

SENSORLESS VECTOR ADJUSTABLE FREQUENCY AC DRIVES

TRODEKS®

MVX9000 Series



- Sensorless Vector Control with Auto Tuning
- Easy to Understand Keypad
- PID Control of a Process Variable Such as Pressure, Flow, Temperature, Liquid Level, etc.
- Built-In Dynamic Braking Chopper
- RS485 Serial Communication Port
- Single-Phase or 3-Phase Input Capability on 240 Vac Rated Units, 3 hp and Below

The Cutler-Hammer® MVX9000 Series sensorless vector adjustable frequency AC Drives from Eaton's electrical business are designed to provide adjustable speed control of 3-phase motors. These microprocessor-based, sensorless vector drives have standard features that can be programmed to tailor the drive's performance to suit a wide variety of application requirements. The MVX9000 sensorless vector series utilizes a 32-bit microprocessor and insulated gate bipolar transistor (IGBTs) which provides quiet motor operation, high motor efficiency and smooth low speed performance. The size and simplicity of the MVX9000 Series makes it ideal for hassle free installation where size is a primary concern. Models rated at 480V, 3-phase, 50/60 Hz are available in sizes ranging from 1 to 10 hp. Models rated at 240V, single- or 3-phase, 50/60 Hz are available in sizes ranging from 0.5 to 7½ hp. Models rated at 115V, single-phase, 50/60 Hz are available in the ¼ to 1 hp size range. The standard drive includes a digital display, operating and programming keys on a removable keypad. The display provides drive monitoring as well as adjustment and



| DESCRIPTION HORSEPOWER | VOLTS | DIMENSIONS IN mm (inch) | | | SHIPPING WEIGHT KG (LBS) |
|---------------------------|-----------|-------------------------|-----------|-----------|-----------------------------|
| | | WIDTH | HEIGHT | DEPTH | |
| ¼ to 1 | 100 - 120 | 100 (3.9) | 151 (5.9) | 145 (5.7) | 2.8 (6.2) |
| ½ to 2 | 200 - 240 | 100 (3.9) | 151 (5.9) | 145 (5.7) | 2.8 (6.2) |
| 3 to 7½ | 200 - 240 | 125 (4.9) | 220 (8.6) | 193 (7.6) | 5.5 (12.1) |
| 1 to 3 | 380 - 480 | 100 (3.9) | 151 (5.9) | 145 (5.7) | 2.8 (6.2) |
| 5 to 10 | 380 - 480 | 125 (4.9) | 220 (8.6) | 193 (7.6) | 5.5 (12.1) |

diagnostic information. The keys are utilized for digital adjustment and programming of the drive and for operator control. Separate terminal blocks for control and power wiring are provided for customer connections. Other features provided as standard include built-in DC braking, RS485 serial communications and PID control.

SPECIFICATIONS

OUTPUT RATINGS

Horsepower: 90 to 132V, ¼ to 1 hp

200 to 240V: ½ to 7½ hp

380 to 480V: 1 to 10 hp

425 to 660V: 1 to 10 hp

Frequency Range: 0.1 to 400 Hz

Overload Rating: 150% for 60 sec

Frequency Resolution:

Digital: 0.1 Hz

Analog: Max (set frequency/1000) Hz

Frequency Accuracy:

Digital: ±0.01% of max frequency

Analog: ±0.2% of max frequency

Undervoltage Carryover Limit:

0.3 to 25 sec

MOTOR PERFORMANCE

Motor Control: Sensorless vector

Constant and Variable Torque:

Standard

Speed Regulation: 0.5% of base speed

INPUT POWER

Voltage: 50/60 Hz ±3 Hz

100 to 120V: -10% +10%/1-phase

200 to 240V: -10% +5%/1-phase

200 to 240V: -10% +5%/3-phase

380 to 480V: -10% +10%/3-phase

500 to 600V: -15% +10%/3-phase

Displacement Power Factor:

Better than 0.95

Efficiency: Typically greater than 95%

DESIGN TYPE

Microprocessor: 32-Bit

Converter Type: Diode

Inverter Type: Insulated gate bipolar transistor

Waveform: Sensorless vector

ENVIRONMENT

Operating Temperature: -10 to 50°C (14 to 122°F), -10 to 40°C (14 to 104°F); above 7½ hp)

Humidity: 20 to 90%, non-condensing

Maximum Elevation: 1000 m (3281')

Codes and Standards: NEMA, IEEE, NEC, design standards, UL Listed, cUL listed, CE marked (requires EMI filter)

Enclosure: Standard, protected chassis (IP20)

PROTECTIVE FEATURES

Ground Fault: Standard

Overload Protection: Standard

Overcurrent: Standard

Overvoltage: Standard

Undervoltage: Standard

Overtemperature: Standard

Overload Limit: Standard

SET UP ADJUSTMENTS, PERFORMANCE FEATURES, OPERATOR CONTROL AND EXTERNAL INTERFACE KEYPAD

Alphanumeric Display: Standard, 1 x 4 character

Digital Indications: Frequency (Hz), Motor Current (amps), User-Defined RUN/STOP, FORWARD/REVERSE and parameters

