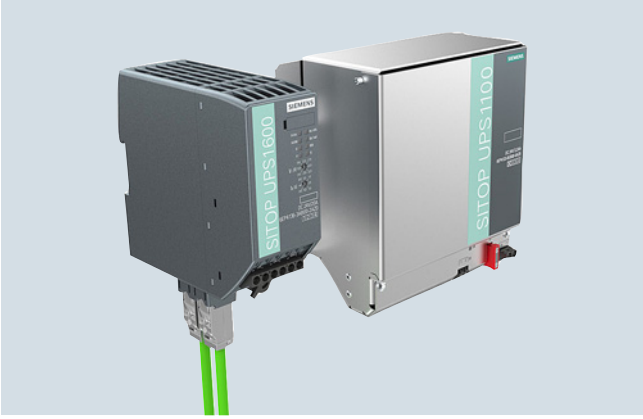
SITOP UPS1600 DC UPS modules

Overview



By combining one DC UPS module SITOP UPS1600 with at least one UPS1100 battery module and a SITOP power supply unit, longer power failures can be bridged without any interruption. The intelligent battery management automatically detects the UPS1100 energy storage unit, ensures optimized temperature-specific charging and continuous monitoring. The compact DC UPS modules have overload capability, for example, to supply the inrush current of industrial PCs. In stand-alone mode, they support starting from the battery.

The DC UPS communicates openly over a USB or Ethernet/PROFINET port. It is easily integrated into the PC or PLC environment over the two Ethernet/PROFINET ports.

Total integration in TIA provides user-friendly engineering in the TIA Portal and is supported with ready-to-use function blocks for S7 user programs and WinCC faceplates for fast visualization.

SITOP UPS Manager supports easy monitoring and configuration in PC systems, e.g. shutdown of several PCs in accordance with the master-slave principle.

The UPS1600 modules with Ethernet/PROFINET ports have an OPC UA server, with which the DC UPS can communicate with both PCs and PLCs, even from different manufacturers, thanks to the open communication standard. Parameter assignment and the diagnostics of the uninterruptible power supply is possible via the open interface.

The integrated web server supports remote monitoring of the DC UPS.

Benefits

- 24 V buffering for a few hours for the purpose of continuing processes
- Open communication over USB or two Ethernet/PROFINET ports
- High-performance DC UPS modules in space-saving, slim design
- High overload capability for mains and buffering operation
- Starting from the battery module supports stand-alone mode, e.g. for starting generators
- Easy configuration thanks to automatic detection of battery modules
- High reliability and availability due to monitoring of the operational readiness, battery feeder, aging and charging status
- Battery protecting charging due to temperature-specific charging characteristic
- Defined shutdown of several PCs or controllers on one UPS (versions with Ethernet/PROFINET)
- Remote monitoring via integrated web server (versions with Ethernet/PROFINET)
- Time-saving engineering in PC-based systems via SITOP UPS Manager (versions with USB or Ethernet/PROFINET)
- NEW: Integrated OPC UA server facilitates flexible, multi-vendor communication with other systems (versions with Ethernet/PROFINET)
- Full integration in TIA saves time and costs during the planning stage and in operation (versions with Ethernet/PROFINET)
- User-friendly engineering in the TIA Portal
- SIMATIC S7 function blocks for easy integration in STEP 7 user programs
- Fast integration in operator control and monitoring with WinCC faceplates
- Direct integration in SIMATIC PCS 7 via SITOP library

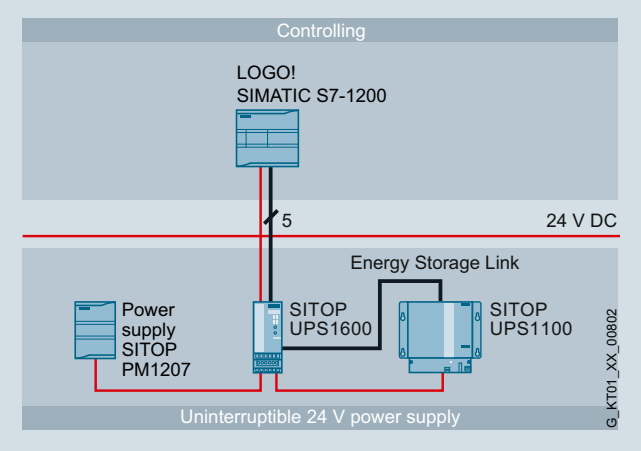
Application

The battery modules that can be connected in parallel bridge power failures for a few hours. This supports the continued operation of processes or parts of them. The function "Starting from the battery" means that the UPS1600 can also be used in stand-alone mode without connection to the supply.

Depending on the communication requirements between the DC UPS and the automation components to be protected against power failure, the version of UPS1600 can be selected accordingly.

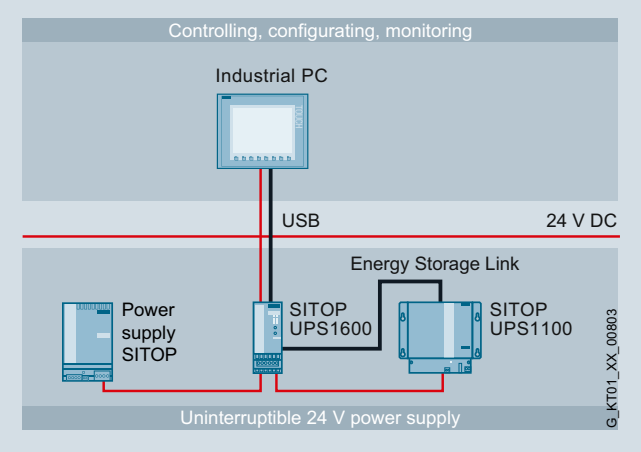
Buffering of simple automation applications

In simple applications with mini PLCs (e.g. obstruction lights, stand-alone hydro-electric plants), 24 V buffering is performed by the UPS1600 without a communications interface. The status messages are transferred to the PLC via the digital outputs (isolated).



