

# STEP-PS/ 1AC/24DC/1.75 - Power supply



2868648

<https://www.phoenixcontact.com/us/products/2868648>

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Primary-switched STEP POWER power supply for DIN rail mounting, input: 1-phase, output: 24 V DC/1.75 A

## Product description

STEP POWER power supplies for distribution boards

The STEP POWER power supply range was developed especially for building automation. The low idling losses and high degree of efficiency ensure maximum energy efficiency. They allow flexible use and can be snapped onto the DIN rail or screwed onto an even surface.

## Your advantages

- Flexible mounting by simply snapping onto the DIN rail or screwing onto a level surface
- Reliable power supply thanks to high MTBF (mean time between failures) of more than 500,000 hours and U/I characteristic curve
- Energy savings thanks to maximum energy efficiency and incredibly low idling losses

## Commercial data

Item number	2868648
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CM13
Product key	CMPS13
GTIN	4046356172844
Weight per piece (including packing)	232 g
Weight per piece (excluding packing)	190 g
Customs tariff number	85044095
Country of origin	VN

## Technical data

### Input data

#### AC operation

Nominal input voltage range	100 V AC ... 240 V AC
Input voltage range	85 V AC ... 264 V AC
Voltage type of supply voltage	AC
Inrush current	< 15 A (typical)
Inrush current integral ( $I^2t$ )	< 0.6 A <sup>2</sup> s
AC frequency range	45 Hz ... 65 Hz
Frequency range DC	0 Hz
Mains buffering time	typ. 25 ms (120 V AC) typ. 150 ms (230 V AC)
Current consumption	0.6 A (120 V AC) 0.3 A (230 V AC)
Nominal power consumption	84.2 VA
Protective circuit	Transient surge protection; Varistor
Power factor (cos phi)	0.57
Typical response time	< 0.5 s
Input fuse	3.15 A (slow-blow, internal)
Recommended breaker for input protection	6 A ... 16 A (Characteristics B, C, D, K)

#### DC operation

Input voltage range	95 V DC ... 250 V DC
Voltage type of supply voltage	DC

### Output data

Efficiency	> 89 % (for 230 V AC and nominal values)
Output characteristic	U/I
Nominal output voltage	24 V DC
Setting range of the output voltage ( $U_{Set}$ )	22.5 V DC ... 29.5 V DC (> 24 V DC, constant capacity restricted)
Output current $I_{max}$	3.75 A
Nominal output current ( $I_N$ )	1.75 A (-25 °C ... 55 °C) 1.9 A (-25 °C ... 40 °C permanent)
Derating	55 °C ... 70 °C (2.5 %/K)
Feedback voltage resistance	≤ 35 V DC
Protection against overvoltage at the output (OVP)	< 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 ±10 %)
Residual ripple	< 60 mV <sub>PP</sub> (20 MHz)
Short-circuit-proof	yes
Output power	42 W

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Peak switching voltages nominal load	< 40 mV <sub>PP</sub> (20 MHz)
Maximum no-load power dissipation	< 0.7 W
Power loss nominal load max.	5 W
Rise time	< 0.5 s (U <sub>OUT</sub> (10 % ... 90 %))
Connection in parallel	yes, for redundancy and increased capacity
Connection in series	yes
Fuse protection (secondary side)	electronic

## Connection data

### Input

Connection method	Screw connection
Conductor cross-section, rigid min.	0.2 mm <sup>2</sup>
Conductor cross-section, rigid 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
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

### Output

Connection method	Screw connection
Conductor cross-section, rigid min.	0.2 mm <sup>2</sup>
Conductor cross-section, rigid 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
Tightening torque, min	0.5 Nm
Tightening torque max	0.6 Nm

## Signaling

Types of signaling	LED
Operating voltage display	Green LED

### Signal output: LED status indicator

Status display	"DC OK" LED green
Note on status display	U <sub>OUT</sub> > 21.5 V: LED lights up

