

# TRIO-PS67/1AC/24DC/3.75/M12-A - Power supply



1376306

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Primary-switched power supply unit TRIO POWER IP67, M12 circular connector, Panel mounting, input: 1-phase, output: 24 V DC / 3.75 A

## Product description

TRIO POWER 3.75 A power supplies with IP67 degree of protection for power-limited circuits offer increased safety thanks to NEC Class 2 classification. The field power supplies are equipped with basic functionality and ensure that the maximum output power of 100 W is not exceeded even in the event of a fault.

## Your advantages

- Increased electrical safety with NEC Class 2
- Quick installation and easy integration thanks to M12 connection
- Direct installation at the load in the field reduces cable lengths and saves space in the control cabinet
- Reliable use with high shock resistance, vibration resistance, and electric strength
- Robust die-cast aluminum housing with IP67 degree of protection ensures reliable protection against dust and water

## Commercial data

Item number	1376306
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CM08
Product key	CMPF13
GTIN	4063151740160
Weight per piece (including packing)	933.6 g
Weight per piece (excluding packing)	690 g
Customs tariff number	85044095
Country of origin	VN

## Technical data

### Input data

#### AC operation

Supply system configuration	Star network (TN, TT, IT (PE))
Nominal input voltage range	100 V AC ... 277 V AC
Input voltage range	100 V AC ... 277 V AC -15 % ... +10 % 115 V AC ... 277 V AC ±10 % (UL)
Derating	< 100 V AC ... 85 V AC (1 %/V)
Switch-on voltage	≥ 80 V AC
Shut-down voltage	< 75 V AC
Typical national grid voltage	120 V AC 230 V AC
Voltage type of supply voltage	AC
Inrush current	≤ 35 A (typical, 277 V AC) 17 A (typical, 120 V AC)
Inrush current integral ( $I^2t$ )	< 0.45 A <sup>2</sup> s
AC frequency range	50 Hz ... 60 Hz ±10 %
Frequency range ( $f_N$ )	50 Hz ... 60 Hz ±10 %
Mains buffering time	> 25 ms (120 V AC) > 25 ms (230 V AC)
Current consumption	1 A (100 V AC) 0.4 A (277 V AC)
Protective circuit	Transient surge protection; Varistor
Power factor (cos phi)	> 0.92
Switch-on time	< 0.2 s
Input fuse	4 A (internal (device protection))
Recommended breaker for input protection	6 A ... 16 A (US/CAN: branch circuit protection ≤ $\frac{1}{2}$ A) (Characteristic B, C, D, K or comparable)
Discharge current to PE	< 0.5 mA

#### DC operation

Nominal input voltage range	110 V DC ... 250 V DC
Input voltage range	110 V DC ... 250 V DC -20 % ... +10 % 120 V DC ... 250 V DC ±10 % (UL)
Derating	< 110 V DC ... 88 V DC (1 %/V)
Switch-on voltage	≥ 75 V DC
Shut-down voltage	< 70 V DC
Voltage type of supply voltage	DC
Current consumption	0.88 A (110 V DC) 0.38 A (250 V DC)

### Output data

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Efficiency	typ. 93 % (120 V AC)
	typ. 94 % (230 V AC)
Nominal output voltage	24 V DC $\pm 2$ % (SELV)
Nominal output current ( $I_N$ )	3.75 A (NEC Class 2 Output)
Derating	> 60 °C ... 70 °C (2.0 %/K)
Feedback voltage resistance	$\leq 35$ V DC
Protection against overvoltage at the output (OVP)	$\leq 35$ V DC
Control deviation	< 1 % (change in load, static 10 % ... 90 %)
	< 3 % (Dynamic load change 10 % ... 90 %, 10 Hz)
	< 0.1 % (change in input voltage $\pm 10$ %)
Residual ripple	$\leq 10$ mV <sub>PP</sub>
Short-circuit-proof	yes
No-load proof	yes
Output power	90 W
Peak switching voltages nominal load	< 100 mV
Maximum no-load power dissipation	< 0.25 W (120 V AC)
	< 0.28 W (230 V AC)
Power loss nominal load max.	< 7.4 W (120 V AC)
	< 6 W (230 V AC)
Rise time	typ. 100 ms ( $U_{OUT}$ (10 % ... 90 %))
Connection in parallel	yes, for increasing power and redundancy with diode
Connection in series	yes, for increased output voltage
Fuse protection (secondary side)	electronic

Signal: DC OK

Continuous load current	100 mA
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## Connection data

### Input

Connection method	M12 circular connector
Coding	S
Type of locking	M12 screw locking
Number of positions	3

