CEAG

Central battery system

EURO ZB.1

with circuit monitoring

COOPER Safety

Central Battery System EURO ZB.1 with Circuit Monitoring

- **Compact design of components and substations**
- **Individual circuit switching**
- **Freely programmable switching modes of the circuits**
- **Maximum safety due to distributed system design**
- **Service-friendly modular units**

With central battery system EURO ZB.1, CEAG offers a solution for all applications where luminaires need not be monitored. EURO ZB.1 has a reliable charging system, is of modular design and distributed configuration. Relevant information about cover status, functioning of luminaire circuits as well as logging of the prescribed tests are collected via the compact control module of the EURO ZB.1 and stored in an log book as required by the respective regulations. Luminaire circuit faults are detected and indicated as faults of the electrical circuits. The results can be printed out by means of the optional event printer PD2.

Central Battery System EURO ZB.1 with Circuit Monitoring

Ordering details

Type	Scope of supply	Order No.
Central battery system EURO-ZB.1/52	Central battery system incl. ST20 E, BCM and DC/DC.2 26 free module slots *1	4 0071 346 070
Central battery system EURO-ZB.1/20K	Central battery system incl. ST20 E, BCM and DC/DC.2 10 free module slots *1	4 0071 346 071
Central battery system EURO-ZB.1/204K	Central battery system incl. ST20 E, BCM and DC/DC.2 14 free module slots *1	4 0071 346 854
Central battery system EURO-ZB.1/26K	Central battery system incl. ST20 E, BCM and DC/DC.2 10 free module slots *1	4 0071 346 615
Central battery system EURO-ZB.1/264K	Central battery system incl. ST20 E, BCM and DC/DC.2 14 free module slots *1	4 0071 346 855
Central battery system EURO-ZB.1/18K	Central battery system incl. ST20 E, BCM and DC/DC.2 10 free module slots	4 0071 346 180
Central battery system EURO-ZB.1/188K	Central battery system incl. ST20 E, BCM and DC/DC.2 18 free module slots	4 0071 346 853
Central battery system ZB 96/LAD	Central battery system incl. ST20 E, BCM and DC/DC.2 (2 free module slots possible)	4 0071 347 400
Substation EURO-US.1/72	Substation incl. ST20 E and DC/DC.2 36 free module slots	4 0071 346 335
Substation EURO-US.1/42	Substation incl. ST20 E and DC/DC.2 21 free module slots	4 0071 347 561
Substation EURO-US.1/26	Substation incl. ST20 E and DC/DC.2 13 free module slots	4 0071 347 560
Substation EURO-US.1/10	Substation incl. ST20 E and DC/DC.2 5 free module slots	4 0071 346 247
Substation EURO ESF-E30/17	Cabinet for substation EURO ESF-E30/17, with control module ST20E, DC/DC-converter, 2 x module rack 8 units and 1 x module rack 4 units	4 0071 347 806
Substation EURO ESF-E30/28	Cabinet for substation EURO ESF-E30/28, with control module ST20E, DC/DC-converter, 4 x module rack	4 0071 347 808

*1 Plus maximal two additional slots in correlation of CM 1.7 A and CM 3.4 A placement.

Ordering details

Type	Order No.
4 pcs. DIN mounting rail incl. mounting accessories	4 0071 347 125
3 pcs. C-section rail incl. mounting accessories	4 0071 347 126
Socket 200 mm for ZB-S, depth 400 mm	4 0071 347 121
Socket 100 mm for ZB-S, depth 400 mm	4 0071 347 120
Socket 200 mm for ZB-S/18C3 and 10C3, depth 330 mm	4 0071 360 049
3-piece baseplate for ZB-S, depth 400 mm, mouse-proof	4 0071 347 124
Cable support rail	4 0071 347 123
Metal flange plate undrilled for battery cabinet	4 0071 346 225
Flange plate with foam rubber for battery cabinet	4 0036 070 164
Fireproof dowel M10 for E30 sub-distribution board, Set of = 12 pcs., for mounting in concrete walls	4 0036 070 298
Optional wall mounting plate for wall mounting for EURO ESF-E30/17	4 0071 347 726

Table of Covers
Technical data EURO ZB.1

Type	EURO ZB.1-52	EURO ZB.1/20K	EURO ZB.1/204K	EURO ZB.1/26K	EURO ZB.1/264K
Modules:					
Control module: ST20E	1	1	1	1	1
DC/DC.2-converter*5	1	1	1	1	1
BCM	1	1	1	1	1
Circuit module SKU*5	0-26*8	0-10*8	0-14*8	0-10*8	0-14*8
Charging module 1.7 A	0-2*1	0-2*3	0-2*3	0-2*4	0-2*4
Charging module 3.4 A	0-6*1	0-1*3	0-1*3	0-2*4	0-2*4
Electrical cabinet construction:					
Rated voltage	400/230 V	230 V	230 V	230 V	230 V
Rated frequency	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
Conductor order and system of earthing in mains power operation/battery operation	TN-C-S / IT	TN-C-S / IT	TN-C-S / IT	TN-C-S / IT	TN-C-S / IT
Insulation class	1	1	1		
Degree of protection	IP21	IP21	IP21	IP21	IP21
Max. current rating mains [Σ L1, L2, L3] [A]	80	60	60	63	63
Max. rated power mains [KW]	18.4	13.8	13.8	14.5	14.5
Max. current rating battery [A]	80	35	35	63	63
Max. rated power battery [KW]	17.3	7.6	7.6	13.6	13.6
Three-phase distribution	No	No	No	No	No
Conductor size for mains and battery supply	50 mm^2	16 mm^2	16 mm^2	16 mm^2	16 mm^2
Outgoing circuits	0 - 6 Feeders	1 Feeder	–	2 Feeders	–
Conductor size	16 mm^2	35 mm^2	–	35 mm^2	–
Max. conductor size final circuits	2.5 mm^2	2.5 mm^2	2.5 mm^2	2.5 mm^2	2.5 mm^2
Mechanical cabinet construction:					
Dimensions H x W x D (mm)	2050 x 800 x 400	2050 x 800 x 400	2050 x 800 x 400	2050 x 800 x 600	2050 x 800 x 600
Material / Design	Sheet steel / Stand alone cabinet	Sheet steel / Compact cabinet	Sheet steel / Compact cabinet	Sheet steel / Compact cabinet	Sheet steel / Compact cabinet
Door stop	right	right	right	right	right
Outer coating	Textured powder paint	Textured powder paint	Textured powder paint	Textured powder paint	Textured powder paint
Colour	RAL 7035	RAL 7035	RAL 7035	RAL 7035	RAL 7035
Partial viewing door	Yes	Yes	Yes	Yes	Yes
Lock	3 mm Two-way	3 mm Two-way	3 mm Two-way	3 mm Two-way	3 mm Two-way
Cable entry from above	Yes	Yes	Yes	Yes	Yes
Cable entry from below	Yes	No	No	No	No
Socket (optional)	100/200	200	200	–	–
Battery capacity, installed in:					
Compact cabinet	–	5.5-53.7 Ah	5.5-53.7 Ah	5.5-89.4 Ah	5.5-89.4 Ah
Battery cabinet	23.3-245 Ah*6	–	–	–	–
Battery rack	23.3-245 Ah*6	–	–	–	–

Other battery sizes on application
*1 When 6 charging modules CM 3,4 A are fitted an additional charging module rack 2-way is necessary.
*2 Up to 8 charging modules are possible when 2 SKUs are fitted.
*3 When 1 charging module is fitted a single booster adapter is necessary.
*4 When 2 charging modules CM 3,4 A are fitted an additional charging module rack 2-way is necessary. (>240 Ah Special design)
*5 After more than 13 SKU CG-S 4 x 1.5 A or 26 SKU CG-S 2 x 3 A / 1 x 6 A a second DC/DC converter is needed.
Please observe that all DC/DC-converters are operated on the same module assembly frame next to each other.

