

CW200

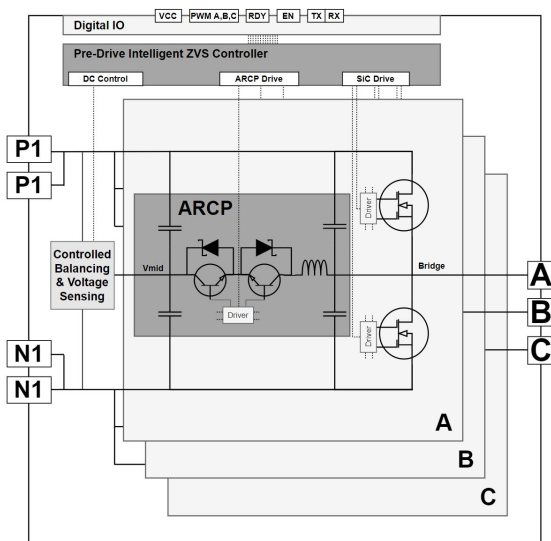
Clean-Wave 200kW Evaluation System



The Pre-Switch Clean Wave is a 3-phase inverter power-stage module for evaluation of Pre-Switch's patented AC soft-switching technology. It is designed for use with permanent magnet or induction motors and DC bus voltages from 500V to 900V. Based on Pre-switch's Pre-Flex™ intelligent real-time adaptive ZVS architecture, the module ensures optimized ZVS switching over the entire voltage and current range.

There is no motor control provided with the unit and must be provided by the end user. The CW200 has differential inputs and requires only 3 PWM signals and 2 signals for hardware handshake. System status including temperature and faults is available through UART.

Advanced fault protection is now available to the user as part of the Pre-Flex 'Blink' protection, and includes industry leading <500ns DESAT protection, OTP, OVP and UVP, as well as cycle by cycle over current protection.



Functional Diagram

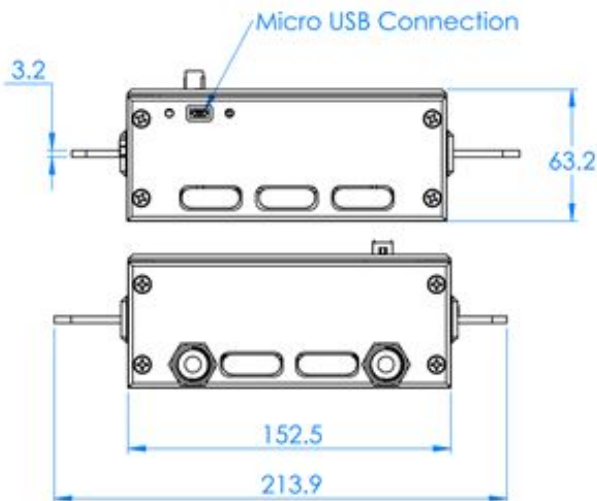
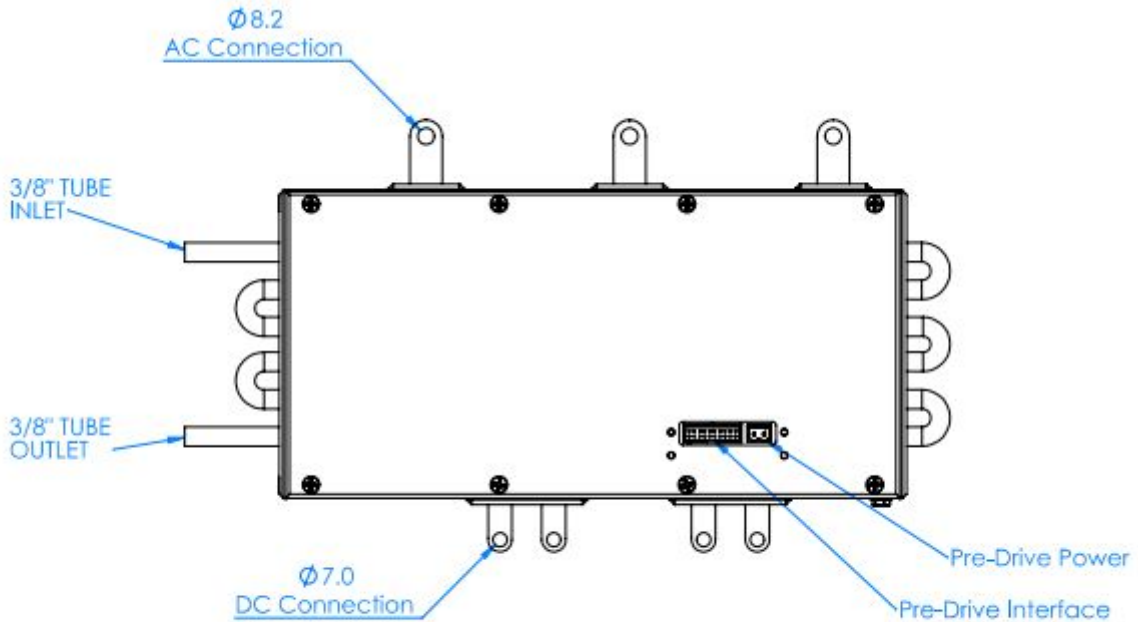
Electrical Specifications	
AC Power Output	100 kW
DC Bus Voltage	500 - 900V
AC Current (30 sec max)	110 Arms
AC Current (continuous)	100 Arms
Vcc	15V ±5%
DC input capacitance	58µF @ 10V
Switching Frequency	10-100 kHz (rec)