### Output

Connection method	M12 circular connector
Coding	A
Type of locking	M12 screw locking
Number of positions	4

## Signaling

Types of signaling	LED
Status display	2 x LED (green)

Signal output: LED status indicator

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Signalization designation	AC OK
Status display	LED
Color	green
AC OK	$AC_{In} > 0.76 \times AC_N$ ( $AC_N = 100 \text{ V AC}$ )

Signal output: LED status indicator

Signalization designation	DC OK
Status display	LED
Color	green
DC OK	$U_{OUT} > 0.9 \times U_N$ ( $U_N = 24 \text{ V DC}$ )

## Electrical properties

Number of phases	1
Insulation voltage input/output	4 kV AC (type test)
	3 kV AC (routine test)

## Product properties

Product type	Power supply
Product family	TRIO POWER IP67
MTBF (IEC 61709, SN 29500)	> 1475000 h (25 °C)
	> 1000000 h (40 °C)
	> 500000 h (60 °C)

Insulation characteristics

Protection class	I
Overvoltage category (EN 61010-1)	II ( $\leq 4000 \text{ m}$ )
Overvoltage category (EN 62477-1)	III ( $\leq 2000 \text{ m}$ )
Pollution degree	2 (IEC 61010-1)

## Dimensions

Item dimensions

Width	100 mm
Height	164 mm
Depth	53 mm

Drill hole

Diameter	4.2 mm
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Installation dimensions

Installation distance right/left	20 mm / 20 mm
Installation distance top/bottom	50 mm / 100 mm

## Mounting

Mounting type	Panel mounting
With protective coating	no

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## Material specifications

Flammability rating according to UL 94 (housing / terminal blocks)	V0
Housing material	Metal
Type of housing	Aluminum (AlMg3)

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP67
Ambient temperature (operation)	-25 °C ... 70 °C (Derating > 60 °C: 2 %/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Maximum altitude	≤ 4000 m (> 2000 m, Derating: 10 %/1000 m)
Climatic class	4K26 (EN 60721-3-4)
Max. permissible relative humidity (operation)	≤ 100 % (at 25 °C, non-condensing)
Permissible humidity (operation)	≤ 100 % (at 25 °C, non-condensing)
Shock	18 ms, 30g, in each space direction (according to IEC 60068-2-27)
Vibration (operation)	10 Hz ... 59.6 Hz, amplitude ±0.35 mm (in accordance with IEC 60068-2-6) 59.6 Hz ... 150 Hz, 5g, 20 cycles

## Standards and regulations

### Electrical safety

Standard designation	Electrical safety
Standards/specifications	IEC 61010-1

### Protective extra-low voltage

Standard designation	Protective extra-low voltage
Standards/specifications	IEC 61010-1 IEC 61010-2-201 (SELV)

### Low-voltage power supplies, DC output

Standard designation	Low-voltage power supplies, DC output
Standards/specifications	EN 61204-3

### Safety requirements for electrical equipment for measurement, control, and laboratory use

Standard designation	Safety requirements for electrical equipment for measurement, control, and laboratory use
Standards/specifications	IEC 61010-1

### Limit values for harmonic currents

Standard designation	Limit values for harmonic currents
Standards/specifications	EN 61000-3-2

### Degrees of protection provided by enclosures (IP code)

Standard designation	Degrees of protection provided by enclosures (IP code)
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Standards/specifications	EN/IEC 60529
Mains variation/undervoltage	
Standard designation	Mains variation/undervoltage
Standards/specifications	SEMI F47 - 0706

## Approvals

UL	
Identification	NEC Class 2 according to UL 1310
UL	
Identification	UL/C-UL Listed UL 61010-1
UL	
Identification	UL/C-UL Listed UL 61010-2-201

## EMC data

Electromagnetic compatibility	Conformance with EMC Directive 2014/30/EU
Low Voltage Directive	Conformance with Low Voltage Directive 2014/35/EC
Interference emission	Interference emission in accordance with EN 61000-6-3 (residential and commercial) and EN 61000-6-4 (industrial)
Noise immunity	Immunity in accordance with EN 61000-6-1 (residential), EN 61000-6-2 (industrial)

Conducted noise emission	
Standards/regulations	EN 55016
	EN 61000-6-3 (Class B)

Noise emission	
Standards/regulations	EN 55011 (EN 55022)

Noise emission	
Standards/regulations	EN 55016
	EN 61000-6-3 (Class B)

Harmonic currents	
Standards/regulations	EN 61000-3-2
	EN 61000-3-2 (Class A)