Diagnostics: Last 3 trips with cause

LED Status Indicators: 8; RUN/STOP, FORWARD/REVERSE, Hz, amps, user defined, and input speed

Operator Functions: START/STOP, speed control (digital or potentiometer), RESET, SETUP keys and ENTER

I/O TERMINAL BLOCK

Analog Inputs: 2 Inputs; 0 to 10 Vdc, 4 to 20 mA

Potentiometer: 1 to 2 KΩ

Analog Voltage: Nominal 10 Vdc, 10K Ω input impedance

Analog Current: Nominal 4 to 20 mA, 250 Ω

Digital Inputs: 6 programmable inputs

Digital Outputs: 1 programmable open collector and 1 form C relay contact

Analog Monitor Output: Analog meter; frequency or output current dynamic brake chopper

PROGRAMMABLE PARAMETERS

Out of the Box: Factory settings loaded for quick start-up

Accel. and Decel.: 2 separately adjustable linear or S curve times; 0.1 to 3000 sec

Auto Restart: Overcurrent, overvoltage and undervoltage with 4 selectable retry restart modes

DC Injection Braking:

External Fault: Terminal input

Jog: Terminal input

Fault Reset: STOP/RESET or terminal input

I/O: NO/NC Selectable

Jump Frequencies: 3; with adjustable width

Parameter Security: Programmable software lock

Preset Speeds: 7 preset speeds

PID Controller: PID process control

Reversing: Keypad or terminal

Speed Setting: Keypad, terminal or pot

START/STOP Control: Keypad or terminal

Stop Modes: Decel, coast or DC injection

RELIABILITY

Pretested Components: Standard

Surface Mount Technology:

Standard (PCBs) Computerized

Testing: Standard

Final Test with Full Load: Standard

Eaton's Cutler-Hammer Engineering Systems and Service: National network of AF drive specialists

To Order

| MODEL NO. | DESCRIPTION | INPUT AMP. SINGLE/ 3 PH RATING | CONT. OUTPUT AMP RATING | WATT LOSS AT 9 KHZ |
|-----------------|---|--------------------------------|-------------------------|--------------------|
| 115 VOLT | | | | |
| MVXF25A0-1 | 0.25 hp AC drive, 1 ph input, 230V, 3 ph output | 6.3/* | 1.6 | 20.0 |
| MVXF50A0-1 | 0.5 hp AC drive, 1 ph input, 230V, 3 ph output | 9.0/* | 2.5 | 20.0 |
| 230 VOLT | | | | |
| MXVF50A0-2 | 0.5 hp AC drive, 1 ph/3 ph input, 3 ph output | 6.3/2.9 | 2.5 | 20.0 |
| MVX001A0-2 | 1 hp AC drive, 1 ph/3 ph input, 3 ph output | 11.5/6.3 | 5.0 | 38.0 |
| MVX002A0-2 | 2 hp AC drive, 1 ph/3 ph input, 3 ph output | 15.7/8.8 | 7.0 | 75.0 |
| MVX003A0-2 | 3 hp AC drive, 1 ph/3 ph input, 3 ph output | 27.5/12.5 | 10 | 110 |
| MVX005A0-2 | 5 hp AC drive, 3 ph input, 3 ph output | */19.6 | 17.0 | 185.0 |
| MVX007A0-2 | 7.5 hp AC drive, 3 ph input, 3 ph output | */31.5 | 25.0 | 275.0 |
| 460 VOLT | | | | |
| MVX001A0-4 | 1 hp AC drive, 3 ph input 460V, 3 ph output | */4.2 | 3.0 | 38.0 |
| MVX002A0-4 | 2 hp AC drive, 3 ph input 460V, 3 ph output | */5.7 | 4.0 | 75.0 |
| MVX003A0-4 | 3 hp AC drive, 3 ph input 460V, 3 ph output | */7.0 | 5.0 | 110.0 |
| MVX005A0-4 | 5 hp AC drive, 3 ph input 460V, 3 ph output | */10.5 | 8.2 | 185.0 |
| MVX007A0-4 | 7.5 hp AC drive, 3 ph input 460V, 3 ph output | */14.0 | 13.0 | 275.0 |
| MVX010A0-4 | 10 hp AC drive, 3 ph input 460V, 3 ph output | */20.6 | 18.0 | 375.0 |

Comes complete with operator's manual.

* Not applicable.

Horsepower ratings are based on the use of a 240 or 480V NEMA B, 4- or 6-pole squirrel cage induction motor and are for reference only. Units are to be selected such that the motor current is less than or equal to the MVX9000 rated continuous output current.

For 208V, 380V or 415V applications, select the unit such that the motor current is less than or equal to the MVX9000 rated continuous output current.

Ordering Examples: MVXF25A0-1, 0.25 hp AC drive, 115V 1 ph input, 230V 3 ph output.

MVX003A0-2, 3 hp AC drive, 230V 1 ph/3 ph input, 230V 3 ph output.