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SITOP Power Supply

SITOP

Catalog KT 10.1

Edition 2014

Answers for industry.

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SITOP power supply

Catalog KT 10.1 · 2014

Dear Customer,

We are pleased to present you with the new Catalog KT 10.1 · 2013. This catalog will provide you with an overview of the current SITOP range of products for the reliable supply of power to manufacturing, process and building automation systems.

We would like to draw your attention in particular to the following new items:

- 1-phase power supplies:
  SITOP smart (PSU100S), 12 V DC/7 A and 14 A as well as 24 V DC/2.5 A, 5 A and 10 A
  PM1507, 24 V DC/3 A as well as 8 A for SIMATIC S7-1500 and ET 200MP
- Expansion modules:
  SITOP PSE200U selectivity modules with single-channel signaling and SITOP PSE202U redundancy modules
- Uninterruptible DC power supplies (DC UPS):
  SITOP UPS1600 with Ethernet/PROFINET or USB interface as well as digital I/O and SITOP UPS1100 battery modules

The products listed in this catalog are also part of the new issue of the CA 01 interactive catalog on DVD. Please contact your local Siemens office or representative if you are interested.

You will find up-to-date information about SITOP on the Internet at:
www.siemens.com/sitop

For rapid product selection, the SITOP Selection Tool is available at:
www.siemens.com/sitop-selection-tool

Our interactive catalog and Industry Mall can be accessed on the Internet at
www.siemens.com/industrymall

We would be pleased to receive any suggestions or requests for improvement – please state catalog name in the subject line – at catalogs.industry@siemens.com.

Best regards

Gunther Klima
General Manager Power Supply Products

Siemens AG, Industry Sector

Answers for industry.

SITOP

SITOP power supply

Catalog KT 10.1 · 2014

The products and systems listed in this catalog are manufactured and marketed using a certified quality management system complying with DIN EN ISO 9001 (certificate registration number 000656 QM08). The certificate is recognized in all IQNet countries.

Supersedes:
Catalog KT 10.1 · 2012

Refer to the Industry Mall for current updates of this catalog:
www.siemens.com/industrymall

The products contained in this catalog can also be found in the Interactive Catalog CA 01.
Order No.:
E86060-D4001-A510-D2-7600

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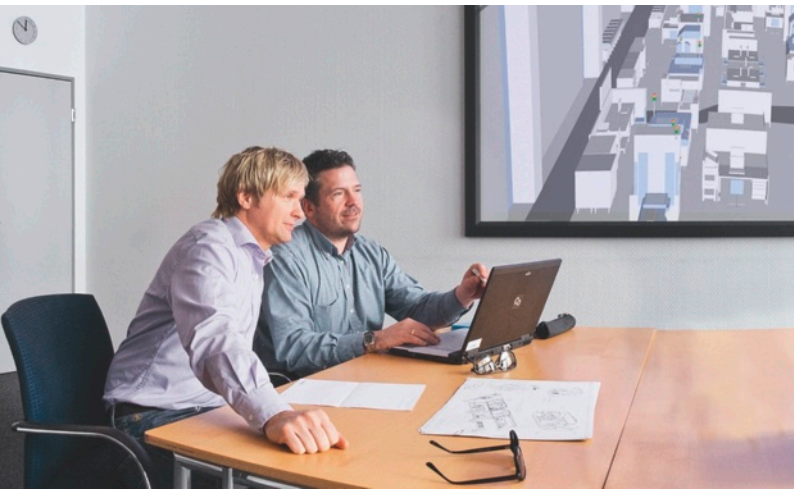


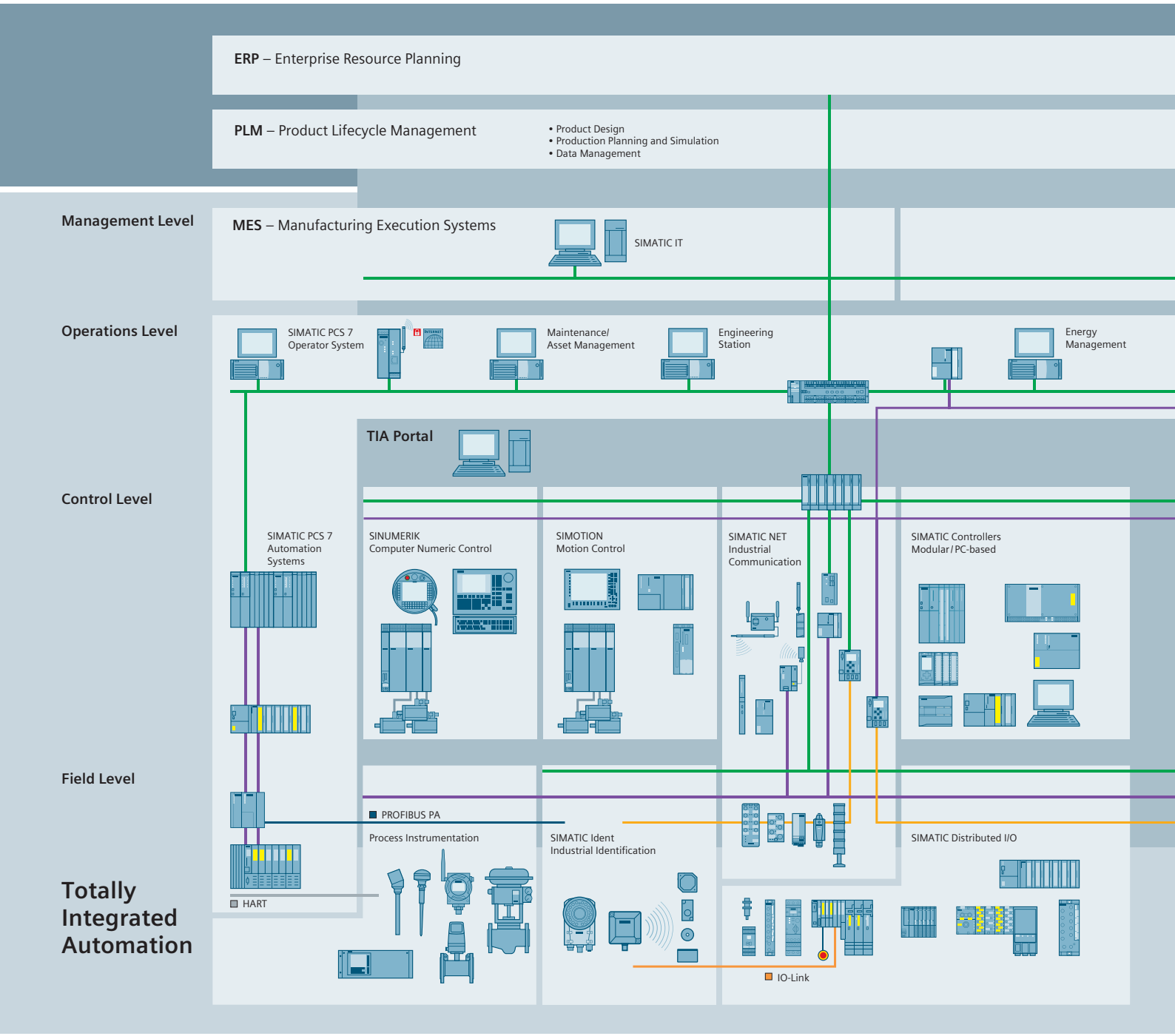
Answers for industry.

Integrated technologies, vertical market expertise and services for greater productivity, energy efficiency, and flexibility.

The Siemens Industry Sector is the world's leading supplier of innovative and environmentally friendly products and solutions for industrial companies. End-to-end automation technology and industrial software, solid market expertise, and technology-based services are the levers we use to increase our customers' productivity, efficiency and flexibility. With a global workforce of more than 100 000 employees, the Industry Sector comprises the Industry Automation, Drive Technologies, and Customer Services divisions, as well as the Metals Technologies Business Unit.

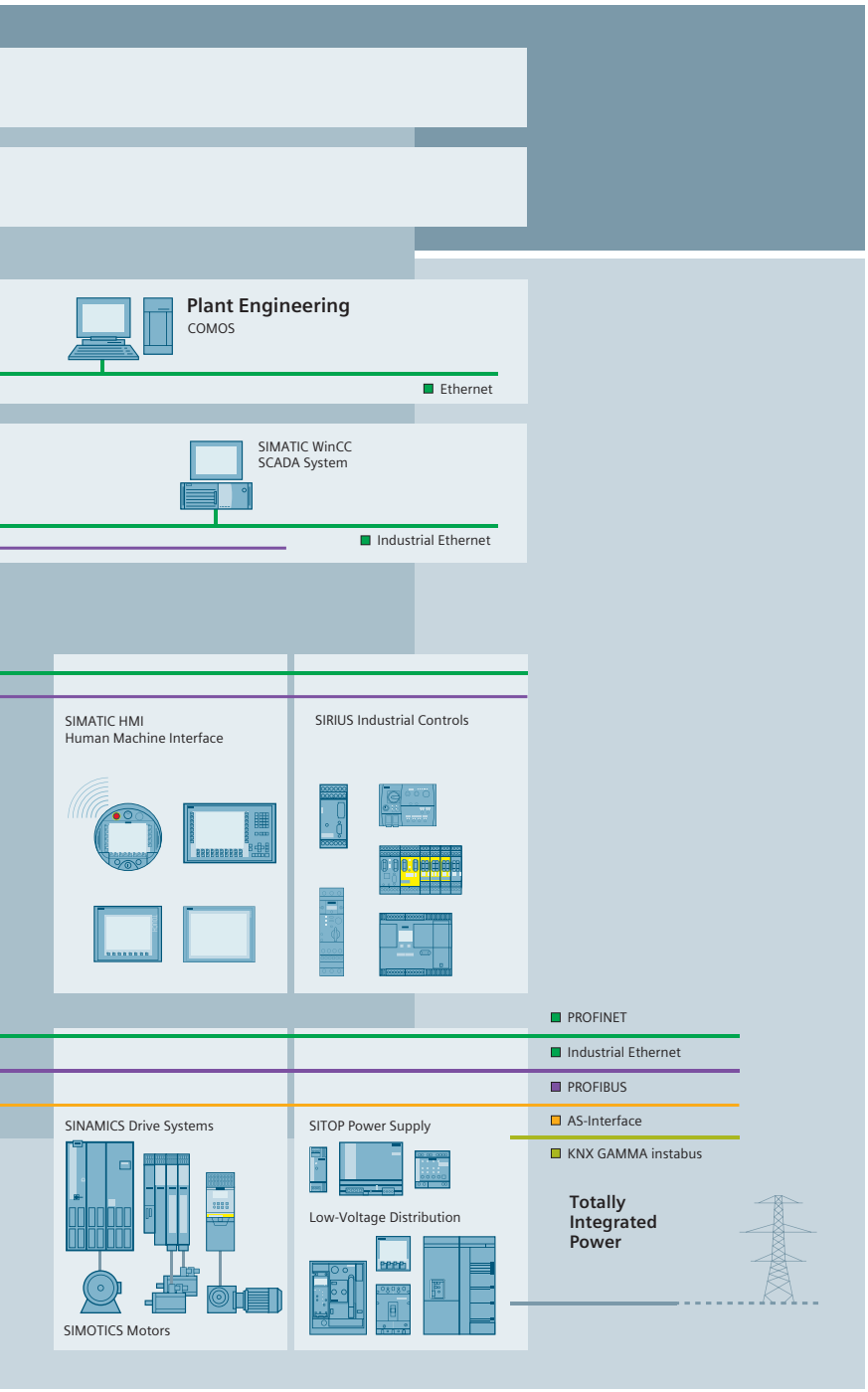
We consistently rely on integrated technologies and, thanks to our bundled portfolio, we can respond more quickly and flexibly to our customers' wishes. With our globally unmatched range of automation technology, industrial control and drive technology as well as industrial software, we equip companies with exactly what they need over their entire value chain – from product design and development to production, sales and service. Our industrial customers benefit from our comprehensive portfolio, which is tailored to their market and their needs.

Market launch times can be reduced by up to 50% due to the combination of powerful automation technology and intelligent industrial software from Siemens Industry. At the same time, the costs for energy or waste water for a manufacturing company can be reduced significantly. In this way, we increase our customers' competitive strength and make an important contribution to environmental protection with our energy-efficient products and solutions.



Setting standards in productivity and competitiveness.

Totally Integrated Automation.



TIA is characterized by its unique continuity.

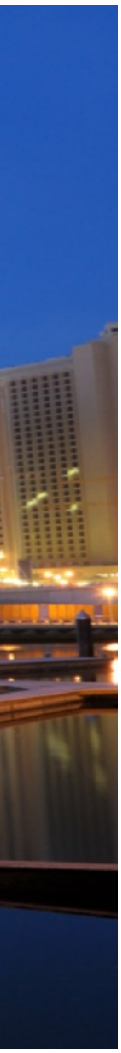
It provides maximum transparency at all levels with reduced interfacing requirements – covering the field level, production control level, up to the corporate management level. With TIA you also profit throughout the complete life cycle of your plant – starting with the initial planning steps through operation up to modernization, where we offer a high measure of investment security resulting from continuity in the further development of our products and from reducing the number of interfaces to a minimum.

The unique continuity is already a defined characteristic at the development stage of our products and systems.

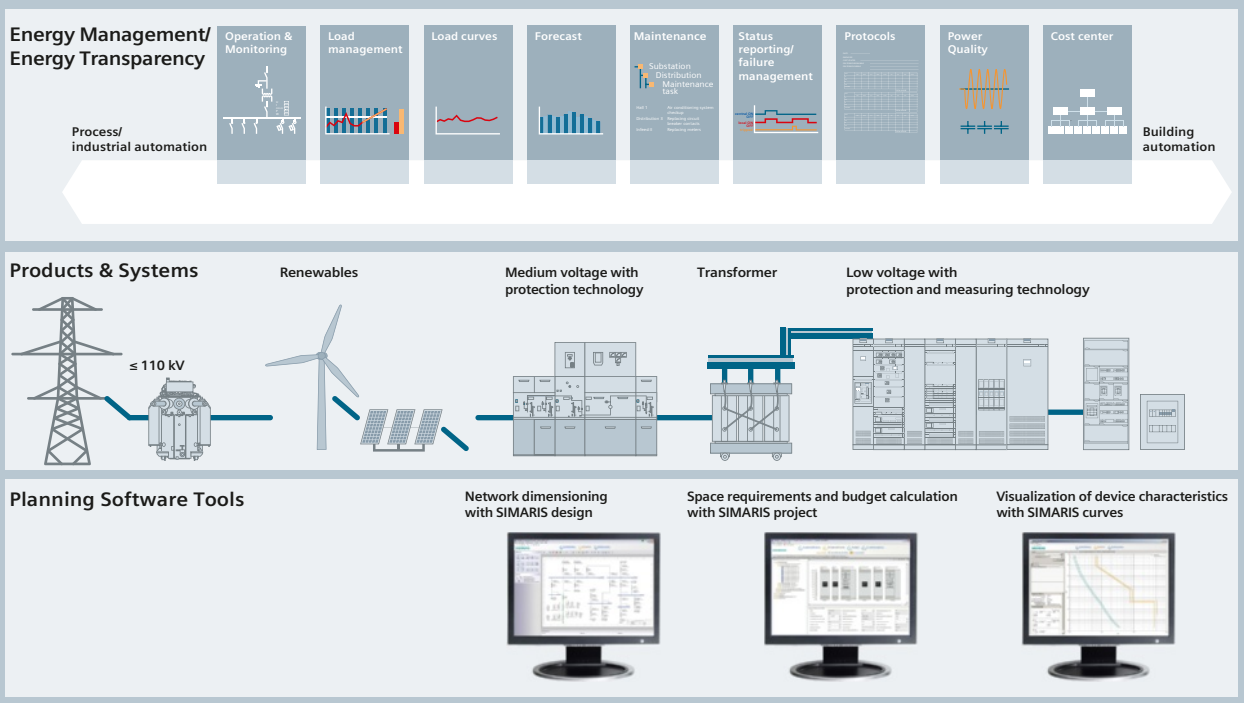
The result: maximum interoperability – covering the controller, HMI, drives, up to the process control system. This reduces the complexity of the automation solution in your plant. You will experience this, for example, in the engineering phase of the automation solution in the form of reduced time requirements and cost, or during operation using the continuous diagnostics facilities of Totally Integrated Automation for increasing the availability of your plant.

Thanks to Totally Integrated Automation, Siemens provides an integrated basis for the implementation of customized automation solutions – in all industries from inbound to outbound.

Totally Integrated Power: Future-proof power supply from one source.



Software tools, products, systems and support for integrated electrical power distribution



The power supply system acts like a "vital artery", forming the basis for the reliable and efficient functioning of all electrically operated building installations. Electrical power distribution therefore requires integrated solutions. Our answer:
Totally Integrated Power (TIP).

This includes software tools and support for planning and configuration and a complete, optimally aligned product and system portfolio for integrated power distribution from medium-voltage switchgear right to socket outlets.

The power distribution products and systems can be interfaced to building or industrial automation systems (Total Building Solutions or Totally Integrated Automation) via communication-capable circuit breakers and components, allowing the full potential for optimization that an integrated solution offers to be exploited throughout the project cycle – from planning right through to installation and operation.

Get more information:

www.siemens.com/tip
www.siemens.com/simaris
www.siemens.com/specifications

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Overview

The benchmark in reliability, efficiency and integration

Efficient operation of a machine or plant requires a reliable, constant power supply.

The quality and reliability of the SITOP stabilized power supplies ensure high levels of safety in DC power supply in industrial engineering and building management systems.

Our perfectly coordinated selection of SITOP power supplies is enhanced by a unique range of add-on modules that extensively protect the 24 V power supplies against interference on the primary and secondary side, right up to complete all-round protection.

TOP reliability

You should think about a good power supply when you are purchasing it – and then never again.

SITOP has proved its reliability more than 10 million times over in almost every supply system in the world. With their wide-range input, excellent load behavior and extensive certifications, SITOP power supplies are already ensuring that the power supply is reliable.

Depending on requirements, the SITOP power supplies can be expanded as required with expansion modules and uninterruptible power supplies (DC UPS). This ensures security of the 24 V supply for a machine or plant even in the event of an overload in the output circuit or power failure on the input side.

TOP efficiency

Production costs are determined more and more by energy costs. Savings here generate valuable competitive advantages. SITOP power supplies make an important contribution to this. Due to the high degree of efficiency, the primary switched power supplies operate extremely efficiently.
The power loss across the entire performance range is low – even during no-load operation. Because a power supply is rarely operated at full load, there is an outstanding potential for savings.

SITOP also supports the entire process chain of the customer efficiently. For example, with easy product selection using the SITOP Selection Tool and comprehensive additional information such as 3D data, circuit diagram macros, certification and individually configurable product documentation.
Every SITOP solution can therefore be planned and ordered, designed, configured and operated in an efficient manner.

TOP integration

The better power supplies are integrated in their industrial environment, the higher their productivity. SITOP is optimally tuned to automation systems such as SIMATIC, SINUMERIK and SIMOTION.

All SIMATIC power supplies and the new uninterruptible power supply SITOP UPS1600 are integrated into the TIA Portal. Engineering for the DC UPS, e.g. integration in the PROFINET network, is extremely easy in the TIA Portal and also supports comprehensive diagnostics. SIMATIC S7 function blocks support easy integration in STEP 7 user programs, and ready-to-use WinCC faceplates are available for operator control and monitoring. Over the two Ethernet interfaces, the UPS1600 is also open for PC-based systems.

The product range at a glance

SITOP lite

The low-cost basic power supply

SITOP compact

The slim power supply unit for control boxes

LOGO!Power

The flat power supply unit for distribution boards

SITOP smart

The powerful standard power supply

SITOP power supplies in SIMATIC design

The optimum supply for SIMATIC S7 and more

SITOP modular

The technology power supply for demanding solutions

SITOP in special designs, made for special tasks

Well prepared for special tasks and conditions

Expansion modules

Redundancy modules
Protection against failure of a power supply by means of redundant configuration of the power supply unit

Selectivity modules
Protection against overload and short circuit by means of electronic protection of 24 V feeds

Buffer module
Protection against power failure for a few seconds

SITOP DC UPS

SITOP UPS500 with capacitors
Protection against power failure on the input side through buffering for a few minutes

SITOP UPS1600 with battery modules
Protection against power failure on the input side through buffering for a few hours.
DC UPS with Ethernet/PROFINET – open and integrated in TIA

1

Power supplies

SITOP lite

The low-cost basic power supply

SITOP lite is the range of power supplies for standard requirements in industrial environments and offers all important functions at a favorable price – without compromising quality and reliability.

The wide-range input with manual switchover supports connection to a wide range of 1-phase supply systems.

Its essential characteristics are

- 24 V/2.5 A, 5 A and 10 A for industrial applications with standard requirements
- 1-phase wide-range input with manual switchover
- Narrow mounting width
- High degree of efficiency
- Green LED for "24 V OK"
- Parallel connection possible
- No lateral installation clearances required
- Ambient temperature range of 0 °C to 60 °C (above 45 °C with derating)
- Cooling through natural convection
- Short-circuit and overload protection
- Certification in accordance with CE and cULus

SITOP compact

The slim power supply unit for control boxes

SITOP compact was developed as a highly space-saving power supply for the low-end performance range. It is especially suited to distributed applications in control boxes and small control cabinets.

It is highly efficient due to a high degree of efficiency over the complete load range. The low no-load losses are also significant here.

Ideal for applications that are frequently in stand-by mode.

Its essential characteristics are

- 24 V/0.6 A, 1.3 A, 2.5 A and 4 A as well as 12 V/2 A and 6.5 A
- 24 V/3.7 A with limited output power of max. 100 VA according to NEC class 2
- Small mounting surface thanks to its slim design
- Wide-range input for 85 V to 264 V AC or 110 V to 300 V DC
- High efficiency across the entire load range: up to 28 % energy savings in comparison with similar devices
- Low energy consumption during no-load operation or stand-by: Energy savings of up to 53 % are possible
- Adjustable output voltage
- Green LED for "Output voltage OK"
- Plug-in terminals
- Temperature range from -20 °C to +70 °C
- Comprehensive certification, e.g. UL, ATEX and GL

LOGO!Power

The flat power supply unit for distribution boards

The miniature power supply units of the LOGO!Power series can be used with considerable versatility in numerous applications in the low-end performance range. This is made possible by various output voltages, the wide-range input with its optional DC mode as well as the flat, stepped profile for mounting in distribution boards.

Its essential characteristics are

- 2 performance classes, each with 5 V, 12 V, and 15 V
- 3 performance classes with 24 V
- Flat LOGO! design with an installation depth of only 55 mm
- Wide-range input for 85 V to 264 V AC or 110 V to 300 V DC
- Constant current for connection of loads with high inrush current
- Power reserve on starting up through 1.5 times the rated current for capacitive loads
- Adjustable output voltage
- Green LED for "Output voltage OK"
- Temperature range from –20 °C to +70 °C
- Extensive certifications such as CE, cULus, FM, GL and ATEX

SITOP smart

The powerful standard power supply

SITOP smart is the optimum power supply unit for many 24 V and 12 V applications: compact dimensions, a strong performance, and a favorable price. Despite its compactness it offers an outstanding overload withstand capability. Thanks to 1.5 times the rated current for 5 seconds, even large loads can be switched on without any problems. With a rated power of 120 %, these slim power supply units are among the most reliable of their kind.

Its essential characteristics are

- 24 V/2.5 A, 5 A, 10 A, 20 A and 40 A for standard applications
- Minimum mounting space required due to slim design, no lateral installation clearances required
- "Extra Power" with 1.5 times the rated current for 5 s/min for brief overloads
- Can be continuously used with 120 % of the rated power at up to 45 °C ambient temperature (24 V versions)
- Signaling contact for "output voltage OK" for easy integration in the plant monitoring system
- Low energy consumption and minimal heat dissipation inside the control cabinet due to the high degree of efficiency
- SITOP PSU100S: Automatic range switchover 120/230 V AC
- SITOP PSU300S: Wide-range input 400 ... 500 V 3 AC
- Adjustable output voltage for compensating voltage drops
- Large temperature range from -10 °C to +70 °C
- Extensive certification for all standard applications worldwide (e.g. cULus, ATEX, cCSAus Class1 Div 2, GL)
- 24 V power supply units expandable with expansion modules and DC UPS

Power supplies

1

SITOP power supplies in SIMATIC design

The optimum supply for SIMATIC S7 and more

The original SIMATIC power supplies merge perfectly into the PLC network in terms of their design and functionality. In addition to the SIMATIC controllers S7-1500, S7-1200, S7-300 and S7-200 and distributed I/O ET 200MP, ET 200M and ET 200pro, they also supply other consumers reliably with 24 V.

Its essential characteristics are

- SIMATIC S7-1500 – The PM 1507 load power supplies supply the system components of the S7-1500 or ET 200MP and the sensors and actuators with 24 V DC. Global use of the devices on supply voltages of 120 V AC and 230 V AC is supported by automatic range switching of the input voltage. The 24 V supply can be switched on and off using a switch. The PM can also be used in the ET200MP distributed I/O.
- SIMATIC S7-1200 – The compact PM 1207 Power Module supplies power to the micro PLC. The automatic range switchover ensures problem-free connection to 1-phase 120 and 230 V grids.
- SIMATIC S7-300 – The compact system and load power supplies for mounting on S7-300 rails features automatic range switchover on single-phase 120/230 V AC grids. The output voltage can be switched on and off using a switch. The connecting comb for the CPU is included in the scope of supply. The power supplies can also be used in ET200M.
- SIMATIC S7-200 – The flat power supply unit is also used for low installation depths.
- SIMATIC ET 200pro – The three-phase power supply to IP67 serves as an electronic/sensor and load power supply and can be directly mounted on the ET 200pro support rail. With a signaling contact for "24 V OK" and "Overtemperature", as well as a second plug-in connector for input voltage loop-through.

SITOP modular

The technology power supply for demanding solutions

SITOP modular offers maximum functionality for use in complex plants and machines.
The wide-range input allows a connection to almost any electrical power system worldwide and ensures a high degree of safety even if there are large voltage fluctuations.
The power boost provides up to three times the rated current for brief periods. And in the event of an overload, you can choose between constant current with automatic restart or latching shutdown.
The high degree of efficiency keeps energy consumption and heating in the control cabinet low, and the compact metal housing also saves space.

Its essential characteristics are

- For demanding 24 V applications from 5 ... 40 A
- DC/DC converter 24 V/20 A for drive and battery networks
- 48 V/10 A and 20 A enable small cable cross-sections
- Compact metal enclosure
- No lateral installation clearances required
- Wide-range input
- Extra power of 150 % for brief operational overloads
- Power boost of 300 % for tripping protective devices
- Selectable short-circuit response
- A soft characteristic can be selected for parallel connection
- High efficiency
- Operating status on 3 LEDs
- 24 V power supply units expandable with expansion modules and DC UPS

SITOP in special designs, made for special tasks

Well prepared for special tasks and conditions

Whether restricted installation conditions, harsh ambient conditions, or special input or output voltages are concerned: These standard power supply units also fulfill exceptional requirements.

For example, low-cost 12 V and 24 V power supplies in a rugged aluminum housing for direct wall mounting in different mounting positions and power supplies to IP67 degree of protection.

Or power supplies with special functions such as battery charging, widely adjustable output voltage and for use in accordance with NEC class 2.

Product examples

- PSU100D – cost-effective power supplies up to 300 W, for direct wall mounting in various mounting positions
- SITOP flat design – in a flat housing for standard rail mounting
- SITOP PSU300E – three-phase power supply with low output and removable plug-in terminals
- SITOP PSU300P – three-phase power supply with degree of protection IP67; it has the same design as the SIMATIC ET200pro PS, but without the second connector for looping through the input voltage
- SITOP PSU300B - power supply optimized for battery charging with three-phase wide-range input, 12 V and 24 V output voltage

Alternative voltages

Power supplies with alternative output voltages

SITOP provides a reliable supply of precisely stabilized DC voltage not just to 24 V loads, but also to loads with "alternative" supply voltage.

SITOP flexi: 3 … 52 V/10 A
Limitless diversity thanks to variable output.
Allows flexible adjustment between 3 and 52 V, so just one standard PS can be used for different special voltages.

SITOP compact: 12 V/2 A and 6.5 A
The slim power supply for control boxes also supplies 12 V consumers extremely efficiently.

LOGO!Power: 5 V, 12 V and 15 V
The flat power supply for distribution boards with these output voltages is available in two power classes.

SITOP modular: 48 V/10 A and 20 A
The high output voltage enables smaller strand cross-sections for wires leading to consumers.

SITOP DC/DC: 12 V/2.5 A
The DC/DC converter in a slim standard mounting rail housing is supplied with 24 V. A SITOP DC UPS can also be used to provide an uninterruptible 12 V supply, for example.

SITOP dual: 2 x 15 V/3.5 A
The electronics power supply for the control cabinet.
The industry-standard rail-mounted device has two 15 V outputs. For example, for electronic loads requiring ±15 V.

AS-i power supply units 30 V
For the 30 V supply of slaves and sensors in the AS-Interface network, 3RX9 and PSN130S power supply units are available with and without data decoupling respectively.

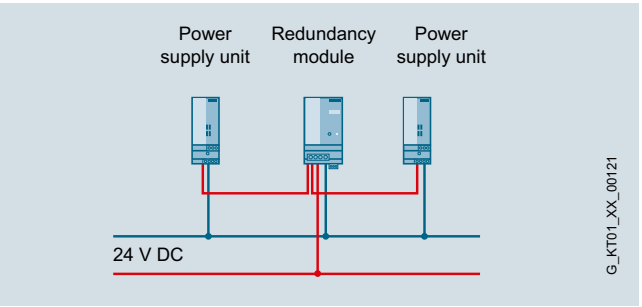
For further devices and information, see Catalog IC 10.

Expansion modules

Expansion modules to increase system availability

A power supply unit on its own cannot guarantee fault-free 24 V supply. Power failures, extreme variations in the mains voltage, or a faulty load can bring plant operation to a standstill and cause high costs. The expansion modules offer everything from extensive protection against interference on the primary and secondary side right up to complete all-round protection.

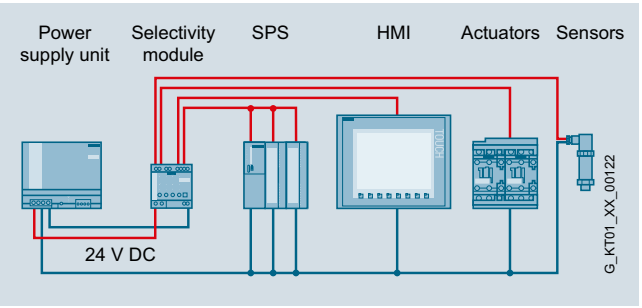
Redundancy modules – for doubling system availability



Advantages of the redundancy modules

- High availability of the 24 V supply thanks to redundant configuration
- Power is reliably supplied even when a power supply fails
- Compact redundancy modules for power supplies up to 40 A
- Redundancy module 24 V/ NEC class 2 with limiting to 100 VA
- Diagnostic signal via LED and signaling contacts
- Adjustable switching threshold for LED and signaling contacts

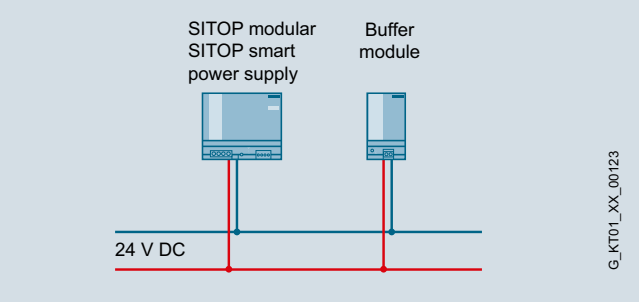
Selectivity modules – for protection of 24 V feeds



Advantages of the selectivity modules

- Protection against overload or short circuit in the 24 V circuit
- Reliable tripping regardless of cable lengths or cross-sections
- Four load feeders per module
- Versions with adjustable output current from 0.5 to 3 A or 3 to 10 A
- Sequential connection of feeds is possible to reduce inrush current
- Diagnostics via group signaling contact or single-channel signaling
- Evaluation via free-of-charge SIMATIC S7 function blocks for modules with single-channel signaling

Buffer module – bridging power failures for a few seconds



Advantages of the buffer module

- Power failures normally only last for a fraction of a second, but they can cause costly and time-consuming damage in sensitive production areas. In combination with SITOP smart and SITOP modular power supply units, the buffer module bridges short voltage dips of this type with its electrolytic capacitors and ensures uninterrupted operation.

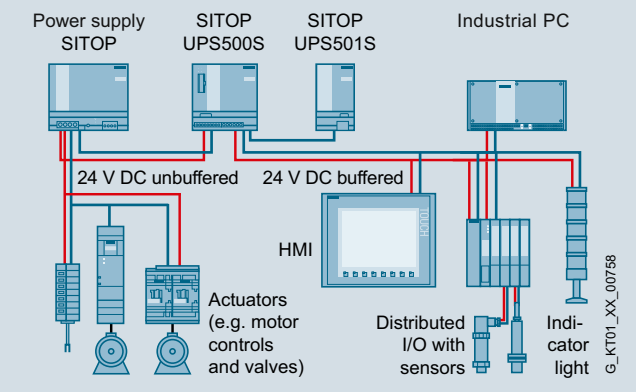
DC UPS

Reliable 24 V, even when the power fails: Uninterruptible power supplies

Power failures normally only last for seconds, but they can have costly and time-consuming consequences in sensitive production areas. In the time range of minutes, the maintenance-free DC UPS modules with capacitor technology supply a reliable 24 V, and in the time range of hours our DC UPS modules ensure the supply with battery modules that also communicate over Ethernet/PROFINET and are fully integrated in TIA (SITOP UPS1600).

SITOP DC UPS with capacitors

The high-capacitance and absolutely maintenance-free double-layer capacitors store sufficient energy to enable PC-based systems to be reliably shut down.



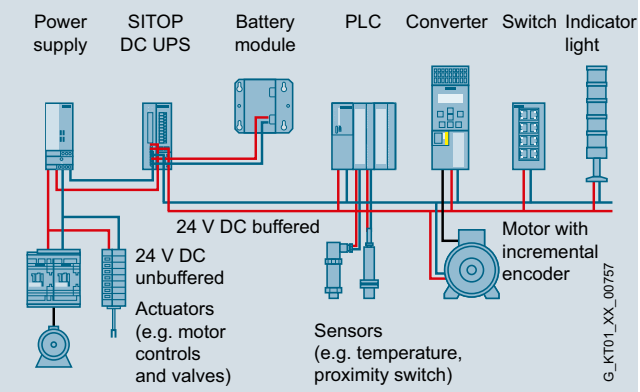
Configuration with SITOP UPS500S: 24 V buffering for backing up process data and performing a controlled shutdown of a PC. To relieve the load on the UPS, the actuators are supplied directly from the power supply unit

Advantages of SITOP DC UPS with capacitors

- Bridging power failures longer than a minute, depending on load current and DC UPS configuration
- Totally maintenance-free double-layer capacitors
- Short charging times
- Long lifetime, also at high ambient temperatures
- No ventilation of the installation location required
- IP65 version for use outside the control cabinet
- Easy PC integration with software tool
- USB interface for PC communication

SITOP DC UPS with battery modules

Compact DC UPS modules ensure continued operation, depending on the capacity of the rechargeable battery and current requirement for periods of hours.



Configuration with SITOP DC UPS and battery module: 24 V buffering to maintain communication, signaling and sensor measured values. To relieve the load on the UPS, the actuators are supplied directly from the power supply unit.

Advantages of SITOP DC UPS with battery modules

- Bridging power failures of a few hours, depending on current requirements
- Long battery lifetime
- Uninterrupted transition from readiness to buffer mode
- Integrated battery management with monitoring of operational readiness, battery feed, age and charge level.
- With serial or USB interface
- Easy PC integration with software tool

DC UPS

SITOP UPS1600 with battery modules

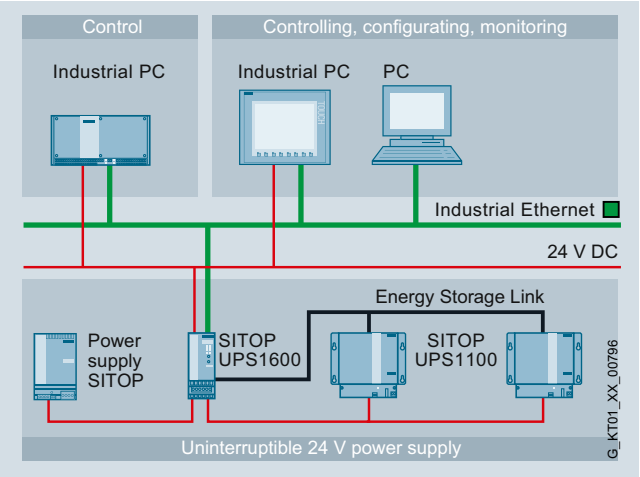
The slim DC UPS module UPS1600 features dynamic overload response, which can be used to activate industrial PCs, for example. The high charging current quickly restores the buffering capacity following a power failure. And for use in stand-alone mode, the UPS can be activated from the battery without input voltage, for example, to start generators via a controller.

It offers open communication via USB or Ethernet/PROFINET and is the first UPS that is fully integrated in TIA.

Advantages of the SITOP UPS1600

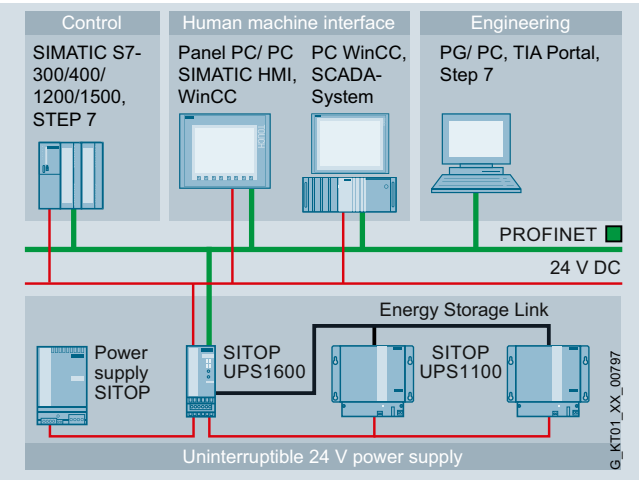
- Compact DC UPS modules SITOP UPS1600 with digital inputs and outputs, USB interface or two Ethernet/PROFINET interfaces
- SITOP UPS1100 battery modules with maintenance-free lead-gel rechargeable battery
- High dynamic overload capability and high charging currents
- Intelligent battery management via energy storage link: automatic detection of battery modules and selection of the optimal, temperature-controlled charging characteristics. Monitoring of operational readiness, battery feed, age and charge level
- All diagnostic data and alarms available via USB and Ethernet/PROFINET
- Start from battery modules when mains voltage is unavailable
- Remote monitoring with integrated web server
- SITOP UPS Manager (free software download) supports configuration and monitoring with PC-based systems
- Full integration in TIA:
  User-friendly engineering in the TIA Portal
  SIMATIC S7 function blocks for integration in user programs (free download)
  Ready-to-use "faceplates" for SIMATIC Panels and SIMATIC WinCC (free download)

Open communication



Configuration and monitoring is performed via the PC software, SITOP UPS Manager. If a power failure occurs, the 24 V buffer and the integration of the DC UPS in Industrial Ethernet enable controlled shutdown of multiple PCs in master/slave mode.

Integration in TIA and TIA Portal



Engineering is simple via the TIA Portal. If a power failure occurs, the 24 V buffer and the integration of the DC UPS in PROFINET enable the controllers to be brought to a defined state independent of one another. The comprehensive diagnostics data of the power supply can be visualized via UPS faceplates.

Overview

With the SITOP Selection Tool, you can select not only your DC power supply, but now also the appropriate uninterruptible power supply (DC UPS) with capacitor or battery technology. The selected products can be ordered via the Industry Mall. You can also find further information such as product data sheets, 3D data or circuit diagram macros.

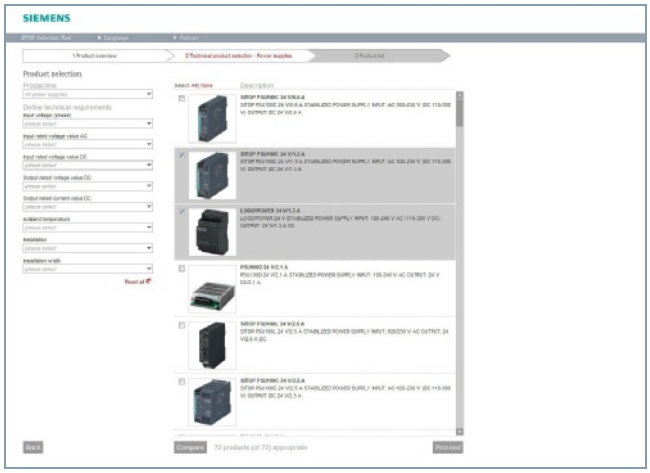
The tool is available on the Internet and in the Industry Mall:
www.siemens.com/sitop-selection-tool
www.siemens.com/industrymall

And this is how you can select,
for example, a ***DC power supply***:

Entering a few technical specifications will automatically select the relevant parameters and show the matching products. You can change the selection parameters any time.

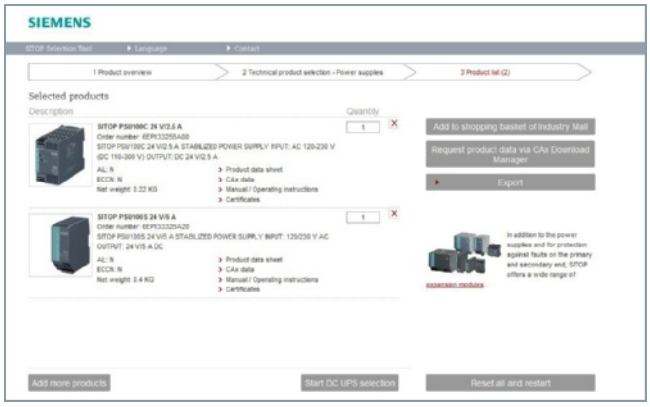
An added support is provided by the possibility to compare several products according to the technical data. You can select between all data, all identical data and all different data. The comparison can also be saved or printed out as a PDF file.

The products thus selected can then be transferred to a product list. You can export this list into several file formats, or even let the Industry Mall adopt this list in the cart.
The product data for all products in the product list can be requested directly via the CAx Download Manager.



First step:
Preselect the relevant power supplies with the help of technical characteristics

2nd step:
To further limit the selection, compare the technical data of several power supplies



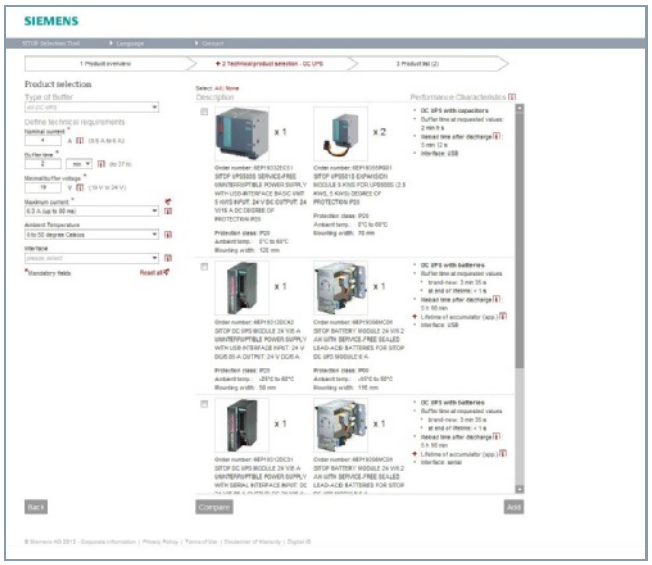
3rd step:
Once you have selected the appropriate products, you can export the data or transfer it directly to the cart of the Industry Mall

SITOP Selection Tool – find the appropriate power supply quickly and easily

Overview (continued)

Following these steps, you can just as easily select the ***appropriate uninterruptible DC power supply (DC UPS)***:

Using appropriate selection parameters such as nominal current, buffer time or buffer voltage (mandatory fields), the appropriate capacitor or battery systems are selected and are then displayed with their performance characteristics. For ease of handling, the tool adjusts the possible input ranges of the selection parameters dynamically. Changes can be made here to the selection parameters at any time. The selection is supported by texts that provide additional information about the required technical features and their relationships.

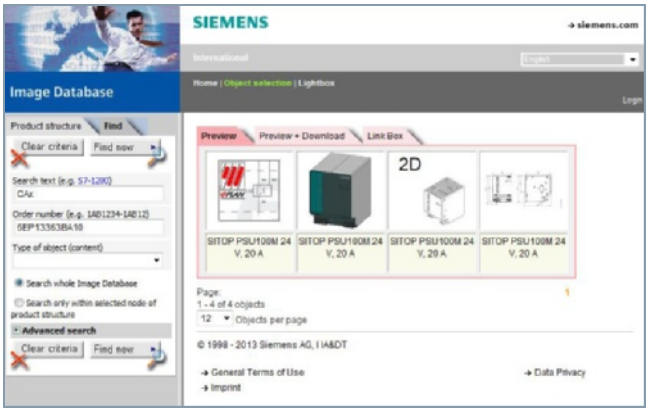


For support with selection, several DC UPS configurations can be compared based on their performance characteristics. The product comparison can be saved or printed out as a PDF file. The relevant DC UPS configuration can then be copied into the product list. It is also possible to select a number of different configurations. The performance data and the requested values can also be displayed here for the selected DC UPS configurations.

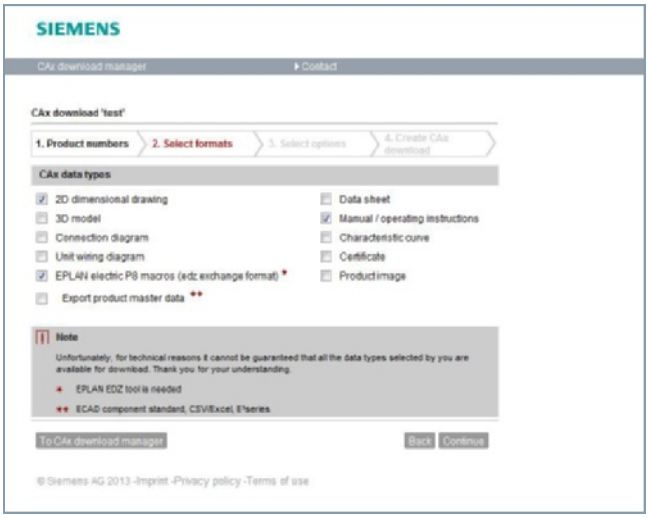
You can then transfer this product list complete with all products directly to the cart of the Industry Mall. If the list is exported as a PDF or Excel file, the performance data and requirement parameters as well as the links to additional product information are also saved. The product data can also be requested directly by means of the CAx Download Manager.

Everything for project planning

Additional information such as 3D data, circuit diagram macros, certificates and operating instructions are available at the click of the mouse. The engineering data can be downloaded in DXF, STEP and EPLAN format and can be used directly for your planning. They are also available via the CAx Download Manager and can be individually selected there as required and called up as a download. You not only save valuable time on planning, but also benefit from traceable documentation.



CAD and CAE data in the industry image database for easy configuration



All the product information is available to download using the CAx Download Manager

Input voltage	Output current	SITOP lite	SITOP compact	LOGO!Power	SITOP smart	SIMATIC design	SITOP modular	Special design - special uses
Output voltage 24 V DC		You will find all the technical specifications for these products on the pages specified below						
1-phase AC								
120 V, 230 V	0.6 A		2/2					
	1.3 A		2/2	2/3				
	2 A					2/3		
	2.1 A							3/2
	2.5 A	3/3	3/3	3/3	3/3	3/3		
	3 A					4/2		
	3.1 A							4/2
	3.5 A					4/2		
	3.7 A		4/3					
	4 A		4/3	4/3				
	4.1 A							4/2
	5 A	5/2			5/2	5/2, 5/3	5/3, 8/2	5/3
	6 A							
	6.2 A							6/2
	8 A					6/2		
	10 A	6/2			6/3	6/3	6/3, 8/3	6/3
	12 A							
	12.5 A							7/2
	20 A				7/2		7/2, 7/3	
	40 A						7/3	
1-phase DC								
48 ... 220 V	0.375 A							2/2
48 ... 110 V	2 A							2/3
24 ... 110 V	2 A					2/3		
110 ... 300 V	0.6 A		2/2					
	1.3 A		2/2	2/3				
	2.5 A		3/2	3/3				
	3.7 A		4/3					
	4 A		4/3	4/3				
120 ... 375 V	2.1 A							
	3.1 A							
	4.1 A							
	6.2 A							
	12 A							
200 ... 900 V	20 A						7/3	
3-phase AC								
400 ... 500 V	5 A						5/3, 8/2	8/2
	8 A							8/2
	10 A				8/3		6/3, 8/3	
	17 A							8/3
	20 A				9/2		7/2, 7/3, 9/2	
	30 A							9/3
	40 A				9/3		7/3, 9/3	

1

Selection tables for power supplies

Input voltage	Output current	SITOP lite	SITOP compact	LOGO!Power	SITOP smart	SIMATIC design	SITOP modular	Special design - special uses
Output voltage 5, 12, 15, 48 V DC		You will find all the technical specifications for these products on the pages specified below						
1-phase AC								
120 V, 230 V	3 - 52 V/2 - 10 A							12/2
	5 V/3 A			12/4				
	5 V/6.3 A			12/4				
	12 V/1.9 A			12/6				
	12 V/2 A		12/6					
	12 V/3 A							12/7
	12 V/4.5 A			12/7				
	12 V/6.5 A		12/7					
	12 V/7 A				12/12			
	12 V/8.3 A							12/12
	12 V/14 A				12/13			
	15 V/1.9 A			12/18				
	15 V/4 A			12/18				
	2 x 15 V/3.5 A							12/18
1-phase DC								
24 V	12 V/2.5 A							12/6
110 ... 300 V	5 V/3 A			12/4				
	5 V/6.3 A			12/4				
	12 V/1.9 A			12/6				
	12 V/2 A		12/6					
	12 V/2.5 A							12/6
	12 V/4.5 A			12/7				
	12 V/6.5 A		12/7					
	15 V/1.9 A			12/18				
	15 V/4 A			12/18				
3-phase AC								
400 ... 500 V	12 V/20 A							12/13
	48 V/10 A						12/21	
	48 V/20 A						12/21	

Customized SITOP products

Overview

Our standard power supplies cannot, of course, satisfy the requirements of every application. We can design an individual power supply for your application-specific requirements. You benefit from the expertise of large-scale production and gain maximum development security and quality.

Our customer-specific solutions are used today in many sectors of mechanical engineering, in automation technology, vehicle electronics, equipment manufacturing, or in industrial instrumentation technology.

If your are interested, please contact your local Siemens office.

SITOP 1-phase 24 V DC, up to 2 A

2

2/2 The smallest ones 0.375 A
2/2 SITOP PSU100C 0.6 A
2/2 SITOP PSU100C 1.3 A
2/3 LOGO!Power 1.3 A
2/3 The S7-300 version 2 A
2/3 The outdoor version 2 A
2/3 The DC/DC converter 2 A
2/8 Ordering data and further information

For AL and ECCN export regulations see page 16/20

Output current up to 2 A

Overview

Product	Special design The smallest ones	SITOP compact PSU100C	SITOP compact PSU100C
Power supply, type	0.375 A	0.6 A	1.3 A
Order No.	6EP1731-2BA00 [1]	6EP1331-5BA00	6EP1331-5BA10
The product families are highlighted in the same color. For an explanation of the product families, see chapter 1, pages 1/8 through 1/12.			
	The optimum power supply for automation solutions in the lowest performance range; with wide-range input for 48-220 V DC; thanks to their compact and slim design, they are particularly suitable for solutions where space is limited and in conjunction with low-voltage switchgear.	Slim power supply unit for the lower performance range, e.g. for distributed use in control boxes. Low energy consumption thanks to high efficiency across the entire performance range as well as minimum energy losses at no-load and connections with removable terminals.	Slim power supply unit for the lower performance range, e.g. for distributed use in control boxes. Low energy consumption thanks to high efficiency across the entire performance range as well as minimum energy losses at no-load and connections with removable terminals.

Technical specifications

Product	Special design The smallest ones	SITOP compact PSU100C	SITOP compact PSU100C
Input			
Rated voltage value $U_{in\ rated}$	DC voltage **48 ... 220 V DC**	1-phase AC or DC **100 ... 230 V AC**	1-phase AC or DC **100 ... 230 V AC**
Supply voltage • 1 for AC rated value • 2 for AC rated value • for DC • Comment			
Input voltage • 1 for AC • 2 for AC • for DC Voltage range Overvoltage resistance Mains buffering at $I_{out\ rated}$, min. Mains buffering Rated line frequency value • 1 • 2 Line frequency range	 30 ... 264 V 30 ... 187 V – 10 ms *at* U_{in} = 220 V 	 110 ... 300 V 85 ... 264 V 2.3 x $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 230 V 50 Hz 60 Hz 47 … 63 Hz	 110 ... 300 V 85 ... 264 V 2.3 x $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 230 V 50 Hz 60 Hz 47 ... 63 Hz
Input current at rated value of input voltage • 24 V rated value • 48 V rated value • 100 V rated value • 110 V rated value • 120 V rated value • 220 V rated value • 230 V rated value	 0.3 A 0.06 A 	 0.28 A 0.18 A	 0.63 A 0.31 A
Switch-on current limit (+25 °C) Duration of the switch-on current limit at 25 °C max. I^2t, *max.*	max. 35 A 3 ms 1.2 A^2s	max. 28 A 0.7 A^2s	max. 34 A 1.2 A^2s
Built-in incoming fuse Protection in the mains power input (IEC 898)	F 4 A/250 V (not accessible) Recommended miniature circuit breaker: 6 A or higher, characteristic C, suitable for DC	Internal Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C	Internal Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C
Output			
Output Rated voltage $U_{out\ rated\ DC}$	Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**
Total tolerance, static ± • Static mains compensation, approx. • Static load compensation, approx.	3 % 0.1 % 0.1 %	3 % 0.1 % 0.2 %	3 % 0.1 % 0.2 %

[1] SIPLUS module, see page 14/3.

LOGO!Power	SITOP in SIMATIC design The S7-300 version	SITOP in SIMATIC design The outdoor version	Special design The DC/DC converter
1.3 A	2 A	2 A	2 A
6EP1331-1SH03 [1]	6ES7307-1BA01-0AA0	6ES7305-1BA80-0AA0 [1]	6EP1732-0AA00
			
The LOGO!Power power supply is optimally matched in design and functionality to the LOGO! logic modules with 24 V DC inputs. The narrowest 24 V LOGO!Power version can be used universally for low current consumption up to 1.3 A.	The proven power supply in SIMATIC S7-300 design; with PS-CPU connecting comb and for mounting direct on S7 rail.	The power supply unit for extreme environmental conditions in SIMATIC S7-300 design; can be snapped onto S7 rail; with PS-CPU connecting comb.	The DC/DC converter for supply from battery and DC systems; with a wide input voltage range from 38 to 121 V DC.
1-phase AC or DC **100 ... 240 V AC**	1-phase AC **120/230 V AC** 120 V 230 V Automatic range switchover	DC voltage **24 ... 110 V DC** 24 ... 110 V	DC voltage **48 ... 110 V DC** **48 ... 110 V**
  110 ... 300 V 85 … 264 V 2.3 × $U_{in\ rated}$, 1.3 ms 40 ms at U_{in} = 187 V 50 Hz 60 Hz 47 ... 63 Hz	 85 … 132 V 170 … 264 V 2.3 × $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 93/187 V 50 Hz 60 Hz 47 … 63 Hz	 16.8 … 138 V 154 V; 0.1 s 10 ms at $U_{in\ rated}$	 38 … 121 V – 5 ms at U_{in} = 48 V –
    0.7 A 0.35 A	 0.9 A 0.5 A	 2.4 A 0.6 A	 1.2 A 0.5 A
max. 25 A 0.8 A^2s	max. 22 A 3 ms 1 A^2s	max. 20 A 10 ms 5 A^2s	max. 33 A
Internal Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C	T 1.6 A/250 V (not accessible) Recommended miniature circuit breaker: 3 A, Characteristic C	T 6.3 A/250 V (not accessible) Recommended miniature circuit breaker: 10 A or higher, characteristic C, suitable for DC	T 2.5 A (not accessible) Recommended miniature circuit breaker: 10 to 25 A, characteristic B, or 6 to 25 A, characteristic C, suitable for DC
Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**
3 % 0.1 % 1.5 %	3 % 0.1 % 0.2 %	3 % 0.2 % 0.4 %	1 % 0.1 % 0.4 %

[1] SIPLUS module, see page 14/3.

