

**CONTROL<sup>TM</sup>  
TECHNIQUES**

# DIGITAX SF

SERVO DRIVES & MOTORS



200 V  
50 W - 2 kW

Easy to use, low  
power servo solutions

**Nidec**  
All for dreams

# 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**

0.05 kW - 2 kW  
200 V



**Digitax HD**

0.25 kW - 7.5 kW  
200 V | 400 V



**Unidrive M700**

0.75 kW - 2.8 MW  
200 V | 400 V | 575 V | 690 V

**300% OVERLOAD**

**200% OVERLOAD**

**Digitax SF Motor**

(Available in low, middle and high inertia)



**Pulse Duty Servo Range - Unimotor HD**

(Optimized with the Control Techniques pulse duty drive)



**Continuous Duty Servo Range - Unimotor FM**

(Optimized with the Control Techniques continuous duty drive)



**Induction**

(Optimized with the Leroy-Somer IMfinity® range)



**High efficiency motors**

# 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

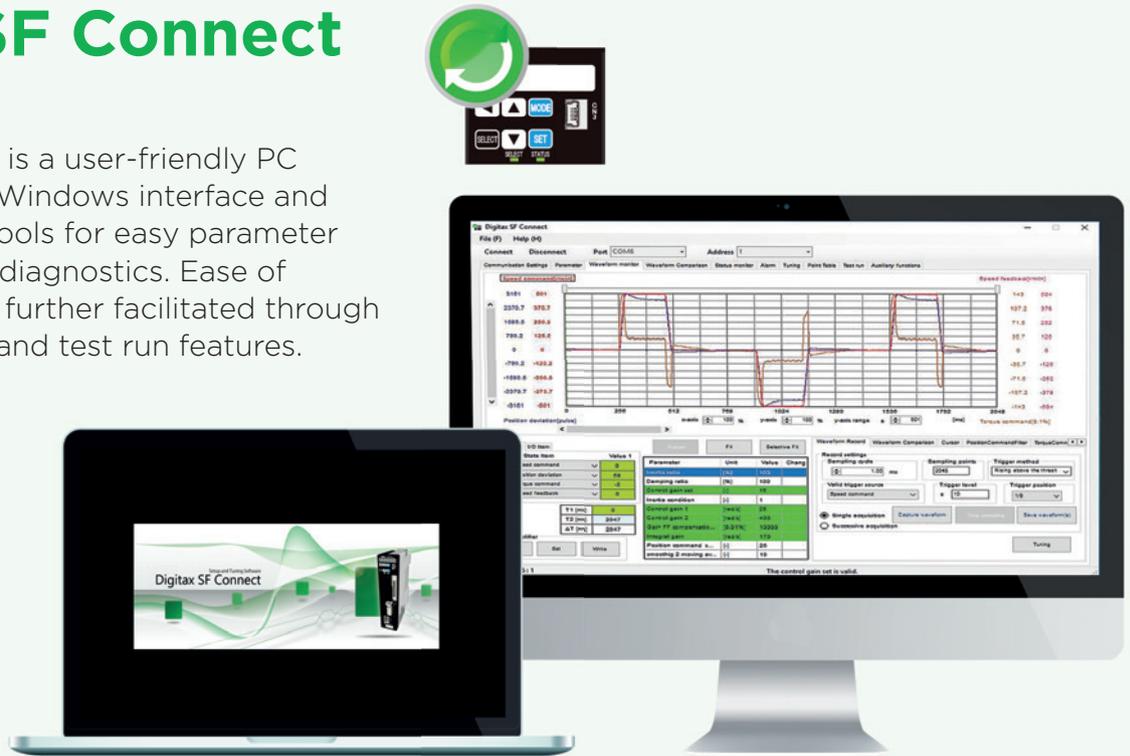
- robust in harsh environments
- ultra-low energy consumption for reduced maintenance

