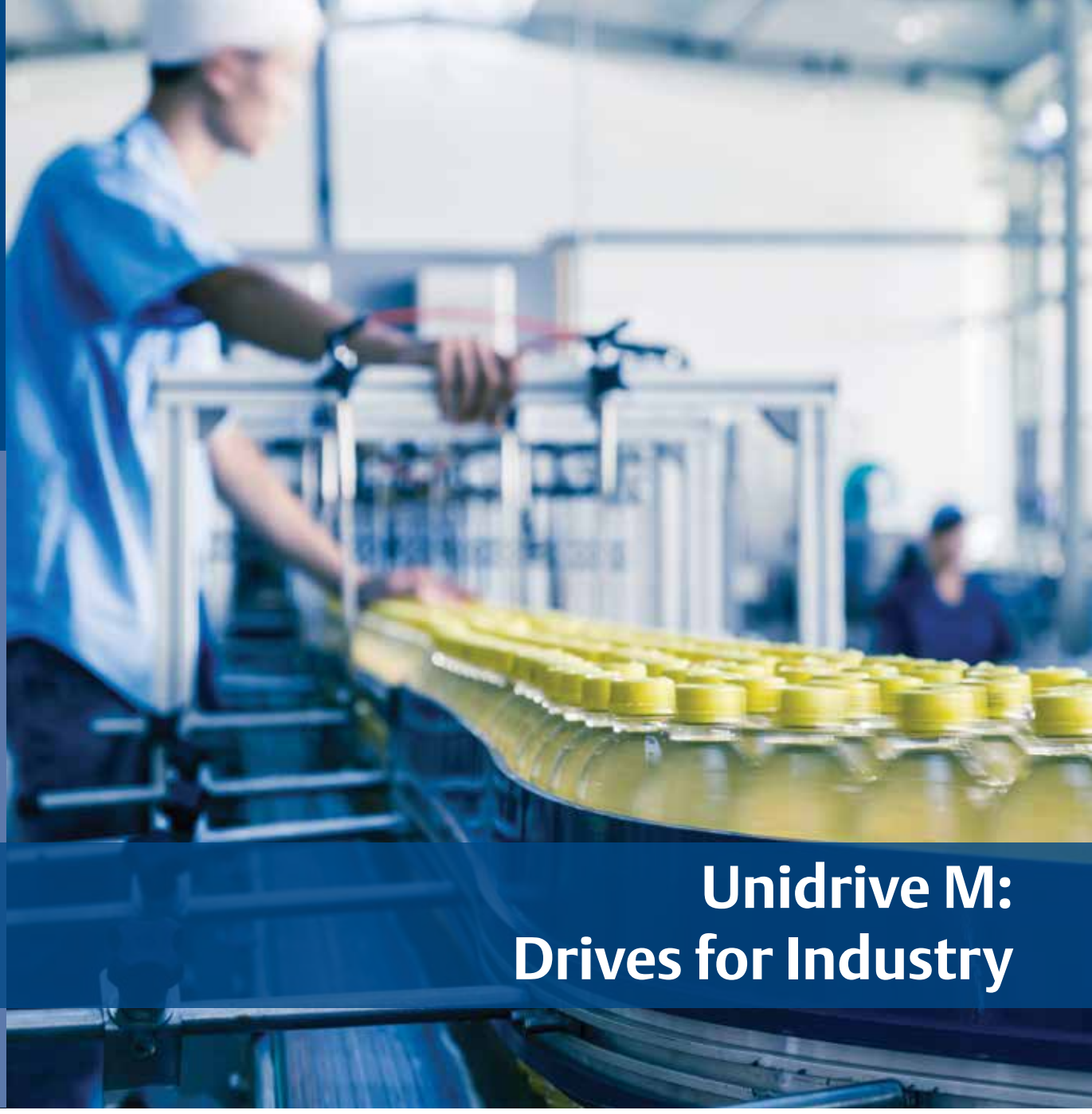


Unidrive M: Drives for Industry

AC and Servo Drive Family for Industrial Applications

0.25 kW - 2.8 MW Heavy Duty (0.33 hp - 4,200 hp)
100 V | 200 V | 400 V | 575 V | 690 V

Control Techniques

EMERSON
Industrial Automation

Emerson
Solving your challenges

Emerson - a legacy of performance

Emerson (NYSE: EMR) is a diversified global manufacturing and technology company, ranked number 121 in the 2014 Fortune 500® annual list of America's largest corporations. We offer a wide range of products and services in the industrial, commercial and consumer markets through our Process Management, Industrial Automation, Network Power, Climate Technologies and Commercial & Residential Solutions businesses. Recognized widely for our engineering capabilities and management excellence, Emerson has approximately 115,000 employees and 220 manufacturing locations worldwide.

115,000
EMPLOYEES WORLDWIDE

220
MANUFACTURING LOCATIONS WORLDWIDE

Control Techniques – a global leader in motion control technology

As part of Emerson, Control Techniques is a leading provider of motion control technology for industrial applications. Our innovative products are used in the most demanding applications requiring performance, reliability and energy efficiency.

With facilities across Europe, the Americas and Asia, we can offer local technical sales, service and design expertise to customers around the world.

Unidrive M – The drive for industrial applications

Unidrive M is a family of six variable speed drives designed specifically for industrial applications. Each Unidrive M model has been designed for specific application needs identified through extensive market research. Unidrive M is evolving the future of industry with the latest drive technology which includes 21 patents granted and 42 patents pending.

Unidrive M
Optimized throughput, open automation systems, maximum ease of use

Unidrive M delivers six drive models, all with superior motor performance and an individual feature-set designed to match specific application needs.

World leading drive performance

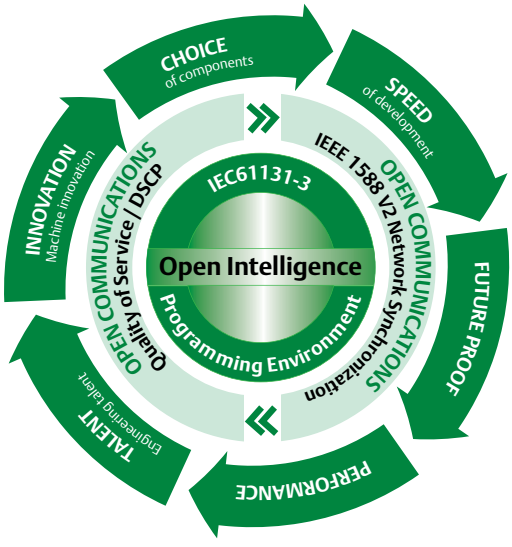
- Increased throughput – exceptional motor control using induction, permanent magnet, servo and linear motors in open or closed loop configuration for total flexibility
- Increased productivity through improved machine control – onboard real-time Ethernet supporting Precision Time Protocol (IEEE 1588 V2)

Open Automation Systems

Openness is at the heart of Unidrive M. Unidrive M supports a wide range of industry standard technologies and protocols including:

- Open programming languages using IEC 61131-3
- Open fieldbuses and networks including EtherNet/IP, EtherCAT, PROFINET and PROFIBUS
- Ethernet protocols, including PTP protocol for clock synchronization to IEEE 1588 V2

This open approach provides significant benefits to machine builders and OEMs:



- Optimized system **performance** with access to the latest industry technologies, programming languages and communication protocols
- **Future proofing** is assured with the adherence to open standards which ensures continuous compatibility with the latest technologies (such as evolving protocols) and avoids the lock-in risk associated with proprietary products
- System development **speed** is maximized due to use of familiar industrial programming languages and compatibility with standard components
- Large **choice** of compatible 'best-in-class' components provided by the flexibility of open automation
- **Innovation** and **talent** recruitment optimized through broad industry knowledge of open technologies

Ease of use

- Fast installation and start-up – intuitive keypads, software tools and easy cable management minimizing installation time

Functional safety

Unidrive M offers different levels of safety functionality to suit various needs, helping users to meet SIL3 (Safety Integrity Level 3) and PLe (Performance Level e), the highest level of safety standard currently available:

- Single and dual Safe Torque Off (STO) inputs
- Advanced safety functions as defined by IEC-61800-5-2 (including Safe Stop 1 and 2, Safe Limited Speed, Safe Limited Position) when an optional SI-Safety module is fitted

Extend the lifetime of your application with ease

As well as retrofitting existing applications that use Emerson's Commander SK and Unidrive SP drives, Unidrive M provides an immediate performance upgrade.

