

TRIO3-UPS/1AC/24DC/10/485-USB - Uninterruptible power supply



1359604

<https://www.phoenixcontact.com/gb/products/1359604>

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TRIO UPS - UPS with integrated power supply, USI (Universal Service Interface), DIN rail mounting, Push-in connection, output: 24 V DC / 10 A

Commercial data

Item number	1359604
Packing unit	1 pc
Minimum order quantity	1 pc
Sales key	CMUD13
Product key	CMUD13
GTIN	4063151689957
Weight per piece (including packing)	1,362 g
Weight per piece (excluding packing)	1,150 g
Country of origin	CN

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Technical data

Input data

Input voltage range	100 V AC ... 240 V AC -15 % ... +10 %
	115 V AC ... 240 V AC ±10 % (UL)
Voltage type of supply voltage	AC
Inrush current integral (I^2t)	typ. < 1 A ² s
Inrush current limitation	typ. < 21 A
Frequency range (f_N)	50 Hz ... 60 Hz ±10 %
Mains buffering time	typ. ≥ \square_{\oplus} ms (120 V AC)
Static Boost ($I_{Stat.Boost}$)	10 A
Switch-on time during battery operation (Bat.-Start)	≤ 5 ms
Discharge current to PE	< 3.5 mA
Current consumption	typ. 4.23 A (100 V AC)
Current consumption I_N ($U_N, I_{OUT} = I_N, I_{charge} = 0$)	2.3 A (120 V AC)
Current consumption I_{max} ($U_N, I_{OUT} = I_{Stat.Boost}, I_{charge} = max$)	3.7 A (120 V AC)
Current consumption $I_{No-Load}$ ($U_N, I_{OUT} = 0, I_{charge} = 0$)	0.11 A (120 V AC)
Current consumption I_{charge} ($U_N, I_{OUT} = 0, I_{charge} = max$)	1.4 A (120 V AC)
Power consumption P_N ($U_N, I_{OUT} = I_N, I_{charge} = 0$)	259 W (120 V AC)
Power consumption P_{max} ($U_N, I_{OUT} = I_{Stat.Boost}, I_{charge} = max$)	421 W (120 V AC)
Power consumption $P_{No-Load}$ ($U_N, I_{OUT} = 0, I_{charge} = 0$)	7.6 W (120 V AC)
Power consumption P_{charge} ($U_N, I_{OUT} = 0, I_{charge} = max$)	166 W (120 V AC)
Input fuse	10 A (internal (device protection))
Recommended breaker for input protection	6 A ... 16 A

Output data

Efficiency	typ. 93.17 % (120 V AC)
	typ. 93.5 % (230 V AC)
Short-circuit-proof	yes
No-load proof	yes
Crest factor	typ. 1.72 (120 V AC)
	typ. 2.04 (230 V AC)
Switch-over time	< 3 ms
Output current limit	10 A
UPS connection in parallel	yes, with diode module uncoupled
UPS connection in series	no
Energy storage device connection in parallel	yes, max. 3
Energy storage device connection in series	no
Feedback voltage resistance	≤ 35 V DC
Protection against overvoltage at the output (OVP)	≤ 35 V DC
Residual ripple	< 25 mV
Rise time	≤ 1 s ($U_{Out} = 10 \% \dots 90 \%$)

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Mains operation

Output voltage	24 V DC
Output voltage range	24 V DC ... 28 V DC (>24 V, performance-limited) max. 240 W
Output current I_N	10 A
Dynamic BOOST $I_{Dyn.Boost}$ ($I_{Dyn.Boost}$)	15 A (5 s)
Dynamic BOOST $I_{Bat.Boost}$ ($I_{Bat.Boost}$)	20 A (5 s)
Output power P_N	240 W
Output power $P_{Dyn. Boost}$	360 W (5 s)
Output power $P_{Bat. Boost}$	480 W (5 s)
Maximum no-load power dissipation	≤ 10 W (120 V AC) ≤ 10 W (230 V AC)
Power loss nominal load max.	≤ 20 W (120 V AC) ≤ 20 W (230 V AC)

