Data sheet

Q.PS-AD3-2405F

Power supplies with 24 VDC output

- Input rated voltage 230 / 400…500 VAC
- Output: 24 VDC ±3% / 5 A
- Power Boost: 7,5 A for at least 3 minutes, up to 60 °C
- 3 different modes for the short-circuit protection are selectable
- Overload protected
- Strong overload without switch-off
- „Power Good"-Relais
- IP 20
- Mounting on DIN rail
- Extremely small size

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Control Systems and Components

Product Range

Figure	Input	Output	Protection	Features
Q.PS-AD1 	Single phase 24 VAC / 40 VDC	24 VDC, 3 A 24 VDC, 5 A 24 VDC, 7 A	Short circuit Overload	
Q.PS-AD2-24xxF 	Single phase 115…240 VAC	24 VDC, 1,5…3 A 24 VDC, 5…7.5 A 24 VDC, 10…14 A	Short circuit Overload Overvoltage	Adjustable output voltage 22…27 VDC
Q.PS-AD3 	One- or Double-phase 230 / 400 - 500 VAC	24 VDC, 5...7.5 A	Short circuit Overload Overvoltage	Adjustable output voltage 22…27 VDC
Q.PS-ADB 	Single phase 110…230 VAC / 24 VDC battery	24 VDC, 5 A	Short circuit Overload Overvoltage	Adjustable charging current 1…5 A, battery diagnostic and different charging modes

Applications

Control panels, where 24 VDC is required to supply PLC's, actors, sensors etc. But also power demanding loads such as solenoid valves, motors, lamps, etc. Can be used in applications for:

- Building automation
- Industrial automation
- Infrastructure plants, such as water or sewage treatment
- Machineries
- Material handling
- etc.

Norms and certifications

- The CE mark according to 2004/108/EC Electromagnetic Compatibility and low voltage directive 2006/95/EC

Electrical safety

- According to IEC/EN60950 (VDE0805) and EN50178 (VDE0160) for assembling devices. The unit must be installed according to IEC/EN60950.

EMC Generic

- Immunity according to EN61000-6-2
  Emission according to EN61000-6-4

Functions Q.PS-AD3-2405F

Input data	
Input voltage	230 VAC / 400…500 VAC
Input Voltage Range	187…264 VAC / 330…550 VAC
Inrush Current (at U_n and I_n)	≤ 17 A ≤ 5 ms
Frequency	47…63 Hz ± 6%
Input Current (Input Rated Voltage)	1.5 / 0.8 A
Internal Fuse	4 A
External Fuse	Fast 10 A
Output data	
Output Voltage (Vn) / Nominal Current (In)	24 VDC ±3% / 5 A
Adjustment range (U_{adj}) Adjustment range (U_{adj})	22…27 VDC
Turn-On delay after applying mains voltage	1 sec (max)
Start up with capacitive load	≤ 50.000 µF
Continuous running current	
Max. continuous current at ≤ 40 °C	7.5 A
Max. continuous current at ≤ 50 °C	6.0 A
Max. continuous current at ≤ 60 °C	5.0 A
Power reserve (power boost) (within 3 min. ≥ 60 °C)	7.5 A
Short-circuit current (Icc)	16 A
Hold-up Time (at 100…240 VAC)	in general 20 ms
Residual Ripple	≤ 80 mVpp
Minimum load	No
Effiziency (at 50% In)	≥ 91%
Short-circuit protection	Yes
Overload protection	Yes
Over Voltage Output protection	Yes (max 35 VDC)
Parallel connection	Yes
Climatic data	
Ambient Temperature (operation)	-25…+70 °C (De rating >60 °C, 2.5%/°C)
Ambient Temperature (storage)	-40… +85 °C
Humidity: no moisture condensation	95% at +25°C
General data	
Isolation Voltage (Input/Output)	3000 VAC
Input / Ground isolation PE	1605 VAC
Output / Ground isolation PE	500 VAC
Degree of protection	IP20
Pollution Degree Environment	2
Protection class	I, with PE connected
Dimension (w×h×d)	55×110×105 mm
Weight	approx 0.60 kg

Contact: Switzerland and International

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Product support and this document in DE, FR, IT, on the website: www.sbc-support.ch

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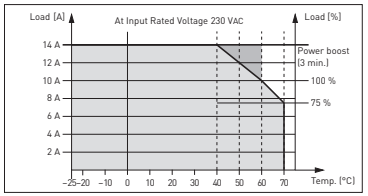
Output characteristics

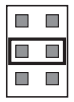
Output Derating Curve



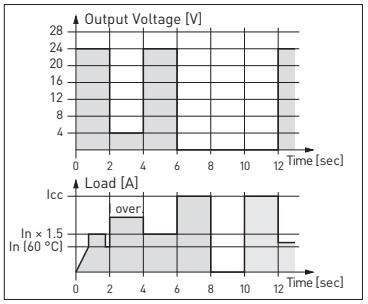
Mode Hiccup-Mode

Automatic restart (default setting). The device tries to re-establish output voltage about every 2 seconds.

