

Documentation | EN

PS3001-2410-0001

Power supply 24 V DC, 10 A, 1 phase

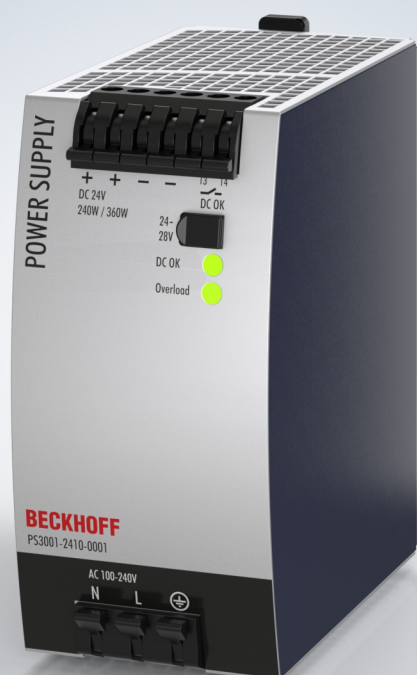


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1 Overview

PS3001-2410-0001 | Power supply 24 V, 10 A, 1-phase



- AC 100-240 V wide-range input
- Width only 60 mm,
- Efficiency up to 93.5%
- 150% peak power, 360 W for 4 s
- Precise triggering of fuses through high overload / peak current
- Active power factor correction (PFC)
- Negligible input inrush current surge
- Full power between -25 °C and +60 °C
- DC-OK relay contact
- Quick connection with spring-loaded terminals

The PS3001-2410-0001 is a 1-phase 24 V power supply with an output current of 10 A and an output power of 240 W.

On the input side, the device features a wide-range input, active power factor correction (PFC) and inrush current limiting.

The PS3001-2410-0001 power supply features an Extra Power output with a maximum output power of 150% over 4 seconds and is able to trigger fuses precisely with a short-term peak current. A DC-OK LED, an overload LED and a potential-free relay contact monitor the status of the output voltage

The power supply is part of the PS3000 family and has a width of 60 mm.

Overview of technical data ^{*)}

Overview of technical data	PS3001-2410-0001
Output voltage	DC 24 V (nominal)
Adjustment range	24 - 28 V (24.1 V preset)
Output current	10 - 9 A (continuous) ambient temperature < 60 °C 7.5 - 6.8 A (continuous) ambient temperature < +70 °C 15 - 13.5 A (short-term up to 4 s) ambient temperature < +70 °C linear derating between +60 °C and +70 °C
Output power	240 W (continuous); 360 W (short-term up to 4 s)
Output ripple	< 50 mVpp (20 Hz to 20 MHz, 50 Ohm)
Input voltage AC	AC 100 - 240 V +15%
Mains frequency	50 - 60 Hz ±6%
Input current AC	2.22 / 1.22 A at 120 / 230 Vac
Power factor	0.98 / 0.92 at 120 / 230 Vac
Inrush current surge AC	typically 4 / 7 A peak at 120 / 230 Vac, temperature-independent
Efficiency	92.6 / 93.5% at 120 / 230 Vac
Losses	19.1 / 16.7 W at 120 / 230 Vac
Operating temperature range	-25 °C to +70 °C
Derating	6 W / °C (+60 °C to +70 °C)
Hold-up time	Typ. 27 / 28 ms at 120 / 230 Vac
Dimensions (W x H x D)	60 x 124 x 117 mm (without DIN rail)
Weight	900 g
Approvals/markings	CE, UKCA, EAC, cULus
*) All values typical for 24 V, 10 A, 230 Vac, 25 °C ambient temperature and after a warm-up time of 5 minutes, unless otherwise stated.	

2 Foreword

2.1 Notes on the documentation

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The documentation has been prepared with care. The products described are, however, constantly under development.

We reserve the right to revise and change the documentation at any time and without prior announcement.

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Patent Pending

The EtherCAT Technology is covered, including but not limited to the following patent applications and patents: EP1590927, EP1789857, EP1456722, EP2137893, DE102015105702 with corresponding applications or registrations in various other countries.

Intended audience

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards.

It is essential that the documentation and the following notes and explanations are followed when installing and commissioning these components.

It is the duty of the technical personnel to use the documentation published at the respective time of each installation and commissioning.

The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

2.2 Safety instructions

Description of instructions

In this documentation the following instructions are used.
These instructions must be read carefully and followed without fail!

DANGER

Serious risk of injury!

Failure to follow this safety instruction directly endangers the life and health of persons.

WARNING

Risk of injury!

Failure to follow this safety instruction endangers the life and health of persons.

CAUTION

Personal injuries!

Failure to follow this safety instruction can lead to injuries to persons.

NOTICE

Damage to environment/equipment or data loss

Failure to follow this instruction can lead to environmental damage, equipment damage or data loss.



Tip or pointer

This symbol indicates information that contributes to better understanding.

Intended use

This device is designed for installation in a housing and is intended for general professional use, for example in industrial control systems or office, communication and measuring equipment.

Do not use this power supply in installations where a malfunction could cause serious injury or danger to human life.

Exclusion of liability

All the components are supplied in particular hardware and software configurations appropriate for the application. Modifications to hardware or software configurations other than those described in the documentation are not permitted, and nullify the liability of Beckhoff Automation GmbH & Co. KG.

Personnel qualification

This description is only intended for trained specialists in control, automation and drive engineering who are familiar with the applicable national standards.

Safety regulations

Please note the following safety instructions and explanations!
Product-specific safety instructions can be found on following pages or in the areas mounting, wiring, commissioning etc.

Safety instructions and installation requirements for the PS3001-2410-0001 power supply** DANGER****Danger of electric shock, fire, injuries, injuries resulting in death!**

- Do not use the power supply without proper grounding (protective conductor). Use the terminal at the input terminal strip for the earth connection, not one of the screws on the housing.
- Switch off the power supply before working on the device. Provide protection against unintentional reconnection.
- Ensure proper wiring by following all local and national regulations.
- Do not modify or attempt to repair the device.
- Do not open the device, as high voltages are present inside.
- Avoid foreign bodies entering the housing.
- Do not use the device in damp locations or in areas where moisture or condensation is likely to occur.
- Do not touch the device when it is switched on or immediately after it has been switched off. Hot surfaces can cause burns.
- If this device is operated outside the specification, the protection provided by the device may be negatively affected.

i Further notes on installation requirements



- If any damage or malfunction occurs during installation or operation, turn off the power supply immediately and return the device to the factory for inspection.
 - Mount the device on a DIN rail according to EN 60715 so that the input terminals are on the underside of the device. It will be necessary to reduce the output current if other installation positions are chosen (see chapter [Installation positions](#) [[▶ 42](#)]).
 - Install the device in a housing that provides protection against electrical, mechanical and fire hazards.
 - Make sure that the wiring is correct by complying with all local and national regulations.
 - ⇒ Use suitable copper cables designed for a minimum operating temperature of 60 °C at ambient temperatures up to +45 °C, 75 °C at ambient temperatures up to +60 °C and 90 °C at ambient temperatures up to +70 °C.
 - ⇒ Make sure that all individual strands of a wire are inside the terminal connection.
 - ⇒ Unused screw terminals should be tightened firmly.
 - The maximum temperature of the ambient air is +70 °C. The operating temperature corresponds to the ambient air temperature and is defined 2 cm below the device.
 - This device is designed for convection cooling and does not require an external fan. Do not obstruct the air circulation. The ventilation grille must not be covered (e.g. by cable ducts)!
 - Maintain the following installation distances:
 - ⇒ 40 mm at the top, 20 mm at the bottom and 5 mm on the left and right are recommended if the device continuously runs at more than 50 % of the rated output.
 - ⇒ Increase this distance to 15 mm if the adjacent device is a heat source (e.g., another power supply).
 - ⇒ The distance can be reduced from 5 mm to zero if the device is permanently loaded with less than 50 %.
 - An isolating device must be provided for the device input.
 - The device is designed, tested and approved for branch circuits up to 20 A without an additional protective device.

If an external input protection device is used, do not use one smaller than a 6 A B or 4 A C characteristic in order to avoid incorrect triggering of the circuit breaker.
 - The device is designed as equipment of "Protection Class I" according to IEC 61140.
 - ⇒ Do not use the device without a proper PE (Protective Earth) connection!
-

i Further notes on operation

- This device contains no parts that require maintenance. If an internal fuse trips, this is due to an internal defect.
 - The device is designed for areas with a degree of pollution 2 in controlled environments. No condensation or frost is allowed.
 - The device housing offers IP20 protection. The housing offers no protection against spilled liquids.
 - The device is designed for operation in the relative humidity range between 5 % and 95 %.
 - The insulation of the device is designed to withstand impulse voltages of overvoltage category III according to IEC 60664-1.
 - The device is suitable for supply from TN, TT or IT networks. The continuous voltage between the input terminal and the PE potential must not exceed 276 Vac.
 - The input can also be supplied by batteries or other DC voltage sources. The continuous potential difference between the supply voltage and the PE/ground potential must not be greater than 375 Vdc.
 - The device is designed for altitudes up to 5000 m. Above 2000 m a reduction of the output current and overvoltage category is required.
-

2.3 Terminology and abbreviations

PE and the earthing symbol 	PE is the abbreviation for "protective earth" and has the same meaning as the earthing symbol 
Earth, ground	This document uses the term "earth" which is the same as the U.S. term "ground".
T.b.d.	Still to be defined, value or description will follow in due course.
AC 230 V	A value preceded by "AC" or "DC" represents a nominal voltage or a nominal voltage range. The nominal voltage or the nominal voltage range may be provided with tolerances. (e.g., AC 230 V \pm 10%). The calculated total range then indicates the working range of the device. Example: DC 12 V refers to a 12 V battery, regardless of whether it is fully charged (13.7 Vdc) or discharged (10 Vdc).
230 Vac	A value followed by the unit Vac or Vdc is an instantaneous value that does not contain any additional tolerances.
50 Hz vs. 60 Hz	Unless otherwise specified, AC 230 V parameters are valid at a mains frequency of 50 Hz.
may	A keyword indicating a choice without implied preference.
shall	A keyword indicating a mandatory requirement.
should	A keyword indicating a choice with a clearly preferred method of implementation.

3 Technical data, mounting, wiring

3.1 AC input

AC input			
AC input	Nom.	AC 100 - 240 V	Suitable for TN, TT and IT networks
AC input range	Min.	85 - 276 Vac	Continuous operation
	Min.	276 - 300 Vac	For up to 500 ms max.
Permissible voltage L or N to earth	Max.	276 Vac	Continuous according to IEC 60664-1
Input frequency	Nom.	50 - 60 Hz	±6 %
Turn-on voltage	Typ.	81 Vac	Static, see Fig. <i>Input voltage range; switch-on behavior definitions</i>
Shut-down voltage	Typ.	63 Vac	Static, see Fig. <i>Input voltage range; switch-on behavior definitions</i>
	Typ.	55 Vac	Dynamic value

AC input		AC 100 V	AC 120 V	AC 230 V	
Input current	Typ.	2.65 A	2.22 A	1.22 A	At 24 V, 10 A, see Fig. <i>Input current over output current; power factor over output current</i>
Power factor*)	Typ.	0.99	0.98	0.92	At 24 V, 10 A, see Fig. <i>Input current over output current; power factor over output current</i>
Peak factor**)	Typ.	1.65	1.67	1.85	At 24 V, 10 A
Start-up delay	Typ.	800 ms	650 ms	340 ms	See Fig. <i>Input voltage range; switch-on behavior definitions</i>
Rise time	Typ.	8 ms	8 ms	8 ms	At 24 V, 10 A, continuous current, 0 mF load capacitance, see fig. <i>Input voltage range; switch-on behavior - definitions</i>
	Typ.	15 ms	15 ms	15 ms	At 24 V, 10 A, continuous current, 10 mF load capacitance, see fig. <i>Input voltage range; switch-on behavior - definitions</i>
Turn-on overshoot	Max.	100 mV	100 mV	100 mV	See Fig. <i>Input voltage range; switch-on behavior definitions</i>

*) The power factor is the ratio of real (or active) power to apparent power in an AC circuit.

