

TRIO-HP/3AC/1KDC/20KW/BI - AC/DC power module



1560712

<https://www.phoenixcontact.com/pc/products/1560712>

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TRIO POWER, bidirectional AC/DC power module with 20 kW output power, Push-in connection, 19" rack mounting, CAN bus, input: 3-phase, output: 50 V DC ... 1000 V DC or input: DC, output: 380 V ... 480 V 3AC



Product description

The highly efficient power electronics system for 19" rack mounting from Phoenix Contact features a high degree of investment security. It enables the cost-effective charging and discharging of your battery storage applications. The modular and scalable system is optimized for bidirectional power conversion with high voltages and currents. By combining several modules, an output power of up to 960 kW is possible.

Your advantages

- Max. 97% efficiency: slight losses during current conversion
- Grid feed-in function
- Scalable system with output power of up to 960 kW possible
- Modular and flexible for various applications
- Widely varying voltage field

Commercial data

Item number	1560712
Packing unit	1 pc
Minimum order quantity	1 pc
Product key	CMHT3J
GTIN	4067923042506
Weight per piece (including packing)	26,400 g
Weight per piece (excluding packing)	24,100 g
Customs tariff number	85044095
Country of origin	CN

Technical data

Input data

AC/DC Mode Power grid

Input voltage range	3x 260 V AC ... 530 V AC
Derating	3x 309 V AC ... 260 V AC (180 W/V)
Frequency range	50 Hz ... 60 Hz \pm 10 %
Input current range	3x 0 A ... 38 A
Inrush current limitation	50 A
Total distortion (THDi)	< 5 % (50% ... 100% output load)
Supply system configuration	Star network (TN-S, TN-C, TT, IT)

DC/AC Mode On-grid

Input voltage range	200 V DC ... 1000 V DC
Derating	273 V DC ... 200 V DC (123 W/V)
Input current range	0 A ... 73 A

Output data

Efficiency	> 96 % ($P_{Out} > 50\%$)
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AC/DC Mode Power grid

Output voltage range	50 V DC ... 1000 V DC
Derating	50 V DC ... 273 V DC (74 W/V)
Output current range	0 A ... 73 A
Nominal power	20 kW
Power dissipation standby	< 20 W
Derating	> 55 °C (1.4 A/K)
Connection in parallel	48 (Modules)
Switch-over time	10 ms (Change of operating mode)
POWER factor	> 0.8 1 (leading and lagging)

DC/AC Mode On-grid

Output voltage range	3x 380 V AC ... 480 V AC
Output current range	0 A ... 38 A
Output power	max. 20 kVA (Nominal power) 22 kVA (Apparent power)
Output frequency	50 Hz ... 60 Hz \pm 10 %
Connection in parallel	48 (Modules)
Switch-over time	10 ms (Operating mode change DC/AC mode on-grid \leftrightarrow AC/DC mode)
Power factor	0.8 ... 1 (leading and lagging)
Power grid AC connection	L1, L2, L3, PE

DC/AC Mode Off-grid

	3x 380 V AC
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Output voltage	3x 400 V AC
	3x 480 V AC
Output power	max. 19.8 kVA (Nominal power)
	22 kVA (Apparent power)
Output frequency	50 Hz (3x 380 V AC / 3x 400 V AC)
	60 Hz (3x 480 V AC)
Connection in parallel	8 (Modules)
Switch-over time	15 s (Operating mode change DC/AC mode off-grid ↔ AC/DC mode)
Power factor	0.8 ... 1 (leading and lagging)
Total harmonic distortion factor (THD)	< 3 %
Power grid AC connection	L1, L2, L3, N, PE

Connection data

AC connection

Designation	AC connection
Identification	L1 / L2 / L3 / N / PE

Conductor connection

Connection method	Push-in connection
rigid	1.5 mm ² ... 16 mm ²
flexible	1.5 mm ² ... 16 mm ²
rigid (AWG)	15 ... 5
AWG	15 ... 5
Stripping length	18 mm (rigid/flexible)

DC connection

Designation	DC connection
Identification	DC+ / DC-

Conductor connection

Connection method	Push-in connection
rigid	1.5 mm ² ... 16 mm ²
flexible	1.5 mm ² ... 16 mm ²
rigid (AWG)	15 ... 5
AWG	15 ... 5
Stripping length	18 mm

Interfaces

Interface	CAN bus
Number of interfaces	1
Connection method	2x RJ45
Supported protocols	CAN 2.0B
Locking	Locking clip
Transmission physics	wired

