

Nidec
All for dreams

CONTROL 
TECHNIQUES



Pulse Train
EtherCAT 



DIGITAX SF

LOW POWER, EASY TO USE SERVO SOLUTIONS

AC DRIVES, SERVO

NEW

DRIVE OBSESSED

SERVO SOLUTIONS FOR CONTINUOUS & PULSE DUTY APPLICATIONS

Receive the ultimate in performance and flexibility for machinery manufacturers with a broad range of servo drives and motors.

Digitax SF

The Digitax SF servo drive and motor package works perfectly with the Control Techniques servo portfolio providing a compact, cost effective and easy to use solution for all kinds of application requirements.

Digitax SF offers:

- High performance drives with pulse train or analog interface and serial communications
- This range of light-duty industrial motors offers several inertia levels to meet different application requirements

Unidrive M700

Providing optimum performance and an extensive power range - M700 is the ideal option for continuous duty applications that need precise continuous torque delivery.

Digitax HD

Bring superior performance to high dynamic, pulse duty applications, where high peak torque is essential for fast acceleration with the Digitax HD range.

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.





Digitax SF

0.05 kW - 2 kW

200 V



Digitax HD

0.25 kW - 7.5 kW

200 V | 400 V



Unidrive M700

1.75 kW - 2.8 MW

200 V | 400 V | 575 V | 690 V

300% Overload



Digitax SF Motor

(Available in low, middle and high inertia)

200% Overload



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

The perfect choice for low powered precision servo solutions with its dedicated servo range from 50W to 2 kW.

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

Magnetic encoder technology

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





Versatile analogue or pulse train interface

Offering easy integration with any PLC or motion controller

Built-in keypad

With 6 digit 7-segment status display for easy startup, parameter setting, and tuning

Operating standalone

Using the on-board 16-point positioning table

PC-USB interface

For parameter settings, tuning, and status display in the dedicated software Digitax SF Connect

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 simple to use PC tool with a familiar Windows interface and intuitive graphical tools for simple parameter setting, tuning and diagnostics.

A positioning table and test run features mean machine start-up is also a breeze.

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.



Drive set-up

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

Visit: www.drive-setup.com



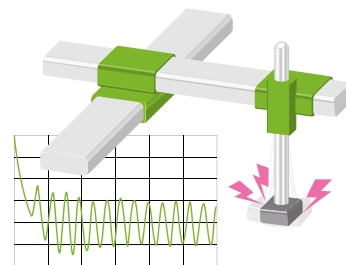
Diagnostic Tool

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

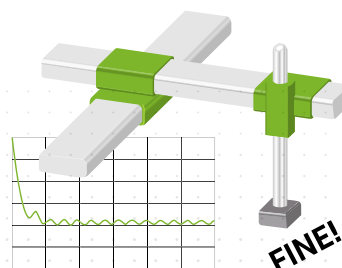
controltechniques.com/mobile-applications



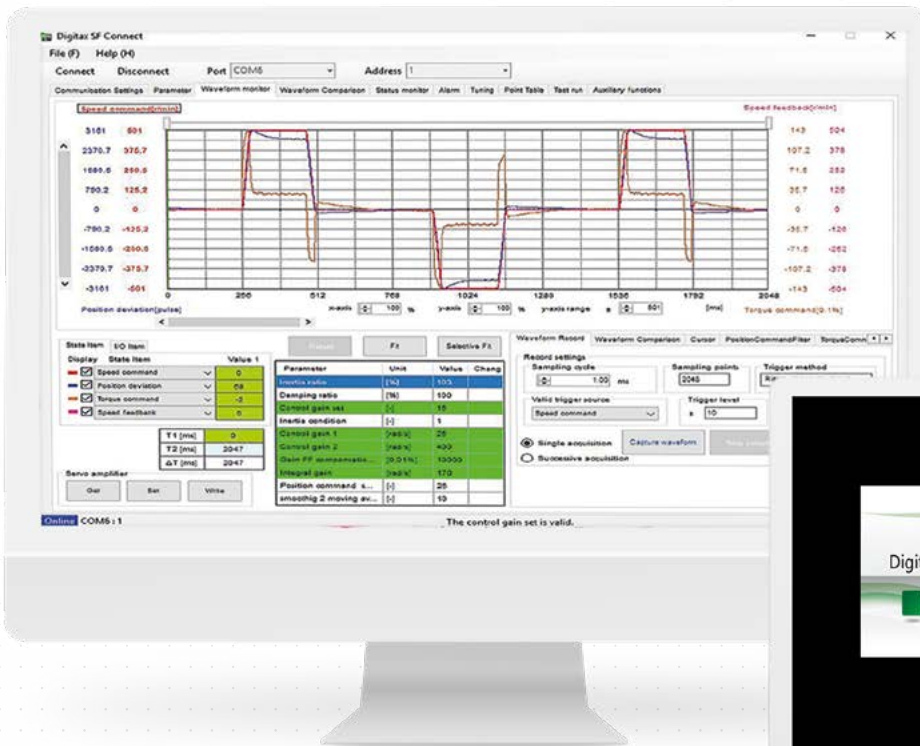
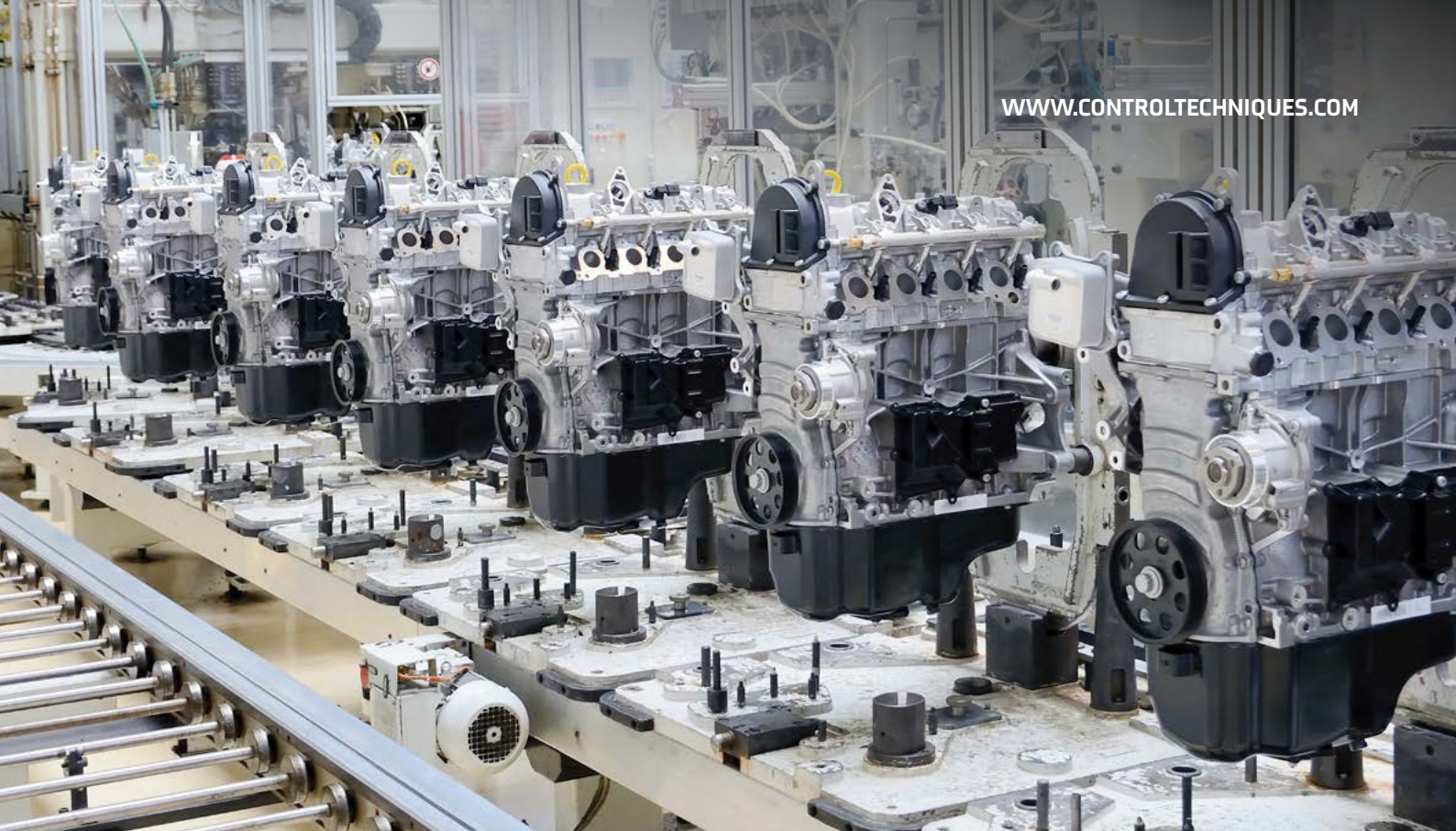
*For Microsoft users, please note that this mobile app operates with Windows 10 only.







● No damping filter used



● Damping filter used



MOTOR & DRIVE COMBINATIONS

		Motor Inertia Level	
		Low Inertia	Middle Inertia
Motor Flange Sizes	40mm		 50 W 100 W 3000 rpm rated 6000 rpm maximum IP65
	60mm	 200 W 400 W 3000 rpm rated 6000 rpm maximum IP65	
	80mm	 750 W 3000 rpm rated 6000 rpm maximum IP65	
	130mm		 1 kW 1.5 kW 2 kW 3000 rpm rated 3000 rpm maximum IP65



High Inertia

Drive Compatibility



200 W | 400 W | 3000 rpm rated
6000 rpm maximum | IP65



750 W | 3000 rpm rated
6000 rpm maximum | IP65



1 kW | 1.5 kW | 2000 rpm rated
3000 rpm maximum | IP67



50 W | 100 W



200 W | 400 W



750 W



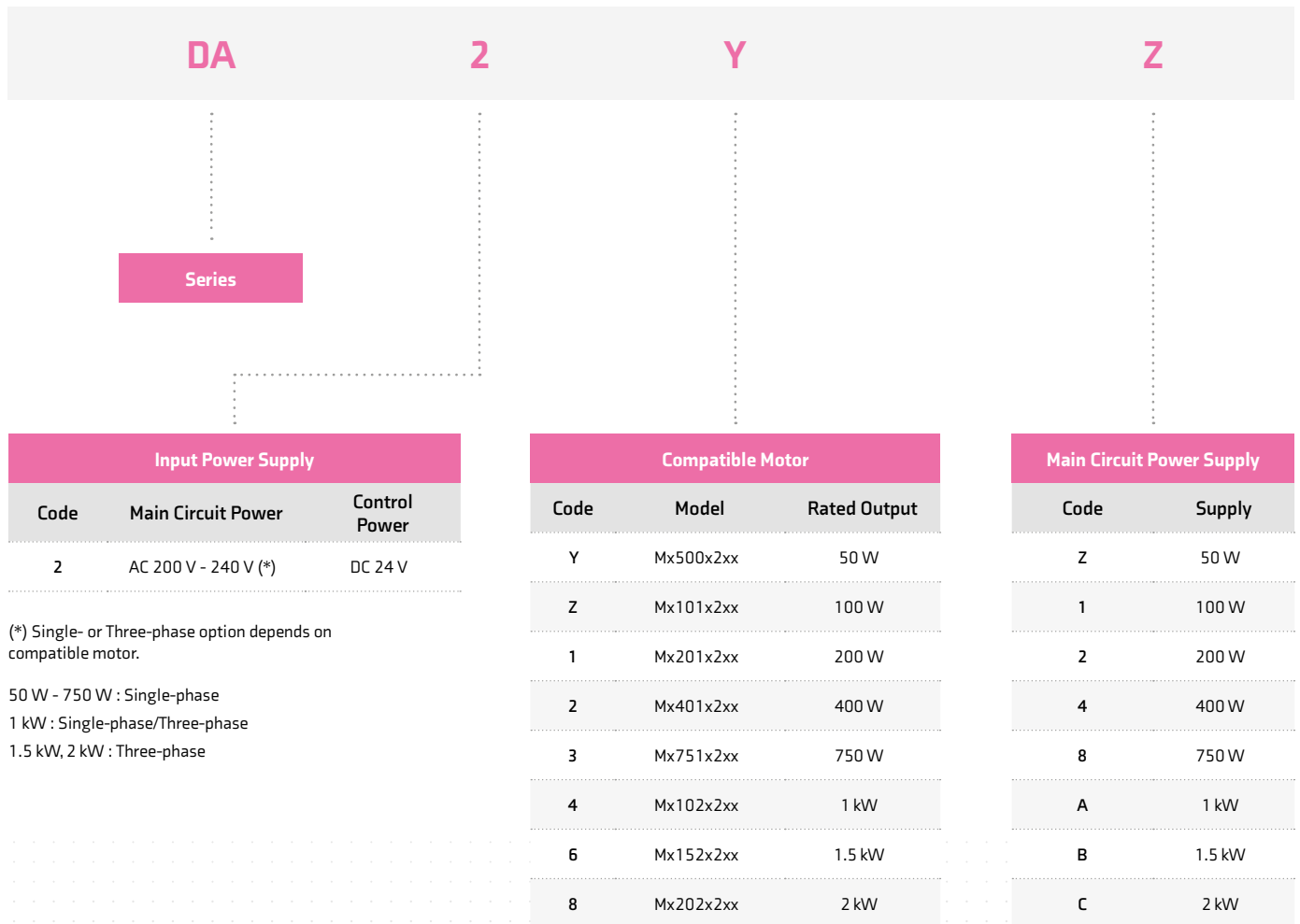
1 kW



1.5 kW | 2 kW

PART NUMBER

DRIVES



(*) 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

PART NUMBER MOTORS

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

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)

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

Brake	
Code	Holding Brake
N	Without
A	With

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



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

PART NUMBER

MOTOR CABLES

M	A	C	01	A	05
⋮	⋮	⋮	⋮	⋮	⋮
Cable Type	Jacket Type	Cable Line	Power Segment	Cable Standard	Cable Length (m)
M = Power cable S = Encoder cable B = Brake cable	A = Dynamic cable B = Fixed cable	A = Power or brake cable C = Encoder - single turn (incremental) S = Encoder - multi-turn with battery (absolute)	01 = 750 W and below 02 = 1 kW and above		01 = 1 03 = 3 05 = 5 10 = 10 15 = 15 20 = 20

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/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
4200-3106	3		

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 18-19)							
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
(Inrush current is approx. 1.4 A)								
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 ² (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	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	
	Pulse input command	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 ^(*1)	EN60034-1 EN60034-5
	EMC Directive ^(*2)	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 Applicable	

(*1) 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

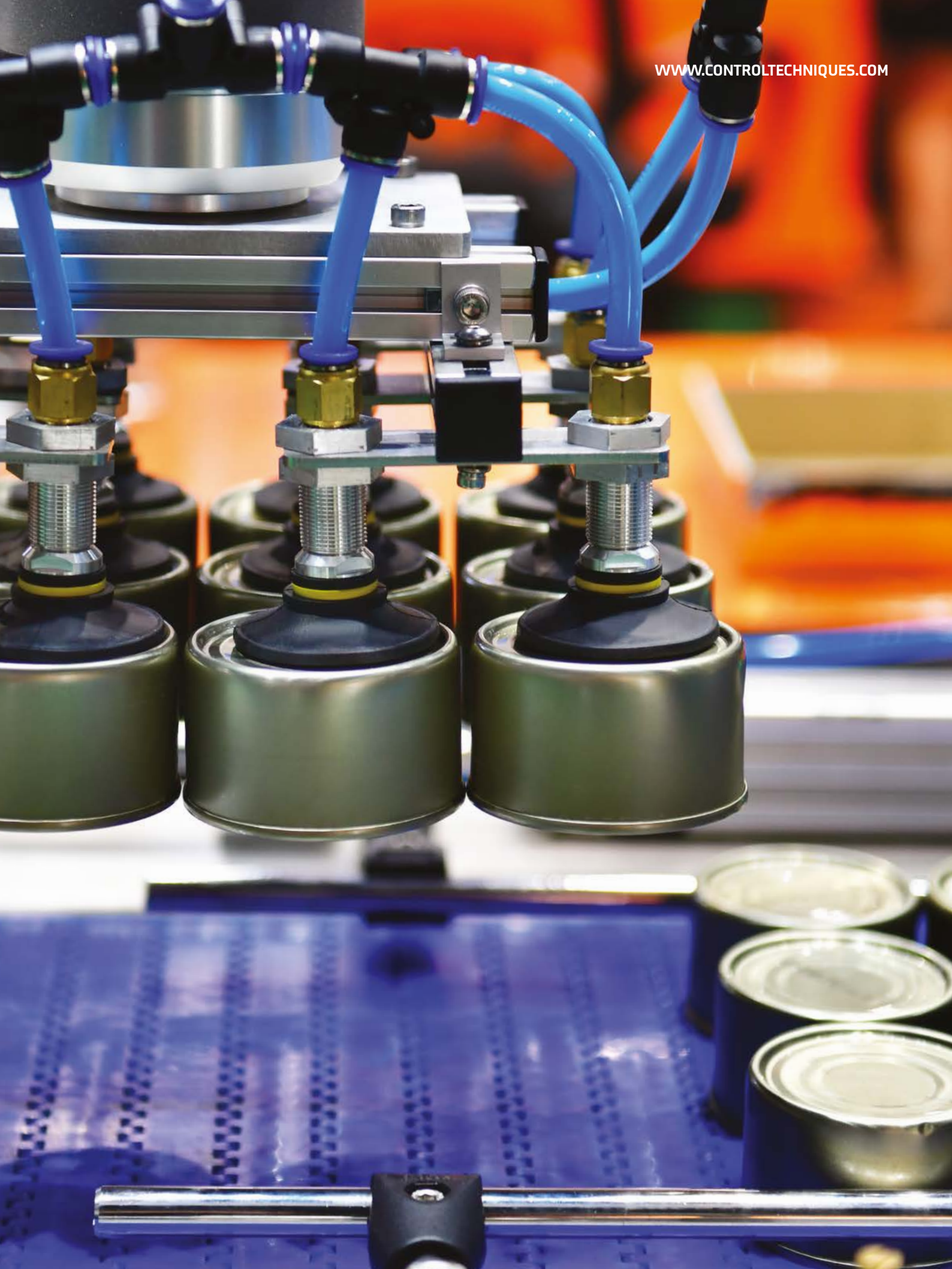


Motor General Specifications	
Item	Specification
Ambient temperature for operation	0 – 40 °C
Ambient humidity for operation	20 – 85 % RH (no condensation)
Ambient temperature for storage	-20 – 65 °C (no condensation) Maximum temperature 80 °C, 72 hours
Ambient humidity for storage	20 – 85 % RH (no condensation)
Atmosphere for operation/storage	Indoor (no direct sunlight), free from corrosive gas, flammable gas, oil mist, dust, combustibles, abrasives
Insulation resistance	≥ 5 M 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 ² (5 G)
Impact resistance	98 m/s ² (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	