Control Specifications	
Input PWM	3 inputs (RS422 standard)
Protections	OTP, OVP, DESAT
Communication	Full duplex RS422 @ 115200
Sensors	MOSFET temperatures, DC bus voltage and midpoint

Mechanical Specifications	
Size	300 mm x 150 mm x 100 mm
Weight	6.4 kg
Environment	15-30°C
Cooling	15-20°C @ > 8 LPM

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Pre-Drive Interface: 20 pin 2.54mm male

15V	1	2	15V
15V	3	4	GND
GND	5	6	GND
A_PWM_P	7	8	A_PWM_N
B_PWM_P	9	10	B_PWM_N
C_PWM_P	11	12	C_PWM_N
ENABLE_P	13	14	ENABLE_N
UART_Rx_P	15	16	UART_Rx_N
UART_Tx_P	17	18	UART_Tx_N
FAULT_P	19	20	FAULT_N

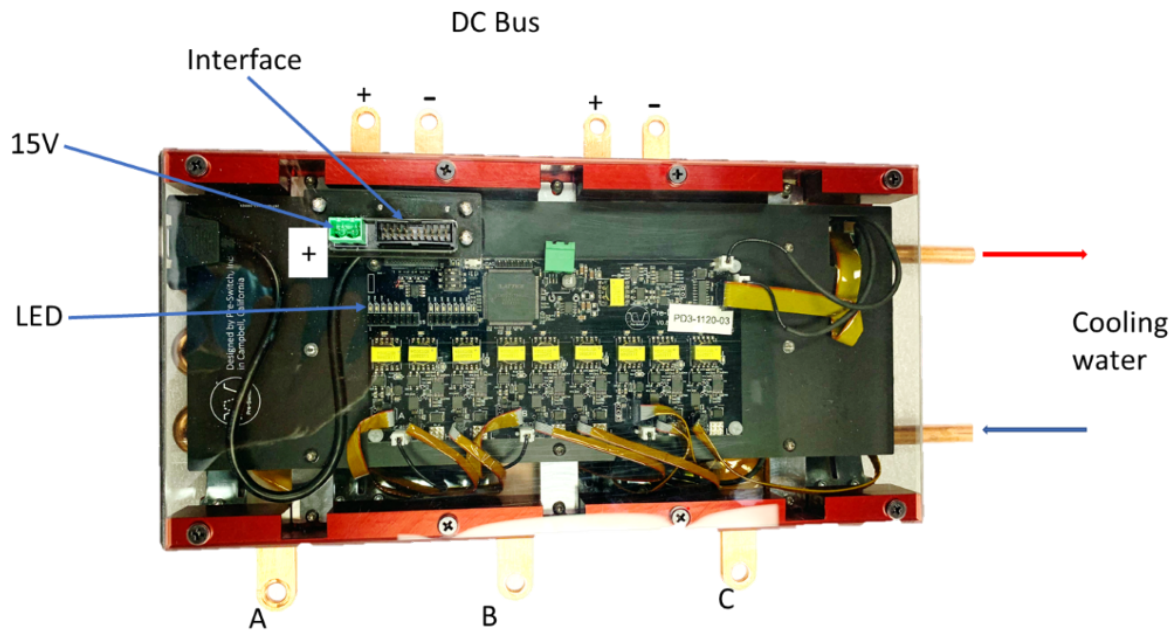
Pre-Drive Power (optional): Phoenix P/N 1757475



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Hardware Connections

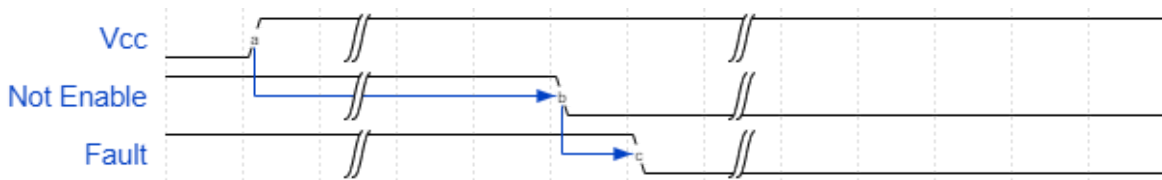


1. DC voltage (500VDC - 900VDC) must be supplied to both DC Bus terminals.
2. Aluminum enclosure should be grounded via a green screw on a side of the enclosure (upper left corner).
3. Vcc can be supplied via Interface connector or via dedicated (15V) green connector.
4. All interface signals and Vcc are galvanically isolated from input DC voltage.
5. Phase outputs A, B, and C are not galvanically isolated from input DC voltage.
6. LEDs which are visible through the top cover show status of PWM A, PWM B, PWM C, Enable, RX, TX, and Fault lines (left to right). They are useful for debugging.

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User provided control and interface

A 15V power supply rated at >15W and an RS422 interface is required. To enable output PWM, the host needs to enable the CW200 via hardware handshake (see diagram below). System status is available through RS422 UART. For detailed information on communication protocol and fault descriptions please see the CW200 User Guide.



PWM Input signals

The CW200 calculates and dynamically adjusts all dead times for each phase separately. The dead times are optimized for minimum duration and guarantee no shoot-through. A single PWM input controls each half bridge. All commutations are managed internally within the system.

Diagram below illustrates how two controls for half bridge MOSFETs are derived from a single PWM input signal:

