

# MC Series Drives

Flexible, simple, rugged, robust!



# MC Series | Our promise

## Commitment to Simplicity

By design, the MC Series is a simple no-nonsense inverter that is easy to install, set up and program. The intuitive keypad and short text display facilitate on-site operation.

## Commitment to Quality

From product design to manufacture, service and training, quality is at the foundation of Lenze Americas corporate philosophy. A quality product is built of superior materials by highly skilled personnel equipped with state-of-the-art instruments. And a quality product is backed by expert training, knowledgeable sales representatives and experienced repair personnel. Continuous life cycle improvement fueled by our pledge to our Customers drives our technology forward. We feel so strongly about quality that each of our products is backed with a two-year warranty.

## Commitment to Innovation

We pride ourselves on delivering products to the market that are designed to meet specific customer needs. Our broad portfolio of innovative products covers very simple variable speed applications through complex motion control. Each product is positioned so that our customers pay only for the level of technology their particular application requires. The MC Series provides up to 150 HP of constant torque for applications ranging from simple ramped start/stop to demanding PID setpoint control.

## Commitment to Technical Support

Experienced engineers are on hand to help customers at all levels solve their problems and find the best solutions for their applications. End users can also be assured that Lenze is always there throughout the life cycle of its products. Technical info, literature and manuals are available from our website or the worldwide network of Lenze's branches and certified distributors.

## Commitment to Performance

Each Lenze product is in a class by itself when it comes to performance. We are not satisfied with average performance. A workhorse on the factory floor, the MC Series' rugged steel enclosure holds up in even the most dust and oil-ridden environments. The MC Series did not reach the marketplace until it outperformed our competitors and exceeded our own rigorous performance requirements. By using the most innovative components, we are able to provide this level of performance at a great value.

## Our Promise

At Lenze Americas it is not good enough to deliver on part of a promise. All of our products including the MC Series deliver the entire package: Value, Quality, Innovation, Simplicity and Performance.

# Lenze



Lenze Americas N.A. Headquarters, Uxbridge, MA

## Specifications

Output wave form	High carrier frequency, sine coded,pulse width modulated (PWM)
Input voltage ratings	240/120,240/200, 480/400,590/480 VAC
Input voltage tolerance	+10%,-15% of rating
Input frequency tolerance	48 to 62 Hz
Output frequency	0-650 Hz
Carrier frequency	2.5 kHz to 14 kHz (Drive rated at 8 kHz)
Frequency stability	+0.00006% / °C
Overload current capacity	180% for 30 seconds, 150% for one minute (at 8 kHz)
Service factor	1.0
Power factor	Near unity
Efficiency	Up to 98.5%
Speed reference follower	0-10 VDC or 4-20 mA
Control voltage	15 VDC
Analog outputs	0-10 VDC,or 2-10 VDC (4-20 mA with 500 ohm total impedance).Proportional to speed and load
Digital outputs	Form C relay: 2A at 28 VDC or 120 VAC Two open-collector outputs: 40mA at 30 VDC
Serial communications	RS485 networkable, Modbus RTU (standard)
Storage temperature	-20° to 70° C Chassis -10°– 55°C Type 1 (IP31) -10°– 50°C Type 4 (IP65) -10°– 40°C Type 12 (IP54) -10°– 40°C
Ambient humidity	Less than 95%, (non-condensing)
Maximum altitude	3300 Feet (1000 meters) w/o derating
Standards	UL, cUL, CE(LVD)
Warranty	2 Years

## System Protection

- ▶ Input line voltage calibration: automatically or manually optimizes over and under voltage trip levels
- ▶ Input line reactors are built-in for:
  - 240V 40-60 HP
  - 480V 75-150 HP
- ▶ Thermal overload: Inverse I<sup>2</sup>t motor thermal protection
- ▶ Two critical frequency avoidance ranges: with adjustable bandwidth
- ▶ Programmable automatic restarting after fault for unattended applications
- ▶ Speed reference selection: keypad or analog input
- ▶ Password protection: enable/disable and setting (0000-9999)
- ▶ Monitor mode: enable/disable allows view-only of password protected parameter settings
- ▶ Parameter reset: reset to factory defaults (choice of 50 Hz or 60 Hz factory settings)
- ▶ Fault history: View log of 8 previous trips w/ drive status at time of trip
- ▶ Fault history reset

