Mounting- and Operating Instruction DualGuard-S

Targed Group: Qualified electricains acc. EN 501 10-1 and
Electrical instucted persons

Powering Business Worldwide

Content

1 Important Notes

1.1 Symbol Key

Important technical safety information in these operating instructions is indicated by symbols. It is imperative that these safety instructions are adhered to. WARNING! DANGER! RISK OF INJURY OR DEATH!

⚠ ATTENTION! DAMAGE TO PROPERTY!

This symbol indicates instructions which, if not observed, may result in damage to health, injury, permanent bodily injury or death

! ATTENTION! DAMAGE TO PROPERTY

This symbol indicates instructions which, if not observed, can lead to material damage or even a total breakdown of the system.

ⓘ NOTE!

This symbol denotes tips and information on practices or how to handle the described appliances and plant components that are important for smooth operations.

1.2 Information on the Operating Manual

This operating manual describes how to handle the device safely and correctly. The safety instructions and information provided as well as local accident prevention regulations applicable to the area of operation and general safety measures must be observed.

Please read the operating manual in full, in particular the chapter on safety and the relevant safety instructions, before beginning any work on the equipment.

The illustrations and circuit diagrams in this manual are in part solely for the purpose of providing visuals for the matters described in the documents. Whenever:

- exact measurements or
- precise illustrations and circuit diagrams tailored to the specifics of the location are required,,

the illustrations and plans that have been specially drawn up for the lighting installation must be followed exactly.

1.3 Applicable Documents

Components from other manufacturers are incorporated into the equipment (e.g. batteries). These additional components are subject to the manufacturer's risk assessments. Compliance of these constructions with current European and national regulations has been certified by the manufacturers of these components.

1.4 Liability and Warranty

All the information and instructions in this operating manual were drawn up in accordance with the valid provisions, the latest state of technology and based on our many years knowledge and experience.

The operating manual must be kept in direct proximity to the central battery system, where it must be accessible to anyone who works on or with the system.

The operating instructions should be read through carefully prior to performing any work on or with the equipment!

CEAG Notlichtsysteme GmbH accepts no liability and/or warranty for any defects that could occur in connection with the delivery and installation of CEAG emergency lighting systems and lights by virtue of other norms and regulations that are prescribed in all-in-one packages in connection with CEAG products. In addition please observe all laws, norms and guidelines of the country in which the equipment is Atng set up and operated.

CEAG accepts no liability or warranty for damage or consequential damage caused by

- improper use,
- non-compliance with the regulations and safeguards for the safe operation of the equipment,
- non-authorized modifications or modifications carried out by non-specialists to the connections and settings of the equipment or to programming,
- the operation of unauthorized or unsuitable devices or groups of devices with the DualGuard-S system.

1.5 Copyright

All material information, texts, drawings, pictures and other illustrations are protected in accordance with copyright law.

1.6 Spare Parts

Only use the manufacturer's original spare parts.

! ATTENTION!

Incorrect or faulty spare parts can result in damage, malfunctions, or a complete failure of the equipment. In the event of the use of unauthorized replacement parts, all guarantee, service, compensation and liability claims become null and void.

1.7 Disposal

Packaging materials are not waste material but valuable assets that can be re-used or recycled.

CEAG has been awarded the recycling certificate issued by INTERSEROH GmbH. The contract number is 85405. This guarantees that all registered packaging material is reused and all the requirements of the Packaging Ordinance are fulfilled

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

Batteries and electrical components contain materials that can result in injury to health and to damage to the environment if they are not disposed of properly. Please observe national guidelines and regulations for the disposal of used batteries and electronic components!

1.8 Safety

At the time of its development and production, the device was manufactured in accordance with the recognized rules of engineering and is deemed to be operationally safe.

The device may prove hazardous, however, if used by personnel who have not been properly trained or if used in an improper or inappropriate manner.

⚠ WARNING!

When planning to use lighting equipment with a DualGuard-S system, first examine whether the electrical equipment in the area intended for use is adequate. Special conditions (e.g. potentially explosive atmospheres or areas with aggressive atmospheres) require special facilities and installations.

Only use the equipment and associated component parts if free of technical defects, taking into account:

• the safety and hazard information in the assembly and operating instructions,

• the established operating and safety instructions for the operator of the equipment,

• the installation and operating data provided in "3 Technical Data" and the CEAG catalog "Emergency lighting and emergency lighting systems".

Malfunctions which could impair the function or safety of the system must be reported immediately to the responsible departments of the plant management and eliminated.

1.9 Intended Use

The DualGuard-S central battery system serves solely to provide power, and to monitor and control the emergency lighting system. Operations are steered by a program. Parameterization is carried out exclusively by specialist personnel with specialized knowledge of the technical principles for the assembly and operation of a lighting system.

Only use lighting that is either manufactured by CEAG or which meets the standards and technical specifications for emergency lighting. You can download the information needed to assess conformity from our website.

Operational safety is guaranteed only if the systems are used for the purpose intended.

DualGuard-S devices meet the requirements of EN62034, "Automated testing systems for battery-operated safety lighting," and are classified as Type PERC.

! ATTENTION!

Any use that exceeds the purpose for which the equipment was intended and/or any other Type of use of the equipment that differs from such purpose is prohibited and is deemed improper use..

1.10 Contents of the Operating Manual

Any person charged with carrying out work on or with of the system, the operating manual must be read before Start of work on the battery read and understood have. This shall also apply if the person concerned has been example has already worked on similar batteries or has been trained by the manufacturer.

Changes and conversions to the system

In order to avoid hazards and to secure the optimal performance may be achieved at the central battery system no changes, extensions or conversions have been carried out which have not been expressly approved by the manufacturer. have been approved.

Any costs incurred in connection with extensions, conversions, or repairs Work that is not described in these instructions are specially trained technical and service personnel (of the manufacturer CEAG or of sales and distribution authorised by CEAG). service companies) reserved!

1.11 Modifying and Retrofitting the Equipment

In order to avoid hazards and to ensure the best possible performance, no modifications, retrofits and add-ons are permitted to the central battery equipment except where expressly approved by the manufacturer.

Work involving upgrades, modifications or maintenance that is not described in this manual must be performed by trained specialized service personnel

(from the manufacturer CEAG or sales and service firms authorized by CEAG)!

1.12 Responsibility of the operator

Only authorized and trained electricians may work on and with the device. The personnel must have been instructed on any hazards that may occur.

Qualified personnel are defined as persons who are able to assess the work assigned to them and recognize possible hazards due to their specialist training, knowledge and experience as well as knowledge of the relevant regulations.

If the personnel do not have the necessary knowledge, they must:

- the personnel have been properly and professionally instructed,
- Tasks and activities must be precisely defined and understood,
- the activities are carried out under the supervision and control of competent personnel.

1.13 Occupational Safety

By following the safety information and instructions provided in this operating manual, injury to persons and damage to materials can be avoided during work on and with the equipment.

However, the following organizational measures must be recorded in writing and complied with:

- Informational and reporting requirements (start, duration, end of the work)
- Safety measures while carrying out the work, (e.g. replacement lighting, deactivation of power supply and secure against re-start (e.g. removal of fuses, actuator, notice signs)
- Protective and safety devices for the personnel working on the equipment
- Protective and safety equipment against hazards posed by nearby equipment (e.g. safety screen, barriers, securing of traffic routes)

When working on the system, the ESD protection must be observed!

The working and safety regulations result from these assembly and operating instructions as well as from the following

- the organisational measures of the plant management (e.g. see above)
- and from the general and technical guidelines and regulations for accident prevention.

1.14 Personal Protective Equipment

When working on and with the equipment the following must be worn:

- Protective clothing
- Close fitting work clothing (low resistance to tearing, narrow sleeves, no rings or other jewelry, etc.).
- Safety shoes
- Electrostatically conductive shoes that comply with Standard EN 345 that protect against any heavy falling objects.

2 Transportation, Packaging and Storage of batteries

2.1 Safety Notes

⚠WARNING! RISK OF INJURY!

Risk of injury from falling parts during transport or during loading and unloading.

! ATTENTION! PHYSICAL DAMAGE!

The battery can be damaged or destroyed by improper transportation.

The following safety instructions must therefore always be observed:

- Never lift loads over persons.
- Always move the device with extreme care and attention.
- Only use lifting tackle and hoisting equipment with sufficient load-bearing capacity.

2.2 Transport over land, enclosed lead battery blocks

When transported over land, enclosed lead battery blocks must be in an upright position. Ander the regulations on the transportation of hazardous goods over roadways (ADR) and regulations on the transport of hazardous goods by rail (RID), batteries that show no signs of damage are not transported as hazardous goods. They must be secured against short-circuit, sliding, falling over and damage. Blocks may be stacked in an appropriate manner, secured to pallets (ADR or RID, Special Regulation 598). Pallets may not be stackedBlocks with reservoirs that are leaking or damaged must be packaged and transported as Class 8 hazardous goods, UN No. 2794.

2.3 Transportation of enclosed lead batteries by sea

The following series are not hazardous goods per IMZB, since they meet IATA Clause A 67:

- Sonnenschein A 400
- Marathon
- Sprinter

2.4 Transportation of enclosed lead batteries by air

The following series are not hazardous goods per IATA Clause A67:

- Sonnenschein A 400
- Marathon
- Sprinter

2.5 Abbreviations

ADR: The European Agreement on the International Transportation of Dangerous Goods by Road (covering most of Europe)

RID: Regulations concerning the International Transportation of Dangerous Goods by Rail (covering most of Europe, parts of North Africa and the Middle East)

IMDG: The International Maritime Dangerous Goods Code

IATA: The International Air Transportation Association (worldwide)

ICAO: Civil Aviation Organization's Technical Instructions for the Safe Transport of Dangerous Goods b

2.6 Transport Inspection

Immediately check the delivery upon receipt for completeness and any transport damage.

In the event of clearly identifiable external transport damage, do not accept delivery or only accept it with reservations.

2.7 Packaging

If no take-back agreement for packaging has been concluded, separate the materials according to Type and size and forward them for use or for recycling.

! ATTENTION!

Always dispose of the packaging material in an environmentally safe manner and in accordance with valid local waste disposal regulations. Where appropriate, contract the services of a recycling company.

The components included in the delivery can be identified either by number and Type or on the basis of a battery drawing.

Do not stack pallets on top of one another.

Always observe the handling instructions on the packaging!

For products labeled "fragile" all measures should be taken to prevent damage during transport.

2.8 Requirements and Prep

- Prevent or remove soiling on surfaces, dust, etc.
- The storage area should comply with the following requirements:
- Protect blocks against effects from weather, dampness or flooding.
- Protect blocks against direct or indirect sunlight.
- Storage rooms for batteries should be kept clean, dry and frost free.
- Batteries must be protected against short-circuit by metal objects or conductive contaminants.
- Batteries must be protected from falling objects, against falling and tipping over.

2.9 Storage Conditions

Temperatures affect the self-discharge rate. D Storage on pallets packaged with plastic foil is generally allowed. However, this is not recommended if the room is subject to large temperature fluctuations or if high relative humidity beneath the foil results in condensation. Over time the condensation can produce a white film on the lead poles (hydration) resulting in a high rate of self-discharge produced by leakage current. The stacking of pallets or devices is not permitted. Avoid storing unpackaged blocks on surfaces with sharp edges. It is recommended that the same Type of storage conditions be provided for separate batches, pallets or rooms.

2.10 Storage

Prior to assembly, store packaged items unopened and according to labeling on the exterior.

Only store packages ander the following conditions:

- Never store out-of-doors
- Always store in a dry, dust-free place

It is in the interest of the user that storage time be kept as short as possible.

2.11 Storage Time

Maximum storage time is 12 months at a temperature of 20°C.

Higher Temperatures result in higher rates of self-discharge and shorten the intervals between re-charging.

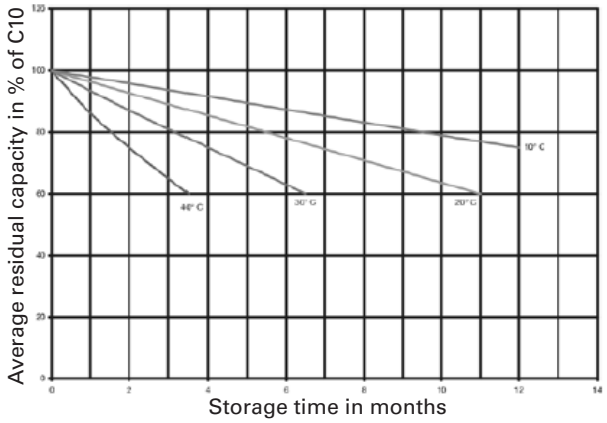


Fig. 1: Sprinter – Residual Capacity in % of C10 versus storage time at different temperatures

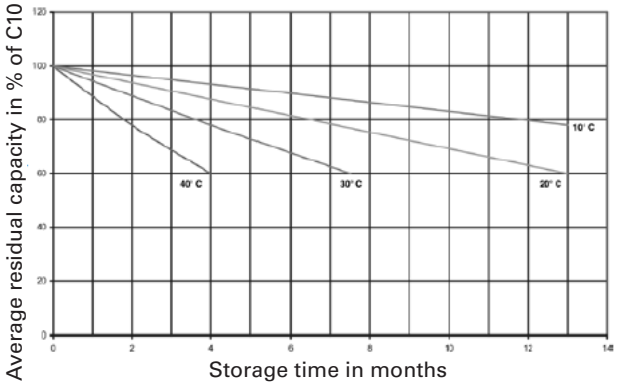


Fig. 2: Marathon – Residual Capacity in % of C10 versus storage time at different temperatures

Measures during Storage

Appropriate storage, based on the FIFO ("first-in, first out") method avoids excess storage time.

If the blocks need cleaning, do not use a cleaning agent and instead use cotton cloths soaked in water without any additives.

For longer periods of storage it is recommended that open-circuit voltage be inspected at the following intervals

- Storage at 20°C: after 6 months, then every 3 months.
- Storage at 30°C: after 4 months, then every 2 months.

Recharging is necessary if open-circuit voltage is < 2.11 V/Z

Continuous charging *) is considered a possibility if the measured open-circuit voltage is < 2.11 volts per cell.

*) Continuous charging means maintenance charging at low rates, approximately equal to self-discharge and sufficient to keep the battery fully charged. It can be carried out either by IU charging (normal trickle charge mode) or I charging (constant current) with limited current.

Continuous charging during storage

Depending on the charger, the charging time must be extended by 24 stands for each 0.04 V below the maximum voltage. The minimum voltage is the lowest limit.

At temperatures < 15 °C a charging time of 20 stands is recommended.

Positioning and installation

Constant voltage charge (IU charge)

Temperature	Max. Voltage per cell	Min. Voltage per cell	Max. current	Charging time at max. voltage
20 °C	2,38 V	2,27 V	0,2 C10	24 h
25 °C	2,35 V	2,25 V	0,2 C10	24 h
30 °C	2,32 V	2,22 V	0,2 C10	24 h

Tab. 1: Values for constant voltage charge (valid for Marathon L)

Temperature	Max. Voltage per cell	Min. Voltage per cell	Max. current	Charging time at max. voltage
20 °C	2,40 V	2,29 V	0,2 C10	24 h
25 °C	2,37 V	2,27 V	0,2 C10	24 h
30 °C	2,35 V	2,25 V	0,2 C10	24 h

Tab. 2: Values for constant voltage charge (valid for Sprinter)

3 Set up and Installation

⚠ SAFETY NOTICE WARNING!
RISK OF INJURY!

Improper installation and installation can lead to serious personal injury and/or damage to property. This work may therefore only be carried out by authorized, instructed personnel familiar with the operation of the device and in compliance with all safety regulations.

- Ensure sufficient freedom of movement.
- Ensure order and cleanliness at the workplace. Loose or loose components and tools are sources of accidents!

3.1 Battery rooms, ventilation and general requirements

General: This is only a guideline and contains excerpts from national and international standards. See DIN EN IEC 62485-2 for more detailed information. Please also follow the user instructions and installation guide.

3.2 Temperature

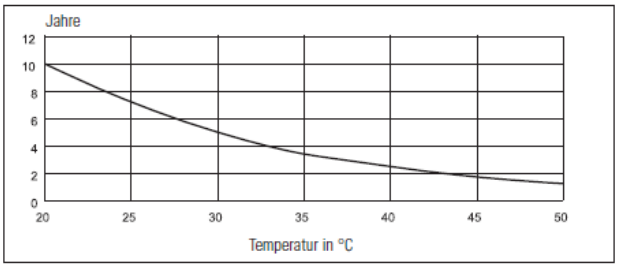


Fig. 1: Sprinter – Service life versus temperature

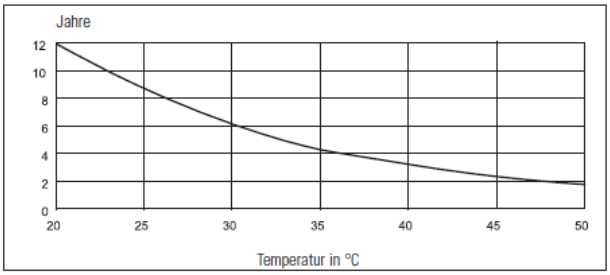


Fig. 2: Marathon – Service life versus temperature

- AGM batteries are designed to operate in the -15°C and +55°C temperature ranges..
- The battery room temperature should be between +10 °C and +30 °C. The battery should be operated in a temperature range of -15 °C and +55 °C.
- The optimum temperature is the nominal temperature of 20 °C.
- Higher temperatures reduce the design Above 40 °C there is a risk of the „thermal runaway effect".

Lower temperatures reduce available capacity and extend recharge time.

- Below approx.-8 °C there is a risk of freezing, but this depends on the state of charge. Nevertheless, it is possible to operate the batteries at low temperatures ander certain conditions.
- Battery temperature affects available capacity.
- The temperature difference between blocks in a battery string must not exceed 5 °C (5 Kelvin).

3.3 Room dimensions and floor condition

The floor of the battery rooms should be level and suitable for carrying the weight of the battery.

From DIN EN IEC 62485-2: The floor area where a person is within arm's reach of the battery must be conductive enough to prevent electrostatic charging. The leakage resistance to an earthed point, measured according to IEC 61340-4-1, must be less than 10 MOhm.

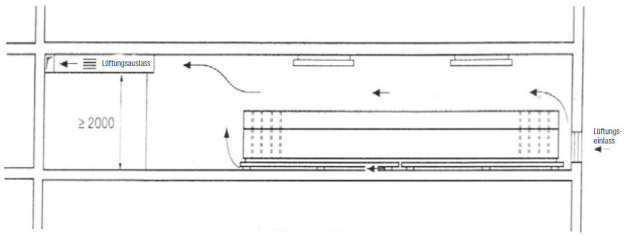
On the other hand, the floor must be sufficiently insulated for the safety of persons. Therefore, the resistance of the floor to leakage from an earthed point, measured according to IEC 61340-4-1, must be:

- at nominal battery voltage 500 V: 50 kOhm R 10 MOhm and
- for battery voltage > 500 V: 100 kOhm R 10 MOhm.

Note 1: In order for the first part of the requirement to take effect, maintenance personnel must wear electrostatically conductive shoes near the battery. The footwear must comply with EN 345.

Note 2: Arm range: 1,25 m distance (For definition of arm range see HD 384.4.41.)...."

Ventilation inlets and outlets: The arrangement for circulation should be as shown below



3.4 Ventilation

To avoid explosions, battery rooms must be ventilated in accordance with DIN EN IEC 62485-2 to dilute gas (hydrogen and oxygen) which is released during charging and discharging. The electrical installation does not have to be EX-protected for this.

It must be designed for humid room conditions.

Never install the battery hermetically sealed.

Spark-forming parts must have a safety distance from the cell or block openings (valves with sealed batteries) in accordance with DIN EN IEC 62485-2.

Heating elements with open flames or glowing surfaces are prohibited. The temperature of heating elements must not exceed 300°C.

3.5 Ventilation requirements

Ventilation and exhaust of electrical operating rooms

Dimensioning of ventilation according to DIN EN IEC 62485-2 (The well-known DIN VDE 0510 Part 2 has been invalid since 01.04.2003.)

The air volume flow required to ventilate a battery room or battery container must be calculated according to the following equation:

$Q = 0.05 \times n \times I_{gas} \times CN \times 10\text{-}3$ [m^3/h]

Q = the required air volume flow, in m^3/h

0.05 = fixed factor

n = number of cells

Igas = the current which causes the gas development in mA per Ah corresponds to 8 mA per Ah at high charge for sealed lead acid batteries.

CN = nominal capacity C10 at 20 °C for lead batteries

Calculation example for the required air volume flow of a DualGuard-S with 155.6 Ah lead battery sealed:

$Q = 0.05 \times n \times I_{gas} \times CN \times 10\text{-}3$

$Q = 0.05 \times 108 \times 8 \times 155.6 \times 10\text{-}3\ m^3/h$

$Q = 6.72\ m^3/h$

To ensure this air volume flow of 6.72 m^3/h, the supply and return air openings in the battery rooms must have the following minimum cross-sections in accordance with DIN EN IEC 62485-2.

Ventilation cross-sections of the supply and return air openings:

A- 28 x Q

A- 28 x 6.72 m^3/h

A- 188,21 cm2

The required ventilation openings in the F90 walls are to be secured in terms of building protection, e.g. by: F90 fire dampers.

As can be seen from the calculation, no complex technical ventilation (e.g. explosion-proof fan) is required even when using the largest battery.

Furthermore, due to the low-maintenance, leak-proof lead batteries used, no special constructional requirements such as electrolyte-resistant floor or floor covering (tiles, door sill) etc. have to be met.

Sealed lead-acid batteries can always be operated in any position (except head position).

Determination of the aeration and ventilation of electrical operating rooms in accordance with DIN EN IEC 62485-2 (Calculated for heavy charge!):

Batterykapazität in Ah C10 At 1,8 V/Z and +20°C	**5.5**	**8.5**	**16.0**	**23.3**	**32.0**	**39.8**	**50.4**	**53.7**	**66.2**	**85.7**	**89.4**	**106.0**	**118.0**	**143.1**	**155.6**	**178.8**	**195.4**	**245.0**	**268.2**	**308.0**	**357.6**
Air volume flow req. for the ventilation of the place of installation [m^3/h]	0.24	0.37	0.69	1.01	1.38	1.72	2.18	2.32	2.86	3.70	3.86	4.58	5.10	6.18	6.72	7.72	8.44	10.58	11.59	13.31	15.45
Vent cross-section of the air inlets and outlets of the place of installation [cm^2]	6.65	10.28	19.35	28.18	38.71	48.14	60.96	64.96	80.08	103.66	108.14	128.22	142.73	173.09	188.21	216.28	236.36	296.35	324.41	372.56	432.55

4 Preparations for battery installation

Check all blocks by measuring the open-circuit voltage.

6 Volt block: U ž 6.33 V

12 volt block: U ž 12.66 V

- When measuring the open-circuit voltage, the correct polarity (possible incorrect installation) must be observed at the same time.
- If drawings were supplied by CEAG Notlichtsysteme GmbH, these must be observed during installation.
- The frames must be horizontally aligned and load-bearing. For rack mounting from 4 levels and 2 rows or 5 levels and 3 rows, the rack should also be firmly anchored in the battery room.
- Racks and cabinets should provide adequate ventilation above and below to allow sufficient dissipation of the heat generated by batteries and their charging system. The distance between cells or blocks should be 10 mm, but at least 5 mm.

4.1 Mounting Battery Blocks and Battery Block Sensors

Insulated tools must be used for the assembly work. Wear rubber gloves, goggles and protective clothing (incl. safety shoes). Remove metal objects such as watches or jewellery. Mount the supplied battery block sensors Type BBS, pole covers for insulation of the battery poles with the battery connectors. Tighten the battery connector with an insulated torque wrench. The following torques apply to screw connections:

- G-M5 flat terminal: 5 ± 1 Nm
- M6 threaded bolt: 6 ± 1 Nm
- M6 threaded hole: 11 ± 1 Nm
- M8 threaded bolt: 8 ± 1 Nm
- M8 threaded hole: 20 ± 1 Nm
- M12 threaded bolt: 25 ± 1 Nm
- Inch 10-32x0.425: 6 ± 1 Nm

After completion of the installation work, thinly coat the connection surfaces with the supplied pole grease.

This measure prevents corrosion, but is not absolutely necessary.

Check total battery voltage. It should correspond to the number of blocks connected in series.

The open-circuit voltage of individual cells should not vary more than 0.02V between them. The following maximum deviations are permitted for block batteries:

- 6 V- Blocks: 0.04 V
- 12 V- Blocks: 0.05 V

Mount the supplied terminal covers to insulate the battery terminals.

4.2 Battery sets in parallel installations

Conditions and characteristics for 2 to 4 strings in parallel:

To connect the battery strings in parallel, the battery connection distributor Type BAE with integrated current shunt per string must be used for battery string monitoring.

- The cable connectors for the positive and negative poles of each string must have the same length.
- The minimum cable cross section for the end connectors of a string is 25 mm^2 per 100 Ah string capacity.
- The end connector cables must end on a copper bar with at least 100 mm^2 per 100 Ah line capacity and at the smallest possible distance.
- Each string has a fuse.

- The strings must have the same number of cells and temperature.

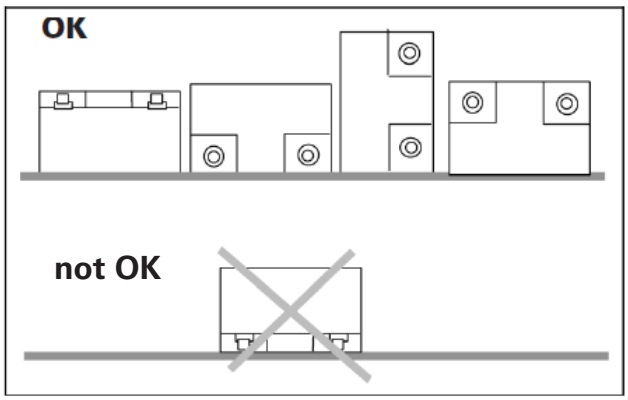
Ander these conditions a parallel connection of up to 4 strings is possible. The discharge data refer to the end poles of each string.

The lead battery Type can also vary as long as the required charging voltage (V/cell) per string is fulfilled.

First pre-assemble each string individually. Make sure that the strings have approximately the same charge state, i.e. similar open-circuit voltages. Only then should the strings be connected in parallel.

4.3 Mounting positions for AGM blocks

The following figures show possible installation positions for sealed AGM blocks



4.4 Operation

⚠ SAFETY INSTRUCTIONS WARNING! RISK OF INJURY!

Improper installation can lead to serious personal injury and/or damage to property. The battery may only be operated by authorized and instructed personnel familiar with the operation of the device and in compliance with all safety regulations.

Before starting work:

- Before starting work, check the battery for completeness and technically perfect condition.
- Ensure sufficient freedom of movement. ATTENTION!

Please do not stick over the battery valve covers when stikking on the battery block sensors or battery block numbering!

During operation:

- In case of malfunctions, first switch off the battery and then secure it against Atng switched on again.

Always wear the battery when working on and with it:

- Safety shoes for protection against heavy falling parts and slipping on non-slip surfaces.

4.5 Maintenance

⚠ SAFETY INSTRUCTIONS WARNING! RISK OF INJURY!

Improper maintenance work can lead to serious personal injury and/or damage to property. This work may only be carried out by authorized and instructed personnel familiar with the operation of the battery and in compliance with all safety regulations.

! MAINTENANCE ATTENTION!

Never use synthetic cloths or sponges to clean the blocks, only water (damp cloths) without additives

4.6 General and controls

Regular checks and maintenance are necessary in relation to:

1. the specified charging voltages and currents,
2. the unloading conditions,
3. the temperature distributions,
4. the storage conditions,
5. the cleanliness of the battery and equipment,
6. and other conditions affecting the safety and service life of the battery (e.g. ventilation of the battery compartment).

Sealed lead-acid batteries do not require refilling with water. That is why they have been described as „maintenance-free". They are sealed by overpressure valves which cannot be opened without destruction. This is the reason for the definition of Valve-Regulated Lead-Acid batteries.

Sealed batteries require the following checks:

Keep the battery clean to avoid leakage currents. Plastic parts of the battery, especially the vessels, must be cleaned with clear water without additives.

Measure and record at least every 6 months:

- Battery voltage
- Voltage of individual cells/blocks (approx. 20%)
- Surface temperature of individual blocks
- battery temperature

The optional battery monitoring system meets these requirements automatically. See separate instruction manual for battery block monitoring.

Annual visual inspections:

- Screw connections (check unsecured screw connections for tight fit)
- Battery installation and accommodation
- ventilation

If block voltages are outside the specified range or if the surface temperatures of different blocks differ by more than 5 K, customer service should be requested.

in operation since	6-V-blocks	12-V-blocks
	6.81 V	13.62 V
< 6 month	6.60- 7.19 V	13.33- 14.16 V
> 6 month	6.64- 7.16 V	13.38- 14.11 V

Tab. 7: Permissible range of float charge voltages

4.7 Disruptions

Behaviour at malfunctions: You will find the relevant information in the installation and operating instructions for the central battery system.

4.8 Spare parts

Only use original spare parts from the manufacturer.

! ATTENTION!

Wrong or faulty spare parts from other manufacturers can cause serious damage to the battery. Ensure the same charging state when changing the battery blocs.

ⓘ RECOMMENDATION:

not more than 25% of the battery packs of a battery set should be replaced. Therefore with 18 packs not more than 5 packs should be replaced.

When 50% of the expected service life is exceeded and single battery packs fail, the complete set should be replaced

4.9 Ordering Spare Parts

Please state the following when ordering spare parts:

- order number
- rated capacity
- Type

In case of complaints you need a RMA- number from us. For further information see www.eaton.com!

5 Transport, Packaging and Storage

⚠ 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 instructions must therefore always be observed:

- Never lift loads over persons.
- Always move the device with the greatest care and caution.
- Only use suitable slings and hoists with sufficient load-bearing capacity.
- Always transport and store the DualGuard-S system upright (markings and tilt indicator on the packaging).
- Avoid ingress of dust and moisture during transport.
- Ensure that all transport routes are clear (sufficient width and clear height for all transport movements). Sufficient space is available for people to move aroand if loads tilt or slip. Have sufficient load-bearing capacity (for load, pakkaging and means of transport). The means of transport used cannot be overstrained with regard to gradients and the nature of the subsoil.
- Only use means of transport (e.g. lift trucks, forklift trucks, etc.), slings (traverses, chains, ropes, etc.) and securing devices (wedges, squared lumber, guide, tensioning, securing ropes, etc.) in perfect technical condition and with sufficient load-bearing capacity.
- Observe all instructions regarding transport conditions, transport position, attachment points on the transport packaging or on the device / switch cabinet.

For the execution of transport work, use only personnel who are familiar with the usual methods and signals and are able to carry out the transport work professionally, safely and in accordance with the risks involved.

5.1 Transport inspection

Check delivery immediately upon receipt for completeness and transport damage. In case of externally recognizable transport damage, do not accept the delivery or accept it only ander reservation.

5.2 Packing

If no return agreement has been made for the packaging, separate materials by Type and size and return them for further use or recycling.

! CAUTION!!

Always dispose of packaging materials in an environmentally friendly manner and in accordance with the applicable local disposal regulations. If necessary, commission a recycling company.

Observe the handling instructions on the packaging!

5.3 Storage

Packages must be closed until assembly and stored in accordance with the installation and storage markings on the outside.

Packages should only be stored ander the following conditions:

- Do not store outdoors
- Dry and dust-free storage
- The storage location should be clean and tidy.
- The storage time should be as short as possible in the interest of the user (FIFO method).
- The stacking of pallets or equipment is not permitted.

6 Assembly and installation of the DualGuard-S

⚠ WARNING! DANGER OF INJURY!

Improper installation and installation can lead to serious personal injury and/or damage to property. This work may therefore only be carried out by authorised, instructed personnel familiar with the operation of the device and in compliance with all safety regulations.

- Ensure sufficient freedom of movement.
- Pay attention to cleanliness and order at the workplace. Loose or loose components and tools are sources of accidents!
- Ensure sufficient cooling of the system
- Observe ambient conditions in accordance with protection Type and class (with regard to protection against contact with live parts and ingress of dust, foreign bodies or moisture).
- The cable length in a lighting circuit up to the last luminaire in the circuit must not exceed the permissible cable length.

Special requirements for distributors with functional integrity Type DualGuard-S ESF... :

The enclosures must be adapted to the masonry in such a way that the enclosures are horizontal. The masonry must be designed to withstand fire for at least 30 minutes. The fire resistance period of the masonry must not be affected by the installation.

The systems illustrated in these installation and operating instructions may differ in their modular configuration when delivered. Special features of customer-specific designs are described in the project documents to be ordered separately.

⚠ WARNING!

Work on the general supply network and the laying of load, signal and control lines as well as the connection of the battery power supply may only be carried out by qualified electricians with special knowledge of the legal and technical principles for the installation and operation of emergency lighting systems. This also applies to the initial commissioning or re-commissioning of the emergency lighting system or the DualGuard-S system.

Take all necessary measures for occupational safety!

In addition to compliance with general technical standards and procedures, this includes, in particular, compliance with all special notes and instructions.

ⓘ NOTE!

All connecting cables may only be laid in accordance with the relevant electrical engineering directives and standards (e.g. DIN VDE 100 series of standards).

In addition, observe all national directives and regulations of the country in which the system is installed and operated. Secure all cable inlets and outlets of the DualGuard-S cabinet against mechanical damage to the cables or moisture ingress using the M cable glands or rubber seals provided for this purpose.

! ATTENTION!

Short-circuits and incorrect polarity can damage the battery bank or the installations of a DualGuard-S system.

When interfering with the electrical system (e.g. connecting control or signal lines) or electronics (e.g. plugging or unplugging modules in the control cabinet), the ESD protection must be observed! Never switch the mains or battery power supply on or off ander load. In both cases, the system must have been blocked beforehand via the control unit.

⚠ DANGER!

If the batteries or battery-powered parts of the system are handled improperly, there is a risk of injury or death due to high currents or electric arcs, which can occur briefly at battery discharge.

It is essential that you observe the instructions in this manual for disconnecting or connecting the batteries (see „Connecting the battery power supply“).

Ensure that the polarity of the battery banks (battery cabinets / racks) is correct.

! ATTENTION!

Short circuits and incorrect polarity can damage the battery bank or the installations of a DualGuard-S system.

At interventions in the electrics (e.g. connection of control or signal lines) or electronics (e.g. plugging or pulling modules in the switch cabinet), the ESD protection must be observed!

Never switch the mains or battery power supply on or off under load. In some cases, the system must have been blocked beforehand by the control unit.

Assembly

Requirements for the work surface / installation site:

Installation on level groand with sufficient bearing capacity.

The installation site must be levelled horizontally.

Holes are provided in the floor plate for fastening to the floor or screwing to a base.

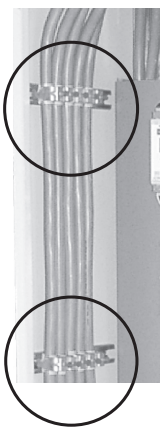
Installation

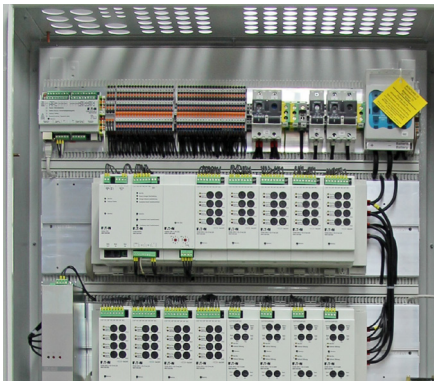
Disconnect all connecting cables (mains and battery power supply) from the power supply and secure them against unintentional reconnection (e.g. removal of all fuses and corresponding protection of the distributor of the general mains supply and the battery bank with information signs and/or locks).

Install the connecting cables (mains and battery power supply) with sufficient length reserve up to the installation location of the DualGuard-S cabinet. Carry out this work properly and professionally in accordance with the applicable directives and standards.

Secure all cable entries with the M cable glands provided.

If possible, lay the connecting cables in the cable areas of the control cabinet.





ⓘ NOTE!

In this illustration, outgoing cables for mains and battery power supply of substations were attached to the cabinet wall on C-rails (item no. 40071347126) with corresponding cable clamps. Do not leave any connecting cables temporarily loose!

Later additions or conversions of the system equipment are possible, but the description of such interventions in the internal equipment is not part of these instructions, as such work is reserved for specially trained CEAG personnel!

The installation of general and emergency lighting is not covered by these instructions.

Install, install and connect the lighting equipment in accordance with the relevant electrical engineering directives and standards. In addition, observe all directives and regulations of the country in which the system is installed and operated.

Usage of RCDs in the incoming mains of DualGuard-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:

DG-S 12C4 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:

DG-S 12C4 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.

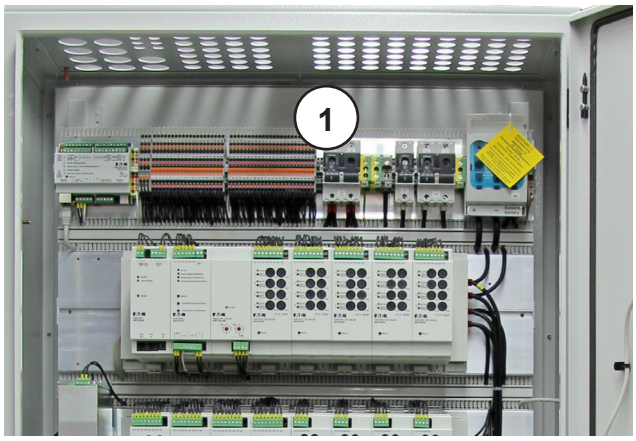
Mains connection

Connecting the mains power supply

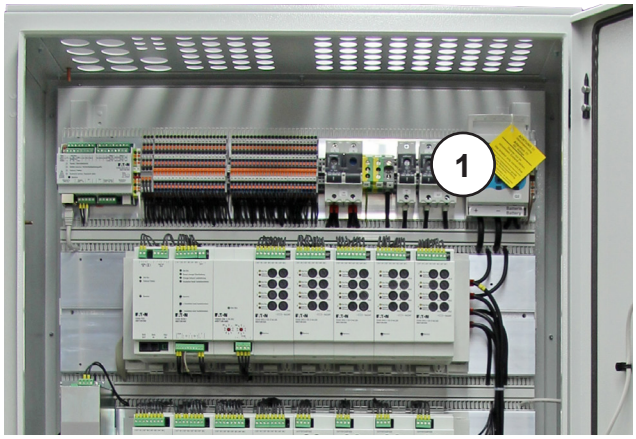
Power is supplied via the general mains supply or via the batteries of a battery bank (battery cabinet or rack).

Example DualGuard-S 12C:

1 phase mains connection to load disconnector (1) and PE terminal



1-phase mains connection of a substation to load disconnector (1) and PE.



Make sure that the mains cable is disconnected. Connect the 230V mains cable to the fuse isolator (1).

Mains connection of sub-stations

If the substations are to be supplied via the power supply of the associated DualGuard-S system, an outgoing distributor for three 1-phase or one 3-phase power supply must be available for connection.

- Make sure that the system and the supply lines are disconnected and secured!
- Connect the protective conductor to the PE terminal block.
- Connect the neutral conductor to the N-terminal block.
- Connect the L-conductor to the terminals of the outgoing distributor.

NOTE!

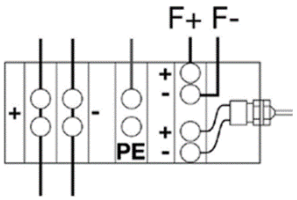
To make work easier, outgoing distributors can be removed from the busbar to the front when the lock on the upper housing wall is released. Once the outgoing cables have been connected, the outgoing distributor can be placed back on the busbar with slight pressure and snapped into place.

Battery Supply Connections

Please observe the battery manufacturer's data sheets enclosed with the CEAG battery banks!

Observe the legal regulations and rules which apply at the place of operation of the emergency lighting system!

NOTE



CEAG battery cabinets are equipped as standard with a cabinet terminal block (see illustration) on which the connecting cables (+/-) for the battery power supply and a temperature sensor (F+/F-) are connected. The PE connection is used to protect live parts of the battery cabinet. In the case of battery racks and battery cabinets, the connecting cables to the end poles of the interconnected batteries are not included in the scope of delivery. In the case of battery racks, the terminal block is not included in the scope of delivery.

CEAG recommends the installation of a battery supply distributor with circuit breaker, string monitoring and fuses for the battery circuit (see „Installation Instructions for Battery Power Distributors"), which enables safe disconnection of the terminals for the connecting cables leading to the DualGuard-S control cabinet.

The battery connection cables (for the DualGuard-S control cabinet and its substations) must be laid in accordance with DIN VDE 0100T520 to be protected against groanding and short circuits!

Ensure that the cables have a conductor cross-section that is suitable for the expected current flows to the connected loads.

Only one temperature sensor (F+ / F-) and up to four battery

strand monitors may be connected to the Battery Control Module BCM.1. Its cable must be routed separately to the battery bank. A 2- to 8-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 nominal 216 V DC! Improper handling can lead to life-threatening electric shocks or burns (due to arcing)!

Ensure that the polarity of the battery banks is correct.

Switch off all connected consumers beforehand („Block the system via the colour touch display") so that no electric arcs occur when the battery circuit is disconnected (or connected)!

ⓘ NOTE!

Sequence of connection:

- Connect the cable marked „+" to the positive terminal of the battery bank.
- Connect the cable marked „-" to the negative terminal of the battery bank.
- When disconnecting the battery power supply, the reverse order applies.

Connecting the Battery Supply

The connecting cables for the battery power supply supply supply the modules of the DualGuard-S (or sub-distribution boards) and the emergency lighting circuits (switched via the SKU.1.1 modules). Furthermore, the charging of the connected battery banks is controlled via the BCM.1 module.

Only when the control is blocked may the connections of the battery power supply be switched off without danger via the load-break switch (Batt). Charging modules and all circuits of the SKU.1s are then disconnected only after the mains power supply has been switched off. Please note that the connection cables from the battery bank (battery cabinet/ frame) may still be live!

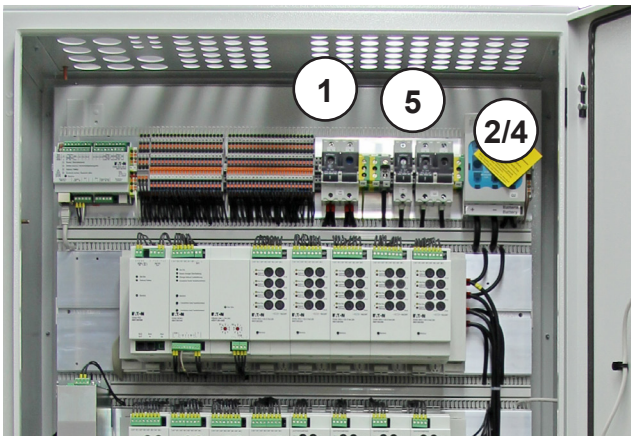
ⓘ NOTE!

The connections (+ /-) are accessible when the moving part of the switch-disconnector (Batt) has been removed (removal is analogous).

Connect the cables for the battery power supply of the DualGuard-S switch cabinet:

Make sure that the system and the supply lines are disconnected!

Connect the positive conductor to the positive terminal of the switch-disconnector.



Connect the negative conductor to the negative terminal of the switch-disconnector.

Pos. 1: Mains connection

Pos. 2: Battery connection

Pos. 4: Shunt for battery current measurement

Pos. 5: Sub-distributor connection

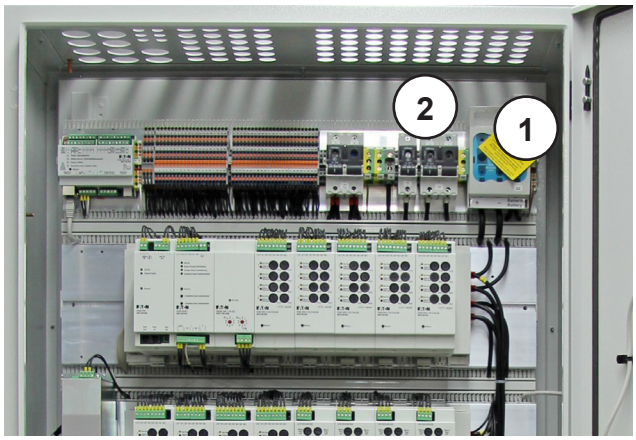
Connection of the battery supply of a substation

Substations are supplied via the power supply of the associated DualGuard-S system. An outgoing distributor can be used for a battery power supply. The middle terminal and associated fuse are not used.

ⓘ NOTE!

To make work easier, outgoing distributors can be removed from the busbar to the front when the lock on the anderside of the housing is released.

Once the outgoing cables have been connected, the outgoing distributor can be reattached to the busbar with slight pressure and snapped into place.



Position of the switch-disconnector (1) for the battery power supply with pos. 2: Outlet distributors (Batt). Observe the warning notices!

Connect the lines for the battery power supply of a substation:

Make sure that the system and the supply lines are disconnected and secured!

Lay the supply lines to/from the DualGuard-S switch cabinet and in its cable ducts and to/from the substation switch cabinet.

Connect the positive conductor to the positive terminal of the outgoing distributor.

Connect the negative conductor to the negative terminal of the output distributor.

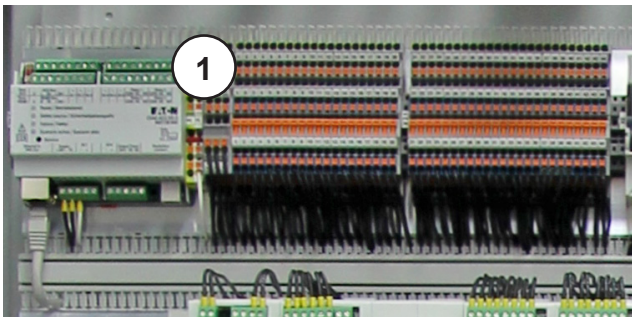
When retrofitting fuse elements, the enclosed sticker must be applied with the correct polarity to identify the connections as shown in the illustration.

Connection of a temperature sensor

A temperature sensor (for temperature monitoring of the battery bank) of the DualGuard-S central battery system is mandatory for emergency lighting systems with a central battery. Connection to the charging unit is made in the control cabinet via terminals (1) F+ and F- on the 3-level installation terminals with spring-cage connection.

Lay the temperature monitoring cable between the battery bank and the DualGuard-S switch cabinet and connect it to the switch cabinet via its 3-storey installation terminals with tension clamp connection.

Position of the terminal block for connecting a temperature sensor



! ATTENTION!

A shielded 2-wire cable must be used as the connecting cable for the temperature sensor. In the system, the shield must be connected to the protective conductor terminal on one side via a shield quick connector.

Connection of a battery string Monitoring

If more than 1 battery string is to be connected, it is possible to install battery connection distributors. The battery connection distributors are available in two versions.

As battery connection distributor with integrated battery string monitoring or without battery string monitoring.

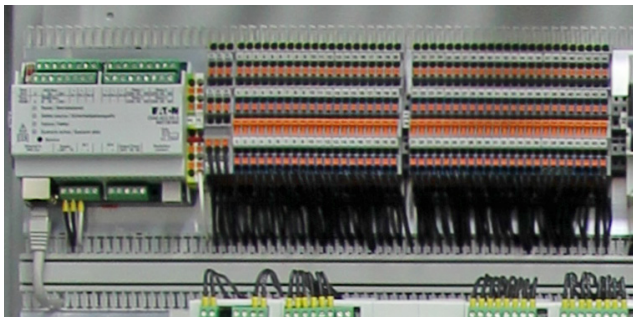
For battery distribution boxes with string monitoring, an additional shielded measuring line must be installed from the DualGuard-S which transmits the string current to the DualGuard-S.

See also operating instructions for battery distribution boxes.

Connection to the BCM.1 module is made in the control cabinet via terminals (1-4) I+ and I- on the 3-level installation terminals with spring-cage connection.

Lay the line for string monitoring between the battery bank and the DualGuard-S control cabinet and connect it in the control cabinet via its 3-level installation terminals with tension clamp connection.

Position of the terminal block for connecting a temperature sensor



! ATTENTION!

A shielded 2-8-wire cable must be used as the connecting cable for string monitoring. In the system, the shield must be connected to the protective conductor terminal on one side via a shield quick connector.

Connection and assembly of internal modules

All modules for the DualGuard-S control cabinet are mounted on a so-called carrier (BGT). These plug-in sockets contact the module at the installation location; plastic snaps secure the position of the module. The required mains or battery power supply for the modules is also provided via these plug-in sockets.

For easy assembly/disassembly, these modules are connected via pluggable screw terminal blocks that can be plugged or unplugged at the front of the modules. The connecting cables of these screw terminals are laid on the terminal strip in the upper area of the control cabinet. The assignment is made via numerical codes on the module and on the terminal block.

External supply and discharge lines are connected via this terminal block series in the upper area of the control cabinet.

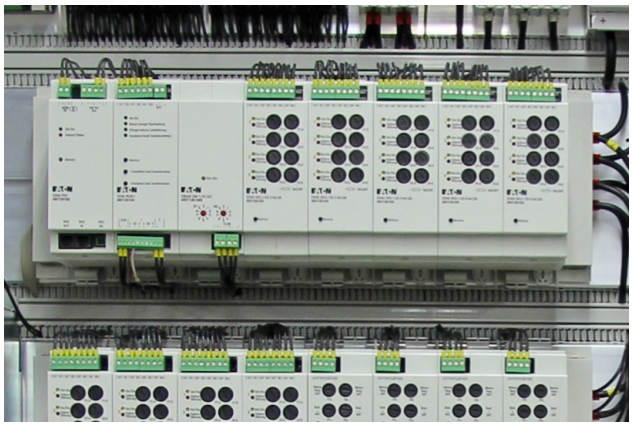
ⓘ NOTE!

The assignment of the circuit numbers used in the touch display and the displayed switching outputs of the SKU.1s is made by selecting the slots on the subracks. Replaced SKU.1s must be re-registered via the touch display.

! ATTENTION!

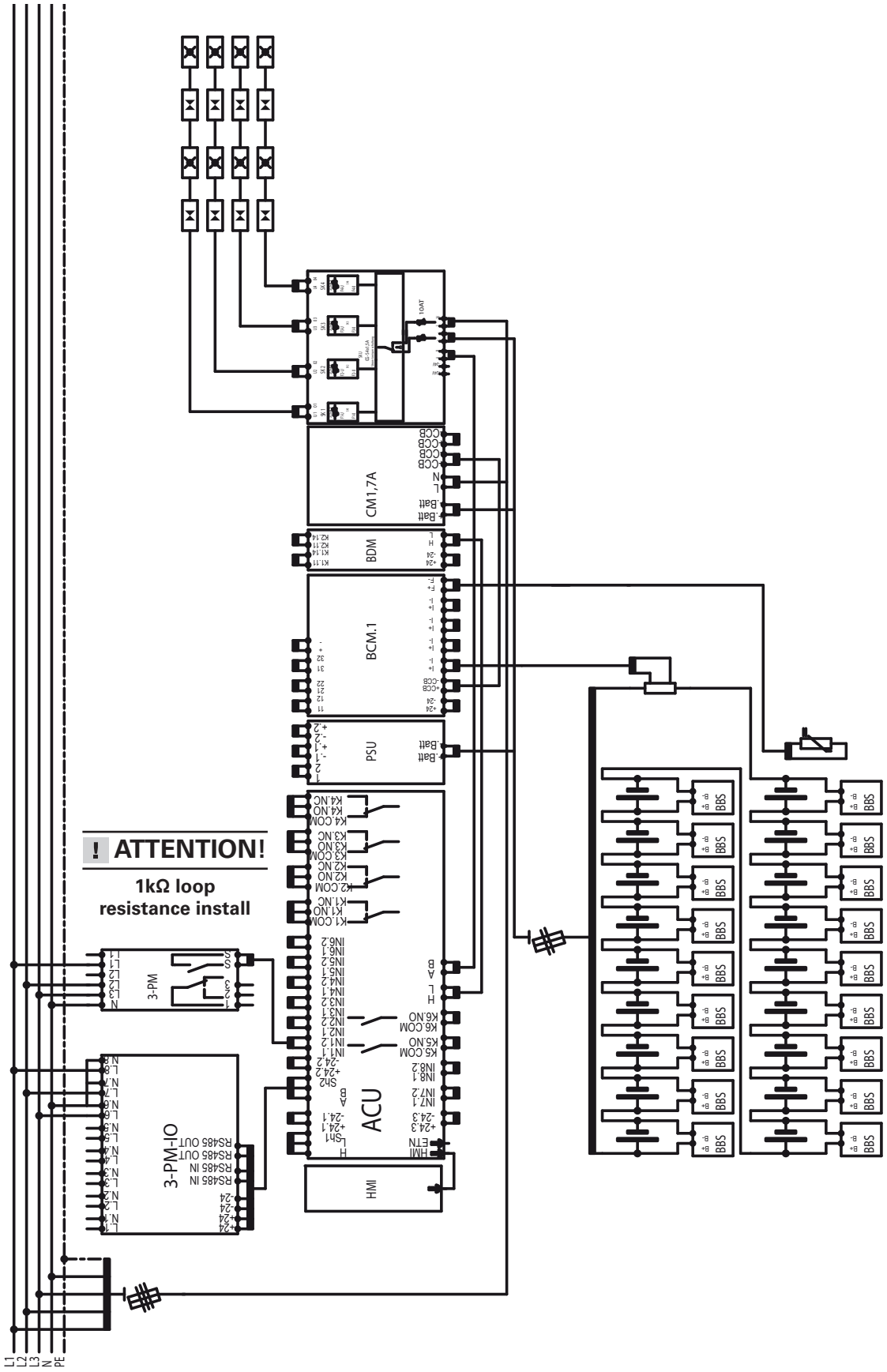
SKU.1 modules must not be plugged or unplugged while the power is on! Deactivate a SKU.1 module via the touch display before pulling or plugging it in, e.g. for test or inspection purposes.

The system must be de-energized for disassembly or modification work.

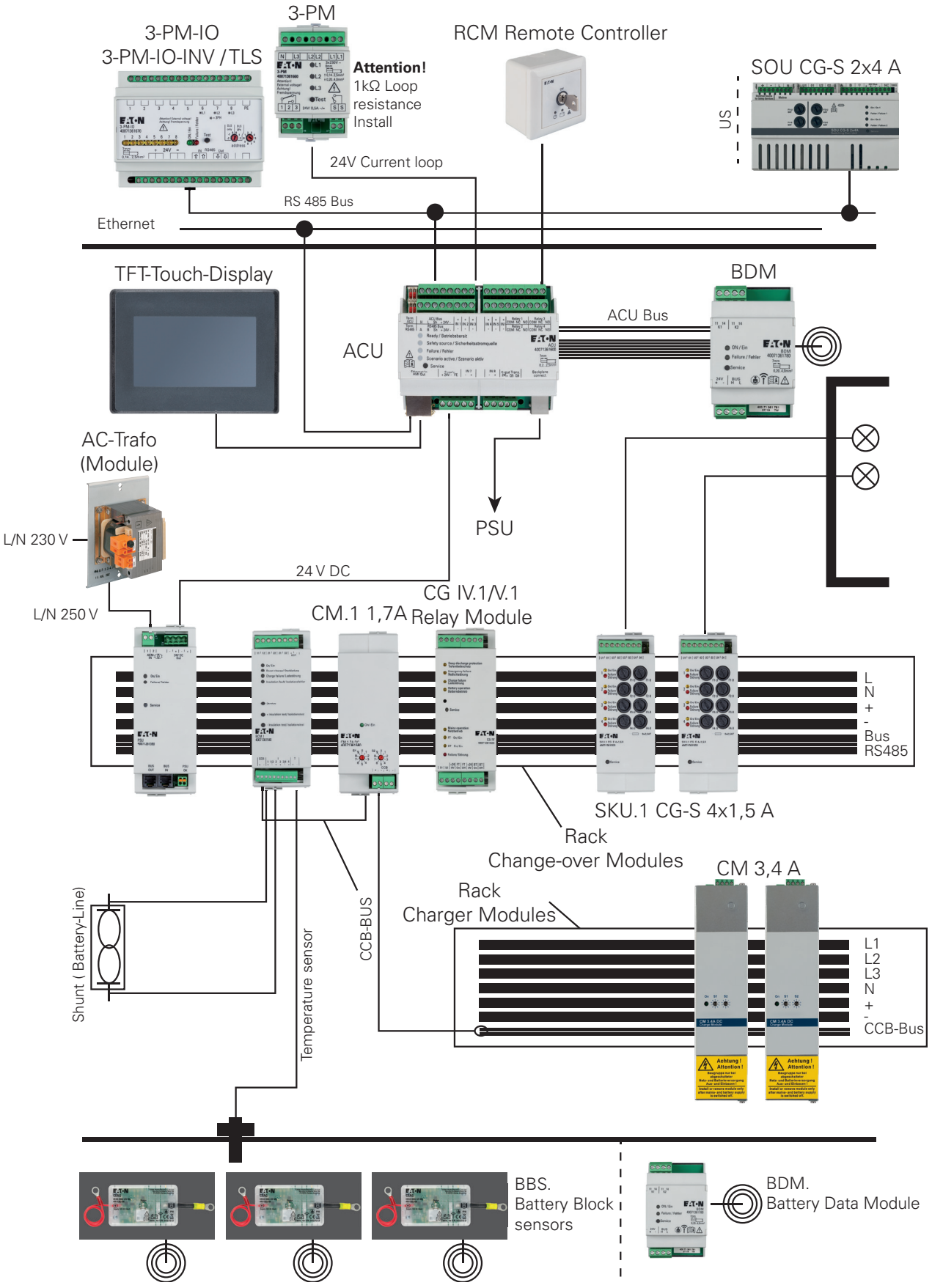


BGT 2 equipped with modules and with 2 free slots

7 Installation example DualGuard-S



8 Block Diagram DualGuard-S



9 Commissioning and further work

SAFETY INSTRUCTIONS! WARNING!

