FAQ – Butler Products

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1 Product & Company

Question	Topic	emost answer
1.1 **Which Butler models are available?**	Product range	**Butler S 50/25** 50 kVA (45 kW), 25 kWh usable capacity, on a purpose-built trailer. Compact, for small to medium-sized construction sites, events and temporary power supply. **Butler M 100/150** 150 kWh net usable (185 kWh installed). The standard version delivers 100 kVA (90 kW); all Butler M units built so far are fitted with the additional power module and deliver 150 kVA (135 kW). For large construction sites, major events and critical emergency power supply. **LinkDuo CEE125 option** A box that couples two Butler S units. Coupled, they deliver 100 kVA and 50 kWh instead of 50 kVA and 25 kWh each. **Customised solutions** Based on our existing systems, we develop customised solutions for appropriate quantities (development costs borne by the customer).

1 Product & Company

<table>
<tr><th>Question</th><th>Topic</th><th>emost answer</th></tr>
<tr><td>1.2 What are the key technical specifications?</td><td>Data sheet</td><td>
<table>
<tr><th></th><th>Butler S 50/25</th><th>Butler M 100/150</th></tr>
<tr><td>Rated power</td><td>50 kVA (45 kW); 2 × S with LinkDuo: 100 kVA / 50 kWh</td><td>150 kVA (135 kW) for all systems built; standard 100 kVA (90 kW)</td></tr>
<tr><td>Usable capacity</td><td>25 kWh</td><td>150 kWh (185 kWh installed)</td></tr>
<tr><td>Cell type</td><td>Li-ion, LMO</td><td>Li-ion, NMC</td></tr>
<tr><td>Output voltage</td><td>230/400 V AC ±5%, 50 Hz</td><td>230/400 V AC, 50 Hz</td></tr>
<tr><td>Charging time</td><td>< 4.5 h (0–100%, 16 A)</td><td>< 4.5 h (5–95%, 63 A)</td></tr>
<tr><td>Operating temperature</td><td>−20 to +40 °C</td><td>−20 to +50 °C</td></tr>
<tr><td>Cooling</td><td>Air cooling</td><td>Industrial air-conditioning unit</td></tr>
<tr><td>Degree of protection</td><td>IP54</td><td>IP54</td></tr>
<tr><td>Dimensions (L × W × H)</td><td>148 × 82 × 110.5 cm</td><td>250 × 112 × 170 cm</td></tr>
<tr><td>Weight without trailer</td><td>approx. 640 kg</td><td>2,850 kg (3,370 kg with trailer)</td></tr>
<tr><td>Noise</td><td>< 52 dB at 1 m</td><td>–</td></tr>
<tr><td>Service life</td><td>11,000 cycles / 15 years</td><td>3,500 cycles / 10 years</td></tr>
</table>
Source: operating manuals Butler S and Butler M.
</td></tr>
<tr><td>1.3 How mature is the Butler? How many units are in operation?</td><td>Product maturity, references</td><td>The Butler has been developed in Switzerland since 2018 and has been in field use since 2019. Today, around 200 Butlers are in operation across Europe:
Butler S: almost 185 units (current 5th generation, GEN05)
Butler M: around 15 units
Both models are continuously developed further; experience from the field flows directly into every new series.</td></tr>
<tr><td>1.4 What does emost develop itself?</td><td>emost know-how</td><td>emost is a system integrator: we specify the individual components and combine them with our own control electronics and IoT system. Quality assurance and final acceptance of every unit are carried out by emost.</td></tr>
<tr><td>1.5 Where are the Butlers manufactured?</td><td>Production</td><td>All Butlers are developed in Switzerland. They are manufactured partly in Switzerland and partly in the EU.</td></tr>
</table>

