ALSPA MV3000
AC Variable Speed Drives

ALSTOM

Power Conversion


MV 3000
ALSPA
ALSTOM

ALSPA MV3000 - AC Variable Speed Drives up to 3600kW

Innovation gives effortless ownership

The innovative ALSPA MV3000 is ALSTOM's 5th generation of AC Variable Speed Drives. Designed throughout for effortless ownership the ALSPA MV3000 sets new standards for variable speed drives for size, ease of use and process availability. With power ratings up to 3,600kW, voltages up to 690V, VVVF encoderless vector and flux vector control modes and a wide range of application functions, ALSPA MV3000 is the one drive you need for all applications:

- Centrifuges
- Coilers, roller tables & mills
- Compressors
- Conveyors
- Crushers & Grinders
- Extruders
- Fans & pumps
- Lifts & hoists
- Mixers & stirrers
- Multi drive systems
- Presses
- Test benches

Specific customer research prior to the development of ALSPA MV3000 highlighted 3 key areas where customers are looking for major improvements on what is available today: the physical design of the equipment, the user interface, process availability.

The MicroCubicle™

Up to 315kW the ALSPA MV3000 is in chassis unit format using the **MicroCubicle™** concept.

MicroCubicle™ means:

- everything is front accessible
- room inside the unit for application specific enhancements
- bookcase format and side by side mounting for maximum packing density

Drive Data Manager™

The majority of users prefer to use a keypad on the plant floor rather than a PC. The **Drive Data Manager™** redefines the keypad concept with menu navigation, on-line help, quick start and instrumentation facilities all wrapped up in an ergonomic design with a large, easy to read display.

NoStop™

By monitoring key aspects of the process, the environment and itself, the MV3000 can do more than just look after itself. It can take intelligent actions in the event of adverse process conditions. This **NoStop™** philosophy means higher plant availability and warning of process problems before they occur.

A full range of products

From 315kW to 3,600kW ALSPA MV3000 is available in DELTA format. DELTA format drives can be supplied either as a kit of parts ready for building into a cubicle or as a completely built and tested package ready for site installation.

DELTA format drives are modular in construction. They use the same control system, **NoStop™** philosophy and **Drive Data Manager™** as the ALSPA MV3000 chassis units. These are combined with up to 6 DELTA inverter modules running in parallel. The 100% commonality across the power range, combined with the modular format means training, knowledge and understanding is applicable across the full power range.

DELTA format MV3000's are available air cooled from 300kW to 1,800kW or liquid cooled from 600kW to 3,600kW.

ALSPA MV3000 - Design Innovation

The ALSPA MV3000 MicroCubicle™

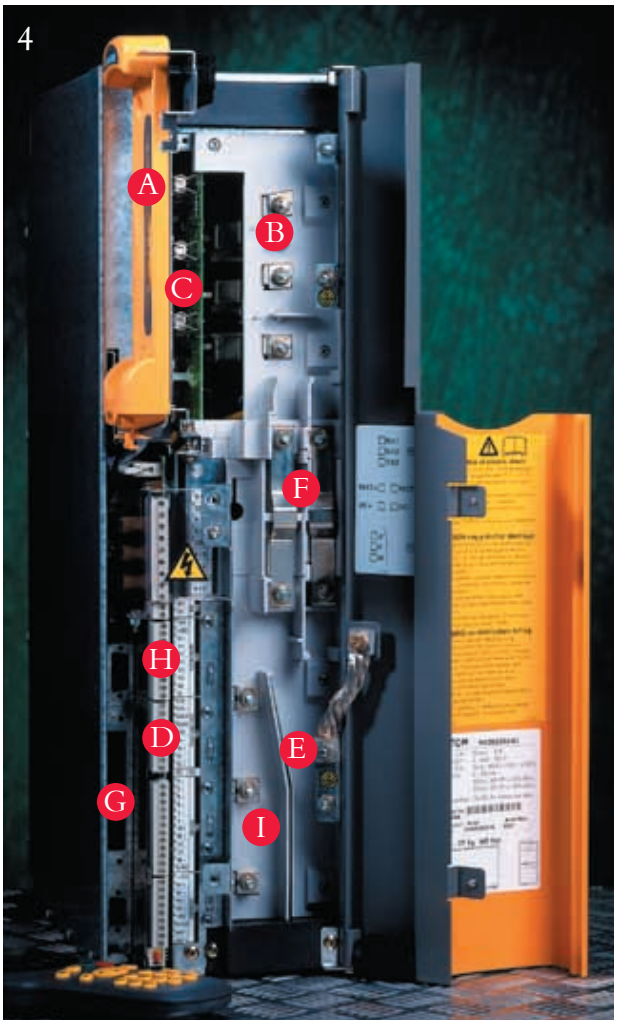
The **MicroCubicle™** concept has been created by ALSTOM to implement three objectives designed to bring major benefits to both the implementer and user of variable speed drive products:

