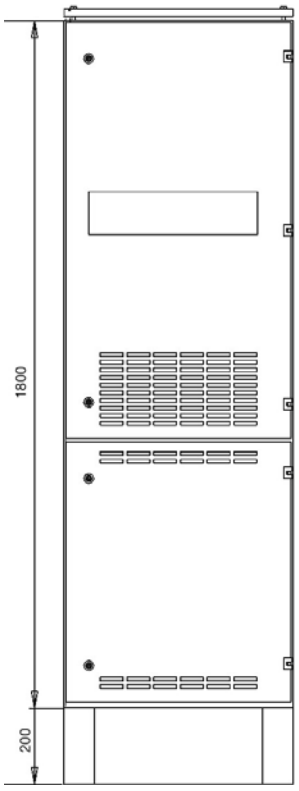
Type of system: ..... ZB-S 10C3
Construction: ..... Sheet steel cabinet
with partial viewing window in the door
Height: ..... 1800 mm
Width: ..... 600 mm
Depth: ..... 350 mm
Weight without battery: ..... approx. 115 kg
Insulation class: I
Degree of protection: ..... IP 21
External painting: ..... Structure powder laquer RAL 7035 light grey
Cable entry: ..... at the top (prepunched roof sheeting)
Cabinet construction: ..... one-piece, not divisible
Hinge: ..... right

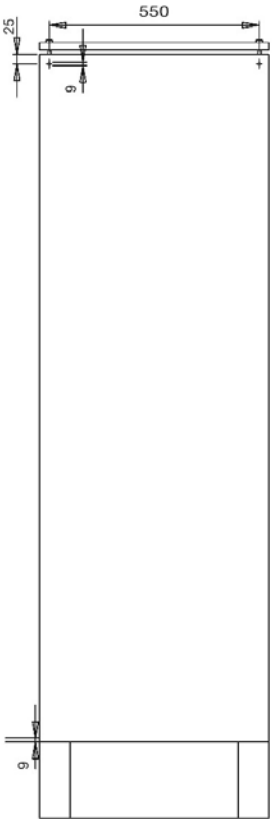
Mains rated voltage: ..... 230V AC, 50/60 Hz
Battery rated voltage: ..... 216V DC
Battery capacity (C10; 1.8 V/Z; +20°C): ..... 5.5-23.3 Ah
Type of battery: ..... Lead acid battery,
10 years service life at +20°C acc. to IEC 486
Duration of emergency lighting: ..... 1 h or 3 h
Recharging time: ..... 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)

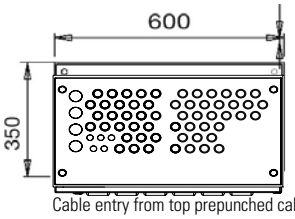
Mains feed in (max. 16mm²): X8
Battery feed in (max. 16mm²): Q2
Max. 40 circuits (max. 4mm²)*: X1.1, X2.1
Marshalling mains (max. 35mm²): X7
Marshalling battery (max. 35mm²): X9
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²): customised
Connection to ext. control switch (max. 4mm²)**: X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**: X1.1.S3-S4
Connection to potential-free signal contacts
(max.4mm²)**: X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**: X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**: X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**: X1.1.+24V Out--24V Out
Connection to 24V analog input (max.4mm²)**: X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.

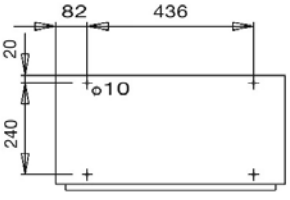




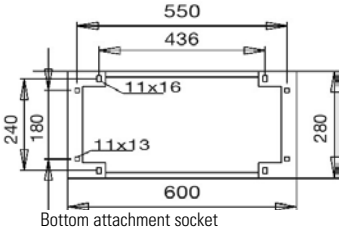




Cable entry from top prepunched cable flange plate:
4 x M32
65 x M20/M25
5 x M16



Bottom attachment cabinet



Bottom attachment socket

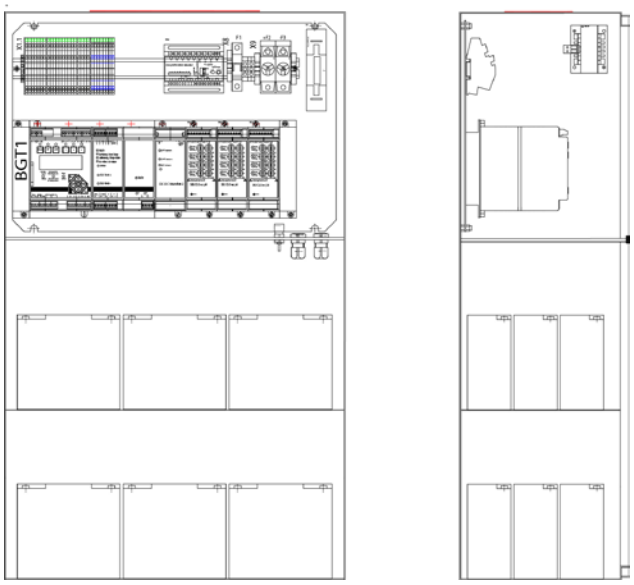
3.10 Data Sheet for ZB-S/2C3

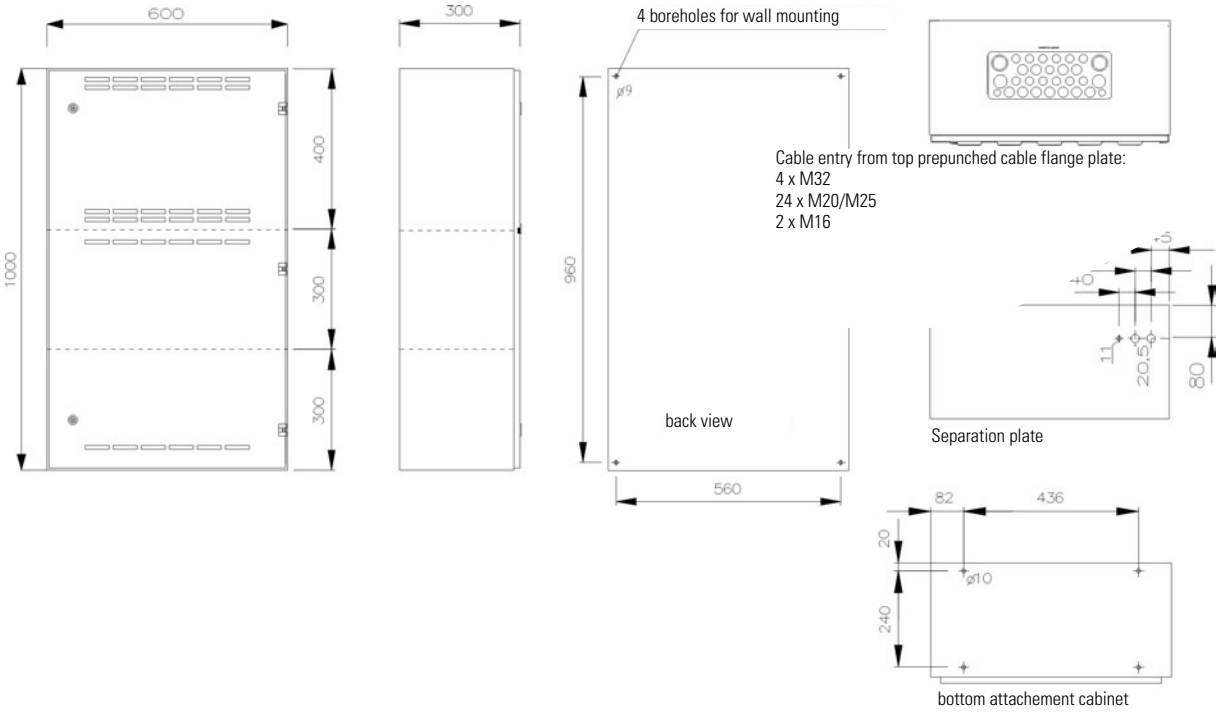
Type of system: ..... ZB-S 2C3
Construction: ..... Sheet steel cabinet with sheet steel door
Height: ..... 1000 mm
Width: ..... 600 mm
Depth: ..... 300 mm
Weight without battery: ..... approx. 50 kg
Insulation class: I
Degree of protection: ..... IP 21
External painting: ..... Structure powder laquer 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): ..... 5.5-14 Ah
Type of battery: ..... Lead acid battery,
10 years service life at +20°C acc. to IEC 486
Duration of emergency lighting: ..... 1 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. 16mm²): X8
Battery feed in (max. 16mm²): X9
Max. 8 circuits (max. 4mm²)*: X1.1
Connection to ext. control switch (max. 4mm²)**: X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**: X1.1.S3-S4
Connection to potential-free signal contacts
(max.4mm²)**: X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**: X1.1.CGS.A-B
Connection to RS485 Bus (max. 4mm²)**: X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**: X1.1.+24V --24V Out
Connection to 24V analog input (max.4mm²)**: X1.1.+24V Out --24V Out
Addresses of optional slots DLS-3Ph, TLS
(max. 4mm²)**: X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.





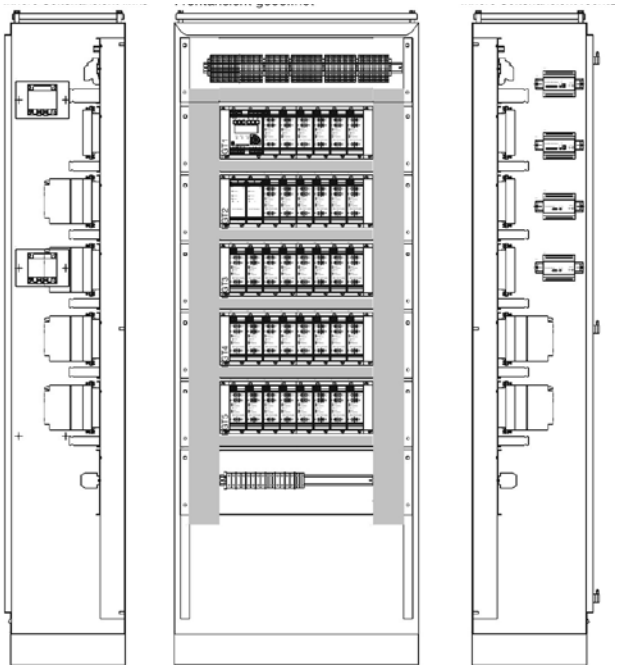
3.11 Data Sheet for US-S/36

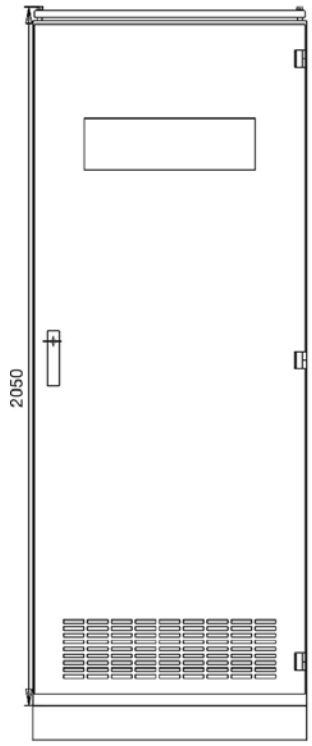
Type of system:	US-S/36
Construction:	Sheet steel cabinet with partial viewing window in the door
Height:	2050 mm
Width:	800 mm
Depth:	400 mm
Weight without battery:	approx. 170 kg
Insulation class:	I
Degree of protection:	IP 21
External painting:	Structure powder laquer RAL 7035 light grey
Cable entry:	at the top (prepunched roof sheeting) at the bottom (open bottom)
Hinge:	right

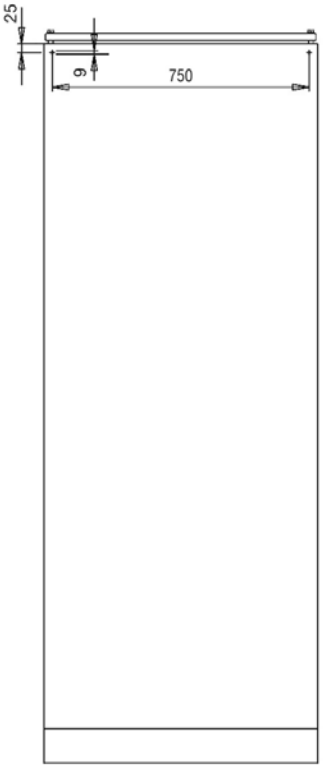
Mains rated voltage:	400V/230V AC, 50/60 Hz
Battery rated voltage:	216V DC
Battery capacity:	
Type of battery:	
Duration of emergency lighting:	
Recharging time:	
Ambient temperature operation:	-5°C up to +35°C

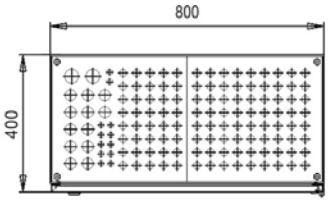
Mains feed in (max. 35mm²):	X8
Battery feed in (max. 35mm²):	X8
Max. 80 circuits (max. 4mm²)*:	X1.1, X2.1, X3.1, X4.1, X5.1
Addresses optional places DLS-3Ph, TLS (max. 2,5mm²): customised	
Connection to ext. control switch (max. 4mm²)**:	X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**:	X1.1.S3-S4
Connection to potential-free signal contacts (max.4mm²)**:	X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**:	X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**:	X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**:	X1.1.+24V Out--24V Out
Connection to 24V analog input (max.4mm²)**:	X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.

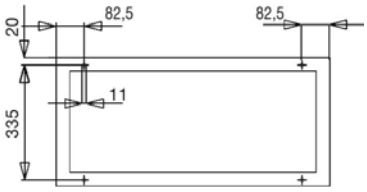






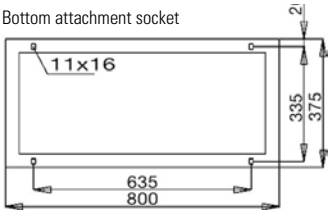


prepunched roof sheeting for
12 x M16x1,5
112 x M20x1,5 / M25x1,5
12 x M32x1,5
2 x M32x1,5 / M40x1,5



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

Bottom attachment socket



3.12 Data Sheet for US-S/28

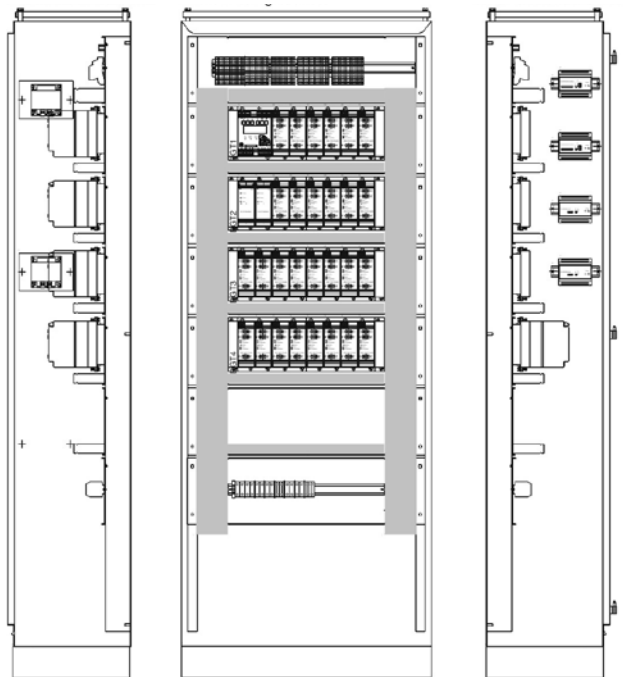
Type of system:	US-S/28
Construction:	Sheet steel cabinet with partial viewing window in the door
Height:	2050 mm
Width:	800 mm
Depth:	400 mm
Weight without battery:	approx. 165 kg
Insulation class:	I
Degree of protection:	IP 21
External painting:	Structure powder laquer RAL 7035 light grey
Cable entry:	at the top (prepunched roof sheeting) at the bottom (open bottom)
Hinge:	right

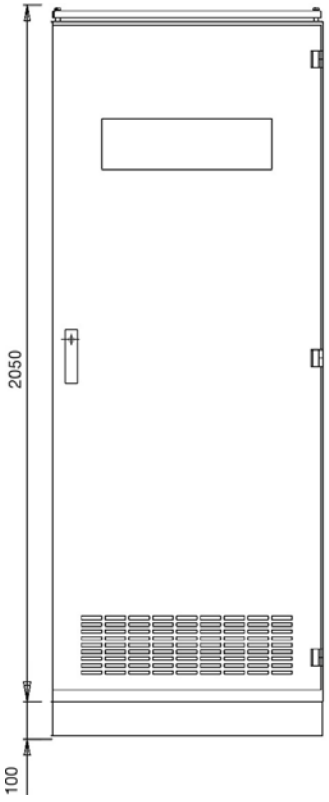
Mains rated voltage:	400V AC, 50/60 Hz
Battery rated voltage:	216V DC
Battery capacity:	
Type of battery:	
Duration of emergency lighting:	
Recharging time:	
Ambient temperature operation:	-5°C up to +35°C

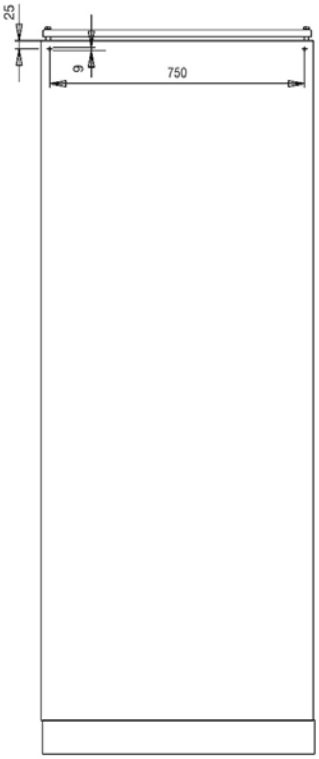
Mains feed in (max. 35mm²):	X8
Battery feed in (max. 35mm²):	X8
Max. 80 circuits (max. 4mm²)*:	X1.1, X2.1, X3.1, X4.1, X5.1
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²):	customised
Connection to ext. control switch (max. 4mm²)**:	X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**:	X1.1.S3-S4
Connection to potential-free signal contacts (max.4mm²)**:	X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**:	X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**:	X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**:	X1.1.+24V Out--24V Out
Connection to 24V analog input (max.4mm²)**:	X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

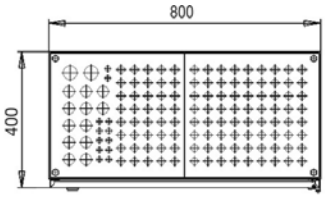
* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.

** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.

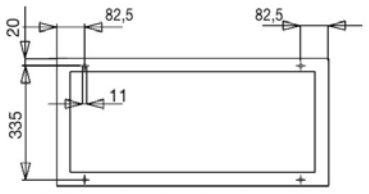






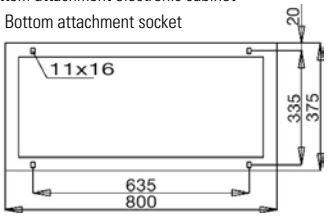


prepunched roof sheeting for
12 x M16x1,5
112 x M20x1,5 / M25x1,5
12 x M32x1,5
2 x M32x1,5 / M40x1,5



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

Bottom attachment socket



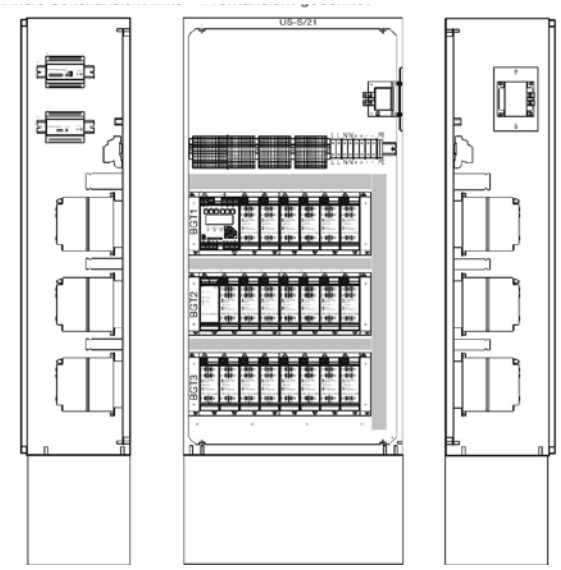
3.13 Data Sheet for US-S/21

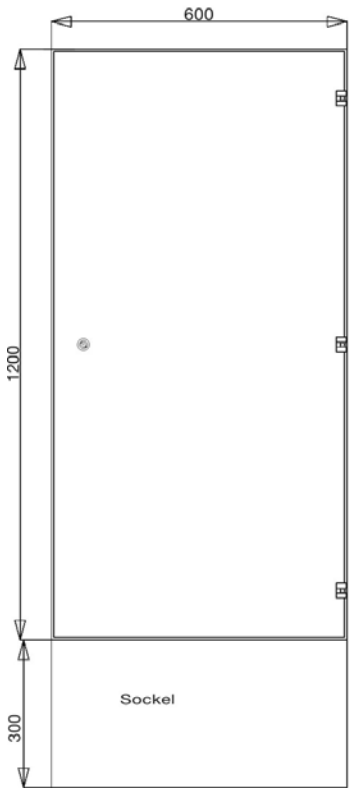
Type of system: US-S/21
Construction: ..... Sheet steel wall mounting cabinet with a door made of sheet
Height: ..... 1200 mm
Width: ..... 600 mm
Depth: ..... 300 mm
Weight without battery: ..... approx. 110 kg
Insulation class: I
Degree of protection: ..... IP 54
External painting: ..... Structure powder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

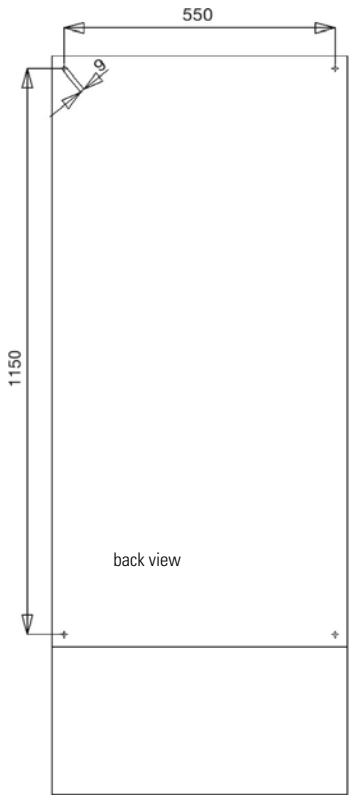
Mains rated voltage: ..... 230V AC, 50/60 Hz
Battery rated voltage: ..... 216V DC
Battery capacity:
Type of battery:
Duration of emergency lighting:
Recharging time:
Ambient temperature operation: ..... -5°C up to +35°C

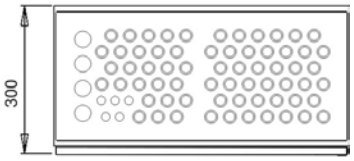
Mains feed in (max. 35mm²): X8
Battery feed in (max. 35mm²): X8
Max. 50 circuits (max. 4mm²)*: X1.1, X2.1, X3.1
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²): customised
Connection to ext. control switch (max. 4mm²)**: X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**: X1.1.S3-S4
Connection to potential-free signal contacts
(max.4mm²)**: X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**: X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**: X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**: X1.1.+24V Out--24V Out
Connection to 24V analog input (max. 4mm²)**: X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.









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

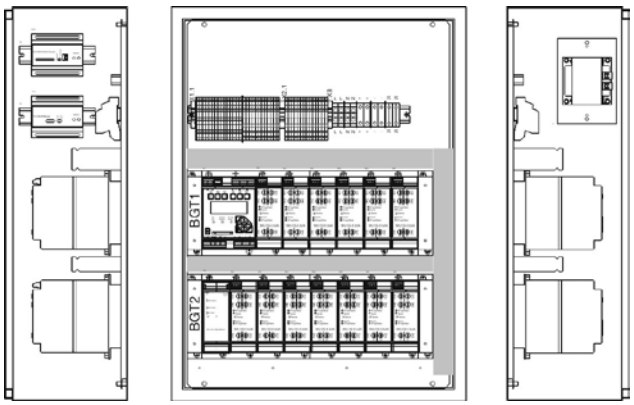
3.14 Data Sheet for US-S/13

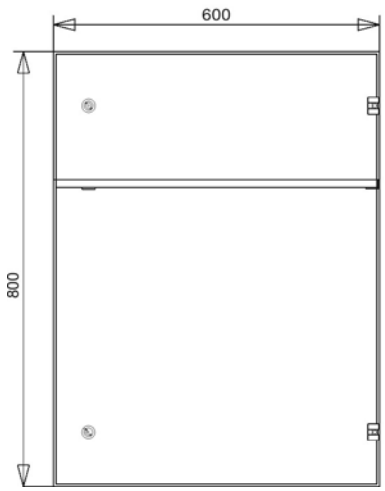
Type of system: US-S/13
Construction: ..... Sheet steel wall mounting cabinet with a door made of sheet
Height: ..... 800 mm
Width: ..... 600 mm
Depth: ..... 250 mm
Weight without battery: ..... approx. 75 kg
Insulation class: I
Degree of protection: ..... IP 54
External painting: ..... Structure powder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

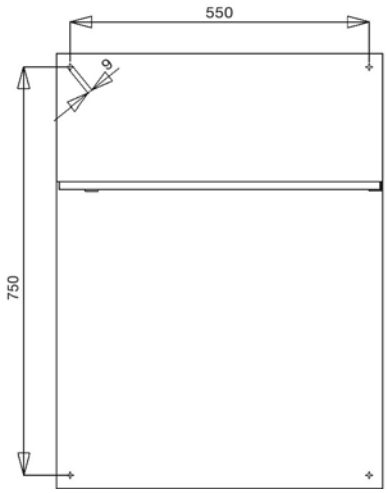
Mains rated voltage: ..... 230V AC, 50/60 Hz
Battery rated voltage: ..... 216V DC
Battery capacity: .....
Type of battery: .....
Duration of emergency lighting: .....
Recharging time: .....
Ambient temperature operation: ..... -5°C up to +35°C

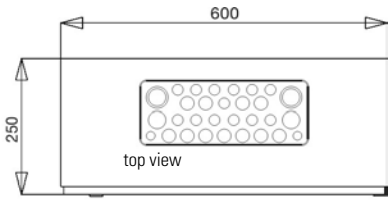
Mains feed in (max. 16mm²): X8
Battery feed in (max. 16mm²): X8
Max. 24 circuits (max. 4mm²)*: X1.1, X2.1
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²): customised
Connection to ext. control switch (max. 4mm²)**: X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**: X1.1.S3-S4
Connection to potential-free signal contacts
(max.4mm²)**: X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**: X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**: X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**: X1.1.+24V Out--24V Out
Connection to 24V analog input (max.4mm²)**: X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.





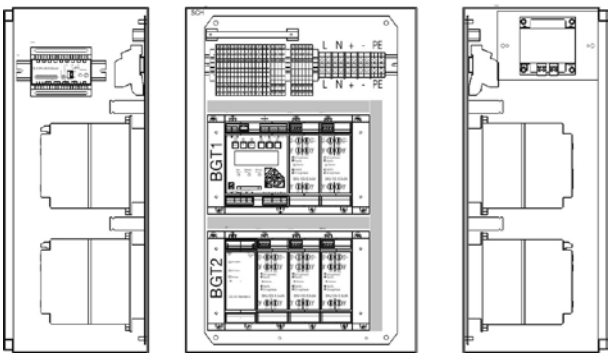




Cable entry from the top
1 x prepunched flange plate for:
Max. 2 x M16
Max. 13 x M20
Max. 11 x M25
Max. 2 x M32
Max. 2 x M32 (M40)

3.15 Data Sheet for US-S/5

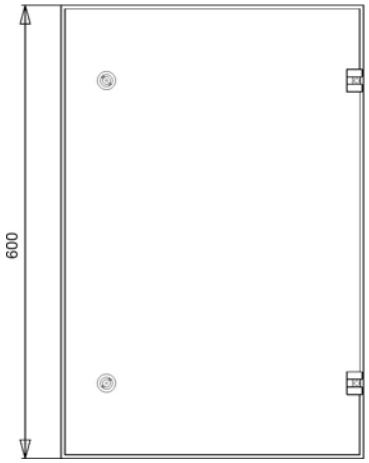
Type of system: US-S/5
Construction: ..... Sheet steel wall mounting cabinet with a door made of sheet
Height: ..... 600 mm
Width: ..... 400 mm
Depth: ..... 250 mm
Weight without battery: ..... approx. 42 kg
Insulation class: I
Degree of protection: ..... IP 54
External painting: ..... Structure powder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

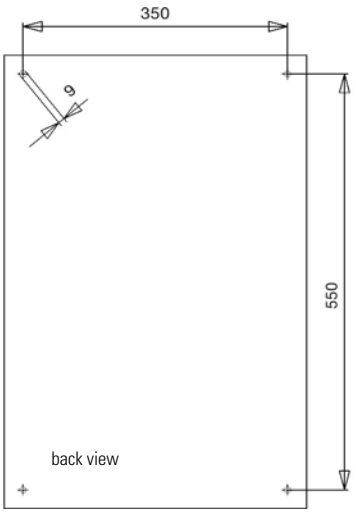


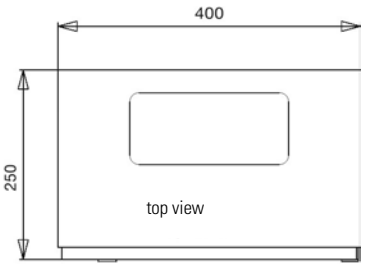
Mains rated voltage: ..... 230V AC, 50/60 Hz
Battery rated voltage: ..... 216V DC
Battery capacity:
Type of battery:
Duration of emergency lighting:
Recharging time:
Ambient temperature operation: ..... -5°C up to +35°C

Mains feed in (max. 16mm²): X8
Battery feed in (max. 16mm²): X8
Max. 20 circuits (max. 4mm²)*: X1.1, X2.1
Addresses optional places DLS-3Ph, TLS (max. 2,5mm²): customised
Connection to ext. control switch (max. 4mm²)**: X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**: X1.1.S3-S4
Connection to potential-free signal contacts
(max.4mm²)**: X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**: X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**: X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**: X1.1.+24V Out--24V Out
Connection to 24V analog input (max. 4mm²)**: X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.







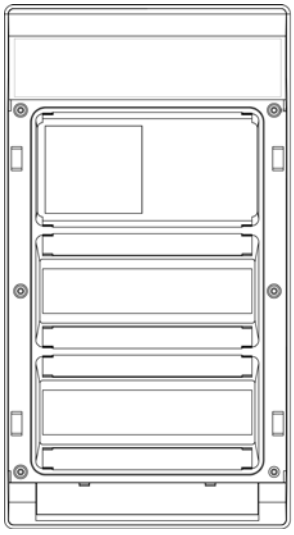
3.16 Data Sheet for US-S/SOU2

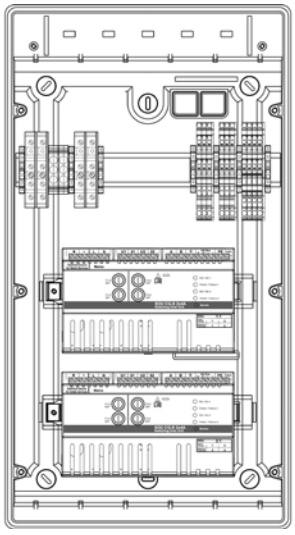
Type of system:	US-S/SOU2
Construction:	Surface-mounted plastic distributor housing of thermoplastic with transparent viewing door
Height:	458 mm
Width:	295 mm
Depth:	129 mm
Weight :	approx. 8,8 kg
Insulation class:	II
Degree of protection:	IP 65
Colour :	Grey (RAL 7032)
Cable entry :	from above (with 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. 16mm²) :	X1.1
Battery feed in (max. 16mm²) :	X1.5
Max. 4 circuits (max.4 mm²)*:	X1.4
Connection to RS485 Bus (max. 4 mm²)** :	X1.2RS485.A-B
Connection to 24V analog output (max. 4 mm²)**:	X1.3+24V Out--24V Out

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.





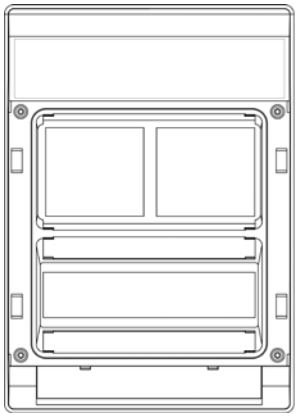
3.17 Data Sheet for US-S/SOU1

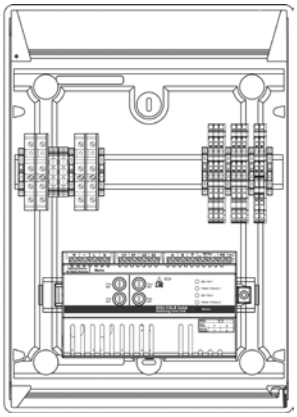
Type of system:	US-S/SOU1
Construction:	Surface-mounted plastic distributor housing of thermoplastic with transparent viewing door
Height:	458 mm
Width:	295 mm
Depth:	129 mm
Weight :	approx. 7,5 kg
Insulation class:	II
Degree of protection:	IP 65
Colour :	Grey (RAL 7032)
Cable entry :	from above (with 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. 16mm²) :	X1.1
Battery feed in (max. 16mm²) :	X1.5
Max. 4 circuits (max.4 mm²)*:	X1.4
Connection to RS485 Bus (max. 4 mm²)** :	X1.2RS485.A-B
Connection to 24V analog output (max. 4 mm²)**:	X1.3+24V Out--24V Out

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.





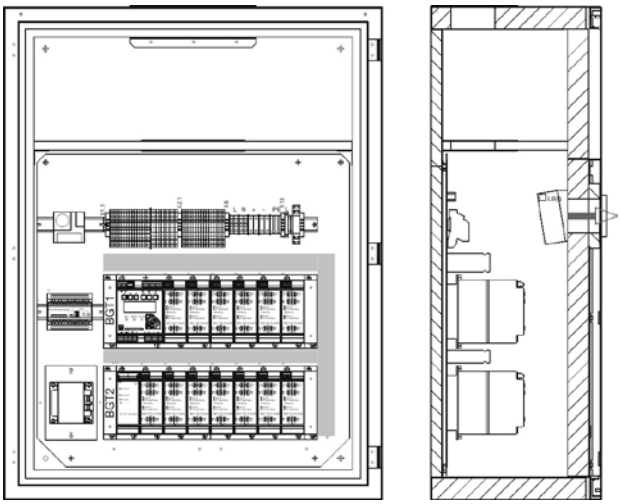
3.18 Data Sheet for ESF-E30/13S

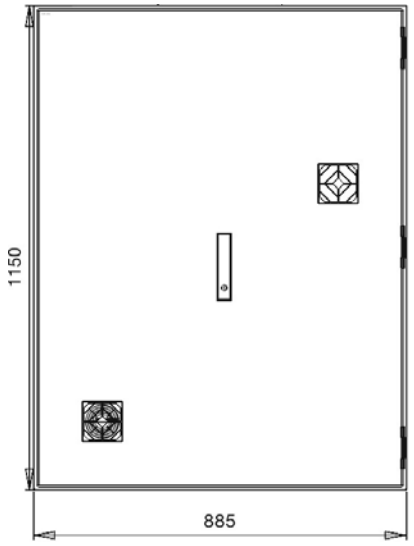
Type of system: ESF-E30/13S
Construction: ..... Sheet steel wall mounting cabinet with a door made of sheet incl. cross point closing and a double-bit key cylinder
Permission: ..... ABZ Z-86.2-1
Height: ..... 1150 mm
Width: ..... 885 mm
Depth: ..... 405 mm
Weight without battery: ..... approx. 235 kg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

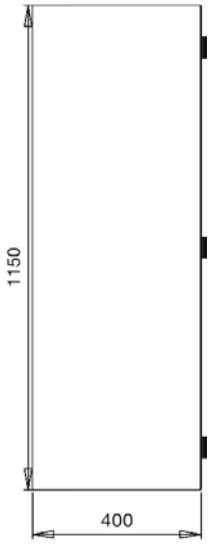
Mains rated voltage: ..... 230V AC, 50/60 Hz
Battery rated voltage: ..... 216V DC
Battery capacity:
Type of battery:
Duration of emergency lighting:
Recharging time:
Ambient temperature operation: ..... -5°C up to +35°C

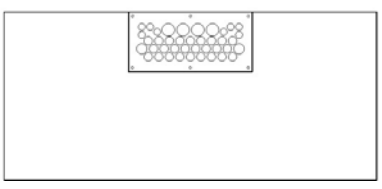
Mains feed in (max. 16mm²): X8
Battery feed in (max. 16mm²): X8
Max. 26 circuits (max. 4mm²)*: X1.1, X2.1
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²): customised
Connection to ext. control switch (max. 4mm²)**: X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**: X1.1.S3-S4
Connection to potential-free signal contacts (max.4mm²)**: X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**: X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**: X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**: X1.1.+24V Out--24V Out
Connection to 24V analog input (max. 4mm²)**: X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.









Cable entry with prepunched flange plate:
4 x M40
26 x M25
8 x M16

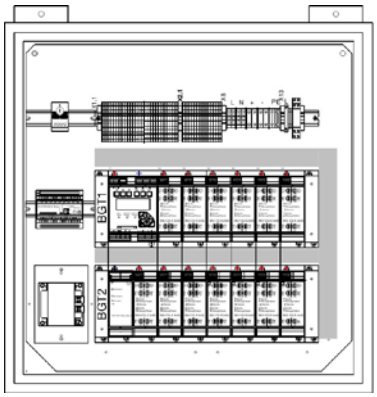
3.19 Data Sheet for ESF-E30/13S-P

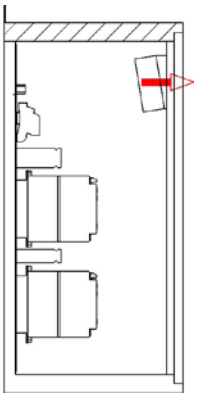
Type of system: ESF-E30/13S-P
Construction: ..... Wall-mounted cabinet
Permission:: ..... ABZ Z-86.2-8
Height: ..... 824 mm
Width: ..... 824 mm
Depth: ..... 400 mm
Weight without battery: ..... approx. 235 kg
Insulation class: I
Degree of protection: ..... IP 54
External painting: ..... Structure powder laquer RAL 7035 light grey
Cable entry: ..... at the top (cable bundle entry)
Hinge: ..... right

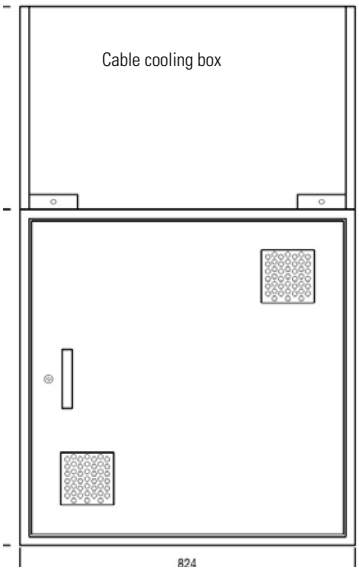
Mains rated voltage: ..... 230V AC, 50/60 Hz
Battery rated voltage: ..... 216V DC
Ambient temperature operation: ..... -5°C up to +35°C

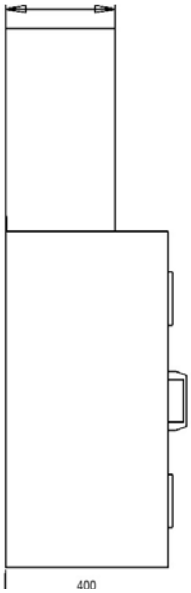
Mains feed in (max. 16mm²): X8
Battery feed in (max. 16mm²): X8
Max. circuits (max.4mm²)*: X1.1, X2.1
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²): customised
Connection to ext. control switch (max. 4mm²)**: X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**: X1.1.S3-S4
Connection to potential-free signal contacts
(max. 4mm²)**: X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**: X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**: X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**: X1.1.+24V Out--24V Out
Connection to 24V analog input (max. 4mm²)**: X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

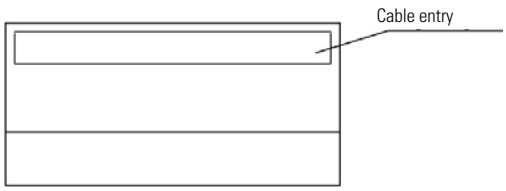
* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.