Buffering of applications with automation computer

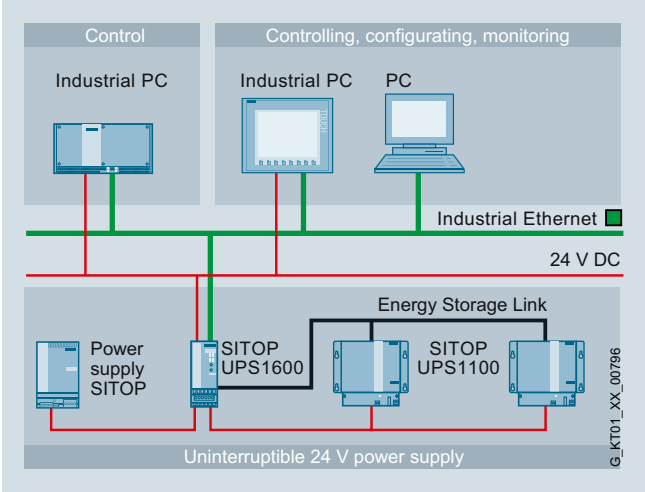
The UPS1600 with a USB interface is used to buffer automation solutions that are controlled by an industrial PC. All operating and configuring data is communicated over the PC interface.



Communication over Ethernet/PROFINET offers the most comprehensive possibilities for diagnostics and system integration. The UPS1600 can be directly integrated into the LAN infrastructure over its two ports.

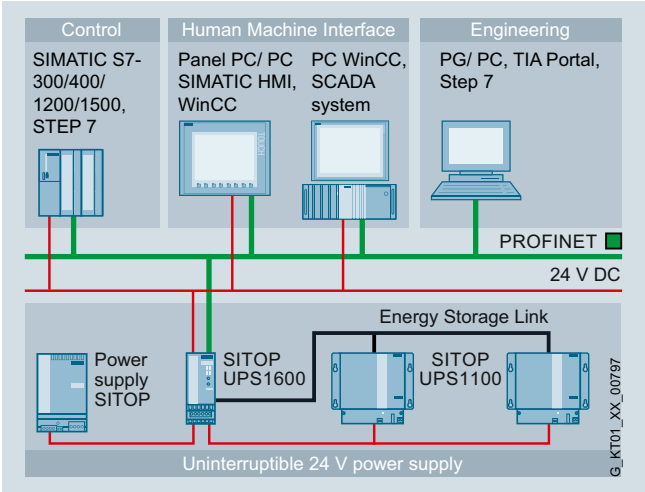
Buffering of applications with networked (Industrial Ethernet) automation computers

The UPS1600 with Industrial Ethernet interface protects complex PC-based applications from power failure. Configuration and monitoring is performed using the PC software SITOP UPS Manager. It also supports defined shutdown of several PCs in accordance with the master-slave principle.



Buffering of applications with networked (PROFINET) automation components

For buffering sensitive plant components (e.g. a pumping station with telecontrol) or complete controller solutions (e.g. machine tools) that are integrated into a networked automation solution, the UPS1600 with PROFINET is the perfect choice. Total integration in TIA offers unique advantages for engineering and operation (e.g. diagnostics or visualization). For example, in buffer mode, several controllers can be brought to a defined independently of each other.



SITOP UPS1600 DC UPS modules

Design

- Compact DC UPS modules UPS1600 24 V/10 A, 20A and 40 A with digital inputs and outputs, optionally with USB interface or two Ethernet/PROFINET ports
- UPS1100 battery modules 1.2 Ah, 3.2 Ah, 7 Ah and 12 Ah with lead rechargeable batteries for use in high temperatures, UPS1100 2.5 Ah battery module with pure-lead rechargeable batteries and UPS1100 5 Ah battery module with lithium-ion technology.

Function

Web server

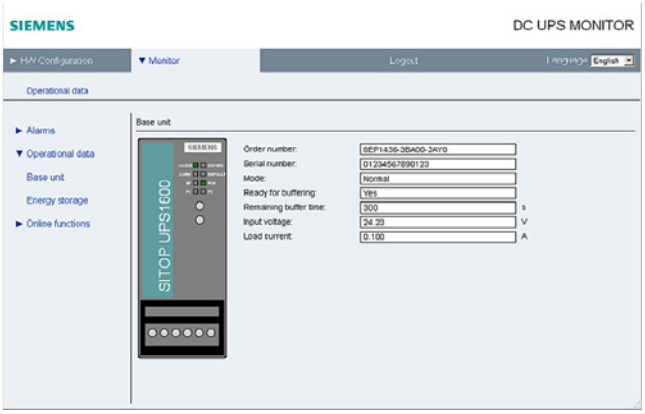
The SITOP UPS1600 with Ethernet/PROFINET has an integrated web server that supports remote monitoring and control of the uninterruptible power supply in 5 languages (DE / EN / FR / IT / ES). Using HTTPS ensures encrypted and safe data transmission.

Remote monitoring and control of:

- Hardware configuration data
- Remote monitoring
- Operating data of the UPS1600 basic unit and the connected UPS1100 battery module
- Alarm messages

Remote access via:

- Firefox 34 or higher, or Internet Explorer 10, 11 (IE 8 with charging of SVG player)
- IP address
- Password



The password-protected web server offers a view of the configuration and operating data.

Software

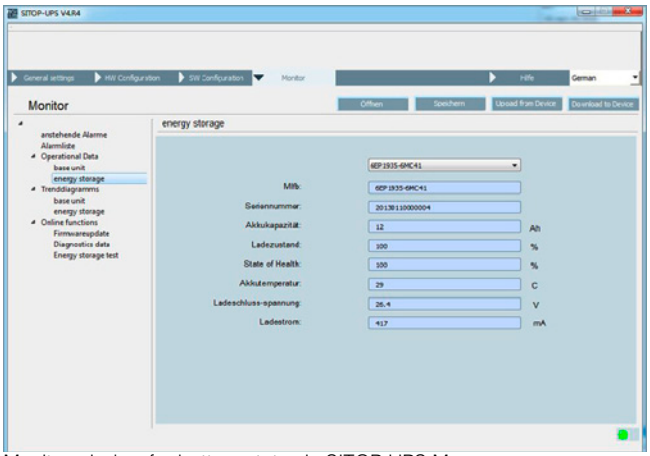
Software tools support convenient integration of the SITOP UPS1600 in both PC-based and PLC-based systems. They make configuring and visualizing the DC UPS easier and the user benefits from the high performance of the SITOP UPS1600.