- Unidrive M100, M200, M300 and M400 offer an upgrade from Commander SK
- Unidrive M600, M700, M701 and M702 offer an upgrade from Unidrive SP
- Smartcards can be used to transfer parameter settings from Unidrive SP to Unidrive M
- The SI-Applications module allows existing Unidrive SP SyPTPro programs to be easily recompiled for Unidrive M700

Reduced machine size

Compact drive dimensions, among the smallest in class at every power rating

Unidrive M scalable industrial drive family

Each Unidrive M model offers an incremental level of functionality, designed to solve more advanced application needs. The family is designed to provide exactly the right drive feature-set for a specific industrial application, sharing a common software foundation and range of common click-in optional modules.

High performance

M700

Flexible Automation

Class leading automation drive providing the highest levels of universal performance with servo, AC and permanent magnet motors. With integrated Ethernet, flexible motion and advanced PLC control

Page 10

M600

Industrial Performance

High performance industrial drive for standard AC induction and high efficiency permanent magnet motors

Page 11

Programmable IEC61131-3 controller using Machine Control Studio software
Open loop vector or V/Hz induction motor control
Enhanced open loop Rotor Flux Control for induction motors (RFC-A)
Open loop permanent magnet motor control (RFC-S)
Closed loop Rotor Flux Control for induction motors (RFC-A)
Closed loop permanent magnet/servo motor control (RFC-S)
Active Front End (AFE) power quality converter*

*requires additional drive for Active Front End operation

Flexibility

M400

Diagnostics and PLC

Fast set-up and diagnostics with plain text display, integrated PLC and safety inputs

Page 12

M300

Safety

Open loop AC drive with flexible safety integration capabilities

Page 13

Value

M200

Communications

Open loop AC drive with easy communication integration options

Page 14

M100

Value

Value and quality for simple applications

Page 15

M700	M600	M400	M300	M200	M100
Up to 2.8 MW (4,200 hp)		Up to 110 kW (150 hp)			Up to 7.5 kW (10 hp)
✓	✓	✓			
✓	✓	✓	✓	✓	✓
✓	✓	✓	✓	✓	
✓	✓				
✓	Option				
✓					
✓	✓				

Unidrive M
Motor control performance

Unidrive M's unique motor control algorithms combined with the latest microprocessor technology ensure it offers the highest stability and bandwidth for all industrial motor types. This enables you to maximize machine throughput in every application and with every motor, from standard AC induction motors to dynamic linear motors and from energy saving permanent magnet motors to high performance servo motors.

Motor control options available include:

Control Mode	Features	Applies to
Open loop vector or V/Hz induction motor control	Open loop motor control for induction motors. Easiest configuration. V/Hz can be used for multiple motor control.	All
Open loop Rotor Flux Control for induction motors (RFC-A)	Vector algorithm utilizing closed loop current control to greatly enhance performance for all induction motor sizes.	M200 - M700
Open loop permanent magnet motor control (RFC-S)	Open loop control of compact, high efficiency, permanent magnet motors (including the Leroy-Somer Dyneo® LSRPM).	M600 - M700
Closed loop Rotor Flux Control for induction motors (RFC-A)	Speed and position control for induction motors, supporting a wide range of feedback devices (including quadrature, SinCos, EnDat, SSI encoders and resolvers).	M600 - M700 M600 + SI-Encoder / SI-Universal Encoder
Closed loop control of permanent magnet and servo motors (RFC-S)	Dynamic control of high efficiency and servo permanent magnet motors supporting a wide range of feedback devices (including quadrature, SinCos, EnDat, SSI encoders and resolvers).	M700
Active Front End for power quality and regeneration	Active Front End allows regeneration of energy back onto the power line. The Active Front End also provides power factor control for power quality management and greatly reduces unwanted power harmonics.	M600 - M700

Matched drives and motors maximize performance and energy efficiency

Energy efficiency

Unidrive M is designed to enhance the energy efficiency of all applications:

- Low power standby mode. In some applications, drives can sit idle for significant periods; Unidrive M's reduced standby power saves energy.
- Easy common DC bus configuration enables braking energy to be recycled within the drive system, reducing energy usage and eliminating external supply components.
- Unidrive M supports sensorless (open loop) control of compact high efficiency permanent magnet motors.
- Active Front End for regenerative AC drive systems.
- Dyneo®: perfectly synergized Permanent Magnet motor and Unidrive M solutions - optimized for performance and energy saving.
- Emerson's Dyneo® Unidrive M and Permanent Magnet motor solutions offer exceptional efficiency levels across all operating speeds, especially at lower speeds where the efficiency is much higher than induction motors.
- Low losses, up to 98% efficient.

Matched servo motors for maximum performance

Emerson offers two ranges of AC brushless servo motors to match diverse application needs.

Unimotor fm

Flexible performance AC brushless servo motor
0.72 Nm – 136 Nm (408 Nm Peak) | 6.37 lb-in - 1,203 lb-in (3,611 lb-in peak)

Unimotor fm is a flexible performance AC brushless servo motor range optimized for use with Unidrive M. The motors are available in six frame sizes with various mounting arrangements, motor lengths and a wide range of feedback options.

Unimotor hd

Compact servo motor for demanding applications
0.72 Nm - 85.0 Nm (255 Nm peak) | 6.37 lb-in - 752 lb-in (2,256 lb-in peak)

Unimotor hd is a high dynamic servo motor range, designed for maximum torque density. This AC brushless servo motor range provides an exceptionally compact, low inertia solution for applications where rapid acceleration and deceleration is required.

Performance

Unidrive M700 AC drive

0.75 kW - 2.8 MW (1.0 hp - 4,200 hp)
200 V / 400 V / 575 V / 690 V

Class leading induction, permanent magnet and servo motor performance, with onboard real-time Ethernet

Unidrive M700 provides high performance motor control and ultimate control flexibility in order to satisfy the requirements of machine builders and high specification industrial and hoisting applications. M700 offers an enhanced upgrade for existing Unidrive SP users.

Unidrive M700 benefits:

Maximize throughput with superior motor control

- High bandwidth motor control algorithm for closed-loop induction, permanent magnet and servo motors - 3,000 Hz current loop bandwidth and 250 Hz speed loop bandwidth
- Flexible speed and position feedback interface supports a wide range of feedback technologies from robust resolvers to high resolution encoders
  - ➪ Up to three encoder channels simultaneously e.g. 1 feedback encoder, 1 reference encoder and 1 simulated output
  - ➪ Quadrature, SinCos (including absolute), SSI, EnDat (up to 4 Mb with EnDat 2.2 and 100 m of cable as line compensation is supported) and resolvers
  - ➪ Simulated encoder output can provide position reference for CAMs, digital lock and electronic gearbox applications

Optimize system performance with onboard Advanced Motion Controller

- M700 incorporates an Advanced Motion Controller capable of controlling 1.5 axis. The motion functions are carried out 'on the drive' so that system performance is maximized

Design flexible centralized and decentralized control systems

- Onboard PLC for logic programs
- MCi modules can be added to execute larger programs for advanced system control capability
- Machine Control Studio is an industry standard IEC61131-3 programming environment for efficient system design and configuration
- Integrated dual port Ethernet switch provides simple connectivity using standard connections
- Onboard real-time Ethernet (IEEE 1588 V2) uses RTMoE (Real Time Motion over Ethernet) to provide fast communication and accurate axis synchronization
- Three System Integration ports are available to fit additional fieldbus, position feedback and I/O options

Conform to safety standards, maximize uptime and reduce costs by integrating directly with safety systems

- M700 has an integrated Safe Torque Off (STO) input and can accommodate an SI-Safety module for safe motion functions

Typical applications

Speed and position control for gearing and ratio control, winding (coilers), web handling, metal cutting, flying shear, rotary knife, test stands, printing, packaging machines, textiles, woodworking, tire manufacturing, theater hoists, cranes.

Unidrive M701 - Unidrive SP replacement

Unidrive M701 has 2 x RS485 ports onboard instead of Ethernet making an ideal upgrade path for Unidrive SP. SP Parameter sets can be ported to Unidrive M using a Smartcard or the Unidrive M connect PC tool. SM-Applications programs can be recompiled for SI-Applications on Unidrive M.