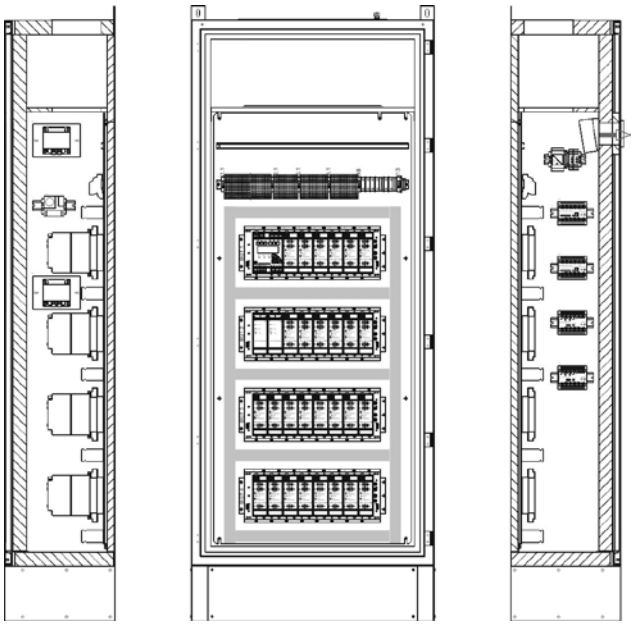
3.20 Data Sheet for ESF-E30/28S

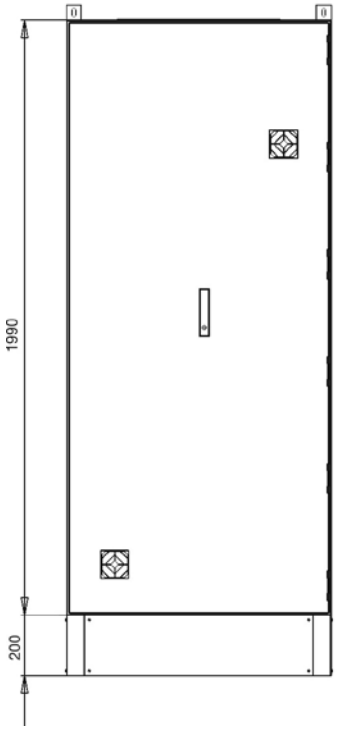
Type of system: ESF-E30/28S
Construction: ..... Sheet steel wall mounting cabinet with a door made of sheet incl. cross point closing and a double-bit key cylinder
Permission:: ..... ABZ Z-86.2-1
Height: ..... 2190 mm
Width: ..... 885 mm
Depth: ..... 405 mm
Weight without battery: ..... approx. 390 kg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

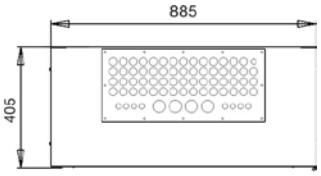
Mains rated voltage: ..... 400/230V AC, 50/60 Hz
Battery rated voltage: ..... 216V DC
Battery capacity :
Type of battery:
Duration of emergency lighting:
Recharging time:
Ambient temperature operation: ..... -5°C up to +35°C

Mains feed in (max. 16mm²): X8
Battery feed in (max. 16mm²): X8
Max. 56 circuits (max. 4mm²)*: X1.1, X2.1, X3.1, X4.1
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²): customised
Connection to ext. control switch (max. 4mm²)**: X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**: X1.1.S3-S4
Connection to potential-free signal contacts
(max.4mm²)**: X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**: X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**: X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**: X1.1.+24V Out--24V Out
Connection to 24V analog input (max. 4mm²)**: X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.







Cable entry with prepunched flange plate:
4 x M40
60 x M25
8 x M16

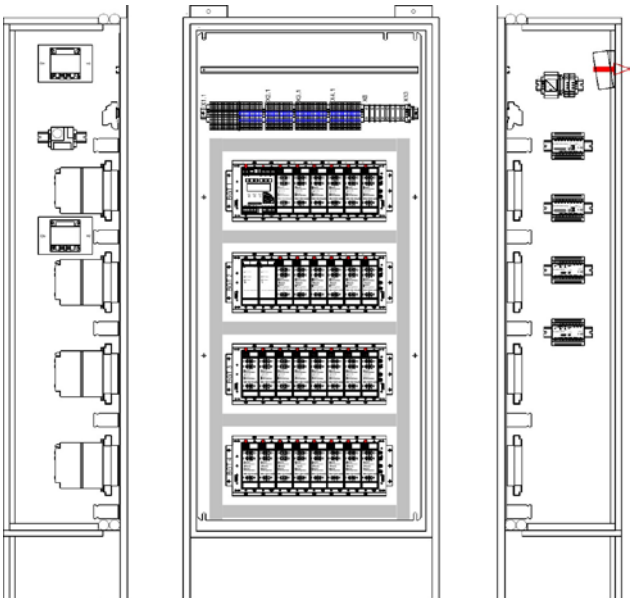
3.21 Data Sheet for ESF-E30/28S-P

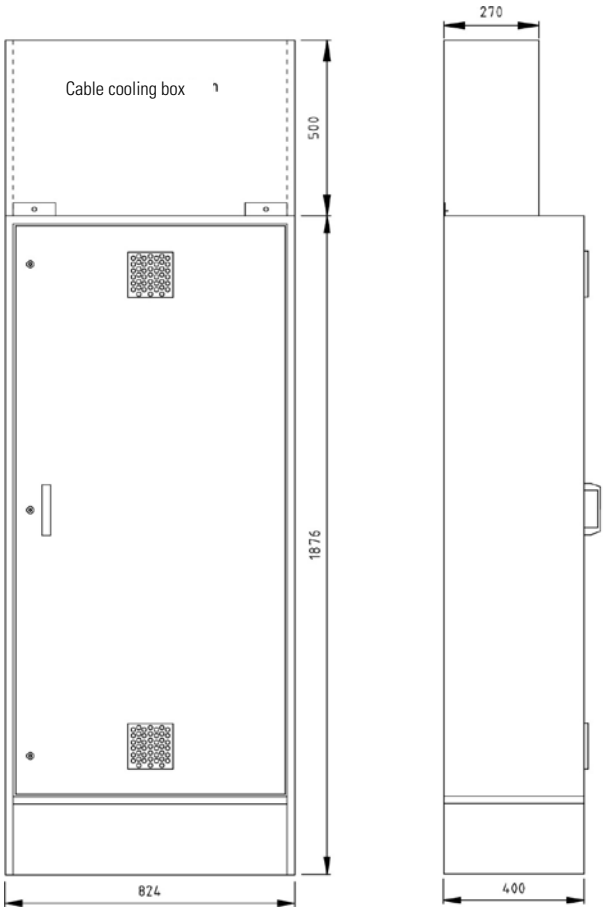
Type of system: ESF-E30/28S-P
Construction: ..... Wall-mounted cabinet
Permission:: ..... ABZ Z-86.2-8
Height: ..... 1876 mm
Width: ..... 824 mm
Depth: ..... 400 mm
Weight without battery: ..... approx. 390 kg
Insulation class: I
Degree of protection: ..... IP 54
External painting: ..... Structure powder laquer RAL 7035 light grey
Cable entry: ..... at the top (cable bundle entry)
Hinge: ..... right

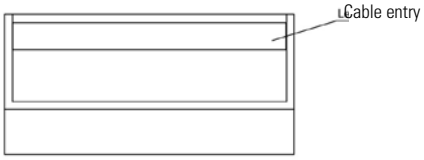
Mains rated voltage: ..... 230V AC, 50/60 Hz
Battery rated voltage: ..... 216V DC
Ambient temperature operation: ..... -5°C up to +35°C

Mains feed in (max. 16mm²): X8
Battery feed in (max. 16mm²): X8
Max. circuits (max. 4mm²)*: X1.1, X2.1
Addresses optional places DLS-3Ph, TLS (max. 2.5mm²): customised
Connection to ext. control switch (max. 4mm²)**: X1.1.S1-S2
Connection to 24V current loop (max. 4mm²)**: X1.1.S3-S4
Connection to potential-free signal contacts
(max. 4mm²)**: X1.1 C0, 14, 12, 24, 22, 34, 32, C1, 44, 54
Connection to CG-S Bus (max. 4mm²)**: X1.1.A-B
Connection to RS485 Bus (max. 4mm²)**: X1.1.RS485.A-B
Connection to 24V analog output (max. 4mm²)**: X1.1.+24V Out--24V Out
Connection to 24V analog input (max. 4mm²)**: X1.1 Z11, Z12, Z21, Z22, Z31, Z32, Z41, Z42

* Max. 2.5mm² flexible with wiring sleeve. The final circuits get wired customised.
** Two strands to max. 0.5 mm² with twin wire end sleeve can be clamped in a clamp spring terminal.

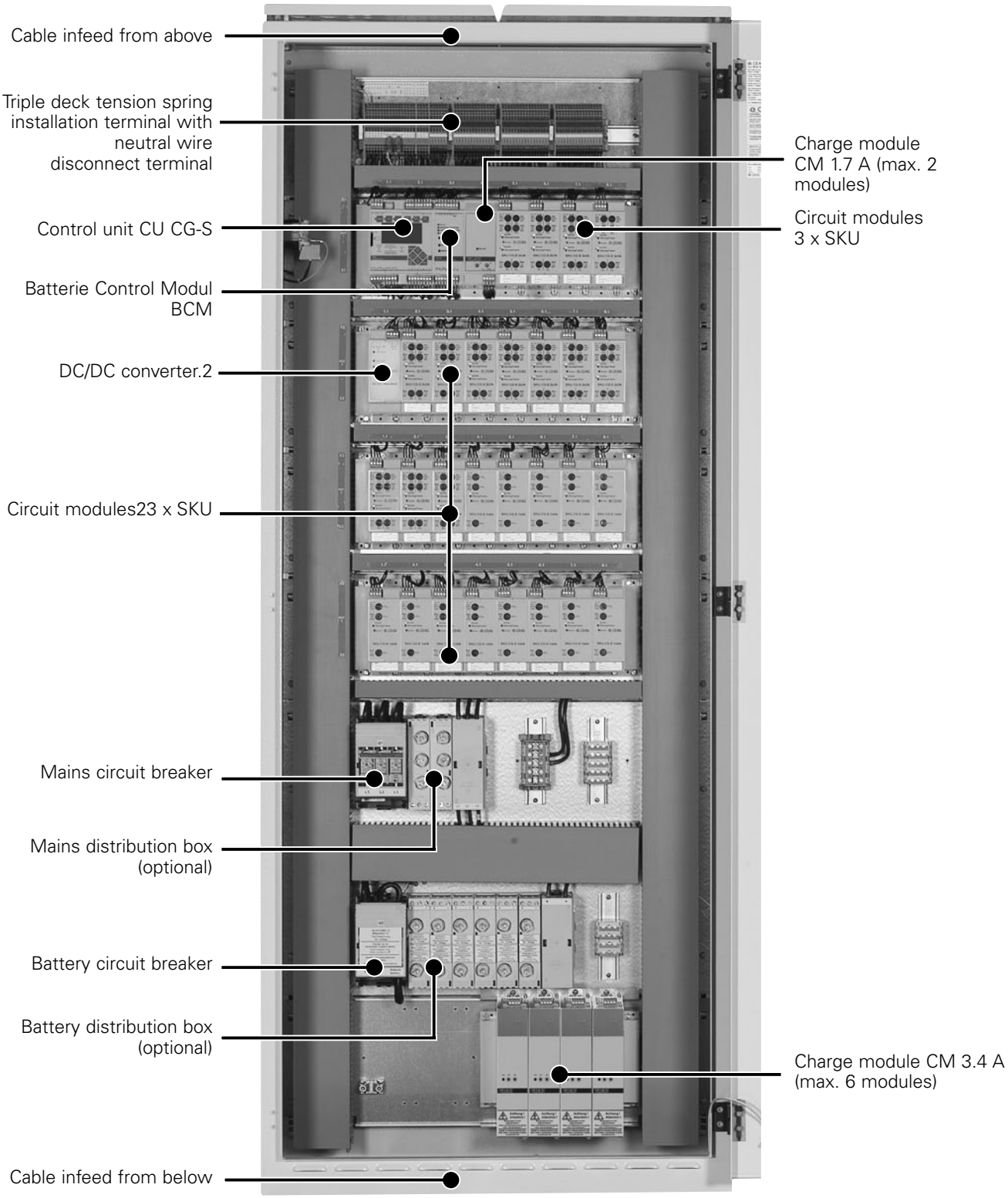






4 Construction and Function

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 thatwithin 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, ESF-E30/13S-P or ESF-E30/28S-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 (resp. CG) with 26 or 56 circuit terminals.

All devices and substations are constructed modularly. The technologies of charging, changing-over and of monitoring form a unit working undependent 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 lightings fails. Another important function of the system is to secure the function standby of all connected emergency and EXIT luminaires by an automatic monitoring.

4.4 Overview over the Components

4.4.1 Control Module ZB-S

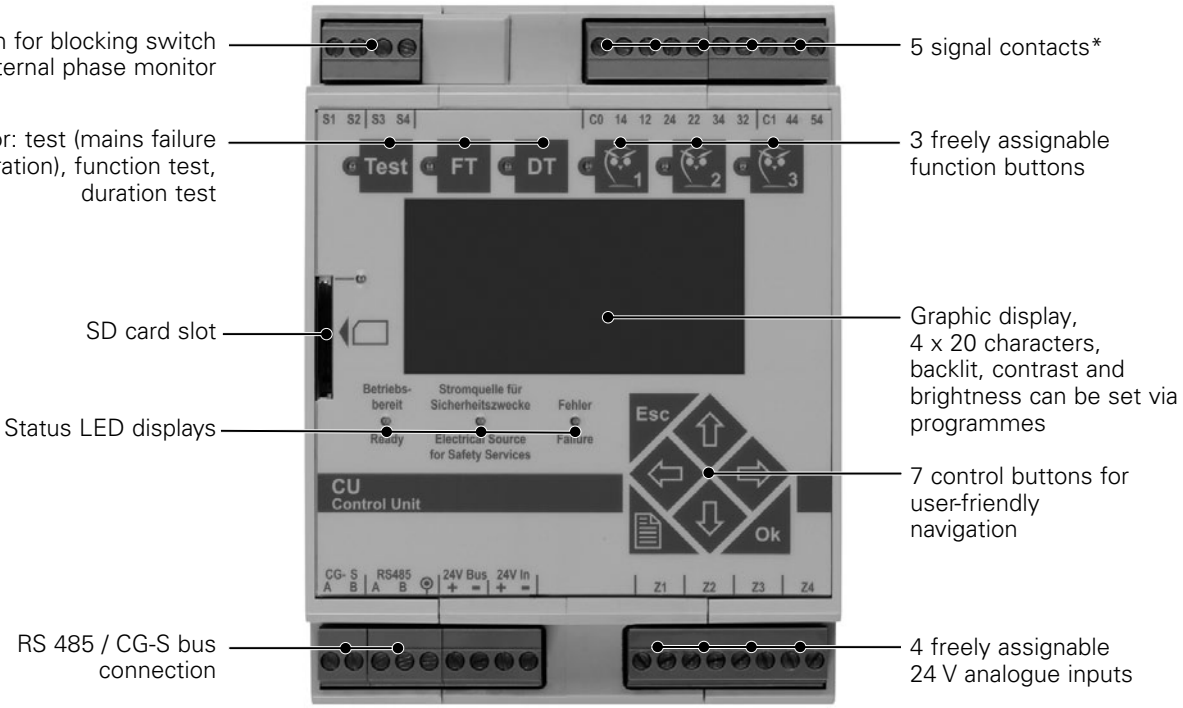
The terminal blocks on the module simplify assembly and dismantling; the connections are taken out to a 3-tier-installation-terminal with tension spring-connection. (s. fig on page 28)

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.



*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.

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 deviceusing keys and graphic display. There are considerable possiblities for userdefined 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
  - 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

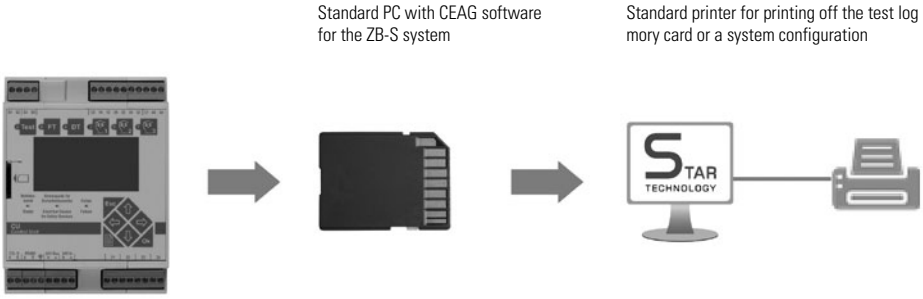
- External:

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 screended (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 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.

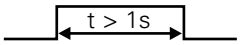
Control inputs

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.

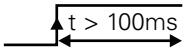
Optional inputs Z1 - Z4

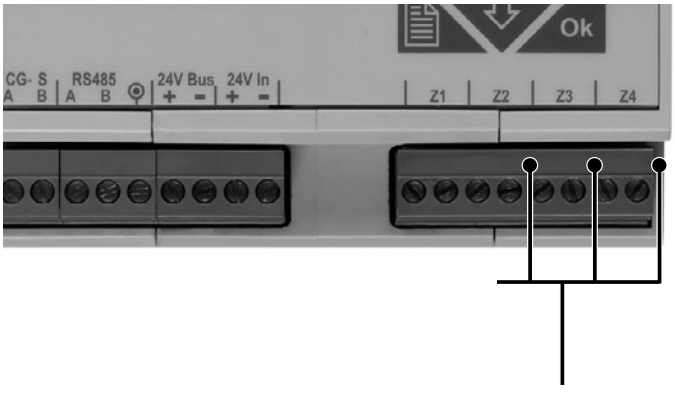
	Z1	Z2	Z3	Z4	Comments:
No function		-			Factory settings
Switch		Level triggered (by use of a switch) 24VDC = ON 0V = OFF			Used as a switch and switches the circuit or the luminaires with "S" function.
Switch inverted					
Manual reset		Edge triggered (by use of a push switch) LOW ➔ HIGH			To reset the 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					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		Edge triggered (by use of a push 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. ISO monitor					
Ext. Battery monitor					
Ext. Monitor					

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 componentsand options

4.4.2 DC/DC Converter.2

This unit provides the central battery system with 24V and 6V direct voltage.

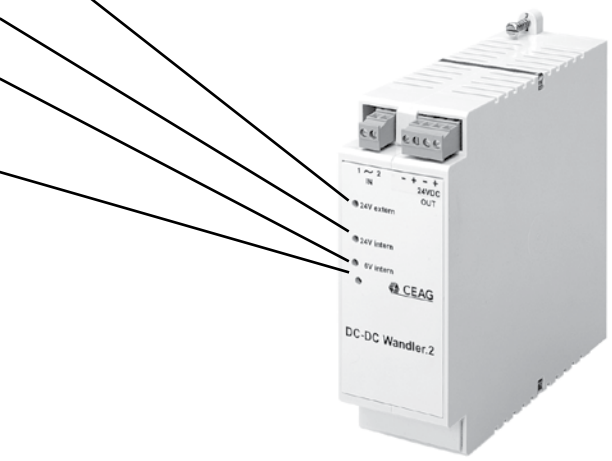
Supply only for optional AC-module.

Attention: When using at least two DC-DC converter please observe that all DC-DC converter has to be used side by side on the same module assembly frame.

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 interal 24V DC voltage is present at the ZB-S system.
- 6 V internal The LED lights up when the interal 6V supply voltage is present.

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



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 DC/DC converter.2.

⚠ ATTENTION!

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

4.4.3 Baterie Control Modul BCM

Indicators

- ON LED

The LED lights up when the BCM is in operation. If the LED does not light up then the BCM 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, 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 mm² 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 module is supplied via the DC/DC converter .2 via the terminals.

⚠ ATTENTION!

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. With integrated fan monitoring.