## Electrical properties

Number of phases	1
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Insulation voltage input/output	4 kV AC (type test)
	3.75 kV AC (routine test)
Insulation voltage output / PE	500 V DC (routine test)
Insulation voltage input/output	3.75 kV AC (routine test)
	4 kV AC (type test)
Insulation voltage input / PE	3.5 kV AC (type test)
	2 kV AC (routine test)

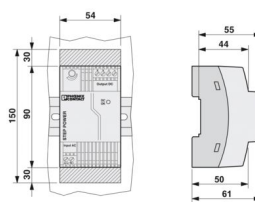
## Product properties

Product type	Power supply
Product family	STEP POWER
MTBF (IEC 61709, SN 29500)	> 1569000 h (40 °C)

## Insulation characteristics

Protection class	II (in closed control cabinet)
Overvoltage category	III
Degree of pollution	2

## Dimensions

Dimensional drawing	
Width	54 mm
Height	90 mm
Depth Device depth (DIN rail mounting)	55 mm (Device depth (DIN rail mounting))
Horizontal pitch	3 Div.

## Installation dimensions

Installation distance right/left	0 mm / 0 mm
Installation distance top/bottom	30 mm / 30 mm

## Mounting

Mounting type	DIN rail mounting
Assembly note	alignable: 0 mm horizontally, 30 mm vertically
Mounting position	horizontal DIN rail NS 35, EN 60715
With protective coating	no

## Material specifications

Housing material	Plastic
Housing material	PC
Foot latch material	POM (Polyoxymethylene)

## Environmental and real-life conditions

### Ambient conditions

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
Ambient temperature (start-up type tested)	-40 °C
Climatic class	3K3 (in acc. with EN 60721)
Max. permissible relative humidity (operation)	≤ 95 % (at 25 °C, non-condensing)
Shock	18 ms, 30g, in each space direction (according to IEC 60068-2-27)
Vibration (operation)	< 15 Hz, amplitude ±2.5 mm (according to IEC 60068-2-6) 15 Hz ... 150 Hz, 2.3g, 90 min.
Temp code	T4A (70 °C)

## Standards and regulations

Rail applications	EN 50121-4
Standard – Electronic equipment for use in electrical power installations and their assembly into electrical power installations	EN 50178/VDE 0160 (PELV)
Standard – Limitation of mains harmonic currents	EN 61000-3-2
Standard - Electrical safety	IEC 62368-1 (SELV)
Standard – Protection against shock currents, basic requirements for protective separation in electrical equipment	EN 50178
Standard – Safety extra-low voltage	IEC 62368-1 (SELV) und EN 60204-1 (PELV)
Standard - Safe isolation	DIN VDE 0100-410
Standard - Safety of transformers	EN 61558-2-16

## Approvals

CSA	CSA-C22.2 No. 107.1-01
Shipbuilding approval	DNV GL (EMC B) ABS, NK
UL approvals	UL/C-UL listed UL 508
	UL/C-UL Recognized UL 60950-1
	UL ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C, D T4A (Hazardous Location) NEC Class 2 as per UL 1310

### Conformity/Approvals

SIL in accordance with IEC 61508	0
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## EMC data

Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Low Voltage Directive	Conformance with Low Voltage Directive 2014/35/EC
EMC requirements for noise emission	EN 61000-6-3
	EN 61000-6-4
EMC requirements for noise immunity	EN 61000-6-1
	EN 61000-6-2

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## Electrostatic discharge

Standards/regulations	EN 61000-4-2
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## Electrostatic discharge

Contact discharge	6 kV (Test Level 3)
Discharge in air	8 kV (Test Level 3)
Comments	Criterion A

## Electromagnetic HF field

Standards/regulations	EN 61000-4-3
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## Electromagnetic HF field