- Standardised flange sizes
- IP 65 or 67 motors

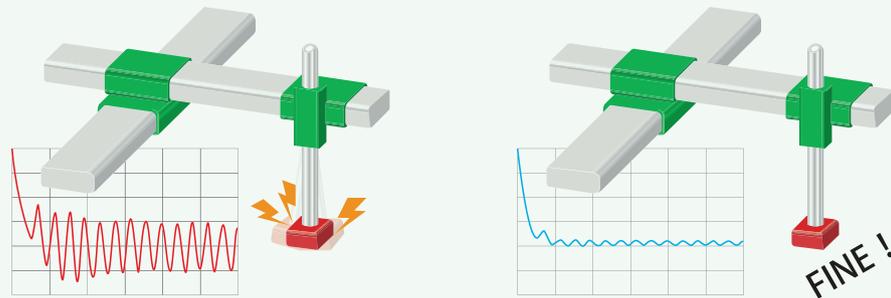
Multiple motor inertia levels available, covering a wide range of applications, from semiconductor manufacturing to textile, packaging machines, robotics, extruders, metering and other applications requiring speed, precision and accuracy.

# 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

**FREE**  
 **DOWNLOAD**

## Drive Set-Up

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

Visit: [www.drive-setup.com](http://www.drive-setup.com)



**FREE**  
 **DOWNLOAD**

## 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](http://www.controltechniques.com/mobile-applications)



\*For Microsoft users, please note that this mobile app operates with Windows 10 only

**Motor and drive combinations**

		MOTOR INERTIA LEVEL	
		Low Inertia	Middle Inertia
<b>MOTOR FLANGE SIZES</b>	40 mm		50 W   100 W 3000 rpm rated 6000 rpm maximum IP65 
	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:**



Series

Input Power Supply		
Code	Main Circuit Power	Control Power
2	AC 200 V - 240 V (*)	DC 24 V

Main Circuit Power Supply	
Code	Supply
Z	50 W
1	100 W
2	200 W
4	400 W
8	750 W
A	1 kW
B	1.5 kW
C	2 kW

Compatible Motor		
Code	Model	Rated Output
Y	Mx500x2xx	50 W
Z	Mx101x2xx	100 W
1	Mx201x2xx	200 W
2	Mx401x2xx	400 W
3	Mx751x2xx	750 W
4	Mx102x2xx	1 kW
6	Mx152x2xx	1.5 kW
8	Mx202x2xx	2 kW

(\*) Single- or Three-phase option depends on compatible motor.

50 W - 750 W : Single-phase  
 1 kW : Single-phase/Three-phase  
 1.5 kW, 2 kW : Three-phase

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 	1.5 kW 2 kW 

**Motors part number key:**

**MY 101 N 2 L N**

Series		
Code	Power	Specification
MX	200 W   400 W   750 W	Low Inertia
MY	50 W   100 W	Middle Inertia
MM	1 kW   1.5 kW   2 kW	Middle Inertia
MZ	200 W   400 W   750 W	High Inertia
MH	1 kW   1.5 kW	High Inertia

Rated Output	
Code	Rated Output
500	50 W
101	100 W
201	200 W
401	400 W
751	750 W
102	1 kW
152	1.5 kW
202	2 kW

Voltage	
Code	Specification
2	AC 200 V to 240 V

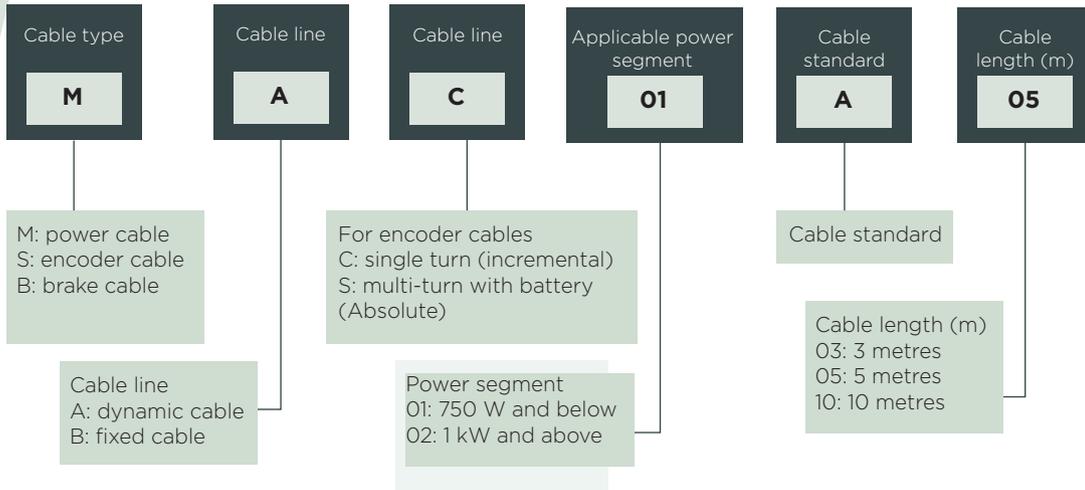
Encoder	
Code	Specification
N	17 bit single turn (incremental)
A	17 bit multi-turn with battery (Absolute)