Output current up to 2 A

Technical specifications (continued)

Product	Special design The smallest ones	SITOP compact PSU100C	SITOP compact PSU100C
Power supply, type	**0.375 A**	**0.6 A**	**1.3 A**
Order No.	**6EP1731-2BA00**	**6EP1331-5BA00**	**6EP1331-5BA10**
Output (continued)			
Residual ripple, peak-peak Spikes (bandwidth approx. 20 MHz)	Max. 150 mV (typ. 50 mV) Max. 240 mV (typ. 50 mV)	Max. 200 mV (typ. 40 mV) Max. 300 mV (typ. 20 mV)	Max. 200 mV (typ. 25 mV) Max. 300 mV (typ. 20 mV)
Adjustment range Settable output voltage Output voltage adjustment Status display On/off behavior	 No – Green LED for 24 V OK No overshoot of U_{out} (soft start)	 No – Green LED for output voltage OK Overshoot of U_{out} approx. 5 %	22.2 ... 26.4 V Yes via potentiometer Green LED for output voltage OK Overshoot of U_{out} approx. 5 %
Startup delay, max. Voltage rise, typ. Rated current $I_{out\ rated}$ Current range • Comment	2.5 s 90 ms **0.375 A** 0 … 0.375 A +60 ... +70 °C: Derating 3%/K	1 s 25 ms **0.6 A** 0 … 0.6 A +55 ... +70 °C: Derating 3%/K	0.6 s 90 ms **1.3 A** 0 … 1.3 A +55 ... +70 °C: Derating 3%/K
Typical power output Temporary overload current • in the event of a short circuit during startup, typical • in the event of a short circuit during operation, typical Duration of overload capability overcurrent • in the event of a short circuit during startup • in the event of a short circuit during operation	9 W 2.7 A 200 ms	14 W 1 A	30 W 3.1 A
Parallel switching for enhanced performance Number of devices that can be switched in parallel to enhance performance, units	No	No	Yes 2
Efficiency			
Efficiency at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$ Power loss at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	66 % 4.6 W	82 % 2.6 W	86 % 4.5 W
Closed-loop control			
Dyn. mains compensation ($U_{in\ rated}$ ± 15 %), max. Dynamic load compensation (I_{out}: 10/90/10 %), U_{out} ± typ. Dynamic load compensation (I_{out}: 50/100/50 %), U_{out} ± typ.	0.3 % 0.4 %	0.1 % 3 %	0.1 % 3 %
Load step settling time • 10 to 90 %, typ. • 50 to 100 %, typ. • 90 to 10 %, typ. • 100 to 50 %, typ. Settling time, maximum	 2 ms 2 ms	 3 ms 3 ms	 5 ms 5 ms
Protection and monitoring			
Output overvoltage protection Current limitation, typ. Property of the output, short-circuit-proof	Yes, according to EN 60950-1 0.41 ... 0.49 A Yes	Yes, according to EN 60950-1 0.7 A Yes	Yes, according to EN 60950-1 1.4 A Yes
Short-circuit protection Sustained short-circuit current maximum rms value Overload/short-circuit indicator	Electronic shutdown, automatic restart 0.9 A –	Electronic shutdown, automatic restart –	Electronic shutdown, automatic restart –
Safety			
Primary/secondary isolation Isolation Protection class	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I
Leakage current • Maximum • Typical	 3.5 mA	 3.5 mA 0.4 mA	 3.5 mA 0.4 mA

LOGO!Power	SITOP in SIMATIC design The S7-300 version	SITOP in SIMATIC design The outdoor version	Special design The DC/DC converter
1.3 A	2 A	2 A	2 A
6EP1331-1SH03	6ES7307-1BA01-0AA0	6ES7305-1BA80-0AA0	6EP1732-0AA00
Max. 200 mV (typ. 10 mV) Max. 300 mV (typ. 20 mV)	Max. 50 mV (typ. 5 mV) Max. 150 mV (typ. 20 mV)	Max. 150 mV (typ. 30 mV) Max. 240 mV (typ. 150 mV)	Max. 100 mV Max. 300 mV
22.2 ... 26.4 V Yes via potentiometer Green LED for output voltage OK No overshoot of U_{out} (soft start)	 No – Green LED for 24 V OK No overshoot of U_{out} (soft start)	 No Green LED for 24 V OK No overshoot of U_{out} (soft start)	23.5 ... 26.5 V Yes via potentiometer Green LED for 24 V OK Overshoot of U_{out} on startup max. 25 V
0.5 s 15 ms **1.3 A** 0 … 1.3 A +55 ... +70 °C: Derating 2%/K	2 s 10 ms **2 A** 0 … 2 A	3 s 5 ms **2 A** 0 … 3 A 3 A up to +60 °C for U_{in}> 24 V	3 s 30 ms **2 A** 0 … 2 A
30 W	48 W 9 A 9 A 90 ms 90 A	48 W 9 A 9 A 270 ms 270 ms	48 W
Yes 2	Yes	Yes 2	Yes 2
85 % 6 W	84 % 9 W	75 % 16 W	84 % 9 W
0.2 % 1 %	0.1 % 0.8 %	0.3 % 2.5 %	0.3 % 0.8 %
1 ms 1 ms	 0.5 ms 0.5 ms 1 ms	 2.5 ms 2.5 ms 5 ms	 2.5 ms 2.5 ms
Yes, according to EN 60950-1 1.7 A Yes	Additional control loop, shutdown at < 28.8 V, automatic restart 2.2 ... 2.6 A Yes	Additional control loop, shutdown at approx. 30 V, automatic restart 3.3 ... 3.9 A Yes	Yes, suppressor diode at output 2.1 ... 3 A Yes
Constant current characteristic 2.4 A –	Electronic shutdown, automatic restart 2 A –	Electronic shutdown, automatic restart 2 A –	Electronic shutdown, automatic restart 2 A –
Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class II (without protective conductor)	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178, creepage distances and clearances > 5 mm Class I	Yes SELV output voltage U_{out} according to EN 60950-1 Class I
	 3.5 mA 0.5 mA	 3.5 mA 0.7 mA	 3.5 mA 0.7 mA

Technical specifications (continued)

Product	Special design The smallest ones	SITOP compact PSU100C	SITOP compact PSU100C
Power supply, type	0.375 A	0.6 A	1.3 A
Order No.	6EP1731-2BA00	6EP1331-5BA00	6EP1331-5BA10
Safety (continued)			
CE mark	Yes	Yes	Yes
UL/CSA approval UL/cUL (CSA) approval	Yes cULus-listed (UL 508, CSA C22.2 No. 142), File E143289, cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC Class 2	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC Class 2
Explosion protection FM approval CB approval Marine approval Degree of protection (EN 60529)	– – No – IP20	ATEX (EX) II 3G Ex nA IIC T4; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4 – Yes GL, ABS IP20	ATEX (EX) II 3G Ex nA IIC T4; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4 – Yes GL, ABS IP20
EMC			
Emitted interference Supply harmonics limitation Noise immunity	EN 55022 Class B Not applicable EN 61000-6-2	EN 55022 Class B Not applicable EN 61000-6-2	EN 55022 Class B Not applicable EN 61000-6-2
Operating data			
Ambient temperature • During operation - Comment • During transport • During storage Humidity class according to EN 60721	 -25 ... +70 °C with natural convection -40 … +70 °C -40 … +70 °C Climate class 3K3, without condensation	 -20 ... +70 °C with natural convection -40 ... +85 °C -40 ... +85 °C Climate class 3K3, without condensation	 -20 ... +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation
Mechanics			
Connection method Connections • Supply input • Output • Auxiliary contacts	Screw terminals L+1, M1, PE: 1 screw terminal each for 0.5 ... 2.5 mm² solid/finely stranded +: 1 screw terminal for 0.5 ... 2.5 mm²; -: 2 screw terminals for 0.5 ... 2.5 mm² –	Screw terminals L, N, PE: Removable screw terminal each for 1 x 0.5 ... 2.5 mm² +: 1 screw terminal for 0.5 ... 2.5 mm²; -: 2 screw terminals for 0.5 ... 2.5 mm² –	Screw terminals L, N, PE: Removable screw terminal each for 1 x 0.5 ... 2.5 mm² +: 1 screw terminal for 0.5 ... 2.5 mm²; -: 2 screw terminals for 0.5 ... 2.5 mm² –
Width of enclosure Height of enclosure Depth of enclosure Mounting width Mounting height Weight, approx. Product property of the enclosure: side-by-side enclosure	22.5 mm 80 mm 91 mm 22.5 mm 180 mm 0.14 kg Yes	22.5 mm 80 mm 100 mm 22.5 mm 180 mm 0.12 kg Yes	30 mm 80 mm 100 mm 30 mm 180 mm 0.17 kg Yes
Type of mounting • Wall mounting • DIN rail mounting • S7-300 rail mounting Installation Electrical accessories Mechanical accessories	 No Yes No Snaps onto DIN rail EN 60715 35x7.5/15	 No Yes No Snaps onto DIN rail EN 60715 35x7.5/15 Removable spring-loaded terminal 6EP1971-5BA00	 No Yes No Snaps onto DIN rail EN 60715 35x7.5/15 Removable spring-loaded terminal 6EP1971-5BA00

LOGO!Power	SITOP in SIMATIC design The S7-300 version	SITOP in SIMATIC design The outdoor version	Special design The DC/DC converter
1.3 A	2 A	2 A	2 A
6EP1331-1SH03	6ES7307-1BA01-0AA0	6ES7305-1BA80-0AA0	6EP1732-0AA00
Yes	Yes	Yes	Yes
Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC Class 2	Yes cULus-listed (UL 508, CSA C22.2 No. 142), File E143289	Yes UL-listed (UL 508), File E143289, CSA (CSA C22.2 No. 142)	Yes cULus-listed (UL 508, CSA C22.2 No. 142), File E179336
ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4 Class I Div. 2, Group ABCD, T4 Yes GL, ABS, DNV, LRS, BV IP20	ATEX (EX) II 3G Ex nA II T4; cULus (ISA 12.12.01, CSA C22.2 No.213) Class I Div. 2 Group ABCD T4, File E330455 Class I Div. 2, Group ABCD, T4 No in S7-300 system IP20	– – No – IP20	– – No – IP20
EN 55022 Class B Not applicable EN 61000-6-2	EN 55022 Class B Not applicable EN 61000-6-2	EN 55011 Class A Not applicable EN 61000-6-2	EN 55022 Class B Not applicable EN 61000-6-2
–20 ... +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	0 ... + 60 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	-25 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K5, transient condensation permitted	0 ... +70 °C with natural convection -40 … +70 °C -40 … +70 °C Climate class 3K3, without condensation
Screw terminals L, N: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.5 ... 2.5 mm^2 –	Screw terminals L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded L+, M: 2 screw terminals each for 0.5 ... 2.5 mm^2 –	Screw terminals L+1, M1, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded L+, M: 3 screw terminals each for 0.5 ... 2.5 mm^2 –	Screw terminals L+1, M1, PE: 1 screw terminal each for 2 x 0.5 mm ... 2.5/1.5 mm^2 solid/finely stranded L+, M: 1 screw terminal each for 2 × 0.5 ... 2.5 mm^2 –
54 mm 90 mm 55 mm 54 mm 130 mm 0.17 kg Yes	40 mm 125 mm 120 mm 40 mm 205 mm 0.4 kg Yes	80 mm 125 mm 120 mm 80 mm 225 mm 0.57 kg Yes	80 mm 135 mm 120 mm 80 mm 235 mm 0.5 kg Yes
No Yes No Snaps onto DIN rail EN 60715 35x7.5/15	No No Yes Can be mounted onto S7 rail Mounting adapter for DIN rail (6EP1971-1BA00)	No No Yes Can be mounted onto S7 rail Mounting adapter for DIN rail (6ES7390-6BA00-0AA0)	No Yes No Snaps onto DIN rail EN 60715 35x15

Output current up to 2 A

Selection and ordering data

Product	Input Voltage $U_{in\ rated}$	Output Voltage $U_{out\ rated}$	Current $I_{out\ rated}$	Order No.	Price
Special design, the smallest ones					
	**48 - 220 V DC**	**24 V DC**	0.375 A	**6EP1731-2BA00**	
SITOP compact, PSU100C					
	**100 - 230 V AC**	**24 V DC**	0.6 A	**6EP1331-5BA00**	
	100 - 230 V AC	**24 V DC**	1.3 A	**6EP1331-5BA10**	
LOGO!Power					
	**100 - 240 V AC**	**24 V DC**	1.3 A	**6EP1331-1SH03**	
SITOP in SIMATIC design, S7-300 version					
	**120/230 V AC**	**24 V DC**	2 A	**6ES7307-1BA01-0AA0**	
SITOP in SIMATIC design, Outdoor version					
	**24 - 110 V DC**	**24 V DC**	2 A	**6ES7305-1BA80-0AA0**	
Special design, The DC/DC converter					
	**48 - 110 V DC**	**24 V DC**	2 A	**6EP1732-0AA00**	

Further information

You can find additional information in the Internet at:

- 2D dimensional drawings, 3D CAD data, circuit diagram macros:
  www.siemens.com/sitop-cax
- Operating instructions:
  www.siemens.com/sitop-manuals
- SITOP Selection Tool:
  www.siemens.com/sitop-selection-tool

SITOP 1-phase
24 V DC, 2.1 A and 2.5 A

3

3/2 PSU100D 2.1 A
3/2 SITOP PSU100L 2.5 A
3/2 SITOP PSU100C 2.5 A
3/3 LOGO!Power 2.5 A
3/3 SITOP PSU100S 2.5 A
3/3 The S7-1200 version 2.5 A
3/8 Ordering data and further information

For AL and ECCN export regulations
see page 16/20

Output currents 2.1 A and 2.5 A

Overview

Product	Special design PSU100D	SITOP lite PSU100L	SITOP compact PSU100C
Power supply, type	2.1 A	2.5 A	2.5 A
Order No.	6EP1331-1LD00	6EP1332-1LB00	6EP1332-5BA00
The product families are highlighted in the same color. For an explanation of the product families, see chapter 1, pages 1/8 through 1/12			
	The low-cost power supply in flat aluminum housing can be screwed directly on a wall in various mounting positions; with wide-range input for global use.	The low-cost power supply for standard requirements in industrial environments; slim design; manual switchover of input voltage range.	Slim power supply unit for the lower performance range, e.g. for distributed use in control boxes. Low energy consumption thanks to high efficiency across the entire performance range as well as minimum energy losses at no-load and connections with removable terminals.

Technical specifications

Product	Special design PSU100D	SITOP lite PSU100L	SITOP compact PSU100C
Input			
Rated voltage value $U_{in\ rated}$	1-phase AC **100 ... 240 V AC**	1-phase AC **120/230 V AC**	1-phase AC or DC **100 ... 230 V AC**
Supply voltage			
• 1 for AC rated value		120 V	
• 2 for AC rated value		230 V	
• Comment		Set by means of selector switch on device	
Input voltage			
• 1 for AC		93 … 132 V	
• 2 for AC		187 … 264 V	
• for DC			110 ... 300 V
Voltage range	85 … 264 V		85 ... 264 V
Overvoltage resistance		2.3 × $U_{in\ rated}$, 1.3 ms	2.3 x $U_{in\ rated}$, 1.3 ms
Mains buffering at $I_{out\ rated}$, min.	15 ms	20 ms	20 ms
Mains buffering	at U_{in} = 115/230 V	at U_{in} = 93/187 V	at U_{in} = 230 V
Rated line frequency value			
• 1	50 Hz	50 Hz	50 Hz
• 2	60 Hz	60 Hz	60 Hz
Line frequency range	47 … 63 Hz	47 … 63 Hz	47 … 63 Hz
Input current at rated value of input voltage			
• 100 V rated value	1.1 A		1.21 A
• 120 V rated value		1.1 A	
• 230 V rated value		0.65 A	0.67 A
• 240 V rated value	0.7 A		
Switch-on current limit (+25 °C)	max. 60 A	max. 27 A	max. 31 A
Duration of the switch-on current limit at 25 °C max.		3 ms	
I^2t, *max.*	1.2 A^2s	0.3 A^2s	2.4 A^2s
Built-in incoming fuse	Internal	T 2 A/250 V (not accessible)	Internal
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 10 A or higher, characteristic C or 16 A or higher, characteristic B	Recommended miniature circuit breaker: 3 A characteristic C	Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C
Output			
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $U_{out\ rated\ DC}$	**24 V**	**24 V**	**24 V**
Total tolerance, static ±	2 %	3 %	3 %
• Static mains compensation, approx.	0.5 %	0.1 %	0.1 %
• Static load compensation, approx.	1 %	0.5 %	0.2 %

LOGO!Power	SITOP smart PSU100S	SITOP in SIMATIC design The S7-1200 version
2.5 A	2.5 A	2.5 A
6EP1332-1SH43 [1]	6EP1332-2BA20	6EP1332-1SH71 [1]
		
LOGO!Power supplies are optimally matched in design and functionality to the LOGO! logic modules. This 24 V LOGO!Power version can be universally used for power requirements up to 2.5 A.	High-performance, standard power supply for 1-phase 120/230 V AC grids, with automatic range switching; high overload capability through extra power with 1.5 times the rated current for 5 s and continuous 120 % output power up to +45 °C ambient temperature.	The power supply PM1207 (Power Module) is optimized for the new SIMATIC S7-1200 controllers in terms of design and functionality and serves as an external supply for the inputs and outputs which, to prevent an imbalance, must not be drawn from the CPU encoder supply.

LOGO!Power	SITOP smart PSU100S	SITOP in SIMATIC design The S7-1200 version
1-phase AC or DC **100 ... 240 V AC**	1-phase AC **120/230 V AC** 120 V 230 V Automatic range switchover	1-phase AC **120/230 V AC** 120 V 230 V Automatic range switchover
  110 ... 300 V 85 ... 264 V 2.3 x $U_{in\ rated}$, 1.3 ms 40 ms at U_{in} = 187 V 50 Hz 60 Hz 47 ... 63 Hz	 85 … 132 V 170 … 264 V 2.3 x $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 93/187 V 50 Hz 60 Hz 47 … 63 Hz	 85 … 132 V 176 … 264 V 2.3 × $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 93/187 V 50 Hz 60 Hz 47 ... 63 Hz
  1.22 A 0.66 A	 1.25 A 0.74 A	 1.2 A 0.67 A
max. 46 A 3 A^2s	max. 33 A 0.4 A^2s	max. 13 A 3 ms 0.5 A^2s
Internal Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C	T 3.15 A/250 V (not accessible) Recommended miniature circuit breaker: 3 A or higher, characteristic C	T 3.15 A/250 V (not accessible) Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C
Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**
3 % 0.1 % 1.5 %	3 % 0.1 % 1 %	3 % 0.1 % 0.2 %

[1] SIPLUS module, see page 14/3

Output currents 2.1 A and 2.5 A

Technical specifications (continued)

Product	Special design PSU100D	SITOP lite PSU100L	SITOP compact PSU100C
Power supply, type	2.1 A	2.5 A	2.5 A
Order No.	6EP1331-1LD00	6EP1332-1LB00	6EP1332-5BA00
Output (continued)			
Residual ripple, peak-peak Spikes (bandwidth approx. 20 MHz)	Max. 100 mV Max. 100 mV	Max. 150 mV (typ. 10 mV) Max. 240 mV (typ. 50 mV)	Max. 200 mV (typ. 55 mV) Max. 300 mV (typ. 50 mV)
Adjustment range Settable output voltage Output voltage adjustment Status display Signaling On/off behavior	22 … 28 V Yes via potentiometer Green LED for 24 V OK Overshoot of U_{out} < 2 %	22.8 … 26.4 V Yes via potentiometer Green LED for 24 V OK Overshoot of U_{out} approx. 4 %	22.2 ... 26.4 V Yes via potentiometer Green LED for output voltage OK Overshoot of U_{out} approx. 1 %
Startup delay, max. • Comment Voltage rise, typ. Maximum voltage rise time of the output voltage	1 s 30 ms	1.5 s 150 ms	0.7 s 100 ms
Rated current $I_{out\ rated}$ Current range • Comment	**2.1 A** 0 … 2.1 A +50 ... +70 °C: Derating 2.5%/K	**2.5 A** 0 … 2.5 A +45 ... +60 °C: Derating 2%/K	**2.5 A** 0 … 2.5 A +50 ... +70 °C: Derating 3.5%/K
Typical power output Temporary overload current • in the event of a short circuit during startup, typical • in the event of a short circuit during operation, typical Duration of overload capability overcurrent • in the event of a short circuit during startup • in the event of a short circuit during operation	50 W	60 W	60 W
Parallel switching for enhanced performance Number of devices that can be switched in parallel to enhance performance, units	Yes 2	Yes 2	Yes 2
Efficiency			
Efficiency at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$ Power loss at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	86 % 8 W	85 % 9 W	87 % 9 W
Closed-loop control			
Dyn. mains compensation ($U_{in\ rated}$ ± 15 %), max. Dynamic load compensation (I_{out}: 10/90/10 %), U_{out} ± typ. Dynamic load compensation (I_{out}: 50/100/50 %), U_{out} ± typ.	0.5 % 5 %	0.3 % 2 %	0.1 % 3 %
Load step settling time • 10 to 90 %, typ. • 50 to 100 %, typ. • 90 to 10 %, typ. • 100 to 50 %, typ. Settling time, maximum		0.5 ms 0.7 ms	4 ms 4 ms
Protection and monitoring			
Output overvoltage protection Current limitation Current limitation, typ. Property of the output, short-circuit-proof	< 35 V 2.5 A Yes	< 33 V 2.6 A Yes	Yes, according to EN 60950-1 3 A Yes
Short-circuit protection Sustained short-circuit current rms value • Maximum • Typical • Comment Overload/short-circuit indicator	Electronic shutdown, automatic restart 6 A –	Constant current characteristic 4 A –	Electronic shutdown, automatic restart –

LOGO!Power	SITOP smart PSU100S	SITOP in SIMATIC design The S7-1200 version
2.5 A	**2.5 A**	**2.5 A**
6EP1332-1SH43	**6EP1332-2BA20**	**6EP1332-1SH71**
Max. 200 mV (typ. 10 mV)	Max. 150 mV (typ. 30 mV)	Max. 150 mV
Max. 300 mV (typ. 50 mV)	Max. 240 mV (typ. 70 mV)	Max. 240 mV
22.2 ... 26.4 V	22.8 … 28 V	
Yes	Yes	No
via potentiometer	via potentiometer	–
Green LED for output voltage OK	Green LED for 24 V OK	Green LED for 24 V OK
	Relay contact (NO contact, rating 60 V DC/0.3 A) for 24 V OK	
No overshoot of U_{out} (soft start)	Overshoot of U_{out} < 3 %	No overshoot of U_{out} (soft start)
0.5 s	0.3 s	6 s
		2 s at 230 V, 6 s at 120 V
10 ms	15 ms	10 ms
2.5 A	**2.5 A**	**2.5 A**
0 … 2.5 A	0 … 3 A	0 … 2.5 A
+55 ... +70 °C: Derating 2%/K	3 A up to +45 °C; +60 ... +70 °C: Derating 3%/K	
60 W	60 W	60 W
	9 A	6 A
	9 A	6 A
	100 ms	100 ms
	800 ms	100 ms
Yes	Yes	Yes
2	2	2
88 %	85%	83 %
8 W	10 W	12 W
0.2 %	0.3 %	0.3 %
2 %		
	5 %	3 %
1 ms	1 ms	
		5 ms
1 ms	1 ms	
		5 ms
		5 ms
Yes, according to EN 60950-1	In the event of an internal fault	< 33 V
	U_{out} < 33 V	
	3 … 3.4 A	
3.3 A		2.65 A
Yes	Yes	Yes
Constant current characteristic	Constant current characteristic	Constant current characteristic
4.8 A		
	3.4 A	2.7 A
	Overload capability 150 % $I_{out\ rated}$ up to 5 s/min	
–	–	–

Output currents 2.1 A and 2.5 A

Technical specifications (continued)

Product	Special design PSU100D	SITOP lite PSU100L	SITOP compact PSU100C
Power supply, type	**2.1 A**	**2.5 A**	**2.5 A**
Order No.	**6EP1331-1LD00**	**6EP1332-1LB00**	**6EP1332-5BA00**
Safety			
Primary/secondary isolation	Yes	Yes	Yes
Isolation	SELV output voltage U_{out} according to EN 60950-1	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1 and EN 50178
Protection class	Class I	Class I	Class I
Leakage current			
• Maximum	3.5 mA	3.5 mA	3.5 mA
• Typical	1 mA	0.4 mA	0.4 mA
CE mark	Yes	Yes	Yes
UL/CSA approval	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1) File E197259, cURus (UL 60950-1, CSA C22.2 No. 60950-1) File E151273	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC Class 2
Explosion protection	–	–	ATEX (EX) II 3G Ex nA IIC T4; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4
FM approval	–	–	–
CB approval	Yes		Yes
Marine approval	–	–	GL, ABS
Degree of protection (EN 60529)	IP20	IP20	IP20
EMC			
Emitted interference	EN 55022 Class B	EN 55022 Class A	EN 55022 Class B
Supply harmonics limitation	Not applicable	Not applicable	Not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data			
Ambient temperature			
• During operation	-10 … +70 °C	0 ... + 60 °C	-20 ... +70 °C
- Comment	with natural convection	with natural convection	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
Humidity class according to EN 60721		Climate class 3K3, without condensation	Climate class 3K3, without condensation
Mechanics			
Connection method	Screw terminals	Screw terminals	Screw terminals
Connections			
• Supply input	L, N, PE: 1 screw terminal each for 0.3 ... 1.3 mm² solid/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm² solid/finely stranded	L, N, PE: removable screw terminal each for 1 x 0.5 ... 2.5 mm²
• Output	+, -: 1 screw terminal each for 0.3 ... 1.3 mm²	+, -: 2 screw terminals each for 0.5 ... 2.5 mm²	+: 1 screw terminal for 0.5 ... 2.5 mm², -: 2 screw terminals for 0.5 ... 2.5 mm²
• Auxiliary contacts	–	–	–
Width of enclosure	97 mm	32.5 mm	45 mm
Height of enclosure	128 mm	125 mm	80 mm
Depth of enclosure	38 mm	120 mm	100 mm
Mounting width		32.5 mm	45 mm
Mounting height		225 mm	180 mm
Weight, approx.	0.35 kg		0.22 kg
Product property of the enclosure: side-by-side enclosure		Yes	Yes
Type of mounting			
• Wall mounting	Yes	No	No
• DIN rail mounting	No	Yes	Yes
• S7-300 rail mounting	No	No	No
Installation	Wall mounting	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Electrical accessories			Removable spring-loaded terminal 6EP1971-5BA00

LOGO!Power	SITOP smart PSU100S	SITOP in SIMATIC design The S7-1200 version
2.5 A	2.5 A	2.5 A
6EP1332-1SH43	6EP1332-2BA20	6EP1332-1SH71
Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class II (without protective conductor) Yes	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I 3.5 mA 0.4 mA Yes	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I 3.5 mA Yes
Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC Class 2	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259, cCSAus (CSA C22.2 No. 60950-1, UL 60950-1, UL 1604)	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950-1, CSA C22.2 No. 60950-1) File E151273
ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4 Class I, Div. 2, Group ABCD, T4 Yes GL, ABS, DNV, LRS, BV IP20	ATEX (EX) II 3G Ex nA nC IIC T4 Gc; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4 – Yes GL, BV IP20	ATEX (EX) II 3G Ex nA II T4; cULus (ISA 12.12.01, CSA C22.2 No.213) Class I Div. 2 Group ABCD T4, File E330455 Class I, Div. 2, Group ABCD, T4 Yes GL, ABS, BV, DNV, LRS, NK IP20
EN 55022 Class B Not applicable EN 61000-6-2	EN 55022 Class B Not applicable EN 61000-6-2	EN 55022 Class B Not applicable EN 61000-6-2
-20 ... +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	-10 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	0 … +60 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation
Screw terminals L, N: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.5 ... 2.5 mm^2 –	Screw terminals L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.5 ... 2.5 mm^2 Alarm signals: 2 screw terminals for 0.5 ... 2.5 mm^2	Screw terminals L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 L+, M: 2 screw terminals each for 0.5 ... 2.5 mm^2 –
72 mm 90 mm 52.6 mm 72 mm 130 mm 0.25 kg Yes	32.5 mm 125 mm 120 mm 32.5 mm 225 mm 0.32 kg Yes	70 mm 100 mm 75 mm 70 mm 140 mm 0.3 kg Yes
No Yes No Snaps onto DIN rail EN 60715 35x7.5/15	No Yes No Snaps onto DIN rail EN 60715 35x7.5/15 Buffer module (Chapter 10)	Yes Yes No Snaps onto DIN rail EN 60715 35x7.5/15, wall mounting

Output currents 2.1 A and 2.5 A

Selection and ordering data

Product	Input Voltage $U_{in\ rated}$	Output Voltage $U_{out\ rated}$	Current $I_{out\ rated}$	Order No.	Price
Special design, PSU100D					
	**100 ... 240 V AC**	**24 V DC**	2.1 A	**6EP1331-1LD00**	
SITOP lite, PSU100L					
	**120/230 V AC**	**24 V DC**	2.5 A	**6EP1332-1LB00**	
SITOP compact, PSU100C					
	**100 ... 230 V AC**	**24 V DC**	2.5 A	**6EP1332-5BA00**	
LOGO!Power					
	**100 ... 240 V AC**	**24 V DC**	2.5 A	**6EP1332-1SH43**	
SITOP smart, PSU100S					
	**120/230 V AC**	**24 V DC**	2.5 A	**6EP1332-2BA20**	
SITOP in SIMATIC design, S7-1200 version					
	**120/230 V AC**	**24 V DC**	2.5 A	**6EP1332-1SH71**	

Further information

You can find additional information in the Internet at:

- 2D dimensional drawings, 3D CAD data, circuit diagram macros:
  www.siemens.com/sitop-cax
- Operating instructions:
  www.siemens.com/sitop-manuals
- SITOP Selection Tool:
  www.siemens.com/sitop-selection-tool

SITOP 1-phase 24 V DC, 3 to 4.1 A

4

4/2 The S7-1500 version 3 A
4/2 PSU100D 3.1 A
4/2 The S7-200 version 3.5 A
4/3 SITOP PSU100C 3.7 A
4/3 SITOP PSU100C 4 A
4/3 LOGO!Power 4 A
4/3 PSU100D 4.1 A
4/8 Ordering data and further information

For AL and ECCN export regulations see page 16/20

Output currents 3 A to 4.1 A

Overview

Product	SITOP in SIMATIC design The S7-1500 version	Special design PSU100D	SITOP in SIMATIC design The S7-200 version
Power supply, type	3 A	3.1 A	3.5 A
Order No.	6EP1332-4BA00	6EP1332-1LD00	6EP1332-1SH31 [1]
			
	The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = Power Module) with automatic range switchover of the input voltage are an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.	The low-cost power supply in flat aluminum housing can be screwed directly on a wall in various mounting positions; with wide-range input for global use.	Optimally matched in design and functionality to the SIMATIC S7 200 micro PLC; flat design, particularly suitable for low cabinet depths.

The product families are highlighted in the same color.

For an explanation of the product families, see chapter 1, pages 1/8 through 1/12.

4

Technical specifications

Product	SITOP in SIMATIC design The S7-1500 version	Special design PSU100D	SITOP in SIMATIC design The S7-200 version
Input			
Rated voltage value $U_{in\ rated}$	1-phase AC **120/230 V AC**	1-phase AC **100 ... 240 V AC**	1-phase AC **120/230 V AC**
Supply voltage			
• 1 for AC rated value	120 V		120 V
• 2 for AC rated value	230 V		230 V
• Comment	Automatic range switchover		Set by means of wire jumper
Input voltage			
• 1 for AC	85 … 132 V		93 … 132 V
• 2 for AC	170 … 264 V		187 … 264 V
• for DC			
Voltage range		85 … 264 V	
Overvoltage resistance	2.3 × $U_{in\ rated}$, 1.3 ms		2.3 × $U_{in\ rated}$, 1.3 ms
Mains buffering at $I_{out\ rated}$, min.	20 ms	15 ms	20 ms
Mains buffering	at U_{in} = 93/187 V	at U_{in} = 115/230 V	at U_{in} = 187 V
Rated line frequency value			
• 1	50 Hz	50 Hz	50 Hz
• 2	60 Hz	60 Hz	60 Hz
Line frequency range	47 ... 63 Hz	47 … 63 Hz	47 … 63 Hz
Input current at rated value of input voltage			
• 100 V rated value		1.5 A	
• 120 V rated value	1.4 A		1.65 A
• 230 V rated value	0.8 A		0.95 A
• 240 V rated value		1 A	
Switch-on current limit (+25 °C)	max. 23 A	max. 60 A	max. 33 A
Duration of the switch-on current limit at 25 °C max.			3 ms
I^2t, max.	1.3 A^2s	1.2 A^2s	1 A^2s
Built-in incoming fuse	T 3.15 A/250 V (not accessible)	Internal	T 2 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 10 A characteristic B or 10 A characteristic C	Recommended miniature circuit breaker: 10 A or higher, characteristic C or 16 A or higher, characteristic B	Recommended miniature circuit breaker: Two-pole miniature circuit breaker 10 A or higher, characteristic C or 6 A or higher, characteristic D
Output			
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $U_{out\ rated\ DC}$	**24 V**	**24 V**	**24 V**
Total tolerance, static ±	1 %	2 %	5 %
• Static mains compensation, approx.	0.1 %	0.5 %	0.1 %
• Static load compensation, approx.		1 %	0.2 %

[1] SIPLUS module, see page 14/3

SITOP compact PSU100C	SITOP compact PSU100C	LOGO!Power	Special design PSU100D
3.7 A	4 A	4 A	4.1 A
6EP1332-5BA20	6EP1332-5BA10	6EP1332-1SH52 [1]	6EP1332-1LD10
			
Slim power supply unit for the lower performance range, e.g. for distributed use in control boxes. Low energy consumption thanks to a high degree of efficiency across the entire performance range and minimum power loss at no-load. Limited output power to set up a 24 V power supply for use in NEC Class 2 circuits.	Slim power supply unit for the lower performance range, e.g. for distributed use in control boxes. Low energy consumption thanks to high efficiency across the entire performance range as well as minimum energy losses at no-load and connections with removable terminals.	The LOGO!Power power supply is optimally matched in design and functionality to the LOGO! logic modules with 24 V DC input. The most powerful 24 V LOGO!Power version can be used universally for current consumption up to 4 A.	The low-cost power supply in flat aluminum housing can be screwed directly on a wall in various mounting positions; with wide-range input for global use.

SITOP compact PSU100C	SITOP compact PSU100C	LOGO!Power	Special design PSU100D
1-phase AC or DC **100 ... 230 V AC**	1-phase AC or DC **100 ... 230 V AC**	1-phase AC or DC **100 ... 240 V AC**	1-phase AC **100 … 240 V AC**
110 … 300 V 85 … 264 V 2.3 x $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 230 V 50 Hz 60 Hz 47 … 63 Hz	110 ... 300 V 85 ... 264 V 2.3 x $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 230 V 50 Hz 60 Hz 47 … 63 Hz	110 … 300 V 85 ... 264 V 2.3 x $U_{in\ rated}$, 1.3 ms 40 ms at U_{in} = 187 V 50 Hz 60 Hz 47 ... 63 Hz	85 … 264 V 15 ms at U_{in} = 115/230 V 50 Hz 60 Hz 47 … 63 Hz
1.88 A 0.95 A	2.25 A 1.15 A	1.95 A 0.97 A	2 A 1.1 A
max. 30 A 3 A^2s	max. 34 A 3 A^2s	max. 30 A 2.5 A^2s	max. 75 A 4 A^2s
Internal Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C	Internal Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C	Internal Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C	Internal Recommended miniature circuit breaker: 10 A or higher, characteristic C or 16 A or higher, characteristic B
Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**
3 % 0.1 % 0.2 %	3 % 0.1 % 0.2 %	3 % 0.1 % 1.5 %	2 % 0.5 % 1 %

[1] SIPLUS module, see page 14/3

Output currents 3 A to 4.1 A

Technical specifications (continued)

Product	SITOP in SIMATIC design The S7-1500 version	Special design PSU100D	SITOP in SIMATIC design The S7-200 version
Power supply, type	**3 A**	**3.1 A**	**3.5 A**
Order No.	**6EP1332-4BA00**	**6EP1332-1LD00**	**6EP1332-1SH31**
Output (continued)			
Residual ripple, peak-peak	Max. 50 mV	Max. 100 mV	Max. 150 mV (typ. 30 mV)
Spikes (bandwidth approx. 20 MHz)	Max. 150 mV	Max. 100 mV	Max. 240 mV (typ. 110 mV)
Adjustment range		22 … 28 V	
Settable output voltage	No	Yes	No
Output voltage adjustment	–	via potentiometer	–
Status display	LED green for 24 V O.K.; LED red for fault; LED yellow for stand-by	Green LED for 24 V OK	–
On/off behavior	No overshoot of U_{out} (soft start)	Overshoot of U_{out} <2 %	No overshoot of U_{out} (soft start)
Startup delay, max.	1.5 s	2.5 s	1 s
• Comment			
Voltage rise, typ.	10 ms		80 ms
Maximum voltage rise time of the output voltage		30 ms	
Rated current $I_{out\ rated}$	**3 A**	**3.1 A**	**3.5 A**
Current range	0 … 3 A	0 … 3.1 A	0 … 3.5 A
• Comment		+50 ... +70 °C: Derating 2.5%/K	
Typical power output	72 W	75 W	84 W
Temporary overload current			
• in the event of a short circuit during startup, typical	12 A		5 A
• in the event of a short circuit during operation, typical	12 A		5 A
Duration of overload capability overcurrent			
• in the event of a short circuit during startup	70 ms		100 ms
• in the event of a short circuit during operation	70 ms		100 ms
Parallel switching for enhanced performance	Yes	Yes	Yes
• Comment	Parallel switching of 3 A and 8 A possible; devices must be activated simultaneously, at I load max. 75 % per device		
Number of devices that can be switched in parallel to enhance performance, units	2	2	5
Efficiency			
Efficiency at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	87 %	86 %	84 %
Power loss at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	11 W	12 W	16 W
Closed-loop control			
Dyn. mains compensation ($U_{in\ rated}$ ± 15 %), max.	0.1 %	0.5 %	0.3 %
Dynamic load compensation (I_{out}: 10/90/10 %), U_{out} ± typ.			
Dynamic load compensation (I_{out}: 50/100/50 %), U_{out} ± typ.	1 %	5 %	3 %
Load step settling time			
• 10 to 90 %, typ.			
• 90 to 10 %, typ.			
Settling time, maximum	5 ms		5 ms
Protection and monitoring			
Output overvoltage protection	Additional control loop, differentiation (closed-loop control) at < 28.8 V	< 35 V	Yes, according to EN 60950-1
Response value current limitation			
• Minimum	3.15 A		
• Maximum	3.6 A		
Current limitation			
Current limitation, typ.	3.4 A	3.7 A	3.8 A
Property of the output, short-circuit-proof	Yes	Yes	Yes
Short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Constant current characteristic up to typ.14 V, electronic shutdown below that, automatic restart
Sustained short-circuit current rms value			
• Maximum			4 A
• Typical		6 A	
Overload/short-circuit indicator	–	–	–

SITOP compact PSU100C	SITOP compact PSU100C	LOGO!Power	Special design PSU100D
3.7 A	4 A	4 A	4.1 A
6EP1332-5BA20	6EP1332-5BA10	6EP1332-1SH52	6EP1332-1LD10
Max. 200 mV (typ. 90 mV) Max. 300 mV (typ. 60 mV)	Max. 200 mV (typ. 80 mV) Max. 300 mV (typ. 80 mV)	Max. 200 mV (typ. 30 mV) Max. 300 mV (typ. 60 mV)	Max. 100 mV Max. 100 mV
 No – Green LED for output voltage OK Overshoot of U_{out} approx. 1 %	22.2 ... 26.4 V Yes via potentiometer Green LED for output voltage OK Overshoot of U_{out} approx. 1 %	22.2 ... 26.4 V Yes via potentiometer Green LED for output voltage OK No overshoot of U_{out} (soft start)	22 … 28 V Yes via potentiometer Green LED for 24 V OK Overshoot of U_{out} <2 %
1.5 s 500 ms **3.7 A** 0 … 3.7 A +50 ... +70 °C: Derating 3.5%/K	1.5 s 400 ms **4 A** 0 … 4 A +50 ... +70 °C: Derating 3.5%/K	0.5 s 15 ms **4 A** 0 … 4 A +55 ... +70 °C: Derating 2%/K	1 s 30 ms **4.1 A** 0 … 4.1 A +50 ... +70 °C: Derating 2.5%/K
89 W	96 W	96 W	100 W
No	Yes 2	Yes 2	Yes 2
87% 14 W	88 % 13 W	89 % 12 W	86 % 16 W
0.1 % 3 %	0.1 % 3 %	0.2 % 1.5 %	0.5 % 5 %
4 ms 4 ms	4 ms 4 ms	1 ms 1 ms	
Yes, according to EN 60950-1 4 A Yes	Yes, according to EN 60950-1 4.8 A Yes	Yes, according to EN 60950-1 5.2 A Yes	< 35 V 4.9 A Yes
Electronic shutdown, automatic restart –	Electronic shutdown, automatic restart –	Constant current characteristic 7.9 A –	Electronic shutdown, automatic restart 10 A –

Output currents 3 A to 4.1 A

Technical specifications (continued)

Product	SITOP in SIMATIC design The S7-1500 version	Special design PSU100D	SITOP in SIMATIC design The S7-200 version
Power supply, type	**3 A**	**3.1 A**	**3.5 A**
Order No.	**6EP1332-4BA00**	**6EP1332-1LD00**	**6EP1332-1SH31**
Safety			
Primary/secondary isolation	Yes	Yes	Yes
Isolation	SELV output voltage U_{out} according to EN 60950-1 and EN 50178 and EN 61131-2	SELV output voltage U_{out} according to EN 60950-1	SELV output voltage U_{out} according to EN 60950-1
Protection class	Class I	Class I	Class I
Leakage current			
• Maximum	3.5 mA	3.5 mA	3.5 mA
• Typical	0.4 mA	1 mA	
CE mark	Yes	Yes	Yes
UL/CSA approval		Yes	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 142), File E143289	cULus-listed (UL 508, CSA C22.2 No. 107.1) File E197259, cURus (UL 60950-1, CSA C22.2 No. 60950-1) File E151273	cULus-listed (UL 508, CSA C22.2 No. 142), File E143289
Explosion protection	cULus (ISA 12.12.01, CSA C22.2 No.213) Class I Div. 2 Group ABCD T4, File E330455	–	–
FM approval		–	–
CB approval	Yes		No
Marine approval		–	–
Degree of protection (EN 60529)	IP20	IP20	IP20
EMC			
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class A
Supply harmonics limitation	EN 61000-3-2	EN 61000-3-2	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data			
Ambient temperature			
• During operation	0 … +60 °C	-10 … +70 °C	0 ... + 60 °C
- Comment	with natural convection	with natural convection	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
Humidity class according to EN 60721	Climate class 3K3, without condensation		Climate class 3K3, without condensation
Mechanics			
Connection method	Screw/spring-loaded terminals	Screw terminals	Screw terminals
Connections			
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2	L, N, PE: 1 screw terminal each for 0.3 ... 1.3 mm^2 solid/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 1.5 mm^2 solid/finely stranded
• Output	L+, M: 2 screw terminals each for 0.5 ... 2.5 mm^2	+, -: 1 screw terminal each for 0.3 ... 1.3 mm^2	L+: 1 screw terminal for 0.5 ... 1 mm^2; M: 2 screw terminals for 0.5 ... 1 mm^2
• Auxiliary contacts		–	–
Width of enclosure	50 mm	97 mm	160 mm
Height of enclosure	147 mm	128 mm	80 mm
Depth of enclosure	129 mm	38 mm	62 mm
Mounting width	50 mm		160 mm
Mounting height	205 mm		280 mm
Weight, approx.	0.45 kg	0.37 kg	0.5 kg
Product property of the enclosure: side-by-side enclosure	Yes		Yes
Type of mounting			
• Wall mounting	No	Yes	Yes
• DIN rail mounting	No	No	Yes
• S7-300 rail mounting	No	No	No
Installation	can be mounted onto S7-1500 rail	Wall mounting	Snaps onto DIN rail EN 60715 35x7.5/15, wall mounting
Electrical accessories			

SITOP compact PSU100C	SITOP compact PSU100C	LOGO!Power	Special design PSU100D
3.7 A	4 A	4 A	4.1 A
6EP1332-5BA20	6EP1332-5BA10	6EP1332-1SH52	6EP1332-1LD10
Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I 3.5 mA 0.4 mA Yes	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I 3.5 mA 0.4 mA Yes	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class II (without protective conductor) Yes	Yes SELV output voltage U_{out} according to EN 60950-1 Class I 3.5 mA 1 mA Yes
Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC Class 2	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1) File E197259, cURus (UL 60950-1, CSA C22.2 No. 60950-1) File E151273
ATEX (EX) II 3G Ex nA IIC T4; cCSAus (CSA C22.2 No 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4 – Yes GL, ABS IP20	ATEX (EX) II 3G Ex nA IIC T4; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4 – Yes GL, ABS IP20	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4 Class I, Div. 2, Group ABCD, T4 Yes GL, ABS, DNV, LRS, BV IP20	– – – IP20
EN 55022 Class B EN 61000-3-2 EN 61000-6-2	EN 55022 Class B EN 61000-3-2 EN 61000-6-2	EN 55022 Class B EN 61000-3-2 EN 61000-6-2	EN 55022 Class B EN 61000-3-2 EN 61000-6-2
-20 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	-20 ... +70 °C with natural convection -40 ... +85 °C -40 ... +85 °C Climate class 3K3, without condensation	-20 ... +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	-10 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C
Screw terminals L, N, PE: Removable screw terminal each for 1 x 0.5 ... 2.5 mm² +: 1 screw terminal for 0.5 ... 2.5 mm² - : 2 screw terminals for 0.5 ... 2.5 mm² –	Screw terminals L, N, PE: Removable screw terminal each for 1 x 0.5 ... 2.5 mm² +: 1 screw terminal for 0.5 ... 2.5 mm² - : 2 screw terminals for 0.5 ... 2.5 mm² –	Screw terminals L, N: 1 screw terminal each for 0.5 ... 2.5 mm² solid/finely stranded +, -: 2 screw terminals each for 0.5 ... 2.5 mm² –	Screw terminals L, N, PE: 1 screw terminal each for 0.3 ... 1.3 mm² solid/finely stranded +, -: 2 screw terminals each for 0.3 ... 1.3 mm² –
52.5 mm 80 mm 100 mm 52.5 mm 180 mm 0.32 kg Yes	52.5 mm 80 mm 100 mm 52.5 mm 180 mm 0.32 kg Yes	90 mm 90 mm 52.6 mm 90 mm 130 mm 0.34 kg Yes	97 mm 158 mm 38 mm 0.5 kg
No Yes No Snaps onto DIN rail EN 60715 35x7.5/15 Removable spring-loaded terminal 6EP1971-5BA00	No Yes No Snaps onto DIN rail EN 60715 35x7.5/15 Removable spring-loaded terminal 6EP1971-5BA00	No Yes No Snaps onto DIN rail EN 60715 35x7.5/15	Yes No No Wall mounting

Output currents 3 A to 4.1 A

Selection and ordering data

Product	Input Voltage $U_{in\ rated}$	Output Voltage $U_{out\ rated}$	Current $I_{out\ rated}$	Order No.	Price
SITOP in SIMATIC design, The S7-1500 version					
	**120/230 V AC**	**24 V DC**	3 A	**6EP1332-4BA00**	
Special design, PSU100D					
	**100 - 240 V AC**	**24 V DC**	3.1 A	**6EP1332-1LD00**	
SITOP in SIMATIC design, The S7-200 version					
	**120/230 V AC**	**24 V DC**	3.5 A	**6EP1332-1SH31**	
SITOP compact, PSU100C					
	**100 - 230 V AC**	**24 V DC**	3.7 A	**6EP1332-5BA20**	
SITOP compact, PSU100C					
	**100 - 230 V AC**	**24 V DC**	4 A	**6EP1332-5BA10**	
LOGO!Power					
	**100 - 240 V AC**	**24 V DC**	4 A	**6EP1332-1SH52**	
Special design, PSU100D					
	**100 - 240 V AC**	**24 V DC**	4.1 A	**6EP1332-1LD10**	

Further information

You can find additional information in the Internet at:

- 2D dimensional drawings, 3D CAD data, circuit diagram macros: www.siemens.com/sitop-cax
- Operating instructions: www.siemens.com/sitop-manuals
- SITOP Selection Tool: www.siemens.com/sitop-selection-tool

SITOP 1-phase and 2-phase 24 V DC, 5 A

5

5/2 SITOP PSU100L 5 A
5/2 SITOP PSU100S 5 A
5/2 The S7-300 version 5 A
5/3 The outdoor version 5 A
5/3 SITOP modular 5 A
5/3 The flat design 5 A
5/8 Ordering data and further information

For AL and ECCN export regulations see page 16/20

Output current 5 A

Overview

Product	SITOP lite PSU100L	SITOP smart PSU100S	SITOP in SIMATIC design The S7-300 version
Power supply, type	5 A	5 A	5 A
Order No.	6EP1333-1LB00	6EP1333-2BA20	6ES7307-1EA01-0AA0
The product families are highlighted in the same color. For an explanation of the product families, see chapter 1, pages 1/8 through 1/12.			
	The low-cost power supply for standard requirements in industrial environments; slim design; manual switchover of input voltage range.	High-performance, standard power supply for 1-phase 120/230 V AC grids, with automatic range switching; high overload capability through extra power with 1.5 times the rated current for 5 s and continuous 120 % output power up to +45 °C ambient temperature.	The proven power supply in SIMATIC S7-300 design; with PS-CPU connecting comb and for mounting direct on S7 rail.
Expansion possibilities	Expansion modules, such as redundancy modules or selectivity modules for the protection of 24 V feeds (chapter 10), and DC UPS for additional protection against power failures (chapter 11)		

Technical specifications

Product	SITOP lite PSU100L	SITOP smart PSU100S	SITOP in SIMATIC design The S7-300 version
Input			
Rated voltage value $U_{in\ rated}$	1-phase AC **120/230 V AC**	1-phase AC **120/230 V AC**	1-phase AC **120/230 V AC**
Supply voltage			
• 1 for AC rated value	120 V	120 V	120 V
• 2 for AC rated value	230 V	230 V	230 V
• Comment	Set by means of selector switch on device	Automatic range switchover	Automatic range switchover
Input voltage			
• 1 for AC	93 … 132 V	85 … 132 V	85 … 132 V
• 2 for AC	187 … 264 V	170 … 264 V	170 … 264 V
Voltage range			
Overvoltage resistance	2.3 × $U_{in\ rated}$, 1.3 ms	2.3 x $U_{in\ rated}$, 1.3 ms	2.3 × $U_{in\ rated}$, 1.3 ms
Mains buffering at $I_{out\ rated}$, min.	20 ms	20 ms	20 ms
Mains buffering	at U_{in} = 93/187 V	at U_{in} = 93/187 V	at U_{in} = 93/187 V
Rated line frequency value			
• 1	50 Hz	50 Hz	50 Hz
• 2	60 Hz	60 Hz	60 Hz
Line frequency range	47 ... 63 Hz	47 ... 63 Hz	47 … 63 Hz
Input current at rated value of input voltage			
• 120 V rated value	2.1 A	2.34 A	2.3 A
• 230 V rated value	1.15 A	1.36 A	1.2 A
• 500 V rated value			
Switch-on current limit (+25 °C)	max. 32 A	max. 40 A	max. 20 A
Duration of the switch-on current limit at 25 °C max.	3 ms		3 ms
I^2t, *max.*	0.8 A^2s	1 A^2s	1.2 A^2s
Built-in incoming fuse	T 3.15 A/250 V (not accessible)	T 3.15 A/250 V (not accessible)	T 3.15 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 6 A or higher, characteristic C	Recommended miniature circuit breaker: 6 A or higher, characteristic C	Recommended miniature circuit breaker: 6 A or higher, characteristic C
Rated voltage $U_{out\ rated\ DC}$	Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**

SITOP in SIMATIC design The outdoor version	SITOP modular	Special design The flat design
5 A	5 A	5 A
6ES7307-1EA80-0AA0 [1]	6EP1333-3BA00 [1] [2]	6EP1333-1AL12
		
The power supply unit for extreme environmental conditions in SIMATIC S7-300 design; can be snapped onto S7 rail; with PS-CPU connecting comb.	Modular power supply with 1-phase and 2-phase wide-range inputs for global use; with selectable output characteristic; functional expansion possible using add-on modules.	The flat design is of great advantage where only low mounting depths are available, e.g. for use with distributed I/O, in machine benches or alcoves; design matched to SIMATIC ET 200B.

Expansion modules, such as redundancy modules or selectivity modules for the protection of 24 V feeds (chapter 10), and DC UPS for additional protection against power failures (chapter 11)

SITOP in SIMATIC design The outdoor version	SITOP modular	Special design The flat design
1-phase AC **120/230 V AC**	1-phase and 2-phase AC **120 ... 230 V/230 ... 500 V AC**	1-phase AC **120/230 V AC**
120 V 230 V Set by means of selector switch on device	120 V ... 230 V 230 V ... 500 V Set by means of selector switch on device; startup from U_{in} > 90/180 V	120 V 230 V Set by means of selector switch on device
93 … 132 V 187 … 264 V	85 … 264 V 176 … 550 V	85 … 132 V 170 … 264 V
2.3 × $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 93/187 V	1300 V_{peak}, 1.3 ms 25 ms at U_{in} = 120/230 V, typ. 150 ms at U_{in} = 400 V	1 2.3 x $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 93/187 V
50 Hz 60 Hz 47 … 63 Hz	50 Hz 60 Hz 47 … 63 Hz	50 Hz 60 Hz 47 … 63 Hz
2.1 A 1.2 A	2.2 A 1.2 A 0.61 A	2.2 A 1.2 A
Max. 45A 3 ms	max. 35 A	max. 32 A 3 ms
1.8 A^2s	1.7 A^2s	0.8 A^2s
T 3.15 A/250 V (not accessible) Recommended miniature circuit breaker: 10 A or higher, characteristic C or 6 A or higher, characteristic D	T 3.15 A (not accessible) Recommended miniature circuit breaker for single-phase operation: 6 A or higher (10 A) characteristic C (B); required for two-phase operation: Miniature circuit breaker 2-pole coupled or circuit breaker 3RV2011-1EA10 (setting 3.8 A) or 3RV2711-1ED10 (UL 489) at 230 V; 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489) at 400/500 V	T 3.15 A/250 V (not accessible) Recommended miniature circuit breaker: 6 A or higher, characteristic C
Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**

[1] SIPLUS module, see page 14/3.

[2] SITOP modular plus 6EP1333-3BA00-8AC0, PCB with protective coating.

Output current 5 A

Technical specifications (continued)

Product	SITOP lite PSU100L	SITOP smart PSU100S	SITOP in SIMATIC design The S7-300 version
Power supply, type	**5 A**	**5 A**	**5 A**
Order No.	**6EP1333-1LB00**	**6EP1333-2BA20**	**6ES7307-1EA01-0AA0**
Output			
Total tolerance, static ±	3 %	3 %	3 %
• Static mains compensation, approx.	0.1 %	0.1 %	0.1 %
• Static load compensation, approx.	0.5 %	1 %	0.5 %
Residual ripple, peak-peak	Max. 150 mV (typ. 50 mV)	Max. 150 mV (typ. 30 mV)	Max. 50 mV (typ. 10 mV)
Spikes (bandwidth approx. 20 MHz)	Max. 240 mV (typ. 150 mV)	Max. 240 mV (typ. 140 mV)	Max. 150 mV (typ. 20 mV)
Adjustment range	22.8 … 26.4 V	22.8 … 28 V	
Settable output voltage	Yes	Yes	No
Output voltage adjustment	via potentiometer	via potentiometer	–
Status display	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK
Signaling		Relay contact (NO contact, rating 60 V DC/0.3 A) for 24 V OK	
On/off behavior	Overshoot of U_{out} approx. 4 %	Overshoot of U_{out} < 3 %	No overshoot of U_{out} (soft start)
Startup delay, max.	1.5 s	3 s	2 s
Voltage rise, typ.	130 ms	15 ms	10 ms
Rated current $I_{out\ rated}$	**5 A**	**5 A**	**5 A**
Current range	0 … 5 A	0 … 6 A	0 … 5 A
• Comment	+45 ... +60 °C: Derating 2%/K	6 A up to +45 °C; +60 ... +70 °C: Derating 1.6%/K	
Typical power output	120 W	144 W	120 W
Temporary overload current			
• in the event of a short circuit during startup, typical		18 A	20 A
• in the event of a short circuit during operation, typical		18 A	20 A
constant overload current in the event of a short circuit during startup, typical			
Duration of overload capability overcurrent			
• in the event of a short circuit during startup		800 ms	100 ms
• in the event of a short circuit during operation		800 ms	100 ms
Parallel switching for enhanced performance	Yes	Yes	Yes
• Comment			
Number of devices that can be switched in parallel to enhance performance, units	2	2	
Efficiency			
Efficiency at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	86 %	88 %	87 %
Power loss at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	17 W	16 W	18 W
Closed-loop control			
Dyn. mains compensation ($U_{in\ rated}$ ± 15 %), max.	0.3 %	0.3 %	0.1 %
Dynamic load compensation (I_{out}: 10/90/10 %), U_{out} ± typ.	2 %		
Dynamic load compensation (I_{out}: 50/100/50 %), U_{out} ± typ.			1 %
Load step settling time			
• 10 to 90 %, typ.	4 ms		
• 50 to 100 %, typ.			0.3 ms
• 90 to 10 %, typ.	4 ms		
• 100 to 50 %, typ.			0.3 ms
Settling time, maximum			
Protection and monitoring			
Output overvoltage protection	< 33 V	In the event of an internal fault U_{out} < 33 V	Additional control loop, shutdown at < 28.8 V, automatic restart
Current limitation		6 … 7.1 A	5.5 … 6.5 A
Current limitation, typ.	5.25 A		
Property of the output, short-circuit-proof	Yes	Yes	Yes
Short-circuit protection	Constant current characteristic	Constant current characteristic	Electronic shutdown, automatic restart
Sustained short-circuit current rms value			
• Maximum			7 A
• Typical	8 A	7.1 A	
• Comment		Overload capability 150 % $I_{out\ rated}$, up to 5 s/min	

SITOP in SIMATIC design The outdoor version	SITOP modular	Special design The flat design
5 A	**5 A**	**5 A**
6ES7307-1EA80-0AA0	**6EP1333-3BA00**	**6EP1333-1AL12**
3 % 0.2 % 0.4 % Max. 150 mV (typ. 40 mV) Max. 240 mV (typ. 90 mV)	3 % 0.1 % 0.1 % Max. 50 mV Max. 200 mV	1 % 0.1 % 0.5 % Max. 150 mV (typ. 40 mV) Max. 240 mV (typ. 100 mV)
No – Green LED for 24 V OK No overshoot of U_{out} (soft start)	24 … 28.8 V Yes via potentiometer Green LED for 24 V OK possible via signaling module (6EP1961-3BA10) Overshoot of U_{out} <3 %	22 … 29 V Yes via potentiometer Green LED for 24 V OK No overshoot of U_{out} (soft start)
3 s 100 ms **5 A** 0 … 5 A	1 s 50 ms **5 A** 0 … 5 A	2 s 40 ms **5 A** 0 … 5 A
120 W 20 A 20 A 180 ms 80 ms	120 W 15 A 5.5 A 25 ms	120 W 20 A 20 A 500 ms 500 ms
No 2	Yes Switchable characteristic 2	Yes 2
84 % 23 W	87 % 18 W	88 % 17 W
0.3 % 3 %	0.1 % 3 %	0.3 % 0.5 %
  0.2 ms 0.2 ms 5 ms	 2 ms 2 ms 5 ms	 0.1 ms 0.1 ms
additional control loop, shutdown at approx. 30 V, automatic restart 5.5 … 6.5 A Yes	< 35 V 5.5 A Yes	additional control loop, shutdown at approx. 33 V, automatic restart 5.5 … 6.5 A Yes
Electronic shutdown, automatic restart 5 A	Optional constant current characteristic approx. 5.5 A or latching shutdown 5.5 A	Electronic shutdown, automatic restart 5 A

Output current 5 A

Technical specifications (continued)

Product	SITOP lite PSU100L	SITOP smart PSU100S	SITOP in SIMATIC design The S7-300 version
Power supply, type	**5 A**	**5 A**	**5 A**
Order No.	**6EP1333-1LB00**	**6EP1333-2BA20**	**6ES7307-1EA01-0AA0**
Safety			
Overload/short-circuit indicator	–	–	
Primary/secondary isolation	Yes	Yes	Yes
Isolation	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1 and EN 50178
Protection class	Class I	Class I	Class I
Leakage current			
• Maximum	3.5 mA	3.5 mA	3.5 mA
• Typical	0.4 mA	0.4 mA	0.5 mA
CE mark	Yes	Yes	Yes
UL/CSA approval	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259, cCSAus (CSA C22.2 No. 60950-1, UL 60950-1, UL 1604)	cULus-listed (UL 508, CSA C22.2 No. 142), File E143289
Explosion protection	–	ATEX (EX) II 3G Ex nA nC IIC t4 Gc; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4	ATEX (EX) II 3G Ex nA II T4; cULus (ISA 12.12.01, CSA C22.2 No.213) Class I Div. 2 Group ABCD T4, File E330455
FM approval	–	–	Class I, Div. 2, Group ABCD, T4
CB approval		Yes	No
Marine approval	–	GL, BV	in S7-300 system
Degree of protection (EN 60529)	IP20	IP20	IP20
EMC			
Emitted interference	EN 55022 Class A	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	–	EN 61000-3-2	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data			
Ambient temperature			
• During operation	0 … +60 °C	-10 ... +70 °C	0 ... + 60 °C
- Comment	with natural convection	with natural convection	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
Humidity class according to EN 60721	Climate class 3K3, without condensation	Climate class 3K3, without condensation	Climate class 3K3, without condensation
Mechanics			
Connection method	Screw terminals	Screw terminals	Screw terminals
Connections			
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm² solid/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm² solid/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm² solid/finely stranded
• Output	+, -: 2 screw terminals each for 0.5 ... 2.5 mm²	+, -: 2 screw terminals each for 0.5 ... 2.5 mm²	L+, M: 3 screw terminals each for 0.5 ... 2.5 mm²
• Auxiliary contacts	–	Alarm signals: 2 screw terminals for 0.5 ... 2.5 mm²	–
Width of enclosure	50 mm	50 mm	60 mm
Height of enclosure	125 mm	125 mm	125 mm
Depth of enclosure	120 mm	120 mm	120 mm
Mounting width	50 mm	50 mm	60 mm
Mounting height	225 mm	225 mm	205 mm
Weight, approx.	0.5 kg	0.5 kg	0.6 kg
Product property of the enclosure: side-by-side enclosure	Yes	Yes	Yes
Type of mounting			
• Wall mounting	No	No	No
• DIN rail mounting	Yes	Yes	No
• S7-300 rail mounting	No	No	Yes
Installation	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15	Can be mounted onto S7 rail
Electrical accessories		Buffer module (chapter 10)	
Mechanical accessories			Mounting adapter for DIN rail (6EP1971-1BA00)

SITOP in SIMATIC design The outdoor version	SITOP modular	Special design The flat design
5 A	5 A	5 A
6ES7307-1EA80-0AA0	6EP1333-3BA00	6EP1333-1AL12
	Yellow LED for "overload", red LED for "latching shutdown"	–
Yes	Yes	Yes
SELV output voltage U_{out} according to EN 60950-1 and EN 50178, creepage distances and clearances > 5 mm	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1 and EN 50178
Class I	Class I	Class I
3.5 mA	3.5 mA	3.5 mA
0.3 mA	0.25 mA	0.26 mA
Yes	Yes	Yes
Yes UL-listed (UL 508), File E143289, CSA (CSA C22.2 No. 142)	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259
–	ATEX (Ex) II 3G Ex nA nC IIC T3 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T3	–
	–	–
No	No	No
–	GL, ABS	–
IP20	IP20	IP20
EN 55011 Class A	EN 55022 Class B	EN 55022 Class B
–	EN 61000-3-2	–
EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
-25 … +70 °C with natural convection	-25 … +70 °C with natural convection	0 … 60 °C with natural convection
-40 … +85 °C	-40 … +85 °C	-40 … +85 °C
-40 … +85 °C	-40 … +85 °C	-40 … +85 °C
Climate class 3K5, transient condensation permitted	Climate class 3K3, without condensation	Climate class 3K3, without condensation
Screw terminals	Screw terminals	Screw terminals
L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded	L, N, PE: 1 screw terminal each for 0.2 ... 2.5 mm^2 solid/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded
L+, M: 3 screw terminals each for 0.5 ... 2.5 mm^2	+, -: 2 screw terminals each for 0.2 ... 2.5 mm^2	L+, M: 3 screw terminals each for 0.5 ... 2.5 mm^2
–	–	–
80 mm	70 mm	160 mm
125 mm	125 mm	130 mm
120 mm	125 mm	60 mm
80 mm	70 mm	160 mm
205 mm	225 mm	230 mm
0.57 kg	1.2 kg	0.6 kg
Yes	Yes	Yes
No	No	No
No	Yes	Yes
Yes	No	No
Can be mounted onto S7 rail	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
	Signaling module, buffer module (chapter 10)	
Mounting adapter for DIN rail (6ES7390-6BA00-0AA0)		

Output current 5 A

Selection and ordering data

Product	Input Voltage $U_{in\ rated}$	Output Voltage $U_{out\ rated}$	Current $I_{out\ rated}$	Order No.	Price
SITOP lite, PSU100L					
	**120/230 V AC**	**24 V DC**	5 A	**6EP1333-1LB00**	
SITOP smart, PSU100S					
	**120/230 V AC**	**24 V DC**	5 A	**6EP1333-2BA20**	
SITOP in SIMATIC design, The S7-300 version					
	**120/230 V AC**	**24 V DC**	5 A	**6ES7307-1EA01-0AA0**	
SITOP in SIMATIC design, The outdoor version					
	**120/230 V AC**	**24 V DC**	5 A	**6ES7307-1EA80-0AA0**	
SITOP modular					
	**120-230/230-500 V AC** **Variant with PCB with protective coating**	**24 V DC**	5 A	**6EP1333-3BA00** **6EP1333-3BA00-8AC0**	
Special design, The flat design					
	**120/230 V AC**	**24 V DC**	5 A	**6EP1333-1AL12**	

Further information

You can find additional information in the Internet at:

- 2D dimensional drawings, 3D CAD data, circuit diagram macros:
  www.siemens.com/sitop-cax
- Operating instructions:
  www.siemens.com/sitop-manuals
- SITOP Selection Tool:
  www.siemens.com/sitop-selection-tool

SITOP 1-phase and 2-phase 24 V DC, 6 to 10 A

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6/2 PSU100D 6.2 A
6/2 The S7-1500 version 8 A
6/2 SITOP PSU100L 10 A
6/3 SITOP PSU100S 10 A
6/3 The S7-300 version 10 A
6/3 SITOP modular 10 A
6/3 The flat design 10 A
6/10 Ordering data and further information

For AL and ECCN export regulations see page 16/20

Output current 6 A to 10 A

Overview

Product	Special design PSU100D	SITOP in SIMATIC design The S7-1500 version	SITOP lite PSU100L
Power supply, type	6.2 A	8 A	10 A
Order No.	6EP1333-1LD00	6EP1333-4BA00	6EP1334-1LB00
The product families are highlighted in the same color. For an explanation of the product families, see chapter 1, pages 1/8 through 1/12.			
	The low-cost power supply in flat aluminum housing can be screwed directly on a wall in various mounting positions; with wide-range input for global use.	The design and functionality of the SIMATIC PM 1507 single-phase load power supply (PM = Power Module) with automatic range switchover of the input voltage are an optimal match to the SIMATIC S7-1500 PLC. It supplies the S7-1500 system components such as CPU, system power supply (PS), I/O circuits of the input and output modules and, if necessary, the sensors and actuators with 24 V DC.	The low-cost power supply for standard requirements in industrial environments; slim design; manual switchover of input voltage range.
Expansion possibilities	Expansion modules, such as redundancy modules or selectivity modules for the protection of 24 V feeds (chapter 10), and DC UPS for additional protection against power failures (chapter 11)		

Technical specifications

Product	Special design PSU100D	SITOP in SIMATIC design The S7-1500 version	SITOP lite PSU100L
Input			
Rated voltage value $U_{in\ rated}$	1-phase AC **100 ... 240 V AC**	1-phase AC **120/230 V AC**	1-phase AC **120/230 V AC**
Supply voltage • 1 for AC rated value • 2 for AC rated value • Comment	 	 120 V 230 V Automatic range switchover	 120 V 230 V Set by means of selector switch on device
Input voltage • 1 for AC • 2 for AC Voltage range Overvoltage resistance Mains buffering at $I_{out\ rated}$, min. Mains buffering	 85 … 264 V 15 ms at U_{in} = 115/230 V	 85 … 132 V 170 … 264 V 2.3 x $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 93/187 V	 93 … 132 V 187 … 264 V 2.3 × $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 93/187 V
Rated line frequency value • 1 • 2 Line frequency range	 50 Hz 60 Hz 47 … 63 Hz	 50 Hz 60 Hz 45 … 65 Hz	 50 Hz 60 Hz 47 … 63 Hz
Input current at rated value of input voltage • 100 V rated value • 120 V rated value • 230 V rated value • 240 V rated value • 500 V rated value	 3.1 A 2 A 	 3.7 A 1.7 A 	 4.1 A 2.4 A
Switch-on current limit (+25 °C) Duration of the switch-on current limit at 25 °C maximum I^2t, max.	max. 75 A 6.5 A²s	max. 62 A 12 A²s	max. 65 A 3 ms 3.3 A²s
Built-in incoming fuse Protection in the mains power input (IEC 898)	Internal Recommended miniature circuit breaker: 10 A or higher, characteristic C or 16 A or higher, characteristic B	T 6.3 A/250 V (not accessible) Recommended miniature circuit breaker: 16 A characteristic B or 10 A characteristic C	T 6.3 A/250 V (not accessible) Recommended miniature circuit breaker: 10 A or higher, characteristic C

1) SIPLUS module, see page 14/3.