DANGER OF INJURY! Never switch the mains or battery power supply on or off ander load (i.e. with end circuits switched on).

The following applies to battery power supply: Never disconnect or connect the connecting cables to the battery bank ander load or open or close the fuse switch for the battery power supply in the switch cabinet ander load.

10 Luminaire addressing

All luminaires with individual luminaire monitoring have two address switches for addressing the luminaires. Each luminaire must be assigned a consecutive address so that the system can communicate with the luminaires.

11 Checking the wiring

Before switching on the emergency lighting:

- Check whether the entire system is enabled and secure this switch-off. Do not switch on the power supply again until all work has been completed.
- Check the execution of all connections and cables according to the drawings and plans for the emergency lighting system as well as the execution of the installation work in accordance with standards and guidelines.
- Check all connections and screw connections for tightness.
- Check all line inlets for tight fit and tightness.

12 Voltage measurements

Measurements of the supply voltages and at the end circuits may only be carried out by qualified electricians!

Observe the special dangers when carrying out measurements on multi-phase power supplies!

Only use measuring instruments with sufficient voltage or current resistance!

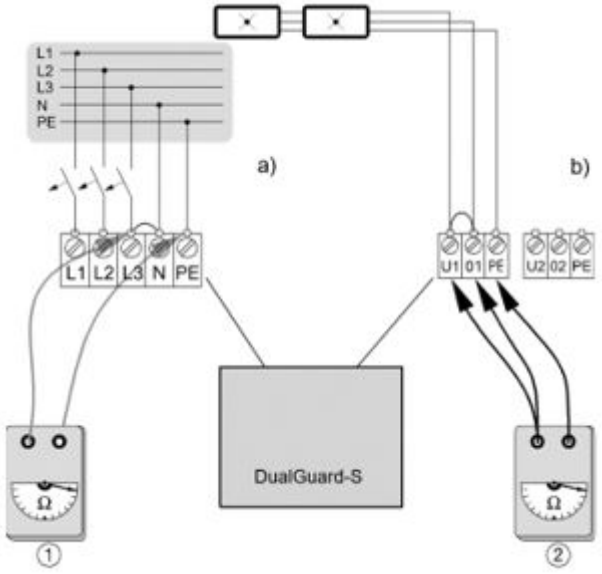
All measurements in the area of internal installations are reserved for CEAG service personnel!

13 Insulation measurement

Check whether the entire system is enabled and secure this shutdown. Do not switch on the power supply again until all work has been completed.

DANGER!

Insulation measurements may only be carried out between the PE protective conductor and each L1, L2 or L3 outer conductor as well as between the PE protective conductor and neutral N conductor. If circuits contain electronic devices, the external and neutral conductors must be connected to each other during the measurement.



a: Insulation measurement at the power supply (mains)

b: Insulation measurements at the end circuits

Measuring voltage max. 500V DC, measuring current 1 mA!

Only use measuring instruments that meet the requirements of DIN VDE 0413.

Disconnect the connecting cables for the mains and battery power supply.

Bridge the connections L and N of the switch cabinet to the terminals of the mains power supply or the battery supply.

the outgoing distributor.

Carry out the insulation measurement for the connections of the mains power supply (L/N) to PE for the DualGuard-S control cabinet and its output distributors and analog for the substations.

On the DualGuard-S control cabinet, bridge the connections U1/O1 etc. on the output terminals of the end circuits of the control cabinet and carry out the insulation measurement for the end circuits U1/O1 or U2/O2 against PE. After the insulation measurements have been completed, remove the bridges from terminals L/N (on the mains power supply or the output distributors) and U1/O1 etc. on the terminals of the end circuits. Reconnect all disconnected connecting cables and check the PE connection of the switch cabinet door.

NOTE!

By bridging L / N or U1 / 01 (...), active components of the electronics and the luminaires (-EVGs) are protected against possible destruction!

Check / replace fuses

The fuses for the mains power supply and the battery power supply are located in the corresponding switch-disconnectors or at the battery bank.

Furthermore, the end circuits in the SKU.1 modules and individual circuits in other modules are fused.

WARNING!

Only open the switch-disconnectors if the system has been disconnected beforehand.

ATTENTION!

Never remove the fuses of the installed modules ander load.

14 Check the fuses of the mains or battery power supply.

To do this, the system must be blocked via the touch display.

Open the switch disconnector for the mains or battery power supply.

Check the switch cabinet and existing subsystems to ensure that all fuses in the load disconnector for the mains or battery power supply meet the specified technical specifications and are properly inserted and intact.

Setting the charge retention voltage Battery Control Module (BCM.1)

SAFETY INSTRUCTIONS

Safety instructions are marked with this symbol in the text of the operating instructions. These should always be read before starting work! Adjustment work on the system may only be carried out by qualified electricians.

General information

If central battery systems are supplied without batteries or if the battery Type is unknown, the charge maintenance voltage is set at the factory to a value of 245 V (i.e. 2.27 V/Z). Depending on the battery Type, the charge retention voltage must be adjusted on site.

The setting of the trickle charge voltage is done via the Touch Screen and is described in chapter Charger Settings

Testing the fuses of SKU.1 modules

For safety reasons, all SKU.1 modules should first be disconnected from the power supply.

Proceed as described for testing and replacement.

ATTENTION!

Only fuses approved by CEAG Notlichtsysteme GmbH may be used.

Checking and changing internal modules

The emergency lighting system must be enabled before internal modules are checked or changed. The following applies here: Before you disconnect the emergency lighting system from the distributor of the general mains power supply or battery power supply, block the system. Then first disconnect the battery power supply and then disconnect the mains power supply. Secure the shutdowns as long as you are working on the system or the system is not in a safe operating condition.

NOTE!

If several systems are supplied by one battery bank, all systems must be blocked before! Begin by activating the lower level of the substations before activating the central battery system.

Before reconnecting the power supply to the battery bank connections for the battery power supply, turn on the mains power supply and make sure that the system is blocked. Only then do you switch on the battery power supply at the battery bank.

For the assembly or disassembly of modules, please refer to the chapter „Connection and assembly of internal modules“ plus all warning notices!

NOTE!

The service button on the front panel must be pressed to log on and off circuit changeovers.

NOTE!

The TFT touch display may only be replaced by trained specialists. It is essential to follow the replacement instructions in the system operating manual.

14 Check the fuses of the mains or battery power supply.

Control and change of external modules

To assemble or disassemble a module, proceed as described ander „Connection and assembly of external modules“. Please note here:

For modules with address switches, set the address provided for the module. Avoid multiple assignment, as this will lead to malfunctions.

In order for replaced external modules to function correctly ander the control, they must have been identified, activated and parameterised via the control software.

A service pin is located on the module which can be used during initial commissioning or for test and inspection purposes. This pin is used to display the addresses and properties of the respective module directly on the touch display of the HMI via the control software.

15 Switching on the system

Switch on the mains power supply of the switch cabinet and its substations via the switch-disconnectors.

Use the switch-disconnectors to switch on the battery power supply of the switch cabinet and its US-S subsystems.

After switching on the system, the colour touch display shows the current system status. All connected escape sign and safety lights are switched on and the system automatically switches to battery operation if its power supply fails.

16 Device Configuration

After switching on the system there are the following possibilities to configure the system.

1) Data download via PC software and USB stick (recommended)

2) Web configuration (only possible if the systems have Internet access)

3) VisionGuard configuration (only possible from VisionGuard version xxx)

4) Manually via HMI (recommended for smaller installations without complex configuration or for smaller modifications)

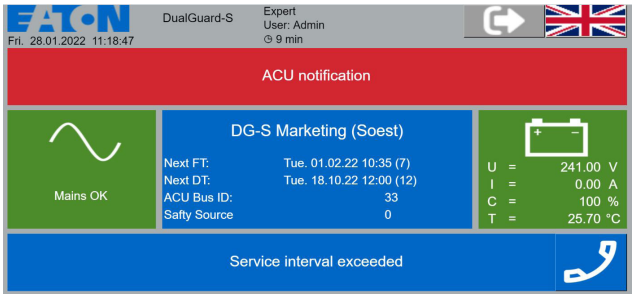
IMPORTANT NOTE!

The systems and luminaires are supplied ex works in such a way that the emergency lighting function is guaranteed even without customer-specific configuration.

After finishing the device configuration it is recommended to create a backup on the Back Up USB Stick with factory specific device configuration with the order number 40071362318 to avoid a new configuration of the device in case of failure.

Configuration of the national language

By touching the icon  the desired language can be set.



The gray bordered language icons are available.

Important Notes on Cyber Security When Using the DualGuard HMI in Ethernet Networks

If the HMI of the DualGuard-S is operated in an Ethernet-based communication network, particular importance should be attached to preventing unauthorized access, e.g. through hacker attacks. Ultimately, however, security is strongly dependent on the operator's equipment, e.g. high password quality, and the network environment in which the HMI is operated. An insecure network environment facilitates unwanted access by unauthorized persons. In order to provide assistance, we would like to point out important points to protect the HMI as securely as possible against unauthorized access.

Settings in the DualGuard-S HMI

Password input:

The password input is very important against unauthorized or unwanted access by strangers! Therefore some rules should be observed when assigning a password:

- It should be at least six characters long
- The password should consist of upper and lower case letters / numbers.
- Avoid names of family members, pets, best friends, favorite stars or their dates of birth or similar constellations.
- If possible, passwords should not appear in dictionaries.
- It should not consist of common variants and repetition or keyboard patterns, so not qwertz or abcd1234 and so on.
- Add simple numbers to the end of the password or one of the usual special characters $! ? #, at the beginning or end of an otherwise simple password is also not recommended.

Use in a network, e.g. Intranet

General information about managed network hardware, e.g. routers, switches, etc.

- Keep the firmware up to date!
- Change the default password of the devices!
- Set up a firewall with MAC address filter!
- Enable DDoS defense (Distributed Denial of Service)
- Block unneeded ports and protocols
- Deactivate unneeded functions of your router!
- Deactivate the remote access of your router!

Further recommendations on practices are described in an EATON white paper „Cybersecurity considerations for electrical distribution systems", which can be downloaded as a PDF file with a search engine under the search term „WP152002EN".

Cross-device control

Through the ACU bus connection, functions can be executed for different groups of devices.

Function	Description
Search ISO Failure	can be performed locally on a main station / substation or on all devices connected to the same battery
Time synchronization	can be activated for one device to synchronize the time of all devices on the ACU bus daily
Synchronization of the function test / duration test time	when changing the test time, there is an option to synchronize the new time with all devices connected to the same battery
Block / Release	when blocking / unblocking there is the option - the local device - all devices on the same battery - individual devices on the ACU bus - all devices on the ACU bus to block
Start / Cancel duration test	Duration tests are always started and aborted synchronously on all devices connected to the same battery

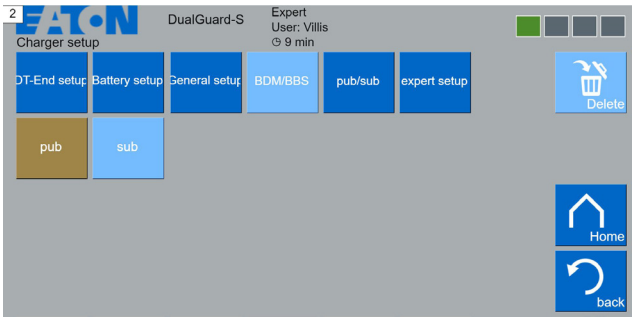
Subscribe charger information

In order for the information of the charger in the main station (BCM.1) to be subscribed to by substations, it must first be published in the main station.

Menu > Basic Settings > Charging/Battery Settings > pub / sub

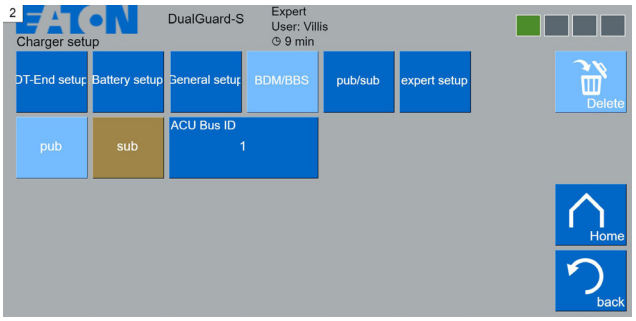
By activating „pub“ the information is automatically published on the ACU bus. If this does not happen, the substation signals a communication disturbance to the subscribed charging unit.

In the substation the information must now be subscribed.



Settings for publishing the charger information on the main device

The substation is now connected to the main station



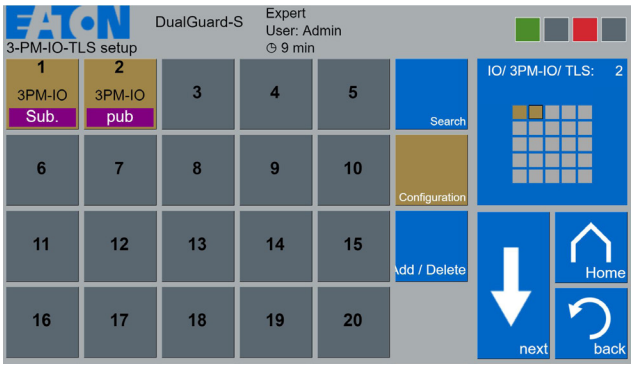
Settings for subscribing to the charging unit in the substation

Subscribe to IO/3PM-IO/TLS

Adding a subscribed module

The configuration for the IO/3PM-IO/TLS modules is done in the same way as subscribing to the loading part information. First a new module must be added manually.

Menu > IO/ 3PM-IO/TLS Setup (Add / Delete active) > Click the module location (1-25) until the corresponding module type (IO / TLS / 3PM-IO) is selected.

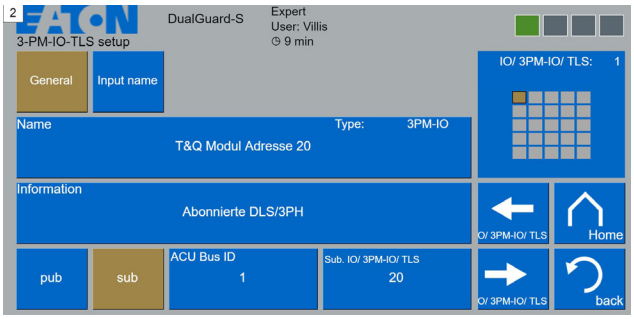


Adding a module

Settings of the subscribed module

Menu > IO/ 3PM-IO/ TLS Setup (configuration active) >Module selection

In addition to the device address (ACU Bus ID) the number (1-25) of the external module must be selected (Sub. IO/ 3PM/ TLS). When assigning the modules, it does not matter from which device to which device the modules are linked. So modules from a substation can be subscribed to the main station or to a device independent of this battery.

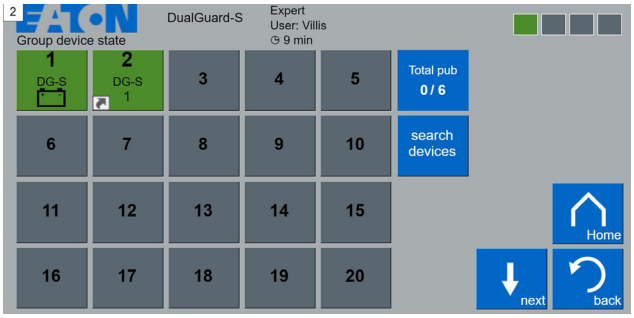


Subscription settings

System boundaries

Since the transfer rate on the ACU bus is limited, a maximum of 50 3PM-IO modules may be published to meet the prescribed response times. Time-uncritical information, such as ACU inputs with the programmed „switch“ function, can be subscribed to or published as required.

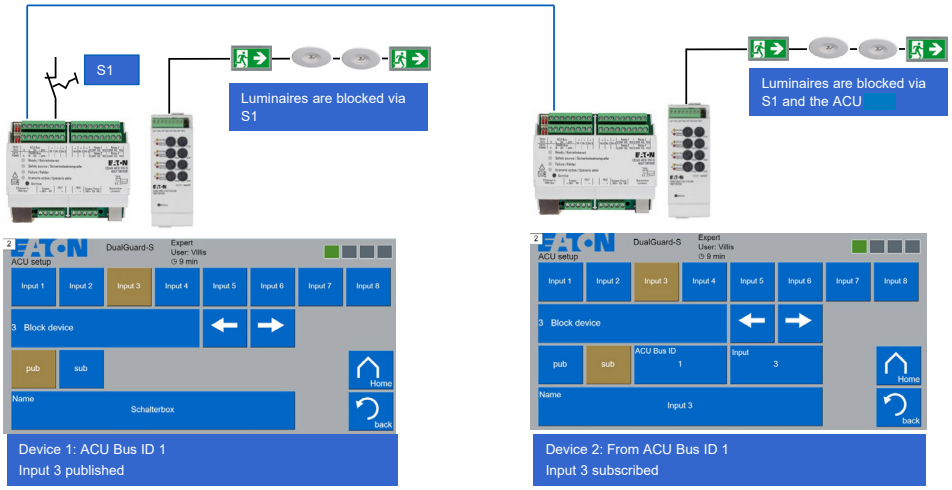
An indication of how much information is already published on the ACU bus is provided by the Group Device Status menu. The information „Total pub“ shows the sum of all published information (both time-critical and non-time-critical).



Number of published information

Subscribe to ACU Module inputs

The inputs of the ACU can also be used on other ACUs. Again, the inputs must be published on one device and subscribed on the other. The terminals of the subscribing device then no longer have any function. To avoid misbehaviour, the subscribed input must be programmed for the same function.

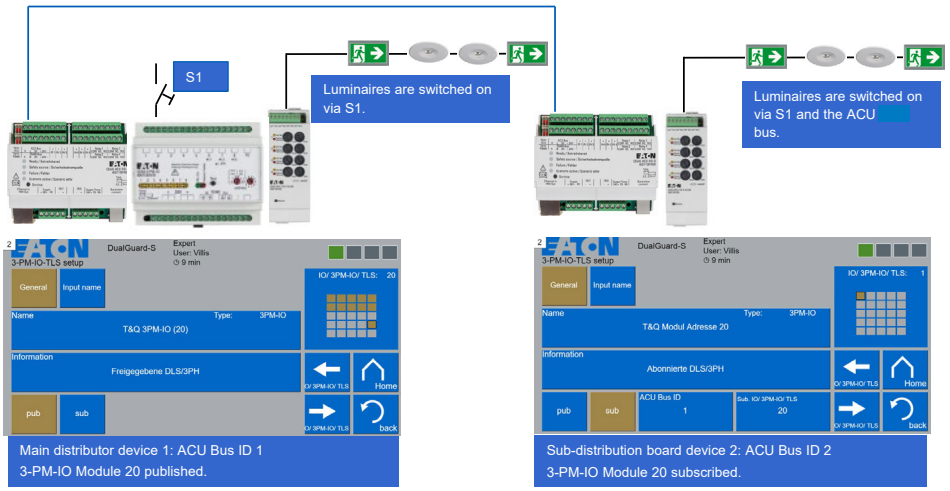


Subscribe to ACU inputs

Subscribing of 3-PM-IO Modules

Example:

System with one main station (ACU Bus ID: 1) and one substation (ACU Bus ID: 2). The modules are published only by the main station and subscribed in the substation, partly on a module place different from the main station.



Assign/ Enter new Password

By pressing the icon you get to the Log In input. Please pay attention to upper and lower case (Shift key).

Factory setting:

User name: Admin
Password: EATON

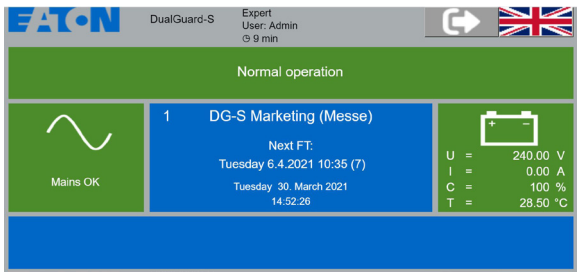
After entering, press key > OK <.

Then press any field.

If the EATON password entered at the factory is to be retained, click on the „Retain password“ icon. If a new password is to be assigned, click on the „Change password“ icon.

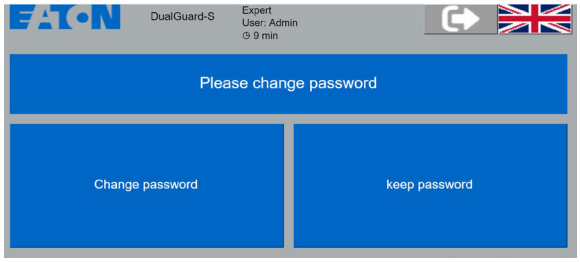
There is a warning message that if the password is lost, the color touch display must be sent in and reset.

Then enter the current password under „Old password“, the new password under „New password“ and repeat under „Acknowledge password“. Then confirm the entry by pressing the „Ok“ key.



ATTENTION!

Please remember the new password as there is no default password.

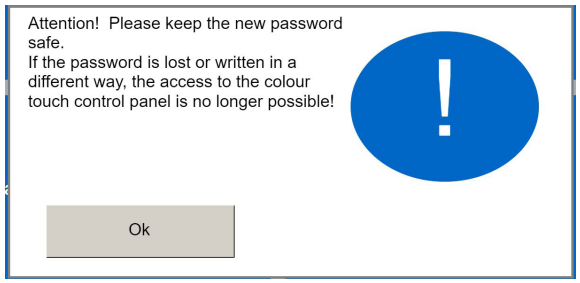


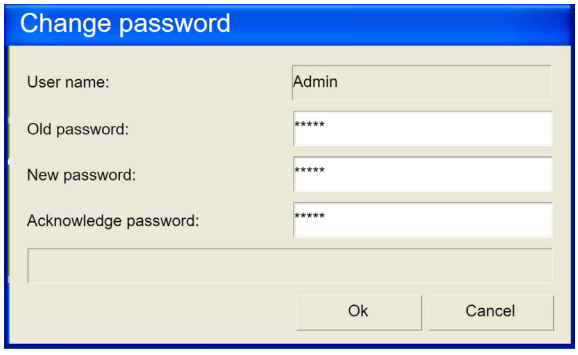
NOTE!

After three incorrect entries of the user name or password in the user group „Admin“, the user is locked for 10 minutes.

In all other user groups, the user is locked for 3 minutes after three incorrect entries.

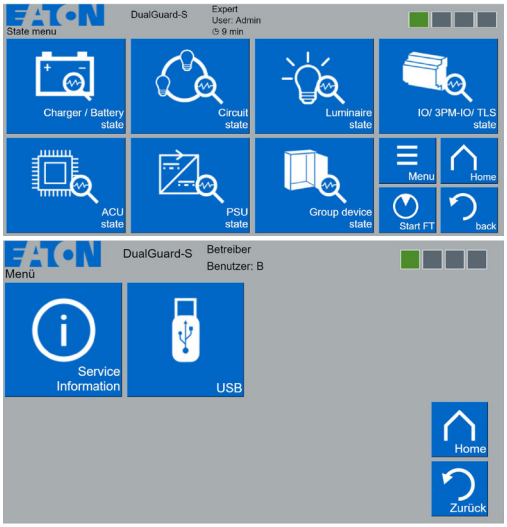
If no entry is made within 10 minutes the user is logged out automatically.

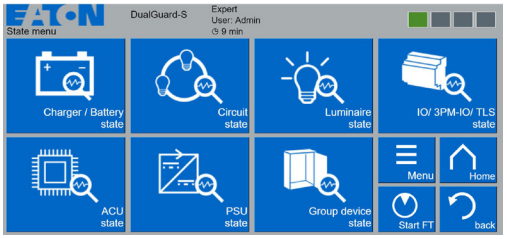
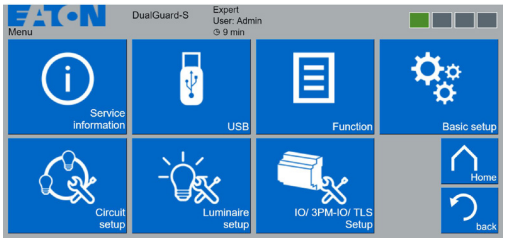
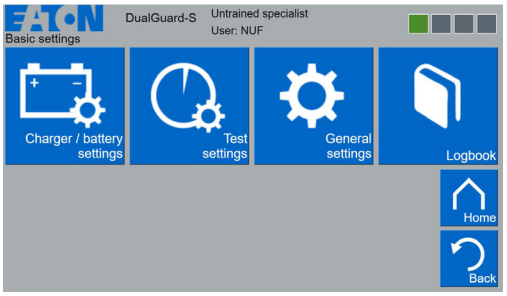
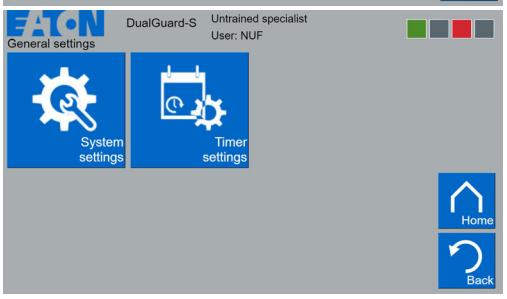




16.1. Table Usergroup

The division of the functions into user groups serves on the one hand to ensure system integrity by avoiding accidental misconfigurations and on the other hand to simplify operation.

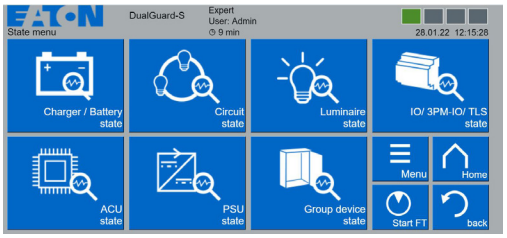
User	Icons	Legitimacy
Operator (All status and service information, data up and download via USB)		• Charging-/Battery Status o Voltage in V, charge-discharge current in A, capacity in %, ambient temperature battery set in°C o Last DT time o Status Battery Block Monitoring (optional) o Status Charging modules (CM) o Software status o String current (optional) o Reset deep discharge o Reset ISO-failure • Circuit Status • Luminaire Status • IO/3PM-IP/TLS Status • ACU Status o Communication Status o Relay Status o Status Inputs • PSU Status • Group device state o Total pup o search devices • Menu o Get service information. o Load and save device configuration via USB - Copy Config to USB - Copy Config from USB - Eject USB - Select Firmware - Copy Lum Types from USB • Start FT

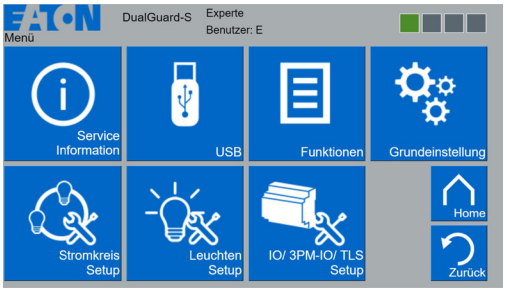
Non-instructed specialist (all status and service information, data up- and download via USB, endurance test) and basic settings)	 	• Charging-/Battery Status o Voltage in V, charge-discharge current in A, capacity in %, ambient temperature battery set in°C o Last DT time o Status Battery Block Monitoring (optional) o Status Charging modules (CM) o Software status o String current (optional) o Reset deep discharge o Reset ISO-failure • Circuit Status • Luminaire Status • IO/3PM-IP/ TLS Status • ACU Status o Communication Status o Relay Status o Status Inputs • PSU Status • Group device state o Total pup o search devices • Menu o Get service information. o Load and save device configuration via USB - Copy Config to USB - Copy Config from USB - Eject USB - Select Firmware - Copy Lum Types from USB • Start FT
	 	Functions: o Start Duration Test (DT) o Cancel Functiontest/Duration Test o Manual reset o Search ISO failure o Luminaire search (all modules) o Learn current values (all Modules) o deregister ext. modules Basic settings o Charger/Battery Setting o Test Settings o General settings - System Settings o Log book • Circuit Setup • Luminaire setup • I/O Module Setup

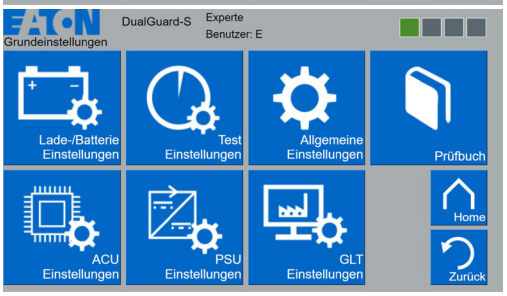
16.1. Table Usergroup

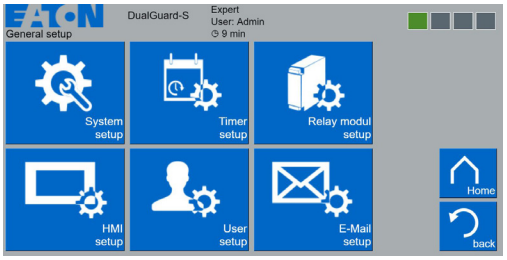
Instructors skilled worker (Includes all legitimacy of operator and untrained professional plus advanced configuration)		• Charging-/Battery Status o Voltage in V, charge-discharge current in A, capacity in %, ambient temperature battery set in°C o Last DT time o Status Battery Block Monitoring (optional) o Status Charging modules (CM) o Software status o String current (optional) o Reset deep discharge o Reset ISO-failure • Circuit Status • Luminaire Status • IO/3PM-IP/TLS Status • ACU Status o Communication Status o Relay Status o Status Inputs • PSU Status • Group device state o Total pup o search devices • Menu o Get service information. o Load and save device configuration via USB - Copy Config to USB - Copy Config from USB - Eject USB - Select Firmware - Copy Lum Types from USB • Start FT • Functions o Start Duration Test (DT) o Cancel Functiontest/Duration Test o Manual reset o Search ISO failure o Luminaire search (all modules) o Learn current values (all Modules) o deregister ext. modules o Block device o Release device o Simulate mains failure o FT short forward run o All luminaires on o non-maintained luminaires on o maintained luminaires off • Basic settings o Charging/Battery Setting o Test Settings o General settings - System Settings - Timer Settings - HMI Settings • Log book • Circuit Setup • Luminaire setup • I/O Module Setup

Expert
(Includes all legitimacy of operator, untrained and instructed operator plus system settings)









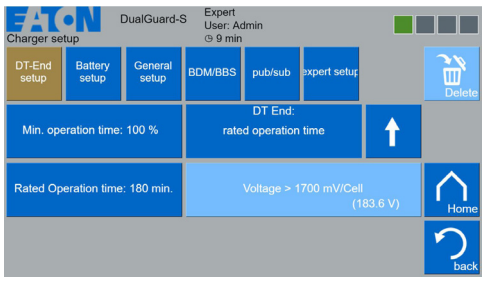
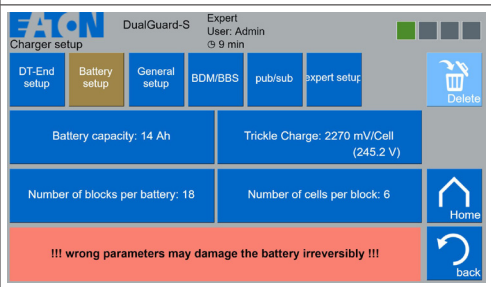
- Charging-/Battery Status
  - o Voltage in V, charge-discharge current in A, capacity in %, ambient temperature battery set in°C
  - o Last DT time
  - o Status Battery Block Monitoring (optional)
  - o Status Charging modules (CM)
  - o Software status
  - o String current (optional)
  - o Reset deep discharge
  - o Reset ISO-failure
- Circuit Status
- Luminaire Status
- IO/3PM-IP/ TLS Status
- ACU Status
  - o Communication Status
  - o Relay Status
  - o Status Inputs
- PSU Status
- Group device state
  - o Total pup
  - o search devices
- Menu
  - o Get service information.
  - o Load and save device configuration via USB
    - - Copy Config to USB
    - - Copy Config from USB
    - - Eject USB
    - - Select Firmware
    - - Copy Lum Types from USB
- Start FT
- Functions
  - o Start Duration Test (DT)
  - o Cancel Functiontest/Duration Test
  - o Manual reset
  - o Search ISO failure
  - o Luminaire search (all modules)
  - o Learn current values (all Modules)
  - o deregister ext. modules
  - o Block device
  - o Release device
  - o Simulate mains failure
  - o FT short forward run
  - o All luminaires on
  - o non-maintained luminaires on
  - o maintained luminaires off
- Basic settings
  - o Charging/Battery Setting
  - o Test Settings
  - o General settings
    - - System Settings
    - - Timer Settings
    - - Relay Module Settings
    - - HMI Settings
    - - User Settings
  - o Log book
  - o ACU settings
  - o PSU Settings
  - o GLT Settings
- Circuit Setup
- Luminaire setup
- I/O Module Setup

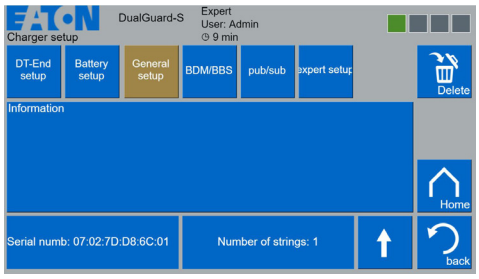
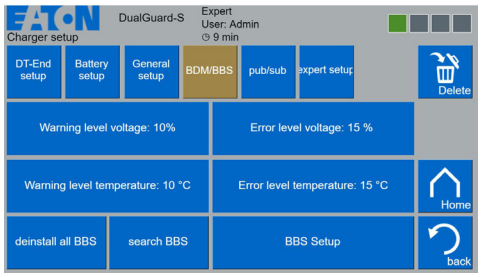
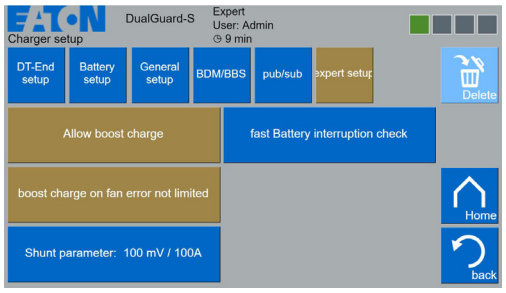
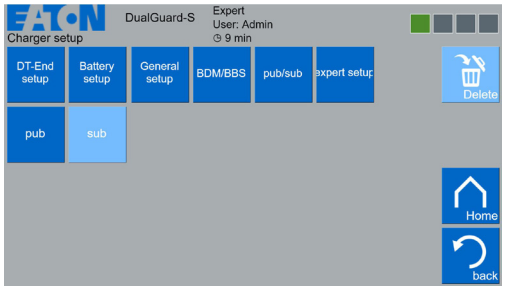
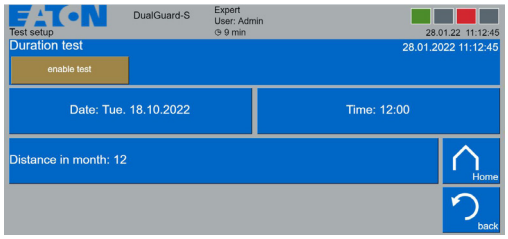
16.2. Table Datendownload via PC Software and USB Stick

Operating steps	Icon	Function	Entries
2		Icon USB	Actuate
3		Icon Copy Config from USB	Actuate. The configuration is automatically loaded from the USB stick.

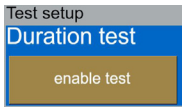
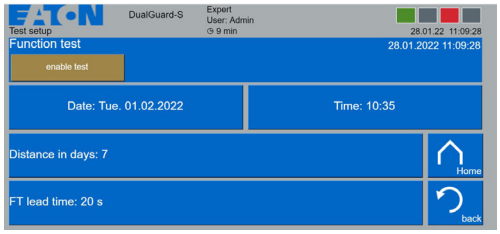
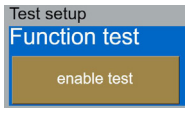
Manual configuration via the HMI

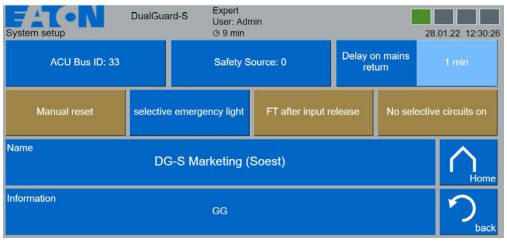
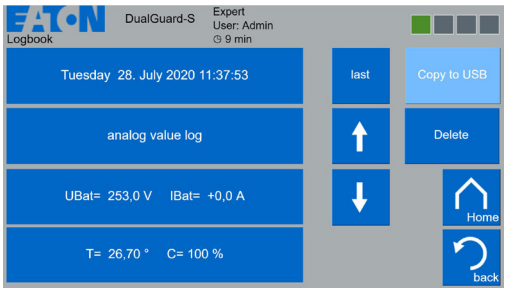
16.3. Table Configure basic settings (login = untrained specialist)

Operating step	Icon	Function	Entries
1		Icon menu	Actuate
2		Icon basic settings	Actuate
3		Icon Charging/Battery Settings	Actuate
4		Icon BT End setup	Entries to the operating duration test length, required time and conditions when the BT is to be aborted. For the limit operating time, the evaluation voltage can also be entered. If the battery voltage at the end of the limit operating time is lower than the evaluation voltage, a capacity error appears.
5		Icon Battery setup	Entries of the nominal capacity, number of battery blocks, cells per block and the float charge voltage

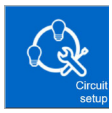
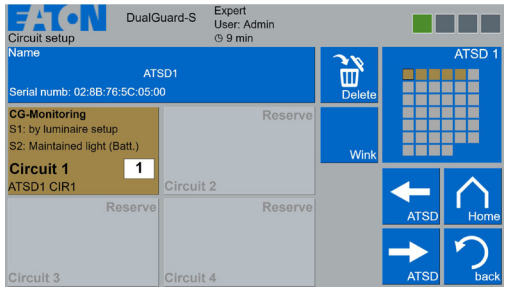
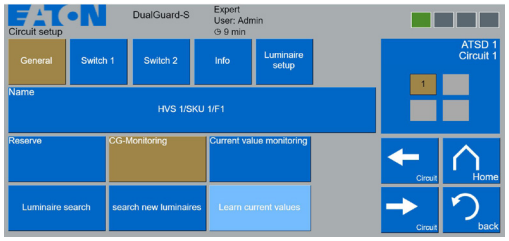
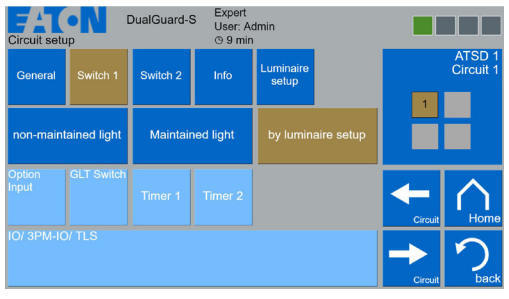
6		Icon General setup	Battery information such as type, order number, etc.
7		Icon BDM/BBS	Enter the warning and error thresholds in % for voltage and temperature. Already set ex works for EATON batteries
8	 	Icon expert setup 	Allow high charge= If the boost charge is deactivated, the charging process is considerably prolonged. Don't trouble boost charging in case of fan malfunction: If this function is deactivated and a fan monitoring system is connected to the ACU module, the strong charge is deactivated if the room ventilation fails. Quick Check Battery Interruption= For countries that require shorter interruption detection times other than EN 50171. Pub/sub= The transmission of the battery values to a substation. hunt parameter: Specifies the measuring range.
9		Icon Test setup	
10		Icon Automatic duration test	Actuate
11		Icons for programming the duration test	Date Start time Duration test Time Start time Duration test Distance between tests Manually value input

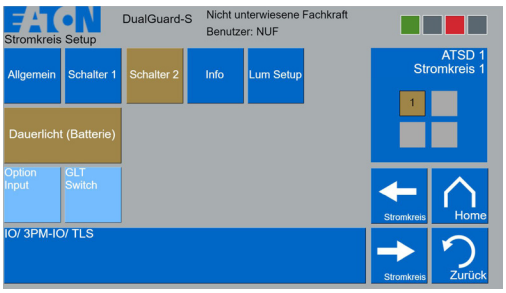
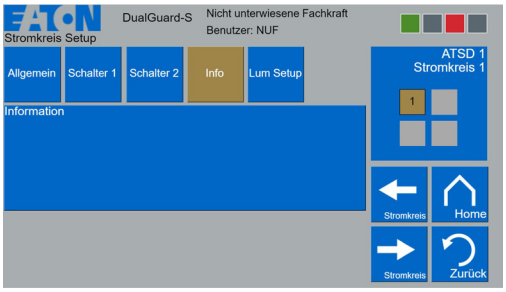
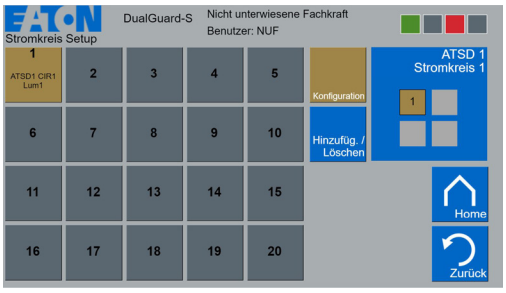
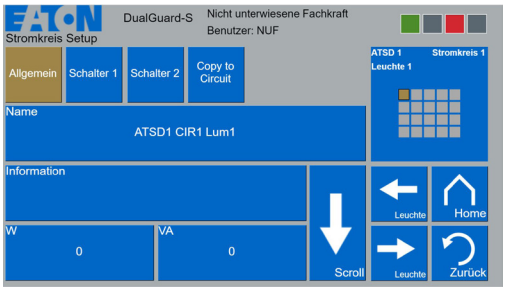
16.3. Table Configure basic settings (login = untrained specialist)

12		Activate test	Actuate
13		Icon for automatic function test	Actuate
14		Icons for programming the function test	Date Start time Function test Time Start time Function test Distance between tests
15		Activate test	Actuate
16		Icon General settings	Actuate
17		Icon System Settings	Actuate

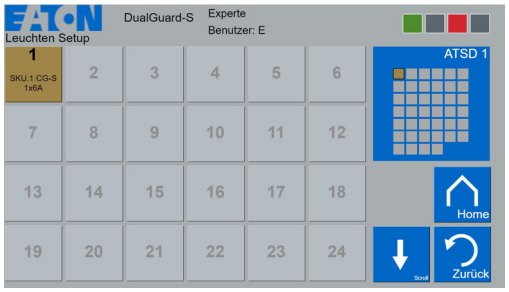
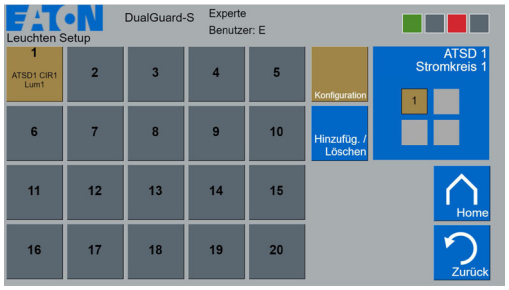
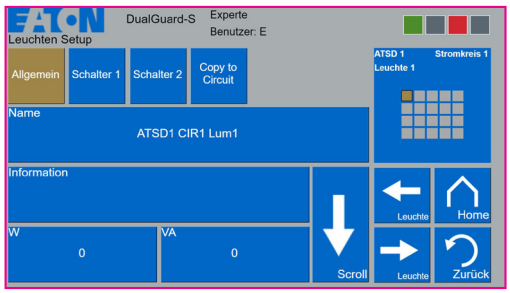
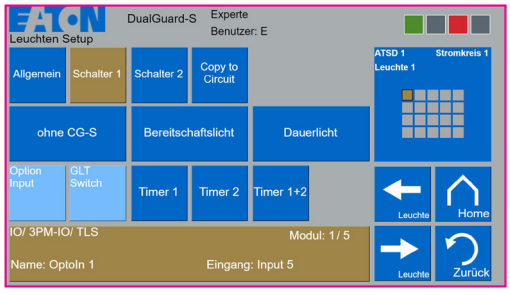
18			ACU Bus ID: Enter ID number 1 to 120 **Attention**: more than 32 devices after technical clarification. Safety power source: Enter 0 to 65535 - ACU Bus ID: 1 With DualGuard-S devices, substations are connected to the main station by subscribing to the information of the charging unit (BCM) from the main station. For this the substation must be connected to the main station via the ACU bus. In addition to the BCM information, IO/3PM-IO/TLS modules and the inputs of the ACUs can also be subscribed to. Several main stations with their substations can also be connected to the same ACU bus, for example to use the information of a 3PM IO in all devices. Each device needs a unique address, the „ACU Bus ID“. -Safety power source: 0 For the unique assignment of devices when connected to the VisionGuard visualization solution, a number must be assigned to the safety power source. All devices that are connected to the same safety power source (usually battery) must use a unique number. The number „0“ has the special meaning that the device works in „island operation“ and therefore does not supply any other devices via its safety power source. The setting range is from 0-65535. Emergency light run-on time -Manual override -selective emergency light -function test according to S1S2 on -Name: -Information:
19		Icon Log book	Actuate
20			

16.4. Table Circuit Setup (Login = Uninstructed specialist)

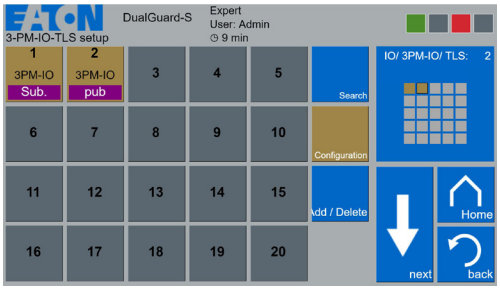
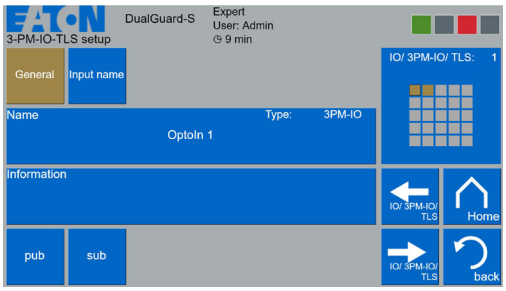
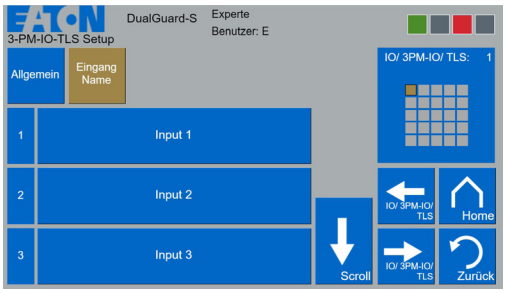
Operating steps	Icon	Function	Entries
2		Icon Menu	Actuate
3		Icon Circuit Setup	Actuate
4		Icon circuit modules (max 40 modules) Search for Ext. modules. (SOU modules mounted outside the DualGuard-S)	The module Icon Actuate which should be configured.
5		Icon Circuits (Max. 4 circuits per module)	Activate the circuit icon to be configured.
6		Icon General To configure the switching and monitoring function and luminaire search.	Max. two switches can be assigned. The circuit can be configured as reserve, CG or circuit monitored. The luminaire search icon (luminaires must be addressed) automatically registers all connected luminaires. The Search for new luminaires icon automatically registers all subsequently installed luminaires.
7		Icon switch 1 To configure the circuit type of the circuit.	Ready light = All lights are switched off and switch on automatically at power failure. Permanent light= All lights are on continuously.

8		Icon switch 2 No function if the circuit is programmed in ready light or continuous light.	
9		Icon Info A free text can be entered.	
10		Icon Lum Setup The icon only has a function if Per Leuchtensetup was previously selected as the circuit type for the circuit.	Actuate
11		Icon Luminaire	Actuate
12		Icon General Name, Information, W and VA. Free text can be entered.	

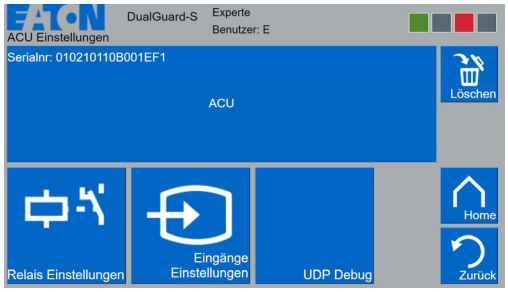
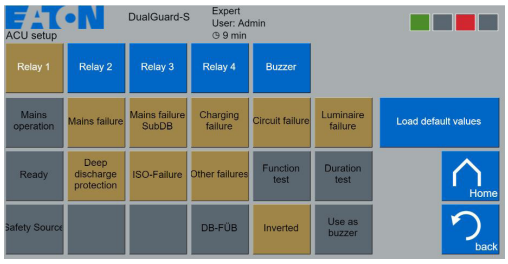
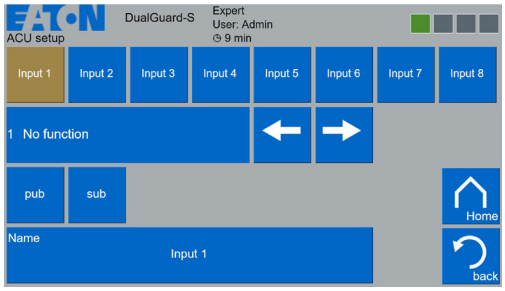
16.5. Table configure Luminaire setup (Login = Uninstructed specialist)

Operating steps	Icon	Function	Entries
1		Icon Menu	Actuate
2		Icon Luminaire setup	Actuate
3		Icon SKU,s There can be up to 40 SKU or SOU circuit modules preceding it.	Activate the circuit module icon to be configured.
4		Icon luminaires Up to 20 luminaires can be connected via circuit to.	Press the light icon which should be configured.
5		Icon General Information can be entered for each luminaire. The switching mode can be determined via the icons switches 1 and 2.	Enter name, information e.g. mounting location and required tool, power in W and VA, category and type:
6		The switching and monitoring mode can be determined via the icons switches 1 and 2. Up to two switches can be assigned to each lamp in the „Programming by lamp setup“ mode.	Icon without CG-S = no monitoring, Ready light icon= Only at power failure switched on. Permanent light icon= Permanently on. Icon Option Input=Light switches on via the ACU inputs. Icon GLT Switch= Luminaire switches on via LON switch. Icons Timer= luminaire switches on via programmed TimerFunction. Icon IO/3PM-IO/TLS= Luminaire switches on via separate I/O modules.

16.6. Table configure IO/3PM-IO/TLS Setup (Login = Uninstructed specialist)

Operating steps	Icon	Function	Entries
1		Icon Menu	Actuate
2		Icon IO/3PM-IO/ TLS Setup	Actuate
3		Icon I/O Modules Up to 25 I/O modules can be present.	The I/O module Icon Actuate which should be configured. If I/O modules are networked, the text pub or sub is displayed in the respective icon.
4		Icon Name Icon Information Icon sub pub This function allows the I/O modules to be networked with each other.	Enter mounting location. For example, note texts such as „Closed room. Bring a key“ Example: In case of power failure phase monitor 1, the lights assigned to phase monitor 2 should switch on. This networking can be programmed within a DualGuard-S device and across devices with up to 32 devices.
5		Icon Input Name There can be up to 8 inputs available.	Assign the input name Icon Actuate to the inputs a text.

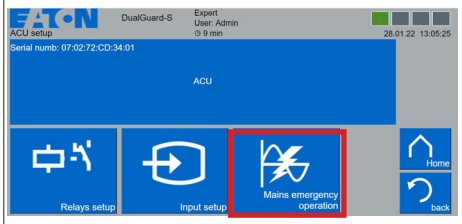
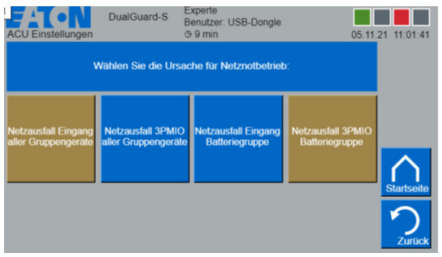
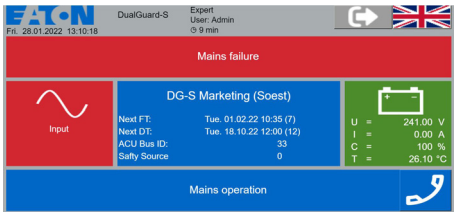
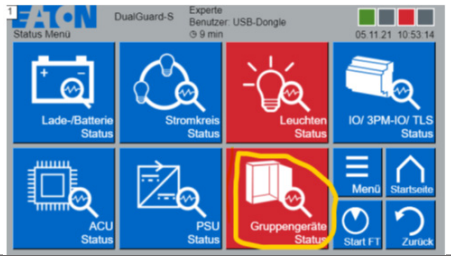
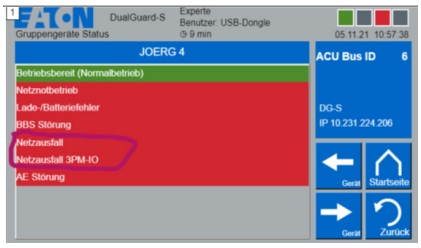
16.7. Table configure ACU settings (Login = Expert)

Operating steps	Icon	Function	Entries
1		Icon Menu	Actuate
2		Icon Basic settings	Actuate
3		Icon ACU settings	Actuate
4		Icon Relay settings	Actuate
5		Icon Relay 1 – 4 and Summer Icon Default Values Load Icon DB-FUB	Select the event icon and assign it to the relay / buzzer At Actuate is reset to factory setting Special configuration for Deutsche Bahn
6		Icon Inputs settings	Actuate
7		The following function can be assigned to each input: - No Function - Switch - Inverse switch - manual reset - Reset deep discharge - Start FT - Start DT - Cancel DT/FT - Block device - Switch off maintained light - Switching on the non-maintained light	Use the arrow icons to select a function - Ventilation monitoring - Ext. ISO Monitor - Ext. Battery Monitor - Ect. Monitor - All Luminaires ON - AE Szenario active - AE failure - Mains failure SubDB

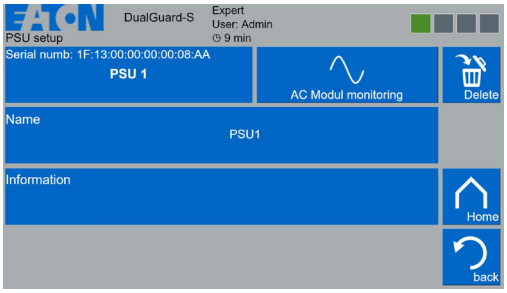
16.7.1 DualGuard-S Group settings

In the DG-S, it is possible to set systems on the ACU bus to emergency mains operation if there is a mains failure on other systems on the ACU bus via ACU input or a mains failure via 3PM-IO. Each system can be programmed individually.

The user must manually confirm the establishment of the connection. The unsecure connection is displayed in the web browser.