Electrostatic discharge	
Standards/regulations	EN 61000-4-2

Electrostatic discharge	
Contact discharge	6 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 (Test Level 3)
Frequency range	1 GHz ... 2 GHz
Test field strength	10 V/m (Test Level 3)
Frequency range	2 GHz ... 6 GHz
Test field strength	10 V/m (Test Level 3)
Comments	Criterion A

## Fast transients (burst)

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

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

## Conducted interference

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

Input/Output	asymmetrical
Frequency range	0.15 MHz ... 80 MHz
Comments	Criterion A
Voltage	10 V (Test Level 3)

## Voltage dips

Standards/regulations	EN 61000-4-11
Voltage	230 V AC
Frequency	50 Hz
Voltage dip	70 %
Number of periods	25 periods
Comments	Criterion A
Voltage dip	40 %
Number of periods	10 periods
Comments	Criterion B
Voltage dip	0 %

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Number of periods	1 period
Comments	Criterion A

## Emitted interference

Standards/regulations	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

## Criteria

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.

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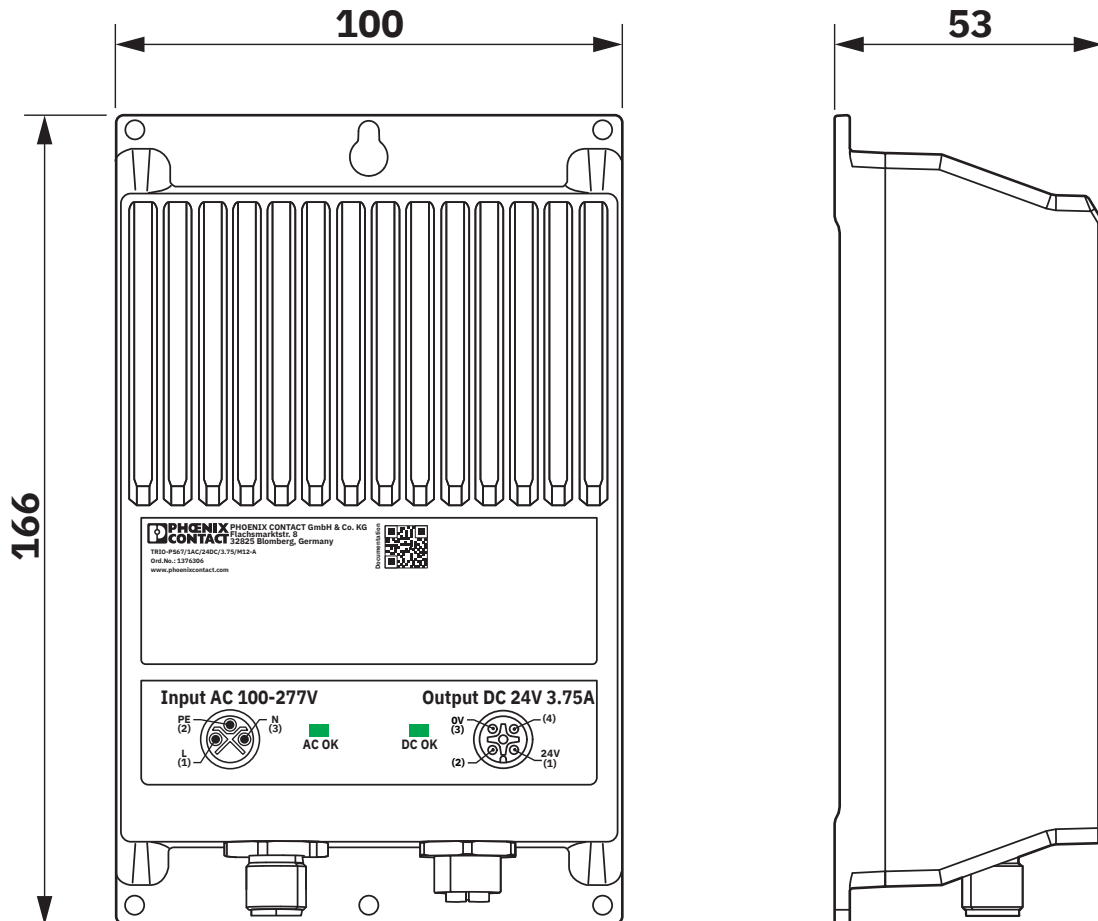


