

CleanWave 100kHz Inverter

250 kW



Pre-Switch

The CleanWave inverter is a high power, compact and light-weight soft-switching intelligent evaluation system optimized to drive electric motors with a "clean" sine wave output resulting from it's 100kHz switching frequency operation. Engineers can quickly evaluate improved motor efficiency gains at 100kHz without adapting their motor control. The CleanWave2 uses Pre-Switch's newest 4th Gen Pre-Flex™ AI soft-switching algorithm for unparalleled adaptable soft-switching efficiency and safety. A peak efficiency of > 99.5% at 100 kHz is achieved using only two discrete United SiC 1200V 9 mΩ SiC FETs per switch position. The inverter includes integrated Field-Oriented Control and a CAN bus interface. Customers may utilize their proprietary motor control if desired. Additionally, many safety and self-diagnostic features have been added for robustness and reliability.

Inverter Specifications

Parameter	Value
V_{bus} Operating	400 – 900 V_{dc}
V_{bus} Nominal	750 V_{dc}
Continuous Output Current	250 A_{rms}
Peak Output Current ¹	390 A_{rms}
Size and Volume	234 x 159 x 33 mm (L x W x H) – 1.23 L
Weight ^{2,3}	2.8 Kg
PWM Frequency ³	10 – 100 kHz
Baseplate Temperature Range ⁴	0 – 80°C
DC Link Capacitance ⁵	Internal

Control Specifications

Parameter	Value
CAN Bus	Standard
Resolver/Encoder input	Standard
System DC Power	10-20 V
Protection	Integrated
3 PWM inputs (RS422 voltage levels)	Custom order

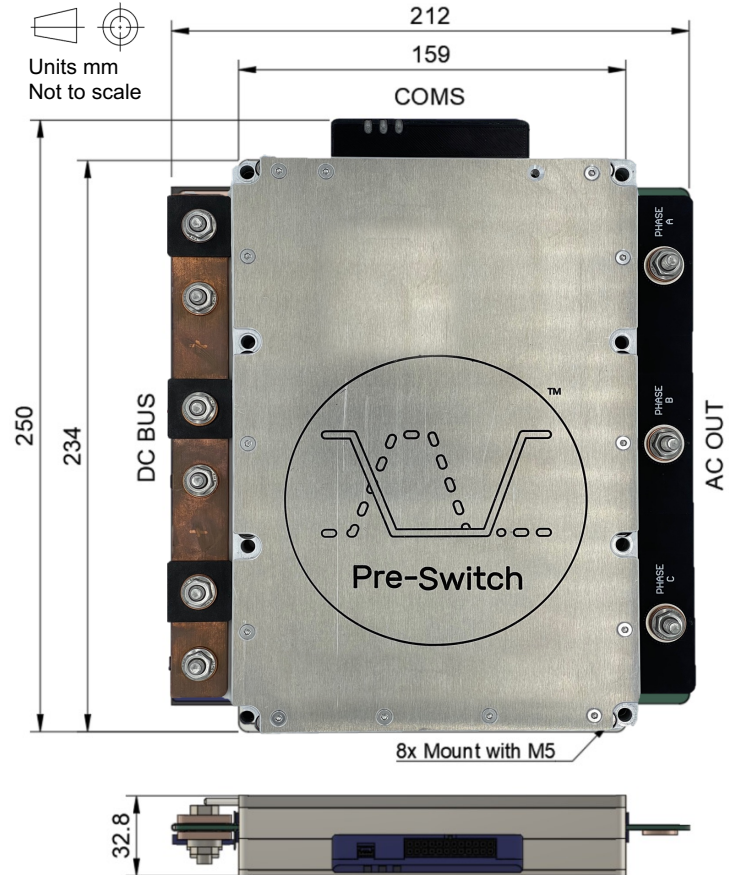
¹ Operating for 30 seconds or less, depends on modulation type and cooling

² With flat baseplate option

³ External dc link capacitance required for < 50 kHz PWM frequency

⁴ Derate after 60°C

⁵ Low inductance interdigitated dc link bus bars (< 2nH) to allow resonant free external dc link capacitors if needed



Highlights:

- Industry leading power density >203 kW/L (3.36 kW/in³)
- 4th Gen Pre-Flex™ SiC AI Algorithm
- >99.5% peak efficiency @ 100 kHz
- PMSM FOC control included – customer configurable
- Integrated variable PWM maximizes modulation index
- Dedicated CPU for customer's proprietary motor control
- Secure remote firmware update capability
- Internal V_{bus} and phase current measurements
- Includes protection for
 - Overvoltage
 - Overcurrent
 - Over temperature
 - External DC link capacitor resonance
- Dust proof and deigned for 50G
- No internal DC link EMI filter required
- Bidirectional - DC/AC or AC/DC
- Three heatsink options: flat baseplate, fin array baseplate, or integrated cold plate
- Optional DC bus bar assembly (shown above)
- Very low conducted and radiated EMI

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