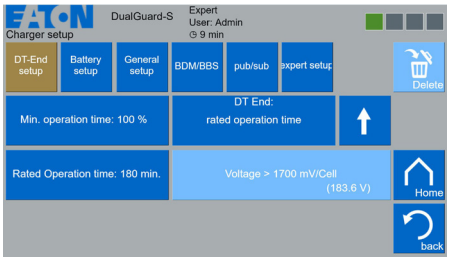
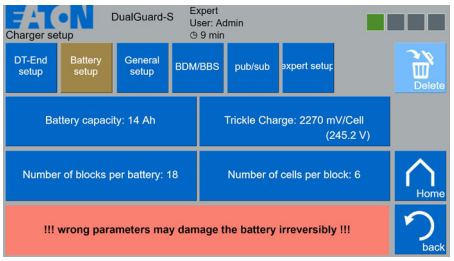
Operating steps	Icon	Function	Entries
1		The mains failure can be configured in the ACU settings.	
2		Group units means that all units on the ACU bus are reacted to. Battery group means that only systems of the battery group to which this system belongs are reacted to.	
3		If the option is active and a mains failure is present, the mains failure group unit is displayed.	
4		Group unit status is displayed in red.	
5		The group unit status can be used to find out which unit has a power failure.	
6		Test book entries for start/end are generated.	

16.8. Table Configure PSU Settings (Login = Expert)

Operating steps	Icon	Function	Entries
1		Icon Menu	Actuate
2		Icon Basic settings	Actuate
3		Icon PSU Settings	Actuate
4		Icon PSU 1-5 Settings	Select the PSU icon to be configured.
5		Icon Serialnr:	

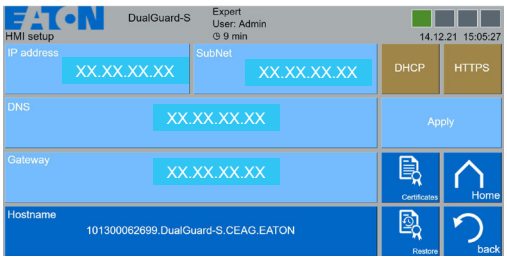
16.9. Charge voltage setting table (Login=Expert)

This setting is made at the factory and only needs to be adjusted if a different type of battery is used.

Operating steps	Icon	Function	Entries
1		Icon Menu	Actuate
2		Icon General setup	Actuate
3		Icon Charger/Battery setup	Actuate
4		Icon Battery setup	Go to Icon Battery Settings and press
5		Icon Battery capacity Number of blocks per battery Trickle charging Number of cells per block	Enter the nominal capacity of the battery at +20°C, 1.8V/Z and C10. Enter the number of battery blocks Enter the float charge voltage per cell in mV. Enter the number of cells per battery block.

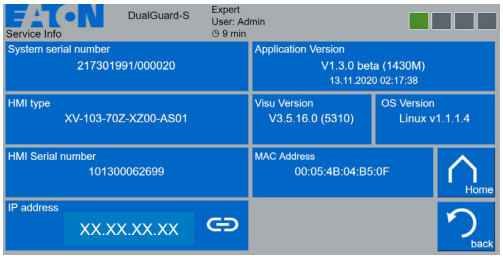
16.10. Table Set Up Web Server (Login Expert)

The DualGuard-S must be connected to the network before setup.

Operating steps	Icon	Function	Entries
1		Query and programming level	Actuate
2		Basic settings	Actuate
3		General Settings	Actuate.
4		HMI Settings	Actuate.
5		Network Settings	Actuate.
6		The information about the IP address, subnet, gateway, etc. comes from the IT department. The web server can be switched off via the „HTTPS“ tile. ATTENTION: A web server that has been switched off can only be switched on again at the HMI. If the HMI is not set to DHCP, the DNS server can be entered manually. The host name is displayed as the HTML website title.	Expert knowledge in dealing with networks necessary.

16.10.1 Table Remote Access via Web Browser

All programming and status functions can be easily executed and queried via any web browser.

Operating steps	Icon	Function	Entries
1		Level for query and programming	Activate
2		Information for the service	Activate
3		Service information about the TFT touch display and the integrated web server.	Enter the IP address on the browser page and save as favourite. https://xx.xx.xx.xx/webvisu.htm

16.10.2 Table installation of HTTPS -Certificates

A connection to the web server of the DG-S HMI can only be established via the „Hypertext Transfer Protocol Secure (HTTPS)".

HTTPS is used to establish confidentiality and integrity in communication between the web server and web browser (client) on the World Wide Web. Among other things, this is achieved through encryption and authentication.

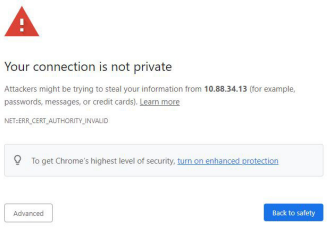
Without encryption, data transmitted over the Internet can be read as plain text by anyone with access to the relevant network. With the increasing spread of open (i.e. unencrypted) WLANs, the importance of HTTPS is growing because it allows content to be encrypted independently of the network.

Authentication is used so that both sides of the connection can verify the identity of the connection partner when establishing the communication. This is to prevent man-in-the-middle attacks and, to some extent, phishing.

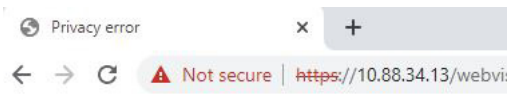
Source: Wikipedia

If no confidentiality has been established between the web server and the web browser, the first time the web page is called up from the browser, a warning is issued that there is no secure connection.

Example Chrome Browser

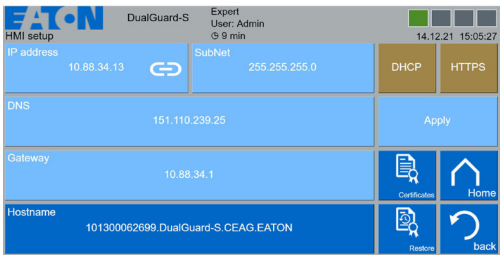
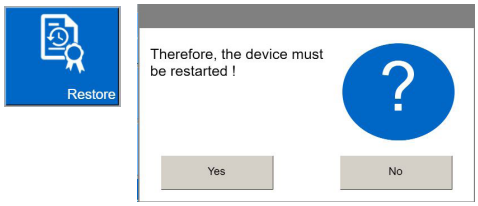
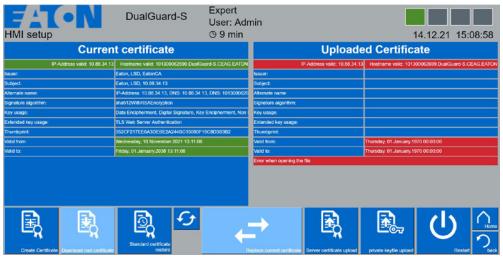


The user must manually confirm the establishment of the connection. The unsecure connection is displayed in the web browser.

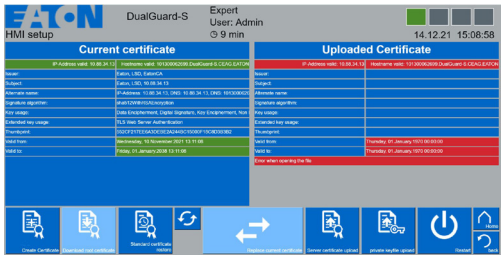


If confidentiality has been established between the web server and the web browser, this is displayed accordingly in the web browser.

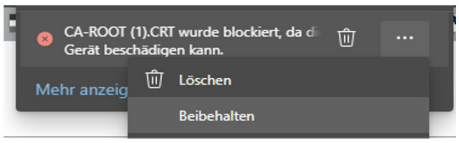
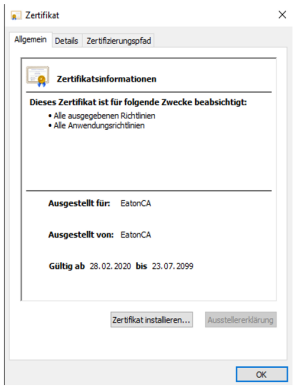
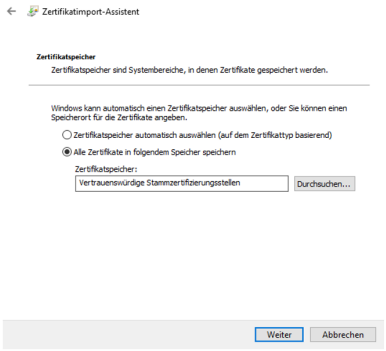
16.10.2 Table installation of HTTPS -Certificates

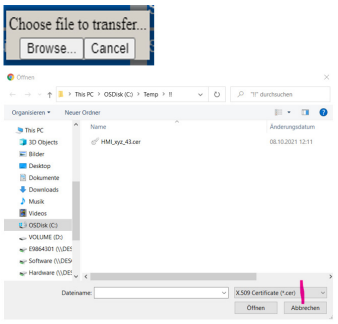
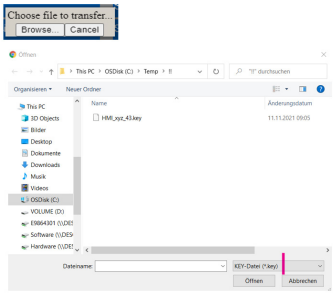
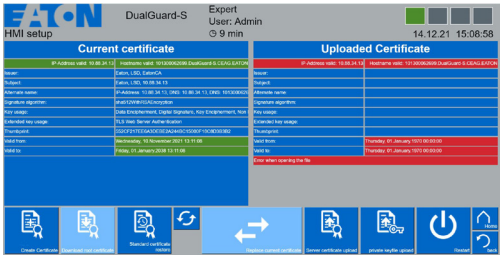
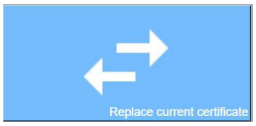
Operating steps	Icon	Function	Entries
1		Configuration	Under „HMI Settings\ Network Settings“ you will find the button „Certificates“ and „Reset“. The „Certificates“ button is only visible on the web page; an additional menu is called up via this button.
2		With the help of the „Reset“ button, loaded certificates or generated certificates are deleted and the certificates that were available on delivery are restored. CAUTION: Incorrect certificates can block access via the website.	In order for the changes to be accepted, it is necessary to restart the DG-S HMI, the following dialogue must be confirmed with „Yes“.
3		Create server certificate with pre-installed root certificate	The following screen is opened by this button.
4		The DG-S HMI has a pre-installed root certificate with 4096 bit key which is used by default.	

16.10.2 Table installation of HTTPS -Certificates

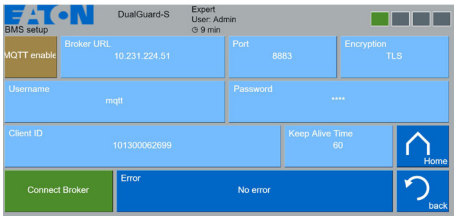
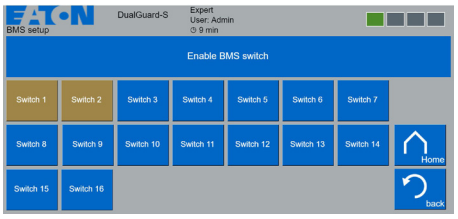
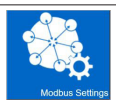
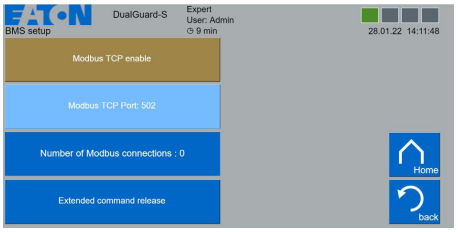
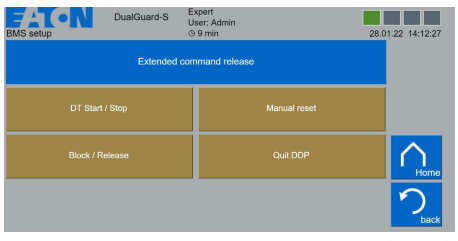
Operating steps	Icon	Function	Entries
5		Status after delivery. Current certificate. The information of the current certificate is displayed here. Red fields Indicates the information that causes the certificate not to be recognised. In this case, neither the IP address nor the host name of the HMI are included in the certificate.	
6	 	A server certificate is issued via „Create certificate“ using the root certificate available on the HMI.	Press This process takes a few seconds and the duration is displayed accordingly.
7		After the certificate creation has been completed, the display can be updated by clicking on the button.	Press
8		The current certificate has been issued on IP address and host name.	
9		To ensure that the certificate is delivered, the HMI must be restarted. The restart button flashes after the certificate has been successfully created. After restarting, the certificate is used.	Press
10		If the host name or the IP address of the HMI changes, the certificate must be created again. With the help of the button „Restore default certificates“, loaded certificates or created certificates are deleted and the certificates that were available at delivery are restored.	
11		Install root certificate on PC In order for the certificate to be accepted as valid by the browser, the corresponding root certificate must be valid and installed in the certificate store of the PC.	The root certificate (CA-ROOT.CER) can be transferred from the HMI to the PC via „Download root certificate“.

16.10.2 Table installation of HTTPS -Certificates

12		Example under Windows Edge: Allow the download (may be detected as unsafe)	
13		Then open the file and install the certificate	Press the O.K. button
14		During installation, you can decide whether the certificate should be installed for all users of this PC or only for the current user.	
15		Location: The certificate must be installed under „Trusted Root Certification Authorities“. Then click on Next and finish. After the installation is complete, the browser must be restarted. The certificates are then recognised as valid by all DG-S HMIs that use the root certificate of the DG-S HMI when creating the server certificate.	
16		Using a server certificate created offline The HMI offers the possibility to use a server certificate created offline. This has the advantage that the key of the master certificate does not have to be copied to the HMI. The self-created key for the server certificate and the master certificate is required on the HMI. When creating the server certificate, the appropriate IP address and the host name of the HMI must be used.	The button „Upload server certificate“ can be used to transfer a „server certificate“ to the HMI.

17		After pressing the button, the following dialogue appears, the file to be transferred can be selected on the PC via „Browse“.	
18		The corresponding key can be transferred to the HMI via the button „Upload private key file“.	
19		After pressing the button, the following dialogue appears, the file to be transferred can be selected on the PC via „Browse“.	
20		The display is updated via this icon	Press
21		If the IP address and the host name of the HMI correspond to the parameters of the uploaded server certificate, the corresponding parameters are highlighted in green in the „Uploaded certificate“ display. If the parameters do not match, the parameters are highlighted in red.	
22	 		To accept the uploaded certificate, the icon „Create current certificate“ must be clicked and then the HMI must be restarted via the button „Restart“.

16.11. Table GLT Settings configuration (Login = Expert)

Operating steps	Icon	Function	Entries
1		Query and programming level	Actuate
2		Basic settings	Actuate
3		GLT Settings	Actuate.
4		VisionGuard settings	Actuate.
5		Icons BMS setup MQTT enable Broker URL Port Encryption Username Password Client ID Keep Alive Time Connect Broker Error Home back	The settings are described in the VisionGuard user manual and must be made when networking the DualGuard-S with the VisionGuard.
6		Icon switch enabling BMS	Actuate
7		Icon switch 1- 16	Up to 16 LON switches can be assigned to the DualGaurd-S. A maximum of two switches can be assigned to each circuit or luminaire.
8		Icon Modbus settings	Actuate
9		Modbus TCP enable Modbus TCP Port: 502 Number of Modbus connections: 0	Disabled: (i.e. a Modbus master cannot access it). Enabled: (i.e. now a Modbus master can access it). The default port for Modbus TCP is 502.
10		Additional Modbus commands	

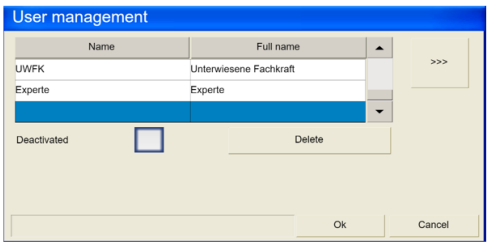
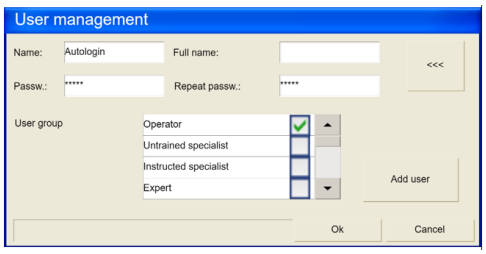
16.12. Table create user groups (Login Expert)

We recommend that the different users assign their own access rights to prevent unauthorized access.
User menus:

- Operator
- Untrained specialist
- Instructed specialist
- Expert

Operating steps	Icon	Function	Entries
1		Query and programming level	Actuate
2		Basic settings	Actuate
3		General settings	Actuate.
4		User settings	Actuate
5		User administration	Actuate
6		For the different users different groups can be created to limit the access rights. Note! The user group Admin should not be changed or deleted.	Press a free field in the „Name“ column. Then click the Actuate >>>> icon.
7		Next, in the field „Name“, enter an abbreviation for the full name in the second field. Then select User Group and click the button „Create User“ Actuate. If you want to create another user group, click on the icon Actuate and repeat the process. Finally, click the OK button. Confirm button.	Example: Name (4 characters minimum): UWFK Full Name: Instructed specialist

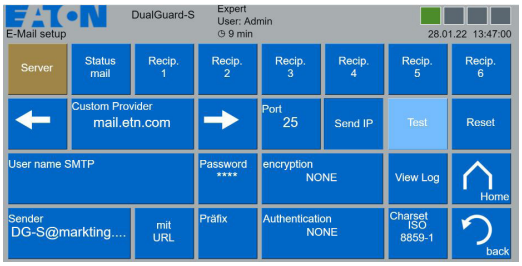
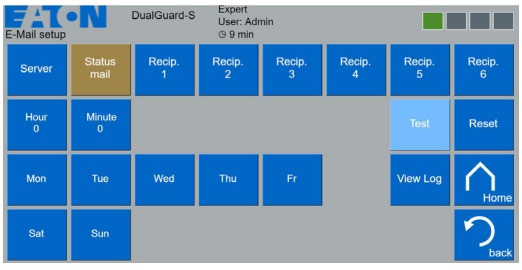
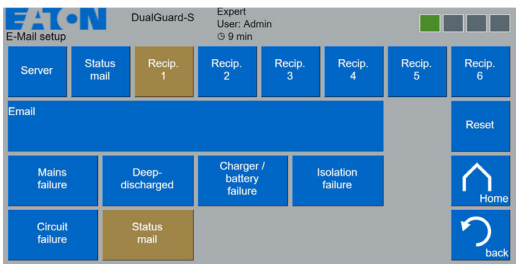
16.12. Table create user groups (Login Expert)

8		To make password entry superfluous, an autologging can be created.	Select an empty user field. Then press the >>> button.
9		Enter Autologin data	In the Name field, enter Autologing. In the Password field, enter 123456. In the Password field, enter 123456 again. In the User group field, click on the user roles for which the autologin is to apply. Finally, click on the icon „Create user“ and press OK.

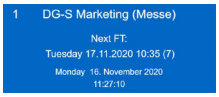
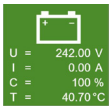
16.13. Table functional test (Login Operator)

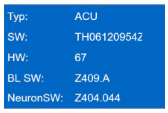
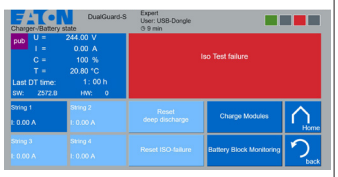
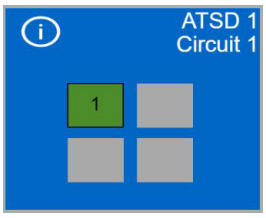
Operating steps	Icon	Function	Entries
1		User Menu	User Name: At least 4 characters Password: At least 6 characters
2		Start FT	During the function test, all system components, external IO modules, monitoring devices and luminaires are checked. The status is displayed on the HMI after the function test. If faults are displayed, they must be rectified and the function test repeated.

16.14. Table e-mail settings(Login Expert)

Operating steps	Icon	Function	Entries
1		Icon menu	Actuate
2		Icon basic settings	Actuate
3		Icon General settings	Actuate
4		Icon E-Mail settings	Actuate
5		"Server Gmail/SecureSockets User name Sender Port Send IP Test Reset Password encryption View Log Prefix Authentication Charset ISO 8859-1 Home Back" With the option „with URL" the sending of the IP address in the e-mail can be switched off.	The mail server settings must be carried out by the IT department.
6		"Status Mail Hour Minute Monday to Sunday Test Reset View Log Home back"	Please enter the days, the time in hours and minutes on which the device status is to be reported as e-mail.
7		"Recipient 1 to 6 Email Mains failure Deep-discharged Charger / battery failure Isolation failure Circuit failure Status Mail"	Please click on the icons to determine which errors should be reported by e-mail.

16.15. Table troubleshooting (Login Operator)

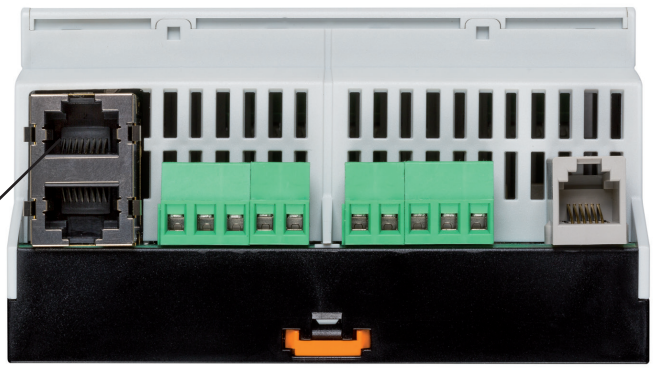
Operating steps	Icon	Function	Status Informationen
1		Sum status	Press more information on the field.
2		Netz OK	Status Information on monitored network distributors
3		Next function test	Start time of the next function test.
4		Battery Info	Charging/discharging voltage Charging/discharging current Available capacity in % of total capacity Ambient temperature of the battery
5		User Menu	User Name: At least 4 characters Password: At least 6 characters
6		Charging-/Batteriestatus	Values: Charge voltage/discharge voltage Charging/discharging current capacity Ambient temperature Duration testTime Info: Software version hardware status Status: battery string Battery block (optional) CM charging module (In test mode and in the event of a power failure, the status of the CM modules is not updated).
7		Circuit Status	circuit switching Circuit status: Battery low overload DC fuse error Backup error AC ISO+ error ISO error communication error battery interruption Luminaire fault DC Luminaire fault AC I< Imin DC I< Imin AC IGBT error Supply voltage inverted.
8		Luminaire Status	Name Information Switch 1 Switch 2 Type Category Nominal power in W Nominal power in VA

9		IO/3PM-IO/TLS Status	Selection of which module requires a status.
10		ACU Status	Actuate
11		ACU Status	Type: Software: Hardware:
12		Information	Information for the Service
13		ISO Test Failure	The error message indicates that the test device in the BCM.1 module for the DC insulation test is not working and must be replaced.
14		If the touch screen or the ACU module is replaced, the software of both modules must be compatible. I In case of incompatibili-ty, the telephone symbol flashes.	
15		Service Contact Infor-mation	Press
16		If you press on the „i", or near the „i", an info dialogue opens	Press

16.16. Connecting the DualGuard-S to the VisionGuard visualization software

To connect the DualGuard-S to the VisionGuard, the DualGuard-S must be connected to the Ethernet via the RJ 45 socket on the ACU module.

All other settings can be found in the 16.14 Connecting the DualGuard-S to the VisionGuard visualization software.



17 General product description DualGuard-S

The DualGuard-S central battery system reliably supplies safety and escape sign luminaires with power (230V AC/220 V DC), automatically checks itself and monitors each of the connected CG-S luminaires (up to 20 per circuit) simply via the supply line. Thanks to STAR technology, the switching mode of each connected CG-S luminaire can be freely programmed via the control section of the central battery system within a 50 or 60 Hz grid. This means that mixed operation of maintained light, switched maintained light and non-maintainedy light is possible in one and the same circuit - and that without an additional data line! The colour touch display in 4.3" or 7" version with non-volatile program memory monitors and controls the central battery system via the ACU module. All functions of the connected devices and emergency lights are automatically checked and reported.

The DualGuard-S uses the search functions to find all lights and I/O modules and automatically detects all modules and system-related lights addressed during installation. The VisionGuard monitoring software can be connected via an Ethernet interface.

DualGuard-S Types

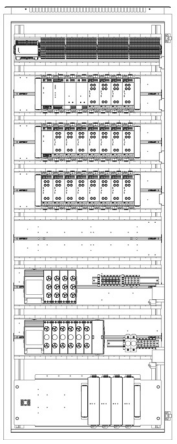
Depending on the requirements on site, different system configurations are used. These standardized configurations have designations, e.g.:

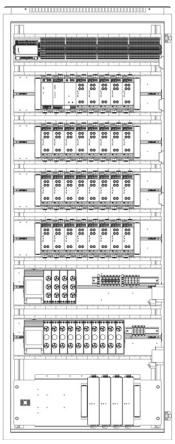
DualGuard-S 28 or DualGuard-S 20
For operation with max. 28 or 20 circuit modules SKU.1.1 CG-S with 88 circuit. Up to 6 substations can be supplied with battery current and mains current (up to 6 substations 1-phase, up to 2 substations 3-phase).

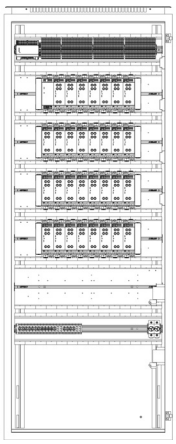
DualGuard-S LAD 100A
The charging and shunting distributor supplies up to fifteen 1-phase or five 3-phase substations with mains and battery voltage. In addition, up to four circuit modules can supply and control 16 circuits.

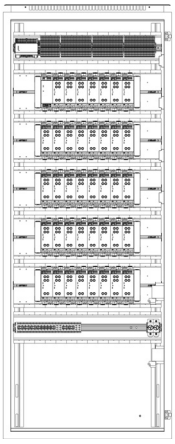
DualGuard-S 12C, DualGuard-S 12C6, DualGuard-S 20C6, DualGuard-S 12C4, DualGuard-S 4C3
for operation with max. 12 or 20 circuit modules SKU.1.1 CG-S.

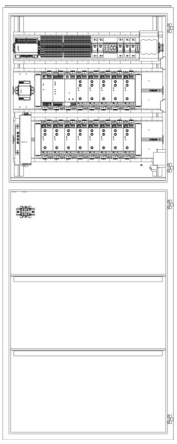
DualGuard-S US 38, US 30, US 23, US 15, US 7
For operation with max. 7, 15, 23, 30 or 38 circuit modules SKU.1.1 CG-S. With these substations, the charging technology of the connected battery emergency power supply is not required; the battery and mains power supply is provided via the DualGuard-S system.

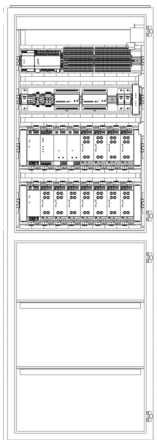

DualGuard-S 20

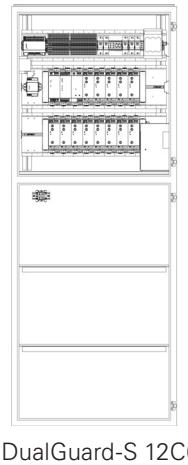

DualGuard-S 28

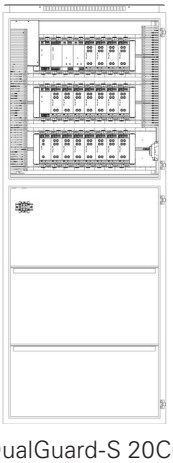

DualGuard-S US 30


DualGuard-S US 38


DualGuard-S 12C


DualGuard-S 12C4


DualGuard-S 12C6

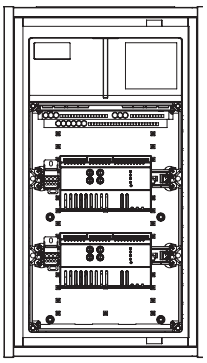

DualGuard-S 20C6

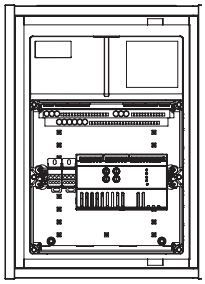
DualGuard-S US-S SOU2, US-S SOU1
For operation with max. 1 or 2 circuit switching modules SOU CG-S. The touch screen is not required for these substations. The battery is supplied by the DualGuard-S system, the mains is supplied via the sub-station of the general power supply (rental power supply).

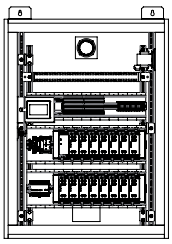
DualGuard-S ESF15-C, ESF30-C
Electrical distributor with a functional integrity of 30 minutes in case of fire for operation with max. 15 or 30 circuit modules SKU.1.1 CG-S.

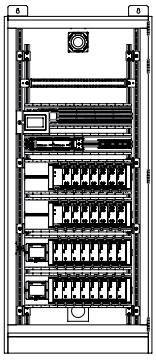
DualGuard-S ESF SOU5, ESF SOU3, ESF SOU2, ESF SOU1
Electrical distributor with a functional integrity of 30 minutes in case of fire for operation with 5, 3, 2 or 1 circuit switching module(s) SOU CG-S 2 x 4 A.

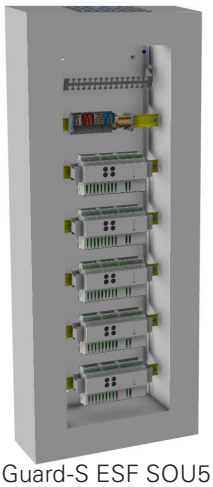
All devices and substations have a modular design. Charging technology, switching technology and monitoring technology form units that work independently of each other so that interactions can be ruled out. The modular design and preassembled cabinet assemblies ensure flexible, high-quality handling. The protective objective of the safety lighting systems is to supply the connected safety lighting in the event of a failure of the general power supply. From the primary backup power source. Furthermore, an important function of the safety lighting system is to ensure the operational readiness of all connected Safety and escape sign luminaires with automatic monitoring.


DualGuard-S US SOU2

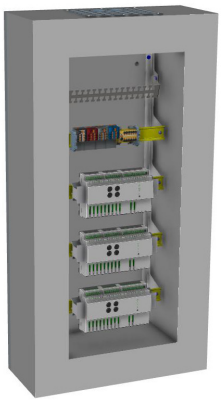

DualGuard-S US SOU1

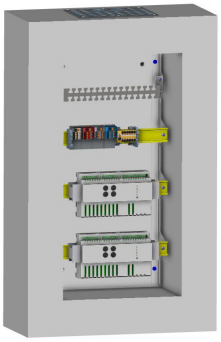

DualGuard-S ESF15-P

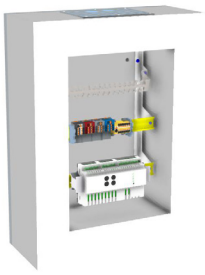

DualGuard-S ESF30-P


DualGuard-S ESF SOU5


DualGuard-S ESF SOU4


DualGuard-S ESF SOU3


DualGuard-S ESF SOU2


DualGuard-S ESF SOU1

18 Overview of assemblies

19 HMI Color Touch Screen 4,3“ and 7“

A freely programmable 4.3“ or 7“ TFT touch display with 4 non-volatile program memories monitors and controls the central battery system in conjunction with the ACU module. All functions such as charging, battery string monitoring, battery block monitoring, bus phase monitor and insulation monitoring device, mains / emergency light switchover and deep discharge protection of the units and the connected emergency lights are automatically tested. Occurring errors are reported via the TFT touch display. An interface allows the connection of a central visualization and monitoring device.

Display Fields:

Battery voltage, battery strand charging current (+), battery strand discharge current in test or error case (-), charging fault, battery block temperature, battery block temperature, phase monitor function, insulation monitor function, light fault with destination in plain text, deep discharge protection, manual reset, emergency light running on (remaining time in minutes), test mode, date / time, iso fault with destination in plain text, failure UV-AV with destination in plain text, error information, programming information, test log.

Function icons:

The following functions can be activated via the function icons:

- Start duration test, abort duration test, manual reset,
- ISO troubleshooting,
- Search lights (all modules),
- Learning current values (all modules),
- log off external modules,
- Blocking, releasing,
- Simulation power failure,
- All lights on, standby light on and continuous light off

Programming Icons

Single light monitoring, circuit monitoring, individual name (20 characters) per device, circuit, light, switch, device address, selective manual reset, after-running emergency light (1-15 min.), selective emergency light, LON switch, timer function, automatic function and operating time test, selection of menu language, password protection

Internal memory:

Internal memory for archiving the device configuration and the prescribed test log information for at least 4 years.

Storage of:

- 300,000 test log entries
- Destination texts of the luminaires (40 characters per luminaire)
- Destination texts of external switches / inputs to phase monitors, DLS, TLS (40 digits per module)
- names of circuits (40 characters per circuit)
- Name of the installation (40 characters)

Using optional CEAG software, programming can be carried out offline on the PC.

NOTE!

Please use our USB Stick to store the configuration and programming in case of a complete defect of the Touch Display.

EATON,s Cybersecurity

Companies are becoming increasingly caught in the cross-hairs of everyday hack attacks. Cyberattacks often cause property damage in the millions. In the digital age, the risk potential is enormously high, so that more and more is being invested in defense mechanisms. Without an appropriate cyber strategy, companies risk not only their systems but also their image. Information security is a top priority at EATON.

Operation

The operation of the color touch screen is divided into menu groups for:

- Installation and commissioning,
- Configuration and programming as well as
- Maintenance and repair.

Configuration

There are extensive possibilities for user-defined settings via a menu-driven user interface

19.1. Table Recommendation Programming and configuration options

Application	First configuration	Revision
Single DualGuard-S	Via a USB stick on the colour touch screen and the PC software via data upload.	Directly on the colour touch screen.
Individual systems with several networked sub-distributors	Via a USB stick on the colour touch screen and the PC software via data upload.	Via the PC software. Directly on the colour touch screen.
Large networked systems	Via the VisionGuard Software	Via the VisionGuard software. Directly on the color touch screen.
Systems without networking but with further spatial separation	Via Web.	Via Web. Directly on the color touch screen.

Order details

Type	Description	Order No.
HMI Module 4,3"	4.3" colour touch for door installation	40071361644
HMI Module 7"	7" colour touch for door installation	40071361654

20 ACU Module

The ACU (Advanced Control Unit) forms the interface between the circuit switches (SKU.1,s), the phase monitors (3-PM, 3-PM-IO and 3-PM-IO-INV modules), the battery block monitoring, the charging technology, the networking with substations, the touch display, the web connection and the VisionGuard visualization. Furthermore, the ACU offers four potential-free signalling contacts as changeover contacts with separate roots whose functions are freely programmable in order to forward status messages such as power failure, emergency lighting fault or battery fault to a higher-level building management system.

In order to start a function test via a higher-level control system or to switch all luminaires from ready light to continuous light or to connect analog phase monitors, eight interrupt and short-circuit-tolerant 24V current loop inputs are provided as standard.

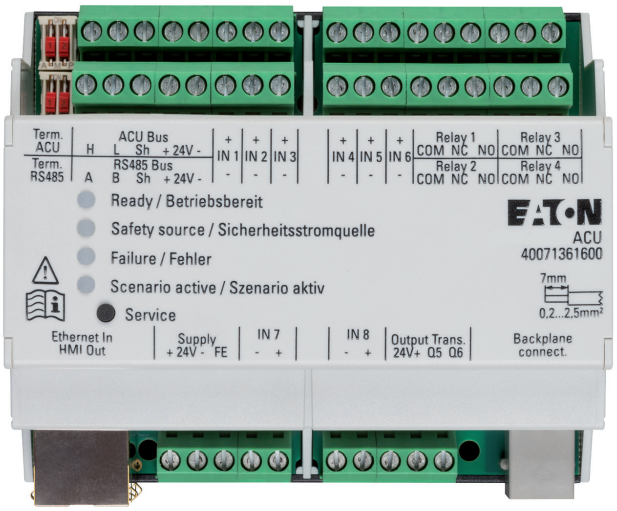
The assignment of which action is to be executed is freely programmable.

Via the internal ACU CAN Bus a networking of up to 32 DualGuard-S devices is possible to forward actions assigned to one device to all devices.

Example:

The lamp which is connected to device 1 can be assigned to the phase changer which is connected to device 32 via the ACU bus.

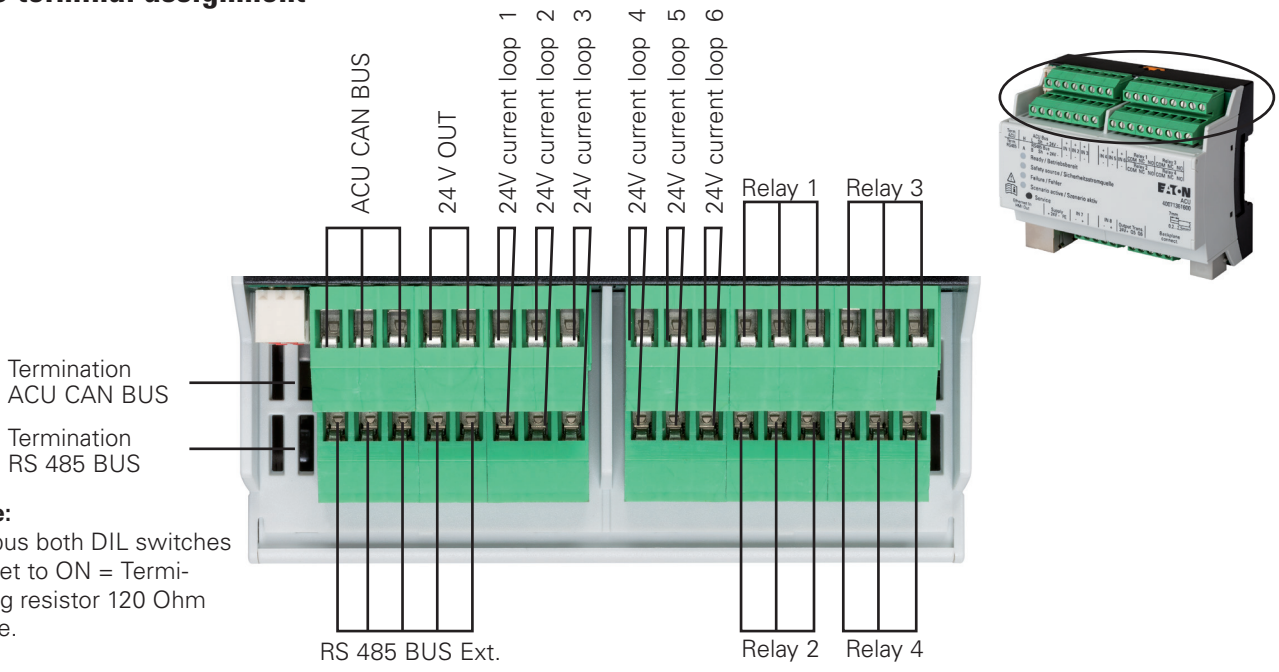
All device information is securely transmitted to any place in the world via the web connection. Furthermore, all configuration and programming work can be done via the web.



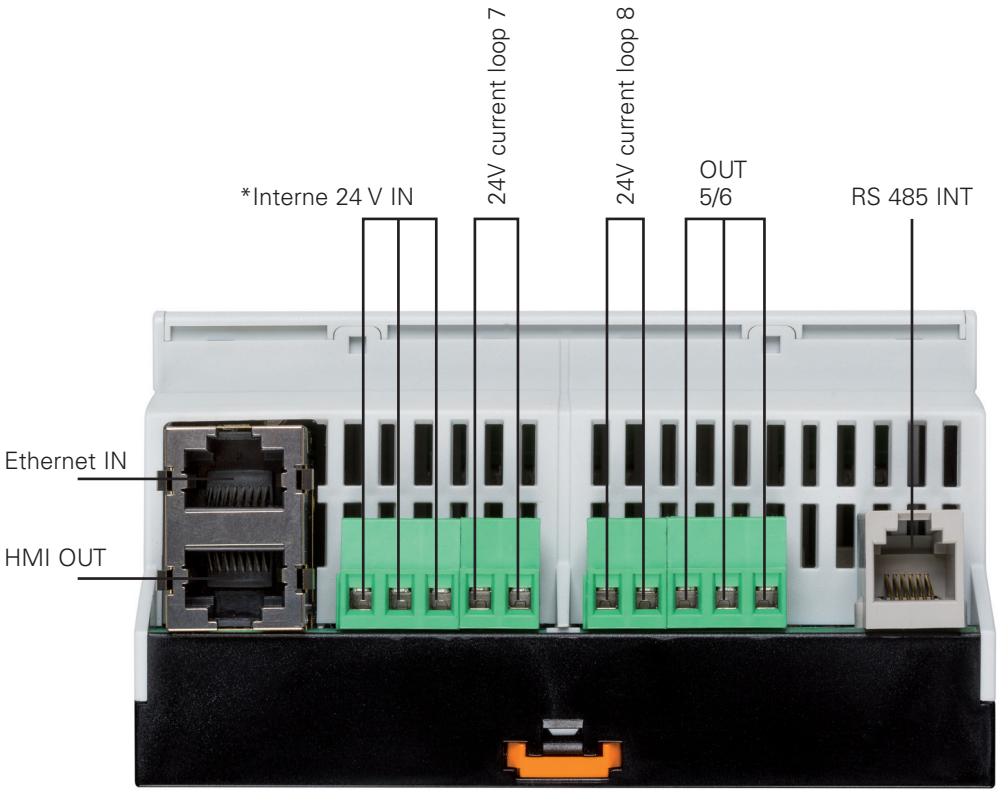
Ordering details

Type	Description	Order No.
ACU Module	Control Module for DIN rail mounting	40071361600

ACU terminal assignment



Note:
Per bus both DIL switches are set to ON = Terminating resistor 120 Ohm active.



*Warning:
At replacement of the ACU modules reconnect the functional earth electrode (FE).

ACU settings 24V I/O inputs

By means of external potential-free relay contacts, the functions described in the table can be activated. The 24V current loops are short-circuit and interruption tolerant. To detect a short circuit a 1KOhm resistor must be connected in series with the signal contact.

NOTE!

Please connect only potential free contacts.

The resistor is only needed if you want to monitor shortcut and interruption of the 24V loop wiring.

Switch, Start FT, ...:
High = Input short-circuited
Low = input open

Switch inverted:
Low = Input short-circuited
High = input open

Block:
High = 1kOhm (between 800 and 1200 Ohm) at input
Low = short-circuited or open

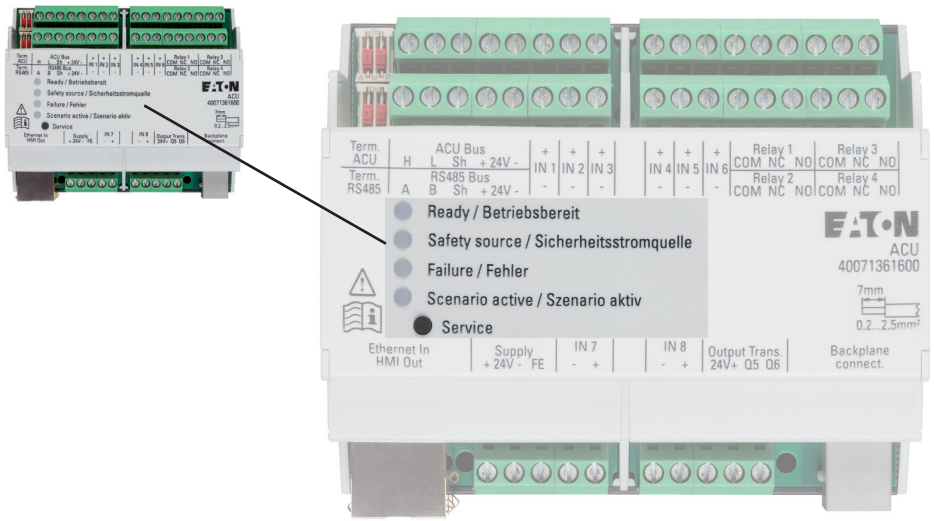
Mains failure UV:
Low = 1kOhm (between 800 and 1200 Ohm) at input
High = short-circuited or open

Name	Input 1	Input 2	Input 3	Input 4	Input 5	Input 6	Input 7	Input 8
Block DualGuard-S	X							
Mains failure		X						
switching of individual emergency lights								
Inverted switching of individual emergency lights								
Start function test			X					
Stop function test				X				
Start duration test					X			
Stop duration test						X		
Manual reset								
Switch all emergency lights to maintained light							X	
Switch all luminaires to non-maintained light								
Switch a defined group of luminaires for maintained lighting								
Scenario active								
AE failure								
Malfunction of the technical ventilation of the battery room								X

ACU settings Relay contacts

Name	Relay 1	Relay 2	Relay 3	Relay 4	Transistor output 1	Transistor output 2
Mains operation						
Mains failure	X					
Mains failure SubDB	X					
Charging failure	X					
Circuit failure	X			X		
Luminaire failure	X					
Ready		X				
Deep discharge protection	X					
ISO-Failure	X					
Other failures	X					
Function test		X				
Duration test		X				
Safety Source			X			
Inverted	X					
Use as buzzer						

LED Service Pin	Description
Ready for operation (green LED):	The device works without problems.
Safety power source (yellow LED):	The emergency lighting and all internal and external modules are powered by the battery.
Faults (red LED):	The device function is disturbed.
Scenario active (orange LED):	An evacuation was triggered via the AE-CU controller.
Service Pin:	To login and logout the ACU module.



ACU Bus sub-station connection

Sub-distribution boards with TFT touch display that are supplied by a DualGuard-S must be connected to each other via the ACU bus:

- Power failures at sub-distributors are detected and reported to the DualGuard-S in order to avoid discharge of the batteries.
- Switching commands of the 3-PM-IO and 3-PM-IO-INV modules can work across devices.
- Networked switching actions and information can be transmitted.
- function and operating time tests are synchronized.

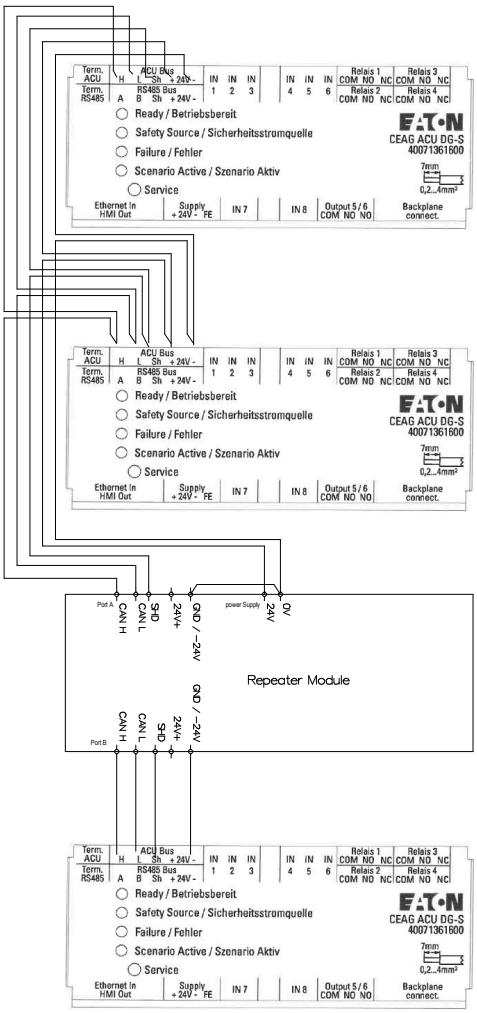
Wire the ACU bus of the individual DualGuard-S ACU modules with a shielded bus cable.

Make sure that the +/- 24V of the individual ACU modules are connected to each other in addition to the H, L and Sh bus terminal.

Terminal assignment ACU bus: H, L, Sh, +24V, -24V

If repeaters are used, they must be supplied via the 24V of the ACU modules.

After the repeater, the terminals H, L, Sh, and the ground or 24V minus must be wired through to the next ACU module so that all ACU modules and repeaters have the same ground potential.



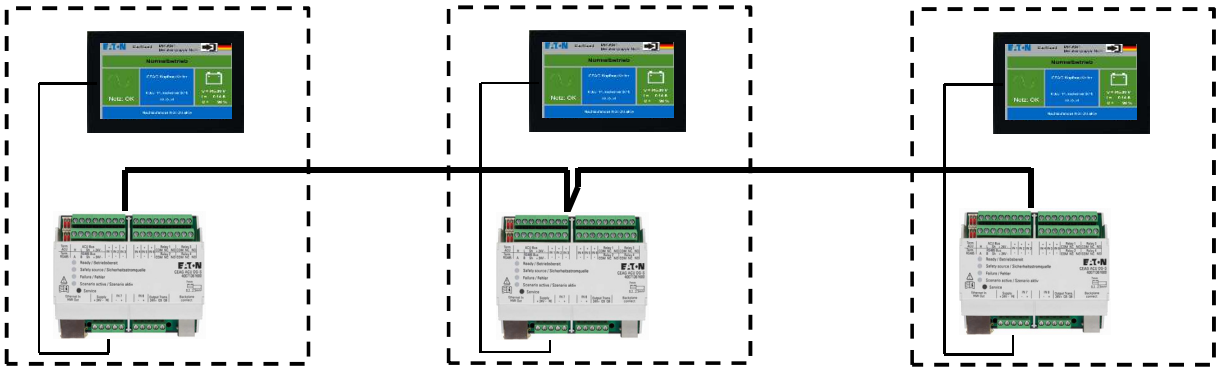
ATTENTION!

Bus topology: linear, double terminated (no spur lines allowed). Cable type (minimum requirement): IY(ST)Y 4 x 2 x 0.8 mm (twisted pair, shielded) - the shield of the cables must be connected to the Sh terminals on the ACU module.

In the ACU modules the 120Ω ohm terminating resistor is integrated and can be activated by the two upper DIL switches.

Connection diagram ACU

ACU Bus – X2.A	
Rated Voltage:	≤ 30V (SELV)
Rated Current:	≤ 0,12A short-circuit proof
Bus Topologie:	Line
Cable Type:	E.g. IY(ST)Y 4x2x0,8mm
Maximum cable length:	900m
Terminating resistor:	Switchable via DIL switch on ACU.
Maximum number of DualGuard-S systems	32, more than 32 devices after technical clarification



21 PSU Module

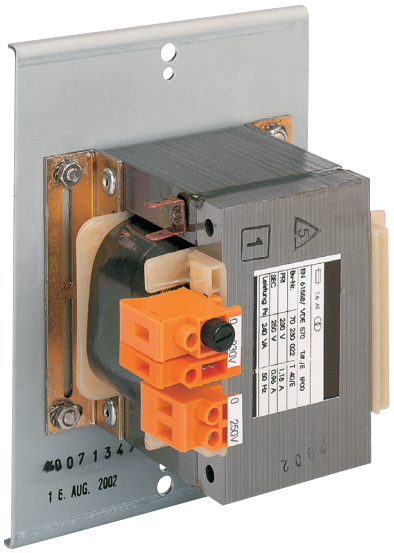
The PSU (Power Supply Unit) module supplies the DualGuard-S central battery system with a 24V and a 6V DC voltage. The integrated deep discharge protection switches off the safety lighting first, then the internal modules and then the PSU in three stages. All critical module parameters are permanently monitored and faults are indicated early on the touch display so that the module can be replaced before a failure. A passive ventilation system ensures that no wear and tear due to contamination can occur as with a technical ventilation system. Due to the parallel connection capability and individual monitoring function of each individual PSU module, 100% functionality is guaranteed even in the event of a failure. The PSU module is powered by the 216V battery and the 250V AC module.

Ordering details

Type	Description	Order No.
PSU Module	Power supply module for rack mounting	40071361590

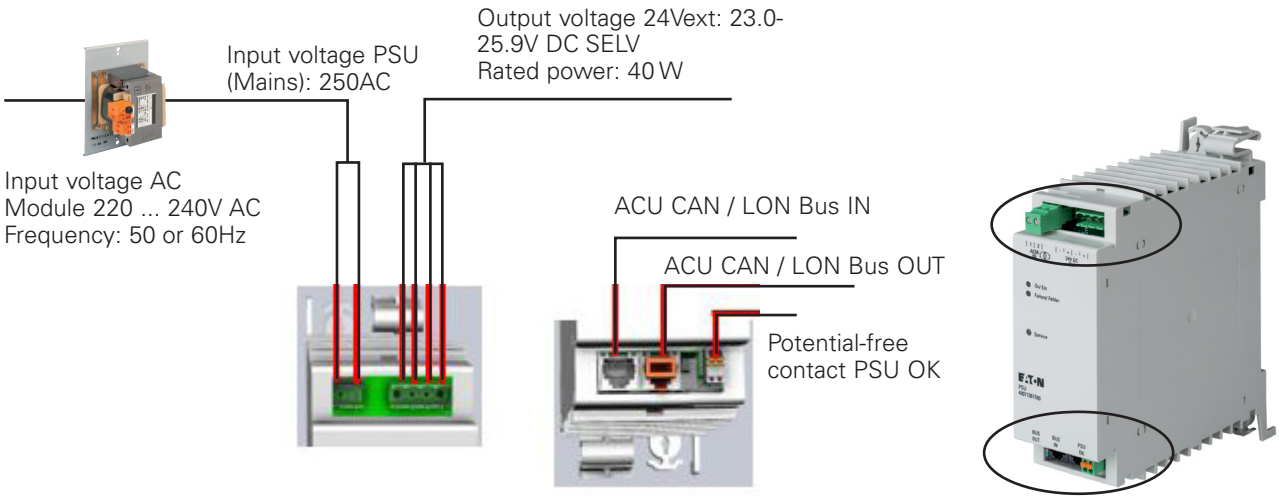
22 AC Module

The optional AC module supplies the PSU module with mains voltage.



Ordering details

Type	Description	Order No.
AC Module	External Transformer Module AC/AC- 240 VA incl. mounting adapter	40071347162



23 BCM.1 Module

The BCM.1 (Battery Control Module) module is part of the charging technology and controls up to 32 charging modules CM.1 1.7 A and CM3.4A via the Charge Control Bus according to the IU1U2 charging characteristic for lead batteries. For this purpose, the temperatures of the battery environment as well as the charge retention voltage and high charge voltage are measured. In addition, the string current of up to four battery strings with 108 cells per string is measured.

The charging voltage is continuously and automatically readjusted on the basis of the measurement results.

A DC insulation monitoring system reports insulation faults in the battery circuit and the automatic ISO fault detection function reports the circuit in which the insulation fault is located.

Ordering details

Type	Description	Order No.
BCM.1 Module	Battery control module for rack mounting	40071361540

ATTENTION!

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

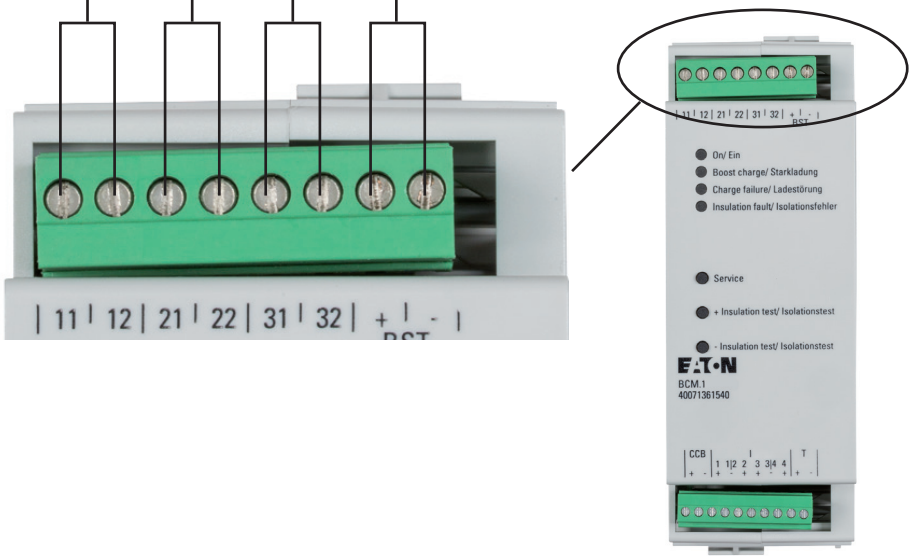
The potential-free relays 11/12, 21/22, 31/32 have no insulation according to SELV. This means that the cabling to the connected systems must at least be single insulated, in addition the power supply (24V/0.5A) must at least be single insulated from mains or battery.

Potential free contact 31/32 is closed during boost charge

Potential free contact 21/22 is closed in case of insulation failure.

The potential-free contact 11/12 is closed in the event of a fault

The terminals have no function in connection with DualGuard-S.