Unidrive M702 – Enhanced Safety

M702 has an additional STO input for applications that require onboard Ethernet and dual STO to comply with SIL 3 or PLe.

Performance drive summary: choose the right feature-set to match your application

Feature	M700	M701	M702	M600
Open loop vector or V/Hz	•	•	•	•
Open loop rotor flux control (RFC-A)	•	•	•	•
Closed loop rotor flux control	•	•	•	• (with SI-Encoder / SI-Universal Encoder)
Active Front End regeneration capability	•	•	•	•
Closed loop control of permanent magnet and servo motors	•	•	•	
Open loop permanent magnet (RFC-S)	•	•	•	•
Analog Inputs / Outputs	3/2	3/2	0/0*	3/2
Digital Inputs / Outputs/ Bidirectional I/O	4/1/3	4/1/3	3/3/0	4/1/3
Relay Output	1	1	1	1
Safe Torque Off Inputs	1	1	2	1
Ethernet	Onboard	SI Option	Onboard	SI Option
Onboard RS485 comms		•		•
Onboard IEC 61131-3	•	•	•	•
MCi/ SI-Applications support	•	•	•	
On-board motion (AMC)	•	•	•	
Digital lock control	•	•	•	•
SI option module slots	3	3	3	3
Onboard Encoder Channels	Up to 3 depending on type	Up to 3 depending on type	Up to 3 depending on type	None (use SI Options)
Cloning via smartcard	•	•	•	•
Cloning via SD card	•	•	•	•

* Analog I/O can be added using SI-I/O modules

Unidrive M600 AC drive

0.75 kW - 2.8 MW (1.0 hp - 4,200 hp)
200 V / 400 V / 575 V / 690 V

High performance drive for induction and sensorless permanent magnet motors

The M600 is the perfect choice for applications that require high performance open-loop control of induction or permanent magnet motors. SI-Encoder / SI-Universal Encoder option modules are available for applications that require more precise closed-loop velocity and digital lock / frequency following of induction motors.

Unidrive M600 benefits:

Enhance throughput with high performance open-loop control of induction and permanent magnet motors

- *Advanced Rotor Flux Control (RFC) algorithm gives maximum stability and control of induction and permanent magnet motors*
- *Up to 200% motor overload suitable for heavy industrial machinery applications*

Reduce system costs by directly integrating with applications

- *M600 incorporates an onboard PLC which can execute Machine Control Studio (IEC61131-3) programs for logic control, sequencing, speed following and digital lock - removing the need for additional PLCs*
- *Fit up to three SI modules to add safe motion, speed feedback, additional I/O and fieldbus communications*

Typical applications

Speed control with high starting torque for extruders, slitters, material transport, compressors, manufacturing, cranes, hydraulic replacement, ratio control, gearing, winding (coilers), web handling and metal cutting. PM sensorless can be used for additional energy saving in fan and pump applications.

Flexibility

Unidrive M400 AC drive

0.25 kW - 110 kW (0.33 hp - 150 hp)
100 V / 200 V / 400 V / 575 V / 690 V

Fast set-up and diagnosis with real-text display, integrated PLC and safety inputs

Unidrive M400 minimizes downtime with an intuitive LCD keypad offering a real-text, multi-language display for rapid set-up and clear diagnostic help. The integrated PLC can execute a substantial range of sequencing and logic programs. Coupled with an impressive I/O count complete with two STO inputs and an SI interface for a fieldbus option or extended I/O, this feature set ensures M400's flexible integration with any system.

Unidrive M400 benefits:

Minimize downtime and system set-up time with advanced keypad options

- Informative, multi-language, 3 line display aids set up and provides diagnostic information
- 4 navigation buttons facilitate intuitive navigation and programming
- Keypad options available:
  - ➪ CI-Keypad - Drive mounted LCD Keypad
  - ➪ Remote IP66 Keypad – Rapid panel mount (1 x 32mm Ø hole)
  - ➪ No keypad – Control/programming performed by PC or fieldbus

Reduce system costs by directly integrating with applications

- M400 incorporates an onboard PLC which can execute Machine Control Studio (IEC61131-3) programs for logic and sequencing with real-time tasks - removing the need for additional PLCs
- Fit an SI module to add fieldbus communications or additional I/O

Improve throughput with advanced open-loop motor control algorithms

- Rotor Flux Control (RFC-A) gives maximum stability and control of induction motors at all powers
- 180% motor overload suitable for heavy industrial machinery applications
- Precise frequency following is possible from an encoder or frequency/direction inputs

Conform to safety standards, maximize uptime and reduce costs by integrating directly with safety systems

- M400 has integrated dual STO inputs for SIL3 / PLe conformity, eliminating the need for external components.

Typical applications

Speed control for conveyors, positive displacement pumps, material handling, cutting, woodworking, applications where fast diagnostics are required.

Onboard PLC enables intelligent operation for applications such as pumps, traffic barriers and industrial washing machines.

Flexible drive summary: choose the right feature-set to match your application

Feature	M400	M300
Open loop vector or V/Hz	•	•
Open loop rotor flux control (RFC-A)	•	•
Analog Inputs / Outputs	2/2	2/1
Digital Inputs / Outputs/Bidirectional I/O	5/0/2	4/0/1
Relay Output	1	1
Safe Torque Off	2	2
Onboard PLC	•	
RS485 comms Modbus RTU	With comms cable and CI-485 Adaptor or AI-485 Adaptor	With comms cable and AI-485 Adaptor
Cloning via SD card	AI-Back-up Adaptor required	AI-Back-up Adaptor required
SI option module slots	1	1
Frequency following with incremental encoder	1	
Removable LCD keypad	•	
LED keypad		•

Unidrive M300 AC drive

0.25 kW - 110 kW (0.33 hp - 150 hp)
100 V / 200 V / 400 V / 575 V / 690 V

Flexible integration with safety and communications

Unidrive M300 is ideal for applications that require cost effective integration into safety systems and advanced RFC-A open-loop induction motor control.

Unidrive M300 benefits:

Conform to machinery standards, maximize uptime and reduce costs by integrating directly with safety systems

- *M300 has integrated dual STO inputs for SIL3, PLe conformity, eliminating the need for external safety components*

Improve throughput with advanced open-loop motor control algorithms

- *Rotor Flux Control (RFC-A) gives maximum stability and control of induction motors at all powers*
- *180% motor overload suitable for heavy industrial machinery applications*

Flexible system integration with SI communications options

- *M300's SI interface enables integration with a wide range of available industry standard fieldbuses and I/O*

Install and configure quickly and easily

- *Simple fixed LED keypad*
- *Useful parameter guide located on the front of the drive*
- *Use Unidrive M Connect or an SD card with AI-Backup adaptor to clone and transfer parameter sets*
- *DIN Rail mounting is supported below 1.5 kW**

Typical applications

Speed control for material transport, cutting, woodworking, machine tools, applications where protection of people or assets is required

**Additional fixings required to maximize security*

Value

Unidrive M200 AC drive

0.25 kW - 110 kW (0.33 hp - 150 hp)
100 V / 200 V / 400 V / 575 V / 690 V

Flexible integration through communications

Unidrive M200 has been designed for applications that require flexible integration with systems via industrial Ethernet protocols and fieldbuses together with advanced RFC-A open-loop motor control.