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Topology	Daisy Chain
Transmission speed	125 kbps
Termination resistor	120 Ω (Terminating the end device)

Electrical properties

Number of phases	3
Electrical isolation between input and output	yes
Insulation voltage input/output	2121 V DC (60 s)
Insulation voltage input, output / housing	2121 V DC (60 s)

Product properties

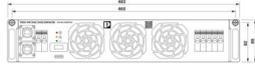
Product family	TRIO POWER
MTBF (IEC 61709, SN 29500)	> 300000 h
Internal fan	yes
Volumetric flow	400 m ³ /h (per module)
Flow direction	from front to back

Insulation characteristics

Protection class	I
Pollution degree	2

Dimensions

Item dimensions

Width	483 mm
Height	89 mm
Depth	520 mm
Dimensional drawing	
Rack unit	2 U

Mounting

Mounting type	19" rack mounting
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Material specifications

Housing material	Zn-Al alloy
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Environmental and real-life conditions

Ambient conditions

Degree of protection	IP20
Ambient temperature (operation)	-40 °C ... 70 °C
Ambient temperature (storage/transport)	-40 °C ... 70 °C
Maximum altitude	2000 m
Permissible humidity (operation)	≤ 95 % (non-condensing)

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Noise level	< 70 dB (1 m, $U_{DC} \geq 400$ V)
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Standards and regulations

Overvoltage category

IEC 60664-1	II
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Safety requirements for power electronic converter systems and equipment - Part 1: General

Standard designation	Safety requirements for power electronic converter systems and equipment - Part 1: General
Standards/specifications	IEC 62477-1

Power generation systems connected to the low-voltage distribution network – Technical minimum requirements for the connection to and parallel operation with low-voltage distribution networks

Standard designation	Power generation systems connected to the low-voltage distribution network – Technical minimum requirements for the connection to and parallel operation with low-voltage distribution networks
Standards/specifications	VDE-AR-N 4105 (DE)

Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources

Standard designation	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
Standards/specifications	UL 1741
	UL 1741 SB

Bidirectional grid-connected power converters

Standard designation	Bidirectional grid-connected power converters
Standards/specifications	IEC 62909-1
	IEC 62909-2

EMC data

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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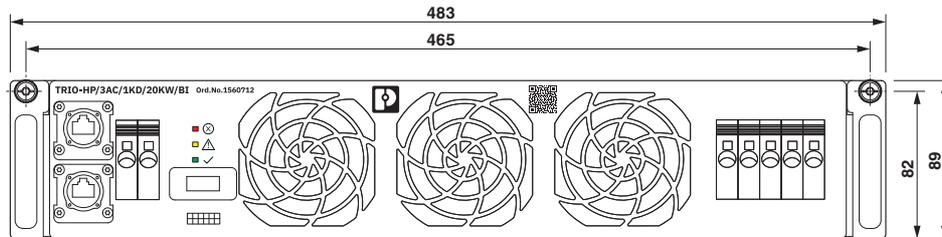


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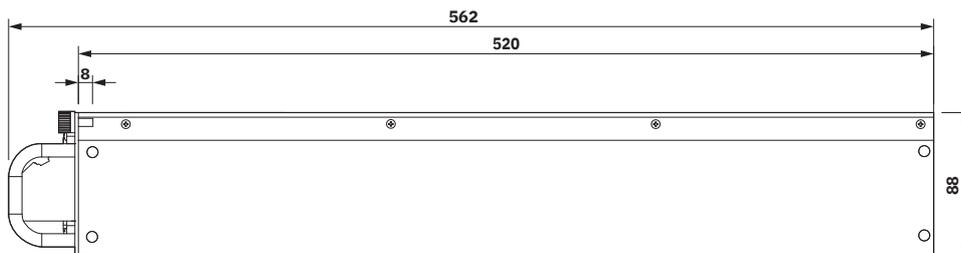
Drawings

Dimensional drawing



Device dimensions (dimensions in mm)

Dimensional drawing



Device dimensions (dimensions in mm)

