# CONTROL<sup>™</sup> TECHNIQUES



Easy to use, low power servo solutions





# Servo solutions for continuous and pulse duty applications

Control Techniques' servo solutions provide ultimate performance and flexibility for machinery manufacturers with a wide range of servo drives and motors.

# **Digitax SF**

The Digitax SF servo drive and motor package complements the Control Techniques servo portfolio with a compact, cost effective and easy to use solution for a range of application requirements. Digitax SF offers:

- High performance drives with pulse train or analog interface and serial communication
- A range of light-duty industrial motors available in several inertia levels to meet different application requirements

# **Digitax HD**

The Digitax HD range brings ultimate performance to high dynamic, pulse duty applications, where high peak torque is required for fast acceleration.





## **Unidrive M700**

Unidrive M700, with high performance and an extensive power range, is the ideal option for continuous duty applications, where precise, continuous torque delivery is required.

## **Unimotor**

Unimotor is a comprehensive family of high performance AC brushless servo motors. With a wide torque and speed range, and a broad selection of feedback options, Unimotor offers the perfect match for Digitax HD and Unidrive M700 to meet any application requirement.

# **Drive and Motor Compatibility**



# **Digitax SF**

Digitax SF responds to the needs of customers requiring low powered precision servo solutions, with a dedicated servo range from 50W to 2 kW.

With 17-bit resolution, robust magnetic encoder technology and pulse train or analog control interface, Digitax SF offers a cost-effective servo solution, without compromising on performance.



Versatile analog or pulse train interface, offering easy integration with any plc or motion controller

Digitax SF can also operate standalone using the on-board 16-point positioning table

Built-in keypad with 6 digit 7-segment status display for easy startup, parameter setting, and tuning

PC-USB interface for parameter settings, tuning, and status display in the dedicated software Digitax SF Connect

Magnetic encoder technology

- robust in harsh environments
- ultra-low energy consumption for reduced maintenance
- Standardised flange sizes
- IP 65 or 67 motors

Multiple motor inertia levels available, covering a wide range of applications, from semiconductor manufacturing to textile, packaging machines, robotics, extruders, metering and other applications requiring speed, precision and accuracy.

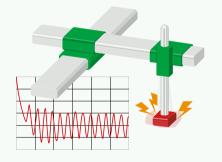
# **Digitax SF Connect**

Digitax SF Connect is a user-friendly PC tool with a familiar Windows interface and intuitive graphical tools for easy parameter setting, tuning and diagnostics. Ease of machine start-up is further facilitated through a positioning table and test run features.

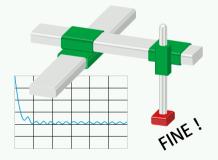




Straightforward to setup and tune, Digitax SF offers high servo performance at the click of a button. For demanding applications, a rich selection of filters to dampen mechanical resonances and suppress tip vibration can be easily configured within Digitax SF Connect with the aid of FFT frequency analysis



No damping filter used



Damping filter used



## **Drive Set-Up**

Quickly find everything you need for quick and easy installation of your drives.

Visit: www.drive-setup.com





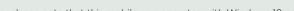
## **Diagnostics tool**

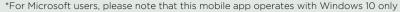
Quickly solve any error codes that the drive may show.

You can download our
Diagnostics Tool app at:
www.controltechniques.com/mobile-applications