Jumper

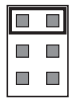


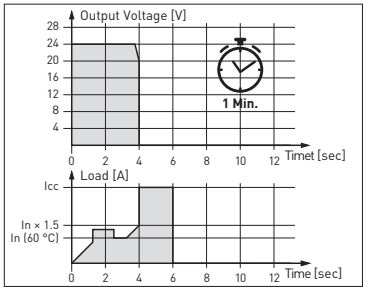
Characteristic



Manual Rest-Mode

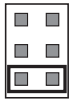
In order to restart the output it is necessary to switch-off the input circuit for about 1 minute.

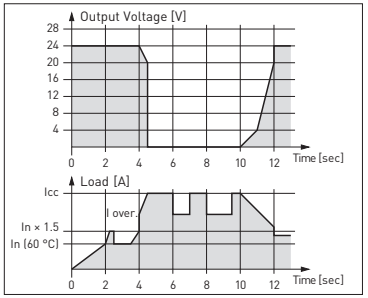




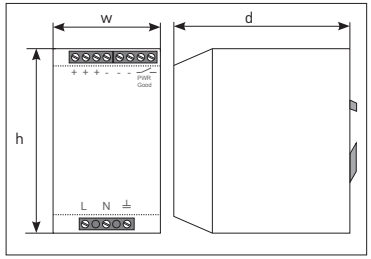
Continuous Out Mode

The output current is kept at high values with near zero voltage.





Dimensions



Mounting Instruction & Users Guide

1-/2-Phases Power supply Q.PS-AD3-2405F

Primary switched power supply: Thank you for having chosen one of our products for your work.
We are certain that it will give the utmost satisfaction and be a notable help on the job.

Application: The power supplies Q.PS-AD3-2405F can be used in areas with extreme industrial environment, and complies with the latest technical standard. Before working with the unit, read these instructions carefully and completely. All these power supplies are single output, IP20 and have Mounting DIN Rail IEC60715/TH35. Class 1 isolation devices suitable for SELV and PELV solutions.

Installation

WARNING

Explosion Hazard. Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
Explosion Hazard. Substitution of components may impair suitability for class I, Division 2.
Switch off the system before connecting the module. Never work on the machine when it is live. The device must be installed in according with EN60950. The device must have a suitable isolating facility outside the power supply unit, via which can be switched to idle. Danger of fatal Injury!

Connection:

Cable Connection: The following cable cross-sections may be used:

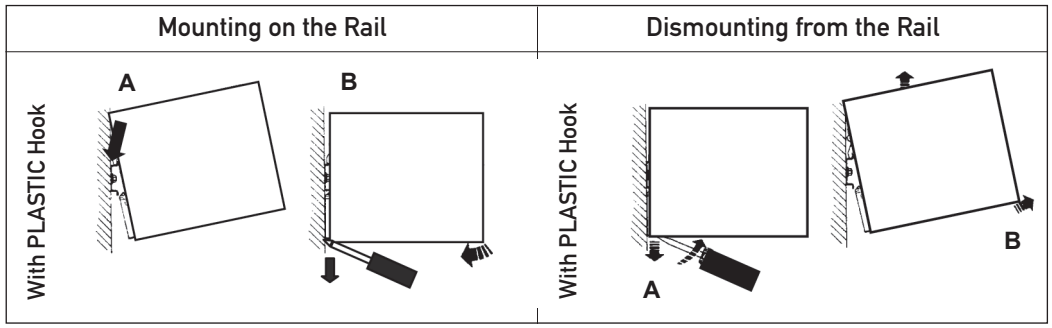
	Solid (mm^2)	Stranded (mm^2)	AWG	Torque (Nm)	Stripping Length
Input	0.2÷2.5	0.2÷2.5	24 … 14	0.5 … 0.6 Nm	7 mm
Output:	0.2÷2.5	0.2÷2.5	24 … 14	0.5 … 0.6 Nm	7 mm
Signal:	0.2÷2.5	0.2÷2.5	24 … 14	0.5 … 0.6 Nm	7 mm

The connection is made by screw type 2.5 mm2 terminal blocks. Use only copper cables that are designed for operating temperatures of >75 °C. Wiring terminals shall be marked to indicate the proper connection for the power supply.
Input: The input connection is made by N/L, L/L, ⏚.
Output: 24 VDC is made via the + (+), - (-).

