

**CONTROLTM
TECHNIQUES**

UNIDRIVE M SERIES

UNIDRIVE M GENERAL PURPOSE DRIVES

M200, M300



0.25kW – 132kW (0.33hp to 175hp)

100V | 200V | 400V | 575V | 690V

**Simple set up.
Built to last.**

Nidec
All for dreams

We're here **when you need us.**

"Control Techniques technicians always address problems quickly and comprehensively. This means a lot to a business such as ours, and is certainly better than we have experienced elsewhere."

- OEM, Offshore, America

All about motor control

We have over 40 years' experience developing drives. Over that time, we've kept close to our customers. This has led us to design intuitive, reliable drives, matched with performance that will keep your equipment moving. **Drive solutions designed with your needs in mind.**

Never be without a solution

You may want support throughout a project, or enjoy the peace of mind knowing someone is here to help if you need it. Our goal is to make it easy for you to tap into specialist knowledge, helping to take some of the pressure off your design team. **We help solve your real world problems.**

Stock when you need it

If you work to Just in Time (JIT) methods, or even if not, you'll want to know that we have stock when you need it.

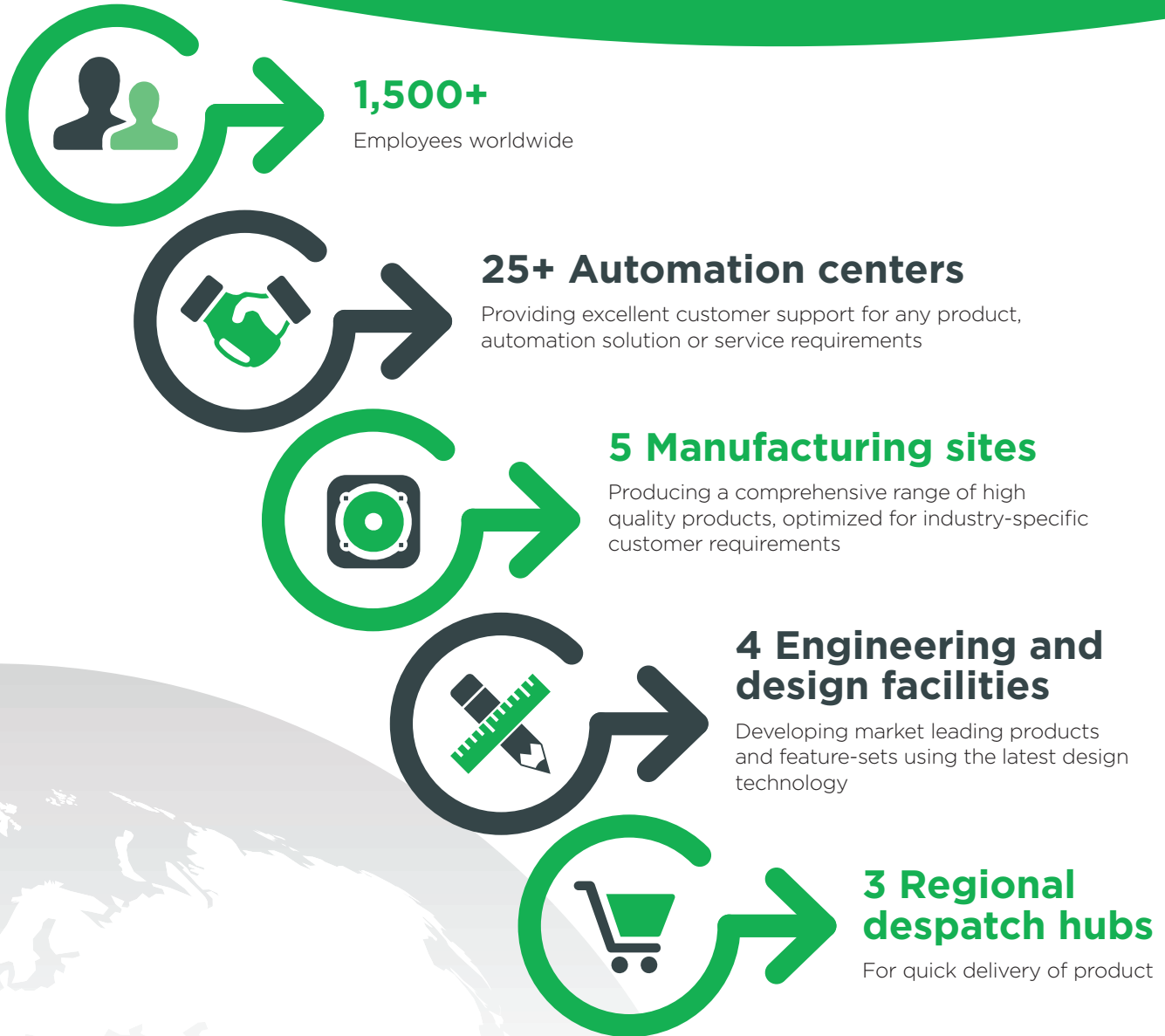
A world of experience

We are not just a local agent. We're a global business with shared knowledge of drive applications across every industry: a central Engineering and Design department; 40+ Automation Centres; the Nidec network of over 400 companies. **We've got you covered for everything that moves and spins.**



An enhanced global presence that benefits all our customers

Through our integrated Drives & Motors organization, we have an extensive global presence that provides comprehensive local support and services. This includes:





Our extensive sales and service networks in Europe, Asia Pacific and the Americas are backed-up by hundreds of carefully selected distributors and service partners, often in remote locations, all over the world.



