

TRIO-PS67/1AC/24DC/10/M12

Power supply unit

Data sheet
109661_en_00

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1 Description

TRIO POWER - robust and distributed power supplies with IP67 degree of protection

The TRIO POWER power supplies with IP67 protection are distinguished by their functionality and robust design. The combination of dustproofness and therefore full touch protection is indicated by the first number of the IP code (IP6x). The second number (IPx7) indicates protection against temporary submersion in water. This means that use in particularly difficult ambient conditions is always ensured.

The dynamic boost ($1.5 \times I_N$ for 5 seconds) safely absorbs starting currents and brief overload situations during operation, and without a dip in the output voltage. On the device side, the power supply is equipped with coded circular connectors.

Features

- Tool-free connection with no danger of mismatching, thanks to coded circular connectors
- Safe operation, thanks to electrically and mechanically extremely robust design
- Worldwide use, thanks to wide-range input
- Fixed 24 V DC output voltage
- Reliable starting of heavy loads, thanks to dynamic boost ($1.5 \times I_N$ for 5 seconds)
- Simplified error diagnostics for remote signaling via DC-OK signal contact
- OVP (Over Voltage Protection) limits surge voltages to ≤ 30 V DC (EN 61131-2)

Technical data (short form)

Input voltage range	100 V AC ... 240 V AC ± 10 % 110 V DC ... 250 V DC ± 10 %
Nominal input voltage range	100 V AC ... 240 V AC 110 V DC ... 250 V DC
Mains buffering	> 15 ms (120 V AC) > 15 ms (230 V AC)
Nominal output voltage (U_N)	24 V DC ± 1 %
Nominal output current (I_N) Dynamic Boost ($I_{Dyn.Boost}$)	10 A 15 A (5 s)
Output power (P_N) Output power ($P_{Dyn.Boost}$)	240 W 360 W
Efficiency	typ. 91 % (120 V AC) typ. 93 % (230 V AC)
Residual ripple	≤ 10 mV _{pp}
MTBF (IEC 61709, SN 29500)	> 1800000 h (25 °C) > 1000000 h (40 °C) > 480000 h (60 °C)
Ambient temperature (operation)	-25 °C ... 70 °C (Derating >60°C: 2.5 %/K)
Startup type tested	-25 °C
Dimensions W/H/D	136 mm / 240 mm / 53 mm
Weight	1.5 kg



Make sure you always use the latest documentation.
It can be downloaded from the product at phoenixcontact.net/products.

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3 Ordering data

Description	Type	Order No.	Pcs./Pkt.
Primary-switched power supply unit, TRIO POWER in IP67 die-cast housing, M12 circular connector, input: 1-phase, output: 24 V DC / 10 A	TRIO-PS67/1AC/24DC/10/M12	1111634	1
Accessories	Type	Order No.	Pcs./Pkt.
Power connector, Power, 3-position, shielded, Socket straight M12, Coding: S, Push-lock spring connection, knurl material: Nickel-plated brass, external cable diameter 6 mm ... 11 mm	SACC-M12FSS-2PEPL-CM SH	1080227	1
Power cable, 3-position, PUR halogen-free, black, free cable end, on Socket straight M12, coding: S, cable length: 1 m, for AC current up to 16 A/230 V	SAC-3P- 1,0-PUR/M12FSS PE	1176479	1
Power connector, Power, 4-position, shielded, Plug straight M12, Coding: L, Push-lock spring connection, knurl material: Nickel-plated brass, external cable diameter 6 mm ... 11 mm	SACC-M12MSL-4PL-CM SH	1080239	1
Power cable, 4-position, PUR halogen-free, black-gray RAL 7021, Plug straight M12, coding: L, on free cable end, cable length: 1.5 m, For direct current up to 12 A/63 V	SAC-4P-M12MSL/ 1,5-105	1425025	1
Connector, Universal, 5-position, unshielded, Socket straight M12, Coding: A, Push-in connection, knurl material: Zinc die-cast, nickel-plated, external cable diameter 4 mm ... 8 mm	SACC-M12FS-5PL M	1424652	1
Sensor/actuator cable, 5-position, PUR halogen-free, black-gray RAL 7021, free cable end, on Socket straight M12, coding: A, cable length: 1.5 m	SAC-5P- 1,5-PUR/M12FS	1669822	1



Our range of accessories is being continually extended, our current range can be found in the download area.

4 Technical data

Input data



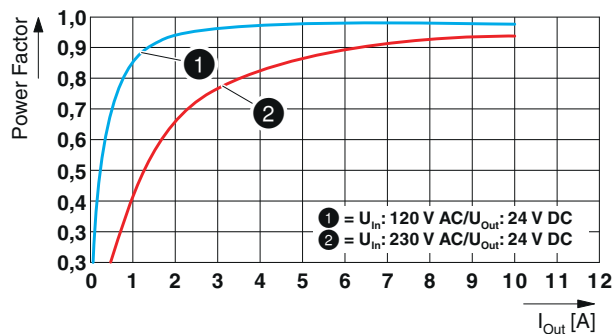
All technical specifications are nominal values and are based on an ambient temperature of 25°C and 70% relative humidity at 2000 m above sea level.

