

# AVID CONTROLS®

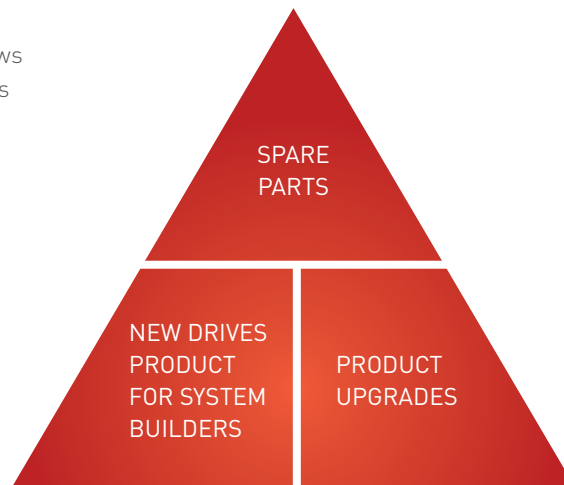
## MV3000 Drive Products and AVID Controls

Authorized Licensed Manufacturer of GE/Converteam MV3000 Product Line

The **MV3000** product range is a proven, reliable and flexible drive system which allows you to build modular construction converters from 200kW through to >6MW suitable for supply voltages from 380V to 690V AC.

### Applications include:

- > Oil Drilling Equipment including Mud Pumps, Draw works and Top Drives
- > Centrifuges
- > Coilers, roller tables & mills
- > Compressors
- > Conveyors
- > Wind & Solar Converters
- > Extruders
- > Fans & pumps
- > Lifts & hoists
- > Mixers and stirrers
- > Marine Propulsion/Thrusters
- > Test benches
- > ... and much more



### AVID & MV3000

The **MV3000** product range is now manufactured by **Avid Controls** under exclusive license from GE. This combines the tried and tested pedigree of an **established product** with the innovation and drive of Avid Controls. It also means that inventory is on the shelf, so you get it when you want it!



## DELTA—MODULAR CONCEPT

The **DELTA** format is an easy to use 'modular solution' which allows **MV3000** components to be connected together in standard cubicles. This gives many advantages including **reduced maintenance** costs by having common spares which are **easy to replace**. This DELTA format is available either as **air cooled or liquid cooled** modules for both inverters and rectifiers.

## AE3000—MORE OPTIONS

Extending the range of traditional 500, 800 and 1000A Delta Modules, Avid now offers the **AE3000** using the **Avid Extreme Inverter (AEI)** modules as part of the **MV3000** product family. The AEI has the highest current density of any power module in the world. In addition to providing more power AEI modules have:

- > Sintered solder-free IGBT chips for extended life operation
- > Rugged IGBT die for improved environmental robustness
- > Reduced internal voltage overshoot
- > A more robust, fully digital gate driver
- > Fully sealed IGBT modules that are protected from condensation
- > Continuous, accurate monitoring of IGBT silicon temperature
- > Fault, Current, Voltage and Temperature indication for every inverter module in the system
- > Know exactly which—if any—Inverter Module has a problem
- > See deviations from normal operation *before* system failure, critical part of your Wind Farm's predictive failure analysis



AEI & DELTA INVERTER POWER MODULES		
COOLING	PRODUCT	CURRENT
Air	MVD500	500A
	AEI550A	550A
Liquid	MVDL800	800A
	AEI 900L	900A
	MVDL1000	1000A
	AEI 1000L	1000A
	AEI 1250L	1250A
	AEI 1400L	1400A

## AVID RECTIFIER MODULES

Avid supplies the conventional MVR1600 Air cooled rectifier and the MVRL2100 Liquid cooled rectifier. This range is now enhanced with the availability of the **AER1800A** (air cooled) and the **AER3500L** (liquid cooled) products to complement the Avid Extreme Inverter modules.

## ACTIVE ENERGY MANAGEMENT

The **MV3000 AEM**—Active Energy Management range implements **low harmonic technology** in the form of two identical IGBT bridges, giving full four quadrant control. A controlled IGBT input bridge replaces the conventional diode bridge to give near sinusoidal supply current during both motoring and regeneration for almost zero harmonic distortion.

## AVID MV3000/AE3000 KEYPAD

Most users prefer to use a keypad on the plant floor rather than a PC. The Avid Keypad redefines the keypad concept with menu navigation, online help, quick start and instrumentation facilities all wrapped in an ergonomic design with a large, easy to read display.



## RELIABILITY BY DESIGN

Reliability has been specifically built into the **MV3000** from concept onwards. With detailed thermal and lifetime modeling, with 60% fewer components than previous generations of drive and with environmental and user error protection built in, the MV3000 is inherently highly reliable.

## PROVEN PEDIGREE

The MV3000 range has a **proven track record** and a massive installed base world-wide.