Drives designed for automation

From the moment they're switched on, our drives are ready to go.

Simple to set up. Accurate. Flexible to your needs.

Type	M200 Standard	M300 Safety
Ideal for	Industrial automation	Industrial applications
Typical applications	Speed control for conveyors, fans, positive displacement pumps and mixers, where their functions are controlled remotely via fieldbus or Ethernet communications	Speed control for material transport, cutting, woodworking, machine tools, applications where protection of people through machine design to EN/IEC 61800-5-2 is required
		
Voltage range	100 – 690 VAC	
Power range	0.25 - 132 kW	
Communications	Options: Ethernet PROFINET EtherCAT PROFIBUS CANopen DeviceNet	
Key features	<ul style="list-style-type: none"> • Fast set-up • Advanced RFC mode for enhanced control • Simple V/Hz control 	<ul style="list-style-type: none"> • Fast set-up • Advanced RFC mode for enhanced control • Simple V/Hz control • Dual channel safe torque off (see p15)
Drive comparison		
Open loop vector or V/Hz	✓	✓
Open loop rotor flux control (RFC-A)	✓	✓
Analogue Inputs / Outputs	2/1	2/1
Digital Inputs / Outputs / Bidirectional I/O	4/0/1	4/0/1
Relay Output ¹	1	1
Safe Torque Off		2
Onboard PLC ²	✓	✓
EIA 485 / Modbus RTU communications ³	✓	✓
Cloning via SD card ⁴	✓	✓

¹ Configurable

² Requires Machine Control Studio (free download)

³ Requires AI-485 Adaptor

⁴ Requires AI-Backup Adaptor

Easy set-up. Reliable performance. Built to last.

No specialist knowledge required

Designed to make set-up 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 set-up

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 24V.



AI-Back-up
Adaptor



AI-Smart
Adaptor

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



1 Set motor rated current (Pr 06)



2 Set motor RPM (Pr 07)



3 Set motor voltage (Pr 08)



4 Set motor power factor (Pr 09)



Clear and concise start up guide

For first time users, our drives come with a step by step guide. This provides everything you need to know, in a clear and concise way.