Software for open, PC-based automation systems

SITOP UPS Manager

Configuration and monitoring is performed easily using the free PC software SITOP UPS Manager, available at:
https://support.industry.siemens.com/cs/document/75854607
It enables the PC events in response to the operating states of the DC UPS to be freely selected and offers comprehensive diagnostic options:

- Configuration
  - Connection via USB or Ethernet
  - All the relevant parameters can be configured in UPS Manager and transferred to the UPS1600
  - Configuration of third-party batteries possible
  - Free selection of PC events in response to the operating states of the DC UPS, e.g. termination of software applications
  - Support for reliable downloading of several PCs according to the master-slave principle
  - The configurations can be saved locally
  - Updating of the UPS1600 firmware is possible
  - Assignment of IP addresses and device names of the UPS1600
  - Can run under Windows XP, Windows 7 (32-bit and 64-bit) operating systems
- Monitoring
  - Readout and display of alarms, statuses and operating variables of the UPS1600 and the connected energy storage unit
  - Tracing of history in trend diagrams



Monitor window for battery status in SITOP UPS Manager

Trend diagram for load current in SITOP UPS Manager

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Function (continued)

Software for TIA-based automation systems

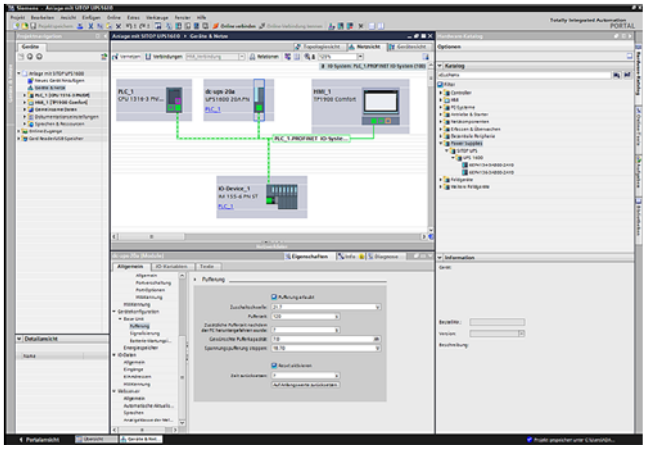
For convenient integration of the DC UPS in the TIA environment, different software modules are available.

Engineering is simple via the TIA Portal. The data for UPS1600 is stored in the hardware catalog version V14 and higher. Special function blocks for SIMATIC S7-300, S7-400, S7-1200 and S7-1500 also support integration in the STEP 7 user program.

The comprehensive diagnostics data of the UPS1600 power supply can be visualized using prepared WinCC faceplates.

TIA Portal

- Convenient and fail-safe integration of SITOP UPS1600 in the PROFINET network by means of drag-and-drop
- Convenient configuration of SITOP UPS1600 basic units with Ethernet/PROFINET and the UPS1100 battery module simply by selecting from the TIA Portal hardware catalog
- Free download of HSP (Hardware Support Package) for TIA Portal version V12 or higher available at http://support.automation.siemens.com/WW/view/en/72341852
- Free GSD file (Generic Station Description) for STEP 7 V5.5 http://support.automation.siemens.com/WW/view/en/75854605



Establishing the PROFINET connection between the SITOP UPS1600 and the controller is easy and fail-safe in the TIA Portal

STEP 7 function blocks

Function blocks are available for STEP 7 user programs on SIMATIC S7-300/400/1200/1500. They allow further processing of the DC UPS operating data.

- Function blocks for STEP 7 V5.5
- Function blocks for STEP 7 in the TIA Portal from Version V12

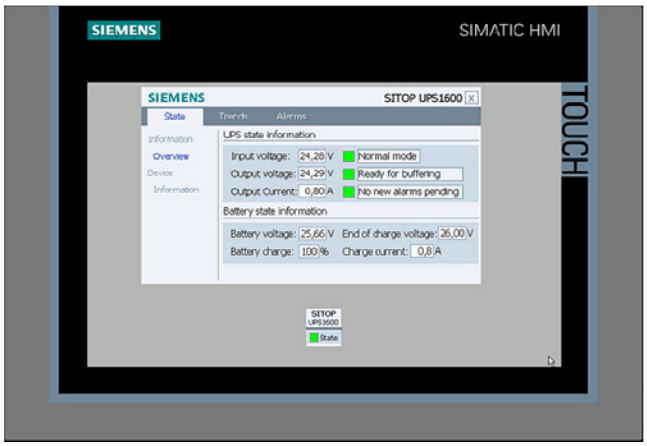
Free download from:
http://support.automation.siemens.com/WW/view/en/78817848

Faceplates for WinCC

Ready-to-use faceplates save programming time for visualization of the uninterruptible power supply. The faceplates show all relevant statuses and values of the DC UPS. They are available for the following systems:

- Faceplates for WinCC from Version V7.4
- Faceplates for WinCC flexible 2008 SP3
- Faceplates for WinCC Comfort/Advanced/Professional in the TIA Portal from version V14

Free download from:
http://support.automation.siemens.com/WW/view/en/78817848



The pre-compiled WinCC faceplates show all the relevant UPS data in a clearly comprehensible display. An icon with color coding for the operating state is also available

Software for SIMATIC PCS 7 process control system

The SITOP library is available with blocks and faceplates for direct integration into SIMATIC PCS 7. The SW blocks in the SIMATIC S7 supply the faceplate on the user interface of the process control system with operating and diagnostics data, generate messages and ensure connection to the maintenance system of PCS 7. This means that PCS 7 users automatically receive information about operating state conditions, maintenance requirements (e.g. battery replacement) and disturbances (e.g. power failures). This ensures constant transparency of the 24 V supply in the control system. The SITOP library is supported in SIMATIC PCS 7 as from version V8.0 with SP2.

