Unidrive M:
General Purpose AC Drives

Unidrive M100-M400
Easy-to-use, flexible and reliable

0.33 - 200 HP (0.25 - 132 kW)
115 V | 208-240 V | 380-480 V | 575 V | 690 V

CONTROL TECHNIQUES ™

Nidec
All for dreams

Easy-to-use General Purpose AC drives

Innovative and intelligent AC drive technology from Control Techniques enables customers to deploy highly productive, easy-to-use control solutions. Beyond achieving superior motor performance, our design philosophy is guided by the voice of our customers to produce truly "user friendly" control solutions. As a result, the drives are quick to install, simple to set up, and easy to maintain. Software tools are intuitive, consistent and flexible.

You will also find that many advanced features are built-in as standard into our drive solutions.

Unidrive M100 AC drive

0.33 HP - 10 HP (0.25 kW - 7.5 kW)
115 V / 208-240 V / 380-480 V

The **Unidrive M100/M101** series was developed in response to increasing customer requests for an easy-to-use, compact cost-effective general purpose AC drive. This drive provides outstanding V/Hz and open loop vector performance up to 10 HP, has a bright, easy to read LED keypad and has an optional parameter copy device. The Unidrive M100 drives use the AI-BACKUP-ADAPTOR and standard SD card for parameter storage, backup and copying. The Unidrive M101 includes a keypad mounted potentiometer.

Unidrive M200 AC drive

0.33 HP - 200 HP (0.25 kW - 132 kW)
115 V / 208-240 V / 380-480 V / 575 V / 690 V

The **Unidrive M200/M201** is available in nine frame sizes, covering all low voltage ranges, and provides up to 200 HP. This versatile drive has several cost and space saving features, such as "snap in" expandable I/O or communication options and onboard PLC (M200 only) using IEC-61131-3 compliant programming software. Unidrive M200 has been designed for applications that require flexible integration with systems via industrial Ethernet protocols and fieldbuses together with advanced open-loop motor Rotor Flux Control (RFC-A).

Unidrive M300 AC drive

0.33 HP - 200 HP (0.25 kW - 132 kW)
115 V / 208-240 V / 380-480 V / 575 V / 690 V

Unidrive M300 provides flexible integration with safety and communications. Unidrive M300 is ideal for applications that require cost-effective integration into safety systems. With two Safe Torque Off (STO) inputs, onboard PLC and an SI interface for a fieldbus, industrial Ethernet or extended I/O options, this feature set ensures Unidrive M300's flexible integration with any system.

Unidrive M400 AC drive

0.33 HP - 200 HP (0.25 kW - 132 kW)
115 V / 208-240 V / 380-480 V / 575 V / 690 V

Unidrive M400 minimizes downtime with an intuitive backlit LCD keypad offering a real-text, multi-language display for rapid setup and clear diagnostic help. The integrated PLC can execute a substantial range of sequencing and logic programs. The Unidrive M400's impressive I/O count complete with two STO inputs, an optional SI interface for extended I/O, fieldbus, industrial Ethernet and intuitive display makes it an ideal solution for stand-alone machine control.

Conforming to standards for quality, safety and interoperability

Control Techniques drives are built to meet rigorous international safety standards, and communicate flawlessly using the most popular fieldbuses and industrial Ethernet.

As such, the drives carry the following approval ratings:

Easy setup, reliable performance and built to last.

No specialist knowledge required

Designed to make setup as simple as possible.
In fact, many applications require changing just
a few settings. Adjustments are easy with the keypad
and clear referencing guide.

Fast setup

For fast batch production, parameters can be transferred
onto new drives using standard SD cards.
You'll need either the optional AI-BACKUP-MODULE
or AI-SMART-ADAPTOR and 24 Vdc power.

Visit www.Drive-Setup.com for step by step guides,
videos, software & product support documentation.

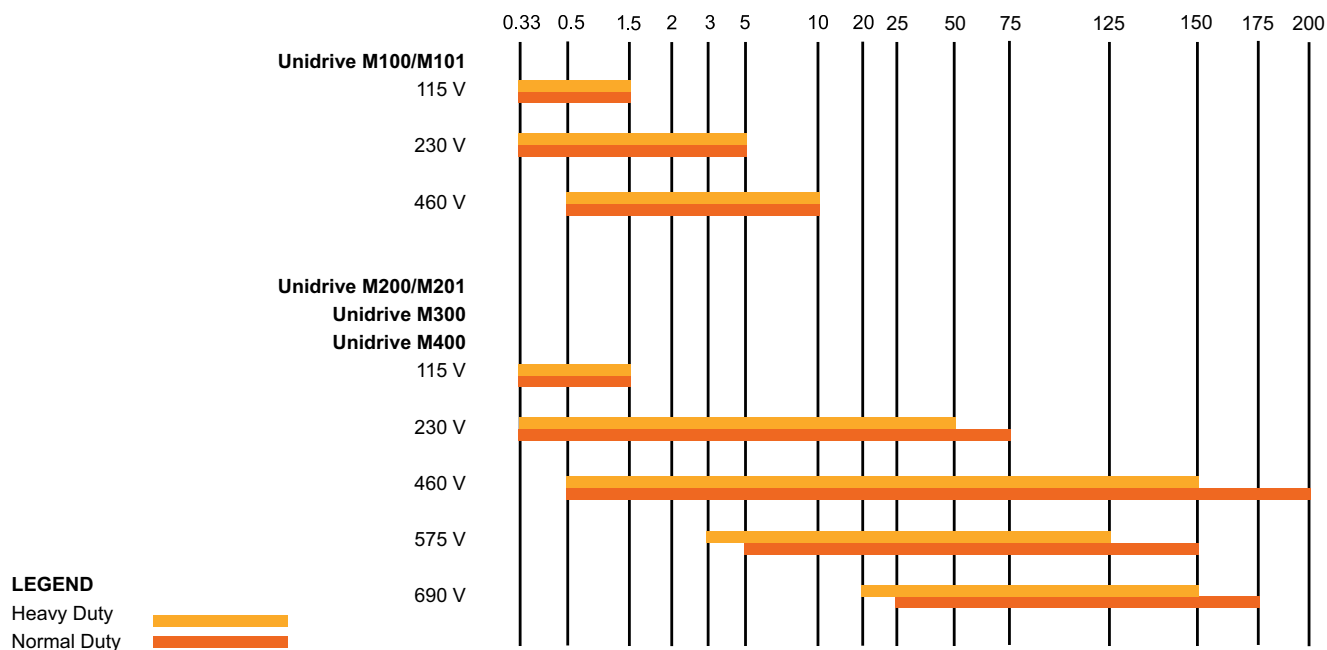AI-BACKUP-ADAPTOR   AI-SMART-ADAPTOR

1. Motor current (Pr 06) **2.** Motor rpm (Pr 07) **3.** Motor voltage (Pr 08) **4.** Motor power factor (Pr 09)

You can find all parameters (Pr) for quick motor setup on the front of the drive, and be up and running within seconds.

AC Drive Horsepower (HP) Ratings

| | 0.33 | 0.5 | 1.5 | 2 | 3 | 5 | 10 | 20 | 25 | 50 | 75 | 125 | 150 | 175 | 200 |

Unidrive M100/M101
- 115 V
- 230 V
- 460 V

Unidrive M200/M201
Unidrive M300
Unidrive M400
- 115 V
- 230 V
- 460 V
- 575 V
- 690 V

LEGEND
Heavy Duty
Normal Duty

AC Drives Ratings

Unidrive M model	Unidrive M100/101 Value Drives	Unidrive M200/201 Optional Communications
Control Technology	Open loop vector, V/Hz	Rotor Flux Control, Open loop vector, V/Hz
Power — Normal Duty	0.33 – 10 HP	0.33 – 200 HP
Power — Heavy Duty	0.33 – 10 HP	0.33 – 150 HP
AC Supply	100-120 V	100-120 V
	200-240 V	200-240 V
	380-480 V	380-480 V
	N/A	500-575 V
	N/A	500-690 V
Input/Output — Analog Inputs	1	1
Analog/Digital Inputs	0	1
Analog Outputs	0	1
Digital Inputs	3	4
Digital Input/Outputs	1	1
Digital/Thermistor Input	0	0
Digital/Frequency/Encoder Inputs	0	0
Relays	1	1
Input/Output Options	N/A	N/A
Communication Options	N/A	CANopen, DeviceNet, EtherNet/IP, Modbus RTU, Modbus TCP/IP, PROFINET RT, PROFIBUS DP, RTMoE
Keypads — Drive	Fixed LED	Fixed LED
Keypads — Remote	N/A	Optional LCD
PLC Programming	N/A	IEC61131(M200 only)
Safe Torque Off	N/A	N/A

Normal Duty

Suitable for most applications, current overload is set at 110% for 60 seconds. Where motor rated current is less than the drive rated continuous current, higher overloads are achieved.

Heavy Duty

Suitable for demanding applications, current overload is set at up to 180% for 3 seconds on frames 1 to 4 (200% for 28 sec. on frames 5 to 8 and 175% for 42 sec on frame 9). Where motor rated current is less than the drive rated continuous current, higher overloads are achieved.

Unidrive M model	Unidrive M300 Safety	Unidrive M400 Multi-language Display
Control Technology	Rotor Flux Control, Open loop vector, V/Hz	Rotor Flux Control, Open loop vector, V/Hz
Power — **Normal Duty**	0.33 – 200 HP	0.33 – 200 HP
Power — **Heavy Duty**	0.33 – 150 HP	0.33 – 150 HP
AC Supply	100-120 V	100-120 V
AC Supply	200-240 V	200-240 V
AC Supply	380-480 V	380-480 V
AC Supply	500-575 V	500-575 V
AC Supply	500-690 V	500-690 V
Input/Output — Analog Inputs	1	1
Input/Output — Analog/Digital Inputs	1	1
Input/Output — Analog Outputs	1	2
Input/Output — Digital Inputs	4	2
Input/Output — Digital Input/Outputs	1	2
Input/Output — Digital/Thermistor Input	0	1
Input/Output — Digital/Frequency/Encoder Inputs	0	2/1/1
Input/Output — Relays	1	1
Input/Output Options	SI-I/O	SI-I/O
Communication Options	CANopen, DeviceNet, EtherNet/IP, Modbus RTU, Modbus TCP/IP, PROFINET RT, PROFIBUS DP, RTMoE	CANopen, DeviceNet, EtherNet/IP, Modbus RTU, Modbus TCP/IP, PROFINET RT, PROFIBUS DP, RTMoE
Keypads — Drive	Fixed LED	Fixed LED
Keypads — Remote	Optional LCD	Optional LCD
PLC Programming	IEC61131	IEC61131
Safe Torque Off	SIL3, Ple, Cat 4	SIL3, Ple, Cat 4

Normal Duty

Suitable for most applications, current overload is set at 110% for 60 seconds. Where motor rated current is less than the drive rated continuous current, higher overloads are achieved.

Heavy Duty

Suitable for demanding applications, current overload is set at up to 180% for 3 seconds on frames 1 to 4 (200% for 28 sec. on frames 5 to 8 and 175% for 42 sec on frame 9). Where motor rated current is less than the drive rated continuous current, higher overloads are achieved.

