

CC-4000 high-voltage boost inverter

Preliminary

High-voltage boost inverter for driving ultra-high-speed turbo compressors in medium and heavy-duty fuel cell systems in mobile, stationary or marine applications. The integrated boost front-end ensures that the maximum inverter output voltage (800 V_{pk}) is available across the full the HV voltage range (250 to 920 V DC), enabling motor control at maximum speed even where the back EMF exceeds the input voltage. Additionally, the consistently high inverter output voltage results in a reduction of the phase current and the cable cross-section of the motor cables to just 6 mm² at 25 kW compressor power, simplifying integration on the system level.

- Designed for the Celeroton TurboCell air compressor CTE-4000 and optimized for fuel cell applications.
- Power electronics with maximum power density at highest inverter efficiency
- Operation of turbo compressor with maximum speed from wide HV voltage range (250 - 920 V DC)
- Continuous compressor power of > 25 kW available from HV voltage > 520 V DC without derating
- Sensorless PMSM speed control up to 140,000 rpm
- Protection class IP67 and IP6K9K



Main specifications

HV voltage range (full perf.)	520 – 850 V DC
HV voltage range (limited perf.)	250 – 520 V DC (lower limited range) 850 – 920 V DC (upper limited range)
HV voltage trip level	< 250 V DC or > 920 V DC
Rated power at output	25 kW (continuous, $\cos(\phi) \geq 0.8$, 520 V DC, 65°C coolant)
Maximum HV input current	50 A DC
Maximum frequency/speed	2.3 kHz / 140,000 rpm
Maximum output voltage	800 V (peak value, phase-phase)
Maximum phase current	40 A rms
LV input voltage range	8 – 32 V DC
Coolant temperature (full perf.)	-40 °C – +65 °C
Coolant temperature (limited perf.)	+65 °C – 100 °C
Ambient temperature	-40 °C – +85 °C
Protection class	IP67 and IP6K9K
Communication interface	CAN 2.0 A/B (500 kbps) incl. daisy chaining CAN FD (option) Proprietary USB service interface
Dimensions (L x W x H)	291 mm x 246 mm x 78 mm

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High-voltage insulation	
Rated insulation voltage	920 V
Rated impulse voltage (BI)	4 kV
Design altitude (for insulation coordination)	5000 m.a.s.l. for applications w/o mains connection 2000 m.a.s.l. for mains connected applications
Over-voltage category	OV2 for basic insulation (BI)

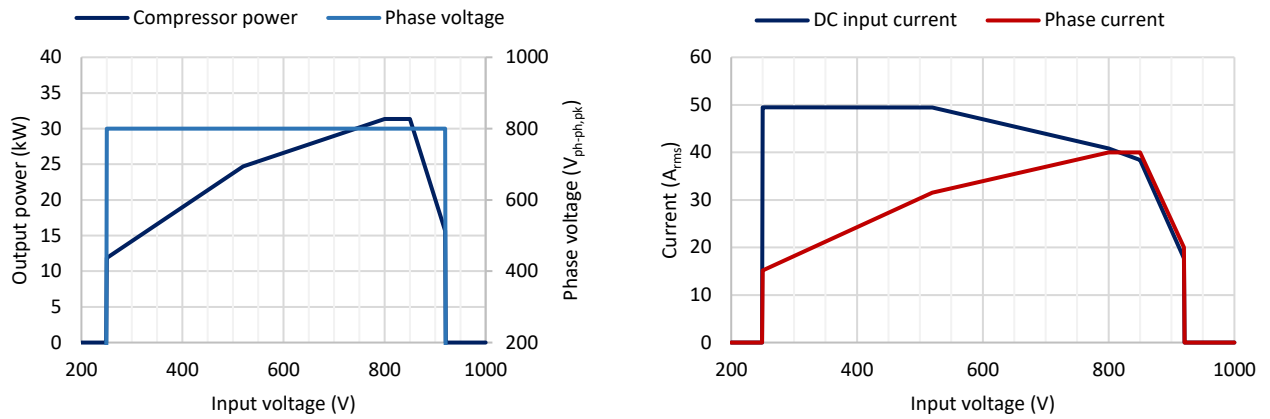
Electrical safety	
Passive discharge	< 60 V DC, 3 min
Active discharge	< 60 V DC, 3 s

