CONTROL TECHNIQUES
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# Mentor II

Digital DC Variable Speed Drive
25 A - 1850 A in Both Single and 4 Quadrant

**The Mentor II provides a wide power range of fully programmable DC drives with a unified control interface.**

**Simple stand-alone applications are quickly configured with a minimum of parameters. Add the application module (MD29) to implement high performance drive systems with local intelligence. This intelligence can then be utilised to eliminate the master PLC by constructing a distributed control system, using the CTNet fieldbus with the System Programming Tool (SYPT): this implements a Soft Logic Controller to IEC61131-3 When integration with a master PLC system is required, a range of fieldbus adapters is available.**

## Key Features

- Wide range of network communication options
- User configurable analogue and digital drive inputs
- Easy to use PC configuration, Software: Mentorsoft
- Regeneration up to 1.15 x $V_{RMS}$
- Available in single and four quadrant
- Armature voltage, tacho or encoder feedback with loss detection
- Phase sequence tolerant with loss detection
- 0.025% resolution for analogue speed demand
- 0.1% speed holding for 100% load change with tacho feedback
- On-board field control with loss detection
- 150% overload capacity for 30 seconds with motor overload protection
- Taper current limit
- Voltages/frequency of supply

## Key Benefits

### Simple Operation

Easy set up of the drive can be done using the main control panel or via a standard communications interface from a host computer.

Fast configuration of standard applications can be achieved using 10 parameters or less.

### Faster Drive Set-Up

Programming the Mentor II has never been easier. Designed to save commissioning time, the drive has easily assimilated function menus browsed and edited via five navigator keys.

### Better Control

A comprehensive self-tuning algorithm gives improved current loop performance for a more uniform response at all speeds. Drive performance is also enhanced with full PID digital speed control.

### More Functions

The main circuit board has been developed to incorporate many additional features as standard.

### Massive Systems Potential

All analogue inputs and most of the digital control inputs are user-configurable, making Mentor II a true systems drive having more versatility and flexibility than ever before.

### Wide Ranging, More Flexible Communications

Mentor II is able to communicate directly with PLCs and host computers or via optional interface cards. This is achieved with the standard RS485 port (see ratings overleaf).

### Digital Speed And Position Loop

This allows several drives to be run in speed or position synchronisation.

### Centrewinder

The drive torque is continuously adjusted to compensate for changing coil diameter, machine losses and coil inertia.

### Shaft Orientation

This allows the user to specify the final position of the motor shaft relative to an electronic feedback datum, for example a marker pulse from an encoder. The position is adjusted by simply changing the value of the appropriate parameter.

### 'S' Ramp

This facility provides a curved function at each end of a user defined acceleration/ deceleration ramp.

ISO 9002 APPROVAL

5 YEAR Digital Drive Warranty

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# Mentor rating table

| Drive type & Model | | Typical (1) Motor Rating @ 400 DC | | Max. Continuous Current Rating (Amps) | | Recommended Fuse Ratings | | | Typical Cable Size AC Input & DC Output | | Cooling Method | Max Field Current Rating (A) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Single Quadrant | Four Quadrant | KW | HP | AC Input | DC Output | HRC AC In (A) | Semiconductor (2) AC In (A) | Semiconductor (2) DC Out (A) | mm²(3) | AWG (4) | | |
| **M25** | **M25R** | 7.5 | 10 | 21 | 25 | 32 | 35 | 40 (5) | 4mm² | 10 | Convection | 8 (7) |
| **M45** | **M45R** | 15 | 20 | 38 | 45 | 50 | 60 | 70 (5) | 6mm² | 6 | Convection | 8 (7) |
| **M75** | **M75R** | 30 | 40 | 60 | 75 | 100 | 100 | 125 (5) | 25mm² | 2 | Convection | 8 (7) |
| **M105** | **M105R** | 37.5 | 50 | 88 | 105 | 100 | 125 | 175 (5) | 35mm² | 1/0 | Fan Cooled | 8 (7) |
| **M155** | **M155R** | 56 | 75 | 130 | 155 | 160 | 175 | 250 (5) | 50mm² | 3/0 | Fan Cooled | 8 (7) |
| **M210** | **M210R** | 75 | 100 | 175 | 210 | 200 | 250 | 300 (5) | 95mm² | 300MCM | Fan Cooled | 8 (7) |
| **M350** | **M350R** | 125 | 68 | 292 | 350 | 355 | 400 | 550 (5) | 150 mm² | (6) | Fan Cooled | 10 (8) |
| **M420** | **M420R** | 150 | 200 | 350 | 420 | 450 | 500 | 700 (5) | 185mm² | (6) | Fan Cooled | 10 (8) |
| **M550** | **M550R** | 200 | 268 | 460 | 550 | 560 | 700 | 900 (5) | 300mm² | (6) | Fan Cooled | 10 (8) |
| **M700** | **M700R** | 250 | 335 | 585 | 700 | 630 | 900 | 1000 (5) | 2x185mm² | (6) | Fan Cooled | 10 (8) |
| **M825** | **M825R** | 300 | 402 | 690 | 825 | 800 | 1000 | 1200 (5) | 2x240mm | (6) | Fan Cooled | 10 (8) |
| **M900** | **M900R** | 340 | 456 | 750 | 900 | 1000 | 1200 | 2x700 (5) | 2x240mm² | (6) | Fan Cooled | 20 (8) |
| **M1200** | **M1200R** | 450 | 603 | 1000 | 1200 | 1250 | 2x700 | 2x900 (5) | 3x400mm² | (6) | Fan Cooled | 20 (8) |
| **M1850** | **M1850R** | 750 | 1105 | 1540 | 1850 | 2000 | 2x1200 | 2x1000 (5) | 3x400mm² | (6) | Fan Cooled | 20 (8) |

