IDEAL FOR INDUSTRIAL COMMUNICATION

SCALANCE powered by SITOP

Controller communication plays an important role in the digitalization of machines, plants, and energy distribution. Our industrial communication portfolio enables the optimal linkage of automation components with the network components based on a professional infrastructure planning and implementation. A reliable power supply is a prerequisite for continuous data exchange. SITOP offers the right power supply for all switches with a 24 V DC input from the SCALANCE portfolio. On the following pages you will find information on their infeed data, such as input voltages and currents, the specification “NEC Class 2”, and the possibility of redundant 24 V supply via two decoupled inputs.

SIEMENS

siemens.com/scalance
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Industrial communication

Industrial Ethernet Switches – SCALANCE X

Industrial Security Appliances – SCALANCE S

Industrial Routers – SCALANCE M

Industrial Wireless LAN – SCALANCE W

SIMATIC CPs and Cloud Connect

Power supplies for a wide range of demands

NEC CLASS 2

Advanced

PROFI NET OPC UA

SITOP PSU8600

SITOP PSU8200

Standard

SITOP PSU6200

SITOP smart

Basic

SITOP lite

LOGO! Power

Special design

SITOP PSU3600 dual

DC/DC converters

SITOP PSU3400

SITOP PSU400M

… individually expandable with add-on modules even up to all-round protection

Redundancy modules

PSE202U

Selectivity modules

PSE200U

Buffer module

DC UPS with …

… capacitors

PROFI NET OPC UA

… batteries

Failure of one PS → Overload in the 24 V circuit

Seconds → Minutes → Hours

Time to bridge in case of power outage

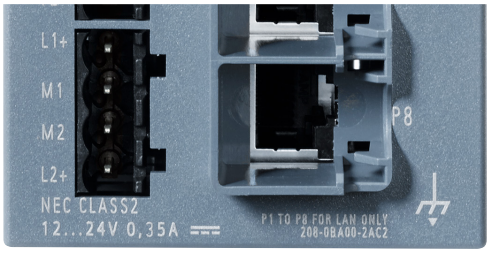
24 V DC supply according to NEC Class 2

24 V power supply with power limitation to 100 VA according to NEC Class 2

By limiting the performance of the power supply, it is assumed that there is no risk of electric shock or fire in the output circuit. This assumption is the basis of the NEC Class 2 (National Electrical Code) standard for electrical equipment in the USA, which is issued by the National Fire Protection Association (NFPA). Power supplies and additional components for the supply of the control circuit with NEC Class 2 approval are characterized by the fact that even in the event of a fault, their output capacity is limited to 100 VA. The use of these certified components as well as the correct and standard-compliant project engineering of the switchgear can significantly simplify the audit in North America.

A power supply with a limitation to 100 VA is not only relevant for switching equipment intended to be used in the USA. The limited output capacity is also used by some automation components to achieve the required fire protection safety. This also includes the SCALANCE portfolio. The devices concerned are identified in the following tables.

The notice regarding the supply with limited power can also be found in the manuals of the respective SCALANCE devices:



SCALANCE devices with a maximum supply of 100 VA are labeled “NEC CLASS 2“ at the 24 V input.

WARNING

The device is designed for operation with a directly connectible safety extra-low voltage (SELV) by means of a power supply with limited power (limited power source, LPS).

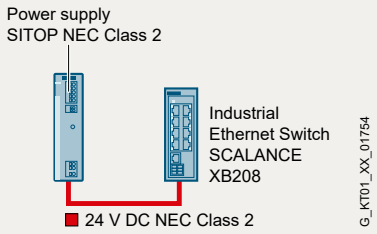
Therefore, only safety extra-low voltages (SELVs) with limited power (limited power source, LPS) according to IEC 60950-1/ EN 60950-1/VDE 0805-1 or IEC 62368-1/EN 62368-1/VDE 62368-1 may be connected to the supply ports or the power supply unit for supplying the device must comply with NEC Class 2 according to the National Electrical Code (r) (ANSI/NFPA 70).