Battery operation

Output voltage	$U_{BAT} - 0,2$ V DC
Output voltage range	19.2 V DC ... 32 V DC
Output current I_N	10 A
Dynamic BOOST $I_{Dyn.Boost}$ ($I_{Dyn.Boost}$)	15 A (5 s)
Dynamic BOOST $I_{Bat.Boost}$ ($I_{Bat.Boost}$)	20 A (5 s)
Output power P_N	240 W
Output power $P_{Dyn. Boost}$	360 W (5 s)
Output power $P_{Bat. Boost}$	480 W (5 s)
Output power P_{OUT} (U_N , $I_{OUT} = I_{dyn.Boost}$)	360 W (5 s)
Maximum no-load power dissipation	≤ 1.5 W (120 V AC) ≤ 1.5 W (230 V AC)
Power loss nominal load max.	≤ 4 W (120 V AC) ≤ 4 W (230 V AC)

Energy storage

Nominal voltage U_N	24 V DC
Charging voltage	max. 32 V DC
Charging current (Preset)	2 A
Charging current (Configurable)	0.2 A ... 5 A (-25 °C ... 55 °C \pm \ominus K)
Charging current (Reduced)	5 A ... 3.75 A (55°C ... 65°C \pm \ominus K)
Charging current (max.)	5 A
Nominal capacity range	1.2 Ah ... 110 Ah
Battery technology	VRLA-AGM
Charge characteristic curve	IU_0U

Connection data

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Input

Position	1.x
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Connection technology

Position marking	1.1 (L/+), 1.2 (N/-), 1.3 (⊕  )
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Conductor connection

Connection method	Push-in connection
rigid	0.2 mm ² ... 4 mm ²
	1.5 mm ²
flexible	0.2 mm ² ... 2.5 mm ²
	1.5 mm ²
flexible with ferrule without plastic sleeve	0.25 mm ² ... 2.5 mm ²
	1.5 mm ²
flexible with ferrule with plastic sleeve	0.25 mm ² ... 2.5 mm ²
	1.5 mm ²
AWG	24 ... 12
	16
Stripping length	10 mm

Output

Position	2.x
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Connection technology

Position marking	2.1 (+), 2.2 (+), 2.3 (-), 2.4 (-)
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Conductor connection

Connection method	Push-in connection
rigid	0.2 mm ² ... 4 mm ²
	1.5 mm ²
flexible	0.2 mm ² ... 2.5 mm ²
	1.5 mm ²
flexible with ferrule without plastic sleeve	0.25 mm ² ... 2.5 mm ²
	1.5 mm ²
flexible with ferrule with plastic sleeve	0.25 mm ² ... 2.5 mm ²
	1.5 mm ²
AWG	24 ... 12
	16
Stripping length	10 mm

Battery

Position	4.x
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Connection technology

Position marking	4.1 (+), 4.2 (-)
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Conductor connection

Connection method	Push-in connection
rigid	0.2 mm ² ... 10 mm ²
	2.5 mm ²
flexible	0.2 mm ² ... 6 mm ²
	2.5 mm ²
flexible with ferrule without plastic sleeve	0.25 mm ² ... 6 mm ²
	2.5 mm ²
flexible with ferrule with plastic sleeve	0.25 mm ² ... 4 mm ²
	2.5 mm ²
AWG	24 ... 8
	14
Stripping length	12 mm

Signal

Position	3.x
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Conductor connection

Connection method	Push-in connection
rigid	0.2 mm ² ... 1.5 mm ²
	0.5 mm ²
flexible	0.2 mm ² ... 1.5 mm ²
	0.5 mm ²
flexible with ferrule without plastic sleeve	0.2 mm ² ... 1.5 mm ²
	0.5 mm ²
flexible with ferrule with plastic sleeve	0.2 mm ² ... 0.75 mm ²
	0.5 mm ²
AWG	24 ... 16
	20
Stripping length	8 mm

