TRIO-PM/1AC/24DC/2500W - Power supply unit

1635194

https://www.phoenixcontact.com/in/products/1635194

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Primary-switched power supply unit, TRIO POWER, Screw connection, CAN bus, Panel mounting, input: 1-phase, output: 24 V DC / 104 A, adjustable from 24 V DC ... 28 V DC

Your advantages

- High power density and high efficiency with a compact design
- Customized use through flexible panel mounting options
- Robust and reliable due to integrated protective functions
- Easy power increase with parallel connection with integrated O-ring diode
- Smart diagnostics with comprehensive monitoring via LED signaling, CAN bus interface, and EOL (End Of Life) reminder

Commercial data

Item number	1635194
Packing unit	1 pc
Minimum order quantity	1 pc
Product key	CMHW13
GTIN	4067923157835
Weight per piece (including packing)	2,392 g
Weight per piece (excluding packing)	2,000 g
Country of origin	CN

Technical data

Input data

AC operation

Supply system configuration	Star network (TN, TT, IT (PE))
Nominal input voltage range	100 V AC ... 240 V AC
Input voltage range	100 V AC ... 240 V AC -15 % ... +10 %
	100 V AC ... 240 V AC ±10 % (UL)
Derating	85 V AC ... 90 V AC (≤1350 W)
	90 V AC ... 180 V AC (≤ 1500 W)
	3.33%/K, >55°C
Typical national grid voltage	120 V AC
	230 V AC
Voltage type of supply voltage	AC
Inrush current	< 15 A (115 V AC, 25 °C)
	< 40 A (230 V AC, 25 °C)
Inrush current integral (I^2t)	< 3364 A^2s
Frequency range (f_N)	50 Hz ... 60 Hz ±5 %
Mains buffering time	typ. 10 ms (120 V AC)
	typ. 10 ms (230 V AC@80% load)
Buffer time	typical 16 ms (120 V AC)
	typical 16 ms (230 V AC@80% load)
Current consumption	16.7 A (100 V AC)
	20 A (85 V AC)
	15 A (180 V AC)
	11.7 A (230 V AC)
	max. 18 A (UL)
Protective circuit	Transient protection
Power factor (cos phi)	0.97 (230 V AC)
Device mains fuse	25 A internal (device protection)
Discharge current to PE	< 2 mA

DC operation

Input voltage range	140 V DC ... 340 V DC -15 %; +10 %
Current consumption	13.8 A (120 V DC)
	7.6 A (350 V DC)

Output data

Efficiency	typ. 92 % (120 V AC)
	typ. 93.5 % (230 V AC)
Nominal output voltage	24 V DC
Setting range of the output voltage (U_{Set})	24 V DC ... 28 V DC (> 24 V DC, constant capacity restricted)
Nominal output current (I_N)	104 A

Dynamic Boost ($I_{Dyn.Boost}$)	max. 145.8 A (5 s)
Short-circuit-proof	yes
No-load proof	yes
Derating	55 °C ... 70 °C (3.33 %/K)
Crest factor	typ. 1.43 (120 V AC)
	typ. 1.44 (230 V AC)
Output current limit	145.8 A
Output power (P_N)	2500 W
Output power ($P_{Dyn. Boost}$)	max. 3500 W (5 s)
Connection in parallel	yes, for increased efficiency and redundancy
	max. 4
Connection in series	yes, for increased output voltage (observe SELV limit)
	max. 2
Feedback voltage resistance	≤ 35 V DC
Protection against overvoltage at the output (OVP)	≤ 35 V DC
Residual ripple	typ. 240 mV_{PP} (maximum)
Control deviation	< 0.5 % (change in load, static 10 % ... 90 %)
	< 5 % (change in load, dynamic 10 % ... 90 %)
	< 0.5 % (change in input voltage ±10 %)
Rise time	≤ 100 ms (U_{Out} = 10 % ... 90 %)
Minimum no-load power dissipation	< 10 W (120 V AC)
Maximum no-load power dissipation	< 10 W (230 V AC)
Minimum nominal load power dissipation	< 20 W (120 V AC)
Power loss nominal load max.	< 20 W (230 V AC)
Integrated fuse protection	yes

Connection data

Input

Position	1.x

Connection technology

Position marking	1.1 (L/+), 1.2 (N/-), 1.3 (⏚ IEC EAC)

