

# MDI SYSTEMS

Motor Drives International Variable Frequency Drive Systems

## MDI Systems' M Series Variable Frequency Drive

- 120, 208, 240, 480, and 590 Voltage
- NEMA 1, 12, 4, and 4X Enclosures
- 1/4 to 50 Horsepower

*High-performance at an affordable price through maximum reliability, flexibility, and user-friendliness.*



**MAXIMUM RELIABILITY** through advanced and proven technology. The M Series utilizes an Intel 196 processor, which was specifically developed for motor control applications. It provides higher reliability through wave-shape generation, I/O handling, and high speed.

The heart of the M Series is based on *Intelligent Power Modules (IPMs)*. These state-of-the-art power modules were introduced by Mitsubishi Electric for high-performance drive applications. IPMs incorporate protective circuits and current sensing directly in the power semiconductor. This results in faster trip response, which allows faults to be cleared before damage can occur.

All of this high-powered circuitry is housed in a *rugged steel enclosure*, which provides maximum protection from the environment. Enclosures are offered in NEMA 1, 4/12, and 4X designs.

**MAXIMUM FLEXIBILITY** through hundreds of programming and operation mode combinations. The keypad allows direct input of values for any of the fifty-plus programmable parameters. All inputs and outputs for speed, control, status, display, etc. are programmable to allow optimization of each application.

**MAXIMUM USER-FRIENDLINESS** through simple programming and operation. Menu-driven, plain-English programming means easy understanding. By not having to learn complex systems using symbols and codes, even first-time users can quickly become comfortable with basic VFD operation.

### STANDARD FEATURES

- Plain-English read out and programming w/8-button keypad
- Full 16-character backlit LCD display w/adjustable contrast
- Display of speed, load, voltage, and run time
- Fault history of last 8 faults
- Two selectable critical frequency avoidance ranges
- Synchronized speed automatic restart
- Rugged NEMA 1 steel enclosure with conduit holes
- Built-in electronic thermal overload
- Speed control reference from 4-20 mA or 0-10 VDC signal
- Speed or load outputs 4-20 mA or 0-10 VDC
- 150% overload for one minute, 180% for 30 seconds
- Automatic/Manual operation mode selection from keypad
- Speed compensated thermal overload trip curve
- Fixed voltage torque boost adjustment

### ADDITIONAL STANDARD FEATURES IN M1000 SERIES

- RS485 Modbus<sup>®</sup> Serial Communications
- Forward/Reverse operation mode from keypad
- Acceleration torque boost setting
- MOP (Motor Operated Pot) speed input function
- JOG input speed selection
- Brake-before-start mode selection

### ADDITIONAL STANDARD FEATURES IN M3000 SERIES

- Johnson Controls Metasys<sup>®</sup> Serial Communications
- Local/Remote operation mode from keypad
- PID setpoint operation mode
- Loss of speed signal sensing
- Flying auto-restart dwell time selection
- Enhanced engineering units speed display selection

Also see [www.vfds.com](http://www.vfds.com)

## M SERIES RATINGS\*

HP	INPUT VOLTAGE	OUTPUT AMPS	MODEL NUMBER
0.25 <sup>3</sup>	240/120	1.4	M(#)103S(+)
0.5 <sup>3</sup>	240/120	2.2	M(#)105S(+)
1 <sup>3</sup>	240/120	4.0	M(#)110S(+)
1.5 <sup>3</sup>	240/120	5.2	M(#)115S(+)
0.5 <sup>3</sup>	240/200	2.2/2.5	M(#)205(+)
1 <sup>3</sup>	240/200	4.0/4.6	M(#)210(+)
1.5 <sup>3</sup>	240/200	5.2/6.0	M(#)215(+)
2 <sup>3</sup>	240/200	6.8/7.8	M(#)220(+)
3 <sup>3</sup>	240/200	9.6/11.0	M(#)230(+)
5	240/200	15.2/17.5	M(#)250(+)
7.5	240/200	22.0/25.0	M(#)275(+)
10	240/200	28.0/32.0	M(#)2100(+)
15	240/200	42.0/48.0	M(#)2150(+)
20 <sup>1</sup>	240/200	54.0/62.0	M(#)2200(+)
25 <sup>2</sup>	240/200	68.0/78.0	M(#)2250(+)
1	480/400	2.0/2.3	M(#)410(+)
2	480/400	3.4/3.9	M(#)420(+)
3	480/400	4.8/5.5	M(#)430(+)
5	480/400	7.6/8.7	M(#)450(+)
7.5	480/400	11.0/12.6	M(#)475(+)
10	480/400	14.0/16.0	M(#)4100(+)
15	480/400	21.0/24.0	M(#)4150(+)
20	480/400	27.0/31.0	M(#)4200(+)
25 <sup>1</sup>	480/400	34.0/39.0	M(#)4250(+)
30 <sup>1</sup>	480/400	40.0/46.0	M(#)4300(+)
40 <sup>2</sup>	480/400	52.0/60.0	M(#)4400(+)
50 <sup>2</sup>	480/400	65.0/75.0	M(#)4500(+)
1	590	1.6	M(#)510(+)
2	590	2.7	M(#)520(+)
3	590	3.9	M(#)530(+)
5	590	6.1	M(#)550(+)
7.5	590	9.0	M(#)575(+)
10	590	11.0	M(#)5100(+)
15	590	17.0	M(#)5150(+)
20	590	22.0	M(#)5200(+)
25 <sup>1</sup>	590	27.0	M(#)5250(+)
30 <sup>1</sup>	590	32.0	M(#)5300(+)
40 <sup>2</sup>	590	41.0	M(#)5400(+)
50 <sup>2</sup>	590	52.0	M(#)5500(+)