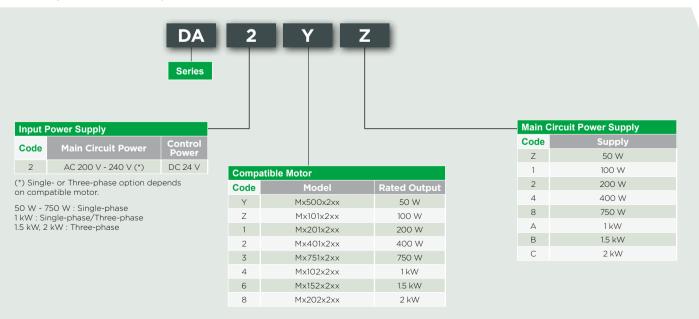


## Motor and drive combinations

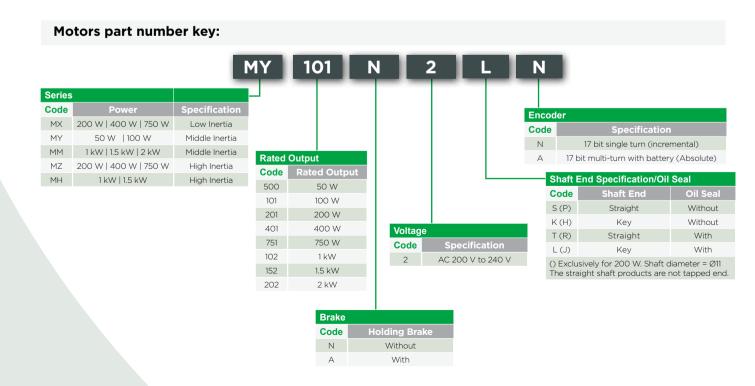
			MOTOR INERTIA LEVEL
_		Low Inertia	Middle Inertia
	40 mm		50 W   100 W 3000 rpm rated 6000 rpm maximum IP65
MOTOR FLANGE SIZES	60 mm	200 W   400 W 3000 rpm rated 6000 rpm maximum IP65	
	80 mm	750 W 3000 rpm rated 6000 rpm maximum IP65	
	130 mm		1 kW   1.5 kW   2 kW 2000 rpm rated 3000 rpm maximum IP67

# **Digitax SF ordering information**

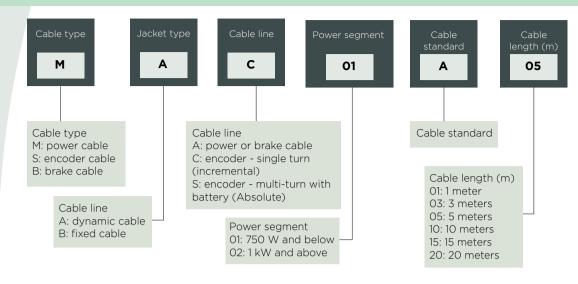
# **Drives part number key:**



High Inertia	Drive Compatibility
	50 W 100 W
200 W   400 W 3000 rpm rated 6000 rpm maximum IP65	200 W 400 W
750 W 3000 rpm rated 6000 rpm maximum IP65	750 W
1 kW   1.5 kW 2000 rpm rated 3000 rpm maximum IP67	1 kW 2 kW



# Motor cables part number key:



Accessories			
Order code	Phases	Accessory	Description
2216-0211	All	Input / Output (I/O) terminal block and cable assembly	Digitax SF drives are equipped with a 50 pin high-density I/O port. For ease of wiring, a pre-assembled cable and DIN rail mountable terminal block with screw-terminals is available to easily connect the drive I/O.
3412-0050	All	Input / Output: Interface Connector	50 pin high-density male plug for control signals, digital I/O and 24V auxiliary power
2490-2754	1	Surge absorber/	Quick response protection against power supply surges from
2490-0004	3	protector	mains supply to the Digitax SF drive.
4200-0056	1		EMC filters prevent emission of electromagnetic interference onto the AC supply lines. To ensure compliance with EMC, use the recommended EMC noise filter
4200-3106	3	EMC Filter	Rated Voltage (V): 250 Vac Rated Current (A): Single phase: 5 A Three Phase: 10 A