Interfaces

Interface	USI (Universal Service Interface)
Number of interfaces	1
Connection method	USB type C
Position	5.x
Locking	Screw
Transmission physics	USB 1.1
Topology	Point-to-point
Transmission speed	12 Mbps
	9600 baud ... 115200 baud (Default: 115200 baud)
Transmission length	max. 3 m
Access time	≤ 2 s

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RS-485

Interface	RS-485 (Modbus RTU)
Number of interfaces	1
Connection method	3-conductor connection via connector
Position	5.x
Locking	Wires screwed into inserted adapter
Transmission physics	Fieldbus
Topology	Modbus RTU
Transmission speed	19200 bps 230400 bps 2400 baud ... 230400 baud
Transmission length	max. 500 m

Signaling

LED signaling

Types of signaling	LED: DC output
Function	Visualization of the operating state of the DC output voltage (DC OK)
Color	red, yellow, green (multicolor LED)
LED off	Device off (Off)
LED on (green), DC OK	Output power in operation < 90% (On (green), DC OK)
LED on (yellow), I _{Out} > 90 %	Output power in operation > 90% (On (yellow), I _{Out} > 90%)
LED on (red), ISHORT	Output power overload > 150% (On (red), I _{SHORT})
LED on (flashing red) OVP	U _{OUT} > OVP (Over voltage protection) (on (flashing red 50%))

LED signaling

Types of signaling	LED: device state
Function	Visual display of the operating state of the UPS
Color	red, yellow, green (multicolor LED)
LED off	Device off (Off)
LED on (green)	Device on (on (green))
LED on (flashing green 90%)	Remote contact is short-circuited with Output (-). (on (flashing green 90%))
LED on (flashing green 10 %)	Signaling time after shutdown in battery operation (on (flashing green 10%))
LED on (yellow)	Battery operation (on (yellow))
LED on (flashing yellow)	Battery charging (on (flashing yellow 50%))
LED on (red)	Group alarm, device (on (red))
LED on (flashing red)	Service mode for battery (on (flashing red 50%))

LED signaling

Types of signaling	LED: battery condition
Function	Visual display of the operating state of the battery

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Color	red, yellow, green (multicolor LED)
LED off	Device off (Off)
LED on (green)	Battery SOH > 6 months (on (green))
LED on (yellow)	Battery SOH < 6 months (on (yellow))
LED on (red)	Group alarm, battery (on (red))
LED on (flashing red)	Battery SOH = 0 months (on (flashing red 50%))

Signal input Bat.-Start

Signalization designation	Bat.-Start
Position	3.x
Position marking	3.6 (Bat.-Start)
Low signal	Connection to Output (-) with < 2.7 kΩ
High signal	Open (> 200 kΩ between Bat.-Start and Output (-))

Signal input Remote

Signalization designation	Remote
Position	3.x
Position marking	3.7 (Remote)
Low signal	Connection to Output (-) with < 2.7 kΩ
High signal	Open (> 200 kΩ between Remote and Output (-))

Signal input Temp.-Sensor

Signalization designation	Temp.-Sensor
Position	3.x
Position marking	3.8 (Temp.-Sensor), 3.9 (Temp.-Sensor)
Voltage	max. 3.5 V (when the sensor is not connected)
Short-circuit current rating	max. 3 mA

Signal output DC OK

Position	3.x
Signalization designation	DC OK
Position marking	3.1 (DC OK)
State condition (Contact closed (battery operation))	$U_{Out} > 20.4 \text{ V}; U_{Out} < 32 \text{ V}$
State condition (Contact open (battery operation))	$U_{Out} < 20.4 \text{ V}; U_{Out} > 32 \text{ V}$
Switching output	Transistor output, active
Output voltage	24 V DC
Continuous load current	20 mA
LED status indicator	green (LED: DC output)