Quickly diagnose faults

Download our free Diagnostics Tool app in the unlikely event that you return an error from the drive. It's 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

Small form, easy install

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



Minimize downtime with robust and reliable drives

Control Techniques is built on 40 years of drive knowledge. We make reliable drives that are designed to keep machines running, even in harsh environments. They meet international standards IEC60721-3-3 3C3* and EN60068-2-60 Meth 4.

Our drives provide extensive protection from the three main causes of field-failure.

* Up to frame size 4



Ingress

Poorly designed drives result in premature failure and shortened service life. We protect our drives with a range of features, which include:

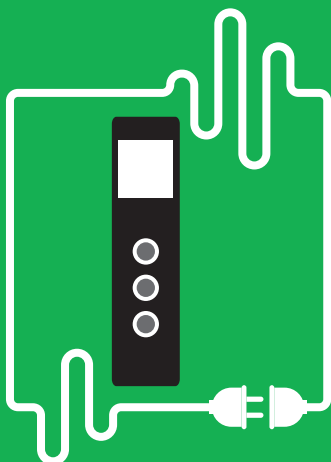


- Conformal coated PCBs – for increased resilience to moisture, dust, chemicals and temperature extremes
- Patented air flow system – efficiently cools drives while protecting internal components from degradation
- Ingress protection up to IP21 – UL open class (NEMA 1) compliant
- On larger drives, higher IP ratings can be achieved with through panel mounting in cabinets



Electrical

Power infrastructure can vary from country to country. Our drives technology manages that variation, so you can export your products with peace of mind.



- Wide supply voltage tolerance – keeps equipment running within their specified tolerances, even when power supplies are variable. This prevents the drive tripping out.
- Trip avoidance – removes the risk of expensive mid-process breakdowns associated with demand fluctuations or brownouts. Designed-in protection against:
 - Load shedding – line speed is reduced to match the change in current
 - Brownouts – power supply loss ride-through prevents stoppage, achieved by regenerating power from the motor and load inertia



Temperature

We design our drives to run in varying operating conditions. Features include:

- Adjustable rating – drives can be derated, enabling them to run in higher temperature environments
- Intelligent three speed, easy-change fan – auto adjusts to achieve optimum performance of drives. The easy-change fan helps reduce maintenance downtime and maximizes fan lifetime.

Our commitment to reliability

Quality management is part of our daily lives.

For many of our customers, ISO 9001 is a prerequisite. That means we maintain consistency of production by following strict principles.

Every product goes through a series of tests throughout the production process. The parts we use come from a fixed supply, so they conform to our test requirements.

Most importantly, we support our staff through rigorous training and ensure full traceability. This ensures the highest standards of quality throughout our factories.



Maximize productivity with **accurate motor control**

“Our design team is always looking to push the boundaries in terms of machine performance. The team thought that they had reached the limits with 26 cycles per minute; with the Unidrive M we increased this to 30.”

