

SIEMENS

SITOP UPS500P

6EP1933-2NC11 (10kWs)

6EP1933-2NC01 (5kWs)

Betriebsanleitung

Operating instructions

Manuel d'utilisation

Manuale di servizio

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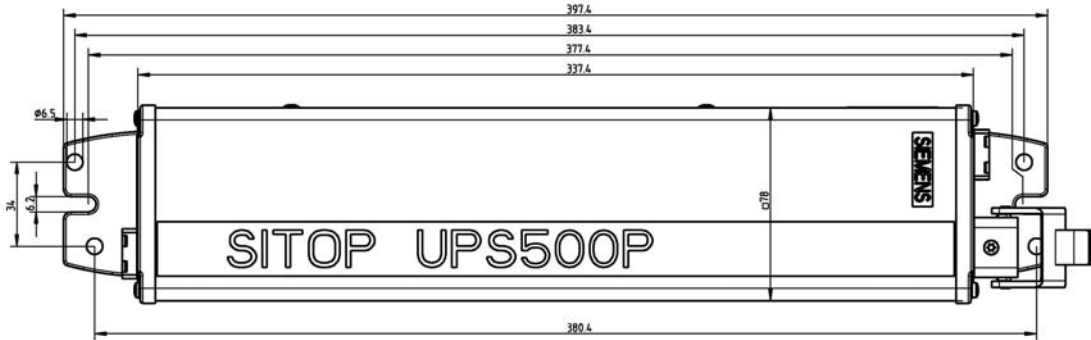
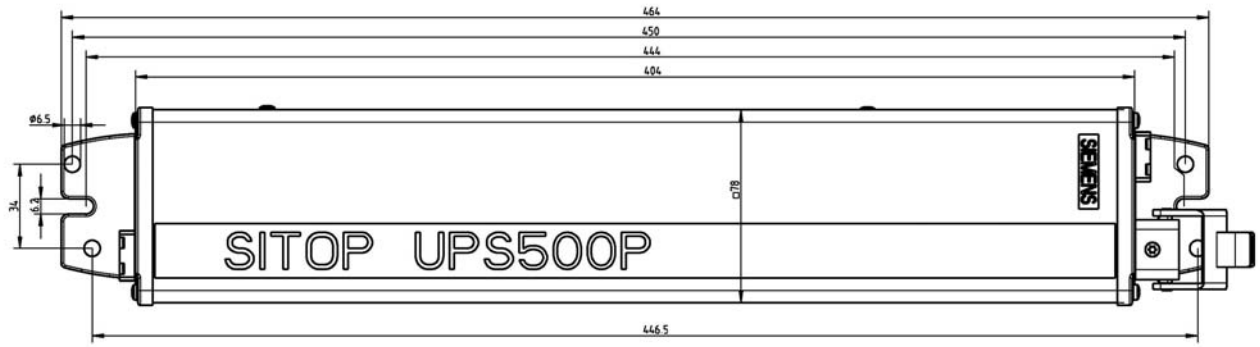
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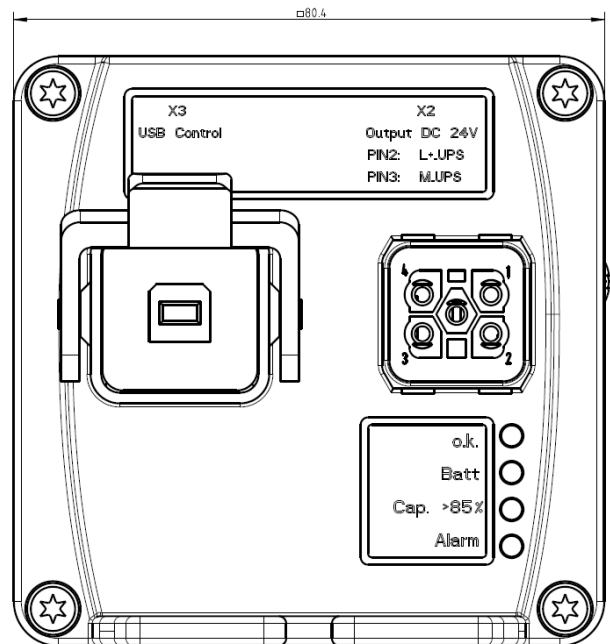
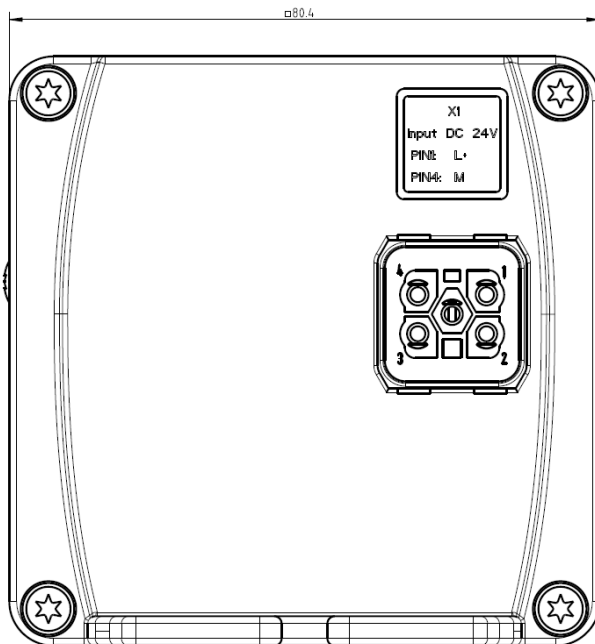
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Connections