Signal output Battery Mode

Position	3.x
Signalization designation	Bat.-Mode
Position marking	3.2 (Bat.-Mode)
State condition (Contact closed)	Device in battery mode
State condition (Contact open)	Device in mains mode or device off

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Switching output	Transistor output, active
Output voltage	24 V DC
Continuous load current	20 mA
LED status indicator	yellow (LED: device state)

Signal output

Position	3.x
Signalization designation	Bat.-Service
Position marking	3.3 (Bat.-Service)
State condition (Contact closed)	Device in battery mode
State condition (Contact open)	Device in mains mode or device off
Switching output	Transistor output, active
Output voltage	24 V DC
Continuous load current	20 mA
LED status indicator	red, flashing (LED: device status)

Signal output Alarm

Position	3.x
Signalization designation	Alarm
Position marking	3.4 (Alarm)
State condition (Contact closed)	no alarm
State condition (Contact open)	Alarm
Switching output	Transistor output, active
Output voltage	24 V DC
Continuous load current	20 mA
LED status indicator	red (LED: battery status)

Signal output Ready

Position	3.x
Signalization designation	Ready
Position marking	3.5 (Ready)
State condition (Contact closed (mains operation))	Battery is fully charged
State condition (Contact closed (battery operation))	As long as output voltage > cut-off voltage
State condition (Contact open (mains operation))	Battery charging
State condition (Contact open (battery operation))	Output voltage < cut-off voltage or device is switched off
Switching output	Transistor output, active
Output voltage	24 V DC
Continuous load current	20 mA

Product properties

Product type	DC UPS with integrated power supply
Product family	TRIO UPS
MTBF (IEC 61709, SN 29500)	885357 h (25 °C)
	551050 h (40 °C)

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264484 h (60 °C)

Insulation characteristics

Protection class	I
Degree of pollution	2

Dimensions

Item dimensions

Width	88 mm
Height	135 mm
Depth	132 mm
Depth (Device depth (DIN rail mounting))	125 mm (Device depth (DIN rail mounting))

Installation dimensions

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

Mounting

Mounting type	DIN rail mounting
Mounting position	horizontal DIN rail NS 35, EN 60715

Material specifications

Material (Housing front)	PS
Flammability rating according to UL 94 (housing / terminal blocks)	V0
Housing material	Aluminum

Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-25 °C ... 70 °C
Ambient temperature (operation) (Output power derating)	> 60 °C (2.5 %/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Maximum altitude	≤ 5000 m
Maximum altitude (Output power derating)	> 2000 m (10 %/1000 m)
Climatic class	3K3 (EN 60721)
Shock	18 ms, 30g, per spatial direction
Vibration (operation)	5 Hz ... 100 Hz, amplitude ±2.5 mm, 2.3g 30 Hz ... 100 Hz, 2.3g, 90 min.

Standards and regulations

Overvoltage category

EN 61010-1	III (≤ 2000 m) / II (≤ 5000 m)
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EN 61010-2-201	III (≤ 2000 m) / II (≤ 5000 m)
Safety of power supply units up to 1100 V (insulation distances)	
Standard designation	Safety of power supply units up to 1100 V (insulation distances)
Standards/specifications	DIN EN 61558-2-16
Electrical safety	
Standard designation	Electrical safety
Standards/specifications	IEC 61010-2-201 (SELV)
Electronic equipment for use in power installations	
Standard designation	Equipping high voltage installations with electronic equipment
Standards/specifications	EN 50178/VDE 0160 (PELV)
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 61010-1 (SELV)
	IEC 61010-2-201 (PELV)
Safe isolation	
Standard designation	Safe isolation
Standards/specifications	IEC 61010-2-201
Limitation of harmonic line currents	
Standard designation	Limitation of harmonic line currents
Standards/specifications	EN 61000-3-2
Mains variation/undervoltage	
Standard designation	Mains variation/undervoltage
Standards/specifications	SEMI F47
	EN 61000-4-11