Shaft End Specification/Oil Seal		
Code	Shaft End	Oil Seal
S (P)	Straight	Without
K (H)	Key	Without
T (R)	Straight	With
L (J)	Key	With

(J) Exclusively for 200 W. Shaft diameter = Ø11  
The straight shaft products are not tapped end.

Brake	
Code	Holding Brake
N	Without
A	With

**Motor cables part number key:**



Accessories			
Order code	Phases	Accessory	Description
2490-2754	1	 Surge absorber/protector	Quick response protection against power supply surges from mains supply to the Digitax SF drive.
2490-0004	3		
4200-0056	1	 EMC Filter	EMC filters prevent emission of electromagnetic interference onto the AC supply lines. To ensure compliance with EMC, use the recommended EMC noise filter  Rated Voltage (V): 250 Vac Rated Current (A): Single phase: 5 A Three Phase: 10 A
4200-3106	3		
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.

Drive Basic Specifications									
Item		Specification							
Drive model		DA2YZ	DA2Z1	DA212	DA224	DA238	DA24A	DA26B	DA28C
Applicable motor		M□500	M□101	M□201	M□401	M□751	M□102	M□152	MM202
Dimensions		(Refer to dimension chart on pages 12-13)							
Drive weight (kg)		0.7			0.8		1.0		1.6
Input power	Main circuit power	Single-phase AC 200 V - 240 V ±10 % 50/60 Hz				Three-phase AC 200 V - 240 V ±10 % 50/60 Hz			
	Control power supply	DC 24 V ±10 %							
	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 consumption (mA Typ.)	170			210		260		350
Control type		Three-phase PWM inverter sine-wave driven							
Output specification	Rated current (A)	0.7	1.0	1.7	2.7	4.3	5.6	9.9	12.2
	Output frequency (Hz)	0 - 500				0 - 250			
Encoder feedback		17 bit single turn (incremental) (The product can function as a multi-turn absolute type when batteries are added.)							
Control signal	Input	8-point (24 VDC system, opto-coupler input insulation) inputs whose functions are switched by the control mode							
	Output	8-point (24 VDC system, open-collector output insulation) outputs whose functions are switched by the control mode							
Analog signal	Input	Single ended (±10 V) input whose functions can be switched by the control mode							
Pulse signal	Input	RS-422 differential Open-collector							
	Output	Encoder feedback pulse (A-/B-/Z-phase), RS-422 differential output Z-phase pulse through open-collector							
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 Normal/Error display on STATUS LED Green light when Power ON Normal, Red light when Power ON Error, Dim when Power OFF							
Regeneration function		A braking resistor may be installed externally							
Control modes		Position control, velocity control, torque control							

Drive Environment Specifications		
Item		Specification
Ambient temperature	For use	0 - 50 °C
	For storage	-20 - 65 °C
Ambient humidity	For use	20 - 85 % RH or less (without condensation)
	For storage	
Atmosphere 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/s <sup>2</sup> (0.6 G) 10 to 60 Hz (no continuous operation allowed at resonant frequency)
Dielectric strength		AC 1,500 V for one minute across the primary and Ground/Earth FG
Electric shock protection		Class I (mandatory grounding)
Overvoltage category		II
Installation environment		Pollution degree 2