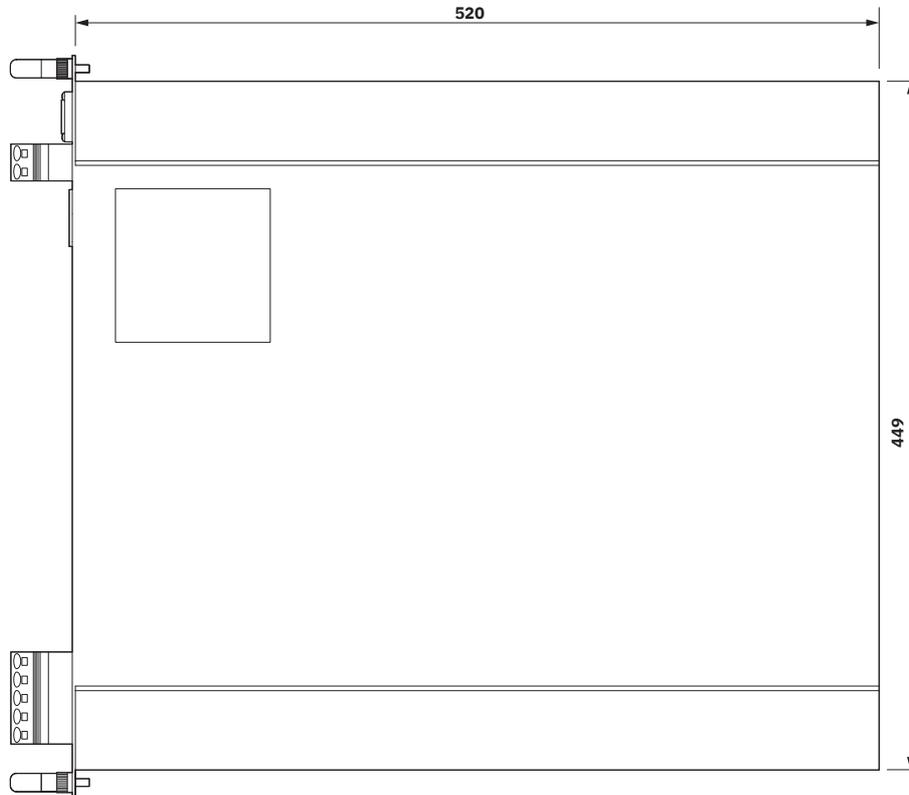
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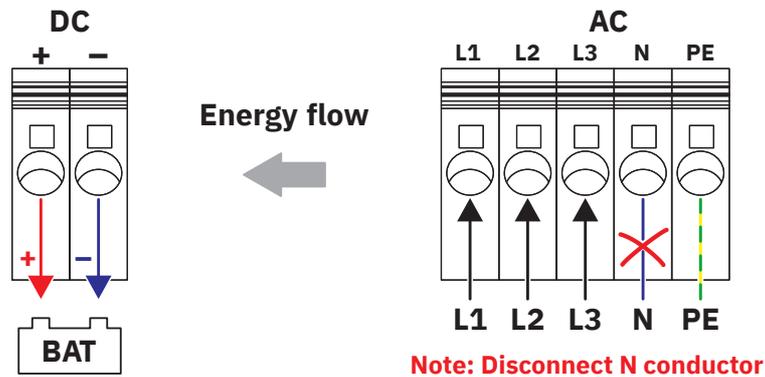
Dimensional drawing



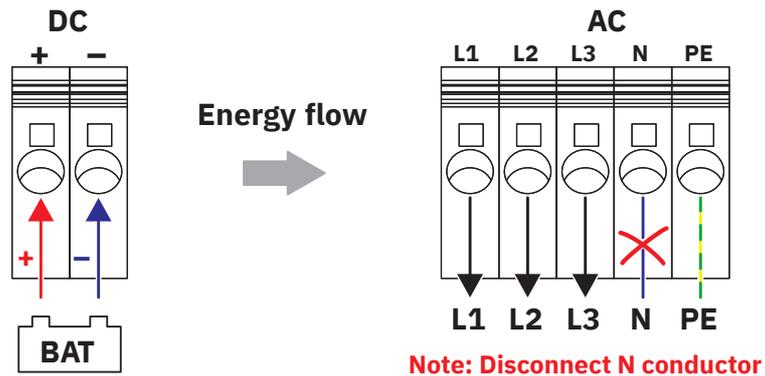
Device dimensions (dimensions in mm)

Schematic diagram

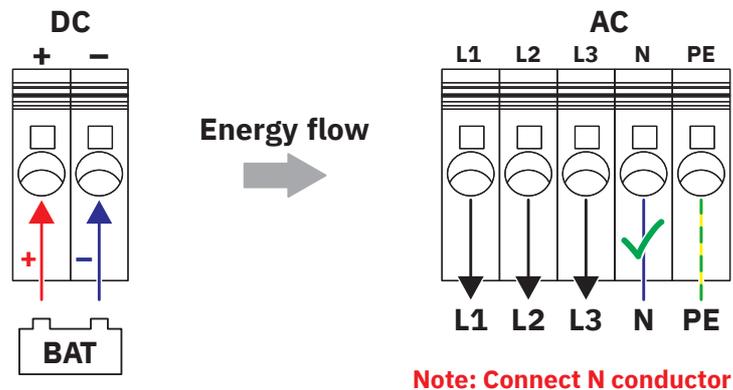
AC/DC Mode Power grid



DC/AC Mode On-grid (Existing power grid)