4.4.5 Circuit change-over modules overview (SKUs)

SKU CG-S 4x1,5A

Number of circuits	4	with STAR-Technology	
Rated current per circuit	1.5 A	dimensions and weights approx. 0.83 kg	
Fuse protections per circuit	2.5 A	H x W X D (in mm)	170 x 55 x 155
max. inrush peak current	60 A/ms	module width	1 TE
max. cable diameter	2.5 mm^2	Item no.	400 71 347 840

SKU CG-S 2x3A

Number of circuits	2	with STAR-Technology	
Rated current per circuit	3 A	dimensions and weights approx. 0.66 kg	
Fuse protections per circuit	5 A	H x W X D (in mm)	170 x 55 x 155
max. inrush peak current	250 A/ms	module width	1 TE
max. cable diameter	2.5 mm^2	Item no.	400 71 347 051

SKU CG-S 1x6A

Number of circuits	1	with STAR-Technology	
Rated current	6 A	dimensions and weights approx. 0.49 kg	
Fuse protections	10 A	H x W X D (in mm)	170 x 55 x 155
max. inrush peak current	250 A/ms	module width	1 TE
max. cable diameter	2.5 mm^2	Item no.	400 71 347 345

SKU CG 2x3A

Number of circuits	2	without switching function for CG-S-EVGs	
Rated current per circuit	3 A	dimensions and weights approx. 0.61 kg	
Fuse protections per circuit	5 A	H x W X D (in mm)	170 x 55 x 155
max. inrush peak current	120 A/ms	module width	1 TE
max. cable diameter	2.5 mm^2	Item no.	400 71 347 290

SKU CG 1x6A

Number of circuits	1	without switching function for CG-S-EVGs	
Rated current	6 A	dimensions and weights approx. 0.47 kg	
Fuse protections	10 A	H x W X D (in mm)	170 x 55 x 155
max. inrush peak current	180 A/ms	module width	1 TE
max. cable diameter	2.5 mm^2	Item no.	400 71 347 346

SOU CG-S 2x4A

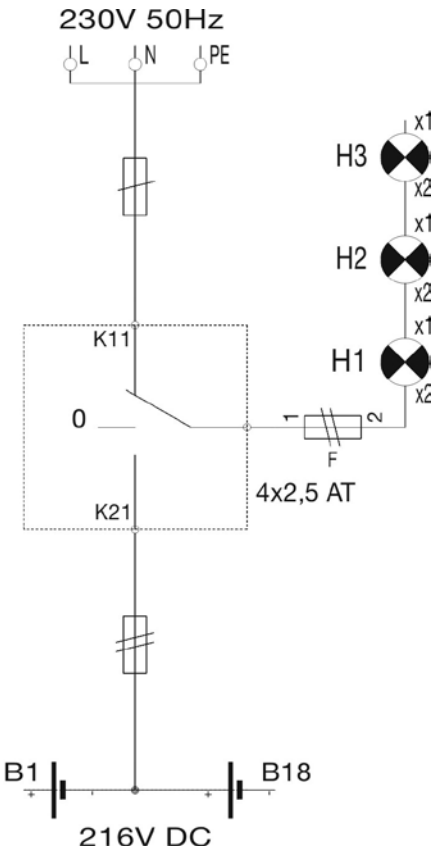
Number of circuits	2	with STAR-Technology	
Rated current per circuit	4 A	dimensions and weights approx. 0.63 kg	
Fuse protections per circuit	8 A	H x W X D (in mm)	178 x 109 x 60
max. inrush peak current	250 A/ms	module width	10 TE
Connection terminals		Item no.	400 71 360 430
Solid:	0.2…4.0 mm^2		
Stranded:	0.2…2.5 mm^2		

Inverter SWR 150

Number of circuits	1	monitored circuit	
Rated current	150 VA	dimensions and weights	0.75 kg
Fuse protections per circuit	1.6 AT	H x W X D (in mm)	170 x 55 x 155
		module width	1 TE
max. cable diameter	2.5 mm^2	Item no.	400 71 347 960

⚠ 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
- 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 71 070 716 / 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" lable 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

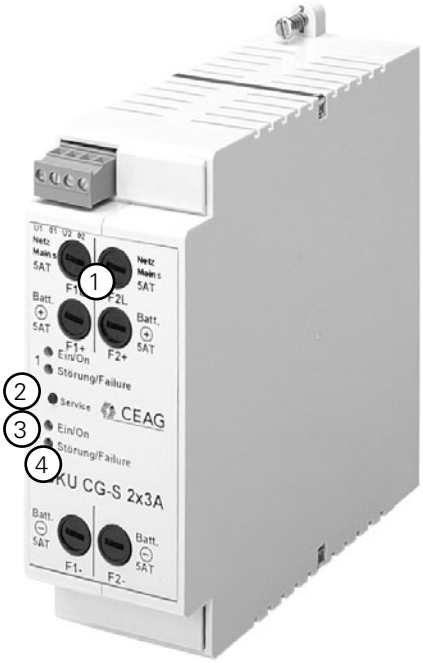
- **Typical change-over time** AC on DC = 450 ms

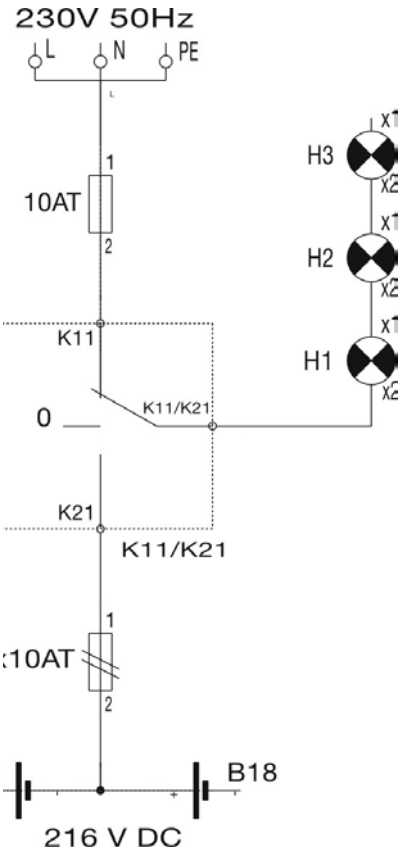
Components for circuit change-over module SKU CG-S 4x1,5A

- (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 occures 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.





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" lable there is a button which must be operated when the system´s basic program is loaded. The basic programming occurs factory made.[1])

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

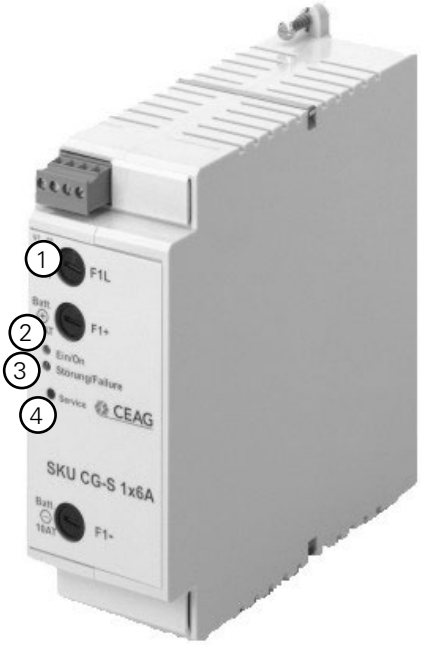
- **Easy access to fuses**
- **Separate savings for** mains and battery operation
- **Connected rating per circuit**660 W
- **Inrush current per circuit** 250 A/ms
- **Typical change-over time** AC on DC = 450 ms

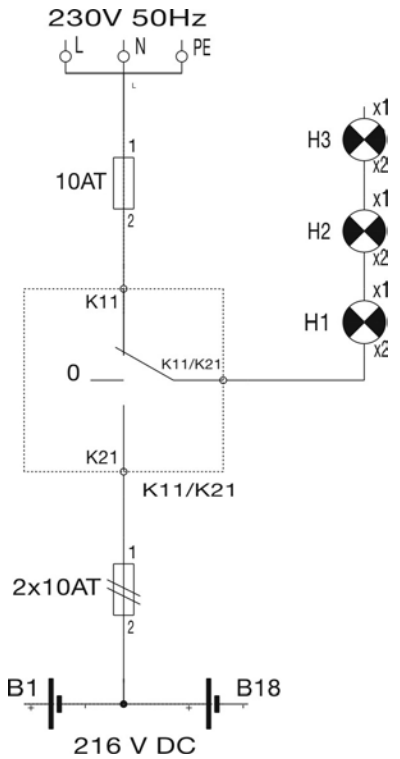
Components for circuit change-over module SKU 2 x 3 A CG-S

- (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 occures 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.





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" lable 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

[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 SKU´s Service Pin takes the operator through the following menu structure of the CU CG-S control module.

NOTE

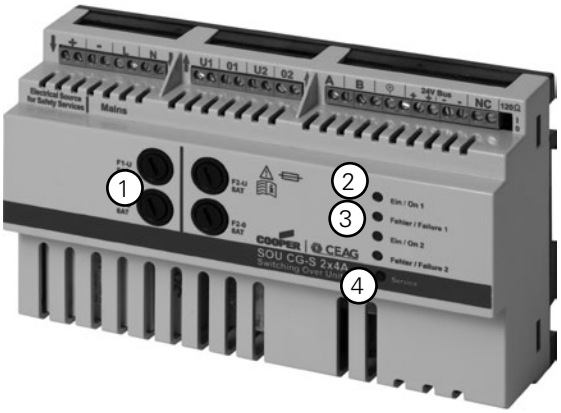
- The new SKU modules for the system ZB-S have the ability, also during breakdown of the controller CU CG-S, to achieve the following switching functions:
  - Mains emergency operation (by breakdown CU CG-S)
  - DC-operation (by power failure)
  - back to the mains emergency operation (return of the mains supply). Admittely, 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.

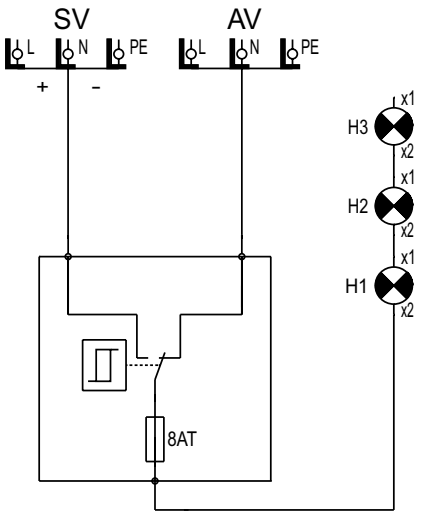
⚠ ATTENTION!

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

⚠ 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" lable 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!

4.4.6 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 (1)	1.6 AT
Max. rated current	0.65 A
Max. connected load	150 VA
For luminaires	KVG opr incandescent lamps WG
Rated power DC/DC converter	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.

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). 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 fest or duration test.

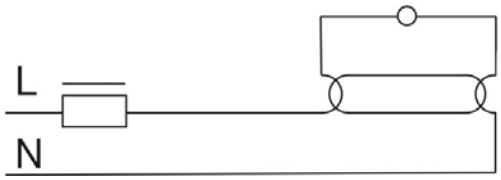
According to the switching mode the output voltage of the inverter is 230V for error-free mains and for mains failure the transformed battery voltage in the form of a sinus-AC voltage!

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 ≈ 25- 35% luminous flux acc. to type of lamp (s. table)

50 Hz ≈ 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 menue „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:

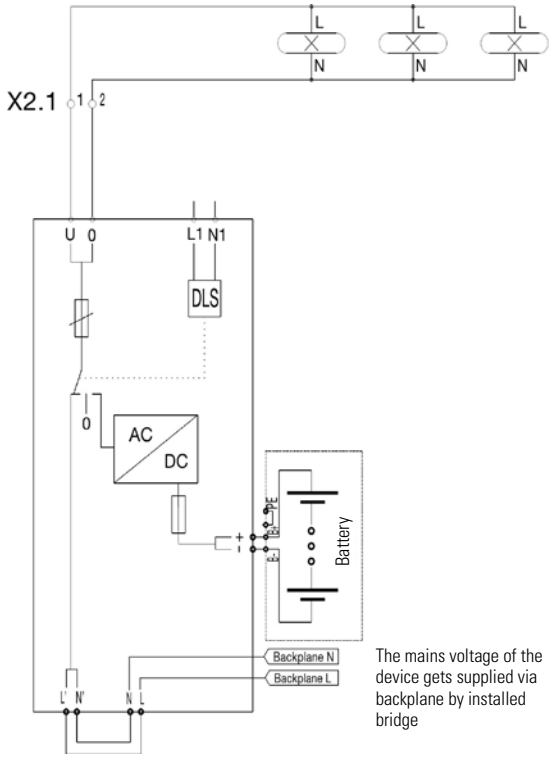
During current-value-monitoring please observe that the current input of CCG luminaires (conventional control gear) in battery mode can vary significant caused by ageing. Environmental conditions can also affect the current input of luminaires in battery mode. (e.g. ambient temperature)

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.

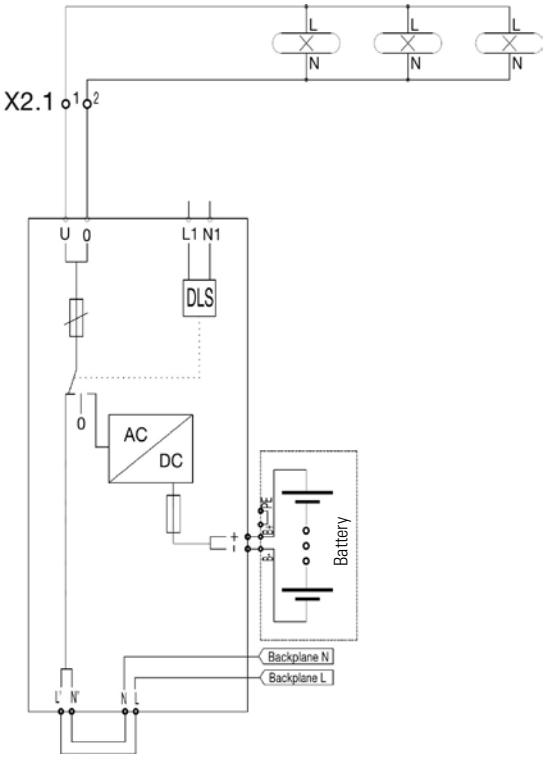
The **Safety lighting in non-maintained mode** operates for the following:

- 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.

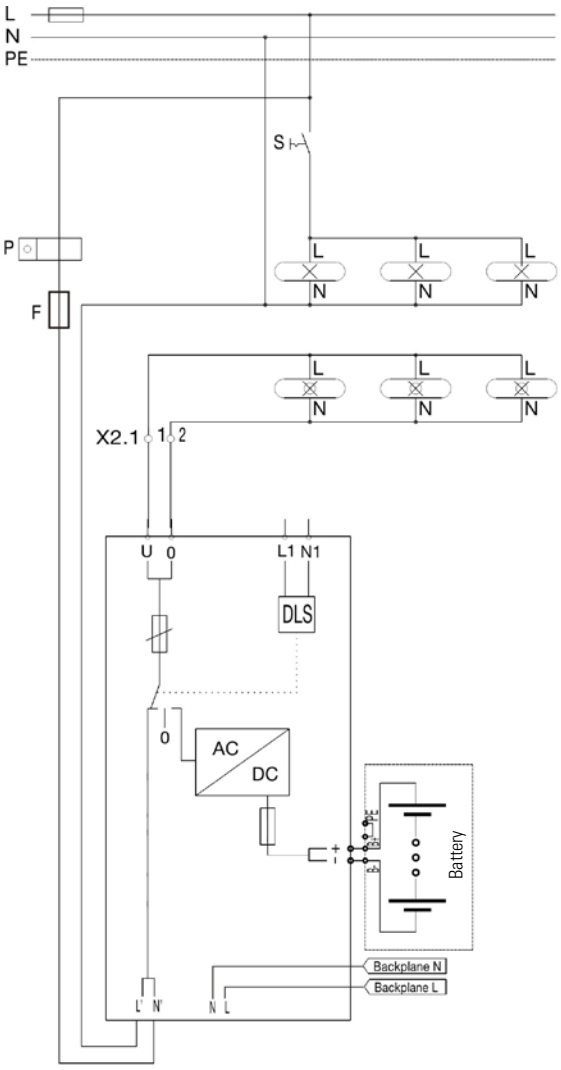


The mains voltage of the device gets supplied via backplane by installed bridge



Maintained light via external power mains supply

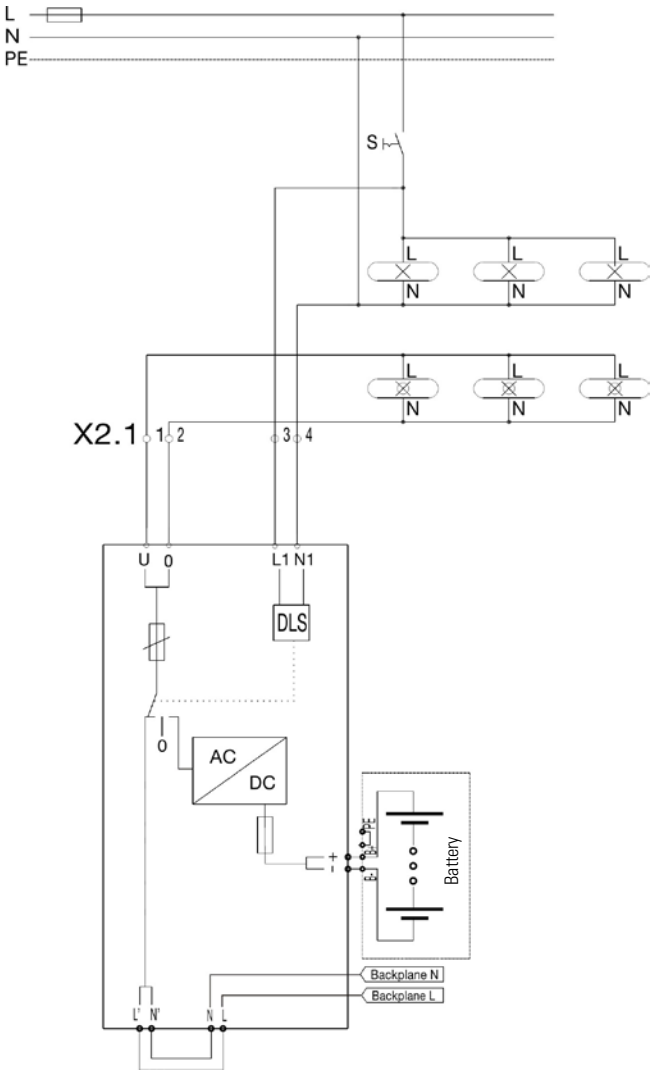
In this supply mode the safety lighting is supplied by an external phase in mains. This switching mode is used particularly for reinstallations with one electric meter per circuit. If there is a failure of the external power supply the SWR 150 swiches to battery operation, automatically. The mains failure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



Switched maintained light via maintained light switch monitoring

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

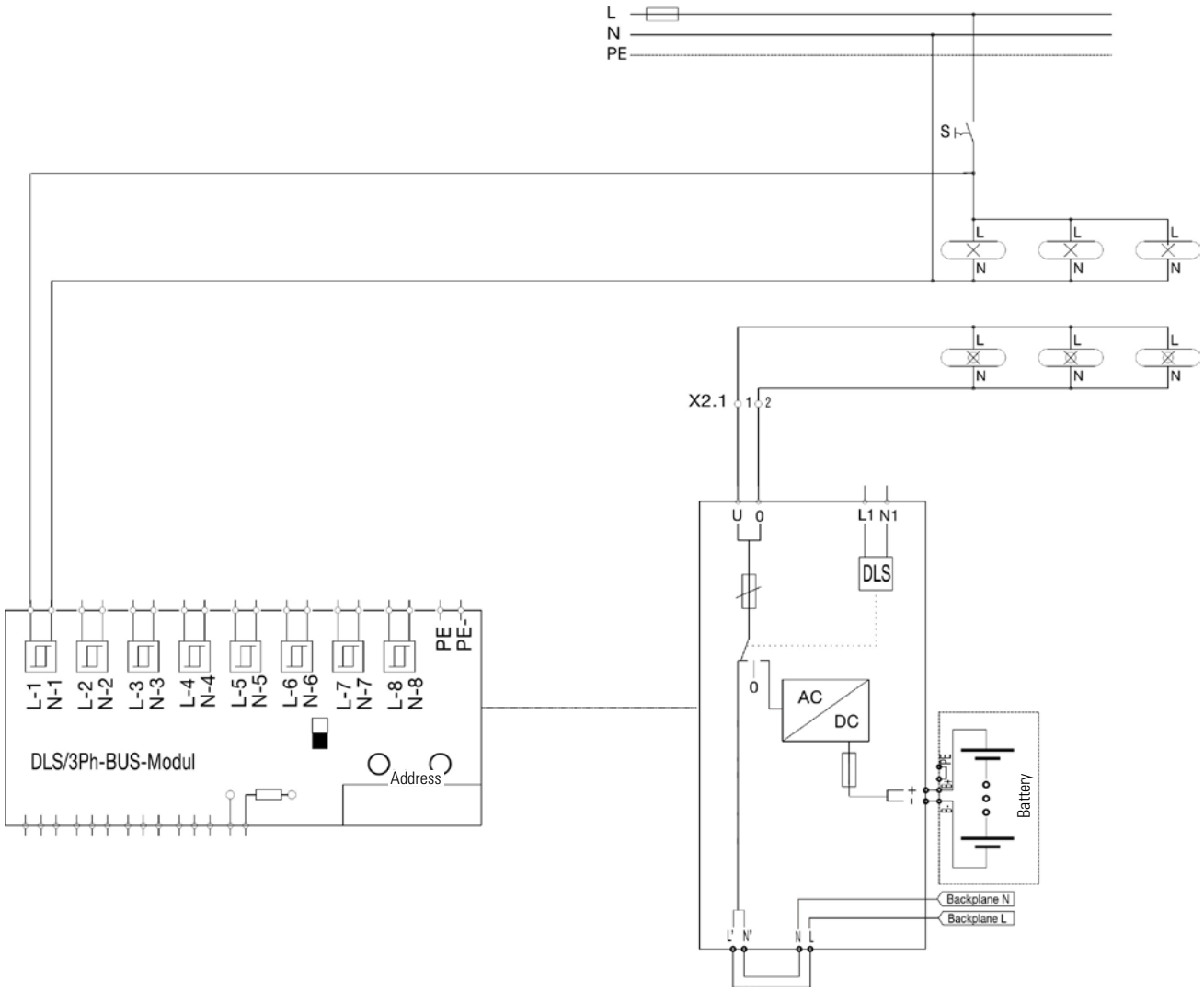
The advantage is the free assignment of the light switches to the final circuit. In dependence of the switch setting the circuit switches on.