Drive function specifications				
Item		Specification		
Position control mode	Pulse input command	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	
		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	
		Maximum command pulse frequency	RS-422 differential: 4 Mpps Open-collector: 200 kpps	
		Input pulse signal form	Pulse + direction, A-/B-phase quadrature encoder pulse, CW + CCW pulse	
		Command pulse-paired frequency	Ratio A/B 1/1,000 < A/B < 1,000 Setting range A: 1 - 65,535      B: 1 - 65,535	
	Internal position command	Control input	Servo ON, alarm reset, position error counter clear, motion start point selection 16, home position sensor input, homing	
		Control output	Alarm status, servo status, servo ready, under torque limit, brake release, homing completion, motion complete	
		Operation mode	Point table, communication operation	
	Smoothing filter		FIR filter	
	Damping control		Enabled	
Velocity control mode	Analog command	Control input	Servo ON, alarm reset, command input inhibit (zero torque command), 2-stage torque limit, CCW/CW run inhibit	
		Control output	Alarm status, servo status, servo ready, under torque limit, brake release	
		Speed command input	Input voltage -10V to +10V (maximum speed is reached at ±10 V)	
	Internal speed command	Control input	Servo ON, alarm reset, start 1 (CCW), start 2 (CW), 8-speed setting, 2-stage torque limit	
		Control output	Alarm status, servo status, servo ready, under torque limit, brake release	
Smoothing filter		IIR filter, FIR filter		
Torque control mode	Analog command	Control input	Servo ON, alarm reset, command input inhibit (zero torque command), 2-stage torque limit, CCW/CW run inhibit	
		Control output	Alarm status, servo status, servo ready, under torque limit, brake release	
		Torque command input	Input voltage -10 V to +10 V (maximum torque is reached at ±10 V)	
	Smoothing filter		IIR filter	
Common features	Speed observer		Available	
	Auto-tuning		Available	
	Encoder output division/multiplication		Available	
	Tuning / function setup		Available through the Digitax SF setup software "Digitax SF Connect" Tuning with the setup panel on the drive front side	
	Protective functions	By hardware	Overvoltage, low voltage, overcurrent, abnormal temperature, overload, encoder error	
		By software	Overspeed, position error too high, parameter errors	
Alarm log		Can be viewed with the setup software Digitax SF Connect		

**Safety Standards**



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

<sup>1)</sup> Install the product in the environment that meets the following requirements: • Overvoltage Category II • Class I • Pollution Degree 2 (Circuitry)

<sup>2)</sup> 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 Ω 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/s <sup>2</sup> (5 G)
Impact resistance	98 m/s <sup>2</sup> (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		M□□□□□2□N	M□□□□□2□A	
Resolution		Incremental 17 bit	Absolute 17 bit	
Environmental requirements	Ambient operating temperature	0 - 85 °C		
	External disturbance magnetic field	±2 mT (20 G) or below		
Electrical specifications	Power supply	Voltage	DC 4.5 - 5.5 V (power supply ripple ≤ 5 %)	
		Current consumption	160 mA typ. (not including inrush current)	
	External battery	Voltage	—	DC 2.4 - 4.2 V
		Current consumption	—	10 μA typ. (*1)
	Multi-turn count		—	65,536 counts
	Maximum revolving speed		6,000 rpm	
	Count-up direction		CCW (*2)	
Output/input type		Differential		
Communication specifications	Transmission method	Half-duplex asynchronous serial communication		
	Communication speed	2.5 Mbps		

