

# MICROMASTER® 420 AC Inverter

## The Simple Standard for Performance

The **MICROMASTER 420** inverter is a basic drive suitable for a variety of variable-speed drive applications. It is especially suitable for applications with pumps, fans, and conveyor systems. The MM420 is a basic inverter that can be configured to meet a variety of interface and Flux Current Control performance requirements. The product is rated for operation from 200V to 480V in power ranges 1/6HP to 15HP.

### Main Characteristics

- Ready to install and operate<sup>1</sup> right out of the box.
- Modular construction allows maximum configuration flexibility.
- Three fully programmable isolated digital inputs with the option for a fourth.
- One scalable analog input can also be used as a fourth digital input.
- One fully programmable analog output.
- One fully programmable relay output.
- Silent motor operation is possible when using high switching frequencies.
- Complete inverter and motor protection.
- Simple commissioning macro.

### Performance Features

- Latest IGBT technology.
- Digital microprocessor control.
- Flux Current Control (FCC) for improved dynamic response and optimized motor control.
- Programmable multi-point V/Hz curve, linear V/Hz control, quadratic V/Hz control.
- Binary Connector (BiCo) technology.
- PI control loop for simple 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.
- Slip compensation for good speed control.
- 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.
- Compound braking for rapid controlled braking
- Four skip frequencies.
- RS-485 Serial Port with optional RS-232.

### Siemens — Your Best Choice

The **MICROMASTER MM420** 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.

<sup>1</sup> 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.

## 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 10 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.

## Technical Specifications – MM420 AC Inverter

Input voltage and power ranges	Constant Torque Ratings		
200 V to 240 V 1 AC ± 10 %	1/6HP to 4HP		
200 V to 240 V 3 AC ± 10 %	1/6HP to 7.5HP		
380 V to 480 V 3 AC ± 10%	1/2HP to 15HP		
Input frequency	47 Hz to 63 Hz		
Output frequency	0 Hz to 650 Hz		
Displacement power factor	.98		
Inverter efficiency	96 % to 97 %		
Overload capability	1.5 x rated output current for 60 seconds (every 300 seconds)		
Inrush current	Less than rated input current		
Control method	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	7, programmable		
Skip frequency bands	4, programmable		
Setpoint resolution	0.01 Hz digital 0.01 Hz serial 10 bit analog		
Digital inputs	3 fully programmable, isolated digital inputs plus the option for a fourth; selectable PNP/NPN		
Analog input	1 for setpoint or PI input (0 to 10 V), scalable, or for use as 4th digital input		
Relay output	1 NO configurable 30 V DC/5 A (resistive), 250 V AC/2 A (inductive)		
Analog output	1, programmable (0/4 mA to 20 mA)		
Serial interfaces	RS-485, optional RS-232, optional PROFIBUS, optional DeviceNet, optional CANbus		
Electromagnetic compatibility	Optional EMC filters to EN 55 011, Class A or Class B, Inverter with internal Class A available		
Braking	DC Injection Braking, Compound Braking		
Protection level	IP 20		
Temperature range	-10°C to +50°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	<ul style="list-style-type: none"> <li>• under-voltage</li> <li>• stall prevention</li> <li>• ground faults</li> <li>• short circuits</li> <li>• motor over-temperature I<sup>2</sup>t, PTC Thermistor or Klixon Thermostat</li> <li>• inverter over-temperature</li> <li>• parameter PIN protection</li> <li>• over-voltage</li> <li>• overload</li> <li>• locked motor</li> </ul>		
Standards	UL, cUL, c-Tick		
CE Mark	Conformity with CE low voltage directive 73/23/EEC, EMC directive 89/336/EEC with filtering		
Dimensions and weights (Without gland plate)	Frame size	W x H x D (mm)	Weight (kg)
	A	73 x 173 x 149	1.0
	B	149 x 202 x 172	3.3
	C	185 x 245 x 195	5.0

## 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 modules 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.

## DeviceNet Communication Module

Optional DeviceNet Module is used for networking inverters to the DeviceNet fieldbus system. Maximum transmission rate of 500 kbaud is possible.

## DRIVEMONITOR and/or STARTER Commissioning Tool

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

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