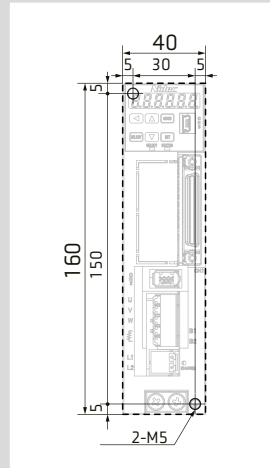
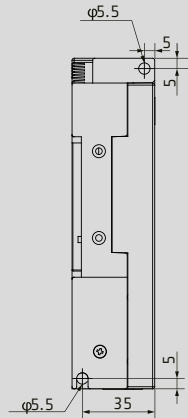
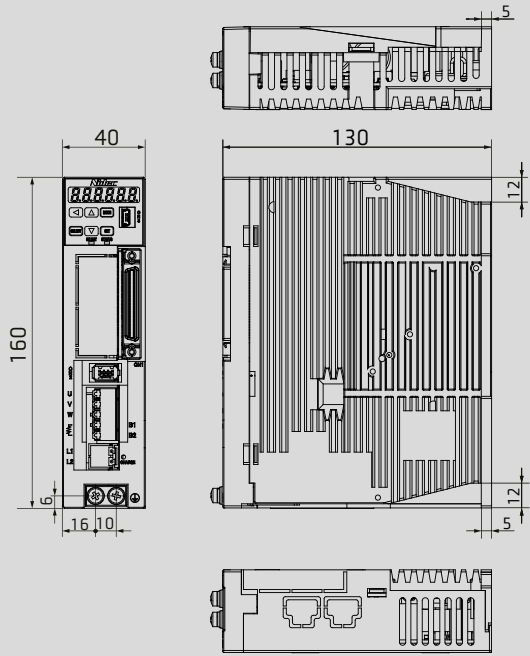
(*1) Measurement conditions: room temperature, motor not in motion, battery voltage of 3.6 V.

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



Dimensions

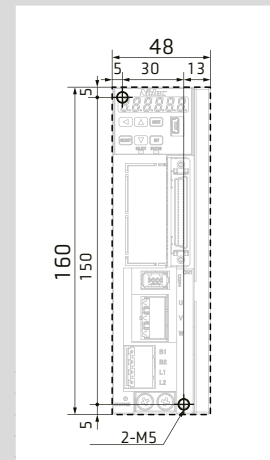
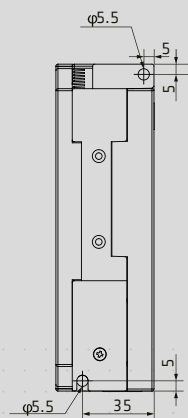
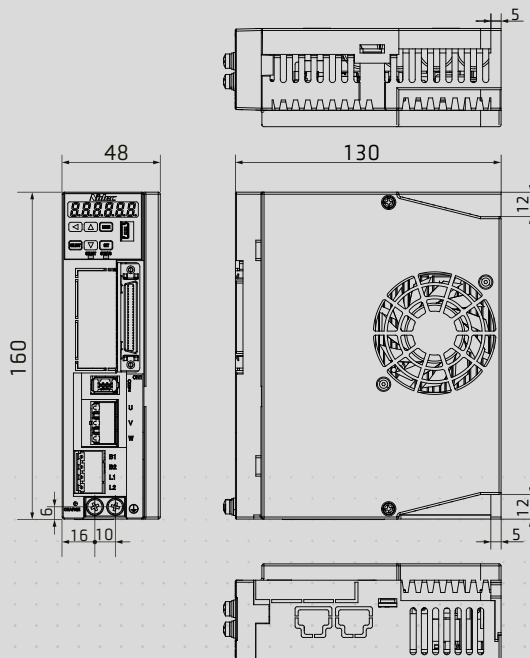
50 W to 400 W (DA2YZ | DA2Z1 | DA212 | DA224)



Mounting Dimensions

(mm)

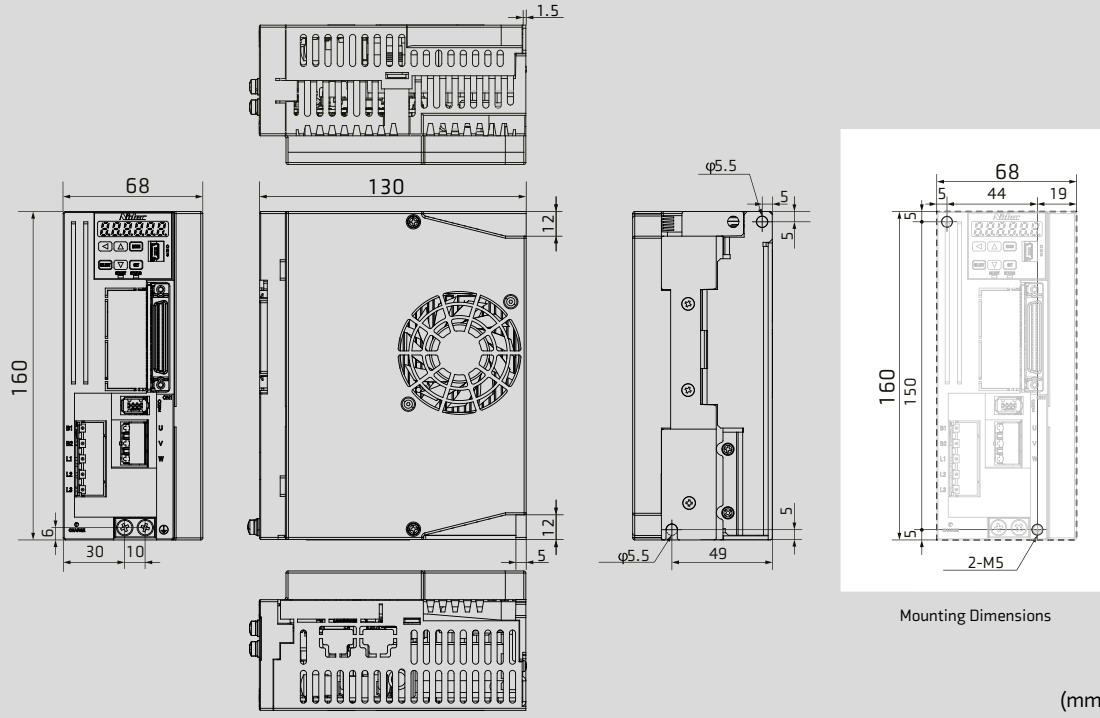
750 W (DA238)



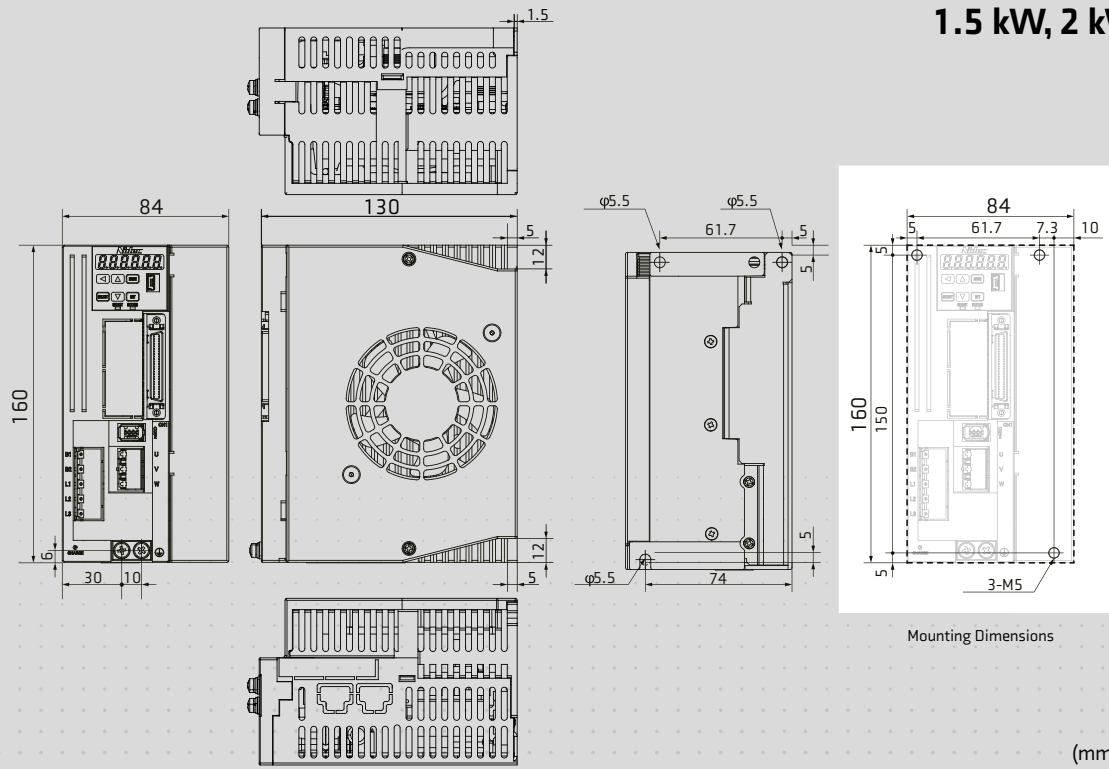
Mounting Dimensions

(mm)

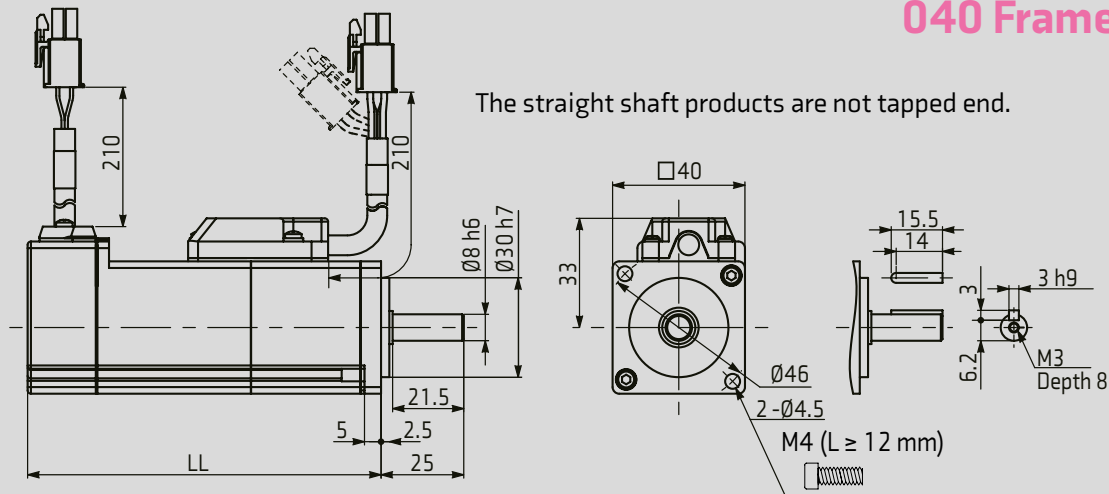
1 kW (DA24A)



1.5 kW, 2 kW (DA26B | DA28C)



040 Frame Specification



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 ²	0.039	0.061
Rotor inertia (with brake)	kg-cm ²	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

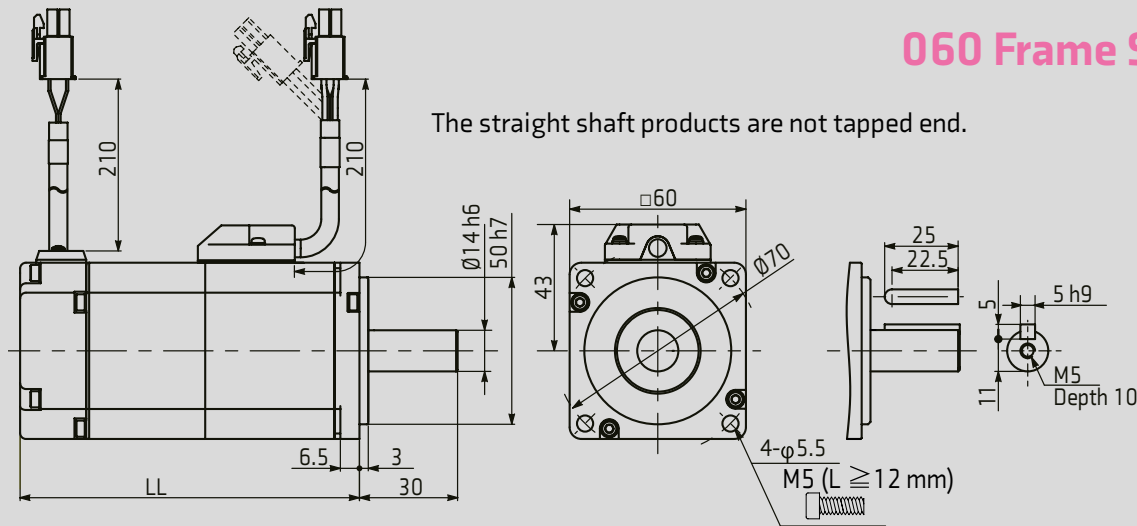
		MY500 2	MY101 2
Rated voltage	V	DC24V ±10 %	DC24V ±10 %
Rated current	A	0.25	0.25
Static friction torque	Nm	>0.16	>0.32
Engage time	ms	<35	<35
Release time	ms	<20	<20
Release voltage	V	> DC1V	> DC1V

Motor Size LL (mm)

Brake	Without		With	
	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 Specification

The straight shaft products are not tapped end.



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 ²	0.14	0.44	0.23	0.71
Rotor inertia (with brake)	kg·cm ²	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

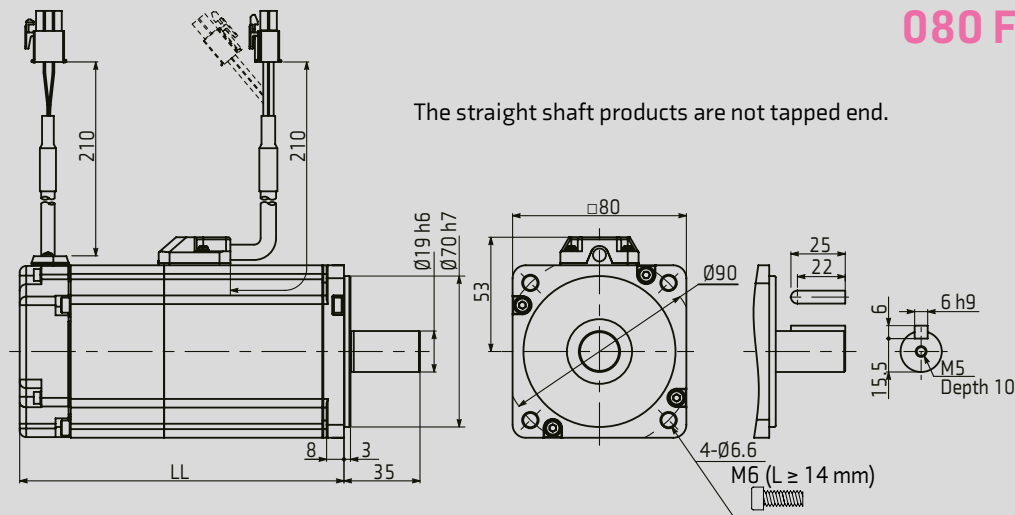
Brake Specification

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

080 Frame Specification



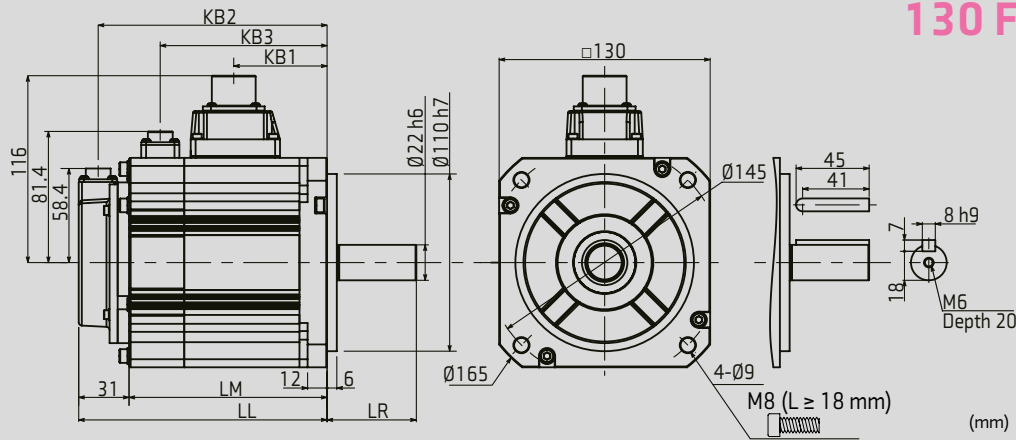
Motor Specifications			
	Unit	MX751 2	MZ751 2
Voltage	V	AC200V-240V	AC200V-240V
Rated output power	kW	0.75	0.75
Rated torque	Nm	2.39	2.39
Instantaneous max. torque	Nm	7.1	7.1
Rotor inertia (without brake)	kg·cm ²	0.74	1.61
Rotor inertia (with brake)	kg·cm ²	0.94	1.81
Mechanical time constant (without 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			
		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
MX751 2		107.3	144.3
MZ751 2		122.3	159.3

The straight shaft products are not tapped end.

