



# AVID CONTROLS®

aggressive

versatile

innovative

driven

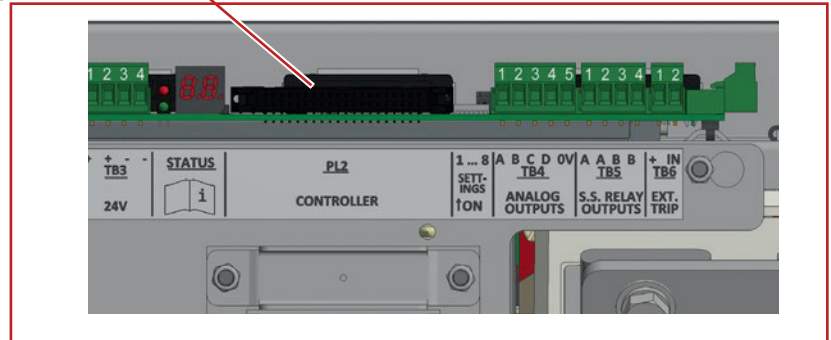
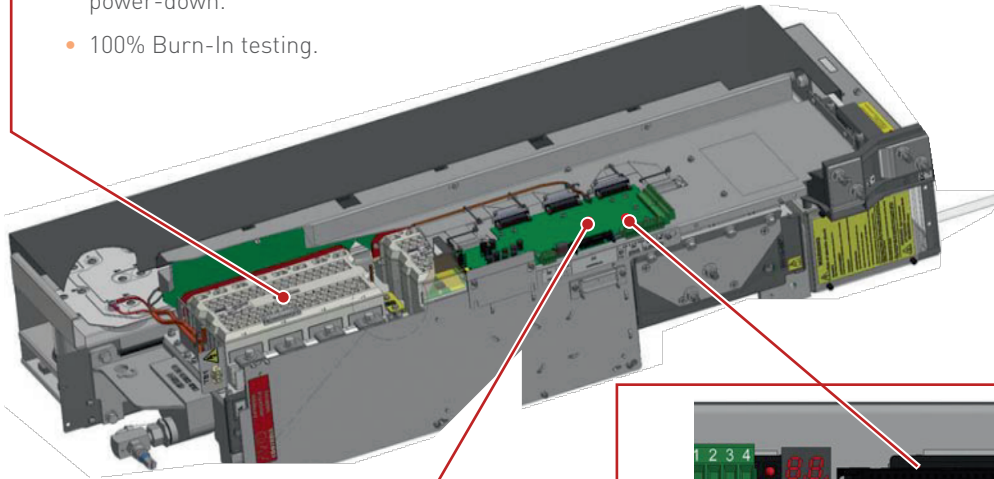
**AE3000** AVID Extreme Liquid Cooled  
Inverter Modules



# AE3000-AVID EXTREME INVERTER MODULE DETAILS

## SKiiP 4 WITH RUGGEDIZED CHIP TECHNOLOGY

- Higher reliability than previous SKiiP modules.
- Manufactured in highly automated facility in Nurnberg Germany.
- Use of Semikron-exclusive rugged IGBT chips from Infineon.
- Soldered joints replaced with high temperature sintered silver bonds—effectively eradicating thermal stress failure of the die to DCB bond.
- Improved internal bus structure reduces voltage spikes and current mismatch on the IGBT die themselves—working voltage up to 1300 Vdc.
- Improved location of temperature feedback device allows for very accurate determination of critical internal temperatures.
- Improved gate driver with fully digital communications between high voltage and low voltage side, and robust power-up, power-down.
- 100% Burn-In testing.



## CIB INTERFACE PLATFORM

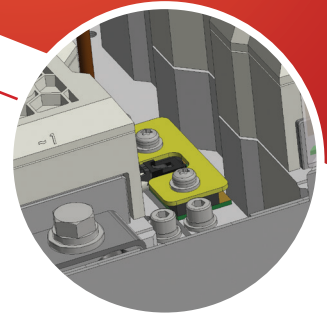
- Plug and play control interface with existing CDC controller.
- Enhanced control interface board (CIB) continually calculates  $T_j$  from temperature sensor now located next to power dies.
- Analog outputs for user diagnostic monitoring.
- Inverter module fault indication via relay output status for customer use.
- Two digit LED display for monitoring currents, IGBT module temperature, DC link voltage and CIB temperature.
- Discrete LEDs for monitoring fault conditions and status of power supplies.

## ENHANCED POWER MODULE DIAGNOSTICS

- MODBUS communication connection for user's existing SCADA system supplied as a standard. Improved diagnostics for your Wind Farms predictive failure analysis via trending currents, temperatures, etc... Fault codes are also provided.
- WIFI connection to iPhone or Android app is optional. Allows you to stand outside the inverter cabinet and safely access the AEI's diagnostics without the dangers of electrical exposure.

