



POWERPACK

Dynamic battery standby
power supply



POWERPACK – The System

POWERPACK is a battery backup, rotating standby power supply, which we have developed as an alternative to conventional emergency standby power units (ESPU).

The system consists of a rotating generator set, a high-performance battery and a charging and control section with remote outgoing unit.

If a mains voltage is applied, the loads are supplied from the mains. In the event of failure or reduction of the mains voltage by more than 15 %, the generator set is started and supplies the connected loads within approx. 2 seconds (transfer time < 15 sec required). On request, the outgoing unit can be extended to include final circuits of the emergency lighting (transfer time < 1 second). Contemporary mixed technology (escape route and emergency luminaires in one circuit) with single luminaire monitoring and IP visualisation is easily possible.

POWERPACK has substantial advantages compared to units with a combustion engine:

No exhaust routing

The standards require exhaust routing above the roof for units with combustion engines. POWERPACK is completely exhaust-free.

No noise generation

While conventional units generate very high noise levels during operation, even when running at full load, the POWERPACK is roughly as loud as a standard hairdryer.

No approval procedures

No exhaust and no noise. For this reason, the POWERPACK is not a system requiring approval.

A TA Air or TA Noise approval (in Germany) is therefore not required.

Space requirement

POWERPACK only requires its own electrical location for the installation.

Compact design

Thanks to the upright converter (direct current motor with coupled three-phase AC generator), POWERPACK is very space-saving.

Maintenance

POWERPACK is virtually maintenance-free, as it has no consumables or wearing parts. The maintenance merely involves the annual testing of the battery.

POWERPACK is the right choice, and not only for the advantages named above. The emission-free system is also convincing with regard to ecological aspects. Due to permanent self-monitoring, the system provides maximum security. A conventional emergency standby power unit (ESPU) cannot ensure this operating reliability.

As a global market leader for rotating, battery standby power supply systems, we are the right partner for the project planning, dimensioning and implementation of your emergency power supply.

POWERPACK is produced to the respective current standards. The system fulfils DIN VDE 0100-560, DIN VDE 0108-100, EN 50171 and EN 50172.

Supply of



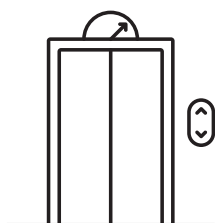
Firefighting water supply

POWERPACK is the ideal standby power supply for pumps for firefighting water supply (sprinkler or pressure increase). The starting currents of the pumps are given particular consideration when dimensioning the system size. The supply times depend on the requirements of the fire protection design analysis. 90-minute supply of the pumps within 12h mains failure can also be achieved easily.



Smoke control (SHEVS / SPS)

POWERPACK supplies smoke control fans in staircases, lift shafts and necessary corridors/escape routes (e.g. underground car park) for the required autonomy of 180 minutes.



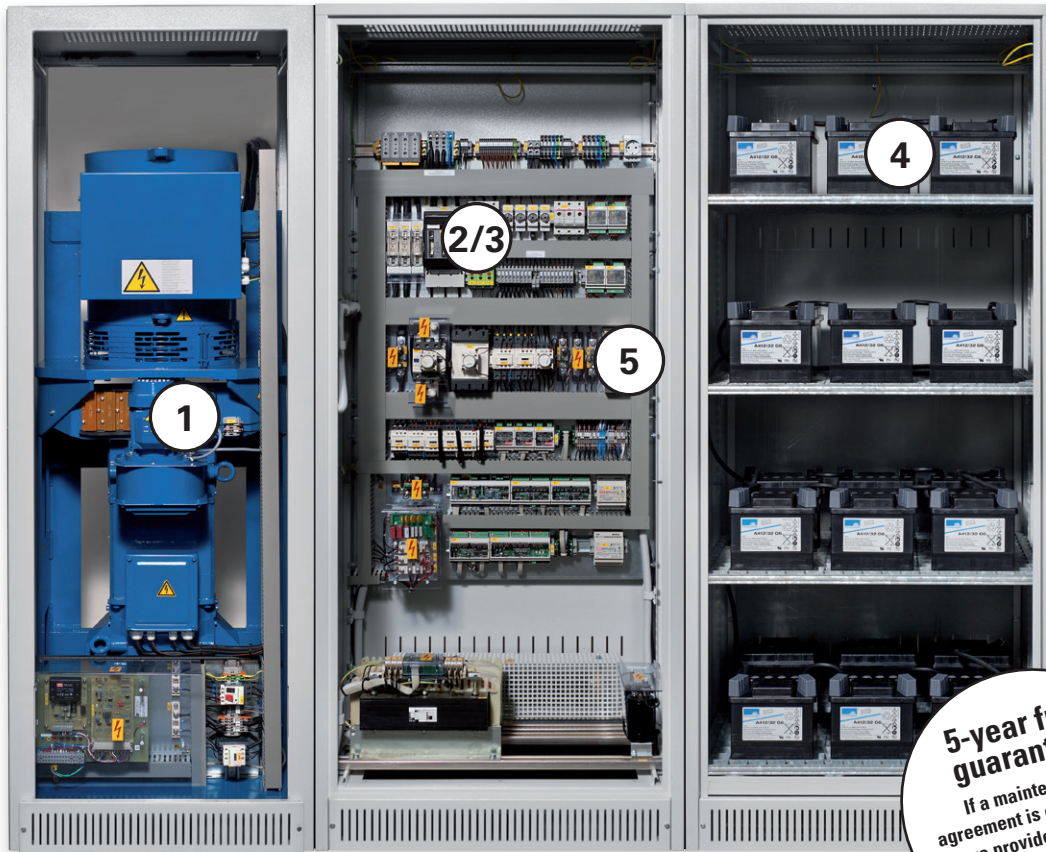
Lifts

POWERPACK ensures safe evacuation runs of passenger lifts. In the event of mains failure, these are lowered cascaded on the evacuation level (requested via the lift control). Fire service lifts can also be supplied. In this way, for example, the lift can be operated for 90 minutes within an 8h mains failure (supply provided after request).



Emergency escape lighting

POWERPACK can be extended to include final circuits for emergency lighting. All final circuits are pre-equipped for mixed technology (escape route and emergency luminaires in one circuit). Single luminaire monitoring is achieved by means of address modules in the luminaires. The stored energy time is designed for 1h, 3h or 8h, depending on the requirements. Up to a system power of 50 kVA, the transfer time is < 1 second.



5-year full guarantee
If a maintenance agreement is concluded, we provide a 5-year guarantee for all parts.

SYSTEM STRUCTURE

1. ROTATING CONVERTER

The heart of the POWERPACKsystem is the rotating generator set. It consists of a direct current shunt motor and a synchronous generator. These are mounted vertically upright on top of each other and are connected by a coupling.

The direct current shunt motor is equipped with a completely laminated magnetic circuit. A speedometer with control electronics ensures that the speed of the direct current motor, and thus the output frequency of the generator, remains constant even if the battery voltage drops.

The synchronous generator is brush less, self-excited and self-regulating. The automatic voltage regulator ensures a constant output voltage (400 V +/- 2 %).

The particular properties of the generator are:

- High steady-state short-circuit current
- Very good peak load performance
- High efficiency
- Low ripple content

The converter complies with or takes into account the basic conditions to DIN 6280-13 and DIN 6280-14 required in DIN VDE 0100-560.

2. SWITCHGEAR /CONTROL CABINET

The control cabinet contains the charging rectifier, the complete control and switching equipment to DIN VDE V 0108-100 and the connector panel with fuses for the mains and loads.

The built-in components are easily accessed and are arranged clearly and are safe to touch.

The core element is the microprocessor-controlled signalling and test system (STS) for permanent monitoring and automatic test running of the system. All data are recorded and registered in the event memory for 2 years.

3. OUTGOING UNIT (CABINET "E0" or "E90")

The loads are fused with low-voltage high-performance fuse circuit breakers (size 0 – 3) or DO2 Lino cur switches. These are mounted under the output terminals for easy access.

The system can be optionally equipped with loads for emergency lighting.

4. BATTERY SYSTEM

Only high-quality, maintenance-free and sealed lead batteries with a useful life of at least 10 years are used.

The battery housings are fully insulated and are set up to be safe to touch and non-spellable. The voltage of each individual cell can be controlled through measurement openings.

The battery blocks are accommodated in modular cabinets, suitable for the switchgear.

Attention must be paid to ensuring sufficient air supply and ventilation of the room in accordance with EN IEC 62485-2.