Approvals

UL

Identification	UL/C-UL Listed UL 61010-1
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UL

Identification	UL/C-UL Listed UL 61010-2-201
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ANSI/UL 121201

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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Shipbuilding

Identification	Nippon Kaiji Kyokai
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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
Interference emission	Interference emission in accordance with EN 61000-6-3 (residential areas), EN 61000-6-4 (industrial areas) and EN 61000-6-8 (commercial areas)
Noise immunity	Immunity in accordance with EN 61000-6-2 (industrial)

Conducted noise emission

Standards/regulations	EN 61000-6-3
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Noise emission

Standards/regulations	EN 61000-6-3
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Harmonic currents

Standards/regulations	EN 61000-3-2
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Flicker

Standards/regulations	EN 61000-3-3
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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)

Electromagnetic HF field

Standards/regulations	EN 61000-4-3
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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
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Fast transients (burst)

Input	± 4 kV (100 kHz)
Output	± 2 kV (100 kHz)
Signal	± 2 kV (100 kHz)
Voltage (Battery)	± 2 kV (100 kHz)
Voltage (USB)	± 2 kV (100 kHz)

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

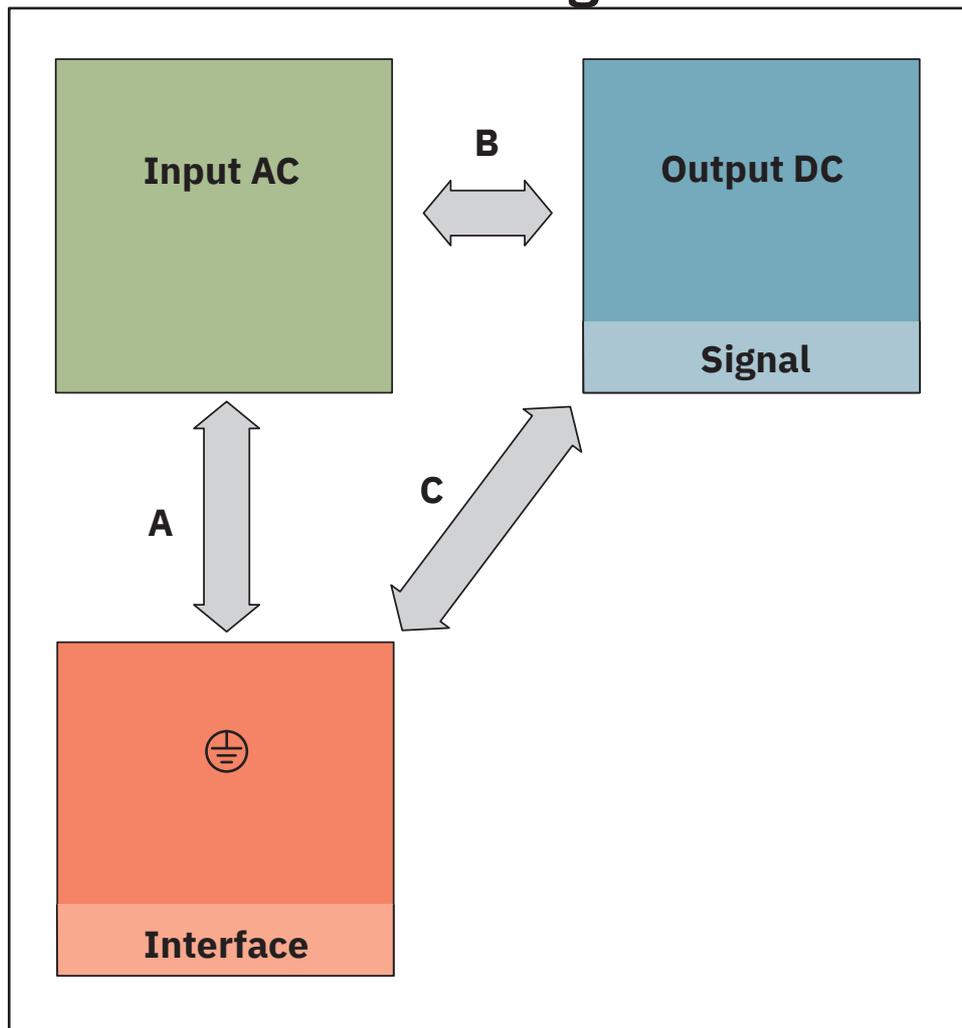
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Drawings