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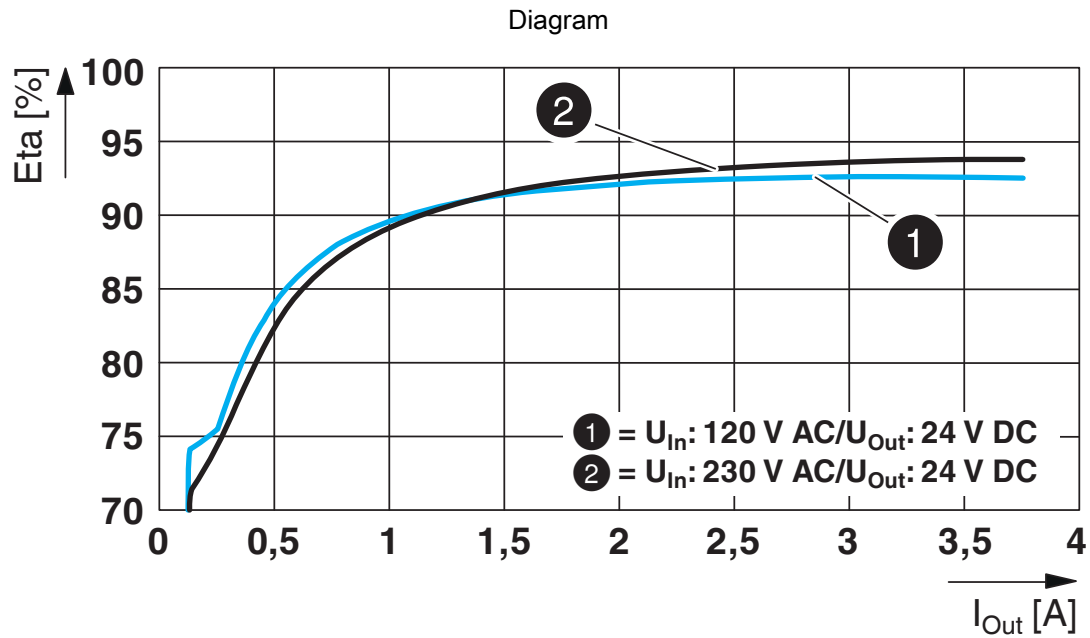
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## Drawings