Shunt connection I4+

Shunt connectors, I3/4-

Shunt connectors, I3+

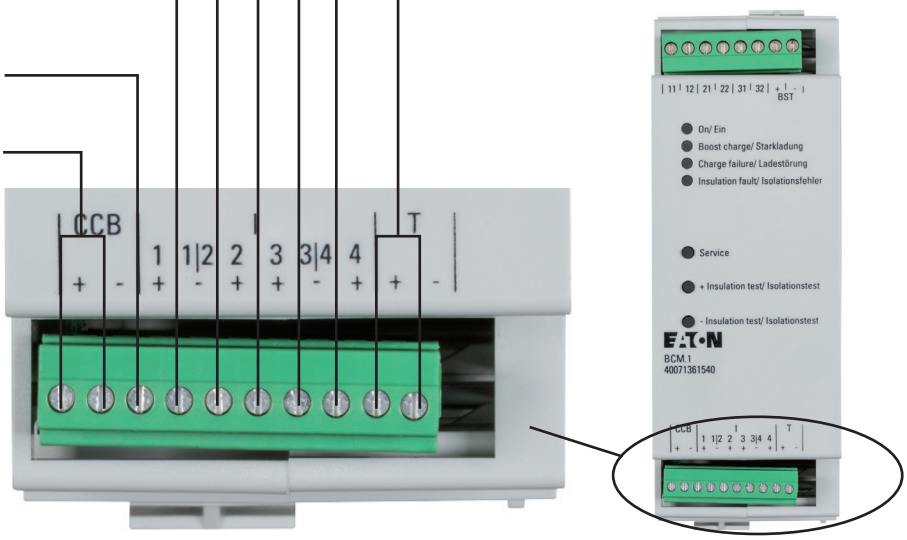
Shunt connectors, I2 +

Shunt connectors, I1/2-

Shunt connectors, I1+

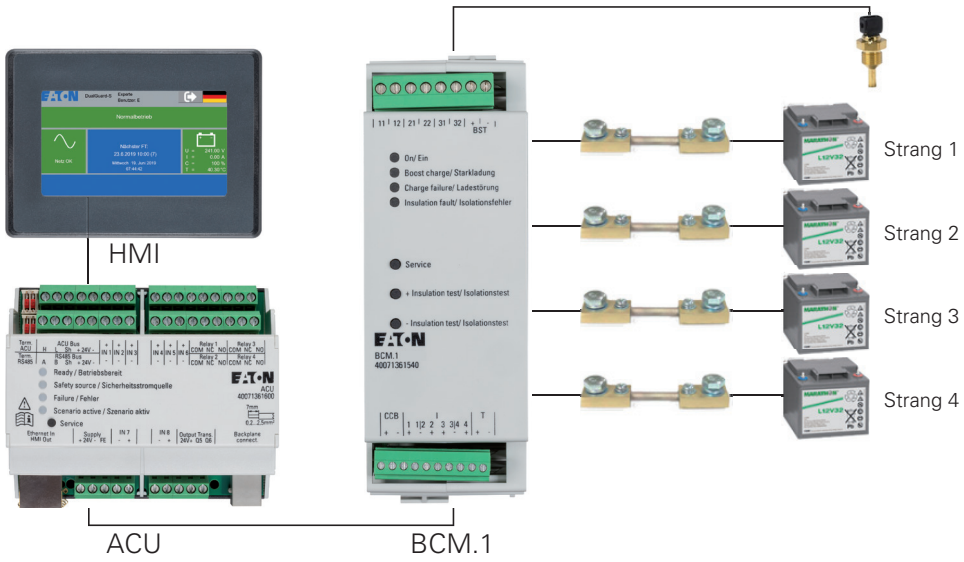
Terminals CCB +/-,

Temperature sensor: An external temperature sensor must be connected to terminals T + and T-.



23 BCM.1 Module

LED´s / Service Push-button	Function
Service Pin:	Pressed shortly = Login BCM.1 module to ACU = Status display on the color touch screen. More than 8 s pressed = Setting of the float charge voltage
ISO-Test + / ISO-Test- button:	Simulation of an insulation fault
LED charging fault :	The LED charging fault lights up red when a module of the charging system (BCM, CM 1.7A or CM3,4 A) is faulty. A detailed error message is displayed on the colour touch screen.
LED ISO Failure:	The ISO fault LED lights up red if there is an insulation fault in the battery circuit.



24 CM.1 1,7 A Charging modules

The CM.1 1.7A charging module is suitable for snap mounting on the DualGuard-S module subrack (max. two CM.1 1.7A) and is used in DualGuard-S systems with smaller connected loads such as compact systems.

In order to achieve the recharge time required by the standard for the projected battery sets, a corresponding number of charging modules must be projected.

The CM modules have their own calibrated charge control and function independently of the BCM.1 module. An integrated fan monitoring automatically reports faults in the technical ventilation.

In order to save energy and extend the service life of the charging modules, the charging modules are switched on alternately during trickle charging. The maximum 32 addresses are set at the factory using rotary switches. The LEDs indicate the operating status of the charging module. Ready for operation (LED lights up).

Ordering details

Type	Description	Order No.
CM.1 1,7A	Charge module 1.7A for rack mounting	40071361580
CM.1 1,7A Made in Germany	Charge module 1.7A for rack mounting. Made in Germany	40071361585

25 CM 3,4 A Charging modules

The CM 3.7A charging module is suitable for mounting on separate charging module subracks with 1 to 8 slots and is used in DualGuard-S systems with larger connected loads such as large compact systems or floor standing cabinets with separate battery accommodation

In order to achieve the recharge time required by the standard for the projected battery sets, a corresponding number of charging modules must be projected.

The combination of the CM.1 1.7A and CM 3.4A charging modules results in the necessary number for each battery size. In order to save energy and extend the service life of the charging modules, the charging modules are switched on alternately during trickle charging.

The CM modules have their own calibrated charge control and function independently of the BCM.1 module. An integrated fan monitoring automatically reports malfunctions of the technical ventilation.

The maximum 32 addresses are set at the factory using rotary switches. The LEDs indicate the operating status of the charging module. Ready for operation (LED lights up).

Ordering details

Type	Description	Order No.
CM 3,4A	Charge module 3.4A for rack mounting	40071360370

26 Circuit change over module SKU.1.1 CG-S 4x1,5A

The SKU.1.1 CG-S 4x1.5A circuit change over module is suitable for snap mounting on the DualGuard-S module rack, supplies and monitors emergency lights with electronic ballast for DC operation via four circuit feeders. CEWA GUARD monitoring checks the function of the connected emergency lights. It is possible to connect up to 20 emergency lights. Mixed operation within a circuit of maintained light, switched maintained light and non-maintained light is possible with STAR technology. An additional data cable is not required for SKU.1 type CG-S.

The group switching of the emergency lighting circuits enables an optimal, space-saving design and thus the supply of a large number of emergency lighting circuits in a small space. The arrangement of the circuit fuses on the front of the module makes it easy to replace them in the event of short circuits or overloads. The LEDs on the front of the unit automatically signal sum faults which are indicated in detail on the HMI. Thus one receives very comfortably all necessary information.

In addition, the generously designed ventilation slots ensure optimum air circulation and heat transport. An automatic insulation fault search in combination with the BCM.1 module and the colour touch screen makes the initial commissioning considerably easier.

Current value monitoring is possible, but should only be used in exceptional cases where individual monitoring is not possible for technical reasons. It must be ensured that the failure of a single light is detected which is difficult with lights with low power consumption such as LED lights due to the supply voltage and ambient temperature fluctuations of the light. It is not possible to precisely locate individual defective luminaires.

Technical description	
Inputs	
Rated voltage AC	220-240 V
Rated voltage DC	184-275 V
Rated frequency	50 or 60 Hz
Outputs	
Rated current	1,5 A
Short-circuit current	1500 A
Switching cycles	10000
cos phi kapazitiv	0,5- 1,0
Maximum own consumption	8W
Ambient temperature	-5°C…+55°C
Degree of protection	IP20
Protection class	2
Distance between ventilation slots	75 mm
Number of circuits	4
Rated current per circuit	1.5 A
Fuse protection per circuit	2.5 A
Max. inrush peak current per circuit	60 A
Max. wire cross-section	2.5 mm^2
Dimensions and weight	0.83 kg
H x W X D (in mm)	170 x 55 x 155
Module width	1 TE (1 and 55 mm)
Typical switching over time:	AC to DC = 450 ms

Ordering details

Type	Description	Order No.
SKU.1.1 CG-S 4 x 1,5A	Circuit switching 4 x 1.5A for Snap subrack Mounting	40071361550

27 Circuit change over module SKU.1.1 CG-S 2x3A

The SKU.1.1 CG-S 2x3A circuit change over module is suitable for snap mounting on the DualGuard-S module subrack, supplies and monitors emergency lights with electronic ballast for DC operation via two circuit feeders. CEWA GUARD monitoring checks the function of the connected emergency lights. It is possible to connect up to 20 emergency lights. Mixed operation within a circuit of maintained light, switched maintaineds light and non-maintained light is possible with STAR technology. An additional data cable is not required for SKU.1 type CG-S.

The individual switching of the emergency lighting circuits enables separate fusing of the battery and mains supply of the emergency lighting so that in the event of a simple earth fault and failure of the mains fuse, the battery can continue to be supplied via the IT grid. The arrangement of the circuit fuses on the front of the module makes it easy to replace them in the event of a short circuit or overload. The LED on the front of the unit automatically reports total faults which are indicated in detail on the HMI. Thus one receives very comfortably all necessary information.

In addition, the generously designed ventilation slots ensure optimum air circulation and heat transport. An automatic insulation fault search in combination with the BCM.1 module and the colour touch screen makes the initial commissioning considerably easier.

Current value monitoring is possible, but should only be used in exceptional cases where individual monitoring is not possible for technical reasons. It must be ensured that the failure of a single light is detected which is difficult with lights with low power consumption such as LED lights due to the supply voltage and ambient temperature fluctuations of the light. It is not possible to precisely locate individual defective luminaires.

Technical description

Inputs	
Rated voltage AC	220-240 V
Rated voltage DC	184-275 V
Rated frequency	50 or 60 Hz
Outputs	
Rated current	3A
Short-circuit current	1500 A
Switching cycles	10000
cos phi kapazitiv	0,5- 1,0
Maximum own consumption	4W
Ambient temperature	-5°C…+55°C
Degree of protection	IP20
Protection class	2
Number of circuits	2
Rated current per circuit	3A
Fuse protection per circuit	5AT
Max. inrush peak current per circuit	250 A
Max. wire cross-section	2.5 mm^2
Dimensions and weight	0.66 kg
H x W X D (in mm)	170 x 55 x 155
Module width	1 TE (1 and 55 mm)
Typical switching over time:	AC to DC = 450 ms

Ordering details

Type	Description	Order No.
SKU.1.1 CG-S 2 x 3A	Circuit switching 2 x 3A for Snap subrack Mounting	40071361560

28 Circuit change over module SKU.1.1 CG-S 1x6A

The SKU.1.1 CG-S 1x6A circuit change over module is suitable for snap mounting on the DualGuard-S module subrack, supplies and monitors emergency lights with electronic ballast for DC operation via a circuit feeder. CEWA GUARD monitoring checks the function of the connected emergency lights. It is possible to connect up to 20 emergency lights. Mixed operation within a circuit of maintained light, switched maintaineds light and non-maintained light is possible with STAR technology. An additional data line is not required for SKU.1 type CG-S.

The individual switching of the emergency lighting circuits enables separate fusing of the battery and mains supply of the emergency lighting so that in the event of a simple earth fault and failure of the mains fuse, the battery can continue to be supplied via the IT grid. The high rated power in combination with an inrush short-circuit current of up to 250A enables the supply of emergency luminaires with high power consumption and high short-circuit currents. The arrangement of the circuit fuses on the front of the module makes it easy to replace them in the event of a short circuit or overload. The LED on the front of the unit automatically reports total faults which are indicated in detail on the HMI. Thus one receives very comfortably all necessary information.

In addition, the generously designed ventilation slots ensure optimum air circulation and heat transport. An automatic insulation fault search in combination with the BCM.1 module and the colour touch screen makes the initial commissioning considerably easier.

Current value monitoring is possible, but should only be used in exceptional cases where individual monitoring is not possible for technical reasons. It must be ensured that the failure of a single light is detected which is difficult with lights with low power consumption such as LED lights due to the supply voltage and ambient temperature fluctuations of the light. It is not possible to precisely locate individual defective luminaires.

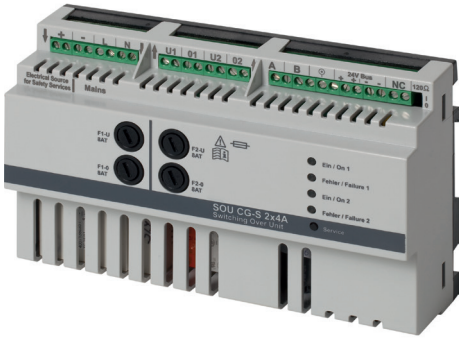
Technical description	
Inputs	
Rated voltage AC	220-240 V
Rated voltage DC	184-275 V
Rated frequency	50 or 60 Hz
Outputs Rated current	6A
Short-circuit current	1500 A
Switching cycles	10000
cos phi kapazitiv	0,5- 1,0
Maximum own consumption	4W
Ambient temperature	-5°C…+55°C
Degree of protection	IP20
Protection class	2
Number of circuits	1
Rated current per circuit	6A
Fuse protection per circuit	10AT
Max. inrush peak current	250 A
Max. wire cross-section	2.5 mm^2
Dimensions and weight	0.49 kg
H x W X D (in mm)	170 x 55 x 155
Module width	1 TE (1 and 55 mm)
Typical switching over time:	AC auf DC = 450 ms

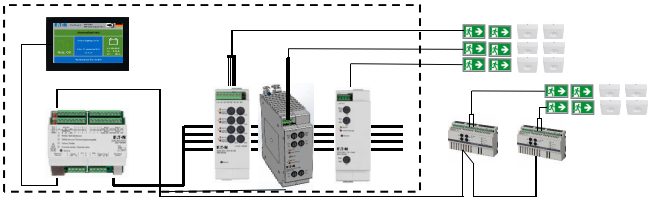
Ordering details

Type	Description	Order No.
SKU.1.1 CG-S 1 x 6A	Circuit switching 1 x 6A for Snap subrack Mounting	40071361570

29 Circuit change over module SOU CG-S 2x4 A

The SOU CG-S 2x4A circuit change over module with second rental current supply is suitable for DIN rail mounting, supplies and monitors emergency lights with electronic ballast for DC operation via two circuit feeders. CEWA GUARD monitoring checks the function of the connected emergency lights. It is possible to connect up to 20 emergency lights. Mixed operation within a circuit of maintained light, switched maintained light and non-maintained light is possible with STAR technology. An additional data cable is not required for SOU type CG-S. The group switching of the emergency lighting circuits enables an optimum, space-saving design in combination with the high rated output and a switch-on short-circuit current of up to 250 A. The module enables the decentralised supply of emergency luminaires with high power consumption and high short-circuit currents in a small space. The arrangement of the circuit fuses on the front of the module makes it easy to replace them in the event of short circuits or overloads. The LEDs on the front panel automatically report total faults which are indicated in detail by pressing the service button on the colour touch display. Thus one receives very comfortably all necessary information with one keystroke.





Technical description

Inputs	
Rated voltage AC	220-240 V
Rated voltage DC	184-275 V
Rated frequency	50/60 Hz
Short-circuit current per circuit	1500 A
Switching cycles	10000
cos phi kapazitiv	0,5- 1,0
Maximum own consumption	9W
Ambient temperature	-5°C…+55°C
Degree of protection	IP20
Protection class	2
Number of circuits	2
Rated current per circuit	4A
Fuse protection per circuit	8AT
Max. inrush peak current per circuit	250 A
Terminals	Rigid: 0.2…4.0 mm^2
with wire end sleeve: 0.2…2.5 mm^2	
Dimensions and weight	0.63 kg
H x W X D (in mm)	109 x 178 x 60
Module width	10 TE (10 and 17,8 mm)

Ordering details

Type	Description	Order No.
SOU CG-S 2 x 4A	Circuit switching over module 2 x 4A for DIN rail mounting.	40071360430

30 CG IV.1 Relay Module

The CGVI.1 relay module is suitable for snap mounting on the DualGuard-S module subrack and enables the DualGuard-S to be connected to a central control station (GLT). The most important system statuses are reported via potential-free signalling contacts. Two input channels are available for remote checking of the DualGuard-S central battery system. A function test can be triggered via the „FT“ input channel, and the following can be performed via the input channel „BT“ is subjected to an endurance test (battery test). Eight LEDs indicate the system status.

Function	Contact 11/12	Contact 21/22	Contact 31/32	Contact 41/42	Contact 51/52
deep discharge protection	ON	-	-	-	-
emergency lighting fault	-	ON	-	-	-
charging fault	-	-	ON	-	-
battery operation	-	-	-	ON	-
mains operation	-	-	-	-	ON

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

24V Function inputs

With a pulse of at least 20 ms/24 V the desired function can be activated.

If a function or duration test is to be triggered again, the function-duration test must be reset via a pulse.

Function test ON => 24V DC ≥ 20ms

Function test OFF => 24V DC ≥ 20ms

Battery duration test ON => 24V DC ≥ 20ms

Battery duration test OFF => 24V DC ≥ 20ms

Ordering details

Type	Description	Order No.
CG IV.1	Relay module for subrack Mounting	40071361620

31 CG V.1 Relay Module

The CGV.1 relay module is suitable for snap mounting on the DualGuard-S module subrack and enables the connection of the DualGuard-S to a central control station (FÜB). The most important system statuses are reported via potential-free signalling contacts. Two input channels are available for remote checking of the DualGuard-S central battery system. A function test can be triggered via the „FT" input channel and an duration test (battery test) via the „BT" input channel. Eight LEDs indicate the system status.

Function	Contact 11/12	Contact 21/22	Contact 31/32	Contact 41/42	Contact 51/52
Not ready for operation	ON	-	-	-	-
Disfunction Prior. 1	-	ON	-	-	-
Disfunction Prior. 2	-	-	ON	-	-
Disfunction Prior. 3	-	-	-	ON	-
Emergency mode	-	-	-	-	ON

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

24V Function inputs

With a pulse of at least 20 ms/24 V the desired function can be activated.

If a function or duration test is to be triggered again, the function-duration test must be reset via a pulse.

Function test ON => 24V DC ≥ 20ms

Function test OFF => 24V DC ≥ 20ms

Battery duration test ON => 24V DC ≥ 20ms

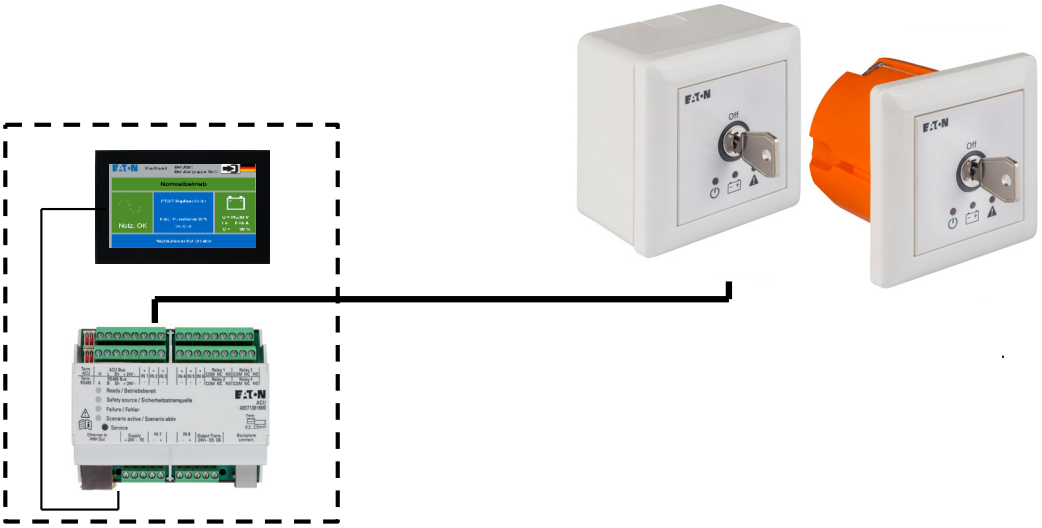
Battery duration test OFF => 24V DC ≥ 20ms

Ordering details

Type	Description	Order No.
CG V.1	Relay module for subrack Mounting	40071361630

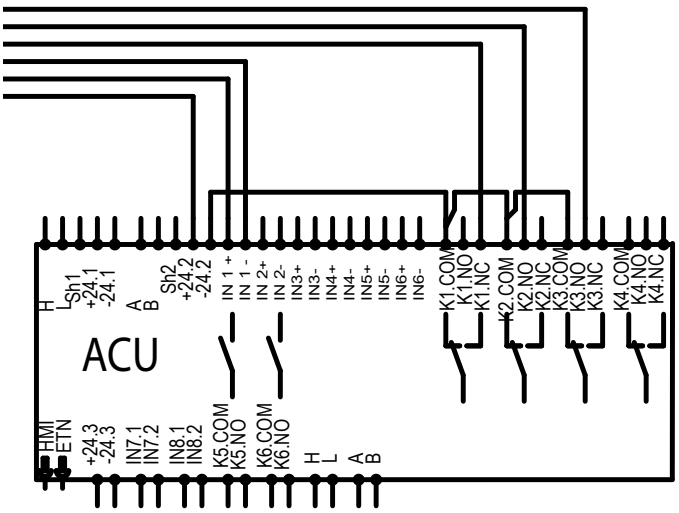
32 RCM-A remote indication

The RCM-A remote display uses a battery power supply to display the the most important system functions safely. A key-operated switch can be used to block emergency lighting operation during periods of inactivity. The remote indicator thus fulfils the requirement that remote switching is only permissible if actuation by Unauthorized persons are not possible. By blocking the emergency operation the battery maintenance charge is not affected. A differential loop monitoring leads to Short-circuit or open-circuit detection to make the system ready for operation. LED indicators: System operational, power source for safety purposes, error.



Connection of the RCM-A remote display AP to the ACU module

Clamps RCM-A Module	Clamps DualGuard-S
12 (LED red)	K1.NC
22 (LED green)	K2.NO
32 (LED yellow)	K3.NO
S1	IN1.1
S2	IN1.2
+24 V	+24 V
	Bridge between -24 V and terminals K1.COM, K2.COM and K3.COM



Ordering details

Type	Scope of supply	Order No.
RCM-AS remote indication	Subassembly for wall mounting	40071362390
RCM-AR remote indication flush-mounted	Component for installation in switch or cavity wall sockets according to DIN VDE 0606	40071362395

33 3-PM Module

In order to avoid the risk of power failures, it is necessary to permanently monitor the function of the general lighting light distributors in order to switch on the safety lighting in the event of a fault. The 3-PM modules are therefore an important part of the safety system.

If one phase fails, the 3-PM module switches a relay contact and interrupts the 24 V current loop (ACU terminals IN 1 to IN 8) to the emergency lighting units. All emergency lights in standby mode are switched to continuous light. A second relay contact (change-over contact 1,2,3) is used to signal the mains failure. E30 wiring of the 24V current loop is not required for installation across fire compartments, as the emergency lighting is automatically switched on in the event of a first fault in the 24V current loop of a suitably designed system in the event of an interruption or short circuit.

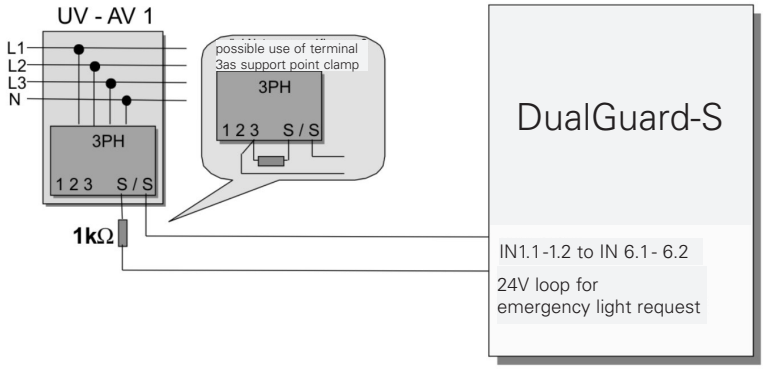
The easily accessible test button offers the advantage that an interruption of the mains voltage is not necessary to check the function of the voltage monitoring devices. As a rule, one of the monitored phases must be enabled without a test button, which at least leads to a failure of the power supply of the general lighting and thus to severe disturbances of the operational processes.

Technical description

Dimensions (W x H X D):	85 x 52 x 64 mm
Weight:	0,07 kg
Assembly:	Vertikal auf DIN-Schiene
Degree of protection:	IP20
Protection class:	II
Ambient temperature:	-5°C…+55°C
Storage temperature:	-20°C…+65°C
Relative humidity:	10…95%, no condensation
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3
Degree of pollution:	2
Overvoltage category:	III for Mains
Rated voltage:	264V
	220…240V AC
Power consumption:	2 W
Relay output:	
Switching voltage:	≤ 30 V DC/AC SELV
Rated current:	≤ 0,5A
Max. Short-circuit current:	≤ 5A
Switching shaft:	≤ 60% UN => OFF
Terminals Connection cross-sections:	0.2-2.5 mm² Rigid/ flexible
LED displays L1, L2, L3:	Grün = Keine Störung
Test button:	Zum Simulieren einer Netzstörung.

Ordering details

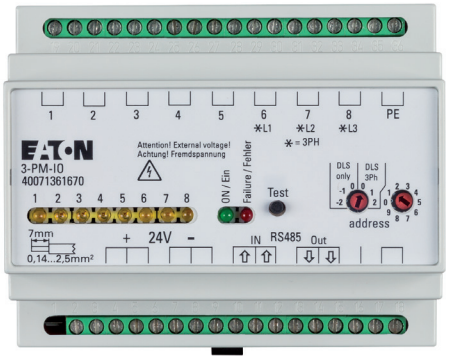
Type	Description	Order No.
3-PM Module	Phase monitor module for DIN rail mounting	40071361660



34 3-PM-IO Module

In order to avoid the risk of power failures, it is necessary to permanently monitor the function of the general lighting light distributors in order to switch on the safety lighting in the event of a fault. The 3-PM-IO modules are therefore an important part of the safety system. The safe functioning of the entire system must be constantly monitored and, in the event of faults, the system must switch on the safety lighting automatically. The results of both automatic and manual tests must be recorded. At the same time, safety luminaires should be switched on with the general lighting during normal operation. EATON´s 3-PM-IO modules offer all these functions in one device in compliance with standards.

The easily accessible test button offers the advantage that an interruption of the mains voltage is not necessary to check the function of the voltage monitoring devices. As a rule, one of the monitored phases must be enabled without a test button, which at least leads to a failure of the power supply of the general lighting and thus to severe disturbances of the operational processes.



IMPORTANT NOTE

Inputs 6 to 8 report a power failure which is forwarded to the visualisation (HMI, WEB, VisionGuard) with the destination specified in the test logbook. Inputs 1 to 5 are used to query the light switch for general lighting and do not signal a power failure.

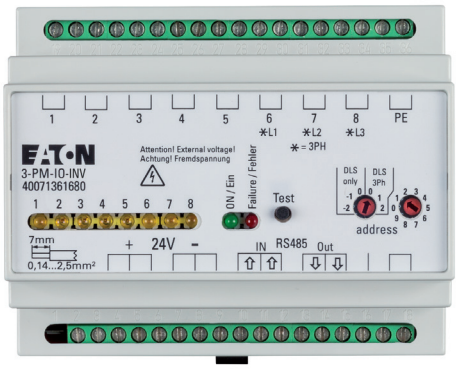
Technical description

Dimensions (W x H x D):	107 x 90 x 58 mm
Weight:	0,2 kg
Installation:	DIN Rail Snap on
Degree of protection:	IP20
Protection class:	II
Ambient temperature:	-10°C…+40°C
Storage temperature:	-20°C…+65°C
Relative humidity:	10%….95% no condensation
Air pressure:	795….1080 hPa
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3
Rated voltage Input (Mains):	UN = 220….240 V AC
Switching thresholds:	≤ 60% UN OFF
	≥ 85% UN ON
Rated voltage:	19.2….30 V DC
Rated current:	0,25A
Rated frequency:	50 or 60 Hz
Degree of pollution	2
Overvoltage category Input (Mains):	III
Overvoltage category 24V supply:	II
Rated insulation voltage:	264 V
Heat dissipation:	< 6.6 W
RS 485 Bus connection:	≤ 30 V SELV
Polarity:	Unabhängig
Bus Topologie:	Line
Cable Type:	Z.B. IY(ST)Y 4x2x0,8mm
Maximum cable lenght:	1200m
Terminating resistor:	120Ω (Durch Brücke an Klemme B1 B2 aktiv)
Terminals Connection cross-sections:	0.2-2.5 mm² rigid/flexible

Ordering details

Type	Description	Order No.
3-PM-IO Module	Phase monitor / light switch interrogation Bus module for DIN rail mounting	40071361670

35 3-PM-IO-INV Module



In order to avoid the risk of power failures, it is necessary to permanently monitor the function of the general lighting light distributors in order to switch on the safety lighting in the event of a fault. The 3-PM-IO-INV modules are therefore an important part of the safety system. The safe functioning of the entire system must be constantly monitored and, in the event of faults, the system must switch on the safety lighting automatically. The results of both automatic and manual tests must be logged. At the same time, emergency luminaires should be switched on with the general lighting during normal operation. EATON´s 3-PM-IO-INV modules offer all these functions in one device in compliance with standards. Deviating from the 3-PM-IO module, the 3-PM-IO-INV module offers inverted measuring inputs so that individual circuit breakers can be monitored with integrated signalling contacts.

The easily accessible test button offers the advantage that an interruption of the mains voltage is not necessary to check the function of the voltage monitoring devices. As a rule, one of the monitored phases must be enabled without a test button, which at least leads to a failure of the power supply of the general lighting and thus to severe disturbances of the operational processes.

IMPORTANT NOTE

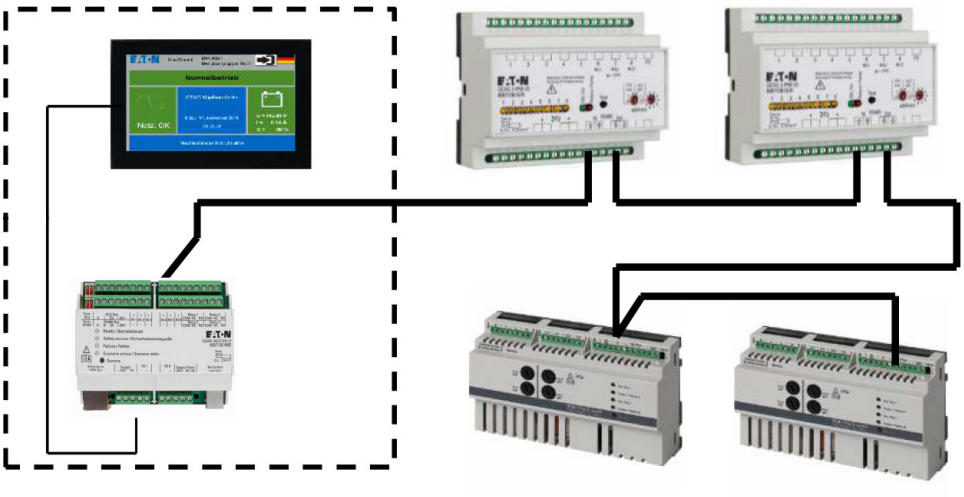
Inputs 6 to 8 report a power failure which is forwarded to the visualization (HMI, WEB, VisionGuard) with the destination specified in the test book. Inputs 1 to 5 are used to query the light switch for general lighting and do not signal a power failure.

Technical description

Dimensions (W x H x D):	107 x 90 x 58 mm
Weight:	0,2 kg
Installation:	DIN Rail Snap on
Degree of protection:	IP20
Protection class:	II
Ambient temperature:	-10°C…+40°C
Storage temperature:	-20°C…+65°C
Relative humidity:	10%….95% no condensation
Air pressure:	795….1080 hPa
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3
Rated voltage Input (Mains):	UN = 220….240 V AC
Switching thresholds:	≤ 60% UN OFF
	≥ 85% UN ON
Rated voltage:	19.2….30 V DC
Rated current:	0,25A
Rated frequency:	50 or 60 Hz
Degree of pollution	2
Overvoltage category Input (Mains):	III
Overvoltage category 24V supply:	II
Rated insulation voltage:	264 V
Heat dissipation:	< 6.6 W
RS 485 Bus connection:	≤ 30 V SELV
Polarity:	Indipendent
Bus Topologie:	Line
Cable type:	Z.B. IY(ST)Y 4x2x0,8mm
Maximum cable lenght:	1200m
Terminating resistor:	120Ω
Terminals Connection cross-sections:	0.2-2.5 mm² rigid/flexible

Ordering details

Type	Description	Order No.
3-PM-IO-INV Module	Phase monitor / light switch interrogation Bus module for DIN rails mounting with inverted inputs	40071361680



Bus connection 3-PM-IO, 3-PM-IO-INV and TLS module

An RS485 bus is wired for data communication with external bus modules.

The wires of the RS 485 bus line must be connected to the ACU terminal strip at the terminal points RS485 A, RS485 B, +24V OUT and-24V OUT.

NOTE!

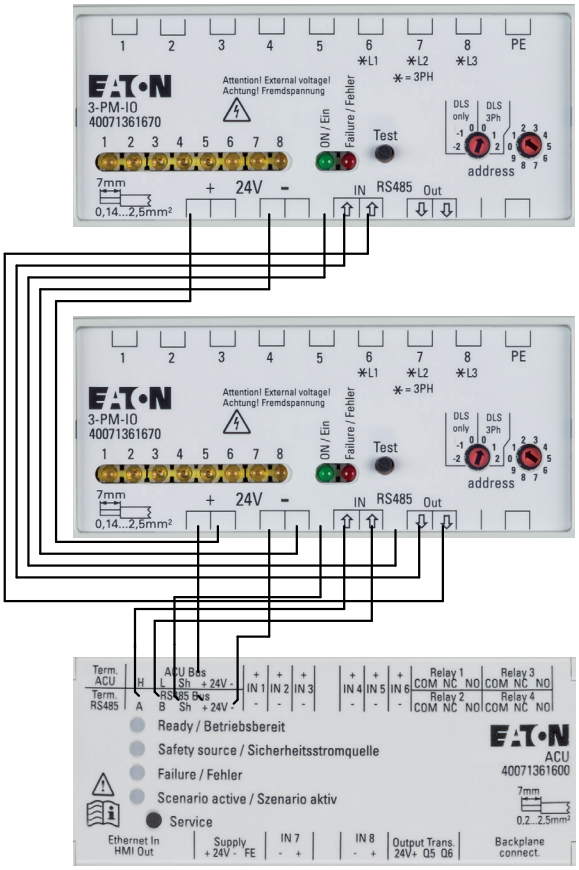
A parallel connection of data lines is not permitted and does not extend the permissible line length.

Wires within a shield can be connected in parallel to supply voltage to the modules.

The two lower DIL switches on the ACU module for the RS 485 bus must be set to „ON" at the beginning of the bus line to activate the 120 Ohm termination resistor.

ATTENTION!

Bus topology: linear, double terminated (no stub lines permitted). Cable type (minimum requirement): IY(ST)Y 4 x 2 x 0.8 mm (twisted pair, shielded) - the cable shield must be connected to the SE terminals of each module and must only be earthed in the DualGuard-S control cabinet. The cable cross-section required for the 24 V bus voltage depends on the cable length and the number of bus modules (Umin = 19 V DC). Only one pair of wires may be used as data cable within the shield- it is not permitted to bundle several data cables within one shielded cable! The 120 Ohm terminating resistor is integrated in the modules and can be activated by a bridge at terminals B1/B2.

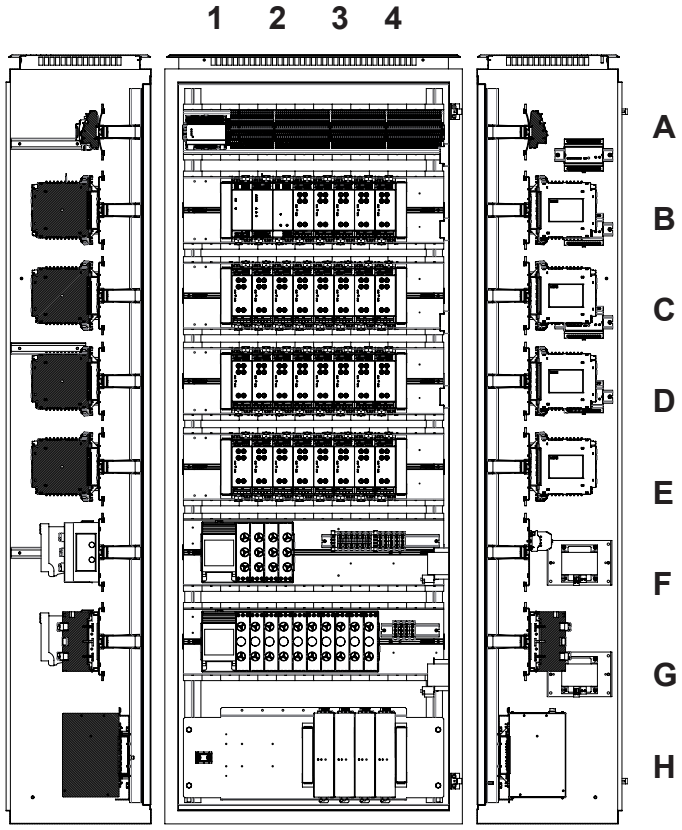


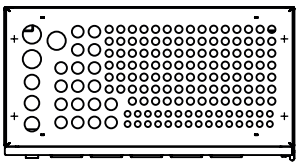
36 DualGuard-S 28

The DualGuard-S 28 in IP21 (IP31 optional) version with individual cable entry in accordance with EN 50171 is suitable for supplying up to 88 circuits for safety and escape sign luminaires 230V / 216V AC/DC in the power range up to 17.3KW. A configurable distribution board for mains and battery enables the connection of 1- and 3-phase sub-distributors of the type DualGuard US, DualGuard-S ESF30 and DualGuard-S SOU. The wiring system with rounded mounting panels does without classic cable ducts and, in combination with the natural ventilation and the large ventilation slots of the mounted modules, ensures a homogeneous control cabinet climate which has been proven by heating tests in accordance with EN 61439-1 under nominal load conditions. The clear, self-explanatory internal modular field structure, taking contact protection into account, rounds off the appearance.

The extensive catalogue of cabinet accessories such as special locks, door hinges right/left, cable glands, bases in various heights, IP31 retrofit kits and IP54 on request offers the right solution for most customer-specific requirements without long delivery times.

The colour touch display with automatic testing device and individual luminaire monitoring with individual status and name indication per luminaire in connection with system-bound ECG / LED supply module including monitoring module without additional data line reports and additionally proclaims the operating status of the external phase monitor modules, the insulation monitoring device as well as the battery strands and, if battery block monitoring technology is used, the operating status of each individual battery block.





Cable entry from above.

Roof plate with IP X1 dripping water protection foil and holes for:

30 x M16

99 x M20

18 x M32

3 x M40

3 x M50

ATTENTION!

The dripping water protection of the film is no longer guaranteed after the cables have been inserted without the appropriate cable gland.

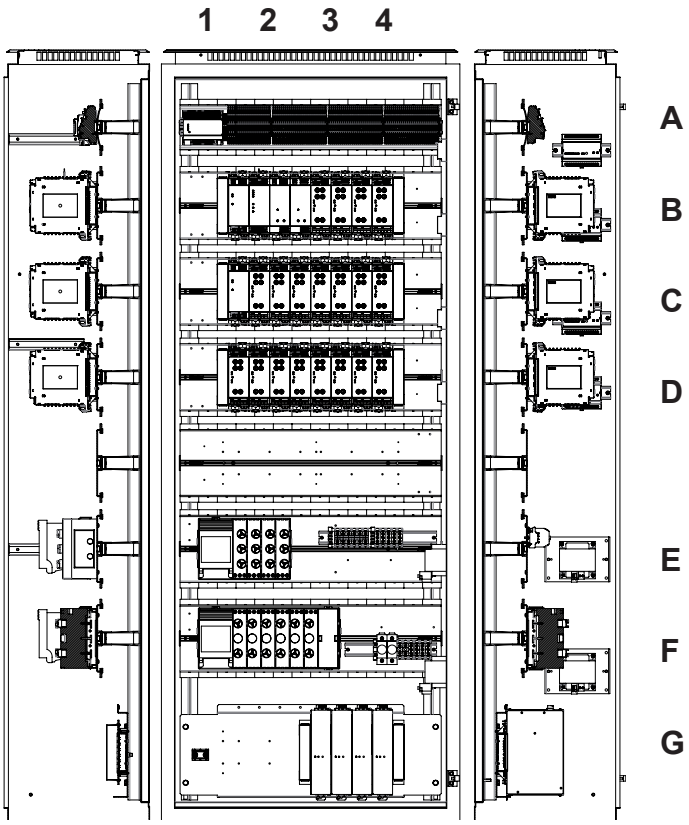
Technical description		Field
Dimensions (H x W x D):	2070 x 800 x 405 mm	
Colour:	RAL 7035	
Weight:	180 kg	
Assembly:	Only set up on non-combustible ground (e.g. concrete).	
Degree of protection:	IP21, optional IP31, on request IP54	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 400/230 V AC	
Rated current (Mains):	IN = 80 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN =80 A	
Rated Frequency:	50 or 60 Hz	
Overvoltage category:	Mains: III / Battery: II	
Max. connected load:	At +35°C < 17,3 KW	
Maximum numbers of modules:		
Controller ACU / HMI:	1/1	A1
PSU:	1-2	B2
BCM.1:	1	2
SKU.1.1 CG-S:		
1x6A	0-28	
2x3A	0-28	
4x1,5A	0-20	
Luminaire circuits:	0-88	
Charger CM 1,7A	1-2	B2
Charger CM 3,4A	0-8	H3-H4
Battery/mains distribution	0-6	
Terminals:		
Luminaire circuits:	4 mm² Rigid/flexible	A3-A4
BCM.1:	4 mm² Rigid/flexible	A1
ACU	2,5mm² Rigid/ 1,5mm² flexible	A1
Battery feed:	50 mm² Rigid/flexible	G1
Battery distribution:	16 mm² Rigid/flexible	G2
Mains feed:	50 mm² Rigid/flexible	F1
Mains distribution board:	16 mm² Rigid/flexible	F2
Order number accesories:		
Cupboard base 100mm	40071362282	
Cupboard base 200mm	40071362283	
Door hinge left	40071362301	
Special locking profile half cylinder	40037079790	
IP 31 Retrofit kit	40071362291	

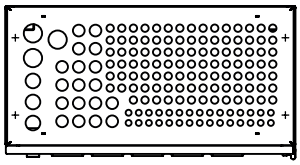
37 DualGuard-S 20

The DualGuard-S 20 in IP21 (IP31 optional) version with individual cable entry in accordance with EN 50171 is suitable for supplying up to 88 circuits for safety and escape sign luminaires 230V / 216V AC/DC in the power range up to 17.3KW. A configurable patch distributor for mains and battery enables the connection of 1- and 3-phase sub-distributors of the type DualGuard US, DualGuard-S ESF30 and DualGuard-S SOU. The wiring system with rounded mounting panels does without classic cable ducts and, in combination with the natural ventilation and the large ventilation slots of the mounted modules, ensures a homogeneous control cabinet climate which has been proven by heating tests in accordance with EN 61439-1 under nominal load conditions. The clear, self-explanatory internal modular field structure, taking contact protection into account, rounds off the appearance.

The extensive catalogue of cabinet accessories such as special locks, door hinges right/left, cable glands, bases in various heights, IP31 retrofit kits and IP54 on request offers the right solution for most customer-specific requirements without long delivery times.

The colour touch display with automatic testing device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and records the operating status of the external phase monitor modules, the insulation monitoring device as well as the battery strings and, if battery block monitoring technology is used, the operating status of each individual battery block.





Cable entry from above.

Roof plate with IP X1 dripping water protection foil and holes for:

30 x M16

99 x M20

18 x M32

3 x M40

3 x M50

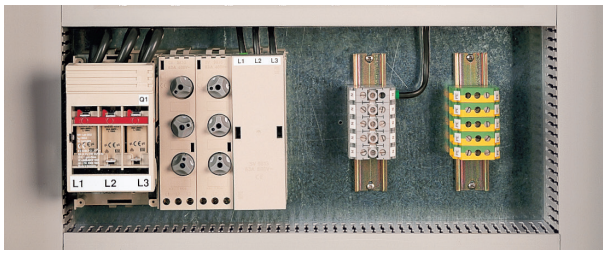
ATTENTION!

The dripping water protection of the film is no longer guaranteed after the cables have been inserted without the appropriate cable gland.

Technical description		Field
Dimensions (H x W x D):	2070 x 800 x 405 mm	
Colour:	RAL 7035	
Weight:	170 kg	
Assembly:	Only set up on non-combustible ground (e.g. concrete).	
Degree of protection:	IP21	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 400/230 V AC	
Rated current (Mains):	IN = 80 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN =80 A	
Rated Frequency:	50 or 60 Hz	
Overvoltage category:	Mains: III / Battery: II	
Max. connected load:	At +35°C < 17,3KW	
Maximum numbers of modules:		
Controller ACU / HMI:	1	A1
PSU:	1-2	B2
BCM.1:	1	B2
SKU.1.1 CG-S:		
1x6A	0-20	
2x3A	0-20	
4x1,5A	0-20	
Luminaire circuits:	0-88	
Charger CM 1,7A	1-2	B2
Charger CM 3,4A	0-8	G3-G4
Battery/mains distribution	0-6	
Terminals:		
Luminaire circuits:	4 mm² Rigid/flexible	A2-A4
BCM.1:	4 mm² Rigid/flexible	A1
ACU	2,5mm² Rigid/ 1,5mm² flexible	A1
Battery feed:	50 mm² Rigid/flexible	E1
Battery distribution:	16 mm² Rigid/flexible	F2-F3
Mains feed:	50 mm² Rigid/flexible	E1
Mains distribution board:	16 mm² Rigid/flexible	E2
Order number accesories:		
Cupboard base 100mm	40071362282	
Cupboard base 200mm	40071362283	
Door hinge left	40071362301	
Special locking profile half cylinder	40037079790	
IP 31 Retrofit kit	40071362291	

38 Connection distributor Mains

The mains power supply of the DualGuard-S 28 or DualGuard-S 20 is provided via a modular mains connection distributor. The distributor contains a size 00C switch-disconnector with a maximum connection cross-section of 50 mm² and enables the connection of up to 6 substations to modular size D02-E18 outgoing distribution boxes and the associated terminals for the neutral and earth conductors. In the case of outgoing feeders to powerful substations, the same outgoing network distributors can also be used in three phases (then connection of max. 2 substations). The components are simply plugged on from the front and securely contacted.



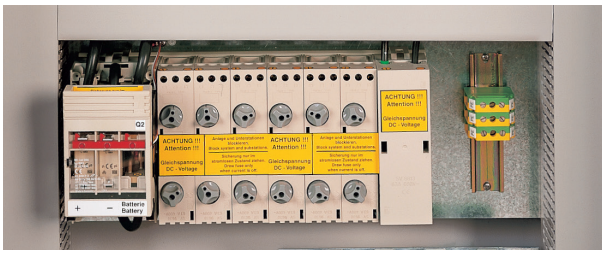
Name:	Data:	Pos.
Assembly:	On busbar	
Degree of protection:	IP20	
Protection class:	I	
Ambient temperature:	55°C	
Rated voltage (Mains):	UN = 400/230 V AC	
Rated current (Mains):	IN = 63 A	
Rated Frequency:	50 or 60 Hz	
Maximum number of outgoing distributors modules	6	
Module	50 mm² Rigid/flexible	
Terminals Connection cross-sections Mains feed:	16 mm² Rigid/flexible	
Terminals Connection cross-sections Mains Distribuiton:	III for Mains	

Ordering details

Type	Description	Order No.
Outgoing distribution module Mains for busbar mounting	Incl. 3 pieces screw caps E18 and 3 pieces D02-fuse links 25A	40071347160
Busbar cover profile	Cover profile in module width for clip mounting to the bottom tray profile	40071347192

39 Connection distributor Battery

The battery power supply of the DualGuard-S 28 or DualGuard-S 20 is provided by a modular battery connection distributor. The distributor contains a size 00C switch-disconnector with a maximum connection cross-section of 50 mm² and enables the connection of up to 6 substations to modular size D02-E18 battery outgoing distributors and the associated terminals for the earth conductors. The components are simply plugged on from the front and securely contacted.



Name:	Data:	Pos.
Assembly:	On busbar	
Degree of protection:	IP20	
Protection class:	I	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN =63 A	
Maximum number of outgoing distributors modules	6	
Module	50 mm² Rigid/flexible	
Terminals Connection cross-sections Mains feed:	16 mm² Rigid/flexible	
Terminals Connection cross-sections Mains Distribuiton:	50 mm² Rigid/flexible	

Ordering details

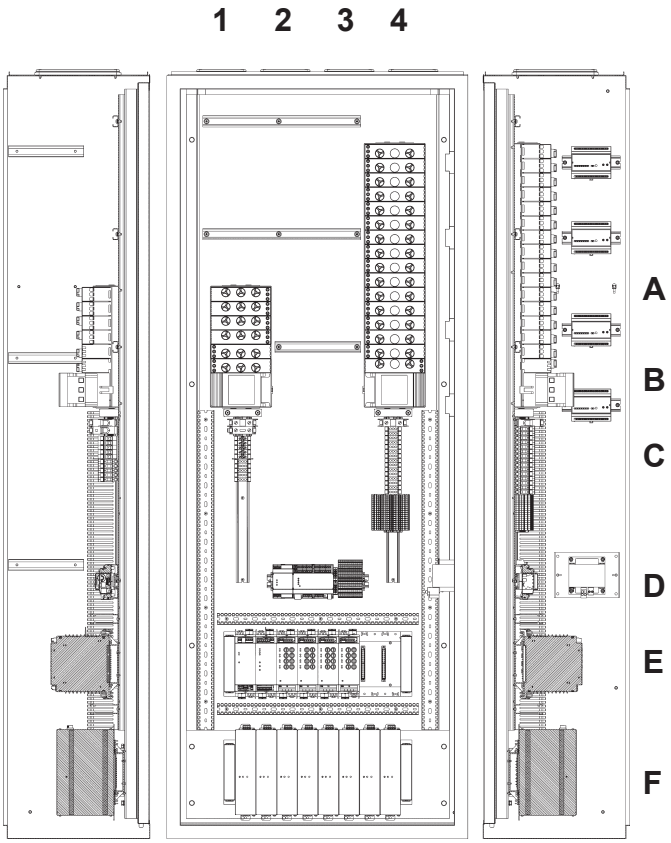
Type	Description	Order No.
Outgoing distribution module Battery for busbar mounting	Incl. 2 pieces screw caps E18 and 3 pieces D02-fuse links 25A	40071347161
Busbar cover profile	Cover profile in module width for clip mounting to the bottom tray profile	40071347192

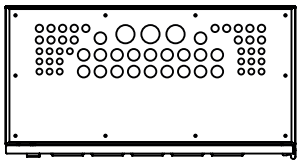
40 DualGuard-S LAD 100

The DualGuard-S LAD 100 in IP21 (IP31 optional, IP54 on request) version with individual cable entry in accordance with EN 50171 is suitable for supplying up to 16 circuits for safety and escape sign luminaires 230V / 216V AC/DC in the power range up to 21.6KW. A configurable distribution board for mains and battery enables the connection of 1- and 3-phase sub-stations of the type DualGuard US, DualGuard-S ESF30 and DualGuard-S SOU. The wiring system with rounded mounting panels does without classic cable ducts and, in combination with the natural ventilation and the large ventilation slots of the mounted modules, ensures a homogeneous control cabinet climate which has been proven by heating tests in accordance with EN 61439-1 under nominal load conditions. The clear, self-explanatory internal modular field structure, taking contact protection into account, rounds off the appearance..

The extensive catalogue of cabinet accessories such as special locks, door hinges right/left, cable glands, bases in various heights, IP31 retrofit kits and IP54 on request offers the right solution for most customer-specific requirements without long delivery times.

The colour touch display with automatic testing device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and records the operating status of the external phase monitor modules, the insulation monitoring device as well as the battery strings and, if battery block monitoring technology is used, the operating status of each individual battery block.





Cable entry from above.

Roof plate with IP X1 dripping water protection foil and holes for:

19 x M16

17 x M20

20 x M32

3 x M50

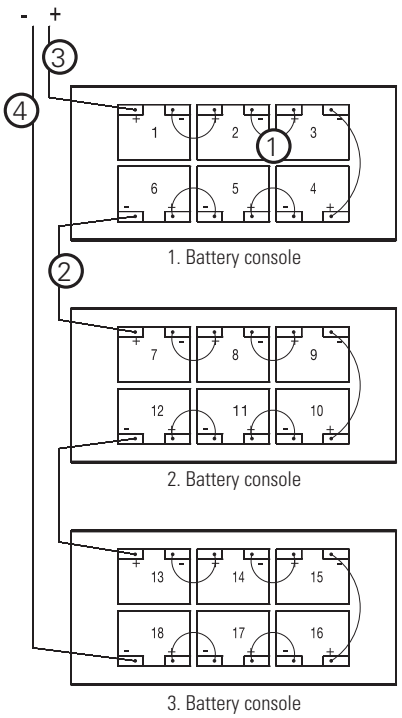
ATTENTION!

The dripping water protection of the film is no longer guaranteed after the cables have been inserted without the appropriate cable gland.