- Easy access to all aspects of the product - gives rapid installation, commissioning, servicing and enhancement.
- Flexible topology - allows application specific enhancements to be added as needed to the base product
- Compact design with a high packing density - results in smaller cubicles and a smaller installed footprint

1 Bookcase format and side by side mounting, with zero gap, gives maximum use of cubicle space.

2 Opening the first door, no tools required, gives access to all the low voltage connections.

3 Opening the second door, screwdriver required, gives access to all high voltage connections.



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A Opening the third door completes access to all subsystems

All doors can be fully opened with drives side by side

All subsystems can be accessed from the front:

B - Rectifier Module

C - Power supply

D - Control Cassette

E - Inverter Module

F - Optional internal Dynamic Brake Unit

G - Optional fieldbus modules

H Control cables have removable connectors and EMC screen clamping

I Power Cables have guide channels for segregation and optimum EMC performance

The ALSPA Drive Data Manager™ - the keypad redefined

The ALSPA **Drive Data Manager™** takes the traditional keypad virtues of:

- small size
- simplicity
- robustness
- affordability

and adds many of the features expected of a PC based package:

- menu navigation
- on-line help and diagnostics
- quick set-up procedure
- parameter set up-load/down-load
- file storage

together with instrumentation features which enable monitoring of the drive e.g.

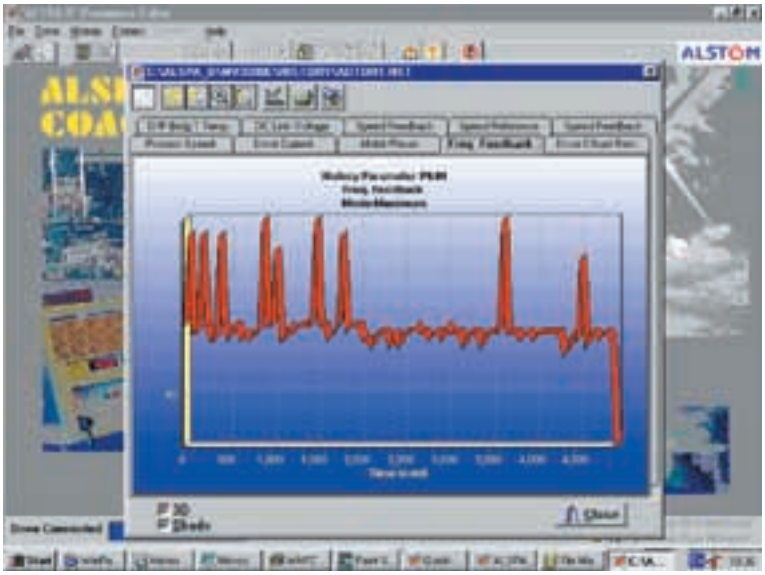
- output volts
- output current
- output kW
- interlock status
- DC link volts

to give effortless interfacing to the drive.

