

# TRIO-UPS-2G/3AC/24DC/20 - Uninterruptible power supply



2906367

<https://www.phoenixcontact.com/us/products/2906367>

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TRIO UPS - UPS with integrated power supply, USB (Modbus/RTU), DIN rail mounting, Push-in connection, input: 3-phase, output: 24 V DC / 20 A

## Product description

Supply DC loads reliably and save space with the TRIO uninterruptible power supplies. An input grid is no longer necessary for startup. Connected industrial PCs can be shut down easily via the integrated USB interface.

## Your advantages

- Space saving: Combination of UPS module and power supply in the same housing
- Long buffer times, thanks to large selection of VRLA energy storage systems
- USB interface for connection to higher-level controllers such as industrial PCs
- Startup from the energy storage system possible, even without mains input
- Universal range of possible applications, thanks to a comprehensive package of approvals and an extended temperature range
- Easy installation, thanks to push-in connection technology

## Commercial data

Item number	2906367
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CM25
Product key	CMUO33
GTIN	4055626068053
Weight per piece (including packing)	2,081 g
Weight per piece (excluding packing)	1,733 g
Customs tariff number	85044095
Country of origin	CN

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2906367

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## Technical data

### Input data

Input voltage range	3x 400 V AC ... 500 V AC -20 % ... +15 %
	2x 400 V AC ... 500 V AC -10 % ... +10 %
Voltage type of supply voltage	AC
Inrush current	< 17.5 A
Inrush current integral ( $I^2t$ )	< 0.76 A <sup>2</sup> s
Frequency range ( $f_N$ )	50 Hz ... 60 Hz ( $\pm 10$ %)
Mains buffering time	$\geq 25$ ms (400 V AC)
Switch-on time	typ. 200 ms
Typical current consumption	3x 1.3 A (400 V AC)
Input fuse	6.3 A (slow-blow, internal)

### Output data

Efficiency	typ. 93 % (400 V AC)
	typ. 92 % (480 V AC)
	typ. 94 % (Battery operation)
Derating	> 60 °C (2.5%/K of $P_{Out\ nom.}$ )
Crest factor	2.5 (400 V AC)
	2.6 (480 V AC)
Switch-over time	< 20 ms
UPS connection in parallel	yes, with diode module uncoupled
UPS connection in series	no
Energy storage device connection in parallel	yes
Feedback voltage resistance	$\leq 35$ V DC
Protection against overvoltage at the output (OVP)	< 30 V DC
Residual ripple	< 20 mV
Control deviation	< 0.3 % (change in load, static 10 % ... 90 %)
	< 5.9 % (Dynamic load change 10 % ... 90 %, 10 Hz)
	< 0.05 % (change in input voltage $\pm 10$ %)
Rise time	< 30 ms
Permissible backup fuse	B10

### Mains operation

Output voltage	24 V DC
Output voltage range	24 V DC ... 28 V DC (> 24 V constant capacity)
Output current $I_N$	20 A
Dynamic BOOST ( $I_{Dyn.Boost}$ )	30 A
Output power $P_{OUT}$ ( $U_N, I_{OUT} = I_N$ )	480 W
Maximum no-load power dissipation	< 3.6 W (400 V AC)
Power loss nominal load max.	< 36 W (480 V AC)

### Battery operation

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2906367

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Output voltage	$U_{BAT} - 0.1 \text{ V DC}$
Output voltage range	18 V DC ... 30 V DC
Output current $I_N$	20 A
Dynamic BOOST ( $I_{Dyn.Boost}$ )	30 A

## Energy storage

Nominal voltage $U_N$	24 V DC
End-of-charge voltage	max. 30 V DC
Charging current (Configurable)	0.2 A ... 3 A (-25 °C ... 40 °C)
Charging current (Reduced)	3 A ... 0 A (40 °C ... 65 °C)
Charging current (Preset)	2.1 A (-25 °C ... 40 °C)
Charging current (max.)	3 A
Nominal capacity range	4 Ah ... 40 Ah
Battery technology	VRLA-AGM
Charge characteristic curve	IU <sub>0</sub> U

## Connection data

### Input

Position	1.x
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### Conductor connection