Technical description		**Field**
Dimensions (H x W x D):	2040 x 800 x 405 mm	
Colour:	RAL 7035	
Weight:	170 kg	
Assembly:	Only set up on non-combustible ground (e.g. concrete).	
Degree of protection:	IP21, optional IP31, on request IP54	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 400/230 V AC	
Rated current (Mains):	IN = 100 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN =100 A	
Rated Frequency:	50 or 60 Hz	
Overvoltage category:	Mains: III / Battery: II	
Max. Wärmeverlustleistung:	At +35°C < 21,6 KW	
Maximum numbers of modules:		
Controller ACU / HMI:	1	D2
PSU:	1-2	E1
BCM.1:	1	E2
SKU.1.1 CG-S:		
1x6A	0-3	
2x3A (one module installed ex works as standard)	1-4	
4x1,5A	0-3	
Luminaire circuits:	16	
Charger CM 1,7A	0-1	E3
Charger CM 3,4A	0-8	F1-4
Terminals:		
Luminaire circuits:	4 mm² Rigid / 4 mm² flexible	D4
BCM.1:	4 mm² Rigid / 4 mm² flexible	D4
ACU	2,5mm² Rigid / 1,5mm² flexible	D2-D3
Battery feed:	50 mm² Rigid / 50 mm² flexible	B4
Battery distribution:	16 mm² Rigid / 16 mm² flexible	A4
Mains feed:	50 mm² Rigid / 50 mm² flexible	B1
Mains distribution board:	16 mm² Rigid / 16 mm² flexible	A1
Order number accesories:		
Cupboard base 100mm	40071362282	
Cupboard base 200mm	40071362283	
Door hinge left	40071362301	
Special locking profile half cylinder	40037079790	
IP 31 Retrofit kit	40071362296	

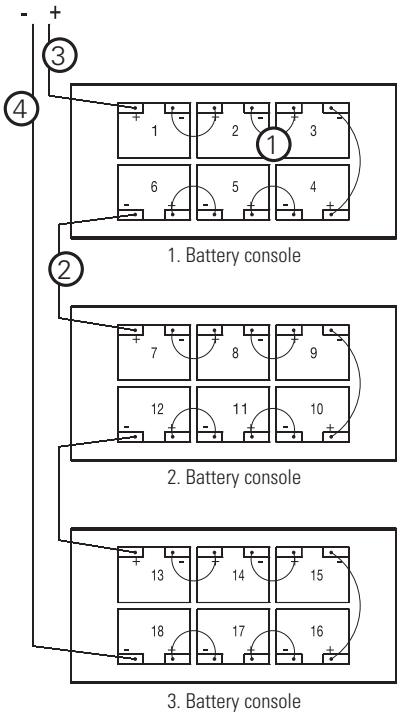
16Ah Battery wiring standing cabinet

Technical description	
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 16 Ah
Nominal battery voltage of all connected cells	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	181,5 x 76,5 x 167,5
End poles	M5
Order Number battery block:	40066071593
Dimensions Battery cabinet in mm (B x H x D):	800 x 2050 x 400
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	221 kg
Degree of protection:	IP21
Order Number wiring set:	40071362067
15 x Length 1:	300 mm
2 x Length 2:	1000 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



23,3 Ah Battery wiring standing cabinet

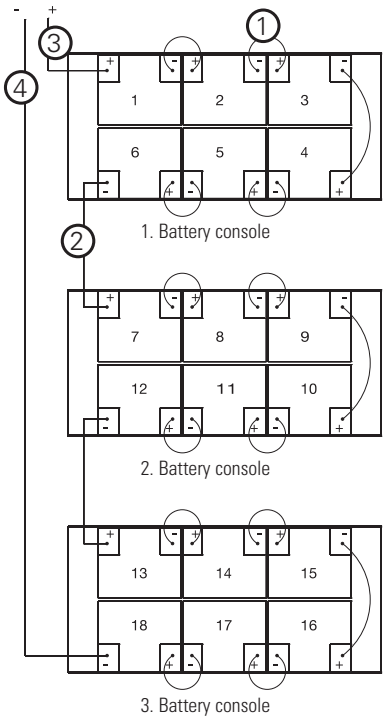
Technical description	
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 23,3 Ah
Nominal battery voltage of all connected cells	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	168 x 127 x 174
End poles	M6
Order Number battery block:	40066070461
Dimensions Battery cabinet in mm (B x H x D):	800 x 2030 x 405
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	295 kg
Degree of protection:	IP21
Order Number wiring set:	40071346779
15 x Length 1:	300 mm
2 x Length 2:	1000 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



32 Ah Battery wiring standing cabinet

Technical description

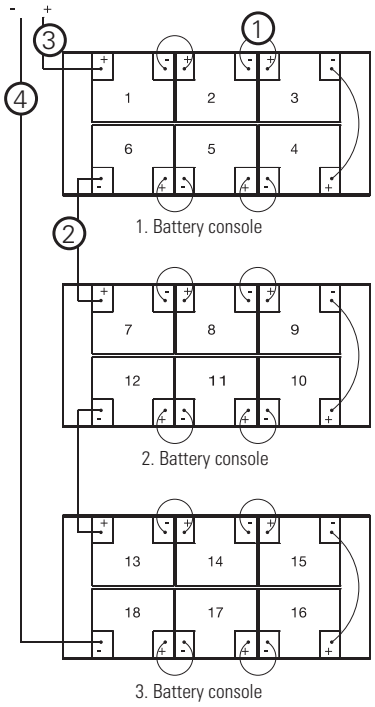
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 32 Ah
Nominal battery voltage of all connected cells	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	198 x 168 x 175
End poles	M6
Order Number battery block:	40066070116
Dimensions Battery cabinet in mm (B x H x D):	800 x 2030 x 405
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	370 kg
Degree of protection:	IP21
Order Number wiring set:	40071346779
15 x Length 1:	300 mm
2 x Length 2:	1000 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



39,8 Ah Battery wiring standing cabinet

Technical description

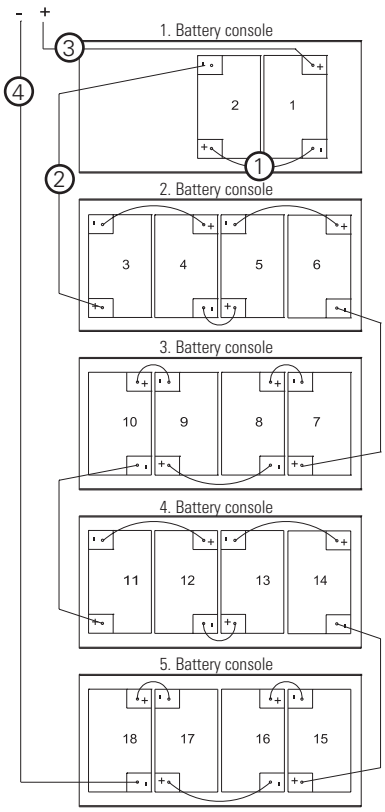
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 39,8 Ah
Nominal battery voltage of all connected cells	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	200 x 169 x 176
End poles	M6
Order Number battery block:	40066041395
Dimensions Battery cabinet in mm (B x H x D):	800 x 2030 x 405
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	388 kg
Degree of protection:	IP21
Order Number wiring set:	40071346779
15 x Length 1:	300 mm
2 x Length 2:	1000 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



50,4 Ah Battery wiring standing cabinet

Technical description

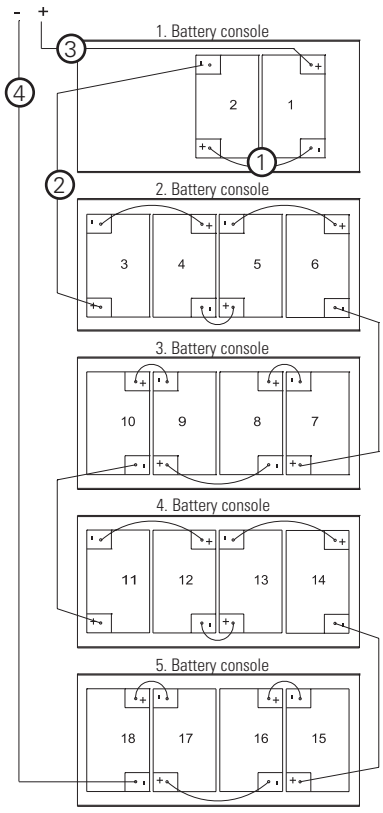
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 50,4 Ah
Nominal battery voltage of all connected cells	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	220 x 172 x 235
End poles	M6
Order Number battery block:	40066070917
Dimensions Battery cabinet in mm (B x H x D):	800 x 2030 x 405
Battery consoles:	5
Terminals:	max. 35 mm²
Weight incl. batteries:	495 kg
Degree of protection:	IP21
Order Number wiring set:	40071347446
13 x Length 1:	360 mm
4 x Length 2:	800 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



53,7 Ah Battery wiring standing cabinet

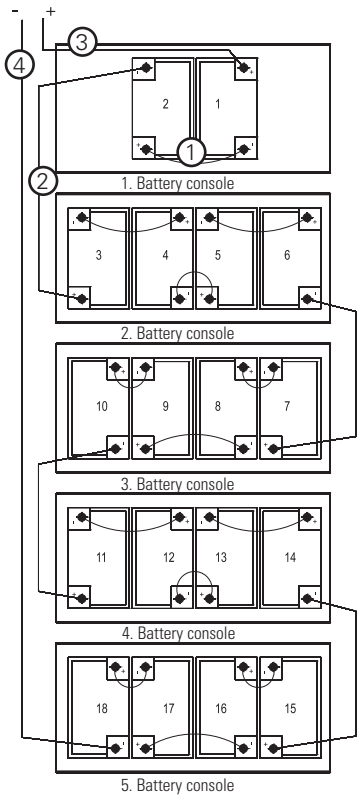
Technical description

Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 53,7 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	220 x 172 x 235
End poles	M6
Order Number battery block:	40066070901
Dimensions per block in mm (L x W x H):	800 x 2030 x 405
Battery consoles:	5
Terminals:	max. 35 mm²
Weight incl. batteries:	549 kg
Degree of protection:	IP21
Order Number wiring set:	40071347446
13 x Length 1:	360 mm
4 x Length 2:	800 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



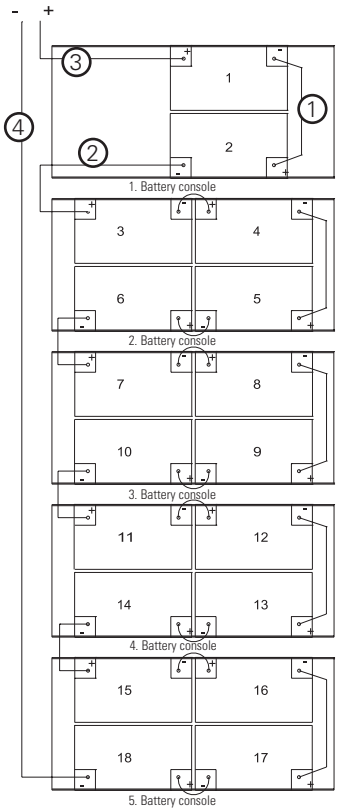
66,2 Ah Battery wiring standing cabinet

Technical description	
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 66,2 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	260,5 x 171 x 239
End poles	M6
Order Number battery block:	40066070902
Dimensions per block in mm (L x W x H):	800 x 2030 x 405
Battery consoles:	5
Terminals:	max. 35 mm²
Weight incl. Batteries:	672 kg
Degree of protection:	IP21
Order Number wiring set:	40071346778
13 x Length 1:	440 mm
4 x Length 2:	800 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



85,7 Ah Battery wiring standing cabinet

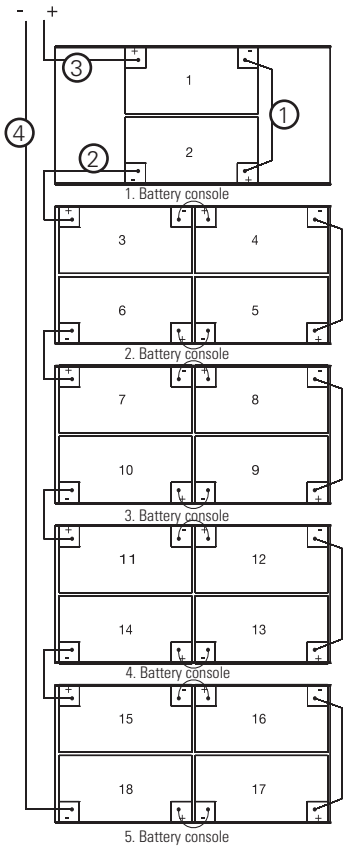
Technical description	
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 85,7 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	309 x 172 x 239
End poles	M8
Order Number battery block:	40066070918
Dimensions per block in mm (L x W x H):	800 x 2030 x 405
Battery consoles:	5
Terminals:	max. 35 mm²
Weight incl. Batteries:	685 kg
Degree of protection:	IP21
Order Number wiring set:	40071360230
13 x Length 1:	350 mm
4 x Length 2:	800 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



89,4 Ah Battery wiring standing cabinet

Technical description

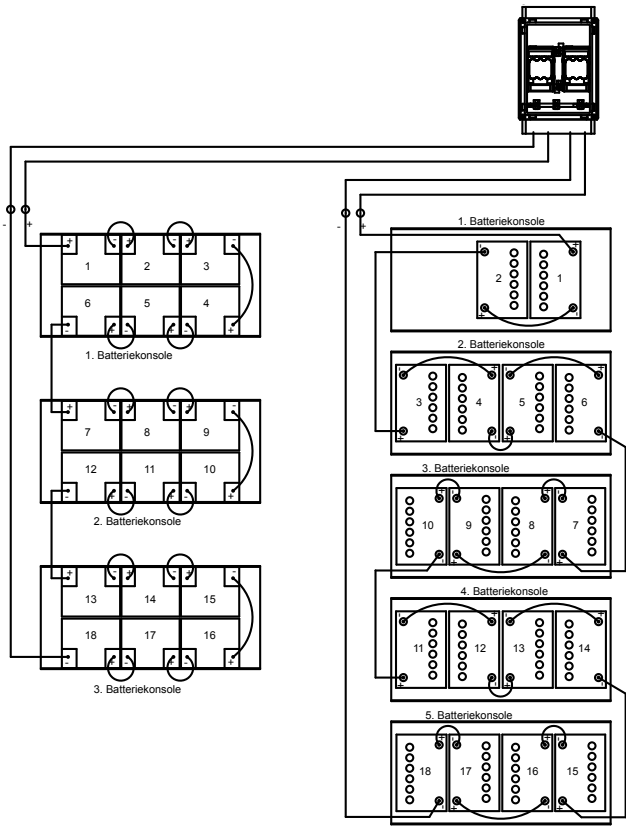
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 89,4 Ahc
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	307,5 x 171 x 239
End poles	M6
Order Number battery block:	40066070821
Dimensions per block in mm (L x W x H):	800x2030x405
Battery consoles:	5
Terminals:	max. 35 mm²
Weight incl. batteries:	750 kg
Degree of protection:	IP21
Order Number wiring set:	40071360230
13 x Length 1:	350 mm
4 x Length 2:	800 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



106 Ah Battery wiring standing cabinet

Technical description

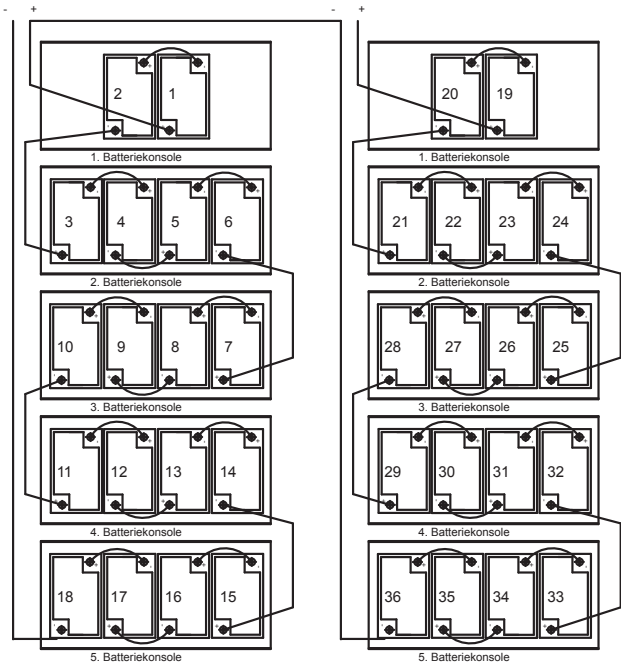
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 106 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	2 x 18 á 12 V
Dimensions per block in mm (L x W x H):	200 x 169 x 176 (39,8 Ah)
	260,5 x 171 x 239 (66,2 Ah)
End poles	M6
Order Number battery block 39,8A Ah:	40066041395
Order Number battery block 66,2A Ah:	40066070902
Dimensions 2 x battery blocks in mm (B x H x D):	800 x 2030 x 405
Battery consoles:	5
Terminals:	max. 35 mm²
Weight incl. batteries:	1060 kg
Degree of protection:	IP21
Order Number wiring set: 39,8Ah:	40071346 778
13 x Length 1:	350 mm
4 x Length 2:	800 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm
Order Number wiring set: 66,2Ah:	40071346779
15 x Length 5:	300 mm
2 x Length 6:	1000 mm
1 x Length 7:	800 mm
1 x Length 8:	2000 mm



118 Ah Battery wiring standing cabinet

Technical description

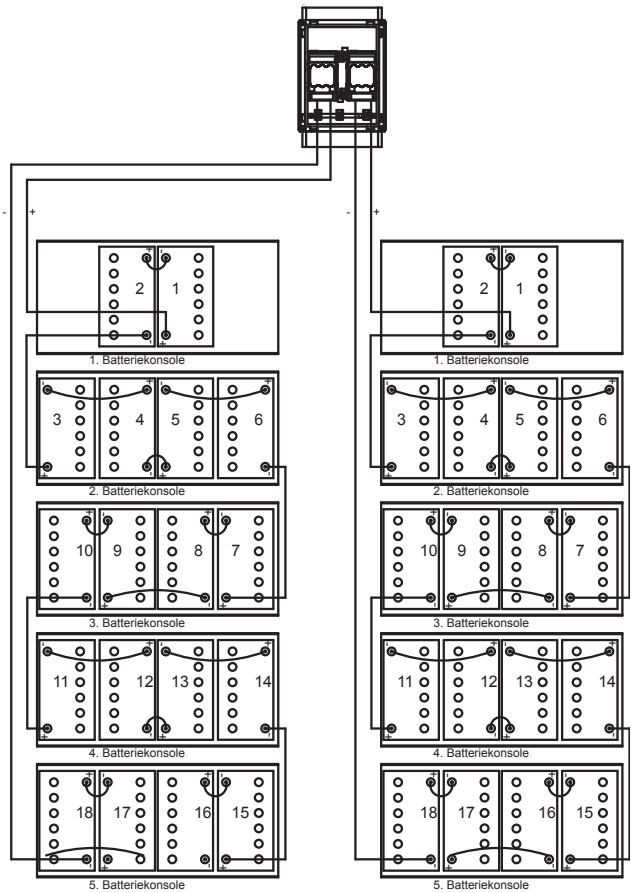
Battery type (C10; 1,8 V/Z; +20 °C):	6 V / 118 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	36 á 6 V
Dimensions per block in mm (L x W x H):	800x2030x405
End poles	M6
Order Number battery block 118A Ah:	40066070466
Dimensions 2 x battery blocks in mm (B x H x D):	800 x 2050 x 400 (per cabinet)
Battery consoles:	5
Terminals:	max. 35 mm²
Weight incl. batteries:	1200 kg
Degree of protection:	IP21
Order Number wiring set: 118 Ah:	40071346775
26 x Length 1:	350 mm
8 x Length 2:	800 mm
2 x Length 3:	800 mm
2 x Length 4:	2000 mm



143,1 Ah Battery wiring standing cabinet

Technical description

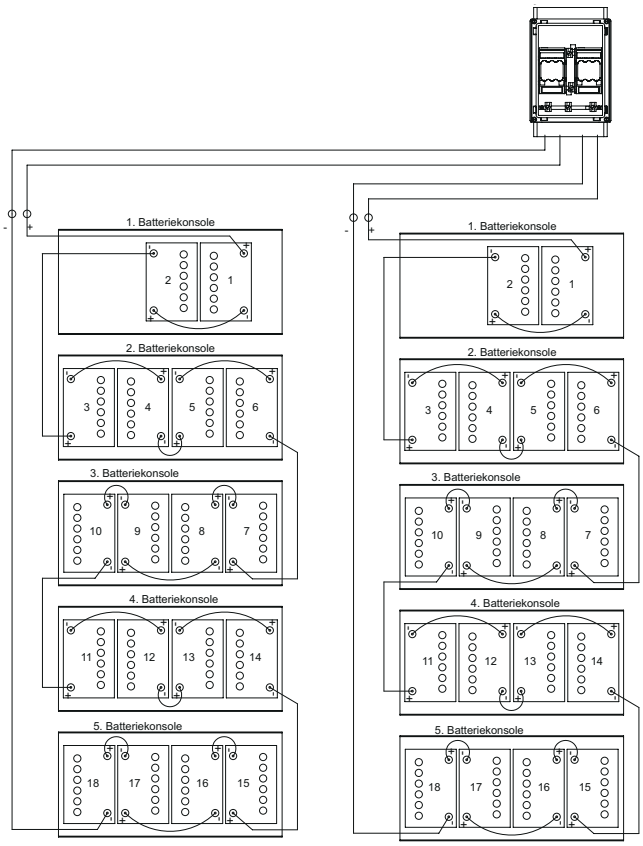
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 143,1 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	2 x 18 á 12 V
Dimensions per block in mm (L x W x H):	220 x 172 x 235 (53,7 Ah)
	307,5 x 171 x 239 (89,4 Ah)
End poles	M6
Order Number battery block 53,7A Ah:	40066070901
Order Number battery block 89,4A Ah:	40066070821
Dimensions 2 x battery blocks per cabinet in mm (B x H x D):	800 x 2030 x 405
Battery consoles:	5
Terminals:	max. 35 mm²
Weight incl. batteries:	1300 kg
Degree of protection:	IP21
Order Number wiring set: 53,7Ah:	40071347446
13 x Length 1:	360 mm
4 x Length 2:	800 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm
Order Number wiring set: 89,4Ah:	40071360230
13 x Length 5:	350 mm
4 x Length 6:	800 mm
1 x Length 7:	800 mm
1 x Length 8:	2000 mm



155,6 Ah Battery wiring standing cabinet

Technical description

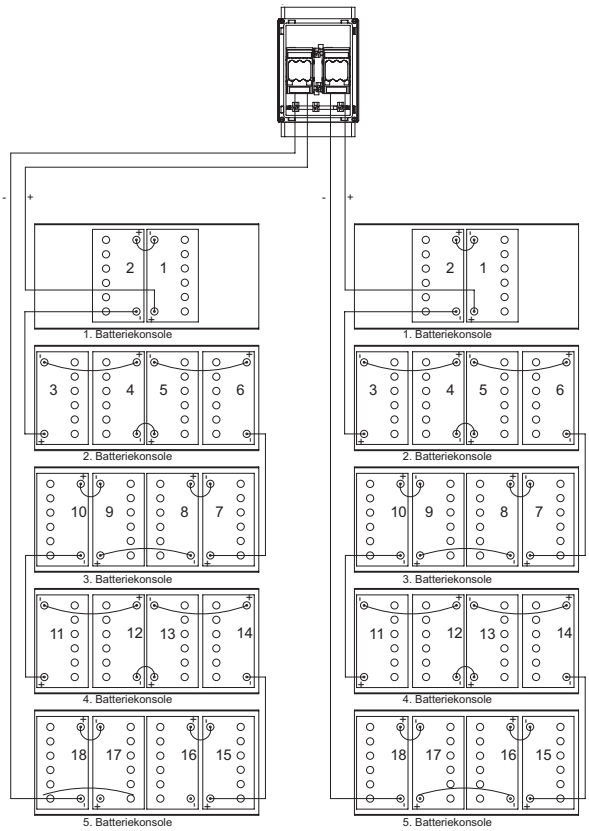
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 155,6 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	2 x 18 á 12 V
Dimensions per block in mm (L x W x H):	260,5 x 171 x 239 (66,2 Ah)
	307,5 x 171 x 239 (89,4 Ah)
End poles	M6
Order Number battery block 53,7A Ah:	40066070902
Order Number battery block 89,4A Ah:	40066070821
Dimensions 2 x battery blocks per cabinet in mm (B x H x D):	800 x 2030 x 405
Battery consoles:	5
Terminals:	max. 35 mm²
Weight incl. batteries:	1422 kg
Degree of protection:	IP21
Order Number wiring set: 53,7Ah:	40071346778
13 x Length 1:	440 mm
4 x Length 2:	800 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm
Order Number wiring set: 89,4Ah:	40071360230
13 x Length 5:	350 mm
4 x Length 6:	800 mm
1 x Length 7:	800 mm
1 x Length 8:	2000 mm



178,8 Ah Battery wiring standing cabinet

Technical description

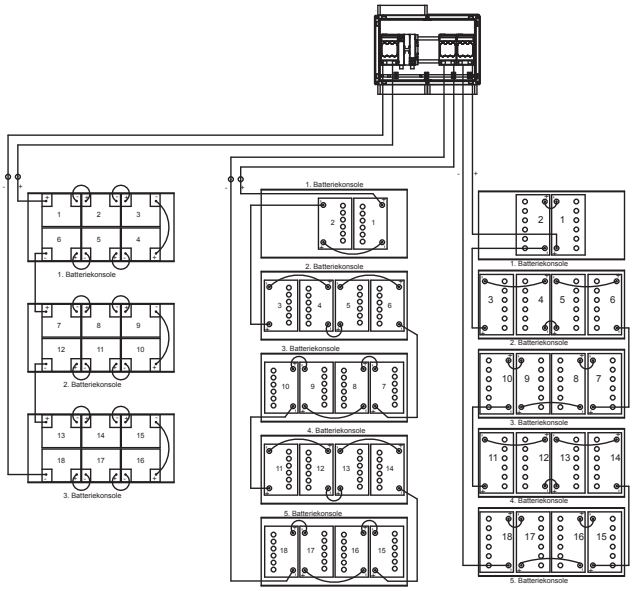
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 178,8 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	2 x 18 á 12 V
Dimensions per block in mm (L x W x H):	307,5 x 171 x 239 (89,4 Ah)
End poles	M6
Order Number battery block 89,4A Ah:	40066070821
Dimensions 2 x battery blocks per cabinet in mm (B x H x D):	800 x 2030 x 405
Battery consoles:	5
Terminals:	max. 35 mm²
Weight incl. batteries:	1500 kg
Degree of protection:	IP21
2 x Order Number wiring set: 89,4Ah:	40071360230
13 x Length 5:	350 mm
4 x Length 6:	800 mm
1 x Length 7:	800 mm
1 x Length 8:	2000 mm



195,4 Ah Battery wiring standing cabinet

Technical description

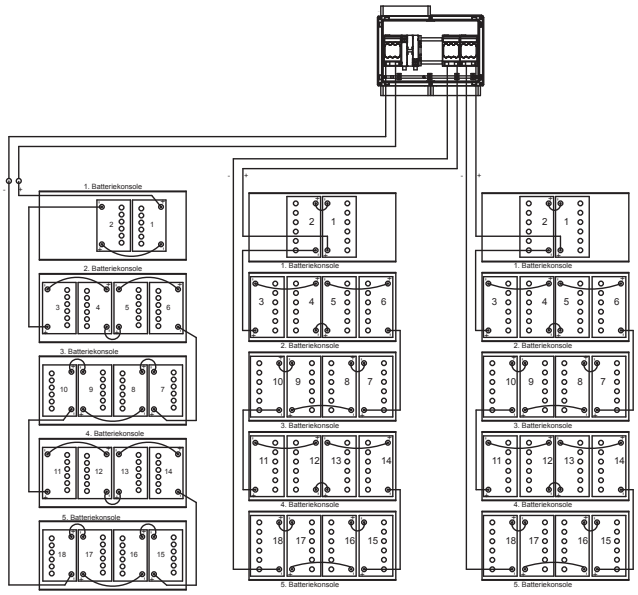
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 195,4 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	2 x 18 á 12 V
Dimensions per block in mm (L x W x H):	200 x 169 x 176 (39,8 Ah)
	260,5 x 171 x 239 (66,2 Ah)
	307,5 x 171 x 239 (89,4 Ah)
End poles	M6
Order Number battery block 39,8A Ah:	40066041395
Order Number battery block 66,2A Ah:	40066070902
Order Number battery block 89,4A Ah:	40066070821
Dimensions 3 x battery cabinets per cabinet in mm (W x H x D):	800 x 2030 x 405
Battery consoles:	2 x 5, 1 x 3
Terminals:	max. 35 mm²
Weight incl. batteries:	1810 kg
Degree of protection:	IP20
Order Number wiring set: 39,8Ah:	40071346778
13 x Length 1:	350 mm
4 x Length 2:	800 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm
Order Number wiring set: 66,2Ah:	40071346779
15 x Length 5:	300 mm
2 x Length 6:	1000 mm
1 x Length 7:	800 mm
1 x Length 8:	2000 mm
Order Number wiring set: 89,4Ah:	40071360230
13 x Length 5:	350 mm
4 x Length 6:	800 mm
1 x Length 7:	800 mm
1 x Length 8:	2000 mm



245 Ah Battery wiring standing cabinet

Technical description

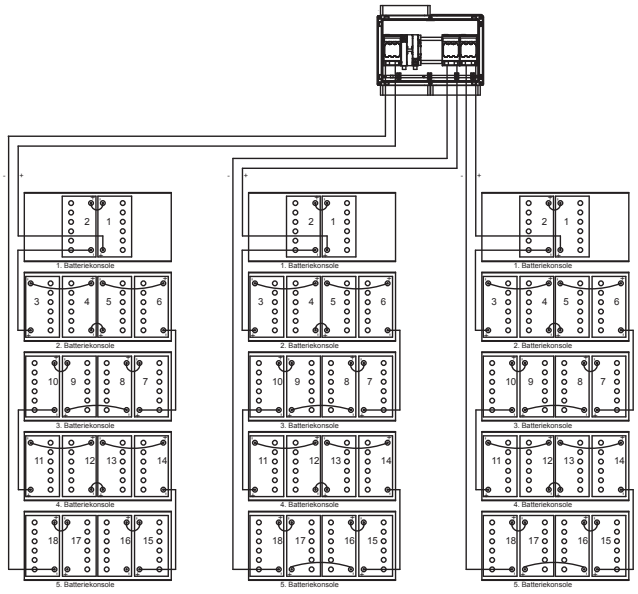
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 245 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	2 x 18 á 12 V
Dimensions per block in mm (L x W x H):	260,5 x 171 x 239 (66,2 Ah)
	307,5 x 171 x 239 (89,4 Ah)
End poles	M6
Order Number battery block 66,2A Ah:	40066070902
Order Number battery block 89,4A Ah:	40066070821
Dimensions 3 x battery cabinets per cabinet in mm (W x H x D):	800 x 2030 x 405
Battery consoles:	2 x 5, 1 x 3
Terminals:	max. 35 mm²
Weight incl. batteries:	2172 kg
Degree of protection:	IP21
Order Number wiring set: 66,2Ah:	40071346778
13 x Length 1:	440 mm
4 x Length 2:	800 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm
2 x Order Number wiring set: 89,4Ah:	40071360230
13 x Length 5:	350 mm
4 x Length 6:	800 mm
1 x Length 7:	800 mm
1 x Length 8:	2000 mm



268,2 Ah Battery wiring standing cabinet

Technical description

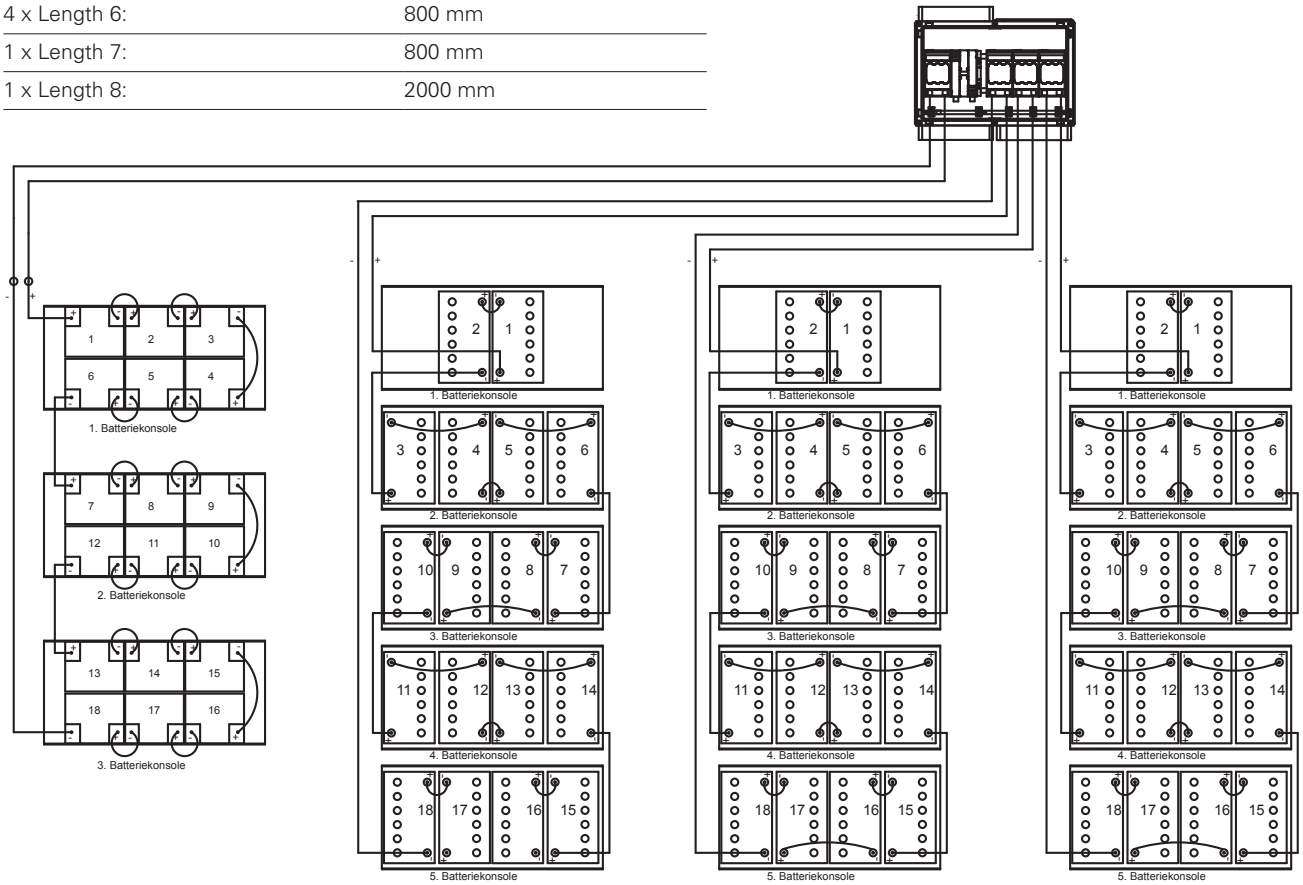
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 268,2 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	3 x 18 á 12 V
Dimensions per block in mm (L x W x H):	307,5 x 171 x 239 (89,4 Ah)
End poles	M6
Order Number battery block 89,4A Ah:	40066070821
Dimensions 3 x battery cabinets per cabinet in mm (W x H x D):	800 x 2030 x 405
Battery consoles:	5
Terminals:	max. 35 mm²
Weight incl. batteries:	2250 kg
Degree of protection:	IP21
3 x Order Number wiring set: 89,4Ah:	40071360230
13 x Length 5:	350 mm
4 x Length 6:	800 mm
1 x Length 7:	800 mm
1 x Length 8:	2000 mm



308 Ah Battery wiring standing cabinet

Technical description

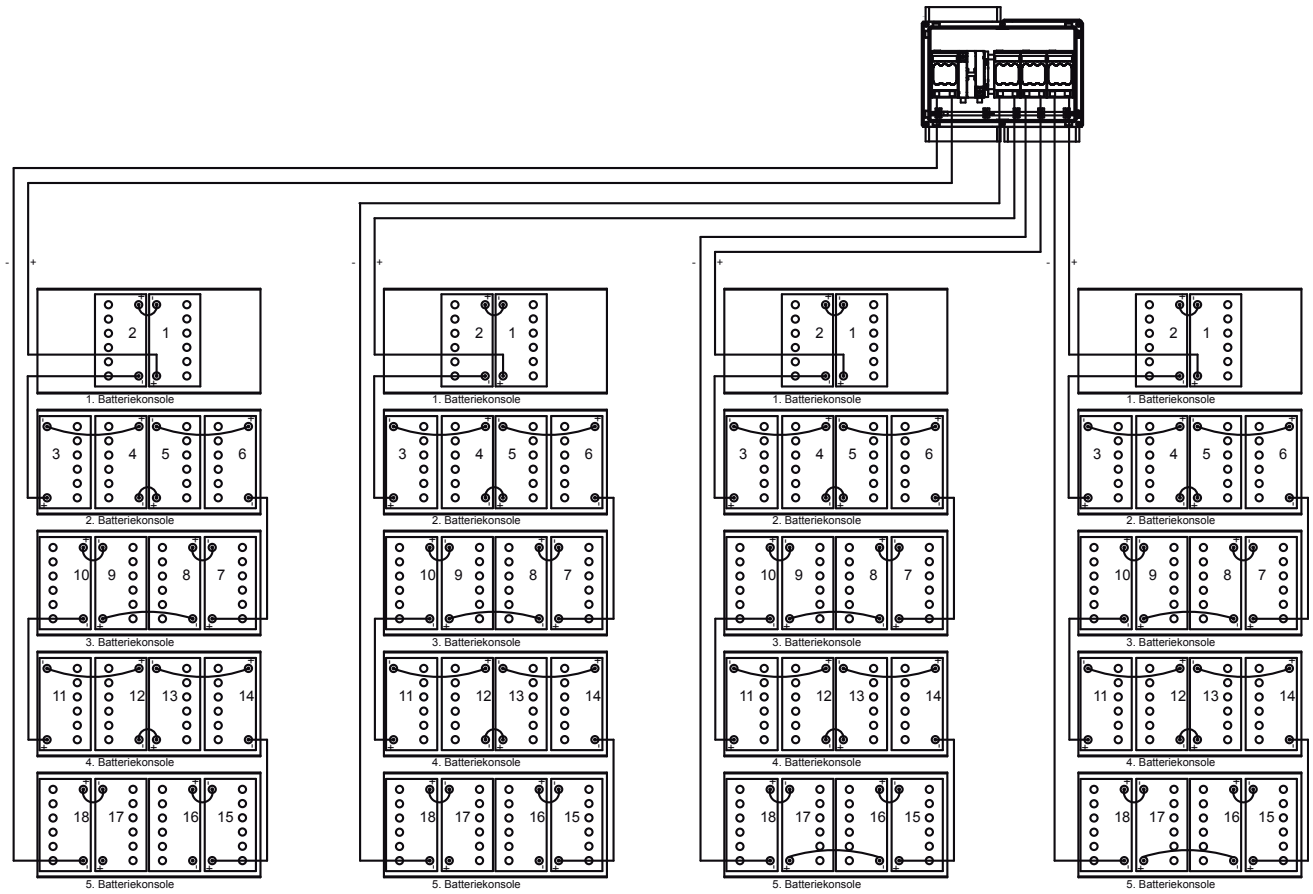
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 308 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	4 x 18 á 12 V
Dimensions per block in mm (L x W x H):	200 x 169 x 176 (18 x 39,8 Ah)
	307,5 x 171 x 239 (54 x 89,4 Ah)
End poles	M6
Order Number battery block 39,8A Ah:	40066041395
Order Number battery block 89,4A Ah:	40066070821
Dimensions 4 battery cabinets per cabinet in mm (W x H x D):	800 x 2030 x 405
Battery consoles:	5
Terminals:	max. 35 mm²
Weight incl. batteries:	3000 kg
Degree of protection:	IP21
Order Number wiring set: 39,8Ah:	40071346779
13 x Length 1:	350 mm
4 x Length 2:	800 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm
3 x Order Number wiring set: 89,4Ah:	40071360230
13 x Length 5:	350 mm
4 x Length 6:	800 mm
1 x Length 7:	800 mm
1 x Length 8:	2000 mm



357,6 Ah Battery wiring standing cabinet

Technical description

Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 357,6 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	3 x 18 á 12 V
Dimensions per block in mm (L x W x H):	307,5 x 171 x 239 (89,4 Ah)
End poles	M6
Order Number battery block 89,4A Ah:	40066070821
Dimensions 4 battery cabinets per cabinet in mm (W x H x D):	800 x 2030 x 405
Battery consoles:	5
Terminals:	max. 35 mm²
Weight incl. batteries:	2250 kg
Degree of protection:	IP21
4 x Order Number wiring set: 89,4Ah:	40071360230
13 x Length 5:	350 mm
4 x Length 6:	800 mm
1 x Length 7:	800 mm
1 x Length 8:	2000 mm

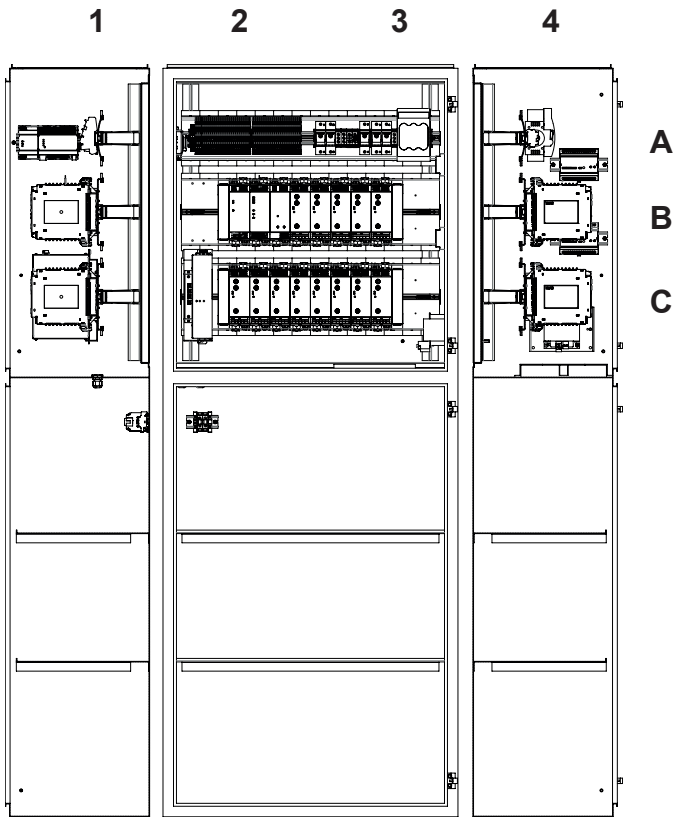


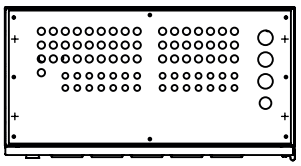
41 DualGuard-S 12C

The DualGuard-S 12C in IP21 (IP31 optional) version with individual cable entry in accordance with EN 50171 is suitable for supplying up to 48 circuits for safety and escape sign luminaires 230V / 216V AC/DC in the power range up to 7.5KW. A shunting feeder for mains and battery enables the connection of a sub-station of type DualGuard US, DualGuard-S ESF30 and DualGuard-S SOU. The wiring system with rounded mounting fields does without classic cable ducts and, in combination with the natural ventilation and the large ventilation slots of the mounted modules, ensures a homogeneous control cabinet climate which has been proven by heating tests in accordance with EN 61439-1 under nominal load conditions. The clear, self-explanatory internal modular field structure, taking contact protection into account, rounds off the appearance.

The extensive catalogue of cabinet accessories such as special locks, door hinges right/left, cable entries, bases in various heights, IP31 retrofit kits and IP54 on request offers the right solution for most customer-specific requirements without long delivery times.

The colour touch display with automatic testing device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and records the operating status of the external phase monitor modules, the insulation monitoring device as well as the battery strings and, if battery block monitoring technology is used, the operating status of each individual battery block.





Cable entry from above.

Roof plate with IP X1 dripping water protection foil and holes for:

28 x M16

49 x M20

1 x M32

3 x M40

ATTENTION!

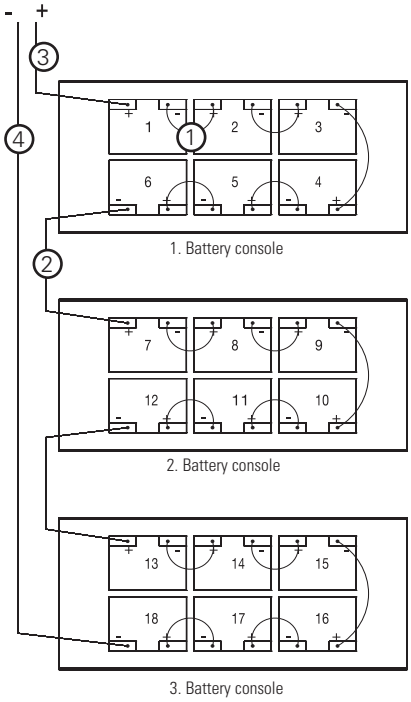
The dripping water protection of the film is no longer guaranteed after the cables have been inserted without the appropriate cable gland.

Technical description		**Field**
Dimensions (H x W x D):	2040 x 800 x 405 mm	
Colour:	RAL 7035	
Weight:	155 kg	
Assembly:	Ground	
Degree of protection:	IP21, optional IP31, on request IP54	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 230 V AC	
Rated current (Mains):	IN = 35 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN =35 A	
Rated Frequency:	50 / 60 Hz	
Overvoltage category:	Mains: III / Battery: II	
Max. connected load:	At +35°C < 7,56 KW	
Maximum numbers of modules:		
Controller ACU	1	A1
PSU	1	B2
BCM.1	1	B3
SKU.1.1 CG-S:		
1x6A	0-12	
2x3A	0-12	
4x1,5A	0-12	
Luminaire circuits:	48	
Charger CM 1,7A	0-2	B3
Charger CM 3,4A	0-1	C2
Terminals:		
Luminaire circuits:	4 mm² Rigid/4 mm² flexible	A2-A3
BCM.1:	4 mm² Rigid/4 mm² flexible	A2
ACU	2,5mm² Rigid/ 1,5mm² flexible	A2
Battery feed:	16 mm² Rigid/16 mm² flexible	A3
Battery distribution:	35 mm² Rigid/35 mm² flexible	A3
Mains feed:	16 mm² Rigid/16 mm² flexible	A3
Mains distribution board:	35 mm² Rigid/35 mm² flexible	A3
Order number accesories:		
Cupboard base 100mm	40071362282	
Cupboard base 200mm	40071362283	
Door hinge left	40071362303	
Special locking profile half cylinder	40037079790	
IP 31 Retrofit kit	40071362293	

16 Ah Battery wiring compact cabinet

Technical description

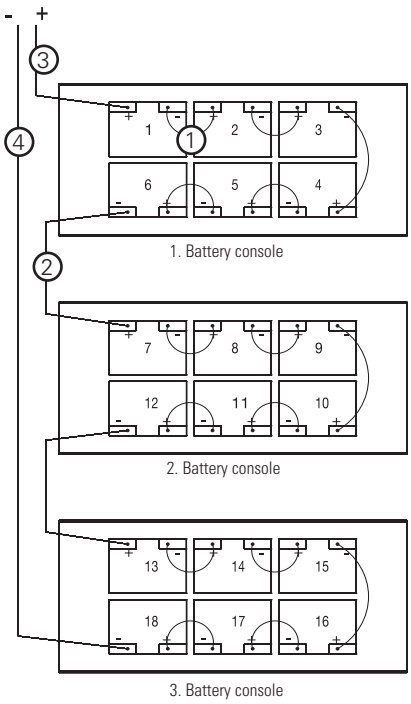
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 16 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	181,5 x 76,5 x 167,5
End poles	M5
Order Number battery block:	40066071593
Dimensions battery cabinet in mm (B x H x D)	800 x 2040 x 405
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	252 kg
Degree of protection:	IP21
Order Number wiring set:	40071362067
15 x Length 1:	300 mm
2 x Length 2:	1000 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



23,3 Ah Battery wiring compact cabinet

Technical description

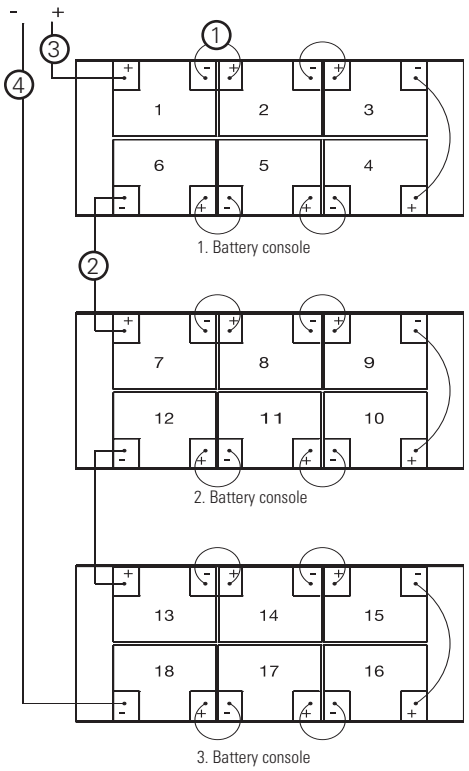
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 23,3 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	168 x 127 x 174
End poles	M6
Order Number battery block:	40066070461
Dimensions compact cabinet in mm (W x H x D)	800 x 2040 x 405
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	326 kg
Degree of protection:	IP21
Order Number wiring set:	40071346779
15 x Length 1:	300 mm
2 x Length 2:	1000 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



32 Ah Battery wiring compact cabinet

Technical description

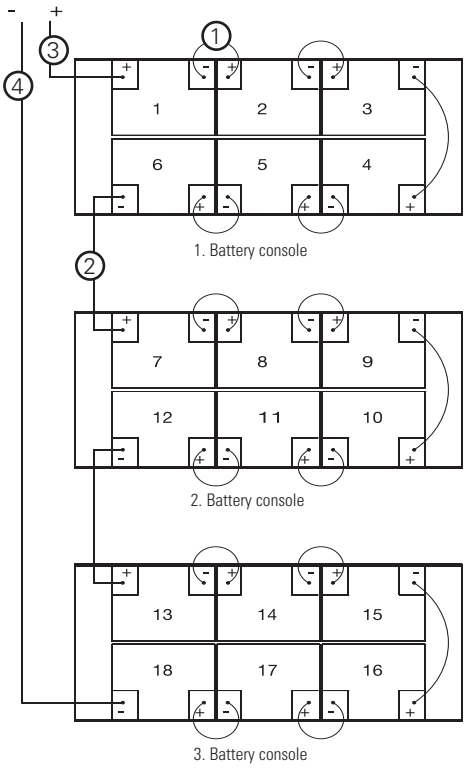
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 32 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	198 x 168 x 175
End poles	M6
Order Number battery block:	40066070116
Dimensions compact cabinet in mm (W x H x D)	800 x 2040 x 405
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	400 kg
Degree of protection:	IP21
Order Number wiring set:	40071346779
15 x Length 1:	300 mm
2 x Length 2:	1000 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



39,8 Ah Battery wiring compact cabinet

Technical description

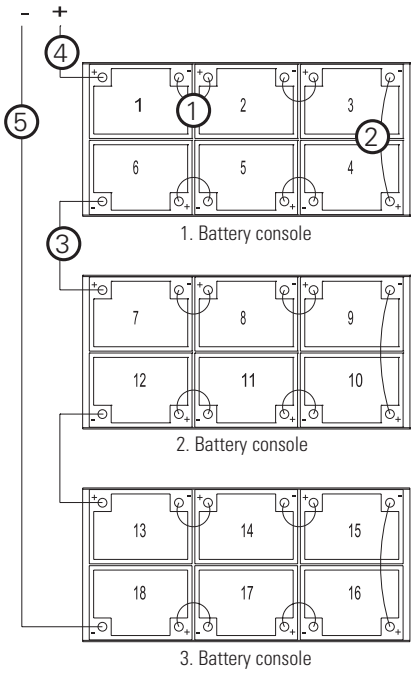
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 39,8 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	200 x 169 x 176
End poles	M-M6
Order Number battery block:	40066041395
Dimensions compact cabinet in mm (W x H x D)	800 x 2040 x 405
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	409 kg
Degree of protection:	IP21
Order Number wiring set:	40071346779
15 x Length 1:	300 mm
2 x Length 2:	1000 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



50,4 Ah Battery wiring compact cabinet

Technical description

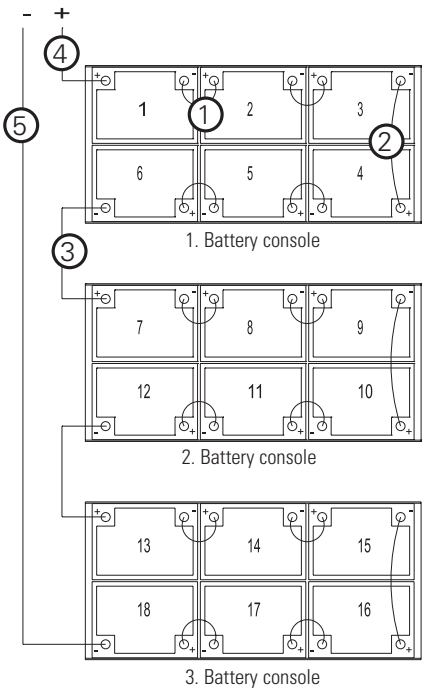
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 50,4 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	220 x 172 x 235
End poles	F-M6
Order Number battery block:	40066070917
Dimensions compact cabinet in mm (W x H x D)	800 x 2040 x 405
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	495 kg
Degree of protection:	IP21
Order Number wiring set:	40071347449
12 x Length 1:	300 mm
3 x Length 2:	440 mm
2 x Length 3:	700 mm
1 x Length 4:	300 mm
1 x Length 5:	1200 mm



53,7 Ah Battery wiring compact cabinet

Technical description

Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 53,7 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	220 x 172 x 235
End poles	F-M6
Order Number battery block:	40066070901
Dimensions compact cabinet in mm (W x H x D)	800 x 2040 x 405
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	519 kg
Degree of protection:	IP21
Order Number wiring set:	40071347449
12 x Length 1:	300 mm
3 x Length 2:	440 mm
2 x Length 3:	700 mm
1 x Length 4:	300 mm
1 x Length 5:	1200 mm

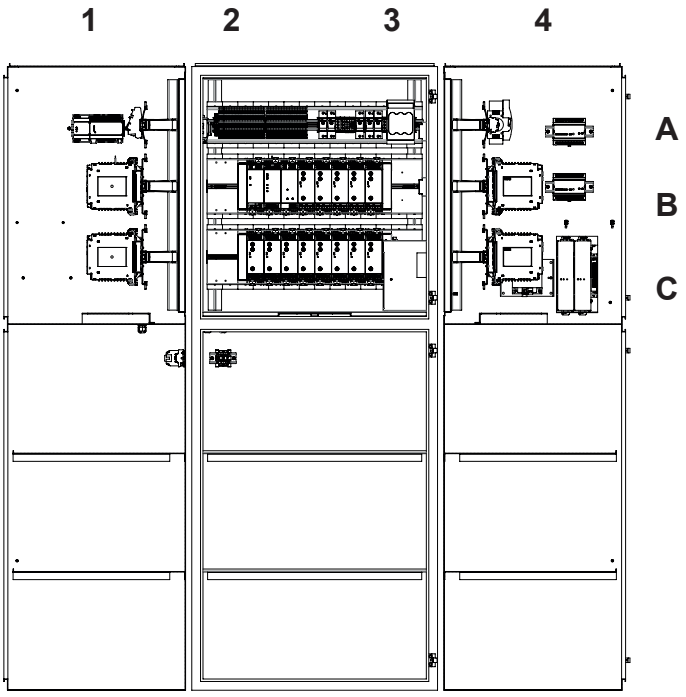


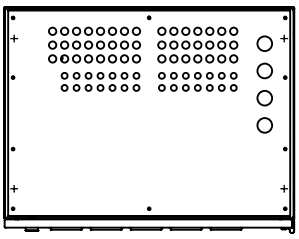
42 DualGuard-S 12C6

The DualGuard-S 12C6 in IP21 (IP31 optional) version with individual cable entry in accordance with EN 50171 is suitable for supplying up to 48 circuits for safety and escape sign luminaires 230V / 216V AC/DC in the power range up to 13.6KW. A distribution board for mains and battery enables the connection of a sub-stations of type DualGuard US, DualGuard-S ESF30 and DualGuard-S SOU. The wiring system with rounded mounting fields does without classic cable ducts and, in combination with the natural ventilation and the large ventilation slots of the mounted modules, ensures a homogeneous control cabinet climate which has been proven by heating tests in accordance with EN 61439-1 under nominal load conditions. The clear, self-explanatory internal modular field structure, taking contact protection into account, rounds off the appearance.

The extensive catalogue of cabinet accessories such as special locks, door hinges right/left, cable entries, bases in various heights, IP31 retrofit kits and IP54 on request offers the right solution for most customer-specific requirements without long delivery times.

The colour touch display with automatic testing device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and records the operating status of the external phase monitor modules, the insulation monitoring device as well as the battery strings and, if battery block monitoring technology is used, the operating status of each individual battery block.





Cable entry from above.

Roof plate with IP X1 dripping water protection foil and holes for:

28 x M16

49 x M20

1 x M32

3 x M40

ATTENTION!

The dripping water protection of the film is no longer guaranteed after the cables have been inserted without the appropriate cable gland.