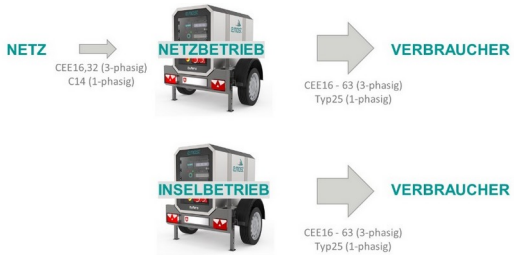
2 Use & Applications

Question	Topic	emost answer
2.1 What is the Butler used for?	Applications	• Construction sites with no or insufficient grid connection, civil engineering sites that need to be mobilised at short notice • Renovation of old buildings and demolition work • Crane operation (e.g. tower cranes) without a suitable three-phase connection • Tunnel and railway construction sites, railway maintenance • Work in fields, forests and nature reserves • Events, film and TV productions • Emergency power and civil protection (floods, storms, blackouts, earthquakes) • Replacement for temporary site power and grid connections
2.2 Is the Butler suitable as an emergency power supply?	Emergency power, civil protection	Yes. After floods, storms or blackouts, power plants and major lines are restored first; it can take days until the local distribution grid is running again. The Butler bridges this gap: • ready for use immediately (start-up approx. 2 minutes), no diesel, no exhaust fumes, quiet (Butler S below 52 dB at 1 m) • clean sine wave voltage, also for medical equipment and IT • Butler M: black-start-capable island mode and UPS function in grid mode • normally usable without earthing and without a qualified electrician (for exceptions see «Is earthing required?») Civil protection organisations have already procured the Butler.
2.3 May the Butler be operated indoors?	Indoor use	Yes. The Butler has no combustion engine and produces no exhaust fumes, so it can readily be used indoors, e.g. for events in halls or for interior demolition. • Ensure adequate ventilation of the battery system • Keep the required distances: 5 m from areas at risk of fire or explosion, 1 m from electrical installations; use in potentially explosive areas is prohibited • Interior demolition: if large consumers such as concrete saws are connected and there is a risk of hitting an external power grid, the Butler must be earthed (see «Is earthing required?»)
2.4 My grid connection is too weak. Can the Butler help?	Boost mode	Yes, with Boost mode. If the grid connection is not sufficient for the connected loads, the Butler switches to Boost mode automatically and without interruption: it is charged e.g. via a 16 A socket while simultaneously supplying loads of up to 50 kVA (Butler S) via the 16 A, 32 A or 63 A socket. • During quiet periods, the Butler charges its battery from the grid • During load peaks (crane, pump, welding machine), the battery supplies the additional power required No grid expansion and no diesel required.

2 Use & Applications

Question	Topic	emost answer
2.5 What experience has been gained in the field so far?	Field experience	The Butler S has been in field use since 2019, is now in its 5th generation (GEN05) and has proven itself as a robust, largely trouble-free system. Examples from our use cases: **Dewatering with UPS function, Biel** Two Butler S units protected six well pumps of 5.6 kW each against grid failure: up to 6 hours of emergency power depending on load, automatic SMS alerts on grid failure and remote monitoring. Diesel operation was reduced by 90%. **Dewatering in hybrid mode, A6 motorway Muri–Rubigen (Kästli Bau AG)** Without site power, a Butler S supplied three pumps and the grid failure monitoring for five weeks. A 20 kVA diesel generator recharged it, running only between approx. 35% and 70% state of charge. Diesel running time was reduced by 90%. **Tunnel renovation at Lake Brienz (ARGE Brienzersee)** Night work with daily set-up and dismantling: the Butler S replaced the diesel generator. Workers needed neither hearing protection nor masks, and after every night shift the state of charge was still around 60%. **Event in a warehouse, Romanshorn** A sustainability event with catering, stage, lighting and live music in an enclosed hall ran 100% on a Butler M and a Butler S, without grid power. 123 kWh were consumed; peak power of the Butler M was 30 kW.

3 Technology & Performance

Question	Topic	emost answer
3.1 How much power does the Butler deliver? How does it handle inrush currents?	Power, overload	**Rated power** • Butler S: 50 kVA (45 kW) • Butler M: 150 kVA (135 kW) for all systems built so far; standard version 100 kVA (90 kW) • 2 × Butler S with LinkDuo: 100 kVA **Overload capacity (both models, relative to rated power)** **100–110%** continuous (30 min at 23 °C) **110–125%** max. 10 min **125–150%** max. 1 min **> 150%** max. 0.2 s This allows short inrush currents from motors, pumps or cranes to be absorbed. The power output may be limited depending on temperature.
3.2 Which connections does the Butler have?	Plugs and sockets	**Butler S – charging** CEE 400 V 32 A and CEE 400 V 16 A. Option: single-phase charging 230 V via C14 appliance inlet (home charging). **Butler S – outputs** CEE 400 V 32 A, CEE 400 V 16 A and type 25 (CH) or Schuko 16 A. Options: CEE 63 A or an additional type 25 socket.  **Butler M – charging** CEE 400 V 63 A and CEE 400 V 32 A. Options: additional CEE 16 A (230 V or 400 V), CCS Type 2 for DC charging stations. **Butler M – outputs** CEE 400 V 16 A, 32 A and 63 A. Options on request: 2 × type 25 (CH) or 2 × Schuko (EU), additional CEE 16 A / 32 A, 125 A output (Powerlock).