In case the device is connected to a redundant power supply (two separate power supplies), both must adhere to the mentioned requirements.

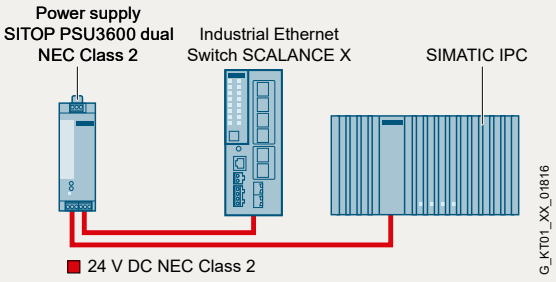
Manuals in SIOS: **https://support.industry.siemens.com**

Configuration examples with NEC Class 2 power supply

There are different options to realize NEC Class 2 control circuits. The conventional way is to use NEC Class 2 power supplies.



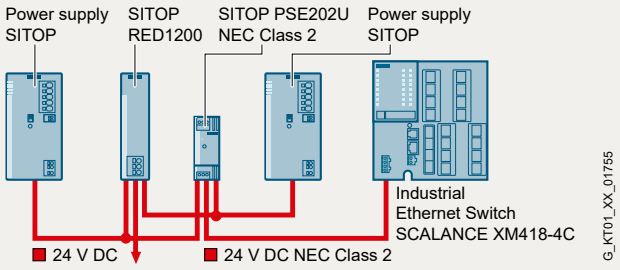
Power supply unit with NEC Class 2, e.g., PSU6200 24 V/3.7 A



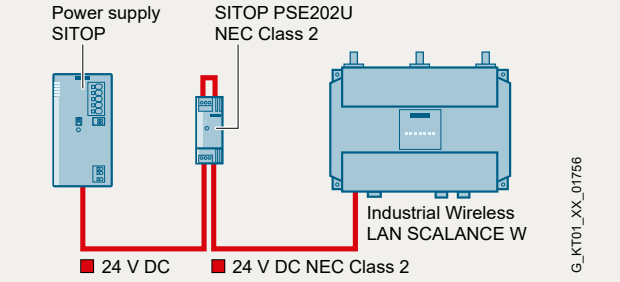
Power supply module SITOP PSU3600 dual with two NEC Class 2 outputs, each adjustable from 12 to 28 V DC

Configuration examples with NEC Class 2 add-on modules

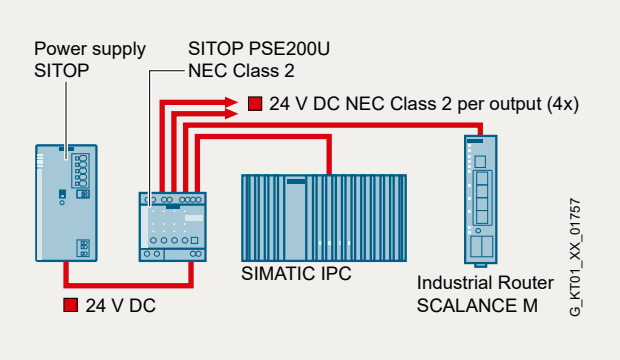
In addition to the conventional variant with an NEC Class 2 power supply, there are options to set up control circuits according to NEC Class 2 with SITOP add-on modules. The certified add-on modules ensure power limitation to 100 VA. This solution has the advantage that a central, high-performance power supply can be used. Depending on the requirements, the NEC Class 2 outputs can be set up decentralized with a variety of add-on modules.