Input voltage range (for DC, connect a suitable fuse)	100 V AC ... 240 V AC $\pm 10\%$ 110 V DC ... 250 V DC $\pm 10\%$
Nominal input voltage range	100 V AC ... 240 V AC 110 V DC ... 250 V DC
Switch-on voltage typ.	≥ 95 V DC
Shut-down voltage typ.	< 95 V DC
Electric strength, max.	≤ 300 V AC (15 s)
Network type	Star network (TN, TT, IT (PE))
Frequency range (f_N)	50 Hz ... 60 Hz $\pm 10\%$
Current consumption (for nominal values) typ.	2.8 A (100 V AC) 1.2 A (240 V AC) 2.4 A (110 V DC) 1.1 A (250 V DC)
Switch-on time	< 1 s
Discharge current to PE	< 3.5 mA
Mains buffering	> 15 ms (120 V AC) > 15 ms (230 V AC)
Inrush current integral (I^2t)	< 0.5 A ² s
Inrush current limitation after 1 ms	typ. 25 A
Input fuse internal (device protection)	6.3 A
Recommended breaker for input protection	6 A ... 16 A (US/CAN: branch circuit protection < 20 A) (Characteristic B, C, D, K or comparable)

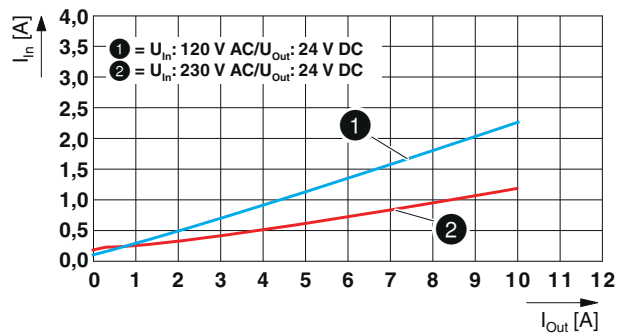
Electric strength of the insulation

Insulation voltage input/output	3 kV AC (type test) 1.5 kV AC (routine test)
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POWER factor



Input current vs. output current



Input connection data

Connection method	M12 circular connector
Type of locking	M12 screw locking
Coding	S-coded
Number of positions	3 (Plug)

Output data

Nominal output voltage (U_N)	24 V DC $\pm 1 \%$
Nominal output current (I_N)	10 A
Dynamic Boost ($I_{Dyn.Boost}$)	15 A (5 s)
Control deviation change in load, static 10 % ... 90 %	< 1 %
Control deviation Dynamic load change 10 % ... 90 %, 10 Hz	< 3 %
Control deviation change in input voltage $\pm 10 \%$	< 0.1 %
Short-circuit-proof	yes
No-load proof	yes
Residual ripple	$\leq 10 \text{ mV}_{pp}$
Connection in parallel	no
Connection in series	no
Feedback voltage resistance	$\leq 35 \text{ V DC}$
Protection against overvoltage at the output (OVP)	$\leq 30 \text{ V DC}$
Rise time typical	$\leq 12 \text{ ms}$ (U_{OUT} (10 % ... 90 %))

Output connection data

Connection method	M12 circular connector
Type of locking	M12 screw locking
Coding	L-coded
Number of positions	4 (Socket)

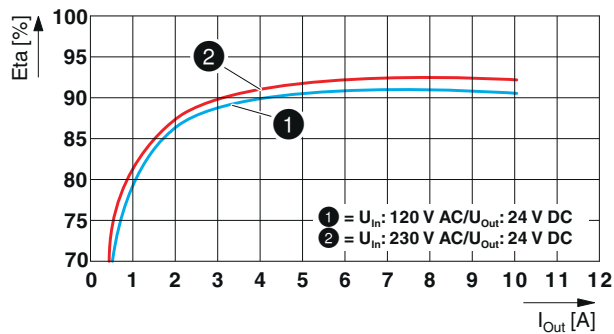
LED signaling		
Signalization designation	AC OK	DC OK
Status indicator	LED	LED
Color	green	green
Signal threshold	$AC_{In} > 0.55 \times AC_N$ ($AC_N = 90 \text{ V AC}$)	$U_{OUT} > 0.9 \times U_N$ ($U_N = 24 \text{ V DC}$)
Relay output		
Signalization designation	DC OK	
Contact assignment	13/14 (closed)	
Maximum contact load	30 V AC/30 V DC(100 mA)	
Signal threshold	$U_{OUT} > 0.9 \times U_N$ ($U_N = 24 \text{ V DC}$)	
Signal connection data		
Connection method	M12 circular connector	
Type of locking	M12	
Coding	A-coded	
Number of positions	5 (Plug)	
Reliability		
	230 V AC	
MTBF (IEC 61709, SN 29500)	> 1800000 h (25 °C) > 1000000 h (40 °C) > 480000 h (60 °C)	
General data		
Degree of protection	IP67	
Protection class	I	
Inflammability class in acc. with UL 94 (housing / terminal blocks)	V0	
Type of housing	Aluminum (AlMg3)	
Dimensions W / H / D (state of delivery)	136 mm / 240 mm / 53 mm	
Weight	1.5 kg	
Power dissipation		
	120 V AC	230 V AC
Maximum power dissipation in no-load condition	< 10 W	< 6 W
Power loss nominal load max.	< 22 W	< 17 W

Efficiency**120 V AC**

typ. 91 %

230 V AC

typ. 93 %

**Ambient conditions**

Ambient temperature (operation)	-25 °C ... 70 °C (Derating >60°C: 2.5 %/K)
Ambient temperature (start-up type tested)	-25 °C
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Max. permissible relative humidity (operation)	≤ 100 % (at 25 °C, non-condensing)
Installation height	≤ 4000 m (> 2000 m, Derating: 10 %/1000 m)
Vibration (operation)	< 15 Hz, amplitude ±2.5 mm (according to IEC 60068-2-6) 15 Hz ... 150 Hz, 4g, 90 min.
Shock	18 ms, 30g, in each space direction (according to IEC 60068-2-27)
Degree of pollution	3
Climatic class	3K3 (in acc. with EN 60721)
Overvoltage category EN 61010-1	III (≤ 2000 m)