130 Frame Specification



Motor Specifications

	Unit	MM102 2	MH102 2	MM152 2	MH152 2	MM202 2
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-cm ²	4.56	24.9	6.67	37.12	8.70
Rotor inertia (with brake)	kg-cm ²	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

Motor Size (mm)

	Brake	LL	LM	LR	KB1	KB2	KB3
MM102 2	Without	128.0	97.0	55.0	57.5	116.0	-
	With	153.0	122.0	55.0	57.5	141.0	102.8
MH102 2	Without	163.0	132.0	70.0	92.5	151.0	-
	With	188.0	157.0	70.0	92.5	176.0	137.8
MM152 2	Without	145.5	114.5	55.0	75.0	133.5	-
	With	170.5	139.5	55.0	75.0	158.5	120.3
MH152 2	Without	180.5	149.5	70.0	110.0	168.5	-
	With	205.5	174.5	70.0	110.0	193.5	155.3
MM202 2	Without	163.0	132.0	55.0	92.5	151.0	-
	With	188.0	157.0	55.0	92.5	176.0	137.8

Brake Specification

Rated voltage	V	DC24V $\pm 10\%$
Rated current	A	1.0
Static friction torque	Nm	>9.55
Engage time	ms	<120
Release time	ms	<30
Release voltage	V	>DC1V

DRIVE OBSESSED



Control Techniques has been designing and manufacturing the best variable speed drives in the world since 1973.

Our customers reward our commitment to building drives that outperform the market. They trust us to deliver on time every time with our trademark outstanding service.

More than 45 years later, we're still in pursuit of the best motor control, reliability and energy efficiency you can build into a drive. That's what we promise to deliver, today and always.

1.4K+

Employees

70

Countries

#1 FOR ADVANCED MOTOR AND DRIVE TECHNOLOGY



Nidec Corporation is a global manufacturer of electric motors and drives.

Nidec was set up in 1973. The company made small precision AC motors and had four employees. Today, it's a global corporation that develops, builds and installs cutting-edge drives, motors and control systems in over 70 countries with a workforce of more than 110,000.

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109K

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Group Turnover

70+

Countries

330+

Companies



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THE GLOBAL DRIVE

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Outstanding Performance

Applying our more than 45 years' engineering experience to everything we do means we outstrip the competition time and again.



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Millions of people around the world trust us knowing we're committed to unrivalled design and top build quality.



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Our drives are built with open design architecture. They integrate with all primary communication protocols providing all the flexibility you could want.



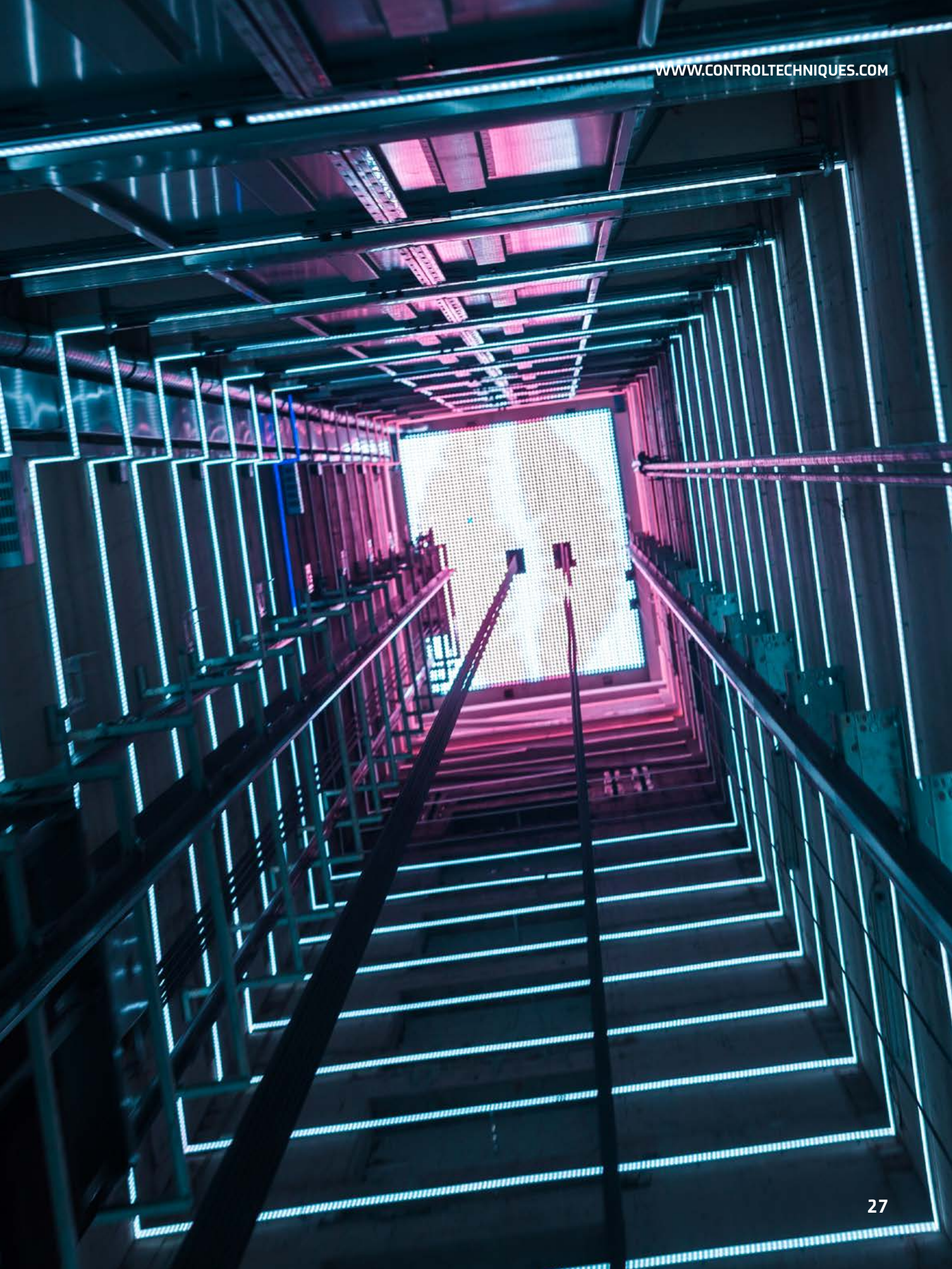
Embedded Intelligence

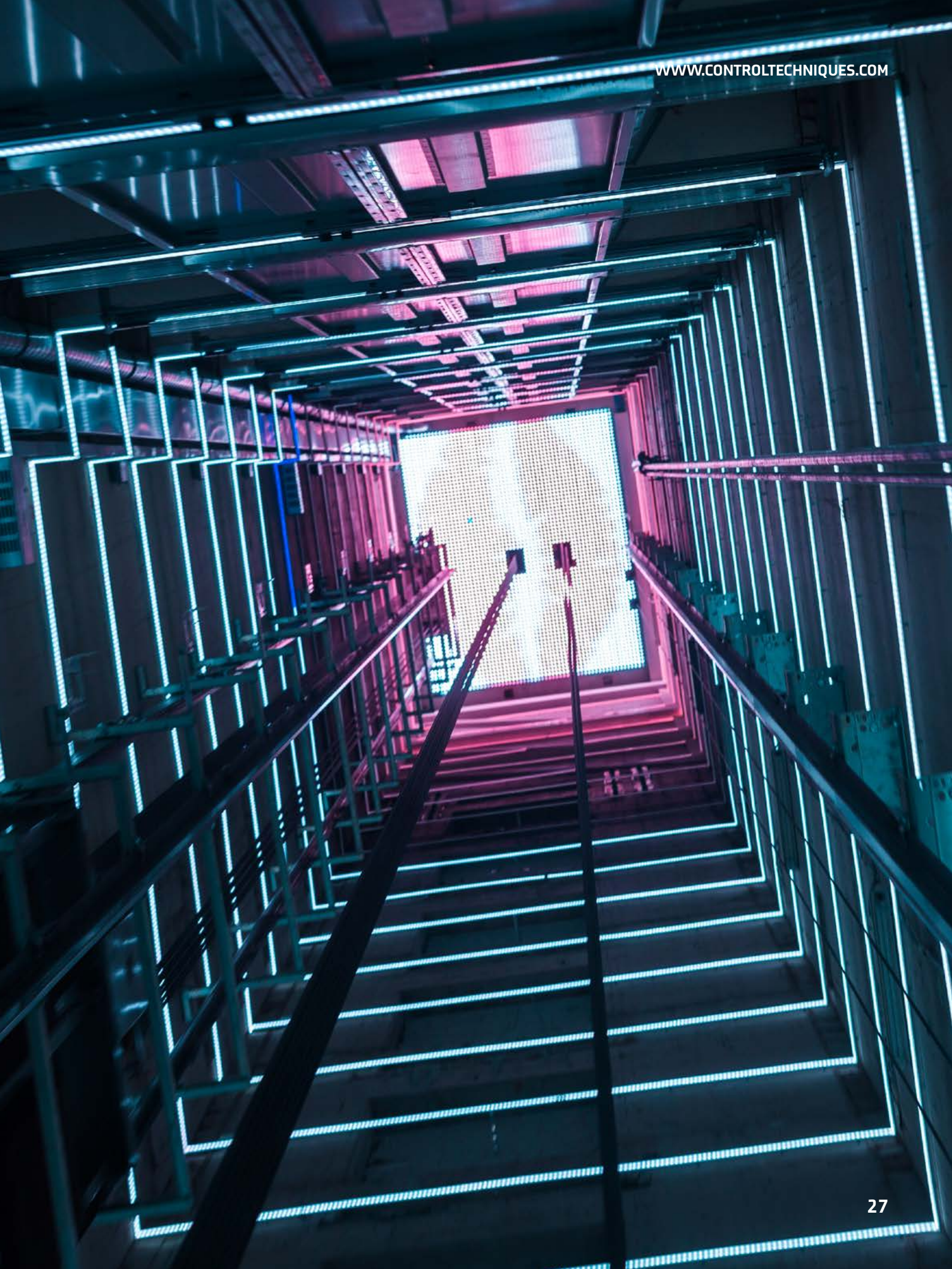
Combining precision motor control with the highest embedded intelligence means ultimate productivity and efficiency for your machinery.

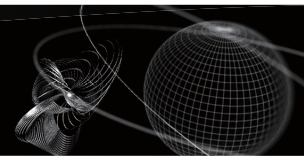


Global Reach, Local Support

Our dedicated Application Engineers in 70 countries are obsessed with ever-better drive design and technology. **That's what gives us the edge.**







DIGITAX SF

EtherCAT®

Models **DB 6 Y Z 11**

Series

Input Power Supply	
Code	Main Circuit Power & Control Power
6	AC200-240 V (*)

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

50-750 W : Single-phase
1 kW : Single-phase / Three-phase
850W, 1.3-2 kW : Three-phase

Specifications	
Code	Specifications
11	Standerd (*)
41	EtherCAT

(*) In the standard amplifier, drive command is input by pulse train or analog voltage.

Compatible Motor		
Code	Motor Rated Power	Motor Models
Y	50 W	M□ 500
Z	100 W	M□ 101
1	200 W	M□ 201
2	400 W	M□ 401
3	750 W	M□ 751
4	1 kW	MX951 M□ 102
5	850 W	MJ851
6	1.5 kW	M□ 152
7	1.3 kW	MJ132
8	2 kW	M□ 202

Amplifier Main circuit power	
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



EtherCAT



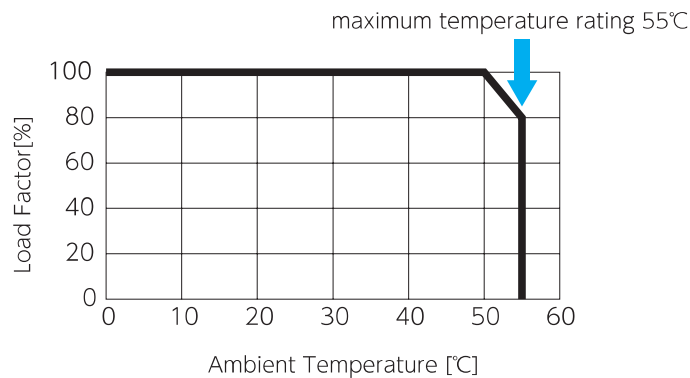
Standerd

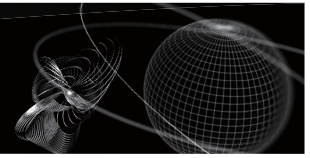
Environmental Specification

Items		Specifications
Ambient temperature	For operation	0 to 55°C (*1, *2)
	For storage	-20 to 65°C
Ambient humidity	For operation	20 to 85%RH (No condensation)
	For storage	
Atmosphere for operation and storage		Indoors (not subject to direct sunlight), Free from corrosive gases, flammable gases, oil mist, dust, flammables, grinding fluid
Altitude		≤ 1,000 m
Vibration		≤ 5.8 m/s ² (0.6 G) 10 to 60 Hz (no continuous operation allowed at frequency of resonance)
Dielectric strength		AC 1,500 V for one minute across the primary and FG
Electric shock protection		Class I (mandatory grounding)
Overvoltage category		III
Installation environment		Pollution degree 2

*1) When mounting amplifiers to an enclosure such as a protection case, install a cooling device, or secure required clearance around it so that ambient temperature will not rise above the specification temperature.

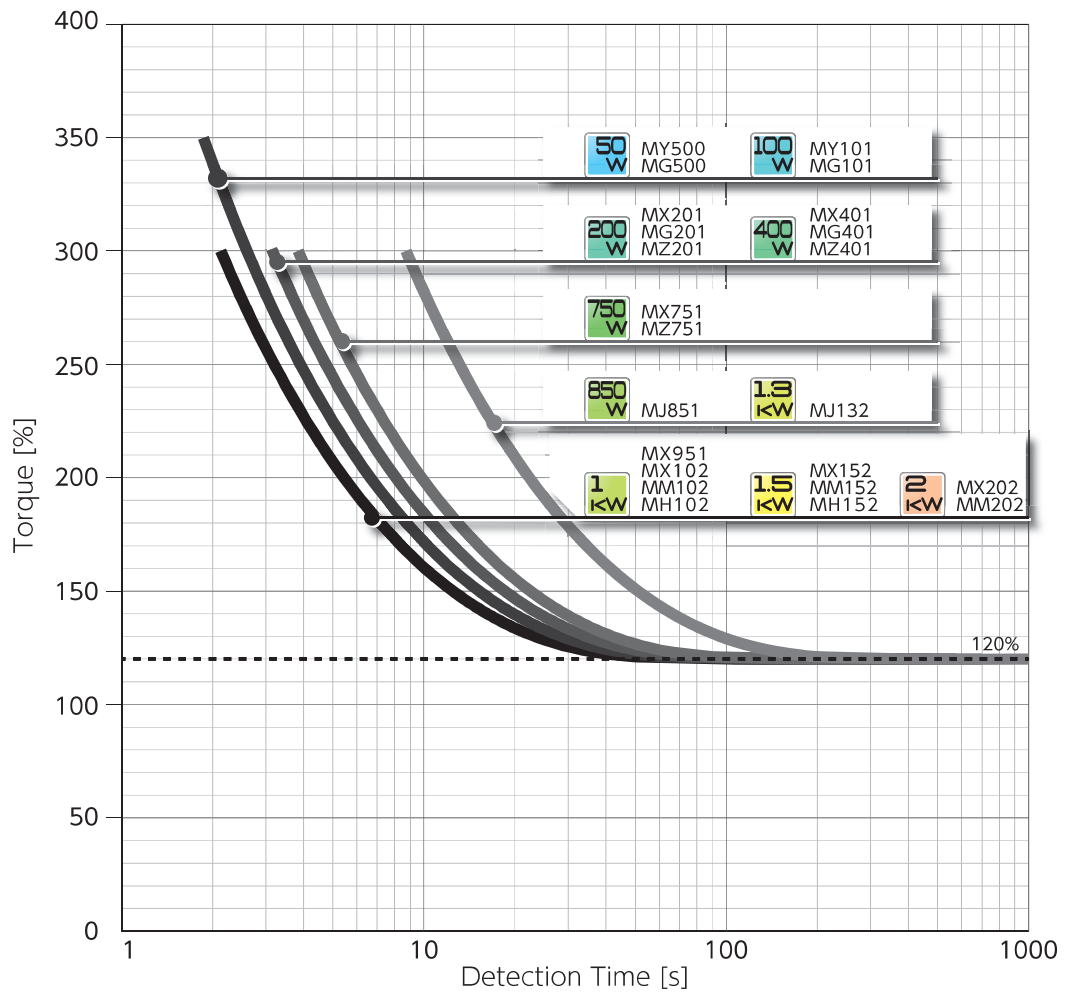
*2) For 2 kW amplifier (DB68C□1), refer to the following temperature derating curve.





Overload Detection Feature

S-FLAG series amplifiers features overload protection - overload alarm output and emergency stop upon alarm output - in case of motor operation with load level above the overload detection curve shown below.



Overload detection feature is reference data.

Be sure to use the motor within the specification temperature range and in the enough radiation environment. Detection time may change by the radiation condition of the motor.

Figure 1

Motor rated output power



DB6YZ11 DB61211
DB6Z111

Mounting holes

M4 (Effective depth = 5 mm) two locations
(Same as bottom side)

Setting panel

Used for parameter setting, tuning,
and status display

Hazardous voltage display LED

This will be lit while there is residual
hazardous voltage inside the amplifier.