Redundant 24 V supply via two power supply units and redundancy module SITOP PSE202U with NEC Class 2



High-performance power supply unit and redundancy module with NEC Class 2



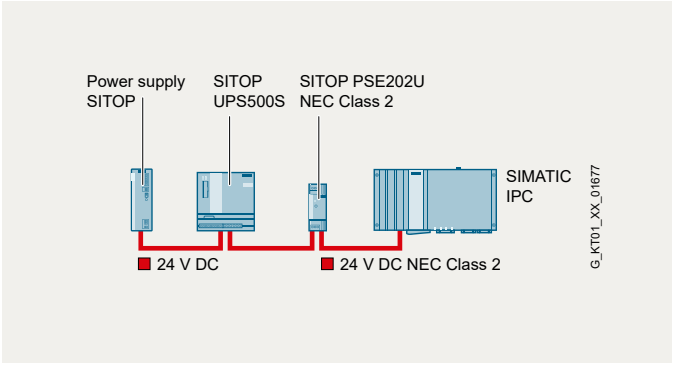
High-performance power supply unit and the selectivity module SITOP PSE200U with NEC Class 2

Uninterruptible 24 V DC supply according to NEC Class 2

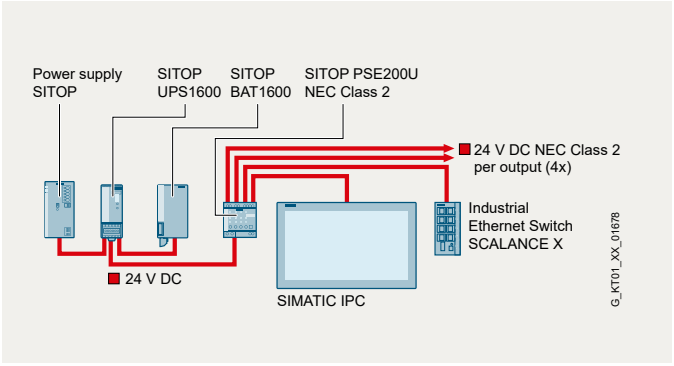
If loads with required NEC Class 2 infeed are supplied by a DC UPS, using a power supply with NEC Class 2 is not sufficient. The reason is the buffer operation during which the load is supplied via the energy storage (battery or capacitors), whose output power is not limited to 100 VA by the DC UPS module.

Using the SITOP add-on modules with NEC Class 2, the power limitation to 100 VA is maintained in both grid and buffer operation. This allows for a more effective power supply unit to be used. Typical consumers are industrial PCs that can be shut down safely by means of the DC UPS even in the event of a grid outage or disconnection.

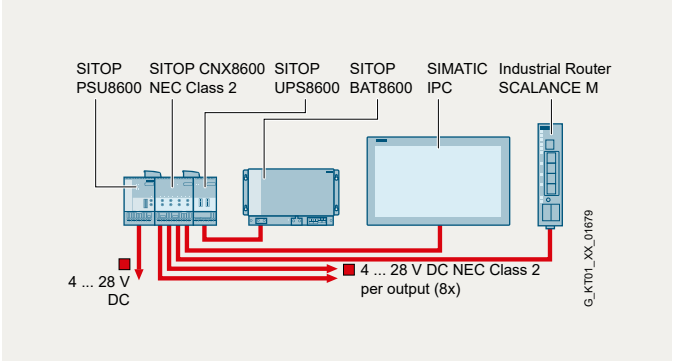
Configuration examples with DC UPS and NEC Class 2 feeders



24 V power supply according to NEC Class 2 via a high-performance power supply unit with capacitor-based DC UPS SITOP UPS500S and redundancy module SITOP PSE202U with NEC Class 2



24 V power supply according to NEC Class 2 via a high-performance power supply unit with DC UPS module SITOP UPS1600 and battery module BAT1600 as well as selectivity module SITOP PSE200U with four NEC Class 2 outputs



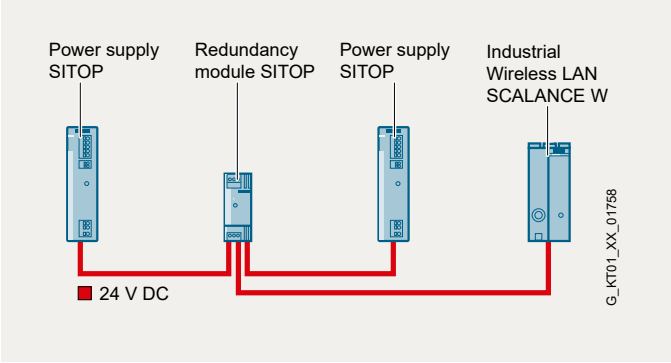
24 V power supply according to NEC Class 2 via power supply system SITOP PSU8600 with expansion module CNX8600 with NEC Class 2 and buffering of the output via DC UPS UPS8600 with battery module BAT8600

Redundant 24 V DC supply

When implementing a redundant power supply, a redundancy module is usually used to decouple the power supply.
For some automation components, a redundancy module is not necessary, as they can be supplied redundantly with two 24 V inputs.