Connection method	Push-in connection
rigid	0.2 mm <sup>2</sup> ... 4 mm <sup>2</sup>
flexible	0.2 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
flexible with ferrule without plastic sleeve	0.25 mm <sup>2</sup> ... 2.5 mm <sup>2</sup>
flexible with ferrule with plastic sleeve	0.25 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
AWG	24 ... 12
Stripping length	10 mm

### Output

Position	2.x
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### Conductor connection

Connection method	Push-in connection
rigid	0.2 mm <sup>2</sup> ... 10 mm <sup>2</sup>
flexible	0.2 mm <sup>2</sup> ... 6 mm <sup>2</sup>
flexible with ferrule without plastic sleeve	0.25 mm <sup>2</sup> ... 6 mm <sup>2</sup>
flexible with ferrule with plastic sleeve	0.25 mm <sup>2</sup> ... 4 mm <sup>2</sup>
AWG	24 ... 8
Stripping length	15 mm

### Signal

Position	3.x
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### Conductor connection

Connection method	Push-in connection
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2906367

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rigid	0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
flexible	0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
flexible with ferrule without plastic sleeve	0.2 mm <sup>2</sup> ... 1.5 mm <sup>2</sup>
flexible with ferrule with plastic sleeve	0.2 mm <sup>2</sup> ... 0.75 mm <sup>2</sup>
AWG	24 ... 16
Stripping length	8 mm

## Battery

Position	4.x
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## Conductor connection

Connection method	Push-in connection
rigid	0.2 mm <sup>2</sup> ... 10 mm <sup>2</sup>
flexible	0.2 mm <sup>2</sup> ... 6 mm <sup>2</sup>
flexible with ferrule without plastic sleeve	0.25 mm <sup>2</sup> ... 6 mm <sup>2</sup>
flexible with ferrule with plastic sleeve	0.25 mm <sup>2</sup> ... 4 mm <sup>2</sup>
AWG	24 ... 8
Stripping length	15 mm

## Interfaces

Interface	USB (Modbus/RTU)
Number of interfaces	1
Connection method	MINI-USB Type B
Locking	Screw

## Signaling

### Signal input Remote

Connection labeling	3.5
Signalization designation	Remote
Low signal	Connection to SGnd with < 2.7 kΩ
High signal	Open (> 35 kΩ between Remote and SGnd)

### Signal input Bat.-Start

Connection labeling	3.6
Signalization designation	Bat.-Start
Low signal	Connection to SGnd with < 2.7 kΩ
High signal	Open (> 200 kΩ between Bat.-Start and SGnd)

### Signal output DC OK

Connection labeling	3.1
Signalization designation	DC OK
Type of signaling	Green LED
Switching output	Transistor output, active
Output voltage	24 V DC
Continuous load current	20 mA

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LED status indicator	green
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## Signal output Alarm

Connection labeling	3.2
Signalization designation	Alarm
Type of signaling	LED red
Switching output	Transistor output, active
Output voltage	24 V DC
Continuous load current	20 mA
LED status indicator	red

## Signal output Battery Mode

Connection labeling	3.3
Signalization designation	Battery mode
Type of signaling	Yellow LED
Switching output	Transistor output, active
Output voltage	24 V DC
Continuous load current	20 mA
LED status indicator	yellow

## Signal output Ready

Connection labeling	3.4
Signalization designation	Ready
Switching output	Transistor output, active
Output voltage	24 V DC
Continuous load current	20 mA

## Electrical properties

Number of phases	3
Insulation voltage input/output	4 kV AC (type test)
	2 kV AC (routine test)
Insulation voltage output / PE	500 V AC
	500 V AC (routine test)
Insulation voltage input / PE	type test
	2 kV AC (routine test)

## Product properties

Product type	DC UPS with integrated power supply
Product family	TRIO UPS
MTBF (IEC 61709, SN 29500)	> 1108720 h (400 V AC, at 25 °C)
	> 680194 h (400 V AC, at 40 °C)
	> 323816 h (400 V AC, at 60 °C)

## Insulation characteristics

Protection class	I
Degree of pollution	2

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## Life expectancy (electrolytic capacitors)

Current	20 A
Temperature	40 °C
Time	71552 h
Additional text	400 V AC

## Dimensions

### Item dimensions

Width	88 mm
Height	130 mm
Depth	160 mm

### Item dimensions with alternative mounting

Width	160 mm
Height	130 mm
Depth	88 mm

### Installation dimensions

Installation distance right/left	0 mm / 0 mm
Installation distance top/bottom	50 mm / 50 mm