3 Technology & Performance

Question	Topic	emost answer
3.3 What voltage quality does the Butler deliver?	Voltage quality	The Butler delivers 230/400 V AC (±5%), 50 Hz, as a clean sine wave. This makes it suitable for sensitive loads such as medical equipment, IT and event technology.
3.4 In which operating modes can the Butler be used?	Operating modes	• Island mode: without grid, as an independent power source (Butler M black-start capable) • Grid mode: Butler connected to the grid, the battery is charged depending on its state of charge (Butler M with UPS function) • Boost: reinforcement of an insufficient grid connection, automatic and uninterrupted switchover • Butler M additionally: hybrid mode with automatic generator start (option) • Butler M: switchover between IT system (without earthing) and TN system on the display within seconds Simultaneous charging and discharging is possible.
3.5 For which temperatures is the Butler designed?	Temperature range, winter use	**Butler S (air-cooled)** • Operation: −20 to +40 °C outside temperature • Charging: three-phase from −10 °C, single-phase from −20 °C **Butler M (industrial air-conditioning unit)** • Operation: −20 to +50 °C ambient temperature • Charging: three-phase from −10 °C; not recommended below 0 °C Usable capacity decreases in cold conditions. If the battery is too cold or too hot, the system blocks the charging plugs or sockets to protect the modules. The Butler must then be warmed up (e.g. in a heated room) or shaded.
3.6 How is the Butler protected against rain and dust?	Degree of protection	Both models have IP54 protection (humidity up to 95%, non-condensing). Do not clean with high-pressure or steam cleaners. When hosing down, no direct water jet may hit the ventilation slots on the underside.

4 Charging, Runtime & Monitoring

Question	Topic	emost answer
4.1 How long does the Butler supply power?	Runtime	This depends on the power of the connected loads and how long they run. Empirical values: • Butler S (25 kWh): supplies a medium-sized construction site for one working day • Butler M (150 kWh): approx. 12–24 working hours In grid or Boost mode, the Butler recharges continuously and can be used correspondingly longer. The remaining time is shown on the display.
4.2 How long does a full charge take?	Charging time	• Butler S: from 0 to 100% in less than 4.5 hours (16 A charging current, above 0 °C) • Butler M: from 5 to 95% in less than 4.5 hours (63 A charging current, above 0 °C); optional DC fast charging via CCS Type 2 at 100 kW
4.3 Can I charge via two cables at the same time?	Charging	No. Charging only takes place via the input plugged in first; further inputs are then inactive.
4.4 Can the Butler be charged with solar power or from a generator?	PV, generator, DC charging	• PV: on the AC side via the inverter of a PV system; Butler M optionally also DC via CCS Type 2 (100 kW) • Generator: only connect to power sources with a TN or TT system, not to small generators without a protection system • Butler M: «automatic generator start» option for hybrid operation
4.5 How is the Butler put into operation?	Operation	Switching on and off via a rotary switch; there is also an emergency stop switch. Start-up takes approx. 2 minutes. The display shows, among other things, the state of charge (SoC), the power per phase and the remaining time. The status LED shows the state: steady green = ready for operation, flashing green = charging, red = starting/shutting down, emergency stop active or fault.
4.6 Can I monitor the Butler remotely?	Monitoring, web application	Yes. Around 120 data points from the battery, power electronics, GPS and system control are continuously transmitted to the emost cloud via a mobile network gateway. The web application at app.emost.com runs in any browser, on computers and smartphones. It shows, among other things, location, state of charge, operating mode, temperature and the status of the battery and power electronics. The customer receives the login details on handover. The stored data enable condition analyses and customer-specific reports. The service partner provides support via remote service. emost must be informed in the event of resale; otherwise the SIM card will be deactivated.

4 Charging, Runtime & Monitoring

Question	Topic	emost answer
4.7 How is the Butler protected against deep discharge?	Battery protection, storage	**During operation** The battery management system continuously monitors the modules. If the state of charge falls below 5%, the CEE sockets are switched off; the type 25/Schuko socket at 0%. They switch on again automatically from 10%. **During storage** • Switch the Butler off after every use • Store at 10 to 35 °C • Check the state of charge monthly; it must be at least 40% (self-discharge)
4.8 How long does the battery last?	Service life	According to information pursuant to the EU Battery Regulation 2023/1542 (capacity loss at end of life 30%): • Butler S (cell type LMO): approx. 11,000 charging cycles or 15 calendar years • Butler M (cell type NMC): approx. 3,500 charging cycles or 10 calendar years