SITOP smart PSU100S	SITOP in SIMATIC design The S7-300 version	SITOP modular	Special design The flat design
10 A	10 A	10 A	10 A
6EP1334-2BA20 [1]	6ES7307-1KA02-0AA0 [1]	6EP1334-3BA00 [1] [2]	6EP1334-1AL12
			
High-performance, standard power supply for 1-phase 120/230 V AC grids, with automatic range switching; high overload capability through extra power with 1.5 times the rated current for 5 s and continuous 120 % output power up to +45 °C ambient temperature.	The proven power supply in SIMATIC S7-300 design; with PS-CPU connecting comb and for mounting direct on S7 rail.	Modular power supply with 1-phase and 2-phase wide-range inputs for global use; with selectable output characteristic; functional expansion possible using add-on modules.	The flat design is of great advantage where only low mounting depths are available, e.g. for use with distributed I/O, in machine benches or alcoves; design matched to SIMATIC ET 200B.

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Expansion modules, such as redundancy modules or selectivity modules for the protection of 24 V feeds (chapter 10), and DC UPS for additional protection against power failures (chapter 11)

SITOP smart PSU100S	SITOP in SIMATIC design The S7-300 version	SITOP modular	Special design The flat design
1-phase AC **120/230 V AC** 120 V 230 V Automatic range switchover	1-phase AC **120/230 V AC** 120 V 230 V Automatic range switchover	1-phase and 2-phase AC **120 ... 230 V/230 ... 500 V AC** 120 … 230 V 230 … 500 V Set by means of selector switch on device	1-phase AC **120/230 V AC** 120 V 230 V Set by means of selector switch on device
85 … 132 V 170 … 264 V 2.3 × $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 93/187 V 50 Hz 60 Hz 47 ... 63 Hz	85 … 132 V 170 … 264 V 2.3 × $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 93/187 V 50 Hz 60 Hz 47 … 63 Hz	85 … 264 V 176 … 550 V 1300 V_{peak}, 1.3 ms 25 ms at U_{in} = 120/230 V, typ. 150 ms at U_{in} = 400 V 50 Hz 60 Hz 47 … 63 Hz	85 … 132 V 170 … 264 V 2.3 × $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 93/187 V 50 Hz 60 Hz 47 … 63 Hz
4.49 A 1.91 A	4.2 A 1.9 A	4.4 A 2.4 A 1.1 A	4 A 2.5 A
max. 60 A 5.6 A^2s	max. 55 A 3 ms 3.3 A^2s	max. 35 A 4 A^2s	max. 65 A 3 ms 3.3 A^2s
T 6.3 A/250 V (not accessible) Recommended miniature circuit breaker: 10 A or higher, characteristic C	T 6.3 A/250 V (not accessible) Recommended miniature circuit breaker: 10 A or higher, characteristic C	T 6.3 A (not accessible) Recommended miniature circuit breaker for 1-phase operation: 6 A or higher (10 A) characteristic C (B); required for 2-phase operation: Miniature circuit breaker 2-pole coupled or circuit breaker 3RV2011-1EA10 (setting 3.8 A) or 3RV2711-1ED10 (UL 489) at 230 V; 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489) at 400/500	T 6.3 A/250 V (not accessible) Recommended miniature circuit breaker: 10 A or higher, characteristic C

[1] SIPLUS module, see page 14/3

[2] SITOP modular plus 6EP1 334-3BA00-8AB0, PCB with protective coating.

Output current 6 A to 10 A

Technical specifications (continued)

Product	Special design PSU100D	SITOP in SIMATIC design The S7-1500 version	SITOP lite PSU100L
Power supply, type	**6.2 A**	**8 A**	**10 A**
Order No.	**6EP1333-1LD00**	**6EP1333-4BA00**	**6EP1334-1LB00**
Output			
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $U_{out\ rated\ DC}$	**24 V**	**24 V**	**24 V**
Total tolerance, static ±	2 %	1 %	3 %
• Static mains compensation, approx.	0.5 %	0.1 %	0.1 %
• Static load compensation, approx.	1 %	0.1 %	0.5 %
Residual ripple, peak-peak	Max. 100 mV	Max. 50 mV	Max. 150 mV (typ. 50 mV)
Spikes (bandwidth approx. 20 MHz)	Max. 100 mV	Max. 150 mV	Max. 240 mV (typ. 150 mV)
Adjustment range	22 … 28 V		22.8 … 26.4 V
Settable output voltage	Yes	No	Yes
Output voltage adjustment	Via potentiometer		Via potentiometer
Status display	Green LED for 24 V OK	LED green for 24 V O.K.; LED red for fault; LED yellow for stand-by	Green LED for 24 V OK
Signaling			
On/off behavior	Overshoot of U_{out} < 2 %	No overshoot of U_{out} (soft start)	Overshoot of U_{out} approx. 4 %
Startup delay, max.	1 s	1.5 s	1.5 s
Voltage rise, typ.		10 ms	170 ms
Maximum voltage rise time of the output voltage	30 ms		
Rated current $I_{out\ rated}$	**6.2 A**	**8 A**	**10 A**
Current range	0 … 6.2 A	0 … 8 A	0 … 10 A
• Comment	+50...+70 °C: Derating 2.5%/K		+45 ... +60 °C: Derating 2%/K
Typical power output	150 W	192 W	240 W
Temporary overload current			
• in the event of a short circuit during startup, typical		35 A	
• in the event of a short circuit during operation, typical		35 A	
constant overload current in the event of a short circuit during			
Duration of overload capability overcurrent			
• in the event of a short circuit during startup		70 ms	
• in the event of a short circuit during operation		70 ms	
Parallel switching for enhanced performance	Yes	Yes	Yes
• Comment		Parallel switching of 3 A and 8 A possible; devices must be activated simultaneously, at I load max. 75 % per device	
Number of devices that can be switched in parallel to enhance performance, units	2	2	2
Efficiency			
Efficiency at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	86 %	90 %	89 %
Power loss at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	24 W	21 W	34 W
Closed-loop control			
Dyn. mains compensation ($U_{in\ rated}$ ± 15 %), max.	0.5 %	0.1 %	0.3 %
Dyn. load compensation			
• (I_{out}: 10/90/10 %), U_{out} ± typ.			2 %
• (I_{out}: 50/100/50 %), U_{out} ± typ.	5 %	2 %	
Load step settling time			
• 10 to 90 %, typ.			0.5 ms
• 50 to 100 %, typ.			
• 90 to 10 %, typ.			0.7 ms
• 100 to 50 %, typ.			
Settling time, maximum		5 ms	

SITOP smart PSU100S	SITOP in SIMATIC design The S7-300 version	SITOP modular	Special design The flat design
10 A	10 A	10 A	10 A
6EP1334-2BA20	6ES7307-1KA02-0AA0	6EP1334-3BA00	6EP1334-1AL12
Controlled, isolated DC voltage **24 V** 3 % 0.1 % 1 % Max. 150 mV (typ. 20 mV) Max. 240 mV (typ. 160 mV)	Controlled, isolated DC voltage **24 V** 3 % 0.1 % 0.5 % Max. 50 mV (typ. 15 mV) Max. 150 mV (typ. 60 mV)	Controlled, isolated DC voltage **24 V** 3 % 0.1 % 0.1 % Max. 50 mV Max. 200 mV	Controlled, isolated DC voltage **24 V** 1 % 0.1 % 0.5 % Max. 150 mV (typ. 50 mV) Max. 240 mV (typ. 200 mV)
22.8 … 28 V Yes Via potentiometer Green LED for 24 V OK Relay contact (NO contact, rating 60 V DC/0.3 A) for 24 V OK Overshoot of U_{out} < 3 %	 No – Green LED for 24 V OK No overshoot of U_{out} (soft start)	24 … 28.8 V Yes Via potentiometer Green LED for 24 V OK Possible via signaling module (6EP1961-3BA10) Overshoot of U_{out} approx. 3 %	22 … 29 V Yes Via potentiometer Green LED for 24 V OK No overshoot of U_{out} (soft start)
3 s 20 ms **10 A** 0 … 12 A 12 A up to +45 °C; +60 ... +70 °C: Derating 3%/K	2 s 10 ms **10 A** 0 … 10 A	1 s 50 ms **10 A** 0 … 10 A +60 ... +70 °C: Derating 2%/K (at 120 V, 230 V) or 3.5 %/K (at 400 V)	2 s 40 ms **10 A** 0 … 10 A
288 W 32 A 32 A 1 000 ms 1 000 ms	240 W 38 A 38 A 80 ms 80 ms	240 W 30 A 12 A 25 ms	240 W 35 A 35 A 70 ms 70 ms
Yes 2	Yes	Yes Switchable characteristic 2	Yes 2
90 % 25 W	90 % 27 W	87 % 36 W	89 % 30 W
0.3 %	0.1 % 2 %	0.1 % 3 %	0.3 % 0.6 %
	    0.1 ms	 2 ms 2 ms 5 ms	 0.1 ms 0.2 ms

Output current 6 A to 10 A

Technical specifications (continued)

Product	Special design PSU100D	SITOP in SIMATIC design The S7-1500 version	SITOP lite PSU100L
Power supply, type	**6.2 A**	**8 A**	**10 A**
Order No.	**6EP1333-1LD00**	**6EP1333-4BA00**	**6EP1334-1LB00**
Protection and monitoring			
Output overvoltage protection	< 35 V	Additional control loop, differentiation (closed-loop control) at < 28.8 V	< 33 V
Response value current limitation			
• Minimum		8.4 A	
• Maximum		9.6 A	
Current limitation			
Current limitation, typ.	7.4 A	9 A	10.5 A
Property of the output, short-circuit-proof	Yes	Yes	Yes
Short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Constant current characteristic
Sustained short-circuit current rms value			
• Maximum			
• Typical	16 A		16 A
• Comment			
Overload/short-circuit indicator	–	–	–
Safety			
Primary/secondary isolation	Yes	Yes	Yes
Isolation	SELV output voltage U_{out} according to EN 60950-1	SELV output voltage U_{out} according to EN 60950-1 and EN 50178 and EN 61131-2	SELV output voltage U_{out} according to EN 60950-1 and EN 50178
Protection class	Class I	Class I	Class I
Leakage current			
• Maximum	3.5 mA	3.5 mA	3.5 mA
• Typical	1 mA	1.3 mA	0.8 mA
CE mark	Yes	Yes	Yes
UL/CSA approval	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1) File E197259, cURus (UL 60950-1, CSA C22.2 No. 60950-1) File E151273	cULus-listed (UL 508, CSA C22.2 No. 142), File E143289	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259
Explosion protection	–	cULus (ISA 12.12.01, CSA C22.2 No.213) Class I Div. 2 Group ABCD T3, File E330455	–
FM approval	–		–
CB approval		Yes	
Marine approval	–		–
Degree of protection (EN 60529)	IP20	IP20	IP20
EMC			
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class A
Supply harmonics limitation	–	EN 61000-3-2	–
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data			
Ambient temperature			
• During operation	-10 … +70 °C	0 ... +60 °C	0 ... + 60 °C
- Comment	with natural convection	with natural convection	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
Humidity class according to EN 60721		Climate class 3K3, without condensation	Climate class 3K3, without condensation

SITOP smart PSU100S	SITOP in SIMATIC design The S7-300 version	SITOP modular	Special design The flat design
10 A	10 A	10 A	10 A
6EP1334-2BA20	6ES7307-1KA02-0AA0	6EP1334-3BA00	6EP1334-1AL12
In the event of an internal fault U_{out} < 33 V	Additional control loop, shutdown at < 28.8 V, automatic restart	< 35 V	Additional control loop, shutdown at approx. 33 V, automatic restart
12 … 14.6 A	11 … 12 A	12 A	11 … 13 A
Yes	Yes	Yes	Yes
Constant current characteristic	Electronic shutdown, automatic restart	Optional constant current characteristic approx. 12 A or latching shutdown	Electronic shutdown, automatic restart
14.6 A Overload capability 150 % $I_{out\ rated}$ to 5 s/min	12 A	12 A	10 A
–	–	Yellow LED for "overload", red LED for "latching shutdown"	–
Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178
Class I	Class I	Class I	Class I
3.5 mA 0.8 mA Yes	3.5 mA 0.6 mA Yes	3.5 mA 0.32 mA Yes	3.5 mA 0.27 mA Yes
Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259, cCSAus (CSA C22.2 No. 60950-1, UL 60950-1, UL 1604)	Yes cULus-listed (UL 508, CSA C22.2 No. 142), File E143289	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259
ATEX (EX) II 3G Ex nA nC II C T4 Gc; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4 – Yes GL, BV IP20	ATEX (EX) II 3G Ex nA II T4; cULus (ISA 12.12.01, CSA C22.2 No.213) Class I Div. 2 Group ABCD T4, File E330455 Class I, Div. 2, Group ABCD, T4 No in S7-300 system IP20	ATEX (Ex) II 3G Ex nA nC IIC T3 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T3 – No GL, ABS IP20	– – No – IP20
EN 55022 Class B EN 61000-3-2 EN 61000-6-2	EN 55022 Class B EN 61000-3-2 EN 61000-6-2	EN 55022 Class B EN 61000-3-2 EN 61000-6-2	EN 55022 Class B – EN 61000-6-2
-10 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	0 ... + 60 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	-25 ... +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	0 ... + 60 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation

Output current 6 A to 10 A

Technical specifications (continued)

Product	Special design PSU100D	SITOP in SIMATIC design The S7-1500 version	SITOP lite PSU100L
Power supply, type	**6.2 A**	**8 A**	**10 A**
Order No.	**6EP1333-1LD00**	**6EP1333-4BA00**	**6EP1334-1LB00**
Mechanics			
Connection method	Screw terminals	Screw/spring-loaded terminals	Screw terminals
Connections			
• Supply input	L, N, PE: 1 screw terminal each for 0.3 ... 1.3 mm^2 solid/finely stranded	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded
• Output	+, -: 2 screw terminals each for 0.3 ... 1.3 mm^2	L+, M: 2 spring-loaded terminals each for 0.5 ... 2.5 mm^2	+, -: 2 screw terminals each for 0.5 ... 2.5 mm^2
• Auxiliary contacts	–		–
Width of enclosure	97 mm	75 mm	70 mm
Height of enclosure	178 mm	147 mm	125 mm
Depth of enclosure	38 mm	129 mm	120 mm
Mounting width		75 mm	70 mm
Mounting height		205 mm	225 mm
Weight, approx.	0.55 kg	0.74 kg	0.75 kg
Product property of the enclosure: side-by-side enclosure		Yes	Yes
Type of mounting			
• Wall mounting	Yes	No	No
• DIN rail mounting	No	No	Yes
• S7-300 rail mounting	No	No	No
Installation	Wall mounting	can be mounted onto S7-1500 rail	Snaps onto DIN rail EN 60715 35x7.5/15
Electrical accessories			
Mechanical accessories			

SITOP smart PSU100S	SITOP in SIMATIC design The S7-300 version	SITOP modular	Special design The flat design
10 A	10 A	10 A	10 A
6EP1334-2BA20	6ES7307-1KA02-0AA0	6EP1334-3BA00	6EP1334-1AL12
Screw terminals L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.5 ... 2.5 mm^2 Alarm signals: 2 screw terminals for 0.5 ... 2.5 mm^2	Screw terminals L, N, PE: 1 screw terminal each for 0.5 ... 1.5 mm^2 solid/finely stranded L+, M: 4 screw terminals each for 0.5 ... 2.5 mm^2 –	Screw terminals L, N, PE: 1 screw terminal each for 0.2 ... 2.5 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.2 ... 2.5 mm^2 –	Screw terminals L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded L+, M: 3 screw terminals each for 0.5 ... 2.5 mm^2 –
70 mm	80 mm	90 mm	160 mm
125 mm	125 mm	125 mm	130 mm
120 mm	120 mm	125 mm	60 mm
70 mm	80 mm	90 mm	160 mm
225 mm	205 mm	225 mm	230 mm
0.8 kg	0.8 kg	1.4 kg	0.72 kg
Yes	Yes	Yes	Yes
No Yes No	No No Yes	No Yes No	No Yes No
Snaps onto DIN rail EN 60715 35x7.5/15	Can be mounted onto S7 rail	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Buffer module (chapter 10)	Mounting adapter for DIN rail (6EP1971-1BA00)	Buffer module, signaling module	

Output current 6 A to 10 A

Selection and ordering data

Product	Input Voltage $U_{in\ rated}$	Output Voltage $U_{out\ rated}$	Current $I_{out\ rated}$	Order No.	Price
Special design, PSU100D					
	**100 ... 240 V AC**	**24 V DC**	6.2 A	**6EP1333-1LD00**	
SITOP in SIMATIC design, The S7-1500 version					
	**120/230 V AC**	**24 V DC**	8 A	**6EP1333-4BA00**	
SITOP lite, PSU100L					
	**120/230 V AC**	**24 V DC**	10 A	**6EP1334-1LB00**	
SITOP smart, PSU100S					
	**120/230 V AC**	**24 V DC**	10 A	**6EP1334-2BA20**	
SITOP in SIMATIC design, The S7-300 version					
	**120/230 V AC**	**24 V DC**	10 A	**6ES7307-1KA02-0AA0**	
SITOP modular					
	**120 ... 230/ 230 ... 500 V AC**	**24 V DC**	10 A	**6EP1334-3BA00**	
	Variant with PCB with protective coating		10 A	**6EP1334-3BA00-8AB0**	
Special design, The flat design					
	**120/230 V AC**	**24 V DC**	10 A	**6EP1334-1AL12**	

Further information

You can find additional information in the Internet at:

- 2D dimensional drawings, 3D CAD data, circuit diagram macros:
  www.siemens.com/sitop-cax
- Operating instructions:
  www.siemens.com/sitop-manuals
- SITOP Selection Tool:
  www.siemens.com/sitop-selection-tool

SITOP 1-phase and 2-phase 24 V DC, 12 to 40 A

7/2 PSU100D 12.5 A
7/2 SITOP smart 20 A
7/2 SITOP PSU100M 20 A
7/3 SITOP PSU400M 20 A
7/3 SITOP modular 20 A
7/3 SITOP modular 40 A
7/8 Ordering data and further information

For AL and ECCN export regulations see page 16/20

Output current 12 A to 40 A

Overview

Product	Special design PSU100D	SITOP smart PSU100S	SITOP modular PSU100M
Power supply, type	12.5 A	20 A	20 A
Order No.	6EP1334-1LD00	6EP1336-2BA10	6EP1336-3BA10
The product families are highlighted in the same color. For an explanation of the product families, see chapter 1, pages 1/8 through 1/12			
	The low-cost power supply in flat aluminum housing can be screwed directly on a wall in various mounting positions; with wide-range input for global use.	High-performance, standard power supply for 1-phase 120/230 V AC grids, with automatic range switching; high overload capability through extra power with 1.5 times the rated current for 5 s and continuous 120 % output power up to +45 °C ambient temperature.	The modular power supply units with 1-phase and 2-phase input for global use; slim design; with 50 % extra power and switchable output characteristic; with integrated signaling contact for "24 V OK"; functional expansion possible using expansion modules.
Expansion possibilities	Expansion modules, such as redundancy modules or selectivity modules for the protection of 24 V feeds (chapter 10), and DC UPS for additional protection against power failures (chapter 11)		

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Technical specifications

Product	Special design PSU100D	SITOP smart PSU100S	SITOP modular PSU100M
Input			
Rated voltage value $U_{in\ rated}$ Supply voltage • 1 for AC rated value • 2 for AC rated value • for DC • Comment	1-phase AC **100 ... 240 V AC**	1-phase AC **120/230 V AC** 120 V 230 V Automatic range switchover	1-phase and 2-phase AC or DC **120 ... 230 V AC** 110 … 300 V [1] Temperature derating necessary at U_{in} < 100 V AC or DC at 50 °C
Input voltage • 1 for AC • 2 for AC • for DC Voltage range Overvoltage resistance Mains buffering at $I_{out\ rated}$, min. Mains buffering Rated line frequency value • 1 • 2 Line frequency range	 85 ... 264 V 15 ms at U_{in} = 115/230 V 50 Hz 60 Hz 47 … 63 Hz	 85 … 132 V 176 … 264 V 2.3 x $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 120/230 V 50 Hz 60 Hz 47 ... 63 Hz	 88 … 350 V [1] 85 … 275 V Implemented internally with varistors 20 ms at U_{in} = 230 V 50 Hz 60 Hz 45 ... 65 Hz
Input current at rated value of input voltage • 100 V rated value • 120 V rated value • 230 V rated value • 240 V rated value Input current for DC at rated value of the input voltage 600 V rated value	 4 A 2 A	 7.5 A 3.5 A	 4.6 A 2.5 A
Switch-on current limit (+25 °C) I^2t, *max.*	max. 60 A 1.1 A^2s	max. 11 A 10 A^2s	max. 20 A 5 A^2s
Built-in incoming fuse Protection in the mains power input (IEC 898)	Internal Recommended miniature circuit breaker: 10 A or higher, characteristic C or 16 A or higher, characteristic B	T 10 A (not accessible) Recommended miniature circuit breaker: 10 A or higher, characteristic C or miniature circuit breaker 3RV2411-1JA10 (120 V) or 3RV2411-1FA10 (230 V)	Yes Recommended miniature circuit breaker for single-phase operation: 10 A characteristic C; necessary for two-phase operation: Miniature circuit breaker 2-pole coupled or circuit breaker 3RV2711-1HD10 (UL 489) at 120 V or 3RV2711-1ED10 (UL 489) at 230 V
Output			
Output Rated voltage $U_{out\ rated\ DC}$	Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**

[1] Startup from 110 V DC (startup from 88 V DC, available soon)

SITOP modular PSU400M	SITOP modular	SITOP modular
20 A	20 A	40 A
6EP1536-3AA00	6EP1336-3BA00 [1) 2)]	6EP1337-3BA00 [2)]
		
The SITOP PSU400M power supply with a 600 V DC input is suitable as an efficient DC/DC converter for drive and battery systems; large input range and temperature range, high efficiency; slim design; with 50 % extra power for 5 s/min.	The modular power supplies with 1-phase and 2-phase inputs for global use; with switchable output characteristic; functional expansion possible using expansion modules.	The modular power supply units with single-phase and two-phase inputs for global use; with switchable output characteristic; functional expansion possible using add-on modules.

Expansion modules, such as redundancy modules or selectivity modules for the protection of 24 V feeds (chapter 10), and DC UPS for additional protection against power failures (chapter 11)

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SITOP modular PSU400M	SITOP modular	SITOP modular
DC voltage **600 V DC**	1-phase and 2-phase AC **120/230 V AC**	1-phase and 2-phase AC **120/230 V AC**
	120 V 230 V	120 V 230 V
600 V (Startup from approx. 400 V DC); derating necessary at 200 ... 300 V and 820 ... 900 V DC	Set by means of wire jumper on device; startup from U_{in} > 93/183 V	Set by means of wire jumper on the device; startup from U_{in} > 95/190 V
	85 … 132 V 176 … 264 V	85 … 132 V 176 … 264 V
200 … 900 V		
Shutdown at U_{in} > 900 V DC	2.3 x $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 230 V	2.3 x $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 230 V
	50 Hz 60 Hz 47 … 63 Hz	50 Hz 60 Hz 47 … 63 Hz
	7.7 A 3.5 A	15 A 8 A
0.85 A		
max. 8 A 0,02 A^2s	max. 60 A 9.9 A^2s	max. 125 A 26 A^2s
Yes, shutdown capacity 20 kA; L/R < 2 ms ("+" and "-" inputs)	Yes Recommended miniature circuit breaker for single-phase operation: 10 A characteristic C; necessary for two-phase operation: Miniature circuit breaker 2-pole coupled or circuit breaker 3RV2411-1JA10 (120 V) or 3RV2411-1FA10 (230 V)	Yes Recommended miniature circuit breaker for single-phase operation: 20 A characteristic C; necessary for two-phase operation: Miniature circuit breaker 2-pole coupled or circuit breaker 3RV2421-4BA10 (120 V) or 3RV2411-1JA10 (230 V)
Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**

[2)] SITOP modular plus 6EP1336-3BA00-8AA0, PCB with protective coating.

[3)] SIPLUS module, see page 14/4

Output current 12 A to 40 A

Technical specifications (continued)

Product	Special design PSU100D	SITOP smart PSU100S	SITOP modular PSU100M
Power supply, type	12.5 A	20 A	20 A
Order No.	6EP1334-1LD00	6EP1336-2BA10	6EP1336-3BA10
Output (continued)			
Total tolerance, static ±	2 %	3 %	3 %
• Static mains compensation, approx.	0.5 %	0.5 %	0.1 %
• Static load compensation, approx.	0.5 %	1 %	0.3 %
Residual ripple, peak-peak	Max. 100 mV	Max. 150 mV	Max. 100 mV (typ. 80 mV)
Spikes (bandwidth approx. 20 MHz)	Max. 100 mV	Max. 240 mV	Max. 200 mV (typ. 100 mV)
Adjustment range	22 … 28 V	24 … 28 V	24 … 28.8 V
Settable output voltage	Yes	Yes	Yes
Output voltage adjustment	Via potentiometer	Via potentiometer	Via potentiometer
• Comment		Max. 480 W	
Status display	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK
Signaling	–	Relay contact (NO contact, rating 50 V DC/0.3 A) for 24 V OK	Relay contact (NO contact, rating 60 V DC/0.3 A) for 24 V OK
On/off behavior	Overshoot of U_{out} < 2 %	No overshoot of U_{out} (soft start)	No overshoot of U_{out} (soft start)
Startup delay, max.	1 s	1.5 s	0.25 s
• Comment			
Voltage rise, typ.	30 ms	50 ms	50 ms
Maximum voltage rise time of the output voltage		500 ms	
Rated current $I_{out\ rated}$	**12.5 A**	**20 A**	**20 A**
Current range	0 … 12.5 A	0 … 20 A	0 … 20 A
• Comment	+50 ... +70 °C: Derating 2.5%/K	24 A up to +45 °C; +60 ... +70 °C: Derating 5%/K	> 60 °C Derating
Typical power output	300 W	480 W	480 W
Temporary overload current			
• in the event of a short circuit during startup, typical		35 A	
• in the event of a short circuit during operation, typical		35 A	60 A
Constant overload current in the event of a short circuit during startup, typical			30 A
Duration of overload capability overcurrent			
• in the event of a short circuit during startup		100 ms	
• in the event of a short circuit during operation		100 ms	25 ms
Parallel switching for enhanced performance	Yes	Yes	Yes
• Comment			Switchable characteristic
Number of devices that can be switched in parallel to enhance performance, units	2	2	2
Efficiency			
Efficiency at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	86 %	90 %	93 %
Power loss at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	48 W	53 W	42 W
Closed-loop control			
Dyn. mains compensation ($U_{in\ rated}$ ± 15 %), max.	0.5 %	1 %	0.5 %
Dynamic load compensation (I_{out}: 50/100/50 %), U_{out} ± typ.	5 %	3 %	1 %
Load step settling time			
• 50 to 100 %, typ.			1 ms
• 100 to 50 %, typ.			1 ms
Settling time, maximum		10 ms	5 ms
Protection and monitoring			
Output overvoltage protection	< 35 V	Yes, according to EN 60950-1	< 33 V
Current limitation, typ.	15 A	21 A	21.5 A
Property of the output, short-circuit-proof	Yes	Yes	Yes
Short-circuit protection	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart	Optional constant current characteristic approx. 23 A or latching shutdown
Sustained short-circuit current rms value			
• Maximum		7 A	
• Typical	15 A		23 A
• Comment		Overload capability 150 % Iout rated to 5 s/min	Overload capability 150 % Iout rated to 5 s/min
Overload/short-circuit indicator	–	–	Yellow LED for "overload", red LED for "latching shutdown"

SITOP modular PSU400M	SITOP modular	SITOP modular
20 A	**20 A**	**40 A**
6EP1536-3AA00	**6EP1336-3BA00**	**6EP1337-3BA00**
3 % 0.3 % 0.3 % Max. 150 mV (typ. 30 mV) Max. 200 mV (typ. 100 mV)	3 % 0.1 % 0.1 % Max. 100 mV (typ. 30 mV) Max. 200 mV (typ. 60 mV)	3 % 0.1 % 0.1 % Max. 100 mV (typ. 60 mV) Max. 200 mV (typ. 120 mV)
24 … 28.8 V Yes Via potentiometer Green LED for 24 V OK, green flashing LED for startup delay Relay contact (NO contact, rating 60 V DC/0.3 A; 30 V DC/1 A) for 24 V OK No overshoot of U_{out} (soft start)	24 … 28.8 V Yes Via potentiometer Green LED for 24 V OK possible via signaling module (6EP1961-3BA10) Overshoot of U_{out} approx. 3 %	24 … 28.8 V Yes Via potentiometer Green LED for 24 V OK possible via signaling module (6EP1961-3BA10) Overshoot of U_{out} approx. 3 %
0.1 s 10 s settable using switch 150 ms **20A** 0 … 20 A +60 ... +70 °C: Derating 5.5%/K	1 s 50 ms **20 A** 0 … 20 A +60 ... +70 °C: Derating 3.5%/K	1 s 50 ms **40 A** 0 … 40 A +60 ... +70 °C: Derating 2.5%/K
480 W 40 A 150 ms	480 W 60 A 23 A 25 ms	960 W 120 A 46 A 25 ms
Yes Switchable characteristic 2	Yes Switchable characteristic 2	Yes Switchable characteristic 2
95 % 25 W	89 % 59 W	88 % 131 W
1.5 % 1.5 %	1 % 2 %	1 % 2 %
1 ms 1 ms 5 ms	2 ms 2 ms 5 ms	2 ms 2 ms 5 ms
< 33 V 22 A Yes	< 35 V 23 A Yes	< 35 V 46 A Yes
Optional constant current characteristic approx. 22 A or latching shutdown 22 A Overload capability 150 % lout rated to 5 s/min Yellow LED for "Overload", red LED for "Latching shutdown", flashing red LED for "Overtemperature"	Optional constant current characteristic approx. 23 A or latching shutdown 23 A Yellow LED for "overload", red LED for "latching shutdown"	Optional constant current characteristic approx. 46 A or latching shutdown 46 A Yellow LED for "overload", red LED for "latching shutdown"

Output current 12 A to 40 A

Technical specifications (continued)

Product	Special design PSU100D	SITOP smart PSU100S	SITOP modular PSU100M
Power supply, type	**12.5 A**	**20 A**	**20 A**
Order No.	**6EP1334-1LD00**	**6EP1336-2BA10**	**6EP1336-3BA10**
Safety			
Primary/secondary isolation	Yes	Yes	Yes
Isolation	SELV output voltage U_{out} according to EN 60950-1	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1 and EN 50178
Protection class	Class I	Class I	Class I
Leakage current			
• Maximum	3.5 mA	3.5 mA	3.5 mA
• Typical	1 mA	1 mA	1 mA
CE mark	Yes	Yes	Yes
UL/CSA approval	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1) File E197259, cURus (UL 60950-1, CSA C22.2 No. 60950-1) File E151273	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; available soon: cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259
Explosion protection	–	ATEX (EX) II 3G Ex nA nC IIC T4 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T4	ATEX (EX) II 3G Ex nA nC IIC T3; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T3
FM approval	–	–	–
CB approval		Yes	No
Marine approval	–	GL	GL, ABS
Degree of protection (EN 60529)	IP20	IP20	IP20
EMC			
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	EN 61000-3-2	EN 61000-3-2	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data			
Ambient temperature			
• During operation	-10 ... +70 °C	0 ... +70 °C	-25 … +70 °C
- Comment	with forced convection (fan)	with natural convection	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
Humidity class according to EN 60721		Climate class 3K3, without condensation	Climate class 3K3, without condensation
Mechanics			
Connection method	Screw terminals	Screw terminals	Screw terminals
Connections			
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 1.3 mm² solid/finely stranded	L1, N, PE: 1 screw terminal each for 0.2 ... 4 mm² solid/finely stranded	L, N, PE: 1 screw terminal each for 0.2 ... 4 mm² solid/finely stranded
• Output	+, -: 2 screw terminals each for 0.5 ... 1.3 mm²	+, -: 2 screw terminals each for 0.2 ... 4 mm²	+, -: 2 screw terminals each for 0.2 ... 4 mm²
• Auxiliary contacts	–	13, 14 (alarm signal): 1 screw terminal each for 0.14 ... 1.5 mm²	Alarm signals: 2 screw terminals for 0.14 ... 1.5 mm²
Width of enclosure	105 mm	115 mm	90 mm
Height of enclosure	199 mm	145 mm	125 mm
Depth of enclosure	41 mm	150 mm	125 mm
Mounting width		115 mm	90 mm
Mounting height		225 mm	225 mm
Weight, approx.	0.81 kg	2.4 kg	1.2 kg
Product property of the enclosure: side-by-side enclosure		Yes	Yes
Type of mounting			
• Wall mounting	Yes	No	No
• DIN rail mounting	No	Yes	Yes
• S7-300 rail mounting	No	No	No
Installation	Wall mounting	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Electrical accessories		Buffer module (chapter 10)	Buffer module (chapter 10)
Mechanical accessories		Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20

SITOP modular PSU400M	SITOP modular	SITOP modular
20 A	20 A	40 A
6EP1536-3AA00	6EP1336-3BA00	6EP1337-3BA00
Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I Yes	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I 3.5 mA 0.4 mA Yes	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I 3.5 mA 0.4 mA Yes
Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259
– – Yes GL; ABS available soon IP20	ATEX (Ex) II 3G Ex nA nC IIC T3 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T3 – No GL; ABS available soon IP20	ATEX (Ex) II 3G Ex nA IIC T3 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T3 – No – IP20
EN 55022 Class A – EN 61000-6-2	EN 55022 Class B EN 61000-3-2 EN 61000-6-2	EN 55022 Class B – EN 61000-6-2
-25 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	0 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	0 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation
Screw terminals DC input +, -, PE: 1 screw terminal each for 0.2 ... 6/4 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.2 ... 6/4 mm^2 solid/finely stranded Alarm signals: 2 screw terminals for 0.14 ... 1.5 mm^2 solid/finely stranded	Screw terminals L, N, PE: 1 screw terminal each for 0.2 ... 4 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.5 ... 4 mm^2 –	Screw terminals L, N, PE: 1 screw terminal each for 0.2 ... 4 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.5 ... 10 mm^2 –
90 mm 125 mm 125 mm 90 mm 225 mm 1.2 kg Yes	160 mm 125 mm 125 mm 160 mm 225 mm 2.2 kg Yes	240 mm 125 mm 125 mm 240 mm 225 mm 2.9 kg Yes
No Yes No Snaps onto DIN rail EN 60715 35x7.5/15 Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	No Yes No Snaps onto DIN rail EN 60715 35x7.5/15 Signaling module, buffer module (chapter 10)	No Yes No Snaps onto DIN rail EN 60715 35x15 Signaling module, buffer module (chapter 10)

Output current 12 A to 40 A

Selection and ordering data

Product	Input Voltage $U_{in\ rated}$	Output Voltage $U_{out\ rated}$	Current $I_{out\ rated}$	Order No.	Price
Special design, PSU100D					
	**100/240 V AC**	**24 V DC**	12.5 A	**6EP1334-1LD00**	
SITOP smart, PSU100S					
	**120/230 V AC**	**24 V DC**	20 A	**6EP1336-2BA10**	
SITOP modular PSU100M					
	**120 ... 230 V AC**	**24 V DC**	20 A	**6EP1336-3BA10**	
SITOP modular, PSU400M					
	**600 V DC**	**24 V DC**	20 A	**6EP1536-3AA00**	
SITOP modular					
	**120/230 V AC** **Variant with PCB with protective coating**	**24 V DC**	20 A	**6EP1336-3BA00** **6EP1336-3BA00-8AA0**	
SITOP modular					
	**120/230 V AC**	**24 V DC**	40 A	**6EP1337-3BA00**	

Further information

You can find additional information in the Internet at:

- 2D dimensional drawings, 3D CAD data, circuit diagram macros:
  www.siemens.com/sitop-cax
- Operating instructions:
  www.siemens.com/sitop-manuals
- SITOP Selection Tool:
  www.siemens.com/sitop-selection-tool

SITOP 3-phase
24 V DC, 5 to 17 A

8/2 SITOP modular 5 A
8/2 SITOP PSU300E 5 A
8/2 SITOP PSU300P 8 A
8/3 SITOP PSU300S 10 A
8/3 SITOP modular 10 A
8/3 SITOP PSU300B 17 A
8/8 Ordering data and further information

For AL and ECCN export regulations see page 16/20

Output currents 5 A to 17 A

Overview

Product	SITOP modular	Special design PSU300E	Special design PSU300P
Power supply, type	5 A	5 A	8 A
Order No.	6EP1333-3BA00 [1) 2)]	6EP1433-0AA00	6EP1433-2CA00
The product families are highlighted in the same color. For an explanation of the product families, see chapter 1, pages 1/8 through 1/12			
	Modular power supply with 1-phase and 2-phase wide-range inputs for global use; with selectable output characteristic; functional expansion possible using add-on modules.	Three-phase power supply with wide-range input and 5 A output current in particularly slim design; with extended mains buffering time, removable screw terminals, floating relay contact "24 V OK."	The 8 A power supply in IP67 degree of protection is suitable for distributed operation on three-phase supplies. The status values "24 V OK" and "Overtemperature" are output on two separate signaling contacts.
Expansion possibilities	Expansion modules, such as redundancy modules or selectivity modules for the protection of 24 V feeds (chapter 10), and DC UPS for additional protection against power failures (chapter 11)		

Technical specifications

Product	SITOP modular	Special design PSU300E	Special design PSU300P
Input			
Rated voltage value $U_{in\ rated}$	1-phase and 2-phase AC **120 ... 230 V/230 ... 500 V AC**	3-phase AC **400 ... 500 V 3 AC**	3-phase AC **400 ... 480 V 3 AC**
• Comment			320 ... 340 V for max. 1 min
Supply voltage			
• 1 for AC rated value	120 V ... 230 V		
• 2 for AC rated value	230 V ... 500 V		
• Comment	Set by means of selector switch on device; startup from U_{in} > 90/180 V		
Input voltage			
• 1 for AC	85 … 264 V		
• 2 for AC	176 … 550 V		
• for DC			
Voltage range		320 … 550 V	340 … 550 V
Overvoltage resistance	1300 V_{peak}, 1.3 ms		Implemented internally with varistors
Mains buffering at $I_{out\ rated}$, min.	25 ms	50 ms	15 ms
Mains buffering	at U_{in} = 120/230 V, typ. 150 ms at U_{in} = 400 V	at U_{in} = 400 V	at U_{in} = 400 V
Rated line frequency value			
• 1	50 Hz	50 Hz	50 Hz
• 2	60 Hz	60 Hz	60 Hz
Line frequency range	47 ... 63 Hz	47 … 63 Hz	45 ... 66 Hz
Input current at rated value of input voltage			
• 120 V rated value	2.2 A		
• 230 V rated value	1.2 A		
• 400 V rated value		0.36 A	0.5 A
• 500 V rated value	0.61 A	0.29 A	
Switch-on current limit (+25 °C)	max. 35 A	max. 15 A	max. 40 A
Duration of the switch-on current limit at 25 °C max.			
I^2t, max.	1.7 A^2s	0.9 A^2s	3.5 A^2s
Built-in incoming fuse	T 3.15 A (not accessible)	none	T 4 A
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker for single-phase operation: 6 A or higher (10 A) characteristic C (B); required for two-phase operation: Miniature circuit breaker 2-pole coupled or circuit breaker 3RV2011-1EA10 (setting 3.8 A) or 3RV2711-1ED10 (UL 489) at 230 V; 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489) at 400/500 V	Required: 3-pole coupled miniature circuit breaker 6 A characteristic B or C or circuit breaker 3RV2011-1DA10, (setting 3 A) or 3RV2711-1DD10 (UL 489)	Required: Circuit breaker 3RV2011-1DA10 or 3RV2711-1DD10 (UL 489)
Output			
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $U_{out\ rated\ DC}$	**24 V**	**24 V**	**24 V**

1) SIPLUS module, see page 14/3.

2) SITOP modular plus 6EP1333-3BA00-8AC0, PCB with protective coating.

SITOP smart PSU300S	SITOP modular	Special design PSU300B
10 A	**10 A**	**17 A**
6EP1434-2BA10	**6EP1436-3BA00** [1]	**6EP1436-3BA20**
		
High-performance, standard power supply for 3-phase networks 400-500 V 3 AC, high overload capability through extra power with 1.5 times the rated current for 5 s and continuous 120 % output power to +45 °C ambient temperature.	Modular power supply with 1-phase and 2-phase wide-range inputs for global use; with selectable output characteristic; functional expansion possible using add-on modules.	For battery charging optimized power supply with three-phase wide-range input for global use; slim design; with integrated signaling contact, functional expansion possible using add-on modules.

Expansion modules, such as redundancy modules or selectivity modules for the protection of 24 V feeds (chapter 10), and DC UPS for additional protection against power failures (chapter 11)

SITOP smart PSU300S	SITOP modular	Special design PSU300B
3-phase AC **400 ... 500 V 3 AC**	1-phase and 2-phase AC **120 ... 230/230 ... 500 V 2 AC** 120 V ... 230 V 230 V ... 500 V	3-phase AC **400 ... 500 V 3 AC**
340 … 550 V	85 … 264 V 176 … 550 V	320 … 575 V
6 ms at U_{in} = 400 V	1300 V_{peak}, 1.3 ms 25 ms at U_{in} = 120/230 V, typ. 150 ms at U_{in} = 400 V	20 ms at U_{in} = 400 V
50 Hz 60 Hz 47 … 63 Hz	50 Hz 60 Hz 47 ... 63 Hz	50 Hz 60 Hz 47 … 63 Hz
0.7 A 0.5 A	4.4 A 2.4 A 1.1 A	1.2 A 1 A
max. 36 A	max. 35 A	max. 18A
0.9 A^2s	4 A^2s	0.8 A^2s
none Required: 3-pole coupled miniature circuit breaker 6 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10, (setting 3 A) or 3RV2711-1DD10 (UL 489)	T 6.3 A (not accessible) Recommended miniature circuit breaker for single-phase operation: 6 A or higher (10 A) characteristic C (B); required for two-phase operation: Miniature circuit breaker 2-pole coupled or circuit breaker 3RV2011-1EA10 (setting 3.8 A) or 3RV2711-1ED10 (UL 489) at 230 V; 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489) at 400/500 V	none Required: 3-pole coupled miniature circuit breaker 6 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10, (setting 3 A) or 3RV2711-1DD10 (UL 489)
Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**	Controlled, isolated DC voltage **24 V**

[1] SIPLUS module, see page 14/3.

Output currents 5 A to 17 A

Technical specifications (continued)

Product	SITOP modular	Special design PSU300E	Special design PSU300P
Power supply, type	**5 A**	**5 A**	**8 A**
Order No.	**6EP1333-3BA00**	**6EP1433-0AA00**	**6EP1433-2CA00**
Output (continued)			
Total tolerance, static ±	3 %	3 %	3 %
• Static mains compensation, approx.	0.1 %	3 %	0.5 %
• Static load compensation, approx.	0.1 %	3 %	0.5 %
Residual ripple, peak-peak	Max. 50 mV	Max. 150 mV (typ. 35 mV)	Max. 200 mV
Spikes (bandwidth approx. 20 MHz)	Max. 200 mV	Max. 240 mV (typ. 70 mV)	Max. 250 mV
Adjustment range	24 … 28.8 V	24 … 29 V	
Settable output voltage	Yes	Yes	No
Output voltage adjustment	via potentiometer	via potentiometer	–
• Comment		Max. 120 W	
Status display	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK
Signaling	possible via signaling module (6EP1961-3BA10)	Relay contact (NO contact, rating 60 V DC/0.3 A) for 24 V OK	Max. 30 V, 10 mA; power good (high level 1L+ for U_{out} in range 21.3 ... 29 V); overtemperature warning at least 30 s before switch-off (high level 1L+ when the max. internal temperature is exceeded)
On/off behavior	Overshoot of U_{out} < 3 %	Overshoot of U_{out} approx. 3 %	Overshoot of U_{out} < 2 %
Startup delay, max.	1 s	0.5 s	1.5 s
Voltage rise, typ.	50 ms	10 ms	40 ms
Maximum voltage rise time of the output voltage		100 ms	
Rated current $I_{out\ rated}$	**5 A**	**5 A**	**8 A**
Current range	0 … 5 A	0 … 5 A	0 … 8 A
• Comment			
Typical power output	120 W	120 W	192 W
Temporary overload current			
• in the event of a short circuit during startup, typical		33 A	50 A
• in the event of a short circuit during operation, typical	15 A	28 A	50 A
Constant overload current in the event of a short circuit during startup, typical	5.5 A		
Duration of overload capability overcurrent			
• in the event of a short circuit during startup		140 ms	100 ms
• in the event of a short circuit during operation	25 ms	135 ms	100 ms
Parallel switching for enhanced performance	Yes	No	No
• Comment	Switchable characteristic		
Number of devices that can be switched in parallel to enhance performance, units	2		
Efficiency			
Efficiency at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	87 %	90 %	88 %
Power loss at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	18 W	13 W	25 W
Closed-loop control			
Dyn. mains compensation ($U_{in\ rated}$ ± 15 %), max.	0.1 %	3 %	0.5 %
Dynamic load compensation (I_{out}: 50/100/50 %), U_{out} ± typ.	3 %	5 %	1 %
Load step settling time			
• 50 to 100 %, typ.	2 ms	1 ms	
• 100 to 50 %, typ.	2 ms	1 ms	
Settling time, maximum	5 ms	30 ms	2 ms
Protection and monitoring			
Output overvoltage protection	< 35 V	Yes, according to EN 60950-1	< 33 V
Current limitation, typ.	5.5 A	11 A	9.4 A
Property of the output, short-circuit-proof	Yes	Yes	Yes
Short-circuit protection	Optional constant current characteristic approx. 5.5 A or latching shutdown	Electronic shutdown, automatic restart	Electronic shutdown, automatic restart
Sustained short-circuit current rms value			
• Maximum		7.5 A	10 A
• Typical	5.5 A		
• Comment			

SITOP smart PSU300S	SITOP modular	Special design PSU300B
10 A	**10 A**	**17 A**
6EP1434-2BA10	**6EP1334-3BA00**	**6EP1436-3BA20**
3 % 0.5 % 1 % Max. 150 mV Max. 240 mV	3 % 0.1 % 0.1 % Max. 50 mV Max. 200 mV	3 % 0.1 % 0.2 % Max. 100 mV Max. 200 mV
24 … 28 V Yes via potentiometer Max. 240 W Green LED for 24 V OK Relay contact (NO contact, rating 60 V DC/0.3 A) for 24 V OK No overshoot of U_{out} (soft start)	24 … 28.8 V Yes via potentiometer Green LED for 24 V OK possible via signaling module (6EP1961-3BA10) Overshoot of U_{out} approx. 3 %	24 … 28.8 V Yes via potentiometer Max. 480 W Green LED for 24 V OK Relay contact (NO contact, rating 60 V DC/0.3 A) for 24 V OK No overshoot of U_{out} (soft start)
1.5 s 30 ms 500 ms **10 A** 0 … 10 A 12 A to +45 °C	1 s 50 ms **10 A** 0 … 10 A +60 ... +70 °C: Derating 2%/K (at 120 V, 230 V) or 3.5 %/K (at 400 V)	2.5 s 500 ms **20 A** 0 … 17 A +60 ... +70 °C: Derating 2%/K
240 W 16 A 16 A 100 ms 100 ms	240 W 30 A 12 A 25 ms	408 W 19 A
Yes 2	Yes Switchable characteristic 2	Yes Switchable characteristic 2
91 % 24 W	87 % 36 W	93 % 31 W
3 % 3 %	0.1 % 3 %	1 % 2 %
2 ms 2 ms 100 ms	2 ms 2 ms 5 ms	2 ms 2 ms 10 ms
Yes, according to EN 60950-1 11 A Yes	< 35 V 12 A Yes	< 35 V 19 A Yes
Electronic shutdown, automatic restart 3.2 A Overload capability 150 % $I_{out\ rated}$ up to 5 s/min	Optional constant current characteristic approx. 12 A or latching shutdown 12 A	Optional constant current characteristic approx. 19 A or latching shutdown 19 A

Output currents 5 A to 17 A

Technical specifications (continued)

Product	SITOP modular	Special design PSU300E	Special design PSU300P
Power supply, type	**5 A**	**5 A**	**8 A**
Order No.	**6EP1333-3BA00**	**6EP1433-0AA00**	**6EP1433-2CA00**
Protection and monitoring (continued)			
Overload/short-circuit indicator	Yellow LED for "overload", red LED for "latching shutdown"		–
Safety			
Primary/secondary isolation	Yes	Yes	Yes
Isolation	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1 and EN 50178
Protection class	Class I	Class I	Class I
Leakage current			
• Maximum	3.5 mA		3.5 mA
• Typical	0.25 mA		0.4 mA
CE mark	Yes	Yes	Yes
UL/CSA approval	Yes	Yes	No
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259	UL-listed (UL 508) available soon
Explosion protection	ATEX (Ex) II 3G Ex nA nC IIC T3 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T3	–	–
FM approval	–		–
CB approval	No	Yes	Yes
Marine approval	GL, ABS		–
Degree of protection (EN 60529)	IP20	IP20	IP67, enclosure type 4 indoor
EMC			
Emitted interference	EN 55022 Class B	EN 55022 Class A	EN 55022 Class A
Supply harmonics limitation	EN 61000-3-2	EN 61000-3-2	–
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data			
Ambient temperature			
• During operation	-25 … +70 °C	0 ... +60 °C	-25 … +55 °C
- Comment	with natural convection	with natural convection	with natural convection
• During transport	-40 … +85 °C	-40 ... +85 °C	-40 … +70 °C
• During storage	-40 … +85 °C	-40 ... +85 °C	-40 … +70 °C
Humidity class according to EN 60721	Climate class 3K3, without condensation	Climate class 3K3, without condensation	Climate class 3K3, without condensation
Mechanics			
Connection method	Screw terminals	Screw terminals	Screw terminals
Connections			
• Supply input	L, N, PE: 1 screw terminal each for 0.2 ... 2.5 mm² solid/finely stranded	L1, L2, L3, PE: removable screw terminal for 0.5 ... 2.5 mm² solid/finely stranded	L1, L2, L3, PE: Plug-in connector HAN Q4/2 (for mating connector, see "Electrical accessories")
• Output	+, -: 2 screw terminals each for 0.2 ... 2.5 mm²	+, -: 2 screw terminals each for 0.5 ... 2.5 mm²	L+, M: 1 x 2 mm² (2-pole cable for +/- with open, labeled ends, 2 x 2 mm²)
• Auxiliary contacts	–	–	Alarm signals: M12 plug-in connector, 5-pin
Width of enclosure	70 mm	42 mm	310 mm
Height of enclosure	125 mm	125 mm	135 mm
Depth of enclosure	125 mm	125 mm	90 mm
Mounting width	70 mm	42 mm	
Mounting height	225 mm	225 mm	
Weight, approx.	1.2 kg	0.6 kg	2.8 kg
Product property of the enclosure: side-by-side enclosure	Yes	Yes	No
Type of mounting			
• Wall mounting	No	No	Yes
• DIN rail mounting	Yes	Yes	No
• S7-300 rail mounting	No	No	No
Installation	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15	Can be mounted on ET 200pro mounting rail
Electrical accessories	Signaling module, buffer module (chapter 10)		Power connector (3RK1911-2BE50 (2.5 mm²))
Mechanical accessories			

SITOP smart PSU300S	SITOP modular	Special design PSU300B
10 A	10 A	17 A
6EP1434-2BA10	6EP1334-3BA00	6EP1436-3BA20
–	Yellow LED for "overload", red LED for "latching shutdown"	Yellow LED for "overload", red LED for "latching shutdown"
Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I Yes	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I 3.5 mA 0.32 mA Yes	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I 3.5 mA 0.9 mA Yes
Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259	Available soon
ATEX (EX) II 3G Ex nAC IIC T4; cCSAus (CSA C22.2 No. 213, ANSI/ ISA-12.12.01) Class I Div. 2 Group ABCD T4 Yes GL IP20	ATEX (Ex) II 3G Ex nA nC IIC T3 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T3 – No GL, ABS IP20	Available soon – No GL IP20
EN 55022 Class B EN 61000-3-2 EN 61000-6-2	EN 55022 Class B EN 61000-3-2 EN 61000-6-2	EN 55022 Class B EN 61000-3-2 EN 61000-6-2
0 ... + 70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	-25 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	-25 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation
Screw terminals L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 4 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.2 ... 4 mm^2 13, 14 (alarm signal): 1 screw terminal each for 0.14 ... 1.5 mm^2	Screw terminals L, N, PE: 1 screw terminal each for 0.2 ... 2.5 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.2 ... 2.5 mm^2 –	Screw terminals L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 4 mm^2 solid/finely stranded +, -: 2 screw terminals each 13, 14 (alarm signal): 1 screw terminal each for 0.14 ... 1.5 mm^2
90 mm 145 mm 150 mm 90 mm 225 mm 1.6 kg Yes	90 mm 125 mm 125 mm 90 mm 225 mm 1.4 kg Yes	70 mm 125 mm 125 mm 70 mm 225 mm 1.2 kg Yes
No Yes No Snaps onto DIN rail EN 60715 35x7.5/15 Buffer module (chapter 10) Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	No Yes No Snaps onto DIN rail EN 60715 35x7.5/15 Signaling module, buffer module (chapter 10)	No Yes No Snaps onto DIN rail EN 60715 35x7.5/15 Buffer module (chapter 10) Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20

Output currents 5 A to 17 A

Selection and ordering data

Product	Input Voltage $U_{in\ rated}$	Output Voltage $U_{out\ rated}$	Current $I_{out\ rated}$	Order No.	Price
SITOP modular					
	**120 ... 230/ 230 ... 500 V AC**	**24 V DC**	5 A	**6EP1333-3BA00**	
	Variant with PCB with protective coating			**6EP1333-3BA00-8AC0**	
Special design, PSU300E					
	**400 ... 500 V 3 AC**	**24 V DC**	5 A	**6EP1433-0AA00**	
Special design, PSU300P					
	**400 ... 480 V 3 AC**	**24 V DC**	8 A	**6EP1433-2CA00**	
SITOP smart, PSU300S					
	**400 ... 500 V 3 AC**	**24 V DC**	10 A	**6EP1434-2BA10**	
SITOP modular					
	**120 ... 230/ 230 ... 500 V 2 AC**	**24 V DC**	10 A	**6EP1334-3BA00**	
Special design, PSU300B					
	**400 ... 500 V 3 AC**	**24 V DC**	17 A	**6EP1436-3BA20**	

Further information

You can find additional information in the Internet at:

- 2D dimensional drawings, 3D CAD data, circuit diagram macros:
  www.siemens.com/sitop-cax
- Operating instructions:
  www.siemens.com/sitop-manuals
- SITOP Selection Tool:
  www.siemens.com/sitop-selection-tool

SITOP 3-phase
24 V DC, 20 to 40 A

9/2 SITOP PSU300S 20 A
9/2 SITOP PSU300M 20 A
9/2 SITOP modular 20 A
9/3 SITOP PSU300B 30 A
9/3 SITOP PSU300S 40 A
9/3 SITOP PSU300M 40 A
9/3 SITOP modular 40 A
9/8 Ordering data and further information

For AL and ECCN export regulations see page 16/20

Output current 20 A to 40 A

Overview

Product	SITOP smart PSU300S	SITOP modular PSU300M	SITOP modular
Power supply, type	20 A	20 A	20 A
Order No.	6EP1436-2BA10 [2]	6EP1436-3BA10	6EP1436-3BA00 [1] [2]
The product families are highlighted in the same color. For an explanation of the product families, see chapter 1, pages 1/8 through 1/12			
	High-performance, standard power supply for 3-phase networks 400-500 V 3 AC, high overload capability through extra power with 1.5 times the rated current for 5 s and continuous 120 % output power to +45 °C ambient temperature.	The modular power supply with 3-phase wide-range input for global use; slim design; with 50 % extra power and switchable output characteristic; with integrated signaling contact for "24 V OK"; functional expansion possible using add-on modules.	Modular power supply with 3-phase wide-range input for use around the world in a wide variety of applications; functional expansion possible using add-on modules.
Expansion possibilities	Expansion modules, such as redundancy modules or selectivity modules for the protection of 24 V feeds (chapter 10), and DC UPS for additional protection against power failures (chapter 11)		

Technical specifications

Product	SITOP smart PSU300S	SITOP modular PSU300M	SITOP modular
Input			
Rated voltage value $U_{in\ rated}$	3-phase AC **400 ... 500 V 3 AC**	3-phase AC **400 V ... 500 V 3 AC**	3-phase AC **400 ... 500 V 3 AC**
Supply voltage			
• 1 for AC rated value			
• 2 for AC rated value			
• for DC			
• Comment			Startup from U_{in} > 340 V
Input voltage			
• 1 for AC			
• 2 for AC			
• for DC			
Voltage range	340 … 550 V	320 … 575 V	320 … 550 V
Overvoltage resistance			2.3 x $U_{in\ rated}$, 1.3 ms
Mains buffering at $I_{out\ rated}$, min.	6 ms	15 ms	6 ms
Mains buffering	at U_{in} = 400 V		at U_{in} = 400 V
Rated line frequency value			
• 1	50 Hz	50 Hz	50 Hz
• 2	60 Hz	60 Hz	60 Hz
Line frequency range	47 ... 63 Hz	47 … 63 Hz	47 … 63 Hz
Input current at rated value of input voltage			
• 400 V rated value	1.2 A	1.2 A	1.1 A
• 500 V rated value	1 A	1 A	0.9 A
Switch-on current limit (+25 °C)	max. 36 A	max. 18 A	max. 35 A
I^2t, max.	0.9 A^2s	0.8 A^2s	0.7 A^2s
Built-in incoming fuse	None	None	None
Protection in the mains power input (IEC 898)	Required: 3-pole coupled miniature circuit breaker 6 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10, (setting 3 A) or 3RV2711-1DD10 (UL 489)	Required: 3-pole coupled miniature circuit breaker 6 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10, (setting 3 A) or 3RV2711-1DD10 (UL 489)	Required: 3-pole coupled miniature circuit breaker 6 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10, (setting 3 A) or 3RV2711-1DD10 (UL 489)
Output			
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $U_{out\ rated\ DC}$	**24 V**	**24 V**	**24 V**
Total tolerance, static ±	3 %	3 %	3 %
• Static mains compensation, approx.	0.5 %	0.1 %	0.1 %
• Static load compensation, approx.	1 %	0.2 %	0.2 %
Residual ripple, peak-peak	Max. 150 mV	Max. 100 mV	Max. 100 mV
Spikes (bandwidth approx. 20 MHz)	Max. 240 mV	Max. 200 mV	Max. 200 mV

[1] SITOP modular plus 6EP1336-3BA00-8AA0, PCB with protective coating.