Frequency range	80 MHz ... 1 GHz
Test field strength	10 V/m
Frequency range	1 GHz ... 2 GHz
Test field strength	10 V/m
Frequency range	2 GHz ... 3 GHz
Test field strength	10 V/m
Comments	Criterion A

## Fast transients (burst)

Standards/regulations	EN 61000-4-4
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## Fast transients (burst)

Input	4 kV (Test Level 4 - asymmetrical)
Output	2 kV (Test Level 3 - asymmetrical)
Comments	Criterion A

## Surge voltage load (surge)

Standards/regulations	EN 61000-4-5
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## Surge voltage load (surge)

Input	2 kV (Test Level 3 - symmetrical)
	4 kV (Test Level 4 - asymmetrical)
Output	1 kV (Test Level 2 - symmetrical)
	0.5 kV (Test Level 1 - asymmetrical)
Comments	Criterion A

## Conducted interference

Standards/regulations	EN 61000-4-6
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## Conducted interference

Frequency range	10 kHz ... 15 kHz
	10 kHz ... 15 kHz
Comments	Criterion A
	Criterion A
Voltage	3 V (Test Level 2)

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	3 V (Test Level 2)
Conducted interference	
Frequency range	10 kHz ... 15 kHz
	10 kHz ... 15 kHz
Comments	Criterion A
	Criterion A
Voltage	3 V (Test Level 2)
	3 V (Test Level 2)
Voltage dips	
Standards/regulations	EN 61000-4-11
Emitted interference	
Standards/regulations	EN 61000-6-3
Radio interference voltage in acc. with EN 55011	EN 55011 (EN 55022) class B used in industry and residential area / EMC 1
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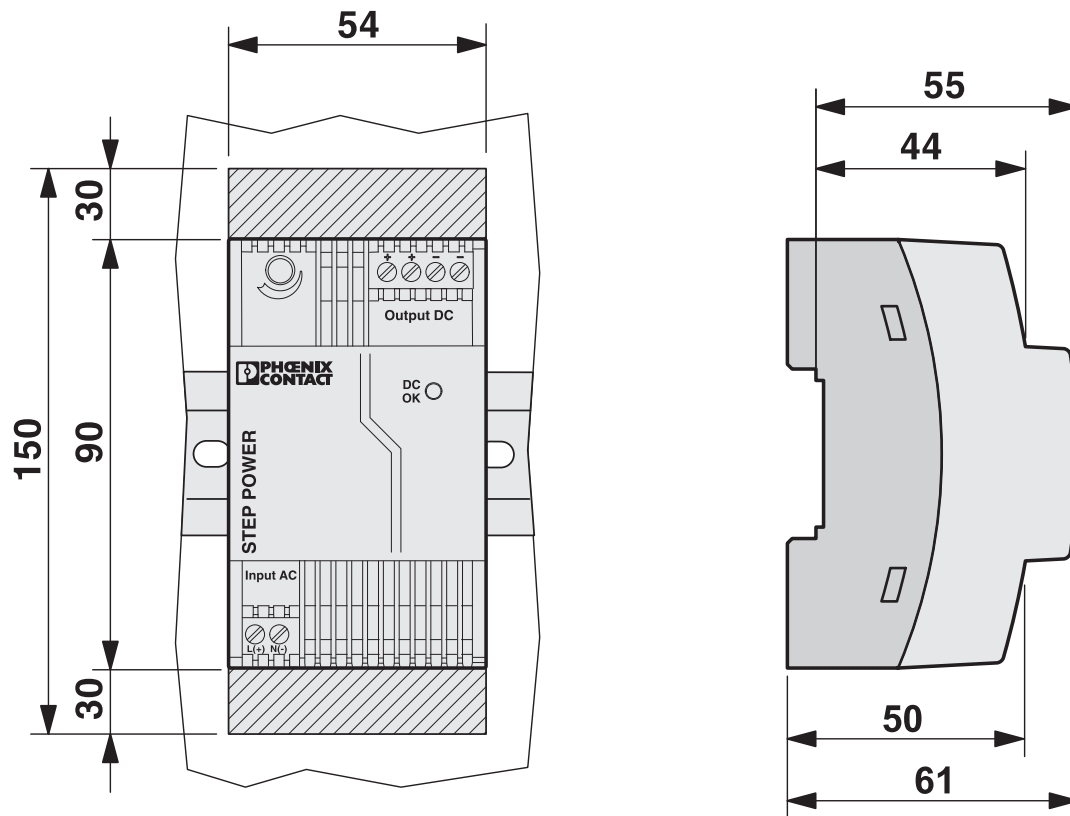