	EURO ZB.1/18K	EURO ZB.1/188K	EURO US.1/72	EURO US.1/42	EURO US.1/42	EURO US.1/10	EURO-ESF-E30/17	EURO-ESF-E30/28
	1	1	1	1	1	1	1	1
	1	1	1	1	1	1	1	1
	1	1	–	–	–	–	–	–
	0-10	0-18	0-36	0-21	0-13	0-5	0-13	0-28
	1	1	–	–	–	–	–	–
	–	–	–	–	–	–	–	–
	230 V	230 V	400/230 V	230 V	230 V	230 V	230 V	400/230 V
	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz	50/60 Hz
	TN-C-S / IT	TN-C-S / IT	TN-C-S / IT	TN-C-S / IT	TN-C-S / IT	TN-C-S / IT	TN-C-S / IT	TN-C-S / IT
	IP21	IP21	IP54	IP54	IP54	IP54	IP54	IP54
	25	25	80	50	50	30	35	50
	5.8	5.8	18.4	11.5	11.5	6.9	8.1	11.5
	25	25	80	50	50	30	35	50
	5.4	5.4	17.3	10.8	10.8	6.5	7.6	10.8
	No	No	Yes	No	No	No	No	Yes
	16 mm^2	16 mm^2	35 mm^2	35 mm^2	16 mm^2	16 mm^2	16 mm^2	16 mm^2
	1 Feeder	1 Feeder	–	–	–	–	–	–
	16 mm^2	16 mm^2	–	–	–	–	–	–
	2.5 mm^2	2.5 mm^2	2.5 mm^2	2.5 mm^2	2.5 mm^2	2.5 mm^2	4 mm^2	4 mm^2
	1800 x 600 x 350	1800 x 600 x 350	2050 x 800 x 400	1200 x 600 x 300	800 x 600 x 250	600 x 400 x 250	1150 x 885 x 405	2190 x 885 x 405
	Sheet steel / Compact cabinet	Sheet steel / Compact cabinet	Sheet steel / Stand alone cabinet	Sheet steel / Wall cabinet	Sheet steel / Wall cabinet	Sheet steel / Wall cabinet	Sheet steel / func. endurance 30 min. / Wall cabinet	Sheet steel / func. endurance 30 min. / Wall cabinet
	right	right	right	right	right	right	right	right
	Textured powder paint	Textured powder paint	Textured powder paint	Textured powder paint	Textured powder paint	Textured powder paint	Textured powder paint	Textured powder paint
	RAL 7035	RAL 7035	RAL 7035	RAL 7035	RAL 7035	RAL 7035	RAL 7035	RAL 7035
	Yes	Yes	Yes	No	No	No	No	No
	3 mm Two-way	3 mm Two-way	3 mm Two-way	3 mm Two-way	3 mm Two-way	3 mm Two-way	3 mm Two-way	3 mm Two-way
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	No	No	Yes	No	No	No	No	No
	200	200	100/200	300	–	–	–	–
	5.5-23.3 Ah	5.5-23.3 Ah	–	–	–	–	–	–
	–	–	–	–	–	–	–	–
	–	–	–	–	–	–	–	–

*6 Higher battery capacities =>118 Ah are achieved by connecting several battery sets in parallel.
After 8 h discharge the maximum battery capacity will be 195.4 Ah.
*7 Please indicate the cable entry when planning the system.
*8 Plus max. two additional slots in correlation of CM 1.7 A and CM 3.4 A placement.

SKU 4 x 1 A

SKU 4 x 1 A

Circuit charger
- **Circuit monitoring per each circuit pair**
- **Individual selection and programming per AC/DC circuit pair**
- **Easy access to fuses**
- **LED indicates fault and Run/ON for each circuit**
- **Supplies ballast luminaires**
- **Service-friendly modular units**

Fusing	1.6 A/250 V / 6.3 x 32
Max. connected load per circuit pair	230 VA/220 W
Max. starting current per circuit	60 A/ms
Number of circuits per module	4 pcs.
Typical switch over time	AC/DC approx. 200 ms
Connection terminals/Clamp terminals	2.5 mm^2 rigid and flexible
Own consumption	3.85 W

Ordering details

Type	Scope of supply	Order No.
SKU 4 x 1 A	Plug-in module for EURO ZB.1 with circuit monitoring	4 0071 346 610
Spare part	Fuse 1,6 AT (6.3 x 32) 250 V (PU 10 pcs.)	4 0071 070 717

SKU 2 x 3 A

SKU 2 x 3 A

Circuit charger
- **Circuit monitoring per each circuit**
- **Individual selection and programming per AC/DC circuit**
- **Separate fusing for mains and battery operation**
- **Easy access to fuses**
- **LED indicates fault and Run/ON for each circuit**
- **Supplies ballast luminaires**
- **Service-friendly modular units**

Fusing	5 AT/250 V, 6.3 x 32
Continuous current rating	3 A per circuit
Starting current	120 A/ms per circuit
Typical switch over time	AC/DC approx. 200 ms
Connection terminals/Clamp terminals	2.5 mm^2 rigid and flexible
Own consumption	3.85 W

Ordering details

Type	Scope of supply	Order No.
SKU	Circuit change over module SKU 2 x 3 A	4 0071 347 306
Spare part	Fuse 5.0 AT (6.3 x 32) 250 V (PU 10 pcs.)	4 0071 689 047

SKU 1 x 6 A

SKU 1 x 6 A

Circuit charger
- **Circuit monitoring per each circuit**
- **Individual selection and programming per AC/DC circuit**
- **Separate fusing for mains and battery operation**
- **Easy access to fuses**
- **LED indicates fault and Run/ON for each circuit**
- **Supplies ballast luminaires**
- **Service-friendly modular units**

Fusing	10 AT/250 V, 6.3 x 32
Continuous current rating	6 A per circuit
Starting current	180 A/ms per circuit
Typical switch over time	AC/DC approx. 200 ms
Connection terminals/Clamp terminals	2.5 mm² rigid and flexible
Own consumption	3.85 W

Ordering details

Type	Scope of supply	Order No.
SKU	Circuit change over module SKU 1 x 6 A	4 0071 347 348
Spare part	Fuse 10 AT (6.3 x 32) 250 V (PU 10 pcs.)	4 0071 070 715

Control module ST 20 E

Control module ST 20 E

**The freely programmable ST 20 E control module with 4-line plain text display is used for programming, monitoring and logging of all operational states.
All functions such as charge, mains and battery changeover and deep discharge protection as well as the emergency luminaires connected to the central power supply system are automatically checked. Optionally, an external phase monitor and an annunciator cover with key-operated switch can be connected by means of terminals. The test intervals for the function and duration test can be inputted. Malfunctions are shown in the display and signalled by means of potential-free contacts. An ‚E/G/A interface' allows connection to an overriding monitoring station.**

Max. current load of volt-free contacts 11/12, 21/22, 31/32	24 V 0.5 A AC/DC
Display	4-line/20 characters per line
Printer interface	DB 25 Centronics

Ordering details

Type	Scope of supply	Order No.
Control module ST 20 E	Plug-in module for all devices	4 0071 346 120

DC-DC Converter

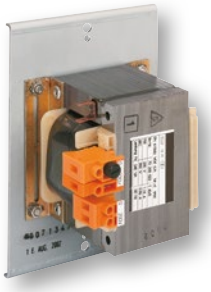
DC/DC Converter

The DC/DC converter converts the 220 V DC battery voltage to 24 V DC and 6 V DC to supply the modules and processor.
With more than 26 SKUs 2 x 3 A/1 x 6 A/4 x 1 A a second DC/DC converter is needed. Please observe that all DC/DC converters are operated on the same module assembly frame next to each other:
- **Supplies 26 SKUs CG-S 2 x 3 A/1 x 6 A or 4 x 1 A**
- **Incoming supply can be run via AC/AC**

24 V external	20 W continuous rating Outgoing circuit with front panel connector Isolated voltage
24 V internal	100 W continuous rating 140 W peak rating (20 ms) Supplies max. 26 SKUs

Ordering details

Type	Order No.
DC/DC Converter	7 0071 347 071



AC Module

AC Module

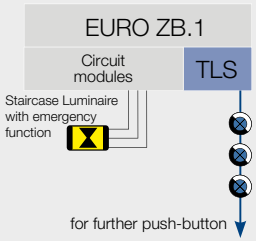
Together with the DC/DC converter, the optional AC module supplies the internal system voltage when the battery supply is isolated, e. g. for maintenance.