**) The peak factor is the mathematical ratio of the peak value to the RMS value of the input current waveform.

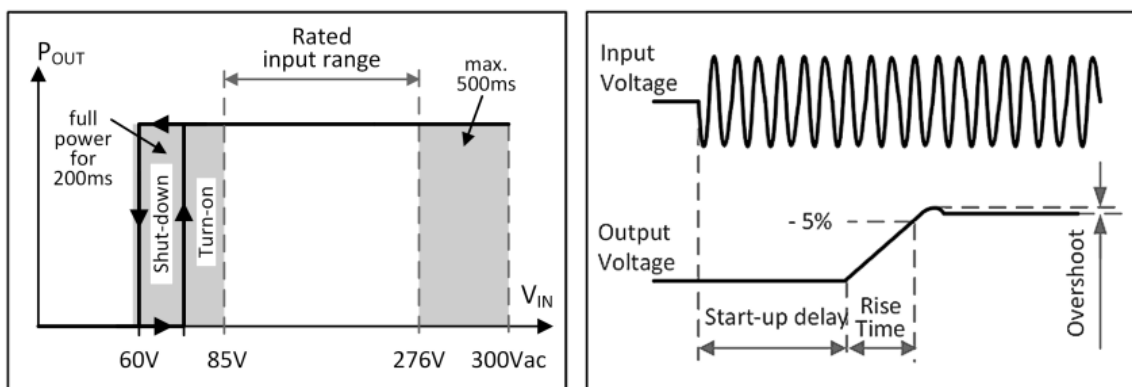


Fig. 1: Input voltage range; switch-on behavior definitions

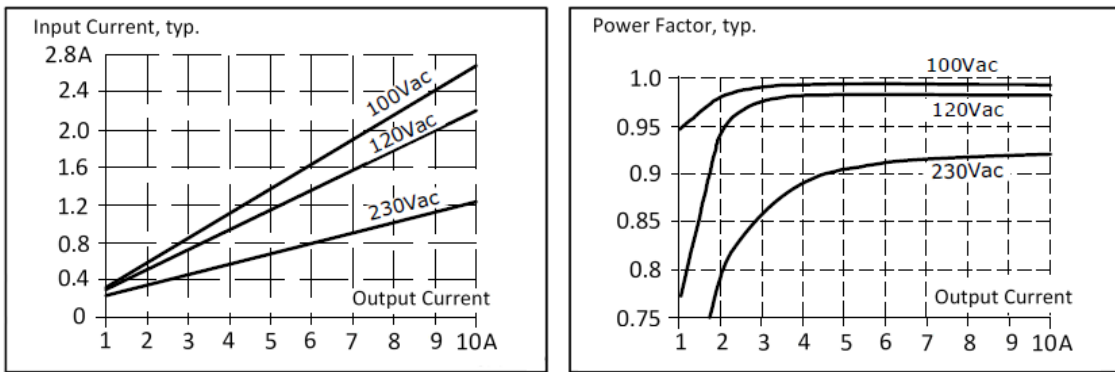


Fig. 2: Input current over output current; power factor over output current

3.2 DC input

DC input			
DC input	Nom.	DC 110 - 150 V	-20% / +25%
DC input range	Min.	88 - 187 Vdc	Continuous operation
DC input current	Typ.	2.37 A	At 110 Vdc, at 24 V, 10 A
Permissible voltage L or N to earth	Max.	375 Vdc	according to IEC 60664-1
Turn-on voltage	Typ.	80 Vdc	static
Shut-down voltage	Typ.	55 Vdc	static

Instructions for DC operation

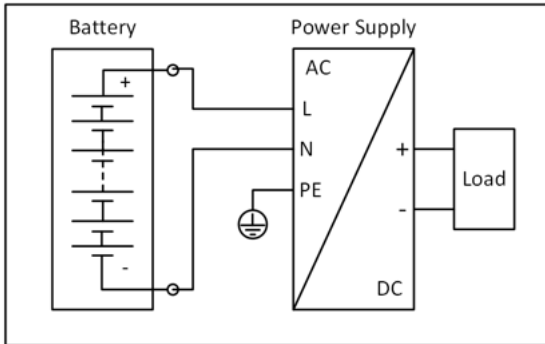


Fig. 3: Wiring for DC input

- Use a battery or a comparable DC source.
Supplying power from the DC link of a frequency converter is not recommended and can lead to a malfunction or damage to the device.
- Connect the positive pole to L and the negative pole to N.
- Connect the PE terminal to the protective conductor or machine ground.

3.3 Input inrush current

Due to the application of an input voltage to the device, the input and output capacitors are charged, as a result of which a current peak is generated at the device's input. This input inrush current must be limited in order to avoid the undesirable tripping of input circuit breakers or the melting of relay or switching contacts.

The following table provides input inrush current values for various operating conditions.

The charge current of the interference suppression capacitors during the first few microseconds after switching on is not taken into account.

This device is equipped with an electronic input inrush current limiter, which reduces the inrush current peak to a minimum value.

		AC 100 V	AC 120 V	AC 230 V	
Input inrush current	Max.	5 A _{peak}	4 A _{peak}	7 A _{peak}	temperature-independent
	Typ.	10 A _{peak}	10 A _{peak}	10 A _{peak}	temperature-independent
Inrush energy	Max.	4 A ² s	4 A ² s	4 A ² s	temperature-independent

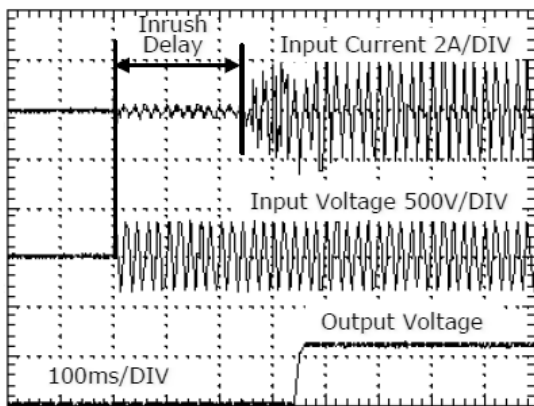


Fig. 4: Typical switch-on behavior at nominal load, 230 Vac input and 25 °C ambient temperature

3.4 Output

The output provides an SELV/PELV nominal voltage that is electrically isolated from the input voltage.

The output is electronically protected against overload, no-load and short circuit. In the event of a protection event, audible noises may occur.

The output is designed to supply any type of load, including capacitive and inductive loads.

Output			
Output voltage	Nom.	24 V	
Adjustment range	Min.	24 - 28 V	Guaranteed value
	Max.	30.0 V	This is the maximum output voltage that can occur in the end position of the potentiometer in clockwise direction due to tolerances. It is not a guaranteed value that can be achieved.
Factory settings	Typ.	24.1 V	±0.2%, at full load and with the device cold
Line regulation	Max.	10 mV	Between 85 Vac and 300 Vac
Load regulation	Max.	100 mV	Between 0 A and 10 A, statistical value, see fig. <i>Output voltage over output current</i>
Residual ripple and ripple voltage	Max.	50 mV _{SS}	Bandwidth 20 Hz to 20 MHz, 50 ohm
Output current - continuous ²⁾	Nom.	10 A	At 24 V and 60 °C ambient temperature
	Nom.	7.5 A	At 24 V and 70 °C ambient temperature
	Nom.	9.0 A	At 28 V and 60 °C ambient temperature
	Nom.	6.8 A	At 28 V and 70 °C ambient temperature
Output current - Extra Power up to 4 s ¹⁾	Nom.	15 A	At 24 V and 70 °C ambient temperature
	Nom.	13.5 A	At 28 V and 70 °C ambient temperature
Output power - continuous	Nom.	240 W	
Output power - Extra Power 4 s ¹⁾	Nom.	360 W	
Extra Power time (bonus time)	Typ.	4 s	Time until the output voltage drops, see Fig. <i>Bonus time over output power</i>
Recovery time	Typ.	7 s	Overload-free time until the power manager is reset, see Fig. <i>Extra Power recovery time</i>
Overload behavior		Continuous current	
Short circuit current	Max.	12.5 A	Continuous current, load impedance 100 mOhm
	Max.	15 A	Continuous current, load impedance 10 mOhm
	Max.	21 A	During Extra Power recovery time, load impedance 100 mOhm,
Output capacity	Typ.	7,000 µF	Included in the power supply
Load feedback	Max.	35 V	The device is resistant and does not show any malfunction when a load feeds back voltage to the power supply. It does not matter whether the power supply is switched on or off. The absorbed energy can be calculated by means of the built-in large-size output capacitor.

¹⁾ **Extra Power**

The power supply is designed to support loads with higher short-term power requirements without damage or shutdown.

The short-time duration/bonus time is controlled in hardware by an output power manager.

Extra Power is available repeatedly. Detailed information can be found in the chapter on [Repeated pulse load \[► 32\]](#).

If the power supply is loaded with Extra Power for longer than in the bonus time diagram (see fig. [Output voltage over output current, typ.; bonus time over output power \[► 17\]](#)), the output current is automatically reduced to the continuous output current.

²⁾ Linear derating between +60 °C and 70 °C ambient temperature

Peak current capability (up to several milliseconds)

The power supply can deliver a peak current that is higher than the specified short-term current. This helps to start current-intensive loads or safely operate downstream circuit breakers.

The additional current is supplied by the built-in output capacitors of the power supply. During this process the capacitors are discharged and cause a voltage drop at the output. Further information can be found in the chapter on [Peak current capability](#) [▶ 34].