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.



4.4.6.1 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]	[	[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.

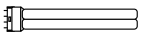
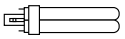
International description	**TC-L** 																							
Socket	2G11																							
Lamp power (W)	36						24										18							
Luminous flux ratio (%)	100		59		43		100		73		57		46		100		71		52		47			
Switch setting	0		5		9		0		3		6		9		0		3		7		9			
Number of luminaires / Current consumption 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]	[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	
Switch setting	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

NOTE

CEAG Notlichtsysteme GmbH attend on downawards 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 acutal 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			

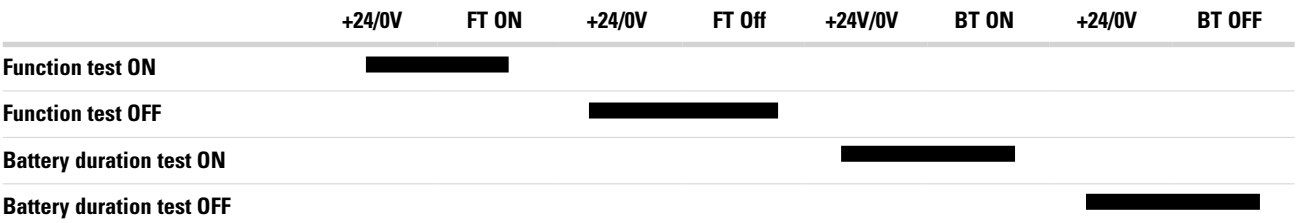
CG V

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



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.

4.4.9 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 sytems.

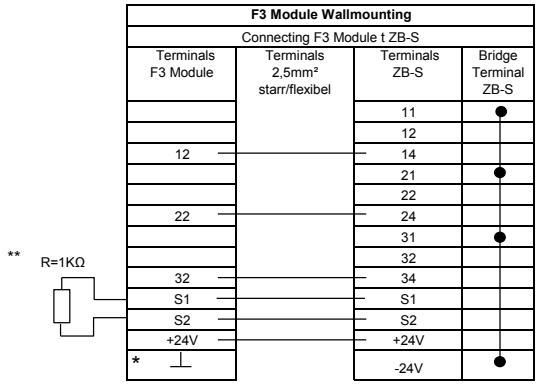
⚠ ATTENTION!

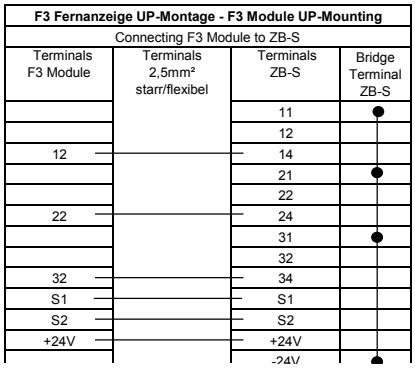
Do not use an external 24-V voltage supply!

NOTE:

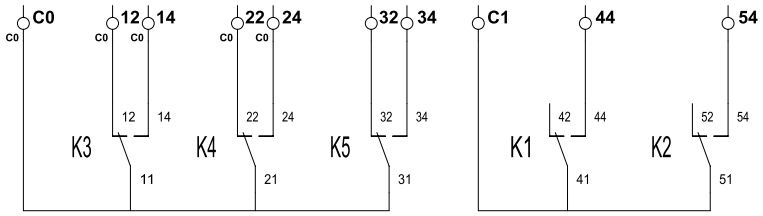
- Observe national rules and regulations governing the indicating and signalling behavior when using a remote switch or a remote indicator for emergency lighting systems.
- Observe the instruc-tions in the Technical Documentation as provided by the manufacturer of the CEAG F3 remote indicator.

Connections F3 Modul



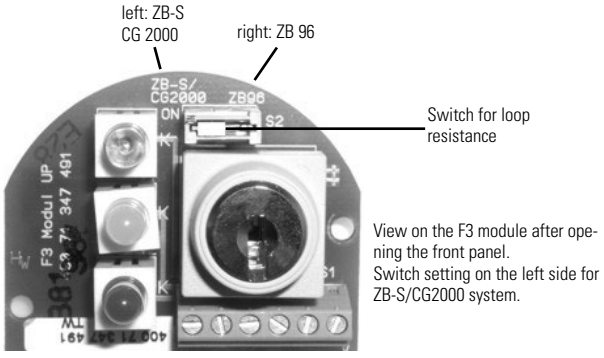


** Loopresistor
* Terminal without function



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.



View on the F3 module after opening the front panel.
Switch setting on the left side for ZB-S/CG2000 system.

4.4.10 External TLS-bus-module

This module monitors the switching status of buttons for up to two separate stairwell illuminations and transmitts 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.

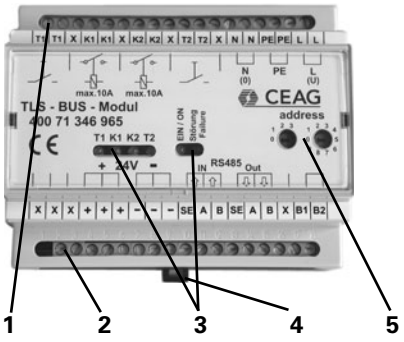
Technical Data

- 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 screended (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

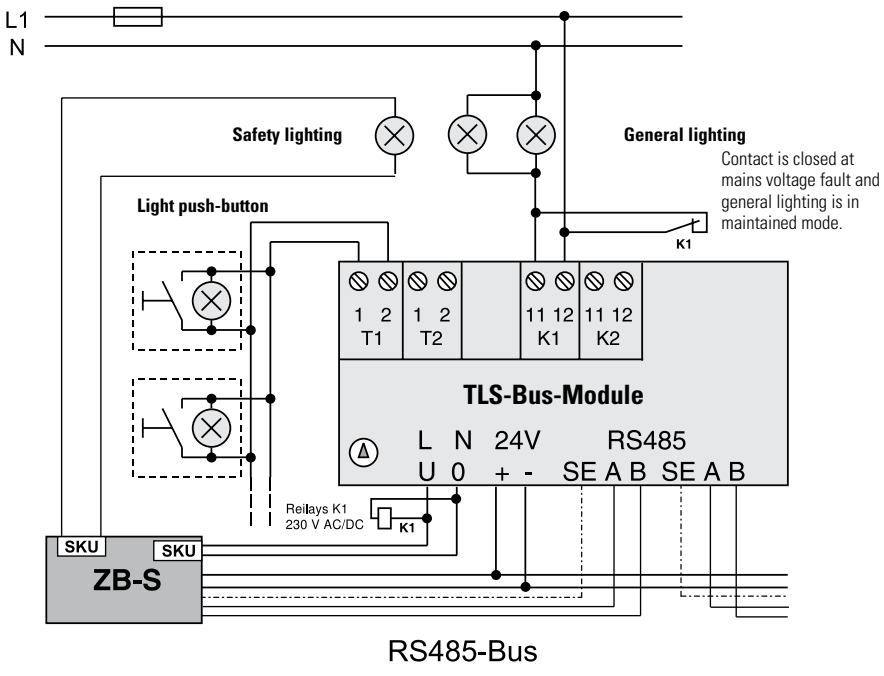
- Assembly in the subdistribution board of the monitored circuits due to the low laying effort for the illumination circuits (compare «Mounting and Connection of external bus modules»).
- Assembly in the control cabinet ZB-S (US-S) due to reasons for simplification of the maintenance (compare «Mounting 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 registrated 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 DLS/3Ph-bus-module and ext. DLS/3Ph-bus-module inverse

This electronic monitoring module acts as a (light-)switch scan and/or for monitoring of the phases of a mains power supply (e. g. in a subdistribution board):

Luminaires of the general lighting and the safety lighting are switched in mains operation in accordance with the switch position and the settings for the controller CU CG-S.

In emergency operation (e. g. after a message about a breakdown of monitored phases of the mains power supply) the circuits of the safety lighting will be operated according to the settings of the controller CU CG-S.

DLS/3Ph-bus-modules are available in two performances which only differ in view of the switching performance (inverting of the DLS circuits)!

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 (minimal standard).
  - Current consumption: 20 mA (15 ... 25 mA) with 8 connected circuits
- Bus connection
  - RS 485
  - Rated voltage U_n = 24 V DC
  - Cable type: 4 x 2 x 0.8 mm IY(ST)Y, Twistet Pair screened (minimum requirements).
  - Connection terminal A, B, SE
- Input circuits
  - up to 8 potential-free disconnected
  - Rated voltage U_n = 230 V
- **Switching performance of DLS-circuits DLS/3Ph/ Switching performance of DLS circuits DLS/3Ph inverse**

U < 138 V = OFF **U < 138 V = ON**
U > 195 V = ON **U > 195 V = OF**F

- Switching performance of 3Ph circuits (same for DLS/3Ph module and DLS/3Ph module inverse)

U < 138 V = OFF
U > 195 V = ON

Application:

Two operation modes are available:

- (pure) DLS-mode
- (mixed) DLS/3Ph-mode

With a dispatcher (pos. 5) the operation mode can be chosen.

- 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 modules»).

- Application-environment

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

NOTE

- Please observe the regulations for bus-technology and screening on the following pages.
- For planning and application of the modules we advice to observe the technical documentations attached to the modules and the catalogues ofCEAG Notlichtsysteme GmbH!
- Optically, the inverse and the non-inverse DLS/3Ph-module only differ in the printed description and the item number!
- Due to break or short-circuit of the RS485-bus line all connected luminaires will be switched on!

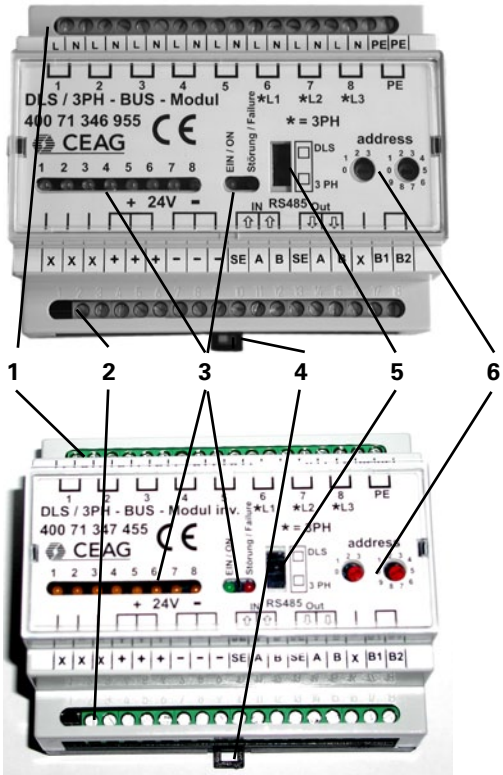


Fig.: DLS/3Ph-bus-module

Pos. 1: top connection terminal for the (monitoring) inputs

Pos. 2: lower connection terminal

Pos. 3: Display-LEDs

LED 1 ... 8 lights up when circuit is closed, resp. the monitored supply voltage is present

LED Ein/On lights up when 24 V DC supply voltage is present

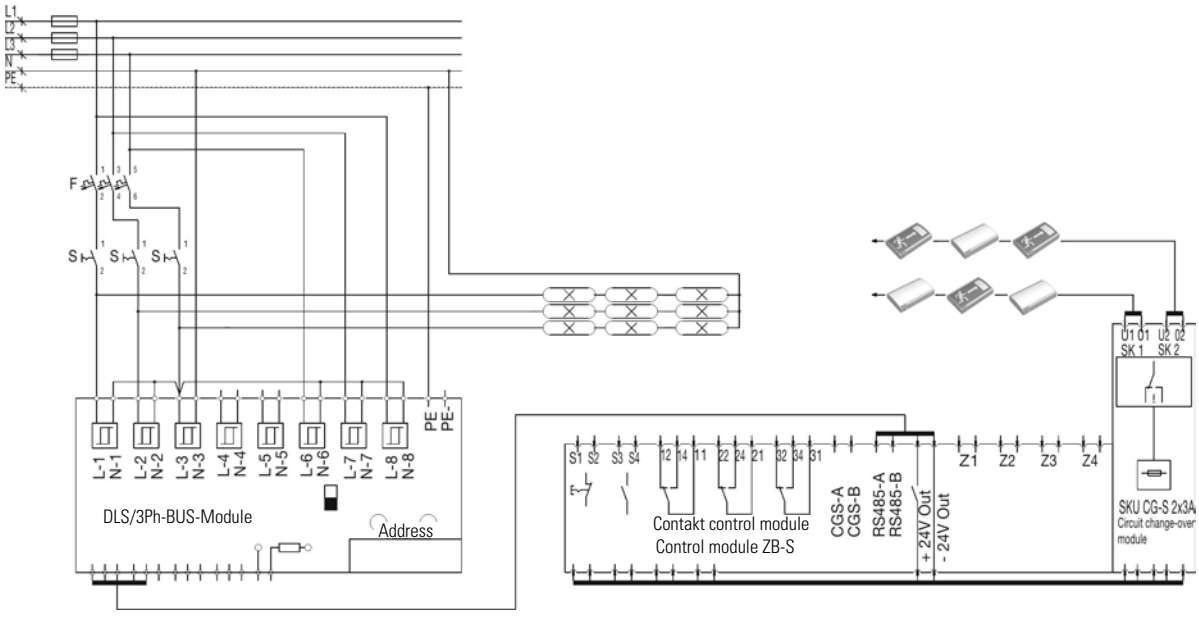
LED Störung/Failure lights up when a fault function was registrated by the module

Pos. 4: Locking device button for a module attached to a 35 mm-DIN-mountingrail
(for demounting pull down the button and demount it)

Pos. 5: Changeover switch for the module operation mode DLS or DLS/3PH

Pos. 6: Bus address

Fig.: DLS/3Ph-bus-module inverse



4.4.12 Webmodule

The webmodule ZB-S is conform to EN 60950-1 and developed, manufactured and tested according to DIN EN ISO 9001.

Technical Data:

Supply voltage: 24 V DC

Power consumption: < 1.5W

Connection: RJ 45

Insulation class:
III, Degree of protection acc. to EN 60529: IP 20

Ambient temperature:-10°C ... +55°C

Connection terminal: 1.5 mm²

Weight: 0.1 kg

Dimensions: 90 x 35 x 58 mm

Scope of application

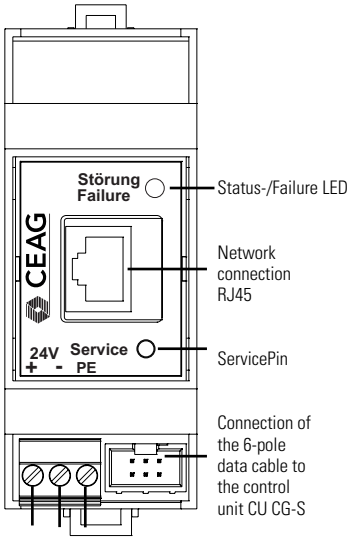
The webmodule ZB-S is used for visualisation and monitoring of a central battery system ZB-S via local ethernet (LAN) with a customary WEB-browser (e. g. Internet Explorer™). Integrated mail-client for a comfortable and event based failure notification for up to 5 email addressees. Password protected 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 ZB-S cabinet is not permitted.

Electrical connection



Status-/Failure LED

Network connection RJ45

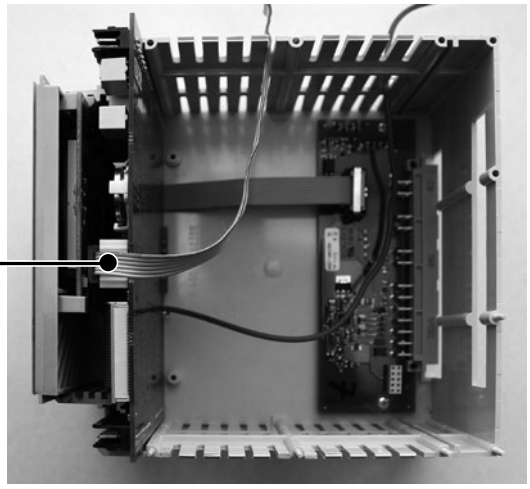
ServicePin

Connection of the 6-pole data cable to the control unit CU CG-S

+ - PE
24 V DC from DC/DC inverter

Web module connection

The CU CG-S control unit must be removed if the web module is updated. Comply with instructions for activation of the control unit. Connect the ribbon cable included with the web module here and route out through the ventilation slots of the control unit housing. Then assemble the control unit again and connect the web module.

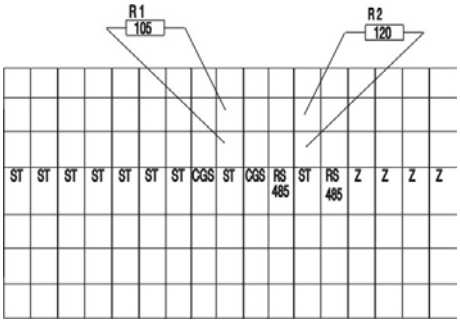


4.4.13 Bus-Technology according to RS 485 or CG-S-Bus

An RS485 bus is used for data communication with external bus modules (DLS/3PH oder 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

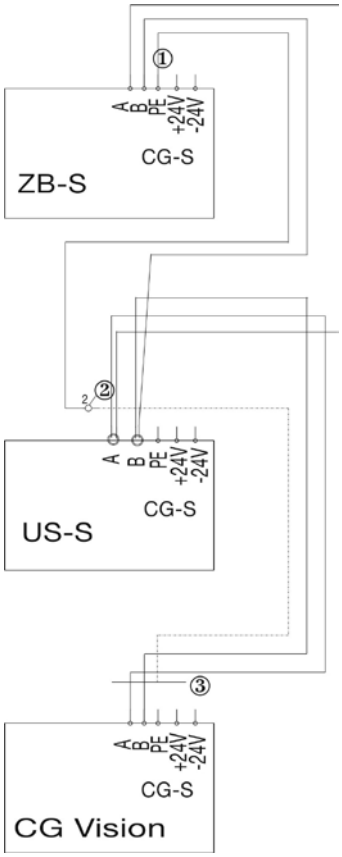
- A parallel switching of data cables is not allowed and does not lead to an extension of the acceptable cable length.
- For power supply of the modules conductors within one screening can be switched in parallel (for calculation compare the catalogue of the system ZB-S).

⚠ ATTENTION!

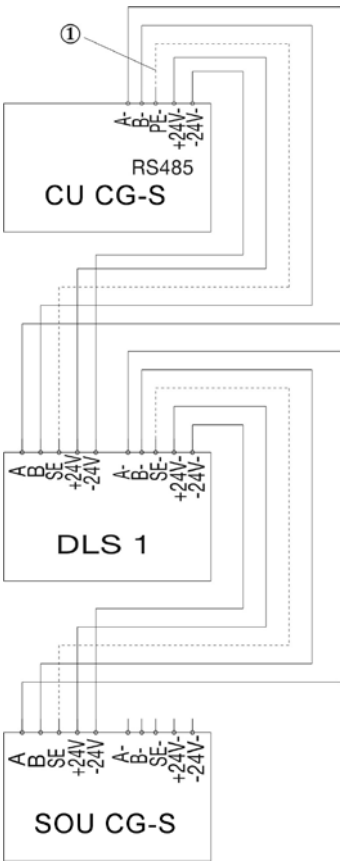
Bus Topology: linear, double terminated (no spur lines allowed). The absolutely essential terminating resistors are included in the control cabinet.

