

# STEP-PS/277AC/24DC/3.5 Single-Phase DIN Rail Power Supply

 [perle.com/products/industrial-power-supply/step-ps-1ac-24dc-3.5-29049458.shtml](https://www.perle.com/products/industrial-power-supply/step-ps-1ac-24dc-3.5-29049458.shtml)

## 24V Industrial Power Supply for Regulated AC/DC or DC/DC Conversion

- 24 V DC Output Voltage
- 3.5 Amps
- 84 Watts
- Single phase AC or DC Input
- Input Voltage Range: 85 ... 305 V AC and 95 ... 250 V DC

The **STEP-PS/1AC/24DC/3.5 Industrial Power Supply** is a rugged AC to DC and DC to DC Converter built to meet the high stability and efficiency expectations of industrial, machine automation and process control environments. With its **low-profile design**, this STEP power supply is ideal for building automation, installation distributors and **flat control panels**. This Switching (switch mode) Power Supply ensures a regulated output voltage even in the event of voltage fluctuations in the power supply network. With all required safety certifications to support ITE (Information Technology Equipment), ruggedized packaging, extended operating temperatures, high peak load capabilities and high isolation voltages, this STEP Industrial Power Supply is designed to meet the needs of your industrial application.



## Industrial operating temperature of -25°C to +70°C

Equipment found in traffic management, oil and gas pipelines, weather tracking, industrial and outdoor applications must function in temperatures that cannot be supported by a commercial power supplies. With an operating temperature of -25°C to +70°C, the STEP-PS/1AC/24DC/3.5 Industrial Power Supply is ideal for use with equipment subjected to harsh environments and severe temperatures.

## High efficiency and low no load power consumption

Compared with other products on the market, this STEP Industrial Power Supply provides excellent energy savings. With a very low no load power consumption and high efficiency at nominal load, just a small amount of electrical energy is converted into undesired heat energy making this a very ECO friendly power supply. This is important if the power supply is on call 24 hours a day, but rarely loaded.

## Flexible mounting

The STEP-PS/1AC/24DC/3.5 power supply offers flexible mounting options. It can either be snapped onto a DIN rail or screwed onto a level surface. When mounting on level surfaces, lugs integrated into the housing eliminate the need for additional mounting material.

## U/I characteristic curve for the supply of capacitive loads

The STEP-PS/1AC/24DC/3.5 Industrial Power Supply is well suited for driving capacitive loads, and DC/DC converters in the primary circuit, due to its U/I characteristic curve. This makes STEP DIN Rail Power Supply suitable for applications such as solar cell testing, solar panel testing, testing of piezoelectric driving devices, capacitor testing, driving and testing of capacitive transducers, powering industrial substation capacitors, and lab-type applications with capacitive-resistive loads. This STEP Power Supply can also be used to power resistive loads, and inductive loads.



## 22.5 to 25 V DC Adjustable Output Voltage Range

Using the rotary potentiometer on the front face of the STEP power supply, the output voltage can be optimally adjusted to meet specific application environment requirements. For example, you can easily adjust to compensate for a voltage drop caused by a long cable length.

## Ideal application environments for a STEP-PS/1AC/24DC/3.5 DIN Rail Power Supply

- flat control panels
- testing of solar cells, solar panels, piezoelectric driving devices and capacitors
- driving and testing of capacitive transducers
- powering industrial substation capacitors
- lab-type applications with capacitive-resistive loads
- automated production process
- building control, security and surveillance, and climate control systems

## Other reasons to choose a STEP-PS/1AC/24DC/3.5 Industrial Power Supply

- DIN Rail mount narrow housing saves space in the control cabinet
- Voltage Isolation input/output: 4 kV AC
- LED indicator for voltage out failure: If the output voltage is below the operational range, the LED turns off.
- Protections: Short-circuit, Overload, Over voltage, Over-temperature
- High MTBF (Mean Time Between Failure) values of more than 500,000 hours at +40°C ensure maximum availability
- IEC Protection Class II Power Supplies

## Industrial Class 2 Power Supply

With the NEC designation as a **Class 2 Power Supply**, all regulations address the wiring requirements (wire size and insulation, wire derating factors, overcurrent protection limits and methods of wiring

installation) between the output of the supply and the input of the load are met by this STEP. The output

voltage and power delivery capabilities of this Class 2 power supply will lower the risk of fire initiation and electrical shocks, which allows for lower cost wiring methods to be employed when installing an electrical system in a building.

### Environmental Product Compliance

REACH SVHC	Lead 7439-92-1
China RoHS	Environmentally Friendly Use Period = 25;

### General

Net weight	0.3 kg
Operating voltage display	Green LED
Efficiency	> 88 % (for 277 V AC and nominal values)
Insulation voltage input/output	4 kV AC (type test) 3.75 kV AC (routine test)
Protection class	II
Degree of protection	IP20
MTBF (IEC 61709, SN 29500)	> 1094000 h (40 °C)
Mounting position	horizontal DIN rail NS 35, EN 60715
Assembly instructions	alignable: 0 mm horizontally, 30 mm vertically