Accessories

C1 Main power / Control power input

Main power input, Control power input,
and Regenerative resistor connection

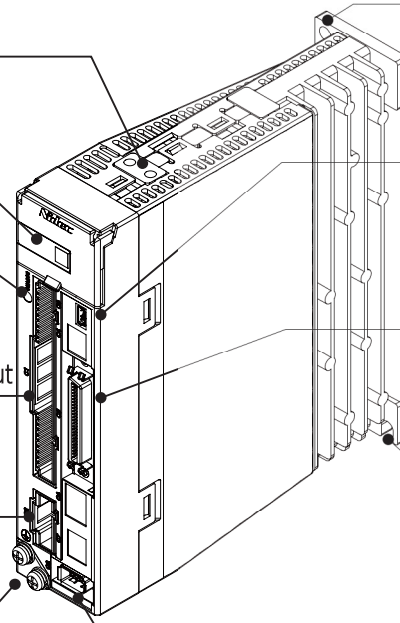
Accessories

C2 Motor power output

Motor power output

FG (Protective earth) terminal

Two terminals:
Attached M4x8 mm screw with spring washer



Mounting holes

∅ 5.5 (one location)
The recommended screw: M5x12 mm,
with spring washer

C3 USB connector

Used for parameter settings, tuning,
and status display in the dedicated
software "S-TUNE II"

C5 User I/O connector

Command input, User I/O, ABZ output,
RS-485 communication

Mounting notch

∅ 5.5 (one location)
The recommended screw: M5x12 mm,
with spring washer

C8 Encoder connector

Encoder connection

Figure 2

Motor rated output power



DB62411

Mounting holes

M4 (Effective depth = 5 mm) two locations
(Same as bottom side)

Setting panel

Used for parameter setting, tuning,
and status display

Hazardous voltage display LED

This will be lit while there is residual
hazardous voltage inside the amplifier.

Accessories

C1 Main power / Control power input

Main power input, Control power input,
and Regenerative resistor connection

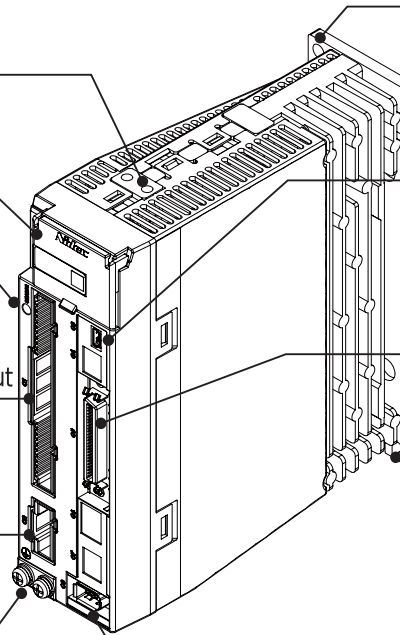
Accessories

C2 Motor power output

Motor power output

FG (Protective earth) terminal

Two terminals:
Attached M4x8 mm screw with spring washer



Mounting holes

∅ 5.5 (one location)
The recommended screw: M5x12 mm,
with spring washer

C3 USB connector

Used for parameter settings, tuning,
and status display in the dedicated
software "S-TUNE II"

C5 User I/O connector

Command input, User I/O, ABZ output,
RS-485 communication

Mounting notch

∅ 5.5 (two location)
The recommended screw: M5x12 mm,
with spring washer

C8 Encoder connector

Encoder connection

Figure 3

Motor rated output power



DB63811
DB64A11

Mounting holes

M4 (Effective depth = 5 mm) two locations
(Same as bottom side)

Setting panel

Used for parameter setting, tuning, and status display

Hazardous voltage display LED

This will be lit while there is residual hazardous voltage inside the amplifier.

Accessories

C1 Main power / Control power input

Main power input, Control power input, and Regenerative resistor connection

Accessories

C2 Motor power output

Motor power output

FG (Protective earth) terminal

Two terminals:
Attached M4x8 mm screw with spring washer

Mounting holes

∅ 5.5 (one location)
The recommended screw: M5x12 mm, with spring washer

C3 USB connector

Used for parameter settings, tuning, and status display in the dedicated software "S-TUNE II"

C5 User I/O connector

Command input, User I/O, ABZ output, RS-485 communication

Mounting notch

∅ 5.5 (one location)
The recommended screw: M5x12 mm, with spring washer

C8 Encoder connector

Encoder connection

Figure 4

Motor rated output power



DB65B11 DB67C11
DB66B11 DB68C11

Mounting holes

M4 (Effective depth = 5 mm) two locations
(Same as bottom side)

Setting panel

Used for parameter setting, tuning, and status display

Hazardous voltage display LED

This will be lit while there is residual hazardous voltage inside the amplifier.

Terminal block

Main power input, Control power input, Regenerative resistor connection, and Motor power output
(The recommended terminal: 2-4S insulation coating ring crimp terminals)

FG (Protective earth) terminal

Two terminals:
Attached M4x8 mm screw with spring washer

Mounting holes

∅ 5.5 (two locations)
The recommended screw: M5x12 mm, with spring washer

C3 USB connector

Used for parameter settings, tuning, and status display in the dedicated software "S-TUNE II"

Mounting hole

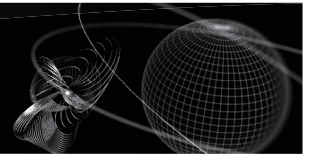
∅ 5.5 (one location)
The recommended screw: M5x12 mm, with spring washer

C5 User I/O connector






Command input, User I/O, ABZ output, RS-485 communication

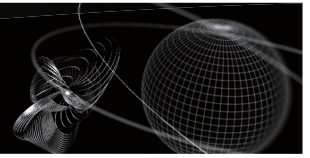
C8 Encoder connector

Encoder connection

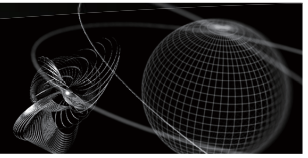


Basic Specifications

Item		Specifications				
Model		DB6YZ11	DB6Z111	DB61211	DB62411	DB63811
Compatible Motor		M□500 	M□101 	M□201 	M□401 	M□751 
External dimensions		(See "Dimensions")				
Mass (Kg)		0.8			1.0	1.1
Main circuit power, Control power		Single-phase AC200-240 V ± 10% 50 / 60 Hz				
Input current (Arms typ)		0.9	1.5	2.6	4.6	7.6
Control type		Three-phase PWM inverter sine-wave driven				
Output Rating	Rated current (A)	0.7	1.0	1.7	2.7	4.2
	Output frequencies (Hz)	0-500				
Encoder feedback		23 bit/17 bit single-turn absolute (The product can function as a multi-turn absolute type when batteries are added.)				
Control signal (*2)	Input	10-point (24 VDC system, photo-coupler input insulation) inputs whose functions are switched by the control mode				
	Output	10-point (24 VDC system, open-collector output insulation) outputs whose functions are switched by the control mode				
Analog signal	Input	1-point (± 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 as well				
Communication function		USB : connection to PC with " S-TUNE II " installed RS-485 : host remote control communication (multi-drop compatible)				
Amplifier status display function		Amplifier 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 regenerative resistor may be installed externally (*3)				
Dynamic brake		Included				
Control mode		Position Control, Velocity Control, Torque Control				



Item	Specifications						
Model	DB64A11		DB65B11	DB66B11	DB67C11	DB68C11	
Compatible Motor	MX951 1 kW	M□102 1 kW	MJ851 850 W	M□152 1.5 kW	MJ132 1.3 kW	M□202 2 kW	
External dimensions	(See "Dimensions")						
Mass (Kg)	1.1		2.0				
Main circuit power Control power	: Three-phase AC200-240 V ^(*) ± 10% 50 / 60 Hz : Single-phase AC200-240 V ± 10% 50 / 60 Hz						
Input current (Arms typ)	Single-phase : 9.9 Three-phase : 5.3		5.3	6.3	8.1	9.2	
Control type	Three-phase PWM inverter sine-wave driven						
Output Rating	Rated current (A)	5.8	5.8	6.9	9.5	10.7	12.2
	Output frequencies (Hz)	0-500					
Encoder feedback	23 bit/17 bit single-turn absolute (The product can function as a multi-turn absolute type when batteries are added.)						
Control signal ^{(*)2}	Input	10-point (24 VDC system, photo-coupler input insulation) inputs whose functions are switched by the control mode					
	Output	10-point (24 VDC system, open-collector output insulation) outputs whose functions are switched by the control mode					
Analog signal	Input	1-point (± 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 as well					
Communication function	USB : connection to PC with "S-TUNE II" installed RS-485 : host remote control communication (multi-drop compatible)						
Amplifier status display function	Amplifier 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 regenerative resistor may be installed externally ^{(*)3}						
Dynamic brake	Included						
Control mode	Position Control, Velocity Control, Torque Control						



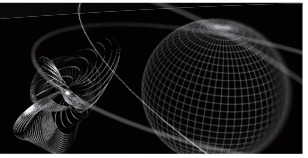
Functions Specifications

Position Control Mode

Item	Specifications	
Pulse Input	Control input	Servo ON, alarm reset, command input not allowed, emergency stop, deviation counter clear, 2-stage torque limit, CCW/CW run not allowed, ABS data demand, homing start
	Control output	Alarm status, servo status, servo ready, under torque limit, brake release, positioning complete, motion complete, alarm, dynamic 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 and direction (PLS + DIR), quadrature phase difference pulse (A-phase + B-phase), positive or negative pulse (CCW + CW)
	Command pulse-paired ratio	ratio A/B : $1/1,000 < A/B < 1,000$ Setting range A : 1 to 65,535, Setting range B : 1 to 65,535
Internal Position	Control input	Servo ON, alarm reset, deviation counter clear, motion start point selection 16, home position sensor input, homing start
	Control output	Alarm status, servo status, servo ready, under torque limit, brake release, homing complete, motion complete
	Operation mode	Point table, communication operation
Smoothing filter	FIR Filter	
Damping control	Enabled	

Velocity Control Mode

Item	Specifications	
Analog Velocity	Control input	Servo ON, alarm reset, command input inhibit (zero torque command), 2-stage torque limit, CCW/CW run prohibited
	Control output	Alarm status, servo status, servo ready, under torque limit, brake release
	Speed command input	Input voltage -10 V to $+10\text{ V}$ (max speed is reached at $\pm 10\text{ V}$)
Internal Velocity	Control input	Servo ON, alarm reset, start 1 (CCW), start 2 (CW), 8-stage speed command 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


Item	Specifications	
Analog Torque	Control input	Servo ON, alarm reset, command input not allowed (zero clamp command) 2-stage torque limit, CCW/CW run prohibited
	Control output	Alarm status, servo status, servo ready, under torque limit, brake release
	Torque command input	Input voltage : - 10 V to +10 V (max speed is reached at ± 10 V)
Smoothing filter	IIR Filter	

Common Features

Item	Specifications	
Speed observer	Available	
Auto-tuning	Available	
Encoder output Division /Multiplication	Available	
Tuning & Function Setup	Available through the S-FLAG setup software "S-TUNE II " Tuning with the setup panel on the amplifier front side	
Protective functions	By hardware	Overvoltage, low voltage, Overcurrent, Abnormal temperature, Overload
	By software	Overspeed, Position deviation too high, Parameter errors, Encoder error
Alarm Log	Can be referenced with the setup software S-TUNE II	

Notice

- *1) In the Amplifier DB64A11 (1 kW), single-phase can be used for primary circuit power source.
To use single-phase 200 to 240 VAC, connect it to the primary circuit power connectors L1 and L3.

Item	Specifications		
Amplifier Model	DB64A11		
Compatible Motor	 (MX951 □ 2 □ □ ** , M □ 102 □ 2 □ □ **)		
Primary Circuit Power Supply	Voltage Range	Three-phase 200 to 240 VAC $\pm 10\%$ 50/60 Hz	Single-phase 200 to 240 VAC $\pm 10\%$ 50/60 Hz
	Input Current	Rated at 4.5 A (200 VAC input) Rated at 3.8 A (230 VAC input) Up to approximately 13 A	Rated at 8.6 A (200 VAC input) Rated at 7.3 A (230 VAC input) Up to approximately 23 A

- *2) Use SELV (Safety Extra Low Voltage/Non-Hazardous Voltage) power supply to User I/O with reinforced isolation from hazardous voltage.
As a countermeasure against amplifier failure, install overcurrent protection or use power output capacity of no higher than 100 W.
- *3) Regenerative resistor values do not guarantee optimal performance. If the generated heat temperature becomes too high, increase the resistance value or select a resistor whose allowable power is larger enough. Whether or not a regenerative resistor installation is necessary can be checked on the Setup Panel or S-TUNE II.

Figure 1

Motor rated output power



DB6YZ41 DB61241
DB6Z141

Mounting holes

M4 (Effective depth = 5 mm) two locations
(Same as bottom side)

Setting panel

Used for EtherCAT communication node address setting and status display

Hazardous voltage display LED

This will be lit while there is residual hazardous voltage inside the amplifier.

Accessories

C1 Main power / Control power input

Main power input, Control power input, and Regenerative resistor connection

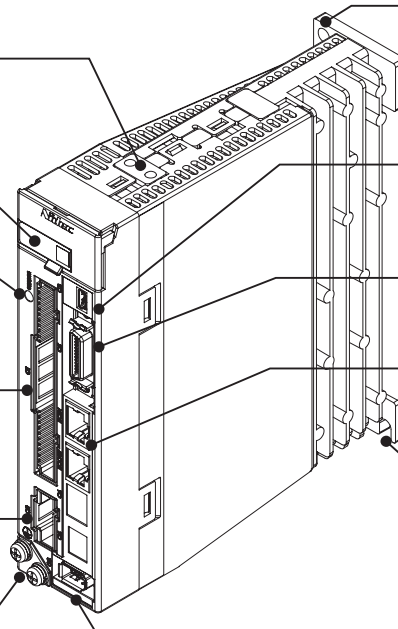
Accessories

C2 Motor power output

Motor power output

FG (Protective earth) terminal

Two terminals:
Attached M4x8 mm screw with spring washer



Mounting holes

∅ 5.5 (one location)
The recommended screw: M5x12 mm, with spring washer

C3 USB connector

Used for parameter settings, tuning, and status display in the dedicated software "S-TUNE II"

C5 User I/O connector

User I/O, ABZ output

ECIN, ECOUT connector

EtherCAT communication connector

Mounting notch

∅ 5.5 (one location)
The recommended screw: M5x12 mm, with spring washer

C8 Encoder connector

Encoder connection

Figure 2

Motor rated output power



DB62441

Mounting holes

M4 (Effective depth = 5 mm) two locations
(Same as bottom side)

Setting panel

Used for EtherCAT communication node address setting and status display

Hazardous voltage display LED

This will be lit while there is residual hazardous voltage inside the amplifier.

Accessories

C1 Main power / Control power input

Main power input, Control power input, and Regenerative resistor connection

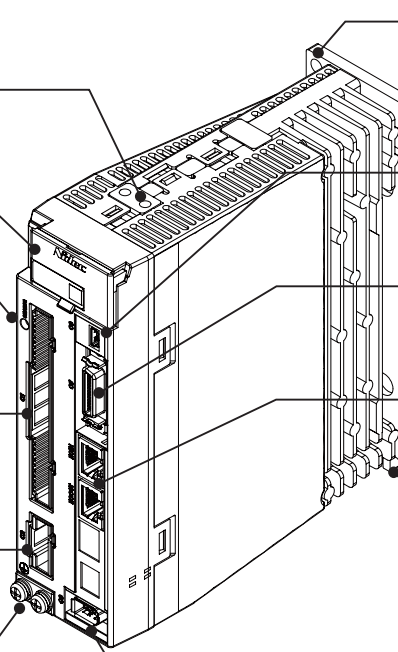
Accessories

C2 Motor power output

Motor power output

FG (Protective earth) terminal

Two terminals:
Attached M4x8 mm screw with spring washer



Mounting holes

∅ 5.5 (one location)
The recommended screw: M5x12 mm, with spring washer

C3 USB connector

Used for parameter settings, tuning, and status display in the dedicated software "S-TUNE II"

C5 User I/O connector

User I/O, ABZ output

ECIN, ECOUT connector

EtherCAT communication connector

Mounting notch

∅ 5.5 (two location)
The recommended screw: M5x12 mm, with spring washer

C8 Encoder connector

Encoder connection

Figure 3

Motor rated output power



DB63841
DB64A41

Mounting holes

M4 (Effective depth = 5 mm) two locations
(Same as bottom side)

Setting panel

Used for EtherCAT communication node address setting and status display

Hazardous voltage display LED

This will be lit while there is residual hazardous voltage inside the amplifier.

Accessories

C1 Main power / Control power input

Main power input, Control power input, and Regenerative resistor connection

Accessories

C2 Motor power output

Motor power output

FG (Protective earth) terminal

Two terminals:
Attached M4x8 mm screw with spring washer

Mounting holes

∅ 5.5 (one location)
The recommended screw: M5x12 mm, with spring washer

C3 USB connector

Used for parameter settings, tuning, and status display in the dedicated software "S-TUNE II"

C5 User I/O connector

User I/O, ABZ output

ECIN, ECOUT connector

EtherCAT communication connector

Mounting notch

∅ 5.5 (one location)
The recommended screw: M5x12 mm, with spring washer

C8 Encoder connector

Encoder connection

Figure 4

Motor rated output power



DB65B41 DB67C41
DB66B41 DB68C41

Mounting holes

M4 (Effective depth = 5 mm) two locations
(Same as bottom side)

Setting panel

Used for EtherCAT communication node address setting and status display

Hazardous voltage display LED

This will be lit while there is residual hazardous voltage inside the amplifier.