Drive E	Basic Specificat	ions							
	Item	Specification							
Drive model		DA2YZ	DA2Z1	DA212	DA224	DA238	DA24A	DA26B	DA28C
App	licable motor	M□500	M□101	M□201	M□401	M□751	M□102	M□152	MM202
D	imensions			(Refe	r to dimens	ion chart c	n pages 12-13)		
Driv	e weight (kg)		_	).7		0.8	1.0		6
	Main circuit power			se AC 200 ) % 50/60	) V - 240 V ) Hz		Three-phase A ±10 %	C 200 V - 50/60 Hz	240 V
	Control power supply				DC	24 V ±10 9			
Input power	Input current	0.8	1.3	2.4	3.6	7.2	Single-phase: 9.7 Three-phase: 5.1	6.1	9.0
	Control power Current		170		210	260	3	350	
	consumption (mA Typ.)		(Inrush current is approx. 1.4 A)						
C	ontrol type	Three-phase PWM inverter sine-wave driven							
Output	Rated current (A)	0.7	1.0	1.7	2.7	4.3	5.6	9.9	12.2
specifica- tion	Output frequency (Hz)	0 - 500					0 - 250		
Enco	oder feedback	17 bit single turn (incremental) (The product can function as a multi-turn absolute type when batteries are added.)							
Control	Input	8-point (24 VDC system, opto- switched by the control mode							
signal	Output	8-point (24 VDC system, open-collector output insulation) outputs whose functions are switched by the control mode							
Analog signal	Input	_		) input who	ose functio	ns can be s	switched by the co	ntrol mode	!
Pulse	Input	RS-422 di Open-coll							
signal	Output			ulse (A-/B gh open-co		RS-422 di	fferential output		
Communication function		USB: connection to PC with Digitax SF Connect installed RS-485: host remote control communication (multi-drop compatible)							
Drive status display function		Drive status display function 6 digits of seven-segment display on Setup Panel							
Regen	eration function	A braking	resistor m	ay be insta	lled extern	ally			
Со	ntrol modes	Position c	ontrol, velo	ocity contr	ol, torque c	ontrol			

Drive Env	Drive Environment Specifications						
	Item	Specification					
Ambient	For use	0 - 50 °C					
temperature	For storage	-20 - 65 °C					
Ambient	For use	20 - 85 % RH or less (without condensation)					
humidity	For storage	20 - 83 % KH OF less (WILHOUL CONDENSATION)					
Atmosphe	ere for operation and storage	Indoor (no direct sunlight), free from corrosive gas, flammable gas, oil mist, dust, combustibles, abrasives					
	Altitude	≤ 1000 m					
	Vibration	≤ 5.8 m/s² (0.6 G) 10 to 60 Hz (no continuous operation allowed at resonant frequency)					
Diel	ectric strength	AC 1,500 V for one minute across the primary and Ground/Earth FG					
Electric shock protection		Class I (mandatory grounding)					
Overv	oltage category						
Installation environment		Pollution degree 2					

Drive f	unction s	pecific	ations		
	It	tem		Specification	
		Control input		Servo ON, alarm reset, command input inhibit, emergency stop, position error counter clear, 2-stage torque limit inhibit, ABS data demand, homing start	
	Pulse	Pulse Control output		Alarm status, servo status, servo ready, under torque limit, brake release, positioning complete, motion complete, alarm, emergency stop brake release, ABS data transmitting, homing complete	
	input command		num command se frequency	RS-422 differential: 4 Mpps Open-collector: 200 kpps	
Position			ulse signal form	Pulse + direction, A-/B-phase quadrature encoder pulse, CW + CCW pulse	
control			and pulse-paired requency	Ratio A/B 1/1,000 < A/B < 1,000 Setting range A: 1 - 65,535 B: 1 - 65,535	
mode	Internal .	Co	ontrol input	Servo ON, alarm reset, position error counter clear, motion start point selection 16, home position sensor input, homing	
	position command	Со	ntrol output	Alarm status, servo status, servo ready, under torque limit, brake release, homing completion, motion complete	
		Оре	eration mode	Point table, communication operation	
	S	moothir	ig filter	FIR filter	
	D	amping	control	Enabled	
	Analog command	Co	ontrol input	Servo ON, alarm reset, command input inhibit (zero torque command), 2-stage torque limit, CCW/CW run inhibit	
		Со	ntrol output	Alarm status, servo status, servo ready, under torque limit, brake release	
Velocity control		Speed	command input	Input voltage -10V to +10V (maximum speed is reached at ±10 V)	
mode	Internal speed		ontrol input	Servo ON, alarm reset, start 1 (CCW), start 2 (CW), 8-speed setting, 2-stage torque limit	
	command Control output		ntrol output	Alarm status, servo status, servo ready, under torque limit, brake release	
	S	moothir	ig filter	IIR filter, FIR filter	
Т	Analog	Co	ontrol input	Servo ON, alarm reset, command input inhibit (zero torque command), 2-stage torque limit, CCW/CW run inhibit	
Torque control	command	Со	ntrol output	Alarm status, servo status, servo ready, under torque limit, brake release	
mode		Torque	command input	Input voltage -10 V to +10 V (maximum torque is reached at ±10 V)	
	S	moothir	ng filter	IIR filter	
	S	peed ob	server	Available	
		Auto-tu	ıning	Available	
		der outp multiplic	ut division/ cation	Available	
Common features	Tunir	ng / func	ction setup	Available through the Digitax SF setup software "Digitax SF Connect" Tuning with the setup panel on the drive front side	
	Protect		By hardware	Overvoltage, low voltage, overcurrent, abnormal temperature, overload, encoder error	
	functio	)ris	By software	Overspeed, position error too high, parameter errors	
	Alarm log		log	Can be viewed with the setup software Digitax SF Connect	