- OEM, Packaging, Italy

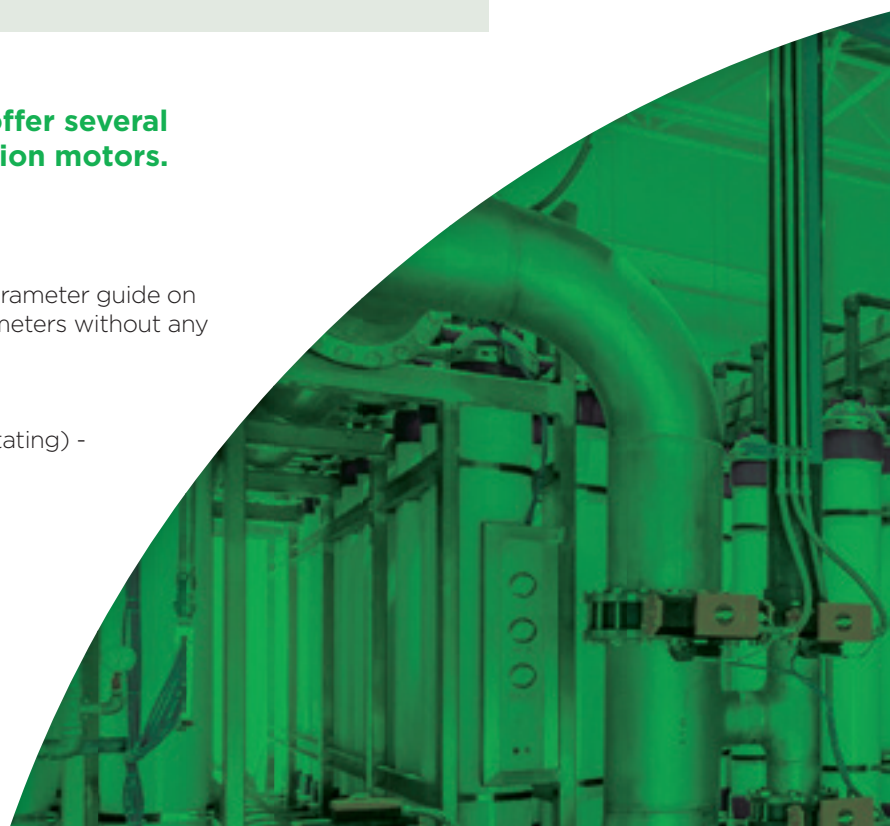
Our unique motor control algorithm, RFC-A mode, allows your drive to achieve current loop rates as low as 125µs. The rate represents how fast the drive updates the current. At this low value, we're able to maintain more control. This means our drives can achieve dynamic acceleration with a high overload capability of 180% for 30 seconds and 150% for 60 seconds. When running at low speeds, RFC-A mode can achieve accurate speed holding.

Motor control modes include:

Control Mode	Features
Open loop vector or V/Hz induction motor control	Reliable performance and easy configuration: <ul style="list-style-type: none"> • 100% torque available down to 1 Hz • Slip compensation • Multi-motor control • Square law V/F mode • Dynamic V/F mode
Enhanced Open Loop Rotor Flux Control for induction motors (RFC-A)	<p>When the load changes, RFC-A mode stabilizes the running speed of the drive. It also prevents drive trips at start up.</p>

To achieve accurate speed control we offer several ways to pair your drives with AC induction motors. These include:

- 1** Clearly laid out keypad with 'quick set-up' parameter guide on the front panel – find and modify input parameters without any technical knowledge
- 2** Two autotune procedures (stationary and rotating) - optimized motor setup
- 3** **Connect** software tool – a complete motor database and set-up wizard



Energy Saving

Variable costs, such as those associated with energy usage, impact on profits. So we've included a range of features to reduce operating costs, benefits you can pass onto your customers. These include:

Low power standby mode - drives can sit idle for significant periods, saving energy

Automatic 3-speed cooling fan - keeps energy usage and acoustic noise to a minimum by intelligently responding to load and the environment

Square law V/F mode - optimized for quadratic loads like pumps and fans to reduce motor losses



Dynamic V/F mode - keeps energy usage and motor losses to a minimum in low load conditions

Unidrive M is 98% efficient - only 2% of energy is lost during the conversion process



Flexible connectivity. Easy commissioning. Enhanced control.