Terminal block

Main power input, Control power input, Regenerative resistor connection, and Motor power output
(The recommended terminal: 2-4S insulation coating ring crimp terminals)

FG (Protective earth) terminal

Two terminals:
Attached M4x8 mm screw with spring washer

Mounting holes

∅ 5.5 (two locations)
The recommended screw: M5x12 mm, with spring washer

C3 USB connector

Used for parameter settings, tuning, and status display in the dedicated software "S-TUNE II"

C5 User I/O connector

User I/O, ABZ output

Mounting hole

∅ 5.5 (one location)
The recommended screw: M5x12 mm, with spring washer

ECIN, ECOUT connector

EtherCAT communication connector

C8 Encoder connector

Encoder connection

Basic Specifications

Items		Specifications				
Amplifier model		DB6YZ41	DB6Z141	DB61241	DB62441	DB63841
Compatible Motor		M□500	M□101	M□201	M□401	M□751
External dimensions		(See "Dimensions")				
Mass (Kg)		0.8			1.0	1.1
Main circuit power & Control power		Single-phase AC200 V-240 V±10% 50 / 60 Hz				
Input current (Arms typ)		0.9	1.5	2.6	4.6	7.6
Control type		Three-phase PWM inverter sine-wave driven				
Output Rating	Rated current (A)	0.7	1.0	1.7	2.7	4.2
	Output frequencies (Hz)	0 - 500				
Encoder feedback		23 bit / 17 bit single-turn absolute (The product can function as a multi-turn absolute type when batteries are added.)				
Control signal (*2)	Input	7-point (24VDC system, photo-coupler input insulation)				
	Output	3-point (24VDC system, photo-coupler output insulation)				
Communication function		EtherCAT (Topology: "Daisy chain", "Star", or "Ring" are available) USB : connection to PC with "S-TUNE II" installed				
Amplifier status display function		Amplifier status display function 2 digits of 7-segment display on Setup Panel (Indicate EtherCAT node ID)				
Regeneration function		A regenerative resistor may be installed externally (*3)				
Dynamic brake		Built-in				
Speed observer		Available				
Auto-tuning		Available				
Encoder output Division/Multiplication		Available				
Tuning & Function Setup		Available through the S-FLAG setup software "S-TUNE II"				
Protective functions	By hardware	Overvoltage, low voltage, Overcurrent, Abnormal temperature, Overload				
	By software	Overspeed, Position deviation too high, Parameter errors, Encoder error				
Alarm Log		Can be referenced with the setup software "S-TUNE II"				

Items		Specifications					
Amplifier model		DB64A41	DB65B41	DB66B41	DB67C41	DB68C41	
Compatible Motor		MX951 	M□102 	MJ851 	M□152 	MJ132 	M□202
	External dimensions	(See "Dimensions")					
Mass (Kg)		1.1	2.0				
Main circuit power & Control power		Three-phase AC 200-240 V ^{(*)1} ± 10% 50 / 60 Hz					
Input current (Arms typ)		Single-phase : 9.9 Three-phase : 5.3	5.3	6.3	8.1	9.2	
Control type		Three-phase PWM inverter sine-wave driven					
Output Rating	Rated current (A)	5.8	5.8	6.9	9.5	10.7	12.2
	Output frequencies (Hz)	0-500					
Encoder feedback		17 bit / 23 bit single-turn absolute (The product can function as a multi-turn absolute type when batteries are added.)					
Control signal ⁽⁺²⁾	Input	7-point (24VDC system, photo-coupler input insulation)					
	Output	3-point (24VDC system, photo-coupler output insulation)					
Communication function		EtherCAT (Topology: "Daisy chain", "Star", or "Ring" are available) USB : connection to PC with "S-TUNE II" installed					
Amplifier status display function		Amplifier status display function 2 digits of 7-segment display on Setup Panel (Indicate EtherCAT node ID)					
Regeneration function		A regenerative resistor may be installed externally ⁽⁺³⁾					
Dynamic brake		Built-in					
Speed observer		Available					
Auto-tuning		Available					
Encoder output Division/Multiplication		Available					
Tuning & Function Setup		Available through the S-FLAG setup software "S-TUNE II"					
Protective functions	By hardware	Overvoltage, low voltage, Overcurrent, Abnormal temperature, Overload					
	By software	Overspeed, Position deviation too high, Parameter errors, Encoder error					
Alarm Log		Can be referenced with the setup software "S-TUNE II"					

Notice

- *1) In the Amplifier DB64A41 (1 kW), single-phase can be used for primary circuit power source.
To use single-phase 200 to 240 VAC, connect it to the primary circuit power connectors L1 and L3.

Item	Specifications		
Amplifier Model	DB64A41		
Compatible Motor	(MX951 □ 2 □ □ ** , M □ 102 □ 2 □ □ **)		
Primary Circuit Power Supply	Voltage Range	Three-phase 200 to 240 VAC ± 10% 50/60 Hz	Single-phase 200 to 240 VAC ± 10% 50/60 Hz
	Input Current	Rated at 4.5 A (200 VAC input) Rated at 3.8 A (230 VAC input) Up to approximately 13 A	Rated at 8.6 A (200 VAC input) Rated at 7.3 A (230 VAC input) Up to approximately 23 A

- *2) Use SELV (Safety Extra Low Voltage/Non-Hazardous Voltage) power supply to User I/O with reinforced isolation from hazardous voltage.
As a countermeasure against amplifier failure, install overcurrent protection or use power output capacity of no higher than 100 W.
- *3) Regenerative resistor values do not guarantee optimal performance. If the generated heat temperature becomes too high, increase the resistance value or select a resistor whose allowable power is larger enough. Whether or not a regenerative resistor installation is necessary can be checked on the Setup Panel or S-TUNE II.

Standard I/O

Items	Specifications
Control input	CW limit sensor, CCW limit sensor, Home sensor, External latch(2-point), Alarm reset, Emergency stop
Control output	Brake release, Alarm status, Servo ready

Operation mode

Item	Specifications
Operation mode	-EtherCAT communication -test run operation by dedicated setup software S-TUNE II

EtherCAT communication Specifications

Items	Specifications
Device Profile	CoE (CANopen over EtherCAT)
Control mode	pp, hm, csp, csv, cst
hm method (homing mode)	1-6, 17-22, 33-37
Synchronous mode	DC (Synchronized), FreeRun (not-Synchronized)
Cycle Time	250 μs, 500 μs, 1 ms, 2 ms, 4 ms

Figure 1

Motor rated output power

- 50 W
- 100 W
- 200 W
- 400 W
- 750 W
- 850 W
- 1 kW
- 1.3 kW
- 1.5 kW
- 2 kW

DB6YZ41
DB6Z141
DB61241

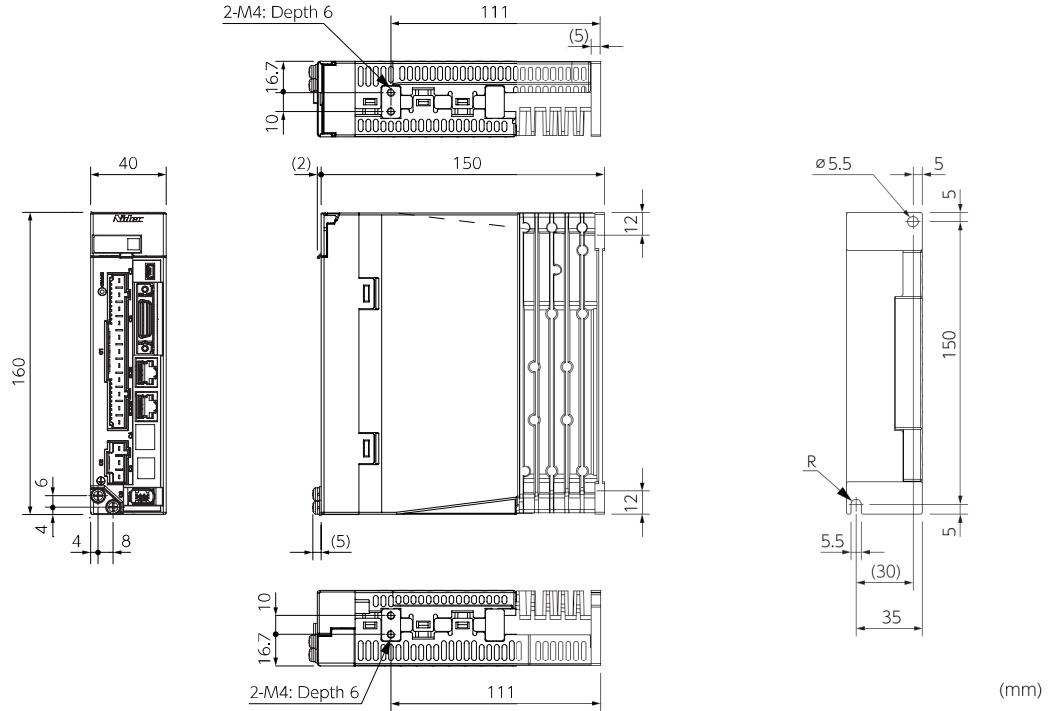


Figure 2

Motor rated output power

- 50 W
- 100 W
- 200 W
- 400 W
- 750 W
- 850 W
- 1 kW
- 1.3 kW
- 1.5 kW
- 2 kW

DB62441

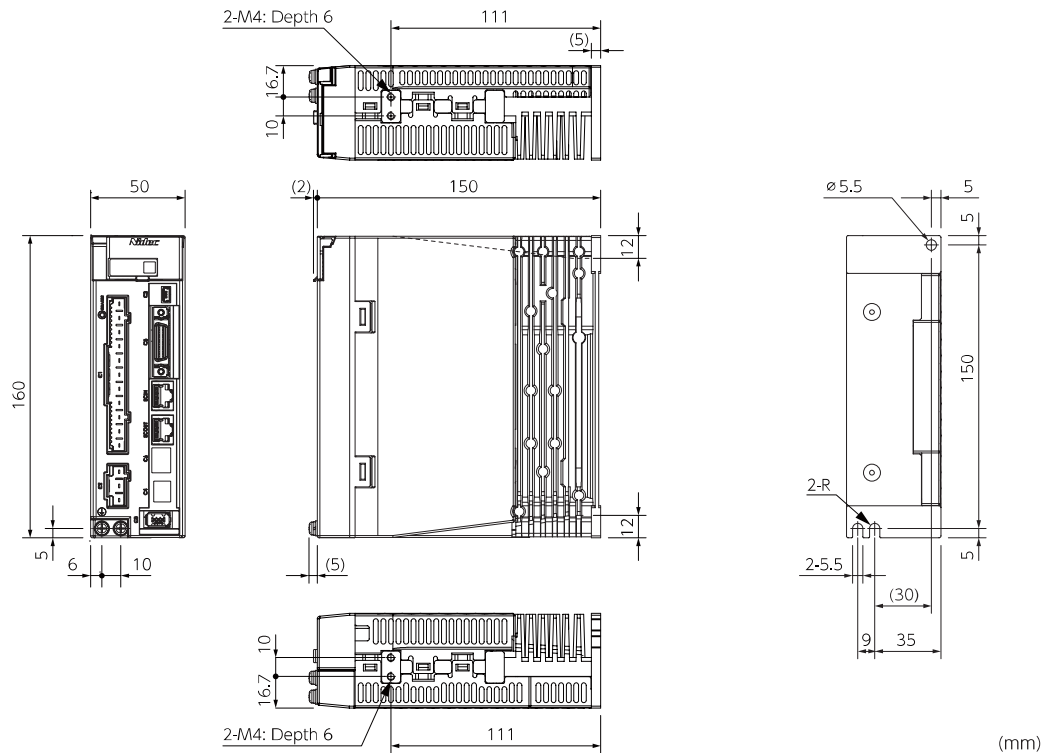


Figure 3

Motor rated output power

- 50 W
- 100 W
- 200 W
- 400 W
- 750 W
- 850 W
- 1 kW
- 1.3 kW
- 1.5 kW
- 2 kW

DB63841
DB64A41

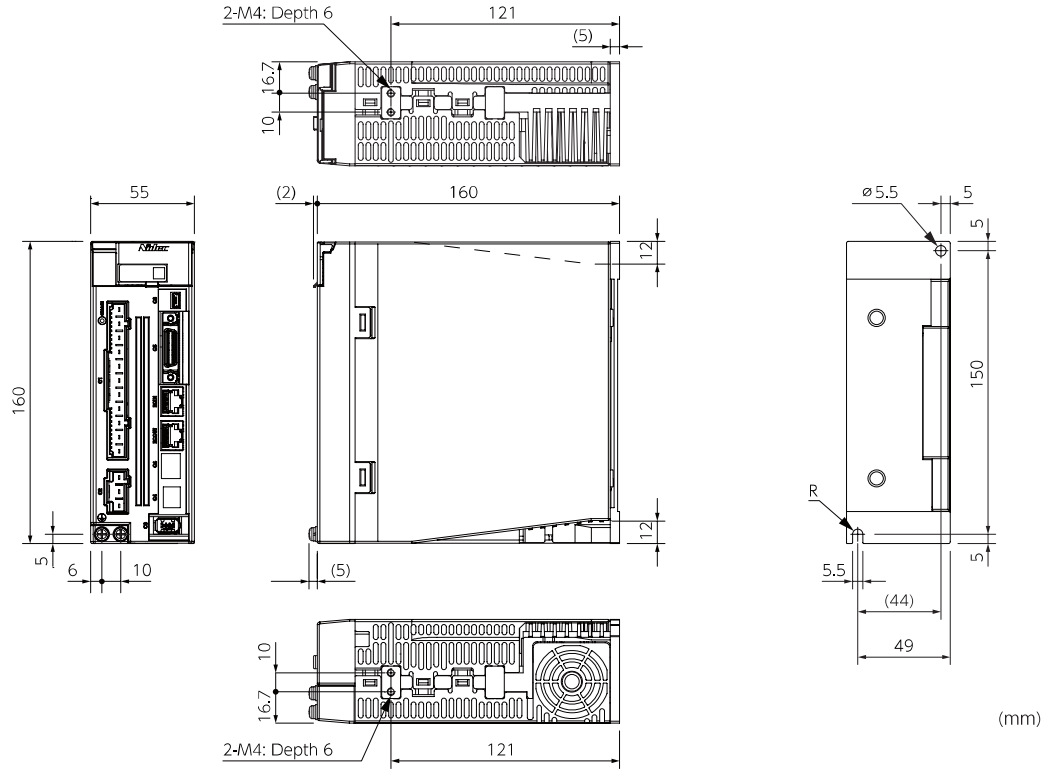
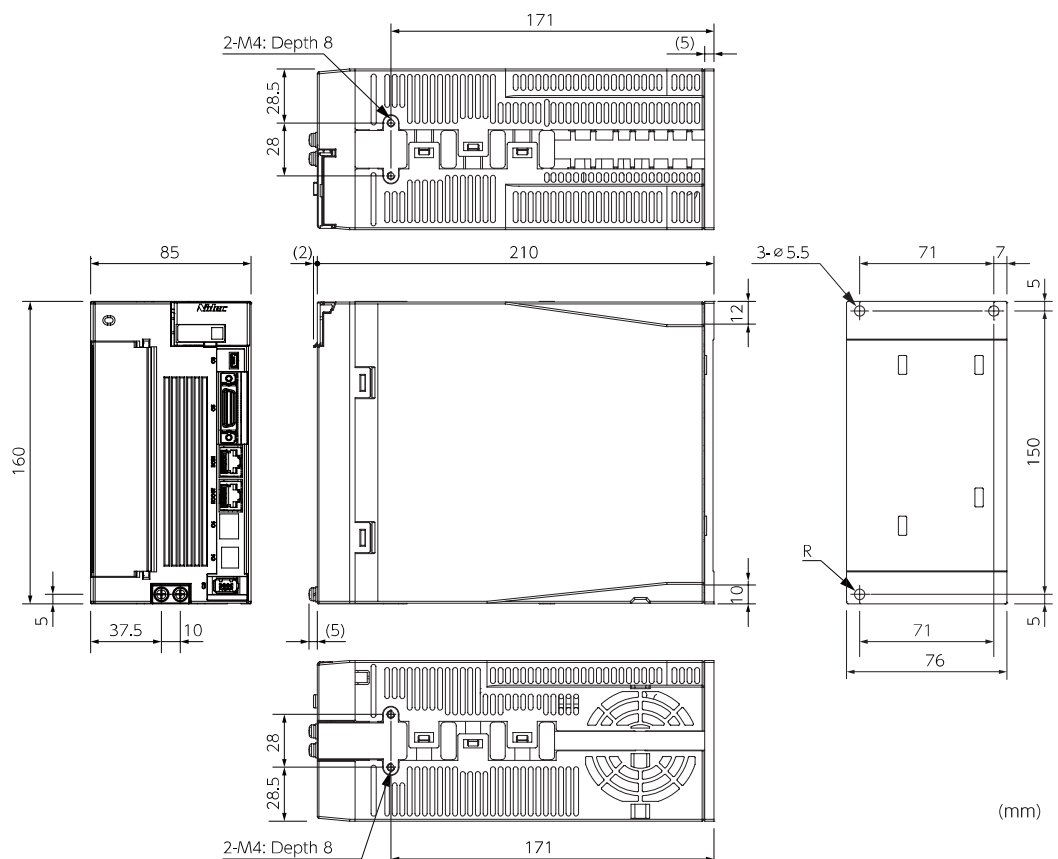


Figure 4

Motor rated output power

- 50 W
- 100 W
- 200 W
- 400 W
- 750 W
- 850 W
- 1 kW
- 1.3 kW
- 1.5 kW
- 2 kW

DB65B41
DB66B41
DB67C41
DB68C41



1000h–1602h

Index	Sub-Index	Name	Units	Type	Access	Range	PDO Mapping	Op-mode	Remarks
1000h	00h	Device Type	–	U32	RO	0 to 4,294,967,295	No	ALL	
1001h	00h	Error Register	–	U8	RO	0 to 255	No	ALL	
1018h	–	Identity Object	–	–	–	–	–	ALL	–
	00h	Number of Entries	–	U8	RO	0 to 12	No	ALL	
	01h	Vendor ID	–	U32	RO	0 to 4,294,967,295	No	ALL	
	02h	Product Code	–	U32	RO	0 to 4,294,967,295	No	ALL	
	03h	Revision Number	–	U32	RO	0 to 4,294,967,295	No	ALL	
	04h	Serial Number	–	U32	RO	0 to 4,294,967,295	No	ALL	
1600h	–	Receive PDO Mapping 1	–	–	–	–	–	–	
	00h	Number of Entries	–	U8	RW	0 to 12	No	ALL	
	01h	1st Receive PDO Mapped	–	U32	RW	0 to 4,294,967,295	No	ALL	
	02h	2nd Receive PDO Mapped	–	U32	RW	0 to 4,294,967,295	No	ALL	
	...								
	0Ch	12th Recieve PDO Mapped	–	U32	RW	0 to 4,294,967,295	No	ALL	
1601h	–	Receive PDO Mapping 2	–	–	–	–	–	–	
	00h	Number of Entries	–	U8	RW	0 to 12	No	ALL	
	01h	1st Receive PDO Mapped	–	U32	RW	0 to 4,294,967,295	No	ALL	
	02h	2nd Receive PDO Mapped	–	U32	RW	0 to 4,294,967,295	No	ALL	
	...								
	0Ch	12th Recieve PDO Mapped	–	U32	RW	0 to 4,294,967,295	No	ALL	
1602h	–	Receive PDO Mapping 3	–	–	–	–	–	–	
	00h	Number of Entries	–	U8	RW	0 to 12	No	ALL	
	01h	1st Receive PDO Mapped	–	U32	RW	0 to 4,294,967,295	No	ALL	
	02h	2nd Receive PDO Mapped	–	U32	RW	0 to 4,294,967,295	No	ALL	
	...								
	0Ch	12th Recieve PDO Mapped	–	U32	RW	0 to 4,294,967,295	No	ALL	