Standards

Electrical safety	IEC 61010-1 (SELV)
Safety requirements for electrical equipment for measurement, control, and laboratory use	IEC 61010-1
Safety extra-low voltage	IEC 61010-1 (SELV) IEC 61010-2-201 (PELV)
Safe isolation	IEC 61558-2-16
Low-voltage power supplies, DC output	EN 61204-3
Limit values for harmonic currents	EN 61000-3-2
Degrees of protection provided by enclosures (IP code)	EN/IEC 60529

Approvals

UL	UL/C-UL Listed UL 61010-1 UL/C-UL Listed UL 61010-2-201
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Current approvals/permissions for the product can be found in the download area under phoenixcontact.net/products

Electromagnetic compatibility		
Conformance with EMC Directive 2014/30/EU		
Noise emission according to EN 61000-6-3 (residential and commercial) and EN 61000-6-4 (industrial)		
CE basic standard	Minimum normative requirements	Higher requirements in practice (covered)
Conducted noise emission EN 55016	EN 61000-6-4 (Class A)	EN 61000-6-3 (Class B)
Noise emission EN 55016	EN 61000-6-4 (Class A)	EN 61000-6-3 (Class B)
Immunity according to EN 61000-6-1 (residential), EN 61000-6-2 (industrial)		
CE basic standard	Minimum normative requirements of EN 61000-6-2 (CE) (immunity for industrial environments)	Higher requirements in practice (covered)
Electrostatic discharge EN 61000-4-2		
Housing contact discharge	4 kV (Test Level 2)	6 kV (Test Level 3)
Comments	Criterion B	Criterion A
Electromagnetic HF field EN 61000-4-3		
Frequency range	80 MHz ... 1 GHz	80 MHz ... 1 GHz
Test field strength	10 V/m (Test Level 3)	10 V/m (Test Level 3)
Frequency range	1.4 GHz ... 2 GHz	1 GHz ... 2 GHz
Test field strength	3 V/m (Test Level 2)	10 V/m (Test Level 3)
Frequency range	2 GHz ... 2.7 GHz	2 GHz ... 6 GHz
Test field strength	1 V/m (Test Level 1)	10 V/m (Test Level 3)
Comments	Criterion B	Criterion A
Fast transients (burst) EN 61000-4-4		
Input	2 kV (Test Level 3 - asymmetrical)	4 kV (Test Level 3 - asymmetrical)
Output	2 kV (Test Level 3 - asymmetrical)	2 kV (Test Level 3 - asymmetrical)
Signal	1 kV (Test Level 3 - asymmetrical)	2 kV (Test Level 3 - asymmetrical)
Comments	Criterion B	Criterion A
Surge voltage load (surge) EN 61000-4-5		
Input	1 kV (Test Level 1 - symmetrical) 2 kV (Test Level 1 - asymmetrical)	2 kV (Test Level 4 - symmetrical) 4 kV (Test Level 4 - asymmetrical)
Output	0.5 kV (Test Level 1 - symmetrical) 0.5 kV (Test Level 1 - asymmetrical)	1 kV (Test Level 3 - symmetrical) 2 kV (Test Level 3 - asymmetrical)
Signal	1 kV (Test Level 2 - asymmetrical)	1 kV (Test Level 2 - asymmetrical)
Comments	Criterion B	Criterion A

Immunity according to EN 61000-6-1 (residential), EN 61000-6-2 (industrial)			
CE basic standard		Minimum normative requirements of EN 61000-6-2 (CE) (immunity for industrial environments)	Higher requirements in practice (covered)
Conducted interference EN 61000-4-6			
	Input/output	asymmetrical	asymmetrical
	Frequency range	0.15 MHz ... 80 MHz	0.15 MHz ... 80 MHz
	Voltage	10 V (Test Level 3)	10 V (Test Level 3)
	Comments	Criterion A	Criterion A
Voltage dips EN 61000-4-11			
Input voltage (230 V AC, 50 Hz)			
	Voltage dip	70 % , 25 periods	70 % , 25 periods
	Comments	Criterion C	Criterion A
	Voltage dip	40 % , 10 periods	40 % , 10 periods
	Comments	Criterion C	Criterion A
	Voltage dip	0 % , 1 period	0 % , 1 period
	Comments	Criterion B	Criterion A
Key			
Criterion A	Normal operating behavior within the specified limits.		
Criterion B	Temporary impairment to operational behavior that is corrected by the device itself.		
Criterion C	Temporary adverse effects on the operating behavior, which the device corrects automatically or which can be restored by actuating the operating elements.		
Emitted interference in acc. with EN 61000-6-3			
Radio interference voltage in acc. with EN 55011	EN 55011 (EN 55022) Class B, area of application: Industry and residential		
Emitted radio interference in acc. with EN 55011	EN 55011 (EN 55022) Class B, area of application: Industry and residential		

5 Symbols used

In this data sheet, symbols are used to draw your attention to important information and potential dangers.



WARNING

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety measures that follow this symbol to avoid possible personal injuries.

There are different categories of personal injury that are indicated by a signal word.



WARNING

This indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

This indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



NOTE

Indication of a required action which if it is not performed may cause damage or malfunction to the device, hardware/software, or surrounding property.



This symbol and the accompanying text provide the reader with additional information or refer to detailed sources of information.

6 Safety regulations and installation notes



Before mounting, starting up or operating the power supply, carefully read through the data sheet.



WARNING: Danger to life by electric shock!