Free download at:
https://support.industry.siemens.com/cs/ww/en/view/109476154

Technical specifications

The table shows the maximum buffering times for the SITOP UPS1100 battery modules for different load currents:

The SITOP Selection Tool offers detailed selection guidance according to criteria such as the required backup time, load current, peak current and battery connection threshold: http://www.siemens.com/sitop-selection-tool

Product brand name	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**
Type of power supply	**24 V/1.2 Ah**	**24 V/2.5 Ah high temperature**	**24 V/3.2 Ah**	**24 V/5 Ah LiFePo**	**24 V/7 Ah**	**24 V/12 Ah**
Article No.	**6EP4131-0GB00-0AY0**	**6EP4132-GB00-0AY0**	**6EP4133-0GB00-0AY0**	**6EP4133-0JB00-0AY0**	**6EP4134-0GB00-0AY0**	**6EP4135-0GB00-0AY0**
Load current	**Buffering times ***					
1 A	27 min	1 h 30 min	2 h	4 h	5 h	8 h 30 min
2 A	14 min	50 min	1 h	2 h 10 min	2 h 40 min	4 h 80 min
3 A	10 min	36 min	45 min	1 h 30 min	1 h 50 min	3 h 10 min
4 A	7 min 50 s	26 min	34 min	1 h 10 min	1 h 20 min	2 h 30 min
6 A	4 min 40 s	15 min	21 min	48 min	48 min	1 h 30 min
8 A	3 min	11 min	15 min	37 min	34 min	1 h
10 A	1 min 30 s	6 min 40 s	9 min 30 s	26 min	21 min	42 min
12 A	-	5 min 40 s	8 min 10 s	23 min	19 min	37 min
14 A	-	4 min 40 s	6 min 50 s	21 min	16 min	32 min
16 A	-	3 min 40 s	5 min 30 s	18 min	13 min	27 min
20 A	-	1 min 40 s	2 min 50 s	13 min	7 min 50 s	17 min
30 A	-	-	-	-	3 min 50 s	10 min
40 A	-	-	-	-	1 min 40 s	5 min 30 s
Ambient temperature	**Service life (when capacity falls to 50% of original capacity), depending on battery temperature, approx.**					
+20 °C	4 years	10 years	4 years	15 years	4 years	4 years
+30 °C	2 years	7 years	2 years	10 years	2 years	2 years
+40 °C	1 year	3 years	1 year	9 years	1 year	1 year
+50 °C	0.5 years	1.5 years	0.5 years	2 years	0.5 years	0.5 years
+60 °C	-	1 year	-	-	-	-

* The determination of the buffer times is based on the discharge period of new and completely charged battery modules with a battery temperature of not less than +25 °C until shutdown of the DC UPS (19 volt). Buffer times for additional values can be determined using the SITOP Selection Tool: www.siemens.com/sitop-selection-tool.

Important information for selecting the battery capacity:

Determination of the mains buffering times is based on the discharge period of new or non-aged, completely charged battery modules at a battery temperature not below +25 °C to the shutdown of the DC UPS.

Battery aging reduces the still available battery capacity up until the end of the service life to typically around 50% of the original capacity value when new (1.2 Ah/3.2 Ah/7 Ah, etc.) and the internal resistance increases. When the message "Battery charge > 85%" appears, only around 50% x 85% = approx. 43% of the originally available capacity can be assumed at the end of the battery service life.

At battery temperatures below +25 °C, the available capacity drops approximately by another 30% at +5 °C battery temperature, to approximately 70% of the approximately remaining 43%. There is then only around 30% of the original capacity available.

A significantly larger battery capacity must therefore be selected when configuring the plant: A drop to approx. 50% is compensated for by selecting 1 / approx. 0.5 = approx. double the battery capacity (required as per the table for the relevant load current and the relevant buffering time). Available capacity of approx. 43% is compensated for by selecting 1 / approx. 0.43 = approx. 2.33 times the battery capacity. Available capacity of approx. 30% is compensated for by selecting 1 / approx. 0.3 = approx. 3.33 times the battery capacity.

Recommendation:

Instead of installing double the battery capacity, regular battery replacement halfway through the expected service life (reduction of capacity to approx. 50%) can be more advisable for the following reasons: Capacity does not drop below 100% until the halfway point of the expected battery life (or slightly beyond). With regular replacement after this point, only the single battery capacity (instead of double capacity) must be installed due to aging (-> neutral in price with regard to battery module costs, but only requires half the space).

Replacing the battery after half its service life dispenses above all with the large scatter range of the residual capacity at the end of the service life, which is not accurately defined by battery manufacturers (after the full time, many batteries are above, but many are also below the average 50% residual capacity, that is to say, even if double the capacity is installed, the influence of aging at the end of service life is not reliably compensated for, rather only typically) -> When replacing after half the expected service life, the configured buffering time is maintained with considerably greater reliability.

In the case of batteries stored in cool conditions (not above +25 °C) and for not longer than approximately 4 months, the following service life can be assumed, strongly dependent on battery temperature: In normal cases (installation in the coolest location in the control cabinet at approx. +30 °C), the battery should be replaced with single installed battery capacity in accordance with the selection table after 1 year of operation!

After a power failure, the battery module is disconnected from the loads at the end of the selected buffering time either automatically or electronically by opening the On/Off control circuit, and as soon as the 24 V input voltage is available again, it is quickly re-charged with the charge current of the relevant DC UPS module (with I-U charge characteristic: First constant current I for fast charging, and changeover to constant voltage U to maintain the charge when the battery is almost full).