Unidrive M200 benefits:

Flexible system integration with communications options

- M200's SI Interface enables integration with a wide range of available industry standard fieldbuses or extended I/O such as SI-Ethernet, SI-EtherCAT, SI-PROFINET RT, SI-PROFIBUS, SI-CANopen and SI-DeviceNet
- AI-485 Adaptor option permits connection to RS485 networks using Modbus RTU

Improve throughput with advanced open-loop motor control algorithms

- Rotor Flux Control (RFC-A) utilizes closed-loop current control to give maximum stability of induction motors at all powers

Install and configure quickly and easily

- Easy-to-use fixed LED keypad
- Useful parameter guide located on the front of the drive
- Use Unidrive M Connect PC tool or SD card with AI-Back-up adaptor to clone and transfer parameter sets
- DIN Rail mounting is supported below 1.5 kW*

Typical applications

Speed control for conveyors, fans, positive displacement pumps and mixers, instances where application functions are controlled remotely via fieldbus or Ethernet communications

Unidrive M201 variant

Integrated speed reference potentiometer enhances customer choice and ease of use

*Additional fixings required to maximize security

Value drive summary: choose the right feature-set to match your application

Feature	M200	M100
Open loop vector or V/Hz	•	•
Open loop rotor flux control (RFC-A)	•	
Analog Inputs / Outputs	2/1	1/0
Digital Inputs / Outputs / Bidirectional I/O	4/0/1	3/0/1
Relay Output	1	1
RS485 comms	With comms cable and AI-485 Adaptor	
SI option module slots	1	
Cloning via SD card	AI-Back up Adaptor required	AI-Back up Adaptor required

Unidrive M100 AC drive

0.25 kW - 7.5 kW (0.33 hp - 10 hp)
100 V / 200 V / 400 V

Value, quality and performance for open-loop applications

Unidrive M100 is a high quality drive designed for general open-loop industrial applications below 7.5 kW (10hp).

Unidrive M100 benefits:

Install and configure quickly and easily

- *Easy-to-use fixed LED keypad*
- *Concise parameter set for ease of use with useful parameter guide located on the front of the drive*
- *Use SD card with AI-Back-up adaptor to clone and transfer parameter sets*
- *Open loop vector or V/Hz mode is quick to configure and has autotuning*
- *Easy DIN Rail mounting up to 1.5 kW**

Typical applications

Frequency control for conveyors, fans, pumps and mixers

**Additional fixings required to maximize security*

M201 and M101 - potentiometer version

Unidrive M101 variant

Integrated speed reference potentiometer to enhance customer choice and ease of use

Machine Controllers: MCi200, MCi210 and SI-Applications

Second processor for PLC programs and multi-axis control

MCi modules add a powerful processor to Unidrive M700 which can execute comprehensive application programs to extend system and machine control capability. As a result of the highly flexible plug-in option module format, system design is streamlined by removing the need for PLCs and other external components. Programs are fast and easy to develop thanks to the user-friendly Machine Control Studio software which uses industry standard IEC 61131-3 programming languages to build highly flexible and productive systems. MCi programs can access and manage Unidrive M's embedded Advanced Motion Controller across a wide range of networks to provide perfectly synchronized multi-axis machine performance and throughput.

Save costs and streamline machine design

- MCi modules eliminate the need for external PLCs and motion controllers
- Plug-in option modules powered from the drive's internal power supply mean less wiring and less physical space is required
- Simple integration with external components such as I/O, HMIs and other networked drives can be achieved using Unidrive M's integrated standard Ethernet ports (with RTMoE or standard protocols), or fieldbuses supported by SI option modules (EtherCAT, PROFINET, PROFIBUS, CANopen)
- MCi210 has two additional Ethernet ports with an internal switch

Build high performance systems and productive machines

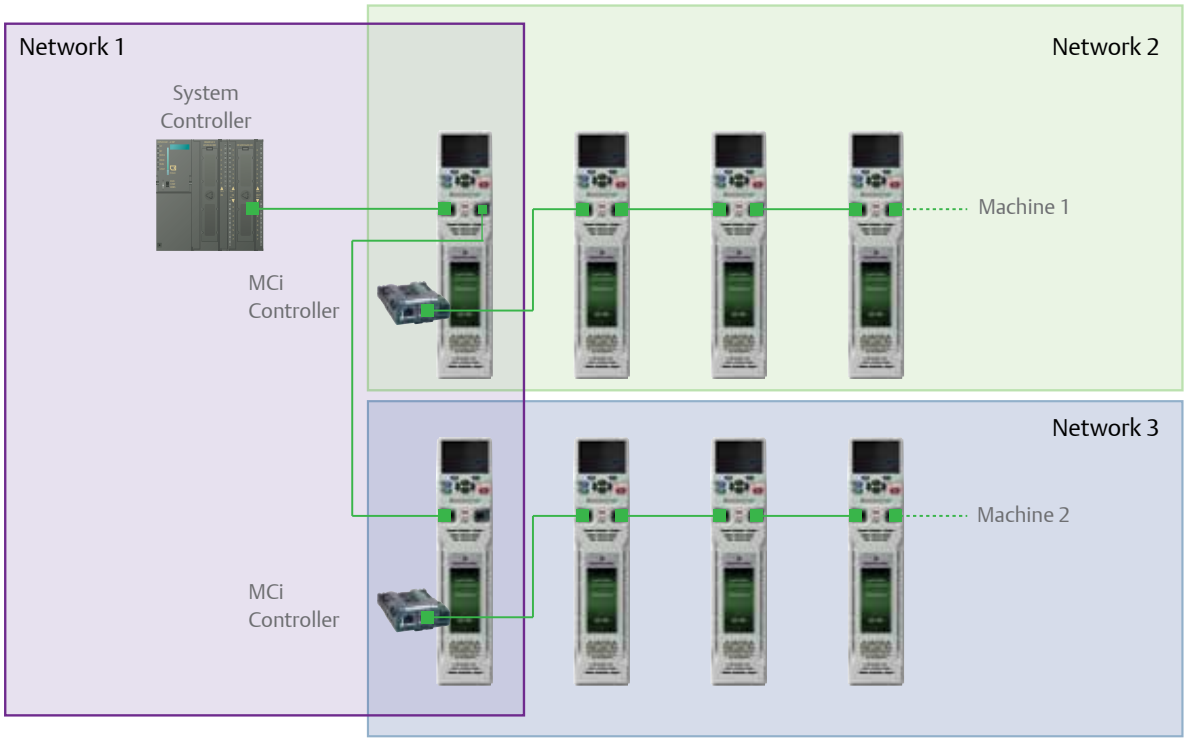
- MCi modules execute comprehensive programs that can control multiple drives and motors simultaneously across real-time networks
- M700's onboard Ethernet using RTMoE (Real Time Motion over Ethernet) provides synchronization and communication between drives using the Precision Time Protocol as defined by IEEE1588 V2
- Performance is optimized by having a motion controller embedded in each networked drive
- MCi210 ensures higher performance by delivering:
  - ➪ Two additional Ethernet ports with an internal switch
  - ➪ Support for standard Ethernet protocols, along with RTMoE for PTP (IEEE 1588) synchronization
  - ➪ Modbus TCP/IP master (up to 5 nodes)
  - ➪ Parallel interface with drive processor provides faster data exchange
  - ➪ Machine control over two segregated Ethernet networks enables greater flexibility in machine design
  - ➪ Extends connectivity with 3 x digital inputs, 1 x digital output and 1 x digital I/O