Conductor connection

Connection method	Screw connection
rigid	1.3 mm² ... 3 mm²
	2.5 mm² (recommended)
flexible	1.3 mm² ... 3 mm²
	2.5 mm² (recommended)
flexible with ferrule without plastic sleeve	1.3 mm² ... 3 mm²
	2.5 mm² (recommended)
flexible with ferrule with plastic sleeve	1.3 mm² ... 3 mm²
	2.5 mm² (recommended)
AWG	18 ... 10 (Cu)

	13 (recommended)
Stripping length	10 mm (Rigid/flexible/ferrule)
	8 mm (Ferrule)
Tightening torque	1.13 Nm ... 1.47 Nm

Output

Position	2.x

Connection technology

Position marking	2.1 (+), 2.2 (-)

Conductor connection

Connection method	Screw connection (Busbar)
rigid	0.2 mm² ... 35 mm²
	35 mm² (recommended)
flexible	0.2 mm² ... 35 mm²
	35 mm² (recommended)
flexible with ferrule without plastic sleeve	0.2 mm² ... 35 mm²
	35 mm² (recommended)
flexible with ferrule with plastic sleeve	0.2 mm² ... 35 mm²
	35 mm² (recommended)
AWG	6 ... 2 (Cu)
	2 (recommended)
Stripping length	10 mm (rigid/flexible/ring cable lug/fork-type cable lug)
Tightening torque	3 Nm

Signal, communication

Position	3.x, 4.x

Connection technology

Position marking	3.1 - 3.10, 4.1 - 4.10

Conductor connection

Connection method	2x 10-pos. pin strip
rigid	0.1 mm² ... 0.4 mm²
	0.34 mm² (recommended)
flexible	0.1 mm² ... 0.4 mm²
	0.34 mm² (recommended)
flexible with ferrule without plastic sleeve	0.1 mm² ... 0.4 mm² (Cu)
	0.34 mm² (recommended)
flexible with ferrule with plastic sleeve	0.1 mm² ... 0.4 mm²
	0.34 mm² (recommended)
AWG	30 ... 22 (Cu)
	22 (recommended)

Interfaces

CAN-Bus

Interface	CAN bus
Number of interfaces	1
Supported protocols	CAN 2.0A, CAN 2.0B
Locking	Locking clip
Transmission physics	wired
Topology	Daisy Chain
Transmission speed	250 kbps
Transmission length	max. 20 m
Termination resistor	120 Ω (Terminating the end device)
Number of power modules as CAN bus devices	max. 16

Signaling

LED signaling

Types of signaling	LED DC OK – signal state operation (U_N = 24 V DC, I_{Out} = I_N)
Function	Visual operating state display
Color	Red, green (multicolor LED)

LED signaling

Types of signaling	LED OVP – signal state operation (U_N = 24 V DC, I_{Out} = I_N)
Function	Visual operating state display
Color	Red, green (multicolor LED)

LED signaling

Types of signaling	LED OCP – signal state operation (U_N = 24 V DC, I_{Out} = I_N)
Function	Visual operating state display
Color	Red, green (multicolor LED)

LED signaling

Types of signaling	LED OTP – signal state operation (U_N = 24 V DC, I_{Out} = I_N)
Function	Visual operating state display
Color	Red, green (multicolor LED)

LED signaling

Types of signaling	LED FAN – signal state operation (U_N = 24 V DC, I_{Out} = I_N)
Function	Visual operating state display
Color	Red, green (multicolor LED)

LED signaling

Types of signaling	LED SCP – signal state operation (U_N = 24 V DC, I_{Out} = I_N)
Function	Visual operating state display
Color	Red, green (multicolor LED)

Signal state

State condition	0.95 * U_{OutSet} U_{Out}<1.05 * U_{OutSet} and I_{OutN}

Signal output DC OK

Position	4.x
Type of signaling	DC OK switch contact - signal state operation (U_N = 24 V DC, I_{Out} = I_N)
Position marking	4.1 (13), 4.2 (14)
Function	Operating state forwarding
Switch contact (floating)	OptoMOS
Switching voltage	max. 30 V DC (SELV)
Current carrying capacity	max. 10 mA
State condition	0.95 * U_{OutSet} < U_{Out} < 1.05 * U_{OutSet} and I_{Out} < I_N (Contact closed)
	1,05 * U_{OutSet} < U_{Out} < 1,1 * U_{OutSet} (Contact closed)
	1.1 * U_{OutSet} < U_{Out} or U_{Out} < 0.9 * U_{OutSet} or I_{Out} > 1.2 * I_N, continuously for 6 s (Contact open)