1604h–1A02h

Index	Sub-Index	Name	Units	Type	Access	Range	PDO Mapping	Op-mode	Remarks
1604h									
–		Receive PDO Mapping 5	–	–	–	–	–		
00h		Number of Entries	–	U8	RW	0 to 12	No	ALL	
01h		1st mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
02h		2nd mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
...									
0Ch		12th mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
1605h									
–		Receive PDO Mapping 6	–	–	–	–	–		
00h		Number of Entries	–	U8	RW	0 to 12	No	ALL	
01h		1st mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
02h		2nd mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
...									
0Ch		12th mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
1A00h									
–		Transmit PDO Mapping 1	–	–	–	–	–		
00h		Number of Entries	–	U8	RW	0 to 12	No	ALL	
01h		1st mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
02h		2nd mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
...									
0Ch		12th mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
1A01h									
–		Transmit PDO Mapping 2	–	–	–	–	–		
00h		Number of Entries	–	U8	RW	0 to 12	No	ALL	
01h		1st mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
02h		2nd mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
...									
0Ch		12th mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
1A02h									
–		Transmit PDO Mapping 3	–	–	–	–	–		
00h		Number of Entries	–	U8	RW	0 to 12	No	ALL	
01h		1st mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
02h		2nd mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
...									
0Ch		12th mapped object	–	U32	RW	0 to 4294967295	No	ALL	

1A04h–1C15h

Index	Sub-Index	Name	Units	Type	Access	Range	PDO Mapping	Op-mode	Remarks
1A04h									
–		Transmit PDO Mapping 5	–	–	–	–	–		
00h		Number of Entries	–	U8	RW	0 to 12	No	ALL	
01h		1st mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
02h		2nd mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
...									
0Ch		12th mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
1A05h									
–		Transmit PDO Mapping 6	–	–	–	–	–		
00h		Number of Entries	–	U8	RW	0 to 12	No	ALL	
01h		1st mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
02h		2nd mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
...									
0Ch		12th mapped object	–	U32	RW	0 to 4,294,967,295	No	ALL	
1C00h									
–		Sync Manager Communication Type	–	–	–	–	–		
00h		Number of Used Sync Manager Channels	–	U8	RO	0 to 255	No	ALL	
01h		Sync Manager Communication Type 0	–	U8	RO	0 to 4	No	ALL	
02h		Sync Manager Communication Type 1	–	U8	RO	0 to 4	No	ALL	
03h		Sync Manager Communication Type 2	–	U8	RO	0 to 4	No	ALL	
04h		Sync Manager Communication Type 3	–	U8	RO	0 to 4	No	ALL	
05h		Sync Manager Communication Type 4	–	U8	RO	0 to 4	No	ALL	
06h		Sync Manager Communication Type 5	–	U8	RO	0 to 4	No	ALL	
1C10h									
00h		Sync Manager 0 PDO Assignment	–	U8	RO	0	No	ALL	
1C11h									
00h		Sync Manager 1 PDO Assignment	–	U8	RO	0	No	ALL	
1C12h									
–		Sync Manager 2 PDO Assignment	–	–	–	–	–		
00h		Number of Assigned PDOs	–	U8	RW	0 to 1	No	ALL	
01h		PDO Mapping Object Index of Assigned RxPDO	–	U16	RW	1600h to 1605h	No	ALL	
1C13h									
–		Sync Manager 3 PDO Assignment	–	–	–	–	–		
00h		Number of Assigned PDOs	–	U8	RW	0 to 1	No	ALL	
01h		PDO Mapping Object Index of Assigned TxPDO	–	U16	RW	1A00h to 1A05h	No	ALL	
1C14h									
00h		Sync Manager 4 PDO Assignment	–	U8	RO	0	No	ALL	
1C15h									
00h		Sync Manager 5 PDO Assignment	–	U8	RO	0	No	ALL	

2000h–2078h

Index	Sub-Index	Name	Units	Type	Access	Range	PDO Mapping	Op-mode	Remarks
200Ch	00h	Warning Latch Time	50ms	U16	RW	0 to 200	No	ALL	No.12.0
200Dh	00h	Timing for Alarm Output	–	U16	RW	0 to 1	No	ALL	No.13.0
2020h	00h	Position Control Mode Setting 1	–	U16	RW	0 to 65,535	No	ALL	No.32.1
203Eh	00h	Velocity Control Mode Setting	–	U16	RW	0 to 65,535	No	ALL	No.62.0
2041h	00h	Deviation Error Detection Setting	–	U16	RW	0 to 65,535	No	ALL	No.65.0, No.65.1
2042h	00h	Position Control Mode Setting 2	–	U16	RW	0 to 65,535	No	ALL	No.66.0, No.66.3
2043h	00h	Drive Restriction Input	–	U16	RW	0 to 65,535	No	ALL	No.67.0 to No.67.3
204Ah	00h	Position Command Filter 1 Notch Frequency	0.1Hz	U16	RW	10 to 2,000	No	ALL	No.74.0
204Bh	00h	Position Command Filter 1 Notch Width	–	U16	RW	128 to 2,048	No	ALL	No.75.0
204Ch	00h	Position Command Filter 1 High Frequency Gain	–	U16	RW	50 to 200	No	ALL	No.76.0
204Fh	00h	Position Command Filter 1 Notch Depth	–	U16	RW	0 to 100	No	ALL	No.79.0
2050h	00h	Position Command Smoothing Filter 1 Moving Average Order	–	U16	RW	1 to 6,250	No	ALL	No.80.0
2052h	00h	Position Command Filter 2 Type	–	U16	RW	0 to 65,535	No	ALL	No.82.0, No.82.1
2053h	00h	Position Command Filter 2 Notch Frequency	0.1Hz	U16	RW	10 to 2,000	No	ALL	No.83.0
2054h	00h	Position Command Filter 2 Notch Width	–	U16	RW	128 to 2,048	No	ALL	No.84.0
2055h	00h	Position Command Filter 2 High Frequency Gain	–	U16	RW	50 to 200	No	ALL	No.85.0
2056h	00h	Position Command Filter 2 Notch Depth	–	U16	RW	0 to 100	No	ALL	No.86.0
205Ah	00h	Speed Deviation Error Detection Value	pulse /100µs	U16	RW	0 to 32,767	No	ALL	No.90.0
205Bh	00h	Speed Deviation Error Detection Delay Time	100µs	U16	RW	0 to 32,767	No	ALL	No.91.0
2066h	00h	Inertia Ratio	%	U16	RW	100 to 10,000	No	ALL	No.102.0
2067h	00h	Damping Ratio	%	U16	RW	10 to 5,000	No	ALL	No.103.0
206Ah	00h	Tuning Inertia Ratio Upper Limit	%	U16	RW	100 to 10,000	No	ALL	No.106.0
206Eh	00h	Tuning Setting 1	–	U16	RW	0 to 65,535	No	ALL	No.110.0, No.110.1
2071h	00h	Tuning Setting 2	–	U16	RW	0 to 65,535	No	ALL	No.113.0, No.113.1
2072h	00h	Position Control Mode Control level	–	U16	RW	5 to 45	No	ALL	No.114.0
2073h	00h	Position Control Mode Control Gain 1	rad/s	U16	RW	5 to 1,000	No	ALL	No.115.0
2074h	00h	Position Control Mode Control Gain 2	rad/s	U16	RW	80 to 5,000	No	ALL	No.116.0
2075h	00h	Position Control Mode Gain FF Compensation 1	0.01%	U16	RW	0 to 15,000	No	ALL	No.117.0
2076h	00h	Position Control Mode Gain FF Compensation 2	0.01%	U16	RW	0 to 15,000	No	ALL	No.118.0
2077h	00h	Position Control Mode Integral Gain	rad/s	U16	RW	45 to 5,000	No	ALL	No.119.0
2078h	00h	Tuning Control Gain Set Upper limit	–	U16	RW	5 to 45	No	ALL	No.120.1

2079h–2101h

Index	Sub-Index	Name	Units	Type	Access	Range	PDO Mapping	Op-mode	Remarks
2079h	00h	Tuning Tuning Constant	–	U16	RW	1 to 200	No	ALL	No.121.0
2081h	00h	Velocity Control Mode Control Gain Set	–	U16	RW	1 to 46	No	ALL	No.129.0
2082h	00h	Velocity Control Mode Control Level	–	U16	RW	1 to 46	No	ALL	No.130.0
2083h	00h	Velocity Control Mode Control Gain 1	rad/s	U16	RW	100 to 6,000	No	ALL	No.131.0
2084h	00h	Velocity Control Mode Gain FF Compensation 1	0.01%	U16	RW	0 to 15,000	No	ALL	No.132.0
2085h	00h	Velocity Control Mode Integral Gain	rad/s	U16	RW	45 to 5,000	No	ALL	No.133.0
2092h	00h	Torque Command Offset	0.1%	U16	RW	–1,000 to 1,000	No	ALL	No.146.0
20A0h	00h	Torque Command Filter Setting	–	U16	RW	0 to 65,535	No	ALL	No.160.0 to No.160.3
20A2h	00h	Torque Command Filter Low-pass Filter Time Constant	0.01ms /rad	U16	RW	0 to 65,535	No	ALL	No.162.0
20A8h	00h	Torque Command Filter Notch Filter Frequency	Hz	U16	RW	0 to 2,500	No	ALL	No.168.0
20A9h	00h	Torque Command Filter Notch Filter Width	–	U16	RW	1 to 16	No	ALL	No.169.0
20AAh	00h	Torque Command Filter Notch Filter Depth	–	U16	RW	0 to 256	No	ALL	No.170.0
20ABh	00h	Torque Command Filter Notch Filter 2 Frequency	0.1Hz	U16	RW	0 to 2,500	No	ALL	No.171.0
20ACh	00h	Torque Command Filter Notch Filter 2 Width	–	U16	RW	1 to 16	No	ALL	No.172.0
20ADh	00h	Torque Command Filter Notch Filter 2 Depth	–	U16	RW	0 to 256	No	ALL	No.173.0
20C1h	00h	Tuning Current Control Gain	–	U16	RW	0 to 1	No	ALL	No.193.0
20E0h	00h	Deceleration and Stop Setting	–	U16	RW	0 to 65,535	No	ALL	No.224.0 to No.224.3
20E1h	00h	Emergency Stop Setting	–	U16	RW	0 to 65,535	No	ALL	No.225.0 to No.225.2
20E2h	00h	Deceleration Stop Working Time	100μs	U16	RW	0 to 16,383	No	ALL	No.226.0
20E3h	00h	Deceleration Stop Rotational Speed to End Deceleration Stop	pulse /100μs	U16	RW	0 to 32,767	No	ALL	No.227.0
20E4h	00h	Deceleration Stop Working Time	100μs	U16	RW	0 to 16,383	No	ALL	No.228.0
20E5h	00h	Quick Stop Average Counter for Smoothing Filter	–	U16	RW	0 to 1,000	No	ALL	No.229.0
20E8h	00h	Deceleration and Stop Setting 2	–	U16	RW	0 to 65,535	No	ALL	No.232.1 to No.232.3
20E9h	00h	Deceleration and Stop Setting 3	–	U16	RW	0 to 65,535	No	ALL	No.233.0, No.233.3
20EAh	00h	Deceleration Stop Delay Time for Braking	100μs	U16	RW	0 to 16,383	No	ALL	No.234.0
20EBh	00h	Deceleration Stop Rotational Speed on Braking	pulse /100μs	U16	RW	0 to 32,767	No	ALL	No.235.0
20ECh	00h	Quick Stop Time Extension	100μs	U16	RW	0 to 3,125	No	ALL	No.236.0
20EDh	00h	Delay Time for Servo Off	100μs	U16	RW	0 to 3,125	No	ALL	No.237.0
20EEh	00h	Delay Time for Mechanical Brake Release	100μs	U16	RW	0 to 3,125	No	ALL	No.238.0
20EFh	00h	Quick Stop Decelerating Time	ms	U16	RW	0 to 100	No	ALL	No.239.0
2101h	00h	Absolute System	–	U16	RW	0 to 2	No	ALL	No.257.0

2103h–2FFFh

Index	Sub-Index	Name	Units	Type	Access	Range	PDO Mapping	Op-mode	Remarks
2103h	00h	Encoder Error Detection Output Switch	–	U16	RW	0 to 65,535	No	ALL	No.259.0, No.259.1
210Bh	00h	Encoder Temperature to Detect Overheat	°C	U16	RW	0 to 127	No	ALL	No.267.0
210Ch	00h	Encoder Voltage to Detect low Battery Voltage	0.1V	U16	RW	0 to 100	No	ALL	No.268.0
212Eh	00h	Torque Control Mode Setting	–	U16	RW	0 to 65,535	No	ALL	No.302.0 to No.302.2
2131h	00h	Voltage Drop Detection Delay Time	ms	U16	RW	25 to 50,000	No	ALL	No.305.0
2152h	00h	Logical Input Masking Configuration	–	U32	RW	0 to 4,294,967,295	No	ALL	–
2165h	00h	Position Command Filter 3 Notch Frequency	0.1Hz	U16	RW	10 to 2,000	No	ALL	No.357.0
2166h	00h	Position Command Filter 3 Notch Width	–	U16	RW	128 to 2,048	No	ALL	No.358.0
2167h	00h	Position Command Filter 3 High Frequency Gain	–	U16	RW	50 to 200	No	ALL	No.359.0
2168h	00h	Position Command Filter 3 Notch Depth	–	U16	RW	0 to 100	No	ALL	No.360.0
216Bh	00h	Following Error Warning Window (position deviation waning detection value)	pulse	U32	RW	0 to 2,147,483,647	No	ALL	No.363.0
216Dh	00h	Following Error Warning Time Out (position deviation waning detection delay time)	100µs	U16	RW	0 to 65,535	No	ALL	No.365.0
2178h	00h	Motor Rotating Position at Encoder Error Holding Method	–	U16	RW	0 to 2	No	ALL	No.376.0
2179h	00h	Motor Rotating Position at Encoder Error Holding Time	ms	U16	RW	0 to 200	No	ALL	No.377.0
21DAh	00h	EtherCAT Communication Setting	–	U16	RW	0 to 65,535	No	ALL	No.474.0
21DCh	00h	Logical IO Polarity	–	U32	RW	0 to 4,294,967,295	No	ALL	–
21DEh	00h	Logical Input Mask with Monitor	–	U32	RW	0 to 4,294,967,295	No	ALL	–
2FFFh	00h	Access to Servo Parameters	–	U16	RW	0 to 65,535	No	ALL	(*1)

*1)

Bit0-7: Control parameter
 1: Amp → Object Dictionary
 2: Object Dictionary → Amp and Save all parameter
 Bit8: Busy bit (Read only)
 Bit9-15: RSV.

4000h

Index	Sub-Index	Name	Units	Type	Access	Range	PDO Mapping	Op-mode	Remarks
4000h	00h	Special function	–	U16	RW	0 to 65,535	No	ALL	(*2)

*2)

Bit0: Clear multi turn data
 Bit1-15: RSV.