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## Drawings

Dimensional drawing



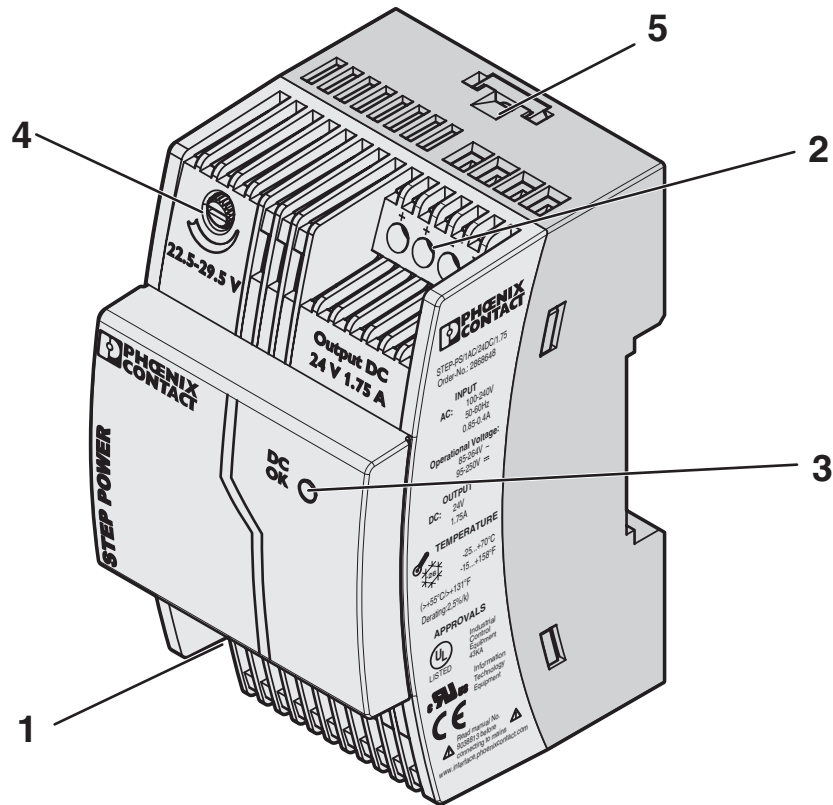
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Schematic diagram



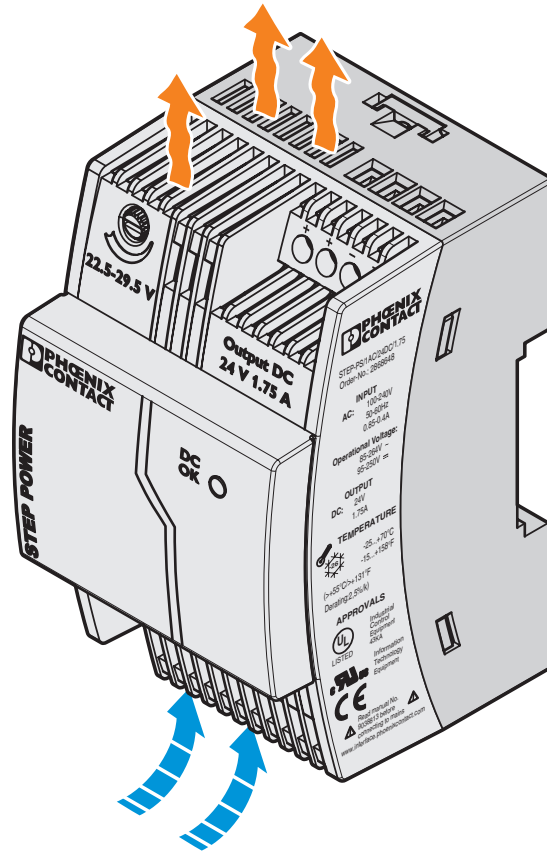
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Schematic diagram