- Only qualified specialist personnel may mount, start up, and operate the power supply.
- Establish connection correctly and ensure protection against electric shock.
- It must be possible to switch off the device outside the power supply in accordance with the regulations of EN 61010-1 (e.g., by line protection on the primary side).
- The protective conductor connection ⊕ for the supply source must be wired to the ground conductor contact ⊕ in the field-side circular connector.
- Never carry out work when voltage is present.

**NOTE**

- Observe the national safety and accident prevention regulations.
- Assembly and electrical installation must correspond to the state of the art.
- The die-cast housing and the device-side circular connectors satisfy the requirements of IP67 protection.
- Outdoor mounting is allowed.
- Avoid an installation location with direct sunlight.
- If the ambient temperature at the mounting location is $>45^{\circ}\text{C}$, prevent direct contact with the power supply. For example, use an additional control cabinet (restricted access location).
- Observe the mechanical and thermal limits at the installation location.
- Mount the power supply in the normal mounting position (device-side circular connectors below).
- Adequate keep-out zones must be ensured for heat emission.
- Ensure that the primary-side wiring and secondary-side wiring are the correct size and have sufficient fuse protection.
- The connection parameters, e.g., required stripping lengths for the wiring, can be found in the installation information for the respective field-side circular connector.
- Use copper cables with an operating temperature $\geq 105^{\circ}\text{C}$ (ambient temperature $< 85^{\circ}\text{C}$).
- The power supply is approved for connection to TN, TT, and IT (PE) power grids (star networks) with a maximum phase-to-phase voltage of 240 V AC.
- The power supply is maintenance-free. Repairs may only be carried out by the manufacturer. The warranty no longer applies if the housing is opened.
- The power supply may only be used for its intended use.

7 Design

7.1 Rating plate

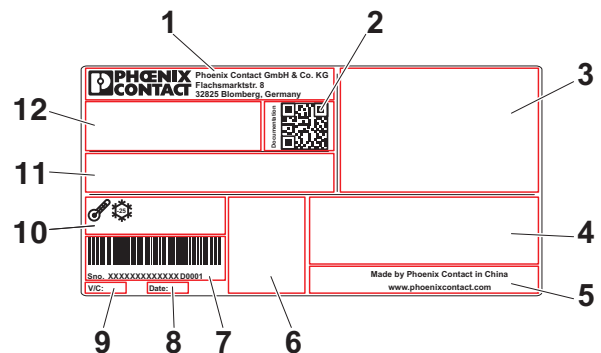
In accordance with the German Product Safety Law (ProdSG) it is only permissible to make such products available on the market if they meet certain safety standards. It must be ensured at all times that users are not exposed to hazards.

In accordance with ProdSG, every device must therefore be fitted with a rating plate. All relevant information on the safe use of the device must also be included.



The power supply device rating plate is located on the front of the housing (as viewed from the front).

Figure 1 Rating plate information



Key

No.	Designation
1	Identification of the provider
2	QR code as web link to the device documentation
3	Device approvals
4	Device-specific warning notice and designation of device documentation accompanying the product
5	Production site of the Phoenix Contact Group
6	Note on disposal
7	Bar code and serial number for device identification
8	Date of manufacture
9	Designation of device revision
10	Ambient conditions
11	Device connection data
12	Product designation

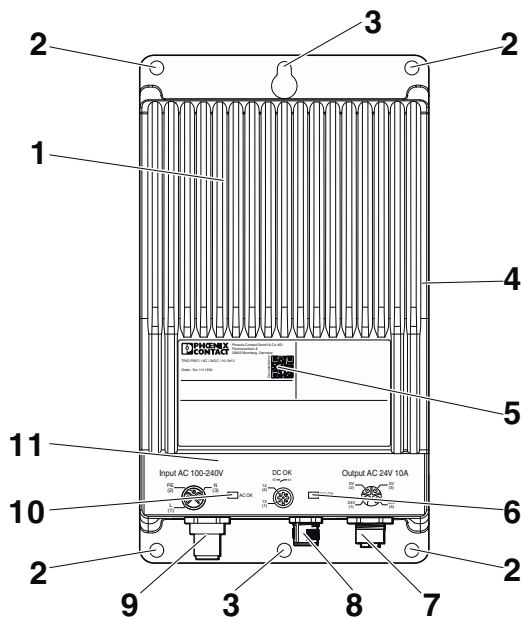
7.2 Device connections and functional elements

Device connections are labeled with connection tags to ensure clear and definitive identification.

The connection tags are split into the following connection levels:

Connection level	Description
1.	AC input
2.	DC output
3.	Signal contact

Figure 2 Location of functional elements and device connections

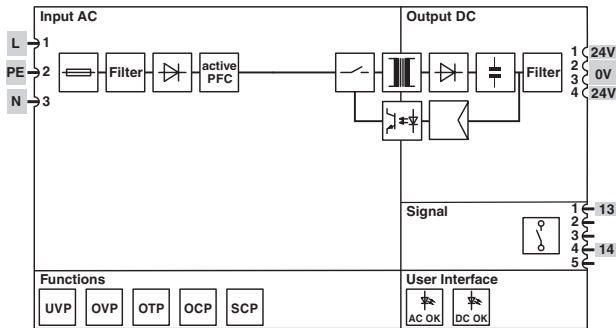


Key

No.	Designation	Connection labeling
1	Die-cast housing	
2	Mounting holes (Ø 5.6mm, external) for console or wall mounting	
3	Mounting holes (Ø 5.6 mm, centered) for mounting on structural or strut profiles	--
4	Pressure compensation membrane (bottom of the housing)	--
5	QR code web link	--
6	Signaling DC OK LED	
7	Screw connecting plug (female connector) for output voltage	Output DC
8		Signal
9	Screw connecting plug (male connector) for input voltage	Input AC
10	AC OK LED signaling	--
11	Marking field, e.g., for plant and location identification	--