WARNING NOTES:

Only appropriately qualified experts are allowed to work on this product or in its vicinity. The proper and safe operation of the product requires proper transport and correct storage, installation and assembly. The product does not contain any parts which can be replaced by the customer. Opening of the product renders all warranty claims null and void.



ATTENTION:

The product contains **electrostatically sensitive devices (ESD)**.

Note

For reasons of clarity, these Operating Instructions do not contain all detailed information for the product and similarly cannot consider every possible case of installation, operation or maintenance. Subject to change without prior notice. In case of doubt, the German text of these Instructions shall prevail.

Description and design:

The UPS500P is a member of the SITOP family and is intended for the short-time buffering of 24 VDC-operated SIMATIC panel PCs. The UPS module is suitable for installation on HMI supporting arms. When installing the module, observe the relevant DIN/VDE regulations or national standards. Connect the "L+" and "M" inputs (X1, pins 1 and 4) of the module to the corresponding output terminals of the supplying 24VDC power pack. The loads to be buffered are powered via the "L+_UPS" and "M_UPS" outputs of the module by the voltage connected to the input of the UPS500P. If the supplying 24VDC voltage falls below the set threshold or in case of a full power failure, the loads are supplied via a voltage transformer from the internal capacitors. The operating states of the module (see "Signaling"), as well as the remote timer start ("R" signal) and manual shutdown of the PC (shutdown, "S signal), are signaled by way of four light-emitting diodes (LEDs) and a USB interface. The full buffer time is only available with fully charged capacitors. This is to be taken into account, in particular, after longer periods of mains power interruption. If a failure of the supplying voltage occurs during the charging process before a sufficient charging state is reached (approx. 25 %), the system will not switch to the buffer mode, as sufficient energy is not available. The power supply for the connected load fails immediately in this case.

Connection and connector pin assignment

| Terminals | Function | Conductor cross-section | Max. cable length | Remark |
|-----------|------------------------------|---|-------------------|--|
| X1.1 | L+ 24 VDC input voltage | 1.5 ... 2.5mm ² 16...13 AWG | up to 3m | Harting PushPull Power connector 4/0 Can be ordered as a connector set, see "Accessories" |
| X1.4 | M 0V DC input voltage | | | |
| X2.2 | L+_UPS 24V DC output voltage | | | |
| X2.3 | M_UPS 0V DC output voltage | | | |
| X3 | USB interface | | | Cable (2m) included in the connector set |



ATTENTION:

The external connection of all terminals must meet the requirements for SELV circuits according to VDE 0805 / EN 60950. UL-listed cable is to be used for all terminals subject to the UL regulations.