The ALSPA Drive Coach™ - getting the most out of your drive

Users of multiple ALSPA MV3000s will find the ALSPA **Drive Coach™** an invaluable assistant in getting the best out of their ALSPA drives. Features include:

- On-line/Off-line parameter editing
- Configuration upload/download and save to disc
- Hyperlink help facility
- Drive history record viewer



ALSPA MV3000 - Maximising Process Availability

NoStop™ - welcome to the world of trip avoidance

Many things can affect the smooth running of a process and produce adverse process conditions. In the past, the self protection philosophy of variable speed drives resulted in the drive "tripping" or shutting down to protect itself. The level of intelligence and protection in the ALSPA MV3000 means that these "self protecting trips" are no longer necessary. The ALSPA MV3000 can take intelligent action in the event of adverse process conditions, resulting in higher plant availability and warning of process problems before they occur.

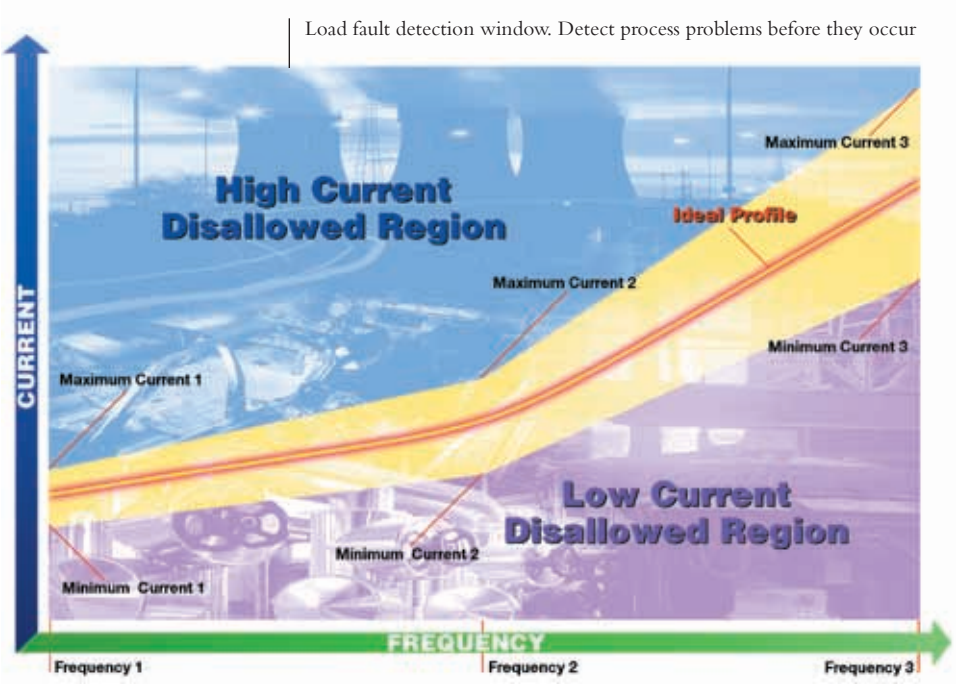
Reliability by design

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

Shock load withstand

The protection for the power devices in the ALSPA 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 ALSPA 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 ALSPA MV3000.

Load fault detection window. Detect process problems before they occur



Active management of over temperature

Monitoring of drive temperature and simulation of motor heating allows the ALSPA MV3000 to take intelligent action should either unit begin to overheat. The action taken depends on the application but can include modifying the PWM waveform to generate less heat or reducing the motor speed where process conditions allow this. User warnings highlight the problem so that permanent solutions can be implemented.

Supply loss ridethrough

Short breaks in the AC mains supply do not need to interrupt your process. The ALSPA MV3000 can ride through such supply losses by regenerating energy from the load inertia to keep the control system healthy. When the AC mains supply is restored the ALSPA MV3000 will immediately accelerate its motor back up to the desired speed.

Dynamic mode change

The ALSPA 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 ALSPA MV3000 can bumplessly transfer to encoderless vector control and so allow the process to continue to its normal completion. If the encoder or cabling problem can be corrected, the MV3000 will transfer back to encoder based vector control without affecting the process. In other applications this facility can be used to purge product from machinery before the problem is corrected, minimising process down time.