SI Applications

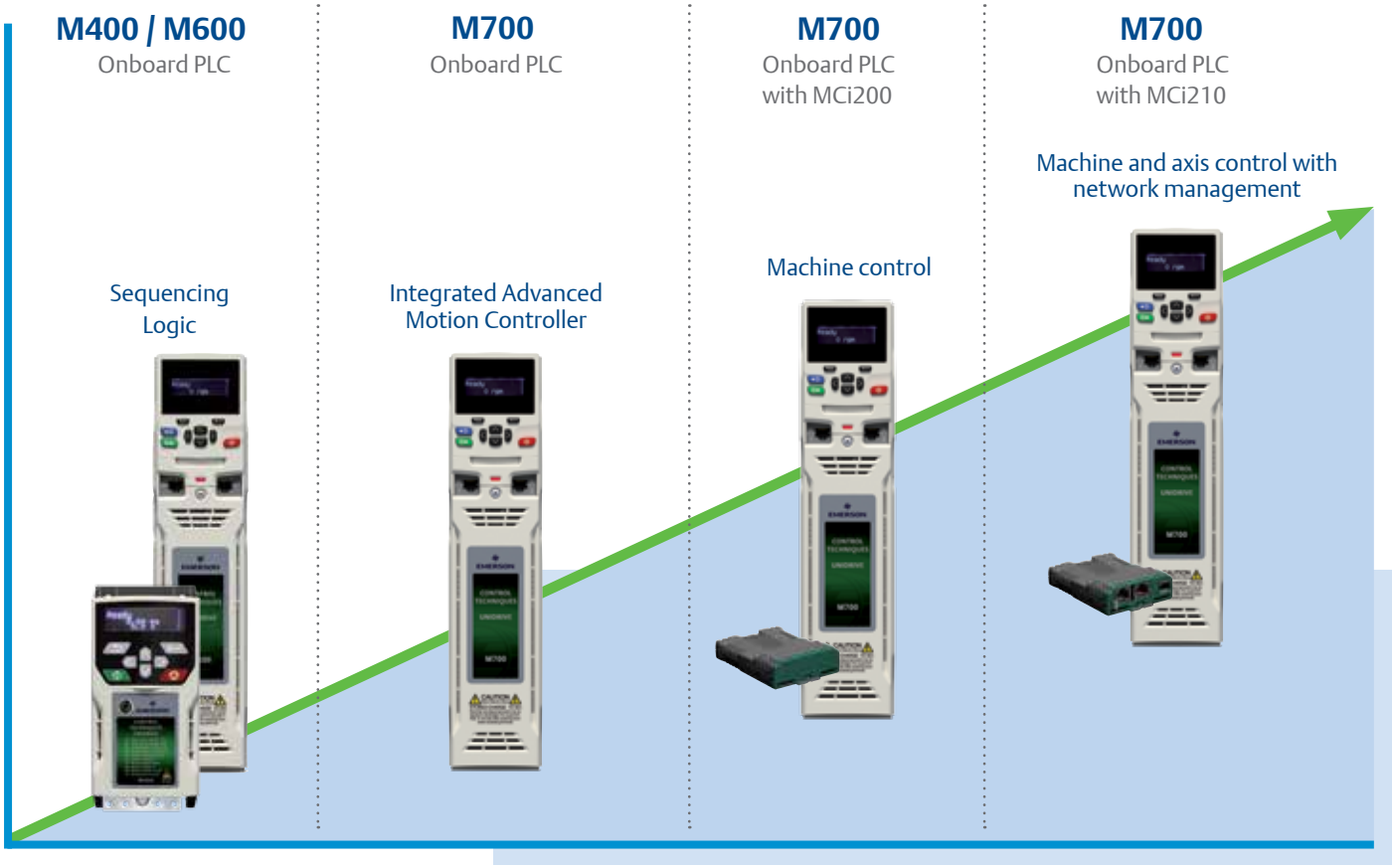
SI-Applications modules allow SyPTPro application programs to be recompiled and executed with Unidrive M700 to enable rapid and simple upgrade for Unidrive SP users. Applications comprising networked Unidrive SP drives with SM-Applications using CTNet or CTSync for real-time control can be quickly replaced with Unidrive M and the SI-Applications module without any compromise to system performance.

- EIA-RS485 port supports ANSI, Modbus-RTU master and follower and Modbus-ASCII master and follower protocols
- CTNet high speed network connection offering up to 5 Mbit/s data rate
- Two 24 V digital inputs and two outputs
- CTSync connection can distribute a master position to multiple drives on a network. Hardware synchronization of speed, position and torque loops

Segregated network control



Increasing Control Capabilities of Unidrive M



Machine Control Studio software

Machine Control Studio provides a flexible and intuitive environment for programming Unidrive M's automation and motion control features. The software provides programming for:

- Unidrive M400, M600 and M700's onboard PLC
- M700 fitted with MCi200 or MCi210 integrated machine control modules
- Ethernet network data configurations

IEC 61131-3 motion and 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.

The following IEC 61131-3 programming languages are supported:

- 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 program, in line with latest PLC practice.

Onboard Advanced Motion Controller

- Advanced 1.5 axis Motion Controller, key features include:
  - Real-time tasks
  - 250 µs cycle time
  - Motion profile generator
  - Electronic gearbox
  - Interpolated CAM
  - Homing functions
  - High speed position freeze
- Can be configured straight from the keypad or using Machine Control Studio
- High performance MCi200 and MCi210 control modules for extra control performance

Open, efficient, synchronized Ethernet

Unidrive M uses standard Ethernet to connect the controller and other devices such as PCs, I/O and HMIs together. Ethernet provides real benefits:

- Maximize machine productivity through high performance deterministic Ethernet, suitable for complete automation and demanding synchronized motion functions
- Access future developments in industries where billions of nodes are installed, future proofing your investments
- Access a choice of network monitoring and diagnostics tools
- Flexible network topologies including star and tree for simplicity and networking

Through advances in Ethernet technology, standard Ethernet hardware now delivers the highest levels of performance in industrial networking. For communication between drives, PCs, I/O and other devices, Unidrive M uses open protocols such as TCP/IP and UDP.

RTMoE

Unidrive M's standard Ethernet also supports RTMoE (Real Time Motion over Ethernet) which provides synchronized communication between drives using the Precision Time Protocol as defined by IEEE1588 V2

- Distributed clocks are used to automatically synchronize the position, speed and current loops across all drives
- Network synchronization of less than 1µs jitter (typically <200 ns)
- 1 ms cycle time for synchronous cyclic data
- Master/follower and peer-to-peer communications
- Bandwidth protection through a network gateway that manages non-real-time Ethernet messages
- Messages are time stamped to enable real-time operation

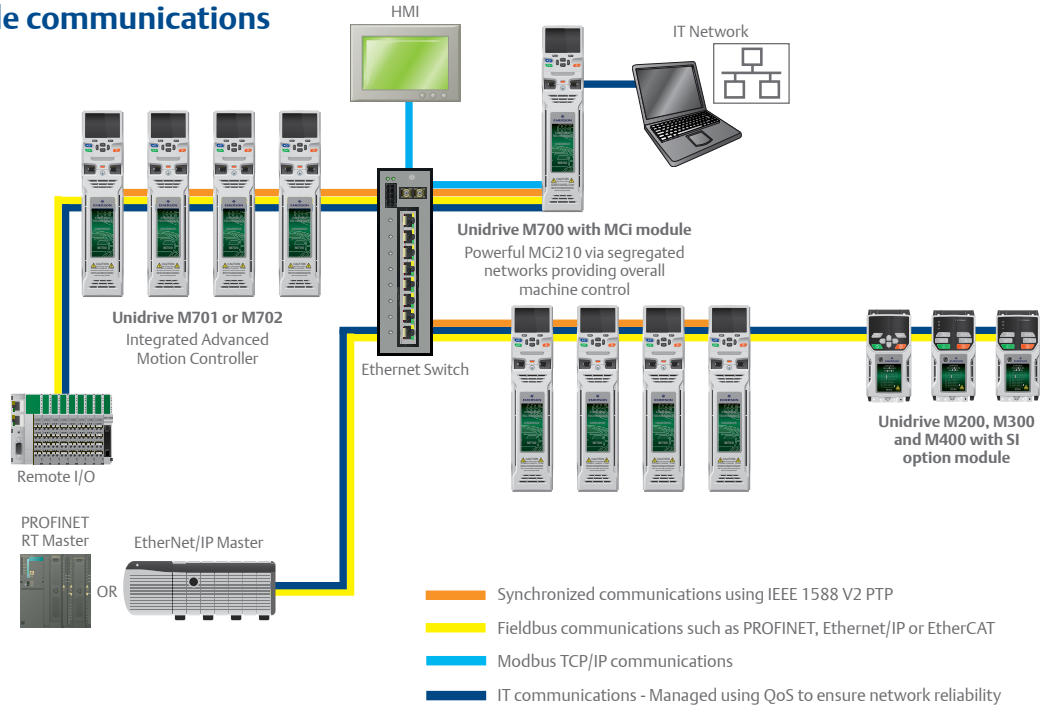
Traffic management

Manage non-critical network traffic through a network gateway

Unidrive M integrates a network gateway feature within the drive's dual port switch. This uses standards called Differentiated Services Code Point (DSCP) and Quality of Service (QoS) to protect bandwidth by eliminating or delaying non-critical messages from outside the control network.