5. TEST EQUIPMENT

The integrated fully-automatic test equipment of the POWERPACKsystem performs the specified functional tests automatically and records not only the test results but also the operating and fault messages.

The logged data and the results of the circuit monitoring and individual luminaire testing can be shown on the display at any time, or output on an optional printer.

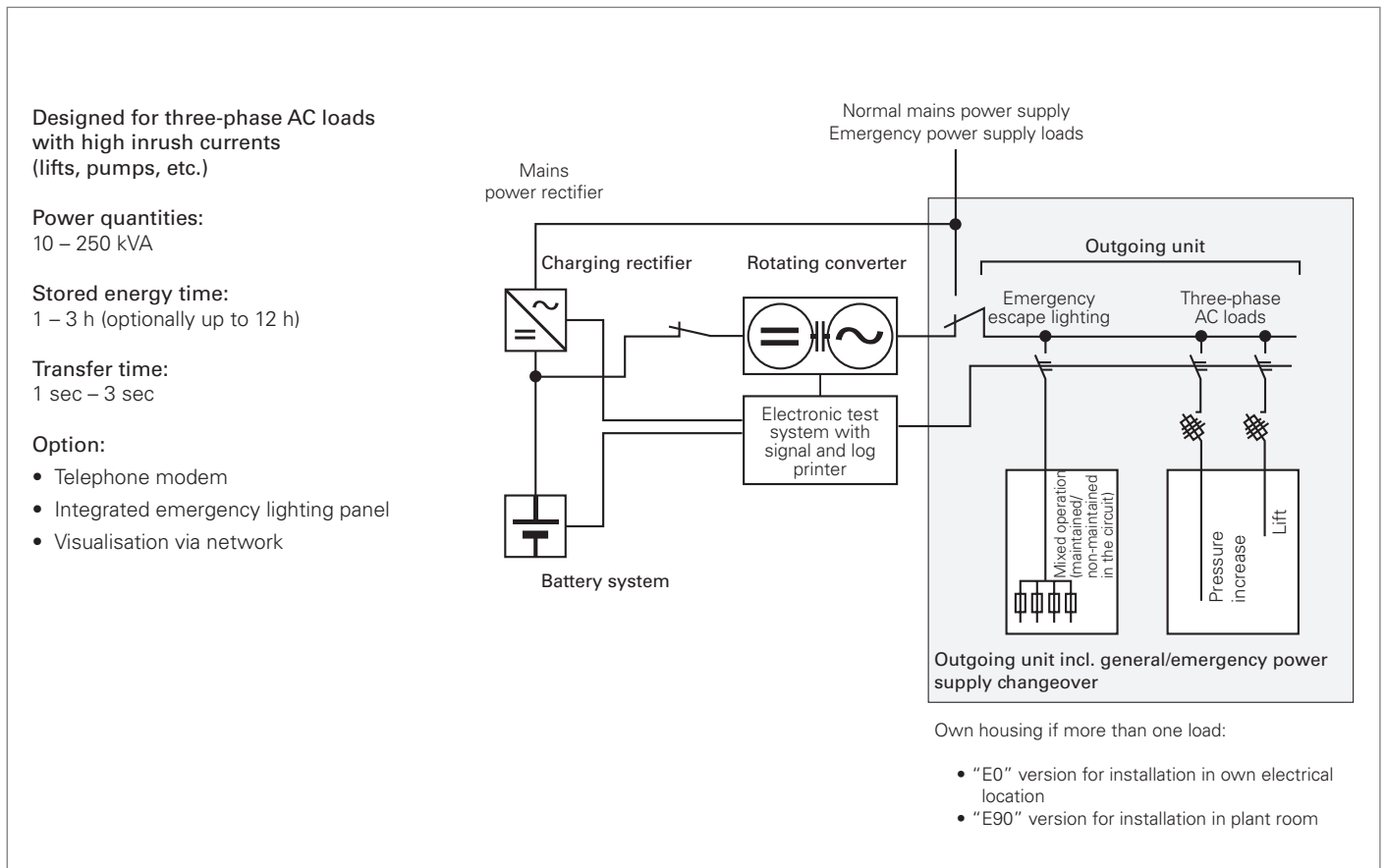
PROJECT PLANNING DATA

Rated apparent power [kVA]	Mains supply cable* [mm ²]	Fusing in V MAIN DISTRIBUTION* [A]	Steady-state short-circuit current (3-pole short-circuit) [A]	Steady-state short-circuit current (1-pole short-circuit) [A]	Max. load fusing [A]	Dimensions e.g. for 1.5 h emergency operation** H x W x D [mm]	Weight [t]
10	5 x 10	50	81	200	20	1800 x 2400 x 600	2.2
15	5 x 16	63	160	400	35	1850 x 2600 x 600	2.4
20	5 x 16	63	180	480	35	2000 x 2400 x 800	2.7
25	4 x 25/16	80	230	570	50	2000 x 2800 x 800	3.0
35	4 x 35/16	100	270	675	50	2000 x 3000 x 800	3.5
45	4 x 50/35	125	400	1000	80	2000 x 3400 x 800	4.1
55	4 x 70/35	160	480	1200	80	2000 x 3600 x 800	4.7
65	4 x 95/50	200	580	1480	100	2000 x 4050 x 800	5.9
80	4 x 95/50	200	690	1725	125	2150 x 4200 x 800	7.2
100	4 x 120/70	250	840	2100	160	2150 x 4800 x 800	8.4
120	4 x 150/70	315	1080	2625	200	2150 x 5800 x 800	10.3
140	4 x 185/95	400	1150	2875	200	2150 x 8800 x 800	11.6
160	4 x 240/120	500	1400	3500	250	2150 x 10200 x 800	13.5
180	2 x 4 x 120/70	630	1600	4000	315	2150 x 12500 x 800	14.8
200	2 x 4 x 150/95	630	1600	4000	315	2150 x 13300 x 800	17.0

***Attention:** If several lifts are supplied, the cross-section and fusing are increased accordingly. Attention must also be paid to the cable length and type of laying.

**The dimensions can change due to different supply times or the number and type of outgoing load units.

SCHEMATIC CIRCUIT DIAGRAM



POWERPACK

TECHNICAL DATA

[kVA]	10 15 20 25 35 45 55 65 80 100 120 140 160 180 200 250	