## World Class Control

- ▶ Four preset speeds
- ▶ Independent Accel and Decel
- ▶ DC injection braking timed or continuous on starting or stopping with programmable maximum load level
- ▶ Dynamic brake enable/disable (dynamic braking requires option card)
- ▶ Base frequency adjustment to calibrate V/Hz to motor requirements with constant or variable torque curves
- ▶ Coast or ramp stopping
- ▶ Auto and Manual mode enable/disable
- ▶ Units display calibration and decimal point adjustment
- ▶ Load meter calibration
- ▶ Adjustable contrast setting for easy viewing of display from any angle
- ▶ Load reference calibration
- ▶ Load indicating output signal selection: 0-10 VDC or 4-20 mA
- ▶ Load/speed indicating output signal calibration
- ▶ Four programmable digital input terminals for speed reference and control activation
- ▶ Programmable terminal for external trip activation or manual reset

## Available Enclosures



**NEMA Type 1**

A true general purpose enclosure, the most commonly used in industry. The Type 1 enclosure allows for a free exchange of air to keep the electronics cool while keeping the enclosure size to a minimum. Installation must be in a relatively clean environment.



**NEMA Type 12**

Intended for environments that contain dust, oil or other airborne contaminants. The Type 12 enclosure is gasketed to protect the electronics. The Type 4 enclosure is recommended for this duty in the smaller power sizes as we can provide the higher degree of protection at the same price. Type 12 is available in higher sizes where Type 4 would be cost prohibitive.



**NEMA Type 4**

For "wash-down" duty, the enclosure is gasketed to protect the electronics from water sprayed directly on and around the drive, typically to keep the equipment clean. And no cooling fans are needed.



**NEMA Type 4X**

Identical to Type 4 (water-tight) but must also protect from caustic agents. Lenze Americas manufactures these drives using stainless-steel enclosures and anodized heat sinks which provide superior heat transfer and greater structural integrity.