7.3 Block diagram

Figure 3 Block diagram



Key

Symbol	Designation – Input AC, Output DC
	Input fuse, internal device protection
	EMC filter
	Rectification
	Power factor correction (PFC)
	Switching transistor
	Transmitter with electrical isolation
	Smoothing capacitor
	Electrically isolated signal transmission (optocoupler)
	Control equipment

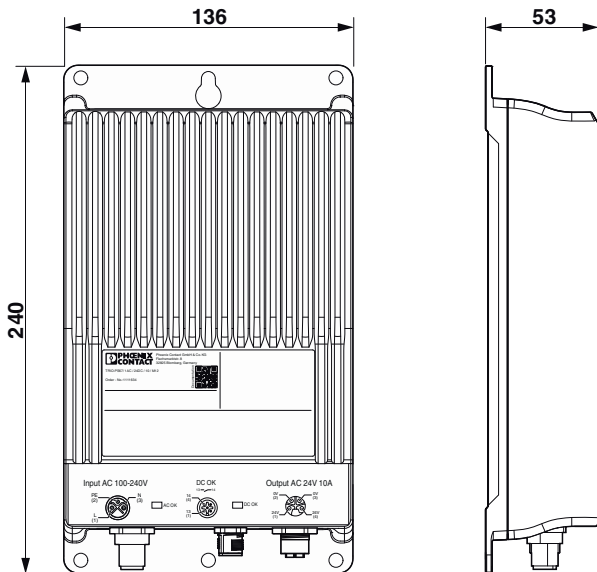
Symbol	Designation – Functions
	Undervoltage protection protects the AC input of the power supply against damage in the event of an AC undervoltage.
	Overvoltage protection protects the DC output of the power supply and the connected load against damage in the event of an overvoltage
	Overtemperature protection protects the power supply against damage in the event of impermissibly high intrinsic external heating.
	Overcurrent protection protects the DC output of the power supply against damage in the event of an impermissibly high current load.
	Short-circuit protection protects the DC output of the power supply against damage in the vent of an output-side short circuit.

Symbol	Designation – Signal
	Floating switch contact (13/14) for forwarding the operational readiness to a superordinate control system.

Symbol	Designation – User interface
	AC OK LED indicates whether the AC input voltage for power supply is present
	DC OK LED, indicates the operating status of the power supply

7.4 Device dimensions

Figure 4 Device dimensions (dimensions in mm)



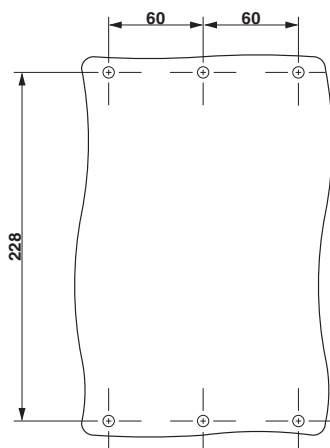
7.5 Drilling pattern for fixing holes



The power supply is mounted on a flat, load-bearing surface. Fix the power supply in place at the outer corners with at least four mounting screws (hole dimensions: 120 x 228 mm).

If the operating conditions are particularly difficult, e.g., due to vibration, six mounting screws can be used.

Figure 5 Drilling pattern for fixing holes (dimensions in mm)



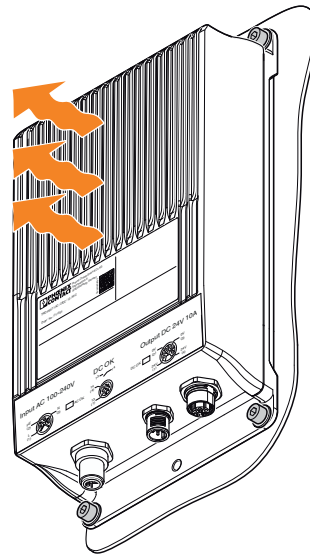
8 Mounting/remove

The power supply is mounted on a console or directly on a flat mounting surface (wall mounting). Mounting on structural or strut profiles is also possible.

8.1 Heat dissipation

Heat is dissipated from the power supply as radiant heat via the heatsink integrated in the housing cover. During mounting, observe the minimum distances specified for the device side (see section: keep-out zones).

Figure 6 Heat dissipation through radiant heat



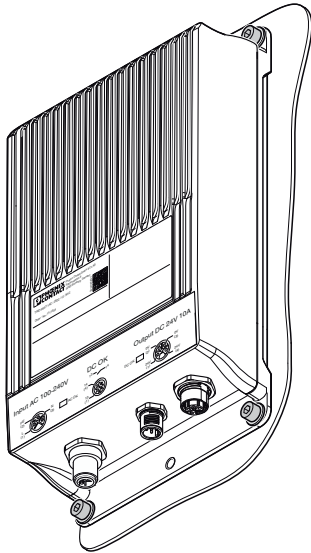
8.2 Mounting position

The specified technical data for the power supply is based on nominal operation.



The power supply is not subject to position-dependent derating.