Technical specifications

Article number	**6EP4134-3AB00-0AY0**[1] **6EP4134-3AB00-1AY0**[1] **6EP4134-3AB00-2AY0**[1]	**6EP4136-3AB00-0AY0**[1] **6EP4136-3AB00-1AY0**[1] **6EP4136-3AB00-2AY0**[1]	**6EP4137-3AB00-0AY0**[1] **6EP4137-3AB00-1AY0**[1] **6EP4137-3AB00-2AY0**[1]
Product brand name	**SITOP UPS1600**	**SITOP UPS1600**	**SITOP UPS1600**
Type of current supply	**DC UPS 24 V/10 A**	**DC UPS 24 V/20 A**	**DC UPS 24 V/40 A**
Input			
Supply voltage at DC Rated value	24 V	24 V	24 V
input voltage range	22 ... 29 V DC	22 ... 29 V DC	22 ... 29 V DC
Adjustable response value voltage for buffer connection	21 ... 25 V; Adjustable: 21 V, 21.5 V, 22 V, 22.5 V, 23 V, 24 V, 25 V DC or via software	21 ... 25 V; Adjustable: 21 V, 21.5 V, 22 V, 22.5 V, 23 V, 24 V, 25 V DC or via software	21 ... 25 V; Adjustable: 21 V, 21.5 V, 22 V, 22.5 V, 23 V, 24 V, 25 V DC or via software
Adjustable response value voltage for buffer connection preset	22.5 V	22.5 V	22.5 V
Input current at rated input voltage 24 V Rated value	14 A; for max. charging current (3 A)	25 A; for max. charging current (4 A)	46 A; for max. charging current (5 A)
Mains buffering			
Type of energy storage	with batteries	with batteries	with batteries
Design of the mains power cut bridging-connection	Adjustable range using rotary coding switch: 0.5 min, 1 min, 2 min, 5 min, 10 min, 20 min, max. buffering time or via software	Adjustable range using rotary coding switch: 0.5 min, 1 min, 2 min, 5 min, 10 min, 20 min, max. buffering time or via software	Adjustable range using rotary coding switch: 0.5 min, 1 min, 2 min, 5 min, 10 min, 20 min, max. buffering time or via software
Charging current	0.1 A - 3 A	0.1 A - 4 A	0.1 A - 5 A
adjustable charging current maximum Note	Automatically depending on battery module	Automatically depending on battery module	Automatically depending on battery module
Output			
Output voltage			
• in normal operation at DC Rated value	24 V	24 V	24 V
• in buffering mode at DC Rated value	24 V	24 V	24 V
Formula for output voltage	V_{in} - approx. 0.01 x I	V_{in} - approx. 0.01 x I	V_{in} - approx. 0.01 x I
ON-delay time typical	60 s	60 s	60 s
Voltage increase time of the output voltage typical	60 ms	60 ms	60 ms
Output voltage in buffering mode at DC	19 ... 28.5 V	19 ... 28.5 V	19 ... 28.5 V
Output current			
• Rated value	10 A	20 A	40 A
• in normal operation	0 ... 30 A	0 ... 60 A	0 ... 120 A
• in buffering mode	0 ... 30 A	0 ... 60 A	0 ... 120 A
Peak current	30 A	60 A	120 A
Property of the output Short-circuit proof	Yes	Yes	Yes
Design of short-circuit protection	Limitation to 3 x I_{rated} for 30 ms/min; through-conductivity for 1.5 x I_{rated} for 5 sec/min	Limitation to 3 x I_{rated} for 30 ms/min; through-conductivity for 1.5 x I_{rated} for 5 sec/min	Limitation to 3 x I_{rated} for 30 ms/min; through-conductivity for 1.5 x I_{rated} for 5 sec/min
Supplied active power typical	240 W	480 W	960 W
Efficiency			
Efficiency in percent			
• at rated output current for rated value of the output current typical	97.7 %	98.2 %	98.8 %
• in case of accumulator operation typical	97.7 %	98.2 %	98.8 %
Power loss [W]			
• at rated output current for rated value of the output current typical	5.6 W	8.6 W	12 W
• in case of accumulator operation typical	5.6 W	8.6 W	12 W

Technical specifications (continued)

Article number	6EP4134-3AB00-0AY0[1] 6EP4134-3AB00-1AY0[1] 6EP4134-3AB00-2AY0[1]	6EP4136-3AB00-0AY0[1] 6EP4136-3AB00-1AY0[1] 6EP4136-3AB00-2AY0[1]	6EP4137-3AB00-0AY0[1] 6EP4137-3AB00-1AY0[1] 6EP4137-3AB00-2AY0[1]
Product brand name	**SITOP UPS1600**	**SITOP UPS1600**	**SITOP UPS1600**
Type of current supply	**DC UPS 24 V/10 A**	**DC UPS 24 V/20 A**	**DC UPS 24 V/40 A**
Protection and monitoring			
Product function			
• reverse polarity protection against energy storage unit polarity reversal	Yes	Yes	Yes
• reverse polarity protection against input voltage polarity reversal	Yes	Yes	Yes
Signaling			
Display version			
• for normal operation	Normal operation: LED green (OK), floating changeover contact "Bat/OK" to setting "OK" ("OK" means: Voltage of the supplying power supply unit is greater than cut-in threshold set at the DC UPS module); Lack of buffer standby: LED red (alarm), floating changeover contact "Alarm/Bat" to setting "Alarm"; Battery replacement required: LED red (alarm) flashing with approx. 0.25 Hz, floating changeover contact "Alarm/Bat" switching with approx. 0.25 Hz; Energy storage > 85%: LED green (Bat > 85%), floating NO contact "Bat > 85" closed; Permissible contact current capacity: DC 60 V/1 A or AC 30 V /1 A	Normal operation: LED green (OK), floating changeover contact "Bat/OK" to setting "OK" ("OK" means: Voltage of the supplying power supply unit is greater than cut-in threshold set at the DC UPS module); Lack of buffer standby: LED red (alarm), floating changeover contact "Alarm/Bat" to setting "Alarm"; Battery replacement required: LED red (alarm) flashing with approx. 0.25 Hz, floating changeover contact "Alarm/Bat" switching with approx. 0.25 Hz; Energy storage > 85%: LED green (Bat > 85%), floating NO contact "Bat > 85" closed; Permissible contact current capacity: DC 60 V/1 A or AC 30 V /1 A	Normal operation: LED green (OK), floating changeover contact "Bat/OK" to setting "OK" ("OK" means: Voltage of the supplying power supply unit is greater than cut-in threshold set at the DC UPS module); Lack of buffer standby: LED red (alarm), floating changeover contact "Alarm/Bat" to setting "Alarm"; Battery replacement required: LED red (alarm) flashing with approx. 0.25 Hz, floating changeover contact "Alarm/Bat" switching with approx. 0.25 Hz; Energy storage > 85%: LED green (Bat > 85%), floating NO contact "Bat > 85" closed; Permissible contact current capacity: DC 60 V/1 A or AC 30 V /1 A
• in buffering mode	Buffered mode: LED yellow (Bat), floating changeover contact "OK/Bat" to setting "Bat"; Prewarning battery voltage < 20.4 VDC: LED red (alarm), floating changeover contact "Alarm/Bat" to setting "Alarm"; Energy storage > 85%: LED green (Bat > 85%), floating NO contact "Bat > 85" closed	Buffered mode: LED yellow (Bat), floating changeover contact "OK/Bat" to setting "Bat"; Prewarning battery voltage < 20.4 VDC: LED red (alarm), floating changeover contact "Alarm/Bat" to setting "Alarm"; Energy storage > 85%: LED green (Bat > 85%), floating NO contact "Bat > 85" closed	Buffered mode: LED yellow (Bat), floating changeover contact "OK/Bat" to setting "Bat"; Prewarning battery voltage < 20.4 VDC: LED red (alarm), floating changeover contact "Alarm/Bat" to setting "Alarm"; Energy storage > 85%: LED green (Bat > 85%), floating NO contact "Bat > 85" closed
Interface			
PC interface	Yes	Yes	Yes
Design of the interface	USB or PROFINET	USB or PROFINET	USB or PROFINET
Safety			
Galvanic isolation between entrance and outlet	No	No	No
Operating resource protection class	Class III	Class III	Class III
Certificate of suitability			
• CE marking	Yes	Yes	Yes
• as approval for USA	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259	cULus-Listed (UL 508, CSA C22.2 No. 107.1), File E197259
• relating to ATEX	IECEx Ex nA nC IIC T4 Gc; ATEX (EX) II 3G Ex nA nC IIC T4 Gc; cULus Class I Div. 2 (ANSI/ISA-12.12.01-2015, CSA C22.2 No. 213-15) Group ABCD, T4; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I, Div. 2, Group ABCD, T4	IECEx Ex nA nC IIC T4 Gc; ATEX (EX) II 3G Ex nA nC IIC T4 Gc; cULus Class I Div. 2 (ANSI/ISA-12.12.01-2015, CSA C22.2 No. 213-15) Group ABCD, T4; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I, Div. 2, Group ABCD, T4	IECEx Ex nA nC IIC T4 Gc; ATEX (EX) II 3G Ex nA nC IIC T4 Gc; cULus Class I Div. 2 (ANSI/ISA-12.12.01-2015, CSA C22.2 No. 213-15) Group ABCD, T4; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.0) Class I, Div. 2, Group ABCD, T4
• C-Tick	Yes	Yes	Yes
Type of certification CB-certificate	Yes	Yes	Yes
Shipbuilding approval	DNV GL, ABS	DNV GL, ABS	DNV GL, ABS
Protection class IP	IP20	IP20	IP20
EMC			
Standard			
• for emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
• for interference immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2