# MC Series | Ratings & Dimensions

Power	Voltage	Input Phase	3 Phase Output Amps	NEMA 1 Model (See Note 1)	H x W x D (inches)	H x W x D (mm)	NEMA 4 & 12 Model (See Notes)	NEMA 4X Model	H x W x D (inches)	H x W x D (mm)
<b>0.25 HP (0.18kW)</b>	240/120	1Ø	1.4	M(*)103SB	7.50 x 4.70 x 3.33	190 x 119 x 85	M1103SC	M1103SE	7.88 x 6.12 x 3.63	200 x 155 x 92
<b>0.5 HP (0.37kW)</b>	240/120 240 240/200	1Ø 1Ø 3Ø	2.2 2.2 2.2/2.5	M(*)105SB M(*)205SB M(*)205B	7.50 x 6.12 x 3.63 7.50 x 4.70 x 3.63 7.50 x 4.70 x 3.63	190 x 155 x 92 190 x 119 x 92 190 x 119 x 92	M1105SC M1205SC M1205C	M1105SE M1205SE M1205E	7.88 x 7.86 x 3.75 7.88 x 6.12 x 4.35 7.88 x 6.12 x 4.35	200 x 200 x 95 200 x 155 x 110 200 x 155 x 110
<b>1 HP (0.75kW)</b>	240/120 240 240/200 480/400 590	1Ø 1Ø 3Ø 3Ø 3Ø	4.0 4.0 4.0/4.6 2.0/2.3 1.6	M(*)110SB M(*)210SB M(*)210B M(*)410B M(*)510B	7.50 x 6.12 x 4.22 7.50 x 4.70 x 4.33 7.50 x 4.70 x 4.33 7.50 x 4.70 x 3.63 7.50 x 4.70 x 3.63	190 x 155 x 107 190 x 119 x 110 190 x 119 x 110 190 x 119 x 92 190 x 119 x 92	M1110SC M1210SC M1210C M1410C M1510C	M1110SE M1210SE M1210E M1410E M1510E	7.88 x 7.86 x 4.90 7.88 x 6.12 x 4.35 7.88 x 6.12 x 4.35 7.88 x 6.12 x 4.35 7.88 x 6.12 x 4.35	200 x 200 x 124 200 x 155 x 110 200 x 155 x 110 200 x 155 x 110 200 x 155 x 110
<b>1.5 HP (1.1kW)</b>	240/120 240 240/200	1Ø 1Ø 3Ø	5.2 5.2 5.2/6.0	M(*)115SB M(*)215SB M(*)215B	7.50 x 6.12 x 4.22 7.50 x 6.12 x 4.22 7.50 x 4.70 x 4.33	190 x 155 x 107 190 x 155 x 107 190 x 119 x 110	M1115SC M1215SC M1215C	M1115SE M1215SE M1215E	7.88 x 7.86 x 4.90 7.88 x 7.86 x 4.90 7.88 x 6.12 x 5.25	200 x 200 x 124 200 x 200 x 124 200 x 155 x 133
<b>2 HP (1.5kW)</b>	240 240/200 480/400 590	1Ø 3Ø 3Ø 3Ø	6.8 6.8/7.8 3.4/3.9 2.7	M(*)220SB M(*)220B M(*)420B M(*)520B	7.50 x 6.12 x 5.12 7.50 x 6.12 x 5.12 7.50 x 6.12 x 4.22 7.50 x 6.12 x 4.22	190 x 155 x 130 190 x 155 x 130 190 x 155 x 107 190 x 155 x 107	M1220SC M1220C M1420C M1520C	M1220SE M1220E M1420E M1520E	7.88 x 7.86 x 4.90 7.88 x 7.86 x 4.90 7.88 x 7.86 x 4.90 7.88 x 7.86 x 4.90	200 x 200 x 124 200 x 200 x 124 200 x 200 x 124 200 x 200 x 124
<b>3 HP (2.2kW)</b>	240 240/200 480/400 590	1Ø 3Ø 3Ø 3Ø	9.6 9.6/11.0 4.8/5.5 3.9	M(*)230SB M(*)230B M(*)430B M(*)530B	7.50 x 6.12 x 5.12 7.50 x 6.12 x 5.12 7.50 x 6.12 x 5.12 7.50 x 6.12 x 5.12	190 x 155 x 130 190 x 155 x 130 190 x 155 x 130 190 x 155 x 130	M1230SC M1230C M1430C M1530C	M1230SE M1230E M1430E M1530E	7.88 x 7.86 x 5.90 7.88 x 7.86 x 5.90 7.88 x 7.86 x 4.90 7.88 x 7.86 x 4.90	200 x 200 x 150 200 x 200 x 150 200 x 200 x 124 200 x 200 x 124
<b>5 HP (3.7kW)</b>	240/200 480/400 590	3Ø 3Ø 3Ø	15.2/17.5 7.6/8.7 6.1	M(*)250B M(*)450B M(*)551B	7.88 x 7.86 x 5.94 7.50 x 6.12 x 5.12 7.88 x 7.86 x 5.94	200 x 200 x 151 190 x 155 x 130 200 x 200 x 151	M1250C M1450C M1550C	M1250E M1450E M1550E	9.75 x 10.26 x 7.20 7.88 x 7.86 x 5.90 7.88 x 7.86 x 5.90	248 x 261 x 183 200 x 200 x 150 200 x 200 x 150
<b>7.5 HP (5.5kW)</b>	240/200 480/400 590	3Ø 3Ø 3Ø	22/25 11.0/12.6 9.0	M(*)275B M(*)475B M(*)575B	9.38 x 7.86 x 6.84 9.38 x 7.86 x 6.25 9.38 x 7.86 x 6.25	238 x 200 x 174 238 x 200 x 159 238 x 200 x 159	M1275C M1475C M1575C	M1275E M1475E M1575E	11.75 x 10.26 x 8.35 9.75 x 10.26 x 7.20 9.75 x 10.26 x 7.20	298 x 261 x 212 248 x 261 x 183 248 x 261 x 183