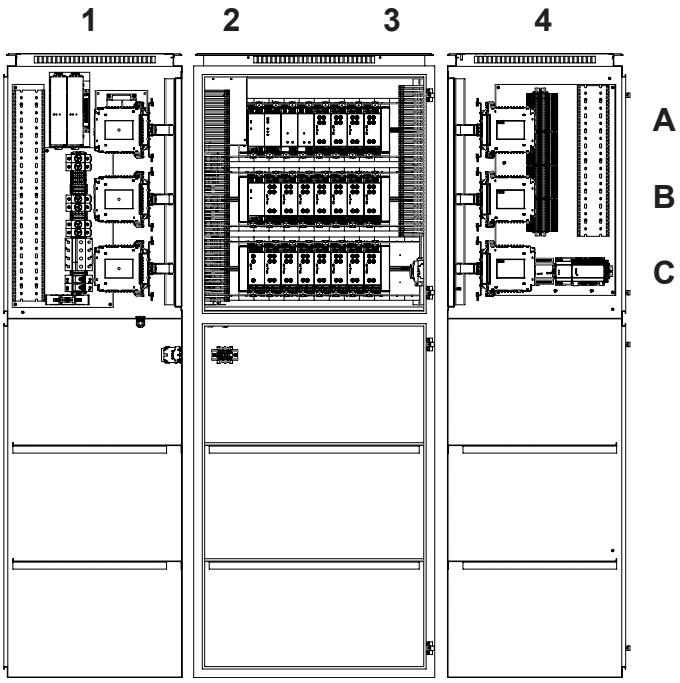
Technical description		**Field**
Dimensions (H x W x D):	2040 x 800 x 605 mm	
Colour:	RAL 7035	
Weight:	206 kg	
Assembly:	Ground	
Degree of protection:	IP21, optional IP31, on request IP54	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 230 V AC	
Rated current (Mains):	IN = 50 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN = 50 A	
Rated Frequency:	50 or 60 Hz	
Overvoltage category:	Mains: III / Battery: II	
Max. connected load:	At +35°C < 13,6 KW	
Maximum numbers of modules:		
Controller ACU / HMI:	1	A1
PSU:	1	B2
BCM.1:	1	B3
SKU.1.1 CG-S:		
1x6A	0-12	
2x3A	0-12	
4x1,5A	0-12	
Luminaire circuits:	48	
Charger CM 1,7A	1-2	B3
Charger CM 3,4A	0-2	C3
Terminals:		
Luminaire circuits	4 mm² Rigid/4 mm² flexible	A3
BCM.1	4 mm² Rigid/4 mm² flexible	A2
ACU	2,5mm² Rigid/ 1,5mm² flexible	A2
Battery feed	16 mm² Rigid/16 mm² flexible	A3
Battery distribution	35 mm² Rigid/35 mm² flexible	A3
Mains feed	16 mm² Rigid/16 mm² flexible	A3
Mains distribution board	35 mm² Rigid/35 mm² flexible	A3
Order number accesories:		
Cupboard base 100mm	40071362284	
Cupboard base 200mm	40071362285	
Door hinge left	40071362302	
Special locking profile half cylinder	40037079790	
IP 31 Retrofit kit	40071362292	

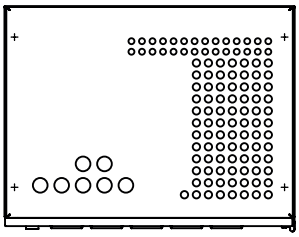
43 DualGuard-S 20C6

The DualGuard-S 20C6 in IP21 (IP31 optional) version with individual cable entry in accordance with EN 50171 is suitable for supplying up to 48 circuits for safety and escape sign luminaires 230V / 216V AC/DC in the power range up to 13.6KW. Two distribution outputs for mains and battery enable the connection of a sub-stations of type DualGuard US, DualGuard-S ESF30 and DualGuard-S SOU. The wiring system with rounded mounting fields does without classic cable ducts and, in combination with the natural ventilation and the large ventilation slots of the mounted modules, ensures a homogeneous control cabinet climate which has been proven by heating tests in accordance with EN 61439-1 under nominal load conditions. The clear, self-explanatory internal modular field structure, taking contact protection into account, rounds off the appearance.

The extensive catalogue of cabinet accessories such as special locks, door hinges right/left, cable glands, bases in various heights, IP31 retrofit kits and IP54 on request offers the right solution for most customer-specific requirements without long delivery times.

The colour touch display with automatic test device and individual luminaire monitoring with individual status and name indication per luminaire in connection with system-bound ECG / LED supply module including monitoring module without additional data line reports and records additionally the operating status of the external phase monitor modules, the insulation monitoring device as well as the battery strings and when using the battery block monitoring technology of each individual battery block.





Cable entry from above.

Roof plate with IP X1 dripping water protection foil and holes for:

28 x M16

81 x M20

7 x M40

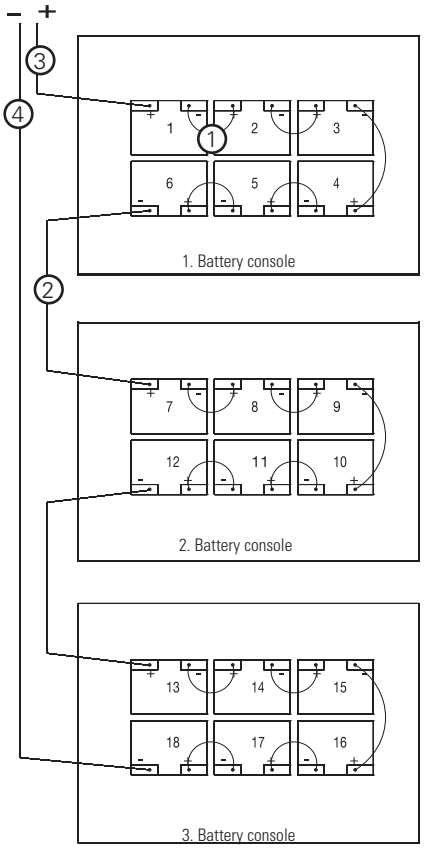
ATTENTION!

The dripping water protection of the film is no longer guaranteed after the cables have been inserted without the appropriate cable gland.

Technical description		**Field**
Dimensions (H x W x D):	2070 x 800 x 605 mm	
Colour:	RAL 7035	
Weight:	216 kg	
Assembly:	Ground	
Degree of protection:	IP21, optional IP31, on request IP54	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 400/230 V AC	
Rated current (Mains):	IN = 50 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN = 50 A	
Rated Frequency:	50 / 60 Hz	
Overvoltage category:	Mains: III / Battery: II	
Max. connected load:	At +35°C < 13,6 KW	
Maximum numbers of modules:		
Controller ACU:	1	A1
PSU:	1-2	B2
BCM.1:	1	B2
SKU.1.1 CG-S:		
1x6A	0-18	
2x3A	0-18	
4x1,5A	0-16	
Luminaire circuits:	68	
Charger CM 1,7A	0-2	B2
Charger CM 3,4A	0-2	C3
Terminals:		
Luminaire circuits	4 mm² Rigid/4 mm² flexible	Â4-B4
BCM.1	4 mm² Rigid/4 mm² flexible	A4-B4
ACU	2,5mm² Rigid/ 1,5mm² flexible	C4
Battery feed	16 mm² Rigid/16 mm² flexible	C1
Battery distribution	35 mm² Rigid/35 mm² flexible	B1
Mains feed	16 mm² Rigid/16 mm² flexible	C1
Mains distribution board	35 mm² Rigid/35 mm² flexible	B1
Order number accesories:		
Cupboard base 100mm	40071362284	
Cupboard base 200mm	40071362285	
IP 31 Retrofit kit	40071362297	
Door hinge left	40071362306	
Special development	40037079790	

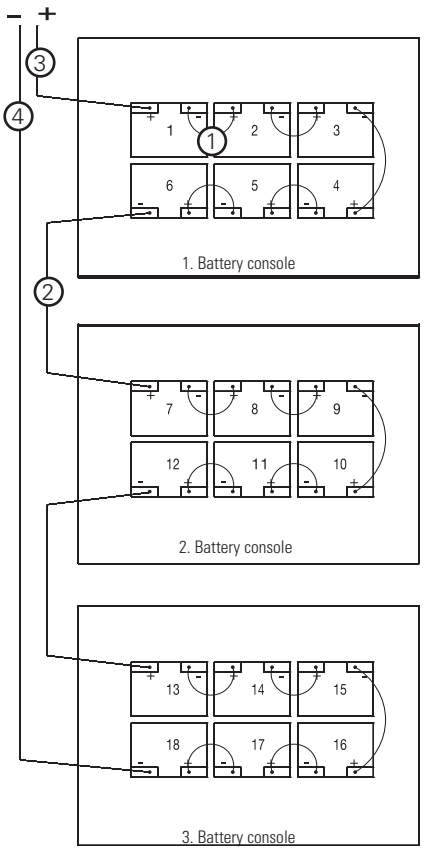
16 Ah Battery wiring compact cabinet

Technical description	
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 16 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	181,5 x 76,5 x 167,5
End poles	M5
Order Number battery block:	40066071593
Dimensions compact cabinet in mm (W x H x D)	800 x 2070 x 605
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	302 kg
Degree of protection:	IP21
Order Number wiring set:	40071346005
15 x Length 1:	240 mm
2 x Length 2:	900 mm
1 x Length 3:	600 mm
1 x Length 4:	1300 mm



23,3 Ah Battery wiring compact cabinet

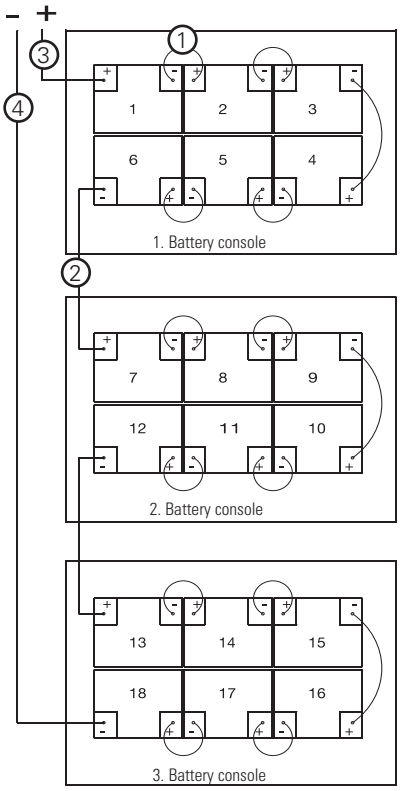
Technical description	
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 23,3 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	168 x 127 x 174
End poles	M6
Order Number battery block:	40066070461
Dimensions compact cabinet in mm (W x H x D)	800 x 2070 x 605
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	376 kg
Degree of protection:	IP21
Order Number wiring set:	40071346779
15 x Length 1:	300 mm
2 x Length 2:	1000 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



32 Ah Battery wiring compact cabinet

Technical description

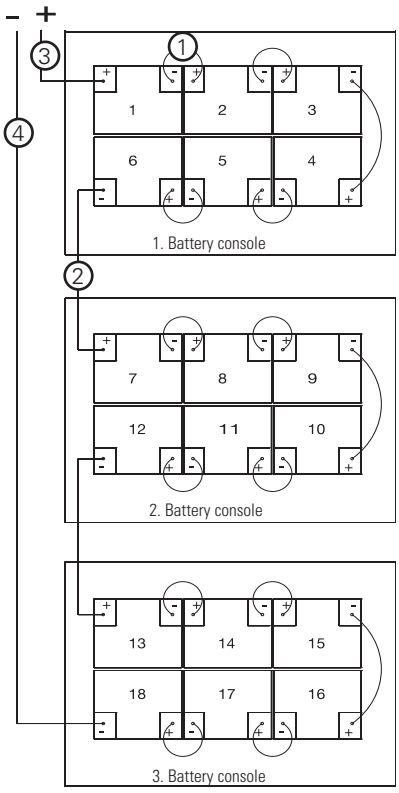
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 32 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	198 x 168 x 175
End poles	M6
Order Number battery block:	40066070116
Dimensions compact cabinet in mm (W x H x D)	800 x 2070 x 605
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	448 kg
Degree of protection:	IP21
Order Number wiring set:	40071346779
15 x Length 1:	300 mm
2 x Length 2:	1000 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



39,8 Ah Battery wiring compact cabinet

Technical description

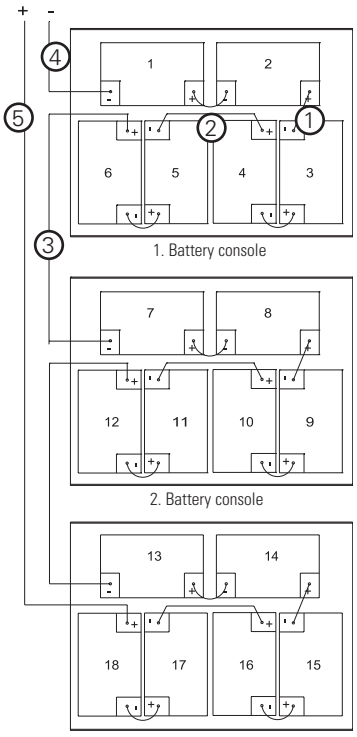
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 39,8 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	200 x 169 x 176
End poles	M-M6
Order Number battery block:	40066041395
Dimensions compact cabinet in mm (W x H x D)	800 x 2070 x 605
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	457 kg
Degree of protection:	IP21
Order Number wiring set:	40071346779
15 x Length 1:	300 mm
2 x Length 2:	1000 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm



50,4 Ah Battery wiring compact cabinet

Technical description

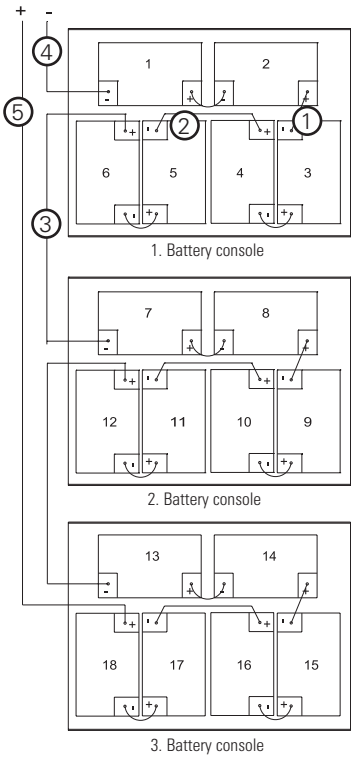
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 50,4 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	220 x 172 x 235
End poles	F-M6
Order Number battery block:	40066070917
Dimensions compact cabinet in mm (W x H x D)	800 x 2070 x 605
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	556 kg
Degree of protection:	IP21
Order Number wiring set:	40071347449
12 x Length 1:	300 mm
3 x Length 2:	440 mm
2 x Length 3:	700 mm
1 x Length 4:	300 mm
1 x Length 5:	1200 mm



53,7 Ah Battery wiring compact cabinet

Technical description

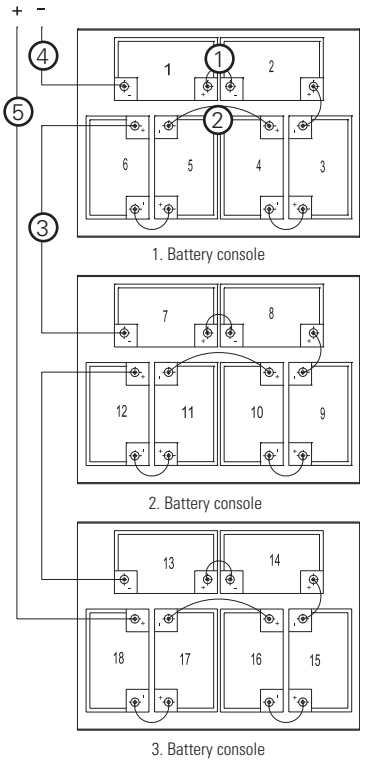
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 53,7 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	220 x 172 x 235
End poles	F-M6
Order Number battery block:	40066070901
Dimensions compact cabinet in mm (W x H x D)	800 x 2070 x 605
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	610 kg
Degree of protection:	IP21
Order Number wiring set:	40071347449
12 x Length 1:	300 mm
3 x Length 2:	440 mm
2 x Length 3:	700 mm
1 x Length 4:	300 mm
1 x Length 5:	1200 mm



66,2 Ah Battery wiring compact cabinet

Technical description

Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 66,2 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	260,5 x 171 x 239
End poles	M-M6
Order Number battery block:	40066070902
Dimensions compact cabinet in mm (W x H x D)	800 x 2070 x 605
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	703 kg
Degree of protection:	IP21
Order Number wiring set:	40071346819
12 x Length 1:	300 mm
3 x Length 2:	440 mm
2 x Length 3:	1000 mm
1 x Length 4:	400 mm
1 x Length 5:	1400 mm



1. Battery console

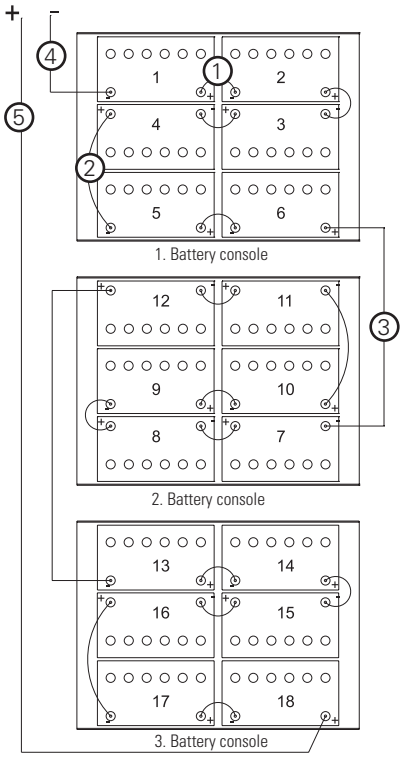
2. Battery console

3. Battery console

85,7 Ah Battery wiring compact cabinet

Technical description

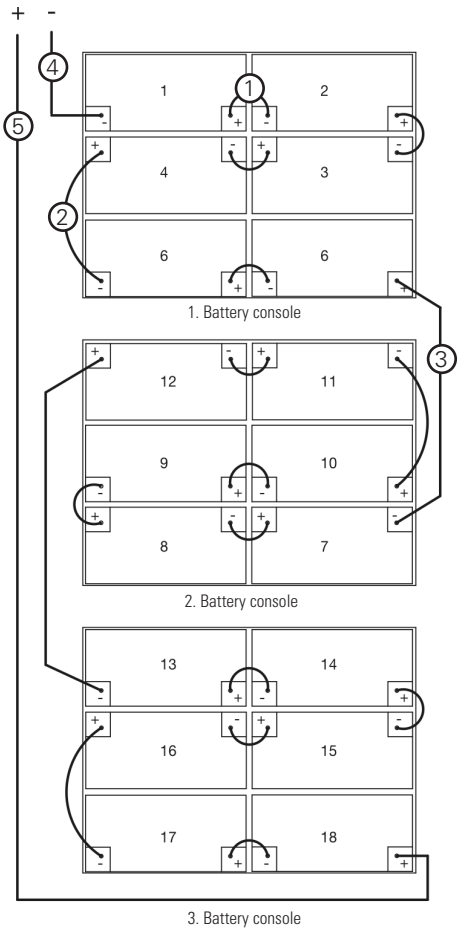
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 85,7 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	309 x 172 x 239
End poles	M-M8
Order Number battery block:	40066070918
Dimensions compact cabinet in mm (W x H x D)	800 x 2070 x 605
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	732 kg
Degree of protection:	IP21
Order Number wiring set:	40071360231
12 x Length 1:	300 mm
3 x Length 2:	360 mm
2 x Length 3:	1500 mm
1 x Length 4:	400 mm
1 x Length 5:	1800 mm



89,4 Ah Battery wiring compact cabinet

Technical description

Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 89,4 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	307,5 x 171 x 239
End poles	M6
Order Number battery block:	40066070821
Temperaturfühler:	
Dimensions compact cabinet in mm (W x H x D)	800 x 2070 x 605
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	795 kg
Degree of protection:	IP21
Order Number wiring set:	40071360231
12 x Length 1:	300 mm
3 x Length 2:	360 mm
2 x Length 3:	1500 mm
1 x Length 4:	400 mm
1 x Length 5:	1800 mm

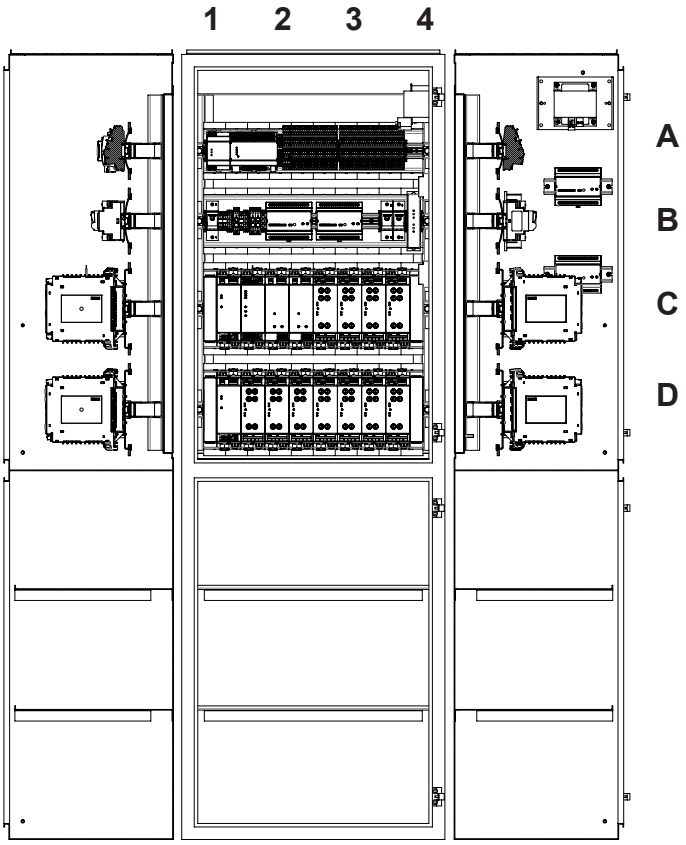


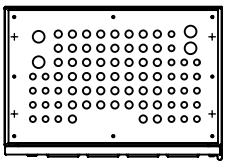
44 DualGuard-S 12C4

The DualGuard-S 12C4 in IP21 (IP31 optional, IP54 on request) version with individual cable entry in accordance with EN 50171 is suitable for supplying up to 48 circuits for safety and escape sign luminaires 230V / 216V AC/DC in the power range up to 5.4KW. A distribution board for mains and battery enables the connection of sub-stations of type DualGuard US, DualGuard-S ESF and DualGuard-S SOU. The wiring system with rounded mounting fields does without classic cable ducts and, in combination with the natural ventilation and the large ventilation slots of the mounted modules, ensures a homogeneous control cabinet climate which has been proven by heating tests in accordance with EN 61439-1 under nominal load conditions. The clear, self-explanatory internal modular field structure, taking contact protection into account, rounds off the appearance.

The extensive catalogue of cabinet accessories such as special locks, door hinges right/left, cable entries, bases in various heights, IP31 retrofit kits and IP54 on request offers the right solution for most customer-specific requirements without long delivery times.

The colour touch display with automatic testing device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and records the operating status of the external phase monitor modules, the insulation monitoring device as well as the battery strings and, if battery block monitoring technology is used, the operating status of each individual battery block.





Cable entry from above.

Roof plate with IP X1 dripping water protection foil and holes for:

28 x M16

49 x M20

4 x M32

ATTENTION!

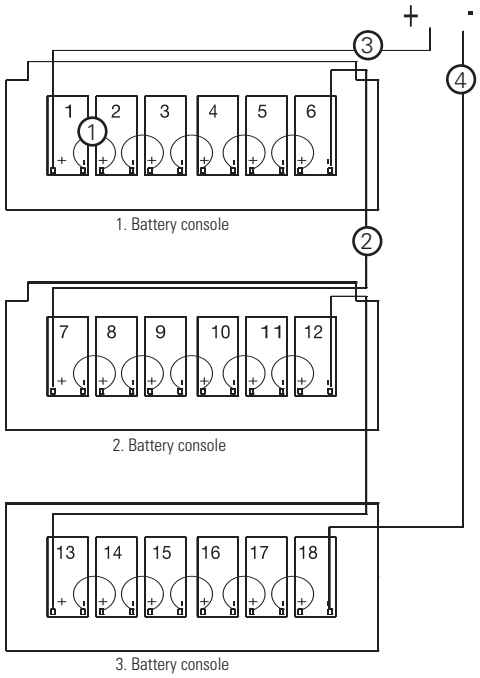
The dripping water protection of the film is no longer guaranteed after the cables have been inserted without the appropriate cable gland.

Technical description		**Field**
Dimensions (H x W x D):	1800 x 600 x 405 mm	
Colour:	RAL 7035	
Weight:	115 kg	
Assembly:	Ground	
Degree of protection:	IP21, optional IP31, on request IP54	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 230 V AC	
Rated current (Mains):	IN = 25 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN =25 A	
Rated Frequency:	50 / 60 Hz	
Overvoltage category:	Mains: III / Battery: II	
Max. connected load:	At +35°C < 5,4 KW	
Maximum numbers of modules:		
Controller ACU / HMI:	1	A1
PSU:	1	C1
BCM.1:	1	C2
SKU.1.1 CG-S:		
1x6A	0-12	
2x3A	0-12	
4x1,5A	0-12	
Luminaire circuits:	48	
Charger CM 1,7A	1	C2
Terminals:		
Luminaire circuits	4 mm² Rigid/flexible	A3-4
BCM.1	4 mm² Rigid/flexible	A2
ACU	2,5mm² Rigid/ 1,5mm² flexible	A1
Battery feed	16 mm² Rigid/flexible	B4
Battery distribution	16 mm² Rigid/flexible	B4
Mains feed	16 mm² Rigid/flexible	B1
Mains distribution board	16 mm² Rigid/flexible	B1
Order number accesories:		
Cupboard base 100mm	40071362280	
Cupboard base 200mm	40071362281	
Door hinge left	40071362300	
Special locking profile half cylinder	40037079790	
IP 31 Retrofit kit	40071362290	

5,5 Ah Battery wiring compact cabinet

Technical description

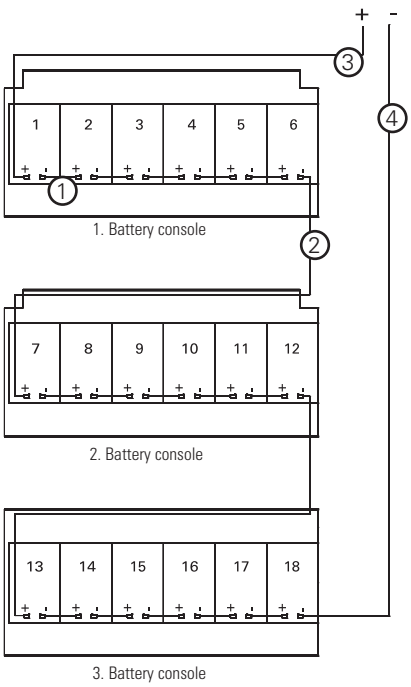
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 5,5 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	152 x 65,5 x 98
End poles	Faston SR-6,3
Order Number battery block:	40066079643
Dimensions compact cabinet in mm (W x H x D)	600 x 1800 x 400
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	160 kg
Degree of protection:	IP21
Order Number wiring set:	40071346005
15 x Length 1:	240 mm
2 x Length 2:	900 mm
1 x Length 3:	600 mm
1 x Length 4:	1300 mm



8,5 Ah Battery wiring compact cabinet

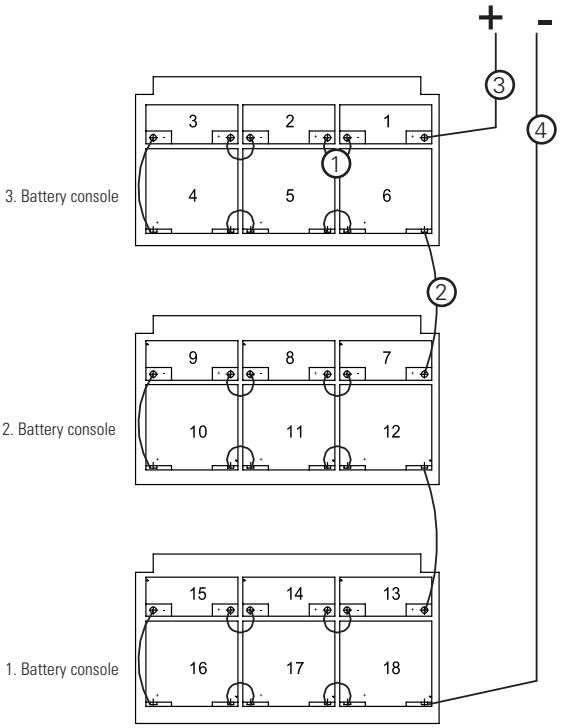
Technical description

Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 8,5 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	152 x 98 x 98
End poles	Faston SR-6,3
Order Number battery block:	40066079644
Dimensions compact cabinet in mm (W x H x D)	600 x 1800 x 400
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	180 kg
Degree of protection:	IP21
Order Number wiring set:	40071346005
15 x Length 1:	240 mm
2 x Length 2:	900 mm
1 x Length 3:	600 mm
1 x Length 4:	1300 mm



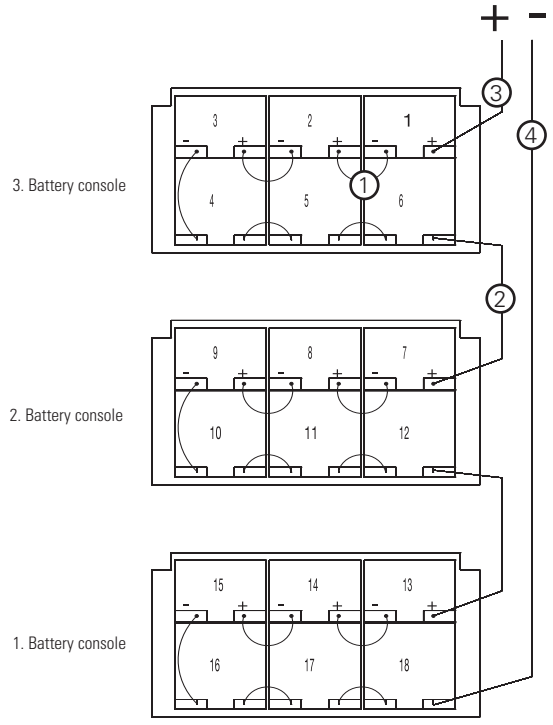
16 Ah Battery wiring compact cabinet

Technical description	
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 16 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	181 x 75 x 167
End poles	M5
Order Number battery block:	40066071593
Dimensions compact cabinet in mm (W x H x D)	600 x 1800 x 400
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	212 kg
Degree of protection:	IP21
Order Number wiring set:	40071362067
15 x Length 1:	
2 x Length 2:	300 mm
1 x Length 3:	1000 mm
1 x Length 4:	800 mm
	2000 mm



23,3 Ah Battery wiring compact cabinet

Technical description	
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 23,3 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	168 x 127 x 174
End poles	M6
Order Number battery block:	40066070461
Dimensions compact cabinet in mm (W x H x D)	600 x 1800 x 400
Battery consoles:	3
Terminals:	max. 35 mm²
Weight incl. batteries:	286 kg
Degree of protection:	IP21
Order Number wiring set:	40071346779
15 x Length 1:	300 mm
2 x Length 2:	1000 mm
1 x Length 3:	800 mm
1 x Length 4:	2000 mm

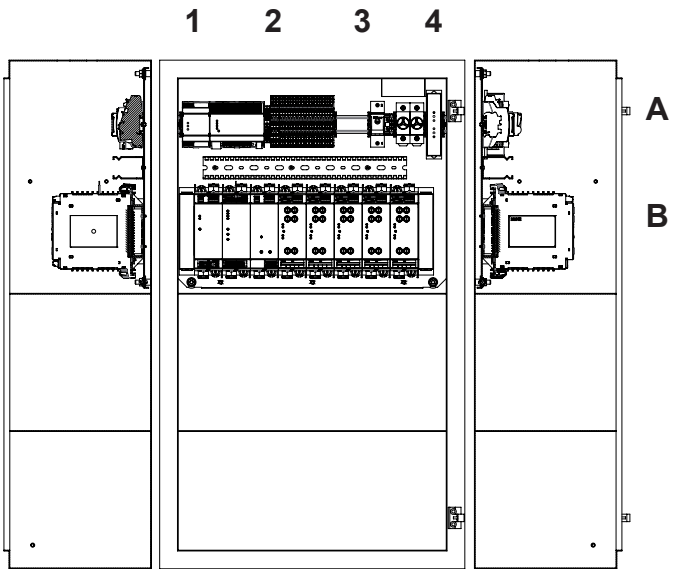


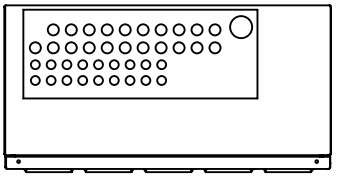
45 DualGuard-S 4C3

The DualGuard-S 4C3 according to EN 50171 is suitable for the supply of safety and escape sign luminaires 230V / 216V AC/DC in large and medium-sized building structures and decentralised power supply of the individual areas due to its compact design. The automatic test device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and additionally proclaims the operating status of the external phase monitor modules, the insulation monitoring device as well as the battery strings and, if battery block monitoring technology is used, each individual battery block.

Consisting of:

Sheet steel compact cabinet with cable entry from above, HMI touch display installed in the door, ACU Controller, BCM.1 charge and insulation monitor and battery string monitoring module, PSU power supply module.





Cable entry from above.

Roof plate with IP X1 dripping water protection foil and holes for:

18 x M16

21 x M20

1 x M32

ATTENTION!

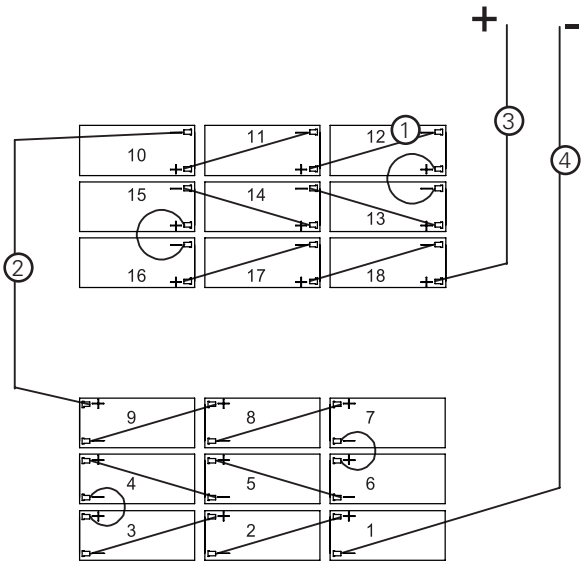
The dripping water protection of the film is no longer guaranteed after the cables have been inserted without the appropriate cable gland.

Technical description		**Field**
Dimensions (H x W x D):	1000 x 600 x 305 mm	
Colour:	RAL 7035	
Weight:	50 kg	
Assembly:	Recommended for wall mounting: 4xM8 (min. 2xM8) Force [N]: 4412 Mounting stability [N]: 2250	
Degree of protection:	IP21	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 230 V AC	
Rated current (Mains):	IN = 12 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN = 12 A	
Rated Frequency:	50 or 60 Hz	
Overvoltage category:	Mains: III / Battery: II	
Max. connected load:	At +35°C < 3,24 KW	
Maximum numbers of modules:		
Controller ACU / HMI:	1	A1
PSU:	1	B1
BCM.1:	1	B2
SKU.1 CG-S:		
1x6A	0-5	
2x3A	0-5	
4x1,5A	0-5	
Luminaire circuits:	20	A2
Charger CM 1,7A	1	B3
Terminals:		
Luminaire circuits	4 mm² Rigid/flexible	A2
BCM.1	4 mm² Rigid/flexible	A2
ACU	2,5mm² Rigid/ 1,5mm² flexible	A1
Mains feed	16 mm² Rigid/flexible	A3

5,5 Ah Battery wiring compact cabinet

Technical description

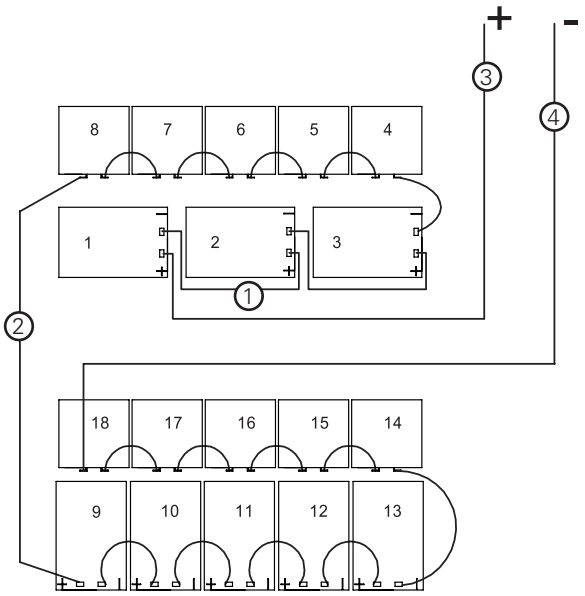
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 5,5 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	152 x 65,5 x 98
End poles	Faston SR-6,3
Order Number battery block:	40066079643
Dimensions compact cabinet in mm (W x H x D)	600 x 1000 x 300
Battery consoles:	2
Terminals:	max. 35 mm²
Weight incl. batteries:	95 kg
Degree of protection:	IP21
Order Number wiring set:	40071346005
15 x Length 1:	240 mm
2 x Length 2:	900 mm
1 x Length 3:	600 mm
1 x Length 4:	1300 mm



8,5 Ah Battery wiring compact cabinet

Technical description

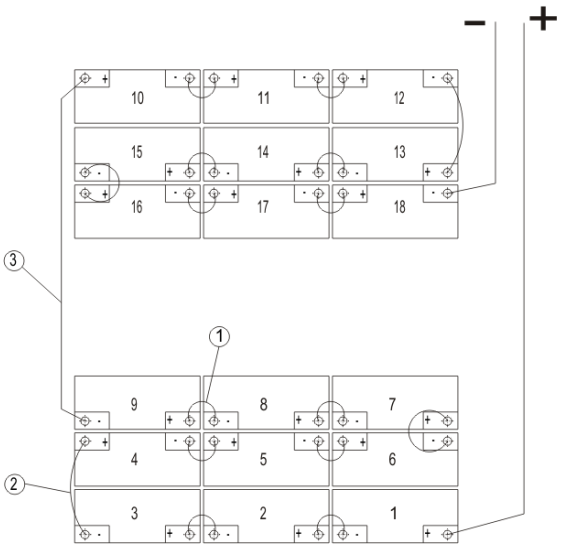
Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 8,5 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	152 x 98 x 98
End poles	Faston SR-6,3
Order Number battery block:	40066079644
Dimensions compact cabinet in mm (W x H x D)	600 x 1000 x 300
Battery consoles:	2
Terminals:	max. 35 mm²
Weight incl. batteries:	115 kg
Degree of protection:	IP21
Order Number wiring set:	40071346005
15 x Length 1:	240 mm
2 x Length 2:	900 mm
1 x Length 3:	600 mm
1 x Length 4:	1300 mm



16 Ah Battery wiring compact cabinet

Technical description

Battery type (C10; 1,8 V/Z; +20 °C):	12 V / 16 Ah
Nominal battery voltage of all switched on cells:	216 V
Numbers of battery blocks:	18 á 12 V
Dimensions per block in mm (L x W x H):	181 x 76 x 167
End poles	M5
Order Number battery block:	40066071593
Dimensions compact cabinet in mm (W x H x D)	600 x 1000 x 350
Battery consoles:	2
Terminals:	max. 35 mm²
Weight incl. batteries:	147 kg
Degree of protection:	IP21
Order Number wiring set:	40071362068
15 x Length 1:	240 mm
2 x Length 2:	900 mm
1 x Length 3:	600 mm
1 x Length 4:	1300 mm

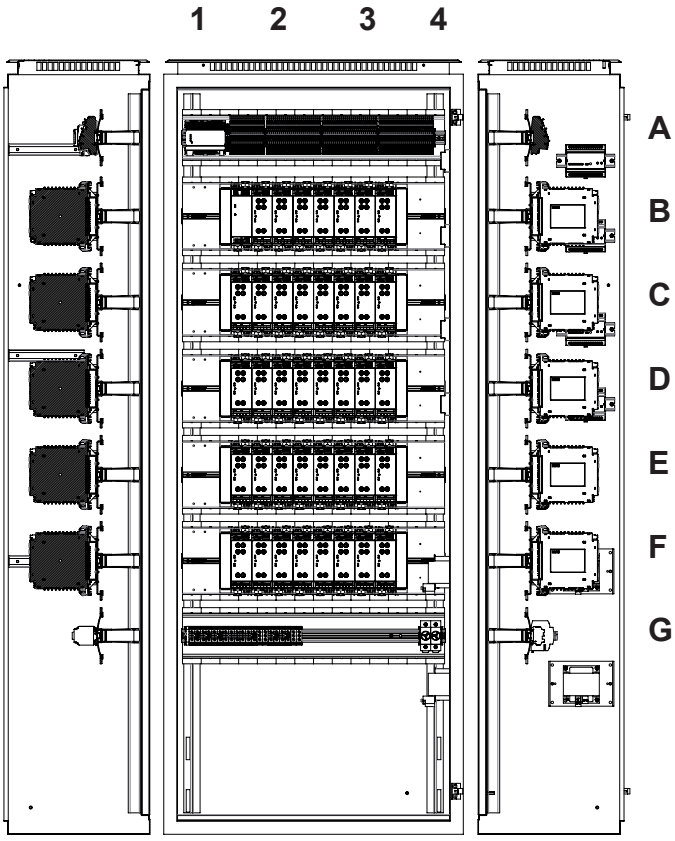


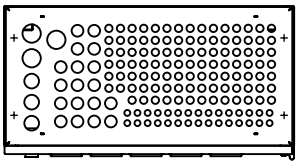
46 DualGuard-S US38

The DualGuard-S US 38 sub-station in IP21 (IP31 optional) version with individual cable entry in accordance with EN 50171 is suitable for supplying up to 88 circuits for safety and escape sign luminaires 230V / 216V AC/DC in the power range up to 17.3KW. The wiring system with rounded mounting panels does without classic cable ducts and, in combination with the natural ventilation and the large ventilation slots of the mounted modules, ensures a homogeneous control cabinet climate which has been proven by heating tests in accordance with EN 61439-1 under nominal load conditions. The clear, self-explanatory internal modular field structure, taking contact protection into account, rounds off the appearance.

The extensive catalogue of cabinet accessories such as special locks, door hinges right/left, cable entries, bases in various heights, IP31 retrofit kits and IP54 on request offers the right solution for most customer-specific requirements without long delivery times.

The colour touch display with automatic testing device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line also reports and logs the operating status of the external phase monitor modules.





Cable entry from above.

Roof plate with IP X1 dripping water protection foil and holes for:

30 x M16

99 x M20

18 x M32

3 x M40

3 x M50

ATTENTION!

The dripping water protection of the film is no longer guaranteed after the cables have been inserted without the appropriate cable gland.

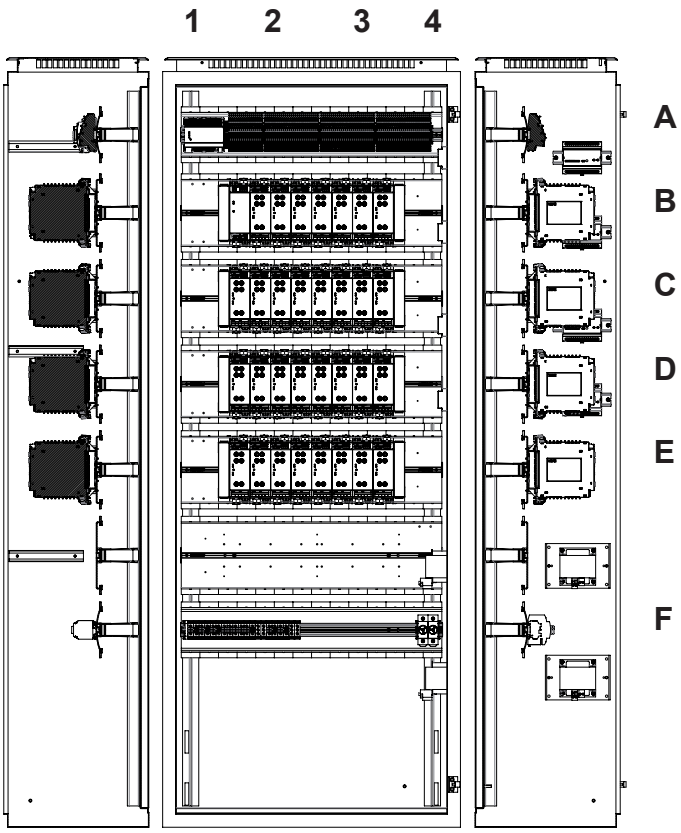
Technical description		**Field**
Dimensions (H x W x D):	2070 x 800 x 405 mm	
Colour:	RAL 7035	
Weight:	170 kg	
Assembly:	Only set up on non-combustible ground (e.g. concrete).	
Degree of protection:	IP21, optional IP31, on request IP54	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 400/230 V AC	
Rated current (Mains):	IN = 80 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN =80 A	
Rated Frequency:	50 or 60 Hz	
Overvoltage category:	Mains: III / Battery: II	
Max. connected load:	At +35°C < 17,3 KW	
Maximum numbers of modules:		
Controller ACU / HMI	1	A1
PSU	1-2	B1
SKU.1.1 CG-S		
1x6A	0-38	
2x3A	0-38	
4x1,5A	0-20	
SWR.1 150	0-7	
Max NumbersLuminaire circuits	88	
Terminals:		
ACU	2,5mm² Rigid/ 1,5mm² flexible	A1
Luminaire circuits	4 mm² Rigid/flexible	A2-4
Battery feed	35 mm² Rigid/ flexible	G2
Battery through-wiring	35 mm² Rigid/flexible	G2
Mains feed	35 mm² Rigid/flexible	G1
Mains through-wiring	35 mm² Rigid/flexible	G1
Order number accesories:		
Cupboard base 100mm	40071362282	
Cupboard base 200mm	40071362283	
Door hinge left	40071362301	
Special locking profile half cylinder	40037079790	
IP 31 Retrofit kit	40071362291	

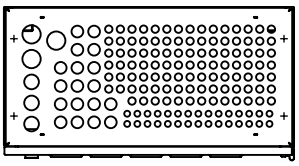
47 DualGuard-S US30

The DualGuard-S US 30 sub-station in IP21 (IP31 optional) version with individual cable entry in accordance with EN 50171 is suitable for supplying up to 88 circuits for safety and escape sign luminaires 230V / 216V AC/DC in the power range up to 17.3KW. The wiring system with rounded mounting panels does without classic cable ducts and, in combination with the natural ventilation and the large ventilation slots of the mounted modules, ensures a homogeneous control cabinet climate which has been proven by heating tests in accordance with EN 61439-1 under nominal load conditions. The clear, self-explanatory internal modular field structure, taking contact protection into account, rounds off the appearance.

The extensive catalogue of cabinet accessories such as special locks, door hinges right/left, cable entries, bases in various heights, IP31 retrofit kits and IP54 on request offers the right solution for most customer-specific requirements without long delivery times.

The colour touch display with automatic testing device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line also reports and logs the operating status of the external phase monitor modules.





Cable entry from above.

Roof plate with IP X1 dripping water protection foil and holes for:

30 x M16

99 x M20

18 x M32

3 x M40

3 x M50

ATTENTION!

The dripping water protection of the film is no longer guaranteed after the cables have been inserted without the appropriate cable gland.

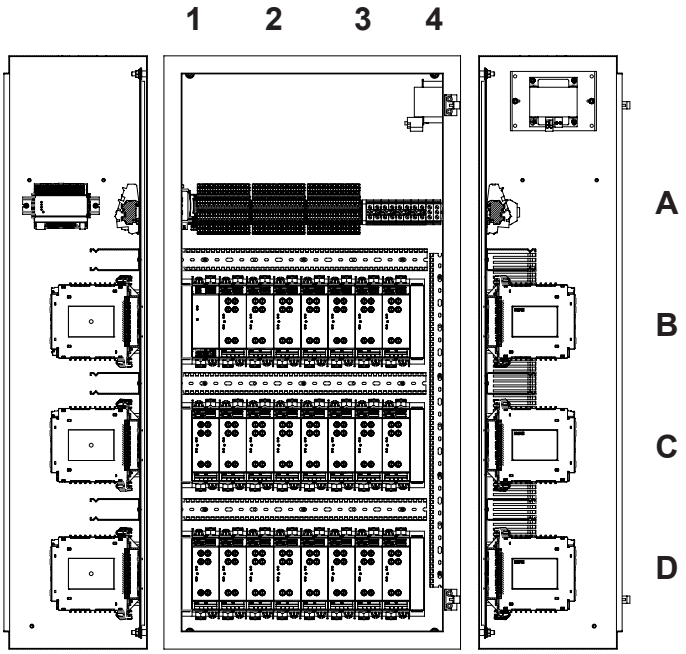
Technical description		**Field**
Dimensions (H x W x D):	2070 x 800 x 405 mm	
Colour:	RAL 7035	
Weight:	165 kg	
Assembly:	Only set up on non-combustible ground (e.g. concrete).	
Degree of protection:	IP21, optional IP31, on request IP54	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 400/230 V AC	
Rated current (Mains):	IN = 80 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN =80 A	
Rated Frequency:	50 or 60 Hz	
Overvoltage category:	Mains: III / Battery: II	
Max. connected load:	At +35°C < 17,3 KW	
Maximum numbers of modules:		
Controller ACU / HMI:	1	A1
PSU:	1-2	B1
SKU.1.1 CG-S:		
1x6A	0-30	
2x3A	0-30	
4x1,5A	0-20	
Max. numbers luminaire circuits:	88	
Terminals:		
ACU	2,5mm² Rigid/ 1,5mm² flexible	A1
Luminaire circuits	4 mm² Rigid/flexible	A2-4
Battery feed	35 mm² Rigid/flexible	F3
Battery through-wiring	35 mm² Rigid/flexible	F4
Mains feed	35 mm² Rigid/flexible	F1
Mains through-wiring	35 mm² Rigid/flexible	F2
Order number accesories:		
Cupboard base 100mm	40071362282	
Cupboard base 200mm	40071362283	
Door hinge left	40071362301	
Special locking profile half cylinder	40037079790	
IP 31 Retrofit kit	40071362291	

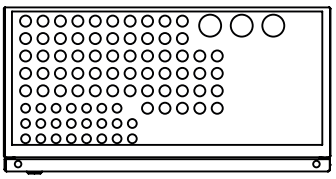
48 DualGuard-S US 23

The DualGuard-S US 23 sub-station in IP54 design with individual cable entry according to EN 50171 is suitable for supplying up to 60 circuits for safety and escape sign luminaires 230V / 216V AC/DC in the power range up to 10.8KW. The wiring system with rounded mounting panels does without classic cable ducts and, in combination with the natural ventilation and the large ventilation slots of the mounted modules, ensures a homogeneous control cabinet climate which has been proven by heating tests in accordance with EN 61439-1 under nominal load conditions. The clear, self-explanatory internal modular field structure, taking contact protection into account, rounds off the appearance.

The extensive catalogue of cabinet accessories such as special locks, door hinges right/left, cable entries offers the right solution for most customer-specific requirements without long delivery times.

The colour touch display with automatic testing device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line also reports and logs the operating status of the external phase monitor modules.





Cable entry from above.

Roof plate with IP X1 dripping water protection foil and holes for:

23 x M16

61 x M20

3 x M40

ATTENTION!

The dripping water protection of the film is no longer guaranteed after the cables have been inserted without the appropriate cable gland.

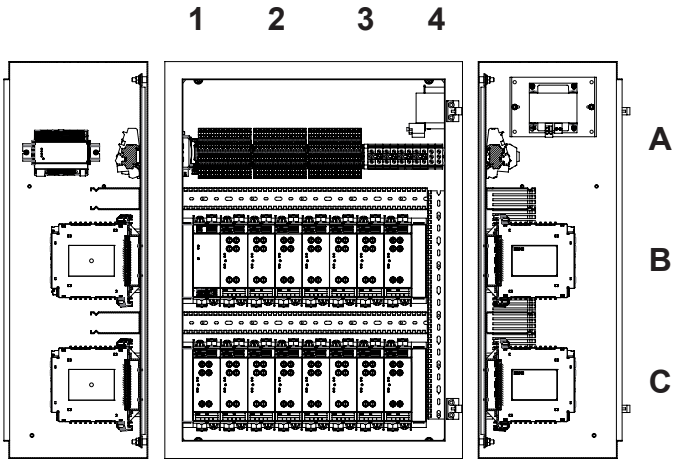
Technical description		**Field**
Dimensions (H x W x D):	1200 x 600 x 305 mm	
Colour:	RAL 7035	
Weight:	110 kg	
Assembly:	Recommended for wall mounting: 4xM8 (min. 2xM8) Force [N]: 3137 Mounting stability [N]: 1600	
Degree of protection:	IP54	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 230 V AC	
Rated current (Mains):	IN = 50 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN =50 A	
Rated Frequency:	50 or 60 Hz	
Overvoltage category:	Mains: III	
Max. connected load:	At +35°C < 10,8 KW	
Maximum numbers of modules:		
Controller ACU / HMI:	1	A1
PSU:	1	B1
SKU.1 CG-S:		
1x6A	0-23	
2x3A	0-23	
4x1,5A	0-14	
Max. numbers luminaire circuits:	52	
Terminals:		
ACU	2,5mm² Rigid/ 1,5mm² flexible	A1
Luminaire circuits	4 mm² Rigid/flexible	A2-4
Battery feed	35 mm² Rigid/flexible	A4
Battery through-wiring	35 mm² Rigid/flexible	A4
Mains feed	35 mm² Rigid/flexible	A4
Mains through-wiring	35 mm² Rigid/flexible	A4

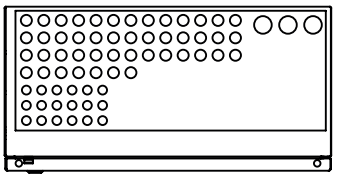
49 DualGuard-S US 15

The DualGuard-S US 15 sub-station in IP54 design with individual cable entry in accordance with EN 50171 is suitable for supplying up to 60 circuits for 230V / 216V AC/DC safety and escape sign luminaires in the power range up to 10.8KW. The clear, self-explanatory internal modular field structure, taking contact protection into account, rounds off the appearance.

The extensive catalogue of cabinet accessories such as special locks, door hinges right/left, cable entries offers the right solution for most customer-specific requirements without long delivery times.

The colour touch display with automatic testing device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line also reports and logs the operating status of the external phase monitor modules.





Cable entry from above.

Roof plate with IP X1 dripping water protection foil and holes for:

18 x M16

46 x M20

3 x M32

ATTENTION!

The dripping water protection of the film is no longer guaranteed after the cables have been inserted without the appropriate cable gland.

NOTE!

Depending on the number and type of switching-over modules (SKUs), a plastic air blade is fitted over the second rack for better heat dissipation.

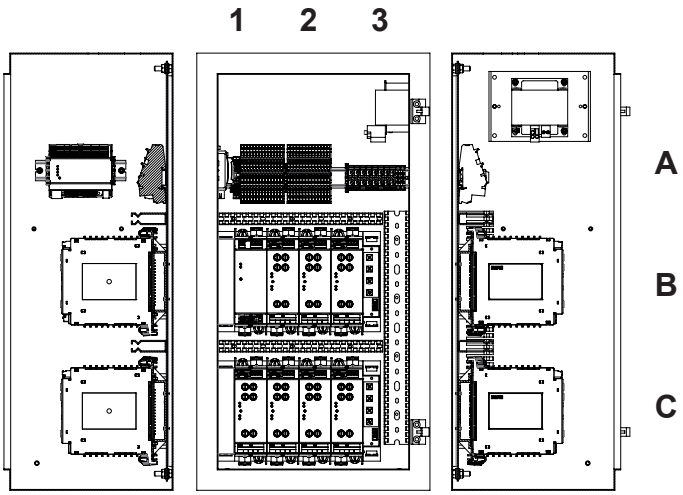
Technical description		**Field**
Dimensions (H x W x D):	800 x 600 x 305 mm	
Colour:	RAL 7035	
Weight:	75 kg	
Assembly:	Recommended for wall mounting: 4xM8 (min. 2xM8) Force [N]: 2450 Mounting stability [N]: 1250	
Degree of protection:	IP54	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 230 V AC	
Rated current (Mains):	IN = 50 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN =50 A	
Rated Frequency:	50 or 60 Hz	
Overvoltage category:	Mains: III / Battery: II	
Max. connected load:	At +35°C < 10,8 KW	
Maximum numbers of modules:		
Controller ACU / HMI:	1	A1
PSU:	1	B1
SKU.1.1 CG-S:		
1x6A	0-15	
2x3A	0-15	
4x1,5A	0-8	
Max. numbers luminaire circuits:	32	
Terminals:		
ACU	2,5mm² Rigid/ 1,5mm² flexible	A1
Luminaire circuits	4 mm² Rigid/flexible	A2-3
Battery feed	16 mm² Rigid/flexible	A4
Battery through-wiring	16 mm² Rigid/flexible	A4
Mains feed	16 mm² Rigid/flexible	A4
Mains through-wiring	16 mm² Rigid/flexible	A4

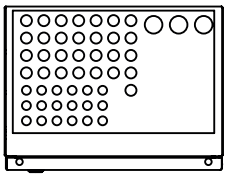
50 DualGuard-S US 7

The DualGuard-S US 7 sub-station in IP54 design with individual cable entry in accordance with EN 50171 is suitable for supplying up to 28 circuits for 230V / 216V AC/DC safety and escape sign luminaires in the power range up to 6.4KW. The clear, self-explanatory internal modular field structure, taking contact protection into account, rounds off the appearance.