Model acc. to	EN 61558/VDE 570
Rated voltage	230 V 50 Hz
Nominal power	240 VA
Fusing	1.6 A

Ordering details

Type	Scope of supply	Order No.
AC-Modul	external transformer module AC/AC-converter 240 VA incl. mounting adapter	4 0071 347 162

Staircase light switching module
plug-in module



TLS staircase light switching module

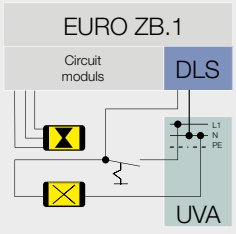
The assignment of the push-buttons to the emergency light circuits as well as the time (1 to 15 min.) can be freely programmed for the TLS. The TLS option has 8 input channels. Using the same push-button for mains luminaires and emergency luminaires a TLS staircase light switch module must be mounted in one distribution board. On mains failure the TLS module effects on the full SKU. It supplies all connected glow lamps of the push-button.

Connection terminals/Clamp terminals	2,5 mm² rigid and flexible
Time setting	1 to 15 min.
Number of button inputs	8 pcs.
Number of push-button pro TLS input with 1 mA glow lamp 0.8 mA glow lamp 0.4 mA glow lamp without glow lamp	 50 pcs. 62 pcs. 125 pcs. any no.
Dimensions (H x B x T) mm	111 x 95 x 89

Ordering details

Type	Scope of supply	Order No.
TLS	Plug-in module	4 0071 343 762

DLS maintained light switch monitor



DLS maintained light switch monitor

By means of the DLS module it is possible to jointly switch luminaires for general lighting and circuits for emergency lighting via existing light switches in mains operation. Only the switched phase (tapping downstream of the light switch) and the respective neutral conductor must be connected to the DLS terminals. Via electrically isolated input channels the DLS module can monitor up to 8 light switches. The assignment of the light switches to the emergency light circuits is freely programmable (max. 2 independent light switches per circuit). The assignment can be altered at any time, e. g. in case of modified use or modified operational procedures. There is no problem to adapt the emergency lighting to all operational requirements without additional cost.

Connection terminals/Clamp terminals	2.5 mm² rigid and flexible
Number of light switch inputs	8 pcs.

Ordering details

Type	Scope of supply	Order No.
DLS	Plug-in module	4 0071 343 761

SDS 8

SDS 8 module

By means of the SDS 8 module it is possible to monitor max. 8 sub-distributions of the general lighting via separate 24 V current loops. The emergency light circuits can thus selectively be switched on. When a sub-distribution fails, only those emergency luminaires will be switched on that are assigned to it.

Connection terminals	2.5 mm² rigid and flexible
Number of 24 V monitoring threshold	8 pcs.

Ordering details

Type	Scope of supply	Order No.
SDS 8	Plug-in module	4 0071 346 075

Note:
It is possible to install max. 4 optional modules (DLS/TLS/SDS 8) either individually or in combination, in one cover or one substation. Max. 2 different, freely programmable DLS or SDS 8 inputs can be assigned, also in combination, to each circuit.

Printer PD 2

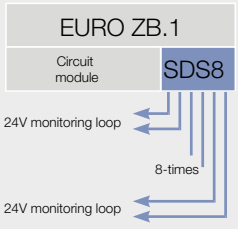
Printer PD 2

The printer logs and memorizes all function tests and mains failures of a EURO ZB.1 cover or a substation.
After the performance of an automatic function test, the results are printed out in plain text also stating the time and date. A mains failure is also logged with time and date. The printer documents the operational state of emergency luminaires of an emergency lighting supply system. With the printer the information on possible failures of luminaires (e. g. defective lamp) is printed out in detail.
The printer must not be used together with a LON module.

Printing paper	Woodfree printing paper
Paper width	57.5 mm
Max. diameter paper roll	50 mm
Core hole diameter	12 mm

Ordering details

Type	Scope of supply	Order No.
PD 2	Plug-in module	4 0071 343 970
Printing paper		4 0078 079 666



CG IV relay module

CG IV relay module

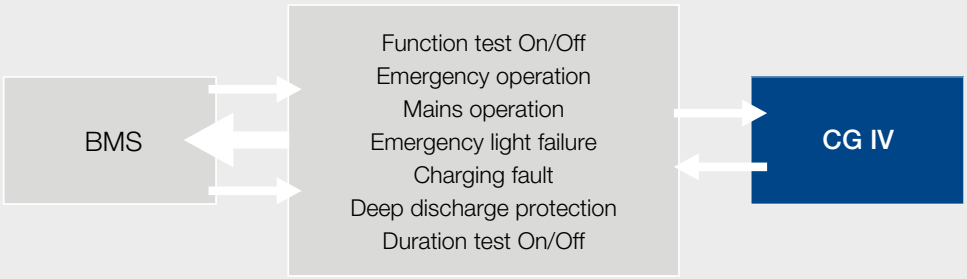
The bipolar CG IV relay module transmits data and operational states of the covers/substations to a central building management system.

Connection terminals/Clamp terminals	2.5 mm² rigid and flexible
Switching capacity of the contacts	24 V/0.5 A AC DC

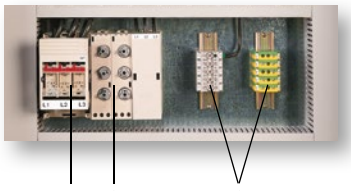
Ordering details

Type	Scope of supply	Order No.
CG IV	Plug-in module	4 0071 343 971

Attention!
The combination of LON module and PD 2 printer in one system is not possible.



EURO ZB.1
Components and Options



Mains distribution board

Mains distribution board

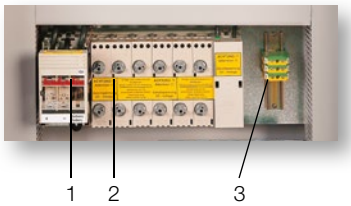
The mains supply to a EURO ZB.1/52 system comes via a modular mains distribution board. This includes a size 00C load disconnector (1) with a maximum conductor size of 50 mm² and allows the connection of up to 6 slave stations to modular size D02-E18 outgoing mains circuits (2) with the necessary terminals for neutral and ground (3).
The same mains distribution boards must also be used three-phase for feeders to powerful slave-stations (accommodates up to 2 slave stations in this case). The components are simply plugged on from the front and securely contacted.


Mains distribution module
D02-E18

Current rating	63 A
Rated operating voltage	400 V
Box terminal for circulator conductor	to 16 mm²
Material	Polyamide (PA 6.6), 30 % glass-fibre-reinforced
Scope of supply	incl. 3 pcs. screw caps E18 and 3 pcs. D02-fuse inserts 25 A

Ordering details

Type	Scope of supply	Order No.
Mains distribution module for track mounting	incl. 3 pcs. screw caps E18 and 3 pcs. D02-fuse inserts 25 A	4 0071 347 160



Battery distribution board

Battery distribution board

The battery supply to a EURO ZB.1/52 system comes via a modular battery distribution board. This includes a size 00C load disconnector (1) with a maximum conductor size of 50 mm² and allows the connection of up to 6 slave stations to modular size D02-E18 outgoing battery circuits (2) with related terminals for ground (3). The components are simply plugged on from the front and securely contacted.