The inputs are decoupled from one another and provide the necessary safety in case one power supply unit fails. Many SCALANCE devices feature a redundant 24 V infeed – see the following overviews with the addition “redundant”.

SITOP power supply with redundancy module



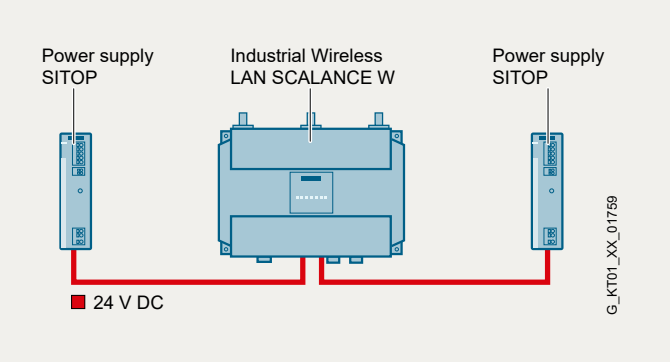
Benefit:

- If a load requires an NEC Class 2 infeed, the PSE202U redundancy module can be used simultaneously for redundancy and power limitation according to NEC Class 2. This allows two power supplies with higher performance to be used to supply all 24 V loads.

Disadvantages:

- Required redundancy modules go along with higher costs, wiring efforts, and space requirements
- Line between redundancy module and load is not redundant (single point of failure)

SITOP power supply without redundancy module



Benefits:

- No redundancy module required, resulting in lower costs, wiring efforts, and space requirements
- No single point of failure in the 24 V supply

Disadvantage:

- If the consumer requires an NEC Class 2 infeed, both power supplies must meet this requirement.

Power supply SCALANCE X – Industrial Ethernet Switches

Operations Level	X-500 managed	XR-500				
						
		24 V/1 – 1.5 A, max. device configuration: 12.5 A				
		redundant				
Control Level	X-400 managed	XM-400	+Port Extender PE408			
				24 V infeed according to NEC Class 2 (max. 100 W) redundant Two 24 V infeeds decoupled from each other for redundant supply		
		24 V/0.6 A	24 V/2 A			
		redundant	redundant			
	X-300 managed	X-300	XR-300WG		XR-300/XR-300EEC	
						
		24 V/0.2 – 1.8 A	24 V/0.5 A		24 V/0.5 A	
		redundant				
Field Level	X-200 managed	XB-200	XC-200	XP-200	XF-200BA	XF-200
						
		24 V/0.17 – 0.41 A	24 V/0.18 – 0.75 A or PoE [1]	24 V/0.2 – 0.4 A	24 V/0.4 A	24 V/0.1 – 0.36 A
		redundant	redundant	redundant	redundant	redundant
	X-200RNA managed X-200IRT managed	X-200RNA	X-200IRT	X-200IRT PRO	XF-200IRT	X-200P IRT
						
		24 V/0.15 A	24 V/0.3 – 0.4 A	24 V/0.2 – 0.3 A	24 V/0.1 – 0.22 A	24 V/0.3 – 0.4 A
		redundant	redundant		redundant	redundant
		(EEC: no NEC Class 2, not redundant)				
	X-100 unmanaged	XB-100	XC-100	XC-100WG	X-100 media converter	
						