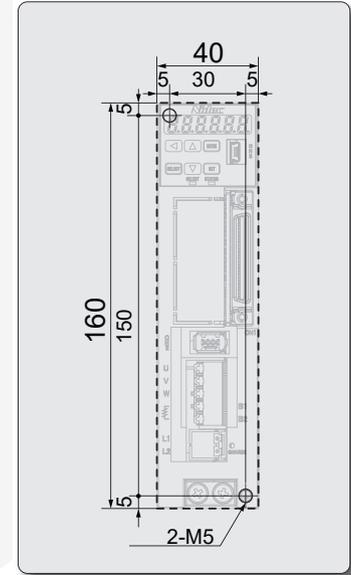
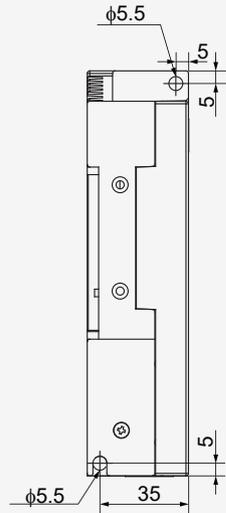
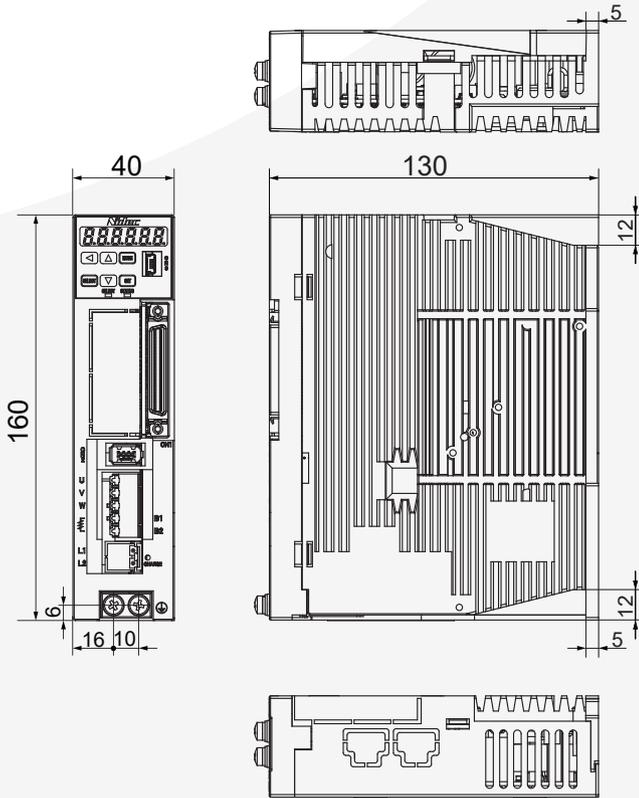
\*1) Measurement conditions: room temperature, motor not in motion, battery voltage of 3.6 V.

\*2) CCW when viewed from the load side shaft end.

**DIGITAX SF**

**Dimensions**

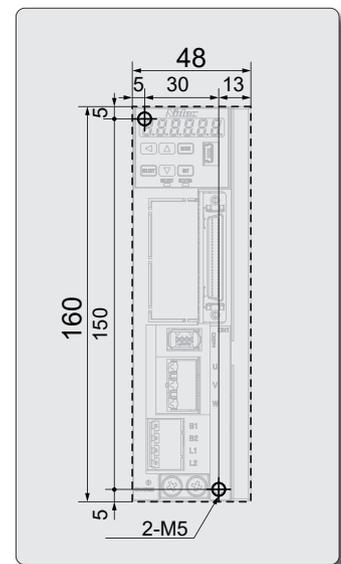
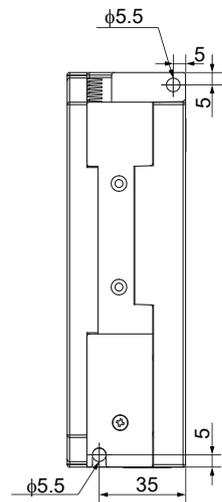
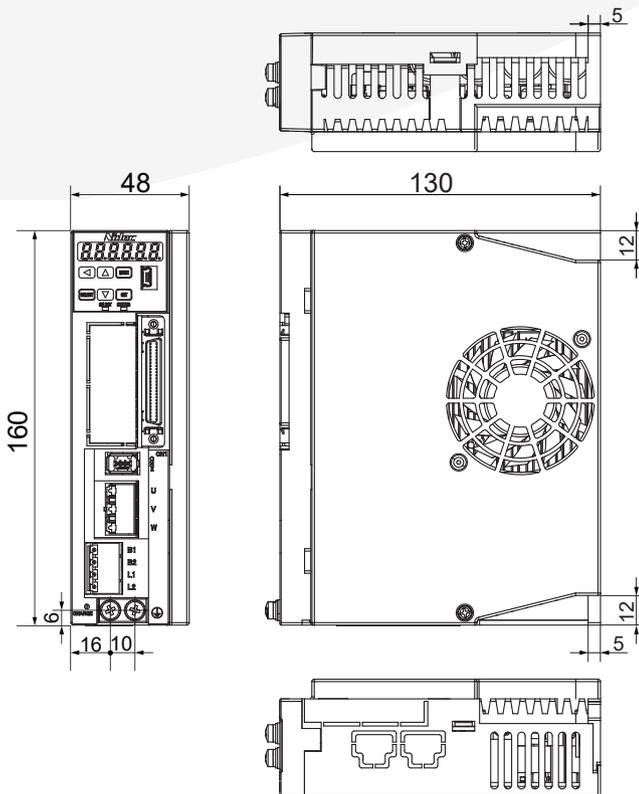
50 W to 400 W (DA2YZ | DA2Z1 | DA212 | DA224)



