AVID CONTROLS®

aggressive

versatile

innovative

driven

Proactive Retrofit **OR**
Complete New Extreme Inverter Module **OR**
Legacy MV3000 Deltas[1]

certified WBENC WOMEN'S BUSINESS ENTERPRISE

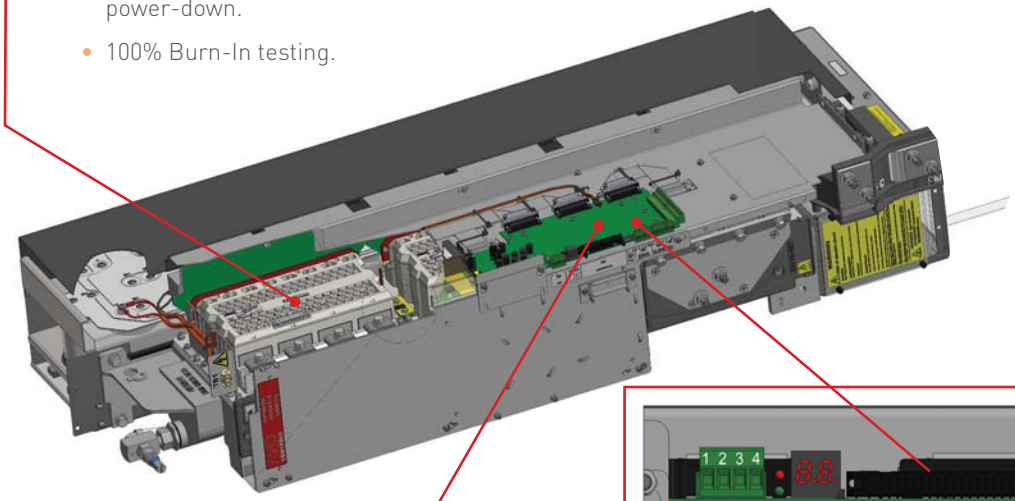
[1] Avid Controls, Inc. has an exclusive license from GE® to manufacture new MV3000 drive system components.

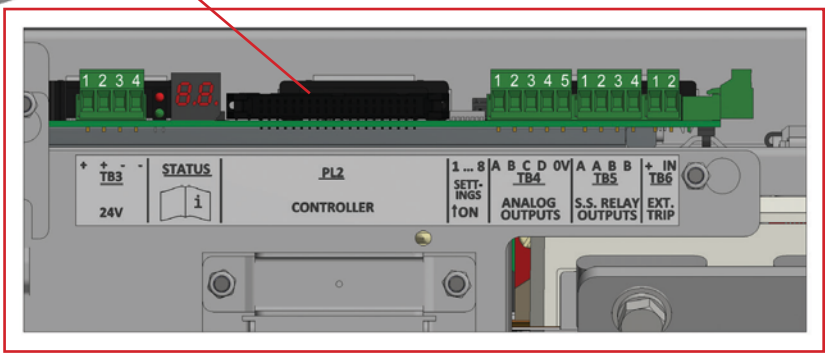
Rev. May 2018

AE3000-AEI3000 INVERTER MODULE DETAILS

SKiiP®4 WITH RUGGEDIZED CHIP TECHNOLOGY

- Higher reliability than previous SKiiP® modules.
- Manufactured in highly automated facility in Nürnberg 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 Tj 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.

MOISTURE AND CONDENSATION FAILURE MITAGATION

- Patent pending 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 moister/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.

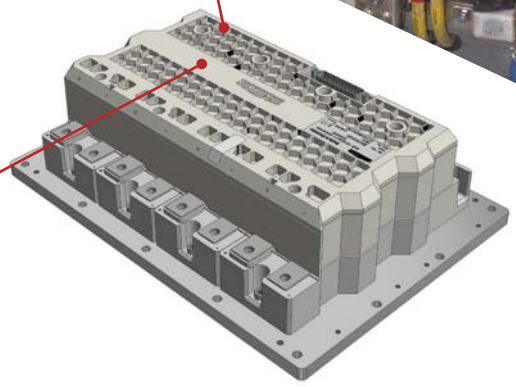
  At fault levels of current, IGBT turn off is slowed down to eliminate destructive voltage spikes.

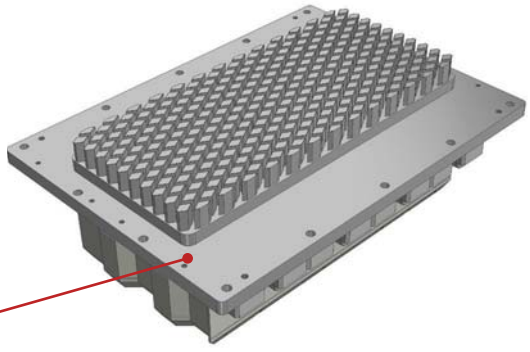
- Component Selection.

  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
- Compatible with industry standard "Delta" module

PRODUCT FAMILY

Model	Description	Rating @ 600VAC Rectified Mudpump Duty[3]	Rating @ 600VAC Rectified Drawworks Duty[3]	Rating @ 690VAC Rectified Marine Propulsion Duty[3]	Rating @ 690VAC AEM Wind Turbine Duty[3]
AEI900L	900A Liquid Cooled Inverter Module	900A	675A	900A	900A
AEI1000L	1000A Liquid Cooled Inverter Module	1000A	750A	1000A	1000A
AEI1400L	1400A Liquid Cooled Inverter Module	1400A	1050A	1400A	1250A

[3] 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.

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