## Mounting

Mounting type	DIN rail mounting
Assembly note	alignable: horizontally 0 mm, vertically 50 mm
Mounting position	horizontal DIN rail NS 35, EN 60715

## Material specifications

Flammability rating according to UL 94 (housing / terminal blocks)	V0
Housing material	Metal
Hood version	PC
Side element version	Aluminum

## Environmental and real-life conditions

### Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 70 °C (> 60 °C Derating: 2,5 %/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Ambient temperature (start-up type tested)	-40 °C
Maximum altitude	≤ 4000 m (> 2000 m, observe derating)
Climatic class	3K3 (in acc. with EN 60721)
Max. permissible relative humidity (operation)	≤ 95 % (at +25 °C, non-condensing)
Shock	30g, 18 ms in accordance with IEC 60068-2-27

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Vibration (operation)	< 12 ... 13.2 Hz, amplitude $\pm 1$ mm, 13.2 ... 100 Hz, 0.7g in accordance with IEC 60068-2-6
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## Standards and regulations

### Overvoltage category

EN 61010-1	II
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### Safety for measurement, control, and laboratory equipment

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

### Protective extra-low voltage

Standard designation	Protective extra-low voltage
Standards/specifications	IEC 61010 (SELV) / (PELV)

### Safe isolation

Standard designation	Safe isolation
Standards/specifications	DIN VDE 0100-410

### Low-voltage power supplies, DC output

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

### Ship's bridge

Standard designation	Ship's bridge
Standards/specifications	IEC/EN 60945

## Approvals

### UL

Identification	UL Listed UL 61010
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### UL

Identification	UL/C-UL Listed ANSI/ISA-12.12.01 Class I, Division 2, Groups A, B, C
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### Shipbuilding

Identification	DNV
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### Shipbuilding

Identification	LR
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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

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	EN 61000-6-2
Noise immunity	Immunity in accordance with EN 61000-6-2 (industrial)
Conducted noise emission	
Standards/regulations	EN 61000-6-3
Noise emission	
Standards/regulations	EN 61000-6-3
DNV GL conducted noise emissions	
DNV	Class B
Additional text	Area power distribution
DNV GL noise radiation	
DNV	Class B
Additional text	Bridge and deck area
Harmonic currents	
Standards/regulations	EN 61000-3-2
Flicker	
Standards/regulations	EN 61000-3-3
Electrostatic discharge	
Standards/regulations	EN 61000-4-2
Electrostatic discharge	
Contact discharge	6 kV (Test Level 3)
Discharge in air	8 kV (Test Level 3)
Electromagnetic HF field	
Standards/regulations	EN 61000-4-3
Electromagnetic HF field	
Frequency range	80 MHz ... 6 GHz
Test field strength	10 V/m
Frequency range	1.4 GHz ... 6 GHz
Test field strength	3 V/m
Fast transients (burst)	
Standards/regulations	EN 61000-4-4
Fast transients (burst)	
Input	4 kV
Output	2 kV
Signal	2 kV
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)
Signal	1 kV (Test Level 2 - asymmetrical)

## Conducted interference

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

Frequency range	0.15 MHz ... 80 MHz
Voltage	10 V

## Attenuated sinusoidal oscillations (ring wave)

Standards/regulations	EN 61000-4-12
Input	2 kV (symmetrical)
	4 kV (asymmetrical)
Comments	Criterion A

