# Maintenance-free UPS does away with battery replacement

## New uninterruptible DC power supply with capacitor technology


Uninterruptible power supplies usually store electrical energy in rechargeable lead-acid batteries. The temperatures inside a control cabinet, however, shorten the service life of the battery substantially, making battery replacement a routine necessity – for instance, once a year at a cabinet temperature of 40 °C. Not so in the case of the innovative DC UPS from SITOP. Capacitors with a long service life mean you don't have to replace batteries, which is how the totally maintenance-free UPS pays for itself within a short time.
As no hydrogen is emitted even in the event of a fault, there is no need for ventilation of the site. The much shorter charging times also mean fast availability following a power failure. The 24 V DC UPS comes in degree of protection IP65 for distributed use, and in IP20 for DIN-rail mounting. This means it is possible to back up data after a power failure, and to safely shut down a PC-based control application, for example.

**The advantages at a glance**

Totally maintenance-free DC UPS with high-capacity double-layer capacitors

- Modularly cascadable for DIN-rail mounting: SITOP UPS500S basic unit 24 V/15 A with integral 2.5 or 5 kW energy storage, combinable with up to 3 UPS501S expansion modules (5 kW)
- SITOP UPS500P 24 V/7 A in degree of protection IP65 for distributed use, e.g. on support arms
- Long-life capacitors eliminate battery replacement: After 8 years, the UPS500 still has 80% of its rated capacity at an ambient temperature of 50°C
- Totally maintenance-free
- No ventilation of the mounting location is necessary (VDE 0510 Part 2 / EN 50272-2)
- Backup is available again quickly
- Safe shutdown and correct restart of SIMATIC PCs
- Software tool supports further processing and response of the PC: www.siemens.com/sitop-ups

SITOP UPS500

Answers for industry.

SIEMENS

## Technical data

| SITOP | UPS500S – basic units 15 A | UPS500P – basic unit 7 A, IP65 |
|---|---|---|
| Order Nos. | 2.5 kW: 6EP1 933-2EC41, 5 kWs: 6EP1 933-2EC51 | 10 kWs: 6EP1933-2NC11 |
| Input data | | |
| Input voltage $U_{e\ rated/range}$ | DC 24 V / 22 ... 29 V | DC 24 V / 22.5 ... 29 V |
| Connection threshold for backup | 22.5 V DC ± 0.1 V (factory setting), UPS500S adjustable in range 22 to 25.5 V DC (in 0.5 V steps) | |
| Input current $I_{e\ rated}$ | 15.2 A + approx. 2.3 A in charge mode | 7A + approx. 2 A in charge mode |
| **Mains buffering** | | |
| Range adjustable via DIP switches | 5, 15, 25, 35, 45, 55, etc. to 315 seconds (in 10 s steps) or max. backup time | – |
| Response to return of input voltage after the set buffer time | Interruption of $U_a$ for 5 s for automatic restart of PCs or optionally no interruption | |
| On/Off control current circuit (via external floating NO contacts) | Backup mode is terminated by opening the control current circuit | – |
| **Output data** | | |
| Output voltage (backup and standard mode) $U_{a\ rated/range}$ | 24 V DC +/– 3% | 24 V DC +/– 3% |
| Output current $I_a$ | 0 ... 15 A | 0 to 7 A |
| Load current | 1 A (factory setting) or 2 A, selectable | 2 A |
| Efficiency (rated operation) / power losses | 97.5 % / 9 W | 96.9% / 5.2 W |
| **Protection and monitoring** | | |
| Polarity reversal protection | Against reversed input voltage | |
| Overload/short-circuit protection | Yes, restart | |
| Standard mode | LED green (o.k.) and floating changeover switch | LED green (o.k.) |
| Backup mode | LED yellow (Bat) and floating changeover switch | LED yellow (Bat) |
| Alarm (not ready for backup) | LED red (Alarm) and floating changeover switch | LED red (Alarm) |
| Capacitor charging (over 85% charged) | Second LED green (Bat > 85 %) and floating NO contact | Second LED green (Bat > 85 %) |
| **Control signals** | | |
| On/Off control signal via floating NO contact | Backup mode is terminated by opening the control current circuit | -- |
| "Remote timer start" via USB interface | Starts mains buffering for the set backup time | Starts mains buffering for the set backup time |
| USB interface | Output of all alarm signals and receipt of the signal "Remote timer start" | |
| Specification 2.0 with Full Speed, i.e. 2 Mbit/s | Supply + 5V from DC UPS („self powered") | Supply + 5V from PC („bus powered") |
| Connection to PC: | Commercially available 4-core shielded cable, 90 ohms, max. 5 m, USB series „B" connector to DC UPS | |
| **General data** | | |
| Radio interference level (EN 55022) / immunity | Class B / immunity to EN 61000-6-2 | Class B / immunity to EN 61000-6-2 |
| Protection class | Class III (ext. circuit and power supply unit: SELV voltage to EN 60950 necessary) | Class III (ext. circuit and power supply unit: SELV voltage to EN 60950 necessary) |
| Degree of protection (EN 60529) | IP20 | IP65 |
| Ambient temperature during operation / Transport and storage temperature | 0 to +60 °C (UPS500P: 0 ... +55°C) for natural convection climate class 3K3 to EN 60721 / –40 to +70 °C | |
| Dimensions (W x H x D) in mm | 120 x 125 x 125 (free space required 50 mm above and 50 mm below) | 470 (without connector) x 80 x 80 |
| Weight | Approx. 1.0 kg | Approx. 2.2 kg |
| Mounting | Snapped onto standard DIN rail EN 50022-35x15/7.5 | Screw-mounted in all installation positions |
| Approvals | CE, UL 508 / CSA C22.2, File E197259 | CE, UL508 planned, File E179336 |