Unidrive M100/M101

Simplicity with Economy

The economical Unidrive M100 & M101 drives are ideal for simple applications where cost is critical and basic operation is required. The Unidrive M100 & M101 operate in V/Hz and open loop vector modes. They have an easy to use LED display keypad for quick setup. The Unidrive M101 also has a speed potentiometer for easy manual speed setting.

The Unidrive M100 & M101 drives also come with the reliability and performance users have come to expect from more powerful and flexible drives from Control Techniques.
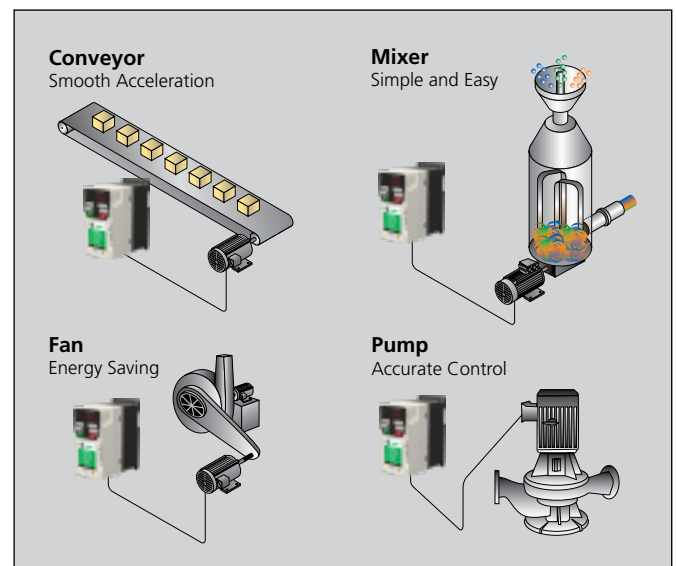
Unidrive M101

The Unidrive M101 variant includes an integrated speed reference potentiometer which enhances choice and ease-of-use.

- 0.33 to 1.5 HP (0.25 to 1 kW), 1Ø 100-120 Vac input, 3Ø 230 V output
- 0.33 to 3 HP (0.25 to 3 kW), 1Ø 200-240 Vac
- 0.33 to 5 HP (0.25 to 4 kW), 3Ø 200-240 Vac
  - 0.5 to 10 HP (0.37 to 7.5 kW), 3Ø 380-480 Vac
- **Easy to setup** – all the parameters you need are printed on the front of the drive (90% of typical applications)
- **Easy installation** – DIN-rail alignment (up to 2 HP)
- **Simple connections** – easy access terminals with clear marking and terminal diagram on inside of the front cover
- **Simple startup** – easy push button setup - no need for complex programming
- **Performance** – V/Hz or high performance open loop vector
- **Output frequency** - 0 to 550 Hz Switching frequency 3 kHz (default), 0.66, 1, 2, 3, 4, 6, 8, 12 and 16 kHz
- **Positive logic control**
- **Catch a spinning motor**
- **SD Card Parameter Copy options** for fast commissioning of multiple drives

Typical applications

Conveyor
Smooth Acceleration

Mixer
Simple and Easy

Fan
Energy Saving

Pump
Accurate Control

FEATURE
Performance Advantage

Unidrive M101 powers up in Keypad Mode
Easy-to-use. Ready to run out of the box.

6 Operator Buttons: Enter, Escape, Up, Down, Stop/Reset and Start. Bright LED Display
Easy to program and use.

Top Ten Level 1 Parameters Listed on the Drive's Front Cover
On-the-spot easy reference for drive setup and maintenance.

Security Lock
Enables the user the ability to lock unwanted parameter edits with a security code.

Configurable Analog and Digital I/O
Customizes drive to the specific application. 3 configurable digital input terminals (defaults are: Enable, Run Forward, Run Reverse), 1 configurable digital input/output terminal (at zero frequency), 1 relay output (Drive OK) and 1 analog input (0-10 V or 0-20/4-20 mA).

Comprehensive Diagnostics
8 display alarm codes, 68 trip codes and 10 trip history log.

Flexible Control Features
8 preset speeds, 7 stopping modes including DC injection braking. Catch a spinning motor algorithm.

Quadratic Motor V/Hz Control
Optimizes multimotor fan and pump operation.

Dynamic Motor V/Hz Control
Optimizes energy savings.

Open Loop Vector Control with True Space Vector Modulation
Precise control algorithm provides full torque down to 1 Hz for exceptional performance.

UNIDRIVE M100/M101 RATINGS

100 / 120 VAC ±10%

Base Order Code M10x- ③	Size	Motor Power ① HP	Motor Power ① kW	Input Phase	Continuous Output Current (A)	Overload Current (A) ②
01100017A	1	0.33	0.25	1	1.7	2.6
01100024A	1	0.5	0.37	1	2.4	3.6
02100042A	2	1	0.75	1	4.2	6.3
02100056A	2	1.5	1.1	1	5.6	8.4

200 / 240 VAC ±10%

Base Order Code M10x- ③	Size	Motor Power ① HP	Motor Power ① kW	Input Phase	Continuous Output Current (A)	Overload Current (A) ②
01200017A	1	0.33	0.25	1	1.7	2.6
01200024A	1	0.5	0.37	1	2.4	3.6
01200033A	1	0.75	0.55	1	3.3	5
01200042A	1	1	0.75	1	4.2	6.3
02200024A	2	0.5	0.37	1/3	2.4	3.6
02200033A	2	0.75	0.55	1/3	3.3	5
02200042A	2	1	0.75	1/3	4.2	6.3
02200056A	2	1.5	1.1	1/3	5.6	8.4
02200075A	2	2	1.5	1/3	7.5	11.3
03200100A	3	3	2.2	1/3	10	15
04200133A	4	3	3.0	1/3	13.3	20
04200176A	4	5	4.0	3	17.6	26.4

380 / 480 VAC ±10%

Base Order Code M10x- ③	Size	Motor Power ① HP	Motor Power ① kW	Input Phase	Continuous Output Current (A)	Overload Current (A) ②
02400013A	2	0.5	0.37	3	1.3	2
02400018A	2	0.75	0.55	3	1.8	2.7
02400023A	2	1	0.75	3	2.3	3.5
02400032A	2	1.5	1.1	3	3.2	4.8
02400041A	2	2	1.5	3	4.1	6.2
03400056A	3	3	2.2	3	5.6	8.4
03400073A	3	3	3	3	7.3	11
03400094A	3	5	4.0	3	9.4	14.1
04400135A	4	7.5	5.5	3	13.5	20.3
04400170A	4	10	7.5	3	17	25.5

① Motor horsepower based on typical 4-pole motor ratings. HP ratings are based on typical 230 V motors for 110/120 V and 200/240 V drives and 460 V for 380/480 V drives. kW ratings are based on typical 220 V motors for 110/120 V and 200/240 V drives and 400 V for 380/480 V drives. Select model based on actual motor nameplate current rating.
② Overload: 150 % (for 60 s).
③ Add 10101AB100 to the base order code when ordering standard US (60 Hz) default products.
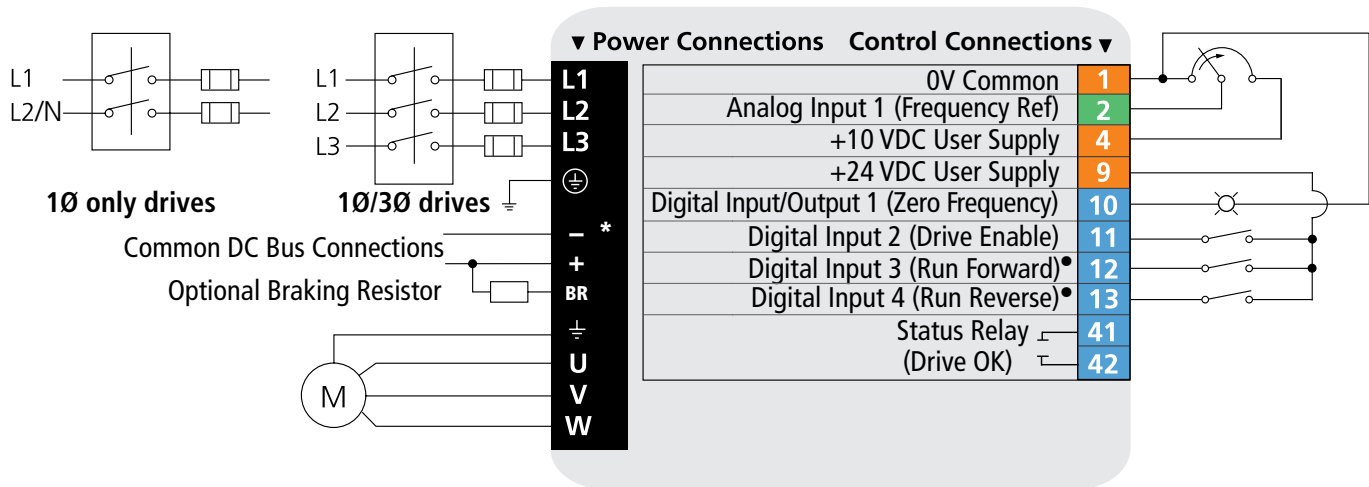
UNIDRIVE M100/M101 FEATURES

M101 variant has additional speed reference potentiometer

Optional hot swappable AI-BACKUP-ADAPTOR allows the drive to use an SD card for parameter cloning and acts as an input for 24 V backup. Can be used without line power. Optional AI-SMART-ADAPTOR has built-in memory for parameter cloning and 24 V backup

LED keypad fitted as standard for quick commissioning and easy use

User-friendly control connections
1 x Analog input
4 x Digital I/O
1 x Relay

Conventional surface mount and DIN rail alignment (DIN rail alignment available on size 1 and 2 only)

10 setup parameters listed on front cover

Easy-to-disconnect internal EMC filter

User-friendly power connections for open loop vector or V/Hz induction motor control

Easy-to-remove terminal cover with tool-less close system (patent pending)

Robust cable management system providing grounding point for shielded control and power cables

Drive rated to IP21 / UL open class (NEMA 1) as standard

Conduit kits are available to meet UL Type 1 rating as standard

UNIDRIVE M100/M101 TERMINAL DIAGRAM

1Ø only drives

1Ø/3Ø drives

Common DC Bus Connections

Optional Braking Resistor

| L1 | L2 | L3 | ⏚ | − * | + | BR | ⏚ | U | V | W |

▼ Power Connections   Control Connections ▼

0V Common	1
Analog Input 1 (Frequency Ref)	2
+10 VDC User Supply	4
+24 VDC User Supply	9
Digital Input/Output 1 (Zero Frequency)	10
Digital Input 2 (Drive Enable)	11
Digital Input 3 (Run Forward)●	12
Digital Input 4 (Run Reverse)●	13
Status Relay	41
(Drive OK)	42