		24 V/0.3 A	24 V/0.2 – 0.33 A	24 V/0.25 A	24 V/0.12 – 0.22 A	
		redundant	redundant		redundant	
	X-000 unmanaged			CSM Compact Switch Module		
		X-000	XB-000	LOGO! CSM	CSM 1277	CSM 377
						
		24 V/0.08 A	24 V/0.1 – 0.52 A	24 V/0.15 A	24 V/0.07 A	24 V/0.07 A

[1] XC-200G PoE does not require NEC Class 2

Power supply SCALANCE W – Industrial Wireless LAN

	11n/Wi-Fi 4			11ac/Wi-Fi 5	11ax/Wi-Fi 6
Client Module					
For production hall mounting		W738 M12	W748 M12	W1748 M12	WUM766-1
					
		24 V/0.25 A or PoE	24 V/0.65 A or PoE	24 V/0.7 A or PoE	24 V/0.55 A or PoE
		redundant	redundant	redundant	redundant
For use in control cabinet	W721, W722	W734	W748		WUM763-1
					
	24 V/0.15 A	24 V/0.25 A or PoE	24 V/0.65 A or PoE		24 V/0.55 A
		redundant	redundant		redundant
Access Points					
For enhanced environment conditions (EEC)		W774 EEC, W778 M12 EEC	W788 M12 EEC	W1788 M12 EEC	WAM766-1 EEC
					
		24 V/0.25 A or PoE	24 V/0.65 A or PoE	24 V/0.7 A or PoE	24 V/0.55 A or PoE
		redundant	redundant	redundant	redundant
For outdoor use			W786		
					
			24 V/0.7 A or PoE		
For production hall mounting		W778 M12	W788 M12	W1788 M12	WAM766-1
					
		24 V/0.25 A or PoE	24 V/0.65 A or PoE	24 V/0.7 A or PoE	24 V/0.55 A or PoE
		redundant	redundant	redundant	redundant
For use in control cabinet	W761	W774	W788		WAM763-1
					
	24 V/0.15 A	24 V/0.25 A or PoE	24 V/0.65 A or PoE		24 V/0.55 A
		redundant	redundant		redundant

24 V infeed according to NEC Class 2 (max. 100 W)

redundant
Two 24 V infeeds decoupled from each other for redundant supply

Power supply SCALANCE M – modems and routers

Public		Private	
Wireless		**Wired**	
M876	**MUM856-1**	**M804PB**	**M826-2**
			
24 V/0.3 A	**24 V/0.55 A or PoE**	**24 V/0.3 A**	**24 V/0.3 A**
6GK5876-4AA00-2BA2 (4G/LTE)	6GK5856-2EA00-3AA1	6GK5804-0AP00-2AA2 (MPI)	6GK5826-2AB00-2AB2 (SHDSL)
redundant	**redundant**	**redundant**	**redundant**

Power supply SCALANCE S – Industrial Security Appliances

Interfaces	**10/100 Mbps**	**10/100/1000 Mbps**
Firewall	**100 Mbps**	**600 Mbps**
VPN	**35 Mbps**	**120 Mbps**
Firewall/NAT/VPN	**S615**	**SC642-2C** **SC646-2C**
	 Maximum: 128 rules 20 VPNs	 Maximum: 1000 rules 200 VPNs
	24 V/0.2 A	**24 V/0.38 – 0.4 A**
	6GK5615-0AA00-2AA2	6GK5642-2GS00-2AC2 6GK5646-2GS00-2AC2
		redundant
Firewall/NAT		**SC622-2C** **SC632-2C** **SC636-2C**
		 Maximum: 1000 rules
	24 V infeed according to NEC Class 2 (max. 100 W)	**24 V/0.38 – 0.4 A**
	redundant Two 24 V infeeds decoupled from each other for redundant supply	6GK5622-2GS00-2AC2 6GK5632-2GS00-2AC2 6GK5636-2GS00-2AC2
		redundant

Power supply SIMATIC NET – CPs and CloudConnect

SIMATIC Controller	CPs – Security communication processors			CloudConnect
S7-1500	TIM 1531 IRC	CP 1542-5 CM 1542-5 CM 1542-1 CP 1543-1 CP 1545-1		SIMATIC CC712 SIMATIC CC716
				