Integrate into any system

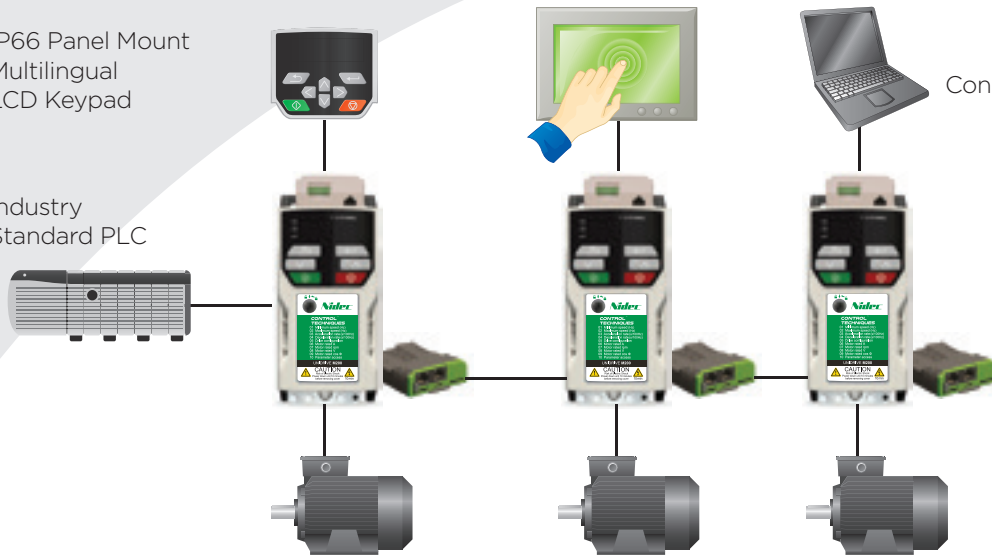
We offer a variety of option modules suited to a range of communication protocols. This makes it easier to retrofit our drives without changing your whole system.

The module options include SI-Ethernet, SI-EtherCAT, SI-PROFINET, SI-PROFIBUS, SI-CANopen and SI-DeviceNet. The AI-485 Adaptor option can also connect to EIA485 / Modbus RTU networks.

IP66 Panel Mount
Multilingual
LCD Keypad

Industry
Standard PLC

Connect



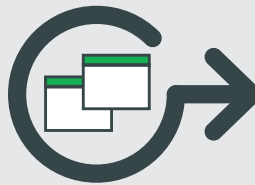


Intuitive commissioning software

For many applications, access to parameters through a keypad isn't enough. Our Connect configuration tool is designed to commission, optimize and monitor drive/system performance. It feels natural to use, and is packed full of useful features, such as:



Easy to navigate, Windows based interface



Cloning – for the fast reproduction of drive parameters, including the import of Commander SK files from our legacy drives



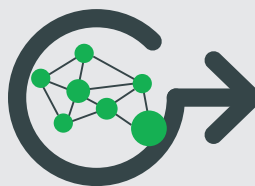
User-friendly graphical tools to enhance data analysis



Customizable screens – call up multiple parameters into one work area



Dynamic drive logic diagrams – visualize and control the drive logic in real-time



Automatic RTU baud rate scanning – finds drives on the network automatically

Download Connect for Windows at:
www.controltechniques.com/unidrivemconnect

Advanced machine control

Increase functionality with onboard PLC, and safety option.

More control, less cost

If you're using an external PLC in your machinery, you'll know that extra functionality comes at a price.

External PLCs and the connecting cables all adds to the BOM cost. Then consider the lost time installing those extra components. Plus there's the cost of holding extra stock items. That's why we've added internal PLCs to our M200 and M300 general purpose drives. This offers a huge opportunity for savings at no extra cost.

Examples of applications using PLCs include:



Intelligent pump control



Washing machines



Entry barriers



Our PLC is controlled by our own IEC 61131-3 fully compliant programming environment. Machine Control Studio