Signalling

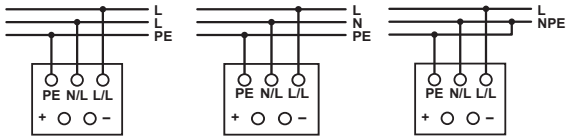
Jumper Settings	Standard Conditions "LED DC ok"	Overflow conditions "LED DC ok"
MANUAL RESET:	Lights up permanently when the output voltage is OK.	Switches off when there is an overload
HICCUP MODE:		Blinks when there is an overload
CONTINUOUS OUT MODE:		Switches off when there is an overload

Rail Mounting:

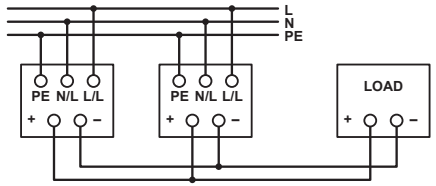


Other modules must have a minimum vertical distance of 10 cm to this power supply in order to guarantee sufficient auto convection. Depending on the ambient temperature and load of the device, the temperature of the housing can become very high!

Connection:



Parallel Connection for Redundancy or Increased capacity:



To result a good current share between all devices in parallel, adjust the output voltage in a tolerance of ± 20 mV. Therefore applying 1 … 2 A load to adjust the output-voltage. Then connect them in parallel.
Use only power supplies of the same model.

Power Good Output Function:

The NC contact open any time the output voltage level goes below 20 VDC ± 5 %. With this Power Good relay the output voltage can continuously be monitored. The maximum rates which can be switched are 30 VDC and 1 A.

Protection:

On the primary side: the device is equipped with an internally fuse. If the internal fuse is activated, it is most probable that there is a fault in the device. If happen, the device must be checked in the factory.
On the secondary side: the device is electrically protected against: Over-load, output over-voltage and short circuit automatically.

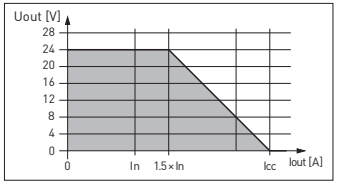
Setting of the modes for Short Circuit an Over Load:

You must turn off the device before change settings.

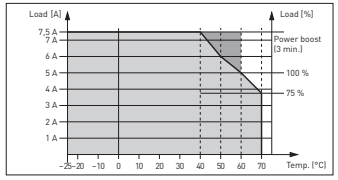
- Jumper position in **MANUAL RESET** (Shut Down Mode): If Overload or Short Circuit happens, the output turns off. To restart the power supply it is necessary to turn off mains input for a few seconds. This protection mode is particularly suggested in applications where safety procedures require that a reset can be carried out only by an authorized person.
- Jumper in **HICCUP MODE** (Auto-Reset): In case of short-circuit or overloading, the output current is interrupted. The device tries again to re-establish the output voltage every 2 second till the problem is cleared. (default factory jumper setting)
- Jumper position in **CONTINUOUS OUT MODE**: If you need a constant power on your load, select this mode. The output power don't switch off. This protection mode is used to meet the requirements of demanding loads such as motors, solenoid valves, lamps, PLC with highly capacitive input circuits and other loads with transient behaviour.

Characteristic Curves

Short circuit and overload
The output of the device is electrically protected against overload and short circuit.
At nominal voltage the device can supply 1.5 the nominal Current without switching off.
In the case of higher overload, the operating point traces the curve illustrated in figure.
As the overload increases, the output voltage is reduced until zero.



Thermal behaviour
The rated maximal air temperature @ nominal current is 60 °C. For ambient temperature above 60 °C, the output current must be reduced by 2.5 % per Kelvin increase in temperature. At the temperature of 70 °C, the output current will be 3/4 × In. The equipment does not switch off in case of ambient temperature up to 70 °C or thermal overload. The devices are protected for excess temperature conditions. In conditions where the power-supply inside temperature is over 70°C will the device shut-down the output and will be automatically restarted when the temperature inside the power-supply is decreased.



Q.PS-AD3-240F

Standards and Certification

Electrical Safety:
Assembling device: UL508, IEC/EN60950 (VDE0805) and EN50178 (VDE0160)
Isolation according: IEC/EN60950
Input/Output separation: SELV EN60095-1 and PELV EN60204-1.
Double or reinforced insulation

EMC Standards (Surge, Transient Immunity):
Immunity: EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-6-2
Emmission: EN61000-6-4, ENC61000-3-2
Standards Conformity:
Safety of Electrical Equipment Machines: EN60204-1.

CE

In according to EMC2004/108/EC and EMC93/68/EEC
Low voltage directive 2006/95/E