Technical specifications (continued)

Article number	6EP4134-3AB00-0AY0[1)] 6EP4134-3AB00-1AY0[1)] 6EP4134-3AB00-2AY0[1)]	6EP4136-3AB00-0AY0[1)] 6EP4136-3AB00-1AY0[1)] 6EP4136-3AB00-2AY0[1)]	6EP4137-3AB00-0AY0[1)] 6EP4137-3AB00-1AY0[1)] 6EP4137-3AB00-2AY0[1)]
Product brand name	**SITOP UPS1600**	**SITOP UPS1600**	**SITOP UPS1600**
Type of current supply	**DC UPS 24 V/10 A**	**DC UPS 24 V/20 A**	**DC UPS 24 V/40 A**
Operating data			
Ambient temperature			
• during operation	-25 ... +70 °C; with natural convection	-25 ... +70 °C; with natural convection	-25 ... +70 °C; with natural convection
• during transport	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
• during storage	-40 ... +85 °C	-40 ... +85 °C	-40 ... +85 °C
Environmental category acc. to IEC 60721	Climate class 3K3, no condensation	Climate class 3K3, no condensation	Climate class 3K3, no condensation
Mechanics			
Type of electrical connection	screw-type terminals	screw-type terminals	screw-type terminals
• input/output/battery module	24 V DC: 2 screw terminals for 0.2 ... 6 mm^2/24 ... 13 AWG	24 V DC: 2 screw terminals for 0.2 ... 6 mm^2/24 ... 13 AWG	24 V DC: 2 screw terminals for 0.5 ... 16 mm^2/20 ... 6 AWG
• for control circuit and status message	14 screw terminals for 0.2 ... 1.5 mm^2/24 ... 16 AWG	14 screw terminals for 0.2 ... 1.5 mm^2/24 ... 16 AWG	14 screw terminals for 0.2 ... 1.5 mm^2/24 ... 16 AWG
Width of the enclosure	50 mm	50 mm	70 mm
Height of the enclosure	125 mm	125 mm	125 mm
Depth of the enclosure	125 mm	125 mm	150 mm
Required spacing			
• top	50 mm	50 mm	50 mm
• bottom	50 mm	50 mm	50 mm
• left	0 mm	0 mm	0 mm
• right	0 mm	0 mm	0 mm
Net weight	0.38 kg	0.39 kg	0.65 kg
Row-on-row building permitted	Yes	Yes	Yes
Mounting type	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Electrical accessories	Battery module	Battery module	Battery module
Equipment marking acc. to DIN EN 81346-2	T	T	T

[1)] Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified)

Ordering data

	Article No.
SITOP UPS1600 24 V/ 10 A	**6EP4134-3AB00-0AY0**
• With USB interface	**6EP4134-3AB00-1AY0**
• with PROFINET/Ethernet: two RJ45 sockets (2 port switch)	**6EP4134-3AB00-2AY0**
SITOP UPS1600, 24 V/ 20 A	**6EP4136-3AB00-0AY0**
• With USB interface	**6EP4136-3AB00-1AY0**
• with PROFINET/Ethernet: two RJ45 sockets (2 port switch)	**6EP4136-3AB00-2AY0**

	Article No.
SITOP UPS1600 24 V/ 40 A	**6EP4137-3AB00-0AY0**
• With USB interface	**6EP4137-3AB00-1AY0**
• with PROFINET/Ethernet: two RJ45 sockets (2 port switch)	**6EP4137-3AB00-2AY0**

SITOP UPS1100 battery modules

Overview

Maintenance-free SITOP UPS1100 battery modules with 1.2 Ah up to 12 Ah and various types of energy storage (lead, pure lead, lithium iron phosphate = LiFePo) for SITOP UPS1600 DC UPS modules. The intelligent UPS1600 battery management charges the UPS1100 with the optimal, temperature-controlled charging characteristics and monitors the status (operating data and diagnostics information) via the energy storage link of the connected battery modules. For longer buffer times, up to six battery modules can be connected in parallel. Mounting onto standard mounting rail or directly to the wall.