Battery distribution module
D02-E18

Current rating	63 A
Rated operating voltage	400 V
Box terminal for circulator conductor	to 16 mm²
Material	Polyamide (PA 6.6), 30 % glass-fibre-reinforced
Scope of supply	incl. 2 pcs. screw caps E18 and 2 pcs. D02-fuse inserts 25 A

Ordering details

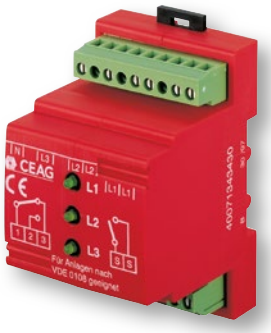
Type	Scope of supply	Order No.
Battery distribution module for track mounting	incl. 2 pcs. screw caps E18 and 2 pcs. D02-fuse inserts 25 A	4 0071 347 161

Cover strip

Busbar guard: Cover strip for clip-mounting to the trunking section. Ready cut to module width. Material: Hard PVC.

Ordering details

Type	Scope of supply	Order No.
Busbar cover strip	Cover strip in module width for clip mounting at the trunking section	4 0071 347 192



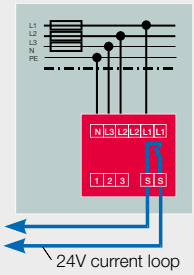
Three-phase monitor

Three-phase monitor

When one phase fails, the module switches a relay contact and interrupts the standard electronic 24 V current loop in the EURO ZB.1 cover and/or the EURO/US substation.
The emergency luminaires in non-maintained mode are switched to mains operation if the mains voltage still applies to the EURO ZB.1 cover (HVS).

Dimensions mm (H x W x D)	85 x 52.5 x 65
Enclosure	Plastic
Connection terminals	2.5 mm² rigid and flexible
Type of mounting	DIN rail
Contact	0.5 A/24 V AC/DC, 1 x open contact, 1 x changeover contact

Subdistribution with 3-phase-monitor



Ordering details

Type	Scope of supply	Order No.
Three-phase monitoring	Module ready for mounting	4 0071 343 430

F3 remote indication

F3 remote indication

Operating from a battery supply, the F3 remote indication ensures the display of important operational information also in a mains fail condition. By means of the built-in key-operated switch, the connected EURO ZB.1 covers can be centrally put out of operation. Thereby, the F3 remote indication permits remote control only if operation by unauthorized persons is prevented.

Connection terminals wall surface-mounting	2.5 mm² rigid and flexible
Dimensions mm (H x W x D)	160 x 80 x 55
Connection terminals recessed	1.5 mm² rigid or 1 mm² flexible
Dimensions mm (H x W x D)	80 x 80 x 55

Ordering details

Type	Scope of supply	Order No.
F3 remote indication	Module surface-mounting	4 0071 338 497
F3 remote indication recessed	Performance for installation in the flush-mounted switch or empty space box acc. to DIN VDE 0606	4 0071 347 490

F3 remote indication recessed

Battery Control Module (BCM)

Battery Control Module (BCM)

The BCM battery control module is for control of the CM 1.7 A and CM 3.4 A charging modules via the Charge Control Bus (CCB). Messages such as fault, isolation fault and boost charge can be forwarded via the zero-potential signal contacts of the BCM.
LEDs on the module signal boost charge, charge fault and isolation fault between the battery + and PE or battery – and PE.
For simulating a battery isolation fault there are two buttons: ISO+ and ISO –.

Charging characteristics		IU
Terminals		2.5 mm² rigid and flexible
End-of-charge voltage (factory setting for +20°C)	boost charge trickle charge	259 V DC 248 V DC
Deep discharge protection		183.6 V DC
Potential-free signal contacts		0.5 A/24 V AC/DC

Ordering details

Type	Scope of supply	Order No.
BCM	Battery Control Module for installation on gear tray	4 0071 360 330

Charging module CM 1.7 A

Charging modules CM 1.7 A and CM 3.4 A

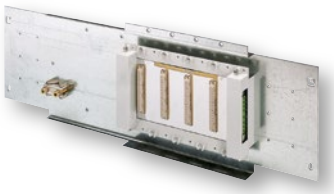
To realise the recharging duration for planned battery sets, the quantity of required charge modules should be used as specified in Table 3 (in this section).

Charging current CM 1.7 A	1.7 A
Charging current CM 3.4 A	3.4 A
Control of the charging modules (32 max.) via the Battery Control Module and the CCB.	
To save energy and extend service life of the charge modules, these are alternatively switched with the float charge.	

Charging module CM 3.4 A

Ordering details

Type	Scope of supply	Order No.
Charging module CM 1,7 A	For installation on gear tray	4 0071 360 340
Charging module CM 3.4 A	For installation on separate gear tray	4 0071 360 370



Booster rack, 4-way

Booster rack

A 4-way booster rack with 3-phase supply is mounted in system type EURO ZB.1/52. This is for supplying the charging modules 3.4 A only!
The optional 2-way booster rack can be used to expand the system to 6 slots.

Connection voltage	400 V AC/220 V DC
Slots 3-phase split	
Conductor size	max. 4 mm²

Booster rack, 2-way

Ordering details

Type	Scope of supply	Order No.
Booster rack 4-way	Unit accommodates 4 charging modules 3.4 A for EURO ZB.1/52	4 0071 347 043
Booster rack 2-way	Unit accommodates 2 additional charging modules 3.4 A (only in connection with 4 0071 347 043)	4 0071 347 130

Booster rack 1-way compact

Booster rack, compact

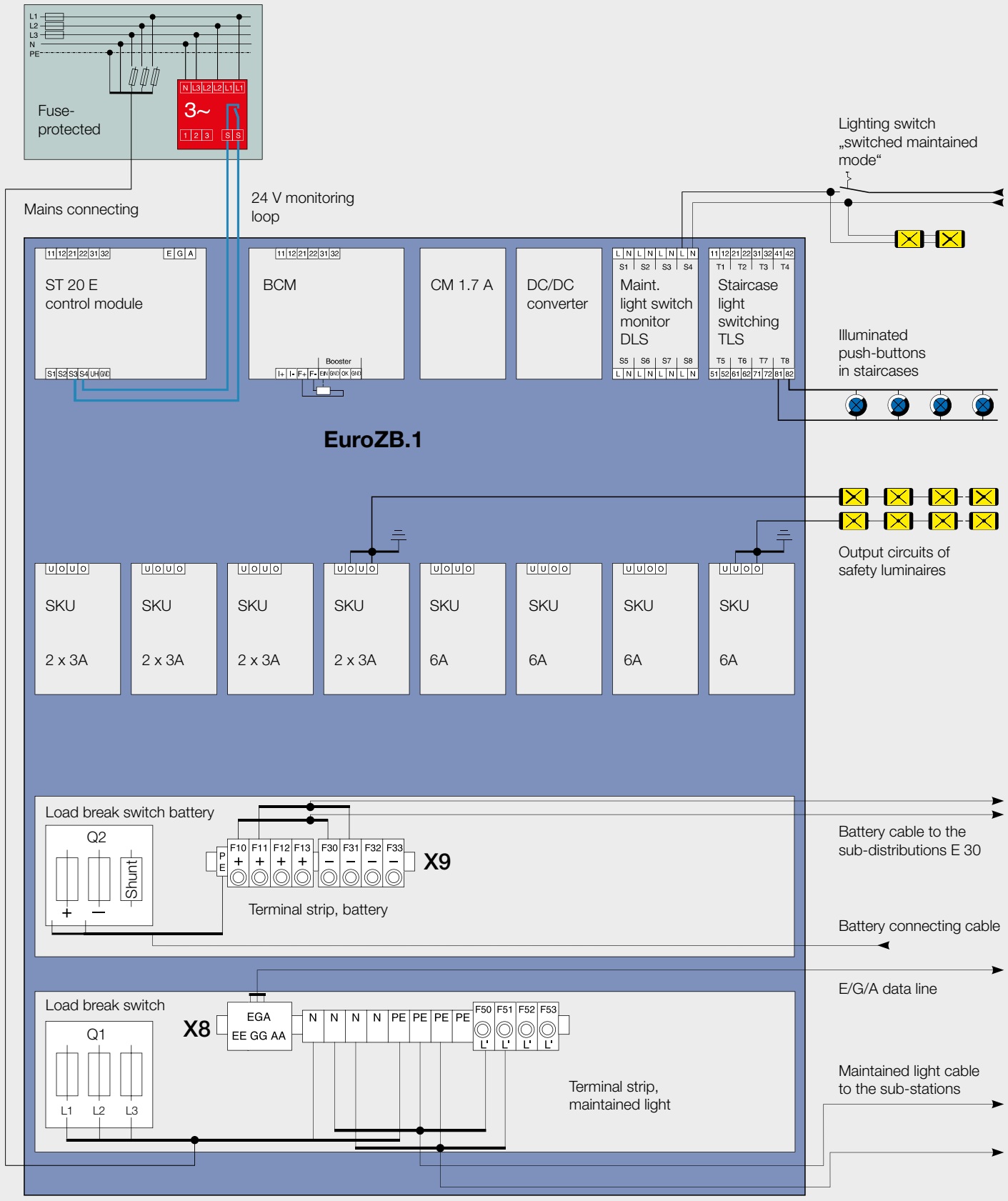
The compact version of the booster rack is intended for use in EURO ZB.1 compact systems. The single compact booster rack has been designed for EURO ZB.1/20K and 204K, the double compact booster rack for system types EURO ZB.1/26K and 264K respectively. These are for supplying the charging modules 3.4 A only!