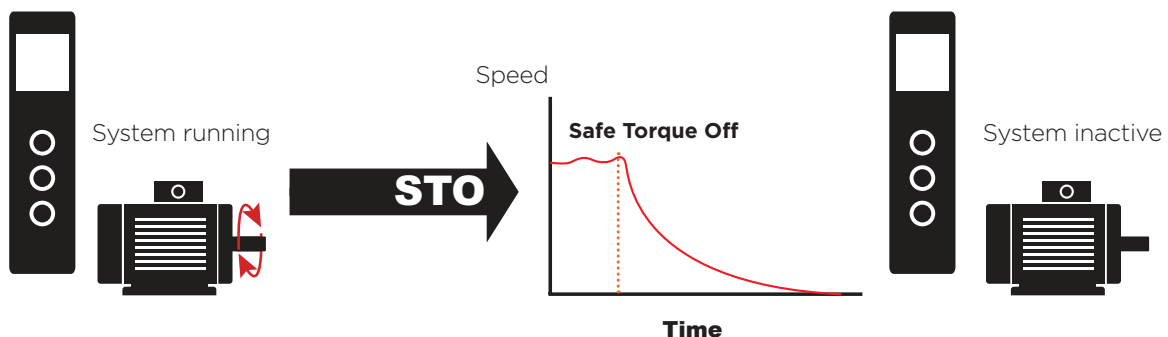
For more information see our PLC brochure.

Integrated safety system*

Unidrive M300 provides a cost effective approach to safety. It features a dual Safe Torque Off (STO) input, certified to SIL3/PLe safety rating and compliant with EN/IEC 61800-5-2.

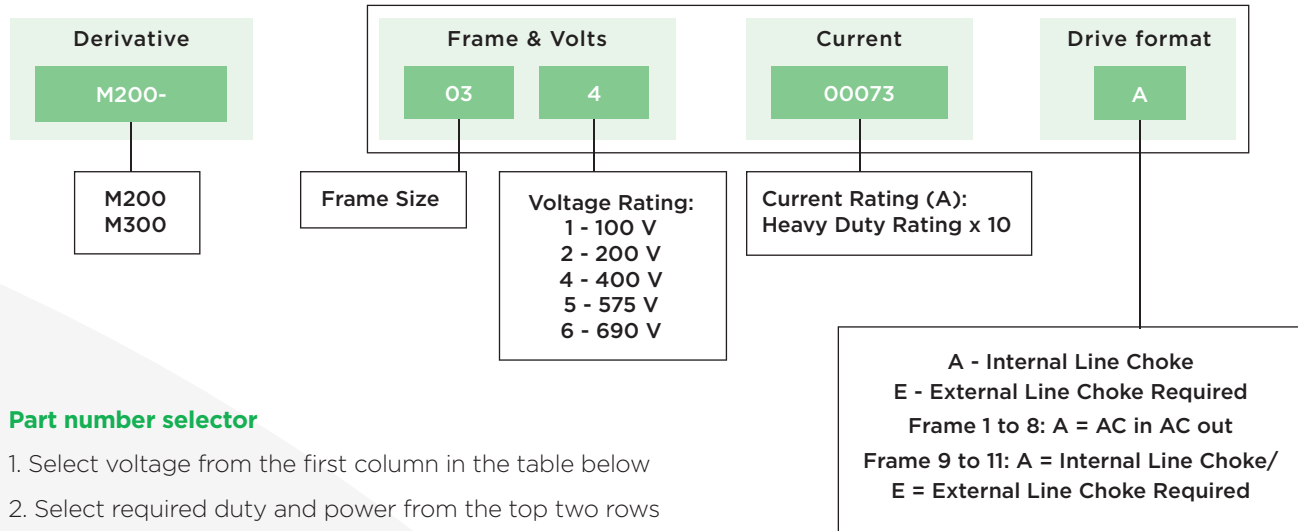
As all the work is done inside the drive, no additional parts are needed. When a machine trips, the STO stops the motor from producing torque, preventing accidental start up.

A simple solution to a serious problem.