DC/AC Mode Off-grid (Independent grid)



Operating modes

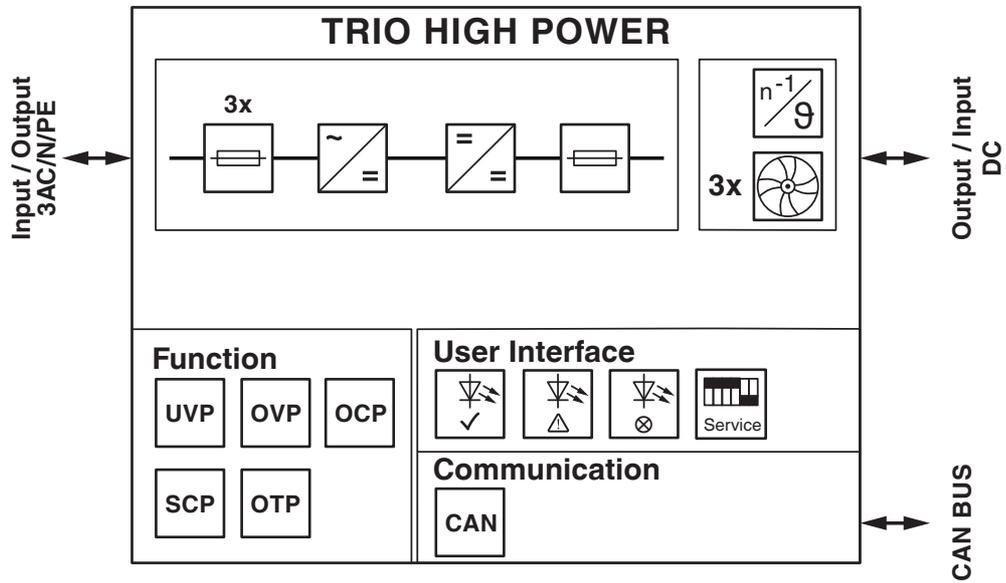
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Block diagram



Block diagram

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Approvals

To download certificates, visit the product detail page: <https://www.phoenixcontact.com/pc/products/1560712>



TÜV SÜD Type tested

Approval ID: B 029429 0045 Rev.01

EU-Type Examination Certificate

Approval ID: N8A 029429 044 R.01

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Classifications

ECLASS

ECLASS-13.0	27040701
ECLASS-15.0	27040701

ETIM

ETIM 10.0	EC002540
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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)
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EF3.1 Climate Change

CO2e kg	652.241 kg CO2e
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Accessories

AXC F 2152 - Controller

2404267

<https://www.phoenixcontact.com/pc/products/2404267>



Controller (SPS), PLCnext Control; Programming: High-level language and IEC 61131-3; Operating system: Yocto/Linux® (real-time); Programming tool: PLCnext Engineer, Eclipse®, Visual Studio®, MATLAB®/ Simulink®; IoT connection: PROFICLOUD and every cloud via cloud connectors; Development process certified in accordance with IEC 62443-4-1, Product certified in accordance with IEC 62443-4-2 (Certification conditions see user documentation); Processor: Arm® Cortex®-A9, 2x 800 MHz.

AXL F IF CAN 1H - Communication module

2702668

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Axioline F, interface module, CAN, transparent protocol, max. transmission speed of 1 Mbps, IP20 protection, including bus base module and Axioline F connectors

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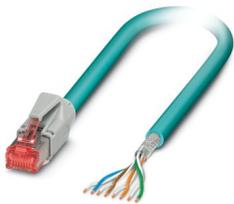
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VS-IP20-OE-94F-LI/2,0 - Network cable

1415255

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Assembled Ethernet cable, CAT6, shielded, 4-pair, AWG 26 stranded (7-wire), RAL 5021 (water blue), RJ45 plug/IP20 on free conductor end, line, length 2 m

ELR HDC-PT-24/650/55-IOL - DC semiconductor circuit breaker

1368127

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DC circuit breaker for protecting, monitoring, and switching high DC loads, intermediate circuit precharging; can be parameterized, 0 V DC ... 800 V DC, up to 55 A, shutdown in the event of short circuit in $<10 \mu\text{s}$ thanks to hybrid technology, integrated bus communication

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