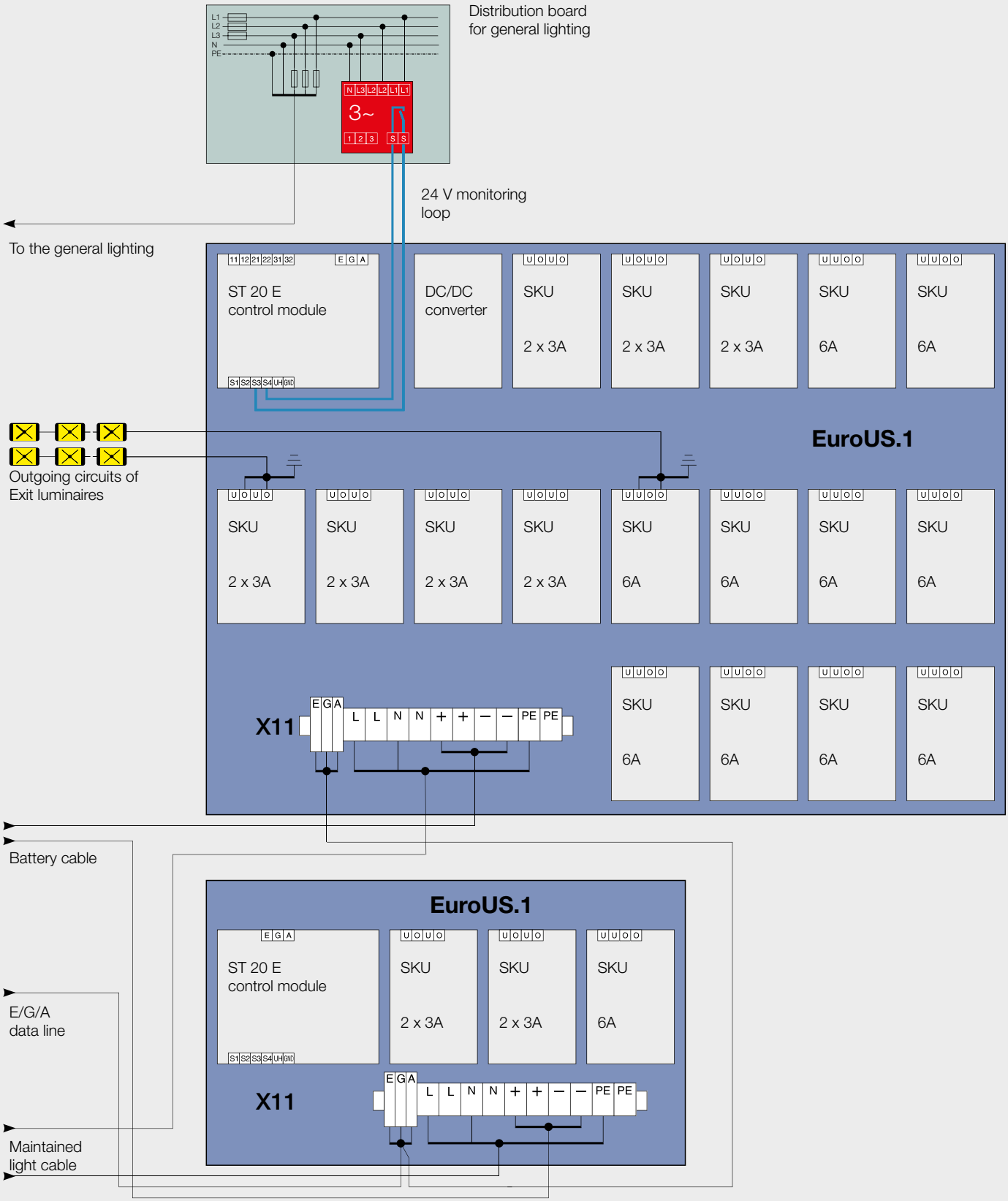
Connection voltage	230 V AC/220 V DC
Conductor size	max. 2.5 mm²

Ordering details

Type	Scope of supply	Order No.
Booster rack 1-way	Unit accommodates 1 charging module 3.4 A compact for EURO ZB.1/20K and 204K	4 0071 347 167
Booster rack 2-way	Unit accommodates 2 charging modules 3.4 A compact for EURO ZB.1/26K and 264K	4 0071 347 130

EURO ZB.1
Installation Example




Distribution board
for general lighting
24 V monitoring
loop
To the general lighting
ST 20 E
control module
DC/DC
converter
SKU
2 x 3A
SKU
6A
EuroUS.1
Outgoing circuits of
Exit luminaires
X11
Battery cable
EuroUS.1
ST 20 E
control module
SKU
2 x 3A
SKU
6A
X11
E/G/A
data line
Maintained
light cable

Planning and Layout of the EuroZB.1 Emergency Lighting Supply System

Based on the data given in the tables, planning the ZB-S central battery system can easily and quickly be carried out.
We recommend the following procedure:

• Calculation of required battery capacity
The number of required emergency luminaires is known from the emergency lighting design with the engineering guides included in part 1 of this catalogue.

Example:
The following number of luminaires has been calculated for the emergency lighting of a meeting hall (3 h rated duration and 12 h recharge period).

Amount	Type	Current consumption	
		per luminaire	in total
100	55021 CG-S	0.03 A	3.00 A
250	55011 CG-S	0.03 A	7.50 A
100	EVG 13.3	0.05 A	5.00 A
		Total:	15.50 A

Based on table 2a and depending on the required rated duration (1 h, 3 h and 8 h), the battery capacity (C10; 1.8V/Z; +20° C) is to be calculated, depending on the maximum discharge current that has been determined on the basis of the total current drawn from the battery by all consumers.

According to EN 50171, batteries with a lifetime of 10 years at +20° C will have to be installed.

In the above example with the required rated duration of 3 h the 53.70 Ah battery (C10; 1.8V/Z; +20° C) is to be selected from the table 2a.

The maximum discharge current for a 3 h discharge according to table 2a is at 15.80 A.

• Calculation of required additional booster.
According to EN 50171, 80 % of capacity must be loaded within 12 h into the discharged battery. In the calculation of the required booster the ageing factor of 25 % must not be considered.

Example:

Current consumption battery	=	15.80 A at 3 h discharge
Required number of boosters 1 x CM 1.7 A and 1 x 3.4 A acc. to table 3 a	=	2 pcs.

• Calculation of required battery capacity including ageing factor according to table 2a
As a lead-acid battery has a capacity loss of 2.5% each year (25% in 10 years) at intended operation this capacity loss has to be included in the battery appointment acc. to EN 50171. The end of the lifetime is reached when the rated voltage of the battery at full load falls below 90%.