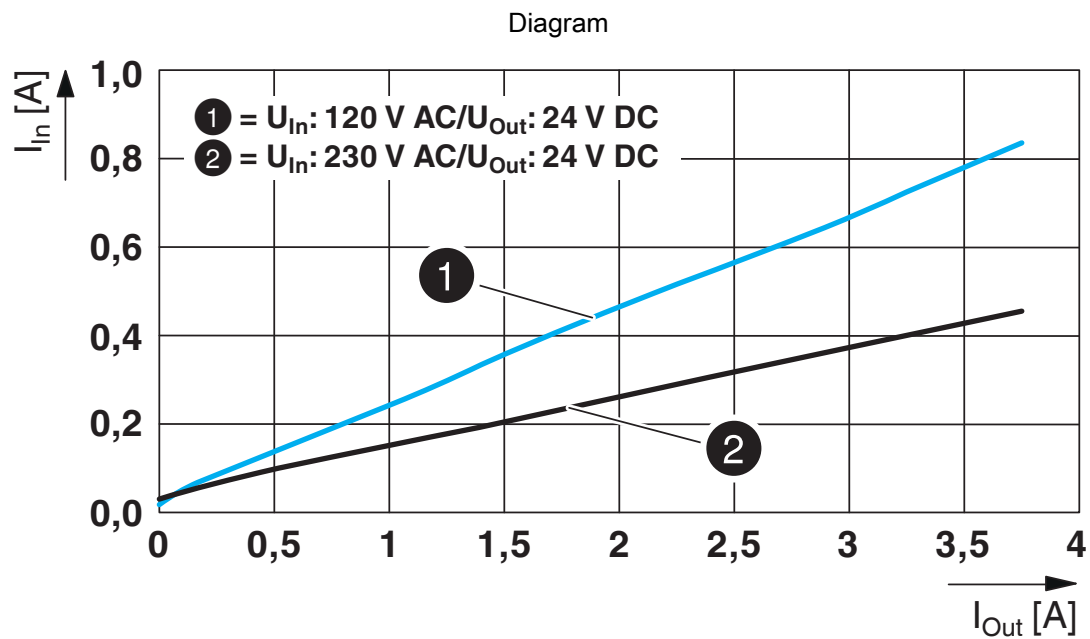
Dimensional drawing



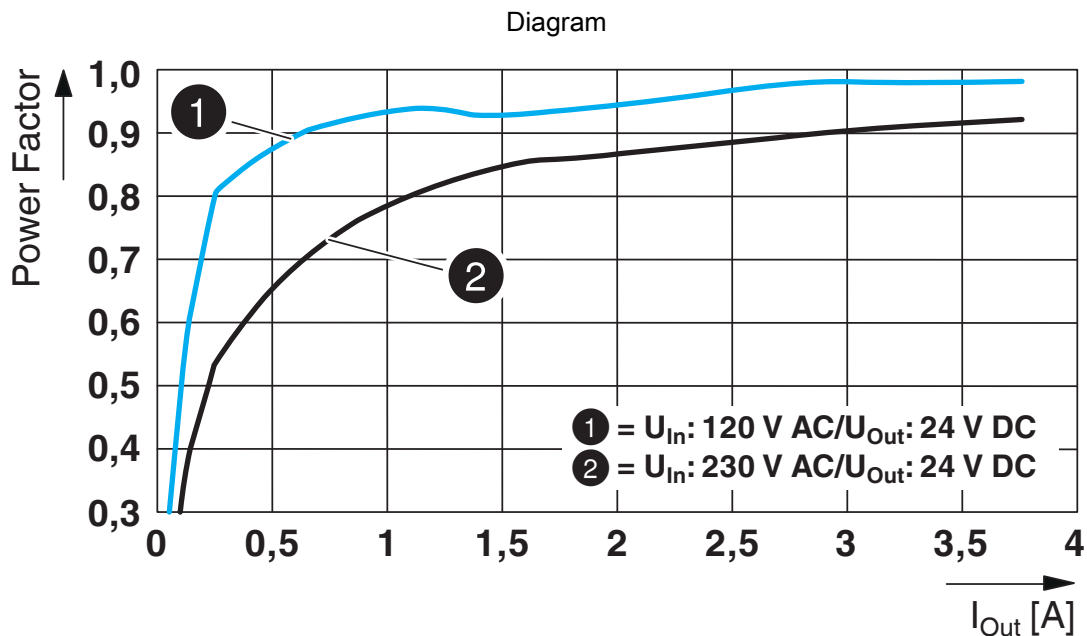
Device dimensions (dimensions in mm)



Efficiency



Input current/output current



Power factor



Output current/installation altitude

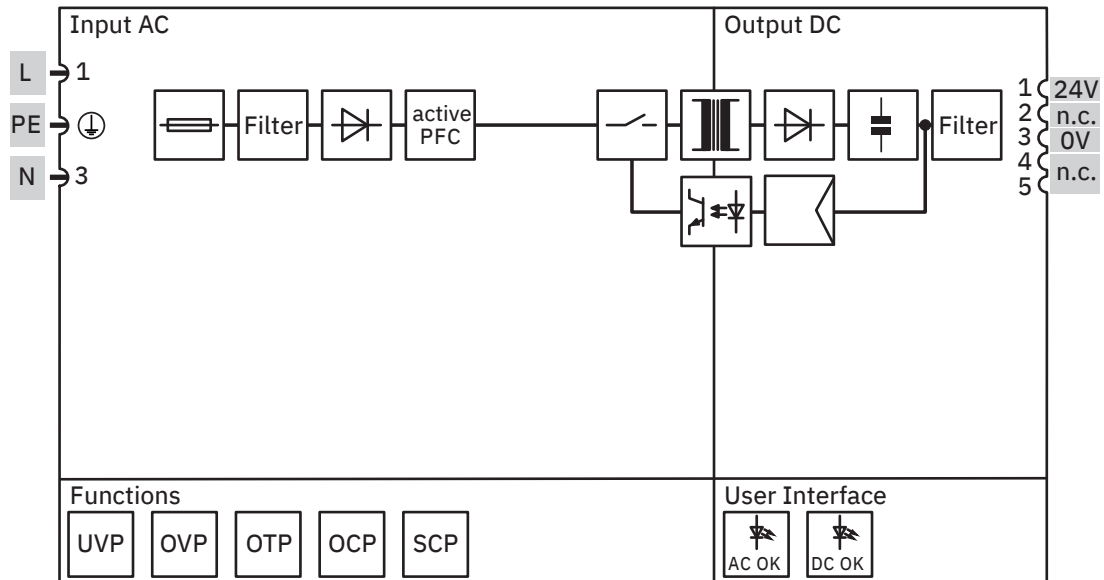
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Block diagram



Block diagram

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## Approvals

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**cULus Listed**

Approval ID: FILE E 123528

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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)
SCIP	d6de200a-a36d-419b-aaa1-7f5e5d44befa

### EF3.1 Climate Change

CO2e kg	22.804 kg CO2e
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