Voltage drops at peak currents	
Typ. 24 V to 20.5 V	At 20 A for 50 ms, ohmic load
Typ. 24 V to 18 V	At 50 A for 2 ms, ohmic load
Typ. 24 V to 14 V	At 50 A for 5 ms, ohmic load

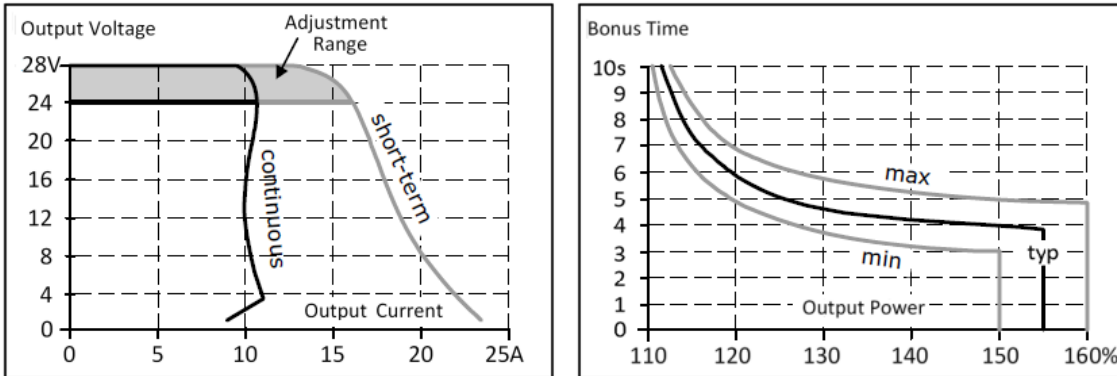


Fig. 5: Output voltage over output current, typ.; bonus time over output power

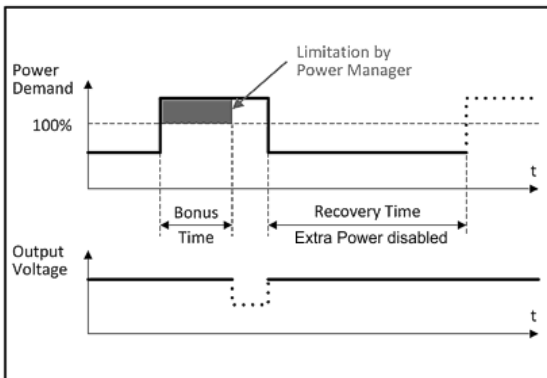


Fig. 6: Extra Power recovery time

Extra Power is available as soon as the power is turned on and after an output short-circuit or output overload.

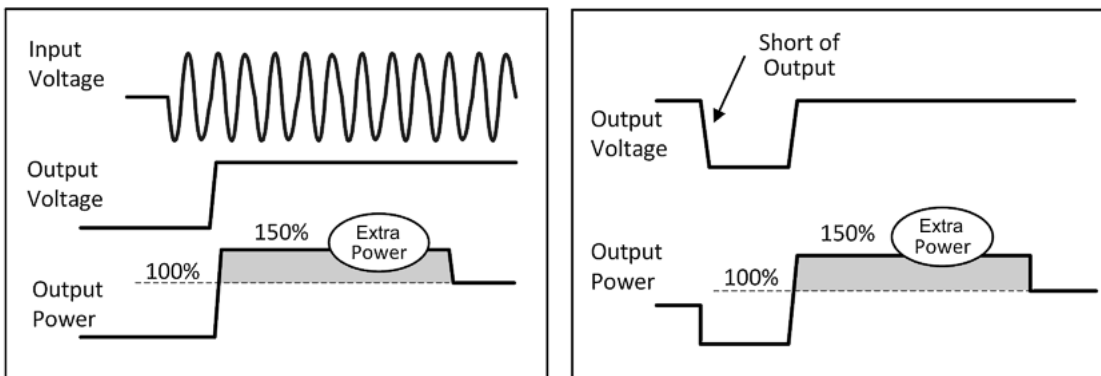


Fig. 7: Extra Power after switching on; Extra Power after short circuit or overload

3.5 Hold-up time

The hold-up time is the time during which the output voltage of a power supply unit remains within the specification after a loss of input power. The hold-up time depends on the output load. Without load the hold-up time can be several seconds. The green DC-OK lamp also lights up during this time.

		AC 100 V	AC 120 V	AC 230 V	
Mains failure Hold-up time	Typ.	26 ms	27 ms	28 ms	At 24 V, 10 A, see Fig. <i>Hold-up time over input voltage</i>
	Typ.	51 ms	53 ms	55 ms	At 24 V, 5 A, see Fig. <i>Hold-up time over input voltage</i>
	Min.	21 ms	22 ms	22 ms	At 24 V, 10 A, see Fig. <i>Hold-up time over input voltage</i>
	Min.	41 ms	42 ms	44 ms	At 24 V, 5 A, see Fig. <i>Hold-up time over input voltage</i>

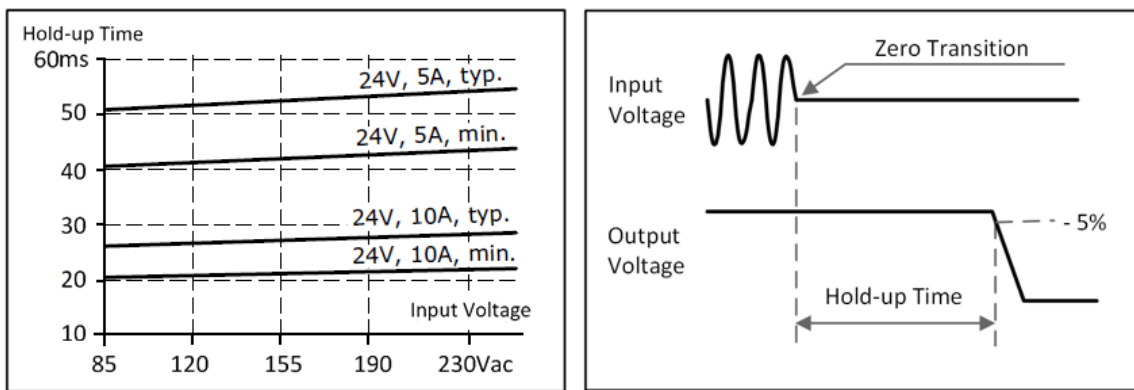


Fig. 8: Hold-up time over input voltage; switch-off behavior, definitions

3.6 DC-OK relay contact

This function monitors the output voltage generated by the power supply itself. It is independent of a voltage fed back from a unit connected in parallel to the power supply output.

DC-OK relay contact	
The contact closes	when the output voltage reaches the set output voltage.
The contact opens	when the output voltage drops more than 10% below the set output voltage. <ul style="list-style-type: none"> • Drops > 1 ms are extended to a signal length of 250 ms. • Drops < 1 ms are ignored.
The contact closes again	when the output voltage exceeds 90% of the set voltage.
Switching hysteresis	typ. 0.7 V
Contact load capacity	Maximum 60 Vdc 0.3 A, 30 Vdc 1 A, 30 Vac 0.5 A, ohmic load Minimum permissible load: 1 mA at 5 Vdc
Insulation voltage	See the table in chapter Dielectric strength [► 29]

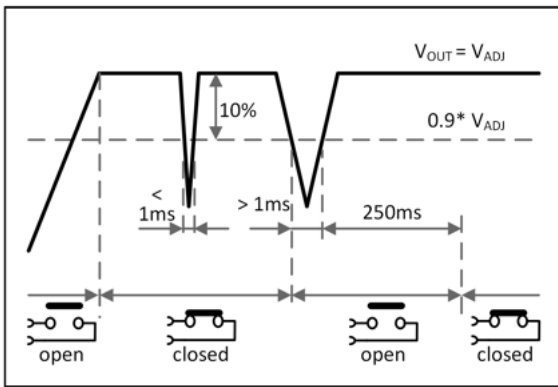


Fig. 9: Behavior of the DC-OK relay contact

● Nature and source of the danger

i The DC-OK function requires the output voltage to reach the rated (=set) level after power-up in order to function as specified.

- If this level is not reached, the overload LED lights up and the DC-OK contact opens. The overload LED goes out when the set voltage is reached.
- ⇒ This is an important condition to be considered especially if the load is a battery, the power supply is used in parallel or the power supply is used for N+1 redundant systems.

3.7 Efficiency and losses

		AC 100 V	AC 120 V	AC 230 V	
Efficiency	Typ.	91.5 %	92.6 %	93.5 %	At 24 V, 10 A
Average efficiency ^{*)}	Typ.	91.7 %	92.4 %	92.4 %	25 % at 2.55 A, 25 % at 5 A, 25 % at 7.5 A. 25 % at 10 A
Losses	Typ.	22.4	19.1 W	16.7 W	At 24 V, 10 A (nominal load)
	Typ.	10.0 W	9.2 W	9.0 W	At 24 V, 5 A (half load)
	Typ.	4.4 W	4.9 W	6.1 W	At 24 V, 0 A (no load)

^{*)} The average efficiency is based on assumptions for a typical application with the power supply unit operating at
 25% of the nominal load during 25% of the time,
 50% of the nominal load during 25% of the time,
 75% of the nominal load during 25% of the time and
 100% of the nominal load during the remaining time.

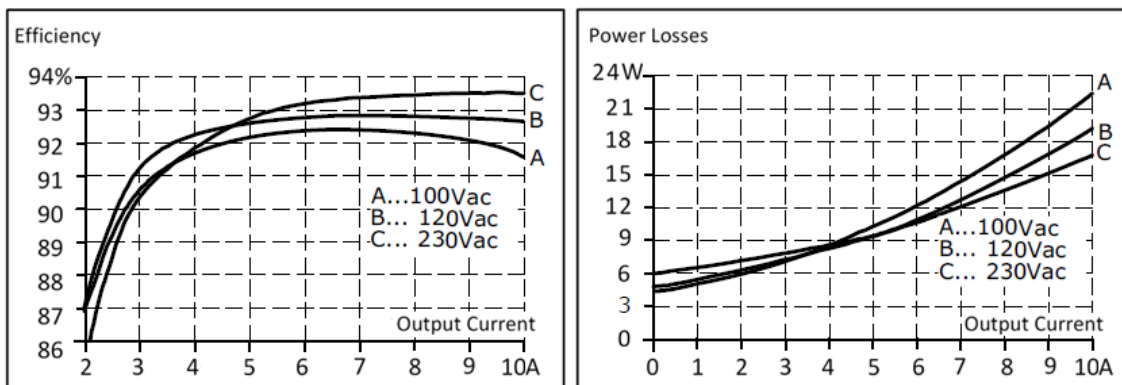


Fig. 10: Efficiency over output current; losses over output current

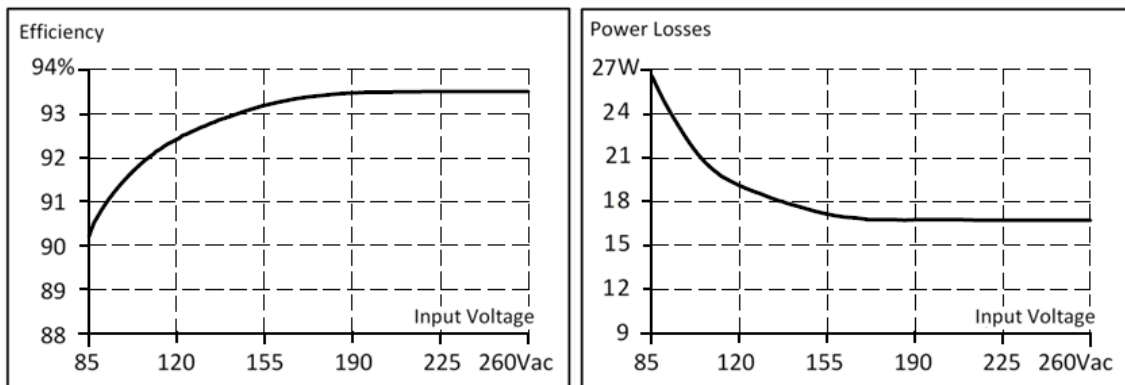


Fig. 11: Efficiency over input voltage; losses over input voltage

3.8 Lifetime expectancy

	AC 100 V	AC 120 V	AC 230 V	
Lifetime expectancy ¹⁾	58,000 h	68,000 h	71,000 h	At 24 V, 10 A and +40 °C
	117,000 h	122,000 h	117,000 h	At 24 V, 5 A and +40 °C
	165,000 h	192,000 h	200,000 h	At 24 V, 10 A and +25 °C
MTBF ²⁾ SN 29500, IEC 61709	472,000 h	528,000 h	572,000h	At 24 V, 10 A and +40 °C
	847,000 h	939,000 h	1,016,000 h	At 24 V, 10 A and +25 °C
MTBF ²⁾ MIL HDBK 217F	334,000 h	340,000 h	345,000 h	At 24 V, 10 A and +40 °C; Ground Benign GB40
	569,000 h	469,000 h	474,000 h	At 24 V, 10 A and +25 °C; Ground Benign GB25
	79,000 h	81,000 h	81,000 h	At 24 V, 10 A and +40 °C; Ground Fixed GF40
	105,000 h	108,000 h	109,000 h	At 24 V, 10 A and +25 °C; Ground Fixed GF25

¹⁾The **calculated lifetime expectancy** shown in the table indicates the minimum number of operating hours (service life) and is determined by the lifetime expectancy of the built-in electrolytic capacitors. The lifetime expectancy is stated in operating hours and is calculated according to the specifications of the capacitor manufacturer. The manufacturer of the electrolytic capacitors only guarantees a maximum life of up to 15 years (131,400 h). Any number exceeding this value represents a calculated theoretical service life which can be used to compare devices.