Electrical properties

Number of phases	1.00
Insulation voltage input/output	4 kV AC (type test)
	1.5 kV AC (routine test)

Product properties

Product type	Power supply
Product family	TRIO POWER
MTBF (IEC 61709, SN 29500)	> 500000 h (25 °C)
	> 25000 h (40 °C)
	> 100000 h (55 °C)
Environmental protection directive	RoHS Directive 2011/65/EU
	Reach

Insulation characteristics

Protection class	I
Degree of pollution	2

Life expectancy (electrolytic capacitors)

Temperature	25 °C
Additional text	8 years

Dimensions

Item dimensions

Width	108 mm
Height	41 mm
Depth	322 mm

Mounting

Mounting type	Panel mounting

Assembly note	Side mounting: 3x M4 screws - installation depth < 4 mm Back mounting: 4x M4 screws - installation depth < 3 mm Mounting with Assembly adapter UWA 20/13 (Item no. 1697537)
With protective coating	no

Material specifications

Flammability rating according to UL 94	V0 (Housing, terminal blocks)
Hood version	Aluminum (AlMg3)
Side element version	Aluminum

Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-20 °C ... 70 °C (>55 °C Derating: 3,33 %/K)
Ambient temperature (storage/transport)	-40 °C ... 85 °C
Ambient temperature (start-up type tested)	-40 °C
Maximum altitude	≤ 5000 m (> 2000 m, Derating: 10 %/1000 m)
Max. permissible relative humidity (operation)	≤ 95 % (at 25 °C, non-condensing)
Shock (operation)	11 ms, 15g, per spatial direction (IEC 60068-2-27)
Vibration (operation)	10 Hz ... 18.2 Hz, amplitude ±0.75 mm (IEC 60068-2-6)
	18.2 Hz ... 150 Hz, 1g, 90 min.

Standards and regulations

Overvoltage category

EN 61010-1	III (≤ 2000 m)
	II (≤ 5000 m)

Overvoltage category

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)

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 - 0706

Approvals

UL

Identification	UL/C-UL Listed UL 61010-1

UL

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

UL

Identification	UL/C-UL Approved UL 62368-1

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
Noise immunity	Immunity in accordance with EN 61000-6-1 (residential), EN 61000-6-2 (industrial)

Conducted noise emission

Standards/regulations (Higher requirements in practice (covered))	EN 55016
	EN 61000-6-3 (Class B)
Noise emission ()	EN 55016
	EN 61000-6-3 (Class B)

Harmonic currents

Standards/regulations	EN 61000-3-2
	EN 61000-3-2 (Class A)
Frequency range	0 kHz ... 2 kHz

Flicker

Standards/regulations	EN 61000-3-3
Frequency range	0 kHz ... 2 kHz

Electrostatic discharge

Standards/regulations	EN 61000-4-2

Electrostatic discharge

Contact discharge	8 kV (Test Level 3)
Discharge in air	15 kV (Test Level 3)
Comments	Criterion A

Electromagnetic HF field

Standards/regulations	EN 61000-4-3

Electromagnetic HF field

Frequency range	80 MHz ... 1 GHz
Test field strength	10 V/m (Test Level 3)
Frequency range	1.4 GHz ... 6 GHz
Test field strength	10 V/m (Test Level 3)
Comments	Criterion A

Fast transients (burst)

Standards/regulations	EN 61000-4-4

Fast transients (burst)

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

Surge voltage load (surge)

Standards/regulations	EN 61000-4-5

Surge voltage load (surge)

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

Surge current load (surge)

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

Conducted interference

Standards/regulations	EN 61000-4-6

Conducted interference

I/O/S	asymmetrical
Frequency range	0.15 MHz ... 80 MHz
Comments	Criterion A
Voltage	6 V (Test Level 4)