Unidrive M - flexible communications

System Integration (SI) option modules allow additional connectivity with PROFINET, EtherCAT, PROFIBUS, DeviceNet, CANopen and I/O. Plus connectivity to legacy CTNet system



Unidrive M feature and specification table

Feature		Unidrive					
		M100	M200	M300	M400	M600	M700
Performance	Current loop update	166 µs				62 µs	
	Heavy Duty peak ratings from cold	150 % (60 s)	180 % (3 s)			200 % (28 s)	
	Normal Duty peak ratings from cold	110 % (165 s)					
	Maximum output frequency	550 Hz**					
	Switching frequency range	0.67, 1, 2, 3, 4, 6 , 8, 12, 16 kHz - 3 kHz default				2, 3, 4, 6, 8, 12, 16 kHz - 3 kHz default	
	High performance current controller						•
Drive status	Status LED				•	•	•
Mechanical attributes	Tile mounting					Frame sizes 3,4,5	
	DIN rail mounting on frame sizes 1 / 2	•	•	•	•		
	Mechanical retrofit capabilities	Commander SK compatible mechanical footprint either as standard or with conversion plates				Unidrive SP compatible (for surface mounting) mechanical footprint either as standard or with conversion plates	
	Common DC bus connections					Frame sizes 3,4,5,6	
Power and motor control	Stationary autotune for permanent magnet motors					•	•
	Wide operating range back-up DC supply					•	•
	24 V control back-up	Opt	Opt	Opt	Opt	•	•
Other	Fan operation	Temperature controlled with standby (off)				Temperature controlled with user adjustable speed limit	
	User replaceable fan(s)	•	•	•	•	•	•
	Conformal coating	•	•	•	•	•	•
	Heatsink mounted braking resistor support (up to frame size 5)					•	•
	Standby mode (energy saving)	•	•	•	•	•	•
Environmental safety and electrical conformance	Can survive environments as described by IEC60721-3-3 3C3	•	•	•	•		
	Can survive environments as described by EN60068-2-60 Meth. 4	•	•	•	•		
	Ingress rating	IP21 / NEMA 1 / UL open class				IP20/ NEMA 1 / UL TYPE 1 UL open class as standard, additional kit needed to achieve Type 1 IP65 / NEMA4 / UL TYPE 12 rating is achieved on the rear of the drive when through panel mounted (IP55 for frame 9 to 11)	

* Power modules can be paralleled up to 2.8 MW/ 4,200 hp

** For higher frequency refer to HS30 and HS70 documentation

Unidrive M set-up, configuration and monitoring

User interface 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.

Type		Benefit	M100	M200	M300	M400	M600	M700
Fixed LED Keypad		LED keypad fitted as standard for quick and easy commissioning and use.	•	•	•			
Fixed LED keypad with speed reference potentiometer		LED keypad with user friendly speed reference potentiometer for quick and easy commissioning and use.	M101	M201				
CI-Keypad		Three line plain text, multi-language LCD keypad for rapid set-up and helpful diagnostics maximizes machine up-time.				Opt		
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	Opt	Opt
Remote keypad RTC		The keypad is remote mountable, allowing flexible mounting on the outside of a panel (meets IP54/ NEMA 12). Three line plain text, multi-language LCD keypad for rapid set-up and helpful diagnostics. Battery operated real-time clock allows accurate time stamping of events, aiding diagnostics.						
KI-Keypad		Plain text, multi-language LCD keypad with up to 4 lines of text for in depth parameter and data descriptions, for an enhanced user experience.					Opt	Opt
KI-Keypad RTC		All the features of the KI-Keypad, but with battery operated real-time clock. This allows accurate time stamping of events, aiding diagnostics.					Opt	Opt

Unidrive M Connect commissioning tool

The Unidrive M Connect PC tool is 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 drive operations are simplified with intuitive graphical tools in a familiar Windows environment
- Dynamic drive logic diagrams and enhanced searchable listings
- Drive and motor performance can be optimized with minimal specialized drive knowledge
- Tool is scalable to match application requirements
- Supports the import of Unidrive SP parameter files and allows full drive cloning (i.e. parameter sets and application programs)
- Matching Unidrive M to Emerson motors (such as Dyneo®) can be achieved quickly and easily using Unidrive M Connect's motor database
- Multiple 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's portable memory devices

Smartcard

Smartcards can be used to back-up parameter sets and basic PLC programs, as well as copying them from one drive to another, including from a Unidrive SP:

- Simplified drive maintenance and commissioning
- Quick set-up for sequential build of machines
- Upgrades to be stored on a Smartcard and sent to the customer for installation

SD card

Standard SD cards can be used for quick and easy parameter and program storage using an adaptor. SD cards provide a huge memory capability allowing a complete system reload if required, and can be easily pre-programmed on a common PC.

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, enhanced safety features and onboard PLCs.

Option		Description
System Integration Modules		
MCi200		Second processor, providing advanced machine control using Machine Control Studio.
MCi210		Adds to the MCi200 with a dual port Ethernet interface directly on the processor and additional I/O.
SI-Applications		Second Processor module, which allows SyPTPro application programs to be re-compiled for Unidrive M700.
SI-Safety		An intelligent, programmable module to meet the IEC 61800-5-2/ISO 13849-1 functional safety standard up to SIL3/PLe.
SI-Ethernet		Ethernet module supports EtherNet/IP and Modbus TCP/IP.
SI-EtherCAT		EtherCAT interface module.
SI-PROFINET RT		PROFINET RT interface module.
SI-PROFIBUS		PROFIBUS interface module.
SI-CANopen		CANopen interface module
SI-DeviceNet		DeviceNet interface module.
SI-Universal Encoder		Encoder input and output interface supporting Quadrature, SinCos, EnDat and SSI encoders.
SI-Encoder		Quadrature encoder input interface module.
SI-I/O		Extended I/O interface module to increase the number of I/O analog and digital points on a drive.

Drive interface units		
AI-Back-up Adaptor		Port adaptor for SD card parameter cloning, and an input for 24 V back-up.
AI-Smart Adaptor		Built-in memory for parameter cloning and 24 V backup.
Smartcard		Smartcard memory device to back-up and copy parameter sets and basic PLC programs.
SD Card Adaptor		Allows an SD card to be inserted into the Smartcard slot, for parameter backup cloning and application programs.
AI-485 Adaptor		Adaptor that allows the drive to communicate via RS485.
KI-485 Adaptor		Allows the drive to communicate via RS485.
CI-485 Adaptor		Adaptor that allows the drive to communicate via RS485.
CT USB Comms cable		The USB Comms cable allows the drive to connect to a PC for use with Unidrive M's PC tools.

†Also requires an adaptor

	Type	Applicable to					
		M100	M200	M300	M400	M600	M700
	Applications						•
							•
							•
	Safety					•	•
	Communications		•	•	•	•	•
			•	•	•	•	•
			•	•	•	•	•
			•	•	•	•	•
			•	•	•	•	•
			•	•	•	•	•
	Feedback					•	•
						•	•
	Additional I/O		•	•	•	•	•

		M100	M200	M300	M400	M600	M700
	Back-up	•	•	•	•		
		•	•	•	•		
						•	•
						•	•
	Communications		•	•	•		
						•	•
					•		
			• †	• †	• †	•	For M701 only

Unidrive M frame sizes and ratings

SINGLE DRIVES

Frame size		1	2	3 (M100 to M400)	4 (M100 to M400)	3 (M600 to M700)	4 (M600 to M700)	
Frame sizes available	M100	•	•	•	•			
	M200 → M400	•	•	•	•			
	M600 → M702					•	•	
Dimensions (H x W x D)	mm	160 x 75 x 130	205 x 78 x 150	226 x 90 x 160	277 x 115 x 175	365 x 83 x 200	365 x 124 x 200	
	in	6.3 x 3.0 x 5.1	8.1 x 3.1 x 5.9	8.9 x 3.5 x 6.3	10.9 x 4.5 x 6.9	14.4 x 3.3 x 7.9	14.4 x 4.9 x 7.9	
Weight	kg (lb)	0.75 (1.65)	1.0 (2.2)	1.5 (3.3)	3.13 (6.9)	4.5 (9.9) Max	6.5 (14.3)	
DC Bus Choke/ AC Line Choke	Internal				•	• *	•	
	External							
Max Continuous Heavy Duty kW Rating	@ 100 V	0.25 kW - 0.37 kW (0.33 hp - 0.5 hp)	0.75 kW - 1.1 kW (1.0 hp - 1.5 hp)					
	@ 200 V	0.25 kW - 0.75 kW (0.33 hp - 1 hp)	0.37 kW - 1.5 kW (0.5 hp - 2 hp)	2.2 kW (3 hp)	3 kW - 4 kW (3 - 5 hp)	0.75 kW - 2.2 kW (1 hp - 3 hp)	3 kW - 4 kW (3 hp - 5 hp)	
	@ 400 V	N/A	0.37 kW - 1.5 kW (0.5 hp - 2 hp)	2.2 kW - 4 kW (3 hp - 5 hp)	5.5 kW - 7.5 kW (7.5 hp - 10 hp)	0.75 kW - 4 kW (1 hp - 5 hp)	5.5 kW - 7.5 kW (10 hp)	
	@ 575 V	N/A						
	@ 690 V	N/A						