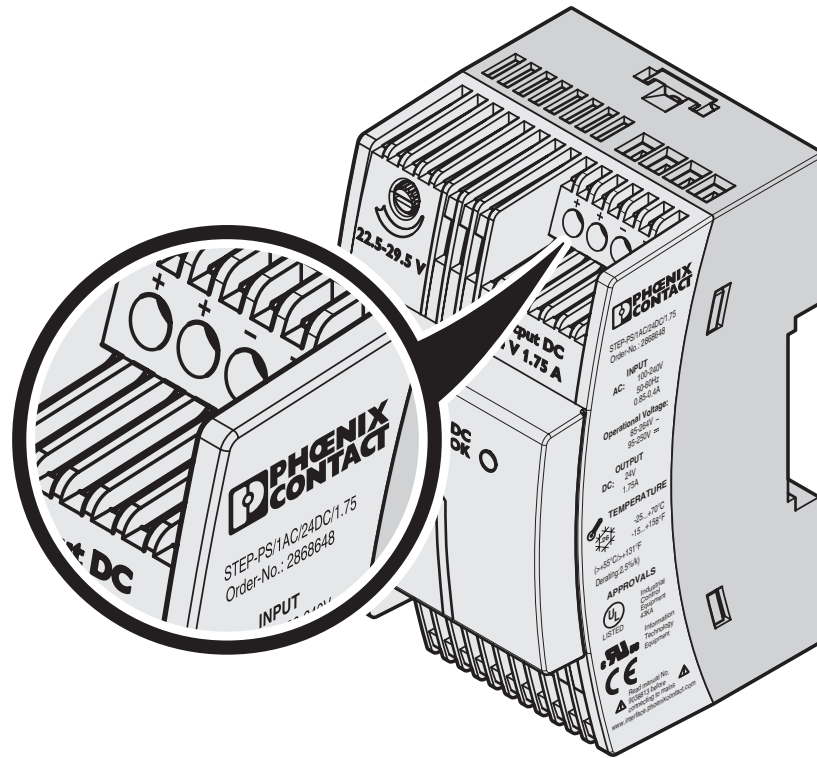
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Schematic diagram