Example:

Current consumption battery 15.50 A + 25% ageing factor	=	19.38 A
U_N battery	=	216 V
90% U_N battery (108 battery) = 194.4 V	=	**1,8 V per battery**

In this example the battery capacity has to be increased from 53.70 Ah to 85.70 Ah.

The maximum discharge current for a 3h discharge is at 23.10 A.

Attention!
In the calculation of the required booster the ageing factor of 25% must not be considered.

• Fuse protection of the mains input
In order to determine the fuse in the main distribution board of the general power supply, you must know the total connected load of the ZB-S system. This is made up of the sum of mains connected loads of the individual luminaires and consumers (see table 1) and of the ratings of the charging booster CM 1.7 A and CM 3.4 A.

Example:

100 pcs. 55021 CG-S	à 16 VA	=	1.60 kVA
250 pcs. 55011 CG-S	à 16 VA	=	4.00 kVA
100 pcs. EVG 13.3			
for 13 W TC-DEL	à 23 VA	=	2.30 kVA
		=	7.90 kVA
Booster CM 1.7 A P_{zu} 0.72 kVA		=	0.72 kVA
Booster CM 3.4 A P_{zu} 0.98 kVA			0.98 kVA
Total connected load		=	10.90 kVA

N-EVG 54 W V-CG-S

Table 1.1
Rated value N-EVG ... V-CG-S for mains and battery operation

Term	T5	T5	T5	T5	T5	T5
Lamp cap	G5	G5	G5	G5	G5	G5
Type N-EVG ... V-CG-S	14 / 21 / 28 / 35 W	14 / 21 / 28 / 35 W	14 / 21 / 28 / 35 W	14 / 21 / 28 / 35 W	24/39 W	24/39 W
Lamp load [W]	14	21	28	35	24	39
Current consumption [A] at 220 V battery operation, setting (Luminous flux Φ_E/Φ_N in %)						
100 %	0.08	0.11	0.15	0.18	0.13	0.19
90 %	0.07	0.10	0.13	0.16	0.12	0.17
80 %	0.064	0.09	0.12	0.14	0.10	0.15
70 %	0.057	0.08	0.11	0.13	0.09	0.13
60 %	0.051	0.07	0.10	0.11	0.08	0.12
50 %	0.045	0.062	0.09	0.10	0.07	0.11
40 %	0.040	0.055	0.08	0.09	0.066	0.10
30 %	0.036	0.050	0.07	0.08	0.059	0.09
Power consumption [A] at 230 V mains operation	0.08	0.11	0.14	0.17	0.12	0.18
Power factor λ	0.96	0.96	0.98	0.98	0.98	0.98
Inrush current [A]	10					
System power lamp + ECG acc. to EN 50294 [W]	16	23	30	37	25	41

N-EVG 58 W V-CG-S

Term	T5	T5	T5	T8	T8
Lamp cap	G5	G5	G5	G13	G13
Type N-EVG ... V-CG-S	49W	54W	80W	36W	58W
Lamp load [W]	49	54	80	36	58
Current consumption [A] at 220 V battery operation, setting (Luminous flux Φ_E/Φ_N in %)					
100 %	0.24	0.26	0.38	0.17	0.25
90 %	0.21	0.23	0.34	0.15	0.22
80 %	0.19	0.21	0.30	0.14	0.20
70 %	0.17	0.18	0.27	0.12	0.18
60 %	0.15	0.16	0.24	0.11	0.16
50 %	0.14	0.15	0.21	0.10	0.14
40 %	0.12	0.13	0.19	0.09	0.13
30 %	0.11	0.12	0.17	0.08	0.11
Power consumption [A] at 230 V mains operation	0.24	0.25	0.37	0.16	0.24
Power factor λ	0.98	0.98	0.98	0.98	0.98
Inrush current [A]	10	10	12	10	10
System power lamp + ECG acc. to EN 50294 [W]	52	57	84	34	53

Depending on the luminous flux (30% … 100%) the correspondend battery current has to be projected.
Dim operation permitted by 30% up to 10°C, 60% up to 0°C only.
For outdoor use set 100 % only!
Note: Setting the address switches 1 and 2 on address 0 there is no luminous flux reduction during battery operation.

Tables

EVG 13.3

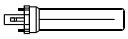
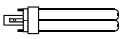
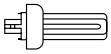
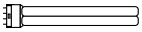
EVG 13.3 V-CG-S

EVG 18 V-CG-S

EVG 18C V-CG-S

Table 1.2

Rated value of EVG 13.3 V-CG-S, EVG 18 V-CG-S and EVG 18C V-CG-S for mains and battery operation

International term	Lamp cap	EVG-type EVG...	Lamp load in [W]	Power consumption at battery operation [A][1]	Power consumption in [VA]	Inrush current [A]	power factor λ
T16 / T5	G 5	13.3 V-CG-S	4	0.020	8	3	0.6
		13.3 V-CG-S	6	0.025	12	3	0.6
		13.3 V-CG-S	8	0.030	16	3	0.6
		13.3 V-CG-S	13	0.050	23	3	0.6
TC-SEL	2 G 7	13.3 V-CG-S	5	0.020	10	3	0.6
		13.3 V-CG-S	7	0.025	13	3	0.6
		13.3 V-CG-S	9	0.030	16	3	0.6
		13.3 V-CG-S	11	0.040	18	3	0.6
TC-DEL	G 24 q-1	13.3 V-CG-S	10	0.035	16	3	0.6
		13.3 V-CG-S	13	0.050	23	3	0.6
	G 24 q-2	18C V-CG-S	18	0.070	30	8	0.6
TC-TEL	GX 24 q-1	13.3 V-CG-S	13	0.050	23	3	0.6
	GX 24 q-2	18C V-CG-S	18	0.070	30	8	0.6
T 26 / T8	G 13	18 V-CG-S	18	0.070	30	8	0.6
TC-F	2 G 10	18 V-CG-S	18	0.070	30	8	0.6
							
TC-L	2 G 11	18 V-CG-S	18	0.070	30	8	0.6
							

[1] Luminous flux Φ_E/Φ_N = 75 %

Table 1.3

Current ratings of incandescent and tungsten halogen lamps

220 V incandescent lamps (AGL)			12 V tungsten halogen lamps with 220 V electronic transformer		
	Φ rated	Current consumption from the battery	Lamp rating	Current rating from the battery	Mains connected load
7 W	30 lm	30 mA	20 W	115 mA	33.6 VA
15 W	90 lm	70 mA	35 W	200 mA	58.0 VA
25 W	230 lm	110 mA	50 W	285 mA	84.0 VA
40 W	430 lm	180 mA	75 W	420 mA	72.6 VA
60 W	730 lm	270 mA	100 W	570 mA	168.0 VA
75 W	960 lm	340 mA			
100 W	1380 lm	450 mA			

Table 2 a
Calculation of the battery capacity of maintenance free OGiV batteries acc. to EN 50171 (higher capacities on request)

Battery capacity C10 at 1.8 V/C and +20°C	Ah	5.5	8.5	14.0	23.3	32.0	39.8	50.4	53.7	66.2	85.7	89.4	106.0 1 x 39.8 1 x 66.2	118.0	143.1 1 x 89.4 1 x 53.7	155.6 1 x 89.4 1 x 66.2	178.8 2 x 89.4	195.4 1 x 89.4 1 x 66.2 1 x 39.8	245.0 2 x 89.4 1 x 66.2	268.2 3 x 89.4	308.0 3 x 89.4 1 x 66.2	357.6 4 x 89.4
max. discharge current [A] with operating time [h], 1.8 V per cell and +20°C ambient temperature	1.0	3.2	4.5	9.3	15.4	20.2	24.1	30.7	37.9	49.2	52.6	63.8	73.3	85.1	101.7	113.0	127.6	137.1	176.8	191.4	215.5	255.2
	1.5	2.5	3.4	6.9	11.9	15.0	19.0	22.7	27.6	34.5	38.3	46.1	53.5	60.0	73.7	80.6	92.2	99.6	126.7	138.3	157.3	194.7
	2.0	2.1	2.9	5.7	9.2	12.3	14.6	18.5	21.5	26.3	31.0	36.0	40.9	46.9	57.5	62.3	72.0	76.9	98.3	108.0	122.6	144.0
	3.0	1.5	2.1	4.1	6.9	9.1	11.0	13.6	15.8	18.2	23.1	26.5	29.2	33.3	42.3	44.7	53.0	55.7	71.2	79.5	90.5	106.0
	8.0	0.7	1.0	1.7	2.8	3.7	4.8	5.9	6.6	7.9	10.3	11.0	12.7	14.2	17.6	18.9	22.0	23.7	29.9	33.0	37.8	44.0