High-voltage interfaces	
Connector type (HV DC interface)	Jonhon EVH6, 2 pos. (cable side connector: EVH6-E2TK-A)
Cable type (HV DC interface)	2x 10 mm ² , shielded
Connector type (motor interface)	Jonhon EVH2, 4 pos. (cable-side connector: EVH2-N4TK-DA)
Cable type (motor interface)	3x 6 mm ² , individually shielded motor cables 1x 6 mm ² , optional PE connection
HVIL	passive loop of high-voltage interfaces
Grounding	2x M6 cable lug

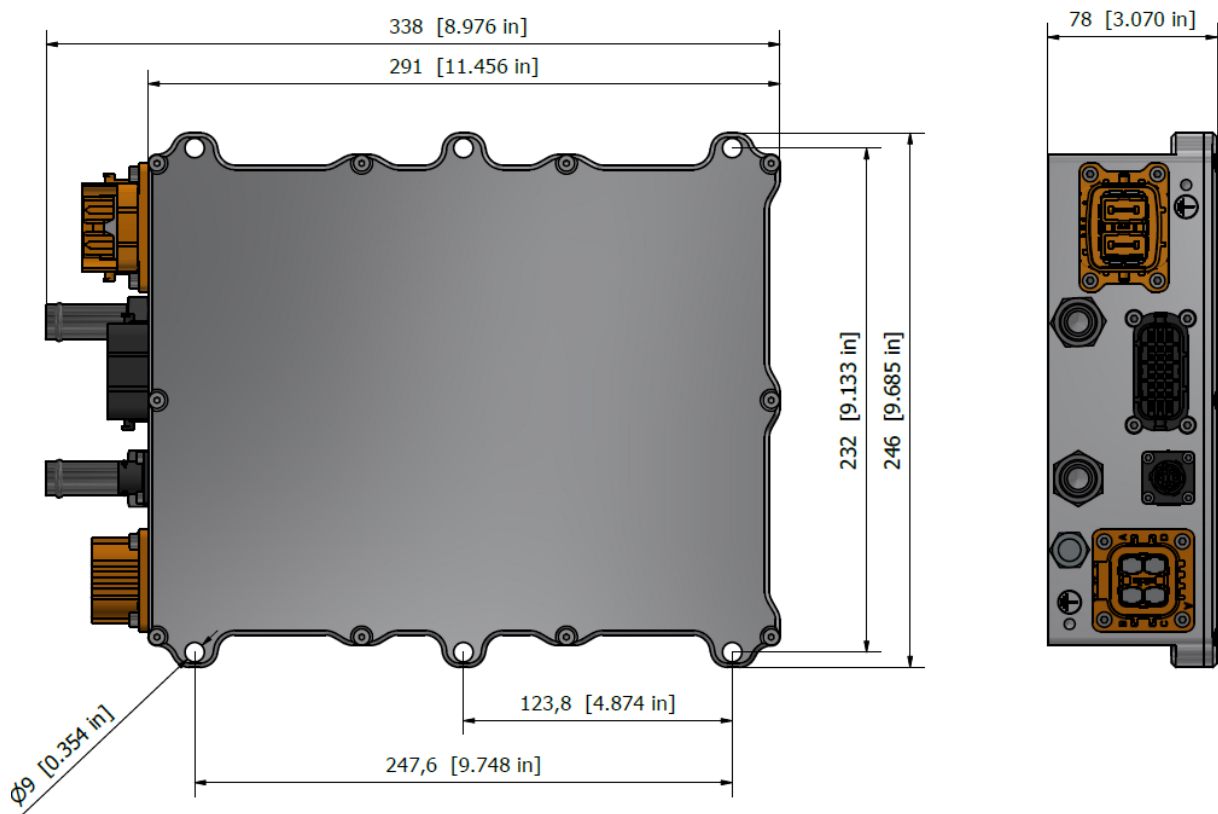
Low-voltage interfaces	
Connector type (LV interface)	Jonhon EVS5, 24 pos. (cable-side connector: EVS5-24BTK-01))
Connector type (sensor interface)	Amphenol eco mate, 6 pos. (cable-side connector: RTS6BS10N6P03)
Available sensor inputs	2x PT1000 for compressor temperature 1x HVIL for motor connector of compressor

Cooling interfaces	
Liquid	Inhibited 50%/50% water glycol mixture
Coolant flow rate (nominal)	10 l/min
In-/outlet connector type	According to SAE J1231 430192
Tube ID	16 mm

Boost inverter operating area



Drawing in mm [inch]



Ordering information	Article number
CC-4000	Contact sales

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