Power frequency magnetic field

Standards/regulations	EN 61000-4-8
Frequency	50 Hz

	60 Hz
Test field strength	30 A/m
Comments	Criterion A

Voltage dips

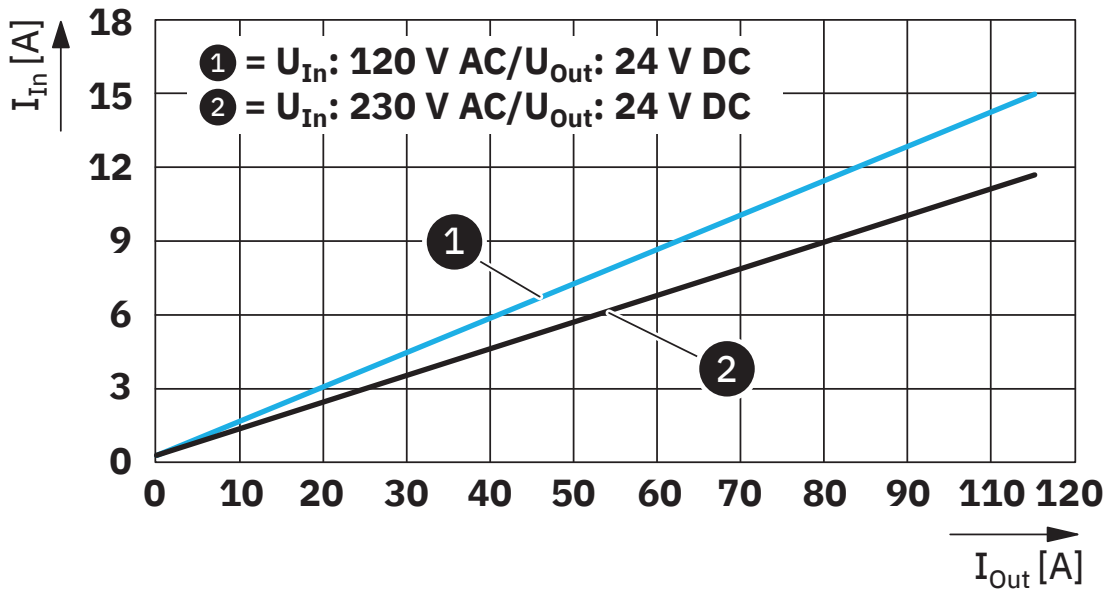
Standards/regulations	EN 61000-4-11
Voltage	230 V AC
Frequency	50 Hz
Voltage dip	95 %
Number of periods	0.5
Additional text	Class 3
Comments	Criterion B
Voltage dip	30 %
Number of periods	25 periods
Additional text	Class 3
Comments	Criterion B

Criteria

Criterion A	Normal operating behavior within the specified limits.
Criterion B	Temporary impairment to operational behavior that is corrected by the device itself.