	24 V/0.16 A	Supply via 15 V backplane bus		24 V/0.25 A
	6GK7543-1MX00-0XE0	6GK7542-5FX00-0XE0 6GK7542-5DX00-0XE0 6GK7542-1AX00-0XE0 6GK7543-1AX00-0XE0 6GK7543-1GX00-0XE0		6GK1411-1AC00 6GK1411-5AC00
S7-300	CP 342-5 CP 342-5 FO	CP 343-1	CP 343-1 Lean	
				
	24 V/0.25 A	24 V/0.16 A	24 V/0.16 A	
	6GK7342-5DA03-0XE0 6GK7342-5DF00-0XE0	6GK7343-1EX30-0XE0	6GK7343-1CX10-0XE0	
ET200 SP	CP 1542 SP-1 CP 1542 SP-1 IRC CP 1543 SP-1			
				
	24 V/0.25 A			
	6GK7542-6UX00-0XE0 6GK7542-6VX00-0XE0 6GK7542-6WX00-0XE0			
S7-1200	CM 1243-5 Profibus Master CP 1242-7 GPRS CP 1243-7 LTE CP 1243-8 IRC	CP 1243-1 CM 1242-5		
				
	24 V/0.1 A or 5 V backplane bus	Supply via 15 V backplane bus		
	6GK7243-5DX30-0XE0 6GK7242-7KX31-0XE0 6GK7243-7KX30-0XE0 6GK7243-7SX30-0XE0 6GK7243-8RX30-0XE0	6GK7243-1BX30-0XE0 6GK7242-5DX30-0XE0		

24 V infeed according to NEC Class 2 (max. 100 W)

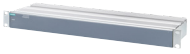
SITOP power supplies and add-on modules

Variants with NEC Class 2 and for PoE (Power-over-Ethernet) supply

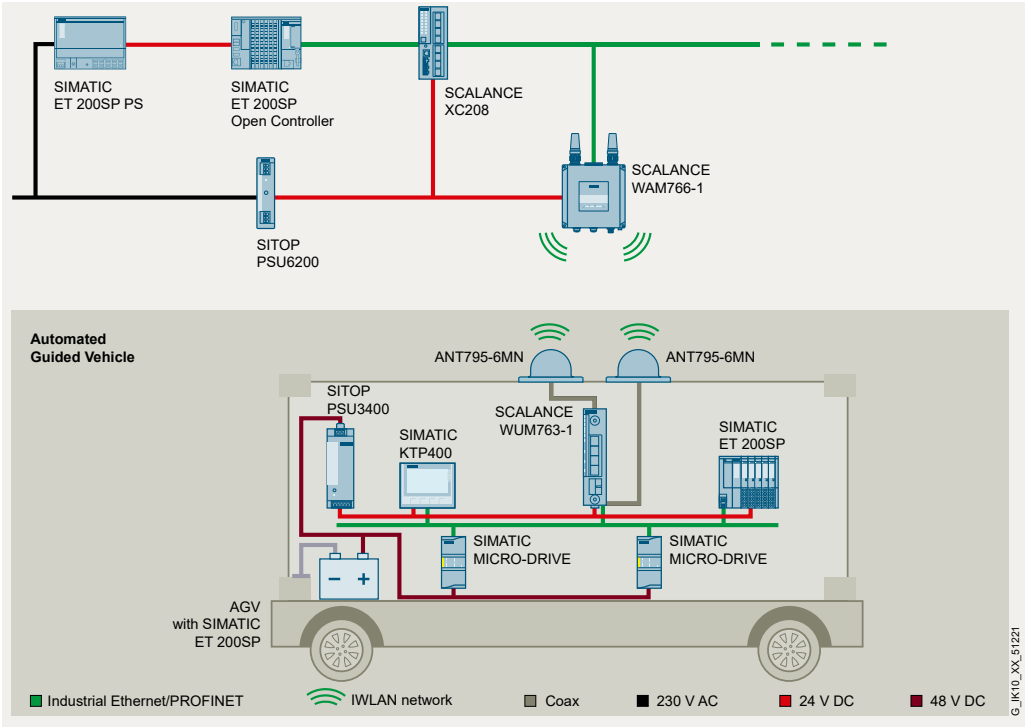
Power supplies with NEC Class 2		Article No.
 	**LOGO!Power**	
	5 V/3 A	**6EP3310-6SB00-0AY0**
	12 V/0.9 A	**6EP3320-6SB00-0AY0**
	12 V/1.9 A	**6EP3321-6SB00-0AY0**
	15 V/1.9 A	**6EP3321-6SB10-0AY0**
	15 V/4 A	**6EP3322-6SB10-0AY0**
	24 V/0.6 A	**6EP3330-6SB00-0AY0**
	24 V/1.3 A	**6EP3331-6SB00-0AY0**
	24 V/2.5 A	**6EP3332-6SB00-0AY0**
	**SITOP PSU6200**	
	12 V/2 A	**6EP3321-7SB00-0AX0**
	24 V/1.3 A	**6EP3331-7SB00-0AX0**
	24 V/2.5 A	**6EP3332-7SB00-0AX0**
	24 V/3.7 A	**6EP3333-7LB00-0AX0**
	**SITOP PSU3600 dual**	
	2 x 15 V/3.5 A	**6EP3323-0SA00-0BY0**
	**DC/DC converters SITOP PSU3400**	
	48 V/24 V/3.5 A	**6EP3233-0TA10-0AY0**