The extensive catalogue of cabinet accessories such as special locks, door hinges right/left, cable entries offers the right solution for most customer-specific requirements without long delivery times.

The colour touch display with automatic testing device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line also reports and logs the operating status of the external phase monitor modules.





Cable entry from above.

Roof plate with IP X1 dripping water protection foil and holes for:

18 x M16

29 x M20

3 x M32

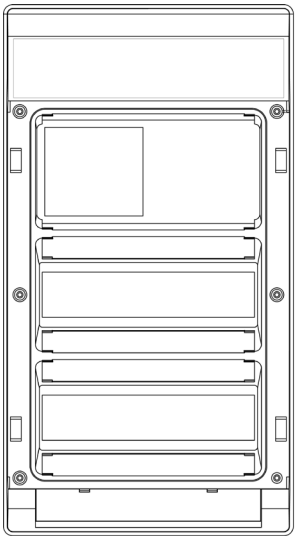
ATTENTION!

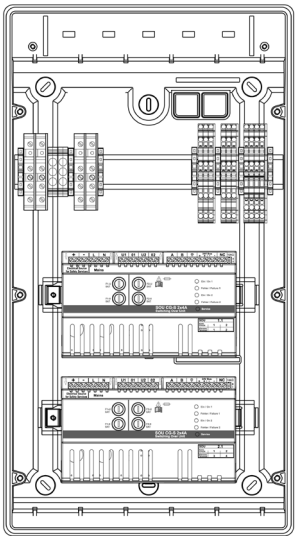
The dripping water protection of the film is no longer guaranteed after the cables have been inserted without the appropriate cable gland.

Technical description		**Field**
Dimensions (H x W x D):	750 x 400 x 305 mm	
Colour:	RAL 7035	
Weight:	42 kg	
Assembly:	Recommended for wall mounting: 4xM8 (min. 2xM8) Force [N]: 1861 Mounting stability [N]: 950	
Degree of protection:	IP54	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 230 V AC	
Rated current (Mains):	IN = 25 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN = 25 A	
Rated Frequency:	50 or 60 Hz	
Overvoltage category:	Mains: III / Battery: II	
Max. connected load:	At +35°C < 6,5 KW	
Maximum numbers of modules:		
Controller ACU / HMI	1	A1
PSU	1	B1
SKU.1.1 CG-S:		
1x6A	0-7	
2x3A	0-7	
4x1,5A	0-7	
Max. numbers luminaire circuits:	28	
Terminals:		
ACU	2,5mm² Rigid/ 1,5mm² flexible	A1
Luminaire circuits	4 mm² Rigid/flexible	A2
Battery feed	16 mm² Rigid/flexible	A3
Battery through-wiring	16 mm² Rigid/flexible	A3
Mains feed	16 mm² Rigid/flexible	A3
Mains through-wiring	16 mm² Rigid/flexible	A3

51 DualGuard-S US SOU2

The DualGuard-S US SOU2 sub-station in accordance with EN 50171 supplies 230V / 216V AC/DC safety and escape sign luminaires and is particularly suitable for installation in fire compartments in buildings with a large number of fire compartments. Thus, the decentralized design of the system can contribute to reducing the costs for function maintenance cabling. The automatic test device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and proclaims the operating states.





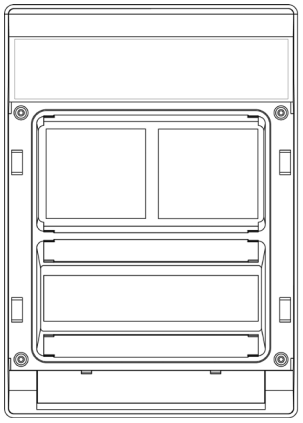
Consisting of:

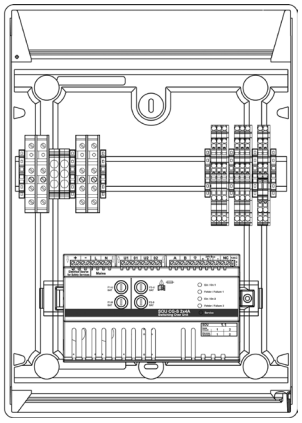
Fire protection wall distributor with cable entry from above and a SOU CG-S 2x4A circuit changeover.

Technical description	
Dimensions (H x W x D):	583 x 295 x 129 mm
Colour:	RAL 7032
Weight:	8,8 kg
Assembly:	Recommended for wall mounting: 4xM8 (min. 2xM8) Force [N]: 1076 Mounting stability [N]: 550
Degree of protection:	IP65
Protection class:	I
Ambient temperature:	-5°C to +35°C
Degree of pollution:	2
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3
Rated voltage (Mains):	UN = 230 V AC
Rated current (Mains):	IN = 16 A
Rated voltage (Battery):	216 V DC
Rated current (Battery):	IN =16 A
Rated Frequency:	50 or 60 Hz
Overvoltage category:	Mains: III / Battery: II
Max. connected load:	At +35°C < 3,5 KW
Maximum numbers of modules:	
SOU CG-S 2x4A	2
Max. numbers luminaire circuits:	4
Terminals:	
Luminaire circuits:	4 mm² Rigid/flexible
Battery feed:	16 mm² Rigid/flexible
Battery through-wiring:	16 mm² Rigid/flexible
Mains feed:	16 mm² Rigid/flexible
Mains through-wiring	16 mm² Rigid/flexible

52 DualGuard-S US SOU1

The DualGuard-S US SOU1 sub-station in accordance with EN 50171 supplies 230V / 216V AC/DC safety and escape sign luminaires and is particularly suitable for installation in fire compartments in buildings with a large number of fire compartments. Thus, the decentralized design of the system can contribute to reducing the costs for function maintenance cabling. The automatic test device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and proclaims the operating states.





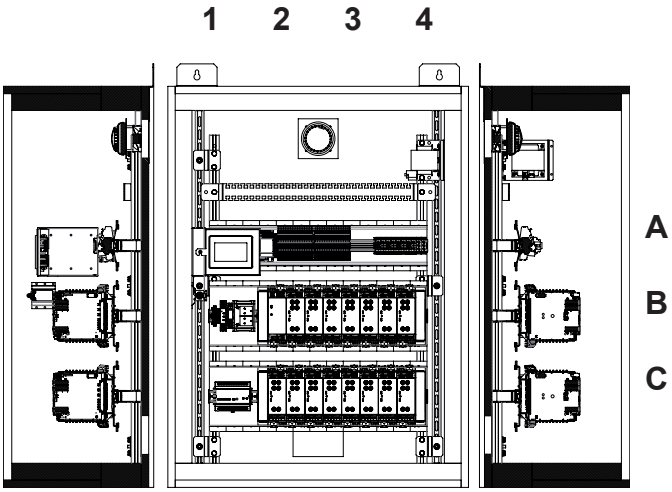
Consisting of:

Fire protection wall distributor with cable entry from above and a SOU CG-S 2x4A circuit changeover.

Technical description

Dimensions (H x W x D):	458 x 295 x 129 mm
Colour:	RAL 7032
Weight:	7,5 kg
Assembly:	Recommended for wall mounting: 4xM8 (min. 2xM8) Force [N]: 1037 Mounting stability [N]: 525
Degree of protection:	IP65
Protection class:	I
Ambient temperature:	-5°C to +35°C
Degree of pollution:	2
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3
Rated voltage (Mains):	UN = 230 V AC
Rated current (Mains):	IN = 8 A
Rated voltage (Battery):	216 V DC
Rated current (Battery):	IN =8 A
Rated Frequency:	50 / 60 Hz
Overvoltage category:	Mains: III / Battery: II
Max. connected load:	At +35°C < 1,7 KW
Maximum numbers of modules:	
SOU CG-S 2x4A	1
Luminaire circuits:	2
Terminals:	
Luminaire circuits	4 mm² Rigid/flexible
Battery feed	16 mm² Rigid/flexible
Battery through-wiring	16 mm² Rigid/flexible
Mains feed	16 mm² Rigid/flexible
Mains through-wiring	16 mm² Rigid/flexible

53 DualGuard-S ESF30 US 15P



The DualGuard-S ESF30 US 15P sub-station with functional integrity of 30 minutes according to EN 50171 and MLAR supplies safety and escape sign luminaires 230V / 216V AC/DC and is particularly suitable in building areas where it is not possible to accommodate the safety-related distribution boxes in a separate electrical operating room separate from the general power supply. The automatic test device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and additionally proclaims the operating status of the external phase monitor modules

Consisting of:

Fire protection housing as wall cabinet with cable entry from above, HMI touch display built-in, ACU controller, PSU power supply module.

Preassembled mounting system for installation of:

Up to 15 pcs power circuit modules

Technical description		**Field**
Dimensions (H x W x D):	1265 x 898 x 449 mm	
Colour:	RAL 7035	
Weight:	169 kg	
Assembly:	Wall	
Degree of protection:	IP42	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 230 V AC	
Rated current (Mains):	IN = 11 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN =11 A	
Rated Frequency:	50 or 60 Hz	
Overvoltage category:	Mains: III / Battery: II	
Max. connected load:	At +35°C < 2,4 KW	
Maximum numbers of modules:		
Controller ACU / HMI	1	A1
PSU	1	B2
SKU.1.1 CG-S:		
1x6A	0-15	
2x3A	0-15	
4x1,5A	0-10	
Max. numbers luminaire circuits:	40	
Terminals:		
ACU	2,5mm² Rigid/ 1,5mm² flexible	A1
Luminaire circuits	4 mm² Rigid/flexible	A2-3
Battery feed	16 mm² Rigid/flexible	A4
Battery through-wiring	16 mm² Rigid/flexible	A4
Mains feed	16 mm² Rigid/flexible	A4
Mains through-wiring	16 mm² Rigid/flexible	A4

54 DualGuard-S ESF30 US 30P

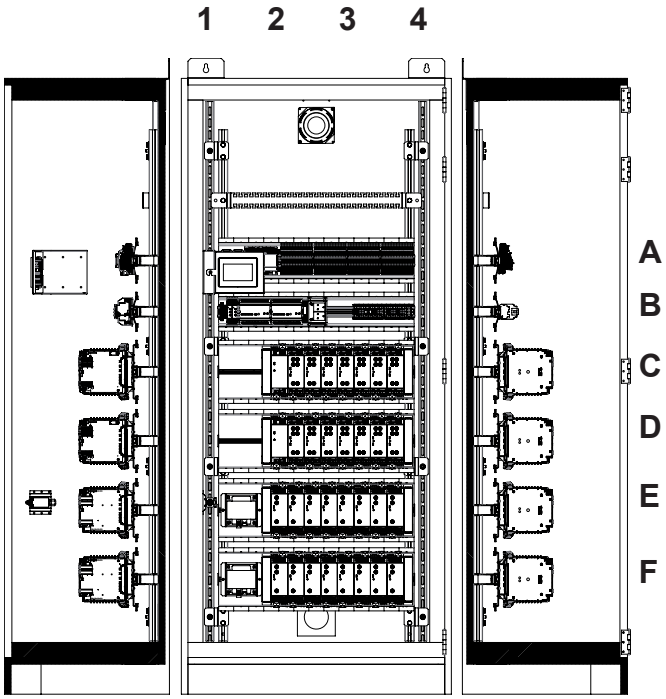
The DualGuard-S ESF30 US 30P sub-station with functional integrity of 30 minutes according to EN 50171 and MLAR supplies safety and escape sign luminaires 230V / 216V AC/DC and is particularly suitable in building areas where it is not possible to accommodate the safety-related distribution boxes in a separate electrical operating room separate from the general power supply. The automatic test device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and additionally proclaims the operating status of the external phase monitor modules.

Consisting of:

Fire protection housing as floor standing cabinet with cable entry from above, HMI touch display built-in, ACU Controller, PSU power supply module.

Preassembled mounting system for installation of:

Up to 30 pcs circuit modules



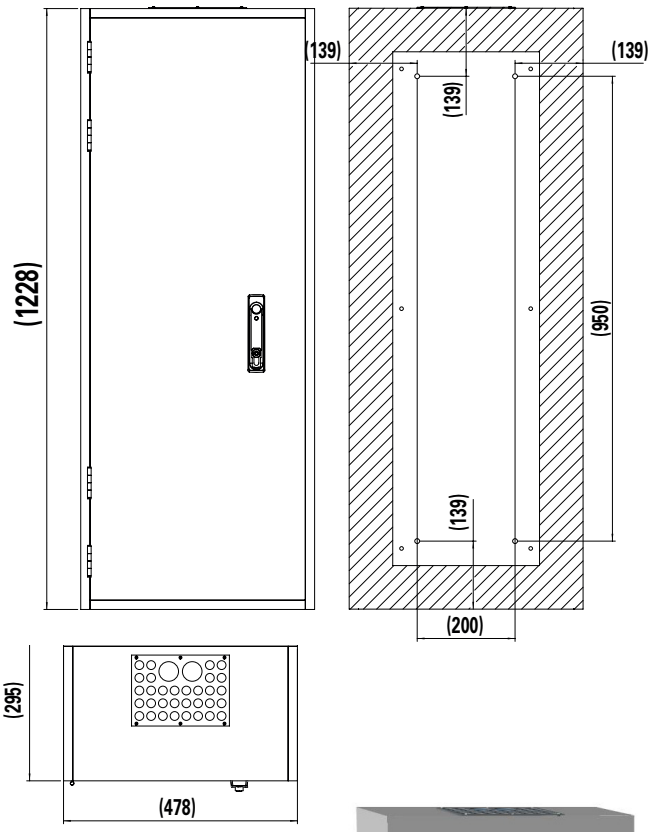
Technical description		**Field**
Dimensions (H x W x D):	2115 x 898 x 549 mm	
Colour:	RAL 7035	
Weight:	330 kg	
Assembly:	Groundmontage	
Degree of protection:	IP42	
Protection class:	I	
Ambient temperature:	-5°C to +35°C	
Degree of pollution:	2	
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3	
Rated voltage (Mains):	UN = 230 V AC	
Rated current (Mains):	IN = 20 A	
Rated voltage (Battery):	216 V DC	
Rated current (Battery):	IN =20 A	
Rated Frequency:	50 / 60 Hz	
Overvoltage category:	Mains: III / Battery: II	
Max. connected load:	At +35°C < 4,3 KW	
Maximum numbers of modules:		
Controller ACU / HMI	1	A1
PSU	1	C1
SKU.1 CG-S:		
1x6A	0-30	
2x3A	0-30	
4x1,5A	0-15	
Max. numbers luminaire circuits:	60	
Terminals:		
ACU	2,5mm² Rigid/ 1,5mm² flexible	A1
Luminaire circuits	4 mm² Rigid/flexible	A2-3
Battery feed	16 mm² Rigid/flexible	B4
Battery through-wiring	16 mm² Rigid/flexible	B4
Mains feed	16 mm² Rigid/flexible	B4
Mains through-wiring	16 mm² Rigid/flexible	B4

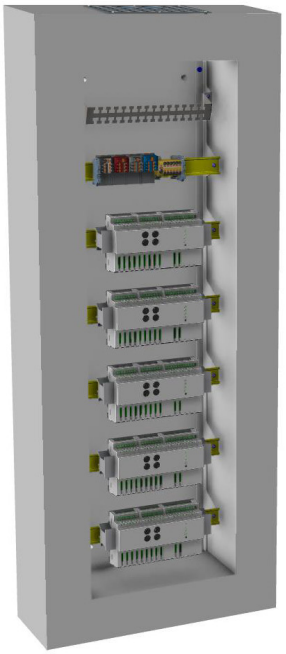
55 DualGuard-S ESF30 US SOU5

The DualGuard-S ESF30 US SOU5 sub-station in accordance with EN 50171 supplies 230V / 216V AC/DC safety and escape sign luminaires and is particularly suitable for installation in fire compartments in buildings with a large number of fire compartments. Thus, the decentralised design of the system can contribute to reducing the costs for function maintenance cabling. The automatic test device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and proclaims the operating states.

Consisting of:

Fire protection wall distributor with cable entry from above and five SOU CG-S 2x4A circuit switches.





Technical description

Dimensions (H x W x D):	1228 x 478 x 295 mm
Colour:	RAL 7035
Weight:	103 kg
Assembly:	Wall
Degree of protection:	IP54
Protection class:	II Schutzisoliert nach VDE 0106
Ambient temperature:	-5°C to +35°C
Degree of pollution:	2
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3
Rated voltage (Mains):	UN = 230V AC
Rated current (Mains):	16A at +35°C
Rated voltage (Battery):	216 V DC
Rated current (Battery):	16A at +35°C
Rated Frequency:	50 or 60 Hz
Overvoltage category:	Mains: III / Battery: II
Max. connected load:	At +35°C < 3,4 KW

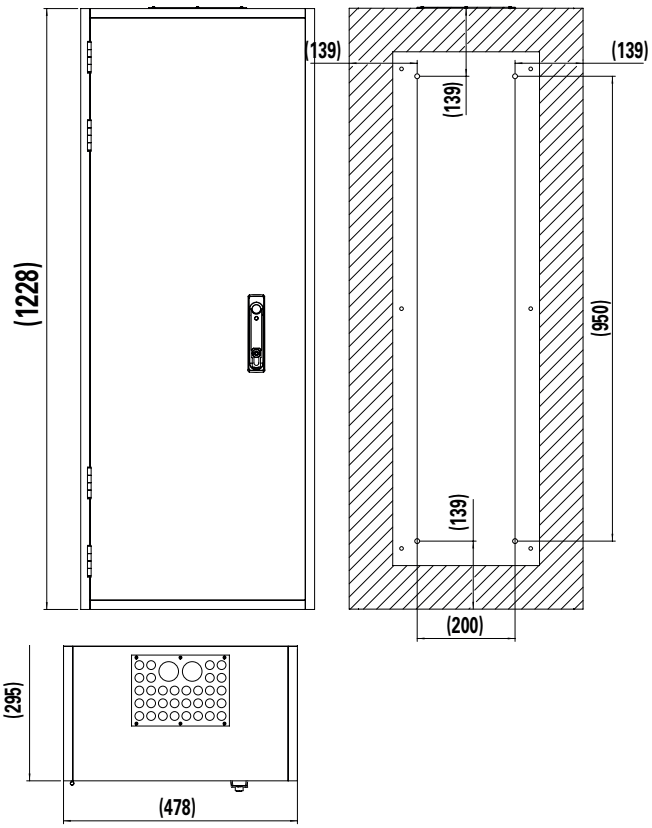
Maximum numbers of modules:	
SOU CG-S 2x4A	5
Max. numbers luminaire circuits:	10
Terminals:	
Luminaire circuits	4 mm² Rigid/flexible
Battery feed	10 mm² Rigid/flexible
Battery through-wiring	10 mm² Rigid/flexible
Mains feed	10 mm² Rigid/flexible
Mains through-wiring	10 mm² Rigid/flexible

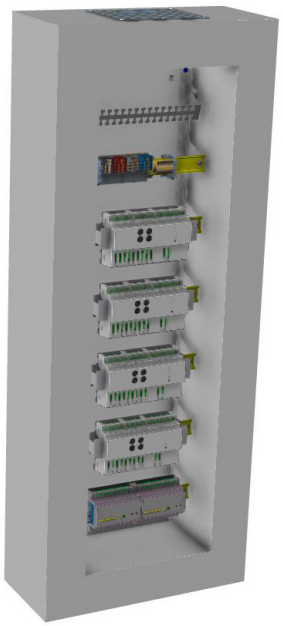
55 DualGuard-S ESF30 US SOU4 IO

The DualGuard-S ESF30 US SOU4 IO sub-station in accordance with EN 50171 supplies 230V / 216V AC/DC safety and escape sign luminaires and is particularly suitable for installation in fire compartments in buildings with a large number of fire compartments. Thus, the decentralised design of the system can contribute to reducing the costs for function maintenance cabling. The automatic test device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and proclaims the operating states.

Consisting of:

Fire protection wall distributor with cable entry from above and four SOU CG-S 2x4A circuit switches.





Technical description	
Dimensions (H x W x D):	1228 x 478 x 295 mm
Colour:	RAL 7035
Weight:	103 kg
Assembly:	Wall
Degree of protection:	IP54
Protection class:	II Protective insulation according to VDE 0106
Ambient temperature:	-5°C to +35°C
Degree of pollution:	2
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3
Rated voltage (Mains):	UN = 230V AC
Rated current (Mains):	IN = 16 A
Rated voltage (Battery):	216 V DC
Rated current (Battery):	IN =16 A
Rated Frequency:	50 or 60 Hz
Overvoltage category:	Mains: III / Battery: II
Max. connected load:	At +35°C < 3,5 KW

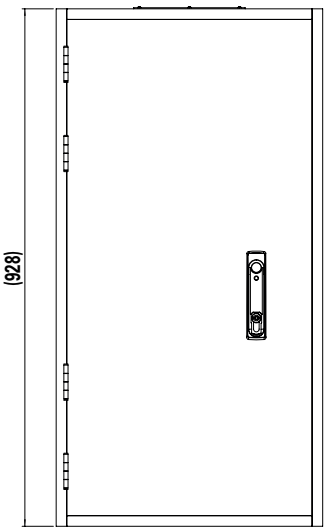
Maximum numbers of modules:	
SOU CG-S 2x4A	4
Max. numbers luminaire circuits:	8
Terminals:	
Luminaire circuits	4 mm² Rigid/flexible
Battery feed	10 mm² Rigid/flexible
Battery through-wiring	10 mm² Rigid/flexible
Mains feed	10 mm² Rigid/flexible
Mains through-wiring	10 mm² Rigid/flexible

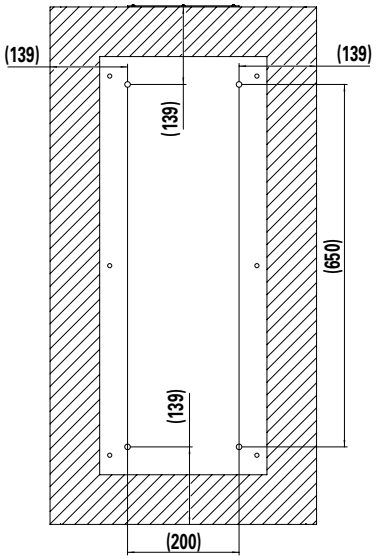
56 DualGuard-S ESF30 US SOU3

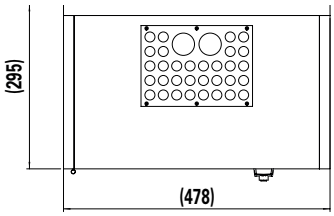
The DualGuard-S ESF30 US SOU3 sub-station in accordance with EN 50171 supplies 230V / 216V AC/DC safety and escape sign luminaires and is particularly suitable for installation in fire compartments in buildings with a large number of fire compartments. Thus, the decentralised design of the system can contribute to reducing the costs for function maintenance cabling. The automatic test device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and proclaims the operating states.

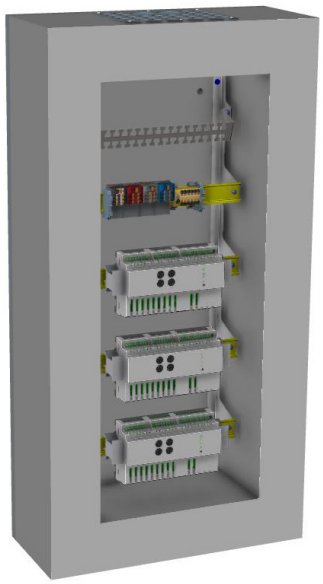
Consisting of:

Fire protection wall distributor with cable entry from above and three SOU CG-S 2x4A circuit switches.









Technical description

Dimensions (H x W x D):	928 x 478 x 295 mm
Colour:	RAL 7035
Weight:	80 kg
Assembly:	Wall
Degree of protection:	IP54
Protection class:	II Schutzisoliert nach VDE 0106
Ambient temperature:	-5°C to +35°C
Degree of pollution:	2
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3
Rated voltage (Mains):	UN = 230V AC
Rated current (Mains):	IN= 10A at +35°C
Rated voltage (Battery):	216 V DC
Rated current (Battery):	IN= 10A at +35°C
Rated Frequency:	50 or 60 Hz
Overvoltage category:	Mains: III / Battery: II
Max. connected load:	At +35°C < 2,1 KW

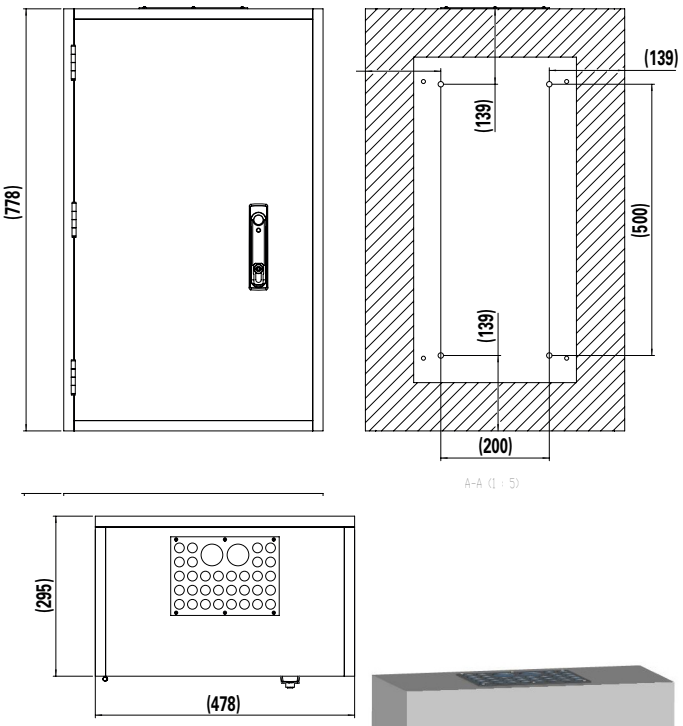
SOU CG-S 2x4A	3
Max. numbers luminaire circuits:	6
Terminals:	
Luminaire circuits	4 mm² Rigid/flexible
Battery feed	10 mm² Rigid/flexible
Battery through-wiring	10 mm² Rigid/flexible
Mains feed	10 mm² Rigid/flexible
Mains through-wiring	10 mm² Rigid/flexible

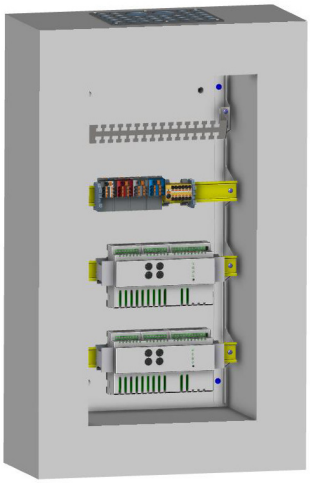
57 DualGuard-S ESF30 US SOU2

The DualGuard-S ESF30 US SOU2 sub-station in accordance with EN 50171 supplies 230V / 216V AC/DC safety and escape sign luminaires and is particularly suitable for installation in fire compartments in buildings with a large number of fire compartments. Thus, the decentralised design of the system can contribute to reducing the costs for function maintenance cabling. The automatic test device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and proclaims the operating states.

Consisting of:

Fire protection wall distributor with cable entry from above and two SOU CG-S 2x4A circuit switches.





Technical description

Dimensions (H x W x D):	778 x 478 x 295 mm
Colour:	RAL 7035
Weight:	69 kg
Assembly:	Wall
Degree of protection:	IP54
Protection class:	II Schutzisoliert nach VDE 0106
Ambient temperature:	-5°C to +35°C
Degree of pollution:	2
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3
Rated voltage (Mains):	UN = 230V AC
Rated current (Mains):	IN = 9A at +35°C
Rated voltage (Battery):	216 V DC
Rated current (Battery):	IN = 9A at +35°C
Rated Frequency:	50 / 60 Hz
Overvoltage category:	Mains: III / Battery: II
Max. connected load:	At +35°C < 1,9 KW

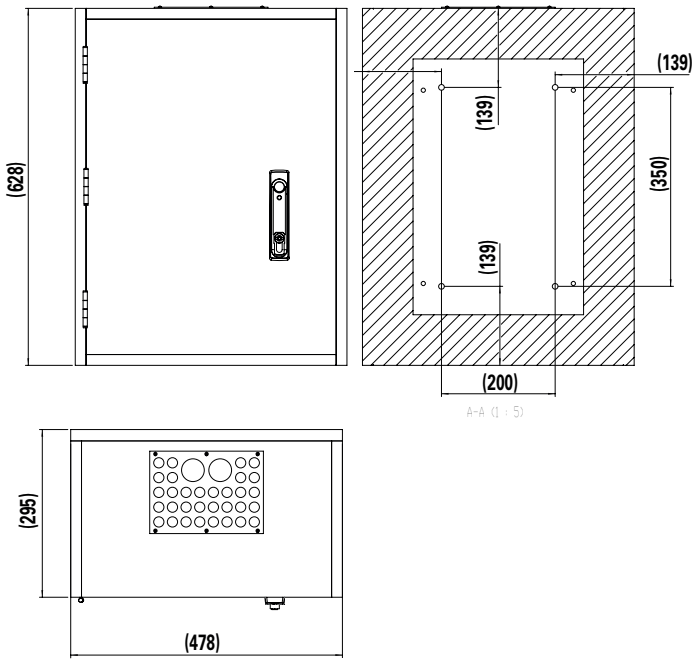
Maximum numbers of modules:	
SOU CG-S 2x4A	2
Max. numbers luminaire circuits:	4
Terminals:	
Luminaire circuits:	4 mm² Rigid/flexible
Battery feed:	10 mm² Rigid/flexible
Battery through-wiring:	10 mm² Rigid/flexible
Mains feed:	10 mm² Rigid/flexible
Mains through-wiring:	10 mm² Rigid/flexible

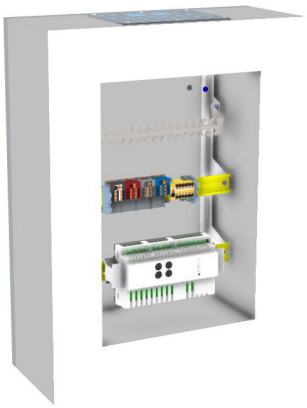
58 DualGuard-S ESF30 US SOU1

The DualGuard-S ESF30 US SOU1 sub-station in accordance with EN 50171 supplies 230V / 216V AC/DC safety and escape sign luminaires and is particularly suitable for installation in fire compartments in buildings with a large number of fire compartments. Thus, the decentralised design of the system can contribute to reducing the costs for function maintenance cabling. The automatic test device and individual luminaire monitoring with individual status and name indication per luminaire in conjunction with system-related ECG / LED supply module including monitoring module without additional data line reports and proclaims the operating states.

Consisting of:

Fire protection wall distributor with cable entry from above and a SOU CG-S 2x4A circuit changeover.





Technical description

Dimensions (H x W x D):	628 x 478 x 295 mm
Colour:	RAL 7035
Weight:	60 kg
Assembly:	Wall
Degree of protection:	IP54
Protection class:	II Schutzisoliert nach VDE 0106
Ambient temperature:	-5°C to +35°C
Degree of pollution:	2
Electromagnetic compatibility:	Industry EN 61000-6-2, Commercial EN 61000-6-3
Rated voltage (Mains):	UN = 230V AC
Rated current (Mains):	IN = 5A at +35°C
Rated voltage (Battery):	216 V DC
Rated current (Battery):	IN = 5A at +35°C
Rated Frequency:	50 or 60 Hz
Overvoltage category:	Mains: III / Battery: II
Max. connected load:	At +35°C < 1,0 KW

Maximum numbers of modules:	
SOU CG-S 2x4A	1
Luminaire circuits:	2
Terminals:	
Luminaire circuits:	4 mm² Rigid/flexible
Battery feed:	10 mm² Rigid/flexible
Battery through-wiring:	10 mm² Rigid/flexible
Mains feed:	10 mm² Rigid/flexible
Mains through-wiring:	10 mm² Rigid/flexible

59 Eaton CCOE Cybersecurity Recommendations

Product Team Guidlines

DualGuard-S has been designed with cybersecurity as an important consideration. A number of features are offered in the product to address cybersecurity risks. These Cybersecurity Recommendations provide information to help users to deploy and maintain the product in a manner that minimizes the cybersecurity risks. These Cybersecurity Recommendations are not intended to provide a comprehensive guide to cybersecurity, but rather to complement customers' existing cybersecurity programs.

Eaton is committed to minimizing the cybersecurity risk in its products and deploying cybersecurity best practices in its products and solutions, making them more secure, reliable and competitive for customers.

The following Eaton whitepapers are available for more information on general cybersecurity best practices and guidelines:

Cybersecurity Considerations for Electrical Distribution Systems (WP152002EN):
http://www.eaton.com/ecm/groups/public/@pub/@eaton/@corp/documents/content/pct_1603172.pdf

Cybersecurity Best Practices Checklist Reminder (WP910003EN):
http://www.cooperindustries.com/content/dam/public/powersystems/resources/library/1100_EAS/WP910003EN.pdf

References

[R1] Cybersecurity Considerations for Electrical Distribution Systems (WP152002EN):
http://www.eaton.com/ecm/groups/public/@pub/@eaton/@corp/documents/content/pct_1603172.pdf

[R2] Cybersecurity Best Practices Checklist Reminder (WP910003EN):
http://www.cooperindustries.com/content/dam/public/powersystems/resources/library/1100_EAS/WP910003EN.pdf

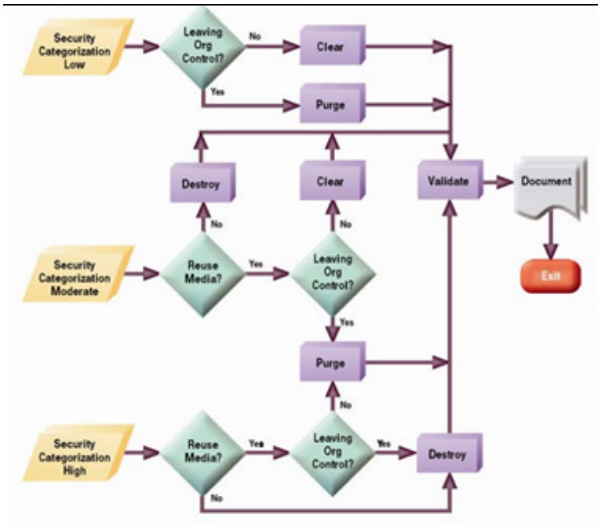
[R3] NIST SP 800-82 Rev 2, Guide to Industrial Control Systems (ICS) Security, May 2015:
https://ics-cert.us-cert.gov/Standards-and-References

[R4] National Institute of Technology (NIST) Interagency "Guidelines on Firewalls and Firewall Policy, NIST Special Publication 800-41", October 2009:
http://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-41r1.pdf

[R5] NIST SP 800-88, Guidelines for Media Sanitization, September 2006:
http://ws680.nist.gov/publication/get_pdf.cfm?pub_id=50819

Category	Description
Asset Management	Keeping track of software and hardware assets in your environment is a pre-requisite for effectively managing cybersecurity. Eaton recommends that you maintain an asset inventory that uniquely identifies each important component. To facilitate this, DualGuard-S supports the following identifying information: - manufacturer, type, serial number, f/w version number, and location. - publisher, name, version, and version date. Please read the corresponding pages of the manual to get information how to find out these parameters.
Risk Assessment	Eaton recommends conducting a risk assessment to identify and assess reasonably foreseeable internal and external risks to the confidentiality, availability and integrity of the system | device and its environment. This exercise should be conducted in accordance with applicable technical and regulatory frameworks such as IEC 62443. The risk assessment should be repeated periodically.
Physical Security	An attacker with unauthorized physical access can cause serious disruption to system functionality. Additionally, Industrial Control Protocols don't offer cryptographic protections, making ICS and SCADA communications especially vulnerable to threats to their confidentiality. Physical security is an important layer of defense in such cases. DualGuard-S is designed to be deployed and operated in a physically secure location. Following are some best practices that Eaton recommends to physically secure your system: - Secure the facility and equipment rooms or closets with access control mechanisms such as locks, entry card readers, guards, man traps, CCTV, etc. as appropriate. - Restrict physical access to cabinets and/or enclosures containing DualGuard-S and the associated system. Monitor and log the access at all times. - Physical access to the telecommunication lines and network cabling should be restricted to protect against attempts to intercept or sabotage communications. It's a best practice to use metal conduits for the network cabling running between equipment cabinets. - DualGuard-S supports the following physical access ports: RJ-45 / USB / SD-Card slot Access to these ports should be restricted. - Do not connect removable media (e.g., USB devices, SD cards, etc.) for any operation (e.g., firmware upgrade, configuration change, or boot application change) unless the origin of the media is known and trusted. - Before connecting any portable device through a USB port or SD card slot, scan the device for malware and viruses.

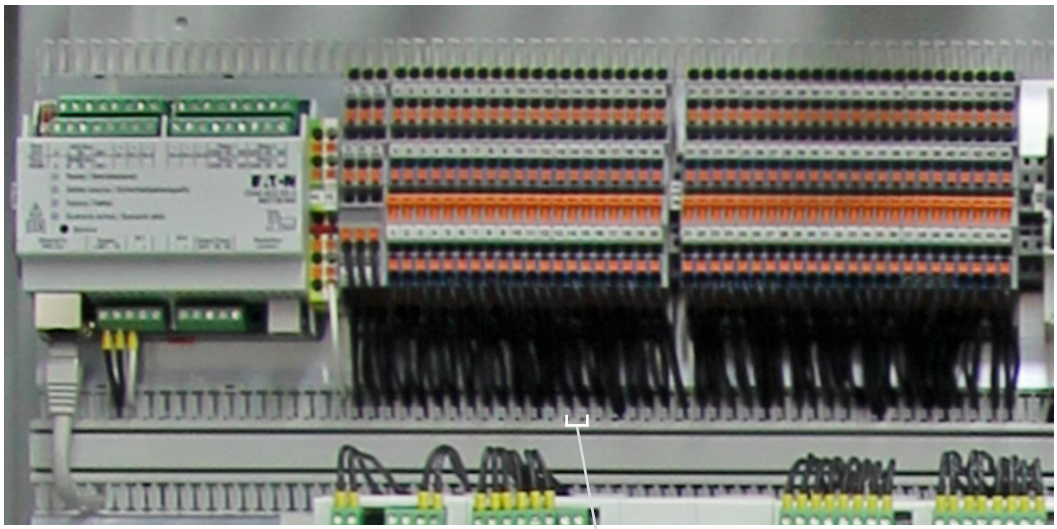
Account Management	Logical access to the system | device should be restricted to legitimate users, who should be assigned only the privileges necessary to complete their job roles/functions. Some of the following best practices may need to be implemented by incorporating them into the organization's written policies: - Ensure default credentials are changed upon first login. DualGuard-S should not be deployed in production environments with default credentials, as default credentials are publicly known. - No account sharing – Each user should be provisioned a unique account instead of sharing accounts and passwords. Security monitoring/logging features in the product are designed based on each user having a unique account. Allowing users to share credentials weakens security. - Restrict administrative privileges- Attackers seek to gain control of legitimate credentials, especially those for highly privileged accounts. Administrative privileges should be assigned only to accounts specifically designated for administrative duties and not for regular use. - Leverage the roles / access privileges to provide tiered access to the users as per the business /operational need. Follow the principle of least privilege (allocate the minimum authority level and access to system resources required for the role). - Perform periodic account maintenance (remove unused accounts). - Ensure password length, complexity and expiration requirements are appropriately set, particularly for all administrative accounts (e.g., minimum 10 characters, mix of upper- and lower-case and special characters, and expire every 90 days, or otherwise in accordance with your organization's policies). - Enforce session time-out after a period of inactivity. - If the device is protected by other means, a User "Autologin" might be configured with password "123456" and a corresponding user group. This user will be logged in automatically when the screen is touched. Keep the device in a safe location if you activate this feature, as anyone with physical access to the device could exploit this.
Time Synchronization	Many operations in power grids and IT networks heavily depend on precise timing information. - Ensure the system clock is synchronized with an authoritative time source (using manual configuration, NTP, SNTP, or IEEE 1588).
Network Security	DualGuard-S supports network communication with other devices in the environment. This capability can present risks if it's not configured securely. Following are Eaton recommended best practices to help secure the network. Additional information about various network protection strategies is available in Eaton Cybersecurity Considerations for Electrical Distribution Systems [R1]. Eaton recommends segmentation of networks into logical enclaves, denying traffic between segments except that which is specifically allowed, and restricting communication to host-to-host paths (for example, using router ACLs and firewall rules). This helps to protect sensitive information and critical services and creates additional barriers in the event of a network perimeter breach. At a minimum, a utility Industrial Control Systems network should be segmented into a three-tiered architecture (as recommended by NIST SP 800-82[R3]) for better security control. Communication Protection:-DualGuard-S provides the option to encrypt its network communications. Please ensure that encryption options are enabled. You can secure the product's communication capabilities by taking the steps of the manual. Eaton recommends opening only those ports that are required for operations and protect the network communication using network protection systems like firewalls and intrusion detection systems / intrusion prevention systems. Use the information below to configure your firewall rules to allow access needed for DualGuard-S to operate smoothly - For Webserver functionality, port 443 (HTTPS is used) - For MQTT, the operator can select any port
Logging and Event Management	- Eaton recommends logging all relevant system and application events, including all administrative and maintenance activities. - Logs should be protected from tampering and other risks to their integrity (for example, by restricting permissions to access and modify logs, transmitting logs to a security information and event management system, etc.). - Ensure that logs are retained for a reasonable and appropriate length of time. - Review the logs regularly. The frequency of review should be reasonable, taking into account the sensitivity and criticality of the system | device and any data it processes.
Secure Maintenance	**Best Practices** Please check Eaton's cybersecurity website for information bulletins about vulnerabilities. www.ceag.de
Business Continuity / Cybersecurity Disaster Recovery	**Plan for Business Continuity / Cybersecurity Disaster Recovery** Eaton recommends incorporating DualGuard-S into the organization's business continuity and disaster recovery plans. Organizations should establish a Business Continuity Plan and a Disaster Recovery Plan and should periodically review and, where possible, exercise these plans. As part of the plan, important system data should be backed up and securely stored, including: - The current configuration. - Documentation of the current permissions / access controls, if not backed up as part of the configuration.

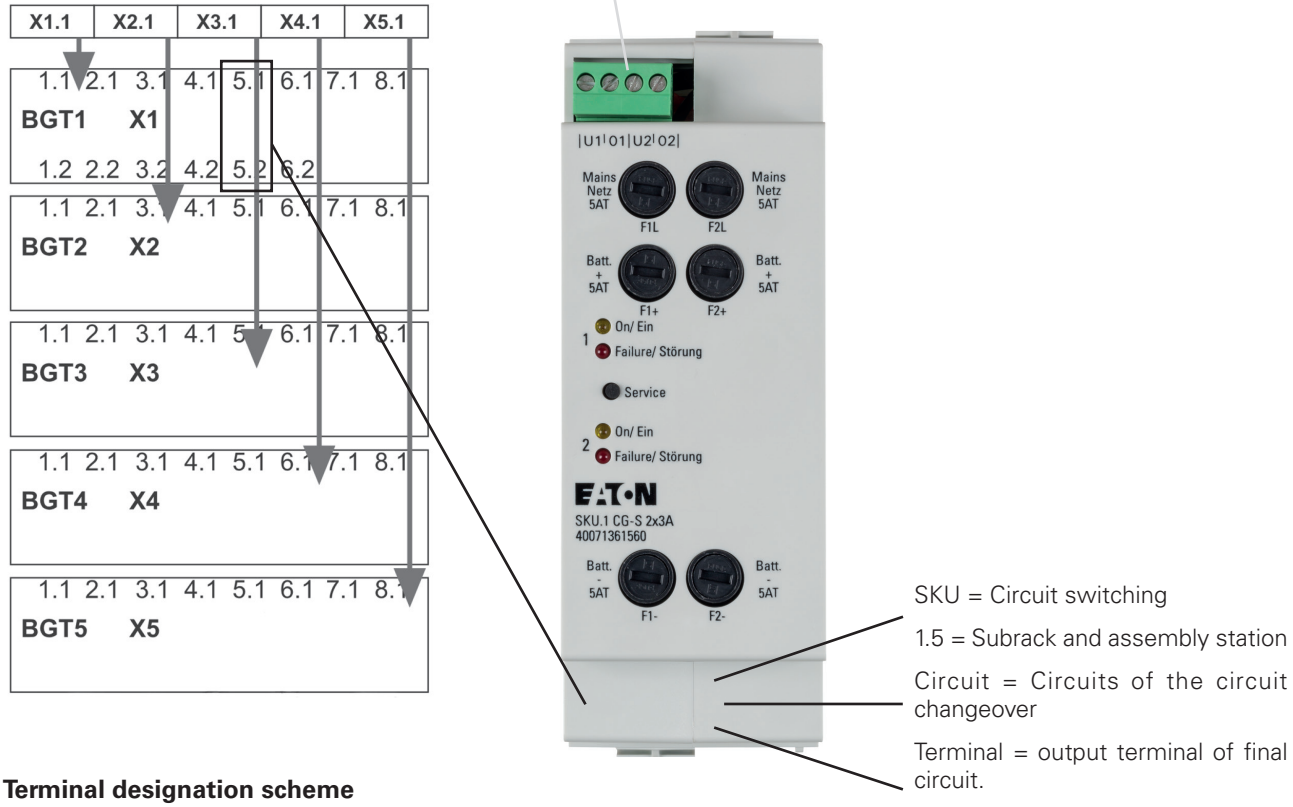
Sensitive Information Disclosure	Eaton recommends that sensitive information (i.e. connectivity, log data, personal information) that may be stored by DualGuard-S be adequately protected through the deployment of organizational security practices.
Decommissioning or Zeroisation	It is a best practice to purge data before disposing of any device containing data. Guidelines for decommissioning are provided in NIST SP 800-88. Eaton recommends that products containing embedded flash memory be securely destroyed to ensure data is unrecoverable.
	 Figure 4-1: Sanitization and Disposition Decision Flow
	Embedded Flash Memory on Boards and Devices Eaton recommends the following methods for disposing of motherboards, peripheral cards such as network adapters, or any other adapter containing non-volatile flash memory. - **Clear:** If supported by the device, reset the state to original factory settings. - **Destroy:** Shred, disintegrate, pulverize, or Incinerate by burning the device in a licensed incinerator.

Appendix A: Overview of pin assignments

All external connections are made via the tension clamp terminal blocks in the upper area of the control cabinet.

The terminal assignment results from the imprints on the front of the housing (for the plug-in screw terminals on the module) and on the terminal blocks for the external connections.





Terminal designation scheme

The assignment of the terminal blocks to the subracks 1 to 5 results from their arrangement from left to right.

Appendix B: Overview of pin assignments

AnlagenType: DualGuard-S

Klemmnummer	KabelType	Zielort	Klemmnummer	KabelType	Zielort
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 D: Position plans of the luminaires

Datum: _____ **Geräte-Adresse:** _____

Uhrzeit: _____ **Name der Anlage:** _____

Leuchte	**20**
Schalter 1	
Schalter 2	
Leuchte	**19**
Schalter 1	
Schalter 2	
Leuchte	**18**
Schalter 1	
Schalter 2	
Leuchte	**17**
Schalter 1	
Schalter 2	
Leuchte	**16**
Schalter 1	
Schalter 2	
Leuchte	**15**
Schalter 1	
Schalter 2	
Leuchte	**14**
Schalter 1	
Schalter 2	
Leuchte	**13**
Schalter 1	
Schalter 2	
Leuchte	**12**
Schalter 1	
Schalter 2	
Leuchte	**11**
Schalter 1	
Schalter 2	

Leuchte	**10**
Schalter 1	
Schalter 2	
Leuchte	**9**
Schalter 1	
Schalter 2	
Leuchte	**8**
Schalter 1	
Schalter 2	
Leuchte	**7**
Schalter 1	
Schalter 2	
Leuchte	**6**
Schalter 1	
Schalter 2	
Leuchte	**5**
Schalter 1	
Schalter 2	
Leuchte	**4**
Schalter 1	
Schalter 2	
Leuchte	**3**
Schalter 1	
Schalter 2	
Leuchte	**2**
Schalter 1	
Schalter 2	
Leuchte	**1**
Schalter 1	
Schalter 2	

Stromkreisname: _____

Schalter 1: _____

Schalter 2: _____

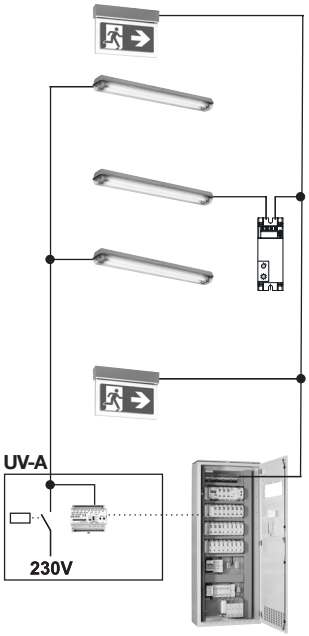
Überwachungsart: _____

Installierte Leistung [W]: _____

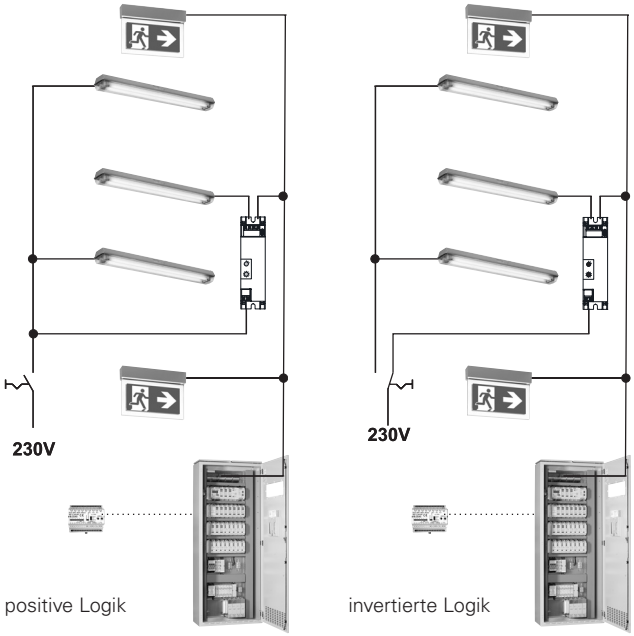
Installierte Leistung [VA]: _____

Appendix E: Installation examples Monitoring Modules

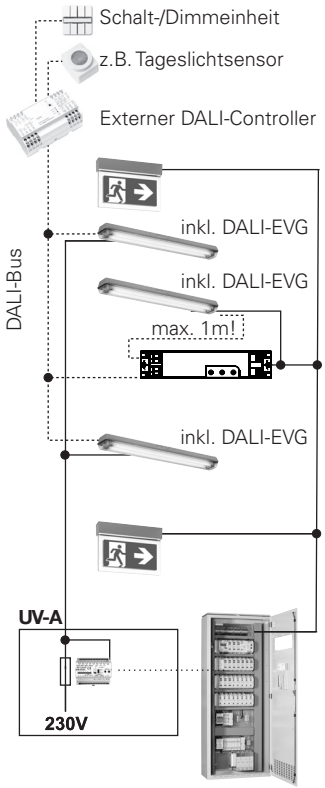
V-CG-S 4 – 400 W
Überwachungsmodul



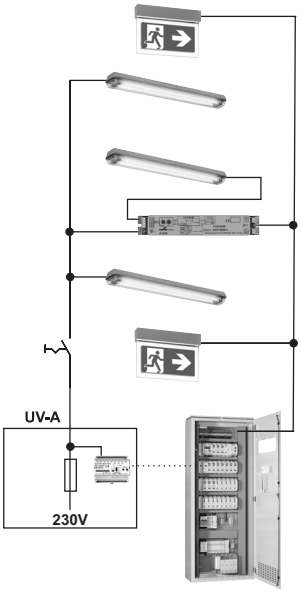
V-CG-SE 4 – 400 W
Überwachungsmodul mit Steuereingang



V-CG-SB Überwachungsmodul mit DALI-Steuereingang



V-CG-SUW Überwachungsmodul mit Umschaltweiche



! ACHTUNG:

At Verwendung von Standard-EVGs muss sichergestellt sein, dass eine einWallfreie Function des EVGs auch im DC-Spannungsbereich von 186 V to 275 V gewährleistet ist. Wir empfehlen, eine entsprechende Bescheinigung des Herstellers einzuholen.

Appendix F: Test and inspection protocol for emergency lighting systems

Functions-/Duration test-Nr.: ____________________ Datum: __________________ Uhrzeit: __________________
Geräte-Nr./Ort: ______________________________ Stromkreis-Nr.: ______________ Leuchten-Nr./Ort: ______________
Fehler beseitigt am: _________________ durch: _________________________ Unterschrift: _________________________

Functions-/Duration test-Nr.: ____________________ Datum: __________________ Uhrzeit: __________________
Geräte-Nr./Ort: ______________________________ Stromkreis-Nr.: ______________ Leuchten-Nr./Ort: ______________
Fehler beseitigt am: _________________ durch: _________________________ Unterschrift: _________________________

Functions-/Duration test-Nr.: ____________________ Datum: __________________ Uhrzeit: __________________
Geräte-Nr./Ort: ______________________________ Stromkreis-Nr.: ______________ Leuchten-Nr./Ort: ______________
Fehler beseitigt am: _________________ durch: _________________________ Unterschrift: _________________________

Functions-/Duration test-Nr.: ____________________ Datum: __________________ Uhrzeit: __________________
Geräte-Nr./Ort: ______________________________ Stromkreis-Nr.: ______________ Leuchten-Nr./Ort: ______________
Fehler beseitigt am: _________________ durch: _________________________ Unterschrift: _________________________

Functions-/Duration test-Nr.: ____________________ Datum: __________________ Uhrzeit: __________________
Geräte-Nr./Ort: ______________________________ Stromkreis-Nr.: ______________ Leuchten-Nr./Ort: ______________
Fehler beseitigt am: _________________ durch: _________________________ Unterschrift: _________________________

Functions-/Duration test-Nr.: ____________________ Datum: __________________ Uhrzeit: __________________
Geräte-Nr./Ort: ______________________________ Stromkreis-Nr.: ______________ Leuchten-Nr./Ort: ______________
Fehler beseitigt am: _________________ durch: _________________________ Unterschrift: _________________________

Functions-/Duration test-Nr.: ____________________ Datum: __________________ Uhrzeit: __________________
Geräte-Nr./Ort: ______________________________ Stromkreis-Nr.: ______________ Leuchten-Nr./Ort: ______________
Fehler beseitigt am: _________________ durch: _________________________ Unterschrift: _________________________

Functions-/Duration test-Nr.: ____________________ Datum: __________________ Uhrzeit: __________________
Geräte-Nr./Ort: ______________________________ Stromkreis-Nr.: ______________ Leuchten-Nr./Ort: ______________
Fehler beseitigt am: _________________ durch: _________________________ Unterschrift: _________________________

Functions-/Duration test-Nr.: ____________________ Datum: __________________ Uhrzeit: __________________
Geräte-Nr./Ort: ______________________________ Stromkreis-Nr.: ______________ Leuchten-Nr./Ort: ______________
Fehler beseitigt am: _________________ durch: _________________________ Unterschrift: _________________________

Functions-/Duration test-Nr.: ____________________ Datum: __________________ Uhrzeit: __________________
Geräte-Nr./Ort: ______________________________ Stromkreis-Nr.: ______________ Leuchten-Nr./Ort: ______________
Fehler beseitigt am: _________________ durch: _________________________ Unterschrift: _________________________

Functions-/Duration test-Nr.: ____________________ Datum: __________________ Uhrzeit: __________________
Geräte-Nr./Ort: ______________________________ Stromkreis-Nr.: ______________ Leuchten-Nr./Ort: ______________
Fehler beseitigt am: _________________ durch: _________________________ Unterschrift: _________________________

General Safety instructions - Batteries

български

Общи инструкции за безопасност

- Батериите не са подходящи за частна употреба.
- Монтирането трябва да се извършва от квалифицирани техници, като се вземат под внимание националните разпоредби за безопасност и предотвратяване на злополуки. При работа с батериите носете предпазни очила и предпазно облекло.
- Батериите трябва да се използват в съответствие с предназначението им, в подходящо и изправно състояние.
- Избягвайте натрупването на електростатичен заряд и изтичане/искри. Опасност от експлозия.
- Ако обвивката на батерията е повредена, изтича корозивен електролит.
- При работа с батериите, първо изключете напълно електрозахранването, уверете се, че не е възможно то да се включи отново и проверете дали уредът не е под напрежение. Не изключвайте батерията, докато е под натоварване.
- При изключване под натоварване или в случай на късо напрежение формираната дъга може да предизвика изгаряния.
- Не поставяйте чужди тела или инструменти върху батерията.
- Внимавайте за падащи части по време на транспортиране.
- Никога не вдигайте или повдигайте блок батерии/клетки за техните полюси.
- Използвайте само оригинални резервни части за подмяна.