²⁾ **MTBF** stands for **Mean Time Between Failure**, which is calculated on the basis of statistical equipment failures and indicates the reliability of a device. It is the statistical representation of the probability of failure of a device and does not necessarily represent the service life of a product. The MTBF number is a statistical representation of the failure probability of a device. For example, an MTBF number of 1,000,000 h means that statistically, if 10,000 devices are installed in the field, one device will fail every 100 hours. However, it is not possible to determine whether the failed device has run for 50,000 hours or only 100 hours.

3.9 Terminals and wiring

The terminals are designed to be finger-safe according to IP20 and are suitable for field or factory wiring.

Technical data	Input	Output	DC-OK signal
Connection cross-section	e*: 0.5 - 6 mm ² f*: 0.5 - 4 mm ² a*: max. 4 mm ² (d<2.8 mm)	e*: 0.5 - 6 mm ² f*: 0.5 - 4 mm ² a*: max. 4 mm ² (d<2.8 mm)	e*: 0.5 - 6 mm ² f*: 0.5 - 4 mm ² a*: max. 4 mm ² (d<2.8 mm)
Connection cross section (AWG)	e*: AWG 20-10 f*: AWG 20-10 a*: AWG 20-10 (d<2.8 mm)	e*: AWG 20-10 f*: AWG 20-10 a*: AWG 20-10 (d<2.8 mm)	e*: AWG 20-10 f*: AWG 20-10 a*: AWG 20-10 (d<2.8 mm)
Strip length	10 mm / 0.4 inch	10 mm / 0.4 inch	10 mm / 0.4 inch

e* = solid wire
f* = stranded wire
a* = with ferrule

Wiring instructions:

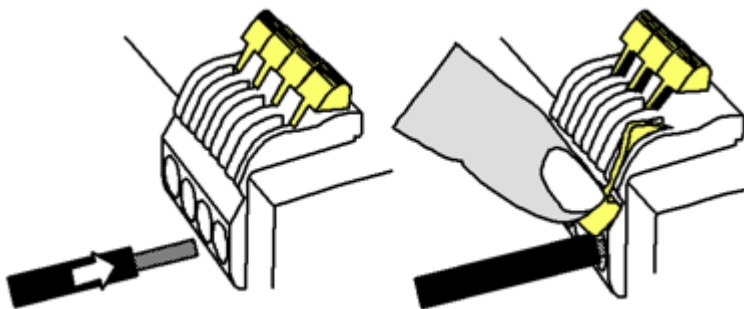


Fig. 12: Insert the wire, then throw the lever; to release the wire: same procedure in reverse

- Use suitable copper wires that are designed at least for the following working temperatures:
+60 °C for ambient temperatures up to +45 °C and
+75 °C for ambient temperatures up to +60 °C and
+90 °C for ambient temperatures up to +70 °C.
- Observe the national installation rules and regulations!
- Make sure that all single wires of a strand are connected to the terminal!
- Do not use the device without PE connection.
- Ferrules are permitted.

Series connection of power supply units:

Series connection (looping from one power supply output to the next) is permitted as long as the average output current flowing through a connection pin does not exceed 25 A. For higher currents please use a separate distribution terminal strip as shown in Fig. *Using distribution terminals.*

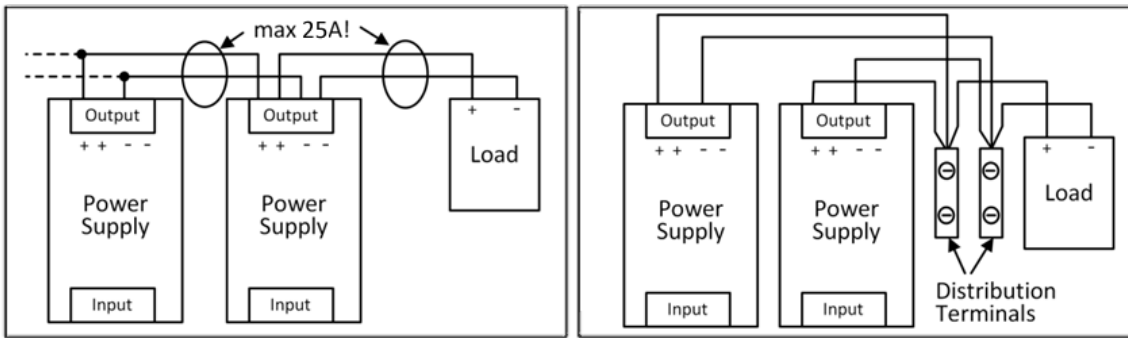


Fig. 13: Series connection of outputs; use of distribution terminals

3.10 Functional wiring diagram

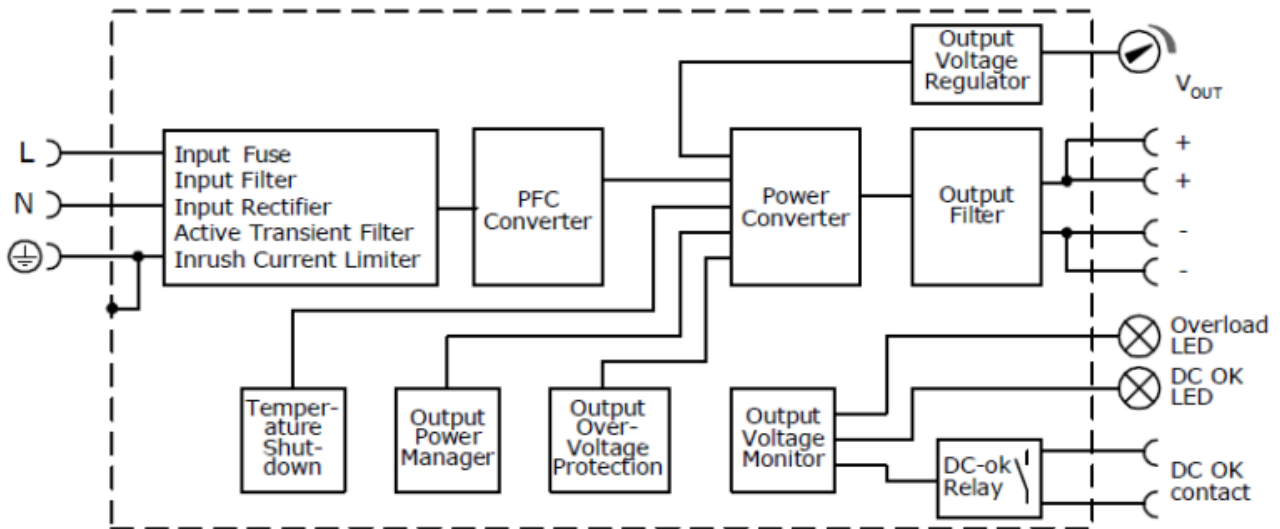


Fig. 14: Functional wiring diagram

3.11 Front side and operating elements

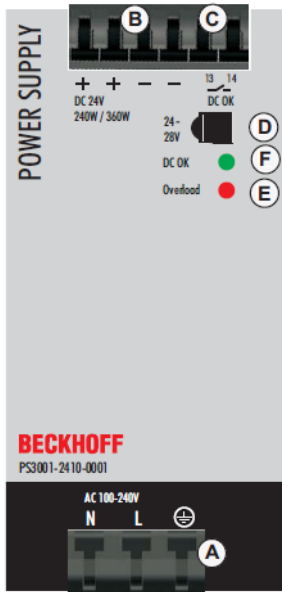



Fig. 15: Front PS3001-2410-0001

Input terminals (quick-connect spring-loaded terminals)

Designation (A)	Description
N	Mains input N
L	Mains input L
	PE input (protective conductor)

Output terminals (quick-connect spring-loaded terminals)

Designation (B)	Description
+	two identical positive poles, positive output
-	two identical negative poles, negative output

DC-OK relay contact (quick-connect spring-loaded terminals)

Designation (C)	Description
13 / 14 make contact	The DC-OK relay contact is synchronized with the DC-OK LED. See chapter on DC OK relay contact [► 19] for more information.

Potentiometer for the output voltage

Designation (D)	Description
Potentiometer cover	Open the flap to adjust the output voltage. Factory setting: 24.1 V

Overload LED

Designation (E)	Description
LED red	On when the voltage at the output terminals is <90% of the set output voltage, or in the event of a short circuit in the output. On when the unit has switched off due to overtemperature. The input voltage is always required.

DC-OK LED

Designation (F)	Description
LED green	On when the voltage at the output terminals is >90% of the set output voltage.

3.12 EMC

The power supply is suitable without any restrictions for application in industrial environments as well as in residential, commercial and light industrial areas and small businesses. A detailed EMC report is available on request.

The device was tested according to EN 61000-6-1, EN 61000-6-2, EN 61000-6-3 and EN 61000-6-4.

EMC interference immunity			
Strong transients	VDE 0160	Over the entire load range	750 V, 1.3 ms
EMC interference emission	According to the generic standards: EN 6100-6-3 and EN6100-6-4		
Conducted interference emission, input lines	EN 55011, EN 55022, FCC Part 15, CISPR 11, CISPR 22		Class B
Conducted interference emission output lines	IEC/CISPR 16-1-2, IEC/CISPR 16-2-1		Limit values for the local DC power connection are met
Interfering radiation	EN 55011, EN 55022		Class B
Harmonic input current	EN 61000-3-2		Requirements for Class A devices met
Voltage fluctuations, flicker	EN 61000-3-3		Requirements met ¹⁾
<p>This device complies with FCC Part 15.</p> <p>Operation is subject to the following two conditions:</p> <ul style="list-style-type: none"> • This device must not cause adverse interference, and • This device must tolerate any interference it is subjected to, including interference that may cause undesired operation. 			