Figure 7 Power supply installed in the normal mounting position



8.3 Installation height

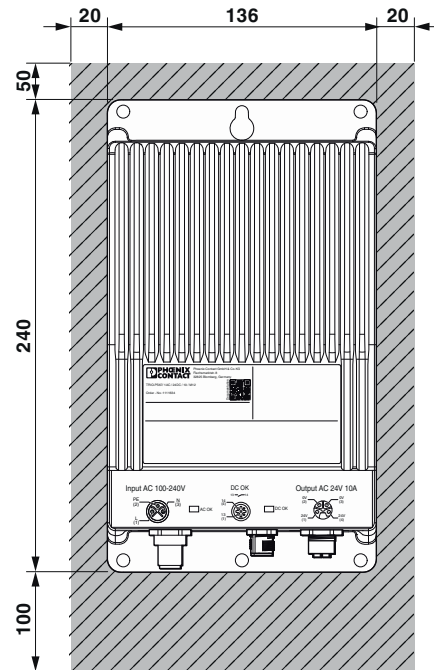
You can operate the power supply without power limitations up to an installation altitude of 2000 m. For altitudes higher than 2000 m, different specifications apply due to the differing air pressure and the reduced convection cooling associated with this (see section: Technical data, Ambient conditions).

8.4 Keep-out areas



In the normal mounting position, the power supply is mounted on a flat surface with mounting screws.

Figure 8 Device dimensions and minimum keep-out areas (in mm)



8.5 Mounting the power supply unit

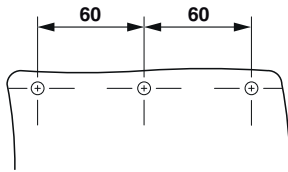
A supporting substructure, mounting wall, or structural profile is essential for the installation of the power supply. The device-side connector (circular connector) is at the bottom when installing in the standard installation position. The die-cast housing is fixed with two or four screws, depending on the type of mounting. Use either Allen screws (such as M5 x 40, ISO 4762) or hexalobular internal driving screws (such as 5 x 40, ISO 10664). In order to secure the screws, use spring washers in accordance with ISO 10670.



Depending on the required mounting position of the power supply, use the temporary mounting aid (eye) to accurately prepare the four mounting holes. They are located in the middle on the top or bottom mounting flange.

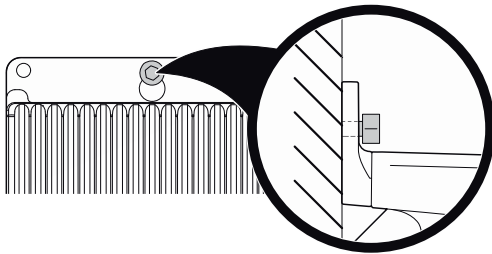
8.5.1 Wall mounting / temporary fixing (mounting aid)

Figure 9 Drilling pattern for temporary mounting



For temporary fixing, use the same screws as for standard fixing (e.g., M5 x 40, ISO 4762 or hexalobular internal driving screws, e.g., 5 x 40, ISO 10664).

Figure 10 Schematic diagram of temporary mounting aid



Proceed as follows to temporarily secure the power supply:

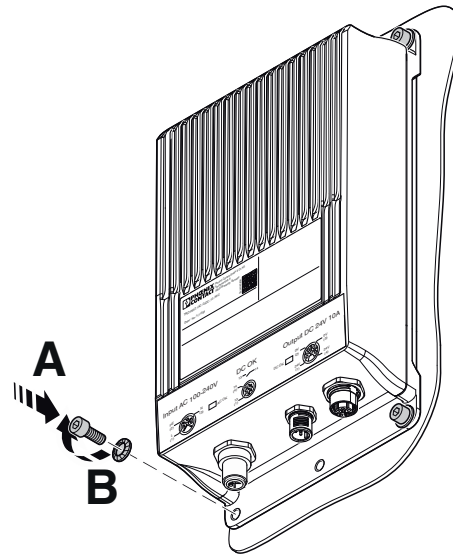
1. Select the appropriate mounting location and the required mounting position. Observe the required keep-out zones.
2. Depending on the mounting position, one or two drill holes are needed as a temporary mounting aid.
3. Drill the necessary number of drill holes using a suitable drill, depending on the type of fixing (threaded or wall plug mounting).
4. Prepare the drill hole(s) for the temporary mounting aid (tap M5 thread or insert 8 x 70 mm wall plug).
5. Screw the required number of screws into the fixing holes using a suitable tool so that the screws are still protruding by min. 10 mm.
6. Place the power supply onto the screws, so that they hold it securely in place.
7. Now perform the actual wall mounting process (see section: Wall mounting)

8.5.2 Wall mounting

Proceed as follows to mount the power supply:

1. Copy the entire drilling pattern onto the substructure or mounting wall.
2. Select suitable fixing material depending on the substructure or mounting wall
3. Drill the necessary number of drill holes using a suitable drill, depending on the type of fixing (threaded or wall plug mounting).
4. Prepare the drill hole(s) for the temporary mounting aid (tap M5 thread or insert 8 x 70 mm wall plug).
5. Fix the die-cast housing in place using four screws and four spring washers
6. Check that the die-cast housing is securely mounted

Figure 11 Schematic diagram of wall mounting

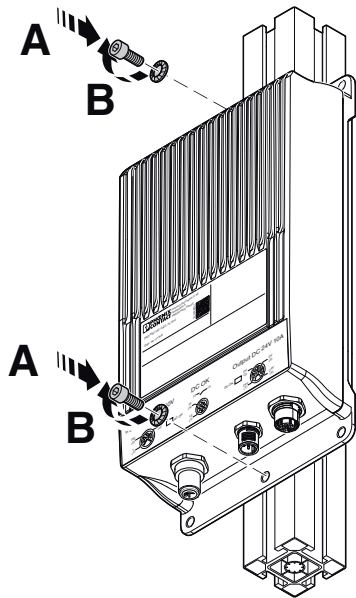


8.5.3 Structural profile

Proceed as follows to mount the power supply:

1. Position the two sliding blocks for fixing in the mounting profile
2. Use the center fixing holes (top, bottom) to fix the die-cast housing
3. Fix the die-cast housing in place using two screws and two spring washers
4. Check that the die-cast housing is securely mounted

Figure 12 Schematic diagram, structural profile mounting



8.6 Removing the power supply unit

i For added security, before loosening all the mounting screws, use the two screws of the temporary mounting aid again.