Technical specifications:

| Input parameters: | | | | |
|--|--|---|------------------------|-------------------------|
| Input nominal voltage: | 24 VDC | Efficiency at 24V with the capacitor charged: | >96% | |
| Range of working voltage: | 22 ... 29V DC | | | |
| Buffer operation connection threshold: | 22.5 VDC | | | |
| Max. input current at 24V during capacitor charging: | 9A DC | | | |
| Max. input current at 24V with the capacitor charged: | 7A DC | | 5kW_s | 10kW_s |
| Output parameters: | | Buffer time at a charging current of 7A (typical) | 21s | 49s |
| Output nominal voltage: | U _{A1} = 24V DC | Buffer time at a charging current of 5A (typical) | 30s | 68s |
| Output nominal current: | I _{A1} = 7A DC | Buffer time at a charging current of 3A (typical) | 53s | 108s |
| Range of output current: | I _{A1} = 0 ... 7A DC | Charging time (with the accumulator fully discharged) | approx. 3min | approx. 10min |
| Conductor cross-section for the X1 input connector and X2 output connector | (1.5...2.5)mm ² AWG16...13 | Charging time (in the case of recharging after buffering) | approx. 2min | approx. 6min |

Protection and monitoring functions

Polarity reversal protection: The module is electronically protected against polarity reversal of the input voltage. Thanks to their geometry, the connectors are non-reversible.

Overcurrent and short-circuit protection: In both normal and buffer operation, the module is protected by way of the internal electronic components at the output. If a current of 30A is exceeded, the output is shut down immediately. In addition, a thermal overload protection is installed. In normal operation, automatic restart attempts are performed approx. every 20s. In buffer operation, saving shutdown is performed. Restart is performed after return to normal operation.

An appropriate overcurrent protection must be provided at the input of the module. To this end, the following options exist:

- Operation on a "SITOP smart 10A" or "SITOP modular 10A" power supply
- Use of a "SITOP select" diagnostic module
- Incorporation of a two-pole 16A circuit-breaker with B tripping characteristic from Siemens, order no. 5SY4216-6, into the incoming circuit

Signaling

All LED indications correspond to those provided via the USB interface (see table below):

- **"Normal operation"**, i.e. the input voltage to the module is higher than the connection threshold. The loads are supplied by the power supply connected in the incoming circuit. In normal operation, the **green LED (1.)** is lit.
- **">85% full charge"**, i.e. the capacitor charge is greater than 85%: The **green LED (3.)** is lit. (OFF means: The capacitor charge is less than 85%.)
- **"Buffer mode"**, i.e. the input voltage is lower than the connection threshold for the buffer mode. The loads are supplied by the UPS500P. In buffer operation, the **yellow LED (2.)** is lit.
- **"Alarm message: Readiness for buffering missing"**: In this operating state, the **red LED (4.)** is lit. Causes for a missing readiness for buffering in **normal operation** may be: a defective capacitor, capacitor voltage too low, or internal errors. In normal operation, the capacitor voltage and thus also the signal output are polled continuously. After rectification of the error, resetting is automatically performed implicitly via a restart attempt after approx. 20 seconds. **In buffer operation, this signal means** that the capacitor voltage has fallen to a minimum, and an enforced shutdown is immediately pending. After shutdown of the buffer operation due to overload, short-circuit or expired buffer time, all light-emitting diodes go out.

| Designation | Normal Operation | | | | | | Buffer Operation | | | | Standby | |
|--|------------------|--------------|-------------------------|--------------|--------------|--------------|------------------|-------------------|--------------|--------------|-----------------------|-----|
| | No errors | | Capacity symmetry error | | Error | | No errors | | Error | | Suspend, capacity<85% | OFF |
| | Capacity>85% | Capacity<85% | Capacity>85% | Capacity<85% | Capacity>85% | Capacity<85% | Capacity>85% | Capacity 20...85% | Capacity<20% | Capacity>85% | | |
| 1. Normal operation | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 2. Buffer operation | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 3. Capacity>85% | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |
| 4. Alarm (Readiness for buffering missing) | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● | ● |

● LED OFF ● LED flashing (interval 2s) ● LED ON

USB interface

The signals are additionally output via a PC-capable USB interface as 5-character strings (see table on the right). A free software tool for reading out and processing the signals can be downloaded from the Internet at <http://www.automation.siemens.com/sitop>. Here you will also find some further information on the interface.