TERMINAL DESCRIPTION

Pin #	Default Function	Type/Description	Notes
1	0V common	Common for external analog signals	
2	Frequency reference	Single ended analog input 11 bit	0 to +10 Vdc, 0-20 mA or 4-20 mA
4	+10 Vdc user supply	Reference supply	5 mA
9	+24 Vdc user supply	Digital I/O supply	100 mA
10	At zero frequency	Digital I/O 1	0 to +24 Vdc
11	Enable	Digital input 2	0 to +24 Vdc
12	Run forward	Digital input 3	0 to +24 Vdc
13	Run reverse	Digital input 4	0 to +24 Vdc
41	Status relay (drive OK)	Normally open contact	2 A, 240 Vac, 0.5 A 30 Vdc inductive load
42			

UNIDRIVE M100/M101 SPECIFICATIONS

Environment

Ambient Operating Temperature	-20°C to 40°C (-4°F to 104°F) @ 3 kHz carrier freq. Operation to 60°C (140°F) with de-rating
Cooling method	Convection and forced convection, model dependent
Humidity	95% maximum non-condensing at 40°C (104°F)
Storage Temperature	-40°C to 60°C (-40°F to 140°F) — 24 months Max.
Altitude	Derate the continuous output current by 1% for every 100 m (328 ft) above 1000 m (3,280 ft) to a maximum of 3000 m (9,840 ft).
Vibration	Tested in accordance with IEC 60068-2-64 and IEC 60068-2-6
Mechanical Shock	Tested in accordance with IEC 60068-2-27 and IEC 60068-2-29
Enclosure	IP20, NEMA 1 conduit kits available
Electromagnetic	In compliance with IEC/EN61000-4-2/3/4/5/6/11, IEC/EN61000-6-1/2/3, IEC/EN61800-3 Immunity
RoHS	Meets the EU directive 2002-95-EC

AC Supply Requirements

Voltage	100V models: 100 to 120 Vac ±10% (size 1 to 2)
	200V models: 200 to 240 Vac ±10% (size 1 to 4)
	400V models: 380 to 480 Vac ±10% (size 2 to 4)
Phase	1Ø and 3Ø (Model dependent)
Maximum Supply Imbalance	2% negative phase sequence, 3% voltage imbalance between phases.
Input Frequency	45 to 66 Hz
Input Displacement Power Factor	0.97

Control

|	
Carrier Frequency	0.667, 1, 2, 3, 4, 6, 8 12 & 16 kHz
Output Frequency	Up to 550 Hz
Frequency Accuracy	±0.02% of full scale
Frequency Resolution	0.01 Hz
Analog Input Resolution	Voltage mode: 11 bits (unipolar)
	Current mode: 11 bits
Braking	DC injection braking standard. Dynamic braking transistor included, requires external resistor.

Protection

DC Bus Undervoltage Trip	100 V model: 175 Vdc (approx. 61 Vac line voltage)
	200 V model: 175 Vdc (approx. 123 Vac line voltage)
	400 V model: 330 Vdc (approx. 233 Vac line voltage)
DC Bus Overvoltage Trip	100 V model: 510 Vdc (approx. 180 Vac line voltage)
	200 V model: 510 Vdc (approx. 361 Vac line voltage)
	400 V model: 870 Vdc (approx. 615 Vac line voltage)
Drive Overload Trip	Current overload value is exceeded. Programmable to allow up to 150% of drive current for 60 seconds.
Instantaneous Overcurrent Trip	220% of rated drive current.
Phase Loss Trip	DC bus ripple threshold exceeded.
Overtemperature Trip	Drive heatsink temperature exceeds 95°C (203°F).
Short Circuit Trip	Protects against output phase-to-phase fault.
Ground Fault Trip	Protects against output phase-to-ground fault.
Motor Thermal Trip	Electronically protects the motor from overheating due to loading conditions.

Approval & Listings

UL, cUL	UL File #E171230
CE	CE approval
C✔	N1652
ISO	9001:2015, 14001
RoHS	RoHS Compliant

Unidrive M100/M101 DIMENSIONS
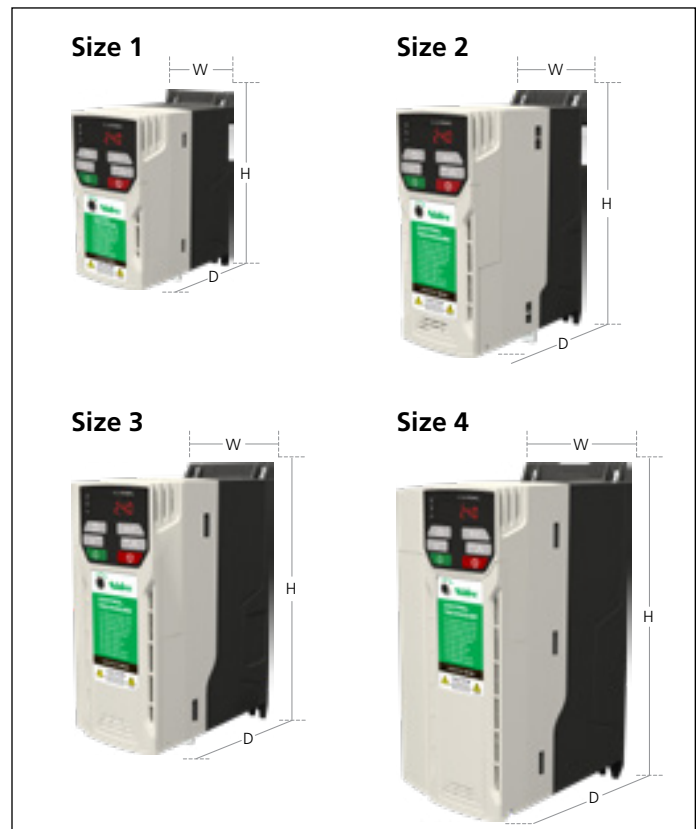
Size 1

Size 2

Size 3

Size 4

Frame size	H		W		D		Weight	
	in	mm	in	mm	in	mm	lbs	kg
1	6.3	160	3.0	75	5.1	130	1.7	.75
2	8.1	205	3.1	78	5.9	150	2.2	1.0
3	8.9	226	3.5	90	6.3	160	3.3	1.5
4	10.9	277	4.5	115	6.9	175	6.9	3.13

To accommodate the added depth with a potentiometer add 0.43 in (11 mm) to the depth of the M101 drives. See Fig #1 page 23. For NEMA Kit dimensions see page 30.

Options

Unidrive M100 options include additional EMC filters, conduit boxes for wall-mounting and parameter copy devices.

OPTIONS AT-A-GLANCE

Option	Description	Order code
Drive Configuration	Parameter copying & 24 V backup; SD card required	AI-BACKUP-ADAPTOR
	8 GB SD Card	CTSD8GB
	Parameter copying & 24 V backup; 4 GB SD card included	AI-SMART-ADAPTOR
Power Accessories	EMC Filters	See Unidrive M Accessories
	Line & Load Reactors	
	Dynamic Braking Resistors	
Environmental Protection & Cable Management	NEMA 1 / UL Type 1 Conduit Box Kits	See Unidrive M Accessories
	Retrofit Kits for Commander SK replacement	
	Fan Replacement Kits	

Drive Configuration and Parameter Programming

Parameter sets can be easily transferred between drives using an SD card with either the AI-BACKUP-ADAPTOR or AI-SMART-ADAPTOR.

The AI-BACKUP-ADAPTOR and AI-SMART-ADAPTOR provide fast and cost-effective drive-to-drive parameter transfer and storage using standard SD memory cards plus 24 Vdc control power backup connectivity. The smart adaptor includes a 4 GB SD card that is not included with the backup adaptor. An 8 GB SD card can be ordered with order code: CTSD8GB

AI-SMART-ADAPTOR

For more information, refer to the Unidrive M Options brochure.

Diagnostic Software

The **Drive Diagnostics APP** allows users to quickly diagnose faults. In the unlikely event that you get a drive error, download our free Diagnostics Tool app. Just input the error code on your device and you'll be given a solution. You can download our Diagnostics Tool App at: **www.controltechniques.com/mobile-applications**

Environmental Protection and Cable Management

UL Type 1 Conduit kits

Frame size	Order code	H		W		D	
		in	mm	in	mm	in	mm
1	C-BOX-OF1	9.9	252	3.0	75	5.1	130
2	C-BOX-OF2	11.6	294	3.0	75	5.9	150
3	C-BOX-OF3	12.4	314	3.5	90	6.3	160
4	C-BOX-OF4	14.3	362	4.5	115	6.9	175

When the following kits are fitted to the drive, it meets UL Type 1.
Shown at right: Unidrive M100 frame size 3 with C-BOX-OF3 conduit box kit installed

Fan replacement kits

Frame size	Order code
1	3470-0092
2	3470-0095
3	3470-0099
4	3470-0103

Retrofit mounting brackets

Frame size	Order code
3	3470-0097
4	3470-0101

These mounting brackets ensure the drive can be mounted on existing Commander SK installations.

# Unidrive M200, M300 and M400

Simplicity with Functionality

The Unidrive M200 has been designed to be a simple, compact, cost-effective AC motor speed controller that delivers performance with simplicity and ease of use. With all the parameters you need for 90% of applications printed on the front of the drive, Unidrive M200 ensures installation and commissioning are straightforward.

For more complex applications, the Unidrive M200 delivers benchmark functionality at no added cost to the base drive itself. Plug-in options, dynamic performance, PLC functionality and other advanced features ensure that in more complex applications Unidrive M200 can deliver more than the average general purpose drive - giving you lower cost solutions and better productivity in your motor control applications. The Unidrive M300 adds Safe Torque Off (STO) functionality and the Unidrive M400 has additional I/O and a multi-language keypad option.
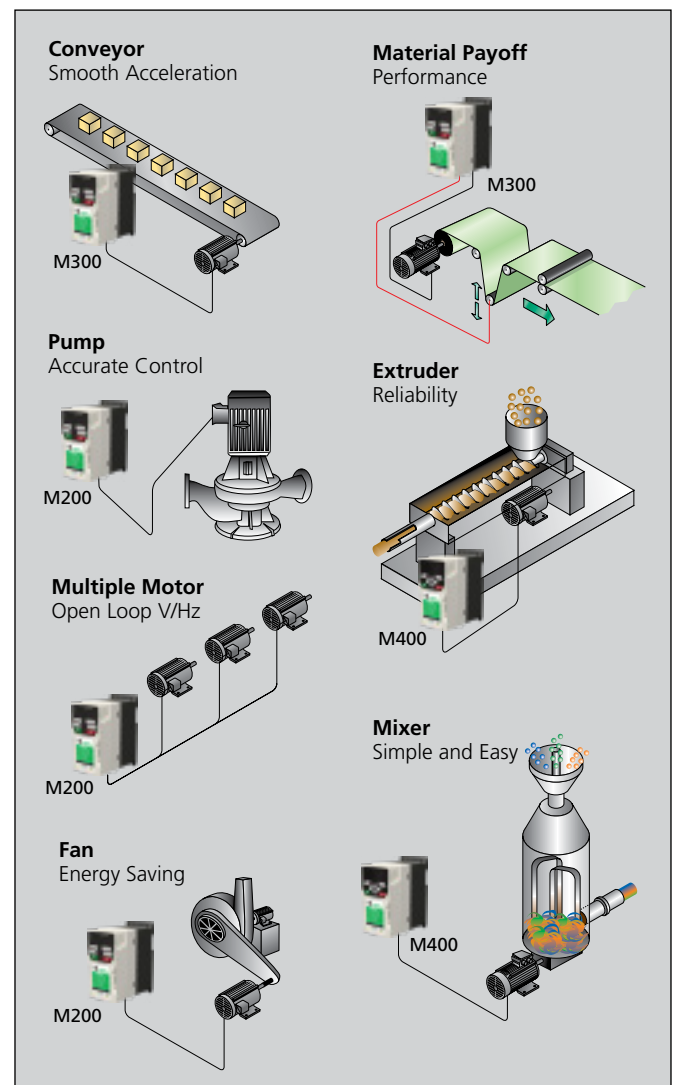
Unidrive M201

The Unidrive M201 variant includes an integrated speed reference potentiometer which enhances choice and ease-of-use.