[2] SIPLUS module, see page 14/4.

Special design PSU300B	SITOP smart PSU300S	SITOP modular PSU300M	SITOP modular
30 A	40 A	40 A	40 A
6EP1437-3BA20	6EP1437-2BA20	6EP1437-3BA10 [1]	6EP1437-3BA00 [1] [2]
			
For battery charging optimized power supply with three-phase wide-range input for global use; slim design; with integrated signaling contact for "24 V OK", functional expansion possible using add-on modules.	High-performance, standard power supply for 3-phase networks 400-500 V 3 AC, high overload capability through extra power with 1.5 times the rated current for 5 s and continuous 120 % output power to +45 °C ambient temperature.	The modular power supply with 3-phase wide-range input for global use; slim design; with 50 % extra power and switchable output characteristic; with integrated signaling contact for "24 V OK"; functional expansion possible using add-on modules.	Modular power supply with 3-phase wide-range input for use around the world in a wide variety of applications; functional expansion possible using add-on modules.

Expansion modules, such as redundancy modules or selectivity modules for the protection of 24 V feeds (chapter 10), and DC UPS for additional protection against power failures (chapter 11)

Special design PSU300B	SITOP smart PSU300S	SITOP modular PSU300M	SITOP modular
3-phase AC **400 ... 500 V 3 AC**	3-phase AC **400 ... 500 V 3 AC**	3-phase AC **400 ... 500 V 3 AC**	3-phase AC **400 ... 500 V 3 AC** Startup from U_{in} > 340 V
320 … 575 V 20 ms at U_{in} = 400 V 50 Hz 60 Hz 47 ... 63 Hz	340 … 550 V 6 ms at U_{in} = 400 V 50 Hz 60 Hz 47 … 63 Hz	320 … 575 V 15 ms at U_{in} = 400 V 50 Hz 60 Hz 47 ... 63 Hz	320 … 550 V 2.3 x $U_{in\ rated}$, 1.3 ms 6 ms at U_{in} = 400 V 50 Hz 60 Hz 47 … 63 Hz
1.6 A 1.3 A	1.7 A 1.5 A	2.6 A 2.1 A	2.2 A
max. 56 A 2.24 A^2s	max. 60 A 3.4 A^2s	max. 56 A 2.24 A^2s	max. 70 A 2.8 A^2s
None Required: 3-pole coupled miniature circuit breaker 10 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10, (setting 3 A) or 3RV2711-1DD10 (UL 489)	None Required: 3-pole coupled miniature circuit breaker 10 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10, (setting 3 A) or 3RV2711-1DD10 (UL 489)	None Required: 3-pole coupled miniature circuit breaker 10 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10, (setting 3 A) or 3RV2711-1DD10 (UL 489)	None Required: 3-pole coupled miniature circuit breaker 10 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10, (setting 3 A) or 3RV2711-1DD10 (UL 489)
Controlled, isolated DC voltage **24 V** 3 % 0.1 % 0.1 % Max. 100 mV Max. 200 mV	Controlled, isolated DC voltage **24 V** 3 % 1 % 2 % Max. 150 mV Max. 240 mV	Controlled, isolated DC voltage **24 V** 3 % 0.1 % 0.2 % Max. 100 mV Max. 200 mV	Controlled, isolated DC voltage **24 V** 3 % 0.1 % 0.2 % Max. 100 mV Max. 200 mV

1) SIPLUS module, see page 14/4.

2) SITOP modular plus 6EP1336-3BA00-8AA0, PCB with protective coating.

Output current 20 A to 40 A

Technical specifications (continued)

Product	SITOP smart PSU300S	SITOP modular PSU300M	SITOP modular
Power supply, type	**20 A**	**20 A**	**20 A**
Order No.	**6EP1436-2BA10**	**6EP1436-3BA10**	**6EP1436-3BA00**
Output (continued)			
Adjustment range	24 … 28 V	24 … 28.8 V	24 … 28.8 V
Settable output voltage	Yes	Yes	Yes
Output voltage adjustment	via potentiometer	via potentiometer	via potentiometer
• Comment	Max. 480 W	Max. 480 W	Max. 480 W
Status display	Green LED for 24 V OK	Green LED for 24 V OK	Green LED for 24 V OK
Signaling	Relay contact (NO contact, rating 60 V DC/0.3 A) for 24 V OK	Relay contact (NO contact, rating 60 V DC/0.3 A) for 24 V OK	possible via signaling module (6EP1961-3BA10)
On/off behavior	No overshoot of U_{out} (soft start)	No overshoot of U_{out} (soft start)	No overshoot of U_{out} (soft start)
Startup delay, max.	1.5 s	2.5 s	2.5 s
• Comment			
Voltage rise, typ.	30 ms		
Maximum voltage rise time of the output voltage	500 ms	500 ms	500 ms
Rated current $I_{out\ rated}$	**20 A**	**20 A**	**20 A**
Current range	0 … 20 A	0 … 20 A	0 … 20 A
• Comment	24 A up to +45 °C; +60 ... +70 °C: Derating 5%/K	+60 ... +70 °C: Derating 3%/K	+60 ... +70 °C: Derating 2%/K
Typical power output	480 W	480 W	480 W
Temporary overload current			
• in the event of a short circuit U_{out} during startup, typical	35 A		
• in the event of a short circuit during operation, typical	35 A	60 A	60 A
Constant overload current			
• in the event of a short circuit during startup, typical		23 A	23 A
• in the event of a short circuit during operation, typical			
Duration of overload capability overcurrent			
• in the event of a short circuit during startup	100 ms		
• in the event of a short circuit during operation	100 ms	25 ms	25 ms
Parallel switching for enhanced performance	Yes	Yes	Yes
• Comment		Switchable characteristic	Switchable characteristic
Number of devices that can be switched in parallel to enhance performance, units	2	2	2
Efficiency			
Efficiency at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	91 %	93 %	90 %
Power loss at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	47 W	36 W	53 W
Closed-loop control			
Dyn. mains compensation ($U_{in\ rated}$ ± 15 %), max.	3 %	1 %	1 %
Dynamic load compensation (I_{out}: 50/100/50 %), U_{out} ± typ.	3 %	2 %	2 %
Load step settling time			
• 50 to 100 %, typ.	2 ms	2 ms	4 ms
• 100 to 50 %, typ.	2 ms	2 ms	4 ms
Settling time, maximum	10 ms	10 ms	10 ms
Protection and monitoring			
Output overvoltage protection	In the event of an internal fault U_{out} < 35 V	< 35 V	< 35 V
Current limitation, typ.	25 A	23 A	23 A
Property of the output, short-circuit-proof	Yes	Yes	Yes
Short-circuit protection	Electronic shutdown, automatic restart	Optional constant current characteristic approx. 23 A or latching shutdown	Optional constant current characteristic approx. 23 A or latching shutdown
Sustained short-circuit current rms value			
• Maximum	7 A		
• Typical		23 A	23 A
• Comment	Overload capability 150 % $I_{out\ rated}$ up to 5 s/min	Overload capability 150 % $I_{out\ rated}$ up to 5 s/min	
Overload/short-circuit indicator		Yellow LED for "overload", red LED for "latching shutdown"	Yellow LED for "overload", red LED for "latching shutdown"

Special design PSU300B	SITOP smart PSU300S	SITOP modular PSU300M	SITOP modular
30 A	40 A	40 A	40 A
6EP1437-3BA20	6EP1437-2BA20	6EP1437-3BA10	6EP1437-3BA00
24 … 28.8 V Yes via potentiometer Green LED for 24 V OK Relay contact (NO contact, rating 60 V DC/0.3 A) for 24 V OK No overshoot of U_{out} (soft start)	24 … 28 V Yes via potentiometer Max. 960 W Green LED for 24 V OK Relay contact (NO contact, rating 60 V DC/0.3 A) for 24 V OK No overshoot of U_{out} (soft start)	24 … 28.8 V Yes via potentiometer Max. 960 W Green LED for 24 V OK Relay contact (NO contact, rating 60 V DC/0.3 A) for 24 V OK No overshoot of U_{out} (soft start)	24 … 28.8 V Yes via potentiometer Max. 960 W Green LED for 24 V OK possible via signaling module (6EP1961-3BA10) No overshoot of U_{out} (soft start)
2.5 s 500 ms **30 A** 0 … 30 A +60 ... +70 °C: Derating 1.7%/K	1.5 s 15 ms 500 ms **40 A** 0 … 40 A 48 A up to +45 °C; +60 ... +70 °C: Derating 2.5%/K	2.5 s 500 ms **40A** 0 … 40 A +60 ... +70 °C: Derating 3.75%/K	2.5 s 500 ms **40 A** 0 … 40 A +60 ... +70 °C: Derating 2%/K
960 W 32 A 32 A	960 W 65 A 65 A 120 ms 120 ms	960 W 120 A 44 A 25 ms	960 W 120 A 46 A 25 ms
Yes Switchable characteristic 2	Yes 2	Yes Switchable characteristic 2	Yes Switchable characteristic 2
93 % 50 W	91.5 % 89 W	92 % 83 W	90 % 106 W
1 % 3 %	3 % 1.5 %	1 % 3 %	1 % 2 %
   10 ms	1 ms 1 ms 10 ms	 10 ms	4 ms 4 ms 10 ms
< 35 V 32 A Yes	In the event of an internal fault U_{out} < 35 V 50 A Yes	< 35 V 44 A Yes	< 35 V 46 A Yes
Optional constant current characteristic approx. 32 A or latching shutdown 32 A Yellow LED for "overload", red LED for "latching shutdown"	Electronic shutdown, automatic restart 14 A Overload capability 150 % $I_{out\ rated}$ up to 5 s/min	Optional constant current characteristic approx. 44 A or latching shutdown 44 A Overload capability 150 % $I_{out\ rated}$ up to 5 s/min Yellow LED for "overload", red LED for "latching shutdown"	Optional constant current characteristic approx. 46 A or latching shutdown 46 A Yellow LED for "overload", red LED for "latching shutdown"

Output current 20 A to 40 A

Technical specifications (continued)

Product	SITOP smart PSU300S	SITOP modular PSU300M	SITOP modular
Power supply, type	20 A	20 A	20 A
Order No.	6EP1436-2BA10	6EP1436-3BA10	6EP1436-3BA00
Safety			
Primary/secondary isolation	Yes	Yes	Yes
Isolation	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1 and EN 50178
Protection class	Class I	Class I	Class I
Leakage current			
• Maximum	3.5 mA	3.5 mA	3.5 mA
• Typical	1 mA	0.9 mA	
CE mark	Yes	Yes	Yes
UL/CSA approval	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259	UL-listed (UL 508), File E197259, CSA (CSA C22.2 No. 14, CSA C22.2 No. 107.1)
Explosion protection	ATEX (EX) II 3G Ex nAC IIC T4; cCSAus (CSA C22.2 No. 213, ANSI/ ISA-12.12.01) Class I Div. 2 Group ABCD T4	ATEX (EX) II 3G Ex nA nC IIC T4; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T4	ATEX (Ex) II 3G Ex nA nC IIC T3 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T3
FM approval		–	–
CB approval	Yes	Yes	No
Marine approval	GL, ABS	GL, ABS	GL, ABS
Degree of protection (EN 60529)	IP20	IP20	IP20
EMC			
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	EN 61000-3-2	EN 61000-3-2	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data			
Ambient temperature			
• During operation	0 ... +70 °C	-25 … +70 °C	0 ... +70 °C
- Comment	with natural convection	with natural convection	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
Humidity class according to EN 60721	Climate class 3K3, without condensation	Climate class 3K3, without condensation	Climate class 3K3, without condensation
Mechanics			
Connection method	Screw terminals	Screw terminals	Screw terminals
Connections			
• Supply input	L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 4 mm^2 solid/finely stranded	L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 4 mm^2 solid/finely stranded	L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 4 mm^2 solid/finely stranded
• Output	+, -: 2 screw terminals each for 0.2 ... 4 mm^2	+, -: 2 screw terminals each for 0.2 ... 4 mm^2	+, -: 2 screw terminals each for 0.33 ... 4 mm^2
• Auxiliary contacts	13, 14 (alarm signal): 1 screw terminal each for 0.14 ... 1.5 mm^2	13, 14 (alarm signal): 1 screw terminal each for 0.14 ... 1.5 mm^2	–
Width of enclosure	90 mm	70 mm	160 mm
Height of enclosure	145 mm	125 mm	125 mm
Depth of enclosure	150 mm	125 mm	125 mm
Mounting width	90 mm	70 mm	160 mm
Mounting height	225 mm	225 mm	225 mm
Weight, approx.	1.6 kg	1.2 kg	2 kg
Product property of the enclosure: side-by-side enclosure	Yes	Yes	Yes
Type of mounting			
• Wall mounting	No	No	No
• DIN rail mounting	Yes	Yes	Yes
• S7-300 rail mounting	No	No	No
Installation	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	Buffer module (chapter 10)	Buffer module (chapter 10)	Signaling module, buffer module (chapter 10)
Mechanical accessories	Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	

Special design PSU300B	SITOP smart PSU300S	SITOP modular PSU300M	SITOP modular
30 A	40 A	40 A	40 A
6EP1437-3BA20	6EP1437-2BA20	6EP1437-3BA10	6EP1437-3BA00
Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I 3.5 mA Yes	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I Yes	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I 3.5 mA Yes	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I 3.5 mA Yes
Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259	Yes UL-listed (UL 508), File E197259, CSA (CSA C22.2 No. 14, CSA C22.2 No. 107.1)
– – No – IP20	ATEX (EX) II 3G Ex nA nC IIC T3; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T3 Yes GL, ABS IP20	ATEX (EX) II 3G Ex nA nC IIC T4; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T4 – Yes GL, ABS IP20	ATEX (Ex) II 3G Ex nA nC IIC T3 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T3 – No – IP20
EN 55022 Class B EN 61000-3-2 EN 61000-6-2	EN 55022 Class B EN 61000-3-2 EN 61000-6-2	EN 55022 Class B EN 61000-3-2 EN 61000-6-2	EN 55022 Class B EN 61000-3-2 EN 61000-6-2
-25 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	0 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	-25 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	0 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation
Screw terminals L, N, PE: 1 screw terminal each for 0.2 ... 4 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.33 ... 10 mm^2 13, 14 (alarm signal): 1 screw terminal each for 0.14 ... 1.5 mm^2	Screw terminals L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 4 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.5 ... 10 mm^2 13, 14 (alarm signal): 1 screw terminal each for 0.14 ... 1.5 mm^2	Screw terminals L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 4 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.33 ... 10 mm^2 13, 14 (alarm signal): 1 screw terminal each for 0.14 ... 1.5 mm^2	Screw terminals L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 4 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.33 ... 10 mm^2 –
150 mm 125 mm 150 mm 150 mm 225 mm 3.4 kg Yes	150 mm 145 mm 150 mm 150 mm 225 mm 3.7 kg Yes	150 mm 125 mm 150 mm 150 mm 225 mm 3.4 kg Yes	240 mm 125 mm 125 mm 240 mm 225 mm 3.2 kg Yes
No Yes No Snaps onto DIN rail EN 60715 35x15 Buffer module (chapter 10) Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	No Yes No Snaps onto DIN rail EN 60715 35x15 Buffer module (chapter 10) Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	No Yes No Snaps onto DIN rail EN 60715 35x15 Buffer module (chapter 10) Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	No Yes No Snaps onto DIN rail EN 60715 35x15 Signaling module, buffer module (chapter 10)

Output current 20 A to 40 A

Selection and ordering data

Product	Input Voltage $U_{in\ rated}$	Output Voltage $U_{out\ rated}$	Current $I_{out\ rated}$	Order No.	Price
SITOP smart, PSU300S					
	**400-500 V 3 AC**	**24 V DC**	20 A	**6EP1436-2BA10**	
SITOP modular PSU300M					
	**400-500 V 3 AC**	**24 V DC**	20 A	**6EP1436-3BA10**	
SITOP modular					
	**400-500 V 3 AC** **Variant with PCB with protective coating**	**24 V DC**	20 A	**6EP1436-3BA00** **6EP1436-3BA00-8AA0**	
Special design, PSU300B					
	**400-500 V 3 AC**	**24 V DC**	30 A	**6EP1437-3BA20**	
SITOP smart, PSU300S					
	**400-500 V 3 AC**	**24 V DC**	40 A	**6EP1437-2BA20**	
SITOP modular PSU300M					
	**400-500 V 3 AC**	**24 V DC**	40 A	**6EP1437-3BA10**	
SITOP modular					
	**400-500 V 3 AC** **Variant with PCB with protective coating**	**24 V DC**	40 A	**6EP1437-3BA00** **6EP1437-3BA00-8AA0**	

Further information

You can find additional information in the Internet at:

- 2D dimensional drawings, 3D CAD data, circuit diagram macros:
  www.siemens.com/sitop-cax
- Operating instructions:
  www.siemens.com/sitop-manuals
- SITOP Selection Tool:
  www.siemens.com/sitop-selection-tool

SITOP expansion modules 24 V DC

10

10/2 Signaling module
10/2 Redundancy module SITOP PSE202U NEC class 2
10/2 Redundancy module SITOP PSE202U 10 A
10/3 Redundancy module SITOP PSE202U 40 A
10/3 Buffer module
10/6 Selectivity module SITOP PSE200U 4 x 3 A
10/6 Selectivity module SITOP PSE200U 4 x 10 A
10/7 Selectivity module SITOP PSE200U 4 x 10 A
10/7 Diagnostics module SITOP select 4 x 10 A
10/12 Inrush current limiter
10/14 Ordering data and further information

For AL and ECCN export regulations see page 16/20

Signaling module, redundancy module, buffer module

Overview

Product	SITOP modular signaling module	PSE202U redundancy module	PSE202U redundancy module
Type		NEC Class 2	10 A
Order No.	6EP1961-3BA10 [1]	6EP1962-2BA00	6EP1964-2BA00
The product families are highlighted in the same color. For an explanation of the product families, see chapter 1, pages 1/8 through 1/12.			
	The signaling module in combination with a regulated SITOP modular power supply (6EP1 .3.-3BA00) can provide annunciation signals describing the operational status of the power supply. It can also switch the power supply on and off by remote operation. It hooks up to the power supply automatically.	The SITOP PSE202U redundancy module is used to decouple two SITOP regulated power supplies in parallel operation. The output power is limited in accordance with NEC class 2. The 24 V supply is reliably maintained when one power supply fails.	The SITOP PSE202U redundancy module is used to decouple two SITOP regulated power supplies in parallel operation. The 24 V supply is reliably maintained when one power supply fails.

Technical specifications

Product	SITOP modular signaling module	PSE202U redundancy module	PSE202U redundancy module
Type		NEC Class 2	10 A
Order No.	6EP1961-3BA10	6EP1962-2BA00	6EP1964-2BA00
Input			
		Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage value $U_{in\ rated}$	–	**24 V DC**	**24 V DC**
Voltage range	–	19 … 29 V	19 … 29 V
Mains buffering	–		
Buffering time, max.	–		
Control input	Non-isolated input for remote ON/OFF switching of the power supply		
Output			
Output		Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $U_{out\ rated\ DC}$		24 V	24 V
Output voltage		U_{in} – approx. 0.5 V	U_{in} – approx. 0.5 V
Settable output voltage		No	No
Status display	–	Green LED for "both input voltages > switching threshold"; red LED for "at least one input voltage < switching threshold" or "output switched off"	Green LED for "both input voltages > switching threshold"; red LED for "at least one input voltage < switching threshold"
Signaling	Isolating relay contacts (changeover contacts, contact rating 6 A/240 V AC) for "Output voltage OK" and "Power supply availability OK".	Isolated relay contact (contact rating 6 A/42 V AC, 30 V DC, but max. 100 VA): Contact closed if one or both input voltages < switching threshold or output is switched off. Setting range of switching threshold 20 V ±0.5 V to 25 V ±0.5 V	Isolated relay contact (contact rating 6 A/42 V AC, 30 V DC): Contact closed if both input voltages > switching threshold, setting range of switching threshold 20 V ± 0.5 V to 25 V ± 0.5 V
Rated current $I_{out\ rated}$	–	3.8 A	10 A
Current range, max.		4.6 A	10 A
• Comment		Maximum aggregate current in the event of an error according to NEC class 2 limit 8 A	Maximum aggregate current 10 A

[1] SIPLUS module, see page 14/4.

PSE202U redundancy module	SITOP buffer module
40 A	40 A
6EP1961-3BA21 [1]	6EP1961-3BA01 [1]
	
The SITOP PSE202U redundancy module is used to decouple two SITOP regulated power supplies in parallel operation. The 24 V supply is reliably maintained when one power supply fails.	With short-term power failures, the load current can be backed up without interruption via the buffer module in combination with a SITOP smart or SITOP modular regulated power supply. The buffer module is connected in parallel to the output of the power supply.

PSE202U redundancy module	SITOP buffer module
40 A	40 A
6EP1961-3BA21	6EP1961-3BA01
Stabilized, isolated DC voltage **24 V DC** 24 … 28.8 V	Stabilized, isolated DC voltage **24 V DC** 24 ... 28.8 V Backup time: • with 40 A load current: 200 ms • with 20 A load current: 400 ms • with 10 A load current: 800 ms • with 5 A load current: 1.6 s Reduces the backup time by 100 ms in combination with 6EP1437-3BA10. Maximum backup time 100 ms in combination with 6EP1336-2BA20. 10 s –
Controlled, isolated DC voltage 24 V U_{in} – approx. 0.5 V No Green LED for "both input voltages > switching threshold"; red LED for "at least one input voltage < switching threshold" Isolated relay contact (changeover contact, contact rating 8 A/240 V AC, 24 V DC): O.K. message if both input voltages > switching threshold, setting range of switching threshold 20 ... 25 V	U_{in} – approx. 1 V Green LED for "supply voltage > 20.5 V" –
40 A 40 A Maximum aggregate current 40 A	40 A

[1] SIPLUS module, see page 14/4

Technical specifications (continued)

Product	SITOP modular signaling module	PSE202U redundancy module	PSE202U redundancy module
Type		NEC Class 2	10 A
Order No.	6EP1961-3BA10	6EP1962-2BA00	6EP1964-2BA00
Protection and monitoring			
Current limiting, static	–		
Short-circuit protection	–		
Safety			
Isolation	Yes, SELV acc. to EN 60950-1 (relay contacts)	Yes, SELV acc. to EN 60950-1 (relay contact)	Yes, SELV acc. to EN 60950-1 (relay contact)
Protection class	Class I	Class III	Class III
Safety test	Yes		
CE mark	Yes	Yes	Yes
UL/CSA approval		Yes	Yes
UL/cUL (CSA) approval	UL-listed (UL 508) File E197259, CSA (CSA C22.2 No. 14, CSA C22.2 No. 107.1)	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; UL-recognized (UL 60950-1, NEC class 2), File E151273	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259
Explosion protection	–		
Degree of protection (EN 60529)	IP20	IP20	IP20
EMC			
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data			
Ambient temperature			
• During operation	0 … +60 °C	-20 … +70 °C	-20 … +70 °C
- Comment	with natural convection	with natural convection	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
Humidity class according to EN 60721	Climate class 3K3, without condensation	Climate class 3K3, without condensation	Climate class 3K3, without condensation
Mechanics			
Connection method	Automatically establishes contact with the basic unit	Screw terminals	Screw terminals
Connections	Screw terminals for 0.14 ... 2.5 mm² solid/finely stranded		
• Supply input		Input, output, and ground: Removable screw terminal, each 1 x 0.5 ... 2.5 mm² solid/finely stranded	Input, output, and ground: Removable screw terminal, each 1 x 0.5 ... 2.5 mm² solid/finely stranded
• Output			
• Auxiliary contacts		Relay contact: 1 screw terminal each for 0.5 ... 2.5 mm² solid/finely stranded	Relay contact: 1 screw terminal each for 0.5 ... 2.5 mm² solid/finely stranded
Width of enclosure	26 mm	30 mm	30 mm
Height of enclosure	125 mm	80 mm	80 mm
Depth of enclosure	116 mm	100 mm	100 mm
Mounting width		30 mm	30 mm
Mounting height		180 mm	180 mm
Weight, approx.	0.15 kg	0.125 kg	0.125 kg
Product property of the enclosure: side-by-side enclosure		Yes	Yes
Type of mounting			
• Wall mounting		No	No
• DIN rail mounting		Yes	Yes
• S7-300 rail mounting			
Installation	Can be snapped directly on the side of the basic unit (6EP1 .3.-3BA00)	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15
Electrical accessories	–	Removable spring-loaded terminal 6EP1971-5BA00	Removable spring-loaded terminal 6EP1971-5BA00

PSE202U redundancy module	SITOP buffer module
40 A	40 A
6EP1961-3BA21	6EP1961-3BA01
	Typ. 40 A Electronically
Yes, SELV acc. to EN 60950-1 (relay contact) Class I Yes Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259	Yes, SELV acc. to EN 60950-1 Class I Yes Yes UL-listed (UL 508) File E197259, CSA (CSA C22.2 No. 14, CSA C22.2 No. 107.1)
ATEX (EX) II 3G Ex nAC IIC T4; cCSAus (CSA C22.2 No. 213, ANSI/ ISA-12.12.01) Class I, Div. 2, Group ABCD, T4 IP20	ATEX (Ex) II 3G Ex nA nC IIC T4 Gc; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T4 P20
EN 55022 Class B EN 61000-6-2	EN 55022 Class B EN 61000-6-2
0 … +60 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	0 … +60 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3 according to EN 60721, no condensation
Screw terminals Input, output, and ground: 1 screw terminal each for 0.33 ... 10 mm^2 solid/finely stranded Relay contact: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded	 One screw terminal each for + and - for 0.5 ... 10 mm^2 solid/finely stranded
70 mm 125 mm 125 mm 70 mm 225 mm 0.5 kg Yes	70 mm 125 mm 125 mm 1.2 kg
No Yes Snaps onto DIN rail EN 60715 35x7.5/15	 Snaps onto DIN rail EN 60715 35x7.5/15

PSE200U selectivity module
SITOP select diagnostics module

Overview

Product	PSE200U selectivity module		
Type	4 x 3 A	4 x 3 A	4 x 10 A
Order No.	6EP1961-2BA11	6EP1961-2BA31	6EP1961-2BA21
			
	The selectivity module is used in conjunction with 24 V power supplies to distribute the load current over several current circuits and to monitor the individual currents. Faults in individual circuits caused by overload or short-circuit are detected and selectively switched off so that further load current paths remain unaffected by the fault. This achieves fast fault diagnostics and minimizes standstill times. Signaling via common signaling contact.	The selectivity module is used in conjunction with 24 V power supplies to distribute the load current over several current circuits and to monitor the individual currents. Faults in individual circuits caused by overload or short-circuit are detected and selectively switched off so that further load current paths remain unaffected by the fault. This achieves fast fault diagnostics and minimizes standstill times. Signaling via status signal output (single-channel signaling).	The selectivity module is used in conjunction with 24 V power supplies to distribute the load current over several current circuits and to monitor the individual currents. Faults in individual circuits caused by overload or short-circuit are detected and selectively switched off so that further load current paths remain unaffected by the fault. This achieves fast fault diagnostics and minimizes standstill times. Signaling via common signaling contact

Technical specifications

Product	PSE200U selectivity module		
Type	4 x 3 A	4 x 3 A	4 x 10 A
Order No.	6EP1961-2BA11	6EP1961-2BA31	6EP1961-2BA21
Input			
	Controlled DC voltage	Controlled DC voltage	Controlled DC voltage
Supply voltage for DC rated value	**24 V**	**24 V**	**24 V**
Input voltage for DC	22 … 30 V	22 … 30 V	22 … 30 V
Overvoltage resistance	35 V	35 V	35 V
Input current at rated value of input voltage	12 A	12 A	40 A
Output			
Output	Controlled DC voltage	Controlled DC voltage	Controlled DC voltage
Output voltage	U_{in} – approx. 0.2 V	U_{in} – approx. 0.2 V	U_{in} – approx. 0.2 V
Total tolerance	In accordance with the supplying input voltage	In accordance with the supplying input voltage	In accordance with the supplying input voltage
Number of channels at output	4	4	4
Output current up to 60 °C per channel, rated value	3 A	3 A	10 A
Adjustable output current	0.5 … 3 A	0.5 … 3 A	3 … 10 A
Output voltage adjustment	Via potentiometer	Via potentiometer	Via potentiometer
Parallel switching for enhanced performance	No	No	No
Channel connection	Simultaneous connection of all channels after power up of the supply voltage > 20 V, delay time of 25 ms, 100 ms, or adjustable "load-optimized" via DIP switch for sequential connection	Simultaneous connection of all channels after power up of the supply voltage > 20 V, delay time of 25 ms, 100 ms, or adjustable "load-optimized" via DIP switch for sequential connection	Simultaneous connection of all channels after power up of the supply voltage > 20 V, delay time of 25 ms, 100 ms, or adjustable "load-optimized" via DIP switch for sequential connection
Efficiency			
Efficiency at $U_{out\ rated}$, $I_{out\ rated}$, approx.	97 %	97 %	99 %
Power loss at $U_{out\ rated}$, $I_{out\ rated}$, approx.	9 W	9 W	10 W
Switch-off characteristic per channel			
Overcurrent switch-off	I_{out} = 1.0 ... 1.3 x set value, switch-off after approx. 5 s	I_{out} = 1.0 ... 1.3 x set value, switch-off after approx. 5 s	I_{out} = 1.0 ... 1.3 x set value, switch-off after approx. 5 s
Current limitation	I_a = 1.3 x set value, switch-off not before typ. 100 ms	I_a = 1.3 x set value, switch-off not before typ. 100 ms	I_a = 1.3 x set value, switch-off not before typ. 100 ms
Immediate switch-off	I_{out} > set value and U_{in} < 20 V, switch-off after approx. 0.5 ms	I_{out} > set value and U_{in} < 20 V, switch-off after approx. 0.5 ms	I_{out} > set value and U_{in} < 20 V, switch-off after approx. 0.5 ms
Residual current at switch-off, typically			
Reset	Using keys for each channel	Using keys for each channel	Using keys for each channel

PSE200U selectivity module	SITOP select diagnostics module
4 x 10 A	4 x 10 A
6EP1961-2BA41	6EP1961-2BA00
	
The selectivity module is used in conjunction with 24 V power supplies to distribute the load current over several current circuits and to monitor the individual currents. Faults in individual circuits caused by overload or short-circuit are detected and selectively switched off so that further load current paths remain unaffected by the fault. This achieves fast fault diagnostics and minimizes standstill times. Signaling via status signal output (single-channel signaling).	The diagnostics module is used in conjunction with 24 V power supplies to distribute the load current over several current circuits and to monitor the individual currents. Faults in individual circuits caused by overload or short-circuit are detected and selectively switched off so that further load current paths remain unaffected by the fault. This achieves fast fault diagnostics and minimizes standstill times.

PSE200U selectivity module	SITOP select diagnostics module
4 x 10 A	4 x 10 A
6EP1961-2BA41	6EP1961-2BA00
Controlled DC voltage **24 V** 22 … 30 V 35 V 40 A	Controlled DC voltage (SITOP select is not designed for operation with DC UPS module 40 A (6EP1931-2FC21/-2FC42) **24 V** 22 … 30 V 35 V; 100 ms 40 A
Controlled DC voltage U_{in} – approx. 0.2 V	Controlled DC voltage U_{in} – approx. 0.3 V
In accordance with the supplying input voltage 4 10 A 3 … 10 A	In accordance with the supplying input voltage 4 10 A 2 … 10 A
Via potentiometer No Simultaneous connection of all channels after power up of the supply voltage > 20 V, delay time of 25 ms, 100 ms, or adjustable "load-optimized" via DIP switch for sequential connection	Via potentiometer No Simultaneous connection of all channels after power up of the supply voltage, delay time of 24 ms or 100 ms programmable for sequential connection
99 % 10 W	97 % 30 W
I_{out} = 1.0 ... 1.3 x set value, switch-off after approx. 5 s I_a = 1.3 x set value, switch-off not before typ. 100 ms I_{out} > set value and U_{in} < 20 V, switch-off after approx. 0.5 ms Using keys for each channel	I_{out} = 1.0 ... 1.3 x set value, switch-off after approx. 5 s I_{out} = 1.3 x set value, switch-off after approx. 50 ... 100 ms I_{out} > set value and U_{in} < 20 V, switch-off after approx. 0.5 ms 20 mA Using keys on the module

Technical specifications (continued)

Product	PSE200U selectivity module		
Type	4 x 3 A	4 x 3 A	4 x 10 A
Order No.	6EP1961-2BA11	6EP1961-2BA31	6EP1961-2BA21
Switch-off characteristic per channel			
Remote RESET	Non-isolated 24 V input (signal level "high" at > 15 V)	Non-isolated 24 V input (signal level "high" at > 15 V)	Non-isolated 24 V input (signal level "high" at > 15 V)
Protection and monitoring			
Device/line protection	5 A internal fuse (not accessible)	5 A internal fuse (not accessible)	5 A internal fuse (not accessible)
Status display	Three-color LED per channel: Green LED for "output connected", yellow LED for "output manually disconnected", red LED for "output disconnected due to overcurrent"	Three-color LED per channel: Green LED for "output connected", yellow LED for "output manually disconnected", red LED for "output disconnected due to overcurrent"	Three-color LED per channel: Green LED for "output connected", yellow LED for "output manually disconnected", red LED for "output disconnected due to overcurrent"
Signaling	Common signaling contact (changeover contact, contact rating 0.1 A/24 V DC)	Status signal output (pulse/pause signal for evaluation by Simatic function block)	Common signaling contact (changeover contact, contact rating 0.1 A/24 V DC)
Safety			
Standard for safety	In accordance with EN 60950-1 and EN 50178	In accordance with EN 60950-1 and EN 50178	In accordance with EN 60950-1 and EN 50178
Protection class	Class III	Class III	Class III
CE mark	Yes	Yes	Yes
UL/CSA approval	Yes	Yes	Yes
UL/cUL (CSA) approval	UL-recognized (UL 2367) File E328600; cURus (UL 508, CSA C22.2 No. 107.1), File E197259	UL-recognized (UL 2367) File E328600; cURus (UL 508, CSA C22.2 No. 107.1), File E197259	UL-recognized (UL 2367) File E328600; cURus (UL 508, CSA C22.2 No. 107.1), File E197259
Standard for explosion protection	ATEX (EN 60079-x); cCSAus (CSA C22.2 No. 213, No. 60079, ANSI/ISA 12.12.01, UL 60079)	ATEX (EN 60079-x); cCSAus (CSA C22.2 No. 213, No. 60079, ANSI/ISA 12.12.01, UL 60079)	ATEX (EN 60079-x); cCSAus (CSA C22.2 No. 213, No. 60079, ANSI/ISA 12.12.01, UL 60079)
Explosion protection	ATEX (EX) II 3G Ex nA nC IIC T4 Gc; cCSAus Class I, Div. 2, Group ABCD, T4	ATEX (EX) II 3G Ex nA IIC T4 Gc; cCSAus Class I, Div. 2, Group ABCD, T4	ATEX (EX) II 3G Ex nA nC IIC T4 Gc; cCSAus Class I, Div. 2, Group ABCD, T4
Marine approval	GL	GL	GL
Degree of protection (EN 60529)	IP20	IP20	IP20
EMC			
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data			
Ambient temperature			
• During operation	0 … +60 °C	0 … +60 °C	0 … +60 °C
• Comment	with natural convection	with natural convection	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
Humidity class according to EN 60721	Climate class 3K3, without condensation	Climate class 3K3, without condensation	Climate class 3K3, without condensation
Mechanics			
Connection method	Screw terminals	Screw terminals	Screw terminals
Connections			
• Supply input	+24 V: 2 screw terminals for 0.5 ... 10 mm²; 0 V: 2 screw terminals for 0.5 ... 4 mm²	+24 V: 2 screw terminals for 0.5 ... 10 mm²; 0 V: 2 screw terminals for 0.5 ... 4 mm²	+24 V: 2 screw terminals for 0.5 ... 10 mm²; 0 V: 2 screw terminals for 0.5 ... 4 mm²
• Output	Outputs 1 ... 4: 1 screw terminal per channel for 0.5 ... 4 mm²	Outputs 1 ... 4: 1 screw terminal per channel for 0.5 ... 4 mm²	Outputs 1 ... 4: 1 screw terminal per channel for 0.5 ... 4 mm²
• Auxiliary contacts	Remote reset: 1 screw terminal for 0.5 ... 4 mm²	Remote reset: 1 screw terminal for 0.5 ... 4 mm²	Remote reset: 1 screw terminal for 0.5 ... 4 mm²
Electrical connection version for signaling contact	3 screw terminals for 0.5 ... 4 mm²	1 screw terminal for 0.5 ... 4 mm²	3 screw terminals for 0.5 ... 4 mm²
Width of enclosure	72 mm	72 mm	72 mm
Height of enclosure	80 mm	80 mm	80 mm
Depth of enclosure	72 mm	72 mm	72 mm
Mounting width	72 mm	72 mm	72 mm
Mounting height	180 mm	180 mm	180 mm
Weight, approx.	0.2 kg	0.2 kg	0.2 kg
Installation	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
Product component included in scope of supply			
Mechanical accessories	Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20
Other information	Technical data applies for rated input voltage and +25°C ambient temperature (if not otherwise specified)	Technical data applies for rated input voltage and +25°C ambient temperature (if not otherwise specified)	Technical data applies for rated input voltage and +25°C ambient temperature (if not otherwise specified)

PSE200U selectivity module	SITOP select diagnostics module
4 x 10 A	4 x 10 A
6EP1961-2BA41	6EP1961-2BA00
Non-isolated 24 V input (signal level "high" at > 15 V)	–
5 A internal fuse (not accessible) Three-color LED per channel: Green LED for "output connected", yellow LED for "output manually disconnected", red LED for "output disconnected due to overcurrent" Status signal output (pulse/pause signal for evaluation by Simatic function block)	Blade-type fuse per channel (equipped when delivered with 15 A fuse) Two-color LED per channel: Green LED for "output connected", red LED for "output disconnected due to overcurrent" Common signaling contact (NO contact, contact rating 0.5 A/24 V DC)
In accordance with EN 60950-1 and EN 50178 Class III Yes Yes UL-recognized (UL 2367) File E328600; cURus (UL 508, CSA C22.2 No. 107.1), File E197259 ATEX (EN 60079-x); cCSAus (CSA C22.2 No. 213, No. 60079, ANSI/ISA 12.12.01, UL 60079) ATEX (EX) II 3G Ex nA IIC T4 Gc; cCSAus Class I, Div. 2, Group ABCD, T4 GL IP20	In accordance with EN 60950-1 and EN 50178 Class III Yes Yes UL-recognized (UL 2367) File E328600; cURus (UL 508, CSA C22.2 No. 107.1) File E197259; cURus (UL 60950, CSA C22.2 No. 60950) File E151273 ATEX (EN 60079-x); cCSAus (CSA E60079-x, UL 60079-x, UL 1604) ATEX (EX) II 3G Ex nAC IIC T4 U; cCSAus Class I, Div. 2, Group ABCD, T4 No IP20
EN 55022 Class B EN 61000-6-2	EN 55022 Class B EN 61000-6-2
0 … +60 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	0 … +60 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation
Screw terminals +24 V: 2 screw terminals for 0.5 ... 10 mm^2; 0 V: 2 screw terminals for 0.5 ... 4 mm^2 Outputs 1 ... 4: 1 screw terminal per channel for 0.5 ... 4 mm^2 Remote reset: 1 screw terminal for 0.5 ... 4 mm^2 1 screw terminal for 0.5 ... 4 mm^2 72 mm 80 mm 72 mm 72 mm 180 mm 0.2 kg	Screw terminals +24 V: 2 screw terminals for 0.33 ... 10 mm^2; 0 V: 2 screw terminals for 0.22 ... 4 mm^2 Outputs 1 ... 4: 1 screw terminal per channel for 0.22 ... 4 mm^2 – 2 screw terminals for 0.22 ... 4 mm^2 72 mm 90 mm 90 mm 72 mm 190 mm 0.4 kg
Snaps onto DIN rail EN 60715 35x7.5/15 Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20 Technical data applies for rated input voltage and +25°C ambient temperature (if not otherwise specified)	Snaps onto DIN rail EN 60715 35x7.5/15 4x blade-type fuse 15 A

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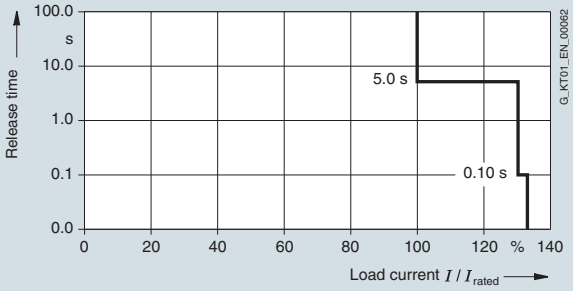
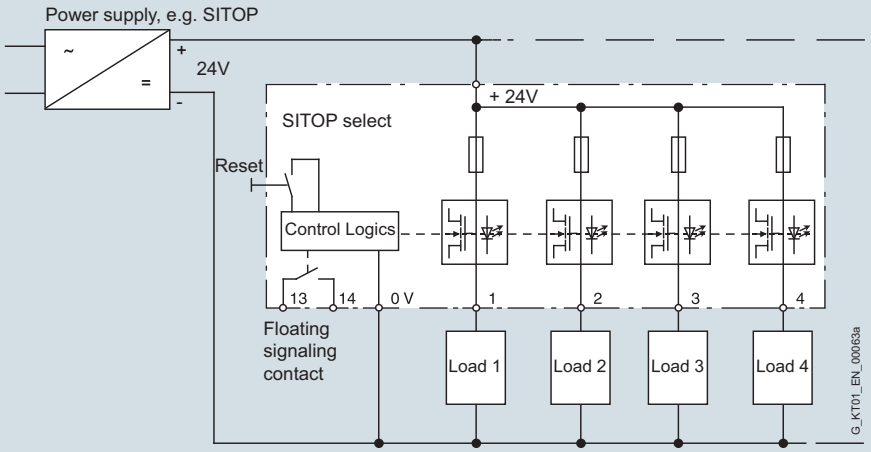
PSE200U selectivity module
SITOP select diagnostics module

Characteristics

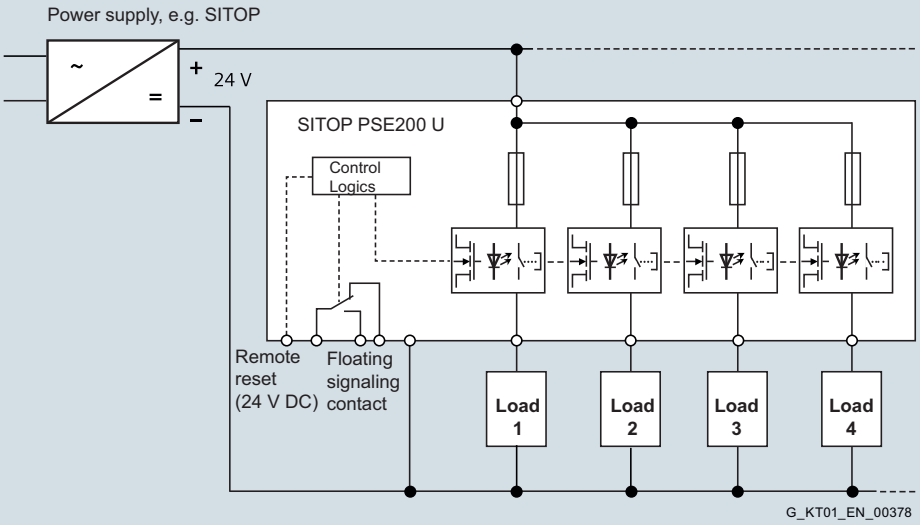


Switch-off characteristic

Circuit diagrams

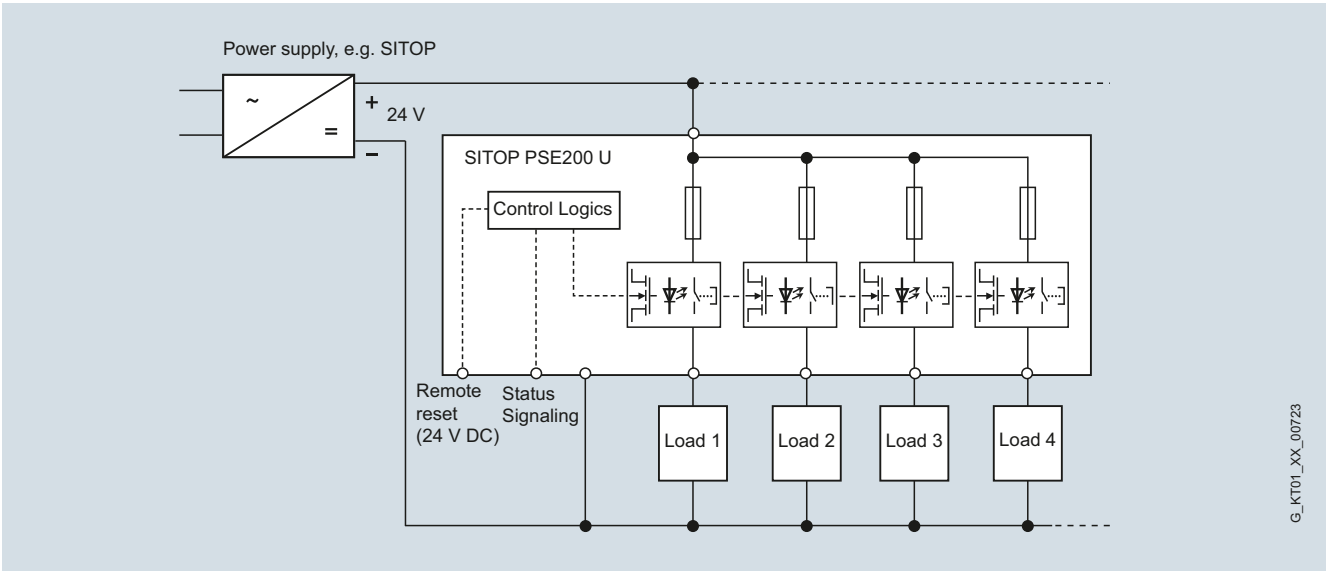


Circuit principle for SITOP select (6EP1961-2BA00)



Circuit principle for SITOP PSE200U (6EP1961-2BA11, - 2BA21)

Circuit diagrams (continued)



Circuit principle for SITOP PSE200U (6EP1961-2BA31, -2BA41)

SITOP inrush current limiter

Overview

Product	SITOP inrush current limiter
Type	10 A
Order No.	6EP1967-2AA00

The SITOP inrush current limiter is used to reliably reduce the starting currents that are caused, for example, by transformers or with pulse-controlled power supplies by the rectifier circuit on the input side with capacitor charging.

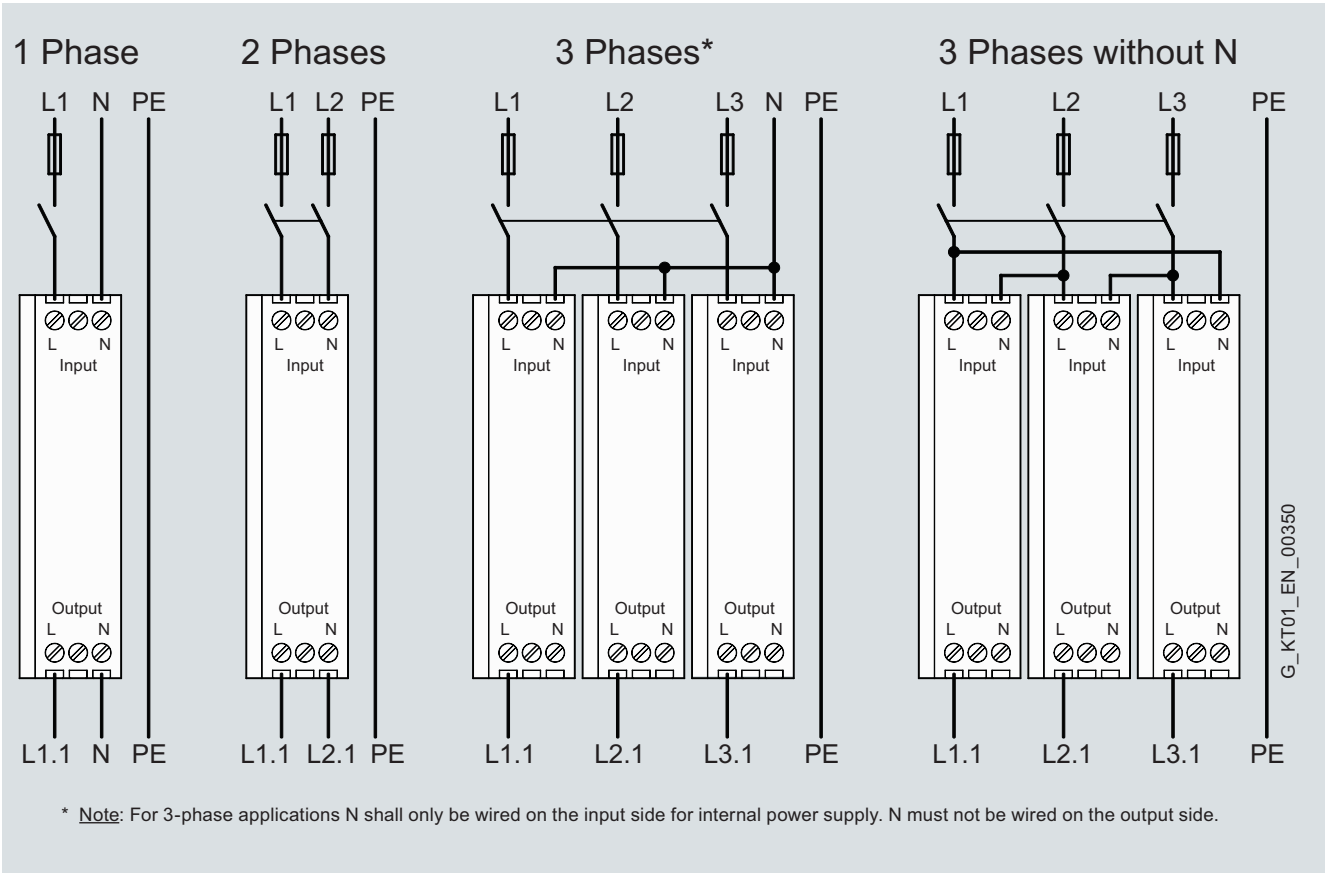
In 1-phase AC networks, it is supplied with rated voltages of 100 V, 120 V or 230 V and in 2-phase and 3-phase AC networks with rated voltages of 208 V to 480 V on the line side upstream of transformers or power supplies and it limits the inrush current temperature-independently up to, for example, < 10 A at 230 V by means of an installed fixed resistor. In static operation, the limit resistance is bypassed after approx. 120 ms to reduce the power losses generated.

Technical specifications

Product	SITOP inrush current limiter
Order No.	6EP1967-2AA00
Input	
Rated voltage value $U_{in\ rated}$	AC voltage 1-phase, 2-phase, 50/60 Hz 100 ... 480 V AC
Voltage range	85 ... 575 V
Overvoltage resistance	–
Input current $I_{in\ rated}$	–
Output	
Rated voltage value $U_{out\ rated}$	In accordance with the supply voltage
Rated current $I_{out\ rated}$	Max. 10 A
Mains buffering	–
Buffering time, max.	–
Parallel switching for enhanced performance	No
Protection and monitoring	
Current limiting, static	–
Short-circuit protection	Must be ensured with an upstream protective device
Signaling/alarm signals	
Status display	Green LED
Alarm signals	–

Product	SITOP inrush current limiter
Order No.	6EP1967-2AA00
Safety	
	In accordance with EN 60950-1 and EN 50178
Isolation	No
Protection class	Class II
CE mark	Yes
UL/cUL (CSA) approval	Yes, cULus-listed (UL 508, CS C22.2 No. 107.1), File E197259
Degree of protection (EN 60529)	IP20
EMC	
Emitted interference	EN 61000-6-3
Noise immunity	EN 61000-6-2
Operating data	
Ambient temperature range	0 ... +60 °C with natural convection
Transport and storage temperature range	-40 ... +85 °C
Humidity class	Climate class 3K3 according to EN 60721, no condensation
Mechanics	
Connections	Input and output (L1, N): One screw terminal each for 0.2 ... 2.5 mm^2, solid/finely stranded
Dimensions (W × H × D) in mm	22.5 × 80 × 91
Weight, approx.	0.12 kg
Installation	Snaps onto DIN rail EN 60715 35×7.5/15

Circuit diagrams



* Note: For 3-phase applications N shall only be wired on the input side for internal power supply. N must not be wired on the output side.

SITOP inrush current limiter connection diagram

Selection and ordering data

Product	Input Voltage $U_{in\ rated}$	Output Voltage $U_{out\ rated}$	Current $I_{out\ rated}$	Order No.	Price
SITOP modular signaling module					
	–	–	–	**6EP1961-3BA10**	
PSE202U redundancy module					
	**24 V DC** **24 V DC** **24 V DC**	**U_{in} – approx. 0.5 V** **U_{in} – approx. 0.5 V** **U_{in} – approx. 0.5 V**	NEC Class 2 10 A 40 A	**6EP1962-2BA00** **6EP1964-2BA00** **6EP1961-3BA21**	
SITOP buffer module for SITOP smart and SITOP modular					
	**24 V DC**	**U_{in} – approx. 1 V**	40 A	**6EP1961-3BA01**	
PSE200U selectivity module					
	**24 V DC** **Version with single-channel signaling**	**U_{in} – approx. 0.2 V**	4 x 3 A 4 x 3 A	**6EP1961-2BA11** **6EP1961-2BA31**	
PSE200U selectivity module					
	**DC 24** **Version with single-channel signaling**	**U_{in} – approx. 0.2 V**	4 x 10 A 4 x 10 A	**6EP1961-2BA21** **6EP1961-2BA41**	
SITOP select diagnostics module					
	**DC 24**	**U_{in} – approx. 0.3 V**	4 x 10 A	**6EP1961-2BA00**	
SITOP inrush current limiter					
	**100 - 480 V AC**	**100 - 480 V AC**	10 A	**6EP1967-2AA00**	

Further information

For the selectivity modules with single-channel signaling (6EP1961-2BA31, 6EP1961-2BA41), function blocks are available free of charge for evaluation by SIMATIC S7-1200/300/400:
http://support.automation.siemens.com/WW/view/en/61450284

You can find additional information in the Internet at:

- 2D dimensional drawings, 3D CAD data, circuit diagram macros:
  www.siemens.com/sitop-cax
- Operating instructions:
  www.siemens.com/sitop-manuals

SITOP DC UPS uninterruptible power supplies 24 V DC

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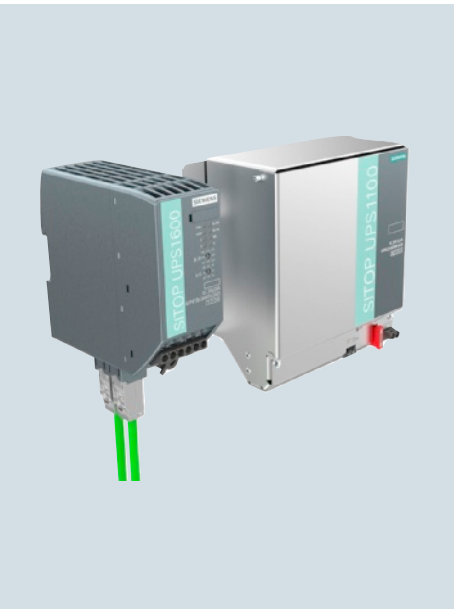

11/2 **Introduction**

11/3 **DC UPS with capacitors**
11/3 SITOP UPS500
11/9 SITOP UPS501S expansion modules

11/10 **DC UPS with battery modules**
11/10 SITOP UPS1600
11/17 SITOP UPS1100 battery modules
11/18 SITOP DC UPS
11/26 SITOP DC UPS battery modules

11/30 **Ordering data and further information**

For AL and ECCN export regulations see page 16/20

Introduction

Overview

SITOP add-on modules protect against power failures with durations of several seconds – from the buffer module through to the system-integrated DC UPS.

Selection is based on the energy storage unit used, the associated ambient conditions, performance and functionality.

The selection matrix should help you to find the right 24 V buffering for your application:

SITOP modules for 24 V buffering	Buffer module	UPS500	UPS1600	DC UPS
				
Energy storage units				
24 V buffering up to	10 s	Minutes	Hours	Hours
Storage medium	Electrolytic capacitors	Double-layer capacitors	Lead-gel batteries	Lead-gel batteries
Lifetime dependent on temperature The specified time refers to a fall to 50 % of the original capacitance in the case of lead batteries and 80 % in the case of capacitors.	0 … +50 °C: > 8 years	… +50 °C: > 8 years	+20 °C…+40°C: 4 ... 1 year	+20 °C…+40 °C: 4 ... 1 year (high-temperature rechargeable battery: +20 °C…+60 °C: > 10 ... 1 year)
Temperature range	0 … +60 °C	0 … +60 °C	0 … +40 °C	0 … +40 °C (high-temperature rechargeable battery: -40 °C…+60 °C)
Ventilation required	–	–	•	•
Degree of protection	IP20	IP20 / IP65 (UPS500P)	IP00	IP00
UPS module/electronics				
Degree of protection	IP20	IP20 / IP65 (UPS500P)	IP20	IP20
Max. rated output current	40 A	15 A	20 A	40 A
Max. dynamic overload current	40 A (200 ms)	25 A (200 ms)	60 A (30 ms) / 30 A (5 s/min)	56 A (80 ms)
Interfaces [1]		I/O, USB	I/O, USB, Ethernet/ PROFINET	I/O, serial, USB
Information about operation and diagnostics via				
• Signaling contact		•	•	•
• OPC server		•	• [1]	•
• Web server			•	
• S7 function blocks			•	
• WinCC faceplate			•	
Shutdown of multiple PCs / PLCs			•	
Starting from the battery, without supply voltage (stand-alone mode)			•	
Engineering via				
• Software tool (PC)		•	•	•
• TIA Portal			•	
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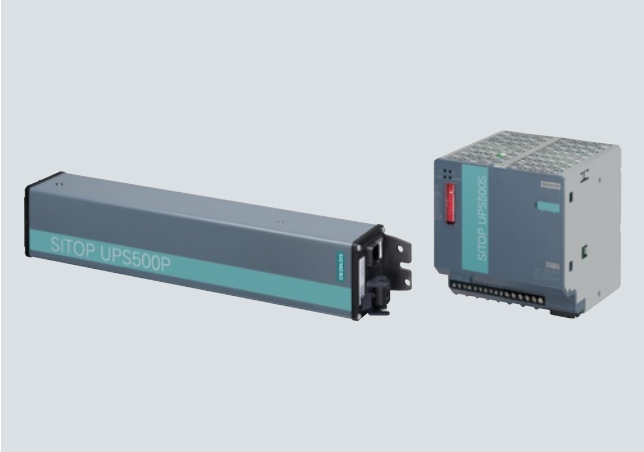
The SITOP Selection Tool offers detailed selection guidance according to criteria such as the required buffer time, nominal current or peak current:
www.siemens.com/sitop-selection-tool

[1] Available soon

Overview



SITOP UPS500 builds on double-layer capacitors as energy storage units and backs up the 24 Volts for longer than a minute.

The advantage of these totally maintenance-free capacitors over lead rechargeable batteries is a long lifetime at high temperatures. Even at temperatures of 50 °C they still have more than 80 % of their capacity after eight years. This means that the energy storage unit does not have to be replaced.

Lead rechargeable batteries, however, must be replaced annually at an ambient temperature of 40 °C, which is not uncommon in the control cabinet. At 40 °C, the capacitors only fall in capacity by 10 %. Because the double-layer capacitors do not emit any gas, the control cabinet does not have to be ventilated.

The considerably shorter charging times also ensure that buffering is available again quickly when power is restored.

The IP65 version SITOP UPS500P in long metal housing is ideally suited to distributed use.