- Cable type (minimum requirement): IY(ST)Y 4 x 2 x 0.8 mm (Twistet 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 V DC, refer to the operationg instructions for the DLS/3Ph-Bus-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



4.4.14 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 expacted 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[1) 2)]
Rated voltage 216 V DC
Dimensions (acc. to performance) different [3)]
Weight (acc. to performance) different [3)]

CEAG-compact battery cabinets

Rage of capacity from 5.5 to 89.4 Ah
Rated voltage 216 V DC
Dimensions (acc. to performance) different [3)]
Weight (acc. to performance) different [3)]

CEAG-battery racks

Range of capacity 23.3 to 268.2 Ah[1)]
Rated voltage 216 V DC
Dimensions (acc. to performance) different [4)]
Weight (acc. to performance) different [4)]

[1)] Battery capacities of more than 126 Ah are reachable with parallel switching of several battery sets.
[2)] Larger capacities on request.
[3)] See CEAG operation instructions for battery cabinets (400 71 860 035)
[4)] 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.

NOTE:

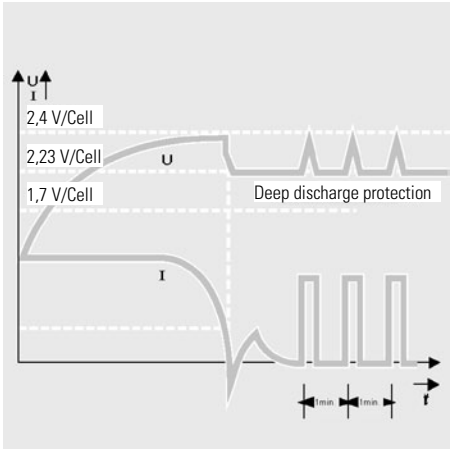
Under normal charging conditions no gas escapes. Refilling of distilled water is not possible as the batteries are closed. Higher temperature leads to a reduction of service life. (compare operation temperatures of batteries on the previous page).

⚠ ATTENTION!

The batteries for standby operation should not be stored for more than three months without charging!

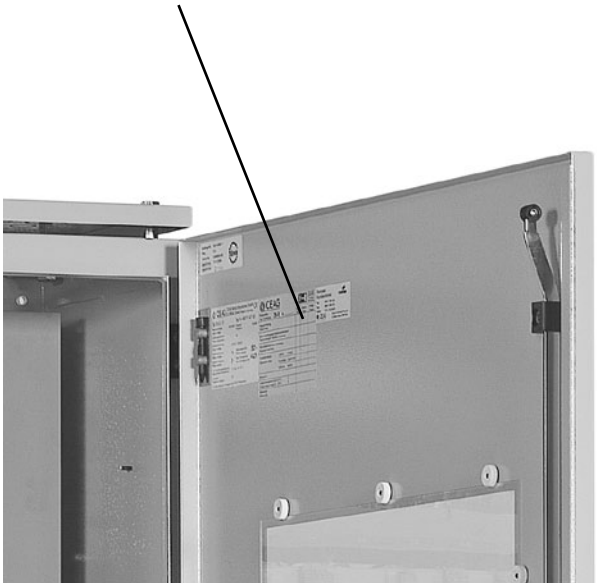
If the mains supply to the ZB-S central battery system is interrupted for more than three days, then the battery circuits must be isolated (by removing the battery fuse). This should be done by qualified electricians (see „Fuse Testing and Replacement“).

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:

COOPER Safety — Made in Germany

Type: ZB-S/10C - 40071347082

Bemessungsspannung *Rated voltage*	1~230V/N/PE 50/60Hz	Schutzart *Protection category*	IP 21
Bemessungsstrom *Max. Rated current:*	A	Sicherung *Fuse*	25 A
Zul. Umgebungstemp. *Max. ambient temperature*	-5 °C / +35 °C	Lst.-NR	31693
Auftr.-Nr. *Order number / Pos*	202259496 / 10		

Prüfung *Check*		Funktionstest *operating test*		
☒ Visuelle Überprüfung *Visual control*		☒ Steuerteil *Control unit*	00 22 84 90 84 00	
☒ Hochspannungstest *High voltage test*		☒ Ladeteil *Charger*		
☒ Schutzleitertest *Protection earth connection point*		☒ Optionen *Options*		
Erhaltungsladespannung bei *Float charge voltage at:*	20 °C	☐ 245,1 V	☒ 247,8 V	

Datum *Date*	Prüfer *Tester*
21.05.2012	H. Lange

Stempel HV / PE Test + Unterschrift

CE Zur Verwendung in Anlagen nach EN 50171 geeignet.
Modified for use electrical installations acc. to EN 50171

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

COOPER Safety — Made in Germany

108 Zellen *cells*	Bemessungskapazität gem. EN 60896-2 (C10; 1,8V/Z; +20°C)		23,3 Ah
Batterietype	P12V600	Sprinter P	Menge *Peaces* 18

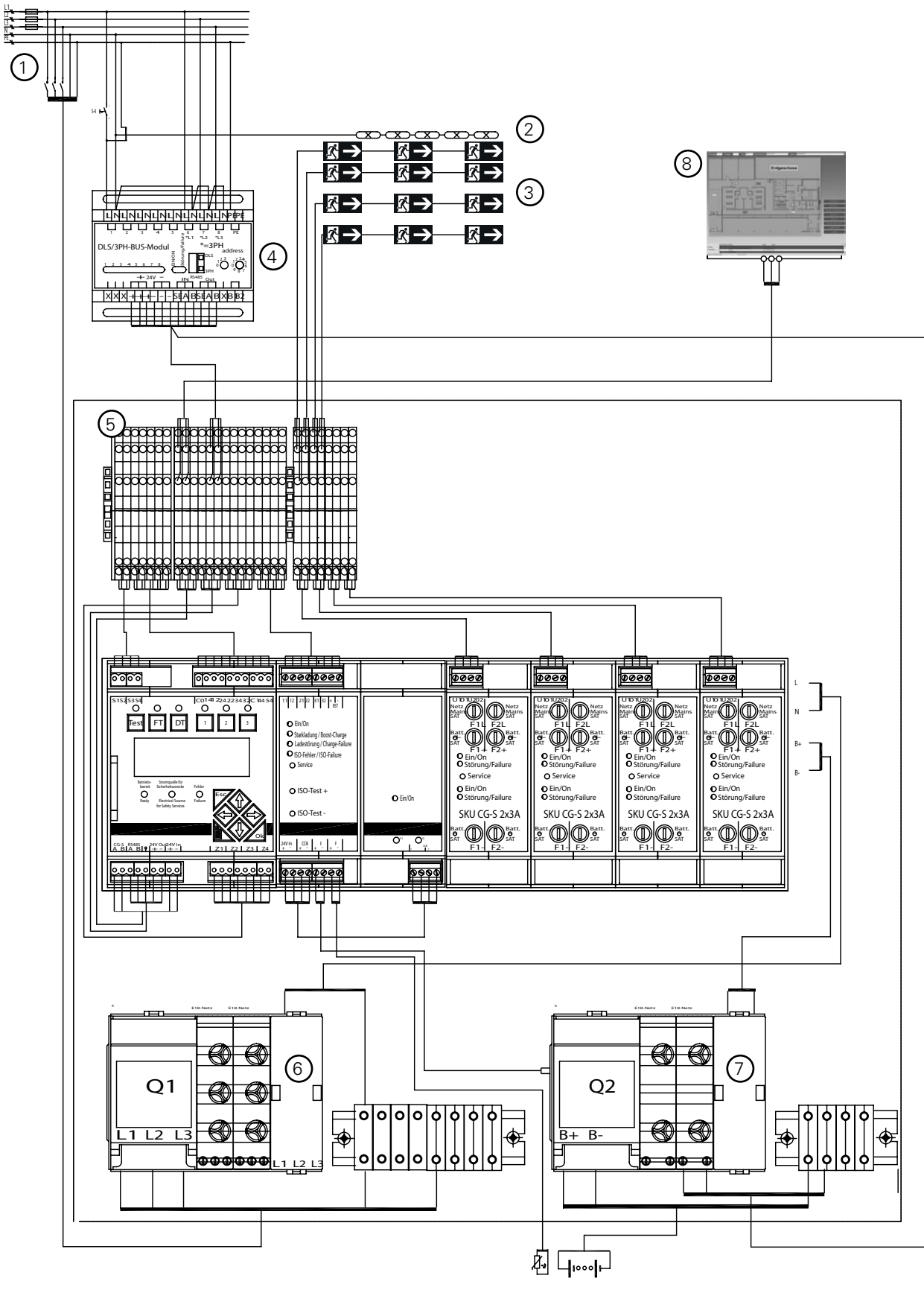
Bemessungsspannung *Rated voltage*	216V DC	Bemessungsstrom *Max. Rated current:*	15,4 A
Bemessungsleistung *Rated power*	3,3 KW	Nennbetriebdauer *Rated duration time*	1,00 h
Bem.-Temperatur *Rated temperature*	20C°	Min. Spannung nach 1,00 h *Min. voltage after*	183,6V DC

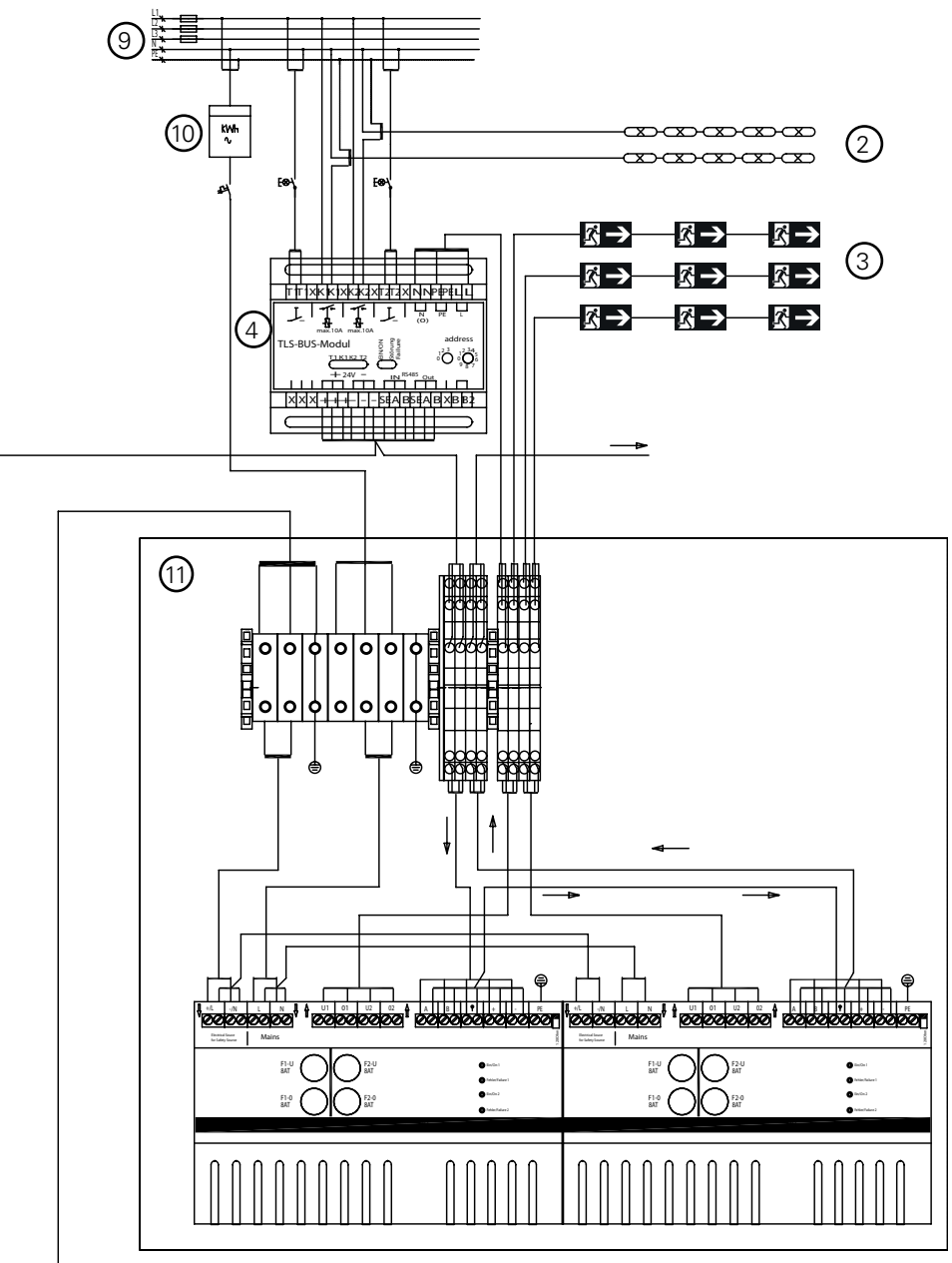
Achtung!
Es dürfen nur auslaufsichere Batterien verwendet werden!
Please use only leak proof batteries!

Vor Inbetriebnahme der Batterien muss sichergestellt werden, dass die eingestellte Erhaltungsladespannung mit den Herstellerangaben übereinstimmen!
Before start-up of the batteries must be guaranteed that float charge voltage is according to manufactures specification!

CE Zur Verwendung in Anlagen nach EN 50171 geeignet.
Modified for use electrical installations acc. to EN 50171

4.6 Example of Installation





1 Mains supply

2 General lighting

3 Emergency luminaires

4 DLS 3-Ph bus module

5 ZB-S system

6 Mains distribution box

7 Battery distribution box

8 CGVision

9 General power supply

10 Rental current meter

11 US-S/SOU2

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 oberserve 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 initi-al commissioning or re-commissioning.

Take all necessary measures to ensure occupational health and safety!

As well as compliance with general trade standards and procdures, 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). Becau-se the system switches over to battery operation when the mains supply is isolated, there are certain proce-dures 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).

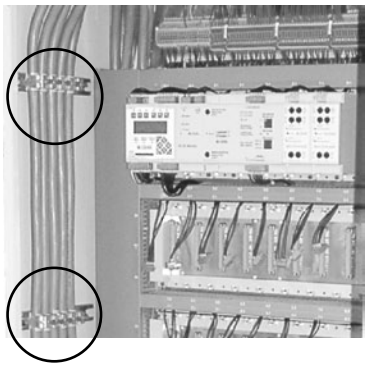
6.2 Assembly

Requirements to the place of assembly:

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

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 proper-ly 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 is must be carried out by specially trained CEAG engineers!

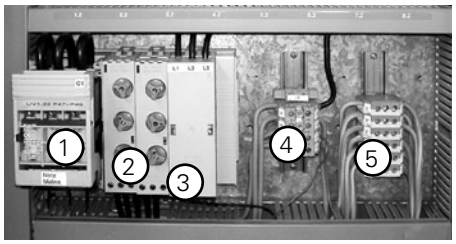
The installation and connection of the general lighting system is not described in this manual.

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).



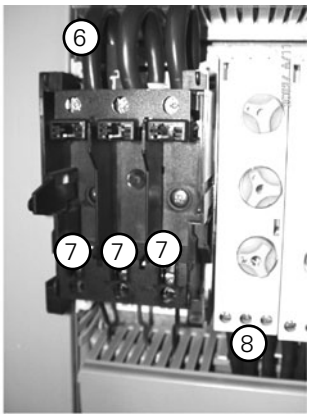
Load disconnector (1) (terminal box and fuse box for the mains supply)

Outgoing distributor (2)

Cabinet distributor (3)

N-terminal block (4)

PE-terminal block (5)



Connections shown with load disconnector 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 disconnector

NOTE

For single-phase operation, a load-current cable only is connected, and the input terminals (pos. 7) on the disconnector 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 <0.5mA (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 x 10 x 0.5mA = 85mA 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.

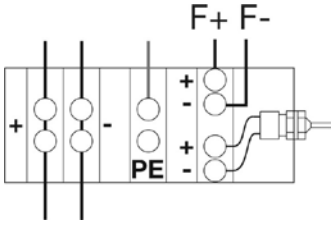
6.5 Connection to battery power supply

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 disconnector 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 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^2 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 mm² 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 disconnector (Batt). The charge modules and all circuits of the SKUs are not off-load until the mains supply is isolated.

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

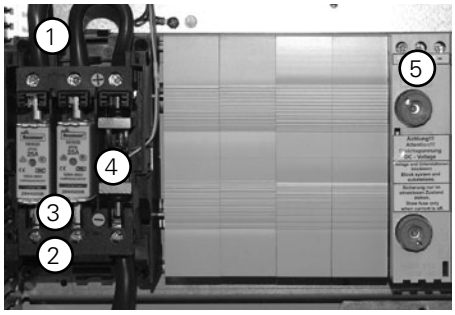
NOTES:

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

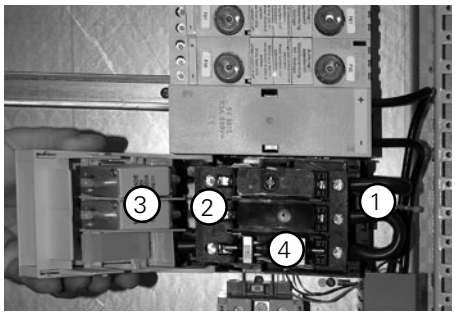
Connecting the cables for the battery supply to the ZB-S control cabinet:

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

ZB-S/26 and ZB-S/18



ZB-S LAD



Open load disconnector (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

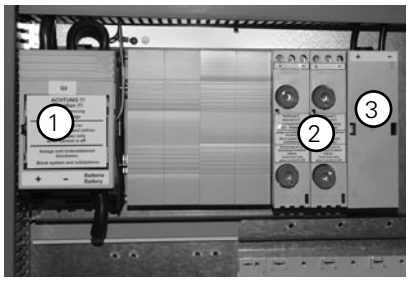
6.5.2 Connecting the Battery supply of a US-S substation

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.

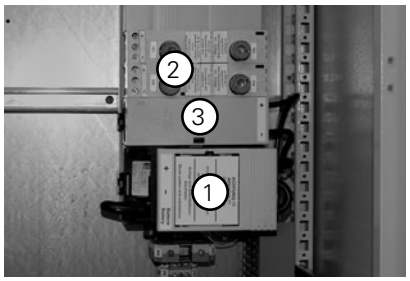
NOTES:

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.

ZB-S/26 and ZB-S/18



ZB-S LAD



Location of the load disconnector (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.

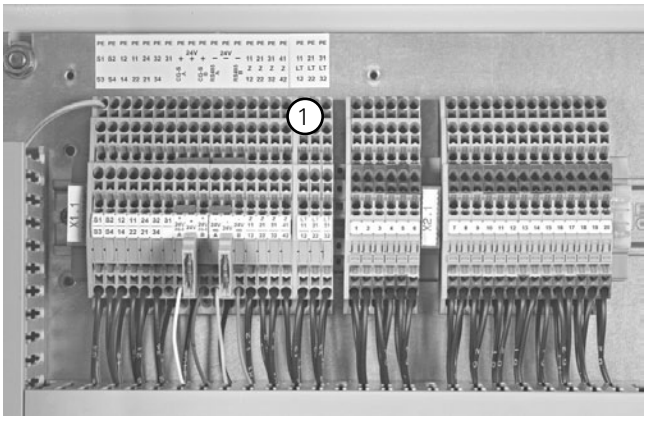
6.6 Connection of temperature sensor

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:

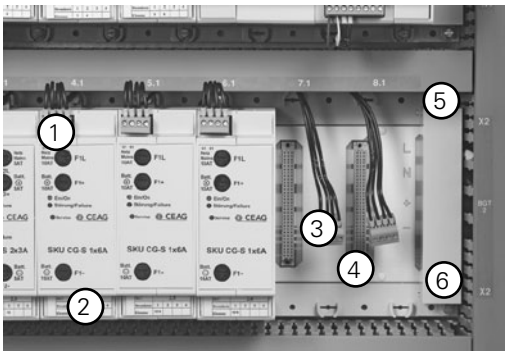
The circuit numbers used in the displays of the CU CG-S controller and the displayed switch outputs of the SKUs are assigned by the choice of slots on the subracks.

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 re-fitting 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 and installation of external modules

External bus modules and devices are designed as multiple built-in devices for mounting in a cabinet/sub-distribution board. They are mounted on a 35mm rail according to DIN EN 50 022.

With light pressure the module gets locked in position.

NOTES:

- The bus cables A/B and their screening must also be connected to the system´s terminals. Please attend to the information regarding bus-technology and screening!
- Install/activate the necessary terminating resistor in the cabinet and at the last device of a bus line (bridge B1-B2).
- Set the address for the module. Avoid assigning the same address more than once as this causes stop-pages.
- Set the intended address for modules with address switch, but avoid multiple assignment as this causes operational faults.
- For further information please refer to the technical documentation of the module!