- 0.3 to 1.5 HP (0.75 to 1.1 kW), 1Ø 100-120 Vac
- 0.3 to 3 HP (0.25 to 2.2 kW), 1Ø 200-240 Vac
- 0.5 to 100 HP (0.75 to 75 kW), 3Ø 200-240 Vac
- 0.5 to 200 HP (0.37 to 132 kW), 3Ø 380-480 Vac
- 3 to 150 HP (3 to 110kW), 3Ø 500-575 Vac
- 25 to 175 HP (18.5 to 132 kW), 3Ø 500-690 Vac
- **Easy to setup** – all the parameters you need (90% of typical applications) are printed on the cover
- **Simple connections** – terminal diagram on the inside cover
- **Simple startup** – no specialist knowledge required, Unidrive M400 has an optional enhanced keypad
- **Communications Options** for: CANopen, DeviceNet, EtherCAT, EtherNet/IP, Modbus RTU, Modbus TCP, PROFIBUS DP, PROFINET RT networks
- **PLC Functionality** – IEC61131-3 programming for advanced solutions eliminating the need for external controllers
- **Expandable I/O** – Unidrive M400 has highest base drive I/O count
- **High Performance Sensorless Solutions** – open loop vector, torque control and rotor flux control

Typical applications

Conveyor
Smooth Acceleration
M300

Material Payoff
Performance
M300

Pump
Accurate Control
M200

Extruder
Reliability
M400

Multiple Motor
Open Loop V/Hz
M200

Mixer
Simple and Easy
M400

Fan
Energy Saving
M200

FEATURE
Performance Advantage

Open loop vector control with true space vector modulation
> Precise control algorithm provides full torque down to 1 Hz for exceptional performance.

Rotor Flux Control
> For most demanding applications, RFC mode provides 180% overload capacity and high stability motor control.

Terminal connections drawings and basic parameters listed on the drive's cover
> On-the-spot easy reference for drive setup and maintenance.

Static auto-tune
> Allows fast motor / drive optimization without uncoupling the load.

Two sets of motor map parameters saved in the drive's memory
> Allows sequenced switching between two motors with different operating characteristics.

Configurable analog and digital I/O
> Customizes drive to the specific application.

S-ramp accel / decel profiling
> Provides smooth speed transitions, minimizing machine "jerk".

Built-in independent PID control
> Eliminates the need for an external PID controller while providing "outer loop" control of a process variable.

Real Time Clock remote keypad option
> For scheduling and timing operations.

Catch a Spinning Motor control
> Provides tripless startup of centrifugal fan loads.

Brake Controller
> Adjustable mechanical brake sequencing with torque proving function – no need for an external controller.

Snap-in (additional) Functionality

Parameter Copy

AI-SMART-ADAPTOR

The AI-BACKUP-ADAPTOR and AI-SMART-ADAPTOR provide fast and cost-effective drive-to-drive parameter transfer and storage using standard SD memory cards plus 24 Vdc control power backup connectivity. The smart adaptor includes a 4 GB SD card that is not included with the backup adaptor.

Operator Interfaces

Unidrive M200 and M300 drives include a bright easy to see LED keypad.

The Unidrive M400 has an optional multi-language CI-KEYPAD. Remote keypads and HMI options are available for all drives. For the greatest flexibility select the Unidrive M400.

REMOTE-KEYPAD

Fieldbus Communications

The available fieldbus and industrial Ethernet networks are CANopen, DeviceNet, EtherCAT EtherNet/IP, Modbus RTU, Modbus TCP, PROFIBUS DP and PROFINET RT.

SI-ETHERNET

Expandable I/O

In addition to the standard built-in I/O, an SI-I/O module is available. For the highest digital and analog I/O count possible select the Unidrive M400.

SI-I/O

SOFTWARE INCLUDED

Our software allows you to optimize the drive tuning, back up the configuration, configure the onboard automation and motion controller and set up the drive-to-drive communications links.

Our drive software is complimentary with no associated licensing fees.

UNIDRIVE M200/M201, M300 and M400 RATINGS

			Motor Power		Continuous Output Current	Peak Output Current	Motor Power		Continuous Output Current	Peak Output Current	Peak Output Current
			HP ①	kW			HP ①	kW			
100 / 120 VAC ±10%			**Normal Duty**				**Heavy Duty**				
Base Order Code Mx0x- ⑤	Frame	Input Phase	HP @ 460 V	kW @ 400 V	IN (A)	(A) ②	HP @ 460 V	kW @ 400 V	I$_H$ (A)	Open loop (A) ③	RFC (A) ④
01100017A	1	1					0.33	0.25	1.7	2.6	3.1
01100024A	1	1	For Normal Duty applications use Heavy Duty ratings				0.5	0.37	2.4	3.6	4.3
02100042A	2	1					1	0.75	4.2	6.3	7.6
02100056A	2	1					1.5	1.1	5.6	8.4	10.1

			Motor Power		Continuous Output Current	Peak Output Current	Motor Power		Continuous Output Current	Peak Output Current	Peak Output Current
			HP ①	kW			HP ①	kW			
200 / 240 VAC ±10%			**Normal Duty**				**Heavy Duty**				
Base Order Code Mx0x- ⑤	Frame	Input Phase	HP @ 230 V	kW @ 220 V	IN (A)	(A) ②	HP @ 230 V	kW @ 220 V	I$_H$ (A)	Open loop (A) ③	RFC (A) ④
01200017A	1	1					0.33	0.25	1.7	2.6	3.1
01200024A	1	1					0.5	0.37	2.4	3.6	4.3
01200033A	1	1					0.75	0.55	3.3	5	5.9
01200042A	1	1					1	0.75	4.2	6.3	7.6
02200024A	2	1/3					0.5	0.37	2.4	3.6	4.3
02200033A	2	1/3	For Normal Duty applications use Heavy Duty ratings				0.75	0.55	3.3	5	5.9
02200042A	2	1/3					1	0.75	4.2	6.3	7.6
02200056A	2	1/3					1.5	1.1	5.6	8.4	10.1
02200075A	2	1/3					2	1.5	7.5	11.3	13.5
03200100A	3	1/3					3	2.2	10	15	18
04200133A	4	1/3					3	3	13.3	20	23.9
04200176A	4	3					5	4	17.6	26.4	31.7
05200250A	5	3	10	7.5	30	33	7.5	5.5	25	37.5	50
06200330A	6	3	15	11	50	55	10	7.5	33	49.5	66
06200440A	6	3	20	15	58	63.8	15	11	44	66	88
07200610A	7	3	25	18.5	75	82.5	20	15	61	91	91.5
07200750A	7	3	30	22	94	103.4	25	18.5	75	112	112.5
07200830A	7	3	40	30	117	128.7	30	22	83	124	124.5
08201160A	8	3	50	37	149	163.9	40	30	116	174	174
08201320A	8	3	60	45	180	198	50	37	132	198	198
09201760A	9	3	75	55	216	237.6	60	45	176	264	264
09202190A	9	3	100	75	266	292.6	75	55	219	328	328.5
09201760E	9	3	75	55	216	237.6	60	45	176	264	264
09202190E	9	3	100	75	266	292.6	75	55	219	328	328.5

① Motor horsepower based on typical 4-pole motor ratings

② Peak current is 110% of drive rating for 165 seconds maximum*

③ Peak current is 150% of drive rating for 60 seconds maximum*

④ Frames 1 to 4 peak current is 180% of drive rating for 3 seconds maximum*
   Frames 5 to 8 peak current is 200% of drive rating for 28 seconds maximum*
   Frame 9 peak current is 175% of drive rating for 42 seconds maximum*

⑤ Add 10101AB100 to the base order code when ordering standard US (60 Hz) default products

*Peak current duration is dependent on drive temperature.

UNIDRIVE M200/M201, M300 and M400 RATINGS

			Motor Power		Continuous Output Current	Peak Output Current	Motor Power		Continuous Output Current	Peak Output Current	Peak Output Current
			HP ①	kW			HP ①	kW			
380 / 480 VAC ±10%			**Normal Duty**				**Heavy Duty**				
Base Order Code Mx0x- ⑤	Frame	Input Phase	HP @ 460 V	kW @ 400 V	IN (A)	(A) ②	HP @ 460 V	kW @ 400 V	I_H (A)	Open loop (A) ③	RFC (A) ④
02400013A	2	3					0.5	0.37	1.3	2.3	2.3
02400018A	2	3					0.75	0.55	1.8	3.2	3.2
02400023A	2	3					1	0.75	2.3	4.1	4.1
02400032A	2	3					1.5	1.1	3.2	5.8	5.8
02400041A	2	3			For Normal Duty applications use Heavy Duty ratings		2	1.5	4.1	7.4	7.4
03400056A	3	3					3	2.2	5.6	10.1	10.1
03400073A	3	3					3	3	7.3	13.1	13.1
03400094A	3	3					5	4	9.4	16.9	16.9
04400135A	4	3					7.5	5.5	13.5	24.3	24.3
04400170A	4	3					10	7.5	17	30.6	30.6
05400270A	5	3	20	15	30	33	20	11	27	40.5	54
05400300A	5	3	20	15	31	34.1	20	15	30	45	60
06400350A	6	3	25	18.5	38	41.8	25	15	35	52.5	70
06400420A	6	3	30	22	48	52.8	30	18.5	42	63	84
06400470A	6	3	50	30	63	69.3	30	22	47	70.5	94
07400660A	7	3	60	37	79	86.9	50	30	66	99	132
07400770A	7	3	75	45	94	103.4	60	37	77	115	154
07401000A	7	3	75	55	112	123.2	75	45	100	150	200
08401340A	8	3	125	75	155	170.5	100	55	134	201	268
08401570A	8	3	150	90	184	202.4	125	75	157	235	314
09402000A	9	3	150	110	221	243.1	150	90	180	300	350
09402240A	9	3	200	132	255	292.6	150	110	211	336	392
09402000E	9	3	150	110	221	243.1	150	90	180	300	350
09402240E	9	3	200	132	255	292.6	150	110	211	336	392

① Motor horsepower based on typical 4-pole motor ratings
② Peak current is 110% of drive rating for 165 seconds maximum*
③ Peak current is 150% of drive rating for 60 seconds maximum*
④ Frames 1 to 4 peak current is 180% of drive rating for 3 seconds maximum*
  Frames 5 to 8 peak current is 200% of drive rating for 28 seconds maximum*
  Frame 9 peak current is 175% of drive rating for 42 seconds maximum*
⑤ Add 10101AB100 to the base order code when ordering standard US (60 Hz) default products

*Peak current duration is dependent on drive temperature.