* M300 only

Key



Part number selector

1. Select voltage from the first column in the table below
2. Select required duty and power from the top two rows
3. Find part number

Heavy Duty (kW)	0.25	0.37	0.55	0.75	1.1	1.5	1.5	2.2	2.2	3.0	4.0	4.0	5.5	5.5
Normal Duty (kW)	0.25	0.37	0.55	0.75	1.1	1.5	2.2	2.2	4.0	3.0	4.0	5.5	5.5	7.5
100/120 Vac ± 10%	01100017A (Size 1)	01100024A (Size 1)		02100042A (Size 2)	02100056A (Size 2)									
200/240 Vac ± 10%	01200017A (Size 1)	01200024A (Size 1) 02200024A (Size 2)	01200033A (Size 1) 02200033A (Size 2)	01200042A (Size 1) 02200042A (Size 2)	02200056A (Size 2)	02200075A (Size 2)		03200100A (Size 3)		04200133A (Size 4)	04200176A (Size 4)			05200250A (Size 5)
380/480 Vac ± 10%		02400013A (Size 2)	02400018A (Size 2)	02400023A (Size 2)	02400032A (Size 2)	02400041A (Size 2)		03400056A (Size 3)		03400073A (Size 3)	03400094A (Size 3)		04400135A (Size 4)	
500/575 Vac ± 10%							05500030A (Size 5)		05500040A (Size 5)			05500069A (Size 5)		06500100A (Size 6)
500/690 Vac ± 10%														

Diagnostics tool

Quickly solve any error codes that the drive may show. You can download our Diagnostics Tool App at:

www.controltechniques.com/mobile-applications



Remote keypad LCD

Remote mountable, intuitive plain text, multilingual LCD keypad for rapid set-up and superior diagnostics



Options and accessories

Unidrive M200 and M300

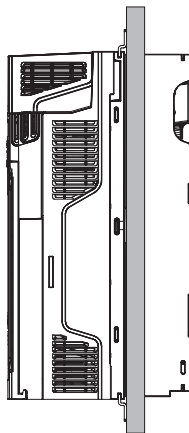
Select options:

Optional keypad		Order code	Option modules (available from frame size 2 and upwards)		Order code
Remote Keypad: Remote mountable, intuitive plain text, multilingual LCD keypad for rapid set-up and superior diagnostics (using the AI485 adaptor along with a comms lead). Rapid and secure panel fit with 1 x 32 mm hole rated to IP66 (NEMA 4).		82500000000001	SI-EtherCAT: EtherCAT interface module		82400000018000
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.		82400000019600	SI-PROFIBUS: PROFIBUS interface module		82400000017500
			SI-Ethernet: Ethernet module supports EtherNet/IP and Modbus TCP/IP		82400000017900
			SI-DeviceNet: DeviceNet interface module		82400000017700
			SI-CANopen: CANopen interface module		82400000017600
			SI-PROFINET: PROFINET interface module		82500000018200
			SI-I/O: extended I/O interface module to increase the number of I/O analog and digital points on a drive		82400000017800
Optional accessories		Order code	Software		Order code
AI-Back-up Adaptor: Port adaptor for SD card parameter cloning, and an input for 24 V back-up		82500000000004	Connect: PC tool for commissioning, optimizing and monitoring drive/system performance.		Available for free on controltechniques.com
AI-485 Adaptor: Adaptor that allows the drive to communicate via RS485		82500000000003			
AI-Smart Adaptor: Built-in memory for parameter cloning and 24 V backup		82500000018500			
RS485 cable: The USB comms cable allows the drive to connect to a PC for use with Unidrive M's PC tools.		4500-0096			
AI-485 24 V Adaptor: Adaptor with 24 V input		82500000019700			

Select accessories:

Optional external EMC filter: Unidrive M's built-in EMC filter complies with EN/IEC 61800-3 External EMC filters are available for when compliance with EN/IEC 61000-6-4 is required				
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
		1	Standard	4200-2001
	200 V	1	Low leakage	4200-2002
		3	Standard	4200-2003
		3	Low leakage	4200-2004
		3	Standard	4200-2005
3	200 V	3	Low leakage	4200-2006
		1	Standard	4200-3000
		1	Low leakage	4200-3001
		3	Standard	4200-3004
	400 V	3	Low leakage	4200-3005
		3	Standard	4200-3008
4	200 V	3	Low leakage	4200-3009
		1	Standard	4200-4000
		1	Low leakage	4200-4001
		3	Standard	4200-4002
	400 V	3	Low leakage	4200-4003
		3	Standard	4200-4004
5	200 V	3	Low leakage	4200-4005
	400 V	3	Standard	4200-0312
	575 V	3	Standard	4200-0402
6	200 V	3	Standard	4200-0122
	400 V	3	Standard	4200-2300
	575 V	3	Standard	4200-4800
7	200 V & 400V	3	Standard	4200-3690
	575 V & 690V	3	Standard	4200-1132
8	200 V & 400V	3	Standard	4200-0672
	575 V & 690V	3	Standard	4200-1972
9	200 V & 400V	3	Standard	4200-1662
	575 V & 690V	3	Standard	4200-3021
9	200 V & 400V	3	Standard	4200-3021
	575 V & 690V	3	Standard	4200-1660

Through hole IP65 kit	
Frame size	Order code
5	3470-0067
6	3470-0055
7	3470-0079
8	3470-0083
9A	3470-0119
9E	3470-0105



Through hole IP65 kit

* The level of compliance is dependent on the motor cable length and switching frequency. For more details please see the product EMC datasheet.

Retrofit mounting brackets	
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

UL Type 1 Conduit kit	
Frame size	Order code
1	3470-0091
2	3470-0094
3	3470-0098
4	3470-0102
5	3470-0069
6	3470-0059
7	3470-0080
8 / 9A	3470-0088
9E	3470-0115

Line reactor	
Frame size	Order code
9E (400 V)	7022-0063
9E (600 V)	7022-0063

Finger-guard grommet	
Frame size	Order code
9A / 9E	3470-0107

Lifting tool	
Frame size	Order code
9A	7778-0045
9E	7778-0016

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

Environmental safety and electrical conformance

- Size 1 to 4:
IP21 / UL open class (NEMA 1). IP20 when the AI Adaptors are fitted. UL TYPE 1 compliance requires the appropriate conduit kit to be fitted.
- Ambient temperature -20 °C (4 °F) to 40 °C (104 °F) as standard. 60 °C/ 140 °F with derating for frames 1-4.
- Size 5 to 9:
IP20 / UL open class (NEMA 1). UL TYPE 1 compliance requires the appropriate conduit kit to be fitted.
IP65 / UL TYPE 12 rating is achieved on the rear of the drive when through panel mounted (9E is IP55).
- Ambient temperature -20 °C (4 °F) to 40 °C (104 °F) as standard. 55 °C/ 131 °F with derating for frames 5-9.

Applicable to all:

- Storage temperature -40 °C to 60 °C (-40 °F to 140 °F).
- Humidity 95 % maximum (non-condensing) at 40 °C (104 °F) in accordance with EN/IEC 60068-2-78 and ANSI/EIA-364-31.
- EN/IEC 60068-2-60, Method 4 Corrosive gas.
- Altitude: 0 to 3000 m (0 to 9843 ft), derate 1 % per 100 m (328 ft) between 1000 m and 3000 m (3281 ft and 9843 ft).
- Random Vibration: Tested in accordance with EN/IEC 60068-2-64 with SI and AI option modules fitted.
- Mechanical Shock: Tested in accordance with EN/IEC 60068-2-29.
- Electromagnetic Immunity complies with EN/IEC 61800-3 and EN/IEC 61000-6-2.
- With onboard EMC filter, complies with EN/IEC 61800-3 (2nd environment).
- EN/IEC 61000-6-3 and EN/IEC 61000-6-4 with optional footprint EMC filter.
- EN/IEC 60146-1-1 Supply conditions.
- EN/IEC 61800-5-1 Electrical Safety.
- EN/IEC 61131-2 I/O.
- UL 508C Electrical Safety.

Connect with us at:



www.controltechniques.com



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P.N. 0778-0190-05 07/18