# **Safety Standards**



5	Specification	Motor	Drive	
	Low Voltage Directive (*1)	EN60034-1 EN60034-5	EN61800-5-1	
EU/EC Directive	EMC Directive (*2)	EN61000-6-2 EN55011 Class A, Group 1	EN61000-6-2 EN55011 Class A, Group 1	
	Machinery Directive	Not Applicable		
UL Standards (*1)		1004-1 1004-6	508C	
South Korea Radio Law (KC)		Not applicable KN11 KN61000-6-2		
China Compulsory	Product Certification System (CCC)	Not Ap	plicable	

<sup>\*1)</sup> Install the product in the environment that meets the following requirements: • Overvoltage Category II • Class I • Pollution Degree 2 (Circuitry)
\*2) Refer to the Digitax SF Instruction Manual for further guidance

Motor General Specifications					
Item	Specification				
Ambient temperature for operation	0 - 40 °C				
Ambient humidity for operation	20 - 85 % RH (no condensation)				
Ambient temperature for storage	-20 - 65 °C (no condensation) Maximum temperature 80 °C, 72 hours				
Ambient humidity for storage	20 - 85 % RH (no condensation)				
Atmosphere for operation/storage	Indoor (no direct sunlight), free from corrosive gas, flammable gas, oil mist, dust, combustibles, abrasives				
Insulation resistance	≥ 5 M <b>Ω</b> at 1,000 VDC				
Dielectric strength	AC 1500 V for one minute across the primary and Ground/Earth FG				
Operating altitude	≤1000 m				
Vibration class	V15 (JEC 2121)				
Vibration resistance	49 m/s² (5 G)				
Impact resistance	98 m/s² (10 G)				
Protective structure	IP65: 50 W - 750 W IP67: 1 kW - 2 kW				
Electric shock protection	Class I (mandatory grounding)				
Overvoltage category	II				
Installation environment	Pollution degree 2				

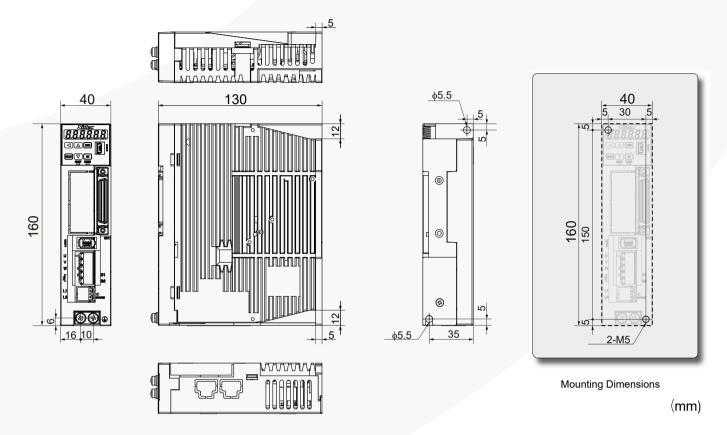
Encoder Basic Specifications							
	Item		Specification				
Motor model			M000020N	M000020A			
	Resolution		Incremental 17 bit	Absolute 17 bit			
Environmental	Ambient oper	rating temperature	0 - 8	35 °C			
requirements	External disturbance magnetic field		±2 mT (20 (	G) or below			
	Power supply	Voltage	DC 4.5 - 5.5 V (power supply ripple ≤ 5 %)				
	Power supply	Current consumption	160 mA typ. (not including inrush current)				
	External battery	Voltage	_	DC 2.4 - 4.2 V			
Electrical		Current consumption	I	10 μA typ. (*1)			
specifications	Multi-turn count		I	65,536 counts			
	Maximum revolving speed		6,000 rpm				
	Count-up direction		CCW (*2)				
	Output/input type		Differential				
Communication	Transmi	ssion method	Half-duplex asynchronous serial communication				
specifications	Commur	nication speed	2.5 Mbps				

<sup>\*1)</sup> Measurement conditions: room temperature, motor not in motion, battery voltage of 3.6 V.