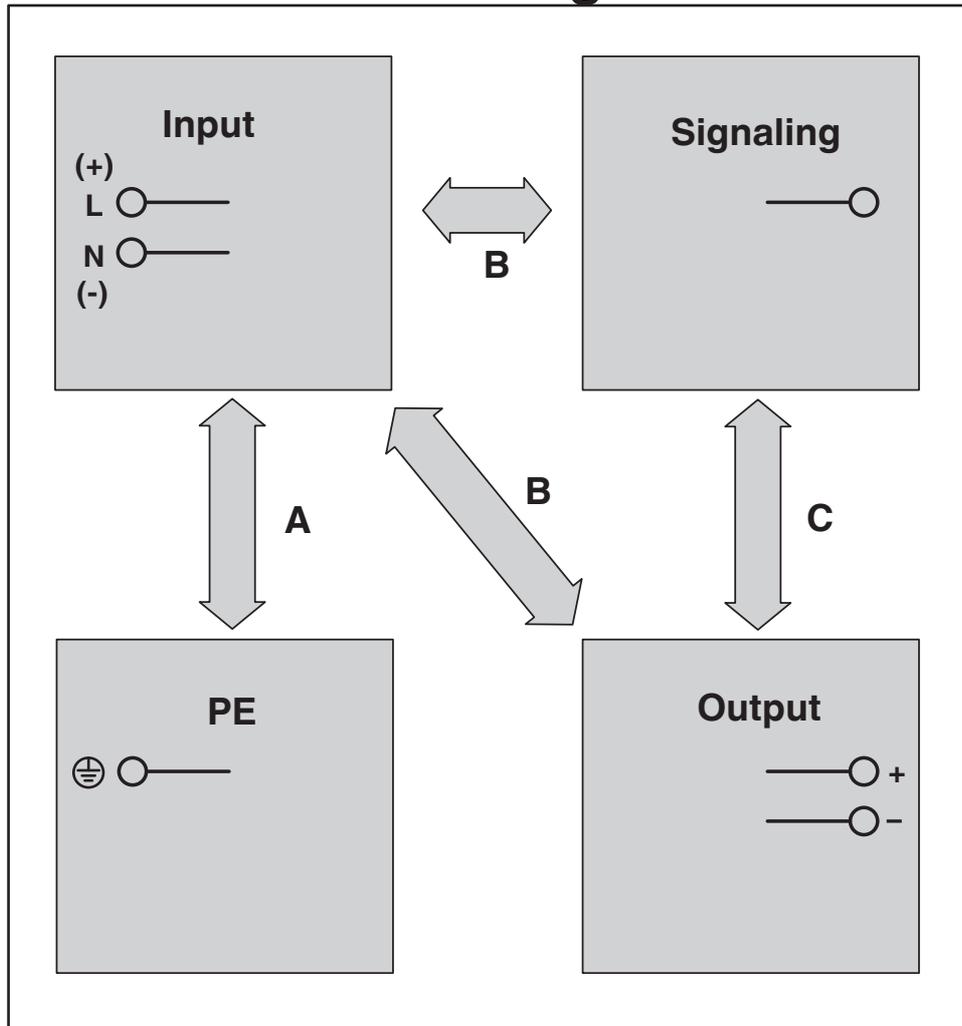
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Drawings