| | SITOP UPS501S expansion module 5 kW | Connector set for SITOP UPS500P |
|---|---|---|
| Order No. | 6EP1935-5PG01 | 6EP1975-2ES00 |
| Description | Expansion module to extend the backup time, up to 3 units can be connected in parallel with a basic unit via connecting cable | Connector for input and output, and preassembled USB cable in 2 m length |
| Dimensions (W x H x D) in mm | 70 × 125 × 125 | -- |
| Weight | Approx. 0.7 kg | -- |

## Backup and charging times

| Configurations SITOP UPS500S/501S | | | | | | | | | UPS500P |
|---|---|---|---|---|---|---|---|---|---|
| Basic module | 2.5 kWs | 5 kWs | 2.5 kWs | 5 kWs | 2.5 kWs | 5 kWs | 2.5 kWs | 5 kWs | 10 kWs |
| Expansion modules | – | – | 1 × 5 kWs | 1 × 5 kWs | 2 × 5 kWs | 2 × 5 kWs | 3 × 5 kWs | 3 × 5 kWs | – |
| Total energy | 2.5 kWs | 5 kWs | 7.5 kWs | 10 kWs | 12.5 kWs | 15 kWs | 17.5 kWs | 20 kWs | 10 kWs |
| **Backup current** | **Backup times** | | | | | | | | |
| 0.5 A | 134 sec | 236 sec | 390 sec | 478 sec | 632 sec | 748 sec | 851 sec | 1007 sec | 647 sec |
| 0.8 A | 90 sec | 167 sec | 266 sec | 346 sec | 440 sec | 527 sec | 580 sec | 706 sec | 435 sec |
| 1 A | 75 sec | 138 sec | 219 sec | 296 sec | 365 sec | 414 sec | 490 sec | 572 sec | 351 sec |
| 2 A | 38 sec | 76 sec | 122 sec | 156 sec | 203 sec | 230 sec | 265 sec | 306 sec | 152 sec |
| 3 A | 26 sec | 52 sec | 82 sec | 106 sec | 136 sec | 159 sec | 186 sec | 213 sec | 108 sec |
| 4 A | 19 sec | 39 sec | 61 sec | 81 sec | 101 sec | 120 sec | 139 sec | 160 sec | 84 sec |
| 5 A | 15 sec | 31 sec | 49 sec | 65 sec | 81 sec | 95 sec | 111 sec | 130 sec | 68 sec |
| 6 A | 12 sec | 26 sec | 40 sec | 55 sec | 67 sec | 80 sec | 94 sec | 106 sec | 57 sec |
| 7 A | 10 sec | 21 sec | 34 sec | 47 sec | 58 sec | 69 sec | 81 sec | 82 sec | 49 sec |
| 8 A | 8 sec | 18 sec | 29 sec | 40 sec | 50 sec | 59 sec | 69 sec | 79 sec | – |
| 10 A | 6 sec | 15 sec | 23 sec | 32 sec | 39 sec | 47 sec | 54 sec | 62 sec | – |
| 12 A | 4 sec | 12 sec | 19 sec | 26 sec | 32 sec | 38 sec | 44 sec | 52 sec | – |
| 15 A | 3 sec | 9 sec | 14 sec | 20 sec | 25 sec | 30 sec | 35 sec | 40 sec | – |
| **Charging current** | **Charging times** | | | | | | | | |
| 2 A | 54 sec | 120 sec | 158 sec | 223 sec | 263 sec | 318 sec | 355 sec | 417 sec | 360 sec |
| 1 A | 110 sec | 205 sec | 311 sec | 425 sec | 503 sec | 625 sec | 695 sec | 816 sec | – |

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