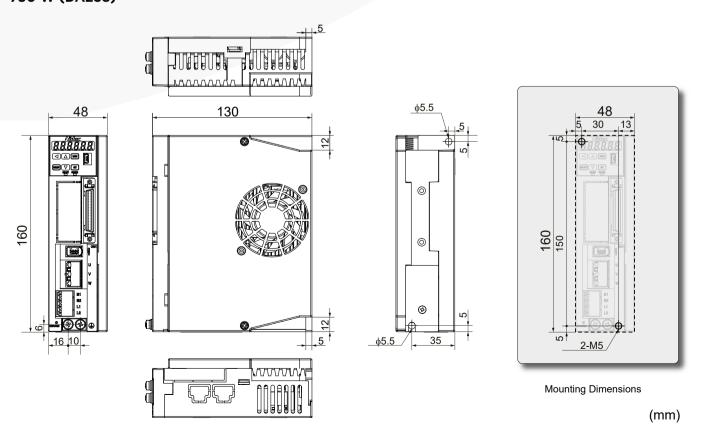
 $<sup>^{*}</sup>$ 2) CCW when viewed from the load side shaft end.

# **Dimensions**

# 50 W to 400 W (DA2YZ | DA2Z1 | DA212 | DA224)

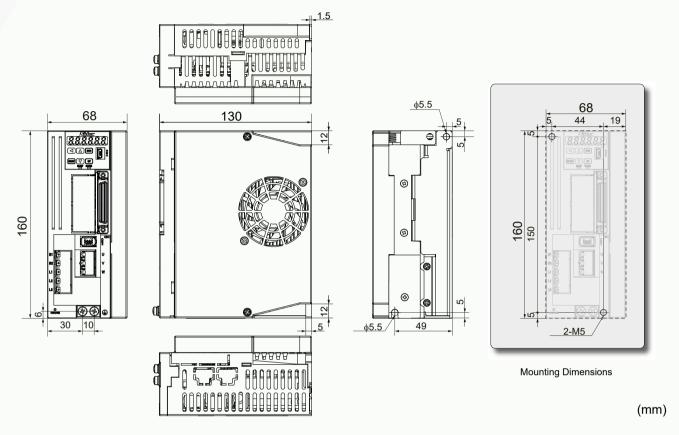


# 750 W (DA238)

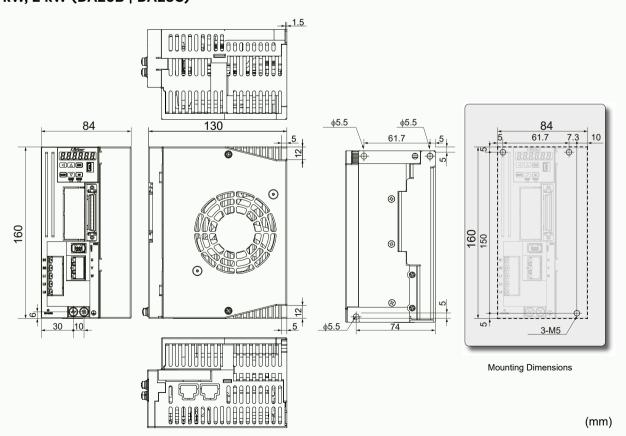


# **Dimensions**

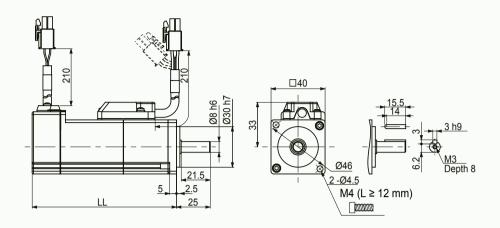
# 1 kW (DA24A)



# 1.5 kW, 2 kW (DA26B | DA28C)



### Dimensions



The straight shaft products are not tapped end.