ALSPA MV3000 - up to 3.6MW

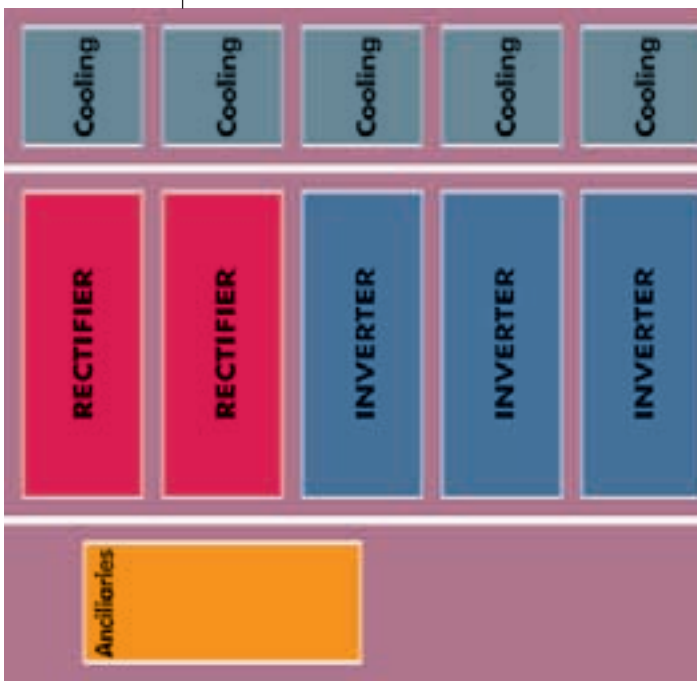
Above 315kW, ALSPA MV3000 comes in the DELTA format. This modular construction uses the same control card and software as the chassis units, combined with the DELTA power modules. Up to 6 DELTA power modules can be added in parallel to give power ratings up to 1.8MW for air cooled designs and up to 3.6MW for liquid cooled designs.

This modular format for higher powered drives brings significant benefits to both the implementer and user of ALSPA MV3000:

- Knowledge/training requirements are the same across a wide power range
- Basic cubicle designs are the same across the power range
- Fully proven kits can be assembled locally
- Module standardisation means spares compatibility across the power range

DELTA modules are designed for ease of assembly into cubicles. Mounted on cross rails, they are easy to slide in and out of the cubicle for servicing. The standard DELTA kit includes everything you need including mounting metalwork and air ducts for standard Rittal cubicles.

... or multiple inverter configuration



Also available are:

- Typical schematics
- Full technical specifications
- Mechanical assembly instructions
- Electrical wiring instructions
- Suggestions for cubicle planning
- Fully dimensioned mechanical drawings

ALSPA MV3000 DELTA based drives can be supplied as a fully tested kit or cubiclised ready for installation on site and commissioning.

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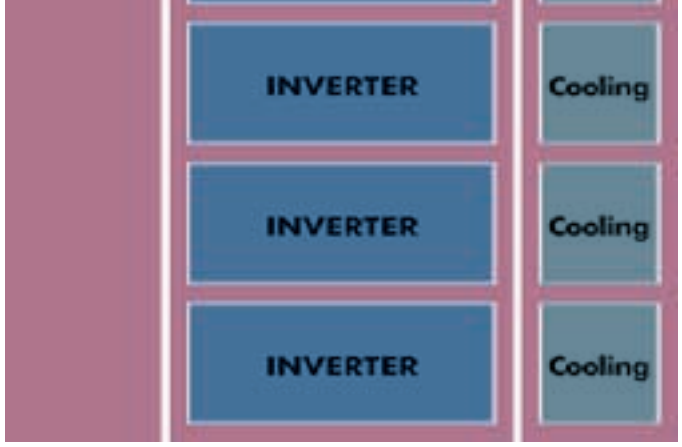
INVERTER
Cooling
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Single inverter configuration...

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