To remove the power supply, perform the same procedure for the relevant type of fixing (wall mounting, structural profile mounting) in reverse.

9 Device-side circular connectors

On the device side, all the connection contacts of the power supply are circular connectors. For the respective contact assignment of the circular connectors for the device supply or load supply, please refer to the relevant section on the input, output or signaling.



For protection against fatal electric shock, the die-cast housing is wired internally to the protective conductor connection of the device-side circular connector for the AC input voltage.



Optionally available circular connectors are required for the field-side connection of the power supply (see accessories).

9.1 Coding of field-side circular connectors

Each field-side circular connector that is required is assigned its special function with different coding. Incorrect connection between Input AC, Output DC, and floating signal contact 13/14 is therefore impossible.

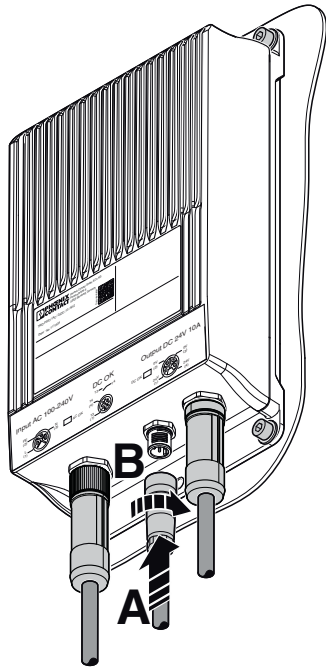
For the coding of field-side circular connectors, refer to the table below:

Device-side marking	Coding
Input AC	S-coded
Output DC	
13/14 (floating contact)	A-coded

9.2 Connecting field-side circular connectors

The field-side circular connectors to be used are coded like the device-side circular connectors. This ensures clear assignment between AC device supply, DC load supply, and the signal contact. Unintentional incorrect connection is prevented.

Figure 13 Schematic diagram, connecting field-side circular connectors



Proceed as follows to connect the field-side circular connectors:

- A Depending on their assigned functionality and coding, securely attach the field-side circular connectors to the device-side circular connectors.
- B To lock the circular connectors, tighten the screw locking by turning it clockwise.

9.3 Releasing field-side circular connectors

To release the field-side circular connectors, perform the same procedure in reverse.

10 Input AC

The power supply is approved for connection to TN, TT, and IT (PE) power grids (star networks) with a maximum phase-to-phase voltage of 240 V AC.

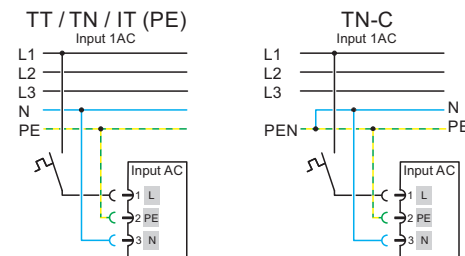
Connection is via the device-side circular connector, connection level 1 (Input AC).

10.1 Primary side connection and fuse protection

The installation of the power supply must conform to the regulations of EN 61010. It must be possible to switch off the power supply using a suitable disconnect device outside the power supply. For example, the primary-side line protection is suitable for this (see technical data).

10.1.1 1AC supply network

Figure 14 Permissible network types for AC supply



10.1.2 DC supply network

Operation on DC power grids is also possible in accordance with the DC nominal input voltage.



DANGER: Hazardous voltage

When operating the power supply on a DC voltage system, observe the maximum permissible input voltage (see section: Technical data).

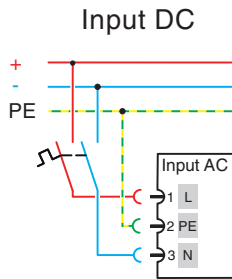
The primary-side fuse protection in DC operation must cover all poles.



NOTE: Damage possible if an incorrect fuse is used

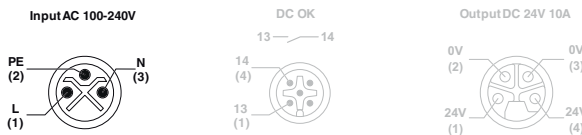
In DC operation, only use fuses that are approved for DC voltages.

Figure 15 Schematic diagram, two-phase fuse protection



10.2 Position of circular connector Input AC

Figure 16 Device-side position and contact assignment of circular connector Input AC



Contact assignment	Description
Contact plug 1	L/+ (mains supply)
Contact plug 2	Protective conductor connection PE
Contact plug 3	N/- (mains supply)

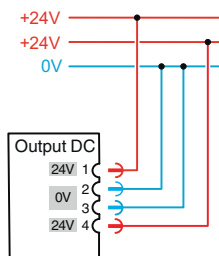
11 Output DC

A DC voltage for supplying the load is provided at the output of the power supply.

Upon delivery, the power supply is preset to a nominal output voltage of 24 V DC. The output voltage value cannot be changed.

Connection is via the device-side circular connector, connection level 2 (Output DC).