Sizes do not include removable mounting brackets

*except 03200050 and 03400062 ratings

	5	6	7	8	9A	9E	10E	11E
	•	•	•	•	•	•		
	•	•	•	•	•	•	•	•
	365 x 143 x 202	265 x 210 x 227	508 x 270 x 280	753 x 310 x 290	1049 x 310 x 290	1010 x 310 x 290	1010 x 310 x 290	1190 x 310 x 312
	14.4 x 5.6 x 8	14.4 x 8.3 x 8.9	20 x 10.6 x 11.0	29.7 x 12.2 x 11.4	41.3 x 12.2 x 11.4	39.7 x 12.2 x 11.4	39.7 x 12.2 x 11.4	46.9 x 12.2 x 12.3
	7.4 (16.3)	14 (30.9)	28 (61.7)	52 (114.6)	66.5 (146.6)	46 (101.4)	46 (101.4)	63 (138.9)
	•	•	•	•	•			
						•	•	•
	N/A							
	5.5 kW (7.5 hp)	7.5 kW - 11 kW (10 hp - 15 hp)	15 kW - 22 kW (20 hp - 30 hp)	30 kW - 37 kW (40 hp - 50 hp)	45 kW - 55 kW (60 hp - 75 hp)	45 kW - 55 kW (60 hp - 75 hp)	75 kW - 90 kW (100 hp - 125 hp)	N/A
	11 kW - 15 kW (20 hp)	15 kW - 22 kW (25 hp - 30 hp)	30 kW - 45 kW (50 hp - 75 hp)	55 kW - 75 kW (100 hp - 125 hp)	90 kW - 110 kW (150 hp)	90 kW - 110 kW (150 hp)	132 kW - 160 kW (200 hp - 250 hp)	185 kW - 250 kW (300 hp - 400 hp)
	1.5 kW - 4 kW (2 hp - 5 hp)	5.5 kW - 22 kW (7.5 hp - 30 hp)	30 kW - 37 kW (40 hp - 50 hp)	45 kW - 55 kW (60 hp - 75 hp)	75 kW - 90 kW (100 hp - 125 hp)	75 kW - 90 kW (100 hp - 125 hp)	110 kW - 132 kW (150 hp - 200 hp)	150 kW - 225 kW (200 hp - 300 hp)
			15 kW - 45 kW (20 hp - 60 hp)	55 kW - 75 kW (75 hp - 100 hp)	90 kW - 110 kW (125 hp - 150 hp)	90 kW - 110 kW (125 hp - 150 hp)	132 kW - 160 kW (175 hp - 200 hp)	185 kW - 250 kW (250 hp - 300 hp)

Unidrive M100 to M400 ratings

100/120 Vac ±10 %							
Order Code	Supply Phases	Heavy Duty			Normal Duty		
		Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)
M100 to M400-01100017A	1	1.7	0.25	0.33	For Normal Duty applications, use Heavy Duty ratings.		
M100 to M400-01100024A	1	2.4	0.37	0.5			
M100 to M400-02100042A	1	4.2	0.75	1			
M100 to M400-02100056A	1	5.6	1.1	1.5			

200/240 Vac ±10 %							
Order Code	Supply Phases	Heavy Duty			Normal Duty		
		Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)
M100 to M400-01200017A	1	1.7	0.25	0.33	For Normal Duty applications, use Heavy Duty ratings.		
M100 to M400-01200024A	1	2.4	0.37	0.5			
M100 to M400-01200033A	1	3.3	0.55	0.75			
M100 to M400-01200042A	1	4.2	0.75	1			
M100 to M400-02200024A	1/3	2.4	0.37	0.5			
M100 to M400-02200033A	1/3	3.3	0.55	0.75			
M100 to M400-02200042A	1/3	4.2	0.75	1			
M100 to M400-02200056A	1/3	5.6	1.1	1.5			
M100 to M400-02200075A	1/3	7.5	1.5	2			
M100 to M400-03200100A	1/3	10	2.2	3			
M100 to M400-04200133A	1/3	13.3	3	3			
M100 to M400-04200176A	3	17.6	4	5			
M200 to M400-05200250A	3	25	5.5	7.5	30	7.5	10
M200 to M400-06200330A	3	33	7.5	10	50	11	15
M200 to M400-06200440A	3	44	11	15	58	15	20
M200 to M400-07200610A	3	61	15	20	75	18.5	25
M200 to M400-07200750A	3	75	18.5	25	94	22	30
M200 to M400-07200830A	3	83	22	30	117	30	40
M200 to M400-08201160A	3	116	30	40	149	37	50
M200 to M400-08201320A	3	132	37	50	180	45	60
M200 to M400-09201760A	3	176	45	60	216	55	75
M200 to M400-09202190A	3	219	55	75	266	75	100
M200 to M400-09201760E	3	176	45	60	216	55	75
M200 to M400-09202190E	3	219	55	75	266	75	100

380/480 Vac ±10 %							
Order Code	Supply Phases	Heavy Duty			Normal Duty		
		Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)
M100 to M400-02400013A	3	1.3	0.37	0.5	For Normal Duty applications, use Heavy Duty ratings.		
M100 to M400-02400018A	3	1.8	0.55	0.75			
M100 to M400-02400023A	3	2.3	0.75	1			
M100 to M400-02400032A	3	3.2	1.1	1.5			
M100 to M400-02400041A	3	4.1	1.5	2			
M100 to M400-03400056A	3	5.6	2.2	3			
M100 to M400-03400073A	3	7.3	3	3			
M100 to M400-03400094A	3	9.4	4	5			
M100 to M400-04400135A	3	13.5	5.5	7.5			
M100 to M400-04400170A	3	17	7.5	10			
M200 to M400-05400270A	3	27	11	20	30	15	20
M200 to M400-05400300A	3	30	15	20	30	15	20
M200 to M400-06400350A	3	35	15	25	38	18.5	25

380/480 Vac ±10 %							
Order Code	Supply Phases	Heavy Duty			Normal Duty		
		Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)
M200 to M400-06400420A	3	42	18.5	30	48	22	30
M200 to M400-06400470A	3	47	22	30	63	30	40
M200 to M400-07400660A	3	66	30	50	79	37	50
M200 to M400-07400770A	3	77	37	60	94	45	60
M200 to M400-07401000A	3	100	45	75	112	55	75
M200 to M400-08401340A	3	134	55	100	155	75	100
M200 to M400-08401570A	3	157	75	125	184	90	125
M200 to M400-09402000A	3	200	90	150	221	110	150
M200 to M400-09402240A	3	224	110	150	266	132	200
M200 to M400-09402000E	3	200	90	150	221	110	150
M200 to M400-09402240E	3	224	110	150	266	132	200

500/575 Vac ±10 %							
Drive	Supply Phases	Heavy Duty			Normal Duty		
		Max Continuous Current (A)	Typical Output (kW)	Motor Power (hp)	Max Continuous Current (A)	Typical Output (kW)	Motor Power (hp)
M200 to M400-05500030A	3	3	1.5	2	3.9	2.2	3
M200 to M400-05500040A	3	4	2.2	3	6.1	4	5
M200 to M400-05500069A	3	6.9	4	5	10	5.5	7.5
M200 to M400-06500100A	3	10	5.5	7.5	12	7.5	10
M200 to M400-06500150A	3	15	7.5	10	17	11	15
M200 to M400-06500190A	3	19	11	15	22	15	20
M200 to M400-06500230A	3	23	15	20	27	18.5	25
M200 to M400-06500290A	3	29	18.5	25	34	22	30
M200 to M400-06500350A	3	35	22	30	43	30	40
M200 to M400-07500440A	3	44	30	40	53	45	50
M200 to M400-07500550A	3	55	37	50	73	55	60
M200 to M400-08500630A	3	63	45	60	86	75	75
M200 to M400-08500860A	3	86	55	75	108	90	100
M200 to M400-09501040A	3	104	75	100	125	110	125
M200 to M400-09501310A	3	131	90	125	150	110	150
M200 to M400-09501040E	3	104	75	100	125	90	125
M200 to M400-09501310E	3	131	90	125	150	110	150