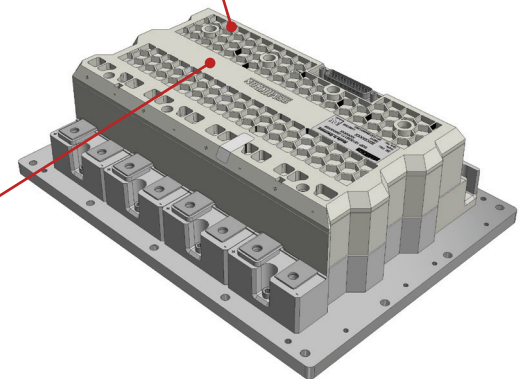
## MOISTURE AND CONDENSATION FAILURE MITIGATION

- Patented sealing of IGBTs for water resistant state
- No dry out necessary when installing a new unit or after a prolonged shutdowns
- Increased reliability with all prior moisture/condensation issues completely solved



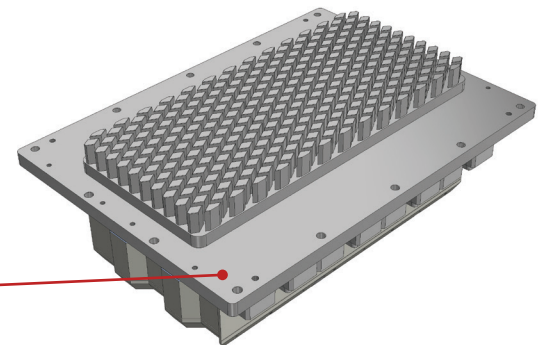
## NEW DIGITAL GATE DRIVER

- Digital Signal Transmission.
  - Precise control of switching delays (reduced need for sharing inductors with new controller).
  - No interference between switching and error signals.
  - Highest possible common mode rejection.
- Active Off Clamp.
  - Previous SKiiP generations used only a resistor to ensure IGBT is OFF in an unpowered state.
  - This is a potential problem if DC link is applied before auxiliary power (as in Delta with SMPS).
  - This has been replaced with an active clamp circuit.
- Internal Power Supply Monitoring.
  - Has been improved to reduce susceptibility to power supply variations.
- Two Speed Turn Off.
  - At fault levels of current, IGBT turn off is slowed down to eliminate destructive voltage spikes.
- Component Selection.
  - Tantalum capacitors have been eradicated from the driver in favor of solid ceramic types.



## RUGGIZED CHIP TECHNOLOGY

- SKiiP 4 Modules have now migrated to Semikron-exclusive H3TRB rugged 70A IGBT chips.
- Compared to standard Infineon IGBT-4 chips they have a **wider isolation zone** around the active area of the chip, and **thicker glass passivation** above the die.
- Under open-die testing at 1000Hr, 85°C & 85% humidity standard IGBT chips exhibit a voltage withstand of **80V** typically. The rugged chips are specified to withstand 80% of their specified voltage (**1360V**) under the same conditions.
- The CAL4 free wheel diode used by Semikron is also specified to this enhanced rating under these conditions.



## AVID IMPROVED COOLING FIN DESIGN

- Optimized pin design - better conductivity, smoother fluid path
- Simulations show 20% improvement in thermal performance with virtually unchanged pressure drop relative to existing design.

## PRODUCT HIGHLIGHTS

- Unmatched Power Density- 1400A in 10" of cabinet width
- Designed, built and tested in Waller, Texas, USA
- Compatible with industry standard "Delta" module

## LIQUID COOLED INVERTER OPTIONS

Model	Description	Rating @ 600VAC Rectified Mudpump Duty <sup>3</sup>	Rating @ 600VAC Rectified Drawworks Duty <sup>3</sup>	Rating @ 690VAC Rectified Marine Propulsion Duty <sup>3</sup>	Rating @ 690VAC AEM Wind Turbine Duty <sup>3</sup>
AEI900L	900A Liquid Cooled Inverter Module	900A	660A	900A	900A
AEI1000L	1000A Liquid Cooled Inverter Module	1000A	733A	1000A	1000A
AEI1250L	1250A Liquid Cooled Inverter Module	1250A	916A	1250A	1250A
AEI1400L	1400A Liquid Cooled Inverter Module	1400A	1026A	1400A	1250A

<sup>3</sup> Ratings are based on particular coolant inlet temperature, DC line voltage levels, speeds, overloads and switching frequency. Consult Avid Controls for particulars and special ratings.

Avid Controls pursues continuous product improvement and innovation. Data in this publication is subject to change without notice. Contact Avid Controls for the latest information.

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