Figure 17 Wiring principle, DC output



11.1 Protection of the secondary side

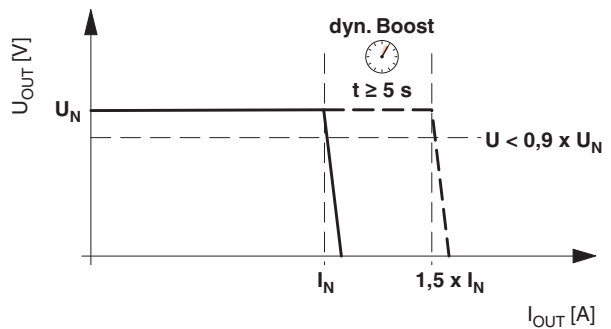
The power supply is electronically short-circuit-proof and no-load-proof. In the event of an error, the output voltage is limited

Overvoltage protection (OVP) limits surge voltages at the DC output to ≤ 30 V DC (EN 61131-2)

11.2 Output characteristic curve

The power supply works with a dynamic power reserve, the dynamic boost, as shown in the U/I characteristic curve in the figure. In the event of a secondary-side short circuit or overload, the output current is limited to $1.5 \times I_N$. The module does not switch off, but supplies a continuous output current instead. The secondary voltage is then reduced until the short circuit is eliminated. The U/I characteristic curve with the dynamic power reserve enables high switch-on currents of capacitive loads or inductive loads to be supplied reliably.

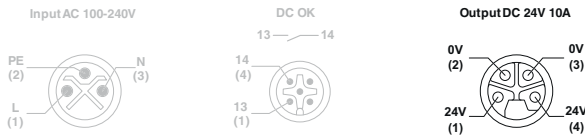
Figure 18 U/I characteristic curve with dynamic load reserve



- $U_N = 24$ V
- $I_N = 10$ A
- $P_N = 240$ W
- $I_{dyn. BOOST} = 15$ A (5 s)
- $P_{dyn. BOOST} = 360$ W (5 s)

11.3 Position of circular connector Output DC

Figure 19 Device-side position and contact assignment of circular connector Output DC

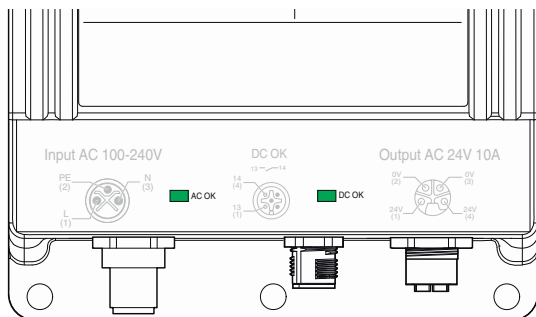


Contact assignment	Description
Contact socket 1	+24 V DC
Contact socket 2	0 V DC
Contact socket 3	0 V DC
Contact socket 4	+24 V DC

12 Signaling

Two LEDs (AC OK, DC OK) and a floating signal contact (N/O contact 13/14) are available for preventive function monitoring of the power supply.

Figure 20 Position of signaling elements



12.1 AC OK LED

The AC OK LED is available for function monitoring. When the power supply is supplied with the necessary AC supply voltage, the LED is steady green. If the supplied input voltage falls below the threshold value of $0.55 \times AC_N$ ($AC_N = 90 \text{ V AC}$), the power supply switches off.

12.2 DC OK-LED

The DC OK LED is available for function monitoring. When the output voltage is $>90\%$ of the nominal output voltage U_{OUT} (24 V DC), the LED is steady green. If the DC output voltage falls below the specified limit value, e.g., due to disruption of the supplied DC output load, the LED is no longer activated.

12.3 Floating signal contact

A floating switch contact can be used to forward data to a higher-level control system. If the input voltage ($0.55 \times AC_N$) is undershot or the nominal output voltage U_{OUT} is $<90\%$, the switch contact (N/O contact 13/14) opens.

Connection is via the device-side circular connector, connection level 3 (signal contact).

Figure 21 Schematic diagram, floating signal contact

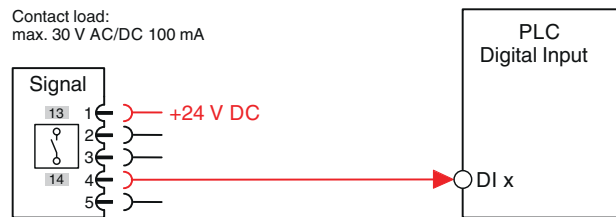
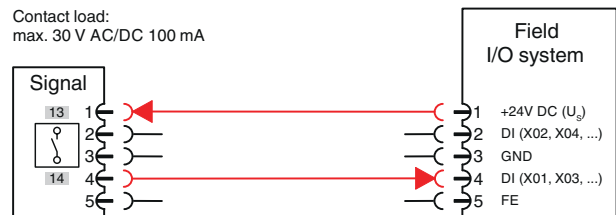


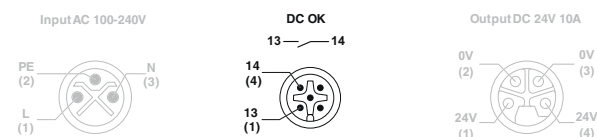
Figure 22 Schematic diagram, floating signal contact on field I/O system



NOTE: Observe maximum current carrying capacity

For the external wiring of the floating switch contact, observe the maximum permissible current carrying capacity of: 30 V AC/DC, 100 mA

Figure 23 Device-side position and contact assignment of circular connector 13/14



Contact assignment	Description
Contact plug 1	Floating switch contact (13)
Contact plug 2	not used
Contact plug 3	not used
Contact plug 4	Floating switch contact (14)
Contact plug 5	not used

13 Disposal and recycling



Ensure the correct disposal of electronic components

Do not dispose of the power supply as household waste.

Observe the applicable national standards and regulations.



Ensure correct disposal or recycling

Dispose of or recycle packaging material that is no longer needed as household waste.

Observe the applicable national standards and regulations.