500/690 Vac ±10 %							
Drive	Supply Phases	Heavy Duty			Normal Duty		
		Max Continuous Current (A)	Typical Output (kW)	Motor Power (hp)	Max Continuous Current (A)	Typical Output (kW)	Motor Power (hp)
M200 to M400-07600190A	3	19	15	20	23	18.5	25
M200 to M400-07600240A	3	24	18.5	25	30	22	30
M200 to M400-07600290A	3	29	22	30	36	30	40
M200 to M400-07600380A	3	38	30	40	46	37	50
M200 to M400-07600440A	3	44	37	50	52	45	60
M200 to M400-07600540A	3	54	45	60	73	55	75
M200 to M400-08600630A	3	63	55	75	86	75	100
M200 to M400-08600860A	3	86	75	100	108	90	125
M200 to M400-09601040A	3	104	90	125	125	110	150
M200 to M400-09601310A	3	131	110	150	150	132	175
M200 to M400-09601040E	3	104	90	125	125	110	150
M200 to M400 -09601310E	3	131	110	150	150	132	175

Unidrive M600 and M700 ratings

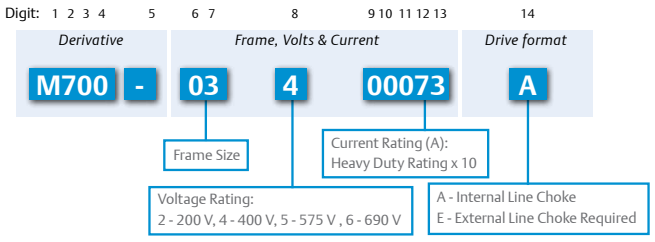
200/240 Vac ±10%						
Drive	Heavy Duty			Normal Duty		
	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)
M600 to M702-03200050A	5	0.75	1	6.6	1.1	1.5
M600 to M702-03200066A	6.6	1.1	1.5	8	1.5	2
M600 to M702-03200080A	8	1.5	2	11	2.2	3
M600 to M702-03200106A	10.6	2.2	3	12.7	3	3
M600 to M702-04200137A	13.7	3	3	18	4	5
M600 to M702-04200185A	18.5	4	5	24	5.5	7.5
M600 to M702-05200250A	25	5.5	7.5	30	7.5	10
M600 to M702-06200330A	33	7.5	10	50	11	15
M600 to M702-06200440A	44	11	15	58	15	20
M600 to M702-07200610A	61	15	20	75	18.5	25
M600 to M702-07200750A	75	18.5	25	94	22	30
M600 to M702-07200830A	83	22	30	117	30	40
M600 to M702-08201160A	116	30	40	149	37	50
M600 to M702-08201320A	132	37	50	180	45	60
M600 to M702-09201760A	176	45	60	216	55	75
M600 to M702-09202190A	219	55	75	266	75	100
M600 to M702-09201760E	176	45	60	216	55	75
M600 to M702-09202190E	219	55	75	266	75	100
M600 to M702-10202830E	283	75	100	325	90	125
M600 to M702-10203000E	300	90	125	360	110	150

380/480 Vac ±10%						
Drive	Heavy Duty			Normal Duty		
	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)
M600 to M702-03400025A	2.5	0.75	1	3.4	1.1	1.5
M600 to M702-03400031A	3.1	1.1	1.5	4.5	1.5	2
M600 to M702-03400045A	4.5	1.5	2	6.2	2.2	3
M600 to M702-03400062A	6.2	2.2	3	7.7	3	5
M600 to M702-03400078A	7.8	3	5	10.4	4	5
M600 to M702-03400100A	10	4	5	12.3	5.5	7.5
M600 to M702-04400150A	15	5.5	10	18.5	7.5	10
M600 to M702-04400172A	17.2	7.5	10	24	11	15
M600 to M702-05400270A	27	11	20	30	15	20
M600 to M702-05400300A	30	15	20	30	15	20
M600 to M702-06400350A	35	15	25	38	18.5	25
M600 to M702-06400420A	42	18.5	30	48	22	30
M600 to M702-06400470A	47	22	30	63	30	40
M600 to M702-07400660A	66	30	50	79	37	50
M600 to M702-07400770A	77	37	60	94	45	60
M600 to M702-07401000A	100	45	75	112	55	75
M600 to M702-08401340A	134	55	100	155	75	100
M600 to M702-08401570A	157	75	125	184	90	125
M600 to M702-09402000A	200	90	150	221	110	150
M600 to M702-09402240A	224	110	150	266	132	200
M600 to M702-09402000E	200	90	150	221	110	150
M600 to M702-09402240E	224	110	150	266	132	200
M600 to M702-10402700E	270	132	200	320	160	250
M600 to M702-10403200E	320*	160	250	361	200	300
M600 to M702-11403770E	377	185	300	437	225	350
M600 to M702-11404170E	417*	200	350	487*	250	400
M600 to M702-11404640E	464*	250	400	507*	280	450

* At 2 kHz switching frequency

500/575 Vac ±10%						
Drive	Heavy Duty			Normal Duty		
	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)
M600 to M702-05500030A	3	1.5	2	3.9	2.2	3
M600 to M702-05500040A	4	2.2	3	6.1	4	5
M600 to M702-05500069A	6.9	4	5	10	5.5	7.5
M600 to M702-06500100A	10	5.5	7.5	12	7.5	10
M600 to M702-06500150A	15	7.5	10	17	11	15
M600 to M702-06500190A	19	11	15	22	15	20
M600 to M702-06500230A	23	15	20	27	18.5	25
M600 to M702-06500290A	29	18.5	25	34	22	30
M600 to M702-06500350A	35	22	30	43	30	40
M600 to M702-07500440A	44	30	40	53	45	50
M600 to M702-07500550A	55	37	50	73	55	60
M600 to M702-08500630A	63	45	60	86	75	75
M600 to M702-08500860A	86	55	75	108	90	100
M600 to M702-09501040A	104	75	100	125	110	125
M600 to M702-09501310A	131	90	125	150	110	150
M600 to M702-09501040E	104	75	100	125	110	125
M600 to M702-09501310E	131	90	125	150	110	150
M600 to M702-10501520E	152	110	150	200	130	200
M600 to M702-10501900E	190	132	200	200	150	200
M600 to M702-11502000E	200	150	200	248	185	250
M600 to M702-11502540E	254*	185	250	288*	225	300
M600 to M702-11502850E	285*	225	300	315*	250	350

500/690 Vac ±10%						
Drive	Heavy Duty			Normal Duty		
	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)	Max Continuous Current (A)	Motor Shaft Power (kW)	Motor Shaft Power (hp)
M600 to M702-07600190A	19	15	20	23	18.5	25
M600 to M702-07600240A	24	18.5	25	30	22	30
M600 to M702-07600290A	29	22	30	36	30	40
M600 to M702-07600380A	38	30	40	46	37	50
M600 to M702-07600440A	44	37	50	52	45	60
M600 to M702-07600540A	54	45	60	73	55	75
M600 to M702-08600630A	63	55	75	86	75	100
M600 to M702-08600860A	86	75	100	108	90	125
M600 to M702-09601040A	104	90	125	125	110	150
M600 to M702-09601310A	131	110	150	150	132	175
M600 to M702-09601040E	104	90	125	125	110	150
M600 to M702-09601310E	131	110	150	155	132	175
M600 to M702-10601500E	150	132	175	172	160	200
M600 to M702-10601780E	178	160	200	197	185	250
M600 to M702-11602100E	210	185	250	225	200	250
M600 to M702-11602380E	238*	200	250	275*	250	300
M600 to M702-11602630E	263*	250	300	305*	280	400



For configurations involving frame size 9 and above refer to the high power brochure

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Moteurs Leroy-Somer SAS. Headquarters: Bd Marcellin Leroy, CS 10015, 16915 Angoulême Cedex 9, France. Share Capital: 65 800 512 €, RCS Angoulême 338 567 258.

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