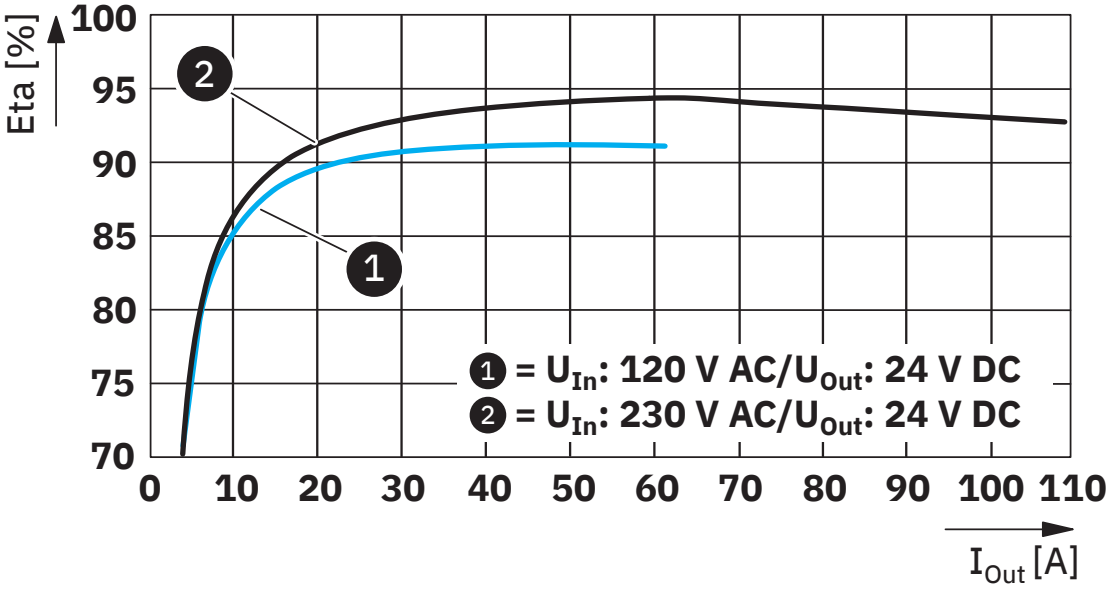
Drawings

Diagram



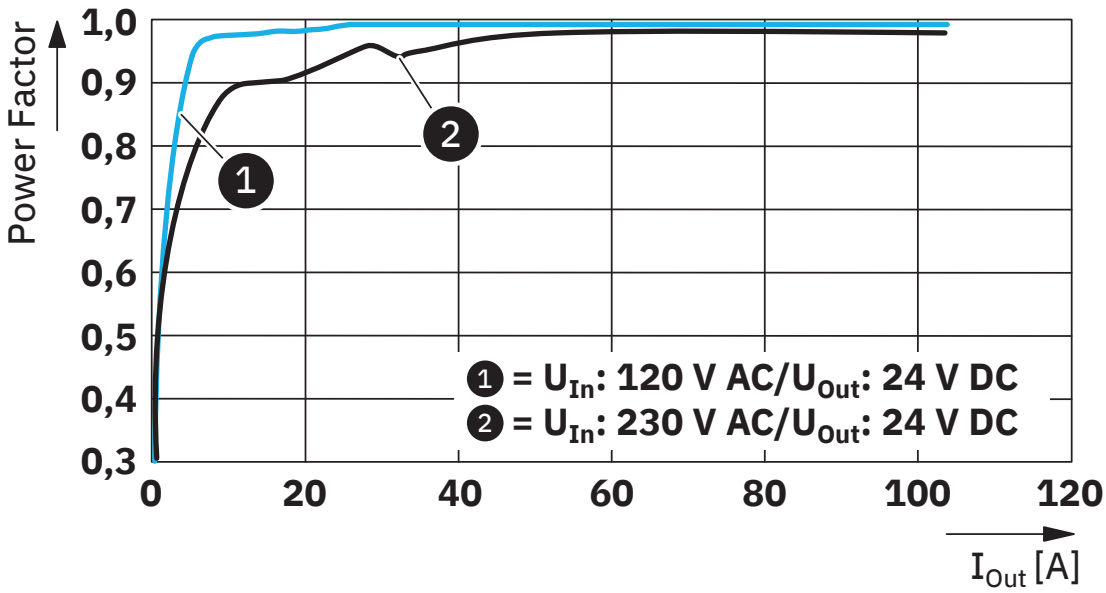
Input current/output current

Diagram



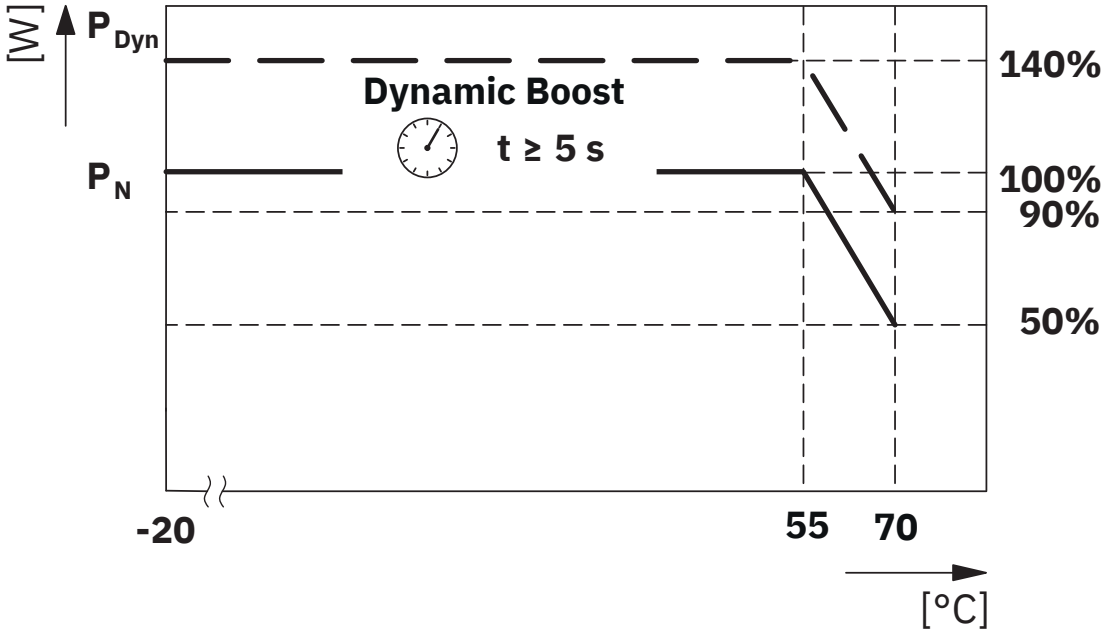
Efficiency

Diagram



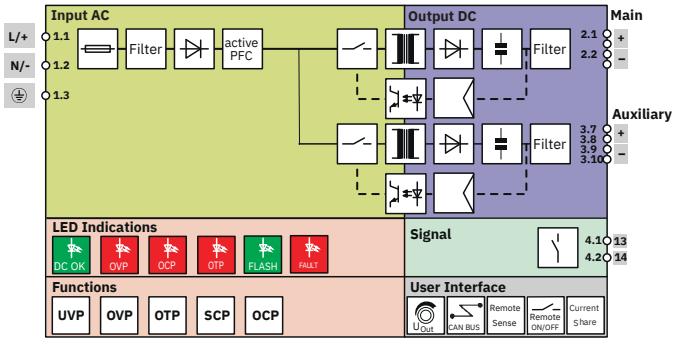
Power factor

Diagram



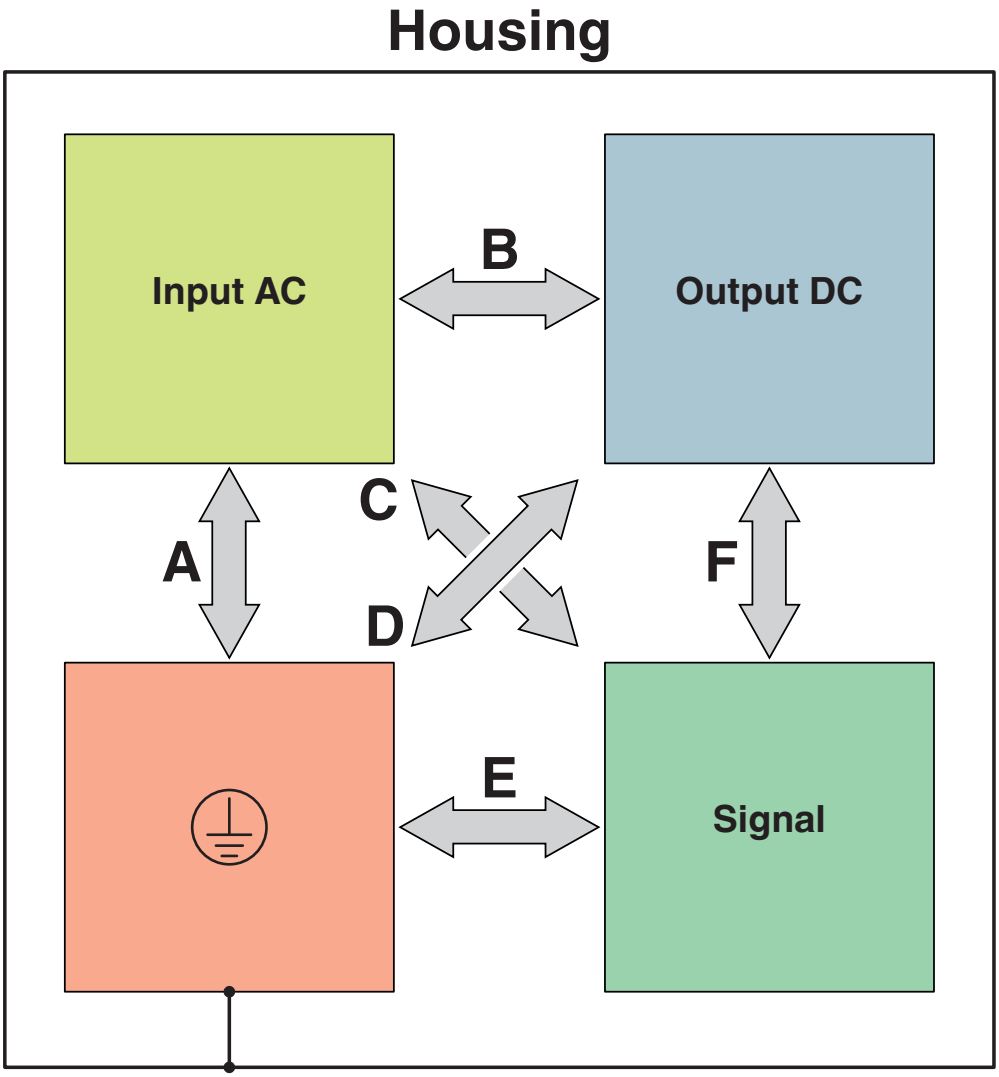
Temperature-dependent derating

Block diagram



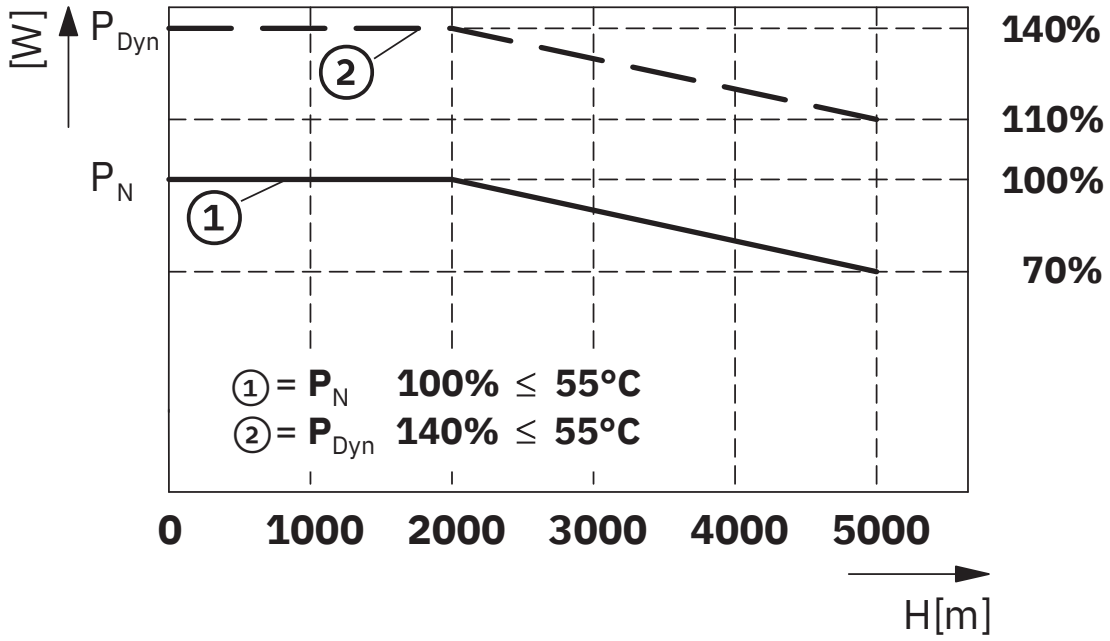
Block diagram

Schematic diagram



Test sections, insulation voltage

Diagram



Altitude-dependent derating

Approvals

To download certificates, visit the product detail page: https://www.phoenixcontact.com/in/products/1635194

IECEE CB Scheme
Approval ID: DK-149995-UL

cULus Recognized
Approval ID: E211944-20240314

cULus Listed
Approval ID: E123528-20240426

Classifications

ECLASS

ECLASS-13.0	27040701
ECLASS-11.0	27040701
ECLASS-12.0	27040701

ETIM

ETIM 9.0	EC002540

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)

Accessories

QUINT4-UPS/24DC/24DC/40 - Uninterruptible power supply

2907077

https://www.phoenixcontact.com/in/products/2907077

QUINT UPS, IQ Technology, DIN rail mounting, Screw connection, input: 24 V DC, output: 24 V DC / 40 A, charging current: 5 A

VAL-SPP-T2-275-1+1-UT-R - Type 2 surge arrester

1466212

https://www.phoenixcontact.com/in/products/1466212

Plug-in surge arrester, in accordance with Type 2/Class II, for 1-phase power supply networks with separate N and PE (3-conductor system: L1, N, PE), with remote indication contact.