UNIDRIVE M200/M201, M300 and M400 RATINGS

Base Order Code Mx0x- ⑤	Frame	Input Phase	Motor Power		Continuous Output Current	Peak Output Current	Motor Power		Continuous Output Current	Peak Output Current	Peak Output Current
			HP ①	kW			HP ①	kW			
500 / 575 VAC ±10%			HP @ 575 V	kW @ 575 V	**Normal Duty**		HP @ 575 V	kW @ 575 V	**Heavy Duty**		
					IN (A)	(A) ②			I_H (A)	Open loop (A) ③	RFC (A) ④
05500030A	5	3	3	2.2	3.9	4.3	2	1.5	3	4.5	6
05500040A	5	3	5	4	6.1	6.7	3	2.2	4	6	8
05500069A	5	3	7.5	5.5	10	11	5	4	6.9	10.3	13.8
06500100A	6	3	10	7.5	12	13.2	7.5	5.5	10	15	20
06500150A	6	3	15	11	17	18.7	10	7.5	15	22.5	30
06500190A	6	3	20	15	22	24.2	15	11	19	28.5	38
06500230A	6	3	25	18.5	27	29.7	20	15	23	34.5	46
06500290A	6	3	30	22	34	37.4	25	18.5	29	43.5	58
06500350A	6	3	40	30	43	47.3	30	22	35	52.5	70
07500440A	7	3	50	37	53	58.3	40	30	44	66	88
07500550A	7	3	60	45	73	80.3	50	37	55	82.5	110
08500630A	8	3	75	55	86	94.6	60	45	63	94.5	126
08500860A	8	3	100	75	108	118.8	75	55	86	129	172
09501040A	9	3	125	90	125	137.5	100	75	104	156	182
09501310A	9	3	150	110	150	165	125	90	131	196	229.2
09501040E	9	3	125	110	125	137.5	100	75	104	156	182
09501310E	9	3	150	110	150	165	125	90	131	196	229.2

① Motor horsepower based on typical 4-pole motor ratings
② Peak current is 110% of drive rating for 165 seconds maximum*
③ Peak current is 150% of drive rating for 60 seconds maximum*
④ Frames 1 to 4 peak current is 180% of drive rating for 3 seconds maximum*
   Frames 5 to 8 peak current is 200% of drive rating for 28 seconds maximum*
   Frame 9 peak current is 175% of drive rating for 42 seconds maximum*
⑤ Add 10101AB100 to the base order code when ordering standard US (60 Hz) default products
*Peak current duration is dependent on drive temperature.

UNIDRIVE M200/M201, M300 and M400 RATINGS

			Motor Power		Continuous Output Current	Peak Output Current	Motor Power		Continuous Output Current	Peak Output Current	Peak Output Current
			HP [1]	kW			HP [1]	kW			
500 / 690 VAC ±10%			**Normal Duty**				**Heavy Duty**				
Base Order Code Mx0x- [5]	Frame	Input Phase	HP @ 690 V	kW @ 690 V	IN (A)	(A) [2]	HP @ 690 V	kW @ 690 V	I_H (A)	Open loop (A) [3]	RFC (A) [4]
07600190A	7	3	25	18.5	23	25.3	20	15	19	28.5	38
07600240A	7	3	30	22	30	33	25	18.5	24	36	48
07600290A	7	3	40	30	36	39.6	30	22	29	43.5	58
07600380A	7	3	50	37	46	50.6	40	30	38	57	76
07600440A	7	3	60	45	52	57.2	50	37	44	66	88
07600540A	7	3	75	55	73	80.3	60	45	54	81	108
08600630A	8	3	100	75	86	94.6	75	55	63	94.5	126
08600860A	8	3	125	90	108	118.8	100	75	86	129	172
09601040A	9	3	150	110	125	137.5	125	90	104	156	182
09601310A	9	3	175	132	155	170.5	150	110	131	196	229.2
09601040E	9	3	150	110	125	137.5	125	90	104	156	182
09601310E	9	3	175	132	155	170.5	150	110	131	196	229.2

[1] Motor horsepower based on typical 4-pole motor ratings

[2] Peak current is 110% of drive rating for 165 seconds maximum*

[3] Peak current is 150% of drive rating for 60 seconds maximum*

[4] Frames 1 to 4 peak current is 180% of drive rating for 3 seconds maximum*
Frames 5 to 8 peak current is 200% of drive rating for 28 seconds maximum*
Frame 9 peak current is 175% of drive rating for 42 seconds maximum*

[5] Add 10101AB100 to the base order code when ordering standard US (60 Hz) default products
*Peak current duration is dependent on drive temperature.

UNIDRIVE M200/M201 and M300 FEATURES

Optional AI-485-ADAPTOR and AI-485-24V-ADAPTOR for RS485 communications

Optional AI-BACKUP-ADAPTOR allows the drive to use an SD card for parameter cloning and acts as an input for 24 V

Optional AI-SMART-ADAPTOR has 4 GB built-in memory for parameter cloning and 24 V

Optional IP66 (NEMA 4) rated remote keypad with intuitive plain text multilingual back-lit LCD display for rapid setup and superior diagnostics.

An optional IP54 (NEMA 12) remote real time clock keypad is also available with reverse button and battery backup.

Dual onboard Safe Torque Off (STO) terminals for easy SIL3 conformity **(M300)**

LED keypad fitted as standard for quick commissioning and ease of use

Conventional surface mount and DIN rail alignment (DIN rail alignment available on size 1 and 2 only)

User-friendly control connections

Useful parameter guide on drive's front panel

Easy-to-disconnect internal EMC filter

User-friendly power connections

Drive rated to IP21 / UL open class (NEMA 1) on size 1 to 4 as standard
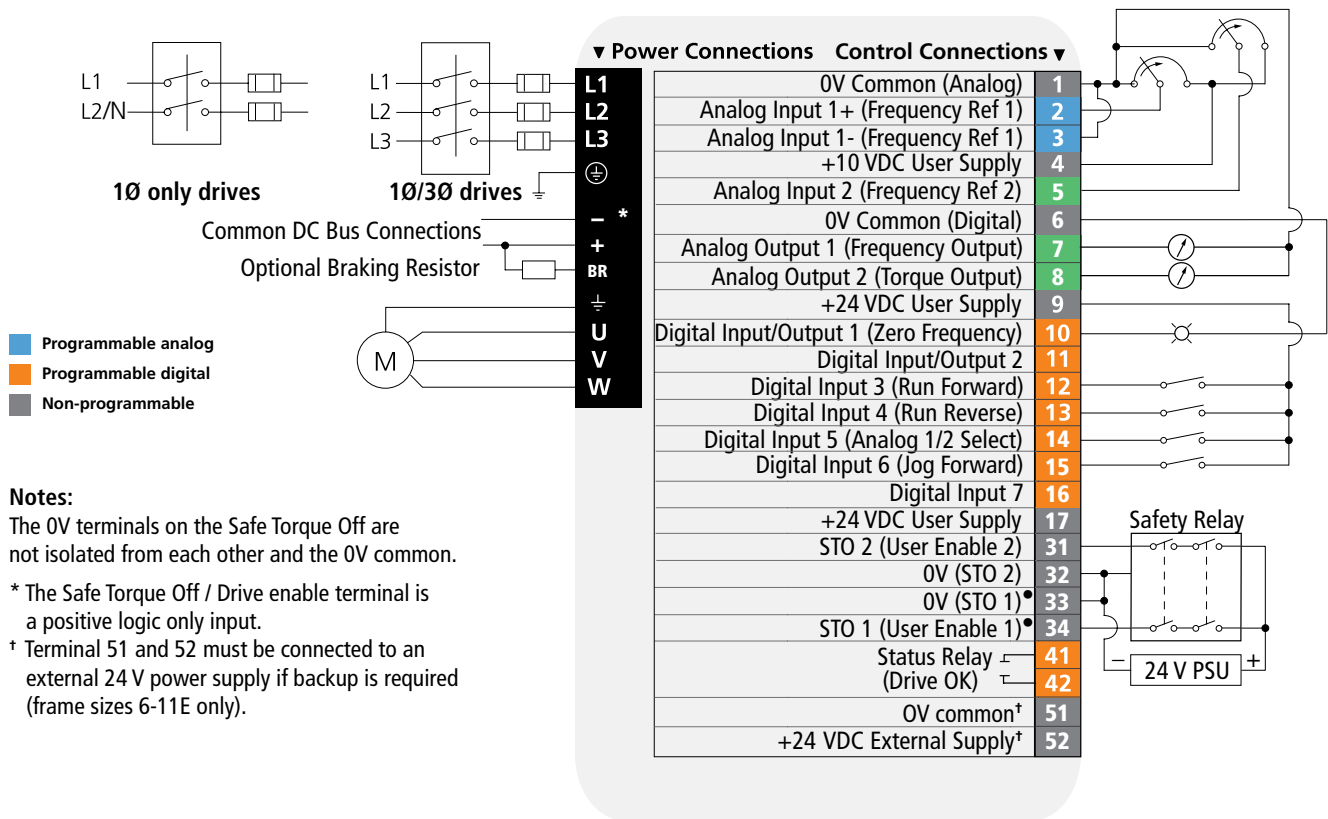
Conduit kits are available to meet UL Type 1 rating

Robust cable management system provides grounding point for shielded control and power cables

System Integration (SI) option module

System Integration (SI) module slot for communications, fieldbus, industrial Ethernet and additional I/O options (frame size 2 and upwards)

UNIDRIVE M200/M201 and M300 TERMINAL DIAGRAM

1Ø only drives

1Ø/3Ø drives

Common DC Bus Connections

Optional Braking Resistor

- **Programmable analog**
- **Programmable digital**
- **Non-programmable**

Notes:
The 0V terminals on the Safe Torque Off are not isolated from each other and the 0V common.

* The Safe Torque Off / Drive enable terminal is a positive logic only input.

† Terminal 51 and 52 must be connected to an external 24 V power supply if backup is required (frame sizes 6-11E only).

