MICROMASTER 440® AC Inverter

The Simple Standard for High Performance

The **MICROMASTER 440** inverter is a vector drive designed for a variety of demanding variable-speed drive applications. It is especially suitable in applications where dynamic response, torque control, and tight speed regulation are required. The MM440 is characterized by its sensorless and optional closed loop vector control capability. The product combines application oriented programming flexibility and ease of use. The MM440 can interface with a variety of input voltage ranges from 200V to 600V in power ranges from 1/6HP to 250HP.

Main Characteristics

- Ready to install and operate[1] right out of the box.
- Simple commissioning macro to easily make changes in factory programming.
- Modular construction allows maximum configuration flexibility.
- Side by side mounting.
- Six fully programmable, isolated digital inputs.
- Two scalable analog inputs can also be used as seventh and eight digital inputs.
- Two fully programmable analog outputs.
- Three fully programmable relay outputs.
- Silent motor operation is possible when using high switching frequencies.
- Complete inverter and motor protection.

Performance Features

- Latest IGBT technology.
- Digital microprocessor control.
- High performance, sensorless vector control system and optional closed loop vector control.
- Auto-tuning for open or closed loop vector.
- Torque control.
- Flux Current Control (FCC).
- Programmable multi-point *V/Hz* curve, linear *V/Hz* control, quadratic *V/Hz* control.
- Binary Connector (BiCo) technology.
- Multiple Drive Data Sets (DDS) and Control Data Sets (CDS).
- High grade PID controller (with auto-tuning) for process control.
- Fast, repeatable digital input response time.
- NPN/PNP Source-Sink control adaptability.
- Programmable acceleration/deceleration, 0s to 650s.
- Multi-curve, adjustable ramp smoothing.
- Flying restart.
- Automatic restart following power failure or fault.
- Fast Current Limit (FCL) for trip-free operation.
- Fine speed adjustment using a high-resolution 10-bit analog input.
- Fully-rated integral Brake Chopper for dynamic braking throughout power range.
- Injection or compound braking for rapid controlled braking.
- Four skip frequencies.
- RS-485 Serial Port with optional RS-232.

Siemens — Your Best Choice

The **MICROMASTER MM440** product line is integrated into the Siemens family of drives, motors, and programmable controller automation products. All products are backed by Siemens worldwide service and support capability. Contact your local Siemens sales office or distributor to get the complete story of the MICROMASTER MM4 drives.

[1] Factory pre-programmed for 4 pole NEMA or IEC motors; digital input control for switching the inverter "on", "reversing", and "fault reset"; and analog setpoint speed control.

over

SIEMENS

Variant Independent Options

Basic Operator Panel (BOP)

With the BOP, individual parameter settings can be made. Values and units are shown on a 5-digit display. One Basic Operator Panel (BOP) can be used for several inverters and can be directly mounted on the inverter or in an enclosure door using an optional mounting kit.

Advanced Operator Panel (AOP)

The AOP allows parameters to be set with the added benefit of a multi-lingual clear text display. In addition, up to 3 different parameter sets can be uploaded and stored in the AOP for download into additional units or off-line manipulation with the AOP desktop programming kit. The AOP can also act as a bus master for up to 31 inverters via USS protocol. It can be directly plugged into the inverter or built into the control cabinet door using an optional mounting kit.

PROFIBUS® Communication Module

With the optional PROFIBUS communication module, PROFIBUS-DP operation is possible up to 12MB. In addition, an AOP or BOP can be attached to the front of the PROFIBUS module, giving a form-fitting, operational display. The PROFIBUS module can also be powered from an external 24V supply to insure the node remains active when power is removed from the inverter.

DRIVEMONITOR Commissioning Tool

DriveMonitor is a Windows™- based, commissioning software package for MICROMASTER inverters. Parameter lists can be read, altered, stored, entered, and printed.