Table 3 a
Number of 1.7 A and 3.4 A booster acc. to DIN EN 50171 for recharging of:

Battery capacity C10 at 1.8 V/C and +20°C	h	A	5.5	8.5	14.0	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
12 hours / 80 %	1.0	1.7	1	1	1	1	1	0	0	0	1	1	1	0	0	1	0	0	1	1	1	1	0
		3.4	0	0	0	0	0	1	1	1	1	1	1	2	2	2	3	3	3	4	4	5	6
	1.5	1.7	1	1	1	1	0	0	0	0	1	1	0	0	1	0	0	1	1	1	0	0	1
		3.4	0	0	0	0	1	1	1	1	1	1	2	2	2	3	3	3	3	4	5	6	6
	2.0	1.7	1	1	1	1	0	0	0	0	1	1	0	0	1	0	0	1	0	0	1	0	0
		3.4	0	0	0	0	1	1	1	1	1	1	2	2	2	3	3	3	4	5	5	6	7
	3.0	1.7	1	1	1	1	0	0	0	1	1	1	0	1	1	0	1	0	0	0	0	1	1
		3.4	0	0	0	0	1	1	1	1	1	1	2	2	2	3	3	4	4	5	6	6	7
	8.0	1.7	1	1	1	0	0	0	1	1	1	0	0	1	0	1	0	1	1	0	1	1	1
		3.4	0	0	0	1	1	1	1	1	1	2	2	2	3	3	4	4	4	6	6	7	8

Table 4
Number of battery cabinets; battery weight

Battery capacity C10 at 1.8 V/C and +20°C	5.5	8.5	14.0	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
No. of battery cabinets (weight approx. 150 kg) per cabinet	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	3	3	3	4	4
Total weight per battery set approx. kg	45	65	100	180	243	252	351	405	499	527	594	612	900	1000	1093	1296	1354	1687	1782	1782	2376

Table 5.1
Calculation of ventilation of electrical rooms acc. to DIN EN 50272-2 (calculated for boost charge):

Battery 216 V	5.5	8.5	14.0	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	0.60	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	16.93	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

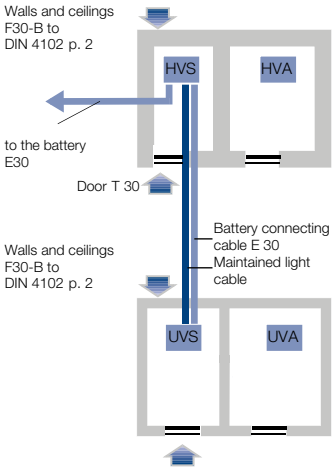
Table 5.2
Calculation of ventilation of electrical rooms acc. to DIN EN 50272-2 (calculated for float charge)*:

Battery 216 V	5.5	8.5	14.0	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]	0.03	0.05	0.08	0.13	0.17	0.21	0.27	0.29	0.36	0.46	0.48	0.57	0.64	0.77	0.84	0.97	1.06	1.32	1.45	1.66	1.93
Vent cross-section of the air inlets and outlets of the place of installation [cm^2]	0.83	1.29	2.12	3.52	4.84	6.02	7.62	8.12	10.01	12.96	13.52	16.03	17.84	21.64	23.53	27.03	29.54	37.04	40.55	46.57	54.07

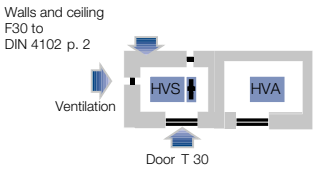
* If a boost charge only occurs occasionally (e.g. monthly), the float charge current can be used for calculation of the air volume current of ventilation.

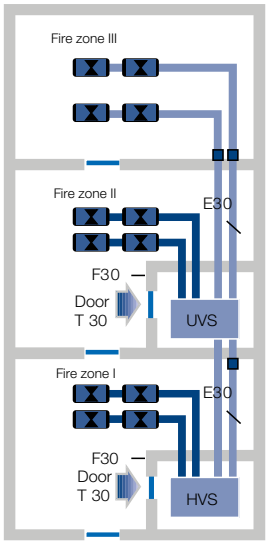
EuroZB.1
Accomodation

Example 1



Example 2





Example for the possible accomodation of a ZB-S and laying of cables which, however, depend on the building's use.

A number of rules and regulations apply to the accomodation of central battery systems, in particular the EltBauVo, DIN EN 50272-2, MLAR and LBO. Depending on the constructional circumstances, the following accomodation possibilities result from these rules and regulations.

Example 1:
Main distribution board of the general lighting power supply (MDB) and main distribution board of the emergency lighting power supply (ZB) in an electrical room.
In case of accomodation acc. to example 1, attention must be paid that the MDB and ZB are isolated from each other so that arcing is safely prevented.

Example 2:
Main distribution board of the emergency lighting power supply (ZB) including the battery, in a separate electrical room.

Ventilation of electrical rooms

Dimensioning of the ventilation acc. to DIN EN 50272-2. The ventilation of rooms, cabinets or containers in the inside of which batteries are operated, is considered sufficient, if a min. air volume flow is ensured that has been calculated according to the following formula:

$Q = 0.05 \times n \times I_{gas} \times CN \times 10^{-3}$ [m³/h]
Q = needed air volume flow, in m³/h
0.05 = fixed factor
n = no. of accumulator cells
Igas = current in mA per Ah, fits 8 mA per Ah for I_{boost} with VRLA batteries
C_N = capacity C_{10} for lead acid at 20° C

Example for a ZB cover with 155.6 Ah lead-acid battery:

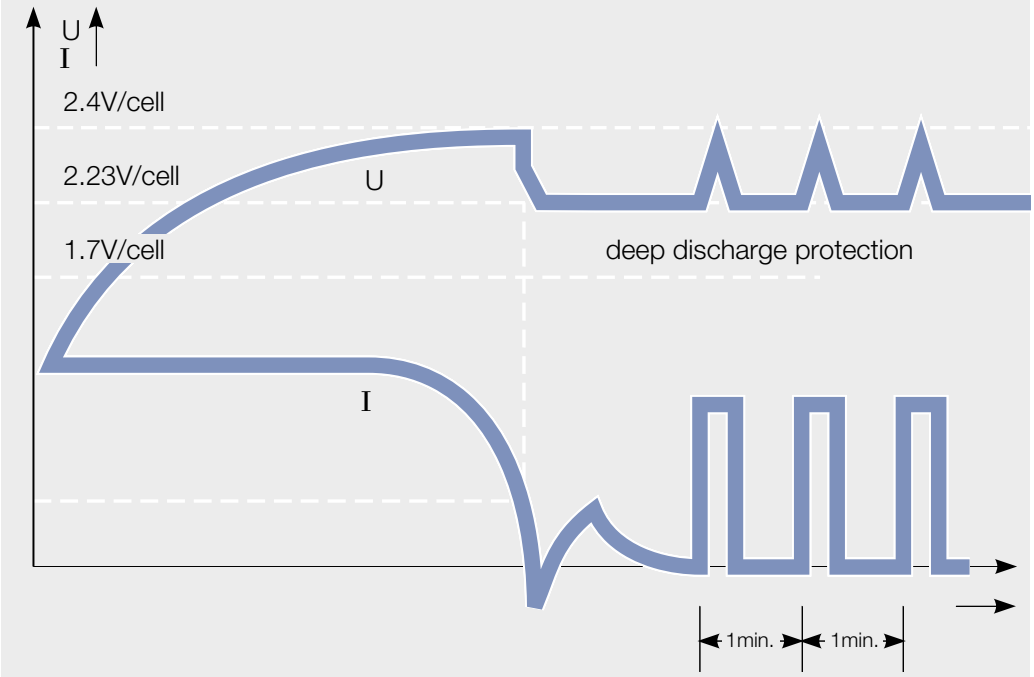
$Q = 0.05 \times n \times I_{gas} \times C_N \times 10^{-3}$
$Q = 0.05 \times 108 \times 8 \times 155.6 \times 10^{-3}$ m³/h
Q = 6.72 m³/h

In order to ensure the air volume flow of 6.912 m³/h, the air inlets and outlets in the electrical distribution room must have the following minimum cross-sections acc. to DIN EN 50272-2.