# Motor Specifications

Motor Specifications	Unit	MY500 🗆 2 🗆 🗆	MY101□2□□
Voltage	V	AC200V-240V	AC200V-240V
Rated output power	kW	0.05	0.1
Rated torque	Nm	0.16	0.32
Instantaneous max. torque	Nm	0.56	1.12
Rotor inertia (without brake)	kg·cm²	0.039	0.061
Rotor inertia (with brake)	kg·cm²	0.047	0.069
Mechanical time constant (without brake)	ms	1.92	1.17
Mechanical time constant (with brake)	ms	2.31	1.32
Electrical time constant	ms	0.74	0.89
Rated speed	rpm	3000	3000
Maximum revolving speed	rpm	6000	6000
Torque constant	Nm/A	0.25	0.35
Induced voltage constant per phase	mV/(rpm)	8.8	12.3
Mass (without brake)	kg	0.4	0.5
Mass (with brake)	kg	0.6	0.8
Permissible radial load	N	68	68
Permissible axial load	N	58	58

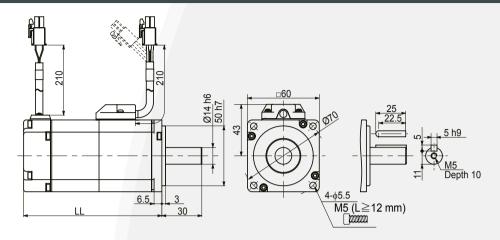
# Brake specification

		MY500 🗆 2 🗆	MY1010200
Rated voltage	V	DC24V ±10 %	DC24V ±10 %
Rated current	А	0.25	0.25
Static friction torque	Nm	>0.16	>0.32
Engage time	ms	<35	<35
Release time	ms	<20	<20
Release voltage	V	> DC1V	> DC1V

### Motor size LL (mm)

Brake	With	nout	With		
Oil seal	Without	With	Without	With	
MY5000200	66.4	72.0	106.8	112.4	
MY1010200	82.4	88.0	122.8	128.4	

### **Dimensions**



The straight shaft products are not tapped end.

# Motor Specifications

Motor Specifications	Unit	MX2010200	MZ2010200	MX401□2□□	MZ401=2==
Voltage	V	AC200V-240V	AC200V-240V	AC200V-240V	AC200V-240V
Rated output power	kW	0.2	0.2	0.4	0.4
Rated torque	Nm	0.64	0.64	1.27	1.27
Instantaneous max. torque	Nm	1.91	1.91	3.82	3.82
Rotor inertia (without brake)	kg·cm²	0.14	0.44	0.23	0.71
Rotor inertia (with brake)	kg·cm²	0.17	0.47	0.26	0.73
Mechanical time constant (without brake)	ms	0.72	2.23	0.47	1.42
Mechanical time constant (with brake)	ms	0.87	2.38	0.53	1.47
Electrical time constant	ms	2.53	2.53	2.92	2.92
Rated speed	rpm	3000	3000	3000	3000
Maximum revolving speed	rpm	6000	6000	6000	6000
Torque constant	Nm/A	0.41	0.41	0.49	0.49
Induced voltage constant per phase	mV/(rpm)	14.3	14.3	17.1	17.1
Mass (without brake)	kg	0.8	1.0	1.3	1.5
Mass (with brake)	kg	1.3	1.5	1.8	2.0
Permissible radial load	N	245	245	245	245
Permissible axial load	N	98	98	98	98

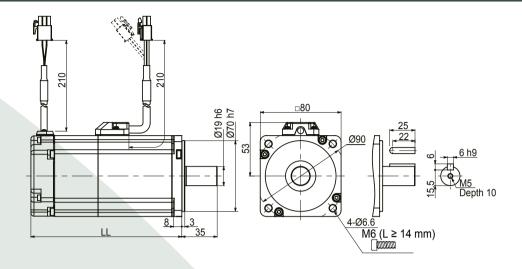
# Brake specification

Rated voltage	V	DC24V ±10 %
Rated current	А	0.3
Static friction torque	Nm	>1.27
Engage time	ms	<50
Release time	ms	<15
Release voltage	V	> DC1V

### Motor size II (mm)

Brake	Without	With
MX2010200	76.5	113.0
MZ2010200	93.5	130.0
MX4010200	93.5	130.0
MZ4010200	110.5	147.0

### Dimensions



The straight shaft products are not tapped end.