Česky

Všeobecné bezpečnostní pokyny

- Baterie nejsou určeny k soukromému využití.
- Veškerou instalaci musí provádět kvalifikovaný elektrikář seznámený s národními bezpečnostními předpisy. Při nakládání s bateriemi si nasaďte ochranné brýle a oděv.
- Baterie se smí používat jen k zamýšlenému účelu a musí být v řádném a nepoškozeném stavu.
- Vyhýbejte se vytvoření elektrostatického náboje a jisker. Riziko výbuchu.
- Pokud je obal baterie poškozen, uniká korozivní elektrolyt.
- Při práci s bateriemi nejprve zcela odpojte napájení, zajistěte, aby nemohlo být znovu zapnuto, a zkontrolujte nepřítomnost napětí. Neodpojujte baterii pod napětím.
- Při odpojení pod napětím nebo v případě zkratu se může vytvořit el. oblouk způsobující popáleniny.
- Nepokládejte na baterii žádné nástroje ani jiné předměty.
- Při přenosu pamatujte na oddělitelné části.
- Nikdy nevytahujte či nezvedejte baterie/články za póly.
- K výměně používejte výhradně originální náhradní díly.

Dansk

Generelle sikkerhedsinstruktioner

- Batteryrne er ikke egnet til privat brug.
- En installation skal altid udføres af en kvalificeret elektriker og ander hensyntagen til nationale sikkerheds- og ulykkesforebyggende regulativer. Bær beskyttelsesbriller og -beklædning ander arbejdet med Batteryrne.
- Batteryrne må kun anvendes i overensstemmelse med den påtænkte brug og i hel og ubeskadiget stand.
- Andgå opbygning af elektrostatisk ladning og afladning/gnister. Eksplosionsfare.
- Hvis Batteryts kasse er beskadiget, udledes ætsende elektrolytter.
- Når der arbejdes med Batteryrne, så sluk først for al strøm, fastslå at den ikke kan tændes igen og tjek, at de er uden spænding. Afbryd ikke Batteryt ander belastning.
- Afbrydes Batteryt ander belastning eller ved kortslutning, kan den skabte bue give forbrændinger.
- Placér ikke fremmedlegemer på Batteryt.
- Pas på løsdele ander transport.
- Hejs eller løft aldrig Batteryr/celler op ved polerne.
- Brug kun originale reservedele ved udskiftning.

Deutsch

Allgemeine Sicherheitshinweise

- Die Batteryn sind nicht für den privaten Gebrauch geeignet.
- Eine Installation darf nur durch qualifizierte Elektrofachkräfte unter Berücksichtigung der nationalen Sicherheits- and Unfallverhütungsvorschriften erfolgen. At ArAtten an Batteryn Schutzbrille and Schutzkleidung tragen.
- Die Batteryn sind bestimmungsgemäß in unbeschädigtem and einWallfreiem Zustand zu betreiben.
- Elektrostatische Auf- bzw. Entladungen/Funken sind zu vermeiden. Explosionsgefahr.
- At Zerstörung der Gehäuse ist der frei-werdende Elektrolyt ätzend.
- At ArAtten an den Batteryn sind diese zuerst komplett frei zu schalten, gegen Wiedereinschalten zu sichern and die Spannungsfreiheit festzustellen. Die Battery nicht unter Last trennen.
- At Trennen unter Last or At Kurzschlüssen können Verbrennungen durch Lichtbögen die Folge sein.
- Keine fremden Gegenstände or Werkzeuge auf der Battery ablegen.
- Atm Transport mit herunter fallenden Teilen rechnen.
- Niemals BlockBatteryn/Zellen an den Polen anheben or hochziehen.
- Als Ersatz dürfen nur Originalteile verwendet werden.

Eesti – Üldised ohutusjuhised

- Akud ei ole mõeldud erakasutuseks.
- Paigaldustööd tuleb jätta kvalifitseeritud elektriku hooleks ning tuleb teha vastavalt siseriiklikele ohutuseeskirjadelete ja õnnetusjuhtumite vältimise reeglitele. Akudega töötamisel kandke kaitseprille ja -riietust.
- Akusid tuleb kasutada nende ettenähtud eesmärgil korrasolevatena ja kahjustamata seisandis.
- Vätige elektrostaatilise laengu kogunemist ja vabanemist/sädemeid. Plahvatusoht.
- Kui aku korpus on kahjustatud, eraldub korrosiivset elekytolüüti.
- Akudega töötamisel lülitage kõigepealt kogu toide täielikultvälja, tagage, et seda ei saa uuesti sisse lülitada ja kontrollige toitepinge puudumist. Ärge ühendage lahti koormuse all olevat akut.
- Koormuse all oleva aku lahtiühendamisel või lõhise korral võib tekkiv elektrikaar põhjustada põletusi.
- Ärge pange aku peale mingeid võõrkehasid ega tööriistu.
- Transportimisel võtke arvesse kukkuvatest osadest lähtuvat ohtu.
- Vältige akuplokkide/-elementide tõstmist poolustest.
- Vahetamiseks kasutage ainult originaalvaruosi.

ελληνικά

Γενικές οδηγίες για την ασφάλεια

- Οι μπαταρίες δεν είναι κατάλληλες για ιδιωτική χρήση.
- Η εγκατάστασή τους πρέπει να γίνεται από εξειδικευμένους ηλεκτρολόγους, λαμβάνοντας υπόψη τους εθνικούς κανονισμούς ασφαλείας και πρόληψης ατυχημάτων. Όταν εργάζεστε με τις μπαταρίες, φοράτε προστατευτικά γυαλιά και προστατευτική ενδυμασία.
- Πρέπει να γίνεται μόνο η προβλεπόμενη χρήση των μπαταριών, στην κατάλληλη κατάστασή τους και χωρίς να παρουσιάζουν βλάβη.
- Αποφεύγετε την πρόκληση ηλεκτροστατικής φόρτισης και αποφόρτισης/σπινθήρων. Κίνδυνος έκρηξης.
- Εάν το περίβλημα της μπαταρίας έχει υποστεί βλάβη, απελευθερώνεται διαβρωτικός ηλεκτρολύτης.
- Όταν εργάζεστε με τις μπαταρίες, κλείνετε τον διακόπτη λειτουργίας, βεβαιώνεστε ότι δεν μπορεί να ανοίξει ξανά και ελέγχετε εάν υπάρχει τάση σε αυτές. Μην αποσυνδέετε την μπαταρία υπό φορτίο.
- Κατά την αποσύνδεση υπό φορτίο ή σε περίπτωση βραχυκυκλώματος, το τόξο που σχηματίζεται μπορεί να προκαλέσει εγκαύματα.
- Μην τοποθετείτε ξένα αντικείμενα ή εργαλεία πάνω στην μπαταρία.
- Έχετε υπόψη σας τα τμήματα που ενδέχεται να πέσουν κατά τη μεταφορά.
- Μη σηκώνετε ποτέ τις μπαταρίες από τους πόλους τους.
- Χρησιμοποιείτε μόνο γνήσια ανταλλακτικά για αντικατάσταση.

English – General safety instructions

- The Batteries are not suitable for private use.
- An installation must be performed by qualified electricians taking into account the national safety and accident prevention regulations. Wear protective goggles and protective clothing when working with the Batteries.
- The Batteries must be used in accordance with their intended use in a proper and andamaged condition.
- Avoid the build-up of electrostatic charge and discharge/sparks. Risk of explosion.
- If the battery casing is damaged, corrosive electrolyte is discharged.
- When working with the Batteries, first turn off the power completely, ensure that it cannot be turned back on, and check if they are free of voltage. Do not disconnect the battery ander load.
- When disconnecting ander load or in case of short circuits, the arc formed can cause burns.
- Do not deposit any foreign objects or tools on the battery.
- Be aware of falling parts during transport.
- Never hoist or lift block Batteries/cells by their poles.
- Use only original spare parts for replacement.

Español

Instrucciones generales de seguridad

- Las baterías no son adecuadas para el uso privado.
- Solo puede instalarlas un electricista cualificado de acuerdo con la normativa de seguridad y prevención de accidentes. Use gafas y ropa de protección cuando manipule las baterías.
- Las baterías deben utilizarse de acuerdo con su uso previsto, en buen estado y sin daños.
- Evite las cargas y descargas electrostáticas y las chispas. Riesgo de explosión.
- Si se daña la carcasa de la batería, se descargará electrolito corrosivo.
- Cuando se disponga a manipular las baterías, desconecte totalmente la corriente eléctrica, asegúrese de que no se pueden volver a conectar y compruebe que no tengan corriente. No desconecte la batería con una carga conectada.
- Al desconectarla con una carga conectada o en caso de que se produzcan cortocircuitos, el arco que se forma puede provocar quemaduras.
- No deposite objetos extraños o herramientas sobre la batería.
- Tenga cuidado con los componentes que podrían caerse durante el transporte.
- No levante las baterías de bloque/pilas por los polos.
- Use solo piezas de repuesto originales para reemplazar las antiguas.

Français

Consignes générales de sécurité

- Les Batteries ne conviennent pas à un usage privé.
- L'installation doit être effectuée par des électriciens qualifiés, conformément aux réglementations nationales sur la sécurité et la prévention des accidents. Portez des lunettes et vêtements de protection lorsque vous travaillez avec les Batteries.
- Les Batteries doivent être utilisées conformément à l'usage auquel elles sont destinées, être en bon état et ne pas être endommagées.
- Évitez l'accumulation de charges électrostatiques et les décharges/étincelles. Risque d'explosion.
- Lorsque le boîtier de la Battery est endommagé, un électrolyte corrosif se décharge.
- Lorsque vous travaillez sur les Batteries, coupez tout d'abord complètement l'alimentation électrique, assurez-vous qu'elle ne peut pas être rétablie et vérifiez que la tension est nulle. Ne déconnectez pas une Battery en charge.
- En cas de déconnexion en charge ou de court-circuits, l'arc qui se forme peut provoquer des brûlures.
- Ne posez aucun objet étranger ou outil sur la Battery.
- Faites attention aux pièces pouvant tomber pendant le transport.
- Ne hissez ou ne soulevez jamais de blocs de Batteries/cellules par leurs pôles.
- N'utilisez que des pièces de rechange d'origine en cas de remplacement.

Hrvatski – Opće sigurnosne upute

- Akumulatori nisu prikladni za privatnu upotrebu.
- Instalaciju moraju provesti kvalificirani električari uzimajući u obzir nacionalne propise za sigurnost i sprečavanje nezgoda. Nosite zaštitne naočale i zaštitnu odjeću tijekom rada s akumulatorima.
- Akumulatori se moraju upotrebljavati u skladu sa svojom namjenom u ispravnom i neoštećenom stanju.
- Izbjegavajte stvaranje elektrostatičkog napona i izboja/iskri. Rizik od eksplozije.
- Ako je kućište akumulatora oštećeno, izbija korozivni elektrolit.
- Kada radite s akumulatorima, prvo u potpunosti isključite napajanje, osigurajte da se ne može uključiti i provjerite da nema napona. Nemojte isključivati akumulator pod opterećenjem.
- Ako isključujete pod opterećenjem ili u slučaju kratkih spojeva, formirani luk može uzrokovati opekotine.
- Nemojte odlagati strane predmete ili alate na akumulator.
- Pripazite na dijelove koji padaju tijekom transporta.
- Nikada ne podižite akumulatore/ćelije držeći za polove.
- Upotrebljavajte samo originalne rezervne dijelove za zamjenu.

Italiano

Indicazioni generali sulla sicurezza

- Le Battery non sono idonee all'uso privato.
- L'installazione deve essere effettuata da un elettricista specializzato prendendo in considerazione le norme nazionali in materia di sicurezza e prevenzione degli infortuni. Indossare occhiali e indumenti protettivi quando si interviene sulle Battery.
- Le Battery devono essere utilizzate conformemente all'uso previsto in condizioni adeguate e senza danni.
- Evitare l'accumulo di cariche elettrostatiche e scariche/scintille. Pericolo di esplosione.
- Se l'involucro della batteria è danneggiato, può verificarsi la fuoriuscita di elettrolita corrosivo.
- Prima di ogni intervento sulle Battery, disattivare completamente l'alimentazione elettrica, accertarsi che non possa essere riattivata e verificare che le Battery siano prive di tensione. Non scollegare Battery sotto carico.
- Se scollegate sotto carico o in caso di cortocircuito, l'arco formato può causare ustioni.
- Non depositare corpi estranei o strumenti sulla batteria.
- Prestare attenzione alla possibile caduta di pezzi durante il trasporto.
- Mai issare o sollevare celle/Battery a blocchi dai loro poli.
- Utilizzare soltanto pezzi di ricambio originali.

Latviski

Vispārējie drošības norādījumi

- Šie akumulatori nav paredzēti personīgai lietošanai.
- Uzstādīšana jāveic kvalificētiem elektriķiem, ievērojot nacionālos drošības un nelaimes gadījumu novēršanas noteikumus. Strādājot ar akumulatoriem lietojiet aizsargbrilles un aizsargapģērbu.
- Akumulatori jālieto saskaņā ar tiem paredzēto lietošanu pareizā un nebojātā stāvoklī.
- Izvairieties no elektrostatiskā lādiņa uzkrāšanās un izlādes/dzirkstelēm. Sprādziena risks.
- Ja akumulatora korpuss ir bojāts, izplūst kodīgs elektrolīts.
- Rīkojoties ar akumulatoriem, vispirms pilnībā izslēdziet barošanu, nodrošiniet, ka to nevar atkal ieslēgt, un pārliecinieties, ka tie nav zem sprieguma. Neatvienojiet akumulatoru, kam pievienota slodze.
- Atvienojot akumulatoru, kam pievienota slodze, vai īsslēguma gadījumos, rodas dzirkstele, kas var izraisīt apdegumus.
- Neuzlieciet uz akumulatora nekādus svešķermeņus vai instrumentus.
- Transportējot uzmanieties no krītošām daļām.
- Nekad necilājiet vai neceliet akumulatoru blokus/šūnas aiz to poliem.
- Nomaiņai izmantojiet tikai oriģinālās rezerves daļas.

Lietuviškas

Bendrieji saugos nurodymai

- Akumuliatoriai neskirti privačiam naudojimui.
- Įrengti turi kvalifikuoti elektrikai, atsižvelgdami į šalies saugos ir nelaimingų atsitikimų prevencijos taisykles. Dirbdami su akumuliatoriais dėvėkite apsauginius akinius ir apsauginius drabužius.
- Akumuliatoriai turi būti naudojami pagal numatytą paskirtį, tinkamos būklės ir nesugadinti.
- Venkite elektrostatinio krūvio susikaupimo ir išlydžio / kibirkščių. Sprogimo pavojus.
- Pažeidus akumuliatoriaus korpusą išteka korozinis elektrolitas.
- Dirbdami su akumuliatoriais pirmiausia visiškai išjunkite maitinimą, pasirūpinkite, kad jis negalėtų būti vėl įjungtas ir patikrinkite, ar neliko įtampos. Neatjunkite akumuliatoriaus, kuris tiekia įtampą imtuvui.
- Atjungiant tokiomis sąlygomis arba susidarius trumpajam jungimui atsiranda elektros lankas,

General Safety instructions - Batteries

kuris gali nudeginti.
- Ant akumuliatoriaus nedėkite jokių pašalinių daiktų ar įrankių.
- Veždami saugokite, kad neužkristų daiktai.
- Niekada nekelkite akumuliatorių ar maitinimo elementų už jų polių.
- Pakeitimui naudokite tik originalias atsargines dalis.

Magyar
Általános biztonsági utasítások
- Az elemek nem megfelelőek magáncélú használatra.
- A felszerelést csak szakképzett villanyszerelő végezheti a helyi biztonsági és baleset-megelőzési szabályozás betartásával. Az elemekkel való munkavégzés során viseljen védőszemüveget és védőruhát.
- Az elemeket rendeltetésszerűen kell használni, és azoknak megfelelő és sértetlen állapotúnak kell lenniük.
- Kerülje az elektrosztatikus töltés kialakulását és annak kisülését/szikrázást. Robbanásveszély.
- Ha az elem burkolata megsérült, korrodáló hatású elektrolit folyadék szabadul fel.
- Ha az elemekkel munkálatokat végez, először szakítsa meg teljesen az áramellátást, biztosítsa azokat bekapcsolás ellen, és ellenőrizze, hogy feszültségmentes állapotban vannak. Ne kapcsolja szét az elemeket terhelés alatt.
- Ha terhelés alatt szétkapcsolja az elemeket, vagy rövidzárlat esetén, a kialakuló villamos ív égési sérülést okozhat.
- Ne helyezzen idegen tárgyakat vagy szerszámokat az elemekre.
- Figyeljen az esetleg leeső összetevőkre szállítás során.
- Soha ne csörlőzze vagy emelje fel a telepeket/cellákat az elektródáktól fogva.
- Csak eredeti cserealkatrészeket használjon.

Nederlands
Algemene veiligheidsinstructies
- De batterijen zijn alleen geschikt voor proffesioneel gebruik.
- De Installatie moet worden uitgevoerd door gekwalificeerde elektromonteurs met inachtneming van de nationale regelgeving voor veiligheid en het voorkomen van ongevallen. Draag bij het werken met de batterijen een beschermende bril en beschermende kleding.
- De batterijen moeten worden gebruikt waarvoor deze bedoeld zijn, op de juiste wijze en in onbeschadigde toestand.
- Voorkom het ontstaan van elektrostatische lading en ontlading/vonken. Risico van explosie.
- Als de batterijbehuizing beschadigd raakt kunnen er bijtende stoffen uitlekken.
- Tijdens werkzaamheden aan de batterijen dienen deze te worden losgekoppeld van de installatie. Zorg er tevens voor dat deze niet zomaar onbedoeld terug ingeschakeld kunnen worden. Ontkoppel nooit de batterijen van de installatie indien er een ontlaadstroom door de batterijen loopt.
- Bij ontkoppelen tijdens gebruik of bij kortsluiting van de batterijen kan brand ontstaan.
- Plaats geen vreemde objecten of gereed-schappen op de batterijen.
- Let op vallende delen tijdens transport.
- Til blokbatterijen/accu's nooit op aan de batterijpolen.
- Gebruik alleen originele onderdelen bij vervanging.

Norsk
Generelle sikkerhetsinstruksjoner
- Batteryne passer ikke for privat bruk.
- En installasjon må utføres av kvalifiserte teknikere som tar hensyn til nasjonale sikkerhetsforskrifter og ulykkesforebyggende forskrifter. Bruk vernebriller og vernebriller når du arAtder med Batteryne.
- Batteryne skal brukes i samsvar med tiltenkt formål, i riktig og uskadet stand.
- Unngå oppbygging av elektrostatisk ladning og utladning/gnister. Fare for eksplosjon.
- Hvis batterikassen er skadet, blir etsende elektrolytt utladet.
- Ved arAtd med Batteryne, skal strømmen først slås helt av, og det skal sikres at den ikke kan slås på igjen. Kontroller at de er spenningsfrie. Ikke koble fra Batteryt ander ladning.
- Når du kobler fra ander belastning eller manglende kortslutninger, kan bueformen forårsake brannskader.
- Ikke plasser noen fremmedlegemer eller verktøyer på Batteryt.
- Vær oppmerksom på fallende deler ander transport.
- Aldri heise eller heis blokkBatteryr/celler ved polene.
- Bruk bare originale reservedeler til erstatning.

Polski
Ogólne instrukcje bezpieczeństwa
- Akumulatory nie nadają się do użytku prywatnego.
- Montaż musi być przeprowadzony przez wykwalifikowanego elektryka z uwzględnieniem lokalnych przepisów bezpieczeństwa pracy i zapobiegania wypadkom. Podczas pracy przy akumulatorach należy nosić okulary ochronne oraz odzież ochronną.
- Akumulatorów należy używać wyłącznie zgodnie z ich zamierzonym przeznaczeniem, gdy są one w dobrym i nieuszkodzonym stanie.
- Należy unikać gromadzenia się ładunku elektrostatycznego oraz wyładowań/iskier. Ryzyko wybuchu.
- Jeżeli obudowa akumulatora jest uszkodzona, wycieka z niej korozyjny elektrolit.
- Podczas pracy przy akumulatorach należy najpierw całkowicie wyłączyć zasilanie, upewnić się, że nie można go włączyć ponownie oraz sprawdzić, czy nie ma napięcia. Nie wolno odłączać akumulatora znajdującego się pod obciążeniem.
- Przy odłączaniu pod obciążeniem lub w przypadku wystąpienia zwarcia, powstały łuk może spowodować poparzenia.
- Nie wolno kłaść żadnych przedmiotów ani narzędzi na akumulatorze.
- Podczas transportu należy uważać na spadające elementy.
- Nie wolno podnosić ani przenosić akumulatorów blokowych/ogniw za ich klemy.
- W przypadku wymiany należy używać wyłącznie oryginalnych części zamiennych.

Português
Instruções gerais de segurança
- As baterias não são adequadas para uso privado.
- A instalação deve ser efetuada por um eletricista qualificado e em conformidade com os regulamentos nacionais de segurança e prevenção de acidentes. Utilize óculos de proteção e vestuário de proteção ao utilizar as baterias.
- As baterias devem ser utilizadas em conformidade com o seu uso previsto e em boas condições, não apresentando danos.
- Evite a acumulação de carga eletrostática e descarga/faíscas. Risco de explosão.
- Se o invólucro da bateria estiver danificado, é libertado um eletrólito corrosivo.
- Ao utilizar as baterias, primeiro desligue a eletricidade completamente, certifique-se de que não pode ser ligada e verifique se não existe tensão. Não remova a bateria sob carga.
- Ao removê-la sob carga ou em caso de curto-circuito, o arco formado pode provocar queimaduras.
- Não coloque quaisquer objetos estranhos ou ferramentas em cima da bateria.
- Tenha atenção à queda de peças durante o transporte.
- Nunca erga ou levante blocos/células de baterias através dos polos.
- Em caso de substituição, utilize apenas peças sobressalentes originais.

Română
Instrucțiuni generale de siguranță
- Bateriile nu sunt destinate pentru uz personal.
- Instalarea trebuie efectuată de către un electrician calificat în conformitate cu reglementările naționale de siguranță și prevenirea accidentelor. În timpul lucrărilor la baterii, purtați ochelari de protecție și îmbrăcăminte de protecție.
- Bateriile trebuie utilizate conform destinației lor într-o stare corespunzătoare și nedeteriorată.
- Evitați producerea încărcării electrostatice și descărcarea acesteia/scântei. Risc de explozie.
- În cazul deteriorării carcasei bateriei se scurge electrolit cu efect coroziv.
- Dacă efectuați lucrări la baterii, întrerupeți mai întâi alimentarea cu curent, asigurați-l împotriva repornirii și verificați ca să nu fie sub tensiune. Nu deconectați bateriile sub sarcină.
- În cazul deconectării sub sarcină și în caz de scurtcircuit, arcul format poate cauza arsuri.
- Nu depozitați obiecte străine sau scule pe baterii.
- Fiți atenți la obiecte care pot cădea în timpul transportului.
- Niciodată nu ridicați blocurile de baterii/celulele ținute de poli.
- Utilizați numai piese de schimb originale.

Русский
Общие инструкции по безопасности
- Аккумуляторы не предназначены для бытового использования.
- Монтаж выполняется квалифицированными электриками с учетом государственных норм и правил ТБ и профилактики несчастных случаев. При работе с аккумуляторами пользуйтесь защитными очками и спецодеждой.
- Аккумуляторы должны использоваться только по назначению, при этом их следует поддерживать в исправном состоянии и оберегать от повреждений.
- Не допускайте накопления электростатического заряда и разрядов/искрения. Это может привести к взрыву.
- При повреждении корпуса аккумулятора из него вытекает агрессивный электролит.
- Перед началом выполнения любых работ с аккумуляторами, необходимо полностью обесточить цепь, обеспечить невозможность несанкционированной подачи питания, а также проверить отсутствие напряжения в цепи. Не отключайте аккумулятор под нагрузкой.
- При отключении под нагрузкой или в случае короткого замыкания происходит дуговой разряд, который может стать причиной ожогов.
- Не кладите на аккумулятор посторонние предметы или инструменты.
- Перемещайте аккумулятор с осторожностью, чтобы не уронить.
- Не поднимайте аккумуляторы/батареи за контакты.
- При замене вышедших из строя деталей используйте только оригинальные запчасти.

Slovenčina
Splošna varnostna navodila
- Batérie nie sú vhodné na súkromné použitie.
- Inštaláciu musí vykonávať kvalifikovaný elektrikár s prihliadnutím na vnútroštátne nariadenia o bezpečnosti a predchádzaní rizikám. Pri práci s batériami noste ochranné okuliare a oblečenie.
- Batérie sa musia používať v súlade s plánovaným používaním v riadnom a nepoškodenom stave.
- Zabráňte vytvoreniu elektrostatického výboja a iskier. Riziko výbuchu.
- Ak je puzdro batérie poškodené, uniká korozívny elektrolyt.
- Pri práci s batériami najprv úplne vypnite napájanie, zaistite, aby sa znova nezapli a skontrolujte, či sú bez napätia. Batériu neodpájajte pod napätím.
- Pri odpojení pod napätím alebo v prípade skratu môže vytvorený oblúk spôsobiť popáleniny.
- Na batériu nedávajte žiadne cudzie predmety či nástroje.
- Počas prepravy dávajte pozor na padajúce predmety.
- Nikdy nedvíhajte blok batérií/články za ich póly.
- Na výmenu používajte originálne náhradné diely.

Slovenščina
Pokyny týkajúce sa všeobecnej bezpečnosti
- Akumulatorji niso ustrezni za zasebno uporabo.
- Namestitev morajo opraviti kvalificirani električarji, pri čemer morajo upoštevati nacionalne predpise za varnost in preprečevanje nesreč. Med delom z akumulatorji uporabljajte zaščitna očala in rokavice.
- Akumulatorje lahko uporabljate samo v skladu z njeno predvideno uporabo v ustreznem in nepoškodovanem stanju.
- Izognite se kopičenju statičnega naboja ter praznjenju/iskrenju. Nevarnost eksplozije.
- Če je ohišje akumulatorja baterije poškodovano, se izpusti korozivni elektrolit.
- Ko delate z akumulatorji, najprej povsem izključite napajanje, se prepričajte, da se ne da več vklopiti, in preverite, če res ni več priklopljen na napetost. Ne izklopite akumulatorja pod obremenitvijo.
- V primeru izklopa pod obremenitvijo ali kratkih stikov lahko iskra povzroči opekline.
- Na akumulator ne odlagajte nobenih tujih predmetov ali orodij.
- Med transportom pazite na padajoče predmete.
- Baterij/celic nikoli ne obešajte ali dvigujte za pole.
- Pri zamenjavi uporabljajte samo originalne rezervne dele.

Suomalainen
Yleiset turvallisuusohjeet
- Akut eivät sovellu yksityiskäyttöön.
- Asennuksen saa suorittaa vain pätevät sähköasentajat ottaen huomioon kansalliset turvallisuus- ja tapaturmantorjuntamääräykset. Käytä suojalaseja ja suojavaatteita työskennellessä akkujen kanssa.
- Akkuja on käytettävä niiden tarkoitettuun käyttötarkoitukseen asianmukaisessa ja vahingoittumattomassa kunnossa.
- Vältä sähkövarauksen kertymistä ja purkautumista/kipinöitä. Räjähdysvaara.
- Syövyttävää nestettä purkautuu jos akun kotelo on vahingoittunut.
- Kun työskentelet akkujen kanssa, sammuta sähköt ensin kokonaan ja varmista ettei niitä voi pistää takaisin päälle. Tarkista sitten ovatko ne jännite-vapaat. Älä irrota kuormitettua akkua.
- Kun irrotat kuormitetun akun tai oikosulun tapahtuessa, muodostunut kaari voi aiheuttaa palovammoja.
- Älä sijoita mitään vieraita esineitä tai työkaluja akun päälle.
- Varo putoavia osia kuljetuksen aikana.
- Älä koskaan nosta akkuja/kennoja niiden navoista.
- Käytä vaihdossa vain alkuperäisiä varaosia.

Svenska
Allmänna säkerhetsföreskrifter
- Dessa Batteryr lämpar sig inte för privat bruk.
- Installation skall utföras av behörig elektriker med hänsyn till de nationella säkerhets- och olycksfalls skyddsföreskrifterna. Använd skyddsglasögon och skyddskläder vid arbete med Batteryr.
- Batteryrna måste användas i enlighet med dess avsedda bruk och i ett korrekt och oskadat skick.
- Andvik uppbyggnad av elektrostatisk laddning och urladdning/gnistor. Risk för explosion.
- Om batterihöljet skadas kommer den frätande elektrolyten att urladdas.
- Medan du arbetar med Batteryrna, stäng först av strömmen helt, se till att den inte kan slås på igen och kontrollera att den inte har spänning. Koppla inte ur Batteryt ander laddning.
- När du kopplar ur ander laddning eller vid kortslutning kan bågen som bildas orsaka brännskador.
- Placera inte några främmande föremål eller verktyg på Batteryt.
- Var uppmärksam på fallande delar ander transport.
- Hissa eller lyft aldrig blockBatteryr/blockceller genom dess poler.
- Använd endast originalreservdelar vid utbyte.

Türkçe
Genel güvenlik talimatları
- Bataryalar özel kullanım için uygun değildir.
- Bir kurulum ulusal güvenlik ve kaza önleme yönetmelikleri dikkate alınarak vasıflı elektrikçiler tarafından yapılmalıdır. Bataryalarla çalışırken, koruyucu gözlük ve koruyucu kıyafetleri giyin.
- Bataryalar, uygun ve zarar görmemiş bir koşulda tasarlanan kullanımı doğrultusanda kullanılmalıdır.
- Elektrostatik şarj ve deşarj/kıvılcım birikmesinden kaçının. Patlama riski.
- Batarya gövdesi zarar görmüşse, korozif elektrolit deşarj olur.
- Bataryalarla çalışırken, ilk olarak gücü tamamen kapatın, tekrar açılamayacağından emin olun ve üzerinde gerilim olmadığını kontrol edin. Yük altındaki bataryaların bağlantısını kesmeyin.
- Yük altında bağlantıyı keserken veya kısa devre durumanda, oluşan ark yanıklara neden olabilir.
- Batarya üzerine yabancı maddeleri veya aletleri koymayın.
- Taşıma esnasında düşen parçalara dikkat edin.
- Blok bataryaları/hücreleri asla kutuplarından yükseltmeyin veya kaldırmayın.
- Değişim için sadece orijinal yedek parçaları kullanın.

إرشادات عامة تخص سلامتك عند التعامل مع البطاريات
البطاريات ليست مناسبة للاستخدام الخاص
يجب أن يقوم كهربائي مؤهل بتركيب البطاريات مع الأخذ في الاعتبار قواعد السلامة الوطنية ومنع الحوادث.
• .يلزمك ارتداء نظارات
وملابس واقية عند التعامل مع البطاريات.
يتعين استخدام البطاريات في حالتها السليمة غير التالفة.
ووفقًا لأغراض الاستخدام المخصصة لها
تجنب تراكم الشحنة الإلكتروستاتيكية والتفريغ / الشرر..
• مخاطر الانفجار
إذا ألحق التلف بغلاف البطارية، سيتم تفريغ المحلول.
الكهربائي المتآكل
عند التعامل مع البطاريات، أبدأ بإيقاف تشغيل الكهرباء بالكامل، وتأكد من عدم إمكانية إعادة تشغيلها، ثم تحقق
• مما إذا كانت خالية من
الجهد الكهربائي. لا تفصل البطارية عند تعرضها لحمل كهربائي
عند فصل البطارية عند تعرضها لحمل كهربائي، أو في.
حالة الدوائر القصيرة، قد يؤدي القوس الكهربائي الناشئ إلى نشوب حروق
لا تتخلص من الأجسام الغريبة للبطارية أو أدواتها.
انتبه لقطع الغيار التي تسقط أثناء النقل.
يحذر رفع بطاريات الإشارات الهادية/الخلايا باستخدام. قطبيها
لا تستخدم إلا قطع الغيار الأصلية لغرض الاستبدال.

General Safety instructions - devices

български

Общи инструкции за безопасност

- Уредите не са подходящи за частна употреба.
- Монтирането трябва да се извършва от квалифицирани техници, като се вземат под внимание националните разпоредби за безопасност и предотвратяване на злополуки.
- Уредите трябва да се използват в съответствие с предназначението им, в подходящо и изправно състояние.
- Отстранете всички чужди тела от уредите, преди първото му използване.
- При работа с уредите, първо изключете напълно електрозахранването, уверете се, че не е възможно то да се включи отново и проверете дали уредът не е под напрежение. (Горното се отнася до електрическата мрежа, резервното захранване и евентуално контролно и външно напрежение.) Не изключвайте веригите, докато са под натоварване.
- Внимавайте за падащи части по време на транспортиране.
- Използвайте само оригинални резервни части за подмяна.

Česky

Všeobecné bezpečnostní pokyny

- Zařízení nejsou určeny k soukromému využití.
- Veškerou instalaci musí provádět kvalifikovaný elektrikář seznámený s národními bezpečnostními předpisy.
- Zařízení se smí používat jen k zamýšlenému účelu a musí být v řádném a nepoškozeném stavu.
- Před prvním použitím ze zařízení odstraňte všechny cizí předměty.
- Při práci na zařízení nejprve zcela odpojte napájení, zajistěte, aby nemohlo být znovu zapnuto, a zkontrolujte nepřítomnost napětí. (Výše uvedený pokyn se týká napájení z rozvodné sítě, záložního napájení a případně i přívodů ovládacího a externího napětí.) Neodpojujte okruh pod napětím.
- Při přenosu pamatujte na oddělitelné části.
- K výměně používejte výhradně originální náhradní díly.

Dansk

Generelle sikkerhedsinstruktioner

- Apparaterne er ikke egnet til privat brug.
- En installation skal altid udføres af en kvalificeret elektriker og ander hensyntagen til nationale sikkerheds- og ulykkesforebyggende regulativer.
- Apparaterne må kun anvendes i overensstemmelse med den påtænkte brug og i hel og ubeskadiget stand.
- Fjern alle fremmedlegemer fra apparaterne inden første anvendelse.
- Når der arbejdes med apparaterne, så sluk først for al strøm, fastslå at den ikke kan tændes igen og tjek, at de er uden spænding. (Ovennævnte er gældende for strømforsyning, nødstrøm og mulig kontrol og ekstern strøm.) Afbryd ikke kredsløbene ander belastning.
- Pas på løsdele ander transport.
- Brug kun originale reservedele ved udskiftning.

Deutsch

Allgemeine Sicherheitshinweise

- Die Geräte sind nicht für den privaten Gebrauch geeignet.
- Eine Installation darf nur durch qualifizierte Elektrofachkräfte unter Berücksichtigung der nationalen Sicherheits- and Unfallverhütungsvorschriften erfolgen.
- Die Geräte sind bestimmungsgemäß in unbeschädigtem and einWallfreiem Zustand zu betreiben.
- Alle Fremdkörper müssen vor der ersten Inbetriebnahme aus den Geräten entfernt werden.
- At ArAtten an den Geräten sind diese zuerst komplett spannungsfrei zu schalten, gegen Wiedereinschalten zu sichern and die Spannungsfreiheit festzustellen. (Gilt for Mainsspannung, Ersatzstromquelle and evtl. Steuer- / Fremdspannungen.) Stromkreise nicht unter Last trennen.
- Atm Transport mit herunter fallenden Teilen rechnen.
- Als Ersatz dürfen nur Originalteile verwendet werden.

Eesti

Üldised ohutusjuhised

- Need seadmed ei ole mõeldud erakasutuseks.
- Paigaldustööd tuleb jätta kvalifitseeritud elektriku hooleks ning tuleb teha vastavalt siseriiklikele ohutuseeskirjadelete ja õnnetusjuhtumite vältimise reeglitele.
- Seadmeid tuleb kasutada nende ettenähtud eesmärgil korrasolevatena ja kahjustamata seisandis.
- Enne esmakordset kasutamist eemaldage seadmetest kõik võõrkehad.
- Seadmetega töötamisel lülitage kõigepealt kogu toide välja, tagage, et seda ei saa uuesti sisse lülitada ja kontrollige toitepinge puudumist. (Eeltoodu kehtib nii võrgupinge, varutoite kui ka võimaliku kontrollpinge ja välise pinge suhtes.) Ärge ühendage lahti koormuse all olevat vooluringi.
- Transportimisel võtke arvesse kukkuvatest osadest lähtuvat ohtu.
- Vahetamiseks kasutage ainult originaalvaruosi.

ελληνικά

Γενικές οδηγίες για την ασφάλεια

- Οι συσκευές δεν είναι κατάλληλες για ιδιωτική χρήση.
- Η εγκατάστασή τους πρέπει να γίνεται από εξειδικευμένους ηλεκτρολόγους, λαμβάνοντας υπόψη τους εθνικούς κανονισμούς ασφαλείας και πρόληψης ατυχημάτων.
- Πρέπει να γίνεται μόνο η προβλεπόμενη χρήση των συσκευών, στην κατάλληλη κατάστασή τους και χωρίς να παρουσιάζουν βλάβη.
- Πριν από την πρώτη χρήση τους, απομακρύνετε όλα τα ξένα αντικείμενα από τις συσκευές.
- Όταν εργάζεστε με τις συσκευές, κλείνετε τον διακόπτη λειτουργίας, βεβαιώνεστε ότι δεν μπορεί να ανοίξει ξανά και ελέγχετε εάν υπάρχει τάση σε αυτές (το ίδιο ισχύει και για τον γενικό διακόπτη ρεύματος, την εφεδρική πηγή ισχύος και την τυχόν τάση ελέγχου και εξωτερική τάση). Μην αποσυνδέσετε τα κυκλώματα υπό φορτίο.
- Έχετε υπόψη σας τα τμήματα που ενδέχεται να πέσουν κατά τη μεταφορά.
- Χρησιμοποιείτε μόνο γνήσια ανταλλακτικά για αντικατάσταση.

English

General safety instructions

- The devices are not suitable for private use.
- An installation must be performed by qualified electricians taking into account the national safety and accident prevention regulations.
- The devices must be used in accordance with their intended use in a proper and andamaged condition.
- Remove all foreign objects from the devices before their first use.
- When working with the devices, first turn off the power completely, ensure that it cannot be turned back on, and check if they are free of voltage. (The above applies to mains power, backup power and possibly control and external voltage.) Do not disconnect the circuits ander load.
- Be aware of falling parts during transport.
- Use only original spare parts for replacement.

Español

Instrucciones generales de seguridad

- Los dispositivos no son adecuados para el uso privado.
- Solo puede instalarlos un electricista cualificado de acuerdo con la normativa de seguridad y prevención de accidentes.
- Los dispositivos deben utilizarse de acuerdo con su uso previsto, en buen estado y sin daños.
- Retire todos los objetos que no pertenezcan a los dispositivos antes del primer uso.
- Cuando se disponga a manipular los dispositivos, desconecte totalmente la corriente eléctrica, asegúrese de que no se pueden volver a conectar y compruebe que no tengan corriente. (Lo anterior se aplica a la red eléctrica, a los grupos electrógenos de emergencia, y posiblemente, también al control y a la corriente externa.) No desconecte los circuitos con una carga conectada.
- Tenga cuidado con los componentes que podrían caerse durante el transporte.
- Use solo piezas de repuesto originales para reemplazar las antiguas.

Français

Consignes générales de sécurité

- Les dispositifs ne conviennent pas à un usage privé.
- L'installation doit être effectuée par des électriciens qualifiés, conformément aux réglementations nationales sur la sécurité et la prévention des accidents.
- Les dispositifs doivent être utilisés conformément à l'usage auquel ils sont destinés, être en bon état et ne pas être endommagés.
- Retirez tous les corps étrangers des dispositifs avant leur première utilisation.
- Lorsque vous travaillez sur les dispositifs, coupez tout d'abord complètement l'alimentation électrique, assurez-vous qu'elle ne peut pas être rétablie et vérifiez que la tension est nulle. (L'énoncé précédent s'applique à l'alimentation du secteur, l'alimentation de secours et peut s'appliquer à la tension de commande et à la tension externe.) Ne déconnectez pas les circuits en charge.
- Faites attention aux pièces pouvant tomber pendant le transport.
- N'utilisez que des pièces de rechange d'origine en cas de remplacement.

Hrvatski

Opće sigurnosne upute

- Uređaji nisu prikladni za privatnu upotrebu.
- Instalaciju moraju provesti kvalificirani električari uzimajući u obzir nacionalne propise za sigurnost i sprečavanje nezgoda.
- Uređaji se moraju upotrebljavati u skladu sa svojom namjenom u ispravnom i neoštećenom stanju.
- Uklonite sve strane predmete iz uređaja prije prve upotrebe.
- Kada radite s uređajima, prvo u potpunosti isključite napajanje, osigurajte da se ne može uključiti i provjerite da nema napona. (Navedeno se odnosi na glavno napajanje, pomoćno napajanje i eventualno kontrolu vanjskog napona.) Nemojte isključivati strujne krugove pod opterećenjem.
- Pripazite na dijelove koji padaju tijekom transporta.
- Upotrebljavajte samo originalne rezervne dijelove za zamjenu.

Italiano

Indicazioni generali sulla sicurezza

- Le unità non sono idonee all'uso privato.
- L'installazione deve essere effettuata da un elettricista specializzato prendendo in considerazione le norme nazionali in materia di sicurezza e prevenzione degli infortuni.
- Le unità devono essere utilizzate conformemente all'uso previsto in condizioni adeguate e senza danni.
- Rimuovere tutti i corpi estranei dale unità prima di utilizzarle per la prima volta.
- Prima di ogni intervento sulle unità, disattivare completamente l'alimentazione elettrica, accertarsi che non possa essere riattivata e verificare che le unità siano prive di tensione. (Quanto sopra vale per la tensione di rete, l'alimentazione di riserva ed eventualmente per la tensione di controllo e la tensione esterna.) Non scollegare i circuiti sotto carico.
- Prestare attenzione alla possibile caduta di pezzi durante il trasporto.
- Utilizzare soltanto pezzi di ricambio originali.

Latviski

Vispārējie drošības norādījumi

- Šīs ierīces nav paredzētas personīgai lietošanai.
- Uzstādīšana jāveic kvalificētiem elektriķiem, ievērojot nacionālos drošības un nelaimes gadījumu novēršanas noteikumus.
- Ierīces jālieto saskaņā ar tām paredzēto lietošanu pareizā un nebojātā stāvoklī.
- Pirms pirmās lietošanas reizes izņemiet no ierīces visus svešķermeņus.
- Rīkojoties ar ierīcēm, vispirms pilnībā izslēdziet barošanu, nodrošiniet, ka tās nevar atkal ieslēgt, un pārliecinieties, ka tās nav zem sprieguma. (Iepriekš minētais attiecas uz barošanu no tīkla, no rezerves barošanas avota, kā arī no iespējama vadības un ārēja sprieguma.) Neatvienojiet ķēdes, kam pievienota slodze.
- Transportējot uzmanieties no krītošām daļām.
- Nomaiņai izmantojiet tikai oriģinālās rezerves daļas.

General Safety instructions - devices

Lietuviškas

Bendrieji saugos nurodymai

- Įrenginiai neskirti privačiam naudojimui.
- Įrengti turi kvalifikuoti elektrikai, atsižvelgdami į šalies saugos ir nelaimingų atsitikimų prevencijos taisykles.
- Įrenginiai turi būti naudojami pagal numatytą paskirtį, tinkamos būklės ir nesugadinti.
- Prieš naudodami pirmą kartą, nuo įrenginio pašalinkite visus pašalinius daiktus.
- Dirbdami su įrenginiais pirmiausia visiškai išjunkite maitinimą, pasirūpinkite, kad jis negalėtų būti vėl įjungtas ir patikrinkite, ar neliko įtampos. (Minėti nurodymai taikomi pagrindiniam maitinimui, atsarginiam maitinimui ir galimai valdymo At išorinei įtampai.) Neatjunkite grandinių, kuriomis teka elektros srovė.
- Veždami saugokite, kad neužkristų daiktai.
- Pakeitimui naudokite tik originalias atsargines dalis.

Magyar

Általános biztonsági utasítások

- A készülékek nem megfelelőek magáncélú használatra.
- A felszerelést csak szakképzett villanyszerelő végezheti a biztonsági és baleset-megelőzési helyi szabályozás betartásával.
- A készülékeket rendeltetésszerűen kell használni, és azoknak megfelelő és sértetlen állapotúnak kell lenniük.
- Az első használat előtt távolítsa el az összes idegen tárgyat a készülékekből.
- Ha a készülékekkel munkálatokat végez, először szakítsa meg teljesen azok áramellátását, biztosítsa bekapcsolás ellen, és ellenőrizze, hogy feszültségmentes állapotban vannak. (A fenti utasítás vonatkozik a tápfeszültségre, készenléti áramellátásra és a vezérlő és külső feszültségre, ha van ilyen.) Ne kapcsolja szét az áramköröket terhelés alatt.
- Figyeljen az esetleg leeső összetevőkre szállítás során.
- Csak eredeti cserealkatrészeket használjon.

Nederlands

Algemene veiligheidsinstructies

- De componenten zijn alleen geschikt voor proffesioneel gebruik.
- Installatie moet worden uitgevoerd door gekwalificeerde elektromonteurs met inachtneming van de nationale regelgeving voor veiligheid en het voorkomen van ongevallen.
- De apparaten moeten worden gebruikt waarvoor deze bedoeld zijn, op juiste wijze en in onbeschadigde toestand.
- Verwijder alle vreemde voorwerpen van de apparaten voordat u deze in gebruik neemt.
- Tijdens werkzaamheden aan de componenten schakelt u eerst alle stroom geheel uit en zorgt u ervoor dat deze niet weer zo maar ingeschakeld kan worden, en controleert u of deze geheel vrij van spanning zijn. (Bovenstaande geldt voor de hoofdspanning, accuspanning en eventuele externe spanning.) Ontkoppel de stroomcircuits niet als deze in gebruik zijn.
- Let op vallende delen tijdens transport.
- Gebruik alleen originele onderdelen bij vervanging.

Norsk

Generelle sikkerhetsinstruksjoner

- Enhetene passer ikke for privat bruk.
- En installasjon må utføres av kvalifiserte teknikere som tar hensyn til nasjonale sikkerhetsforskrifter og ulykkesforebyggende forskrifter.
- Enhetene skal brukes i samsvar med tiltenkt formål, i riktig og uskadet stand.
- Fjern alle fremmedlegemer fra enhetene før første gangs bruk.
- Ved arAtd med enhetene, skal strømmen først slås helt av, og det skal sikres at den ikke kan slås på igjen. Kontroller at de er spenningsfrie. (Det ovennevnte gjelder nettstrøm, ekstrastrøm og mulig kontroll- og ekstern spenning.) Ikke koble fra kretsene ander ladning.
- Vær oppmerksom på fallende deler ander transport.
- Bruk bare originale reservedeler til erstatning.

Polski

Ogólne instrukcje bezpieczeństwa

- Urządzenia nie nadają się do użytku prywatnego.
- Montaż musi być przeprowadzony przez wykwalifikowanego elektryka z uwzględnieniem krajowych przepisów bezpieczeństwa pracy i zapobiegania wypadkom.
- Urządzeń należy używać wyłącznie zgodnie z ich zamierzonym przeznaczeniem, gdy są one w dobrym i nieuszkodzonym stanie.
- Przed pierwszym użyciem należy usunąć z urządzeń wszystkie obce ciała.
- Podczas pracy przy urządzeniach należy najpierw całkowicie wyłączyć zasilanie, upewnić się, że nie można go włączyć ponownie oraz sprawdzić, czy nie ma napięcia. (powyższe instrukcje dotyczą zasilania sieciowego, zasilania awaryjnego oraz napięcia sterowniczego i zewnętrznego.) Nie wolno odłączać obwodów znajdujących się pod obciążeniem.
- Podczas transportu należy uważać na spadające elementy.
- W przypadku wymiany należy używać wyłącznie oryginalnych części zamiennych.

Português

Instruções gerais de segurança

- Os dispositivos não são adequados para uso privado.
- A instalação deve ser efetuada por um eletricista qualificado e em conformidade com os regulamentos nacionais de segurança e prevenção de acidentes.
- Os dispositivos devem ser utilizados em conformidade com o seu uso previsto e em boas condições, não apresentando danos.
- Remova todos os objetos estranhos dos dispositivos antes de utilizá-los pela primeira vez.
- Ao utilizar os dispositivos, primeiro desligue a eletricidade completamente, certifique-se de que não pode ser ligada e verifique se não existe tensão. (O supramencionado aplica-se à rede elétrica, à energia de reserva e à possível tensão de controlo e externa.) Não desligue os circuitos sob carga.
- Tenha atenção à queda de peças durante o transporte.
- Em caso de substituição, utilize apenas peças sobressalentes originais.

Română

Instrucțiuni generale de siguranță

- Aparatele nu sunt destinate pentru uz personal.
- Instalarea trebuie efectuată de către un electrician calificat în conformitate cu reglementările naționale de siguranță și prevenirea accidentelor.
- Aparatele trebuie utilizate conform destinației lor într-o stare corespunzătoare și nedeteriorată.
- Îndepărtați toate corpurile străine din aparat înainte de prima utilizare a acestuia.
- Dacă efectuați lucrări la aparate, întrerupeți mai întâi alimentarea cu curent, asigurați-le împotriva reporniri și verificați ca să nu fie sub tensiune. (Cele de mai sus se referă la alimentarea de la rețea, alimentarea de rezervă, tensiunea de reglare și curenții de scurgere.) Nu întrerupeți circuitele sub sarcină.
- Fiți atenți la obiecte care pot cădea în timpul transportului.
- Utilizați numai piese de schimb originale.

Русский

Общие инструкции по безопасности

- Устройства не предназначены для бытового использования.
- Монтаж выполняется квалифицированными электриками с учетом государственных норм и правил ТБ и профилактики несчастных случаев.
- Светильники должны использоваться только по назначению, при этом их следует поддерживать в исправном состоянии и оберегать от повреждений.
- Перед началом эксплуатации устройств удалите с их поверхности все посторонние объекты.
- Перед началом выполнения любых работ со светильниками, необходимо полностью обесточить их, обеспечить невозможность несанкционированной подачи питания, а также проверить отсутствие напряжения в цепи. (Подразумевается магистраль питания, резервное питание и, по возможности, напряжение в цепи управления и внешней цепи.) Не разрывайте цепи, находящиеся под нагрузкой.
- Перемещайте аккумулятор с осторожностью, чтобы не уронить.
- При замене вышедших из строя деталей используйте только оригинальные запчасти.

Slovenčina

Splošna varnostna navodila

- Zariadenia nie sú vhodné na súkromné použitie.
- Inštaláciu musí vykonávať kvalifikovaný elektrikár s prihliadnutím na vnútroštátne nariadenia o bezpečnosti a predchádzaní rizikám.
- Zariadenia sa musia používať v súlade s plánovaným používaním v riadnom a nepoškodenom stave.
- Pred prvým použitím odstráňte všetky cudzie predmety zo zariadení.
- Pri práci so zariadeniami najprv úplne vypnite napájanie, zaistite, aby sa znova nezapli a skontrolujte, či sú bez napätia. (Uvedené sa vzťahuje na sieťové napájanie, záložný zdroj a možnú kontrolu a externé napätie.) Obvody neodpájajte pod napätím.
- Počas prepravy dávajte pozor na padajúce predmety.
- Na výmenu používajte originálne náhradné diely.

Slovenščina

Pokyny týkajúce sa všeobecnej bezpečnosti

- Naprave niso ustrezne za zasebno uporabo.
- Namestitev morajo opraviti kvalificirani elektriki, pri čemer morajo upoštevati nacionalne predpise za varnost in preprečevanje nesreč.
- Napravo lahko uporabljate samo v skladu z njeno predvideno uporabo v ustreznem in nepoškodovanem stanju.
- Pred prvo uporabo naprave morate iz nje odstraniti vse tuje predmete.
- Ko delate na napravi, najprej povsem izključite napajanje, se prepričajte, da se je ne da več vklopiti, in preverite, če res ni več priklopljena na napetost. (Zgornje se nanaša na glavno napajanje, rezervno napajanje in tudi krmilnik ter zunanje napajanje.) Ne izklopite vezij pod napetostjo.
- Med transportom pazite na padajoče predmete.
- Pri zamenjavi uporabljajte samo originalne rezervne dele.

Suomalainen

Yleiset turvallisuusohjeet

- Laitteet eivät sovellu yksityiskäyttöön.
- Asennuksen saa suorittaa vain pätevät sähköasentajat ottaen huomioon kansalliset turvallisuus- ja tapaturmantorjuntamääräykset.
- Laitteita on käytettävä niiden tarkoitettuun käyttötarkoitukseen asianmukaisessa ja vahingoittumattomassa kunnossa.
- Poista kaikki vieraat esineet laitteista ennen niiden ensimmäistä käyttökertaa.
- Kun työskentelet laitteiden kanssa, sammuta sähköt ensin kokonaan ja varmista ettei niitä voi pistää takaisin päälle. Tarkista sitten ovatko ne jännitevapaat. (Edellä mainittu koskee verkkovirtaa, varavoimaa ja mahdollisesti ohjausjännitettä ja ulkoista jännitettä.) Älä irrota kuormitettuja virtapiirejä.
- Varo putoavia osia kuljetuksen aikana.
- Käytä vaihdossa vain alkuperäisiä varaosia.

Svenska

Allmänna säkerhetsföreskrifter

- Dessa enheter lämpar sig inte för privat bruk.
- Installation skall utföras av behörig elektriker med hänsyn till de nationella säkerhets- och olycksfalls skyddsföreskrifterna.
- Enheterna måste användas i enlighet med dess avsedda bruk och i ett korrekt och oskadat skick.
- Ta bort alla främmande föremål från enheterna innan de används för första gången.
- Medan du arbetar med enheterna, stäng först av strömmen helt, se till att den inte kan slås på igen och kontrollera att den inte har spänning. (Ovanstående gäller elnät, reservström och eventuellt kontroll- och extern spänning.) Koppla inte ur kretsarna ander laddning.
- Var uppmärksam på fallande delar ander transport.
- Använd endast originalreservdelar vid utbyte.

Türkçe

Genel güvenlik talimatları

- Aygıtlar özel kullanım için uygun değildir.
- Bir kurulum ulusal güvenlik ve kaza önleme yönetmelikleri dikkate alınarak vasıflı elektrikçiler tarafından yapılmalıdır.
- Aygıtlar, uygun ve zarar görmemiş bir koşulda tasarlanan kullanımı doğrultusunda kullanılmalıdır.
- İlk kullanım öncesinde aygıttaki tüm yabancı maddeleri giderin.
- Aygıtlarda çalışırken, ilk olarak gücü tamamen kapatın, tekrar açılamayacağından emin olun ve üzerinde gerilim olmadığını kontrol edin. (Yukarıdaki ana güç kaynağı, yedek güç kaynağı ve muhtemelen kontrol ve harici gerilim için uygulanır.) Yük altında devrelerin bağlantısını kesmeyin.
- Taşıma esnasında düşen parçalara dikkat edin.
- Değişim için sadece orijinal yedek parçaları kullanın.

الإرشادات العامة للسلامة عند استخدام الأجهزة

الأجهزة ليست مناسبة للاستخدام الخاص.

يجب أن يقوم كهربائي مؤهل بتركيب البطاريات مع الأخذ في الاعتبار قواعد السلامة الوطنية ومنع الحوادث. •

يتعين استخدام الأجهزة في حالتها السليمة غير التالفة ووفقًا لأغراض الاستخدام المخصصة لها.

قم بإزالة جميع القطع الغريبة من الأجهزة قبل الاستخدام الأول لها.

عند التعامل مع الأجهزة، أبدأ بإيقاف تشغيل الكهرباء بالكامل، وتأكد من عدم إمكانية إعادة تشغيلها، ثم تحقق مما إذا كانت خالية من الجهد. (ينطبق الوارد أعلاه على التيار الكهربائي، والطاقة الاحتياطية، والجهد الخارجي والذي يمكن التحكم فيه.) يحذر فصل الدوائر عند تعرضها للحمل الكهربائي.

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