Schematic diagram

Housing



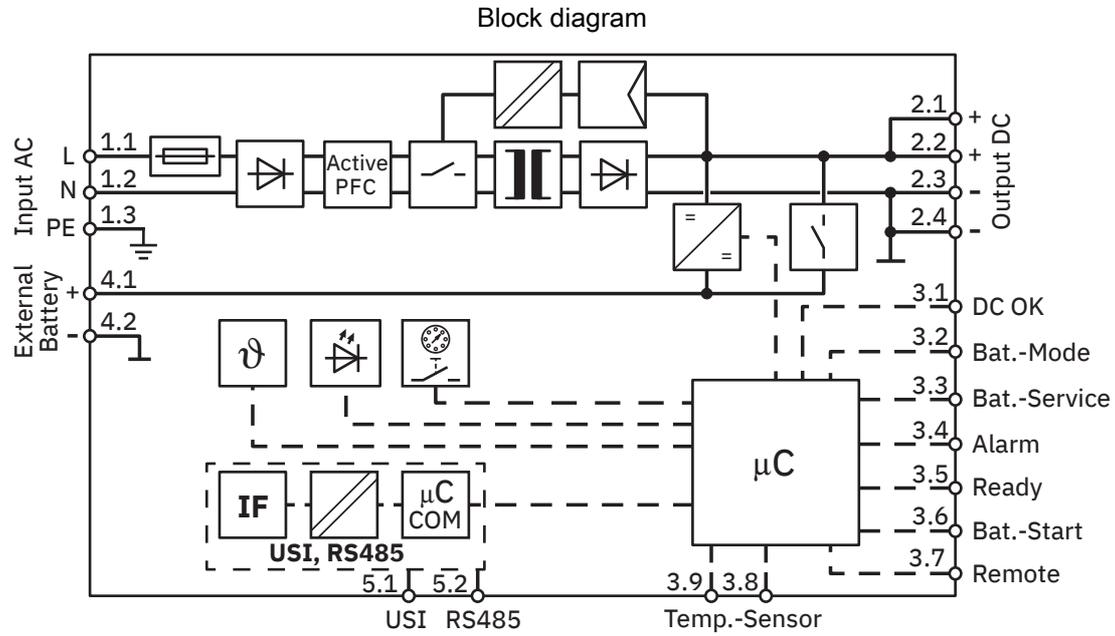
Insulation electric strength

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Block diagram

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Approvals

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IECEE CB Scheme

Approval ID: SI-11928



cULus Listed

Approval ID: E123528-20220207

DNV

Approval ID: TAA00000BM

CoC / Compliance Statement

Approval ID: C211-0012/25



cULus Listed

Approval ID: E199827-20220214

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Classifications

ECLASS

ECLASS-13.0	27040705
ECLASS-15.0	27040705

ETIM

ETIM 9.0	EC000382
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Environmental product compliance

EU RoHS

Fulfills EU RoHS substance requirements	Yes
Exemption	34, 6(c), 7(a), 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.)	Hexahydromethylphthalic anhydride(CAS: n/a)
	Lead(CAS: 7439-92-1)

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