VAL-SEC-T2-2+0-380DC-FM - Type 2 surge arrester

2907876

https://www.phoenixcontact.com/in/products/2907876

Pluggable surge protective device, in accordance with Type 2/Class II, for DC power sources with linear operating characteristics, with remote indication contact.

VAL-SEC-T2-2+0-48DC-FM - Type 2 surge arrester

2907865

https://www.phoenixcontact.com/in/products/2907865

Pluggable surge protective device, in accordance with Type 2/Class II, for DC power sources with linear operating characteristics, with remote indication contact.

VAL-US-120/40/1+1-FM - Type 1 surge protection device

2910349

https://www.phoenixcontact.com/in/products/2910349

Surge protective device, two channel with remote indicator contact for 120 V AC, 2-wire plus ground.

VAL-US-120/40/1+0-FM - Type 1 surge protection device

2910348

https://www.phoenixcontact.com/in/products/2910348

Surge protective device, single channel with remote indicator contact for 120 V AC

PLT-SEC-T3-120-FM-UT - Type 3 surge protection device

2907918

https://www.phoenixcontact.com/in/products/2907918

Type 2/3 surge protection, consisting of protective plug and base element, with integrated status indicator and remote signaling for single-phase power supply networks. Nominal voltage: 120 V AC/DC

CBMC E4 24DC/1-4A NO - Electronic circuit breaker

2906031

https://www.phoenixcontact.com/in/products/2906031

Multi-channel electronic circuit breaker for protecting four loads at 24 V DC in the event of overload and short circuit. With electronic locking of the set nominal currents. For installation on DIN rails.

CBMC EG4 24DC/1-8A NO - Electronic circuit breaker

1065730

https://www.phoenixcontact.com/in/products/1065730

Multi-channel electronic circuit breaker with electrical isolation for protecting four loads at 24 V DC in the event of overload or short circuit. With electronic locking of the set nominal currents. For installation on DIN rails.

CBMC E4 24DC/1-10A NO - Electronic circuit breaker

2906032

https://www.phoenixcontact.com/in/products/2906032

Multi-channel electronic circuit breaker for protecting four loads at 24 V DC in the event of overload and short circuit. With electronic locking of the set nominal currents. For installation on DIN rails.

CBM E4 24DC/0.5-10A NO-R - Electronic circuit breaker

2905743

https://www.phoenixcontact.com/in/products/2905743

Multi-channel, electronic circuit breaker with active current limitation for protecting four loads at 24 V DC in the event of overload and short circuit. With nominal current assistant and electronic locking of the set nominal currents. For installation on DIN rails.

CAPAROC E4 12-24DC/1-4A - Electronic circuit breaker

1115657

https://www.phoenixcontact.com/in/products/1115657

Four-channel electronic circuit breaker module for protecting 12 and 24 V DC loads against overload and short circuit. Nominal current adjustable from 1 A to 4 A via LED button. For DIN rail installation via the CAPAROC current rails.

CAPAROC E4 12-24DC/1-10A - Electronic circuit breaker

1115658

https://www.phoenixcontact.com/in/products/1115658

Four-channel electronic circuit breaker module for protecting 12 and 24 V DC loads against overload and short circuit. Nominal current adjustable from 1 A to 10 A via LED button. For DIN rail installation via the CAPAROC current rails.

CBM E8 24DC/0.5-10A NO-R - Electronic circuit breaker

2905744

https://www.phoenixcontact.com/in/products/2905744

Multi-channel, electronic circuit breaker with active current limitation for protecting eight loads at 24 V DC in the event of overload and short circuit. With nominal current assistant and electronic locking of the set nominal currents. For installation on DIN rails.

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