<b>10 HP (7.5kW)</b>	240/200 480/400 590	3Ø 3Ø 3Ø	28/32 14.0/16.0 11.0	M(*)2100B M(*)4100B M(*)5100B	11.25 x 7.86 x 6.84 9.38 x 7.86 x 6.84 9.38 x 7.86 x 7.40	286 x 200 x 174 238 x 200 x 174 238 x 200 x 188	M12100C M14100C M15100C	M12100E M14100E M15100E	13.75 x 10.26 x 8.35 11.75 x 10.26 x 8.35 11.75 x 10.26 x 8.35	349 x 261 x 212 298 x 261 x 212 298 x 261 x 212
<b>15 HP (11kW)</b>	240/200 480/400 590	3Ø 3Ø 3Ø	42/48 21/24 17.0	M(*)2150B M(*)4150B M(*)5150B	12.75 x 7.86 x 6.84 11.25 x 7.86 x 6.84 12.75 x 7.86 x 6.84	324 x 200 x 174 286 x 200 x 174 324 x 200 x 174	M12150C M14150C M15150C	M12150E M14150E M15150E	15.75 x 10.26 x 8.35 13.75 x 10.26 x 8.35 13.75 x 10.26 x 8.35	400 x 261 x 212 349 x 261 x 212 349 x 261 x 212
<b>20 HP (15kW)</b>	240/200 480/400 590	3Ø 3Ø 3Ø	54/62 27/31 22	M(*)2200B M(*)4200B M(*)5200B	12.75 x 10.26 x 7.74 12.75 x 7.86 x 6.84 12.75 x 7.86 x 7.40	324 x 261 x 197 324 x 200 x 174 324 x 200 x 188	M12200C M14200C M15200C	----- M14200E M15200E	15.75 x 10.26 x 8.35 15.75 x 10.26 x 8.35 15.75 x 10.26 x 8.35	400 x 261 x 212 400 x 261 x 212 400 x 261 x 212
<b>25 HP (18.5kW)</b>	240/200 480/400 590	3Ø 3Ø 3Ø	68/78 34/39 27	M(*)2250B M(*)4250B M(*)5250B	15.75 x 10.26 x 8.35 12.75 x 10.26 x 7.74 12.75 x 10.26 x 7.74	400 x 261 x 212 324 x 261 x 197 324 x 261 x 197	M12250D M14250D M15250D	----- ----- -----	20.25 x 10.26 x 8.35 15.75 x 10.26 x 8.35 15.75 x 10.26 x 8.35	514 x 261 x 212 400 x 261 x 212 400 x 261 x 212
<b>30 HP (22kW)</b>	240/200 480/400 590	3Ø 3Ø 3Ø	80/92 40/46 32	M(*)2300B M(*)4300B M(*)5300B	15.75 x 10.26 x 8.35 12.75 x 10.26 x 7.74 12.75 x 10.26 x 8.25	400 x 261 x 212 324 x 261 x 197 324 x 261 x 210	M12300D M14300D M15300D	----- ----- -----	20.25 x 10.26 x 8.35 15.75 x 10.26 x 8.35 15.75 x 10.26 x 8.35	514 x 261 x 212 400 x 261 x 212 400 x 261 x 212
<b>40 HP (30kW)</b>	240/200 480/400 590	3Ø 3Ø 3Ø	120/104 52/60 41	M(*)2400B M(*)4400B M(*)5400B	25.00 x 13.00 x 10.50 15.75 x 10.26 x 8.35 15.75 x 10.26 x 8.35	635 x 330 x 212 400 x 261 x 212 400 x 261 x 212	----- M14400D M15400D	----- ----- -----	----- 20.25 x 10.26 x 8.35 20.25 x 10.26 x 8.35	----- 514 x 261 x 212 -----
<b>50 HP (37.5kW)</b>	480/400 590	3Ø 3Ø	65/75 52	M(*)4500B M(*)5500B	19.75 x 10.26 x 8.55 19.75 x 10.26 x 8.55	502 x 261 x 217 502 x 261 x 217	M14500D M15500D	----- -----	21.00 x 13.72 x 8.35 21.00 x 13.72 x 8.35	533 x 348 x 212 533 x 348 x 212
<b>60 HP (45kW)</b>	240/200 480/400 590	3Ø 3Ø 3Ø	177/154 77/88 62	M(*)2600B M(*)4600B M(*)5600B	47.00 x 16.64 x 11.85 19.75 x 10.26 x 8.55 19.75 x 10.26 x 8.55	1194 x 423 x 301 502 x 261 x 217 502 x 261 x 217	----- M14600D M15600D	----- ----- -----	----- 21.00 x 13.72 x 8.35 21.00 x 13.72 x 8.35	----- 533 x 348 x 212 533 x 348 x 212
<b>75 HP (55kW)</b>	480/400	3Ø	110/96	M(*)4750B	29.00 x 16.64 x 11.85	737 x 423 x 301	M14750D	-----	37.00 x 18.00 x 13.30	940 x 457 x 338
<b>100 HP (75kW)</b>	480/400	3Ø	143/124	M(*)41000B	29.00 x 24.42 x 11.85	737 x 620 x 301	M141000D	-----	37.00 x 18.00 x 13.30	991 x 660 x 338
<b>125 HP (90kW)</b>	480/400	3Ø	179/156	M(*)41250B	29.00 x 24.42 x 11.85	737 x 620 x 301	M141250D	-----	39.00 x 26.00 x 13.30	991 x 660 x 338
<b>150 HP (110kW)</b>	480/400	3Ø	207/180	M(*)41500B	29.00 x 36.66 x 11.85	737 x 931 x 301	-----	-----	-----	-----