6.8.1 DLS/3Ph-Bus-Module

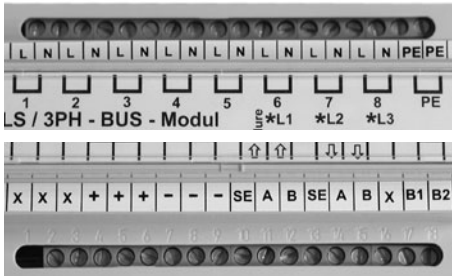
If possible these modules should be installed direct in the sub-distribution boards which supply the associated circuits (for the general lighting or stairwell lighting). This is advisable because it means that only one bus cable needs to be run (to RS 485 connection on the CU CG-S control module) between the external modules and the related controller (in the ZB-S cabinet or its US-S substations). The cables for the 24V supply for the bus modules can be laid with a 4-core cable together with the bus.

The 24V supply and the bus cable can now be looped through inside the sub-distribution board on the devices. In many cases it is desirable to all controlgear to be concentrated in a single control cabinet (e. g. for the central operation and monitoring of all switching elements and circuits).

For such requirements CEAG can supply a preassembly for fitting DIN mounting rails in the cabinet (ZB-S or US-S) to which external modules can then be mounted (accessory part no. 400 71 347 125).

With this type of assembly a cable must be run between the cabinet (ZB-S or US-S) and the distribution board for the mains supply (of the monitored circuits) for each command. You will find the block connection diagram and further technical information on the pages 53.

The terminal assignment will be found on the device. The terminals can accept cables up to 2.5mm² cross-section.

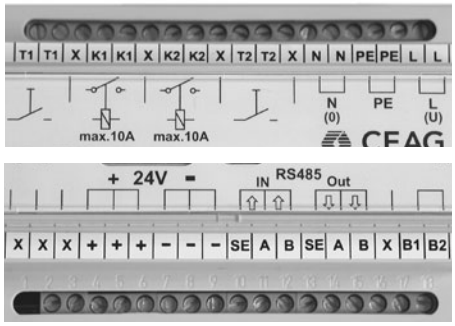


Terminal assignment on the DLS/3Ph-bus-module (top/bottom)
X = terminal not assigned

6.8.2 TLS-Bus-Module

If possible these modules should be installed direct in the sub-distribution boards which supply the associated circuits (for the general lighting or stairwell lighting). They can be mounted in the ZB-S or US-S cabinets. Otherwise the same criteria for selecting the installation position apply as for the DLS/3Ph bus modules.

You will find the block connection diagram and further technical information on page 51!



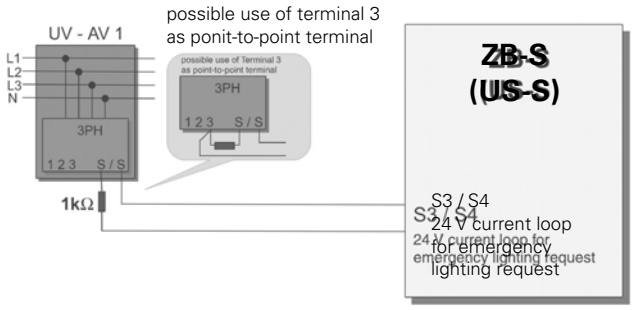
Terminal assignment on the TLS bus module (top/bottom)
X = terminal not assigned

The supply for the glow lamps in the light pushbuttons is connected to the upper terminal strip on the module, terminals N (O) and L (U); the PE terminal is also connected to the PE terminal of the SKU!

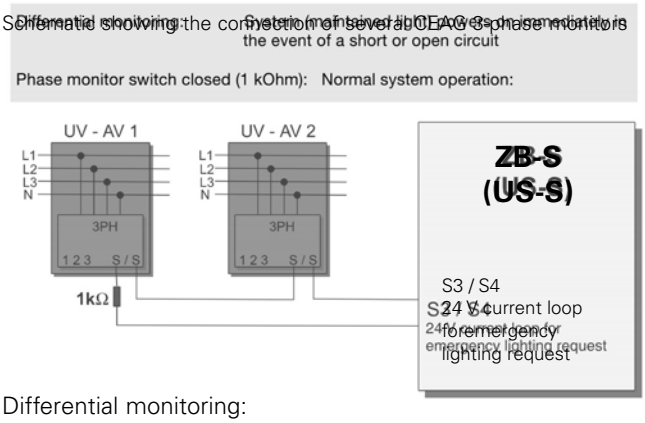
6.8.3 CEAG 3-phase monitors with 24V current loop

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-phase monitor 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-phase monitor

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 jumpe-red.

6.8.4 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.

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.

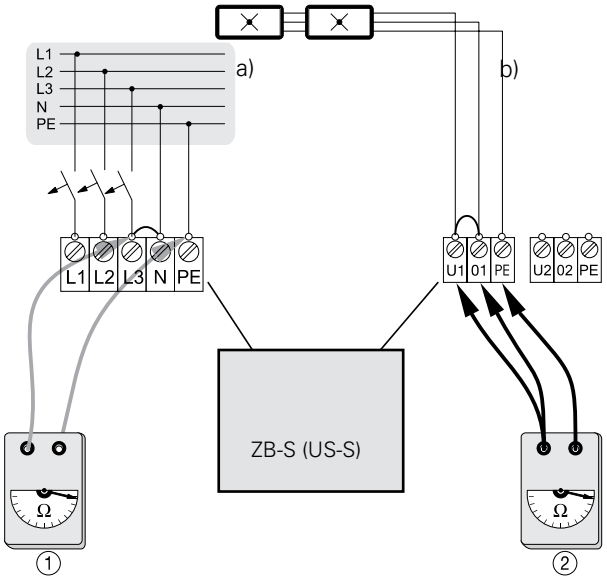
⚠ DANGER!

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 / 01 (...) will protect active components of the electronics in the ZB-S (US-S) cabinet and of the luminaires (ballasts) from possible destruction!

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 diconnector 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)

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.

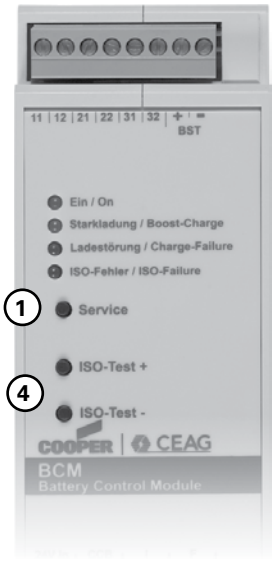
General Information

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 for several seconds until the green LEDs flash alternately. The control unit display is now controlled by the BCM.
   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

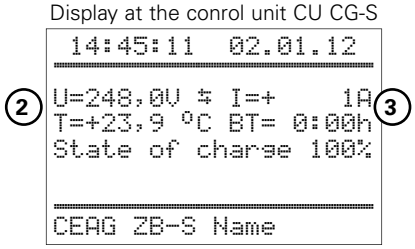


⚠ CAUTION!

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.

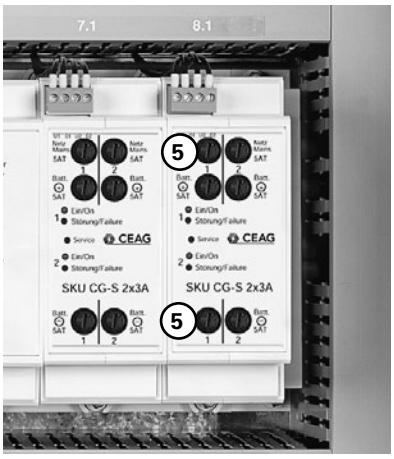
Display at the conrol unit CU CG-S



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 dismounting 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 dismounting of a module please see chapter 6.8 „Connection and installation of external modules“. Please observce 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. If 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 disconnector.
- 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 disconnector.
- Switch on the controllers with <<Release device>> menu option.

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, DC/DC converter, 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 occured. 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!

⚠ 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 disconnector 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.

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 DC/DC Converter

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) and charging module CM 1,7 A, CM 3,4 A

BCM

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 (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

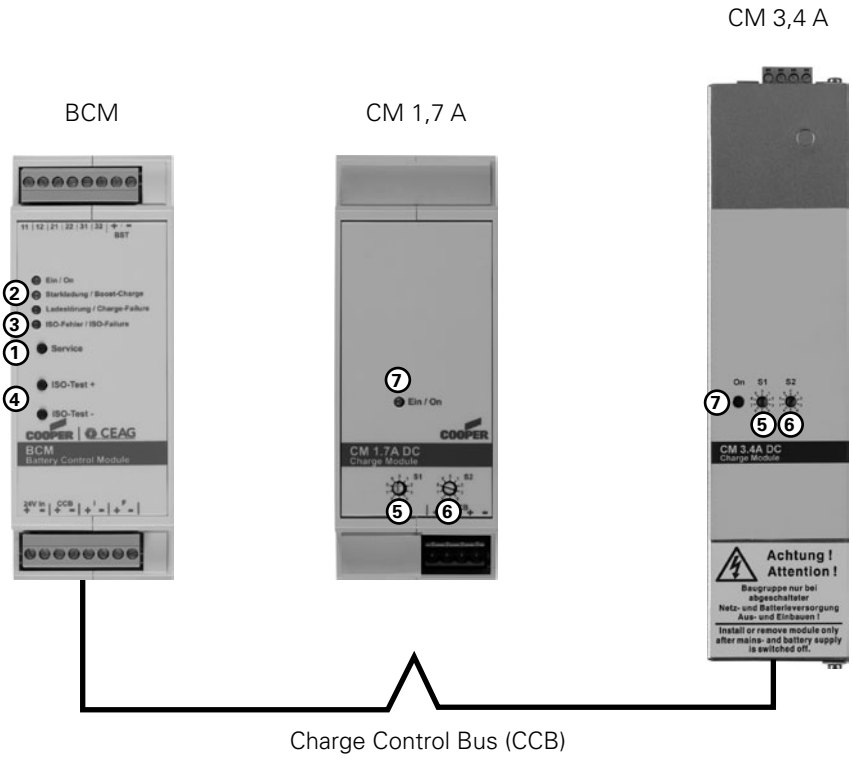
The circuit change over module supplies and monitors emergency luminaires with electronic ballasts for DC operation. The CEWA GUARD monitor checks the function of the luminaires that are connected to it. Up to 20 luminaires per circuit can be connected. Mixed operation within a circuit of maintained 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

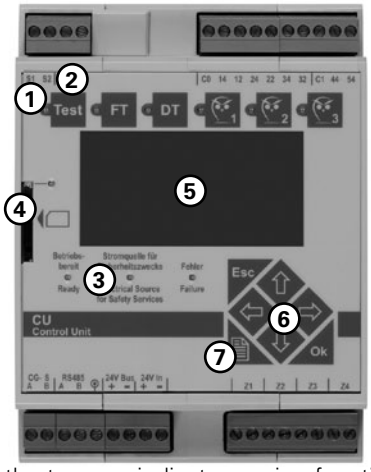
- individual circuit changing per emergency lighting circuit; not at 4x1,5 and SOU
- freely programmable for maintained light, switched maintained light or non-maintained light;
- easy access to fuses (1) at the front of the module;
- LEDs (2) for fault and run RUN/ON for each circuit;
- service button (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 theFunction 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 wether 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.

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), refered 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).

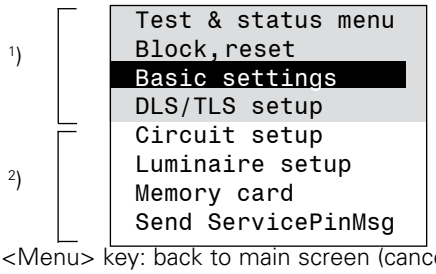
Graphic display (main screen during normal operation)

Starting point: **Main screen**

☞ <Menu> **Selecting the main menu:**

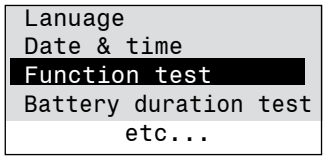
☞ ⇧ / ⇩: Select Basic settings in the main menu

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. parameters.

Main menu

- 1. Test & status menu
- 2. Block & reset alarms
- 3. Basic settings
- 4. DLS/TLS setup
- 5. Circuit setup
- 6. Luminaire setup
- 7. Logbooksetup
- 8. Send ServicePinMsg

- 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:

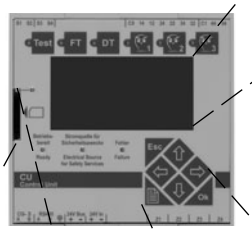
☞ <ok> +⇧ / ⇩: contrast adjustment
☞ <ok> + ⇦ / ⇨: brightness adjustment
These parameters can also be set with menu option "3.10 Display Setting" in menu "3 Basic Settings".
Here the parameters can be numerically set as percentages.

1 Test & status menu

- 1.1 Start functiontest
- 1.2 Start durationtest
- 1.3 Cancel durationtest
- 1.4 Sum failure info
- 1.5 Circuit state
- 1.6 Luminaire state
- 1.7 DLS/TLS/3PhW state
- 1.8 Charging/Bat. state
- 1.9 Relay state
- 1.10 Substation state

Main screen (Example)

Control module CU CG-S



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
⇧ ⇩ ⇦ ⇨

ⓘ 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 Mulit 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.

- 2 Block, Reset
  - 2.1 Block device
  - 2.2 Release device
  - 2.3 Manual reset
  - 2.4 Reset deep discharge
  - 2.5 Reset ISO-failure
  - 2.6 ISO-failuresearch
- 3 Basic settings
  - 3.1 Language
  - 3.2 Date & time
  - 3.3 Functiontest
  - 3.4 Durationtest
  - 3.5 Delay time mains return
  - 3.6 Manual reset
  - 3.7 Selective EmgcyOper.
  - 3.8 Relay setup
  - 3.9 Buzzer setup
  - 3.10 Display setup
  - 3.11 Charger setup
  - 3.12 Printer setup
  - 3.13 Relay module setup
  - 3.14 Webserver setup
  - 3.15 Timer setup
  - 3.16 Substation setup
  - 3.17 Connection to BMS
  - 3.18 Function keys
  - 3.19 Optional inputs
  - 3.20 Serialnumber & type
  - 3.21 Password protection
  - 3.22 Daylight saving time
  - 3.23 Service info
- 4 DLS-/TLS setup
  - 4.1 Search DLS/TLS ...
  - 4.2 Text assignment
  - 4.3 TLS times
- 5 Circuit setup
  - 5.1 Deactivate module
  - 5.2 Search ext. modules
  - 5.3 Text assignment
  - 5.4 Monitoring mode
  - 5.5 DLS/TLS-Assignment
  - 5.6 Get new rated value
- 6 Luminaire setup
  - 6.1 Add / remove
  - 6.2 Luminaire search
  - 6.3 Text assignments
  - 6.4 DLS/TLS-Assignment
- 7 Memory card
  - 7.1 Search logbook
  - 7.2 Erase logbook
  - 7.3 Save configuration
  - 7.4 Lead configuration
- 8 Send ServicePinMsg
  - this action is executed when <ok> is pressed[1])

[1]) Provided only for service engineers

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> iniciates the abort of the running duration testcancels 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 referes 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
```

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
Circuit state
Luminaire state
Luminaire state
etc.
```

☞ <ok>
Menu 1.6:

```
SKU 2/1 ⇆ circuit:1⇆
....5.....10.....15....2
□■⊟
Luminaire name
```

- ☞ Select input field/line with ⇵
- ☞ Select SKU or circuit with ⇆
  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 ⇆
  Line 4 shows the luminaire name (see "6.2 Text assignments")

```
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 ⇆
  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 configu-red as a combined DLS/3-phase monitor.
  □ Switch status/Phase Off
  ■ Switch status/Phase On

```
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=213.0 V   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 ⇆ 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
```

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

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

```
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 ⇆
  Line 2 shows the current operation status of the chosen station ZB-S by Multi Master Mode M3.

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 ↓↑ 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 ⇆
Device name
```

☞ <ok> initiates the function:
All functions are cancelled;
all outputs will be isolated!
In case of mains failure occures 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)

☞ Selection with the buttons ↓↑ between the displayed options.
☞ Selection of a ZB-S system with ⇆

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

```
Block device
Release device
Manual reset
Reset deep discharge
```

☞ <ok>
Menu 2.2:

```
This device
all devices
Device address  01 ⇆
Device name
```

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

```
Block device
Release device
Manual reset
Reset deep discharge
```

(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
```

(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
```

(Menu 2.5: only directly at the station)
☞ <ok>

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 ⇆
cancel search
```

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

☞ Selecection of cursor position with ↓↑
☞ <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
```

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 ⇵
- ☞ <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 3.1: The currently selected language is displayed [1])

- ☞ Use the ⇵ keys to toggle between "Language: National language" [2]) and "Language: english"
- ☞ Finish and return to Menu 3 with <Menu>

[1]) Setting on delivery/initial commissioning

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

[2]) Can only be selected when memory card is inserted.

```
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!

- ☞ Select the date and time positions with ⇵
- ☞ Change with ⇆
- ☞ Finish with <Menu>

This request follows:

```
     Substation
   synchronise ?

Menu = no    OK = yes
```

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

```
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 ⇆
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 ⇵
- ☞ Change with ⇆
- ☞ Finish with <Menu>

This request follows:

```
     Substation
   synchronise ?

Menu = no    OK = yes
```

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

☞ <ok> Menu 3.4:

```
B-Test Date&Time
We 11.12.07    12:00

Interval in months: 12
```

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

- ☞ Select the input position for date, time and interval (in months) with ⇵
- ☞ Change with ⇆
- ☞ Finish with <Menu>

This request follows:

```
     Substation
   synchronise ?

Menu = no    OK = yes
```

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 ↓↑
- ☞ <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

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

☞ <ok>
Menu 3.5:

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

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>

```
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.

```
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
Load defaults
```

Note: See also menu option 1.9 "Relay status" in menu 1 "Test & status menu".

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>

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 ↓↑
- ☞ <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
Gerätestörung
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 ↓↑
- ☞ Select buzzer "On" (✶) or buzzer "Off" (no ✶) with keys ⇆
- ☞ 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 ↓↑
- ☞ Set the values (0 to 100%) with keys ⇆
- ☞ 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 ↓↑
- ☞ Change the settings with ⇆
  - – 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
```

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 ⇵
- ☞ <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

```
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.

```
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 loged 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.

```
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 appeares 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 addresse: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

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 ↓↑
- ☞ <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

```
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
```

Note: The entries in lines 3 and 4 are for information for the system integrator only.

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 ↓↑
- ☞ Select a device (bus) address (1 ... 32) in line 1 with keys ⇆(display — : no interface)
- ☞ Select no/yes in line 2 for the option LON switch with ⇆
- ☞ Line 4: Device name user-definable. See text assignment 4.2
- ☞ Finish and return to Menu 3 with <Menu>

```
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 ⇆
- ☞ Highlight the function with ↓↑
- ☞ Select the function (✶) with <ok>
- ☞ Finish and return to Menu 3 with <Menu>

```
Substation setup
Connection to BMS
Function keys
Option inputs
etc....
```

☞<ok>
Menu 3.19:

```
Option input      1 ⇆
No function
Switch                1)
Switch inverted       2)  ✶
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
```

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 ⇆
- ☞ Highlight the events with ↓↑
- ☞ 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.

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 ↓↑
- ☞ <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

```
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
```

- ☞ Line selection (1 - 3) with ↓↑
- ☞ Selection of the nominal operating duration (1, 2, 3 or 8h) and limit operating duration (10 to 100%) with keys ⇆
  The nominal and limit operating duration is the basis for the operating duration test.
- ☞ Finish and return to Menu 3 with <Menu>

NOTE

Factory setting = 100%
A change to the limit operating duration has to be done by our customer service!

```
Function keys
Optional inputs
Serialnumber & type
Password protection
etc....
```

☞ <ok>
Menu 3.21:

```
Password:
deactivated             ⇆
Password (6 digits)
```

- ☞ Select the "deactivated" or "activated" setting with keys

When "activated" is selected the password prompt also appears:

```
Password:
activated
Password (6 digits)
Password: 123231
```

- ☞ Enter the password (the digits can only be entered with keys F1, F2 or F3)
- ☞ Finish and return to Menu 3 with <Menu>

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.

```
Password:   1
```

- ☞ Select the input point with keys

When password protection is active, all (sub)menus are protected from use without a password, except:
- Menu 1 "Test & status menu"
- Menu 2 "Block, reset".

```
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 ⇆
  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 ↓↑
- ☞ 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 ↓↑
- ☞ <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
```

☞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.