¹⁾ Tested with constant current loads, non-pulsating

Switching frequencies		
PFC converter	40 kHz to 220 kHz	Dependent on input voltage and output load
Main converter	105 kHz	constant frequency
Auxiliary converter	35 kHz	constant frequency

3.13 Environment

Environment		
Operating temperature ¹⁾	-25 °C to + 70 °C	Reduction of the output power according to Fig. <i>Output current over ambient temperature</i>
Storage temperature	-40 °C to + 85 °C	For storage and transport
Output load reduction (Derating) ²⁾	6 W/°C	+60 °C to +70 °C
	0.65 A/1000 m or 5°C/1000 m	For installation altitudes > 2000 m, see fig. <i>Output current over installation altitude</i>
Humidity ³⁾	5 to 95% r.h.	According to IEC 60068-2-30
Atmospheric pressure	110 kPa - 54 kPa	see fig. <i>Output current over installation altitude</i>
Oscillation, sinusoidal ⁴⁾	2 - 17.8 Hz: ±1.6 mm; 17.8 - 500 Hz: 2 g 2 hours/axis	According to IEC 60068-2-6
Impacts ⁴⁾	30 g 6 ms, 20 g 11 ms 3 impacts/direction, 18 impacts in total	According to IEC 60068-2-27
Installation altitude	0 to 5000 m	see fig. <i>Output current over installation altitude</i>
Overvoltage category	III	According to IEC 60664-1, for installation altitudes up to 2000 m
	II	According to IEC 60664-1, for installation altitudes > 2000 m
Degree of pollution	2	According to IEC 62103, EN 50178, non-conductive
LABS-free	The device does not release any silicones or other paint-wetting impairment substances and is suitable for use in paint shops.	
Corrosive gas	Meets the requirements of ISA-71.04-1985, Severity Level G3, IEC 60068-2-60 Test Ke Method 4 for a service life of at least 10 years in these environments.	
Audible noises	The power supply may emit audible noises in the event of an overload, no-load or short circuit.	
<p>¹⁾ The working temperature is identical to the room temperature or the ambient temperature and is defined as the air temperature 2 cm below the device.</p> <p>²⁾ The derating is not hardware-controlled. The user must take this into account in order to stay below the reduced current limits, so that device overload is avoided.</p> <p>³⁾ Do not energize when condensation is present!</p> <p>⁴⁾ Tested in conjunction with DIN rails according to EN 60715 with a height of 15 mm and a thickness of 1.3 mm and standard installation position.</p>		

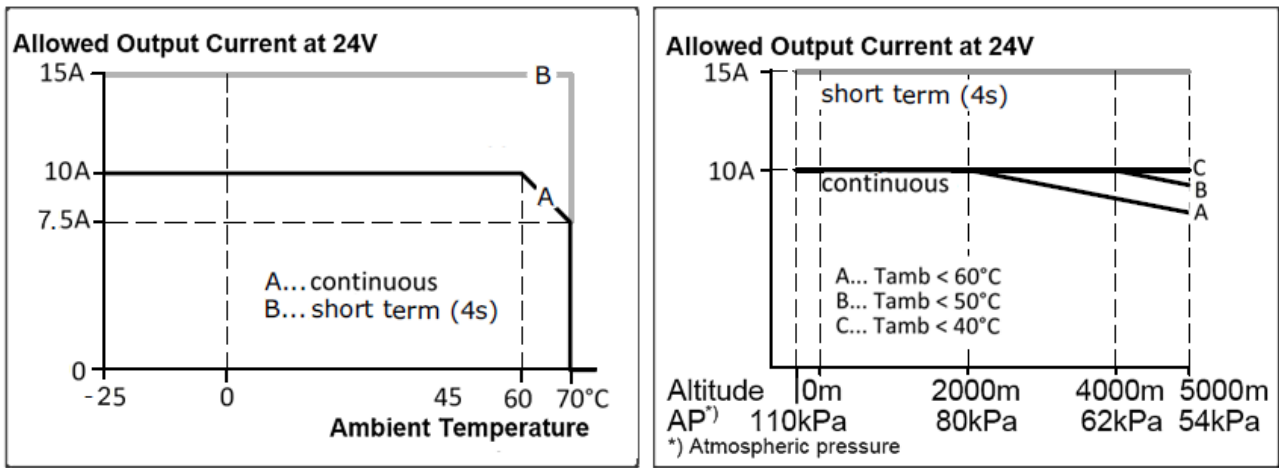


Fig. 16: Output current over ambient temperature; output current over installation altitude

3.14 Protective functions

Protective functions		
Output overvoltage protection	Typ. 35 Vdc Max. 39 Vdc	In the event of an internal power supply fault, a redundant circuit limits the maximum output voltage. The output switches off and automatically tries to switch on again.
Protection class	IP20	EN/IEC 60529
Overtemperature protection	included	Output shutdown with automatic restart. Temperature sensors are installed on critical components inside the device and switch off the device in safety-critical situations. This can happen, for example, if the ambient temperature is too high, ventilation is obstructed or derating requirements are not met. There is no correlation between the operating temperature and the switch-off temperature, as this depends on the input voltage, the load and the installation methods.
Protection against input transients	MOV (metal oxide varistor)	For further notes, see chapter EMC ▶ 25
Input fuse	included	Not user-replaceable

3.15 Safety features

Safety features		
Protection class	I	Conforms to IEC 61140 PE (protective conductor) connection required
Insulation resistance	Min. 500 MOhm	In the delivery state between input and output, measured with 500 Vdc
	Min. 500 MOhm	In the delivery state between input and PE, measured with 500 Vdc
	Min. 500 MOhm	In the delivery state between output and PE, measured with 500 Vdc
	Min. 500 MOhm	In the delivery state between output and DC-OK contacts, measured with 500 Vdc
PE resistance	Max. 0.1 Ohm	Resistance between PE terminal and housing in the area of the DIN rail mounting bracket.
Leakage current	Typ. 0.19 mA / 0.44 mA	At 100 Vac, 50 Hz, TN, TT / IT network
	Typ. 0.29 mA / 0.65 mA	At 120 Vac, 60 Hz, TN, TT / IT network
	Typ. 0.53 mA / 1.04 mA	At 230 Vac, 50 Hz, TN, TT / IT network
	Max. 0.25 mA / 0.54 mA	At 110 Vac, 50 Hz, TN, TT / IT network
	Max. 0.38 mA / 0.79 mA	At 132 Vac, 60 Hz, TN, TT / IT network
	Max. 0.74 mA / 1.29 mA	At 264 Vac, 50 Hz, TN, TT / IT network

3.16 Dielectric strength

The output voltage is potential-free and has no resistive connection to earth.

The output is isolated from the input by double or reinforced insulation.

Type and component tests are carried out by the manufacturer. Field tests can be performed in the field using suitable test equipment that ramps up the voltage with a slow ramp (2 s rising and 2 s falling).

- Connect all input terminals and all output poles to each other before performing the tests.
- During the test, set the cut-off current to the value shown in the table below.
- When checking the input to DC-OK (see the following figure. B^{*)}), make sure that the maximum voltage between DC-OK and the output is not exceeded (see column D in the table below). When performing the test, we recommend connecting the DC OK contact pins and the output contact pins.
- We recommend connecting either the positive pole or the negative pole of the output circuit to the protective conductor system. This avoids situations in which the load starts unexpectedly or cannot be disconnected if an unnoticed earth leakage occurs.

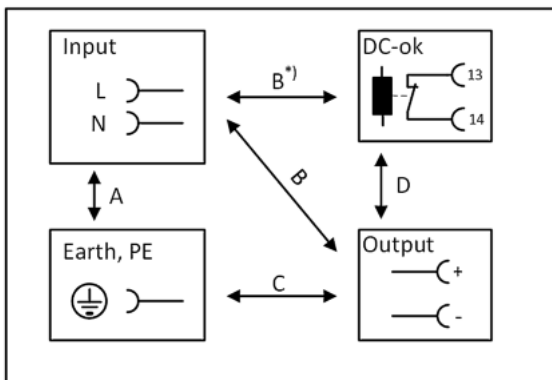


Fig. 17: Dielectric strength

		A	B	C	D
Type test	60 s	2500 Vac	3000 Vac	500 Vac	500 Vac
Component test	5 s	2500 Vac	2500 Vac	500 Vac	500 Vac
Field test	5 s	2000 Vac	2000 Vac	500 Vac	500 Vac
Cut-off current setting for field testing		> 10 mA	> 10 mA	> 20 mA	> 1 mA

3.17 Declaration of conformity and approvals

	EU declaration of conformity
	UK Declaration of Conformity Trade conformity assessment for England, Scotland and Wales The UKCA mark indicates conformity with the UK Statutory Instruments 2016 No. 1101 (LVD) 2016 No. 1091 (EMC) and 2012 No. 3032 (RoHS)
	Registration for the Eurasian Customs Union market (Russia, Kazakhstan and Belarus)
	UL Certificate, UL508 Applicable for US and Canada

3.18 Dimensions and weight

Dimensions and weight	
Overall width	60 mm
Height	124 mm
Depth	117 mm The height of the DIN rails must be added to the depth of the device to calculate the total installation depth required
Weight	900 g
DIN rail	Use 35 mm DIN rails according to EN 60715 or EN 50022 with a height of 7.5 or 15 mm. The height of the DIN rail must be added to the depth of the device (117 mm) to calculate the total installation depth required.
Housing material	Housing: Aluminum alloy Cover: galvanized steel
Installation clearances	See chapter on Safety instructions and installation requirements
Ingress protection	Small parts such as screws, nuts etc. with a diameter of more than 3.5 mm.

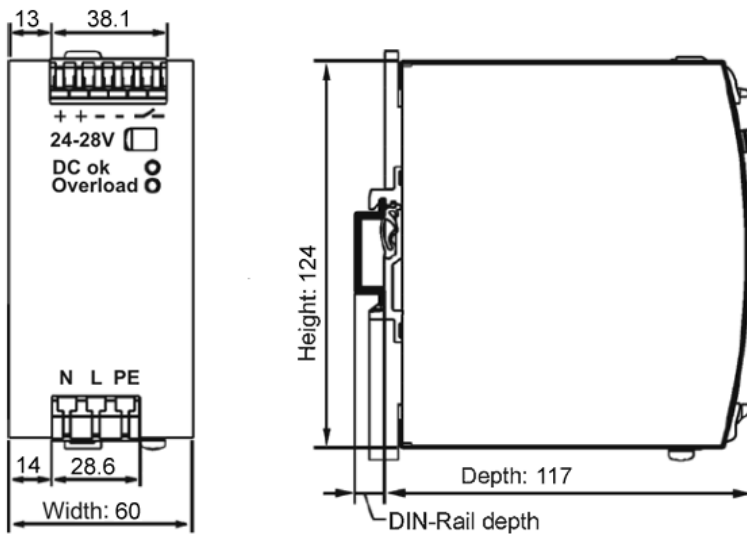


Fig. 18: Front/side view PS3001-2410-0001, all specifications in mm

4 Application notes

4.1 Repeated pulse load

Typically a load current is not constant and varies with time. This power supply is designed to support loads with a higher short-term power demand (Extra Power). The short-term duration is hardware-controlled by an output power manager and is available repeatedly. If the Extra Power load lasts longer than the hardware controller allows, the output voltage drops. Extra Power is available again after the Extra Power recovery time has elapsed (see [Output voltage over output current, typ.; bonus time over output power \[► 17\]](#) chapter).

To avoid this, the following conditions must be met:

- The power requirement of the pulse must be less than 150% of the rated output power.
- The duration of the pulse power must be shorter than the permitted extra power time. (see [Output \[► 16\]](#))
- The average (RMS) output current must be below the specified continuous output current.
If the effective current is higher, the device responds with a thermal shutdown after a certain time. The maximum duty cycle curve (Fig. *Repeated pulse loads, definitions*) can be used to check whether the average output current is below the rated current.