5 Safety & Standards

Question	Topic	emost answer
5.1 How is the Butler electrically protected? Is earthing required?	Protection concept, earthing	**Grid mode (TN/TT system)** When the Butler is connected to the grid by cable, it becomes part of the grid's protection concept, like a normal load. Only connect to power sources with a TN or TT system. **Island mode (IT system)** Without the grid, protective separation applies: the outputs are routed via miniature circuit breakers, built-in residual current devices (RCD) and insulation monitoring (IMD); the system has insulation equivalent to protection class II. This operating mode does not require installation by a qualified electrician. **Principle** Thanks to the built-in RCDs, the Butler (S and M) can be used without earthing in island mode and in grid mode on TN/TT systems. Without RCD protection, earthing would be required. **Exceptions: earthing mandatory despite IT protection concept** • for work with a risk of hitting an external power grid, e.g. interior demolition with large consumers such as concrete saws, or cutting work on walls containing cables • for work within 10 m of overhead contact lines of railways or trams • when connected to an unmonitored IT system • Butler M in the ECO version (without insulation monitoring): always external earthing For this purpose, every Butler (S and M) has a connection for equipotential bonding (PE terminal on the control panel, e.g. for an earth rod). Correct installation must be verified by measurement by a qualified electrician. In the event of a fault without earthing, the unit and connected loads must not be touched. **Butler M: switchover IT ↔ TN** The Butler M can be switched from IT system (without earthing) to TN system on the display within seconds.

5 Safety & Standards

<table>
<tr><th>Question</th><th>Topic</th><th>emost answer</th></tr>
<tr><td>5.2 Which standards and directives does the Butler comply with?</td><td>Conformity, certification</td><td>emost issues an EU declaration of conformity (CE) for both models. The following were applied:
<table>
<tr><th>Directive / standard</th><th>Content</th><th>S</th><th>M</th></tr>
<tr><td>Low Voltage Directive (LVD) 2014/35/EU</td><td>Electrical safety</td><td>✓</td><td>✓</td></tr>
<tr><td>EMC Directive 2014/30/EU</td><td>Electromagnetic compatibility</td><td>✓</td><td>✓</td></tr>
<tr><td>RoHS Directive 2011/65/EU</td><td>Restriction of hazardous substances</td><td>✓</td><td>✓</td></tr>
<tr><td>Battery Regulation (EU) 2023/1542</td><td>Batteries and waste batteries</td><td>✓</td><td></td></tr>
<tr><td>EN IEC 62040-1:2019/A11:2021</td><td>UPS – Part 1: Safety requirements</td><td>✓</td><td>✓</td></tr>
<tr><td>EN 62040-2:2006/AC:2006</td><td>UPS – Part 2: EMC requirements</td><td>✓</td><td>✓</td></tr>
<tr><td>IEC 62619:2022</td><td>Safety of lithium batteries for industrial applications</td><td>✓</td><td></td></tr>
<tr><td>IEC 62620:2014</td><td>Lithium batteries for industrial applications</td><td>✓</td><td></td></tr>
<tr><td>IEC 61429:1997</td><td>Marking with the international recycling symbol</td><td>✓</td><td></td></tr>
</table>
Source: EU declarations of conformity Butler S (08.10.2024) and Butler M 150/150 (29.06.2026).
In addition: the battery modules have passed the UN 38.3 transport test (prerequisite for transport according to UN 3536). Vibration tested according to AECTP-400 and IEC 60068-2-64.</td></tr>
<tr><td>5.3 How safe is the Butler during storage, transport and operation?</td><td>Safety, fire risk</td><td>Storage and transport
The system is switched off; the battery is then completely disconnected from the rest of the system.
Operation
The battery management system (BMS) continuously monitors the modules and shuts down in the event of a fault. If temperatures are too high or too low, plugs and sockets are blocked.
Fire risk of Li-ion batteries
In the event of severe external heating (e.g. a fire nearby), the battery can accelerate a fire. A distance of 5 m from areas at risk of fire or explosion therefore applies, and the unit must always be used in accordance with the operating manual. Modifications to the system are not permitted and void all warranties.</td></tr>
</table>