## NEMA 1

Note 1: "M(\*)" signifies either M1 for the M1000 series or M3 for M3000 series.

## NEMA 4 and NEMA12

Note 2: Replace the "M1" at the beginning of the model number with "M3" to specify a M3000 series drive.

Note 3: Model numbers ending with "C" are suitable for NEMA 4 and NEMA 12 applications.

Note 4: Model numbers ending with "D" are suitable for NEMA 12 applications.

# MC Series | Features and Benefits

## The M1000 industrial drives

The intelligent, versatile and cost-effective choice for industrial applications.

From harsh environments to high torque loads, the M1000 Series microdrives meet the toughest requirements with outstanding reliability, at a low cost. The easy-to-program M1000 offers full features, extensive I/O, and a full array of programmable functions. The M1000 is available in a power range of 1/4 to 150 HP (0.18 - 110 kW) and voltages ranging from 115 to 575 VAC.

With its Enhanced Torque System (ETS), a highly efficient sine coding algorithm and "auto-voltage boost," the M1000 delivers maximum starting and accelerating torque and tight speed regulation, even under fluctuating load conditions. A built-in, UL-approved thermal overload provides full motor protection.

### M1000 drive features

- ▶ Manual boost for high starting torque
- ▶ Auto-boost for high torque acceleration at any speed
- ▶ Power-up & auto restart modes
- ▶ Sleep mode with adjustable speed threshold and time.
- ▶ Adjustable units display: Hz, RPM, %, /SEC, /MIN, /HR
- ▶ Slip compensation for tight speed regulation even under fluctuating loads
- ▶ Control configuration: local, remote, both, serial communications
- ▶ Auxiliary outputs - two open collector outputs and a Form C relay. Functions include: Run, Fault, Inverse Fault, Fault Lockout, At Commanded Speed, Above a Preset Speed, Current Limit, Auto/ Manual Mode Indication, PID High/Low Alarms
- ▶ Modbus® RTU Serial Communication Protocol
- ▶ PID: direct or reverse acting with adjustable Proportional, Integral, and Derivative gains, signal calibration, high and low level alarms.

### M1000 and M3000 options

Expand the capabilities of your MC drive with the following options. All options can be factory installed or field installed.

- ▶ Dynamic Braking: for faster stopping or deceleration
- ▶ Additional Form-C relay
- ▶ Remote Keypad (up to NEMA 4X rating)

## The M3000 industrial drives

The choice when your process control demands fast acceleration and response.

Designed expressly for use where the motor control is an integral part of a process, the M3000 is rated for constant torque applications but can easily be configured for variable torque applications.

Most "process control" drives are designed for variable torque applications where the motor is driving a centrifugal fan or pump. As such, these drives are limited to 110% current for overload situations such as acceleration or responding to a feedback change.

The MC3000 is a true Constant Torque drive rated for 180% of rated current for 30 seconds and 150% for one minute; this allows faster response to system changes and the ability to apply the MC3000 to non-centrifugal applications such as compressors, conveyors and other "constant torque" loads.

The M3000 is available in the same power ranges and voltages as the M1000.

### M3000 drive features

- ▶ 3-speed synchronized flying restarts
- ▶ Loss of follower signal action: fault or go to preset speed
- ▶ Control configuration: local, remote, serial communications, keypad, terminal strip, PID mode
- ▶ Adjustable units display: PSI, CFM, GPM, FPM, IN, FT, Hz, RPM, %, /SEC, /MIN, /HR
- ▶ Auxiliary outputs - two open collector outputs and a Form C relay: Functions include Loss of Speed Reference Signal in addition to those listed for the M1000.
- ▶ Sleep mode with adjustable speed threshold and time.
- ▶ Modbus® RTU Serial Communication Protocol (standard)



### Display that makes sense

The MC Series keypad display has been designed to make it easy to understand what is happening with the AC motor that is driving your machine or process. Motor frequency (Hz) may not make as much sense to your operator as motor speed (rpm) or conveyor speed (fpm) or flow rate (gpm). Displays can be configured to show what you need to see, in the units that you need to see them in. Because our displays are in English, programming the MC is easy to understand, often eliminating the need to have the manual in one hand while programming with the other!

**The best machines and production facilities  
around the world use Lenze.**



*Positioning our Customers for Success. We take our Customer's requirements seriously. A new application is an opportunity to test, prove and expand our drive's capabilities while solving our Customer's motion control needs.*



*Customer Service has always been and will always be our number one commitment. Our success depends on it.*



*Driving design technology forward means we never stop thinking about process improvements. Did we deliver a quality product to market that meets the Customer's needs? That is the key.*



*Innovation takes art and skill to combine what's new and what's proven to produce a product with exceptional form, fit and function.*

**Lenze**

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