Mounting Dimensions

(mm)

750 W (DA238)

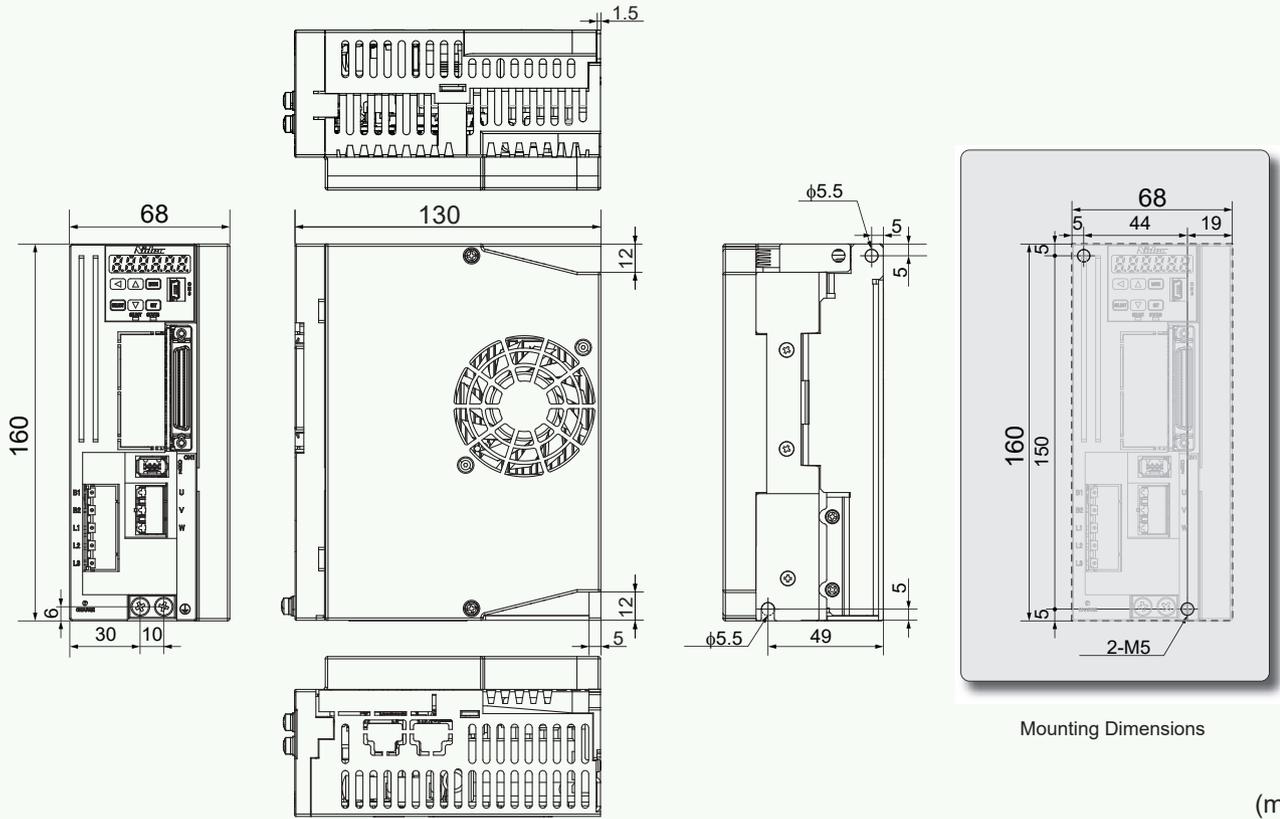


Mounting Dimensions

(mm)