Technical specifications

Article number	**6EP4131-0GB00-0AY0**[1)3)]	**6EP4132-0GB00-0AY0**[1)3)]	**6EP4133-0GB00-0AY0**[1)3)]	**6EP4133-0JB00-0AY0**[1)]	**6EP4134-0GB00-0AY0**[1)3)]	**6EP4135-0GB00-0AY0**[1)3)]
Product	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**
Product type	**Battery module 1.2 Ah**	**Battery module 2.5 Ah**	**Battery module 3.2 Ah**	**Battery module 5 Ah**	**Battery module 7 Ah**	**Battery module 12 Ah**
Charging current charging voltage						
End-of-charge voltage at DC						
• at -10 °C recommended	28.0 V	28.0 V	28.0 V	28.0 V	28.0 V	28.0 V
• at 0 °C recommended	28.0 V	28.0 V	28.0 V	28.0 V	28.0 V	28.0 V
• at 10 °C recommended	27.8 V	27.8 V	27.8 V	28.8 V	27.8 V	27.8 V
• at 20 °C recommended	27.3 V	27.3 V	27.3 V	28.8 V	27.3 V	27.3 V
• at 30 °C recommended	26.8 V	26.8 V	26.8 V	28.8 V	26.8 V	26.8 V
• at 40 °C recommended	26.6 V	26.6 V	26.6 V	28.8 V	26.6 V	26.6 V
• at 50 °C recommended	26.3 V	26.3 V	26.3 V	28.8 V	26.3 V	26.3 V
• at 60 °C recommended	-	26,0 V	-	-	-	-
Permissible charging current, max.	0.3 A	5 A	0.8 A	2.1 A	1.75 A	3 A
Rated voltage V_{out} DC	24 V	24 V	24 V	24 V	24 V	24 V
Rated current value $I_{out\ rated}$	10 A	10 A; 20 A	10 A; 20 A	10 A; 20 A	20 A; 40 A	20 A; 40 A

Technical specifications (continued)

Article number	6EP4131-0GB00-0AY0[1)3)]	6EP4132-0GB00-0AY0[1)3)]	6EP4133-0GB00-0AY0[1)3)]	6EP4133-0JB00-0AY0[1)]	6EP4134-0GB00-0AY0[1)3)]	6EP4135-0GB00-0AY0[1)3)]
Product	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**
Product type	**Battery module 1.2 Ah**	**Battery module 2.5 Ah**	**Battery module 3.2 Ah**	**Battery module 5 Ah**	**Battery module 7 Ah**	**Battery module 12 Ah**
Safety						
Short-circuit protection	Battery fuse 15 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 25 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 25 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 25 A/32 V (FKS blade-type fuse + holder); overcurrent switch-off at 60 A > 30 ms/min and 24 A > 5 s/min	Battery fuse 2x 25 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 2x 25 A/32 V (solid-state circuitry blade-type fuse + support)
Design of the overload protection	Valve control	Valve control	Valve control	Valve control	Valve control	Valve control
Status display	LED green: Battery OK; LED flashing green: Error or warning; OFF: No communication	LED green: Battery OK; LED flashing green: Error or warning; OFF: No communication	LED green: Battery OK; LED flashing green: Error or warning; OFF: No communication	LED green: Battery OK; LED flashing green: Error or warning; OFF: No communication	LED green: Battery OK; LED flashing green: Error or warning; OFF: No communication	LED green: Battery OK; LED flashing green: Error or warning; OFF: No communication
Safety						
Protection class	Class III	Class III	Class III	Class III	Class III	Class III
CE mark	Yes	Yes	Yes	Yes	Yes	Yes
UL/cUL (CSA) approval	cURus-Recognized (UL 1778, CSA C22.2 No. 107.1), File E219627	cURus-Recognized (UL 1778, CSA C22.2 No. 107.1), File E219627	cURus-Recognized (UL 1778, CSA C22.2 No. 107.1), File E219627	cURus-Recognized (UL 1778, CSA C22.2 No. 107.1), File E219627	cURus-Recognized (UL 1778, CSA C22.2 No. 107.1), File E219627	cURus-Recognized (UL 1778, CSA C22.2 No. 107.1), File E219627
Explosion protection	IECEx Ex nA nC IIC T4 Gc; ATEX (EX) II 3G Ex nA IIC T4 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I, Div. 2, Group ABCD, T4	IECEx Ex nA nC IIC T4 Gc; ATEX (EX) II 3G Ex nA IIC T4 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I, Div. 2, Group ABCD, T4	IECEx Ex nA nC IIC T4 Gc; ATEX (EX) II 3G Ex nA IIC T4 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I, Div. 2, Group ABCD, T4	-	IECEx Ex nA nC IIC T4 Gc; ATEX (EX) II 3G Ex nA IIC T4 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I, Div. 2, Group ABCD, T4	IECEx Ex nA nC IIC T4 Gc; ATEX (EX) II 3G Ex nA IIC T4 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I, Div. 2, Group ABCD, T4
Marine approval	DNV GL, ABS	DNV GL, ABS	DNV GL, ABS	DNV GL, ABS	DNV GL, ABS	DNV GL, ABS
Degree of protection (EN 60529)	IP20	IP20	IP20	IP20	IP20	IP20
Operating[2)]						
Ambient temperature						
• during operation	-15 ... +50 °C	-40 ... +60 °C	-15 ... +50 °C	-20 ... +50 °C	-15 ... +50 °C	-15 ... +50 °C
• during transport	-20 ... +50 °C	-40 ... +60 °C	-20 ... +50 °C	-40 ... +60 °C	-20 ... +50 °C	-20 ... +50 °C
• during storage	-20 ... +50 °C	-40 ... +60 °C	-20 ... +50 °C	-40 ... +60 °C	-20 ... +50 °C	-20 ... +50 °C
Relative temporary capacity loss at 20 °C in a month typical	3 %	3 %	3 %	3 %	3 %	3 %
Service life[4)]						
Service life of energy storage						
• Note	capacity falls to 50 % of original capacity	capacity falls to 50 % of original capacity	capacity falls to 50 % of original capacity	capacity falls to 50 % of original capacity	capacity falls to 50 % of original capacity	capacity falls to 50 % of original capacity
• at 20 °C typical	4 y	10 y	4 y	15 y	4 y	4 y
• at 30 °C typical	2 y	7 y	2 y	10 y	2 y	2 y
• at 40 °C typical	1 y	3 y	1 y	9 y	1 y	1 y
• at 50 °C typical	0.5 y	1.5 y	0.5 y	2 y	0.5 y	0.5 y
• at 60 °C typical	-	1 y	-	-	-	-