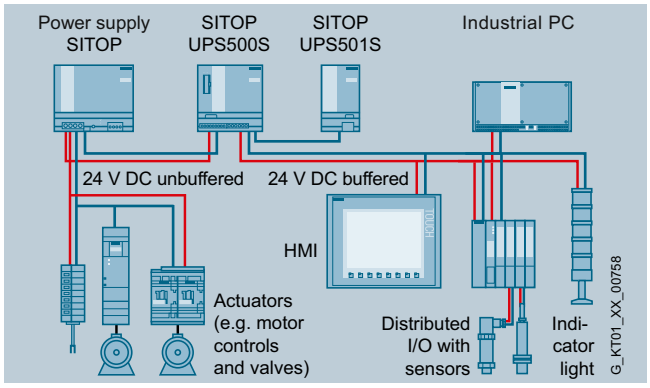
Benefits

- 24 V buffering for a few minutes to allow data to be backed up and applications to be closed.
- Absolutely maintenance-free
- Long lifetime, also at high temperatures
- High ambient temperatures up to +60 °C
- Short charging times
- No ventilation is required since no gas is emitted
- Distributed applications without control cabinet possible
- Software tool, free of charge, for easy configuring and integrating in PC-based systems

Application

The high-capacitance double-layer capacitors bridge power failures for a few minutes. The time is normally sufficient, for example, for the safe shutdown of PC-based automation systems. The USB interface and a free software tool enable easy communication with the PC.

The capacitors have an extremely long life even at high temperature, and can be used at ambient temperatures of up to 60 °C. SITOP UPS500P in IP65 degree of protection can also be installed outside the control cabinet in a distributed configuration.

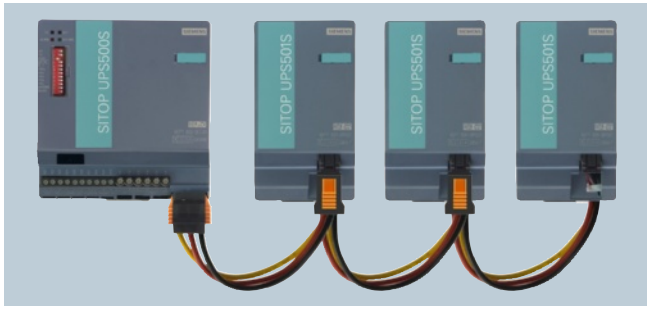


Configuration with SITOP UPS500S:
24 V buffering for backing up process data and performing a controlled shutdown of a PC. To relieve the load on the UPS, the actuators are supplied directly from the power supply unit.

Design

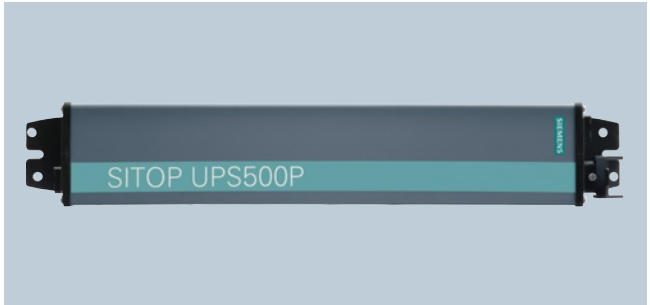
SITOP UPS500S

- Compact 24 V/ 15 A basic units with integrated energy storage units of 2.5 or 5 kWs
- Digital inputs/outputs and USB interface
- For combination with up to three UPS501S expansion modules (of 5 kWs each) to extend the buffering time
- Metal housing in IP20 degree of protection for mounting on standard rails



SITOP UPS500P

- 24 V/ 7 A basic units with integrated energy storage units of 5 or 10 kWs
- USB interface
- Rugged aluminum housing in IP65 degree of protection for distributed applications
- Screw mounting in all mounting positions



Function

SITOP DC UPS tool

Via the USB interface, all relevant messages about the status of the uninterruptible DC power supply can be transmitted to a PC (e.g. SIMATIC IPC). The DC UPS can also be configured via the USB interface.

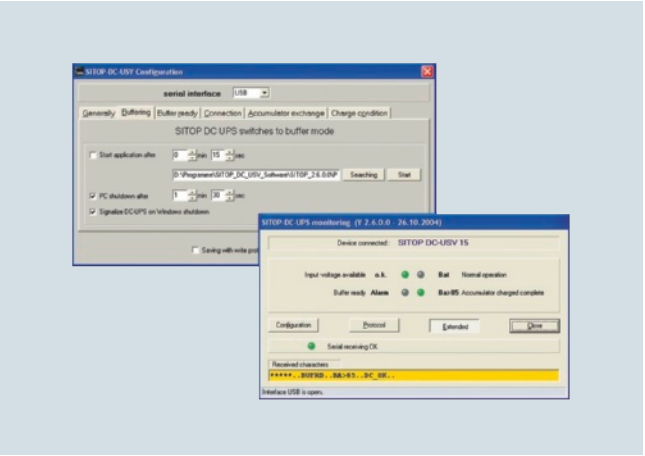
The SITOP DC UPS software provides the user with a free tool that is extremely easy to use for the purpose of monitoring and configuring the DC UPS. Signals sent from the uninterruptible DC power supply can be processed on the PC. In monitoring mode, the statuses of the uninterruptible DC power supply are visualized on the PC.

Safe shutdown in the event of a power failure and automatic PC restart are supported. It is also possible to freely define responses to the different operating states of the uninterruptible DC power supply, so that extremely flexible integration into a wide variety of applications is possible.

Overview of configuration possibilities:

- Times for shutting down the PC
- UPS switch-off
- Further processing of all signals, e.g. linking to proprietary software or WinCC flexible
- Monitoring and display of UPS operating status
- OPC server for linking signals to proprietary applications
- Automatic restarting of IPCs when power is restored during shutdown

The software runs under Windows 2000, Windows XP, Windows Vista and Windows 7 operating systems. It is available as downloadable freeware on the SITOP homepage.
http://www.siemens.com/sitop-ups



Monitoring and configuration window of software V3 for SITOP DC UPS

Technical specifications

The UPS500S can be extended to 20 kWs using UPS501S expansion modules to extend the buffering time.

The table shows the maximum buffering time for the possible configurations and the two UPS500P units for different load currents.

The load current can be set to 1 A or 2 A with the UPS500S.

Selection table SITOP UPS500 (optional with SITOP UPS501S expansion module) and mains buffering times

Buffering and charging times										
SITOP UPS500S / 501S configurations									**UPS500P**	
Basic unit	2.5 kWs	5 kWs	2.5 kWs	5 kWs	2.5 kWs	5 kWs	2.5 kWs	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	5 kWs	10 kWs
Load current	**Buffer times**									
0.5 A	134 s	236 s	390 s	478 s	632 s	748 s	851 s	1007 s	284 s	647 s
0.8 A	90 s	167 s	266 s	346 s	440 s	527 s	580 s	706 s	190 s	435 s
1 A	75 s	138 s	219 s	296 s	365 s	414 s	490 s	572 s	153 s	351 s
2 A	38 s	76 s	122 s	156 s	203 s	230 s	265 s	306 s	80 s	152 s
3 A	26 s	52 s	82 s	106 s	136 s	159 s	186 s	213 s	53 s	108 s
4 A	19 s	39 s	61 s	81 s	101 s	120 s	139 s	160 s	40 s	84 s
5 A	15 s	31 s	49 s	65 s	81 s	95 s	111 s	130 s	30 s	68 s
6 A	12 s	26 s	40 s	55 s	67 s	80 s	94 s	106 s	25 s	57 s
7 A	10 s	21 s	34 s	47 s	58 s	69 s	81 s	82 s	21 s	49 s
8 A	8 s	18 s	29 s	40 s	50 s	59 s	69 s	79 s	–	–
10 A	6 s	15 s	23 s	32 s	39 s	47 s	54 s	62 s	–	–
12 A	4 s	12 s	19 s	26 s	32 s	38 s	44 s	52 s	–	–
15 A	3 s	9 s	14 s	20 s	25 s	30 s	35 s	40 s	–	–
Charging current	**Charging times**									
2 A	54 s	120 s	158 s	223 s	263 s	318 s	355 s	417 s	130 s	360 s
1 A	110 s	205 s	311 s	425 s	503 s	625 s	695 s	816 s	-	-

Important information for selecting the energy storage units:

When the mains buffering times were determined, the discharge period of new or non-aged, completely charged capacitors was used as a basis. At a continuous ambient temperature of +50 °C, a loss of capacity of approx. 20 % must be considered after a service life of 8 years.

The SITOP Selection Tool offers detailed selection guidance according to criteria such as the required backup time, nominal current or peak current. Available at: http://www.siemens.com/sitop-selection-tool

DC UPS with capacitors SITOP UPS500

Technical specifications

Product	SITOP UPS500S 15 A	SITOP UPS500P 7 A
Power supply, type	Basic unit 15 A	Basic device 7 A, IP65
Order No.	**6EP1933-2EC41** (with USB interface and 2.5 kWs) **6EP1933-2EC51** (with USB interface and 5 kWs)	**6EP1933-2NC01** (with USB interface and 5 kWs) **6EP1933-2NC11** (with USB interface and 10 kWs)
		
Input L+/M in normal operation		
Rated voltage value $U_{in\ rated}$ [1]	Controlled DC voltage **24 V DC**	Controlled DC voltage **24 V DC**
Voltage range	22 ... 29 V	22,5 ... 29 V
Connection threshold for buffering	22.5 V DC ± 0.1 V (factory setting), adjustable in the range 22 ... 25.5 V DC (in 0.5 V increments)	22.5 V DC ± 0.1 V
Rated current $I_{in\ rated}$	15.2 A + approx. 2.3 A with empty energy storage (capacitor)	7 A + approx. 2 A with empty energy storage (capacitor)
Mains buffering		
Mains buffering or buffering times without add-on modules	6EP1 933-2EC41: 15 A for 3 s or 10 A for 6 s or 5 A for 15 s or 2 A for 38 s 6EP1 933-2EC51: 15 A for 9 s or 10 A for 15 s or 5 A for 31 s or 2 A for 76 s	7 A for 49 s or 5 A for 68 s or 3 A for 108 s or 1 A for 351 s
Mains buffering or buffering times with expansion modules	For longer buffering times, see table	Not applicable
On/off control circuit	External isolated NO contact required (loading max. 15 V DC/max. 10 mA), buffering is terminated by disconnecting the control circuit.	Not applicable
Methods of setting the buffering time	Adjustable using DIP switches to a maximum buffering time up to forced shutdown at approx. 7 V internal capacitor voltage (output remains constant at 24 V up to that point) or to a time limit of 5 ... 315 s (in 10 s increments) if the energy content is sufficient for the required current	Not applicable
Interruption	Adjustable with DIP switch, either: • Interruption of the output voltage despite returning input voltage for 5 s following expiry of set buffering time to support automatic restarting of industrial PCs or • No forced interruption on expiry of the set buffer time	Not applicable
Output L+/M in normal operation		
Rated voltage value $U_{out\ rated}$	24 V DC	24 V DC
Voltage range	23.3 ... 24.7 V DC or 24 V DC ±3%	23.3 ... 24.7 V DC or 24 V DC ±3%
Startup delay	Approx. 600 ms	Approx. 600 ms
Voltage rise	Approx. 25 ms	Approx. 25 ms
Output current I_{out}	**0 ... 15 A**	**0 ... 7 A**
Dynamic current with overload	Electronic current limitation to typically 25 A for approx. 200 ms, then electronic shutdown of the output with automatic restart attempts (approx. 20 s intervals between restart attempts)	Electronic shutdown at typ. 30 A, automatic restart after 20 s
Dynamic current with short-circuit	Electronic current limitation to typically 25 A for approx. 110 ms, then electronic shutdown of the output with automatic restart attempts (approx. 20 s intervals between restart attempts)	Electronic shutdown at typ. 30 A, automatic restart after 20 s

[1] All SITOP 24 V DC power supplies are permissible without restriction.

Technical specifications (continued)

Product	SITOP UPS500S 15 A	SITOP UPS500P 7 A
Power supply, type	**Basic unit 15 A**	**Basic device 7 A, IP65**
Order No.	**6EP1933-2EC41** (with USB interface and 2.5 kWs) **6EP1933-2EC51** (with USB interface and 5 kWs)	**6EP1933-2NC01** (with USB interface and 5 kWs) **6EP1933-2NC11** (with USB interface and 10 kWs)
Output L+/M with buffer mode		
Rated voltage value $U_{out\ rated}$	24 V DC	24 V DC
Approximate voltage range	23.3 ... 24.7 V DC or 24 V DC ± 3 %	23.3 ... 24.7 V DC or 24 V DC ± 3 %
Output current I_{out}	0 ... 15 A	0 ... 7 A
Dynamic current with overload	Electronic current limitation to typically. 25 A for approx. 200 ms, then electronic shutdown of the output (restart following return to normal operation)	Electronic shutdown at typ. 30 A, automatic restart after 20 s
Dynamic current with short-circuit	Electronic current limitation to typically. 25 A for approx. 110 ms, then electronic shutdown of the output (restart following return to normal operation)	Electronic shutdown at typ. 30 A, automatic restart after 20 s
Charging current	Approx. 1 A (factory setting), adjustable to 1 A or 2 A (charging is carried out with closed and open on/off circuit)	2 A permanently set
Charging time after a discharge	6EP1 933-2EC41: 110 s with 1 A, 54 s with 2 A 6EP1 933-2EC51: 205 s with 1 A, 120 s with 2 A	Approx. 300 s
Charging time with add-on modules	For longer charging times, see table	Not applicable
Efficiency / heat loss		
At $U_{out\ rated}$, $I_{out\ rated}$ approx.	97.5 % / 9 W	96.5 % / 5.2 W
Protection and monitoring		
Reverse polarity protection	against polarity reversal on input voltage	against polarity reversal on input voltage
Overload protection	Electronic shutdown of the output in accordance with "dynamic current with overload" in normal operation (automatic restart attempts) or in buffer mode (restart following return to normal operation)	Electronic shutdown of the output in accordance with "dynamic current with overload" in normal operation (automatic restart attempts) or in buffer mode (restart following return to normal operation) Thermal overload protection
Short-circuit protection	Electronic shutdown of the output in accordance with "dynamic current with short-circuit" in normal operation (automatic restart attempts) or in buffer mode (restart following return to normal operation), built-in (inaccessible) 20 A fuse.	Electronic shutdown of the output in accordance with "dynamic current with overload" in normal operation (automatic restart attempts) or in buffer mode (restart following return to normal operation) Thermal overload protection
Signaling		
Normal operation	Green LED (OK) and isolated relay contact (changeover contact) [2]	Green LED (OK)
Buffer mode (capacitor supplies load alone or in addition to the PS in the case of overload)	Green LED (Bat) and isolated relay contact (changeover contact) [2]	Yellow LED (Bat)
Alarm (buffer not ready, or prewarning from < 12 V capacitor voltage)	Red LED (alarm) and isolated relay contact (changeover contact) [2]	Red LED (Alarm)
"Capacitor charged > 85 %" [1]	Second green LED (Bat > 85 %) and isolated NO contact closed (de-energized position = open)	Second green LED (Bat > 85 %)

[1] 85 % with regard to residual capacity still available depending on aging. The original capacity (= capacity when new) reduces by only approx. 20 % within 8 years of operation even at a high ambient temperature of the device of +50 °C, for example, so that 80 % residual capacity still remains. The backup times also reduce by approximately 20 % in 8 years (at +50 °C) with small currents (up to approximately 5 A), and by approximately 30 % with high load currents (over 10 A).
Note: The lower the ambient temperature, the smaller the capacity reduction (approximately one half per 10 °C lower ambient temperature, that is at +40 °C, for example, only 10 % capacity reduction in 8 years).

[2] Permissible contact rating: 60 V DC/1 A or 30 V AC/1 A.

Technical specifications (continued)

Product	SITOP UPS500S 15 A	SITOP UPS500P 7 A
Power supply, type	**Basic unit 15 A**	**Basic device 7 A, IP65**
Order No.	**6EP1933-2EC41** (with USB interface and 2.5 kWs) **6EP1933-2EC51** (with USB interface and 5 kWs)	**6EP1933-2NC01** (with USB interface and 5 kWs) **6EP1933-2NC11** (with USB interface and 10 kWs)
USB interface		
	Output of all alarm signals and receipt of the "Remote timer start" signal Technical design: Specification 2.0 with full speed, i.e. 2 Mbit/s, supplied with +5 V by DC UPS ("self powered") Required connection to the PC: Commercially available 4-core shielded cable, 90 ohms, max. 5 m, USB series "A" connector to PC and USB series "B" connector to DC UPS	Output of all alarm signals and receipt of the "Remote Timer start" signal Technical design: Specification 2.0 with full speed, i.e. 2 Mbit/s, supplied with +5 V by DC UPS ("self powered") Required connection to the PC: see connector set
Software	A software tool for reading out and processing the signals (can run under Windows 2000, Windows XP, Windows Vista and Windows 7) is available for downloading from the Internet at http://www.siemens.com/sitop-ups This site also provides more information on the interface	A software tool for reading out and processing the signals (can run under Windows 2000, Windows XP, Windows Vista and Windows 7) is available for downloading from the Internet at http://www.siemens.com/sitop-ups This site also provides more information on the interface
Control signals		
On/off control signal	Buffering is terminated by opening the control circuit or by means of DIP switches on the device (DIP switch must be in "Off" position). All other functions are retained	Not applicable
"Remote timer start" via USB interface	Starts mains buffering for the set buffering time	Starts mains buffering for the set buffering time
Safety		
Primary/secondary isolation	No	No
Protection class	Class III (ext. circuit and power supply unit: SELV in accordance with EN 60950 required)	Class III (ext. circuit and power supply unit: SELV in accordance with EN 60950 required)
EMC		
Emitted interference	Radio interference suppression according to EN 55022, limit-value curve B	Radio interference suppression according to EN 55022, limit-value curve B
Noise immunity	Noise immunity according to EN 61000-6-2	Noise immunity according to EN 61000-6-2
Ambient conditions		
Ambient temperature during operation	0 ... +60 °C with natural convection	0 ... +55 °C with natural convection
Transport/storage temperature	–40 °C ... +70 °C	–40 °C ... +70 °C
Degree of protection (EN 60529)	IP20	IP65
Humidity class	Rated conditions in accordance with EN 60721, climate class 3K3 (relative humidity 5 % ... 85 % and absolute humidity 1 g/m^3 ... 25 g/m^3; no condensation)	Rated conditions in accordance with EN 60721, climate class 3K3 (relative humidity 5 % ... 85 % and absolute humidity 1 g/m^3 ... 25 g/m^3; no condensation)
Approvals		
CE	Yes	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1) File E197259	–

Technical specifications (continued)

Product	SITOP UPS500S 15 A	SITOP UPS500P 7 A
Power supply, type	**Basic unit 15 A**	**Basic device 7 A, IP65**
Order No.	**6EP1933-2EC41** (with USB interface and 2.5 kWs) **6EP1933-2EC51** (with USB interface and 5 kWs)	**6EP1933-2NC01** (with USB interface and 5 kWs) **6EP1933-2NC11** (with USB interface and 10 kWs)
Mechanics		
Input connections 24 V DC	2 screw terminals for 1 ... 4 mm^2/17 ... 11 AWG	See connector set [1]
Output connections 24 V DC	4 screw terminals for 1 ... 4 mm^2/17 ... 11 AWG	See connector set [1]
Connections for control circuit and alarm signals	10 screw terminals for 0.5 ... 2.5 mm^2/20 ... 13 AWG	Not applicable
USB port	Yes	Yes
Dimensions (W × H × D) in mm	120 × 125 × approx. 125	400 (without connector) × 80 × 80 470 (without connector) × 80 × 80
Required clearances	50 mm above and 50 mm below the device	50 mm above and 50 mm below the device
Weight	Approx. 1.0 kg	Approx. 1.9 kg Approx. 2.2 kg
Installation	Snaps onto DIN rail EN 60715 35×7.5/15	Screw mounting

[1] The connector set contains connection plugs for input and output and pre-assembled USB cables 2 m long (connector set not included in the scope of delivery of SITOP UPS500P); MLFB: 6EP1975-2ES00

Overview

Product	SITOP UPS501S
Power supply, type	**Expansion module**
Order No.	**6EP1935-5PG01**

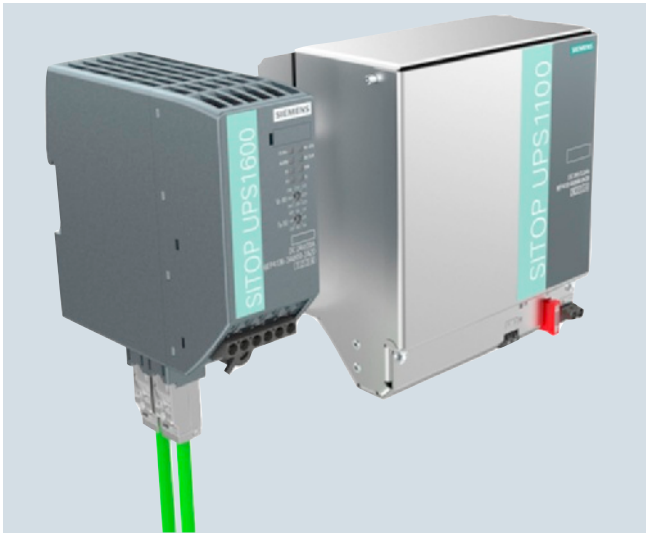
- Additional energy storage (5 kW)
- Up to 3 expansion modules can be connected to a SITOP UPS500S to extend the buffer times
- Complete with balancing and safety circuits

Technical specifications

Product	SITOP UPS501S
Power supply, type	**Expansion module**
Order No.	**6EP1935-5PG01**
Mechanics	
Connections	Can be easily connected to SITOP UPS500S via a user-friendly plug-in system
Dimensions (W × H × D) in mm	Approx. 70 × 125 × 125
Weight	Approx. 0.7 kg
Installation	Snaps onto DIN rail EN 60715 35×7.5/15

DC UPS with battery modules SITOP UPS1600

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 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)
- Full integration in TIA saves time and money in planning and 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

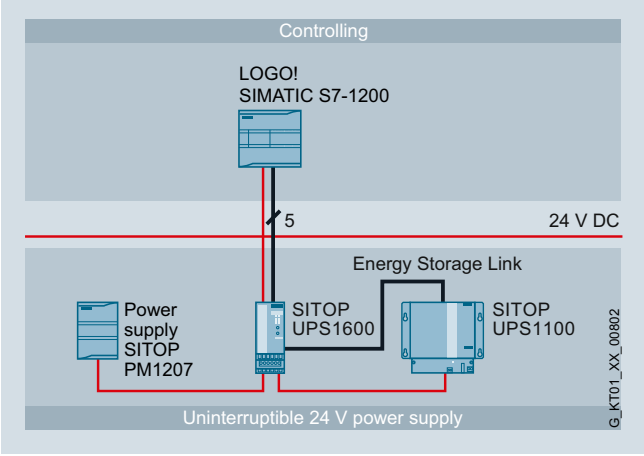
Application

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.

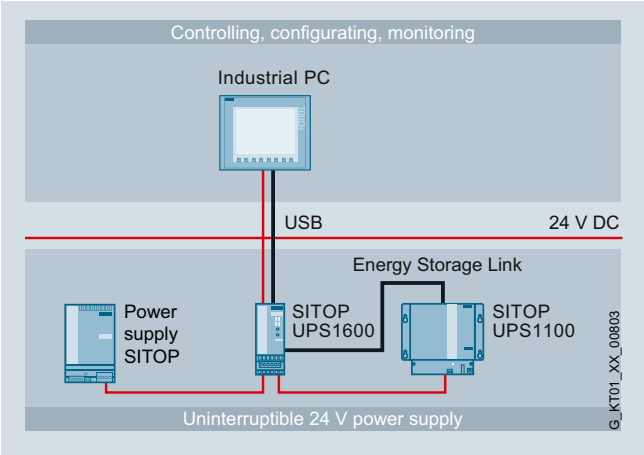
Buffering of simple automation applications

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

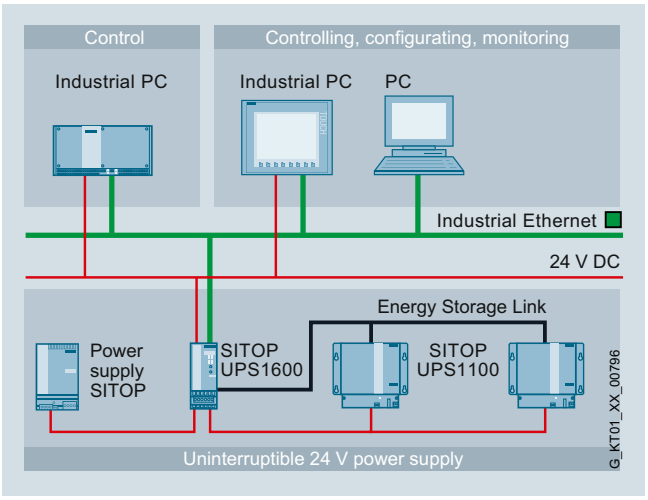
The UPS1600 with a USB interface is used to buffer automation solutions that are controlled by an industrial PC. All operating and configuring data is communicated over the PC interface.



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.

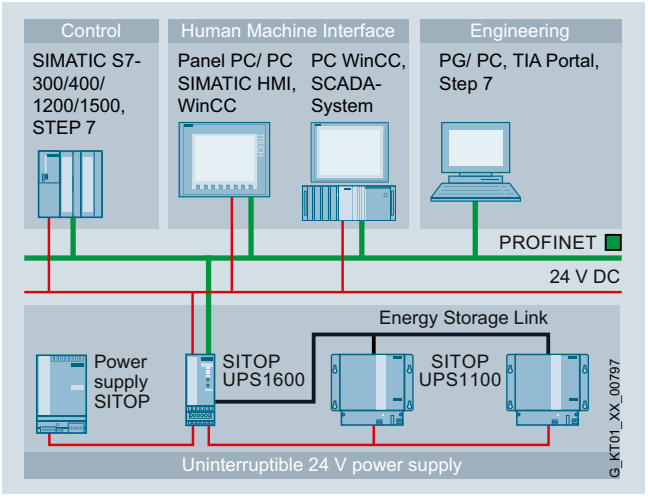
Buffering of applications with networked (Industrial Ethernet) automation computers

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.



DC UPS with battery modules SITOP UPS1600

Design

- Compact DC UPS modules UPS1600 24V/10 A, 20 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 with lead rechargeable batteries of corrosion-resistant lead-calcium high-performance grid plates and glass fiber

Function

SITOP UPS1600 web server

The SITOP UPS1600 with Ethernet/PROFINET has an integrated web server that supports remote monitoring of the uninterruptible power supply.

Remote monitoring of

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

Remote access via

- Firefox or Internet Explorer 9 (IE 8 with charging of SVG player)
- IP address
- Password

The password-protected web server supports viewing of the configuring and operating data.

SITOP UPS1600 software

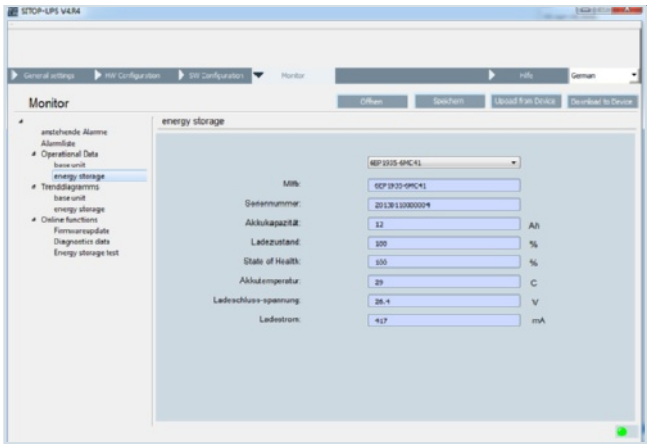
Software tools support convenient integration of the SITOP UPS1600 in both PC-based and PLC-based systems. They make configuring and visualizing the DC UPS easier and the user benefits from the high performance of the SITOP UPS1600.

Software for open, PC-based automation systems

SITOP UPS Manager

Configuration and monitoring is performed easily using the free PC software SITOP UPS Manager. It enables the reactions of the PC 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 "non-coded" rechargeable batteries is possible
  - Reactions of the PC to the operating states of the UPS can be freely selected, 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
  - Integrated OPC server (available soon)
  - Updating of the UPS1600 firmware is possible
  - Executable on Windows XP, Windows 7 and Windows 8 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 battery status in SITOP UPS Manager

Function (continued)

Software for TIA-based automation systems

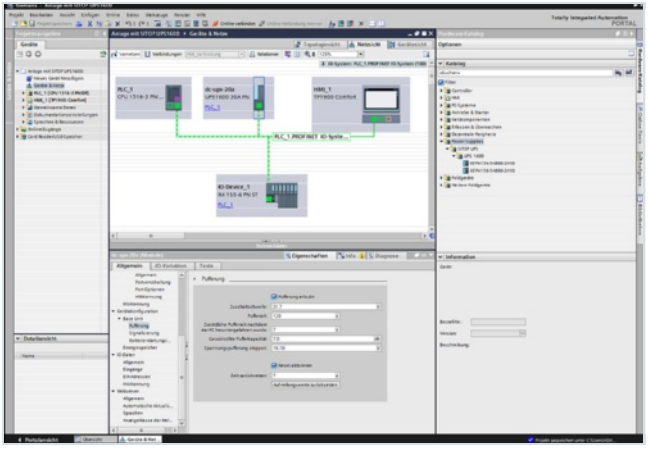
For convenient integration of the DC UPS in the TIA environment, different software modules are available.

Engineering is simple via the TIA Portal. The data for UPS1600 is stored in the hardware catalog version V13 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 UPS faceplates for WinCC.

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 hardware catalog of the TIA Portal
- Free download of HSP (Hardware Support Package) for TIA Portal version V12 SP1 available at http://support.automation.siemens.com/WW/view/en/75854606
- Free download of GSD file (generic station description) for STEP 7 V 5.5 available from 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

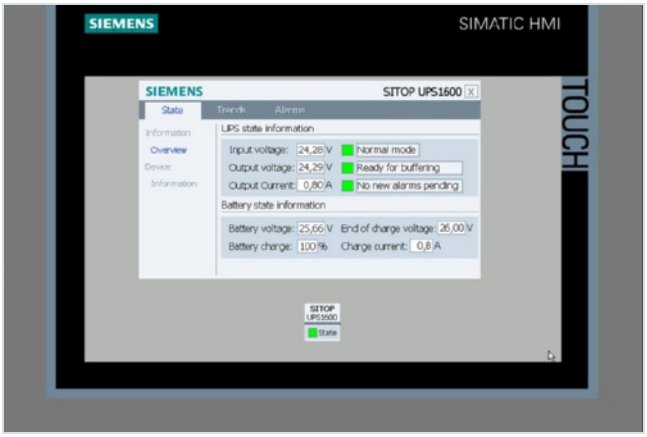
Function blocks are available for STEP 7 user programs on SIMATIC S7-300/400/1200/1500 respectively. They allow further processing of the DC UPS operating data. Free download from: http://support.automation.siemens.com/WW/view/en/75854608

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:

- WinCC V7.2 + STEP 7 Professional 2010
- WinCC flexible 2008 SP3 + STEP 7 Professional 2010
- WinCC Comfort/Advanced/Professional V11 SP2 + STEP 7 Professional V11 SP2
- WinCC V12 + STEP 7 V12

Free download at:
http://support.automation.siemens.com/WW/view/en/75854608



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

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DC UPS with battery modules SITOP UPS1600

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, nominal current, peak current and battery connection threshold: www.siemens.com/sitop-selection-tool

SITOP	UPS1100 24V, 1.2 Ah (6EP4131-0GB00-0AY0)	UPS1100 24V, 3.2 Ah (6EP4133-0GB00-0AY0)	UPS1100 24V, 7 Ah (6EP4134-0GB00-0AY0)
Load current	Buffer times		
1 A	24.5 min	2.6 h	5.4 h
2 A	15.5 min	1 h	2.6 h
3 A	9 min	39.3 min	1.6 h
4 A	6.5 min	27.1 min	1.2 h
6 A	3.5 min	17.5 min	41 min
8 A	2 min	12.1 min	28.6 min
10 A	1 min	9 min	21.8 min
12 A	–	7 min	17.3 min
14 A	–	5 min	15.1 min
16 A	–	4 min	12.5 min
20 A	–	1 min	9.1 min

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 by another 30 % at +5 °C battery temperature to approx. 70 % of approx. 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: Until the halfway point of the expected battery life (or slightly beyond) capacity does not drop below 100 %. With regular replacement after halfway through the expected service life, only single battery capacity (instead of double capacity) must be installed regarding aging (-> neutral in price with regard to battery module costs, but only requires half the space).

Replacement after half the service life dispenses in particular 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, even if double the capacity is installed, the influence of aging at the end of service life is not reliably compensated for, but 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:

Battery temperature	Drop to approx. 50 % of residual capacity	Recommendation: Replace all (with 100 % residual capacity)	Alternative recommendation
+20 °C	4 years	2 years	
+30 °C	2 years	1 year	
+40 °C	1 year	0.5 years	Install double capacity and replace (1 × per year)

In normal cases (installation in the coolest location in the control cabinet at approx. +30 °C), the battery with single installed battery capacity should be replaced 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-V 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 (continued)

DC UPS modules	SITOP UPS1600 24 V/ 10 A	SITOP UPS1600 24 V/ 20 A
Order No.	**6EP4134-3AB00-0AY0** **6EP4134-3AB00-1AY0** (with USB interface) **6EP4134-3AB00-2AY0** (with 2 Ethernet/PROFINET interfaces)	**6EP4136-3AB00-0AY0** **6EP4136-3AB00-1AY0** (with USB interface) **6EP4136-3AB00-2AY0** (with 2 Ethernet/PROFINET interfaces)
		
Input data		
Input voltage $U_{in\ rated}$ / range [1]	24 V DC/ 21 ... 29 V	24 V DC/ 21 ... 29 V
Connection threshold for buffering	22.5 V DC ± 3 % (factory setting), settable: 21 V, 21.5 V, 22 V, 22.5 V, 23 V, 24 V, 25 V DC or via software.	22.5 V DC ± 3 % (factory setting), settable: 21 V, 21.5 V, 22 V, 22.5 V, 23 V, 24 V, 25 V DC or via software.
Input current $I_{out\ rated}$	Approx. 14 A for max. charging current (3 A)	Approx. 25 A for max. charging current (4 A)
Mains buffering		
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	0.5 min, 1 min, 2 min, 5 min, 10 min, 20 min, max. buffering time or via software
Behavior on restoration of input voltage after buffering time	Interruption of U_{out} for 5 s for the automatic restart of PCs or optionally no interruption	Interruption of U_{out} for 5 s for the automatic restart of PCs or optionally no interruption
On/off control circuit (via external isolated NO contact)	by opening the circuit the buffer mode is terminated	by opening the circuit the buffer mode is terminated
Starting from battery with input voltage missing (over external isolated NO contact)	by closing the circuit the buffer mode is started	by closing the circuit the buffer mode is started
Energy storage units		
Connectable batteries	– coded Siemens types SITOP UPS1100 (max. 6 over Energy Storage Link) – non-coded Siemens types 6EP1935-6M... – other manufacturers	– coded Siemens types SITOP UPS1100 (max. 6 over Energy Storage Link) – non-coded Siemens types 6EP1935-6M... – other manufacturers
Output data		
Output voltage in normal operation	Input voltage U_{in} minus approx. 0.2 V	Input voltage U_{in} minus approx. 0.2 V
Output voltage in buffer mode	27 V DC (no load); 24V (50 % battery rated current); 22 V (100 % battery rated current); 18.5 V (exhaustive discharge protection)	27 V DC (no load); 24V (50 % battery rated current); 22 V (100 % battery rated current); 18.5 V (exhaustive discharge protection)
Output +Bat/-Bat in normal operation	I-V charging characteristic (first rapid charging current, then charge retention)	I-V charging characteristic (first rapid charging current, then charge retention)
End-of-charge voltage	Automatic temperature-specific setting with SITOP UPS1100 battery modules	Automatic temperature-specific setting with SITOP UPS1100 battery modules
Output current – rated value • Power boost for 30 ms • Extra power for 5 s/min	**0 ... 10 A** 30 A 15 A	**0 ... 20 A** 60 A 30 A
Charging current	Max. 3 A automatic adjustment with UPS1100; otherwise selectable 0.3 A, 0.8 A, 3 A	Max. 4 A automatic adjustment with UPS1100; otherwise selectable 0.8 A, 1.75 A, 4 A
Efficiency for normal operation and charged battery	> 97 %	> 98 %
Protection and monitoring		
Reverse polarity protection	against input voltage U_{in} and against batteries	against input voltage U_{in} and against batteries
Overload / short-circuit protection	Yes, restart in normal operation	Yes, restart in normal operation
Signaling		
Normal operation/buffer mode	LED 1 (OK/BAT) green/yellow and isolated changeover switch 1	LED 1 (OK/BAT) green/yellow and isolated changeover switch 1
Charging status (over 85 % charged)	LED 2 (BAT. > 85 %) green/yellow and isolated changeover switch 3	LED 2 (BAT. > 85 %) green/yellow and isolated changeover switch 3

[1] All SITOP 24 V DC power supplies are permissible without restriction

Technical specifications (continued)

DC UPS modules	SITOP UPS1600 24 V/ 10 A	SITOP UPS1600 24 V/ 20 A
Order No.	**6EP4134-3AB00-0AY0** **6EP4134-3AB00-1AY0** (with USB interface) **6EP4134-3AB00-2AY0** (with 2 Ethernet/PROFINET interfaces)	**6EP4136-3AB00-0AY0** **6EP4136-3AB00-1AY0** (with USB interface) **6EP4136-3AB00-2AY0** (with 2 Ethernet/PROFINET interfaces)
Signaling (continued)		
Alarm (not ready for buffering)	LED 3 (Alarm) red and isolated changeover switch 2	LED 3 (Alarm) red and isolated changeover switch 2
Battery status	LED 4 (BAT.FAULT) red and isolated changeover switch 2: Battery defective, yellow: selected buffering time not assured, yellow flashing: overtemperature	LED 4 (BAT.FAULT) red and isolated changeover switch 2: Battery defective, yellow: selected buffering time not assured, yellow flashing: overtemperature
PROFINET interface	LED 5 (SF) green and LED 6 (RUN)	LED 5 (SF) green and LED 6 (RUN)
Ethernet	LED 7 (P1) green/yellow and LED 8 (P2) green/yellow, link and activity	LED 7 (P1) green/yellow and LED 8 (P2) green/yellow, link and activity
General data		
Radio interference suppression (EN 55022)/ noise immunity	Class B / Noise immunity to EN 61000-6-2	Class B / Noise immunity to EN 61000-6-2
Protection class	Class III (ext. circuit and power supply unit: SELV voltage to EN 60950 is required)	Class III (ext. circuit and power supply unit: SELV voltage to EN 60950 is required)
Degree of protection (EN 60529)	IP20	IP20
Ambient temperature during operation with natural convection	-25 ... + 70 °C (derating from 60 °C)	-25 ... + 70 °C (derating from 60 °C)
Transport/storage temperature	-40 ... + 85 °C	-40 ... + 85 °C
Dimensions (W x H x D) in mm	50 x 125 x 125	50 x 125 x 125
Weight, approx.	0.4 kg without interface, 0.42 kg with USB, 0.45 kg with Ethernet/PROFINET interfaces	0.4 kg without interface, 0.42 kg with USB, 0.45 kg with Ethernet/PROFINET interfaces
Installation	Snaps onto DIN rail DIN EN 50022-35x15/7.5	Snaps onto DIN rail DIN EN 50022-35x15/7.5
Approvals	CE, cULus, C-Tick; KCC; GL, ABS, ATEX	CE, cULus, C-Tick; KCC; GL, ABS, ATEX

Technical specifications

Battery modules	UPS1100 24V, 1.2 Ah	SITOP UPS1100 24V, 3.2 Ah	SITOP UPS1100 24V, 7 Ah
For SITOP UPS1600	10 A	10 A	10 A and 20 A
Order No.	6EP4131-0GB00-0AY0	6EP4133-0GB00-0AY0	6EP4134-0GB00-0AY0
			
Recommended end of charge voltage (set automatically by SITOP UPS1600):	26.4…27.3 V DC (> +20 °C), 27.3…29.0 V DC (< + 20 °C)	26.4…27.3 V DC (> +20 °C), 27.3…29.0 V DC (< + 20 °C)	26.4…27.3 V DC (> +20 °C), 27.3…29.0 V DC (< + 20 °C)
Charging current	max. 0.3 A	max. 0.8 A	max. 1.75 A
Rated output voltage	24 V DC, 22 ... 27.0 V DC (no load)	24 V DC, 22 ... 27.0 V DC (no load)	24 V DC, 22 ... 27.0 V DC (no load)
Rated output current	10 A	15 A	30 A
Integral battery fuse	15 A/32 V	15 A/32 V	30 A/32 V
Signaling	LED green: Battery OK, flashing green: Error or warning, OFF: No communication	LED green: Battery OK, flashing green: Error or warning, OFF: No communication	LED green: Battery OK, flashing green: Error or warning, OFF: No communication
Degree of protection (EN 60529)	IP00	IP00	IP00
Ambient temperature	-10…+50 °C	-10…+50 °C	-10…+50 °C
Transport/storage temperature	-40…+85 °C	-40…+85 °C	-40…+85 °C
Service life (when capacity falls to 50 % of original capacity), depending on battery temperature, approx.	+20 °C: 4 years, +30 °C: 2 years, +40 °C: 1 year, +50 °C: 0.5 years	+20 °C: 4 years, +30 °C: 2 years, +40 °C: 1 year, +50 °C: 0.5 years	+20 °C: 4 years, +30 °C: 2 years, +40 °C: 1 year, +50 °C: 0.5 years
Installation	Standard rail or wall mounting	Standard rail or wall mounting	Wall mounting
Dimensions (W x H x D) in mm	89 x 130 x 107	190 x 169 x 79.5	186 x 186 x 110.5
Weight, approx.	1.9 kg	3.8 kg	6.1 kg
Certification	CE, cULus, C-Tick; KCC; GL, ABS, ATEX	CE, cULus, C-Tick; KCC; GL, ABS, ATEX	CE, cULus, C-Tick; KCC; GL, ABS, ATEX

24 V DC

DC UPS with battery modules SITOP DC UPS

Overview

By combining a DC UPS module with at least one 24 V battery module and a SITOP power supply unit, longer power failures can be bridged without any interruption. Even if a greater buffering current is required, the DC UPS with maintenance-free lead battery provides optimum safety. It spans power failures up to several hours long and delivers up to 40 A.

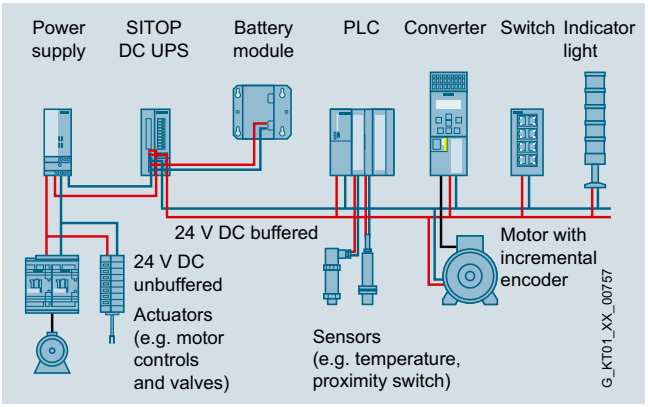
Benefits

- 24 V buffering for a few hours for the purpose of continuing processes
- Maintenance-free battery modules from 1.2 to 12 Ah
- High reliability and availability due to monitoring of the operational readiness, battery feeder, aging and charging status
- Long operating life of loads and batteries due to integrated battery management
- Settings by means of DIP switches: Battery connection threshold, end-of-charge voltage, charging current, bridging time
- SW tool, free of charge, for easy configuring and integrating in PC-based systems

Application

These battery modules that can be connected in parallel bridge power failures for a few hours. This enables processes or parts of them to be continued, measured values to be recorded without interruption and communication to be maintained. High-performance industrial PCs that have to be shut down also have somewhat higher energy demands. Especially if a large panel continues to be operated during the shutdown. The DC UPS is used, for example, in machine tool production, in the textile industry, in all types of production lines, bottling plants or also for the obstacle lights of wind power plants.

The serial or USB interface and a free software tool enable easy communication with a PC.



Configuration with SITOP DC UPS and battery module: 24 V buffering to maintain communication, signaling and sensor measured values. To relieve the load on the UPS, the actuators are supplied directly from the power supply unit.

Design

- DC UPS modules 24 V/6 A, 15 A and 40 A
- Digital inputs/outputs, optionally with serial or USB interface

- Battery modules 1.2 Ah, 3.2 Ah, 7 Ah, 12 Ah with lead rechargeable batteries of corrosion-resistant lead-calcium high-performance grid plates and glass fiber
- Battery module 2.5 Ah with "high-temperature battery" of pure lead

Function

SITOP DC UPS tool

Via the USB interface, all relevant messages about the status of the uninterruptible DC power supply can be transmitted to a PC (e.g. SIMATIC IPC). The DC UPS can also be configured via the USB interface.

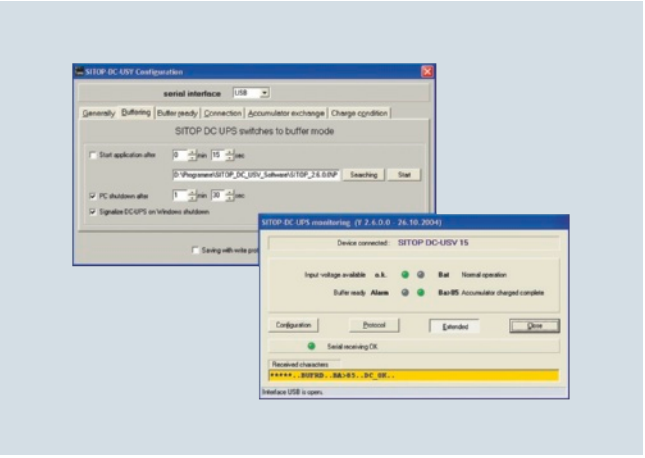
The SITOP DC UPS software provides the user with a free tool that is extremely easy to use for the purpose of monitoring and configuring the DC UPS. Signals sent from the uninterruptible DC power supply can be processed on the PC. In monitoring mode, the statuses of the uninterruptible DC power supply are visualized on the PC.

Safe shutdown in the event of a power failure and automatic PC restart are supported. It is also possible to freely define responses to the different operating states of the uninterruptible DC power supply, so that extremely flexible integration into a wide variety of applications is possible.

Overview of configuration possibilities:

- Times for shutting down the PC
- UPS switch-off
- Further processing of all signals, e.g. linking to proprietary software or WinCC flexible
- Monitoring and display of UPS operating status
- OPC server for linking signals to proprietary applications
- Automatic restarting of IPCs when power is restored during shutdown

The software runs under Windows 2000, Windows XP, Windows Vista and Windows 7 operating systems. It is available as downloadable freeware on the SITOP homepage.
http://www.siemens.com/sitop-ups



Monitoring and configuration window of software V3 for SITOP DC UPS

Technical specifications

The table shows the maximum buffering times for the battery modules for different load currents.

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

Load current	Battery module 1.2 Ah (6EP1935-6MC01)	Battery module 3.2 Ah (6EP1935-6MD11)	Battery module 7 Ah (6EP1935-6ME21)	Battery module 12 Ah (6EP1935-6MF01)	Battery module 2.5 Ah (6EP1935-6MD31)
1 A	34.5 min	2.6 h	5.4 h	9 h	2 h
2 A	15 min	1 h	2.6 h	4.6 h	1 h
3 A	9 min	39.3 min	1.6 h	2.9 h	37.5 min
4 A	6.5 min	27.1 min	1.2 h	2.2 h	27 min
6 A	3.5 min	17.5 min	41 min	1.2 h	17.6 min
8 A	2 min	12.1 min	28.6 min	53.3 min	12.5 min
10 A	1 min	9 min	21.8 min	43.5 min	8.8 min
12 A	–	7 min	17.3 min	33.3 min	6.8 min
14 A	–	5 min	15.1 min	27.5 min	5.1 min
16 A	–	4 min	12.5 min	23.8 min	4.3 min
20 A	–	1 min	9.1 min	20.1 min	–
25 A	–	–	–	12.6 min	–
30 A	–	–	–	9.1 min	–

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 by another 30 % at +5 °C battery temperature to approx. 70 % of approx. 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.

Technical specifications (continued)

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: Until the halfway point of the expected battery life (or slightly beyond) capacity does not drop below 100 %. With regular replacement after halfway through the expected service life, only single battery capacity (instead of double capacity) must be installed regarding aging (-> neutral in price with regard to battery module costs, but only requires half the space).

Replacement after half the service life dispenses in particular 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, even if double the capacity is installed, the influence of aging at the end of service life is not reliably compensated for, but 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:

Battery temperature	Drop to approx. 50 % of residual capacity	Recommendation: Replace all (with 100 % residual capacity)	Alternative recommendation
+20 °C	4 years	2 years	
+30 °C	2 years	1 year	
+40 °C	1 year	0.5 years	Install double capacity and replace (1 × per year)

In normal cases (installation in the coolest location in the control cabinet at approx. +30 °C), the battery with single installed battery capacity should be replaced in accordance with the selection table after 1 year of operation!

- On the DC UPS module 40 A, at least 2 battery modules of 7 Ah or higher must be connected in parallel for output currents > 30 A. When connecting battery modules in parallel, you must ensure identical capacity and aging.
- 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-V 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 (continued)

Product	DC UPS module	DC UPS module	DC UPS module
Power supply, type	6 A	15 A	40 A
Order No.	**6EP1931-2DC21** **6EP1931-2DC31** (with serial interface) **6EP1931-2DC42** (with USB interface)	**6EP1931-2EC21** [1] **6EP1931-2EC31** (with serial interface) **6EP1931-2EC42** (with USB interface)	**6EP1931-2FC21** [1] **6EP1931-2FC42** (with USB interface)
			
Input L+/M in normal operation			
Rated voltage value $U_{in\ rated}$ [2] Voltage range	Controlled DC voltage **24 V DC** 22 ... 29 V DC	Controlled DC voltage **24 V DC** 22 ... 29 V DC	Controlled DC voltage **24 V DC** 22 ... 29 V DC
Connection threshold for battery	22.5 V DC ±0.1 V (factory setting), **adjustable in the range 22 to 25.5 V DC** (in 0.5 V increments)	22.5 V DC ±0.1 V (factory setting), **adjustable in the range 22 to 25.5 V DC** (in 0.5 V increments)	22.5 V DC ±0.1 V (factory setting), **adjustable in the range 22 to 25.5 V DC** (in 0.5 V increments)
Rated current $I_{in\ rated}$	6 A + approx. 0.6 A with empty battery	15 A + approx. 1 A with empty battery	40 A + approx. 2.6 A with empty battery
Mains buffering			
Mains buffering or buffer time	Dependent on connected battery and load current, see selection table battery module and mains buffering times as well as the relevant important information notes!		
On/off control circuit	External isolated NO contact required (loading max. 15 V DC / max. 10 mA). With an open control circuit, the battery is isolated from output L+, thus canceling line buffering. If there is no input voltage, a quiescent current of approximately 0.3 mA is drawn from the battery disconnected from the output.		
Methods of setting the buffering time	**Adjustable** using DIP switches to a maximum buffering time up to forced shutdown through exhaustive discharge protection (at approx. 19 V) or to a time limit **of 5 ... 635 s** (in 10 s increments)		
Interruption	**Adjustable** using DIP switch, **either:** • Interruption in output voltage despite returning input voltage for min. 5 s following expiry of set buffering time to support automatic restarting of industrial PCs or • No forced interruption on expiry of the set buffer time		
Output L+/M in normal operation			
Rated voltage value $U_{out\ rated}$	**24 V DC** (output voltage of SITOP power supply)	**24 V DC** (output voltage of SITOP power supply)	**24 V DC** (output voltage of SITOP power supply)
Voltage range	Input voltage U_{in} less approx. 0.5 V DC	Input voltage U_{in} less approx. 0.5 V DC	Input voltage U_{in} less approx. 0.5 V DC
Startup delay	Approx. 1 s	Approx. 1 s	Approx. 1 s
Voltage rise	Typ. 60 ms	Typ. 60 ms	Typ. 360 ms
Output current I_{out}	**0 ... 6 A**	**0 ... 15 A**	**0 ... 40 A**
Dynamic current with overload	Electronic current limitation to 1.05 ... 1.4 × $I_{out\ rated}$ for approx. 80 ms, then electronic shutdown of the output with automatic restart attempts (approx. 20 s intervals between restart attempts)		
Dynamic current with short-circuit	Electronic current limitation to 1.5 ... 3 × $I_{out\ rated}$ for approx. 20 ms, then electronic shutdown of the output with automatic restart attempts (approx. 20 s intervals between restart attempts)		
Output L+/M with battery operation			
Rated voltage value $U_{out\ rated}$	**24 V DC** (from battery module)	**24 V DC** (from battery module)	**24 V DC** (from battery module)
Approximate voltage range	27 ... 19 V DC at I_{out} = 0.05 × C × 1/h or 24 V at I_{out} = 1 × C × 1/h or 23 V at I_{out} = 2 × C × 1/h (C = total connected battery capacity in Ah), 19 V switch-off threshold for deep discharge protection		
Output current I_{out} [3]	**0 ... 6 A** (permanently permissible)	**0 ... 15 A** (permanently permissible)	**0 ... 40 A** (permanently permissible)
Dynamic current with overload	Electronic current limitation to 1.05 ... 1.4 × $I_{out\ rated}$ for approx. 80 ms, then latching switch-off of output (restart following return to normal operation)		
Dynamic current with short-circuit	Electronic current limitation to 1.5 ... 3 × $I_{out\ rated}$ for approx. 20 ms, then latching switch-off of output (restart following return to normal operation)		

[1] SIPLUS module, see page 14/4.

[2] All SITOP 24 V DC power supplies are permissible without restriction.

[3] In order to implement more than 30 A up to max. 40 A output current for the DC-UPS module 40 A, two 7 Ah or 12 Ah battery modules connected in parallel are required.

Technical specifications (continued)

Product	DC UPS module	DC UPS module	DC UPS module
Power supply, type	**6 A**	**15 A**	**40 A**
Order No.	**6EP1931-2DC21** **6EP1931-2DC31** (with serial interface) **6EP1931-2DC42** (with USB interface)	**6EP1931-2EC21** [1] **6EP1931-2EC31** (with serial interface) **6EP1931-2EC42** (with USB interface)	**6EP1931-2FC21** **6EP1931-2FC42** (with USB interface)
Output +Bat/-Bat in normal operation			
Output +Bat/-Bat in normal operation	***I-U* charging characteristic** (first constant current *I*, then constant voltage *U*)	***I-U* charging characteristic** (first constant current *I*, then constant voltage *U*)	***I-U* charging characteristic** (first constant current *I*, then constant voltage *U*)
End-of-charge voltage *U*	26.6 V DC ±0.1 V (factory setting for +40 °C battery temperature), **adjustable in the range 26.3 to 29.3 V** (in 0.1 V increments)	26.6 V DC ±0.1 V (factory setting for +40 °C battery temperature), **adjustable in the range 26.3 to 29.3 V** (in 0.1 V increments)	26.6 V DC ±0.1 V (factory setting for +40 °C battery temperature), **adjustable in the range 26.3 to 29.3 V** (in 0.1 V increments)
Charging current *I*	Approx. 0.4 A (factory setting), **adjustable to 0.2 A or 0.4 A** (charging is carried out with closed and open on/off circuit) At a battery voltage of < 6 V (batteries defective), charging is not carried out as a protective measure	Approx. 0.7 A (factory setting), **adjustable to 0.35 A or 0.7 A** (charging is carried out with closed and open on/off circuit) At a battery voltage of < 6 V (batteries defective), charging is not carried out as a protective measure	Approx. 2 A (factory setting), **adjustable to 1 A or 2 A** (charging is carried out with closed and open on/off circuit) At a battery voltage of < 6 V (batteries defective), charging is not carried out as a protective measure
Efficiency/heat loss			
At $U_{out\ rated}$, $I_{out\ rated}$ approx.	95 % / 7 W	96.2 % / 14 W	97.2 % / 28.6 W
With battery operation, approx.	94.5 % / 8 W	96 % / 15 W	96.9 % / 33.6 W
Protection and monitoring			
Reverse polarity protection	Against polarity reversal on input voltage and batteries	Against polarity reversal on input voltage and batteries	Against polarity reversal on input voltage and batteries
Overload protection	In accordance with "dynamic current with overload" in normal operation (automatic restart attempts) or in battery mode (restart following return to normal operation)		
Short-circuit protection	In accordance with "dynamic current with short-circuit" in normal operation (automatic restart attempts) or in_battery mode (restart following return to normal operation). Built-in (not accessible) 16 A fuse (6 A and 15 A on DC UPS module) or 64 A fuse (40 A on DC UPS module).		
Exhaustive discharge protection	Automatic shutdown when battery voltage falls below approx. 19 V. At a battery voltage of < 6 V (batteries defective), charging is not carried out as a protective measure.		
Monitoring "Wire breakage in battery circuit"	Alarm signal if battery circuit not closed or if it opens during operation (cyclic test approximately every 20 s)		
Monitoring "Battery replacement required"	Alarm signal flashing at approx. 0.25 Hz repetition frequency (approx. 2 s alarm, approx. 2 s no alarm, approx. 2 s alarm, etc.). Check every 4 hours with 6 ohm load for 1 s if no buffer mode or switch-off has taken place within 4 hours.	Alarm signal flashing at approx. 0.25 Hz repetition frequency (approx. 2 s alarm, approx. 2 s no alarm, approx. 2 s alarm, etc.). Check every 4 hours with 3 ohm load for 1 s if no buffer mode or switch-off has taken place within 4 hours.	Alarm signal flashing at approx. 0.25 Hz repetition frequency (approx. 2 s alarm, approx. 2 s no alarm, approx. 2 s alarm, etc.). Check every 4 hours with 1 ohm load for 1 s if no buffer mode or switch-off has taken place within 4 hours. No monitoring if switch position of compatibility switch is "On"!
Monitoring "Battery charge > 85 %"	Indication whether batteries are charged to at least 85 % of residual capacity still available depending on aging		

Technical specifications (continued)

Product	DC UPS module	DC UPS module	DC UPS module
Power supply, type	**6 A**	**15 A**	**40 A**
Order No.	**6EP1931-2DC21** **6EP1931-2DC31** (with serial interface) **6EP1931-2DC42** (with USB interface)	**6EP1931-2EC21** [1] **6EP1931-2EC31** (with serial interface) **6EP1931-2EC42** (with USB interface)	**6EP1931-2FC21** **6EP1931-2FC42** (with USB interface)
Signaling [4]			
Normal operation	Green LED (OK) and isolated changeover contact "24 V DC OK/Bat" at setting "24 V DC OK" [5]		
Buffer or battery mode (battery supplies load alone or in addition to PS in the case of overload)	Yellow LED (Bat) and isolated changeover contact "24 V DC OK/Bat" at setting "Bat" (de-energized position)		
Alarm (buffer not ready, or pre-warning from < 20.4 V battery voltage)	Red LED (alarm) and isolated changeover contact at setting "Alarm" (= Off position). Causes of the buffer not being ready during normal operation can include: Off status or open on/off control circuit, battery module not connected, polarity reversal or defective battery (battery voltage< 18.5 V) or wire breakage between battery and UPS module. Scanning and thus updating of the signal every 20 s. Causes of the buffer not being available during buffer operation can include: Battery voltage has dropped below 20.4 V DC (= pre-warning before shutdown through exhaustive discharge protection) and shutdown of the battery due to overload, short-circuit, exhaustive discharge protection or expired buffering time. The red LED then goes out.		
"Battery replacement required"	Red LED (alarm) flashing at 0.25 Hz and isolated changeover contact (alarm) switching at approx. 0.25 Hz		
"Battery charge > 85 %"	Second green LED (Bat > 85 %) and isolated NO contact closed (de-energized position = open)		
Compatibility switch	Only on **6EP1931-2FC21 only** The following can be selected using DIP switches: Switch position "Off" - "significant properties analogous to new DC UPS range" or "On" switch position - "analogous to previous DC UPS module 40 (6EP1931-2FC01)". With compatibility switch in "On" position: Output of the alarm signal changes: - The red LED flashes on wire-break between rechargeable battery and DC UPS module with $^1/_3$ Hz and isolated changeover contact (alarm) switching at approx. $^1/_3$ Hz. A battery test does not take place.		
Optional interface and software			
Serial interface	Only on **6EP1931-2.C31** Output of all alarm signals and receipt of the "Remote timer start" signal. Technical design: PC-compatible. 8N1 send and receive, 9600 bit/s, 8 data bits, 1 stop bit, no parity bit. Required connection to the PC: 1 : 1 interconnected 9-pole sub D extension cable (connector/socket), only pin 2 (RXD), pin 3 (TDX) and pin 7 (RTS) are required.		
USB interface	Only on **6EP1931-2.C42** Output of all alarm signals and receipt of the "Remote timer start" signal. Technical design: Specification 2.0 with full speed, i.e. 2 Mbit/s. Supplied with +5 V by DC UPS ("self powered"). Required connection to the PC: Commercially available 4-core shielded cable, 90 Ohm, max. 5 m, USB series "A" connector to PC and USB series "B" connector to DC UPS		
Software	A software tool for reading out and processing the signals (can run under Windows 2000, Windows XP, Windows Vista and Windows 7) is available for downloading from the Internet at http://www.siemens.com/sitop-ups. This site also provides more information on the interface.		
Control signals			
On/off control signal	Buffering is terminated or the battery is disconnected from the output by opening the control circuit or by means of DIP switches on the device (DIP switch must be in "Off" position). All other functions are retained.		
"Remote timer start" via serial interface or USB	Starts mains buffering for the set buffering time	Starts mains buffering for the set buffering time	Starts mains buffering for the set buffering time

[4] Permissible contact rating: 60 V DC/1 A or 30 V AC/1 A.