(1) This rating may be increased at higher armature voltage.
(2) DC fuses must be fast semiconductor type, with a rated voltage of 500V DC for 400V supply and 700V DC for 480V supply.
(3) The cable sizes are for 3-core (3-wire) and 4-core (4-wire) pvc-insulated armoured (conduited) cable with copper conductors, and laid in accordance with defined conditions.
(4) Typical wire gauge sizes based on 300C (860F) ambient, 1.25 x rated current, 750C (1670F) copper wire with no more than 3 conductors in a conduit or raceway. Branch circuit protection must be provided by the user. All wiring must conform to NEC Art. 310 and applicable electrical codes.
(5) Not required for Single Quadrant. May not be required in applications where load inertia is low and regeneration infrequent.
(6) Refer to NEC Table 310-16 for wire sizes.
(7) M25 to M210 fitted with MDA3 field controller as standard.
(8) Fixed voltage. Optional field controller FXM5 available.



## Motors

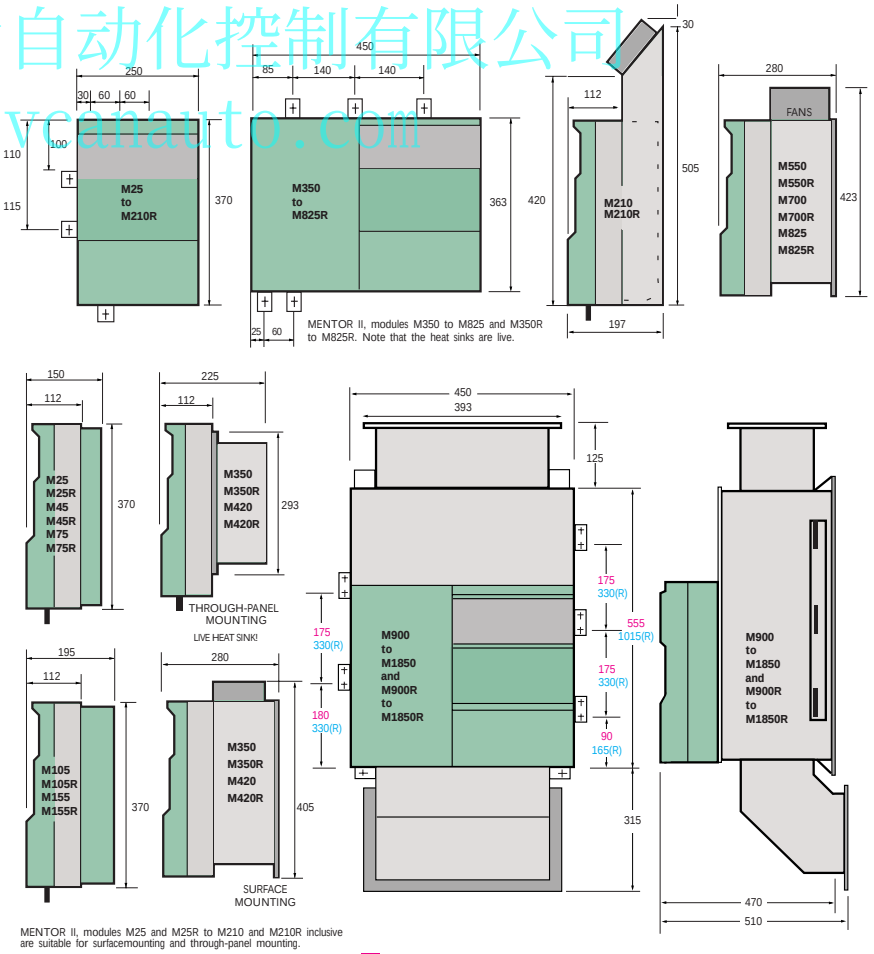
See Page 96

## Options/software

| | |
|---|---|
| Modbus (MD29/MD29AN) | Page 76/53 |
| Applications Card (MD29) | See Page 76 |
| CT Net Interface (MD29AN) | See Page 53 |
| Profibus-DP Interface (MD24) | See Page 50 |
| DeviceNet Interface (MD25) | See Page 51 |
| Interbus-S Interface (MDIBS) | See Page 52 |
| Expansion I/O Module (I/O box) | See Page 68 |
| Field Controller For DC Motors (FXM5) | See Page 77 |
| MentorSoft | See Page 79 |

## Further Information

| Item | Part.No |
|---|---|
| Quick Reference Guide | 0410-0008 |
| Mentor User Guide | 0410-0009 |
| Mentor Brochure | 0175-0106 |
| Mentor Product Data | 0175-2060 |




Single Quadrant dimensions

Four Quadrant (R) dimensions

**All dimensions in mm**