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Technical specifications (continued)

Article number	6EP4131-0GB00-0AY0[1)3)]	6EP4132-0GB00-0AY0[1)3)]	6EP4133-0GB00-0AY0[1)3)]	6EP4133-0JB00-0AY0[1)]	6EP4134-0GB00-0AY0[1)3)]	6EP4135-0GB00-0AY0[1)3)]
Product	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**	**SITOP UPS1100**
Product type	**Battery module 1.2 Ah**	**Battery module 2.5 Ah**	**Battery module 3.2 Ah**	**Battery module 5 Ah**	**Battery module 7 Ah**	**Battery module 12 Ah**
Mechanics						
Connection technology	screw-type terminals	screw-type terminals	screw-type terminals	screw-type terminals	screw-type terminals	screw-type terminals
Connection for power supply unit	1 screw terminal each for 0.2 ... 6 mm^2 for + BATT and - BATT	1 screw terminal each for 0.2 ... 6 mm^2 for + BATT and - BATT	1 screw terminal each for 0.2 ... 6 mm^2 for + BATT and - BATT	1 screw terminal each for 0.5 ... 16 mm^2 for + BATT and - BATT	1 screw terminal each for 0.5 ... 16 mm^2 for + BATT and - BATT	1 screw terminal each for 0.5 ... 16 mm^2 for + BATT and - BATT
Type of electrical connection for control circuit and status message	1 screw terminal each for 0.14 ... 4 mm^2	1 screw terminal each for 0.14 ... 4 mm^2	1 screw terminal each for 0.14 ... 4 mm^2	1 screw terminal each for 0.14 ... 4 mm^2	1 screw terminal each for 0.14 ... 4 mm^2	1 screw terminal each for 0.14 ... 4 mm^2
Product component belonging to	Accessories pack with solid-state circuitry fuse 15 A	Accessories pack with solid-state circuitry fuse 25 A	Accessories pack with solid-state circuitry fuse 25 A	Accessories pack with solid-state circuitry fuse 15 A	Accessories pack with solid-state circuitry fuse 25 A	Accessories pack with solid-state circuitry fuse 25 A
Width of the enclosure	89 mm	265 mm	190 mm	189 mm	186 mm	253 mm
Height of the enclosure	130 mm	115 mm	170 mm	186 mm	186 mm	186 mm
Depth of the enclosure	107 mm	76 mm	79 mm	113 mm	110 mm	110 mm
Installation width	89 mm	265 mm	190 mm	189 mm	186 mm	253 mm
Installation height	145 mm	130 mm	184 mm	201 mm	201 mm	201 mm
Weight, approx.	1.9 kg	3.7 kg	3.8 kg	3.4 kg	6.1 kg	9.8 kg
Installation	snaps onto DIN rail EN 60715 35x7.5/15 or keyhole mounting for hooking in to M4 screws	snaps onto DIN rail EN 60715 35x7.5/15 or keyhole mounting for hooking in to M4 screws	snaps onto DIN rail EN 60715 35x15 or keyhole mounting for hooking in to M4 screws	snaps onto DIN rail EN 60715 35x7.5/15 or keyhole mounting for hooking in to M4 screws	can be screwed onto flat surface (keyhole mounting for hooking in to M4 screws)	can be screwed onto flat surface (keyhole mounting for hooking in to M4 screws)
Number of cells	12	12	12	16	12	12
Equipment marking acc. to DIN EN 81346-2	G	G	G	G	G	G

1) Specifications at rated input voltage and ambient temperature +25 °C (unless otherwise specified).

2) For storage, mounting and operation of lead-acid batteries, the relevant DIN/VDE regulations or country-specific regulations (e.g. VDE 0510 Part 2/ EN 50272-2) must be observed.

3) You must ensure that the battery site is sufficiently ventilated. Possible sources of ignition must be at least 50 cm away.

4) Along with the storage and operating temperature, other factors such as the duration of the storage period and the charge status during storage have a decisive influence on the possible useful life. Batteries should therefore be stored as briefly as possible, always fully charged, and within the temperature range 0 to +20 °C.

Ordering data

	Article No.
SITOP UPS 1100 battery module 1.2 Ah With maintenance-free, sealed lead-acid rechargeable batteries for DC UPS module SITOP UPS1600, 10 A	**6EP4131-0GB00-0AY0**
SITOP UPS 1100 battery module 3.2 Ah With maintenance-free, sealed lead-acid rechargeable batteries for DC UPS module SITOP UPS1600, 10 A and 20 A	**6EP4133-0GB00-0AY0**
SITOP UPS 1100 battery module 5 Ah, LiFePo With maintenance-free, sealed rechargeable lithium iron phosphate batteries for DC UPS module SITOP UPS1600, 10 A and 20 A	**6EP4133-0JB00-0AY0**

	Article No.
SITOP UPS 1100 battery module 7 Ah With maintenance-free, sealed rechargeable lead-acid batteries for DC UPS module SITOP UPS1600, 10 A, 20 A and 40 A	**6EP4134-0GB00-0AY0**
SITOP UPS 1100 battery module 12 Ah With maintenance-free, sealed rechargeable lead-acid batteries for DC UPS module SITOP UPS1600, 20 A and 40 A	**6EP4135-0GB00-0AY0**
SITOP UPS 1100 battery module 2.5 Ah, high temperature With maintenance-free, closed lead-acid batteries for DC UPS module SITOP UPS1600, 10 A and 20 A	**6EP4132-0GB00-0AY0**