### Standards and Regulations

Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Noise immunity	EN 61000-6-2:2005
Standards/regulations	EN 61000-4-2
Contact discharge	4 kV (Test Level 2)
Standards/regulations	EN 61000-4-3
Frequency range	80 MHz ... 1 GHz
Test field strength	10 V/m
Frequency range	1.4 GHz ... 2 GHz
Test field strength	3 V/m

Standards/regulations	EN 61000-4-4
Comments	Criterion B
Standards/regulations	EN 61000-6-3
	EN 61000-4-6
Frequency range	10 kHz ... 80 MHz
Voltage	10 V (Test Level 3)
Standards/regulations	EN 61000-4-11
Low Voltage Directive	Conformance with LV directive 2006/95/EC
Standard - Safety of transformers	EN 61558-2-16
Standard - Electrical safety	IEC 60950-1/VDE 0805 (SELV)
Standard – Electronic equipment for use in electrical power installations and their assembly into electrical power installations	EN 50178/VDE 0160 (PELV)
Standard – Safety extra-low voltage	IEC 60950-1 (SELV) and EN 60204-1 (PELV)
Standard - Safe isolation	DIN VDE 0100-410
Standard – Protection against shock currents, basic requirements for protective separation in electrical equipment	EN 50178
Standard – Limitation of mains harmonic currents	EN 61000-3-2
UL approvals	UL/C-UL listed UL 508
	UL/C-UL Recognized UL 60950-1
	NEC Class 2 as per UL 1310
Shock	18 ms, 30g, in each space direction (according to IEC 60068-2-27)
Vibration (operation)	< 15 Hz, amplitude $\pm 2.5$ mm (according to IEC 60068-2-6)
	15 Hz ... 150 Hz, 2.3g, 90 min.
Information technology equipment - safety (CB scheme)	CB Scheme
Rail applications	EN 50121-4
<b>Connection data, input</b>	
Connection method <a href="https://www.perle.com/products/industrial-power-supply/step-ps-1ac-24dc-3.5-29049458.shtml">https://www.perle.com/products/industrial-power-supply/step-ps-1ac-24dc-3.5-29049458.shtml</a>	Screw connection
Conductor cross section solid min	0.2 mm <sup>2</sup>

Conductor cross section solid max.	2.5 mm <sup>2</sup>
Conductor cross section flexible min.	0.2 mm <sup>2</sup>
Conductor cross section flexible max.	2.5 mm <sup>2</sup>
Conductor cross section AWG min.	24
Conductor cross section AWG max.	12
Stripping length	6.5 mm
Screw thread	M3
<b>Output data</b>	
Nominal output voltage	24 V DC $\pm$ 1 %
Setting range of the output voltage ( $U_{Set}$ )	22.5 V DC ... 25 V DC (> 24 V DC, constant capacity restricted)
Nominal output current ( $I_N$ )	3.5 A (-25 °C ... 55 °C)
Output current $I_{max}$	6 A
Derating	55 °C ... 70 °C (2.5%/K)
Connection in series	yes
Feedback resistance	$\leq$ 35 V DC
Protection against surge voltage on the output	< 35 V DC
Control deviation	< 1 % (change in load, static 10 % ... 90 %)
	< 2 % (change in load, dynamic 10 % ... 90 %)
	< 0.1 % (change in input voltage $\pm$ 10 %)
Residual ripple	< 10 mV <sub>PP</sub> (20 MHz)
Output power	84 W
Typical response time	< 0.5 s
Peak switching voltages nominal load	< 30 mV <sub>PP</sub> (20 MHz)
Maximum power dissipation in no-load condition	< 0.6 W
Power loss nominal load max.	11.5 W

**Dimensions**

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Width

90 mm

Height	90 mm
Depth	61 mm
Weight per piece	379.0 GRM
<b>Input data</b>	
Nominal input voltage range	100 V AC ... 277 V AC
Input voltage range	85 V AC ... 305 V AC
	95 V DC ... 250 V DC
AC frequency range	45 Hz ... 65 Hz
Frequency range DC	0 Hz
Current consumption	1.43 A (120 V AC)
	0.75 A (277 V AC)
Nominal power consumption	147.7 VA
Inrush surge current	< 40 A (typical)
Mains buffering	typ. 25 ms (120 V AC)
	typ. 160 ms (277 V AC)
Input fuse	4 A (slow-blow, internal)
Choice of suitable circuit breakers	6 A ... 16 A (Characteristics B, C, D, K)
Power factor (cos phi)	0.64
<b>Connection data, onput</b>	
Connection method	Screw connection
Conductor cross section solid min.	0.2 mm <sup>2</sup>
Conductor cross section solid max.	2.5 mm <sup>2</sup>
Conductor cross section flexible min.	0.2 mm <sup>2</sup>
Conductor cross section flexible max.	2.5 mm <sup>2</sup>
Conductor cross section AWG min.	24
Conductor cross section AWG max.	12
Stripping length	6.5 mm
Screw thread	M3

Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 70 °C (> 55° C derating : 2.5%/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Max. permissible relative humidity (operation)	≤ 95 % (at 25 °C, non-condensing)
Climatic class	3K3 (in acc. with EN 60721)
Degree of pollution	2

### Approvals

- cULus Listed
- cULus Recognized
- EAC
- UL Recognized
- cUL Recognized
- cUL Listed
- IECEE CB Scheme
- UL Listed

### Step-PS Industrial Power Supply Block Diagram