- > Over 10,000 Wind Turbine Converters representing 23 GW of installed capacity
- > Over 15,000 x 1000A Liquid Cooled Delta Power modules in non-wind applications including Solar and general Industrial
- > Over 500 MW of Marine and Offshore applications including thrusters and cargo pumps

## SHOCK LOAD WITHSTAND

The protection for the power devices in the MV3000 is incredibly fast. As a result, when an instantaneous overload occurs, such as a blockage in a pump, the output current is clipped at 180% of full load current. This allows the MV3000 to continue powering the motor without damage to itself and, if the blockage is temporary, the process can continue without interruption. In fact, the protection is sufficiently complete that it is possible to Direct On Line start a fully rated motor on the output of an MV3000.

## ACTIVE MANAGEMENT OF OVER TEMPERATURE

Monitoring of drive temperatures and simulation of motor heating allows the MV3000 to take intelligent action should either unit begin to overheat.

## SUPPLY LOSS RIDE THROUGH

Short breaks in the AC mains supply do not need to interrupt your process. The MV3000 can ride through such supply losses by generating energy from the load inertia to keep the control system healthy.



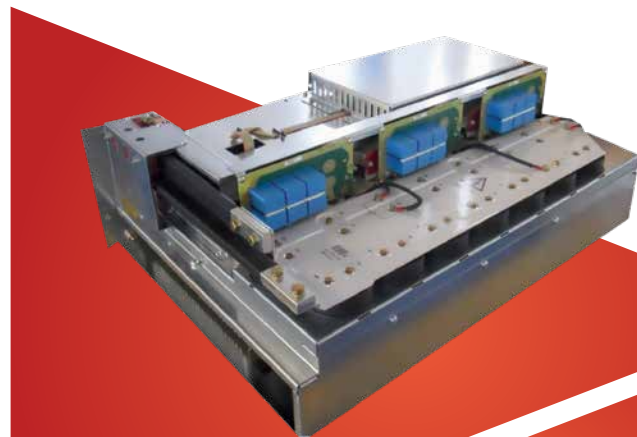
## DYNAMIC MODE CHANGE

The MV3000 can change its control mode on-line bumplessly. Many processes require the low speed dynamic performance of encoder-based vector control for process start but not once the process is running at normal speeds. If the encoder or encoder cabling fails while the process is running, the MV3000 can instantly transfer to encoderless vector control and so allow the process to continue to its normal completion.

## AIR OR LIQUID COOLING

The **MVD500** Delta module is the workhorse of the air-cooled range and is available with standard and high capacity fan cooling options. Up to six 500A modules can be connected in parallel and can be used in standard DFE mode using the 1600A rectifier or as an AEM configuration. Air cooling offers the advantage of simplicity and ease of maintenance.

For higher powers >800A, the liquid cooled Delta modules are used where a liquid coolant system transfers heat away from the power electronics to a position where it can be easily dissipated outside the actual installation area—providing an extremely compact and cost-effective solution that allows space saving of up to 60% when compared to similar air-cooled packages. Another advantage of liquid cooling is that almost silent operation of the drive can be achieved.



## SYSTEM UPGRADES & SPARE PARTS

In addition to providing new drive systems, Avid offers solutions for upgrades to your existing drive systems. Upgrading an existing system with new modules provides a more cost-effective solution than buying a brand new drive system as many original parts can be retained including the cabinet. The upgrade is also achieved in less time than installing new.

## UPGRADE EXAMPLES & OPPORTUNITIES

A 1.3MW Air Cooled drive on a large pump, installed in 1995, was upgraded by having its 5 x obsolete GDD377 Delta modules replaced with new MVD500 modules. The controller was upgraded from the original Omega controller to a new CDC. The original rectifier and magnetics were retained as was the cabinet and power cables.

A large mixing machine employing 4 x MVDL643 obsolete liquid cooled deltas was upgrading by replacing the Delta modules with new MVDL800 modules. The system retained its original control and cooling system and the upgrade was done over one weekend thus minimizing downtime.

A 1MW AEM drive was upgraded to drive a new 1.2MW motor by replacing the MVDL1000 modules with AEI1250L modules.

An early generation 2.3MW wind turbine converter installed in 2006 had all six delta units replaced with four brand new AEI1250L inverters from Avid thus improving reliability and extending the life of the turbine. AVID provided a kit with all of the parts needed for the upgrade. Remote diagnostics was also installed allowing all turbine converter data to be displayed on an iPhone.

## YOU AND AVID CONTROLS

Building on many years' experience in the harsh environment of the drives drilling sector, you can be sure that Avid Controls will supply **world class products** which will enhance the reliability and performance of your plant. Furthermore, you can rely on Avid to support your existing installed systems. The team at Avid plans to continuously innovate new products and enhance the existing product line for many years to come.



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