603Fh-6098h

Index	Sub-Index	Name	Units	Type	Access	Range	PDO Mapping	Op-mode	Remarks
603Fh	00h	Error Code	–	U16	RO	0 to 65,535	TxPDO	ALL	
6040h	00h	Controlword	–	U16	RW	0 to 65,535	RxPDO	ALL	
6041h	00h	Statusword	–	U16	RO	0 to 65,535	TxPDO	ALL	
6060h	00h	Modes of Operation	–	I8	RW	0 to 10	RxPDO	ALL	
6061h	00h	Modes of Operation Display	–	I8	RO	0 to 10	TxPDO	ALL	
6062h	00h	Position Demand Value	pulse	I32	RO	–2,147,483,648 to 2,147,483,647	TxPDO	CSP	
6064h	00h	Position Actual Value	pulse	I32	RO	–2,147,483,648 to 2,147,483,647	TxPDO	ALL	
6065h	00h	Following Error Window	pulse	U32	RW	0 to 4,294,967,295	No	CSP	
606Ch	00h	Velocity Actual Value	pulse/s	I32	RO	–2,147,483,648 to 2,147,483,647	TxPDO	ALL	
6071h	00h	Target Torque	0.1%	I16	RW	–32,768 to 32,767	RxPDO	CST	
6072h	00h	Max Torque	0.1%	U16	RW	0 to 65,535	RxPDO	ALL	
6074h	00h	Torque Demand	0.1%	I16	RO	–32,768 to 32,767	TxPDO	ALL	
6077h	00h	Torque Actual Value	0.1%	I16	RO	–32,768 to 32,767	TxPDO	ALL	
607Ah	00h	Target Position	pulse	I32	RW	–2,147,483,648 to 2,147,483,647	RxPDO	CSP	
607Bh	–	Position Range Limit	–	–	–	–	–	ALL	
	00h	Number of Entries		U8	RO	2	No		
	01h	Min Position Range Limit	pulse	I32	RW	–2,147,483,648 to 2,147,483,647	No		
	02h	Max Position Range Limit	pulse	I32	RW	–2,147,483,648 to 2,147,483,647	No		
607Ch	00h	Home Offset	pulse	I32	RW	–2,147,483,648 to 2,147,483,647	RxPDO	HM	
607Fh	00h	Max Profile Velocity	pulse/s	U32	RW	0 to 4,294,967,295	RxPDO	ALL	
6080h	00h	Max Motor Speed	rpm	U32	RW	0 to 4,294,967,295	RxPDO	ALL	
6081h	00h	Profile Velocity	pulse/s	U32	RW	0 to 4,294,967,295	RxPDO	PP	
6083h	00h	Profile Acceleration	pulse/s ²	U32	RW	0 to 4,294,967,295	RxPDO	PP	
6084h	00h	Profile deceleration	pulse/s ²	U32	RW	0 to 4,294,967,295	RxPDO	PP	
6091h	–	Gear Ratio	–	–	–	–	–	CSP	
	00h	Number of Entries		U8	RO		No		
	01h	Motor Revolutions	–	U32	RW	1 to 4,294,967,295	No		
	02h	Shaft Revolutions	–	U32	RW	1 to 4,294,967,295	No		
6098h	00h	Homing Method	–	I8	RW	0 to 37	No	HM	

6099h–6502h

Index	Sub-Index	Name	Units	Type	Access	Range	PDO Mapping	Op-mode	Remarks
6099h	-	Homing Speeds	-	-	-	-	-	HM	
	00h	Number of Entries		U8	RO	2	No		
	01h	Speed During Search for Switch	pulse/s	U32	RW	1 to 4,294,967,295	No		
	02h	Speed During Search for Zero	pulse/s	U32	RW	1 to 4,294,967,295	No		
609Ah	00h	Homing Acceleration	pulse/s ²	U32	RW	0 to 4,294,967,295	No	HM	
60B0h	00h	Position Offset	pulse	I32	RW	-2,147,483,648 to 2,147,483,647	RxPDO	CSP	
60B1h	00h	Velocity Offset	pulse/s	I32	RW	-2,147,483,648 to 2,147,483,647	RxPDO	CSV	
60B2h	00h	Torque Offset	0.1%	I16	RW	-32,768 to 32,767	RxPDO	CSP, CSV, CST	
60B8h	00h	Touch Probe Function	-	U16	RW	0 to 65,535	RxPDO	ALL	
60B9h	00h	Touch Probe Status	-	U16	RO	0 to 65,535	TxPDO	ALL	
60BAh	00h	Touch Probe 1 Positive Edge	pulse	I32	RO	-2,147,483,648 to 2,147,483,647	TxPDO	ALL	
60BBh	00h	Touch Probe 1 Negative Edge	pulse	I32	RO	-2,147,483,648 to 2,147,483,647	TxPDO	ALL	
60BCh	00h	Touch Probe 2 Positive Edge	pulse	I32	RO	-2,147,483,648 to 2,147,483,647	TxPDO	ALL	
60BDh	00h	Touch Probe 2 Negative Edge	pulse	I32	RO	-2,147,483,648 to 2,147,483,647	TxPDO	ALL	
60F4h	00h	Following Error Actual Value	pulse	I32	RO	-2,147,483,648 to 2,147,483,647	TxPDO	CSP	
60FDh	00h	Digital Inputs	-	U32	RO	0 to 4,294,967,295	TxPDO	ALL	
60FFh	00h	Target Velocity	pulse/s	I32	RW	-2,147,483,648 to 2,147,483,647	RxPDO	CSV	
6502h	00h	Supported Drive Modes	-	U32	RO	0 to 4,294,967,295	No	ALL	(*)

*) Supported Drive Mode : PP, CSP, CSV, CST, HM

Data Type	Size (bytes)	Description	Range
U8	1	Unsigned Short Integer	0 to 255
I8	1	Signed Short Integer	-128 to 127
U16	2	Unsigned Integer	0 to 65,525
I16	2	Signed Integer	-32,768 to 32,767
U32	4	Unsigned Double Integer	0 to 2 ³² (0 to 4,294,967,295)
I32	4	Signed Double Integer	-2 ³¹ to 2 ³¹ -1 (-2,147,483,648 to 2,147,483,647)

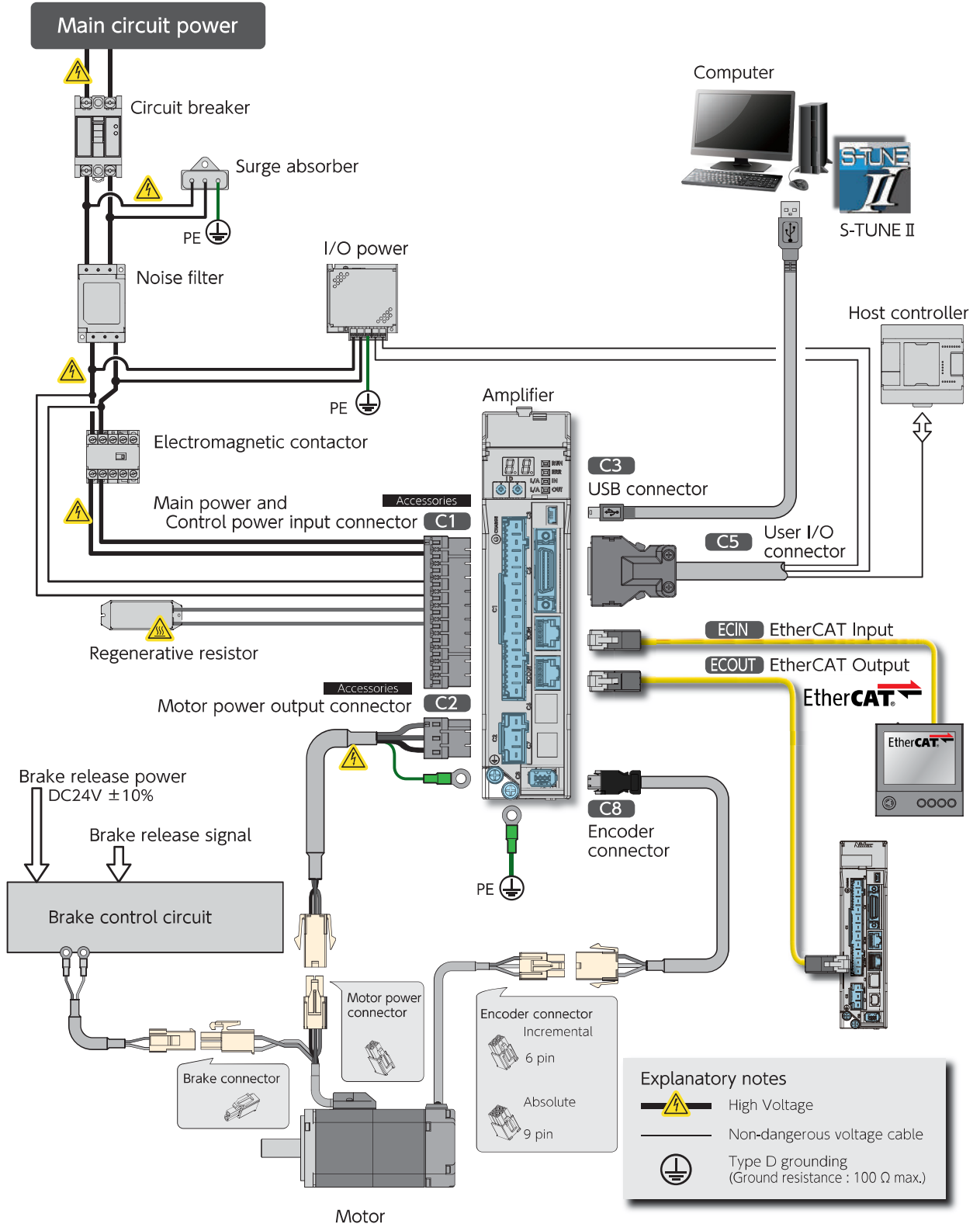
Access	Description
RO	Read Only
RW	Read / Write

EtherCAT Communication model

Wiring Pattern 1

Motor rated output power

- 50 W
- 100 W
- 200 W
- 400 W
- 750 W
- 850 W
- 1 kW
- 1.3 kW
- 1.5 kW
- 2 kW



This wiring diagram depicts one example configuration: a 200 W motor and its compatible amplifier.

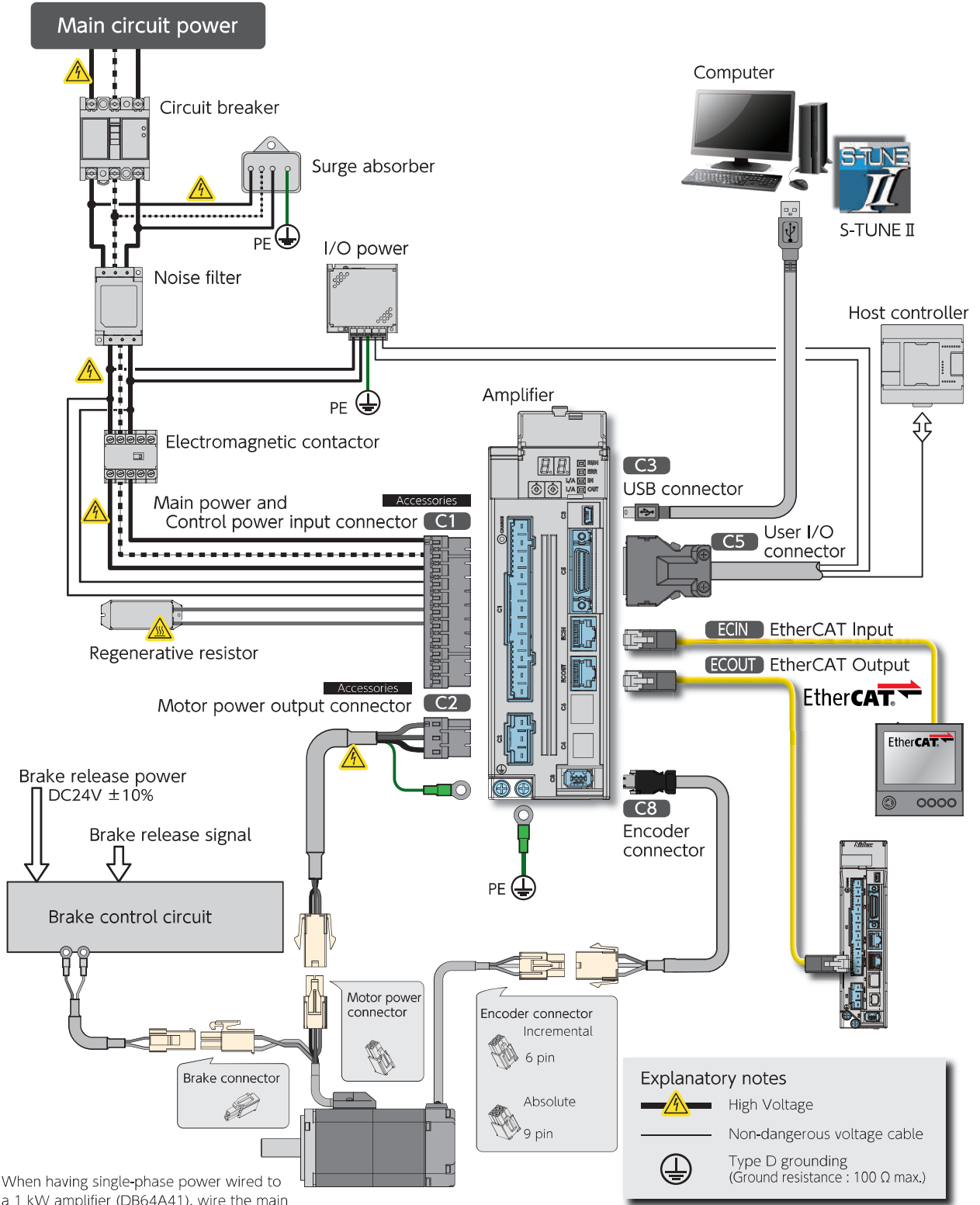
EtherCAT Communication model

Wiring Pattern 2

Motor rated output power

- 50 W
- 100 W
- 200 W
- 400 W
- 750 W
- 850 W
- 1 kW
- 1.3 kW
- 1.5 kW
- 2 kW

MX951



When having single-phase power wired to a 1 kW amplifier (DB64A41), wire the main power AC200 V between the L1 and L3 terminals of the amplifier.

Motor

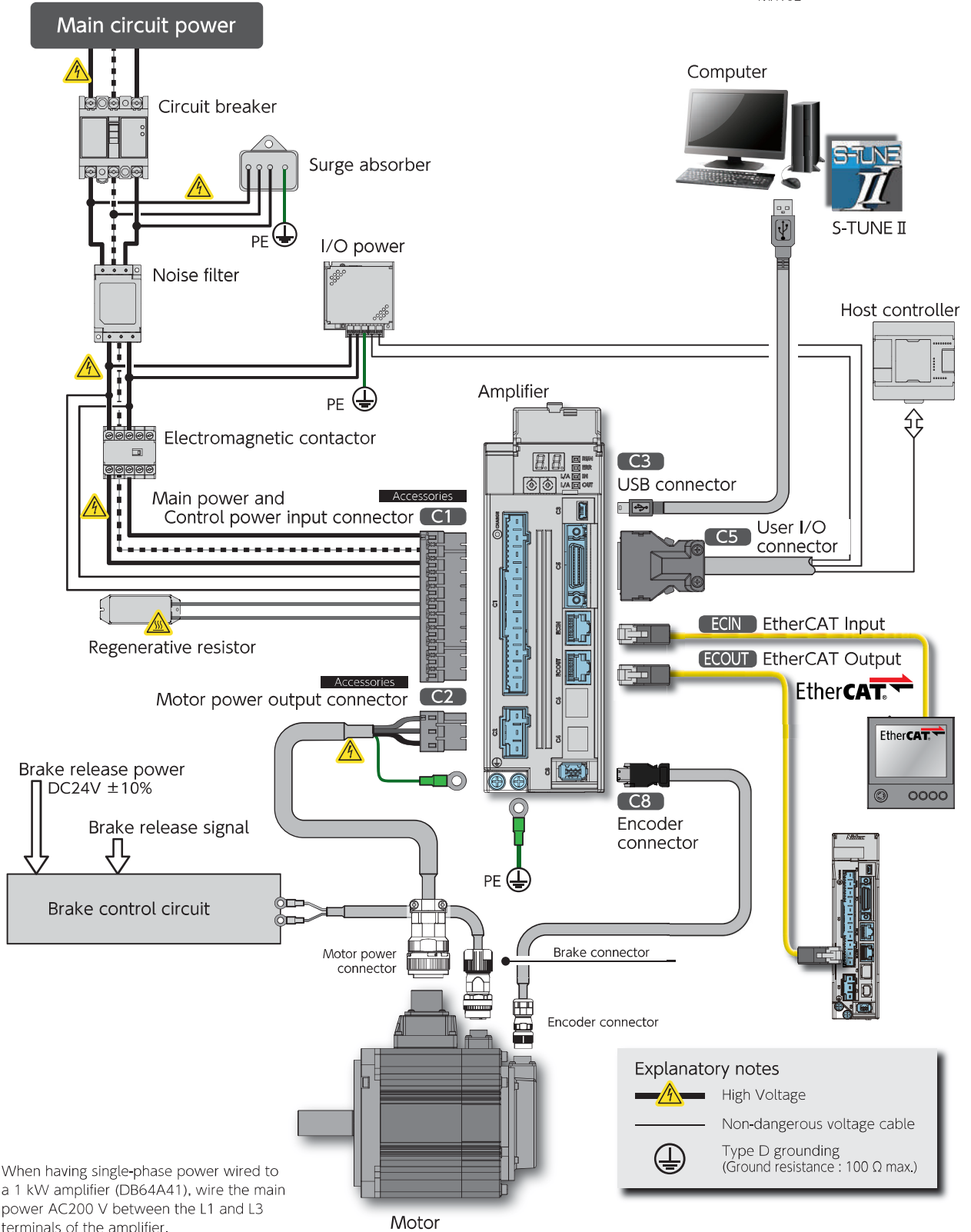
EtherCAT Communication model

Wiring Pattern 3

Motor rated output power

50 W	100 W	200 W	400 W	750 W	850 W	1 kW	1.3 kW	1.5 kW	2 kW
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MX102
MM102
MH102



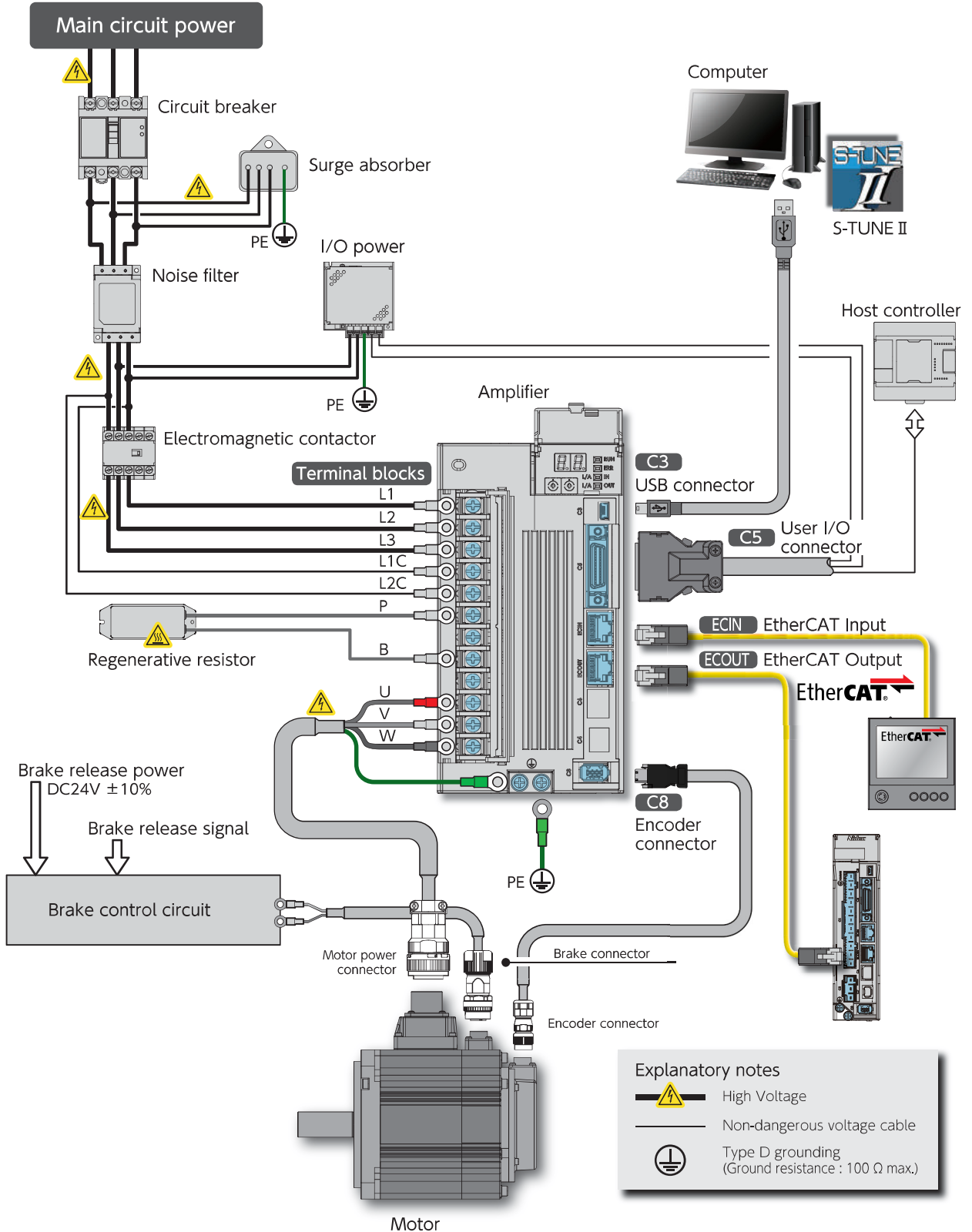
When having single-phase power wired to a 1 kW amplifier (DB64A41), wire the main power AC200 V between the L1 and L3 terminals of the amplifier.

