



Unidrive M700



**Class leading performance
with onboard real-time Ethernet**

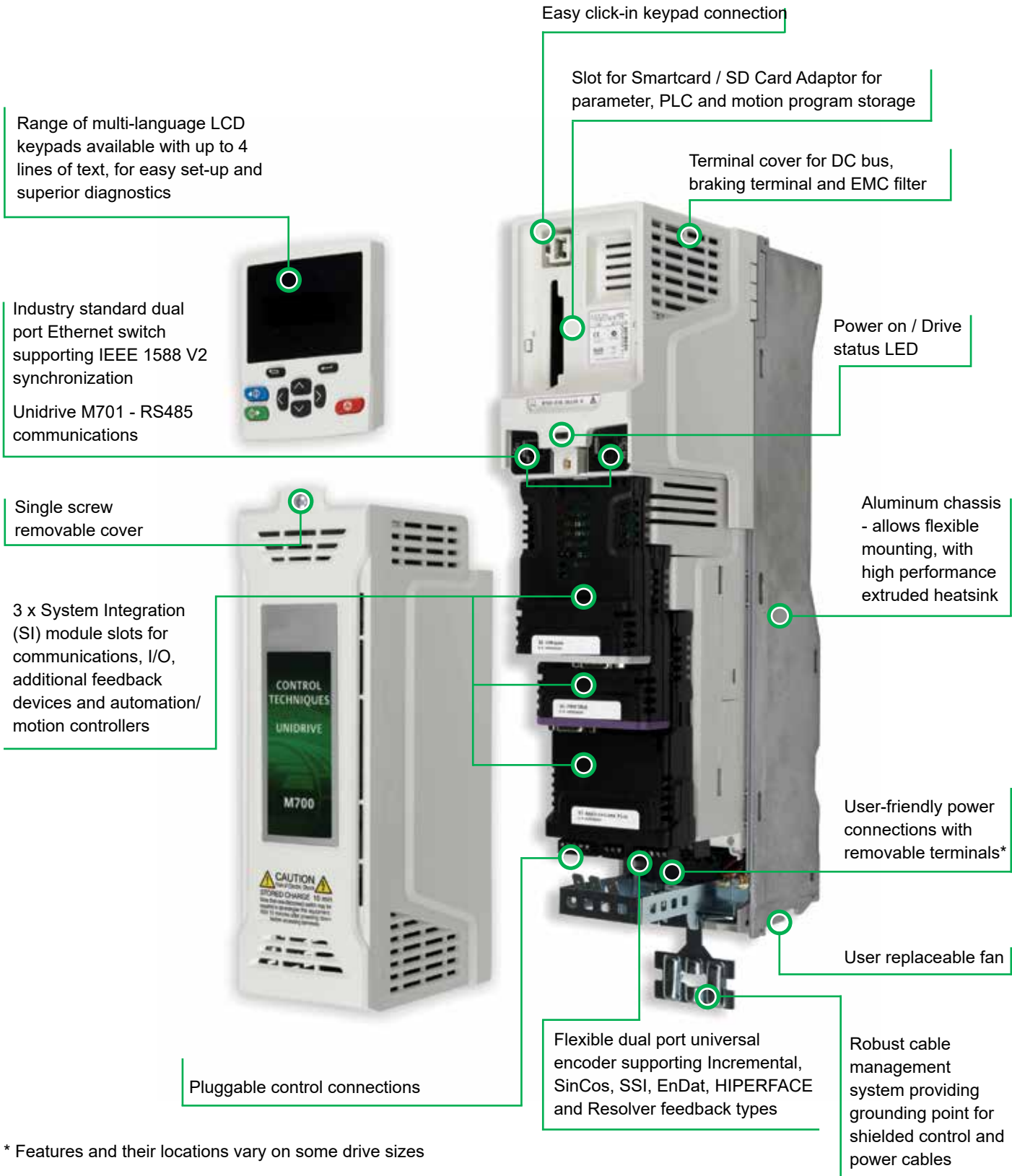
0.75 kW - 2.8 MW Heavy Duty (1.0 hp - 4,200 hp)
200 V | 400 V | 575 V | 690 V



CONTROL TECHNIQUES™

Nidec
All for dreams

Unidrive M700 features



* Features and their locations vary on some drive sizes

Performance control for every motor

Control Techniques' unique motor control algorithms combined with the latest microprocessor technology ensure that Unidrive M drives offer the highest stability and bandwidth for all industrial motor types. This enables maximum 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.

- High bandwidth motor control algorithm for open and closed loop induction and PM servo motors with up to 3,000 Hz current loop bandwidth and 250 Hz speed loop bandwidth

Matched servo motors for maximum performance

Nidec 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.

Electronic nameplates

- All Unimotor servo motors with communication based encoders come with electronic nameplate data preloaded. Unidrive M uses this data directly for faster and more accurate motor matching and commissioning.