[5] "24 V DC OK" means: voltage of the power supply unit is greater than the battery connection threshold set on the DC UPS module.

Technical specifications (continued)

Product	DC UPS module	DC UPS module	DC UPS module
Power supply, type	**6 A**	**15 A**	**40 A**
Order No.	**6EP1931-2DC21** **6EP1931-2DC31** (with serial interface) **6EP1931-2DC42** (with USB interface)	**6EP1931-2EC21** 1) **6EP1931-2EC31** (with serial interface) **6EP1931-2EC42** (with USB interface)	**6EP1931-2FC21** **6EP1931-2FC42** (with USB interface)
Safety			
Primary/secondary isolation	No	No	No
Protection class	Class III (ext. circuit and power supply unit: SELV in accordance with EN 60950 required)	Class III (ext. circuit and power supply unit: SELV in accordance with EN 60950 required)	Class III (ext. circuit and power supply unit: SELV in accordance with EN 60950 required)
EMC			
Emitted interference	Radio interference suppression according to EN 55022, Class B	Radio interference suppression according to EN 55022, Class B	Radio interference suppression according to EN 55022, Class B
Noise immunity	Noise immunity according to EN 61000-6-2	Noise immunity according to EN 61000-6-2	Noise immunity according to EN 61000-6-2
Ambient conditions			
Ambient temperature during operation	-25 ... +60 °C with natural convection	-25 ... +60 °C with natural convection	-25 ... +60 °C with natural convection
Transport/storage temperature	−40 ... +85 °C	−40 ... +85 °C	−40 ... +85 °C
Degree of protection (EN 60529)	IP20	IP20	IP20
Humidity class	Conditions of use in accordance with EN 60721, climate class 3K3 (relative humidity 5 % to 85 % and absolute humidity 1 g/m^3 to 25 g/m^3; no condensation)	Conditions of use in accordance with EN 60721, climate class 3K3 (relative humidity 5 % to 85 % and absolute humidity 1 g/m^3 to 25 g/m^3; no condensation)	Conditions of use in accordance with EN 60721, climate class 3K3 (relative humidity 5 % to 85 % and absolute humidity 1 g/m^3 to 25 g/m^3; no condensation)
Approvals			
CE mark	Yes	Yes	Yes
UL/cUL (CSA) approval	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
Mechanics			
Input connections 24 V DC	2 screw terminals for 1... 4 mm^2/17 ... 11 AWG	2 screw terminals for 1 ... 4 mm^2/17 ... 11 AWG	2 screw terminals for 0.33 ... 10 mm^2/22 ... 7 AWG
Output connections 24 V DC	4 screw terminals for 1 ... 4 mm^2/17 ... 11 AWG	4 screw terminals for 1 ... 4 mm^2/17 ... 11 AWG	4 screw terminals for 0.33 ... 10 mm^2/22 ... 7 AWG
Battery module connections 24 V DC	2 screw terminals for 1 ... 4 mm^2/17 ... 11 AWG	2 screw terminals for 1 ... 4 mm^2/17 ... 11 AWG	2 screw terminals for 0.33 ... 10 mm^2/22 ... 7 AWG
Connections for control circuit and alarm signals	10 screw terminals for 0.5 ... 2.5 mm^2/20 ... 13 AWG	10 screw terminals for 0.5 ... 2.5 mm^2/20 ... 13 AWG	10 screw terminals for 0.5 ... 2.5 mm^2/20 ... 13 AWG
Dimensions (W × H × D) in mm	50 × 125 × approx.125	50 × 125 × approx.125	102 × 125 × 125
Weight, approx.	0.4 kg (with serial or USB interface: 0.45 kg)	0.4 kg (with serial or USB interface: 0.45 kg)	1.1 kg (with serial or USB interface: 1.1 kg)
Installation	Snaps onto DIN rail EN 60715 35×7.5/15	Snaps onto DIN rail EN 60715 35×7.5/15	Snaps onto DIN rail EN 60715 35×7.5/15

DC UPS with battery modules
SITOP DC UPS battery modules

Overview

Product	Battery module 1.2 Ah	Battery module 2.5 Ah	Battery module 3.2 Ah
Battery type	Maintenance-free lead-acid batteries	Maintenance-free pure lead batteries	Maintenance-free, closed lead-acid batteries
Order No.	6EP1935-6MC01	6EP1935-6MD31	6EP1935-6MD11
			
	Battery module for DC UPS module 6 A. It has two maintenance-free, closed lead-acid batteries (from the same lot) which are installed in a holder and connected in series with corrosion-resistant lead-calcium high-performance grid plates and glass fiber. Completely prewired with battery retainer and terminals Low self-discharge rate of approximately 3 % per month (at +20 °C)	High-temperature battery module for DC UPS module 6 A and 15 A. It has two maintenance-free, closed pure lead-acid batteries (from the same lot), which are installed in a holder and connected in series. Completely prewired with battery retainer and terminals Low self-discharge rate of approximately 3 % per month (at +20 °C)	Battery module for DC UPS module 6 A and 15 A. It has two maintenance-free, closed lead-acid batteries (from the same lot) which are installed in a holder and connected in series with corrosion-resistant lead-calcium high-performance grid plates and glass fiber. Complete with battery retainer and terminals. Low self-discharge rate of approximately 3 % per month (at +20 °C).

Technical specifications

Product	Battery module 1.2 Ah	Battery module 2.5 Ah	Battery module 3.2 Ah
Battery type	Maintenance-free lead-acid batteries	Maintenance-free pure lead batteries	Maintenance-free, closed lead-acid batteries
Order No.	6EP1935-6MC01	6EP1935-6MD31	6EP1935-6MD11
Charging current/ charging voltage			
	Maintenance-free, closed lead-acid batteries	**Maintenance-free pure lead-acid batteries**	**Maintenance-free, closed lead-acid batteries**
Recommended end-of-charge voltage (stand-by use), dependent on battery temperature	27.8 V at +10 °C 27.3 V at +20 °C 26.8 V at +30 °C 26.6 V at +40 °C	29.0 V at −10 °C 28.6 V at 0 °C 28.3 V at +10 °C 27.9 V at +20 °C 27.5 V at +30 °C 27.2 V at +40 °C 26.8 V at +50 °C 26.4 V at +60 °C	27.8 V at +10 °C 27.3 V at +20 °C 26.8 V at +30 °C 26.6 V at +40 °C
Recommended charging current	Max. 0.3 A	Max. 5 A	Max. 0.8 A
Protection			
Short-circuit protection	Battery fuse 7.5 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 15 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 15 A/32 V (solid-state circuitry blade-type fuse + support)
Battery protection	Valve control	Valve control	Valve control
Safety			
Protection class	Class III	Class III	Class III
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
Degree of protection (EN 60529)	IP00	IP00	IP00
Operating data [1]			
Ambient temperature range	0 ... +40 °C	−40 ... +60 °C with natural convection	0 ... +40 °C with natural convection
Transport and storage temperature range	−20 ... +50 °C	−40 ... +60 °C	−20 ... +50 °C
Self-discharge rate	Approx. 3 % per month at 20 °C battery temperature (increases with the temperature)	Approx. 3 % per month at 20 °C battery temperature (increases with the temperature)	Approx. 3 % per month at 20 °C battery temperature (increases with the temperature)

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

	Battery module 7 Ah	Battery module 12 Ah
	Maintenance-free, closed lead-acid batteries	Maintenance-free, closed lead-acid batteries
	6EP1935-6ME21	6EP1935-6MF01
		
	Battery module for DC UPS module 6 A, 15 A and DC UPS module 40 A (for > 30 to 40 A, 2 units are required in parallel). It has two maintenance-free, closed lead-acid batteries (from the same lot) which are installed in a holder and connected in series with corrosion-resistant lead-calcium high-performance grid plates and glass fiber. Completely prewired with battery retainer and terminals. Low self-discharge rate of approximately 3 % per month (at +20 °C)	Battery module for DC UPS module 6 A, 15 A and DC UPS module 40 A (for > 30 to 40 A, 2 units are required in parallel). It has two maintenance-free, closed lead-acid batteries (from the same lot) which are installed in a holder and connected in series with corrosion-resistant lead-calcium high-performance grid plates and glass fiber. Completely prewired with battery retainer and terminals. Low self-discharge rate of approximately 3 % per month (at +20 °C)

	Battery module 7 Ah	Battery module 12 Ah
	Maintenance-free, closed lead-acid batteries	Maintenance-free, closed lead-acid batteries
	6EP1935-6ME21	6EP1935-6MF01
	Maintenance-free, closed lead-acid batteries	**Maintenance-free, closed lead-acid batteries**
	27.8 V at +10 °C 27.3 V at +20 °C 26.8 V at +30 °C 26.6 V at +40 °C	27.8 V at +10 °C 27.3 V at +20 °C 26.8 V at +30 °C 26.6 V at +40 °C
	Max. 1.75 A	Max. 3 A
	Battery fuse 30 A/32 V (solid-state circuitry blade-type fuse + support)	Battery fuse 30 A/32 V (solid-state circuitry blade-type fuse + support)
	Valve control	Valve control
	Class III	Class III
	UL/cUL-recognized (UL 1778, CSA C22.2 No. 107.1), File E219627	cURus-recognized (UL 1778, CSA C22.2 No. 107.1), File E219627
	IP00	IP00
	0 ... +40 °C	0 ... +40 °C
	−20 ... +50 °C	−20 ... +50 °C
	Approx. 3 % per month at 20 °C battery temperature	Approx. 3 % per month at 20 °C battery temperature

Technical specifications (continued)

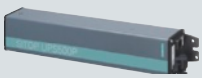
Product	Battery module 1.2 Ah	Battery module 2.5 Ah	Battery module 3.2 Ah
Battery type	**Maintenance-free lead-acid batteries**	**Maintenance-free pure lead batteries**	**Maintenance-free, closed lead-acid batteries**
Order No.	**6EP1935-6MC01**	**6EP1935-6MD31**	**6EP1935-6MD11**
Service life [1]			
The service life of the lead-acid batteries (capacity falls to 50 % of original capacity) depends on the battery temperature as follows:	Approx. 4 years at +20 °C Approx. 2 years at +30 °C Approx. 1 year at +40 °C	Approx. >10 years at +20 °C Approx. 7 years at +30 °C Approx. 3 years at +40 °C Approx. 1.5 years at +50 °C Approx. 1 year at +60 °C	Approx. 4 years at +20 °C Approx. 2 years at +30 °C Approx. 1 year at +40 °C
Mechanics			
Connection	1 screw terminal each for 0.08 ... 2.5 mm^2 for +BAT and –BAT	1 screw terminal each for 0.08 ... 2.5 mm^2 for +BAT and –BAT	1 screw terminal each for 0.08 ... 2.5 mm^2 for +BAT and –BAT
Accessories, included	Accessories pack with spare solid-state circuitry fuse 7.5 A	Accessories pack with spare solid-state circuitry fuse 15 A	Accessories pack with spare solid-state circuitry fuse 15 A
Dimensions (W × H × D) in mm	96 × 106 × 108	265 × 151 × 91	190 × 151 × 82
Weight, approx.	1.8 kg	3.8 kg	3.2 kg
Installation	Snaps onto DIN rail EN 60715 35×7.5/15 or keyhole mounting for hooking onto M4 screws	Snaps onto DIN rail EN 60715 35×7.5/15 or keyhole mounting for hooking onto M4 screws	Snaps onto DIN rail EN 60715 35×7.5/15 or keyhole mounting for hooking onto M4 screws

[1] 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.

	Battery module 7 Ah	Battery module 12 Ah
	Maintenance-free, closed lead-acid batteries	Maintenance-free, closed lead-acid batteries
	6EP1935-6ME21	6EP1935-6MF01
	Approx. 4 years at +20 °C Approx. 2 years at +30 °C Approx. 1 year at +40 °C	Approx. 4 years at +20 °C Approx. 2 years at +30 °C Approx. 1 year at +40 °C
	1 screw terminal each for 0.08 ... 4 mm^2 for +BAT and –BAT	1 screw terminal each for 0.08 ... 4 mm^2 for +BAT and –BAT
	Accessories pack with spare solid-state circuitry fuse 15 A and 30 A	Accessories pack with spare solid-state circuitry fuse 15 A and 30 A
	186 × 168 × 121	253 × 168 × 121
	6.0 kg	9.0 kg
	Can be screwed onto flat surface ("keyhole mounting" for hooking onto M4 screws)	Can be screwed onto flat surface ("keyhole mounting" for hooking onto M4 screws)

Ordering data and further information

Selection and ordering data

Product	Input Voltage $U_{in\ rated}$	Output; energy Voltage $U_{out\ rated}$	Current $I_{out\ rated}$	Order No.	Price
SITOP UPS500S					
	**24 V DC**	**24 V DC; 2.5 kWs**	15 A	**6EP1933-2EC41**	
	24 V DC	**24 V DC; 5 kWs**	15 A	**6EP1933-2EC51**	
SITOP UPS501S					
	**24 V DC**	**24 V DC; 5 kWs**	15 A	**6EP1935-5PG01**	
SITOP UPS500P					
	**24 V DC**	**24 V DC; 5 kWs**	7 A	**6EP1933-2NC01**	
	24 V DC	**24 V DC; 10 kWs**	7 A	**6EP1933-2NC11**	
Connector set					
	Connector set consisting of connector for input and output with pre-assembled USB cable (2 m long)			**6EP1975-2ES00**	
SITOP UPS1600					
	**24 V DC**	**24 V DC;**	10 A	**6EP4134-3AB00-0AY0**	
	24 V DC	**24 V DC; with USB interface**	10 A	**6EP4134-3AB00-1AY0**	
	24 V DC	**24 V DC; with 2 Ethernet/ PROFINET interfaces**	10 A	**6EP4134-3AB00-2AY0**	
	24 V DC	**24 V DC;**	20 A	**6EP4136-3AB00-0AY0**	
	24 V DC	**24 V DC; with USB interface**	20 A	**6EP4136-3AB00-1AY0**	
	24 V DC	**24 V DC; with 2 Ethernet/ PROFINET interfaces**	20 A	**6EP4136-3AB00-2AY0**	
SITOP UPS1100					
	**24 V DC** Capacity: **1.2 Ah**		10 A	**6EP4131-0GB00-0AY0**	
	**24 V DC** Capacity: **3.2 Ah**		10 A	**6EP4133-0GB00-0AY0**	
	**24 V DC** Capacity: **7 Ah**		10 A and 20 A	**6EP4134-0GB00-0AY0**	

Selection and ordering data (continued)

Product	Input Voltage $U_{in\ rated}$	Output; energy Voltage $U_{out\ rated}$	Current $I_{out\ rated}$	Order No.	Price
DC UPS module					
	**24 V DC**	**24 V DC**	6 A	**6EP1 931-2DC21**	
	24 V DC	**24 V DC, with serial interface**	6 A	**6EP1 931-2DC31**	
	24 V DC	**24 V DC, with USB interface**	6 A	**6EP1 931-2DC42**	
	**24 V DC**	**24 V DC**	15 A	**6EP1 931-2EC21**	
	24 V DC	**24 V DC, with serial interface**	15 A	**6EP1 931-2EC31**	
	24 V DC	**24 V DC, with USB interface**	15 A	**6EP1 931-2EC42**	
	24 V DC	**24 V DC**	40 A	**6EP1 931-2FC21**	
	24 V DC	**24 V DC, with USB interface**	40 A	**6EP1 931-2FC42**	
Battery module					
	**Capacity:**				
	• 1.2 Ah			**6EP1 935-6MC01**	
	• 2.5 Ah, high-temperature battery module			**6EP1 935-6MD31**	
	• 3.2 Ah			**6EP1 935-6MD11**	
	• 7 Ah			**6EP1 935-6ME21**	
	• 12 Ah			**6EP1 935-6MF01**	

Further information

You can find additional information in the Internet at:

- 2D dimensional drawings, 3D CAD data, circuit diagram macros:
  www.siemens.com/sitop-cax
- Operating instructions:
  www.siemens.com/sitop-manuals

SITOP
Alternative voltages

12/2 **Output voltage 3 - 52 V**
SITOP flexi

12/4 **Output voltage 5 V**
12/4 LOGO!Power 5 V/3 A
12/4 LOGO!Power 5 V/6.3 A

12/6 **Output voltage 12 V**
12/6 LOGO!Power 12 V/1.9 A
12/6 SITOP PSU100C 12 V/2 A
12/6 SITOP DC/DC 12 V/2.5 A
12/7 PSU100D 12 V/3 A
12/7 LOGO!Power 12 V/4.5 A
12/7 SITOP PSU100C 12 V/6.5 A
12/12 SITOP PSU100S 12 V/7 A
12/12 PSU100D 12 V/8.3 A
12/13 SITOP PSU100S 12 V/14 A
12/13 SITOP PSU300B 12 V/20 A

12/18 **Output voltage 15 V**
12/18 LOGO!Power 15 V/1.9 A
12/18 LOGO!Power 15 V/4 A
12/18 SITOP dual 2 x 15 V/3.5 A

12/21 **Output voltage 48 V**
12/21 SITOP PSU300M 48 V/10 A
12/21 SITOP modular 48 V/20 A

12/24 **Ordering data and further information**

For AL and ECCN export regulations
see page 16/20

Alternative voltages

Output voltage 3 - 52 V

Overview

Product	Special design SITOP flexi
Power supply, type	3-52 V/2-10 A
Order No.	6EP1353-2BA00

The power supply with flexible output voltage from 3 to 52 V; suitable for all application areas requiring a special voltage other than 24 V.

Technical specifications

Product	Special design SITOP flexi
Input	
Rated voltage value $U_{in\ rated}$	1-phase AC **120/230 V AC**
Supply voltage	
• 1 for AC rated value	120 V
• 2 for AC rated value	230 V
• Comment	Set by means of wire jumper
Input voltage	
• 1 for AC	85 … 132 V
• 2 for AC	170 … 264 V
Overvoltage resistance	2.3 x $U_{in\ rated}$, 1.3 ms
Mains buffering at $I_{out\ rated}$, min.	10 ms
Mains buffering	at Pa = 120 W and U_{in} = 93/187 V
Rated line frequency value	
• 1	50 Hz
• 2	60 Hz
Line frequency range	63 … 47 Hz
Input current at rated value of input voltage	
• 120 V rated value	2.2 A
• 230 V rated value	0.9 A
Switch-on current limit (+25 °C), max.	32 A
I^2t, *max.*	0.8 A^2s
Built-in incoming fuse	T 3.15 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 6 A or higher, characteristic C
Output	
Output voltage	Controlled, isolated DC voltage 3 - 52 V DC
Total tolerance, static ±	1 %
• Static mains compensation	Approx. 0.1 %
• Static load compensation	Approx. 0.2 %
Sense line connection, maximum voltage control per line	0.5 V
Residual ripple, peak-peak	Max. 50 mV (typ. 20 mV)
Spikes (bandwidth approx. 20 MHz)	Max. 100 mV (typ. 80 mV)
Adjustment range	3 … 52 V
Settable output voltage	Yes
Output voltage adjustment	via potentiometer or analog control voltage signal 0 ... 2.5 V
Status display	Green LED for 24 V OK
Signaling	Power good via relay contact, current monitor signal 0 ... 2.5 V
On/off behavior	No overshoot of U_{out} (soft start)
Startup delay, max.	3 s
Voltage rise, typ.	80 ms
Rated current $I_{out\ rated}$	10 A
• Min.	2 A
• Max.	10 A
Current range	0 … 10 A
• Comment	Max. 120 W
Typical power output	120 W

Technical specifications (continued)

Product	Special design SITOP flexi
Power supply, type	**3-52 V/2-10 A**
Order No.	**6EP1353-2BA00**
Output (continued)	
Constant overload current for short-circuit	
• During startup, typically	10 A
• During operation, typically	10 A
Parallel switching for enhanced performance	Yes
Number of devices that can be switched in parallel to enhance performance, units	2
Efficiency	
Efficiency at $U_{out\ rated}$, $I_{out\ rated}$	Approx. 84 %
Power loss at $U_{out\ rated}$, $I_{out\ rated}$	Approx. 23 W
Protection and monitoring	
Output overvoltage protection	According to EN 60950-1
Current limitation	2 … 10 A
Current limitation	2 ... 10 A, adjustable via potentiometer or analog control voltage signal 0 ... 2.5 V
Property of the output, short-circuit-proof	Yes
Short-circuit protection	Electronic current limitation (2 ... 10 A) in the range 3 ... 12 V or power limitation (120 W) in the range 12 ... 52 V
• Comment	Matching the set current limitation 2 ... 10 A
Overload/short-circuit indicator	Red LED for current or power limiting
Safety	
Primary/secondary isolation	Yes
Isolation	SELV output voltage U_{out} according to EN 60950-1 and EN 50178
Protection class	Class I
Leakage current, max.	3.5 mA
CE mark	Yes
UL/CSA approval	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 142), File E143289
Explosion protection	–
FM approval	–
CB approval	No
Approvals	No
Marine approval	–
Degree of protection (EN 60529)	IP20
EMC	
Emitted interference	EN 55022 Class B
Supply harmonics limitation	EN 61000-3-2
Noise immunity	EN 61000-6-2
Operating data	
Ambient temperature	
• During operation	0 … 60 °C
• Comment	with natural convection
• During transport	-40 … +85 °C
• During storage	-40 … +85 °C
Humidity class according to EN 60721	Climate class 3K3, without condensation
Mechanics	
Connection method	Screw terminals
Connections	
• Supply input	L1, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded
• Output	L+: 1 screw terminal for 0.5 ... 2.5 mm^2; M: 2 screw terminals for 0.5 ... 2.5 mm^2
• Auxiliary contacts	Alarm signals, control inputs: 1 screw terminal each for 0.14 ... 1.5 mm^2
Width of enclosure	75 mm
Height of enclosure	125 mm
Depth of enclosure	125 mm
Mounting width	75 mm
Mounting height	225 mm
Weight, approx.	0.9 kg
Product property of the enclosure: side-by-side enclosure	Yes
Type of mounting	
• Wall mounting	No
• DIN rail mounting	Yes
• S7-300 rail mounting	No
Installation	Snaps onto DIN rail EN 60715 35x7.5/15

Alternative voltages

Output voltage 5 V

Overview

Product	LOGO!Power	LOGO!Power
Power supply, type	5 V/3 A	5 V/6.3 A
Order No.	6EP1311-1SH03	6EP1311-1SH13
		

LOGO!Power supplies are optimally matched in design and functionality;
with wide-range input 85 V to 264 V AC and option for installing in built-in miniature distribution boards, they can be used universally in the low-end performance range. Operation is also possible on DC voltages from 110 V to 300 V DC.

Technical specifications

Product	LOGO!Power	LOGO!Power
Input		
Rated voltage value $U_{in\ rated}$	1-phase AC or DC **100 ... 240 V AC**	1-phase AC or DC **100 ... 240 V AC**
Voltage range	85 ... 264 V	85 ... 264 V
Input voltage for DC	110 … 300 V	110 … 300 V
Overvoltage resistance	2.3 $U_{in\ rated}$, 1.3 ms	2.3 $U_{in\ rated}$, 1.3 ms
Mains buffering at $I_{out\ rated}$	Min. 40 ms	Min. 40 ms
Mains buffering	at U_{in} = 187 V	at U_{in} = 187 V
Rated line frequency value		
• 1	50 Hz	50 Hz
• 2	60 Hz	60 Hz
Line frequency range	47 … 63 Hz	47 … 63 Hz
Input current at rated value of input voltage		
• 120 V rated value	0.36 A	0.71 A
• 230 V rated value	0.22 A	0.37 A
Switch-on current limit (+25 °C)	max. 26 A	max. 50 A
I^2t, max.	0.8 A^2s	3 A^2s
Built-in incoming fuse	Internal	Internal
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C	Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C
Output		
Rated voltage $U_{out\ rated\ DC}$	Controlled, isolated DC voltage 5 V	Controlled, isolated DC voltage 5 V
Total tolerance, static ±	3 %	3 %
• Static mains compensation, approx.	0.2 %	0.1 %
• Static load compensation, approx.	1.5 %	2 %
Residual ripple, peak-peak	Max. 100 mV (typ. 10 mV)	Max. 100 mV (typ. 15 mV)
Spikes (bandwidth approx. 20 MHz)	Max. 100 mV (typ. 20 mV)	Max. 100 mV (typ. 70 mV)
Adjustment range	4.6 ... 5,4 V	4.6 ... 5,4 V
Settable output voltage	Yes	Yes
Output voltage adjustment	via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK
On/off behavior	No overshoot of U_{out} (soft start)	No overshoot of U_{out} (soft start)
Startup delay, max.	0.5 s	0.5 s
Voltage rise, typ.	20 ms	10 ms
Rated current $I_{out\ rated}$	3 A	6.3 A
Current range	0 … 3 A	0 … 6.3 A
• Comment	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K
Typical power output	15 W	30 W
Parallel switching for enhanced performance	Yes	Yes
Number of devices that can be switched in parallel to enhance performance, units	2	2
Efficiency		
Efficiency at $U_{out\ rated}$, $I_{out\ rated}$	Approx. 77 %	Approx. 83 %
Power loss at $U_{out\ rated}$, $I_{out\ rated}$	Approx. 4 W	Approx. 6 W

Technical specifications (continued)

Product	LOGO!Power	LOGO!Power
Power supply, type	**5 V/3 A**	**5 V/6.3 A**
Order No.	**6EP1311-1SH03**	**6EP1311-1SH13**
Closed-loop control		
Dyn. mains compensation ($U_{in\ rated}$ ± 15 %), max.	0.2 %	0.2 %
Dynamic load compensation (I_{out}: 10/90/10 %), typ.	3 %	3 %
Load step settling time		
• 10 to 90 %, typ.	2 ms	2 ms
• 90 to 10 %, typ.	2 ms	2 ms
Protection and monitoring		
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, typ.	3.8 A	8.2 A
Property of the output, short-circuit-proof	Yes	Yes
Short-circuit protection	Constant current characteristic	Constant current characteristic
Sustained short-circuit current rms value	max. 5 A	max. 10 A
Overload/short-circuit indicator	–	–
Safety		
Primary/secondary isolation	Yes	Yes
Isolation	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1 and EN 50178
Protection class	Class II (without protective conductor)	Class II (without protective conductor)
CE mark	Yes	Yes
UL/CSA approval	Yes	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (UL 1310)	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4
CB approval	Yes	Yes
Marine approval	GL, ABS	GL, ABS
Degree of protection (EN 60529)	IP20	IP20
EMC		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	Not applicable	Not applicable
Noise immunity	EN 61000-6-2	EN 61000-6-2
Operating data		
Ambient temperature		
• During operation	–20 ... +70 °C	-20 … +70 °C
• Comment	with natural convection	with natural convection
• During transport	–40 ... +85 °C	–40 ... +85 °C
• During storage	–40 ... +85 °C	–40 ... +85 °C
Humidity class according to EN 60721	Climate class 3K3, without condensation	Climate class 3K3, without condensation
Mechanics		
Connection method	Screw terminals	Screw terminals
Connections		
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm² solid/finely stranded 0.5 ... 2.5 mm²	L, N: 1 screw terminal each for 0.5 ... 2.5 mm² solid/finely stranded
• Output	+, -: 2 screw terminals each for 0.5 ... 2.5 mm²	+, -: 2 screw terminals each for 0.5 ... 2.5 mm²
• Auxiliary contacts	–	–
Width of enclosure	54 mm	72 mm
Height of enclosure	90 mm	90 mm
Depth of enclosure	55 mm	55 mm
Mounting width	54 mm	72 mm
Mounting height	130 mm	130 mm
Weight, approx.	0.17 kg	0.25 kg
Product property of the enclosure: side-by-side enclosure	Yes	Yes
Type of mounting		
• Wall mounting	No	No
• DIN rail mounting	Yes	Yes
• S7-300 rail mounting	No	No
Installation	Snaps onto DIN rail EN 60715 35x7.5/15	Snaps onto DIN rail EN 60715 35x7.5/15

Alternative voltages

Output voltage 12 V

Overview

Product	LOGO!Power	SITOP compact PSU100C	Special design SITOP DC/DC
Power supply, type	12 V/1.9 A	12 V/2A	12 V/2.5 A
Order No.	6EP1321-1SH03	6EP1321-5BA00	6EP1621-2BA00
The product families are highlighted in the same color. For an explanation of the product families, see chapter 1, pages 1/8 through 1/12.			
	LOGO!Power supplies are optimally matched in design and functionality to the LOGO! logic modules. The slimmest 12 V LOGO!Power version can be universally used for low power requirements up to 1.9 A.	Slim power supply unit for the lower performance range, e.g. for distributed use in control boxes. Low energy consumption thanks to high efficiency across the entire performance range as well as minimum energy losses at no-load and connections with removable terminals.	DC/DC converter for connection to 24 V DC networks over permanent wiring. Output voltage 12 V DC; floating, short circuit-proof, open circuit-proof.

Technical specifications

Product	LOGO!Power	SITOP compact PSU100C	Special design SITOP DC/DC
Input			
Rated voltage value $U_{in\ rated}$	1-phase AC or DC **100 ... 240 V AC**	1-phase AC or DC **100 ... 230 V AC**	DC voltage PELV/SELV **24 V DC**
Voltage range	85 ... 264 V	85 … 264 V	
Input voltage for DC	110 … 300 V	110 … 300 V	18.5 ... 30.2 V
Overvoltage resistance	2.3 × $U_{in\ rated}$, 1.3 ms	2.3 × $U_{in\ rated}$, 1.3 ms	
Mains buffering at $I_{out\ rated}$, min.	40 ms	20 ms	
Mains buffering	at U_{in} = 187 V	at U_{in} = 230 V	
Rated line frequency value			
• 1	50 Hz	50 Hz	
• 2	60 Hz	60 Hz	
Line frequency range	47 … 63 Hz	47 … 63 Hz	
Input current at rated value of input voltage			
• 24 V rated value			2.5 A
• 100 V rated value			
• 120 V rated value	0.53 A	0.63 A	
• 230 V rated value	0.3 A	0.31 A	
• 240 V rated value			
Switch-on current limit (+25 °C)	25 A	33 A	20 A
Duration of the switch-on current limit at 25 °C typically			5 ms
I^2t, max.	0.8 A^2s	1.2 A^2s	
Built-in incoming fuse	Internal	Internal	Not accessible
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C	Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C	Recommended miniature circuit breaker: 10 A characteristic B
Output			
Rated voltage $U_{out\ rated\ DC}$	Controlled, isolated DC voltage 12 V	Controlled, isolate DC voltage 12 V	Controlled, isolated DC voltage 12 V
Total tolerance, static ±	3 %	3 %	3 %
Static mains compensation, approx.	0.1 %		0.1 %
Static load compensation, approx.	1.5 %		0.4 %
Residual ripple, peak-peak	Max. 200 mV (typ. 10 mV)	Max. 200 mV (typ. 40 mV)	Max. 100 mV (typ. 50 mV)
Spikes (bandwidth approx. 20 MHz)	Max. 300 mV (typ. 20 mV)	Max. 300 mV (typ. 50 mV)	Max. 50 mV (typ. 50 mV)
Adjustment range	10.5 … 16.1 V	10.5 … 12.9 V	12 … 14 V
Settable output voltage	Yes	Yes	Yes
Output voltage adjustment	via potentiometer	via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for 12 V OK
On/off behavior	No overshoot of U_{out} (soft start)	Overshoot of U_{out} approx. 5 %	

Special design PSU100D	LOGO!Power	SITOP compact PSU100C
12 V/3 A	12 V/4.5 A	12 V/6.5 A
6EP1321-1LD00	6EP1322-1SH03	6EP1322-5BA10
		
The low-cost power supply in flat aluminum housing can be screwed directly on a wall in various mounting positions; with wide-range input for global use.	The LOGO!Power power supply is optimally matched in design and functionality to the LOGO! logic modules with 12 V DC input. The most powerful 12 V LOGO!Power version can be used universally for current consumption up to 4.5 A.	Slim power supply unit for the lower performance range, e.g. for distributed use in control boxes. Low energy consumption thanks to high efficiency across the entire performance range as well as minimum energy losses at no-load and connections with removable terminals.

Special design PSU100D	LOGO!Power	SITOP compact PSU100C
1-phase AC **100 … 240 V AC** 85 … 264 V 15 ms at U_{in} = 115/230 V 50 Hz 60 Hz 47 … 63 Hz	1-phase AC or DC **100 … 240 V AC** 85 … 264 V 110 … 300 V 2.3 x $U_{in\ rated}$, 1.3 ms 40 ms at U_{in} = 187 V 50 Hz 60 Hz 47 … 63 Hz	1-phase AC or DC **100 … 230 V AC** 85 ... 264 V 110 … 300 2.3 x $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 230 V 50 Hz 60 Hz 47 ... 63 Hz
0.75 A 0.5 A	 1.13 A 0.61 A	1.6 A 0.8 A
60 A 1.2 A^2s Internal Recommended miniature circuit breaker: 10 A or higher, characteristic C or 16 A or higher, characteristic B	55 A 3 A^2s Internal Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C	31 A 3 A^2s Internal Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C
Controlled, isolated DC voltage 12 V	Controlled, isolated DC voltage 12 V	Controlled, isolated DC voltage 12 V
2 % 0.5 % 1 % Max. 100 mV Max. 100 mV	3 % 0.1 % 1.5 % Max. 200 mV (typ. 10 mV) Max. 300 mV (typ. 70 mV)	3 % Max. 200 mV (typ. 80 mV) Max. 300 mV (typ. 80 mV)
11 … 14 V Yes via potentiometer Green LED for 12 V OK Overshoot of U_{out} < 2 %	10.5 … 16.1 V Yes via potentiometer Green LED for output voltage OK No overshoot of U_{out} (soft start)	10.5 ... 12.9 V Yes via potentiometer Green LED for output voltage OK Overshoot of U_{out} approx. 1 %

Output voltage 12 V

Technical specifications (continued)

Product	LOGO!Power	SITOP compact PSU100C	Special design SITOP DC/DC
Power supply, type	12 V/1.9 A	12 V/2 A	12 V/2.5 A
Order No.	6EP1321-1SH03	6EP1321-5BA00	6EP1621-2BA00
Output (continued)			
Startup delay, max.	0.5 s	0.6 s	0.5 s
Voltage rise, typ.	10 ms	10 ms	300 ms
Rated current $I_{out\ rated}$	1.9 A	2 A	2.5 A
Current range	0 … 1.9 A	0 … 2 A	0 … 2.5 A
• Comment	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 3%/K	
Typical power output	23 W	24 W	
Temporary overload current for short-circuit			
• During startup, typically			3.3 A
• During operation, typically			3.3 A
Constant overload current for short-circuit			
• During startup, typically			3.3 A
• During operation, typically			3.3 A
Parallel switching for enhanced performance	Yes	Yes	Yes
Number of devices that can be switched in parallel to enhance performance, units	2	2	2
Efficiency			
Efficiency at $U_{out\ rated}$, $I_{out\ rated}$	Approx. 80 %	Approx. 82 %	Approx. 83 %
Power loss at $U_{out\ rated}$, $I_{out\ rated}$	Approx. 5 W	Approx. 5.8 W	Approx. 6.1 W
Closed-loop control			
Dynamic mains compensation ($U_{in\ rated}$ ±15 %)	max. 0.2 %	max. 0.1 %	max. 0.5 %
Dynamic load compensation (I_{out}: 10/90/10 %)	typ. 3 %	typ. 3 %	
Dynamic load compensation (I_{out}: 50/100/50 %)			typ. 3 %
Load step settling time			
• 10 to 90 %, typ.	1 ms	4 ms	
• 90 to 10 %, typ.	1 ms	3 ms	
• 50 to 100 %, typ.			5 ms
• 100 to 50 %, typ.			2 ms
Settling time, maximum			5 ms
Protection and monitoring			
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1	< 24 V
Current limitation			3.0 ... 3.6 A
Current limitation, typ.	2.8 A	2.4 A	3.3 A
Property of the output, short-circuit-proof	Yes	Yes	Yes
Short-circuit protection	Constant current characteristic	Electronic shutdown, automatic restart	Constant current characteristic approx. 3.2 A
Sustained short-circuit current rms value			
• Maximum	3.6 A		
• Typical			3.2 A
• Comment			
Overload/short-circuit indicator	–	–	Red LED for "overload"
Safety			
Primary/secondary isolation	Yes	Yes	Yes
Isolation	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1
Protection class	Class II (without protective conductor)	Class I	Class II
Leakage current			
• Maximum		3.5 mA	
• Typical		0.4 mA	
CE mark	Yes	Yes	Yes
UL/CSA approval	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (UL 1310)	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cCSAus (CSA C22.2 No. 60950-1, UL 60950-1)	cCSAus (UL 508, CSA22.2-107, UL60950-1, CSA22.2-60950-1)
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4	ATEX (EX) II 3G Ex nA IIC T4; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4	–
FM approval	Class I, Div. 2, Group ABCD, T4	–	–
CB approval	Yes	Yes	No
Marine approval	GL, ABS	GL, ABS	–
Degree of protection (EN 60529)	IP20	IP20	IP20

Special design PSU100D	LOGO!Power	SITOP compact PSU100C
12 V/3 A	12 V/4.5 A	12 V/6.5 A
6EP1321-1LD00	6EP1322-1SH03	6EP1322-5BA10
2.5 s 30 ms 3 A 0 … 3 A +50 ... +70 °C: Derating 2.5%/K	0.5 s 10 ms 4.5 A 0 … 4.5 A +50 ... +70 °C: Derating 2%/K	1 s 500 ms 6.5 A 0 ... 6.5 A +50 ... +70 °C: Derating 3.5%/K
36 W	50 W	78 W
Yes 2	Yes 2	Yes 2
Approx. 84 % Approx. 6.5 W	Approx. 85 % Approx. 10 W	Approx. 86 % Approx. 12.5 W
max. 0.5 % typ. 5 %	max. 0.2 % typ. 4 % 	max. 0.1 % typ. 3 %
	1 ms 1 ms	3 ms 3 ms
< 17.6 V 3.6 A Yes	Yes, according to EN 60950-1 5.8 A Yes	Yes, according to EN 60950-1 7.2 A Yes
Electronic shutdown, automatic restart 6 A –	Constant current characteristic 7 A –	Electronic shutdown, automatic restart –
Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I 3.5 mA 1 mA Yes	Yes SELV output voltage U_{out} according to EN 60950 1 and EN 50178 Class II (without protective conductor) Yes	Yes SELV output voltage U_{out} according to EN 60950 1 and EN 50178 Class I 3.5 mA 0.4 mA Yes
cULus-listed (UL 508, CSA C22.2 No. 107.1) File E197259, cURus (UL 60950-1, CSA C22.2 No. 60950-1) File E151273 – – – IP20	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273 ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4 Class I, Div. 2, Group ABCD, T4 Yes GL, ABS IP20	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cCSAus (CSA C22.2 No. 60950-1, UL 60950-1) ATEX (EX) II 3G Ex nA IIC T4; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4 – Yes GL, ABS IP20

Output voltage 12 V

Technical specifications (continued)

Product	LOGO!Power	SITOP compact PSU100C	Special design SITOP DC/DC
Power supply, type	**12 V/1.9 A**	**12 V/2 A**	**12 V/2.5 A**
Order No.	**6EP1321-1SH03**	**6EP1321-5BA00**	**6EP1621-2BA00**
EMC			
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	Not applicable	Not applicable	-
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2
Operating data			
Ambient temperature			
• During operation	-20 … +70 °C	-20 … +70 °C	0 … 60 °C
• Comment	with natural convection	with natural convection	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
Humidity class according to EN 60721	Climate class 3K3, without condensation	Climate class 3K3, without condensation	Climate class 3K3, without condensation
Mechanics			
Connection method	Screw terminals	Screw terminals	Screw terminals
Connections			
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded	L, N, PE: Removable screw terminal each for 1 x 0.5 ... 2.5 mm^2	+, -: 1 screw terminal each for 0.5 ... 2.5 mm^2
• Output	+, -: 2 screw terminals each for 0.5 ... 2.5 mm^2	+: 1 screw terminal for 0.5 ... 2.5 mm^2; -: 2 screw terminals for 0.5 ... 2.5 mm^2	+, -: 2 screw terminals each for 0.5 ... 2.5 mm^2
• Auxiliary contacts	–	–	–
Width of enclosure	54 mm	30 mm	32.5 mm
Height of enclosure	90 mm	80 mm	125 mm
Depth of enclosure	55 mm	100 mm	125 mm
Mounting width	54 mm	30 mm	32.5 mm
Mounting height	130 mm	180 mm	225 mm
Weight, approx.	0.17 kg	0.12 kg	0.32 kg
Product property of the enclosure: side-by-side enclosure	Yes	Yes	Yes
Type of mounting			
Wall mounting	No	No	No
DIN rail mounting	Yes	Yes	Yes
S7-300 rail mounting	No	No	No
Installation	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		Removable spring-loaded terminal 6EP1971-5BA00	

Special design PSU100D	LOGO!Power	SITOP compact PSU100C
12 V/3 A	12 V/4.5 A	12 V/6.5 A
6EP1321-1LD00	6EP1322-1SH03	6EP1322-5BA10
EN 55022 Class B Not applicable EN 61000-6-2	EN 55022 Class B Not applicable EN 61000-6-2	EN 55022 Class B EN 61000-3-2 EN 61000-6-2
-10 … +70 °C with natural convection -40 ... +85 °C -40 ... +85 °C	-20 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	-20 ... +70 °C with natural convection -40 ... +85 °C -40 ... +85 °C Climate class 3K3, without condensation
Screw terminals L, N, PE: 1 screw terminal each for 0.3 ... 1.3 mm^2 solid/finely stranded +, -: 1 screw terminal each for 0.3 ... 1.3 mm^2 –	Screw terminals L, N: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.5 ... 2.5 mm^2	Screw terminals L, N, PE: Removable screw terminal each for 1 x 0.5 ... 2.5 mm^2 +: 1 screw terminal for 0.5 ... 2.5 mm^2, -: 2 screw terminals for 0.5 ... 2.5 mm^2 –
97 mm 98 mm 38 mm 0.37 kg	72 mm 90 mm 55 mm 72 mm 130 mm 0.25 kg Yes	52.5 mm 80 mm 100 mm 52.5 mm 180 mm 0.32 kg Yes
Yes No No Wall mounting	No Yes No Snaps onto DIN rail EN 60715 35x7.5/15	No Yes No Snaps onto DIN rail EN 60715 35x7.5/15 Removable spring-loaded terminal 6EP1971-5BA00

Alternative voltages

Output voltage 12 V

Overview

Product	SITOP smart PSU100S	Special design PSU100D
Power supply, type	12 V/7 A	12 V/8.3 A
Order No.	6EP1322-2BA00	6EP1322-1LD00
The product families are highlighted in the same color. For an explanation of the product families, see chapter 1, pages 1/8 through 1/12		
	Powerful standard power supply for single-phase networks 120/230 V AC, with automatic range switching; high overload capability due to extra power with 1.5 times the rated current for 5 s.	The low-cost power supply in flat aluminum housing can be screwed directly on a wall in various mounting positions; with wide-range input for global use.

Technical specifications

Product	SITOP smart PSU100S	Special design PSU100D
Input		
Rated voltage value $U_{in\ rated}$	1-phase AC **120/230 V AC**	1-phase AC **100 ... 240 V AC**
Supply voltage		
• 1 for AC rated value	120 V	
• 2 for AC rated value	230 V	
• Comment	Automatic range switchover	
Input voltage		
• 1 for AC	85 … 132 V	
• 2 for AC	170 … 264 V	
• for DC		
Voltage range		85 … 264 V
Overvoltage resistance	2.3 x $U_{in\ rated}$, 1.3 ms	
Mains buffering at $I_{out\ rated}$, min.	20 ms	15 ms
Mains buffering	at U_{in} = 93/187 V	at U_{in} = 115/230 V
Rated line frequency value		
• 1	50 Hz	50 Hz
• 2	60 Hz	60 Hz
Line frequency range	47 … 63 Hz	47 … 63 Hz
Input current at rated value of input voltage		
• 100 V rated value		2 A
• 120 V rated value	1.73 A	
• 230 V rated value	0.99 A	
• 240 V rated value		1.1 A
• 400 V rated value		
• 500 V rated value		
Switch-on current limit (+25 °C) I^2t, *max.*	max. 45 A	max. 75 A 5.5 A^2s
Built-in incoming fuse	T 3.15 A/250 V (not accessible)	Internal
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 6A or higher, characteristic C	Recommended miniature circuit breaker: 10 A or higher, characteristic C or 16 A or higher, characteristic B
Output		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $U_{out\ rated\ DC}$	**12 V**	**12 V**
Total tolerance, static ±	3 %	2 %
• Static mains compensation, approx.	0.1 %	0.5 %
• Static load compensation, approx.	1 %	1 %
Residual ripple, peak-peak	Max. 150 mV (typ. 20 mV)	Max. 100 mV
Spikes (bandwidth approx. 20 MHz)	Max. 240 mV (typ. 100 mV)	Max. 100 mV
Adjustment range	11.5 … 15.5 V	11 … 14 V
Settable output voltage	Yes	Yes
Output voltage adjustment	via potentiometer	via potentiometer
Status display	Green LED for 12 V OK	Green LED for 12 V OK

SITOP smart PSU100S	Special design PSU300B
12 V/14 A	**12 V/20 A**
6EP1323-2BA00	**6EP1424-3BA00**
	
Powerful standard power supply for single-phase networks 120/230 V AC, with automatic range switching; high overload capability due to extra power with 1.5 times the rated current for 5 s.	For battery charging optimized power supply with three-phase wide-range input for global use; slim design; with switchable output characteristic, functional expansion possible using add-on modules.

SITOP smart PSU100S	Special design PSU300B
1-phase AC **120/230 V AC** 120 V 230 V Automatic range switchover	3-phase AC **400 ... 500 V 3 AC**
85 … 132 V 170 … 264 V	320 … 575 V
2.3 x $U_{in\ rated}$,, 1.3 ms 20 ms at U_{in} = 93/187 V	2.3 × $U_{in\ rated}$, 1.3 ms 20 ms at U_{in} = 400 V
50 Hz 60 Hz 47 … 63 Hz	50 Hz 60 Hz 47 … 63 Hz
3.24 A 1.41 A	0.7 A 0.6 A
max. 60 A	max. 18 A 0.8 A^2s
T 6.3 A/250 V (not accessible) Recommended miniature circuit breaker: 10 A or higher, characteristic C	None Required: 3-pole coupled miniature circuit breaker 6 ... 10 A characteristic C or circuit breaker 3RV2011-1DA10 (setting 3 A) or 3RV2711-1DD10 (UL 489)
Controlled, isolated DC voltage **12 V**	Controlled, isolated DC voltage **12 V**
3 % 0.1 % 1 %	3 % 2 % 4 %
Max. 150 mV (typ. 20 mV) Max. 240 mV (typ. 100 mV)	Max. 100 mV Max. 200 mV
11.5 … 15.5 V Yes via potentiometer Green LED for 12 V OK	12 … 14 V Yes via potentiometer Green LED for 12 V OK

Output voltage 12 V

Technical specifications (continued)

Product	SITOP smart PSU100S	Special design PSU100D
Power supply, type	**12 V/7 A**	**12 V/8.3 A**
Order No.	**6EP1322-2BA00**	**6EP1322-1LD00**
Output (continued)		
Signaling	Relay contact (NO contact, contact rating 60 V DC/0.3 A) for 12 V OK	
On/off behavior	Overshoot of U_{out} < 3 %	Overshoot of U_{out} < 2 %
Startup delay, max.	0.3 s	1 s
Voltage rise, typ.	10 ms	
Maximum voltage rise time of the output voltage		30 ms
Rated current $I_{out\ rated}$	**7 A**	**8.3 A**
Current range	0 … 7 A	0 … 8.3 A
• Comment	+50 ... +70 °C: Derating 0.75%/K	+50 ... +70 °C: Derating 2.5%/K
Typical power output	84 W	100 W
Temporary overload current		
• in the event of a short circuit during startup, typical	25 A	
• in the event of a short circuit during operation, typical	25 A	
Constant overload current in the event of a short circuit during startup, typical		
Duration of overload capability overcurrent		
• in the event of a short circuit during startup	800 ms	
• in the event of a short circuit during operation	800 ms	
Parallel switching for enhanced performance	Yes	Yes
• Comment		
Number of devices that can be switched in parallel to enhance performance, units	2	2
Efficiency		
Efficiency at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	84 %	84 %
Power loss at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	15 W	19 W
Closed-loop control		
Dyn. mains compensation ($U_{in\ rated}$ ± 15 %), max.		0.5 %
Dynamic load compensation (I_{out}: 50/100/50 %), U_{out} ± typ.		5 %
Load step settling time		
• 50 to 100 %, typ.		
• 100 to 50 %, typ.		
Settling time, maximum		
Protection and monitoring		
Output overvoltage protection	< 20V	< 17.6 V
Current limitation	7 … 8.8 A	
Current limitation, typ.		9.9 A
Property of the output, short-circuit-proof	Yes	Yes
Short-circuit protection	Constant current characteristic	Electronic shutdown, automatic restart
Sustained short-circuit current rms value		
• Typical	8.8 A	10 A
• Comment	overload capability 150 % $I_{out\ rated}$ up to 5 s/min	
Overload/short-circuit indicator	–	–
Safety		
Primary/secondary isolation	Yes	Yes
Isolation	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1 and EN 50178
Protection class	Class I	Class I
Leakage current		
• Maximum	3.5 mA	3.5 mA
• Typical	0.4 mA	1 mA
CE mark	Yes	Yes
UL/CSA approval	Yes	
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259, cCSAus (CSA C22.2 No. 60950-1, UL 60950-1, UL 1604)	cULus-listed (UL 508, CSA C22.2 No. 107.1) File E197259, cURus (UL 60950-1, CSA C22.2 No. 60950-1) File E151273

SITOP smart PSU100S	Special design PSU300B
12 V/14 A	12 V/20 A
6EP1323-2BA00	6EP1424-3BA00
Relay contact (NO contact, contact rating 60 V DC/0.3 A) for 12 V OK Overshoot of U_{out} < 3 %	Relay contact (NO contact, contact rating 60 V DC/0.3 A) for 12 V OK No overshoot of U_{out} (soft start)
0.3 s 10 ms	2.5 s 500 ms
14 A 0 … 14 A +50 ... +70 °C: Derating 3.5%/K	**20 A** 0 … 20 A 20 A to +70 °C
168 W 40 A 40 A 800 ms 800 ms	240 W 60 A 22 A 25 ms
Yes 2	Yes Switchable characteristic 2
87 % 24 W	88 % 20 W
	2 % 4 %
	2 ms 2 ms 10 ms
< 20V 14 … 16.4 A Yes	< 35 V 22 A Yes
Constant current characteristic 16.4 A Overload capability 150 % $I_{out\ rated}$ up to 5 s/min –	Optional constant current characteristic approx. 22 A or latching shutdown 22 A Overload capability 150 % $I_{out\ rated}$ up to 5 s/min Yellow LED for "overload", red LED for "latching shutdown"
Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I 3.5 mA 0.8 mA Yes	Yes SELV output voltage U_{out} according to EN 60950-1 and EN 50178 Class I 3.5 mA Yes
Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259, cCSAus (CSA C22.2 No. 60950-1, UL 60950-1, UL 1604)	Yes cULus-listed (UL 508, CSA C22.2 No. 107.1), File E19725

Output voltage 12 V

Technical specifications (continued)

Product	SITOP smart PSU100S	Special design PSU100D
Power supply, type	**12 V/7 A**	**12 V/8.3 A**
Order No.	**6EP1322-2BA00**	**6EP1322-1LD00**
Safety (continued)		
Explosion protection	ATEX (EX) II 3G Ex nA nC IIC t4 Gc; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4	–
FM approval	–	–
CB approval	Yes	
Marine approval	GL	–
Degree of protection (EN 60529)	IP20	IP20
EMC		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	EN 61000-3-2	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2
Operating data		
Ambient temperature		
• During operation	-10 … +70 °C	-10 … +70 °C
- Comment	with natural convection	with natural convection
• During transport	-40 … +85 °C	-40 … +85 °C
• During storage	-40 … +85 °C	-40 … +85 °C
Humidity class according to EN 60721	Climate class 3K3, without condensation	
Mechanics		
Connection method	Screw terminals	Screw terminals
Connections		
• Supply input	L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded	L, N, PE: 1 screw terminal each for 0.3 ... 1.3 mm^2 solid/finely stranded
• Output	+,-: 2 screw terminals each for 0.5 ... 2.5 mm^2	+, -: 2 screw terminal each for 0.3 ... 1.3 mm^2
• Auxiliary contacts	Alarm signals: 2 screw terminals for 0.5 ... 2.5 mm^2	–
Width of enclosure	50 mm	97 mm
Height of enclosure	125 mm	158 mm
Depth of enclosure	125 mm	38 mm
Mounting width	50 mm	
Mounting height	225 mm	
Weight, approx.	0.5 kg	0.57 kg
Product property of the enclosure: side-by-side enclosure	Yes	
Type of mounting		
• Wall mounting	No	Yes
• DIN rail mounting	Yes	No
• S7-300 rail mounting	No	No
Installation	Snaps onto DIN rail EN 60715 35x7.5/15	Wall mounting
Mechanical accessories		

SITOP smart PSU100S	Special design PSU300B
12 V/14 A	**12 V/20 A**
6EP1323-2BA00	**6EP1424-3BA00**
ATEX (EX) II 3G Ex nA nC IIC t4 Gc; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4 – Yes GL IP20	– – No – IP20
EN 55022 Class B EN 61000-3-2 EN 61000-6-2	EN 55022 Class B EN 61000-3-2 EN 61000-6-2
-10 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	-25 … +60 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation
Screw terminals L, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded +,-: 2 screw terminals each for 0.5 ... 2.5 mm^2 Alarm signals: 2 screw terminals for 0.5 ... 2.5 mm^2	Screw terminals L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 4 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.2 ... 4 mm^2 Alarm signals: 2 screw terminals for 0.14 ... 1.5 mm^2 solid/finely stranded
70 mm 125 mm 125 mm 70 mm 225 mm 0.8 kg Yes	70 mm 125 mm 125 mm 125 mm 225 mm 1.2 kg Yes
No Yes No Snaps onto DIN rail EN 60715 35x7.5/15	No Yes No Snaps onto DIN rail EN 60715 35x7.5/15 Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20

Alternative voltages

Output voltage 15 V

Overview

Product	LOGO!Power	LOGO!Power	Special design SITOP dual
Power supply, type	15 V/1.9 A	15 V/4 A	2 x 15 V/3.5 A
Order No.	6EP1351-1SH03	6EP1352-1SH03	6EP1353-0AA00
			
	The LOGO!Power supply unit with flat stepped profile and 54 mm width supplies 15 V applications up to 1.9 A, e.g in instrumentation.	The LOGO!Power supply unit with flat stepped profile and 72 mm width supplies 15 V applications up to 4 A, e.g in instrumentation.	The industrial power supply with two 15 V outputs that can be switched in parallel and in series; can be used, for example, to supply electronic loads with ±15 V.

The product families are highlighted in the same color.

For an explanation of the product families, see chapter 1, pages 1/8 through 1/12.

Technical specifications

Product	LOGO!Power	LOGO!Power	Special design SITOP dual
Input			
	1-phase AC or DC	1-phase AC or DC	1-phase AC
Rated voltage value $U_{in\ rated}$	**100 ... 240 V AC**	**100 ... 240 V AC**	**120 ... 230 V AC**
Voltage range	85 ... 264 V	85 … 264 V	93 … 264 V
Input voltage for DC	110 … 300 V	110 … 300 V	
Overvoltage resistance	2.3 × $U_{in\ rated}$, 1.3 ms	2.3 × $U_{in\ rated}$, 1.3 ms	Surge voltage in accordance with EN 61000-6-2 Table 4
Mains buffering at $I_{out\ rated}$, min.	40 ms	40 ms	10 ms
Mains buffering	at U_{in} = 187 V	at U_{in} = 187 V	at U_{in} = 120 V, 40 ms at U_{in} = 187 V
Rated line frequency value			
• 1	50 Hz	50 Hz	50 Hz
• 2	60 Hz	60 Hz	60 Hz
Line frequency range	47 … 63 Hz	47 … 63 Hz	63 … 47 Hz
Input current at rated value of input voltage			
• 120 V rated value	0.63 A	1.24 A	1.9 A
• 230 V rated value	0.33 A	0.68 A	1.15 A
Switch-on current limit (+25 °C), max.	25 A	55 A	30 A
Duration of the switch-on current limit at 25 °C typically			3 ms
I^2t, max.	0.8 A^2s	3 A^2s	3 A^2s
Built-in incoming fuse	Internal	Internal	T 4 A/250 V (not accessible)
Protection in the mains power input (IEC 898)	Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C	Recommended miniature circuit breaker: 16 A or higher, characteristic B or 10 A or higher, characteristic C	Recommended miniature circuit breaker: 10 A or higher, characteristic C or 16 A or higher, characteristic B
Output			
	Controlled, isolated DC voltage	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $U_{out\ rated\ DC}$	15 V	15 V	15 V
Output voltage			2 x 15 V DC
• on output 1 at DC rated value			15 V
• on output 2 at DC rated value			15 V
Total tolerance, static ±	3 %	3 %	2 %
Static mains compensation, approx.	0.1 %	0.1 %	0.2 %
Static load compensation, approx.	1.5 %	1.5 %	0.2 %
Residual ripple, peak-peak	Max. 200 mV (typ. 10 mV)	Max. 200 mV (typ. 10 mV)	Max. 50 mV (typ. 20 mV)
Spikes (bandwidth approx. 20 MHz)	Max. 300 mV (typ. 30 mV)	Max. 300 mV (typ. 70 mV)	Max. 150 mV
Adjustment range	10.5 … 16.1 V	10.5 … 16.1 V	14.5 … 17 V
Settable output voltage	Yes	Yes	Yes
Output voltage adjustment	via potentiometer	via potentiometer	via potentiometer
Status display	Green LED for output voltage OK	Green LED for output voltage OK	Green LED for U_{out} >10 V (common indicator)
On/off behavior	No overshoot of U_{out} (soft start)	No overshoot of U_{out} (soft start)	Overshoot of U_{out} < 3 %
Startup delay, max.	0.5 s	0.5 s	1 s
Voltage rise, typ.	15 ms	15 ms	
Rated current Iout rated	1.9 A	4 A	3.5 A

Technical specifications (continued)

Product	LOGO!Power	LOGO!Power	Special design SITOP dual
Power supply, type	**15 V/1.9 A**	**15 V/4 A**	**2 x 15 V/3.5 A**
Order No.	**6EP1351-1SH03**	**6EP1352-1SH03**	**6EP1353-0AA00**
Output (continued)			
Output current			
• on output 1 rated value			3.5 A
• on output 2 rated value			3.5 A
Current range	0 … 1.9 A	0 … 4 A	0 … 3.5 A
• Comment	+55 ... +70 °C: Derating 2%/K	+55 ... +70 °C: Derating 2%/K	2 x 0 ... 3.5 A up to +45 °C; +45 ... +60 °C: Derating 2%/K
Typical power output	23 W	50 W	105 W
Parallel switching for enhanced performance	Yes	Yes	Yes
Number of devices that can be switched in parallel to enhance performance, units	2	2	2
Efficiency			
Efficiency at $U_{out\ rated}$, $I_{out\ rated}$	Approx. 81 %	Approx. 85 %	Approx. 80 %
Power loss at $U_{out\ rated}$, $I_{out\ rated}$	Approx. 7 W	Approx. 11 W	Approx. 27 W
Closed-loop control			
Dyn. mains compensation ($U_{in\ rated}$ ± 15 %), max.	0.2 %	0.2 %	
Dynamic load compensation (I_{out}: 10/90/10 %), U_{out} ± typ.	2.8 %	3 %	
Load step settling time			
• 10 to 90 %, typ.	1 ms	1 ms	
• 90 to 10 %, typ.	1 ms	1 ms	
Protection and monitoring			
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, max.			4.9 A
Current limitation, typ.	2.7 A	5.7 A	Limit point < 4.9 A; switch-off point < 6 A
Property of the output, short-circuit-proof	Yes	Yes	Yes
Short-circuit protection	Constant current characteristic	Constant current characteristic	Electronic shutdown, automatic restart
Sustained short-circuit current rms value	max. 3.6 A	max. 7 A	
Overload/short-circuit indicator	–	–	–
Safety			
Primary/secondary isolation	Yes	Yes	Yes
Isolation	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1
Protection class	Class II (without protective conductor)	Class II (without protective conductor)	Class I
Leakage current, max.			3.5 mA
CE mark	Yes	Yes	Yes
UL/CSA approval	Yes	Yes	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (UL 1310)	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cURus-recognized (UL 60950, CSA C22.2 No. 60950), File E151273, NEC class 2 (UL 1310)	cULus-listed (UL 508, CSA C22.2 No. 142), File E179336
Explosion protection	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4	ATEX (EX) II 3G Ex nA IIC T3; cCSAus (CSA C22.2 No. 213-M1987, ANSI/ISA-12.12.01-2007) Class I, Div. 2, Group ABCD, T4	–
FM approval	Class I, Div. 2, Group ABCD, T4	Class I, Div. 2, Group ABCD, T4	–
CB approval	Yes	Yes	No
Marine approval	GL, ABS	GL, ABS	–
Degree of protection (EN 60529)	IP20	IP20	IP20
EMC			
Emitted interference	EN 55022 Class B	EN 55022 Class B	EN 55011 Class A
Supply harmonics limitation	Not applicable	Not applicable	–
Noise immunity	EN 61000-6-2	EN 61000-6-2	EN 61000-6-2

Output voltage 15 V

Technical specifications (continued)

Product	LOGO!Power	LOGO!Power	Special design SITOP dual
Power supply, type	**15 V/1.9 A**	**15 V/4 A**	**2 x 15 V/3.5 A**
Order No.	**6EP1351-1SH03**	**6EP1352-1SH03**	**6EP1353-0AA00**
Mechanics			
Connection method	Screw terminals	Screw terminals	Screw terminals
Connections			
• Supply input	L, N: 1 screw terminal each for 0.5 ... 2.5 mm² solid/finely stranded	L, N: 1 screw terminal each for 0.5 ... 2.5 mm² solid/finely stranded	L1, N, PE: 1 screw terminal each for 0.5 ... 2.5 mm² solid/finely stranded
• Output	+, -: 2 screw terminals each for 0.5 ... 2.5 mm²	+, -: 2 screw terminals each for 0.5 ... 2.5 mm²	P15_1, GND_1, GND_2: 1 screw terminal each for 0.5 ... 2.5 mm²; P15_2: 2 screw terminals for 0.5 ... 2.5 mm²
• Auxiliary contacts	–	–	–
Width of enclosure	54 mm	72 mm	75 mm
Height of enclosure	90 mm	90 mm	125 mm
Depth of enclosure	55 mm	55 mm	125 mm
Mounting width	54 mm	72 mm	75 mm
Mounting height	130 mm	130 mm	325 mm
Weight, approx.	0.17 kg	0.25 kg	0.75 kg
Product property of the enclosure: side-by-side enclosure	Yes	Yes	Yes
Type of mounting			
• Wall mounting	No	No	No
• DIN rail mounting	Yes	Yes	Yes
• S7-300 rail mounting	No	No	No
Installation	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
Operating data			
Ambient temperature			
• During operation	–20 ... +70 °C	–20 ... +70 °C	0 … 60 °C
• Comment	with natural convection	with natural convection	with natural convection
• During transport	–40 ... +85 °C	–40 ... +85 °C	-40 … +70 °C
• During storage	–40 ... +85 °C	–40 ... +85 °C	-40 … +70 °C
Humidity class according to EN 60721	Climate class 3K3, without condensation	Climate class 3K3, without condensation	Climate class 3K3, without condensation

Overview

Product	SITOP modular PSU300M	SITOP modular
Power supply, type	48 V/10 A	48 V/20 A
Order No.	6EP1456-3BA00	6EP1457-3BA00
		
	The 3-phase 48 V power supply for powerful loads that are supplied with double the usual 24 V; with wide-range input; slim design; 50 % extra power for 5 s/min.	The modular 48 V power supply for powerful loads that are supplied with double the usual 24 V; with wide-range input and switchable output characteristic; function expansion possible with add-on module.