SITOP add-on modules with NEC Class 2		
	**Redundancy module SITOP PSE202U**	
	24 V/3.5 A	**6EP1962-2BA00**
	**Selectivity module SITOP PSE200U**	
	24 V/4 x 3 A	
	with common signaling contact	**6EP1961-2BA51**
	with single-channel signaling	**6EP1961-2BA61**
	**Expansion module for power supply system SITOP PSU8600 – SITOP CNX8600**	
	8 x 2.5 A	**6EP4436-8XB00-0DY0**

Power supplies for SCALANCE XR-500 without NEC Class 2		Article No.
	**SCALANCE PS598-1**	
	24 V/12.5 A	**6GK5598-1AA00-3AA0**
	24 V/20.8 A	**6GK5598-2AA00-3AA0**

Power supplies for PoE (Power-over-Ethernet) with NEC Class 2		
	**SCALANCE PS924 POE**	
	54 V/1.6 A Input 120/230 V AC	**6GK5923-0PS00-3AA2**
	54 V/1.6 A Input 24 V DC	**6GK5924-0PS00-1AA2**
without NEC Class 2		
	**RUGGEDCOM RPS1300**	
	54 V/2.6 A	**6GK6000-8HS01-0AA0**
	**SCALANCE PSR9230 POE**	
	54 V/4 A	**6GK5923-0PS00-2RA3**

Example for the selection of power supplies: Application “automated guided vehicle system”



Fixed installation

Network components:	Power consumption at 24 V:
SCALANCE XC208	175 mA (NEC Class 2)
SCALANCE WAM766-1	550 mA (NEC Class 2)
Total	**0.725 A**

Selected power supplies:

- SITOP PSU6200 24 V/1.3 A NEC Class 2
- SIMATIC ET 200SP PS 24 V/5 A for ET 200SP Open Controller

Automated guided vehicle system

Automation components:	Power consumption at 24 V:
SCALANCE WUM763-1	550 mA (NEC Class 2)
SIMATIC ET 200SP	600 mA, starting current 900 mA
SIMATIC KTP400 Comfort	310 mA
Total	**1.46 A**

Selected DC/DC converter:

- SITOP PSU3400 48 V/24 V/3.5 A NEC Class 2

More information:

siemens.com/scalance
siemens.com/sitop

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Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to the enterprise network or the Internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit: **https://www.siemens.com/industrialsecurity.**

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed under: **https://www.siemens.com/industrialsecurity.**