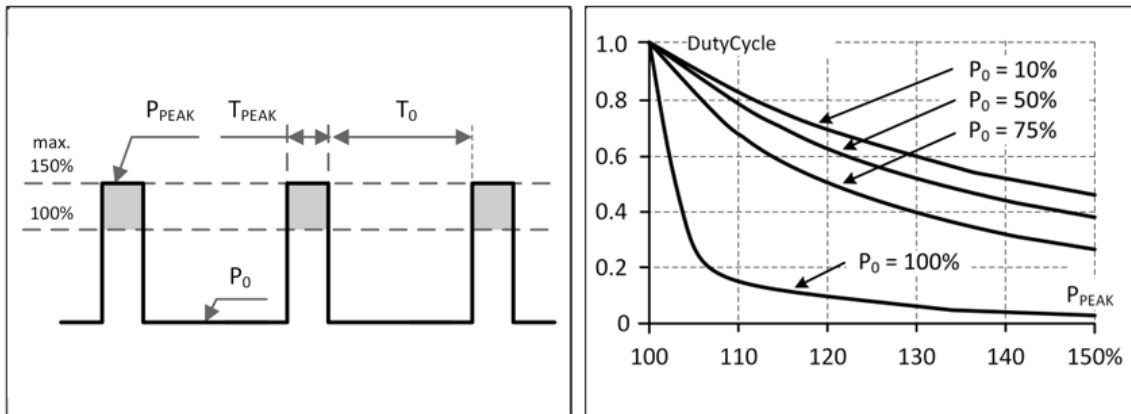


Fig. 19: Repeated pulse loads, definitions; Max. duty cycle curve

Key	
P_0	Base load (W)
P_{PEAK}	Pulse load (over 100%)
T_0	Duration between pulses (s)
T_{PEAK}	Pulse duration (s)

Calculation:

$$\text{Duty cycle} = T_{PEAK} / (T_{PEAK} + T_0)$$

$$T_0 = (T_{PEAK} - (\text{DutyCycle} \times T_{PEAK})) / \text{DutyCycle}$$

Example:

A load is operated continuously with 120 W (= 50% of the nominal output load).
 From time to time a peak power of 360 W (= 150% of the nominal output load) is required for 1 second.

- The question is: how often can this impulse be supplied without overloading the power supply?
 - Draw a vertical line at $P_{PEAK} = 150\%$ and a horizontal line where the vertical line crosses the curve $P_0 = 50\%$. Read the maximum duty cycle from the duty cycle axis (= 0.37)
 - Calculate the required pause length T_0 (base load):
 - Result: Required pause length = 1.7 s
 - Max. repetition rate = pulse + pause length = 2.7 s

$$T_0 = (T_{PEAK} - (\text{DutyCycle} \times T_{PEAK})) / \text{DutyCycle} = (1 \text{ s} - (0.37 \times 1 \text{ s})) / 0.37 = \mathbf{1.7 \text{ s}}$$

Further examples of pulse load tolerance

P_{PEAK}	P_0	T_{PEAK}	T_0
360 W	240 W	1 s	>25 s
360 W	0 W	1 s	>1.3 s
300 W	120 W	1 s	> 0.75 s
360 W	120 W	0.1 s	>0.16 s
360 W	120 W	1 s	>1.6 s
360 W	120 W	3 s	>4.9 s

4.2 Peak current capability

The device can deliver peak currents (for up to several milliseconds) that are higher than the specified short-term currents.

This helps when starting loads with high current intensity. Magnetic coils, contactors and pneumatic modules often have a stationary coil and a pick-up coil. The inrush current requirement of the pick-up coil is several times higher than the stationary current and usually exceeds the rated output current (including Extra Power). The situation is exactly the same when starting a capacitive load.

The peak current capability also ensures safe operation of downstream circuit breakers of load circuits. The load circuits are often individually fused with circuit breakers or fuses. In the event of a short circuit or overload in a circuit, the fuse or circuit breaker needs a certain amount of overcurrent to open in time. This prevents a voltage drop in adjacent circuits.

The additional current (peak current) is supplied by the power converter and the built-in large-size output capacitors of the power supply. The capacitors are discharged during such an event, which leads to a voltage drop at the output. The following two examples show typical voltage drops for ohmic loads:

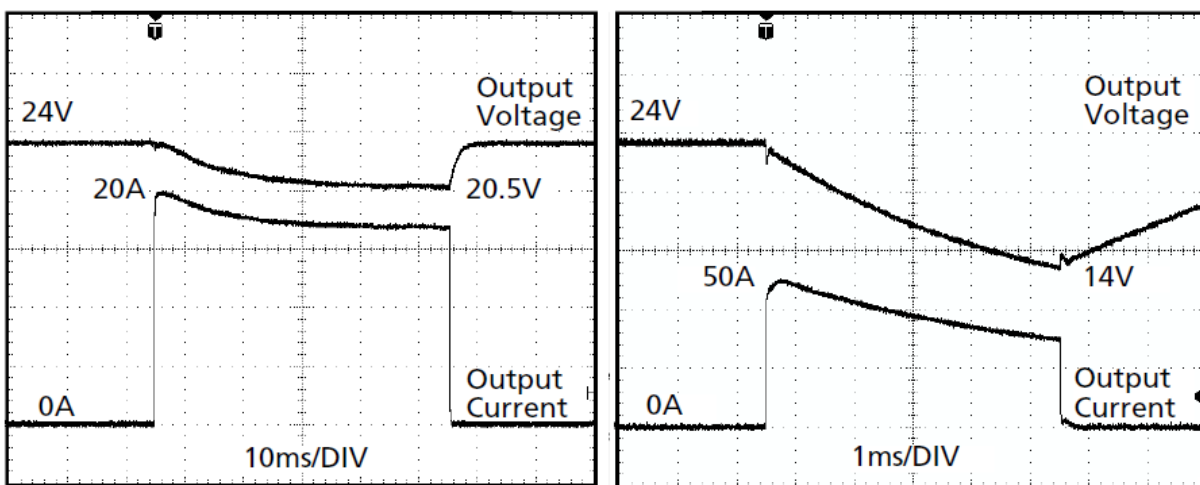


Fig. 20: 20 A peak current for 50 ms, typ. (2x nominal current); 50 A peak current for 5 ms, typ. (5x nominal current)

Peak current voltage drops	
Typically from 24 V to 20.5 V	At 20 A for 50 ms, ohmic load
Typically from 24 V to 18 V	At 50 A for 2 ms, ohmic load
Typically from 24 V to 14 V	At 50 A for 5 ms, ohmic load

Control of DC-OK relay

Please note: The DC-OK relay is activated if the voltage drops by more than 10% for more than 1 ms

4.3 External input protection

The device is tested and approved for circuits up to 20 A. External protection is only required if the supply line has a protection that is higher than this. Also check the local regulations and requirements. Local regulations may apply in some countries.

If an external fuse is required or used, minimum requirements must be taken into account to avoid false tripping of the circuit breaker. A circuit breaker with a minimum value of 6 A with B or 4 A C characteristic should be used.

4.4 Operation on two phases

The power supply can also be used on two phases of a three-phase system. Such a phase-to-phase connection is permissible as long as the supply voltage is below 240 V+10 %.

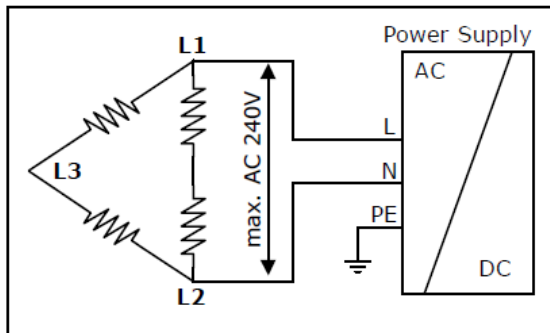


Fig. 21: Operation on two phases

Make sure that the conductor connected to the N terminal is fused appropriately.

4.5 Output circuit breakers

Standard circuit breakers (or UL1077 circuit breakers) are generally used for AC supply systems and can also be used for 24 V branches.

Circuit breakers are used to protect cables and circuits. If the current value and the characteristics of the circuit breaker are matched to the cable thickness used, the wiring is considered thermally safe, regardless of whether the circuit breaker opens or not.

To avoid voltage drops and situations with undervoltage in adjacent 24 V branches fed from the same source, a fast (magnetic) trip of the circuit breaker is desirable. Fast switch-off within 10 ms is required, which approximately corresponds to the bridging time of PLCs. This requires power supplies with high reserve current and large output capacitors. In addition, the impedance of the faulty branch must be sufficiently small for the current to actually flow. The following table contains typical test results that show which circuit breakers with B and C characteristics trip magnetically, depending on the wire cross-section and the wire length.

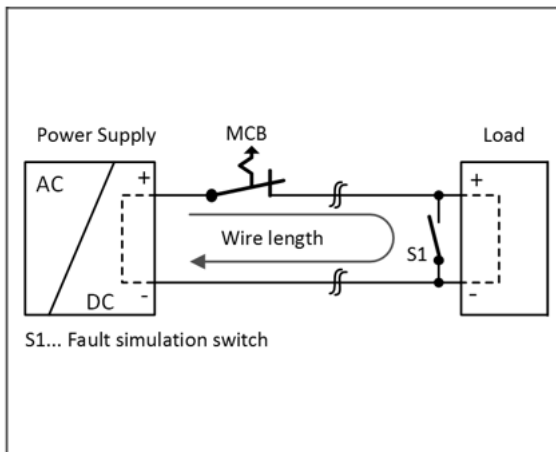


Fig. 22: Test circuit

Maximum wire length^{*)} for fast (magnetic) tripping:

	0.75 mm ²	1.0 mm ²	1.5 mm ²	2.5 mm ²
C-2A	23 m	29 m	48 m	69 m
C-3A	20 m	24 m	38 m	57 m
C-4A	12 m	16 m	22 m	33 m
C-6A	5 m	7 m	9 m	14 m
C-8A	3 m	4 m	5 m	7 m
C-10A	2 m	3 m	4 m	6 m
C-13A	1 m	1 m	2 m	2 m

	0.75 mm ²	1.0 mm ²	1.5 mm ²	2.5 mm ²
B-6A	11 m	14 m	24 m	34 m
B-10A	5 m	8 m	11 m	18 m
B-13A	4 m	6 m	8 m	10 m

^{*)} Don't forget to double the distance to the load (or the cable length) when calculating the total cable length (plus and minus cable).

4.6 Charging batteries

The power supply can be used to charge lead-acid or maintenance-free batteries. (Two 12 V batteries in series).

Instructions for charging batteries:

- Adjust the output voltage, measured at no load and at the battery end of the cable, very precisely to the end-of-charge voltage.

End-of-charge voltage	27.8 V	27.5 V	27.15 V	26.8 V
Battery temperature	10 °C	20 °C	30 °C	40 °C

- Use a 15 A or 16 A circuit breaker or a blocking diode between the power supply and the battery.
- Make sure that the output current of the power supply is below the permissible charging current of the battery.
- Only use matched batteries when connecting 12 V types in series.
- The reverse current to the power supply (battery discharge current) is typically 3 mA when the power supply is switched off (except when using a blocking diode).

4.7 Series connection

Power supplies of the same type can be connected in series to increase the output voltages. As many devices can be connected in series as necessary, as long as the sum of the output voltages does not exceed 150 Vdc. Voltages with a potential higher than 60 Vdc are no longer regarded as safety extra-low voltage and can be dangerous. Such voltages must be protected with a touch guard.