Technical specifications

Product	SITOP modular PSU300M	SITOP modular
Input		
Rated voltage value $U_{in\ rated}$	3-phase AC **400 ... 500 V 3 AC**	3-phase AC **400 ... 500 V 3 AC**
Note regarding supply voltage		Startup from U_{in} > 340 V
Voltage range	320 … 575 V	320 … 550 V
Overvoltage resistance	2.3 x $U_{in\ rated}$, 1.3 ms	2.3 x $U_{in\ rated}$, 1.3 ms
Mains buffering at $I_{out\ rated}$, min.	15 ms	6 ms
Mains buffering	at U_{in} = 400 V	at U_{in} = 400 V
Rated line frequency value		
• 1	50 Hz	50 Hz
• 2	60 Hz	60 Hz
Line frequency range	47 … 63 Hz	47 … 63 Hz
Input current at rated value of input voltage		
• 400 V rated value	1.2 A	2.2 A
• 500 V rated value	1 A	
Switch-on current limit (+25 °C) I^2t, *max.*	max. 18 A 0.8 A^2s	max. 70 A 2.8 A^2s
Built-in incoming fuse	None	None
Protection in the mains power input (IEC 898)	Required: 3-pole coupled miniature circuit breaker 6 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10, (setting 3 A) or 3RV2711-1DD10 (UL 489)	Required: 3-pole coupled miniature circuit breaker 10 ... 16 A characteristic C or circuit breaker 3RV2011-1DA10, (setting 3 A) or 3RV2711-1DD10 (UL 489)
Output		
Output	Controlled, isolated DC voltage	Controlled, isolated DC voltage
Rated voltage $U_{out\ rated\ DC}$	**48 V**	**48 V**
Total tolerance, static ±	3 %	3 %
• Static mains compensation, approx.	0.1 %	0.1 %
• Static load compensation, approx.	0.2 %	0.2 %
Residual ripple, peak-peak	Max. 100 mV	Max. 100 mV (typ. 10 mV)
Spikes (bandwidth approx. 20 MHz)	Max. 200 mV	Max. 200 mV (typ. 80 mV)
Adjustment range	42 … 56 V	42 … 56 V
Settable output voltage	Yes	Yes
Output voltage adjustment	via potentiometer	via potentiometer
• Comment	Max. 480 W	Max. 960 W
Status display	Green LED for 48 V OK	Green LED for 48 V OK
Signaling	Relay contact (NO contact, contact rating 60 V DC/0.3 A) for 48 V OK	possible via signaling module (6EP1961-3BA10)
On/off behavior	No overshoot of U_{out} (soft start)	No overshoot of U_{out} (soft start)
Startup delay, max.	2.5 s	2.5 s
Voltage rise, typ.	15 ms	20 ms
Maximum voltage rise time of the output voltage	500 ms	
Rated current $I_{out\ rated}$	**10 A**	**20 A**
Current range	0 … 10 A	0 … 20 A
• Comment	+60 ... +70 °C: Derating 3%/K	

Output voltage 48 V

Technical specifications (continued)

Product	SITOP modular PSU300M	SITOP modular
Power supply, type	**48 V/10 A**	**48 V/20 A**
Order No.	**6EP1456-3BA00**	**6EP1457-3BA00**
Output (continued)		
Typical power output	480 W	960 W
constant overload current in the event of a short circuit during startup, typical	11 A	23 A
short-term overload current in the event of a short circuit during operation, typical	23 A	60 A
Duration of the overload capability overcurrent in the event of a short circuit during operation	25 ms	25 ms
Parallel switching for enhanced performance	Yes	Yes
• Comment	Switchable characteristic	Switchable characteristic
Number of devices that can be switched in parallel to enhance performance, units	2	2
Efficiency		
Efficiency at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	93 %	90 %
Power loss at $U_{out\ rated}$, $I_{out\ rated,\ approx.}$	36 W	106 W
Closed-loop control		
Dyn. mains compensation ($U_{in\ rated}$ ± 15 %), max.	1 %	
Dynamic load compensation (I_{out}: 50/100/50 %), U_{out} ± typ.	2 %	
Load step settling time		
• 50 to 100 %, typ.	2 ms	
• 100 to 50 %, typ.	2 ms	
Settling time, maximum	10 ms	
Protection and monitoring		
Output overvoltage protection	Yes, according to EN 60950-1	Yes, according to EN 60950-1
Current limitation, typ.	11 A	23 A
Property of the output, short-circuit-proof	Yes	Yes
Short-circuit protection	Optional constant current characteristic approx. 11 A or latching shutdown	Optional constant current characteristic approx. 23 A or latching shutdown
Sustained short-circuit current rms value, typical	11 A	23 A
• Comment	Overload capability 150 % $I_{out\ rated}$ up to 5 s/min	
Overload/short-circuit indicator	Yellow LED for "overload", red LED for "latching shutdown"	Yellow LED for "overload", red LED for "latching shutdown"
Safety		
Primary/secondary isolation	Yes	Yes
Isolation	SELV output voltage U_{out} according to EN 60950-1 and EN 50178	SELV output voltage U_{out} according to EN 60950-1
Protection class	Class I	Class I
Leakage current		
• Maximum	3.5 mA	3.5 mA
• Typical		0.68 mA
CE mark	Yes	Yes
UL/CSA approval	Yes	Yes
UL/cUL (CSA) approval	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259	cULus-listed (UL 508, CSA C22.2 No. 107.1), File E197259; cCSAus (CSA C22.2 No. 60950, UL 60950)
Explosion protection	ATEX (EX) II 3G Ex nA nC IIC T4; cCSAus (CSA C22.2 No. 213, ANSI/ISA-12.12.01) Class I Div. 2 Group ABCD T4	–
FM approval	–	–
CB approval	Yes	No
Marine approval	GL, ABS	GL, ABS
Degree of protection (EN 60529)	IP20	IP20
EMC		
Emitted interference	EN 55022 Class B	EN 55022 Class B
Supply harmonics limitation	EN 61000-3-2	EN 61000-3-2
Noise immunity	EN 61000-6-2	EN 61000-6-2

Technical specifications (continued)

Product	SITOP modular PSU300M	SITOP modular
Power supply, type	**48 V/10 A**	**48 V/20 A**
Order No.	**6EP1456-3BA00**	**6EP1457-3BA00**
Operating data		
Ambient temperature • During operation - Comment • During transport • During storage Humidity class according to EN 60721	 -10 … +70 °C with natural convection -40 … +85 °C -40 … +85 °C Climate class 3K3, without condensation	 0 … 60 °C with natural convection -40 ... +85 °C -40 ... +85 °C Climate class 3K3, without condensation
Mechanics		
Connection method Connections • Supply input • Output • Auxiliary contacts	Screw terminals L1, L2, L3, PE: 1 screw terminal each for 0.5 ... 2.5 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.2 ... 4 mm^2 13, 14 (alarm signal): 1 screw terminal each for 0.14 ... 1.5 mm^2	Screw terminals L1, L2, L3, PE: 1 screw terminal each for 0.2 ... 4 mm^2 solid/finely stranded +, -: 2 screw terminals each for 0.33 ... 10 mm^2 –
Width of enclosure Height of enclosure Depth of enclosure Mounting width Mounting height Weight, approx. Product property of the enclosure: side-by-side enclosure	70 mm 125 mm 125 mm 70 mm 225 mm 1.2 kg Yes	240 mm 125 mm 125 mm 240 mm 225 mm 3.2 kg Yes
Type of mounting • Wall mounting • DIN rail mounting • S7-300 rail mounting Installation Electrical accessories Mechanical accessories	 No Yes No Snaps onto DIN rail EN 60715 35x7.5/15 Device labeling plate 20 mm x 7 mm, pale turquoise 3RT1900-1SB20	 No Yes No Snaps onto DIN rail EN 60715 35x15 Signaling module

Ordering data and further information

Selection and ordering data

Product	Input Voltage $U_{in\ rated}$	Output Voltage $U_{out\ rated}$	Current $I_{out\ rated}$	Order No.	Price
Special design, SITOP flexi					
	**120/230 V AC**	**3 - 52 V DC**	2-10 A	**6EP1353-2BA00**	
LOGO!Power					
	**100 ... 240 V AC**	**5 V DC**	3 A	**6EP1311-1SH03**	
LOGO!Power					
	**100 ... 240 V AC**	**5 V DC**	6.3 A	**6EP1311-1SH13**	
LOGO!Power					
	**100 ... 240 V AC**	**12 V DC**	1.9 A	**6EP1321-1SH03**	
SITOP compact, PSU100C					
	**100 ... 230 V AC**	**12 V DC**	2 A	**6EP1321-5BA00**	
Special design, SITOP DC/DC					
	**24 V DC**	**12 V DC**	2.5 A	**6EP1621-2BA00**	
Special design, PSU100D					
	**100 ... 240 V AC**	**12 V DC**	3 A	**6EP1321-1LD00**	
LOGO!Power					
	**100 ... 240 V AC**	**12 V DC**	4.5 A	**6EP1322-1SH03**	

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Selection and ordering data (continued)

Product	Input Voltage $U_{in\ rated}$	Output Voltage $U_{out\ rated}$	Current $I_{out\ rated}$	Order No.	Price
SITOP compact, PSU100C					
	**100 ... 230 V AC**	**12 V DC**	6.5 A	**6EP1322-5BA10**	
SITOP smart, PSU100S					
	**120/230 V AC**	**12 V DC**	7 A	**6EP1322-2BA00**	
Special design, PSU100D					
	**100 ... 240 V AC**	**12 V DC**	8.3 A	**6EP1322-1LD00**	
SITOP smart, PSU100S					
	**120/230 V AC**	**12 V DC**	14 A	**6EP1323-2BA00**	
Special design, PSU300B					
	**400 ... 500 V 3 AC**	**12 V DC**	20 A	**6EP1424-3BA00**	
LOGO!Power					
	**100 ... 240 V AC**	**15 V DC**	1.9 A	**6EP1351-1SH03**	
LOGO!Power					
	**100 ... 240 V AC**	**15 V DC**	4 A	**6EP1352-1SH03**	
Special design, SITOP dual					
	**120 ... 230 V AC**	**2 × 15 V DC**	2 × 3.5 A	**6EP1353-0AA00**	

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Ordering data and further information

Selection and ordering data (continued)

Product	Input Voltage $U_{in\ rated}$	Output Voltage $U_{out\ rated}$	Current $I_{out\ rated}$	Order No.	Price
SITOP modular PSU300M					
	**400-500 V 3 AC**	**48 V DC**	10 A	**6EP1456-3BA00**	
SITOP modular					
	**400-500 V 3 AC**	**48 V DC**	20 A	**6EP1457-3BA00**	

Further information

You can find additional information in the Internet at:

- 2D dimensional drawings, 3D CAD data, circuit diagram macros:
  www.siemens.com/sitop-cax
- Operating instructions:
  www.siemens.com/sitop-manuals
- SITOP Selection Tool:
  www.siemens.com/sitop-selection-tool

Accessories

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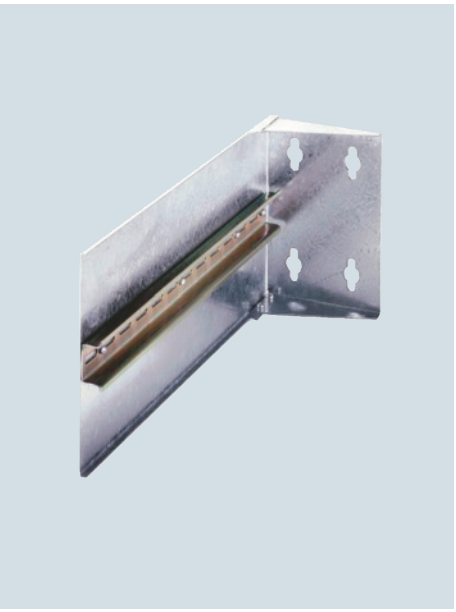

13/2 Spring-loaded caps
13/2 Mounting bracket
13/2 Mounting adapter for DIN rail
13/2 Connector for devices in IP65 and IP67 degree of protection
13/2 Device labeling plates
13/2 Ordering data and further information

For AL and ECCN export regulations see page 16/20

Mounting bracket, mounting adapter, connector, device labeling plates

Mounting bracket

Product	Mounting bracket 90°
Mounting bracket	For a depth of 320 mm
Order No.	6EP1971-2BA00

The combination of a SITOP power supply and a 90° mounting bracket results in a minimum surface area requirement on the rear panel of the control cabinet (the width of the power supply becomes the depth, and the depth becomes the width). The mounting bracket is suitable for control cabinets with a depth of 320 mm or more.

Technical specifications of mounting bracket

Dimensions (W × H × D) in mm	100 × 150 × 320
Sheet metal thickness	1.5 mm
Mounting rail, attached	DIN rail EN 60715 35×15
Weight, approx.	0.9 kg
Installation	Can be screwed onto a flat surface (keyhole mounting for hooking onto M6 screws, drill hole distance 90 mm height, 50 mm side)
Accessories, included	4 M6 combi screws
Suitable, for example, for	SITOP 24 V/20 A (6EP1336-3BA00, 6EP1436-3BA00) SITOP 24 V/40 A (6EP1337-3BA00, 6EP1437-3BA00) SITOP 48 V/20 A (6EP1457-3BA00)

Mounting adapter for DIN rail

The 24 V/2 A (6ES7305-1BA80-0AA0) and 24 V/5 A (6ES7307-1EA80-0AA0) 1-phase power supplies are special mechanical versions for SIMATIC S7-300 which can be mounted on S7 rails.
A mounting adapter (6ES7390-6BA00-0AA0) for mounting on EN 60715 35x15 DIN rails is available separately as an accessory.

The 24 V/ 2 A (6ES7307-1BA01-0AA0), 24 V/5 A (6ES7307-1EA01-0AA0) and 10 A (6ES7307-1KA02-0AA0) power supplies are variants for SIMATIC S7-300 and can be mounted on S7 rails.
A mounting adapter (6EP1971-1BA00) for installation on the DIN rail EN 60715 35×15/7.5 is separately available as an accessory.

Connector for devices in IP65 and IP67 degrees of protection

For the SITOP PSU300P power supply (6EP1433-2CA00) in IP67 degree of protection, a power connection plug (3RK1911-2BE50) is available as an accessory.

For the maintenance-free SITOP UPS500P DC UPS modules (6EP1933-2NC01, 6EP1933-2NC11) in IP65 degree of protection, a connector set (6EP1975-2ES00) for input and output and with pre-assembled USB cable (2 m long) is available as an accessory.

Device labeling plates

For the labeling of power supplies, blank device labeling plates (10 mm x 7 mm, pastel turquoise) are available with the order number 3RT1900-1SB10 and (20 mm x 7 mm, pastel turquoise) with the order number 3RT1 900-1SB20.

The package unit comprises 816 or 340 labels on frames. For usability, refer to "Accessories" in the technical specifications of the respective power supplies.

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Selection and ordering data

Product	Description	Order No.	Price
Spring-loaded caps			
	For SITOP PSU100C and PSE202U; pack of 100 units	**6EP1971-5BA00**	
Mounting bracket 90°			
	For a depth of 320 mm	**6EP1971-2BA00**	
Mounting adapter			
	For DIN rail EN 60715 35x7.5/15	**6EP1971-1BA00**	
	For DIN rail EN 60715 35x15	**6ES7390-6BA00-0AA0**	
Power connector			
	For SITOP PSU300P	**3RK1911-2BE50**	
Connector set			
	For UPS500P	**6EP1975-2ES00**	
Device labeling plates			
	Pastel turquoise, 10 x 7 mm; pack containing 816 units	**3RT1900-1SB10**	
	Pastel turquoise, 20 x 7 mm; pack containing 340 units	**3RT1900-1SB20**	

Further information

You can find additional information in the Internet at:

- 2D dimensional drawings, 3D CAD data, circuit diagram macros: www.siemens.com/sitop-cax
- Operating instructions: www.siemens.com/sitop-manuals

SIPLUS power supplies

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14/2 Overview
14/2 Technical specifications
14/3 Selection and ordering data

For AL and ECCN export regulations see page 16/20

Overview

Particularly harsh industrial environments demand products with special characteristics - products that are more rugged than standard products

Siemens offers the perfect answer to these requirements with SIPLUS extreme.

SIPLUS product variants are based on the SITOP, LOGO!Power standard power supplies and the power supplies for SIMATIC S7 and expansion modules, and feature the following characteristics:

- Extended ambient temperature range (e.g. -40 … +70 °C) and conformal coating as protection against extreme and difficult conditions and contact with substances
- Conformal coating as protection against extreme and difficult conditions and contact with substances
- DIN EN 50155: Conforms with standard for electronic equipment used on rolling stock (EN 50155, temperature T1, category)
- Hard gold-plated contacts for improved contacting at low currents

Technical specifications

Ambient conditions	
Relative humidity	5 ... 100%, condensation permissible
Biologically active substances, conformity with EN 60721-3-3	Class 3B2 mold, fungus, spores (excluding fauna).
Chemically active substances, conformity with EN 60721-3-3	Class 3C4 incl. salt mist and ISA -S71.04 severity level G1; G2; G3; GX [1)]
Mechanically active substances, conformity with EN 60721-3-3	Class 3S4 incl. sand, dust [1)]
Air pressure (depending on the highest positive temperature range specified)	1080 ... 795 hPa (-1000 ... +2000 m) see ambient temperature range 795 ... 658 hPa (+2000 ... +3500 m) derating 10 K 658 … 540 hPa (+3500 … +5000 m) derating 20 K
Further technical specifications	See the corresponding standard products

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[1)] The supplied plug covers must remain in place over the unused interface when operated in atmospheres containing corrosive gases!

Selection and ordering data

Product	SIPLUS version	Standard product	Order No.	Price
1-phase				
SIPLUS LOGO!Power 1.3 A				
	-25 … +70 °C; protected against contact with substances	**6EP1331-1SH03** see page 2/3	**6AG1331-1SH03-7AA0**	
SIPLUS LOGO!Power 2.5 A				
	-25 … +70 °C; protected against contact with substances	**6EP1332-1SH43** see page 3/3	**6AG1331-1SH43-7AA0**	
SIPLUS S7-200 PS203 3.5 A				
	-25 … +70 °C; protected against contact with substances	**6EP1332-1SH31** see page 4/2	**6AG1203-1SH31-2AA0**	
SIPLUS S7-300 PS 305 2 A				
	-25 … +70 °C; protected against contact with substances EN 50155	**6ES7305-1BA80-0AA0** see page 2/3	**6AG1305-1BA80-2AA0**	
SIPLUS PS 24 0.375 A				
	protected against contact with substances	**6EP1731-2BA00** see page 14/3	**6AG1931-2BA00-3AA0**	
SIPLUS S7-1200 PM 1207				
	-25 … +70 °C; protected against contact with substances	**6EP1332-1SH71** see page 3/3	**6AG1332-1SH71-7AA0**	
	protected against contact with substances	**6EP1332-1SH71** see page 3/3	**6AG1332-1SH71-4AA0**	
SIPLUS LOGO!Power 4 A				
	-25 … +70 °C; protected against contact with substances	**6EP1332-1SH52** see page 4/3	**6AG1332-1SH52-7AA0**	
SIPLUS LOGO! upmiter 1.25 A [1]				
	-25 … +70 °C; protected against contact with substances		**6AG1053-1AA00-2AA0**	
SIPLUS S7-200 upmiter 2.5 A [1]				
	-25 … +70 °C; protected against contact with substances		**6AG1203-1AA00-2AA0**	
SIPLUS S7-300 upmiter 4 A [1]				
	-25 … +60 °C; protected against contact with substances		**6AG1305-1AA00-2AA0**	
1-phase and 2-phase				
SIPLUS PS modular 5 A				
	-40 … +70 °C; protected against contact with substances	**6EP1333-3BA00** see page 5/3	**6AG1933-3BA00-2AA0**	
SIPLUS S7-300 PS 307 5 A Outdoor				
	-25 … +70 °C; protected against contact with substances EN 50155	**6ES7307-1EA80-0AA0** see page 5/3	**6AG1307-1EA80-2AA0**	
SIPLUS PS modular 10 A				
	-40 … +60 °C; protected against contact with substances	**6EP1334-3BA00** see page 6/3	**6AG1334-3BA00-2AA0**	
	protected against contact with substances	**6EP1334-3BA00** see page 6/3	**6AG1334-3BA00-4AA0**	
SIPLUS PS smart 10 A				
	protected against contact with substances	**6EP1334-2BA20** see page 6/3	**6AG1334-2BA01-4AA0**	
SIPLUS S7-300 PS 307, 10 A				
	-25 … +70 °C; protected against contact with substances	**6ES7307-1KA02-0AA0** see page 6/3	**6AG1307-1KA02-7AA0**	

[1] Ballast for battery operation with internal combustion engines (input: 10.5 ... 59 V DC, output: 20.4 ... 28.8 V DC).

Selection and ordering data (continued)

Product	SIPLUS version	Standard product	Order No.	Price
1-phase and 2-phase (continued)				
SIPLUS PS smart 20 A				
	-25 … +70 °C; protected against contact with substances	**6EP1436-2BA10** see page 9/2	**6AG1436-2BA10-7AA0**	
SIPLUS PS modular 20 A				
	-40 … +70 °C; protected against contact with substances	**6EP1336-3BA00** see page 7/3	**6AG1336-3BA00-7AA0**	
	protected against contact with substances	**6EP1336-3BA00** see page 7/3	**6AG1936-3BA00-4AA0**	
SIPLUS PS modular 40 A				
	-40 … +70 °C; protected against contact with substances	**6EP1337-3BA00** see page 7/3	**6AG1337-3BA00-7AA0**	
3-phase				
SIPLUS PS modular 5 A				
	-40 … +70 °C; protected against contact with substances	**6EP1333-3BA00** see page 8/2	**6AG1933-3BA00-2AA0**	
SIPLUS PS modular 10 A				
	-40 … +60 °C; protected against contact with substances	**6EP1334-3BA00** see page 8/3	**6AG1334-3BA00-2AA0**	
SIPLUS PS modular 20 A				
	-40 … +70 °C; protected against contact with substances	**6EP1436-3BA00** see page 9/2	**6AG1436-3BA00-7AA0**	
SIPLUS PSU300M 40 A				
	-25 … +70 °C; protected against contact with substances	**6EP1437-3BA10** see page 9/3	**6AG1437-3BA10-7AA0**	
SIPLUS PS modular 40 A				
	protected against contact with substances	**6EP1437-3BA00** see page 9/3	**6AG1437-3BA00-4AA0**	
Expansion modules				
SIPLUS PS signaling module				
	Hard gold-plated contacts protected against contact with substances	**6EP1961-3BA10** see page 10/2	**6AG1961-3BA10-6AA0**	
	-25 … +70 °C; protected against contact with substances	**6EP1961-3BA10** see page 10/2	**6AG1961-3BA10-7AA0**	
SIPLUS PSE202U redundancy module				
	-40 … +70 °C; protected against contact with substances	**6EP1961-3BA21** see page 10/3	**6AG1961-3BA21-7AX0**	
	protected against contact with substances	**6EP1961-3BA21** see page 10/3	**6AG1961-3BA21-4AX0**	
SIPLUS PS buffer module				
	-25 … +70 °C; protected against contact with substances	**6EP1961-3BA01** see page 10/3	**6AG1961-3BA01-7AA0**	
DC UPS uninterruptible power supplies				
SIPLUS PS DC UPS module 15 A				
	-25 … +60 °C; protected against contact with substances	**6EP1931-2EC21** see page 11/22	**6AG1931-2EC21-2AA0**	
SIPLUS PS DC UPS module 40 A				
	-25 … +70 °C; protected against contact with substances	**6EP1931-2FC21** see page 11/22	**6AG1931-2FC21-7AA0**	

Technical information and notes on configuration

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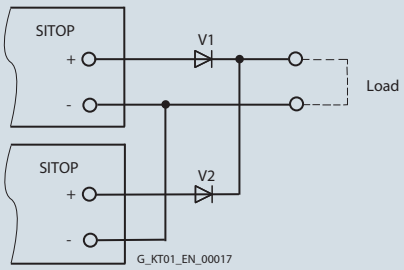


15/2 Power supplies in general
15/5 Supply system data, line-side connection
15/9 Possible system disturbances and their causes
15/10 Installation instructions, mounting areas and fixing options
15/13 Parallel connection
15/14 Series connection to increase the voltage
15/15 Battery charging with SITOP
15/16 Fusing of the 24 V DC output circuit, selectivity
15/20 Overview of important standards and approvals

Power supplies in general

Power supplies

In plant building or mechanical equipment manufacture, or in any other situations in which electrical controls are used, a safe and reliable power supply is needed to supply the process with power.

The functional reliability of electronic controls and therefore the reliable operation of automated plants is extremely closely linked to the resistance of the load power supply to failure. Final control elements as well as input and output modules will only respond to command signals if the power supply is operating reliably.

In addition to requirements such as safety, particular demands are placed on the electromagnetic compatibility (EMC) of the power supply with reference to the tolerance range of the output voltage as well as its ripple.

Important factors that determine problem-free implementation are, in particular:

- An input current with a low harmonic content
- Low emitted interference
- Adequate immunity (noise immunity) to interference

EMC	Interference phenomena
Emission (emitted interference)	Interference caused by television and radio reception
	Interference coupling on data lines or power supply cables
Noise immunity (immunity to interference)	Faults on the power cable due to switching non-resistive loads such as motors or contactors
	Static discharge due to lightning strikes
	Electrostatic discharge through the human body
	Conducted noise induced by radio frequencies

Selected interference phenomena

General notes on DC power supplies

The DC power supply is a static device with one or more inputs and one or more outputs that converts a system of AC voltage and AC current and/or DC voltage and DC current to a system with different values of DC voltage and DC current by means of electromagnetic induction for the purpose of transmitting electrical energy.

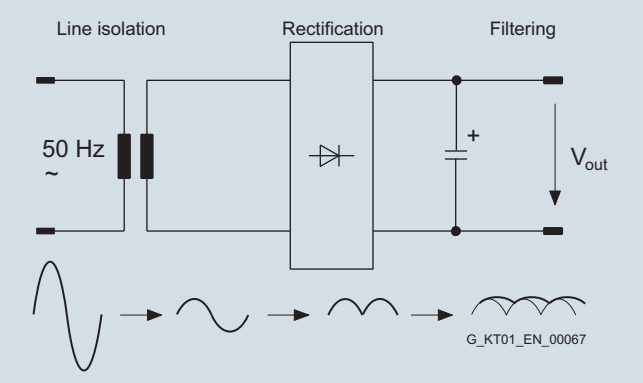
The type of construction of a DC power supply is primarily decided by its intended use.

Non-stabilized DC power supplies

The AC mains voltage is transformed using 50 Hz/60 Hz safety transformers to a protective extra-low voltage and smoothed with down-circuit rectification and capacitor filtering.

In the case of non-stabilized DC power supplies, the DC output voltage is not stabilized at a specific value, but the value is varied in accordance with the variation in (mains) input voltage and the loading.

The ripple is in the Volt range and is dependent on the loading. The value for the ripple is usually specified as a percentage of the DC output voltage level. Non-stabilized DC power supplies are characterized by their rugged, uncomplicated design that is limited to the important factors and focused on a long service life.



Block diagram: non-stabilized power supplies

Stabilized DC power supplies

Stabilized DC power supplies have electronic control circuits that maintain the DC voltage at the output at a specific value with as little variation as possible. Effects such as variation in input voltage or changes in load at the output are electrically compensated in the specified function area.

The ripple in the output voltage for stabilized DC power supplies lies in the millivolt range and is mainly dependent on the loading at the outputs.

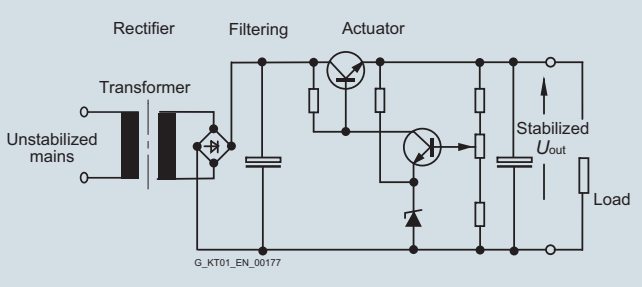
Stabilized DC power supplies can be implemented on different functional principles. The most common types of circuit are:

- Linear stabilized power supplies
- Magnetic voltage stabilizers
- Secondary pulsed switched-mode power supplies
- Primary pulsed switched-mode power supplies

The most suitable principle for a particular application case will depend mainly on the application. The objective is to generate a DC voltage to supply the specific load as inexpensively and as accurately as possible.

Stabilized DC power supplies (continued)

Linear stabilized power supplies



Block diagram: Transformer with in-phase regulation

The transformer with in-phase regulation operates according to a conventional principle. The supply is provided from an AC supply system (one, two or three conductor supply).

A transformer is used to adapt it to the required secondary voltage.

The rectified and filtered secondary voltage is converted to a stabilized voltage at the output in a regulation section. The regulation section comprises a final control element and a control amplifier. The difference between the stabilized output voltage and the non-stabilized voltage at the filter capacitor is converted into a thermal loss in the final control element. The final control element functions in this case like a rapidly changeable ohmic impedance. The thermal loss that arises in each case is the product of output current and voltage drop over the final control element.

This system is extremely adaptable. Even without further modifications, several output voltages are possible. In the case of multiple outputs, the individual secondary circuits are usually generated from separate secondary windings of the input transformer. Some applications can only be resolved in accordance with this circuit principle. Especially when highly accurate regulation, minimal residual ripple and fast compensation times are required.

The efficiency is, however, poor and the weight and volume are considerable. The transformer with in-phase regulation is therefore only an economical alternative at low power ratings.

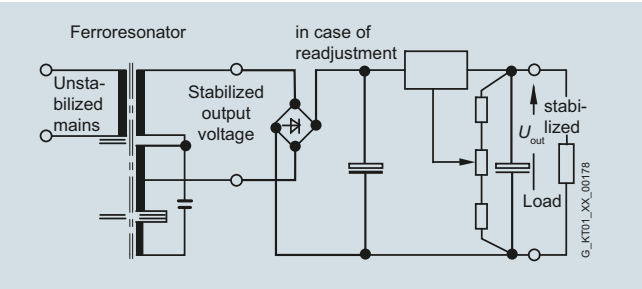
Advantages:

- Simple, well-proven circuit principle
- Good to excellent control characteristics
- Fast compensation time

Disadvantages:

- Relatively high weight and large volume due to the 50 Hz transformer
- Poor efficiency, heat dissipation problems
- Low storage time

Magnetic stabilizer



Block diagram: Magnetic stabilizer

The complete transformer comprises two components. The "ferro resonator" and a series-connected auxiliary regulator. The input winding and the resonance winding of the magnetic stabilizer are decoupled to a large extent by means of the air gap. The magnetic stabilizer supplies a well-stabilized AC voltage. This is rectified and filtered. The transformer itself is operated in the saturation range.

The ferro resonator frequently has a transformer with in-phase regulation connected downstream to improve the control accuracy. Secondary pulsed switched-mode regulators are frequently also connected downstream.

The magnetic stabilizer technique is reliable and rugged but is also large-volume, heavy and relatively expensive.

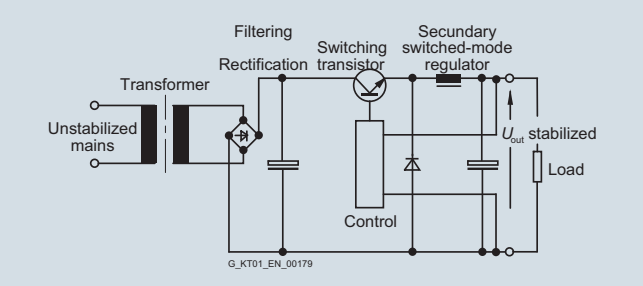
Advantages:

- Good to excellent control characteristics in combination with series-connected linear regulators
- Significantly better efficiency than a transformer with in-phase regulation alone

Disadvantages:

- The ferro resonator is frequency dependent
- The power supplies are large and heavy due to the magnetic components

Secondary pulsed switched-mode power supplies



Block diagram: Secondary pulsed switched-mode power supplies

Isolation from the supply system is implemented in this case with a 50 Hz transformer. Following rectification and filtering, the energy is switched at the output by means of pulsing through a switching transistor in the filtering and storage circuit. Thanks to the transformer at the input that acts as an excellent filter, the mains pollution is low. The efficiency of this circuit is extremely high.

This concept offers many advantages for power supplies with numerous different output voltages.

To protect the connected loads, however, care must be taken; in the event of the switching transistor breaking down, the full, non-stabilized DC voltage of the filter capacitor will be applied to the output. However, this danger also exists in the case of linear stabilized power supplies.

Advantages:

- Simple design and high efficiency
- Multiple outputs, also galvanically isolated from one another, are easily implemented by means of several secondary windings
- Fewer problems with interference than with primary pulsed switched-mode power supplies

Disadvantages:

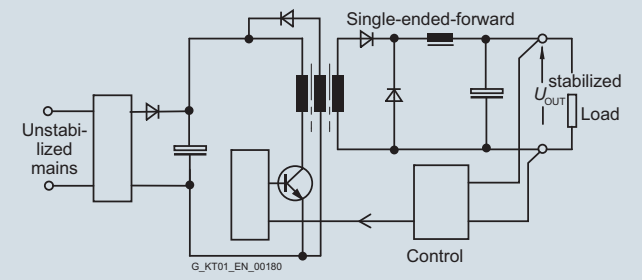
- The 50 Hz transformer makes the power supplies relatively large and heavy
- The output ripple (spikes) correspond to those of a primary pulsed switched-mode power supply

Power supplies in general

Stabilized DC power supplies (continued)

Primary pulsed switched-mode power supplies

The term SMPS (Switch Mode Power Supply) or primary switched-mode regulator is often used in the literature.



Block diagram: Single-ended forward converter

The primary switched-mode regulators are available in many different circuit versions. The most important basic circuits are single-ended forward converters, flyback converters, half-bridge converters, full-bridge converters, push-pull converters and resonance converters.

The general principle of operation of the primary switched-mode regulator is shown in the block diagram of the single-ended forward converter:

The non-stabilized supply voltage is first rectified and filtered. The capacitance of the capacitor in the DC link determines the storage time of the power supply on failure of the input voltage. The voltage at the DC link is approximately 320 V DC for a 230 V supply. A single-ended converter is then supplied with this DC voltage and transfers the primary energy through a transformer to the secondary side with the help of a pulse width regulator at a high switching frequency. The switching transistor has low power losses when functioning as a switch so that the power balance lies between > 70 % and 90 % depending on the output voltage and current.

The volume of the transformer is small in comparison with a 50 Hz transformer due to the high switching frequency because the transformer size, taking into account the higher switching frequency, is smaller. Using modern semiconductors, clock frequencies of 100 kHz and above can be achieved. However, switching losses increase at excessively high clock frequencies so that in each case a compromise has to be made between high efficiency and the largest possible clock frequency. In most applications, the switching frequencies lie between approximately 20 kHz and 250 kHz depending on the output power.

The voltage from the secondary winding is rectified and filtered. The system deviation at the output is fed back to the primary circuit through an optocoupler. By controlling the pulse width (conducting phase of the switching transistor in the primary circuit), the necessary energy is transferred to the secondary circuit and the output voltage is regulated. During the non-conducting phase of the switching transistor, the transformer is demagnetized through an auxiliary winding. Exactly the same amount of energy is transferred as is removed at the output. The maximum pulse width for the pulse duty factor for these circuits is < 50 %.

Advantages:

- Small magnetic components (transformer, storage reactor, filter) thanks to the high operating frequency
- High efficiency thanks to pulse width regulation
- Compact equipment units
- Forced-air cooling is not necessary up to the kW range
- High storage times are possible in case of power failure by increasing the capacitance in the DC link
- Large input voltage range possible

Disadvantages:

- High circuit costs, many active components
- High costs for interference suppression
- The mechanical design must be in accordance with HF criteria

Primary switched-mode power supplies have taken over from the other switching modes in recent years. This is due, in particular, to their compact size, minimal weight, high efficiency and excellent price/performance ratio.

Summary

The most important characteristics of the circuit types described above are summarized in the table.

Comparison criteria	Connection types			
	Primary-switched mode	**Secondary-switched mode**	**Transformer with in-phase regulation**	**Magnetic stabilizer**
Input voltage range	Very large	Medium	Very small	Large
Regulation speed	Medium	Medium	Very fast	Slow
Storage time after power failure	Very long	Long	Very short	Long
Residual ripple	Medium	Medium	Very low	Medium
Power loss	Very small	Small	Large	Very small
Size	Very small	Medium	Very large	Large
Weight	Very light	Medium	Heavy	Very heavy
Interference suppression overhead	Very large	Medium	Low	Medium

Comparison criteria for basic circuit variants

Supply system data

When dimensioning and selecting plant components, the supply system data, supply system conditions and operating modes must be taken into account for these components.

The most important data for a supply system include the rated voltage and rated frequency. These data for the supply system are designated as rated values in accordance with international agreements.

Generally used rated voltages and rated frequencies

Standard EN 60038 "CENELEC rated voltages" applies in Europe.

The international standard IEC 60038, Edition 7, 2009, "IEC standard voltages" was included to a considerable extent in this standard.

The IEC 60038 standard is the result of an international agreement to reduce the diverse rated voltage values that are in use for electrical supply networks and traction power supplies, load installations and equipment.

In the low-voltage range, it is emphasized in EN 60038 that the 220 V/380 V values (previously applicable in continental Europe) and 240 V/415 V values (previously applicable in the United Kingdom) for three-phase electricity supplies have been replaced by a single standardized value of 230 V/400 V. The supply frequency in Europe is 50 Hz.

The tolerances for the rated voltages of the supply systems that were specified for the transition period up to 2003 were intended to ensure that equipment rated for the voltages prevailing at the time could be operated safely until the end of its service life.

Year	Rated voltage	Tolerance range
Up to 1987	220 V/380 V	-10 % to +10 %
1988 to 2003	230 V/400 V	-10 % to + 6 %
Since 2003	230 V/400 V	-10 % to +10 %

Conversion of low-voltage systems

Supply voltages over 400 V (e.g. 500 V, 690 V) are occasionally used in Europe in large industrial plants.

The IEC recommendation of 230 V/400 V has been implemented as national regulation in the most important countries, as far as the conditions in the country allow.

In North America, Central America and some northern South American countries the rated value for AC supply voltage is 120 V, but twice the supply voltage, i.e. 240 V, is common for larger consumers. The low-voltage supply systems are normally implemented in these countries as single-phase three-conductor systems. Three-phase AC current is often unavailable to small consumers, if it exists at all, so the voltage is 208 V or 415 V, and three-phase networks are available for larger consumers at 480 V. The supply frequency is 60 Hz.

In Asia, AC supply voltages of 100 V or 110 V (50 Hz or 60 Hz) are also common.

Worldwide, numerous country-specific and regional characteristics prevail about which the local plant operators must be directly consulted.

International supply voltages and frequencies in low-voltage systems

Country	Supply voltage
Western Europe:	
Belgium	50 Hz 230/400 – 127-220 V
Denmark	50 Hz 230/400 V
Germany	50 Hz 230/400 V
Finland	50 Hz 230/400-500 [1] – 660 [1] V
France	50 Hz 127/220 – 230/400 – 500 [1] – 380/660 [1] – 525/910 [1] V
Greece	50 Hz 230/400 – 127/220 [2] V
Great Britain	50 Hz 230/400 V
Ireland	50 Hz 230/400 V
Iceland	50 Hz 127/220 [2] – 230/400 V
Italy	50 Hz 127/220 – 230/400 V
Luxembourg	50 Hz 230/400 V
The Netherlands	50 Hz 230/400 – 660 [1] V
Northern Ireland	50 Hz 230/400 – Belfast 220/380 V
Norway	50 Hz 230-230/400-500 [1] – 690 [1] V
Austria	50 Hz 230/400 – 500 [1] – 690 [1] V
Portugal	50 Hz 230/400 V
Sweden	50 Hz 230/400 V
Switzerland	50 Hz 230/400 – 500 [2] V
Spain	50 Hz 230/400 V

[1] Industry only

[2] No further expansion

Supply system data, line-side connection

International supply voltages and frequencies in low-voltage systems (continued)

Country	Supply voltage
Eastern Europe:	
Albania	50 Hz 230/400 V
Bulgaria	50 Hz 230/400 V
Russian Federation	50 Hz 230/400 – 690 [1] V
Croatia	50 Hz 230/400 V
Poland	50 Hz 230/400 V
Romania	50 Hz 230/400 V
Serbia	50 Hz 230/400 V
Slovakia	50 Hz 230/400 – 500 [1] – 690 [1] V
Slovenia	50 Hz 230/400 V
Czech Republic	50 Hz 230/400 – 500 [1] – 690 [1] V
Hungary	50 Hz 230/400 V
Middle East:	
Afghanistan	50 Hz 220/380 V
Bahrain	50 Hz 230/400 V
Cyprus	50 Hz 240/415 V
Iraq	50 Hz 220/380 V
Israel	50 Hz 230/400 V
Jordan	50 Hz 220/380 V
Kuwait	50 Hz 240/415 V
Lebanon	50 Hz 110/190 – 220/380 V
Oman	50 Hz 220/380 – 240/415 V
Qatar	50 Hz 240/415 V
Saudi Arabia	60 Hz 127/220 – 220/380 – 480 [1] V (220/380 – 240/415 V 50 Hz: a few remaining areas only)
Syria	50 Hz 115/200 – 220-380 – 400 [1] V
Turkey	50 Hz 220/380 V (parts of Istanbul: 110/190 V)
United Arab Emirates (Abu Dhabi; Ajman; Dubai; Fujairah; Ras al Khaymah; Sharjah; Um al Qaywayn)	50 Hz 220/380 – 240/415 V
Yemen (North)	50 Hz 220/380 V
Yemen (South)	50 Hz 230/400 V
Far East:	
Bangladesh	50 Hz 230/400 V
Burma	50 Hz 230/400 V
People's Republic of China	50 Hz 127/220 – 220/380 V (in mining: 1140 V)
Hong Kong	50 Hz 200/346 V
India	50 Hz 220/380 – 230/400 – 240/415 V
Indonesia	50 Hz 127/220 – 220/380 – 400 [1] V
Japan	50 Hz 100/200 – 400 [1] V
South Honshu, Shikoku, Kyushu, Hokkaido, North Honshu	60 Hz 110/220 – 440 [1] V
Cambodia	50 Hz 120/208 V – Phnom Penh 220/238 V
Korea (North)	60 Hz 220/380 V
Korea (South)	60 Hz 100/200 [2] – 220/380 – 440 [1] V
Malaysia	50 Hz 240/415 V
People's Republic of Mongolia	50 Hz 220/380 V
Pakistan	50 Hz 230/400 V
Philippines	60 Hz 110/220 – 440 V
Singapore	50 Hz 240/415 V
Sri Lanka	50 Hz 230/400 V

[1] Industry only

[2] No further expansion

International supply voltages and frequencies in low-voltage systems (continued)

Country	Supply voltage
Far East (continued)**:**	
Taiwan	60 Hz 110/220 – 220 – 440 V
Thailand	50 Hz 220/380 V
Vietnam	50 Hz 220/380 V
North America:	
Canada	60 Hz 600 – 120/240 – 460 – 575 V
USA	60 Hz 120/208 – 120/240 – 277/480 – 600 [1] V
Central America:	
Bahamas	60 Hz 115/200 – 120/208 V
Barbados	50 Hz 110/190 – 120/208 V
Belize	60 Hz 110/220 – 220/440 V
Costa Rica	60 Hz 120/208 [2] – 120/240 – 127/220 – 254/440 [2] – 227/480 [1] V
Dominican Republic	60 Hz 120/208 – 120/240 – 480 [1] V
Guatemala	60 Hz 120/208 – 120/240 – 127/220 – 277/480 [1] – 480 [1] – 550 [1] V
Haiti	50 Hz 220/380 V (Jacmel), 60 Hz 110/220 V
Honduras	60 Hz 110/220 – 127/220 – 277/480 V
Jamaica	50 Hz 110/220 – 440 [1] V
Cuba	60 Hz 120/240 – 220/380 – 277/480 [1] – 440 [1] V
Mexico	60 Hz 127/220 – 440 [1] V
Nicaragua	60 Hz 110/220 – 120/240 – 127/220 – 220/440 – 254/40 [1] V
Panama	60 Hz 120/208 [1] – 120/240 – 254/4401 – 277/480 [1] V
Puerto Rico	60 Hz 120/208 – 480 V
El Salvador	60 Hz 110/220 – 120/208 – 127/220 – 220/440 – 240/480 [1] – 254/440 [1] V
Trinidad	60 Hz 110/220 – 120/240 – 230/400 V
South America:	
Argentina	50 Hz 220/380 V
Bolivia	60 Hz 220/380 – 480 V, 50 Hz 110/220 – 220/380 V (exception)
Brazil	60 Hz 110/220 – 220/440 – 127/220 – 220/380 V
Chile	50 Hz 220/380 V
Ecuador	60 Hz 120/208 – 127/220 V
Guyana	50 Hz 110/220 V (Georgetown), 60 Hz 110/220 – 240/480 V
Colombia	60 Hz 110/220 – 150/260 – 440 V
Paraguay	60 Hz 220/380 – 220/440 V
Peru	60 Hz 220 – 220/380/440 V
Surinam	60 Hz 115/230 – 127/220 V
Uruguay	50 Hz 220 V
Venezuela	60 Hz 120/208 – 120/240 – 208/416 – 240/480 V
Africa:	
Egypt	50 Hz 110/220 – 220/380 V
Ethiopia	50 Hz 220/380 V
Algeria	50 Hz 127/220 – 220/380 V
Angola	50 Hz 220/380 V
Benin	50 Hz 220/380 V
Ivory Coast	50 Hz 220/380 V
Gabon	50 Hz 220/380 V
Ghana	50 Hz 127/220 – 220/380 V
Guinea	50 Hz 220/380 V
Kenya	50 Hz 220/380 V

[1] Industry only

[2] No further expansion

Supply system data, line-side connection

International supply voltages and frequencies in low-voltage systems (continued)

Country	Supply voltage
Africa (continued)**:**	
Cameroon	50 Hz 127/220 – 220/380 V
Congo	50 Hz 220/380 V
Liberia	60 Hz 120/208 – 120/240 V
Libya	50 Hz 127/220 [2] – 220/380 V
Madagascar	50 Hz 127/220 – 220/380 V
Malawi	50 Hz 220/380 V
Mali	50 Hz 220/380 V
Morocco	50 Hz 115/200 – 127/220 – 220/380 – 500 [1] V
Mauritius	50 Hz 240/415 V
Mozambique	50 Hz 220/380 V
Namibia	50 Hz 220/380 V
Niger	50 Hz 220/380 V
Nigeria	50 Hz 220/415 V
Rwanda	50 Hz 220/380 V
Zambia	50 Hz 220/380 V – 415 – 550 [1] V
Senegal	50 Hz 127/220 – 220/380 V
Sierra Leone	50 Hz 220/380 V
Somalia	50 Hz 220-220/440 V
Sudan	50 Hz 240/415 V
South Africa	50 Hz 220/380 – 500 [1] – 550/950 [1] V
Swaziland	50 Hz 220/380 V
Tanzania	50 Hz 230/400 V
Togo	50 Hz 127/220 – 220/380 V
Tunisia	50 Hz 115/200 – 220/380 V
Uganda	50 Hz 240/415 V
Zaire	50 Hz 220/380 V
Zimbabwe	50 Hz 220/380 V

Connection and fusing on the line side

All SITOP and LOGO!Power supplies are built-in devices. Compliance with the pertinent country-specific regulations is essential for installation and electrical connection of the devices. During installation, protective gear and isolating gear must be provided for activating the power supply.

Power supply units cause a current inrush immediately after connection of the input voltage due to charging of the load capacitor, however, it falls back to the rated input current level after a few milliseconds. Aside from the internal impedances of the power supply, the inrush current is dependent on the size of the input voltage applied as well as the source impedance of the supply network and the line impedance of the supply line. The maximum inrush current for the power supplies is specified in the applicable technical data. It is important for dimensioning up-circuit protective devices.

Single-phase SITOP and LOGO!Power supplies are equipped with internal device protection (fuses). For connection to the supply system, only one protective device (fuse or MCB) must be provided for line protection in accordance with the rated current of the installed cable. The circuit breakers recommended in the data sheets and operating instructions were selected such that even during the maximum inrush current that can occur under worst-case conditions when switching on the supply voltage, the circuit breaker will not trip. A two-pole connected miniature circuit breaker is required for the connection of certain device types.

Three-phase SITOP power supplies do not have internal device protection. The up-circuit protective device (3-phase coupled miniature circuit breaker or motor protection switch) protects the cables and devices. The protective devices specified in the data sheets and operating instructions are optimized to the characteristics of the relevant power supplies.

[1] Industry only

[2] No further expansion

Possible system disturbances and causes

Overview

The quality of the mains voltage has become a decisive factor in the functioning, reliability, maintenance costs and service life of highly sensitive electronic installations and devices (computers, industrial controls, instrumentation, etc.).

Mains disturbances cause system failures and affect the function of plants as well as electronic loads. They can also result in total failure of the installation or equipment.

The most frequent types of disturbance are:

- Long-term overvoltages
- Long-term undervoltages
- Interference pulses and transients
- Voltage dips and surges
- Electrical noise
- Momentary network failure
- Long-term network failure

Mains disturbances can be caused by a number of things, e.g.:

- Switching operations in the supply system
- Long cable paths in the supply system
- Environmental influences such as thunderstorms
- Mains overloads

Typical causes of mains disturbances generated in-house are:

- Thyristor-controlled drives
- Elevators, air-conditioning, photocopiers
- Motors, reactive-power compensation systems
- Electrical welding, large machines
- Switching of lighting equipment

Disturbances in mains voltages can occur individually or in combination. Possible reasons for these disturbances, their effects and reactions can include:

System disturbances	Percentage of total disturbance	Effect	Measure
Overvoltage The supply voltage is exceeded for a long period by more than +6 % (according to IEC 60038)	Approx. 15 % - 20 %	Can result in overheating and even thermal destruction of individual components. Causes total failure.	SITOP power supplies provide sufficient protection against minimal overvoltages outside the permissible tolerance range thanks to their wide operating voltage range.
Undervoltage The supply voltage is undershot over a long period by more than –10 % (acc. to IEC 60038)	Approx. 20 % - 30 %	Can result in undefined operating states of loads. Causes data errors.	For use of a SITOP DC UPS (uninterruptible DC power supply), see chapter 11.
Interference pulses Energy-rich pulses (e.g. 700 V/1 ms) and energy-poor transients (e.g. 2500 V/20 µs) result from switching operations in the supply system	Approx. 30 % - 35 %	Can result in undefined operating states of the loads and can lead to the destruction of components.	For use of overvoltage protection devices, see Catalog LV 10.1 2013, chapter 6.
Voltage dips and surges The voltage level changes suddenly and in an uncontrolled manner, e.g. due to changes in loading and long cable routes	Approx. 15 % - 30 %	Can result in undefined operating states and destruction of components. Cause data errors.	SITOP power supplies offer sufficient protection against temporary voltage interruptions thanks to the internal buffering time.
Electrical noise A mix of frequencies superimposed on the mains due to bad grounding and/or strong HF emitters such as radio transmitters or thunderstorms	Approx. 20 % - 35 %	Can result in undefined operating states of loads. Causes data errors.	SITOP power supplies offer sufficient resistance to electro-magnetic disturbance with internal circuitry.
Voltage interruption Short-term interruption of the supply voltage (up to approx. 100 ms) due to short-circuiting in neighboring supply systems or starting of large electrical machines	Approx. 8 % - 10 %	Can result in undefined operating states of loads, especially those with insufficient mains buffering. Causes data errors.	For use of a SITOP buffer module (in combination with SITOP smart or SITOP modular), see chapter 10.
Voltage interruption Long interruption of the supply voltage (longer than approx. 100 ms)	Approx. 2 % - 5 %	Can result in undefined operating states of loads, especially those with insufficient mains buffering. Causes data errors.	For use of a SITOP DC UPS (uninterruptible DC power supply), see chapter 11.

Installation instructions, mounting areas and fixing options

Installation instructions

All SITOP and LOGO!Power supplies are built-in devices. They must be mounted vertically so that the supply air can enter the ventilation slots at the bottom of the devices and leave through the upper part of the devices. The minimum distances specified in the relevant operating instructions for the top, bottom and side of the devices must be observed to ensure free air convection.

The option of mounting in non-vertical positions with the appropriate derating is specified in the respective user documentation (manual).

Mounting areas and fixing options

Power supply	Order No.	Required mounting area	Mounting on a DIN rail acc. to EN 60715		Wall mounting
		in mm (W x H)	35 x 7.5 mm	35 x 15 mm	
SITOP 24 V, 1-phase and 2-phase power supplies					
24 V/0.375 A	6EP1731-2BA00	22.5 x 180	X	X	
24 V/0.6 A	6EP1331-5BA00	22.5 x 180	X	X	
24 V/1.3 A	6EP1331-5BA10	30 x 180	X	X	
24 V/1.3 A	6EP1331-1SH03	54 x 130	X	X	
24 V/2 A	6ES7307-1BA01-0AA0 3)	40 x 205	2)	2)	
	6ES7305-1BA80-0AA0 3)	80 x 225		1)	
	6EP1732-0AA00	80 x 235		X	X
24 V/2.1 A	6EP1331-1LD00	58 (117) x 128			X
24 V/2.5 A	6EP1332-2BA20	33 x 225	X	X	
	6EP1332-5BA00	45 × 180	X	X	
	6EP1332-1SH43	72 x 130	X	X	
	6EP1332-1SH71	70 x 140	X	X	X
	6EP1332-1LB00	33 × 225	X	X	
24 V/3 A	6EP1332-4BA00 5)	50 x 225			
24 V/3.1 A	6EP1332-1LD00	58 (117) x 128			X
24 V/3.5 A	6EP1332-1SH31	160 x 280	X	X	X
24 V/3.7 A	6EP1332-5BA20	52 x 180	X	X	
24 V/4 A	6EP1332-5BA10	52.5 x 180	X	X	
	6EP1332-1SH52	90 x 130	X	X	
24 V/4.1 A	6EP1332-1LD10	58 (117) x 158			X
24 V/5 A	6EP1333-3BA00	70 x 225	X	X	
	6EP1333-2BA20	50 x 225	X	X	
	6ES7307-1EA01-0AA0 3)	60 x 205	2)	2)	
	6EP1333-1LB00	50 x 225	X	X	
	6ES7307-1EA80-0AA0 3)	80 x 225		1)	
	6EP1333-1AL12	160 x 230	X	X	
24 V/6.2 A	6EP1333-1LD00	58 (117) x 178			X
24 V/8 A	6EP1333-4BA00 5)	75 x 205			
24 V/10 A	6EP1334-3BA00	90 x 225	X	X	
	6EP1334-2BA20	70 x 225	X	X	
	6ES7307-1KA02-0AA0 3)	80 x 205	2)	2)	
	6EP1334-1LB00	70 x 225	X	X	
	6EP1334-1AL12	160 x 230	X	X	
24 V/12.5 A	6EP1334-1LD00	61 (125) x 199			X
24 V/20 A	6EP1336-2BA10	115 x 225	X	X	
	6EP1336-3BA10	90 x 225	X	X	
	6EP1536-3AA00	90 x 225	X	X	
	6EP1336-3BA00	160 × 225	X	X	
24 V/40 A	6EP1337-3BA00	240 x 225		X	

Mounting areas and fixing options (continued)

Power supply	Order No.	Required mounting area in mm (W x H)	Mounting on a DIN rail acc. to EN 60715 35 x 7.5 mm	35 x 15 mm	Wall mounting
SITOP 24 V, 3-phase power supplies					
24 V/8 A	6EP1433-2CA00 [4]	Approx. 310 x 285			X
	6ES7148-4PC00-0HA0 [4]	Approx. 310 x 285			X
24 V/10 A	6EP1434-2BA10	90 × 225	X	X	
24 V/17 A	6EP1436-3BA20	70 x 225	X	X	
24 V/20 A	6EP1436-3BA10	70 x 225	X	X	
	6EP1436-3BA00	160 x 225	X	X	
	6EP1436-2BA10	90 × 225	X	X	
24 V/30 A	6EP1437-2BA20	150 x 225		X	
24 V/40 A	6EP1437-3BA10	150 x 225		X	
	6EP1437-3BA00	240 x 225		X	
	6EP1437-2BA20	150 x 225		X	
SITOP 24 V, uninterruptible power supplies					
SITOP UPS500S (2.5 kWs)	6EP1933-2EC41	120 x 225	X	X	
SITOP UPS500S (5 kWs)	6EP1933-2EC51	120 × 225	X	X	
SITOP UPS501S expansion module	6EP1935-5PG01	70 x 225	X	X	
SITOP UPS500P (5 kWs)	6EP1933-2NC01	500 x 178			X
SITOP UPS500P (10 kWs)	6EP1933-2NC11	570 x 178			X
SITOP UPS1600 10A (with USB interface; with Ethernet/ Profinet interface)	6EP4134-3AB00-0AY0 (-1AY0; -2AY0)	50 x 225	X	X	
SITOP UPS1600 20A (with USB interface; with Ethernet/ Profinet interface)	6EP4136-3AB00-0AY0 (-1AY0; -2AY0)	50 x 225	X	X	
DC UPS 6 A (with serial/ USB interface)	6EP1931-2DC21 (-2DC31/-2DC42)	50 x 225	X	X	
DC UPS 15 A (with serial/ USB interface)	6EP1931-2EC21 (-2EC31/-2EC42)	50 x 225	X	X	
DC UPS 40 A (with serial/ USB interface)	6EP1931-2FC21 (-2FC42)	102 x 225	X	X	
SITOP 24 V, uninterruptible power supplies, battery modules					
SITOP UPS1100 1.2 Ah	6EP4131-0GB00-0AY0	116 x 126	X	X	X
SITOP UPS1100 3.2 Ah	6EP4133-0GB00-0AY0	210 x 171	X	X	X
SITOP UPS1100 7 Ah	6EP4134-0GB00-0AY0	206 x 188			X
Battery module 1.2 Ah	6EP1935-6MC01	116 x 126	X	X	X
Battery module 2.5 Ah	6EP1935-6MD31	285 x 171	X	X	X
Battery module 3.2 Ah	6EP1935-6MD11	210 x 171	X	X	X
Battery module 7 Ah	6EP1935-6ME21	206 x 188			X
Battery module 12 Ah	6EP1935-6MF01	273 x 138			X
SITOP 24 V, expansion modules					
Signaling module	6EP1961-3BA10	26 x 225			
Redundancy module	6EP1962-2BA00	30 x 180	X	X	
	6EP1964-2BA00	30 x 180	X	X	
	6EP1961-3BA21	70 x 225	X	X	

Installation instructions, mounting areas and fixing options

Mounting areas and fixing options (continued)

Power supply	Order No.	Required mounting area in mm (W x H)	Mounting on a DIN rail acc. to EN 60715 35 x 7.5 mm	35 x 15 mm	Wall mounting
SITOP 24 V, expansion modules					
Buffer module	6EP1961-3BA01	70 x 225	X	X	
Selectivity module	6EP1961-2BA11, -2BA31	72 x 180	X	X	
	6EP1961-2BA21, -2BA41	72 x 180	X	X	
Diagnostics module	6EP1961-2BA00	72 x 190	X	X	
Switch-on current limiter	6EP1967-2AA00	22.5 x 180	X	X	
SITOP alternative voltages					
3-52 V/120 W	6EP1353-2BA00	75 x 225	X	X	
5 V/3 A	6EP1311-1SH03	54 x 130	X	X	
5 V/6.3 A	6EP1311-1SH13	72 x 130	X	X	
12 V/1.9 A	6EP1321-1SH03	54 x 130	X	X	
12 V/2 A	6EP1321-5BA00	30 × 180	X	X	
12 V/2.5 A	6EP1621-2BA00	32.5 × 225	X	X	
12 V/3 A	6EP1321-1LD00	158 (117) x 98			X
12 V/4.5 A	6EP1322-1SH03	72 x 130	X	X	
12 V/6.5 A	6EP1322-5BA10	52.5 × 180	X	X	
12 V/7 A	6EP1322-2BA00	50 x 225	X	X	
12 V/8.3 A	6EP1322-1LD00	58 (117) x 158			X
12 V/14 A	6EP1323-2BA00	70 x 225	X	X	
12 V/20 A	6EP1424-3BA00	70 × 225	X	X	
15 V/1.9 A	6EP1351-1SH03	54 x 130	X	X	
15 V/4 A	6EP1352-1SH03	72 x 130	X	X	
2 × 15 V/3.5 A	6EP1353-0AA00	75 × 325	X	X	
48 V/10 A	6EP1456-3BA00	70 × 225	X	X	
48 V/20 A	6EP1457-3BA00	240 × 255		X	

1) With additional mounting adapter 6ES7390-6BA00-0AA0.
2) With additional mounting adapter 6EP1971-1BA00.
3) Installation on S7-300 rail.
4) Installation on ET200pro mounting rail.
5) Installation on S7-1500 rail.