Matched drives and motors maximize performance and 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
- Nidec'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

Motor control options available include:

Control Mode	Features
Open loop vector or V/Hz induction motor control	Open loop motor control for induction motors and the easiest configuration. V/Hz can be used for multiple motor control.
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.
Open loop permanent magnet motor control (RFC-S)	Open loop control of compact, high efficiency, permanent magnet motors (including the Leroy-Somer Dyneo® LSRPM).
Closed loop Rotor Flux Control for induction motors (RFC-A)	Speed and position control for induction motors, supporting a wide range of feedback devices.
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.
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.

Control Mode

Open loop vector or V/Hz induction motor control
Open loop Rotor Flux Control for induction motors (RFC-A)



Closed loop permanent magnet motor control (RFC-S)



Open loop permanent magnet motor control (RFC-S)



Closed loop Rotor Flux Control for induction motors (RFC-A)



Active Front End (AFE)
power quality converter



Optional Drive Programming and Operator Interface

Unidrive M Connect



KI-Keypad



KI-Keypad RTC



Remote Keypad



Remote keypad RTC



Operator Interface



Smartcard



SD Card using SD Card Adaptor



KI-485 Adaptor



Centralized PLC / Motion Control

Motion Controller



PLC

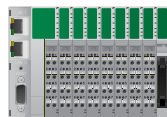


Industrial Computer



Optional Input/Output

Remote I/O



SI-I/O



4 x Digital I/O
3 x Analog input (default) / Digital input
1 x Analog output (default) / Digital input
2 x Relay

Standard on M700/M701



5 x Analog I/O
8 x Digital I/O (including 2 x high speed I/O [250 µs])
1 x Relay output
1 x STO

M702: includes 2 x STO, while analog I/O is not present



Applications with PLC or Motion Functionality

Standard

Easy to use onboard PLC and advanced motion control using an industry standard IEC61131-3 programming environment



SI-Applications Plus compatible module which allows existing SyPTPro application programs to be re-compiled for M700



MCi200 Advanced machine control using industry standard IEC61131-3 programming languages



MCi210 Extended advanced machine control using industry standard IEC61131-3 programming languages with simultaneous connectivity to 2 separate Ethernet networks



Communications

Standard

Ethernet (IEEE 1588 V2)
Modbus TCP/IP
EtherNet/IP
TCP/IP
UDP



SI-EtherCAT



SI-PROFIBUS



SI-Ethernet



SI-DeviceNet



SI-CANopen



SI-PROFINET



Feedback

Standard

2 x universal encoder input channels
Support includes EnDat 2.2, HIPERFACE and SSI
1 x simulated encoder output



SI-Encoder



SI-Universal Encoder



Safety

SI-Safety



DC Back-up Power Supply

24 - 1067 Vdc power*



24 Vdc control



*Drive voltage rating dependent

Unidrive M700 ratings and specifications

Environmental safety and electrical conformance

- IP20 / NEMA1 / 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
- Frames 9, 10 & 11 achieve IP55 / NEMA4 / UL TYPE 12 rating on the rear of the drive when through panel mounted
- Ambient temperature -20 °C to 40 °C as standard. Up to 55 °C with derating
- Humidity 95 % maximum (non-condensing) at 40 °C
- Altitude: 0 to 3000 m, derate 1 % per 100 m between 1000 m and 3000 m
- Random Vibration: Tested in accordance with IEC 60068-2-64
- Mechanical Shock Tested in accordance with IEC 60068-2-29
- Storage temperature -40 °C to 70 °C
- Electromagnetic Immunity complies with EN 61800-3 and EN 61000-6-2
- With onboard EMC filter, complies with EN 61800-3 (2nd environment)
- EN 61000-6-3 and EN 61000-6-4 with optional footprint EMC filter
- IEC 60146-1-1 supply conditions
- IEC 61800-5-1 (Electrical Safety)
- IEC 61131-2 I/O
- Safe Torque Off, independently assessed by TÜV to IEC 61800-5-2 SIL 3 and EN ISO 13849-1 PLe
- UL 508C (Electrical Safety)

Optional media and accessories

Description	Order code
SD Card Adaptor	82400000016400
Smartcard (64 kB)	3130-1212

Internal brake resistor

Frame size	Order code
3	1220-2752
4 & 5	1299-0003

DC bus paralleling kit

Frame size	Order code
3	3470-0048
4	3470-0061
5	3470-0068
6	3470-0063
6 (connect to frame 3,4 & 5)	3470-0111