▼ Power Connections	Control Connections ▼	
	0V Common	1
	Analog Input 1 (Frequency Ref 1)	2
	+10 VDC User Supply	4
	Analog/Digital Input (Frequency Ref 2)	5
	Analog Output (Frequency Output)	7
	+24 VDC User Supply	9
	Digital Input/Output 1 (Zero Frequency)	10
	Digital Input 2 (Drive Enable)	11
	Digital Input 3 (Run Forward)	12
	Digital Input 4 (Run Reverse)	13
	Digital Input 5 (Analog 1/2 Select)	14
	STO 2 (User Enable 2)	31
	0V (STO 2)	32
	0V (STO 1)•	33
	STO 1 (User Enable 1)•	34
	Status Relay	41
	(Drive OK)	42
	0V common†	51
	+24 VDC External Supply†	52

Safety Relay

24 V PSU

TERMINAL DESCRIPTION

Pin #	Default Function	Type/Description	Notes
1	0V common	Common for external analog signals	
2	Frequency reference 1	Single ended analog input 11 bit	0 to +10 Vdc, 0-20 mA or 4-20 mA
4	+10 Vdc user supply	Reference supply	5 mA
5	Frequency reference 2	Single ended analog input 11 bit or digital input	0 to +10 Vdc or 0 to + 24 Vdc
7	Output frequency	Single ended analog output	0 to +10 Vdc
9	+24 Vdc user supply	Digital I/O supply	100 mA
10	At zero frequency	Digital I/O 1	0 to +24 Vdc
11	Enable	Digital input 2	0 to +24 Vdc
12	Run Forward	Digital input 3	0 to +24 Vdc
13	Run Reverse	Digital input 4	0 to +24 Vdc
14	Analog input 1/2 select	Digital input 5	0 to +24 Vdc
31 (35•)	Safe Torque Off/ Drive enable	STO 2	0 to +24 Vdc
32 (36•)	0V STO 2	0V STO 2	0V common for STO 2
33 (32•)	0V STO 1	0V STO 1	0V common for STO 1
34 (31•)	Safe Torque Off/ Drive enable	STO 1	0 to +24 Vdc
41	Status relay (drive OK)	Normally open contact	2 A, 240 Vac, 0.5 A, 30 Vdc inductive load
42			
51†	0V common	Common for backup supply	
52†	+24 Vdc external supply	Backup control supply	24 Vdc, 40 W

UNIDRIVE M400 FEATURES

Optional AI-485-ADAPTOR and AI-485-24V-ADAPTOR for RS485 communications

Optional AI-BACKUP-ADAPTOR allows the drive to use an SD card for parameter cloning and acts as an input for 24 V backup. Optional AI-SMART-ADAPTOR has built-in memory for parameter cloning and 24 V backup

Optional CI-KEYPAD - intuitive plain text multilingual back-lit LCD keypad for rapid setup and superior diagnostics

Optional IP66 (NEMA 4) rated remote keypad with intuitive plain text multilingual back-lit LCD display for rapid setup and superior diagnostics

An optional IP54 (NEMA 12) remote real time clock keypad is also available with reverse button and battery backup

Power-on / drive status LED

Dual onboard Safe Torque Off (STO) terminals for easy SIL3 conformity

Conventional surface mount and DIN rail alignment (DIN rail alignment available on size 1 and 2 only)

Drive rated to IP21 / UL open class (NEMA 1) on size 1 to 4 as standard

User-friendly control connections

Conduit kits are available to meet UL Type 1 rating

Easy-to-disconnect internal EMC filter*

User-friendly power connections*

Easy-to-remove terminal cover with tool-less close system (patent pending)

Robust cable management system providing grounding point for shielded control and power cables

System Integration (SI) option module

System Integration (SI) module slot for communications, fieldbus, industrial Ethernet and additional I/O options (frame size 2 and upwards)

*Features and their locations vary on some drive sizes.

UNIDRIVE M400 TERMINAL DIAGRAM

1Ø only drives

1Ø/3Ø drives

Common DC Bus Connections

Optional Braking Resistor

- Programmable analog (blue)
- Programmable digital (orange)
- Non-programmable (grey)

Notes:

The 0V terminals on the Safe Torque Off are not isolated from each other and the 0V common.

* The Safe Torque Off / Drive enable terminal is a positive logic only input.

† Terminal 51 and 52 must be connected to an external 24 V power supply if backup is required (frame sizes 6-11E only).

▼ Power Connections   Control Connections ▼

0V Common (Analog)	1
Analog Input 1+ (Frequency Ref 1)	2
Analog Input 1- (Frequency Ref 1)	3
+10 VDC User Supply	4
Analog Input 2 (Frequency Ref 2)	5
0V Common (Digital)	6
Analog Output 1 (Frequency Output)	7
Analog Output 2 (Torque Output)	8
+24 VDC User Supply	9
Digital Input/Output 1 (Zero Frequency)	10
Digital Input/Output 2	11
Digital Input 3 (Run Forward)	12
Digital Input 4 (Run Reverse)	13
Digital Input 5 (Analog 1/2 Select)	14
Digital Input 6 (Jog Forward)	15
Digital Input 7	16
+24 VDC User Supply	17
STO 2 (User Enable 2)	31
0V (STO 2)	32
0V (STO 1)•	33
STO 1 (User Enable 1)•	34
Status Relay	41
(Drive OK)	42
0V common†	51
+24 VDC External Supply†	52

Safety Relay

24 V PSU

TERMINAL DESCRIPTION

Pin #	Default Function	Type/Description	Notes
1	0V common	Common for external analog signals	
2	Frequency reference 1	Single/double ended analog input 11 bit	0 to +/-10 Vdc, 0-20 mA or 4-20 mA
3	Frequency reference 1	Single/double ended analog input 11 bit	0 to +10 Vdc, 0-20 mA or 4-20 mA
4	+10 Vdc user supply	Reference supply	5 mA
5	Frequency reference 2	Single ended analog input 11 bit or digital input	0 to +10 Vdc, 0-20 mA or 4-20 mA or 0 to 24 Vdc
6	Digital I/O 0V	Common for external digital signals	
7	Output frequency	Single ended analog output or digital output	0 to +10 Vdc, 0-20 mA or 4-20 mA or 0 to 24 Vdc
8	Output torque	Single ended analog output or digital output	0 to +10 Vdc, 0-20 mA or 4-20 mA or 0 to 24 Vdc
9	+24 Vdc user supply	Digital I/O supply	100 mA
10	At zero frequency	Digital I/O 1	0 to +24 Vdc
11	Unassigned	Digital I/O 2	0 to +24 Vdc
12	Run Forward	Digital input 3	0 to +24 Vdc
13	Run Reverse	Digital input 4	0 to +24 Vdc
14	Analog input 1/2 select	Digital input 5, thermistor input	0 to +24 Vdc
15	Jog forward	Digital input 6 or Frequency or AB encoder input	0 to +24 Vdc
16	Unassigned	Digital input 7 or AB encoder input	0 to +24 Vdc
17	+24 Vdc user supply		
31 (35•)	Safe Torque Off/ Drive enable	STO 2	0 to +24 Vdc
32 (36•)	0V STO 2	0V STO 2	0V common for STO 2
33 (32•)	0V STO 1	0V STO 1	0V common for STO 1
34 (31•)	Safe Torque Off/ Drive enable	STO 1	0 to +24 Vdc
41	Status relay (drive OK)	Normally open contact	2 A, 240 Vac, 0.5 A, 30 Vdc inductive load
42			
51†	0V common	Common for backup supply	
52†	+24 Vdc external supply	Backup control supply	24 Vdc, 40 W

UNIDRIVE M200/M201, M300 and M400 SPECIFICATIONS

Environment

Ambient Operating Temperature	Size 1 -4: -20°C to 60°C (-4°F to 140°F) @ 3 kHz carrier freq. Size 5 - 9: -20°C to 55°C (-4°F to 131°F) @ 3 kHz carrier freq. Size 1-4: Operation to 60°C (140°F) with de-rating Size 5-9: Operation to 55°C (131°F) with de-rating
Cooling method	Convection and forced convection, model dependent
Humidity	95% maximum non-condensing at 40°C (104°F)
Storage Temperature	Size 1 - 4: -40°C to 60°C (-40°F to 140°F) — 24 months Max. Size 5 - 9: -40°C to 55°C (-40°F to 131°F) — 24 months Max.
Altitude	Derate the continuous output current by 1% for every 100 m (328 ft) above 1000 m (3,280 ft) to a maximum of 3000 m (9,840 ft).
Vibration	Tested in accordance with IEC 60068-2-64 and IEC 60068-2-6
Mechanical Shock	Tested in accordance with IEC 60068-2-27 and IEC 60068-2-29
Enclosure	IP20, NEMA 1 conduit kits available
Electromagnetic	In compliance with IEC/EN61000-4-2/3/4/5/6/11, IEC/EN61000-6-1/2/3, IEC/EN61800-3 Immunity
RoHS	Meets the EU directive 2002-95-EC

AC Supply Requirements

Voltage	100 V models: 100 to 120 Vac ±10% (size 1, 2) 200 V models: 200 to 240 Vac ±10% (size 1-9) 400 V models: 380 to 480 Vac ±10% (size 2-9) 500 V models: 500 to 575 Vac ±10% (size 5-9) 600 V models: 500 to 690 Vac ±10% (size 7-9)
Phase	1Ø and 3Ø (Model dependent)
Maximum Supply Imbalance	2% negative phase sequence, 3% voltage imbalance between phases
Input Frequency	45 to 66 Hz
Input Displacement Power Factor	0.97

Control

Carrier Frequency	Size 1 - 4: 0.667, 1, 2, 3, 4, 6, 8 12 & 16 kHz Size 5 - 9: 2, 3, 4, 6, 8 12 & 16 kHz
Output Frequency	Up to 550 Hz
Frequency Accuracy	±0.02% of full scale
Frequency Resolution	0.01 Hz
Analog Input Resolution	Voltage mode: 11 bits (unipolar)
	Voltage mode: 11 bits + 1 sign bit (bipolar) (M400 only)
	Current mode: 11 bits
Braking	DC injection braking standard. Dynamic braking transistor included, requires external resistor

Protection

DC Bus Undervoltage Trip	100 V models: 175 Vdc (approx. 61 Vac line voltage) 200 V models: 175 Vdc (approx. 123 Vac line voltage) 400 V models: 330 Vdc (approx. 233 Vac line voltage) 500 V models: 435 Vdc (approx. 308 Vac line voltage) 600 V models: 435 Vdc (approx. 308 Vac line voltage)
DC Bus Overvoltage Trip	100 V models: 510 Vdc (approx. 180 Vac line voltage) 200 V models: 510 Vdc (approx. 361 Vac line voltage) size 1-4 415 Vdc (approx. 293 Vac line voltage) size 5-9 400 V models: 870 Vdc (approx. 615 Vac line voltage) size 1-4 830 Vdc (approx. 587 Vac line voltage) size 5-9 500 V models: 990 Vdc (approx. 700 Vac line voltage) 600 V models:1190 Vdc (approx. 841 Vac line voltage)
Drive Overload Trip	Current overload value is exceeded. Programmable to allow up to 150% of drive current for 60 seconds.
Instantaneous Overcurrent Trip	Size 1 - 4: 220% of rated motor current Size 5 - 9: 150% to 220% of full rated motor current (model dependent)
Phase Loss Trip	DC bus ripple threshold exceeded
Overtemperature Trip	Drive heatsink temperature exceeds 95°C (203°F)
Short Circuit Trip	Protects against output phase-to-phase fault
Ground Fault Trip	Protects against output phase-to-ground fault
Motor Thermal Trip	Electronically protects the motor from overheating due to loading conditions

Approval & Listings

UL, cUL	UL File #E171230
CE	CE approval
C✔	N1652
ISO	9001:2015, 14001
RoHS	RoHS Compliant
TÜV	EN ISO 13849-1 - Cat 4, PL e, EN61800-5-2/ EN62061/IEC 61508 - SIL 3 Safe Torque Off (Unidrive M300 & M400 only) UL yellow card certification reference FSPC E171230