```
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
```

- ☞ <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>

```
Search DLS/TLS ...
Text assignment
TLS times
```

☞Menu 4.2: <ok>

```
Text assignments
DLS+3Phase monit. No ⇆

DLS/TLS Text
```

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).

- ☞ Line selection (line 2, 4) with ↓↑
- ☞ Select a bus address with ⇆
  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 ↓↑
  - Select the input point with ⇆
  - All the possible alphanumeric characters are displayed cyclically with the cursor keys ↓↑.
  - 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>

```
Search DLS/TLS ...
Text assignment
TLS times
```

Menu 4.3:
☞ <ok>

```
TLS:No       Port:No ⇆
Time          1 min ⇆

DLS/TLS Text
```

- ☞ Line selection (line 1, 2) with ↓↑
- ☞ Make changes in the input field with⇆

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 ⇆
In line 2 the stairwell light operation times 1 sec, 1 ... 15 min can be selected with⇆
Line 3 shows the module name (s. menu 4.2).

- ☞ Finish and return to Menu 4 with <Menu>

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
```

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 5.1:
☞ <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>

```
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 2x3
Key OK=activate
```

- ☞ Selection of a module address with ⇆
- ☞ <ok>: Activation of module address and search for further modules.

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 ↓↑
- ☞ <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 ⇆ circuit:2⇆
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 ↓↑
- ☞ Successive selection of subrack/SKU and circuit with ⇆
- ☞ Changing the circuit name:
  - Select line 4 with ↓↑
  - Select the input point with ⇆
  - All the possible alphanumeric characters are displayed cyclically with the cursor keys ↓↑.
  - 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 ⇆ circuit:2⇆
Current value monitoring⇆
max. deviation
20% ⇆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.

The following modes can be selected in line 2:
- CG monitoring
- Current value monitoring
- Reserve circuit

- ☞ Select line 1, 2, 3 or the input fields in line 1 with ↓↑
- ☞ Successive selection of SKU/output and (final) circuit with ⇆
  Line 4 shows the circuit name (see menu 5.2)
- ☞ Select the monitoring mode with keys ⇆
- ☞ Finish and return to Menu 5 with <Menu>

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:

$$\text{max. dev.} < \frac{P_{min}}{P_{ges}} \times 100$$

(P_{min} = Mains connected load of the smallest luminaire)
(P_{ges} = 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:

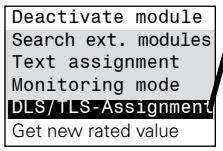
Main menu

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

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



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>

Note: The possible settings in line 3 depend partly on the selection made in line 2

Switch assignment

in line 2 Switch 1	in line 3 Switch 2
Non maintained mode	none
Maintained light (mains)	Maintained light (Batt) TLS xx/x (Batt)
per luminaire setup	Maintained light (Batt) TLS xx/x (Batt)
Timer 1 Timer 2 Timer 1&2	Maintained light (Batt) DLS xx/y 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 ...)

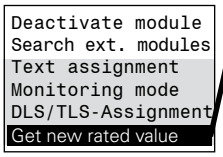
y: Inputs of the module (e.g. for switch interrogation) or Switched outputs of TLS modules

TLS can only be assigned to complete circuits.

Switch assignment

in line 2 Switch 1	in line 3 Switch 2
Non maintained mode or 3-phase monitor	none 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 Timer 2 Timer 1&2	Maintained light (Batt) DLS xx/y 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



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!

8.4.6 Menu 6 “Luminaire setup”

Overview:

Main menu

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

Menu 6

```
Add / remove
Luminaire search
Text assignments
DLS/TLS-Assignment
```

- ☞ 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

```
Add / remove
Luminaire search
Text assignments
DLS/TLS-Assignment
```

☞ <ok>
Menu 6.1:

```
SKU 1/8⇆ circuit:2⇆
...5...10...15...20
-□-□-□-□-------□□-
Luminaire text
```

Notes:
The SKUs and circuit numbers are assigned by their placing on the module slots of the subrack.

Only “present”(□) 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”.

- ☞ Select line 1 or the input fields in line 1 with ↓↑
- ☞ Successive selection of SKU/subrack and (final) circuit with ⇆
  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 ⇆ (e.g. cursor flashing on position 3)
  Line 4 displays the luminaire text (Name if previously entered).
  Use the <ok> key to set or remove a luminaire at the selected position.

```
Add / remove
Luminaire search
Text assignments
DLS/TLS-Assignment
```

☞<ok>
Menu 6.2:

```
all circuits
SKU 1/8⇆ circuit:2⇆

circuit name
```

- ☞ Select line 1 and 2 resp. the input fields in line 2 with ↓↑
- ☞ Successive selection of SKU/subrack and (final) circuit with ⇆
- ☞ 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 nessessary correct the luminaire address of the affected circuit.

```
Add / remove
Luminaire search
Text assignments
DLS/TLS-Assignment
```

☞<ok>
Menu 6.3:

```
SKU 1/8⇆ circuit:2⇆
...5...10...15...20
-□-□-□-□-------□□-
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, 2, 4 or the input fields in line 1 with ↓↑
- ☞ Successive selection of SKU and (final) circuit with ⇆
  (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 (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
  – Select the input point with
  – All the possible alphanumeric characters are displayed cyclically with the cursor keys.
  – Once a name has been fully entered, confirm the entry with <ok>. 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
```

Menu 6

```
Add / remove
Luminaire search
Text assignments
DLS/TLS-Assignment
```

- ☞ 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

```
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 ↓↑ Select input field with ⇆
- ☞ 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:

```
SKU 1/8⇆ circuit:2 ⇆
....5...10...15...20
Line 3
Luminaire text
```

- ☞ Line selection (line 2 and 3) with ↓↑
- ☞ Select a luminaire in line 2 with keys ⇆ (line 4 shows "not installed" or the luminaire name)
- ☞ possible selections in line 3 with keys ⇆ (see table below) If there are two switch assignments in line 3, use keys ↓↑ 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" switchable	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 ⇆ DLS xx/y ⇆ (OR operation) It can be assigned 1 timer and a switch: "Timer 1 ⇆ DLS xx/y ⇆" "Timer 2 ⇆ DLS xx/y ⇆" "Timer 1 & 2 ⇆ DLS xx/y ⇆"

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 start-
ed direct from
the main menu by
pressing <ok>
```

☞ 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

```
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 ⇆

– 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
```

☞ <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"

Important NOTE
Once deleted, log book entries cannot be restored.

```
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
```

☞ <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

Important NOTE
The current configuration is irrevocably overwritten with the new configuration!

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).

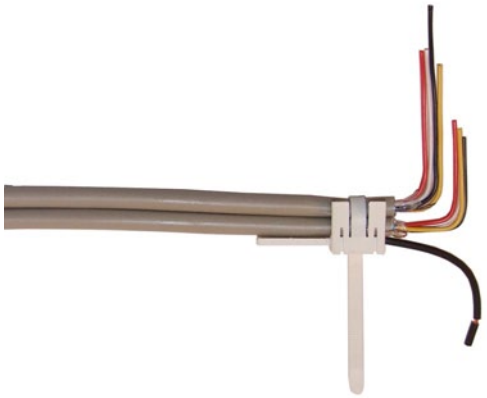
There are a number of ways in which interference can be controlled.

- 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.



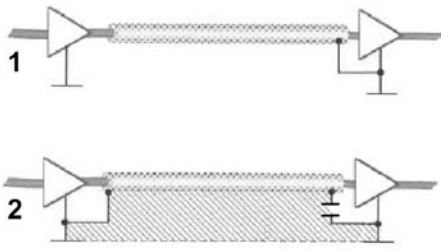
NOTE:

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).



NOTE:

The avoidance of ground loops contributes to the trouble-free operation of a system.

Condenser 220nF Y3 ≥ 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. Socalled 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.

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 unti 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!

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 ↓↑ 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 ↓↑ between the displayed options.

☞ Selection of a ZB-S system with ⇆

ⓘ Device address referes 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 occures no battery operation.

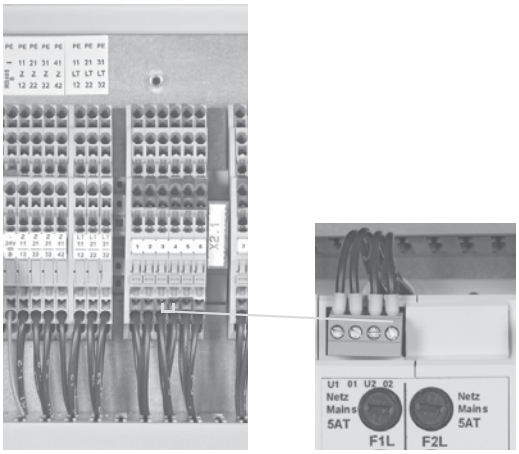
```
Block device
Release device
Manual reset
Deep discharge reset
```

☞ <ok>
Menu 2.2:

```
This device
all devices
Device address  01 ⇆
Device name
```

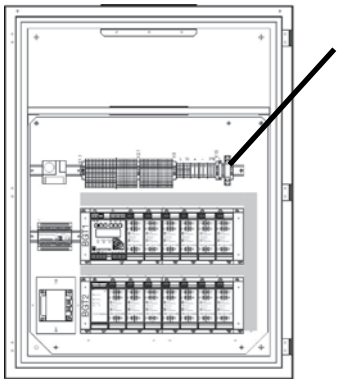
☞ <ok> initiates the function:
The selected stations will be swichted free and restart operation.

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

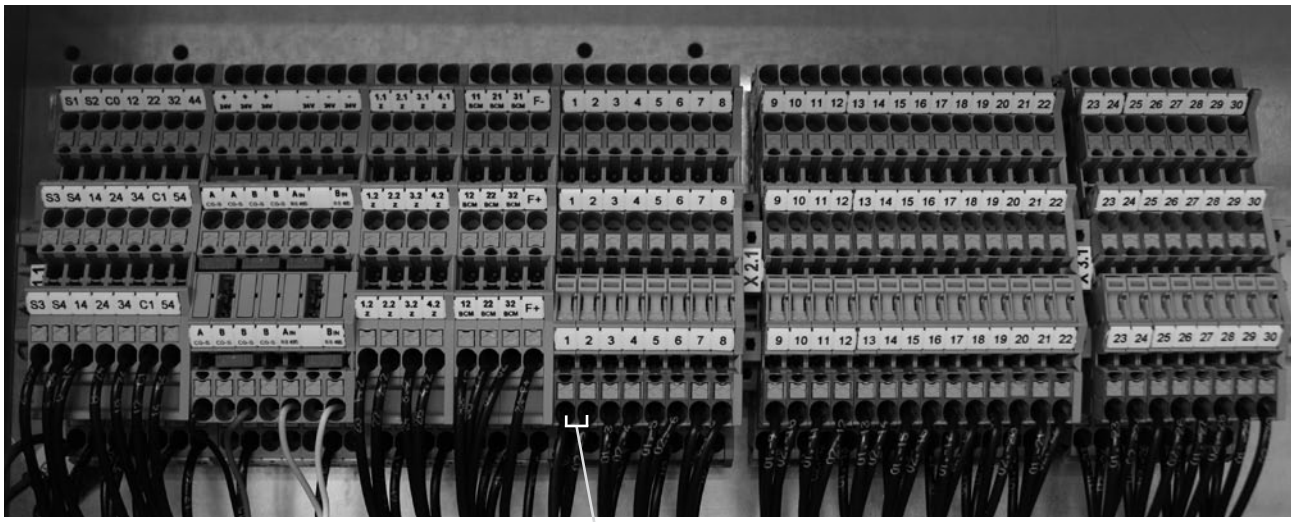


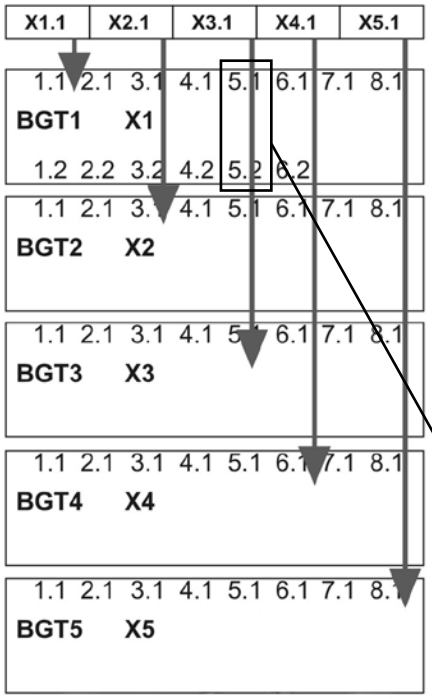
A plug-in fuse is located on the connection terminal block in the upper area of the distributor for protecting the technical ventilation. If the fan is taken out of operation during maintenance work then this fuse can be removed.

Switching off the fan by adjusting the thermostat is not permitted.

Appendix A: Overview of terminal assignments

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.





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		

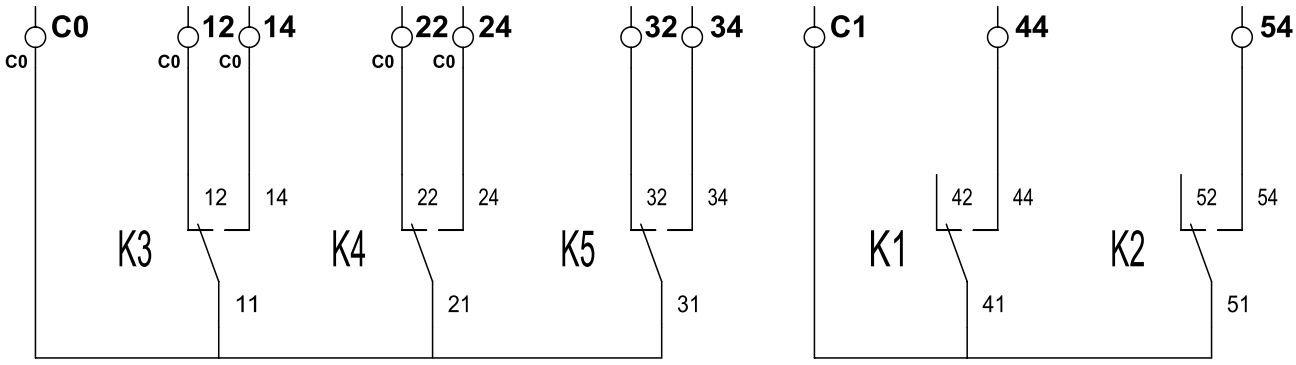
Appendix B: VDE requirements for telecommunication contacts and buzzers

Designation	ZB-S default setting						Notes / Comments
	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		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.		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: • Charger fault • Battery temperature sensor error • Booster fault • Battery circuit interrupted • Battery capacity too low (acc. to duration test) • Fan fault (detected via Z1-Z4) • Transmission fault to charger • Battery voltage too high • Battery voltage too low
Circuit fault	X						Circuit fault means: • Circuit fuse defective • Overload • Circuit ISO error (after manual ISO error search) • Current value < nominal value (with current value monitoring)
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

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 K3, K4, K5 can be freely parameterised, for each: 1 x changeover contact 1 x 24V; 0.5A
Relay contacts K1 (external buzzer) and K2 (technical switching cabinet ventilation) have fixed assignments.

Appendix C: Location plan for the luminaires

Date: _____ Decice address: _____

Time: _____ Name of the system: _____

Luminaire	**20**
Switch 1	
Switch 2	
Luminaire	**19**
Switch 1	
Switch 2	
Luminaire	**18**
Switch 1	
Switch 2	
Luminaire	**17**
Switch 1	
Switch 2	
Luminaire	**16**
Switch 1	
Switch 2	
Luminaire	**15**
Switch 1	
Switch 2	
Luminaire	**14**
Switch 1	
Switch 2	
Luminaire	**13**
Switch 1	
Switch 2	
Luminaire	**12**
Switch 1	
Switch 2	
Luminaire	**11**
Switch 1	
Switch 2	

Luminaire	**10**
Switch 1	
Switch 2	
Luminaire	**9**
Switch 1	
Switch 2	
Luminaire	**8**
Switch 1	
Switch 2	
Luminaire	**7**
Switch 1	
Switch 2	
Luminaire	**6**
Switch 1	
Switch 2	
Luminaire	**5**
Switch 1	
Switch 2	
Luminaire	**4**
Switch 1	
Switch 2	
Luminaire	**3**
Switch 1	
Switch 2	
Luminaire	**2**
Switch 1	
Switch 2	
Luminaire	**1**
Switch 1	
Switch 2	

Circuit name: _____

Switch 1: _____

Switch 2: _____

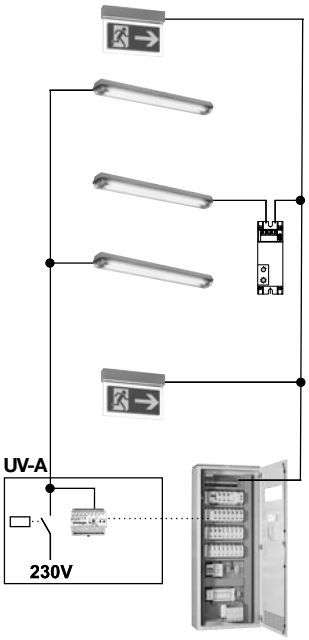
Monitoring mode:_____

Installed wattage [W]: _____

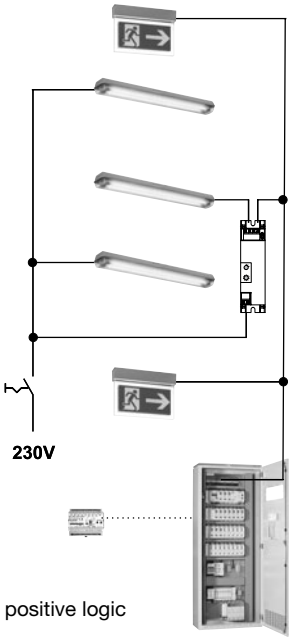
Installed load [VA]: _____

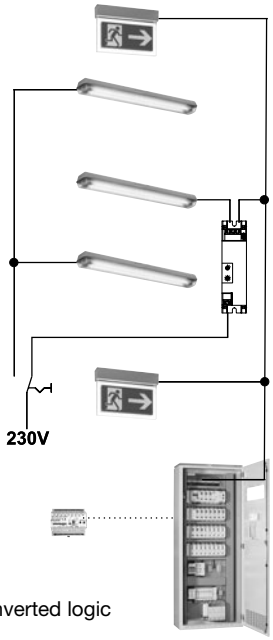
Appendix D: Installation example monitoring modules

V-CG-S 4 – 400 W
Monitoring Module

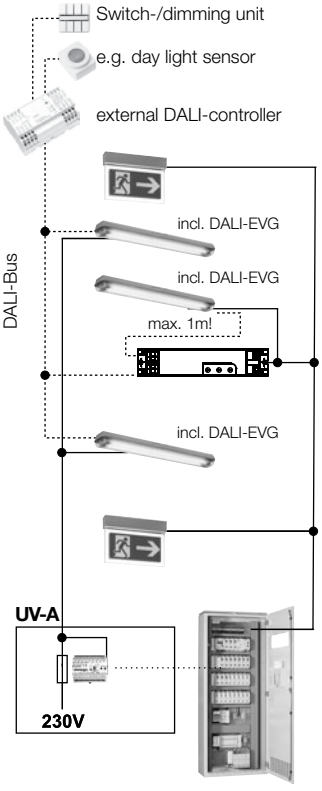


V-CG-SE 4 – 400 W
Monitoring Module with Control Input

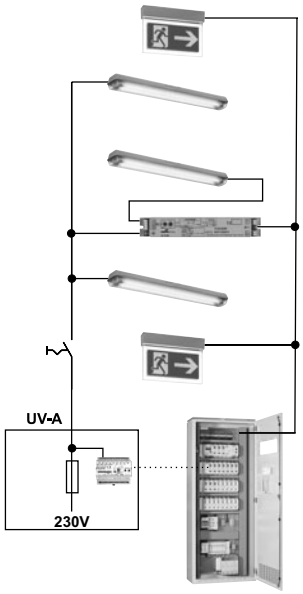




V-CG-SB Monitoring module
with DALI control input



V-CG-SUW Monitoring module
with change over unit



IMPORTANT NOTICE!

The module is only for use with CEAG-emergency ligthing 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: ☐ Maintanance: ☐ Other (see remarks) ☐

To be filled in by CEAG only:

Berechnen: ☐ Kostenpauschale: _____ Kostenfrei: ☐ Festlegung durch ZKD ☐

CEAG-Auftragsnr.: _____ Anlagentyp: _____

Bemerkungen: _____

_____

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