Dimensions

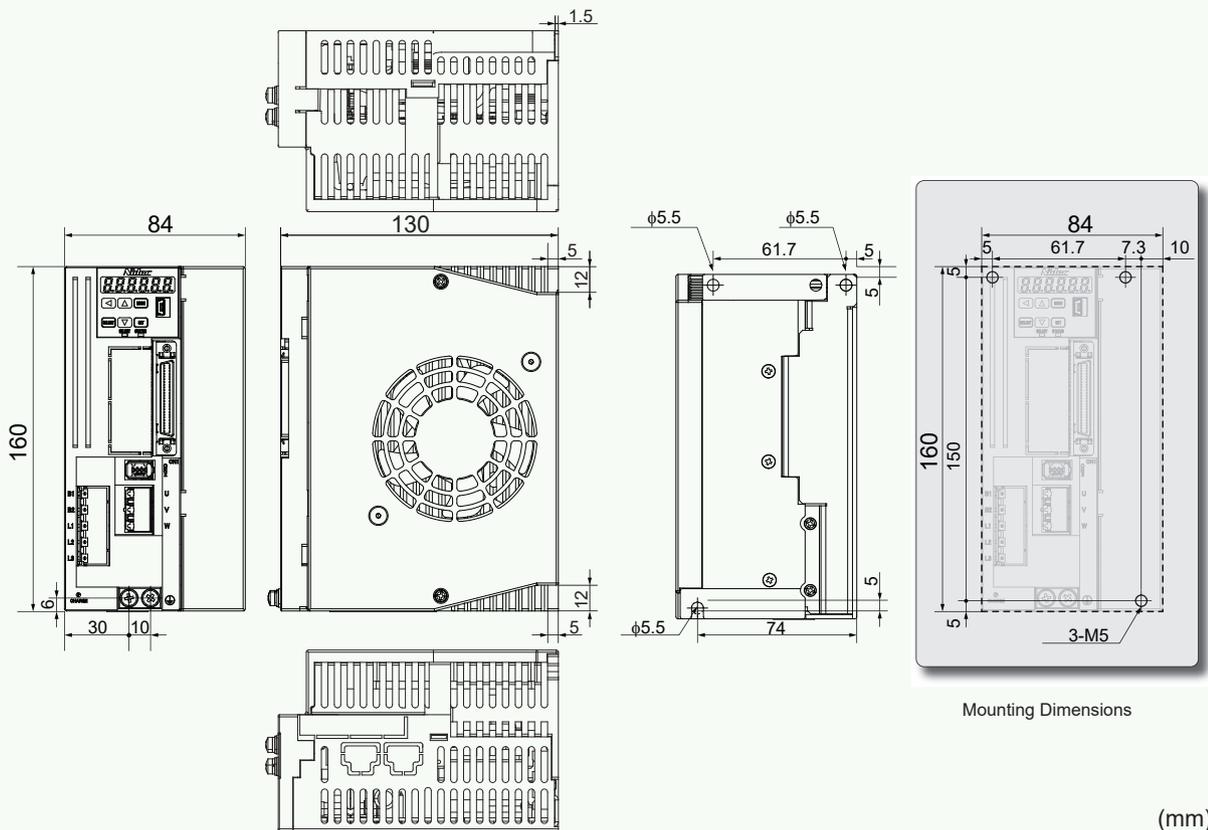
1 kW (DA24A)



Mounting Dimensions

(mm)

1.5 kW, 2 kW (DA26B | DA28C)

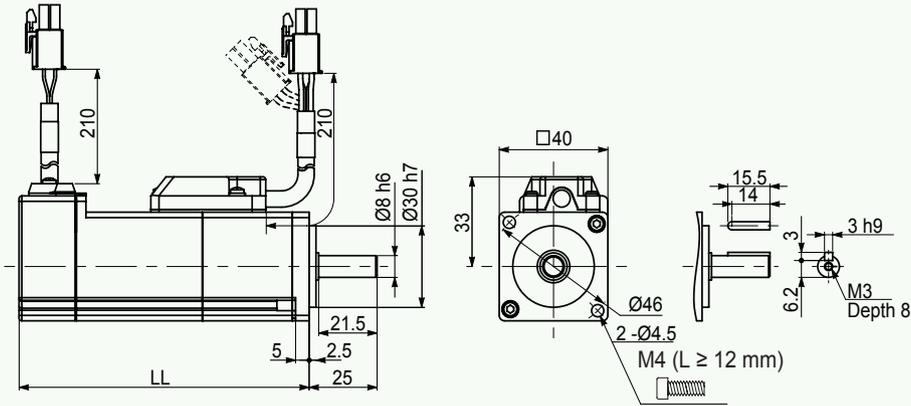


Mounting Dimensions

(mm)