UNIDRIVE M200/M201, M300 and M400 DIMENSIONS

Size 1

Size 2

Size 3

Size 4

Size 5

Size 6

Size 7

Size 8

Size 9E

Size 9A

Frame size	H		W		D		Weight	
	in	mm	in	mm	in	mm	lbs	kg
1	6.3	160	3.0	75	5.1	130	1.7	.75
2	8.1	205	3.1	78	5.9	150	2.2	1.0
3	8.9	226	3.5	90	6.3	160	3.3	1.5
4	10.9	277	4.5	115	6.9	175	6.9	3.13
5	15.4	391	5.6	143	7.9	201	16.3	7.4
6	15.4	391	8.3	210	9.0	229	30.9	14
7	21.9	556	10.6	270	11.0	280	61.7	28
8	31.7	805	12.2	310	11.4	290	114.6	52
9E	39.8	1010	12.2	310	11.4	290	101.4	46
9A	43.6	1107	12.2	310	11.4	290	146.6	66.5
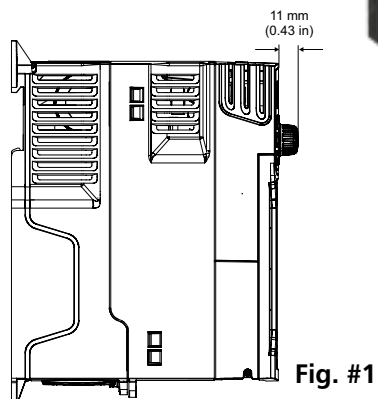
11 mm
(0.43 in)

Fig. #1

To accommodate the added depth with a potentiometer, add 0.43 in (11 mm) to the depth of the M201 drives.
See Fig. #1 above. For NEMA Kit dimensions see page 30.

OPTIONS AT-A-GLANCE

Option	Description	Order code
Drive Configuration & Programming	Configuration software	UNIDRIVE-M-CONNECT
	USB Cable for PC to drive (requires a 485 adaptor)	CT-USB-CABLE
	Cloning and parameter storage (includes 4 GB SD card)	AI-SMART-ADAPTOR
	Cloning and parameter storage (requires SD card)	AI-BACKUP-ADAPTOR
	8GB SD Card	CTSD8GB
Operator Interfaces	Fixed LED display	M200, M300
	Fixed LED display with speed reference potentiometer	M201
	Plain text multi-language LCD display	CI-KEYPAD-LCD (M400 only)
	Remote LCD display (requires cable)	REMOTE-KEYPAD
	Remote LCD display with real-time clock (requires cable)	REMOTE-KEYPAD-RTC
	Remote display cable	UM-LCD-485-XXX*
	HMI operator interfaces	See Unidrive M Accessories
Input/Output (Sizes 2 and up accept up to one SI total)	Extended I/O	SI-I/O
Communications (Sizes 2 and up accept up to one SI total)	Modbus RTU	AI-485-ADAPTOR
	Modbus RTU with 24 V backup connections	AI-485-24V-ADAPTOR
	Modbus RTU	CI-485-ADAPTOR (M400 only)
	PROFIBUS DP	SI-PROFIBUS
	DeviceNet	SI-DEVICENET
	CANopen	SI-CANOPEN
	PROFINET RT	SI-PROFINET
	EtherCAT	SI-ETHERCAT
	EtherNet /IP, Modbus TCP	SI-ETHERNET
Application Programming Software (IEC61131-3)	PLC programming	MACHINE-CONTROL-STUDIO
Power Accessories	Internal EMC filters	Standard
	External EMC filters	See Unidrive M Accessories
	Line & load reactors	
	Dynamic braking resistors	
Environmental Protection & Cable Management	NEMA 1 / UL Type 1 conduit box kits	See Unidrive M Accessories
	Retrofit kits for Commander SK replacement	
	Fan replacement kits	

*XXX=cable length in 5 foot increments (max 330 ft), standard lengths are (005, 010, 015, 025 and 050)

Options

The Unidrive M200-M400 series have been designed to offer simplicity with an impressive selection of options and standard features. It also offers functionality that enables users to get more productivity from their machines.

Drive Programming and Configuration

Parameter sets can be easily transferred between drives using an SD card with AI-BACKUP-ADAPTOR or AI-SMART-ADAPTOR.

The AI-BACKUP-ADAPTOR and AI-SMART-ADAPTOR provide fast and cost-effective drive-to-drive parameter transfer and storage using standard SD memory cards plus 24 Vdc control power back up connectivity. The smart adaptor includes a 4 GB SD card that is not included with the backup adaptor.

AI-BACKUP-ADAPTOR
(provides SD card usage for programming / cloning)

AI-SMART-ADAPTOR
(provides SD card (supplied) usage for programming / cloning)

Diagnostic Software

The **Drive Diagnostics APP** allows users to quickly diagnose faults. In the unlikely event that you get a drive error, download our free Diagnostics Tool app. It is available for Apple, Android and Windows operating systems. Just input the error code on your device and you'll be given a solution. You can download our Diagnostics Tool App at:
www.controltechniques.com/mobile-applications

For more information, refer to the Unidrive M Accessories brochure.

Programming and Commissioning Software

Unidrive M Connect commissioning tool

Unidrive M Connect is our latest drive configuration tool for commissioning, optimizing and monitoring drive/system performance. Its development draws from extensive user research, using human centered design principles to give the ultimate user experience:

- Task based commissioning is simplified via familiar Windows interface
- Intuitive graphical tools enhance and simplify user experience
- Dynamic drive logic diagrams and searchable listings are present
- Drive and motor performance can be optimized with minimal specialized drive knowledge
- Supports the import of Commander SK parameter files and allows full drive cloning
- Multiple simultaneous communications channels for a more complete overview of the system
- Drive Discovery gives the ability to find drives on a network automatically without the user having to specify their addresses
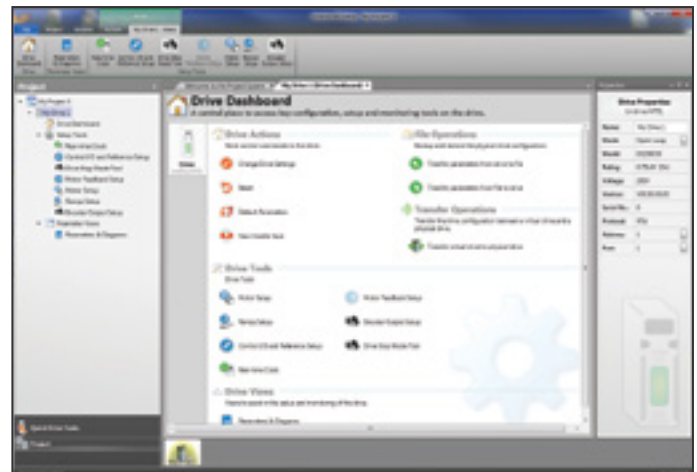
Unidrive M drive and motor setup tool screen

SOFTWARE INCLUDED

Our software allows you to optimize the drive tuning, back up the configuration, configure the onboard automation and motion controller and set up the drive-to-drive communications links.

Our drive software is complimentary with no associated licensing fees.

UNIDRIVE M200/M201, M300 and M400

Operator Interfaces

Depending on the model, the Unidrive M200-M400 drives can operate and be set up using the standard fixed keypad, the REMOTE-KEYPAD, REMOTE-KEYPAD-RTC or the multi-language CI-KEYPAD-LCD (Unidrive M400 only).

The REMOTE-KEYPAD is a NEMA4 (IP66) rated LCD keypad that can be remote mounted with the same features as the CI-KEYPAD. The REMOTE-KEYPAD-RTC provides an additional auxiliary function button for remote forward/reverse or run reverse control and is rated to NEMA12 (IP65). Either an AI-485-ADAPTOR or CI-485-ADAPTOR (M400 only) is required plus a UM-485-xxx cable in order to connect a remote keypad option. These items must be ordered separately.

User Keypad Options

Unidrive M benefits from a number of keypad choices to meet your application needs. Unidrive M is quick and easy to set up. The drives may be configured using a selection of keypads, SD or SmartCard or the supplied commissioning software that guides the user through the configuration process.

Human Machine Interface (HMI)

These operator interface units complement the product line by offering an impressive way of accessing parameters and adding more programming power to your application. Optional keypads, remote keypads, and operator interface terminals enable greater control and oversight of your drives and applications. Our unique open communications platform allows; drive-to-PLC, drive-to-I/O, and drive-to-operator interface communication. HMI offerings extend from 2-line terminals to color touch-screen panels.

Type		Benefit	M100	M200	M300	M400	Order Code
Fixed LED Keypad		LED keypad fitted as standard for quick and easy commissioning and use.	•	•	•		Fixed Standard (not orderable separately)
Fixed LED keypad with speed reference potentiometer		LED keypad with user friendly speed reference potentiometer for quick and easy commissioning and use.	M101	M201			Fixed Standard (not orderable separately)
LCD Keypad		Three line plain text, multi-language LCD keypad for rapid setup and helpful diagnostics maximizes machine up-time.				Opt	CI-KEYPAD-LCD
Remote Keypad		All the features of the CI-KEYPAD-LCD, but remote mountable. This allows flexible mounting on the outside of a panel and meets IP66 (NEMA 4).		Opt*	Opt*	Opt*	REMOTE-KEYPAD
Remote Keypad RTC		The keypad is remote mountable, allowing flexible mounting on the outside of a panel (meets IP54/ NEMA 12). Three line multi-language plus custom text LCD keypad for rapid setup and helpful diagnostics. Battery operated real-time clock allows accurate time stamping of events, aiding diagnostics.		Opt*	Opt*	Opt*	REMOTE-KEYPAD-RTC

*Requires an RS485 adaptor and cable (order code: UM-LCD-485-xxx)

For more information, refer to the Unidrive M Accessories brochure.

Communications & I/O

Integrate, automate, communicate with Unidrive M options

Unidrive M drives support a wide range of optional click-in System Integration (SI) modules that allow them to integrate seamlessly with existing automation systems and other vendor supplied equipment. These include communications, I/O, feedback devices, and onboard PLCs.