Unidrive M700 feature and specification table

Performance	Current loop update: 62 µs
	Heavy Duty peak rating: 200 % (3 s)
	Maximum output frequency: 550 Hz
	Switching frequency range: 2, 3, 4, 6, 8, 12, 16 kHz (3 kHz default)
	High performance current controllers
Onboard intelligence	Programmable Logic Control (PLC)
	Real-time tasks
	Digital lock control
	Advanced Motion Controller
Onboard comms	Ethernet (2 switched ports), (M701: RS485)
Mechanical attributes	Tile mounting on sizes 3, 4, 5
	Unidrive SP compatible mechanical footprint either as standard or with conversion plates
	Common DC bus connections on sizes 3, 4, 5, 6
Parameter back-up	Ethernet/serial port cloning
	SD card (using SD-Card Adaptor)
	Smartcard reader support
	Electronic motor nameplate parameter storage (HIPERFACE)
Feedback	2 x Encoder input and 1 x Simulated encoder output
Onboard I/O	3 x Analog input, 2 x Analog output, 4 x Digital input, 1 x Digital output, 3 x Bidirectional digital input or output
	(M702: 3 x Digital input, 3 x Digital output and no Analog I/O)
	1 x Relay output
Machine safety	1 x Safe Torque Off (STO) terminal, (M702: 2 x STO)
Power and motor control	Stationary autotune for permanent magnet motors
	Mechanical load resonance compensation
	Wide operating range back-up DC supply
	24 V control back-up
Other	Temperature controlled fan operation with user adjustable speed limit
	User replaceable fan(s)
	Conformal coating
	Standby mode (energy saving)

Unidrive M operating modes

Operating mode	RFC from cold	RFC from 100 %	Open loop from cold	Open loop from 100 %
Normal duty overload with motor rated current = drive rated current	110 % for 165 s	110 % for 9 s	110 % for 165 s	110 % for 9 s
Heavy duty overload with motor rated current = drive rated current (size 8 and below)	200 % for 28 s	200 % for 3 s	150 % for 60 s	150 % for 7 s
Heavy duty overload with motor rated current = drive rated current (size 9E and 10)	170 % for 42 s	170 % for 5 s	150 % for 60 s	150 % for 7 s

Unidrive M frame sizes and ratings

SINGLE DRIVES



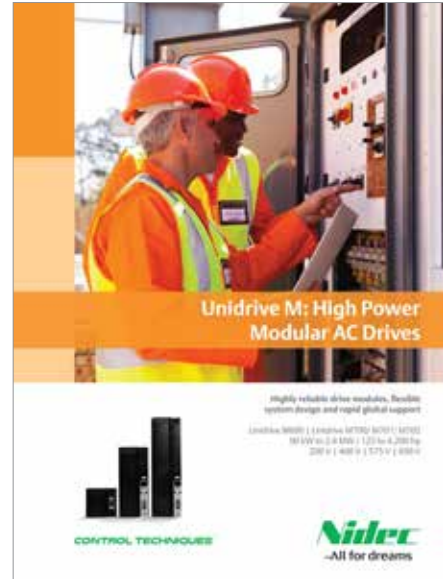
Frame size		3	4	5	6	7	8	
Frame sizes available	M700 → M702	•	•	•	•	•	•	
Dimensions (H x W x D)	mm	365 x 83 x 200	365 x 124 x 200	365 x 143 x 200	365 x 210 x 227	508 x 270 x 280	753 x 310 x 290	
	in	14.4 x 3.3 x 7.9	14.4 x 4.9 x 7.9	14.4 x 5.6 x 7.6	14.4 x 8.3 x 8.9	20 x 10.6 x 11.0	29.7 x 12.2 x 11.4	
Weight	kg (lb)	4.5 (9.9) Max	6.5 (14.3)	7.4 (16.3)	14 (30.9)	28 (61.7)	52 (114.6)	
DC Bus Choke/ AC Line Choke	Internal	•*	•	•	•	•	•	
	External							
Max Continuous Heavy Duty kW Rating	@ 100 V	N/A						
	@ 200 V	0.75 kW - 2.2 kW (1 hp - 3 hp)	3 kW - 4 kW (3 hp - 5 hp)	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)	
	@ 400 V	0.75 kW - 4 kW (1 hp - 5 hp)	5.5 kW - 7.5 kW (7.5 hp - 10 hp)	11 kW - 15 kW (15 hp - 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)	
	@ 575 V	N/A		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)	
	@ 690 V	N/A				15 kW - 45 kW (20 hp - 60 hp)	55 kW - 75 kW (75 hp - 100 hp)	

*except 03200050 and 03400062 ratings

Sizes do not include removable mounting brackets



	9A	9E	10E	11E
	•	•	•	•
	1049 x 310 x 290	1010 x 310 x 290	1010 x 310 x 290	1190 x 310 x 312
	41.3 x 12.2 x 11.4	41.3 x 12.2 x 11.4	41.3 x 12.2 x 11.4	46.9 x 12.2 x 12.3
	66.5 (146.6)	46 (101.4)	46 (101.4)	63 (138.9)
	•			
		•	•	•
	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
	90 kW - 110 kW (125 hp - 150 hp)	90 kW - 110 kW (125 hp - 150 hp)	132 kW - 160 kW (200 hp - 250 hp)	185 kW - 250 kW (300 hp - 400 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)
	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)



For information on our high power Unidrive M modules (90 kW - 2.8 MW) refer to the Unidrive M high power brochure - available online.



For information on our Unidrive HS70 and HS30 high frequency drives (0-3,000 Hz), refer to the Unidrive HS flyer - available online