# 040 Frame Motor and Brake Specifications

## 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·cm <sup>2</sup>	0.039	0.061
Rotor inertia (with brake)	kg·cm <sup>2</sup>	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

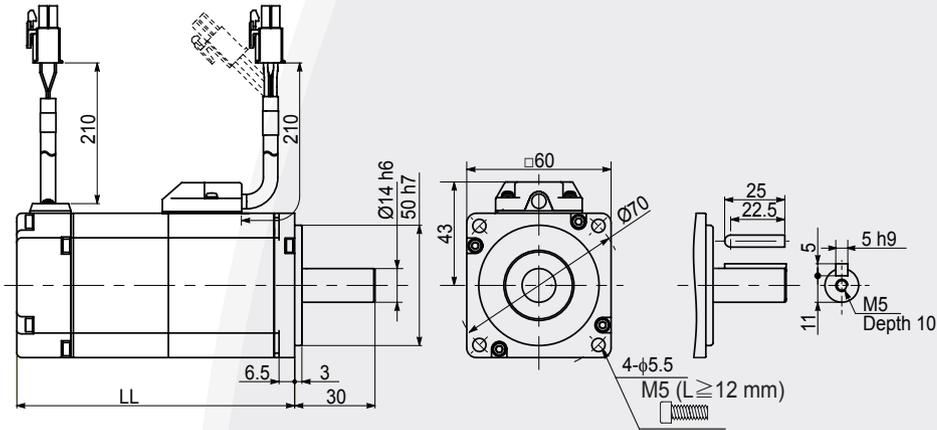
		MY500 □ 2 □ □	MY101 □ 2 □ □
Rated voltage	V	DC24V ±10 %	DC24V ±10 %
Rated current	A	0.25	0.25
Static friction torque	Nm	>0.16	>0.32
Engage time	ms	<35	<35
Release time	ms	<20	<20
Release voltage	V	> DC1V	> DC1V

## Motor size LL (mm)

Brake	Without		With	
Oil seal	Without	With	Without	With
MY500 □ 2 □ □	66.4	72.0	106.8	112.4
MY101 □ 2 □ □	82.4	88.0	122.8	128.4

# 060 Frame Motor and Brake Specifications

## Dimensions



The straight shaft products are not tapped end.

## Motor Specifications

Motor Specifications	Unit	MX201□2□□	MZ201□2□□	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·cm <sup>2</sup>	0.14	0.44	0.23	0.71
Rotor inertia (with brake)	kg·cm <sup>2</sup>	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	A	0.3
Static friction torque	Nm	>1.27
Engage time	ms	<50
Release time	ms	<15
Release voltage	V	> DC1V

## Motor size LL (mm)

Brake	Without	With
MX201□2□□	76.5	113.0
MZ201□2□□	93.5	130.0
MX401□2□□	93.5	130.0
MZ401□2□□	110.5	147.0







# Nidec

All for dreams

## #1 for advanced motor and drive technology

Nidec Corporation is a global manufacturer of electric motors and drives. Founded in 1973, Nidec has worldwide operations and a workforce of more than 110,000 who develop, manufacture and install motors, drives and control systems in industrial plants, automobiles, home appliances, office equipment and information technology.



**110,000**  
EMPLOYEES  
WORLDWIDE



**\$13.7B**  
GROUP  
TURNOVER



**70+**  
COUNTRIES



**230+**  
COMPANIES

# 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



### 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.

### 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.



### 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

Connect with us at:



[www.controltechniques.com](http://www.controltechniques.com)

**Control Techniques is your global drives specialist.**

With operations in over 70 countries, we're open for business wherever you are in the world.

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

[www.controltechniques.com](http://www.controltechniques.com)



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