5 Safety & Standards

Question	Topic	emost answer
5.4 Which safety precautions apply when handling the Butler?	Li-ion batteries as dangerous goods	• Set up on firm ground so that it cannot tip over; place sleepers or pallets underneath when setting down • Secure the trailer against rolling away with the wheel chocks supplied and engage the safety lock • Extend the height-adjustable support on the drawbar and the lowerable rear stands (retract them again for transport) • Protect the battery storage system against mechanical damage • Keep at least 5 m from areas at risk of fire or explosion; use in potentially explosive atmospheres is prohibited • Keep at least 1 m from electrical installations (charging equipment, loads) • Ensure adequate ventilation • Do not switch the Butler on or off while large loads are active (high currents, risk of arcing); exception: emergency stop • Always switch off connected devices before unplugging • Before connecting a three-phase load, measure the polarity at the plug or load • Only use tested standard plugs and cables and ensure all connectors are firmly seated • Observe the earthing requirements in the operating manual

6 Transport, Maintenance & Disposal

Question	Topic	emost answer
6.1 What must be observed during transport?	Transport, ADR	As standard on a trailer (Butler S: Agados or BTR trailer; Butler M: BTR trailer), ADR-compliant according to UN 3536. • Transport and longer storage (e.g. over the weekend) only when switched off • Mounting frame with locking bolts; crane lifting eyes with recesses for lashing straps • Position the battery system so that the control panel faces backwards in the direction of travel • To be carried: accompanying documents according to ADR / UN 3536, transport documents and a 2 kg ABC powder fire extinguisher • Label the trailer according to ADR Weight: Butler S approx. 640 kg without trailer; Butler M 2,850 kg without or 3,370 kg with trailer.

6 Transport, Maintenance & Disposal

Question	Topic	emost answer
6.2 How much maintenance does the Butler need?	Maintenance	Very little: no engine, no oil or fuel filter changes as with a diesel generator. **By the customer** • Clean the housing externally as needed (no high-pressure or steam cleaner) • Replace filter mats: every 1,000 operating hours, at least once or twice a year • For very dusty applications, especially tunnel construction sites: every 6 months or approx. 500 operating hours • With trailer: check brake linings, have the trailer inspected by the responsible authority, check ADR labelling **By the service partner, annually (documented)** • Check the function of the RCDs and the insulation monitoring (test button) • Check the labelling inside the system • Inspect operationally relevant parts and clean them with compressed air; corrosion check inside • Visual inspection of modules and power electronics, check screw connections and cables **Every 5 years** In addition, scheduled replacement of electrical components such as fans and capacitors.
6.3 What should I do in the event of a fault?	Troubleshooting, service levels	In the event of a fault, the display shows an error code. The customer first checks possible causes using the operating manual (chapter «Troubleshooting by the customer»). Do not attempt to rectify faults not described there yourself. • Level 1: telephone advice from the service partner • Level 2: on-site support from the service partner • Level 3: for complex faults, involvement of emost, with a replacement unit if necessary emost response time: within half a working day.
6.4 What happens at the end of the service life?	Disposal, recycling	Please contact your dealer or emost directly; we ensure proper recycling. The disposal of Li-ion batteries is regulated differently depending on the country and region (in the EU, e.g. by the Battery Regulation). emost AG, Hagackerstrasse 9, 8953 Dietikon, Switzerland, support@emost.com

7 Purchase, Rental & Service

Question	Topic	emost answer
7.1 Can I rent or buy the Butler?	Sales channels	Both: rental, rent-to-own, purchase and leasing, via our partners or directly from emost. In Switzerland, we offer rental with full service support.
7.2 How much does the Butler cost?	Prices	Purchase prices on request. Rental prices depend on the number of units, rental period, how short-notice the request is, season and industry (rental request at www.emost.com).
7.3 Is the Butler worthwhile compared with a diesel generator?	Cost-effectiveness	Yes. Over the service life, operating costs are up to 60% lower than with a comparable diesel generator: no fuel, hardly any maintenance, no refuelling trips. Around 18 t of CO_2 per year can be saved per unit. In hybrid mode with a small diesel generator, the generator's running time is reduced by up to 90% (use cases dewatering Biel and A6 Muri–Rubigen). With stricter emission regulations and rising diesel prices, the advantage will continue to grow.
7.4 What warranty is provided?	Warranty	Standard warranty: 2 years or 3,000 operating hours, extendable to 5 years or 8,000 operating hours. We guarantee operating hours rather than cycles because partial and full cycles are difficult to distinguish. With very intensive use, the warranty for the Butler S corresponds to about 6,000 cycles. Modifications to the system void all warranties.
7.5 What are the delivery times?	Delivery time	Purchase: two to four months depending on the order. Rental: quotation within 24 hours, set-up typically within 48 hours.
7.6 Are there dealers and service partners near me?	Partner network	The DACH region (Germany, Austria, Switzerland) is very well covered; the Europe-wide network is being continuously expanded. For partners see www.emost.com.