### \*NOTES:

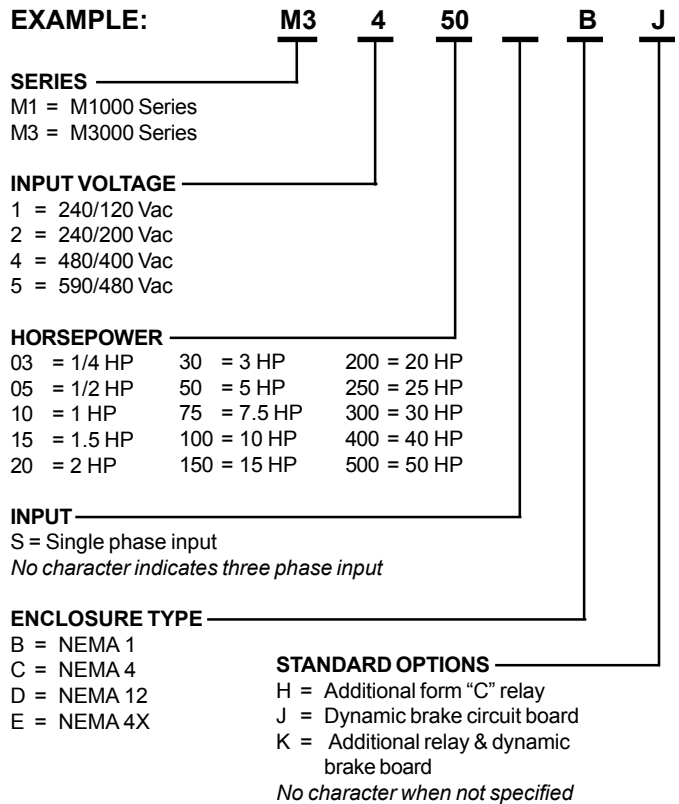
- (#) 1 = M1000 model; 3 = M3000 model  
 (+) B = NEMA 1 enclosure  
 C = NEMA 4 enclosure (see notes 1 & 2 for enclosure type availability)  
 D = NEMA 12 enclosure (see notes 1 & 2 for enclosure type availability)  
 E = NEMA 4X enclosure (see notes 1 & 2 for enclosure type availability)
- <sup>1</sup> Available in NEMA 1 & 12 enclosure types  
<sup>2</sup> Available in NEMA 1 enclosure type  
<sup>3</sup> Available in single-phase input (240V 3-phase output)

## SPECIFICATIONS

<b>Input Voltages (50/60 Hz)</b>	120V, 200-240V, 400-480V, 590V
<b>Input Voltage Tolerance</b>	+ 10%, -15%
<b>Input Frequency (50/60 Hz)</b>	+/- 5%
<b>Ambient Temperature</b>	-10° to 40° C
<b>Ambient Humidity</b>	Up to 95% (non-condensing)
<b>Overload Rating</b>	150% for one minute 180% for 30 seconds
<b>Altitude</b>	6000 ft. above sea level without derate
<b>Storage Temperature</b>	-20° to 70° C
<b>Fundamental Power Factor</b>	Near unity at all speeds
<b>Typical Efficiency</b>	Up to 97%

## PART NUMBER DESCRIPTION

### EXAMPLE:



**Salt Lake City Office**  
 501 West 700 South  
 Salt Lake City, UT 84101  
 PH: 801.366.4100  
 PH: 800.433.4548  
 FX: 801.487.7437

**Denver Office**  
 4905 B Ironton St.  
 Denver, CO 80239  
 PH: 303.574.9448  
 PH: 800.511.7734  
 FX: 303.574.9389

**Boise Office**  
 Boise, ID  
 PH: 208.573.1038  
 PH: 800.433.4548

**Portland Office**  
 Portland, OR  
 PH: 800.433.4548