# Motor Specifications

Motor Specifications	Unit	MX7510200	MZ7510200
Voltage	V	AC200V-240V	AC200V-240V
Rated output power	kW	0.75	0.75
Rated torque	Nm	2.39	2.39
Instantaneous max. torque	Nm	7.1	7.1
Rotor inertia (without brake)	kg·cm²	0.74	1.61
Rotor inertia (with brake)	kg·cm²	0.94	1.81
Mechanical time constant (without brake)	ms	0.40	0.86
Mechanical time constant (with brake)	ms	0.50	0.96
Electrical time constant	ms	4.60	4.60
Rated speed	rpm	3000	3000
Maximum revolving speed	rpm	6000	6000
Torque constant	Nm/A	0.63	0.63
Induced voltage constant per phase	mV/(rpm)	21.9	21.9
Mass (without brake)	kg	2.2	2.5
Mass (with brake)	kg	3.0	3.3
Permissible radial load	N	392	392
Permissible axial load	N	147	147

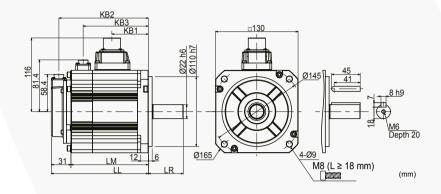
# Brake specification

Rated voltage	V	DC24V ±10 %
Rated current	А	0.4
Static friction torque	Nm	>2.39
Engage time	ms	<70
Release time	ms	<20
Release voltage	V	> DC1V

### Motor size LL (mm)

Brake	Without	With
MX7510200	107.3	144.3
MZ7510200	122.3	159.3

### **Dimensions**



The straight shaft products are not tapped end.

# Motor Specifications

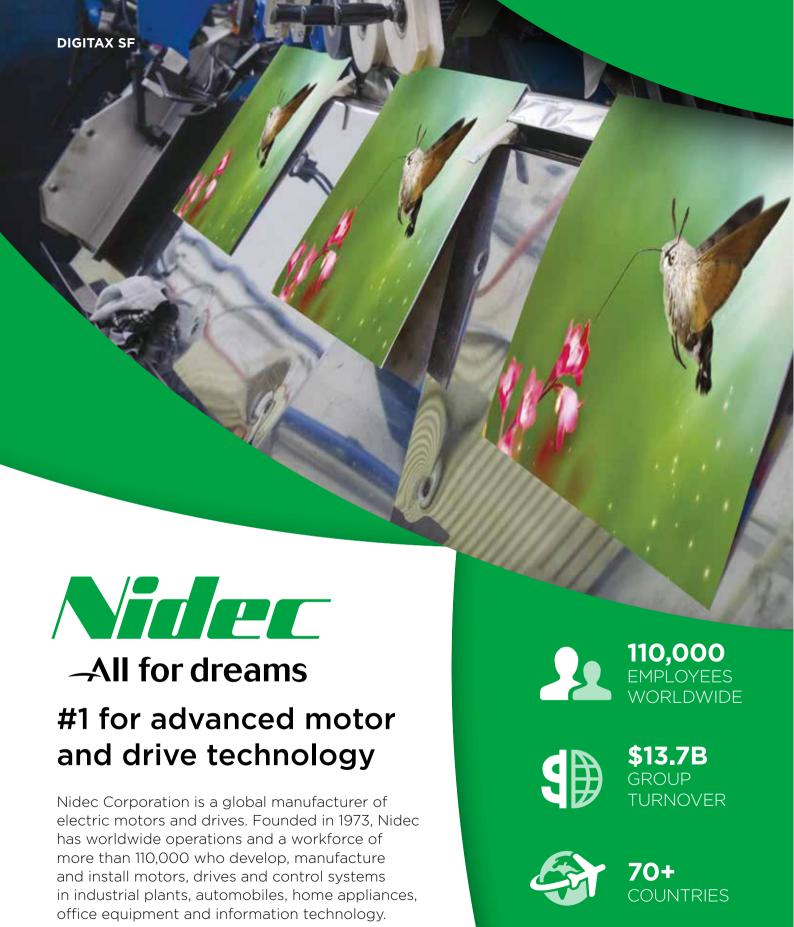
Motor Specifications	Unit	MM1020200	MH1020200	MM1520200	MH152□2□□	MM2020200
Voltage	V	AC200V-240V	AC200V-240V	AC200V-240V	AC200V-240V	AC200V-240V
Rated output power	kW	1.0	1.0	1.5	1.5	2.0
Rated torque	Nm	4.77	4.77	7.16	7.16	9.55
Instantaneous max. torque	Nm	14.3	14.3	21.5	21.5	28.6
Rotor inertia (without brake)	kg·cm²	4.56	24.9	6.67	37.12	8.70
Rotor inertia (with brake)	kg·cm²	6.24	26.4	8.35	38.65	10.38
Mechanical time constant (without brake)	ms	0.76	4.17	0.60	3.32	0.58
Mechanical time constant (with brake)	ms	1.05	4.43	0.75	3.46	0.69
Electrical time constant	ms	10.1	10.1	12.2	12.2	12.2
Rated speed	rpm	2000	2000	2000	2000	2000
Maximum revolving speed	rpm	3000	3000	3000	3000	3000
Torque constant	Nm/A	0.88	0.88	0.81	0.81	0.85
Induced voltage constant per phase	mV/(rpm)	30.9	30.9	28.4	28.4	29.6
Mass (without brake)	kg	5.6	7.6	7.0	9.0	8.4
Mass (with brake)	kg	7.0	9.0	8.4	10.4	9.8
Permissible radial load	N	490	490	490	490	490
Permissible axial load	N	196	196	196	196	196