System Integration Modules

Option		Description	Type	M100	M200	M300	M400
SI-ETHERNET		Ethernet module supports EtherNet/IP and Modbus TCP/IP.	Communications		•	•	•
SI-ETHERCAT		EtherCAT interface module.			•	•	•
SI-PROFINET-V2		PROFINET RT interface module.			•	•	•
SI-PROFIBUS		PROFIBUS DP interface module.			•	•	•
SI-CANOPEN		CANopen interface module			•	•	•
SI-DEVICENET		DeviceNet interface module.			•	•	•
SI-I/O		Extended I/O interface module - increase the number of analog and digital I/O on a drive.	Additional I/O		•	•	•

Drive Interface Units

Option		Description	Type	M100	M200	M300	M400
AI-BACKUP-ADAPTOR		Port adaptor for SD card parameter cloning, and an input for 24 V backup.	Backup	•	•	•	•
AI-SMART-ADAPTOR		Built-in memory for parameter cloning and 24 V backup.		•	•	•	•
AI-485-ADAPTOR		RS485 Adaptor for Modbus RTU communications.	Communications		•	•	•
AI-485-24V-ADAPTOR		RS485 Adaptor for Modbus RTU communications with 24 V backup connections.			•	•	•
CI-485-ADAPTOR		RS485 Adaptor for Modbus RTU communications.					•
CT-USB-CABLE		USB Communications cable to connect to a PC for use with Unidrive M's PC tools.	Cable		•†	•†	•†

†Also requires an adaptor

Inputs and Outputs

SI-I/O Option Module

4 x Digital I/O
3 x Analog inputs (default) / digital inputs
1 x Digital input
2 x Relays

Onboard - Unidrive M200

3 x Analog I/O
5 x Digital I/O
1 x Relay

Onboard - Unidrive M300

3 x Analog I/O
5 x Digital I/O
2 x STO
1 x Relay

Onboard - Unidrive M400

4 x Analog I/O
7 x Digital I/O
2 x STO
1 x Relay

PLC Programming Software

Machine Control Studio

Unidrive M200-M400's onboard PLC is programmed using Machine Control Studio which provides a flexible and intuitive environment for programming.

IEC 61131-3 automation programming

The programming environment is fully IEC 61131-3 compliant and therefore familiar, fast and easy to use for control engineers around the world.

Supports IEC 61131-3 programming languages:
• Structured Text (ST)
• Function Block Diagram (FBD)
• Structured Function Chart (SFC)
• Ladder Diagram (LD)
• Instruction List (IL)

Also supported:
• Continuous Function Chart (CFC)

Intuitive IntelliSense functionality helps to write consistent and robust programs, speeding up software development.

Programmers have access to a vibrant open-source community for function blocks. Machine Control Studio also supports customers' own function block libraries, with on-line monitoring of program variables with user defined watch windows and help for on-line change of programs, in line with latest PLC practices.
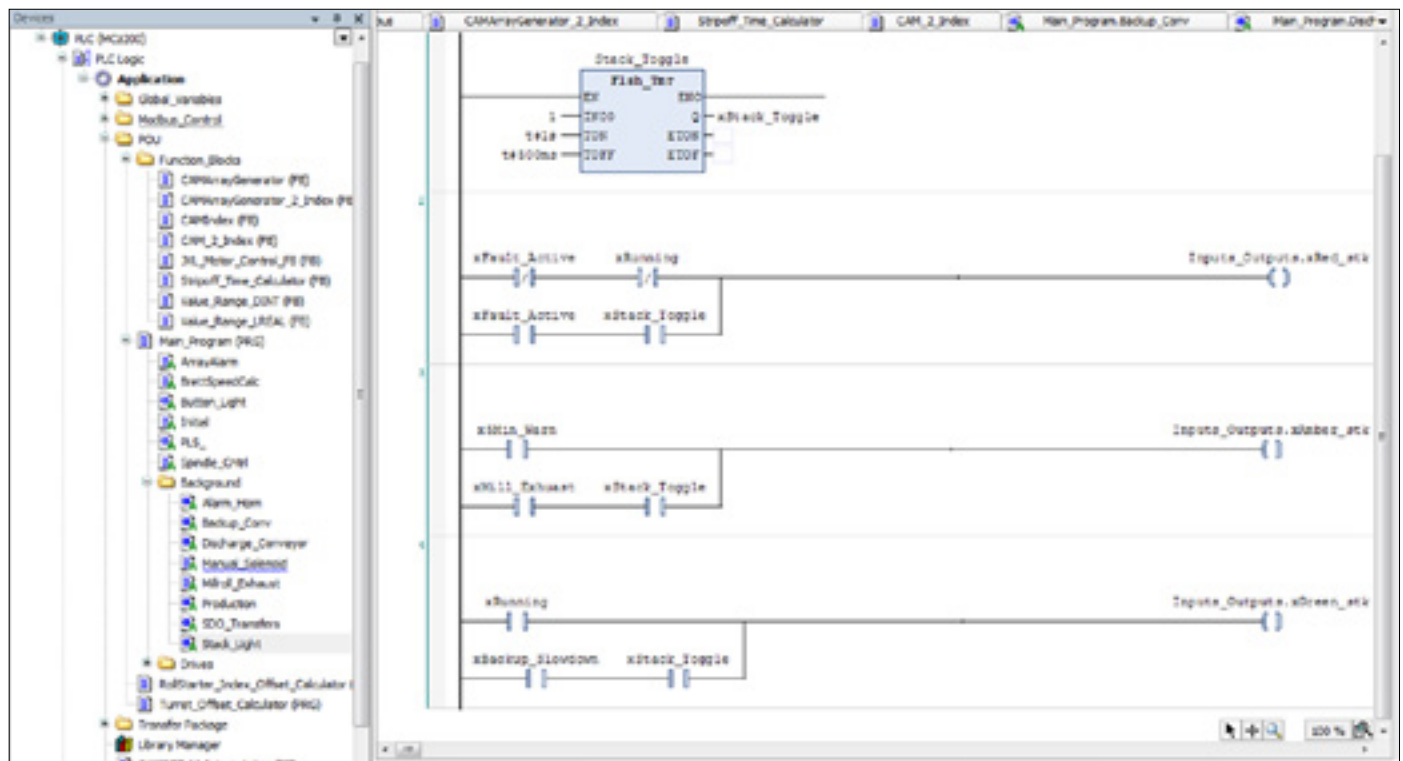
Ladder Logic

SOFTWARE INCLUDED

Our software allows you to optimize the drive tuning, back up the configuration, configure the onboard automation and motion controller and set up the drive-to-drive communications links.

Our drive software is complimentary with no associated licensing fees.

Power Accessories

Optional external EMC filters

Unidrive M built-in EMC filter complies with EN/IEC 61800-3. External EMC filters are required for compliance with EN/IEC 61000-6-4 as per the table below.

Frame size	Voltage	Phases	Type	Order code
1	All	1	Standard	4200-1000
	All	1	Low leakage	4200-1001
2	100 V	1	Standard	4200-2000
	200 V	1	Standard	4200-2001
	200 V	1	Low leakage	4200-2002
	200 V	3	Standard	4200-2003
	200 V	3	Low leakage	4200-2004
	400 V	3	Standard	4200-2005
	400 V	3	Low leakage	4200-2006
3	200 V	1	Standard	4200-3000
	200 V	1	Low leakage	4200-3001
	200 V	3	Standard	4200-3004
	200 V	3	Low leakage	4200-3005
	400 V	3	Standard	4200-3008
	400 V	3	Low leakage	4200-3009
4	200 V	1	Standard	4200-4000
	200 V	1	Low leakage	4200-4001
	200 V	3	Standard	4200-4002
	200 V	3	Low leakage	4200-4003
	400 V	3	Standard	4200-4004
	400 V	3	Low leakage	4200-4005
5	200 V	3	Standard	4200-0312
	400 V	3	Standard	4200-0402
	575 V	3	Standard	4200-0122
6	200 V	3	Standard	4200-2300
	400 V	3	Standard	4200-4800
	575 V	3	Standard	4200-3690
7	200 V & 400 V	3	Standard	4200-1132
	575 V & 690 V	3	Standard	4200-0672
8	200 V & 400 V	3	Standard	4200-1972
	575 V & 690 V	3	Standard	4200-1662
9A	200 V & 400 V	3	Standard	4200-3021
	575 V & 690 V	3	Standard	4200-1660
9E	200 V & 400 V	3	Standard	4200-4460
	575 V & 690 V	3	Standard	4200-2210

External EMC filter

Line and Load Reactors

Line reactors (sometimes called "line chokes") are a common power accessory for electronic variable speed drives. These components add an extra margin of protection for AC drives from supply transients. Line reactors are strongly recommended for installation with AC drives that do not have built-in inductors. Load reactors are used on the output of AC drives to reduce the effects of high motor wiring capacitance and to "soften" the dV/dt (rate of change of voltage) applied to the motor windings.
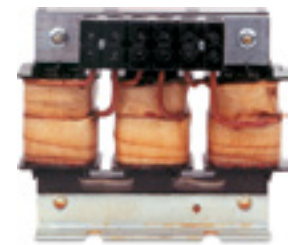
Line/Load Reactor

DB Resistors

AC drives provide a constant torque stopping profile when a dynamic brake resistor is applied across the DC bus circuit. Dynamic braking can be employed under a stop command or anytime a decrease in motor speed is commanded, provided the AC drive is enabled and programmed for ramp stop (fast ramp mode). Two types of dynamic braking kits are available for Control Techniques AC Drives. The E-stop duty kits are rated for light start/stop or deceleration duty cycles. The cyclic duty kits are intended for heavy duty applications that need the capability to dissipate regenerated energy on a more continuous or repetitive basis such as downhill conveyors, hoists and feeders.

Galvanized NEMA 1 with normally closed thermostat

See the Unidrive M Accessories brochure for full details.

Environmental Protection and Cable Management

UL Type 1 Conduit boxes

Frame size	Order code	H		W		D	
		in	mm	in	mm	in	mm
1	C-BOX-OF1	9.9	252	3.0	75	5.1	130
2	C-BOX-OF2	11.6	294	3.0	75	5.9	150
3	C-BOX-OF3	12.4	314	3.5	90	6.3	160
4	C-BOX-OF4	14.3	362	4.5	115	6.9	175
5	C-BOX-F5	16.1	408	5.6	143	7.9	200
6	C-BOX-F6	16.2	411	8.3	210	8.9	227
7	C-BOX-F7	33.2	843	10.6	270	11.0	280
8	C-BOX-F8	44.8	1139	14.0	356	12.4	315
9E	C-BOX-F9	55.3	1405	12.2	310	11.4	290
9A	C-BOX-F9	56.9	1444	12.2	310	11.4	290

For overall drive dimensions see pages 10 and 23.

Retrofit mounting brackets

These mounting brackets ensure the drive can be mounted in existing Commander SK installations.

Frame size	Order code
3	3470-0097
4	3470-0101
5	3470-0066
6	3470-0074
7	3470-0078
8	3470-0087
9A / 9E	3470-0118

Fan replacement kits

Frame size	Order code
1	3470-0092
2	3470-0095
3	3470-0099
4	3470-0103

Unidrive M400 frame size 7 with
C-BOX-F7 conduit box kit installed

Compact & easy to install

Unidrive M drives are amongst the smallest in their class, ideal for machine builds where size matters.

Clear and concise start up guides

For first time users, our drives come with a step-by-step guide. This provides everything you need to know for basic installations, in a clear and concise way.**Additionally, our quick-start webpage features 'how to' video guides and technical information. You can access the information at: www.drive-setup.com**

24/7 technical support

- **1-800-893-2321**
- **Techsupport.cta@mail.nidec.com**

Quickly diagnose faults

In the unlikely event that you get a drive error, download our free Diagnostics Tool app. It is available for Apple, Android and Windows operating systems. Just input the error code on your device and you'll be given a solution. You can download our Diagnostics Tool App at:
www.controltechniques.com/mobile-applications

SOFTWARE INCLUDED

Our software allows you to optimize the drive tuning, back up the configuration, configure the onboard automation and motion controller and set up the drive-to-drive communications links.

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