Vent cross-section of the air inlets and outlets:
$A \geq 28 \times Q$
$A \geq 28 \times 6.72$ m³/h
A ≥ 188.21 cm²

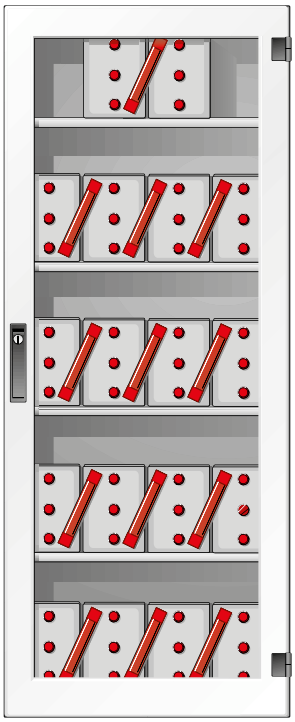
The required vents in the F90 walls must be guarded by fire protection measures, e. g. F90 fire shutters. As the calculation shows, the use of even the largest battery does not require an elaborate technical ventilation (e.g. explosion protected fans). Due to the installed low maintenance of sealed lead acid gas recombination batteries, no further special constructional requirements such as a floor resistant to electrolyte or a floor covering (tiles) etc. have to be met.

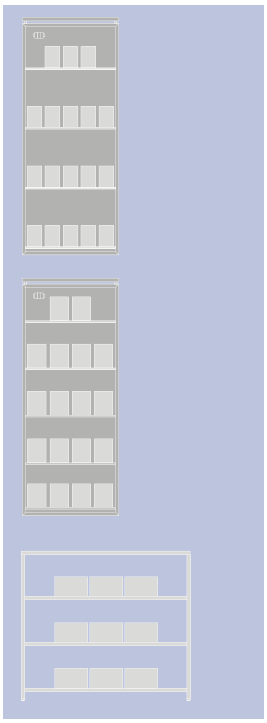
VRLA valve regulated lead acid monobloc batteries can operate in any position. Exception on top.



Properties of environmentally friendly battery technology:

- low-maintenance, leak-proof gas recombination battery block
- extremely low gassing due to antimony-free alloys and an internal recombination of the generated oxygen
- service life: 10 years
- density of acid between 1.24 kg/l and 1.26 kg/l
- design according to DIN
- electrolyte and aerial oxygen proof pole bushing
- low self-discharge, therefore the possibility of long rest periods during transport and storage





The patented CEAG charge monitoring method enables the recognition of:

- a blown fuse
- a failure in the charging circuit
- a faulty charging unit
- missing batteries
- battery voltage monitoring

Table 2 b
Calculation of the battery capacity of maintenance free OGiV batteries **not acc. to EN 50171**
(higher capacities on request)

Battery capacity C10 at 1.8 V/C and +20°C	Ah	5.5	8.5	14.0	23.3	32.0	39.8	50.4	53.7	66.2	85.7	89.4	106.0 1 x 39.8 1 x 66.2	118.0	143.1 1 x 89.4 1 x 53.7	155.6 1 x 89.4 1 x 66.2	178.8 2 x 89.4	195.4 1 x 89.4 1 x 66.2 1 x 39.8	245.0 2 x 89.4 1 x 66.2	268.2 3 x 89.4	308.0 3 x 89.4 1 x 66.2	357.6 4 x 89.4
max. discharge current [A] with operating time [h], 1.7 V per cell and +20°C ambient temperature	1.0	3.4	4.7	9.7	16.7	20.8	26.2	31.7	40.9	52.6	55.3	66.8	78.8	90.0	107.7	119.4	133.6	145.6	186.2	200.4	226.6	267.2
	1.5	2.6	3.5	7.3	13.2	15.5	19.9	23.5	29.5	37.4	40.5	47.9	57.3	67.4	77.4	85.3	95.8	105.2	133.2	143.7	163.6	198.6
	2.0	2.2	3.0	6.1	9.8	12.7	16.0	19.2	22.8	28.6	32.9	37.2	44.6	51.7	60.0	65.8	74.4	81.8	103.0	111.6	127.6	148.8
	3.0	1.6	2.2	4.4	7.2	9.3	11.8	14.1	16.6	19.5	24.5	27.2	31.3	35.4	43.8	46.7	54.4	58.5	73.9	81.6	93.4	108.8
	8.0	0.7	1.0	1.8	3.0	3.9	5.1	6.1	6.8	8.2	10.8	11.2	13.3	14.9	18.0	19.4	22.4	24.5	30.6	33.6	38.7	44.8

Table 3 b
Number of 1.7 A and 3.4 A booster **not acc. to EN 50171** for recharging of 10 h and 20 h:

Recharging cycle [h]	h	A	5.5	8.5	14	23.3	32	39.8	50.4	53.7	66.2	85.7	89.4	106	118	143.1	155.6	178.8	195.4	245	268.2	308	357.6
10	1.0	1.7	1	1	1	1	0	0	0	0	1	0	0	0	1	0	0	1	0	1	0	0	0
		3.4	0	0	0	0	1	1	1	1	1	2	2	2	2	3	3	3	4	4	5	6	7
	1.5	1.7	1	1	1	1	0	0	0	1	1	0	0	1	1	0	1	0	0	0	1	1	1
		3.4	0	0	0	0	1	1	1	1	1	2	2	2	2	3	3	4	4	5	5	6	7
	2.0	1.7	1	1	1	1	0	0	1	1	1	0	0	1	0	1	1	0	1	1	0	0	0
		3.4	0	0	0	0	1	1	1	1	1	2	2	2	3	3	3	4	4	5	6	7	8
	3.0	1.7	1	1	1	0	0	0	1	1	0	1	1	0	0	1	0	1	0	0	0	1	2
		3.4	0	0	0	1	1	1	1	1	2	2	2	3	3	3	4	4	5	6	7	7	8
	8.0	1.7	1	1	1	0	0	1	1	1	0	1	1	0	1	0	1	0	1	0	1	1	0
		3.4	0	0	0	1	1	1	1	1	2	2	2	3	3	4	4	5	5	7	7	8	10
20	1.0	1.7	1	1	1	1	1	1	1	1	0	0	0	0	1	1	1	0	0	1	1	0	1
		3.4	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2	3	3
	1.5	1.7	1	1	1	1	1	1	1	0	0	0	0	1	1	1	0	0	0	1	0	1	0
		3.4	0	0	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2	3	3	4
	2.0	1.7	1	1	1	1	1	1	0	0	0	0	0	1	1	0	0	0	1	0	0	1	0
		3.4	0	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2	3	3	3	4
	3.0	1.7	1	1	1	1	1	1	0	0	0	1	1	1	1	0	0	1	1	0	1	0	1
		3.4	0	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2	3	3	4	4
	8.0	1.7	1	1	1	1	1	0	0	0	0	1	1	1	0	0	1	1	0	1	0	1	0
		3.4	0	0	0	0	0	1	1	1	1	1	1	1	2	2	2	2	3	3	4	4	5