# Brake specification

Rated voltage	V	DC24V ±10 %
Rated current	А	1.0
Static friction torque	Nm	>9.55
Engage time	ms	<120
Release time	ms	<30
Release voltage	V	> DC1V

# Motor size (mm)

	Brake	LL	LM	LR	KB1	KB2	KB3
	Without	128.0	97.0	55.0	57.5	116.0	-
MM1020200	With	153.0	122.0	55.0	57.5	141.0	102.8
MI 1102-2	Without	163.0	132.0	70.0	92.5	151.0	-
MH1020200	With	188.0	157.0	70.0	92.5	176.0	137.8
NANA1EO-O	Without	145.5	114.5	55.0	75.0	133.5	-
MM1520200	With	170.5	139.5	55.0	75.0	158.5	120.3
MH1520200	Without	180.5	149.5	70.0	110.0	168.5	-
MHIDZUZUU	With	205.5	174.5	70.0	110.0	193.5	155.3
MM2025255	Without	163.0	132.0	55.0	92.5	151.0	-
MM2020200	With	188.0	157.0	55.0	92.5	176.0	137.8



230 COM

# CONTROL TECHNIQUES

# **DRIVE SPECIALISTS SINCE 1973**

Drives: they're what we do. Whether you're designing a new machine or installing a replacement, we know you need quick delivery and an easy set up, with the confidence that your drive's going to keep on performing with accurate control.

So leave it to the specialists. We've dedicated ourselves to designing and manufacturing variable speed drives since 1973. This means quick set up, high reliability, maximum motor control and fast, efficient service.



1,000+ OEM CUSTOMERS



5M+
INSTALLED
DRIVES



1,500+
EMPLOYEES
WORLDWIDE



**70** COUNTRIES



# **Outstanding** performance

The outstanding performance of our drives is the fruit of over 45 years of engineering experience in drive design.



# Technology you can rely on

Robust design and the highest build quality ensure the enduring reliability of the millions of drives installed around the world.



# **Open design architecture**

Based on open design architecture, our drives integrate with all primary communication protocols.

# Global reach, local support

Highly experienced, locally based Application Engineers design and support drive technology to provide maximum value, wherever you are in the world.



# **Embedded** intelligence

Precision motor control is combined with the highest embedded intelligence, ensuring maximum productivity and efficiency of your machinery.

A part of the Nidec Group

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For more information, or to find your local drive centre representatives, visit

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