Schematic diagram

# Housing



Insulation electric strength

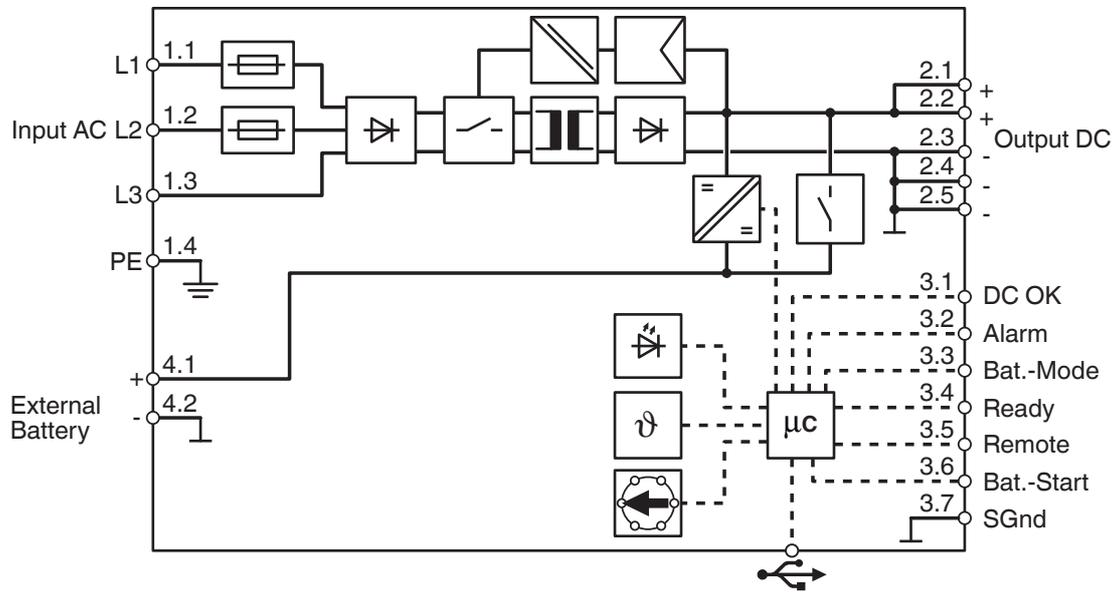
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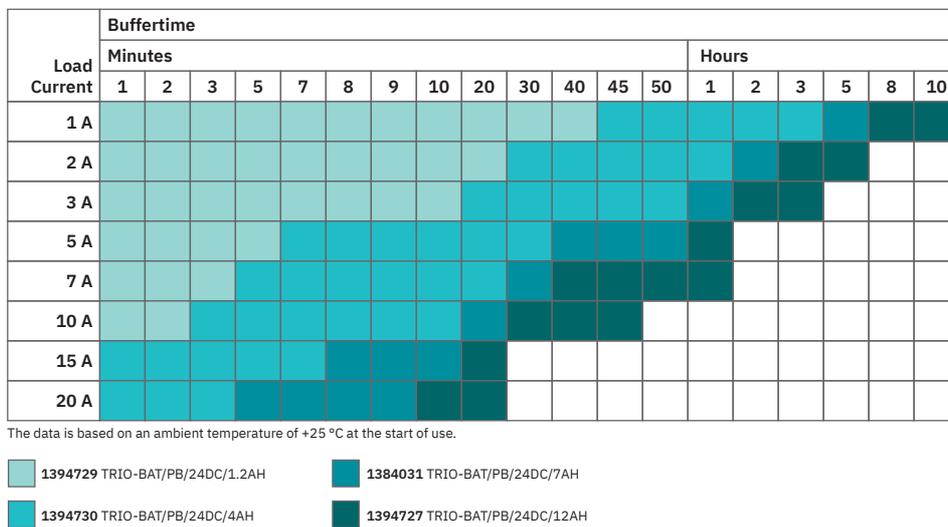
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Block diagram



Block diagram

Graphic



Buffer times for TRIO DC UPS for TRIO battery modules

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## Graphic

Load Current	Buffertime																				
	Minutes						Hours														
	30	35	40	45	50	55	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20
1 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
7 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
10 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
15 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
20 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

The data is based on an ambient temperature of +25 °C at the start of use.

■ 1348516 UPS-BAT/PB/24DC/20AH      ■ 1354641 UPS-BAT/PB/24DC/40AH

Buffer times for TRIO DC UPS for lead battery module

## Graphic

Load Current	Buffertime																									
	Minutes										Hours															
	10	12	15	20	25	30	35	40	45	50	55	1	2	3	4	5	6	7	8	9	10	12	14	16	18	20
1 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
2 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
3 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
5 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
7 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
10 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
15 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
20 A	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

The data is based on an ambient temperature of +25 °C at the start of use.

■ 2320416 UPS-BAT/VRLA-WTR/24DC/13AH      ■ 2320429 UPS-BAT/VRLA-WTR/24DC/26AH

Buffer times for TRIO DC UPS for VRLA-WTR battery modules

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## Approvals

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### DNV

Approval ID: TAA00000BM



### IECEE CB Scheme

Approval ID: DK-69956-UL



### EAC

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



### LR

Approval ID: LR2002877TA



### EAC

Approval ID: RU-DE.B.00184/20



### UL Listed

Approval ID: E123528



### cUL Listed

Approval ID: E123528

### BSH

Approval ID: 1025a



### KC

Approval ID: R-R-PCK-2906367



### cUL Listed

Approval ID: E199827



### UL Listed

Approval ID: FILE E 199827

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## Classifications

### ECLASS

ECLASS-13.0	27040705
ECLASS-15.0	27040705

### ETIM

ETIM 9.0	EC000382
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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(a), 7(c)-I, 7(c)-II

### 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	eb6ca739-9ca9-45a5-ba85-1c4906236287

### EF3.0 Climate Change

CO2e kg	240.5 kg CO2e
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