Planning aids

As an aid for planning and construction, operating instructions with mounting options, dimensional drawings and principle circuits with pin names in different file formats (also suitable for CAD applications) are available for download on the Internet.

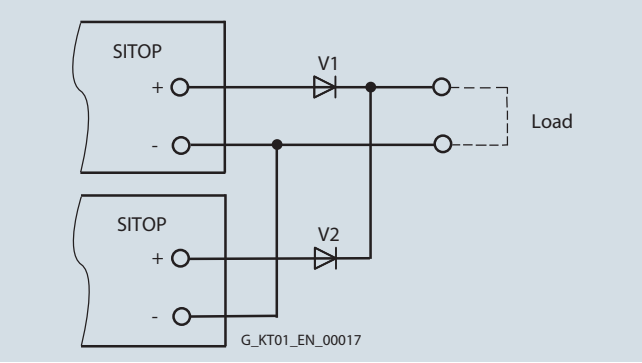
Further information is available on the Internet at
http://www.siemens.com/sitop

Parallel connection for redundant operation

Two SITOP power supplies of the same type can be connected in parallel through diodes for a redundant configuration. 100% redundancy only exists for two power supplies when the total load current is no higher than that which one power supply can supply alone and when the supply for the primary side is also implemented redundantly (i.e. a short-circuit on the primary side will not trigger a shared fuse which would disconnect both power supplies from the mains).

Parallel connection with decoupling diodes for redundant operation is permitted for all SITOP power supplies. The diodes V1 and V2 are used for decoupling. They must have a blocking voltage of at least 40 V (on decoupling from 24 V power supplies) and it must be possible to load them with a current equal to or greater than the maximum output current of the respective SITOP power supply. For diode dimensioning, see the following note "General information on selection of diodes".

The ready-to-use add-on "SITOP PSE202U modular redundancy modules" are available as a simple alternative to diode dimensioning (Order No.: 6EP1962-2BA00, 6EP1964-2BA00, 6EP1961-3BA21) for redundant connection of two power supplies.



Parallel connection of two SITOP power supplies for redundant operation

General information on selection of diodes

The diodes must be dimensioned for the maximum dynamic current. This can be the dynamic current during power-up in the short-circuit case, or the dynamic current during a short-circuit in operation (the larger of the two values should be taken from the relevant technical specifications).

To dissipate the significant power loss of the decoupling diodes (sustained short-circuit current x diode conductive-state voltage), the diodes must be equipped with suitably dimensioned heat sinks.

An additional safety margin is recommended, because the output capacitor integral to the power supply generates an additional peak current in the short-circuit case. This additional current flows only for a few milliseconds so it is within the period in which diodes are permitted to be loaded with a multiple of the rated current (< 8.3 ms, known as the permissible surge current for diodes) .

Example

Two 1-phase SITOP modular power supplies with 10 A rated output current (Order No.: 6EP1334-3BA00) are connected in parallel. The dynamic overcurrent in the event of a short-circuit during operation is approx. 30 A for 25 ms.

The diodes should therefore have a loading capability of 40 A to be safe, the common heat sink for both diodes must be dimensioned for the maximum possible current of approximately 24 A (sustained short-circuit current) x diode conductive-state voltage.

Parallel connection for performance enhancement

To enhance performance, identical types of most SITOP power supplies can be connected in parallel galvanically (the same principle as parallel connection for redundant operation, but without decoupling diodes):

The types permitted for direct galvanic parallel connection are listed in the relevant technical specifications under "Output, parallel connection for performance enhancement".

Prerequisite

- The output cables connected to terminals "+" and "-" of every power supply should be installed with an identical length and cross-section (or the same impedance) to the common external linking point.
- The power supplies connected in parallel must be switched simultaneously using a common switch in the mains supply line (e.g. using the main switch available in control cabinets).
- The output voltages of the power supplies must be measured under no-load operation before they are connected in parallel and are permitted to differ by up to 50 mV. This usually corresponds to the factory default setting. If the output voltage is changed in case of variable power supplies, the "–" terminals should first be connected and then the voltage difference between the "+" output terminals measured under no-load conditions before these are connected. The voltage difference must not exceed 50 mV.

Note

With a direct galvanic connection in parallel of more than two SITOP power supplies, further circuit measures may be necessary for short-circuit and overload protection!

Series connection to increase the voltage

Series connection to increase the voltage

To generate a load voltage of e.g. 48 V DC, two 24 V SITOP power supplies of the same type can be connected in series. The SITOP outputs "+" and "–" are isolated up to at least 60 V DC against PE (creepage and clearances as well as radio interference suppression capacitors on "+" and "–" against PE), so that with this type of series connection (see Figure), the following points can be grounded:

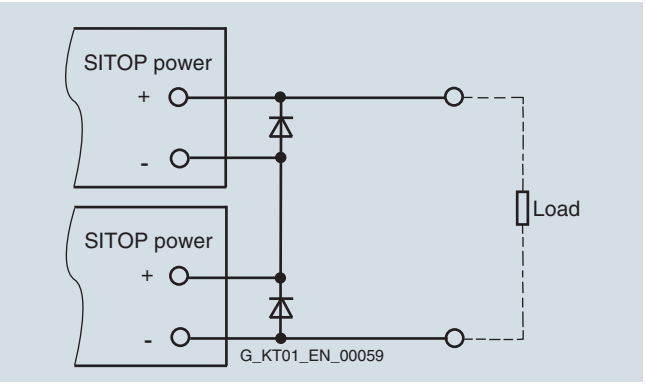
- "–" of the lower power supply (results in +48 V DC against PE)
- Midway "+"/ "–" between both power supplies (results in ±24 V DC against PE)
- "+" of the upper power supply (results in -48 V DC against PE)

Note

If two devices are connected in parallel, it cannot be guaranteed that the voltage will remain below the maximum permissible SELV voltage of 60 V DC in the event of a fault.

The purpose of diodes V1 and V2 is to protect the electrolytic output capacitor integrated in the power supply against reverse voltages > 1 V. As a result of the not absolutely simultaneous power-up (even when a common mains switch is used for switching on, differences of a few tens of milliseconds can occur between the various startup-up delays), the power supply which starts up more quickly supplies current from output "–" of the slower power supply whose output electrolytic capacitor is then theoretically impermissibly discharged.

The internal LC filter causes the internal rectifier diode on the secondary side of the slower-starting power supply to accept this current a few milliseconds later; this means that the external diode connected with its anode to "–" and cathode to "+" is essential on each power supply. These diodes are, however, only loaded dynamically so that the 8.3 ms surge current loading capability (specified in the data sheets for suitable diodes) can be used as a basis for dimensioning and it is not usually necessary to cool the diodes using heat sinks.



Series connection of two SITOP power units to double the voltage

Example

Two 1-phase SITOP modular power supplies with 10 A rated output current (Order No.: 6EP1 334-1AL12) should be connected in series for increasing the voltage. They supply approximately 35 A dynamically for 700 ms on power-up in the short-circuit case or also, for example, with loads with a high-capacity input capacitor that momentarily act as a short-circuit at the start.

Suitable diodes for V1 and V2 are, for example, of Type SB 340[1)] (Schottky diode in axially wired enclosure DO-201AD with approximately 5.3 mm diameter and approximately 9.5 mm length of body).

40 V are permissible as the blocking voltage, and the stationary direct current load capacity $I_{F\,AV}$ is 3 A. The dynamic surge current loading capacity $I_{F\,SM}$ important in this case is sufficient for the selected SITOP power supply at more than 100 A for 8.3 ms. For SITOP power supplies with a lower rated output current, this diode can also be used, but it is over-dimensioned.

- Manufacturer: General Instrument
- Distributor: e.g. RS Components, Spoerle

1) We do not accept any liability for this diode recommendation.

Battery charging with SITOP power supplies

The SITOP PSU300B 12 V/20 A (order number 6EP1424-3BA00), 24 V/17 A (order number 6EP1436-3BA20) and 24 V/30 A power supplies (order number 6EP1437-3BA20) are suitable for charging lead-acid batteries. In the case of a V/I characteristic set for parallel operation, the battery will be charged with a constant current until approximately 95 % of the set SITOP output voltage has been achieved. The charging current is then continuously reduced from 1.2 x rated current at 95 % of the set voltage to approximately 0 A or the self-discharge current of the battery at 100 % of the set output voltage, that is, resistance characteristic in this range.

As reverse voltage protection and polarity reversal protection, we recommend that a diode suitable for at least 1.2 x rated current of the power supply with a blocking voltage of at least 40 V is connected in series with the "+" output (anode connected to "+" output of the SITOP PSU300B and cathode connected to positive pole of the battery).

The output voltage of the power supply must be set at no-load to the end-of-charge voltage plus the voltage drop at the diode. For an end-of-charge voltage of e.g. 27.0 V DC (usual at 20 °C to 30 °C battery temperature; specifications of the battery manufacturer must be observed!) and 0.8 V voltage drop at the diode, the power supply must be set to 27.8 V during no-load operation.

General note for using SITOP power supplies as a battery charging unit

When using SITOP as a battery charging unit, the regulations of VDE 0510 or the relevant national regulations must be observed, and adequate ventilation of the battery location must be provided. SITOP power supplies are designed as rack-mounting units, and protection against electric shock should therefore be provided by installation in an appropriate housing.

The value recommended by the battery manufacturer must be set as the end-of-charge voltage (depending on the battery temperature). An ideal temperature for the lead-acid battery is between +20 °C to +30 °C and the recommended end-of-charge voltage in this case is usually about 27 V.

Fusing of the 24 V DC output circuit, selectivity

Fusing of 24 V power supply circuits and selectivity

With non-stabilized rectifiers (power transformer equipped with rectifier) the output usually had to be protected with a suitable fuse so that its rectifier diodes would not fail in the event of an overload or a short-circuit (this would destroy the DC loads due to the resulting alternating voltage and lead to serious damage in most cases).

On the other hand, the stabilized SITOP power supplies are provided with integral electronic short-circuit protection that automatically protects both the power supply and the supplied 24 V DC circuits against an excess current in the event of an overload/short-circuit. A distinction must be made between the following three cases with respect to fusing on the secondary side:

Example 1: No fusing

Fusing the secondary side (24 V DC) for protecting the load circuits and lines is not required if the respective cross-sections are selected for the maximum possible output current rms value. Depending on the event (short-circuit or overload) this may either be the short-circuit rms value or the current limitation value.

Example SITOP modular 10 (Order No.: 6EP1334-3BA00)

- 10 A rated current
- Current limitation typ. 12 A
- Short-circuit current rms value approximately 12 A

The technical specifications usually specify typical values, maximum values are approximately 2 A above the typical value. In the example here, a maximum possible output current rms value of approximately 14 A must therefore be used for line dimensioning.

Example 2: Reduced conductor cross-sections

If smaller conductor cross-sections are used than specified in the relevant standards (e.g. EN 60204-1), the affected 24 V load infeed cables must be protected with a suitable circuit breaker.

It is then unimportant whether the power supply enters current limiting mode (overload) or delivers the maximum short-circuit current (low-resistance short-circuit). The load supply is in any case protected against an overload by the line protection matched to the conductor cross-section.

Example 3: Selectivity

In cases where a load which has failed (e.g. because of a short-circuit) has to be rapidly detected or where it is essential to selectively switch it off before the power supply enters current limiting mode (with current limiting mode, the voltage would also fall for all remaining 24 V DC loads), there are two possibilities for the secondary side connection:

- Use of a SITOP PSE200U selectivity module or the SITOP select diagnostics module for distributing the 24 V DC supply between up to 4 load feeders. Each output can be set between 0.5 A and 3 A (order number: 6EP1961-2BA11, -2BA31) or 3 A and 10 A (order number: 6EP1961-2BA21, -2BA41) or 2 A and 10 A (order number: 6EP1961-2BA00).
- Series connection of appropriate 24 V DC fuses or miniature circuit breakers

The basis for selection of the 24 V DC fuse or circuit breaker is the short-circuit current above the rated current which the SITOP power supplies deliver in the event of a short-circuit during operation (values are specified in the respective technical specifications under "Output, dynamic V/I on short-circuit during operation").

It is not easy to calculate the amount of the short-circuit current flowing into the usually not ideal "short-circuit" and the amount flowing into the remaining loads. This depends on the type of overload (high-resistance or low-resistance short-circuit) and the type of load connected (resistive, inductive and capacitive/electronic loads).

However, it can be assumed with a first approximation in the average case encountered in practice that the difference of dyn. V/I minus 50 % SITOP rated output current is available for the immediate tripping of a circuit breaker within a typical time of 12 ms (with 14 times the rated DC with a circuit breaker characteristic C acc. to IEC 898, or with 7 times the rated DC with a circuit breaker characteristic B or with 5 times the rated DC with a circuit breaker characteristic A). Please refer to the following tables for circuit breakers appropriate for selected fusing according to this assumption.

List of ordering data and tripping characteristics of single-pole circuit breakers 5SY4...

acc. to IEC 898 / EN 60898, for use up to 60 V (250 V AC, switching capacity 10,000 A)

Rated current	Tripping characteristic	Order No.	Range for immediate tripping < 100 ms for operation with direct current (alternating current)	Required DC for immediate tripping in < 100 ms	Required DC for immediate tripping in approx. 12 ms
1 A	Type A	5SY4 101-5	DC: 2 ... 5 (AC: 2 ... 3) x I_{rated}	2 ... 5 A DC	5 A DC
1 A	Type C	5SY4 101-7	DC: 5 ... 14 (AC: 5 ... 10) x I_{rated}	5 ... 14 A DC	14 A DC
1.6 A	Type A	5SY4 115-5	DC: 2 ... 5 (AC: 2 ... 3) x I_{rated}	3.2 ... 8 A DC	8 A DC
1.6 A	Type C	5SY4 115-7	DC: 5 ... 14 (AC: 5 ... 10) x I_{rated}	8 ... 22.4 A DC	22.4 A DC
2 A	Type A	5SY4 102-5	DC: 2 ... 5 (AC: 2 ... 3) x I_{rated}	4 ... 10 A DC	10 A DC
2 A	Type C	5SY4 102-7	DC: 5 ... 14 (AC: 5 ... 10) x I_{rated}	10 ... 28 A DC	28 A DC
3 A	Type A	5SY4 103-5	DC: 2 ... 5 (AC: 2 ... 3) x I_{rated}	6 ... 15 A DC	15 A DC
3 A	Type C	5SY4 103-7	DC: 5 ... 14 (AC: 5 ... 10) x I_{rated}	15 ... 42 A DC	42 A DC
4 A	Type A	5SY4 104-5	DC: 2 ... 5 (AC: 2 ... 3) x I_{rated}	8 ... 20 A DC	20 A DC
4 A	Type C	5SY4 104-7	DC: 5 ... 14 (AC: 5 ... 10) x I_{rated}	20 ... 56 A DC	56 A DC
6 A	Type A	5SY4 106-5	DC: 2 ... 5 (AC: 2 ... 3) x I_{rated}	12 ... 30 A DC	30 A DC
6 A	Type B	5SY4 106-6	DC: 3 ... 7 (AC: 3 ... 5) x I_{rated}	18 ... 42 A DC	42 A DC
6 A	Type C	5SY4 106-7	DC: 5 ... 14 (AC: 5 ... 10) x I_{rated}	30 ... 84 A DC	84 A DC
8 A	Type A	5SY4 108-5	DC: 2 ... 5 (AC: 2 ... 3) x I_{rated}	16 ... 40 A DC	40 A DC
8 A	Type C	5SY4 108-7	DC: 5 ... 14 (AC: 5 ... 10) x I_{rated}	40 ... 112 A DC	112 A DC
10 A	Type A	5SY4 110-5	DC: 2 ... 5 (AC: 2 ... 3) x I_{rated}	20 ... 50 A DC	50 A DC
10 A	Type B	5SY4 110-6	DC: 3 ... 7 (AC: 3 ... 5) x I_{rated}	30 ... 70 A DC	70 A DC
10 A	Type C	5SY4 110-7	DC: 5 ... 14 (AC: 5 ... 10) x I_{rated}	50 ... 140 A DC	140 A DC
13 A	Type A	5SY4 113-5	DC: 2 ... 5 (AC: 2 ... 3) x I_{rated}	26 ... 65 A DC	65 A DC
13 A	Type B	5SY4 113-6	DC: 3 ... 7 (AC: 3 ... 5) x I_{rated}	39 ... 91 A DC	91 A DC
13 A	Type C	5SY4 113-7	DC: 5 ... 14 (AC: 5 ... 10) x I_{rated}	65 ... 182 A DC	182 A DC
16 A	Type A	5SY4 116-5	DC: 2 ... 5 (AC: 2 ... 3) x I_{rated}	32 ... 80 A DC	80 A DC
16 A	Type B	5SY4 116-6	DC: 3 ... 7 (AC: 3 ... 5) x I_{rated}	48 ... 112 A DC	112 A DC
16 A	Type C	5SY4 116-7	DC: 5 ... 14 (AC: 5 ... 10) x I_{rated}	80 ... 224 A DC	224 A DC

Fusing of the 24 V DC output circuit, selectivity

Miniature circuit breakers [1] acc. to EN 60898 (DIN VDE 0641 T11) in 24 V DC circuits which are powered by SITOP modular or SITOP smart power supplies

Order No.	$I_{out\ rated}$	$I_{out\ dyn.}$	Characteristic A									
			1 A	1.6 A	2 A	3 A	4 A	6 A	8 A	10 A	13 A	16 A
6EP1332-2BA20	2.5 A	9 A/ 800 ms	✓	✓	❍	X	X	X	X	X	X	X
6EP1333-2BA20	5 A	18 A/ 800 ms	✓	✓	✓	✓	❍	X	X	X	X	X
6EP1333-3BA00	5 A	15 A/ 25 ms	✓	✓	✓	❍	❍	X	X	X	X	X
6EP1334-2BA20	10 A	32 A/ 1000 ms	✓	✓	✓	✓	✓	✓	❍	X	X	X
6EP1334-3BA00	10 A	30 A/ 25 ms	✓	✓	✓	✓	✓	✓	❍	X	X	X
6EP1434-2BA10	10 A	16 A/ 100 ms	✓	✓	✓	✓	❍	X	X	X	X	X
6EP1336-2BA10	20 A	35 A/ 100 ms	✓	✓	✓	✓	✓	✓	❍	❍	X	X
6EP1336-3BA00	20 A	60 A/ 25 ms	✓	✓	✓	✓	✓	✓	✓	✓	❍	❍
6EP1336-3BA10	20 A	60 A/ 25 ms	✓	✓	✓	✓	✓	✓	✓	✓	❍	❍
6EP1436-2BA10	20 A	35 A/ 100 ms	✓	✓	✓	✓	✓	✓	❍	❍	X	X
6EP1436-3BA00	20 A	60 A/ 25 ms	✓	✓	✓	✓	✓	✓	✓	✓	❍	❍
6EP1436-3BA10	20 A	60 A/ 25 ms	✓	✓	✓	✓	✓	✓	✓	✓	❍	❍
6EP1337-3BA00	40 A	120 A/ 25 ms	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6EP1437-2BA20	40 A	65 A/ 120 ms	✓	✓	✓	✓	✓	✓	✓	✓	✓	❍
6EP1437-3BA00	40 A	120 A/ 25 ms	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
6EP1437-3BA10	40 A	120 A/ 25 ms	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

$I_{out\ rated}$: Rated output current.
$I_{out\ dyn}$: Dynamic overcurrent at short-circuit during operation.
✓: Instantaneous tripping, due to dynamic overcurrent resulting from a short-circuit > limit current of electromagnetic tripping.
❍: Instantaneous tripping likely, since at least 50 % of dynamic overcurrent resulting from a short-circuit is within tolerance band of the tripping characteristic.
X: No instantaneous tripping.

[1] This selection of trippable circuit breakers is based on the maximum possible short-circuit current of the power supply and the respective tripping characteristic at +20 °C. Additional parameters that may also be relevant in practice, such as self-heating, increases in ambient temperature, line impedance and currents flowing in parallel paths, were not taken into account.

	Characteristic B				Characteristic C									
	6 A	10 A	13 A	16 A	1 A	1.6 A	2 A	3 A	4 A	6 A	8 A	10 A	13 A	16 A
	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	X	X	X	X	✓	❍	X	X	X	X	X	X	X	X
	X	X	X	X	✓	X	X	X	X	X	X	X	X	X
	❍	X	X	X	✓	✓	✓	❍	X	X	X	X	X	X
	❍	X	X	X	✓	✓	✓	❍	X	X	X	X	X	X
	X	X	X	X	✓	❍	X	X	X	X	X	X	X	X
	❍	X	X	X	✓	✓	✓	❍	X	X	X	X	X	X
	✓	❍	X	X	✓	✓	✓	✓	✓	❍	X	X	X	X
	✓	❍	X	X	✓	✓	✓	✓	✓	❍	X	X	X	X
	❍	X	X	X	✓	✓	✓	❍	X	X	X	X	X	X
	✓	❍	X	X	✓	✓	✓	✓	✓	❍	X	X	X	X
	✓	❍	X	X	✓	✓	✓	✓	✓	❍	X	X	X	X
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❍	X	X
	✓	❍	❍	X	✓	✓	✓	✓	✓	❍	X	X	X	X
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❍	X	X
	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	❍	X	X

Standards and approvals

Overview of important standards and approvals

EN	European standards
EN 50178	Electronic equipment for use in power installations
EN 55022	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
EN 60079	Electrical apparatus for explosive gas atmospheres
EN 60529	Degrees of protection provided by enclosures (IP code)
EN 60721	Classification of environmental conditions
EN 60950-1	Information technology equipment – Safety
EN 61000-3-2	Electromagnetic compatibility (EMC) – Part 3-2: Limits for harmonic current emissions (equipment input current ≤16 A per phase)
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61000-6-3	Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for residential, commercial and light industrial environments
UL	**Underwriters Laboratories**
UL 508	Industrial control equipment
UL 1604	Electrical equipment for use in class I and class II, division 2, and class III hazardous (classified) locations
UL 1778	Uninterruptible power supply equipment
UL 2367	Solid state overcurrent protectors
UL 60079	Electrical apparatus for explosive gas atmospheres
UL 60950 -1	Information technology equipment – Safety
ANSI	**American National Standards Institute**
ANSI/ISA–12.12.01	Non-incendive electrical equipment for use in Class I and II, Division 2 and Class III, Divisions 1 and 2 hazardous (classified) locations
CSA	**Canadian Standards Association**
CSA C22.2 No. 14	Industrial control equipment
CSA C22.2 No. 142	Process control equipment
CSA C22.2 No. 107.1	General use power supplies
CSA C22.2 No. 213	Non-incendive electrical equipment for use in Class I, Division 2 hazardous locations
CSA C22.2 No. 60079	Electrical apparatus for explosive gas atmospheres
CSA C22.2 No. 60950-1	Information technology equipment – Safety
ATEX	**Equipment and protective systems intended for use in Potentially Explosive Atmospheres**
FM	**Factory Mutual Research**
ABS	**American Bureau of Shipping**
GL	**Germanischer Lloyd**

Appendix

16

16/2 **Siemens Industry Training**

16/3 **Partners at Industry Automation and Drive Technologies**

16/4 Siemens Solution Partner Automation

16/5 **Siemens Automation Cooperates with Education**

16/5 Applicable practical know-how

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Faster and more applicable know-how: Hands-on training from the manufacturer

Siemens Industry Training provides you with comprehensive support in solving your tasks.

Training by the market leader in the industry enables you to make independent decisions with confidence. Especially where the optimum and efficient use of products and plants are concerned. You can eliminate deficiencies in existing plants, and exclude expensive faulty planning right from the beginning.

First-class know-how directly pays for itself: In shorter startup times, high-quality end products, faster troubleshooting and reduced downtimes. In other words, increased profits and lower costs.

Achieve more with Siemens Industry Training

- Shorter times for startup, maintenance and servicing
- Optimized production operations
- Reliable configuration and startup
- Minimization of plant downtimes
- Flexible plant adaptation to market requirements
- Compliance with quality standards in production
- Increased employee satisfaction and motivation
- Shorter familiarization times following changes in technology and staff

Contact

Visit our site on the Internet at:

www.siemens.com/sitrain

or let us advise you personally.

Siemens Industry Training Customer Support Germany:

Phone: +49 (911) 895-7575

Fax: +49 (911) 895-7576

E-Mail: info@sitrain.com

Highlights Siemens Industry Training

Top trainers

Our trainers are skilled teachers with direct practical experience. Course developers have close contact with product development, and directly pass on their knowledge to the trainers.

Practical experience

The practical experience of our trainers enables them to teach theory effectively. But since theory can be pretty drab, we attach great importance to practical exercises which can comprise up to half of of the course time. You can therefore immediately implement your new knowledge in practice. We train you on state-of-the-art methodically/didactically designed training equipment. This training approach will give you all the confidence you need.

Wide variety

With a total of about 300 local attendance courses, we train the complete range of Siemens Industry products as well as interaction of the products in systems.

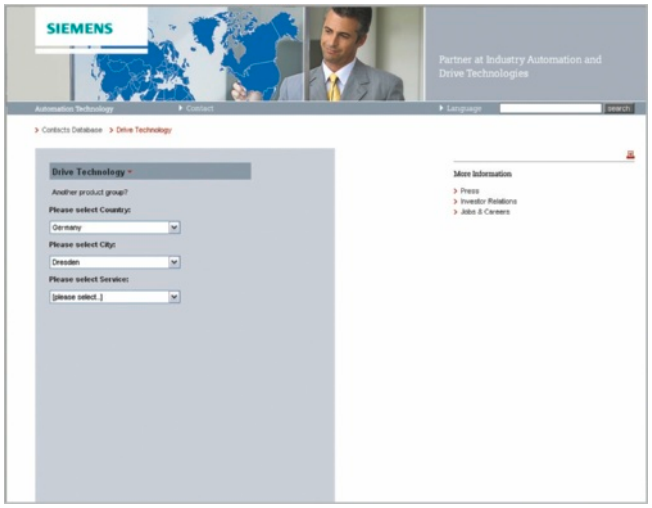
Tailor-made training

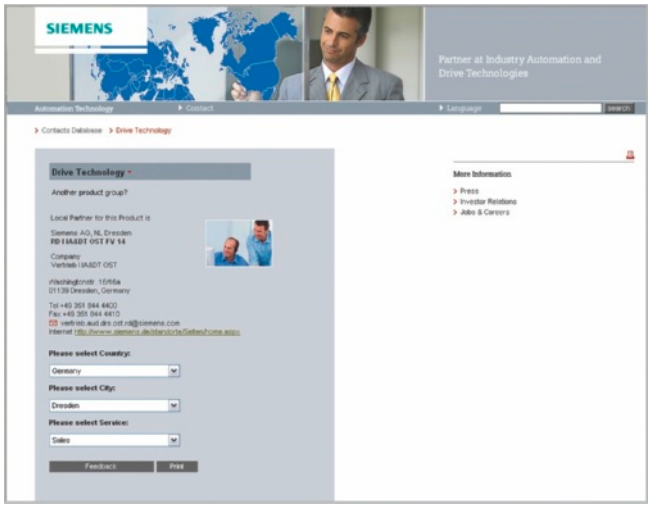
We are only a short distance away. You can find us at more than 50 locations in Germany, and in 62 countries worldwide. You wish to have individual training instead of one of our 300 courses? Our solution: We will provide a program tailored exactly to your personal requirements. Training can be carried out in our Training Centers or at your company.

The right mixture: Blended learning

"Blended learning" is a combination of various training media and sequences. For example, a local attendance course in a Training Center can be optimally supplemented by a teach-yourself program as preparation or follow-up. Additional effect: Reduced traveling costs and periods of absence.

Partners at Industry Automation and Drive Technologies





At Siemens Industry Automation and Drive Technologies, more than 85 000 people are resolutely pursuing the same goal: long-term improvement of your competitive ability. We are committed to this goal. Thanks to our commitment, we continue to set new standards in automation and drive technology. In all industries – worldwide.

At your service locally, around the globe for consulting, sales, training, service, support, spare parts ... on the entire Industry Automation and Drive Technologies range.

Your personal contact can be found in our Contacts Database at:
www.siemens.com/automation/partner

You start by selecting a

- Product group,
- Country,
- City,
- Service.

Siemens Solution Partner Automation

Overview

Siemens Solution Partner Automation

Solution Partner
Automation

SIEMENS

Solution Partner: Highest quality - guaranteed

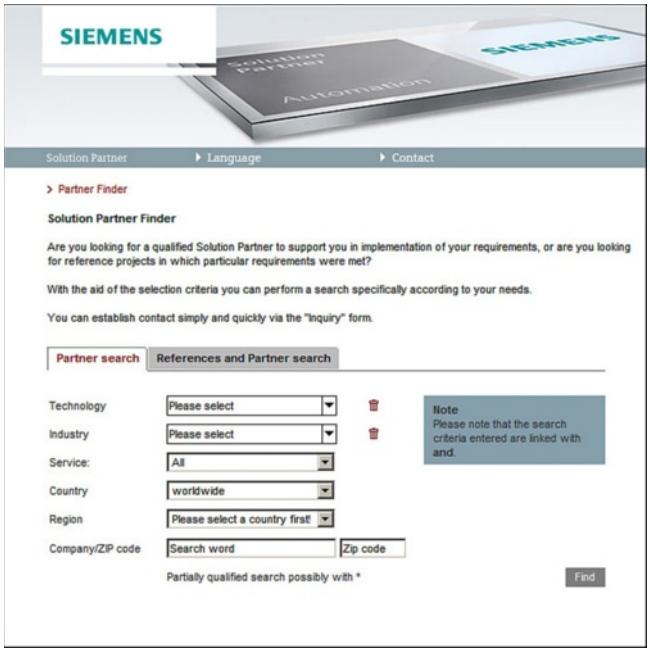
The products and systems from Siemens Industry Automation and Drive Technologies offer the ideal platform for all automation applications.

Under the name of Siemens Solution Partner Automation, selected system integrators around the world act as uniformly qualified solution providers for the Siemens range of products and services in the fields of automation and drives. Day after day, they utilize their qualified product and system know-how as well as their excellent industry expertise to your advantage – for all requirements.

The partner emblem is the guarantee and indicator of proven quality. The basis for this are defined quality features that identify Solution Partners as reliable and competent solution providers:

- Solution quality
  Always a good result with tried and tested solutions expertise.
- Expert quality
  Certified technical competence ensures maximum efficiency.
- Project quality
  With proven project experience straight to the target.
- Portfolio quality
  Comprehensive portfolio for state-of-the-art solutions from a single source.

Solution Partner Finder



The Siemens Solution Partner Program helps you to find the optimum partner for your specific requirements.

Support is provided by the Solution Partner Finder, a comprehensive online platform that showcases the profiles of all our solution partners. You can convince yourself of the competence of the respective Solution Partner by means of the references provided. Various search criteria are available for this purpose.

Once you have located a partner, you are only one small step away from contacting them.

Find the right partner here for your specific task and convince yourself of the solution competence provided:

www.siemens.com/automation/partnerfinder

Additional information on the Siemens Solution Partner Program is available online at:

www.siemens.com/automation/solutionpartner

Comprehensive teaching support for educational institutions

Cooperates with Education

Automation

SIEMENS

Siemens Automation Cooperates with Education (SCE) offers a global system for sustained support of technical skills. SCE supports educational institutions in their teaching assignment in the industrial automation sector and offers added value in the form of partnerships, technical expertise, and know-how. As the technological leader, our comprehensive range of services can support you in the knowledge transfer for Industry 4.0.

Our services at a glance

- Training curriculums for your lessons
- Trainer packages for hands-on learning
- Courses convey up-to-date, specialist knowledge
- Support for your projects/textbooks
- Complete didactic solutions from our partners
- Personal contact for individual support

Training curriculums for your lessons

Use our profound industrial know-how for practice-oriented and individual design of your course. We offer you more than 100 didactically prepared training curriculums on the topics of automation and drives technology free of charge. These materials are perfectly matched to your curricula and syllabuses, and optimally suited for use with our trainer packages. This takes into account all aspects of a modern industrial solution: installation, configuration, programming, and commissioning. All documents, including projects, can be individually matched to your specific requirements.

Particular highlights:

- With the new SIMATIC PCS 7 curriculums and trainer packages, you can pass on basic, practice-oriented PCS 7 knowledge at universities within about 60 hours (= 1 semester), using plant simulation.
- The new TIA Portal training materials for SIMATIC S7-1200 are available in English, German, French, Italian, Spanish and Chinese for download.

www.siemens.com/sce/documents

Trainer packages for hands-on learning

Our SCE trainer packages offer a specific combination of original industrial components which are perfectly matched to your requirements and can be conveniently used in your course. These price reduced bundles available exclusively to schools include innovative and flexible hardware and software packages. SCE can currently offers more than 90 SCE trainer packages including related equipment. These cover both the factory and process automation sectors. You can use them to impart the complete course contents on industrial automation at a very low cost.

Trainer packages are available for:

- Introduction to automation technology with LOGO! logic module and SIMATIC S7-1200 compact controller
- PLC engineering with SIMATIC S7 hardware and STEP 7 software (S7-300, S7-1500 and TIA Portal)
- Operator control and monitoring with SIMATIC HMI
- Industrial networking over bus systems with SIMATIC NET (PROFINET, PROFIBUS, IO-Link)
- Sensor systems with VISION, RFID and SIWAREX
- Process automation with SIMATIC PCS 7
- Power Monitoring Devices SENTRON PAC 4200
- Motor Management SIMOCODE
- Networked drive and motion technologies with SINAMICS/ SIMOTION
- CNC programming with SinuTrain

Important ordering notes:

Only the following institutions are authorized to obtain trainer packages: vocational schools, Colleges and Universities, in-house vocational training departments, non commercial research institutions and non commercial training departments.

To purchase a trainer package, you require a specific end-use certificate, which you can obtain from your regional sales office.

www.siemens.com/sce/tp

Applicable practical know-how

Comprehensive teaching support for educational institutions (continued)

Courses convey up-to-date specialist knowledge

Profit from our excellent know-how as the leader in industrial technologies. We offer you specific courses for automation and drive technology worldwide. These support you in the practice-oriented transferring of product and system know-how, are in conformance with curriculums, and derived from the training fields. Compact technical courses especially for use at universities are also available.

Our range of courses comprises a wide variety of training modules based on the principle of Totally Integrated Automation (TIA). The focus is on the same subject areas as with the SCE trainer packages.

Every PLC and drive course is oriented on state-of-the-art technology. Your graduates can thus be prepared optimally for their future professional life.

In some countries we are offering classes based on our training curriculums. Please inquire with your SCE contact partner.

www.siemens.com/sce/contact

Support for your projects/textbooks

Automation and drive technology is characterized by continuous and rapid developments. Service and Support therefore play an important role.

We can provide you with consulting for selected projects and support from your personal SCE contact as well as our web based and regional Customer Support.

As a particular service, SCE supports technical authors with our know-how as well as with intensive technical consulting. Siemens library of special textbooks covering the industrial automation sector provides an additional resource for you and your students. These can be found at the SCE web site.

www.siemens.com/sce/contact
www.siemens.com/sce/books

Complete didactic solutions

Our partners for learning systems offer a wide range of training systems and solutions for use in your courses or laboratory.

These models have been designed based on our trainer packages and thus save you the time and cost of self-construction of individual components. The Partner systems provide you with simple and effective help in the fulfillment of your teaching assignment.

www.siemens.com/sce/partner

Contact for individual support

You can find your personal SCE contact on our Internet site. Your local SCE Promoter will answer all your questions concerning the complete SCE offering, and provide you with timely and competent information about innovations. When you encounter challenges, you can profit from our global team of excellence.

If a direct SCE contact is not listed for your country, please contact your local Siemens office.

www.siemens.com/sce/contact

SCE Support Finder for your Internet request

You are an educator and need support on the topic of industry automation? Send us your request:

www.siemens.com/sce/supportfinder

Scan the QR code for further information (SCE homepage)

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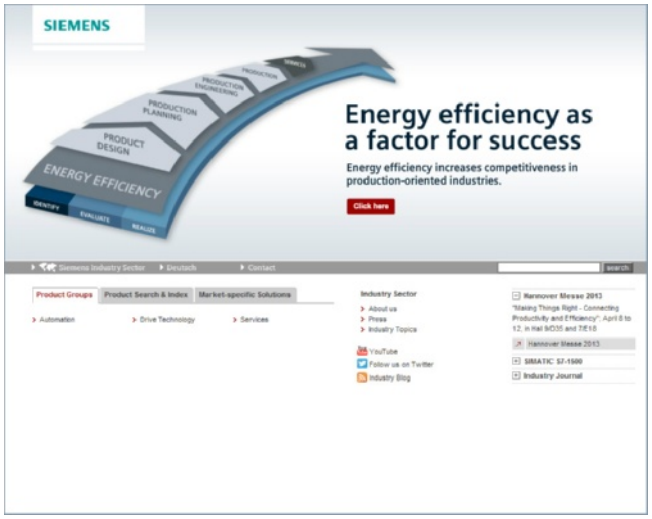
Siemens Industry Automation and Drive Technologies in the WWW



A detailed knowledge of the range of products and services available is essential when planning and configuring automation systems. It goes without saying that this information must always be fully up-to-date.

Siemens Industry Automation and Drive Technologies has therefore built up a comprehensive range of information in the World Wide Web, which offers quick and easy access to all data required.

Under the address

www.siemens.com/industry

you will find everything you need to know about products, systems and services.

Product Selection Using the Interactive Catalog CA 01 of Industry

Detailed information together with convenient interactive functions:
The interactive catalog CA 01 covers more than 80 000 products and thus provides a full summary of the Siemens Industry Automation and Drive Technologies product base.

Here you will find everything that you need to solve tasks in the fields of automation, switchgear, installation and drives.
All information is linked into a user interface which is easy to work with and intuitive.

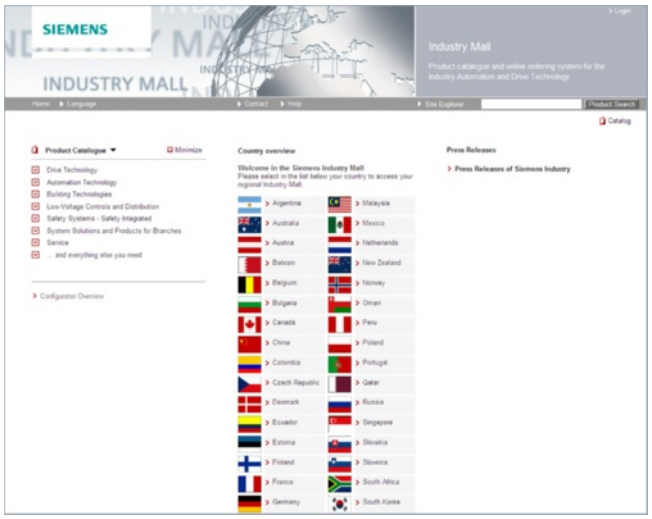
After selecting the product of your choice you can order at the press of a button, by fax or by online link.

Information on the interactive catalog CA 01 can be found in the Internet under

www.siemens.com/automation/ca01

or on DVD.

Easy Shopping with the Industry Mall



The Industry Mall is the virtual department store of Siemens AG on the Internet. Here you have access to a huge range of products presented in electronic catalogs in an informative and attractive way.

Data transfer via EDIFACT allows the whole procedure from selection through ordering to tracking of the order to be carried out online via the Internet.

Numerous functions are available to support you.

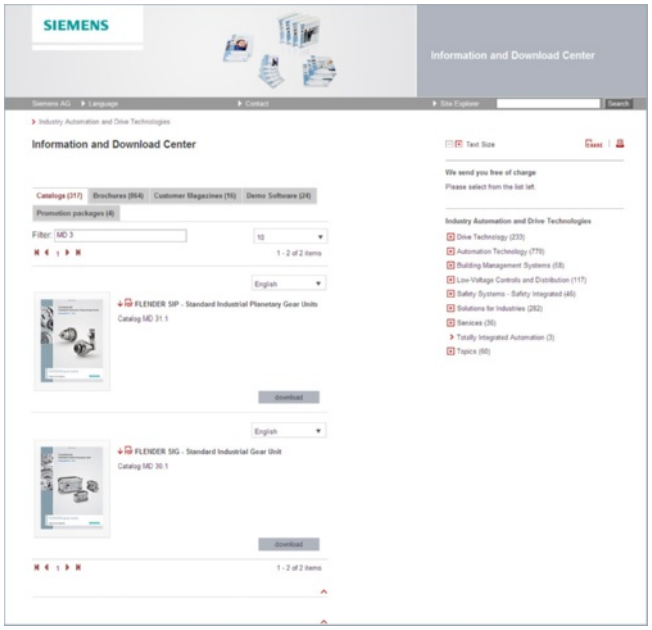
For example, powerful search functions make it easy to find the required products, which can be immediately checked for availability. Customer-specific discounts and preparation of quotes can be carried out online as well as order tracking and tracing.

Please visit the Industry Mall on the Internet under:

www.siemens.com/industrymall

Information and Download Center
Social Media, Mobile Media

Downloading Catalogs



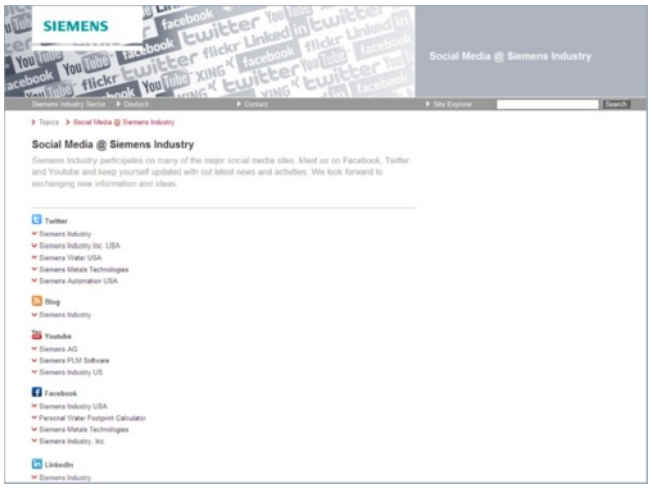
In addition to numerous other useful documents, you can also find the catalogs listed on the back inside cover of this catalog in the Information and Download Center. Without having to register, you can download these catalogs in PDF format or increasingly as digital page-turning e-books.

The filter dialog box above the first catalog displayed makes it possible to carry out targeted searches. If you enter “MD 3” for example, you will find both the MD 30.1 and MD 31.1 catalogs. If you enter “ST 70” both the ST 70 catalog and the associated news or add-ons are displayed.

Visit us on the web at:

www.siemens.com/industry/infocenter

Social Media



Connect with Siemens through social media: visit our social networking sites for a wealth of useful information, demos on products and services, the opportunity to provide feedback, to exchange information and ideas with customers and other Siemens employees, and much, much more. Stay in the know and follow us on the ever-expanding global network of social media.

Connect with Siemens Industry at our central access point:

www.siemens.com/industry/socialmedia

Or via our product pages at:

www.siemens.com/automation

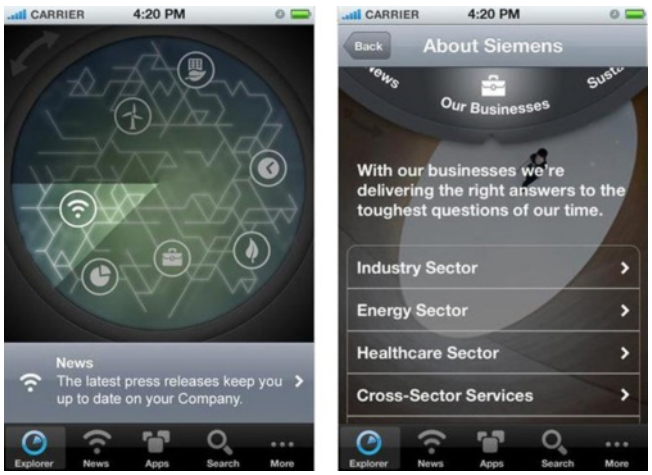
or

www.siemens.com/drives

To find out more about Siemens' current social media activities visit us at:

www.siemens.com/socialmedia

Mobile Media



Discover the world of Siemens.

We are also constantly expanding our offering of cross-platform apps for smartphones and tablets. You will find the current Siemens apps at the app store (iOS) or at Google Play (Android).

The Siemens app, for example, tells you all about the history, latest developments and future plans of the company – with informative pictures, fascinating reports and the most recent press releases.

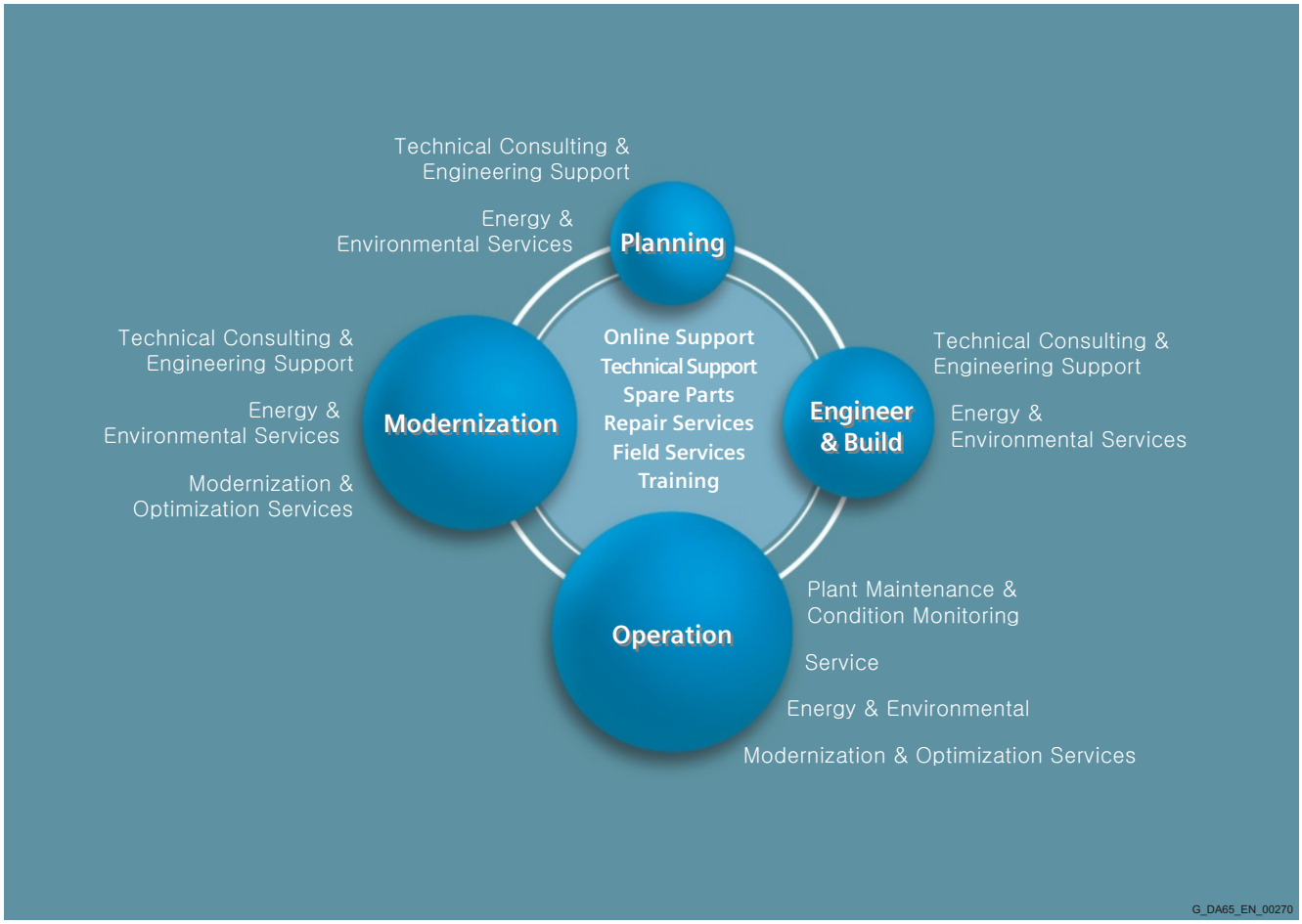
Your machines and plant can do more – with Industry Services.

Whether it is production or process industry - in view of rising cost pressure, growing energy costs, and increasingly stringent environmental regulations, services for industry are a crucial competitive factor in manufacturing as well as in process industries.

All over the world Siemens supports its customers with product, system, and application-related services throughout the entire life cycle of a plant. Right from the earliest stages of planning, engineering, and building, all the way to operation and modernization. These services enable customers to benefit from the Siemens experts' unique technological and product knowledge and industry expertise.

Thus downtimes are reduced and the utilization of resources is optimized. The bottom line: increased plant productivity, flexibility, and efficiency, plus reduced overall costs.

Discover all advantages of our service portfolio:
www.siemens.com/industry-services



Siemens supports its clients with technology based Services across a plants entire life cycle.

Industry Services for the entire life cycle

Online Support

Online support is a comprehensive information system for all questions relating to products, systems, and solutions that Siemens has developed for industry over time. With more than 300,000 documents, examples and tools, it offers users of automation and drive technology a way to quickly find up-to-date information. The 24-hour service enables direct, central access to detailed product information as well as numerous solution examples for programming, configuration and application.

The content, in six languages, is increasingly multimediabased – and now also available as a mobile app. Online support's "Technical Forum" offers users the opportunity to share information with each other. The "Support Request" option can be used to contact Siemens' technical support experts. The latest content, software updates, and news via newsletters and Twitter ensure that industry users are always up to date.

www.siemens.com/industry/onlinesupport

Online Support App

Using the Online Support app, you can access over 300,000 documents covering all Siemens industrial products - anywhere, any time. Regardless of whether you need help implementing your project, fault-finding, expanding your system or are planning a new machine.

You have access to FAQs, manuals, certificates, characteristics curves, application examples, product notices (e.g. announcements of new products) and information on successor products in the event that a product is discontinued.

Just scan the product code printed on the product directly using the camera of your mobile device to immediately see all technical information available on this product at a glance. The graphical CAx information (3D model, circuit diagrams or EPLAN macros) is also displayed. You can forward this information to your workplace using the e-mail function.

The search function retrieves product information and articles and supports you with a personalized suggestion list. You can find your favorite pages – articles you need frequently – under "mySupport". You also receive selected news on new functions, important articles or events in the News section.

Scan the QR code for information on our Online Support app.

The app is available free of charge from the Apple App Store (iOS) or from Google Play (Android).

www.siemens.com/industry/onlinesupportapp

Technical Support

The ability to quickly analyze system and error messages and take appropriate action are key factors in ensuring that plants run safely and efficiently. Questions can arise at any time and in any industry, whether it's an individual product or a complete automation solution. Siemens technical support offers individual technical assistance in matters related to functionality, how to operate, applications, and fault clearance in industrial products and systems – at any time and globally, over the phone, by e-mail, or via remote access. Experienced experts from Siemens answer incoming questions promptly. Depending on the requirements, they first consult specialists in the areas of development, on-site services, and sales. Technical support is also available for discontinued products that are no longer available. Using the support request number, any inquiry can be clearly identified and systematically tracked.

Spare Parts

Drive and automation systems must be available at all times. Even a single missing spare part can bring the entire plant to a standstill – and result in substantial financial losses for the operator. The spare parts services from Siemens protects against such losses – with the aid of quickly available, original spare parts that ensure smooth interaction with all other system components. Spare parts are kept on hand for up to ten years; defective parts can be returned. For many products and solutions, individual spare parts packages ensure a preventive stock of spare parts on-site. The spare parts services is available around the world and around the clock. Optimum supply chain logistics ensure that replacement components reach their destination as quickly as possible. Siemens' logistics experts take care of planning and management as well as procurement, transportation, customs handling, warehousing, and complete order management for spare parts.

Repair Services

Reliable electrical and electronic equipment is crucial for operating continuous processes. That is why it is essential that motors and converters always undergo highly specialized repair and maintenance. Siemens offers complete customer and repair services – on site and in repair centers – as well as technical emergency services worldwide. The repair services include all measures necessary to quickly restore the functionality of defective units. In addition, services such as spare parts logistics, spare parts storage and rapid manufacturing are available to plant operators in all verticals. With a global network of certified repair shops operated by Siemens as well as third parties, Siemens handles the maintenance and overhaul of motors, converters, and other devices as an authorized service partner.

Field Services

It's a top priority in all industries: the availability of plants and equipment. Siemens offers specialized maintenance services such as inspection and upkeep as well as rapid fault clearance in industrial plants – worldwide, continuously, and even with emergency services as needed. The services include startup as well as maintenance and fault clearance during operation. The startup service includes checking the installation, function tests, parameterization, integration tests for machines and plants, trial operation, final acceptance, and employee training. All services, including remote maintenance of drives, are also available as elements of customized service contracts.

Industry Services for the entire life cycle

Training

Increasingly, up-to-date knowledge is becoming a determining factor in success. One of the key resources of any company is well-trained staff that can make the right decision at the right moment and take full advantage of the potential. With SITRAIN – Training for Industry, Siemens offers comprehensive advanced training programs. The technical training courses convey expertise and practical knowledge directly from the manufacturer. SITRAIN covers Siemens' entire product and system portfolio in the field of automation and drives. Together with the customer, Siemens determines the company's individual training needs and then develops an advanced training program tailored to the desired requirements. Additional services guarantee that the knowledge of all Siemens partners and their employees is always up-to-date.

Technical Consulting & Engineering Support

The efficiency of plants and processes leads to sustainable economic success. Individual services from Siemens help save substantial time and money while also guaranteeing maximum safety. Technical consulting covers the selection of products and systems for efficient industrial plants. The services include planning, consulting, and conceptual design as well as product training, application support, and configuration verification – in all phases of a plant's lifecycle and in all questions related to product safety. Engineering support offers competent assistance throughout the entire project, from developing a precise structure for startup to product-specific preparation for implementation as well as support services in areas such as prototype development, testing and acceptance.

Energy & Environmental Services

Efficient energy use and resource conservation – these top sustainability concerns pay off – both for the environment and for companies. Siemens offers integrated solutions that unlock all technical and organizational potential for successful environmental management. Customized consulting services are aimed at sustainably lowering the cost of energy and environmental protection and thus increasing plant efficiency and availability. The experts provide support in the conceptual design and implementation of systematic solutions in energy and environmental management, enabling maximum energy efficiency and optimized water consumption throughout the entire company. Improved data transparency makes it possible to identify savings potential, reduce emissions, optimize production processes, and thereby noticeably cut costs.

Modernization & Optimization Services

High machine availability, expanded functionality and selective energy savings – in all industries, these are decisive factors for increasing productivity and lowering costs. Whether a company wants to modernize individual machines, optimize drive systems, or upgrade entire plants, Siemens' experts support the projects from planning to commissioning.

Expert consulting and project management with solution responsibility lead to security and make it possible to specifically identify savings potential in production. This secures investments over the long term and increases economic efficiency in operation.

Plant Maintenance & Condition Monitoring

Modern industrial plants are complex and highly automated. They must operate efficiently in order to ensure the company's competitive strength. In addition, the steadily increasing networking of machines and plants require consistent security concepts. Maintenance and status monitoring as well as the implementation of integrated security concepts by Siemens' experts support optimum plant use and avoid downtime. The services include maintenance management as well as consulting on maintenance concepts, including the complete handling and execution of the necessary measures. Complete solutions also cover remote services, including analysis, remote diagnosis, and remote monitoring. These are based on the Siemens Remote Services platform with certified IT security.

Service Contracts

Making maintenance costs calculable, reducing interfaces, speeding up response times, and unburdening the company's resources – the reduced downtimes that these measures achieve increase the productivity of a plant. Service contracts from Siemens make maintenance and repairs more cost-effective and efficient. The service packages include local and remote maintenance for a system or product group in automation and drive technology. Whether you need extended service periods, defined response times, or special maintenance intervals, the services are compiled individually and according to need. They can be adjusted flexibly at any time and used independently of each other. The expertise of Siemens' specialists and the capabilities of remote maintenance thus ensure reliable and fast maintenance processes throughout a plant's entire lifecycle.

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Appendix

Notes

Notes

Conditions of sale and delivery Export regulations

1. General Provisions

By using this catalog you can acquire hardware and software products described therein from Siemens AG subject to the following Terms and Conditions of Sale and Delivery (hereinafter referred to as "T&C"). Please note that the scope, the quality and the conditions for supplies and services, including software products, by any Siemens entity having a registered office outside Germany, shall be subject exclusively to the General Terms and Conditions of the respective Siemens entity. The following T&C apply exclusively for orders placed with Siemens Aktiengesellschaft, Germany.

1.1 For customers with a seat or registered office in Germany

For customers with a seat or registered office in Germany, the following applies subordinate to the T&C:

- the "General Terms of Payment"[1] and,
- for software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or Registered Office in Germany"[1] and,
- for other supplies and services, the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry"[1].

1.2 For customers with a seat or registered office outside Germany

For customers with a seat or registered office outside Germany, the following applies subordinate to the T&C:

- the "General Terms of Payment"[1] and,
- for software products, the "General License Conditions for Software Products for Automation and Drives for Customers with a Seat or Registered Office outside of Germany"[1] and
- for other supplies and/or services, the "General Conditions for Supplies of Siemens Industry for Customers with a Seat or Registered Office outside of Germany"[1].

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The prices are in € (Euro) ex point of delivery, exclusive of packaging.

The sales tax (value added tax) is not included in the prices. It shall be charged separately at the respective rate according to the applicable statutory legal regulations.

Prices are subject to change without prior notice. We will charget the prices valid at the time of delivery.

To compensate for variations in the price of raw materials (e.g. silver, copper, aluminum, lead, gold, dysprosium and neodym), surcharges are calculated on a daily basis using the so-called metal factor for products containing these raw materials. A surcharge for the respective raw material is calculated as a supplement to the price of a product if the basic official price of the raw material in question is exceeded.

The metal factor of a product indicates the basic official price (for those raw materials concerned) as of which the surcharges on the price of the product are applied, and with what method of calculation.

An exact explanation of the metal factor can be downloaded at:

www.siemens.com/automation/salesmaterial-as/catalog/en/terms_of_trade_en.pdf

To calculate the surcharge (except in the cases of dysprosium and neodym), the official price from the day prior to that on which the order was received or the release order was effected is used.

To calculate the surcharge applicable to dysprosium and neodym ("rare earths"), the corresponding three-month basic average price in the quarter prior to that in which the order was received or the release order was effected is used with a one-month buffer (details on the calculation can be found in the explanation of the metal factor).

3. Additional Terms and Conditions

The dimensions are in mm. In Germany, according to the German law on units in measuring technology, data in inches apply only to devices for export.

Illustrations are not binding.

Insofar as there are no remarks on the individual pages of this catalog - especially with regard to data, dimensions and weights given - these are subject to change without prior notice.

4. Export regulations

We shall not be obligated to fulfill any agreement if such fulfillment is prevented by any impediments arising out of national or international foreign trade or customs requirements or any embargoes and/or other sanctions.

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Subject to change without prior notice
Article No. E86060-K2410-A101-A9-7600
MP.R1.SC.0000.70.3.03 / Dispo 10001
KG 0913 3. S 208 En
Printed in Germany

www.siemens.com/automation