Grounding of the output is required if the sum of the output voltage is more than 60 Vdc.

Avoid application of return voltage (e.g. from a braking motor or battery) to the output terminals in a series connection.

Restrictions: Keep a mounting distance of 15 mm (left/right) between two power supplies and do not install the power supplies above each other. Power supplies connected in series should only be used in the standard installation position (terminals on the underside of the device).

Remember that leakage current, electromagnetic interference, inrush current and harmonics increase when using multiple power supplies.

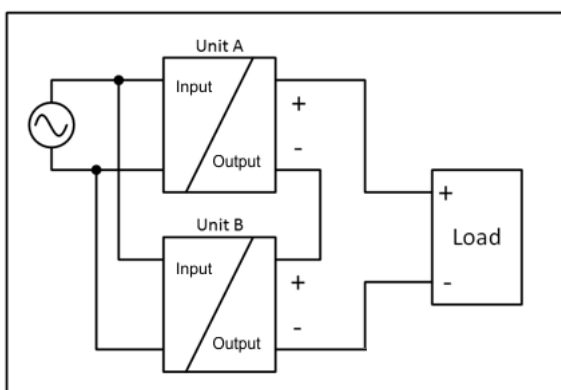


Fig. 23: Series connection

4.8 Parallel use to increase power

Power supplies of the same type from the PS3xxx series can be connected in parallel to increase the output power.

- The output voltage must be set to the same value (± 100 mV), or the units can be left with the factory settings.
- If more than three devices are connected in parallel, a fuse or circuit breaker with a rated current of 15 A or 16 A is required at each output. Alternatively a diode can be used.

Restrictions:

- Maintain an installation distance of 15 mm (left/right) between two power supplies.
- Do not install the power supplies above each other.
- In "Parallel Use" mode power supplies should only be used in the standard installation position (input terminals on the underside of the device, output terminals at the top), not in other installation positions or under other conditions that require a reduction in the output current (e.g., installation altitude, operation at temperatures about $+60^{\circ}\text{C}$, ...).
- Note that leakage current, electromagnetic interference, input inrush current, and harmonics increase when using multiple power supplies.

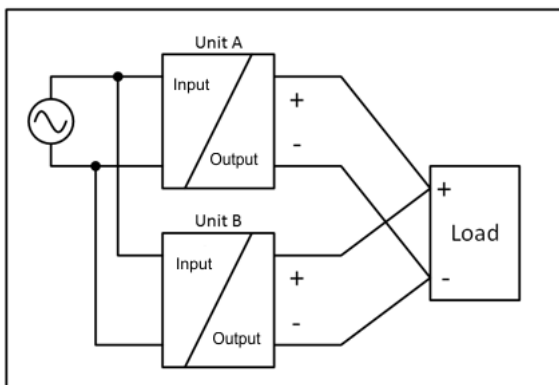


Fig. 24: Parallel connection

4.9 Parallel use for redundancy

Recommendations for the construction of redundant power supply systems:

- Power supplies that contain a DC-OK signal contact are best suited for the construction of redundant power supply systems.
 - Use this DC-OK signal contact to monitor the individual power supplies.
 - For the power supplies with EtherCAT (e.g. PS2001-2420-1001) the DC-OK bit can be used for monitoring.
- Use separate grids for each power supply whenever possible.
- It is recommended to set the output voltages of all devices to the same value (± 100 mV) or to leave them at the factory setting.

4.9.1 1+1 Redundancy

It is possible to connect power supplies in parallel for redundancy operation in order to achieve better system availability. Redundant systems provide a certain amount of additional power to operate the load when a power supply unit fails. The simplest method is to connect two power supplies in parallel. This is called 1+1 redundancy. If one power supply fails, the other can automatically supply the load current without interruption.

The 1+1 redundancy allows ambient temperatures up to +70 °C.

i Notes on parallel use for 1+1 redundancy

- Be sure to use a redundancy module in order to decouple devices from one another. This prevents the defective device from becoming a load for the other device and the output voltage no longer being maintainable.
- Note that leakage current, EMI, input inrush current and harmonics increase when using multiple devices.

Wiring example:

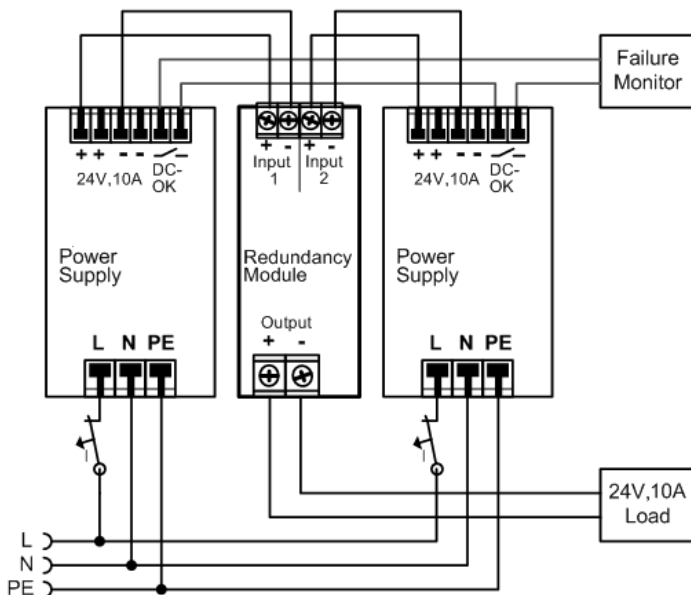


Fig. 25: Wiring for 1+1 redundancy with a PS9401-2420-0000 redundancy module

4.9.2 N+1 Redundancy

Notes on parallel use for N + 1 redundancy

- Note that leakage current, EMI, input inrush current and harmonics increase when using multiple devices.
- The ambient temperature may not exceed +60 °C for N + 1 redundancy systems.

Redundancy systems for higher power requirements are usually set up using the N + 1 method. For example, four devices with a nominal current of 10 A are connected in parallel for a 30 A redundancy system.

- Keep a mounting distance of 15 mm (left/right) between two power supplies.
- Do not install the power supplies above each other.
- Do not use power supplies connected in parallel in an installation position that deviates from the standard installation position (connection terminals on the underside of the device) or in a different state requiring a reduction in the output current.

Wiring example:

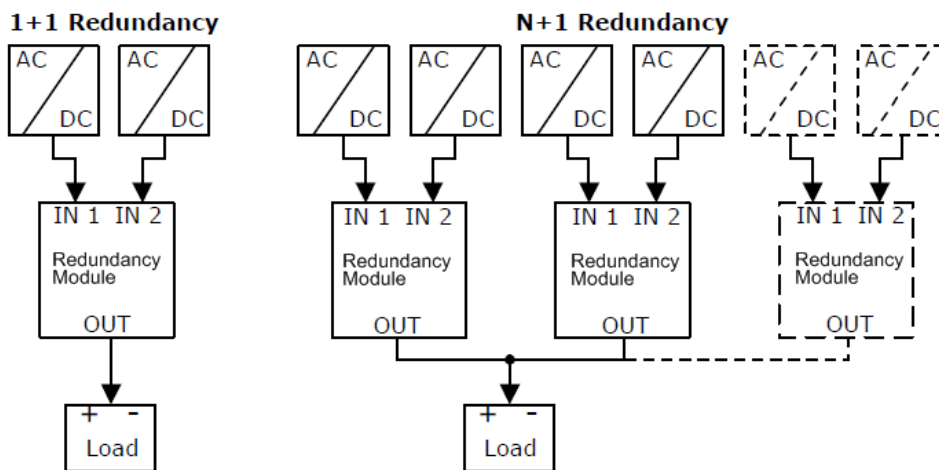


Fig. 26: Wiring for 1 + 1 redundancy and N + 1 redundancy

4.10 Use in a tightly sealed enclosure

When the power supply is installed in a tightly sealed enclosure, the temperature inside the housing is higher than outside. In this case, the temperature inside the housing is considered the ambient temperature for the power supply.

The power supply is positioned at the center of the housing. There are no other heat-generating elements in the housing

The temperature sensor in the housing is positioned at the center on the right side of the power supply with a distance of 1 cm.

The following measurement results can be used as reference for estimating the temperature rise inside the housing.

	Case A	Case B
Housing size	180 mm x 180 mm x 165 mm Housing Rittal, protection class IP66 PK 9519 100, plastic	180 mm x 180 mm x 165 mm Housing Rittal, protection class IP66 PK 9519 100, plastic
Input voltage	230 Vac	230 Vac
Load	24 V, 8 A; (=80 %)	24 V, 10 A; (=100 %)
Temperature inside the housing	41.0 °C	46.2 °C
Temperature outside the housing	21.0 °C	21.0 °C
Temperature increase	20.0 K	25.5 K

4.11 Installation positions

Installation positions other than the input connections at the bottom and the output at the top require a reduction of the continuous output power or a limitation of the maximum permissible ambient temperature.

The service life and MTBF values listed in the chapter [Lifetime expectancy](#) [► 21] apply only to the standard installation position.

The following diagrams provide an indication of the permissible output currents for installation altitudes up to 2,000 m.

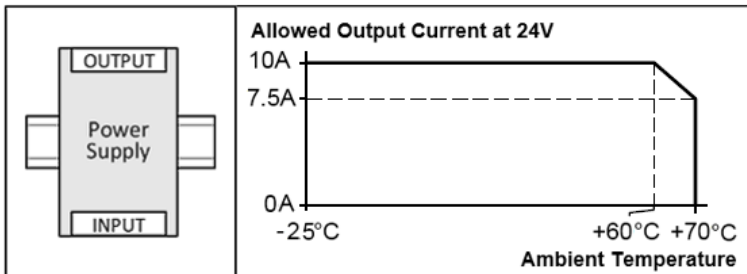


Fig. 27: Installation position A (standard installation position)

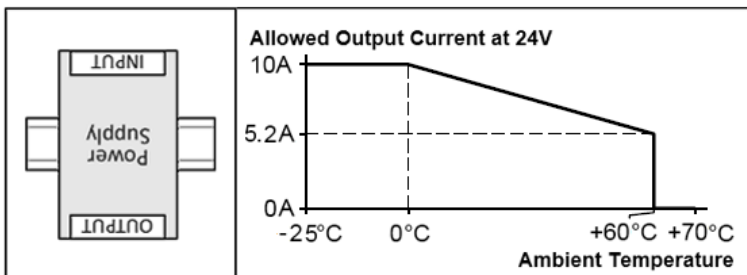


Fig. 28: Installation position B (upside down)

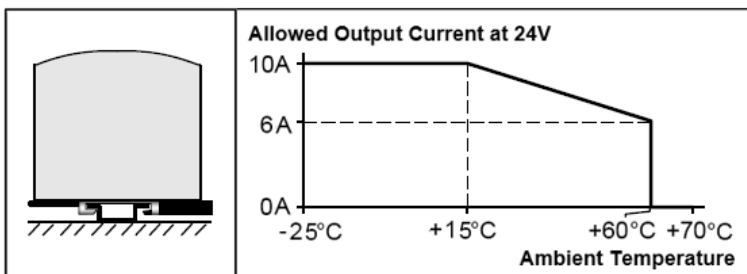


Fig. 29: Installation position C (table mounting)

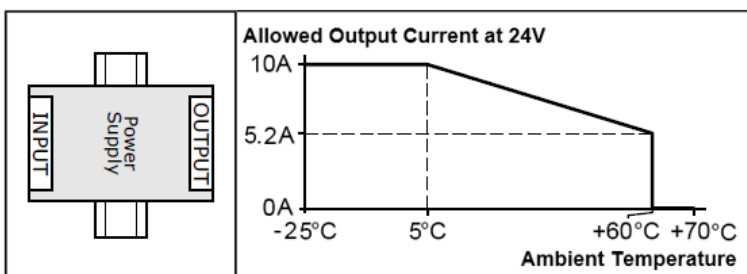


Fig. 30: Installation position D (horizontal clockwise)

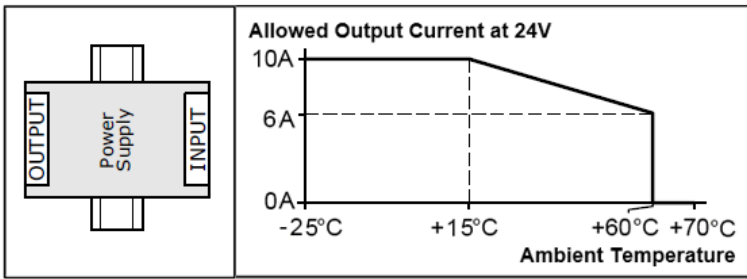


Fig. 31: Installation position E (horizontal counterclockwise)

5 Disposal



Products marked with a crossed-out wheeled bin shall not be discarded with the normal waste stream. The device is considered as waste electrical and electronic equipment. The national regulations for the disposal of waste electrical and electronic equipment must be observed.