Technical design: The USB interface complies with Specification 2.0. Communication is performed at full speed, i.e. 12Mbit/s; the USB interface is supplied with +5V from the connected PC via the USB cable ("bus powered"); output of the signal states every 75ms \pm 20%; 29ms \pm 20% data output; 46ms \pm 20% break. The connection to the PC is provided via a standard shielded 4-wire USB cable with a wave resistance of 90 ohm and a maximum length of 5m, with an A-type USB connector A to the PC and a B-type USB connector to the UPS500P. The cable comprises two 28 to 20 AWG non-twisted USB supply lines (VBUS and GND) and two 28 AWG twisted-pair data lines (D+ and D-). Connector pin assignment: Pin 1: VBUS (+4.40 V ... +5.25 VDC), send data on pin 2 (D-) and pin 3 (D+), pin 4: GND. Receive data (in buffer operation only): Reception of the "R" character (remote timer start signal) starts the timer in the module after the buffer time (at the end of the buffer operation, the output voltage for the timer is interrupted for 10 seconds). An automatic restart is performed upon resumption of the mains power supply. Reception of the "S" character (remote shutdown signal) shuts down the module after the buffer time. An automatic restart is performed upon "Mains OFF" and subsequent resumption of the mains voltage.

| Signal | Plain text |
|---------------------------------|------------|
| Normal operation | DC_OK |
| No normal operation | DC_LO |
| No buffer operation | ***** |
| Buffer operation | *BAT* |
| \geq 85% full charge | BA>85 |
| \leq 85% full charge | BA<85 |
| Readiness for buffering present | BUFRD |
| Readiness for buffering missing | ALARM |

Environment

Field conditions according to EN 60721-3-3, climatic category 3K3 (relative humidity 5% to 85% and absolute humidity 1 g/m³ to 25 g/m³; no condensation). Permanent installation, weather-protected, degree of contamination 2
Temperature for storage and transport: -40 ... +70°C
Temperature for operation: 0 ... +55°C (UL and CSA applications: 45°C)

Weight

6EP1933-2NC11 approx. 2.2kg
6EP1933-2NC01 approx. 1.9kg

Applicable standards

Degree of protection: IP65 to EN60529 (VDE 0470, Part 1) with all connectors plugged on all terminals
Class of protection III to EN60950
VDE 0100 Part 410 (IEC 364-4-41)
VDE 0106 Part 1 (IEC 536)
VDE 0113 Part 1 (EN 60204-1)
IEC 61131

NFPA compatibility (National Fire Protection Association)

Modules of the type as described therein are exclusively approved for installation in industrial machines in accordance with the "Electrical Standard for Industrial Machinery".

Mounting instructions

For proper heat dissipation, the module is to be installed in such a way that free air circulation is possible on at least two sides of the module. To minimize interference and thermal load, the UPS500P modules should be installed at least 50 cm away from commutation reactors. The USB cable must not be routed directly parallel to power lines (in particular, lines between frequency converter and motor, or between frequency converter and commutation reactor). To minimize interference, a clearance of at least 10cm is to be maintained to these lines.

For installation / removal, see diagram on page 2.

Accessories

6EP1975-2ES00 SITOP UPS500P connector set comprises

- 2 Harting HAN PushPull Power 4/0 connectors for the 24V inputs/outputs X1 and X2
- 1 Harting HAN 3 A TG USB-B cable (length 2m) for the X3 USB interface

Alternatively, the following can be ordered from Harting:

09 35 232 0421 HAN PushPull Power 4/0
one connector each for X1 and X2

61 06 202 0044 HAN 3 A TG USB-B
Type B USB cable, length 2m, for X3

61 04 301 0633 Dummy connector for X3 for use if the USB interface is not used

Disposal guidelines

Packaging and packaging aids are suitable for recycling and should always be returned for recycling.

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