Technical Specifications – MM440 AC Inverter

Input voltage and power ranges 200 V to 240 V 1 AC ± 10% 200 V to 240 V 3 AC ± 10% 380 V to 480 V 3 AC ± 10% 500 V to 600 V 3 AC ± 10%	Constant Torque Ratings[1] 1/6HP to 4HP 1/6HP to 60HP 1/2HP to 250HP 1HP to 100HP			
Input frequency	47 Hz to 63 Hz			
Output frequency	0 Hz to 650 Hz (Vector controlled drives 0 Hz to 200 Hz)			
Displacement power factor	.98			
Inverter efficiency	96% to 97%			
Overload capability	1.5 x rated output current for 60 seconds (every 300 seconds) or 2.0 x rated for 3 seconds (every 60 seconds).			
Inrush current	Less than rated input current			
Control method	Sensorless Vector Control; Closed-loop Vector Control option; Flux Current Control (FCC); Programmable V/Hz curve; Linear V/Hz curve; Quadratic V/Hz curve			
PWM frequency	2 kHz to 16 kHz (in 2 kHz steps)			
Fixed frequencies	15, programmable			
Skip frequency bands	4, programmable			
Setpoint resolution	0.01 Hz digital 0.01 Hz serial 10 bit analog			
Digital inputs	6 fully programmable, isolated digital inputs plus the option for up to eight; selectable PNP/NPN			
Analog input	2 for setpoint or PI input (0-10V, 0-20mA, or -10 to +10V) scalable, or for use as 7th and 8th digital inputs			
Relay output	3 configurable 30 V DC/5 A (resistive), 250 V AC/2 A (inductive); 2 Form C, 1 NO			
Analog output	2, programmable (0/4 mA to 20 mA)			
Serial interfaces	RS-485, optional RS-232			
Electromagnetic compatibility	Optional EMC filters to EN 55 011, Class A or Class B, Inverter with internal filter Class A available			
Braking	DC Injection Braking, Compound Braking, Dynamic Braking, Integral Brake Chopper fully rated across power range			
Protection level	IP 20			
Temperature range	CT -10°C to +50°C VT -10°C to +40°C			
Storage temperature	-40°C to +70°C			
Humidity	95% Relative Humidity – non-condensing			
Operational altitudes	up to 3,300 ft (1,000 m) without derating			
Protection features	• under-voltage • over-voltage • stall prevention • overload • ground faults • locked motor • short circuits • motor over-temperature I^2t, PTC Thermistor or Klixon Thermostat • inverter over-temperature • parameter PIN protection			
Standards	UL, cUL, c-Tick			
CE Mark	Conformity with CE low voltage directive 73/23/EEC and the EMC directive 89/336/EEC with filtering			
Dimensions and weights (Without gland plate)	Frame size	W x H x D (mm)	W x H x D (in.)	Weight (lbs)
	A	73 x 173 x 149	2.9 x 6.8 x 5.9	3
	B	149 x 202 x 172	5.9 x 8.0 x 6.8	7.3
	C	185 x 245 x 195	7.3 x 9.6 x 7.7	12.1
	D	275 x 520 x 245	10.8 x 20.5 x 9.6	35
	E	275 x 650 x 245	10.8 x 25.6 x 9.6	44
	F w/o filter	350 x 850 x 320	13.8 x 33.5 x 12.6	123
	Fx	330 x 1555 x 360	13.0 x 61.2 x 14.1	242
	Gx	330 x 1875 x 560	13.0 x 74.0 x 22.0	420

[1] Frame C and higher have VT ratings that will allow drive operation one power size up from published CT rating. Output overload and ambient temperature rating decrease when VT is activated. Consult Siemens for details.

Specifications are subject to change without notice.

Siemens Energy & Automation, Inc.
Power Conversion Division - Industry Drives
3333 Old Milton Parkway, Alpharetta, GA 30005

Tel: 800-964-4114
http://www.sea.siemens.com

Printed in the USA
Publication No. GDFL-00101-0602