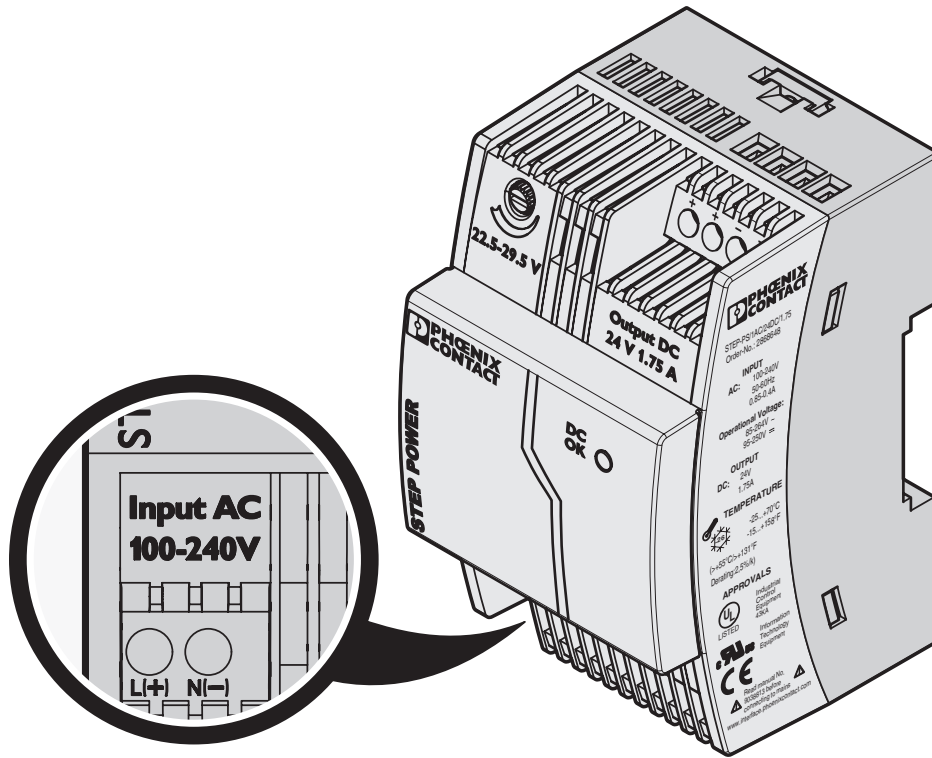
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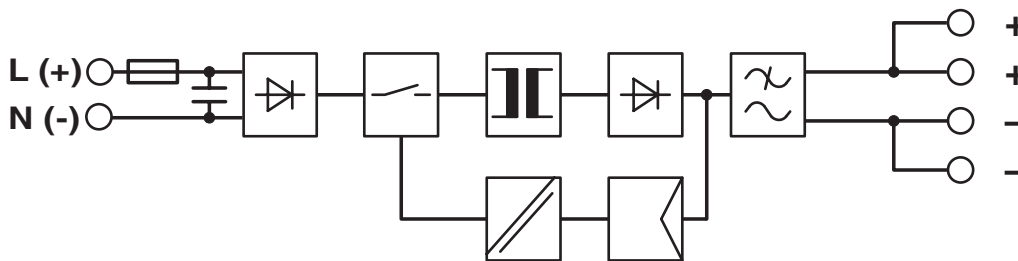
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Schematic diagram



Block diagram



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## Approvals

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**cUL Recognized**

Approval ID: FILE E 214596



**UL Recognized**

Approval ID: FILE E 214596



**IECEE CB Scheme**

Approval ID: DK-36104-M1-UL



**EAC**

Approval ID: RU S-DE.BL08.W.00764



**NK**

Approval ID: TA24454M



**EAC**

Approval ID: RU S-DE.BL08.W.00764



**UL Listed**

Approval ID: E123528



**cUL Listed**

Approval ID: E123528

**BSH**

Approval ID: 581

**ABS**

Approval ID: 23-2446587-PDA

**DNV**

Approval ID: TAA00001YD

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**IECEE CB Scheme**

Approval ID: NL2-021195



**cUL Listed**

Approval ID: E199827



**UL Listed**

Approval ID: E199827

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## Classifications

### ECLASS

ECLASS-13.0	27040701
ECLASS-15.0	27040701

### ETIM

ETIM 10.0	EC002540
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### UNSPSC

UNSPSC 21.0	39121000
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## Environmental product compliance

### EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	6(c), 7(c)-I

### China RoHS

Environment friendly use period (EFUP)	EFUP-25
	An article-related China RoHS declaration table can be found in the download area for the respective article under "Manufacturer declaration". For all articles with EFUP-E, no China RoHS declaration table issued and required.

### EU REACH SVHC

REACH candidate substance (CAS No.)	Lead(CAS: 7439-92-1)
	Lead(CAS: 7439-92-1)
SCIP	b667060c-538a-4c0d-ac33-11cabbef5657

### EF3.1 Climate Change

CO2e kg	5.207 kg CO2e
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