[min.]	up to 180 min	
	Voltage:	230/400 V ± 10 %
	Frequency:	50 Hz ± 5 %
	Voltage:	230/400 V ± 2 % (static load) 230/400 V ± 10 % (dynamic load)
	Frequency:	50 Hz ± 1 % (static load) 50 Hz ± 5 % (dynamic load)
	Recovery time:	0.3 s
	Interference suppression level:	'N' in accordance with VDE 0875
	120 %	for 1 h
	150 %	for 5 min
	250 %	for 30 sec
	min. 85 %	
	$3 \times I_{nm}$ for 3-pole short-circuit	for 10 sec
	$4.8 \times I_{nm}$ for 2-pole short-circuit	for 7 sec
	$7.8 I_{nm}$ for 1-pole short-circuit	for 3 sec
	70 – 82 dB(A) in emergency operation	
	Signal and test system for automatic test run	
Sealed lead batteries (other battery types possible)	Design life:	12 years
	Nominal voltage:	420 V/228 V
Capacity reserve in accordance with EN 50171	Number of cells:	210/114
	End-point voltage:	1.8 V/cell
	IU	
All operating states and fault messages are displayed clearly on a block diagram by means of LEDs.	<ul style="list-style-type: none"> • Load voltage (L1 – L3) • Load current (L1 – L3) • Frequency • Battery voltage • Charging current 	<ul style="list-style-type: none"> • Operating hours counter • Active load power (L1 – L3) • Apparent load power (L1 – L3) • Power factor (cos phi) (L1 – L3) • Withdrawal capacity
	Temperature:	0 °C to + 40 °C switchgear + generator +5 °C to + 25 °C battery
	Rel. humidity:	max. 95 % non-condensing
Modular sheet steel cabinets	Degree of protection:	IP 20
	Cable entry:	optionally from above /below
	Paint finish (cabinet):	RAL 7035 (other colours optional)
	Paint finish (converter):	RAL 5019
	Right/left-hinged door:	selectable
Potential-free signals to DIN VDE 0100-560 (changeover contact)	<ul style="list-style-type: none"> • Ready for operation • Battery mode 	<ul style="list-style-type: none"> • Collective fault • Emergency operation
Optional:	<ul style="list-style-type: none"> • Emergency escape lighting with single luminaire monitoring (mixed operation) • WEB-MASTER link 	