6 Appendix

6.1 Accessories

6.1.1 Redundancy and buffer modules

Power supply	Accessories	
	Redundancy module	Buffer module
PS3001-2410-0001	PS9401-2420-0000	PS9011-2420-0001

PS9401-2420-0000 – Redundancy Module



The PS9401-2420-0000 is a redundancy module that can be used to construct 1+1 and N+1 redundant systems.

It has two input channels, to which power supplies with an output current of up to 12 A can be connected, and an output that can carry nominal currents up to 20 A. The output can also be operated with up to 24 A if the ambient temperature is < +45 °C.

The redundancy module uses MOSFET technology instead of diodes for decoupling the two input channels. This reduces the heat development and the voltage drop between input and output. Due to the low power loss, the device is very narrow and requires a width of just 32 mm on the DIN rail.

Large connection terminals enable secure and fast installation. The redundancy module requires no additional auxiliary voltage.

Due to the international approvals package, the device is suitable for virtually every application.

Observe the connection instructions in the chapter "[Parallel use for redundancy \[p. 39\]](#)"!

PS9011-2420-0001 – Buffer Module



The PS9011-2420-0001 buffer module is an additional device for 24 V DC power supply units. It supplies power to bridge typical mains power failures or extends the hold-up time after switching off the AC voltage.

If the power supply unit supplies sufficient voltage, the buffer module stores energy in the integrated electrolytic capacitors. In the event of a failure of the mains voltage, the stored energy is supplied to the DC bus in a controlled process.

The buffer module can be connected at any point in parallel with the load circuit and does not require any control wiring.

A buffer module can provide 20 A of additional power and can be added in parallel to increase the output current or hold-up time.

The PS9011-2440-0000 buffer module can optionally be used to achieve longer hold-up times.

6.1.2 UPS- component

CU8130-0xxx – UPS component



CU8130-0xxxs are battery-backed, uninterruptible power supplies (UPS). If the external 24 V DC input voltage is lost, the UPS takes over the supply of the devices connected to it thanks to its regulated and buffered 24 V DC output voltage.

The CU81xx UPS series is suitable for all Beckhoff components, particularly Industrial PCs, Embedded PCs, Panels and Panel PCs.

The main features of this UPS are:

- battery module based on NiMH cells
- mounting of the UPS on the DIN rail or on the rear panel of the control cabinet
- protocol-based communication with the Industrial PC either via OCT (**O**ne **C**able **T**echnology) or USB
- digital signals for communication with non-protocol-capable end devices
- TwinCAT PLC function blocks for querying the UPS operation

A special feature of the Beckhoff CU81xx devices is OCT (**O**ne **C**able **T**echnology) as communication technology between UPS and Industrial PC. This means that the two connecting lines (+24 V, 0 V) between Industrial PC and UPS are used not only to supply the Industrial PC, but also for bidirectional data transmission.

If both sides are OCT-capable, no further connection, e.g., via USB, is required.

Further information on UPS components can be found on the Beckhoff [homepage](#).

6.1.3 Mounting accessories

Power supply	Accessories	
	Wall mounting	Side mounting
PS3001-2410-0001	ZS5301-0001	ZS5301-0006

ZS5301-0001 – Bracket for wall mounting

This bracket is used to mount the devices to a wall or panel without using a DIN rail. The two aluminum brackets and the black plastic slider of the power supply must be removed to allow the steel brackets to be mounted.

For further information, check the documentation for the [ZS5031-0001](#)

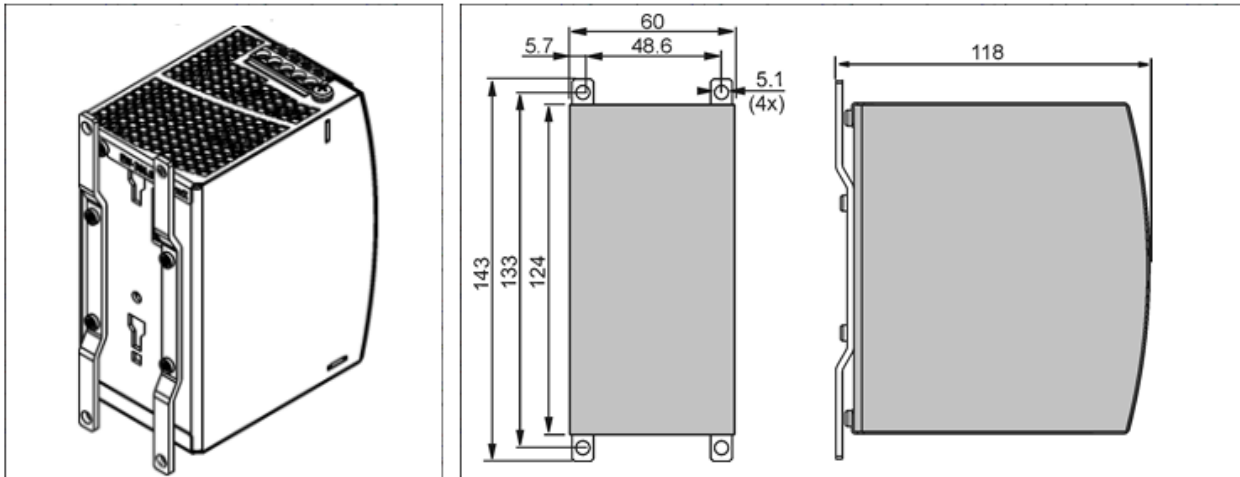


Fig. 32: Isometric view, wall mounting front view, all dimensions in mm

ZS5301-0006 – Bracket for side mounting

This bracket is used to mount the power supply unit laterally with or without the use of a DIN rail to save installation depth.

The two aluminum brackets and the black plastic slider of the device must be removed to allow the steel brackets to be mounted.

For lateral DIN rail mounting, the previously removed aluminum brackets and the plastic slider must be mounted on the steel bracket.

For more information please refer to the [ZS5301-0006](#) documentation.

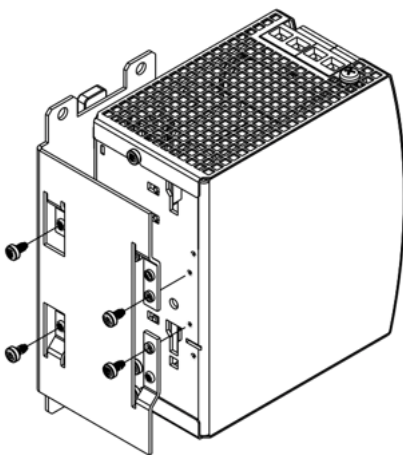


Fig. 33: Mounting information

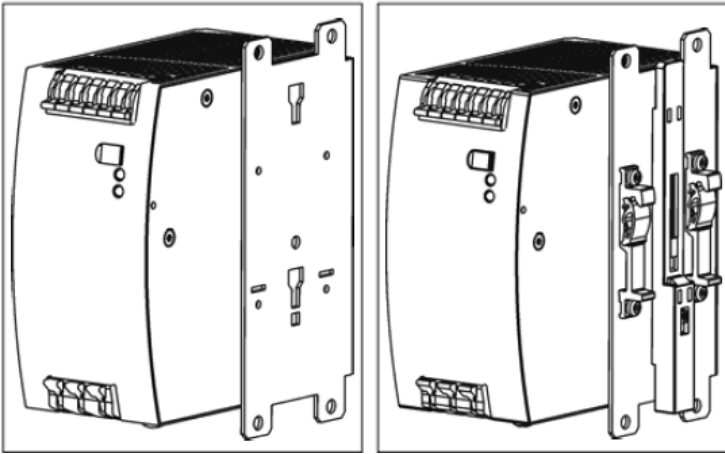


Fig. 34: Lateral mounting with and without DIN rail brackets

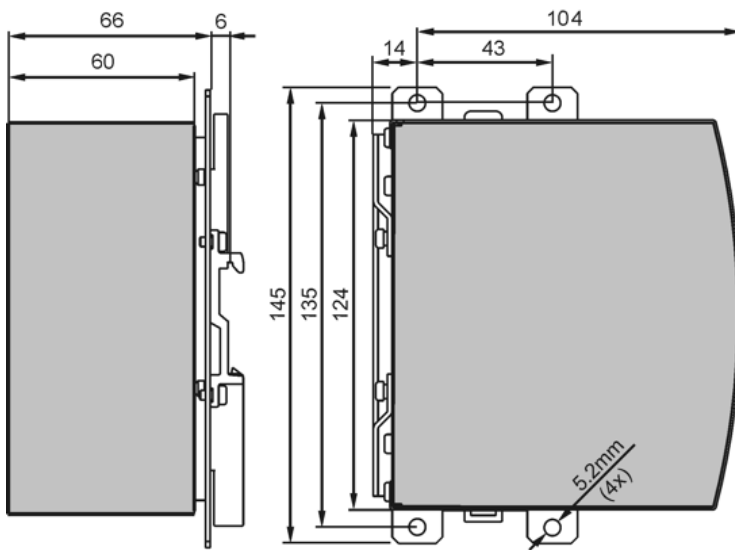


Fig. 35: Installation dimensions of bracket for side mounting, all dimensions in mm

6.2 Documentation issue status

Version	Comment
1.2	<ul style="list-style-type: none">• Update chapter "Parallel use to increase power"
1.1	<ul style="list-style-type: none">• Update chapter "Parallel use redundancy"• Update chapter "Overview" and "Declaration of conformity and approvals"• Chapter "Disposal" added• Update chapter "Accessories"
1.0	<ul style="list-style-type: none">• First release
0.1	<ul style="list-style-type: none">• Preliminary documentation for PS3001-2410-0001

6.3 Support and Service

Beckhoff and their partners around the world offer comprehensive support and service, making available fast and competent assistance with all questions related to Beckhoff products and system solutions.

Beckhoff's branch offices and representatives

Please contact your Beckhoff branch office or representative for local support and service on Beckhoff products!

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You will also find further documentation for Beckhoff components there.

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