EtherCAT Communication model

Wiring Pattern 4

Motor rated output power

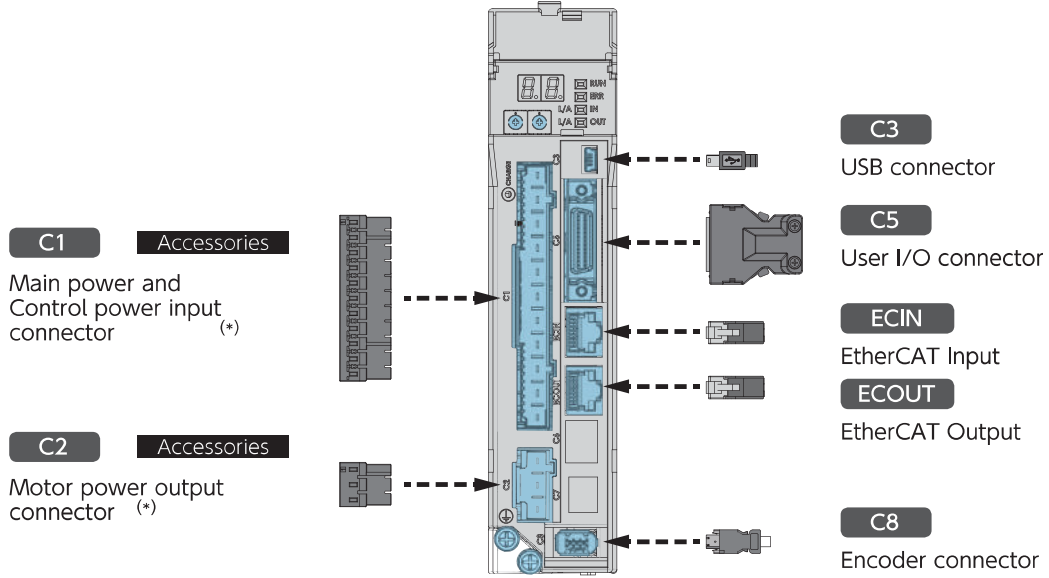
- 50 W
- 100 W
- 200 W
- 400 W
- 750 W
- 850 W
- 1 kW
- 1.3 kW
- 1.5 kW
- 2 kW





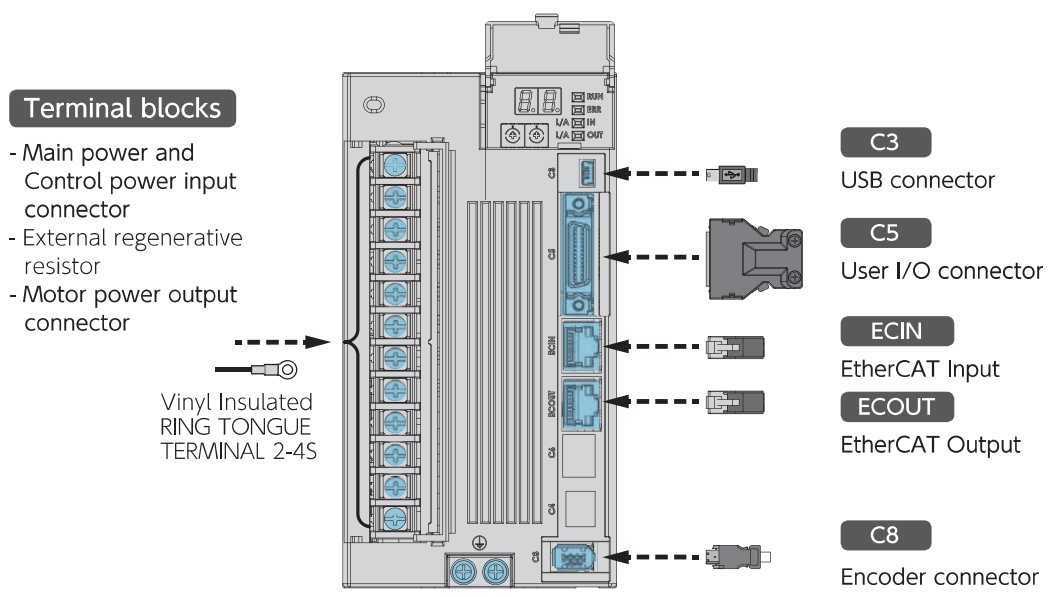
EtherCAT Communication model

Amplifier Connectors	Motor rated output power	50 W	100 W	200 W	400 W	750 W	850 W	1 kW	1.3 kW	1.5 kW	2 kW
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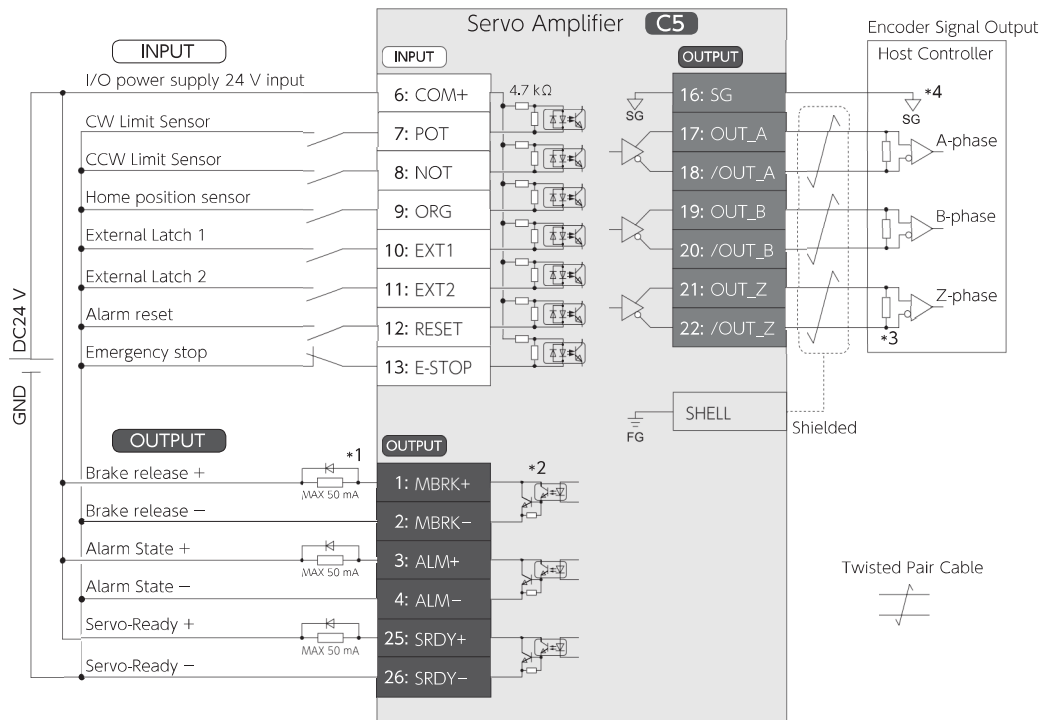


Accessories Spring Opener
1981045-1
(Tyco Electronics JAPAN)

Amplifier Connectors	Motor rated output power	50 W	100 W	200 W	400 W	750 W	850 W	1 kW	1.3 kW	1.5 kW	2 kW
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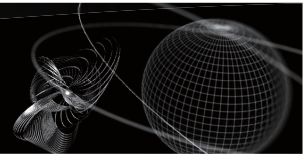
EtherCAT Communication Standard Wiring Pattern



- *1) When driving a load containing inductance component such as relay, connect a protection circuit (diode).
The motor brake cannot be driven directly. Be sure to use a circuit that interfaces with a diode built-in type relay.
- *2) The output circuit configuration is an open collector Darlington transistor output. Connects to relays and optical isolators.
Note that when the transistor is on, connector-emitter voltage V_{CE} (SAT) is approximately 1 V; a standard TTL IC does not satisfy V_{IL} and cannot be connected directly.
- *3) Be sure to connect a termination resistor of approximately 220 Ω .
- *4) Make the connection to the communication IC signal ground of the host controller that amplifier encoder output signals are connecting to.
Connecting signal ground SG to control power GND may result in malfunction.
- *5) If Z-phase pulse width is too small to be measured accurately by the host controller, decrease pulse division rate by using pulse output ratio (parameters No.276.0 and No.278.0) or decrease rotational speed to increase the pulse width.
Pulse width [ms] = $2 / \text{rotational speed [r/min]} / (\text{division ratio} \times 2^{17}) \times 60 \times 1,000$.
- *6) For the command circuit configuration with a variable resistor (VR) and a resistor (R), (VR) must be 2 k Ω (1/4 W or more) and (R) must be 100 Ω to 200 Ω (1/4 W or more), so that command input voltage range is -10 V to +10 V.



Safety Precautions



Signs below indicate two severity levels of bodily injury/loss, or property damage that could be caused by failure to observe the precautions and proper use of this product.

Symbols below indicate two types of precautions that users must follow.

DANGER	Identifies information about imminent hazards that are likely to cause death or serious injury.		Safety Precautions - Don'ts
CAUTION	Identifies information about hazards that could cause injury or property damage.		Safety Precautions - Dos

The following signs identify information about anticipated hazards.

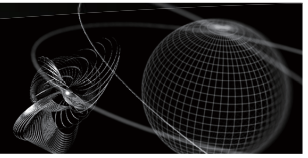
	Danger and Caution Causes unexpected motions, unstable motions, or uncontrollable motions Hampers optimal performance of the product, or shortens its service life		Fire hazard
	Electric shock hazard		Injury hazard
	Burns hazard		Failure and damage hazard

DANGER

Symbol	Precautions (Dos and Don'ts)	Anticipated Hazards
Installation & Wiring		
	Never connect your S-FLAG II motor directly to commercial power supply.	
	No flammables away near your S-FLAG II motor and amplifier.	
	Be sure to protect the amplifier with a protective enclosure and allow the required clearance around the amplifier (as specified in the S-FLAG II instruction manual) from the enclosure or any devices.	
	Install your S-FLAG II in a location with little dust, and free from water or oil splash.	
	Mount the motor or amplifier on nonflammable surface such as metal.	
	Be sure to have any wiring work carried out by an electrician.	
	Always ground the FG terminals of the motors and amplifiers.	
	When working with wires, always turn off the circuit breakers first, carry out the work properly and methodically.	
	Be sure to connect all cables properly and insulate all conductors with insulating material.	
Handling & Operation		
	Never touch the inside of amplifier.	
	Cables must not be damaged, stressed, loaded, or pinched.	
	Never touch the revolving component of the motor while it is in motion.	
	Do not use this product near flammable materials or where it could be subjected to water sprays, a corrosive atmosphere, or an atmosphere of flammable gases.	
	Do not use the product at a location which is subjected to severe vibrations or impact forces.	
	Do not use the product with any of cables being immersed in oil or water.	
	Do not carry out any wiring work or operations with wet hands.	
	When handling a shaft end key-grooved motor, do not touch the key groove with unprotected hands.	
	Do not touch the motor or the sink of amplifier as they become hot.	
	Do not have the motor driven by external force.	
Other Precautions		
	Be sure to verify safety after an earthquake.	
	Carry out mounting and installation securely, in order to prevent fire or personal injury during an earthquake.	
	Install an external emergency stop circuit so that operations can be stopped and power supplies shut down immediately upon occurrence of an emergency.	
Maintenance & Inspection		
	Never dismantle the S-FLAG II product.	
	The amplifier has components with dangerously high voltage. Prior to each wiring or inspection work, allow more than 5 minutes (after power shuts off) for complete discharge of internal voltage.	

CAUTION

Symbol	Precautions (Dos and Don'ts)	Anticipated Hazards
Installation & Wiring		
	Do not touch the connector terminals directly with hands.	
	Do not cover the vent holes of the amplifier. Do not allow ingress of foreign matter.	
	Observe the specifications of motor/amplifier combinations.	
	For test runs, be sure to check motor movement with the motor being fixed in place and not attached to your mechanical system first, and after test runs install the motor in the mechanical system.	
	Follow the specified mounting method and orientations.	
	Use the right mounting method that is suitable to the main body weight and the rated output of this product.	



⚠ CAUTION

Symbol	Precautions (Dos and Don'ts)	Anticipated Hazards
Handling & Operations		
⊘	Do not step on this product or place any heavy object on it.	⚠ ⚠ ⚠
	To avoid unstable motions, never make drastic changes in tuning.	⚠
	Do not approach your machine after power restoration following power outage. It may restart unexpectedly. Configure your machine to ensure safety of your personnel against its unexpected restarts.	⚠
	Do not use the product where it could be exposed to direct sunlight.	⚠
	Do not apply impact load to the product.	⚠
	Never operate or stop the motor using the electromagnetic contactor installed on the main power supply side.	⚠
	The brake installed in the motor is only for holding. Do not use it as a decelerating device.	⚠ ⚠
	Do not use if the motor or amplifier is malfunctioning, broken, or damaged.	⚠ ⚠ ⚠
!	Confirm that your power supply specifications comply with this product's.	⚠
	The holding brake is not a stopping device to secure machine safety. To ensure safety, prepare a stopping device for your machinery.	⚠
	Upon occurrence of an alarm, eliminate the cause and secure safety before resetting the alarm and restarting your machine.	⚠
	Connect the brake control relay and the emergency stop relay in series.	⚠ ⚠
Transportation & Storage		
⊘	Do not store the product where it could be subjected to water, moisture, toxic gases, or liquids.	⚠
	Do not hold the cables or the motor shaft when transporting.	⚠ ⚠
	Do not let the product fall off or fall over during transportation or installation.	⚠
!	If the product was stored away for an extended period of time, check with our distributor.	⚠
	Store the product in a location that meets the requirement of storage environments described in the instruction manual.	⚠
Disposal		
!	Prior to disposal of batteries, insulate them with tape or other material. Dispose of them following the local laws and regulations.	
	When disposing of the S-FLAG II product, treat it as industrial waste.	
Maintenance & Inspection		
⊘	Overhauls must not be done by anyone but Nidec Sankyo Corporation.	⚠
	Do not turn the power supply on and off too frequently.	⚠
	Your motor, heat sink of the amplifier, or regenerative resistor may become dangerously hot. Do not touch any of them with hands when power is on or for a while after power shutdown.	⚠ ⚠
!	If your amplifier or motor fails, shut down both of the control power supply and the main circuit power supply.	⚠
	When not using the product for an extended period of time, be sure to turn the power off.	⚠

Other Considerations and Precautions

Export of this product or its applications

If the end user or application of the product assumes to be involved in military activities or weapons, its export may be subject to "Foreign Exchange and Foreign Trade Law (Japan)" (or equivalent in your country). Have adequate legal reviews and follow any required export procedures.

Medical applications

Do not attempt to use this product or its application for human life related field. This product has been designed and manufactured for general industrial use and its medical applications are not allowed.

Applications for special environments or purposes such as nuclear power, aerospace and transportation

Please contact us in advance.

Applications that could cause serious accidents or damages due to our product failures

Be sure to have safety device or protection device installed before using your equipment.

Applying voltage over the rated power supply of this product

Could become fire or smoke hazard to the amplifier. Be sure to check and confirm proper wiring before turning the power on. Be particularly careful in a location such as clean room.

Operations with the motor shaft not grounded electrically

Depending on the device or installation environment, bearing noise might get increased by galvanic corrosion of the motor bearings. Carry out careful check and test on grounding.

Operations in environment under significant influences of external noise and static electricity

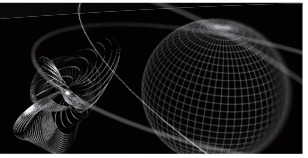
This product has been designed and manufactured along with extensive noise tests. However, there is a possibility of unexpected behaviors, depending on user's environment. Practice a fail-safe design and also take adequate measures to ensure safety within the range of machine motion.

Use of this product in a manner not specified by the manufacture

Such use shall void the manufacture warranty. Be mindful before you attempt to do so.



Safety Precautions



Maintenance and Inspection

Perform regular maintenance and inspections for safe use of this product. Ensure the safety before each inspection work. This product assumes the following operation conditions.

- Ambient temperature : Average annual temperature of 30°C (not exceeding the rated temperature range)
- Maximum load factor : 80%
- Maximum operating hours : 20 hours a day

Daily Inspection : Check the following before each operation.

- Check ambient temperature, humidity and atmosphere.
- No foreign objects or dust, especially nothing is blocking the vent holes.
- No over bent or damages of the wires.
- Power supply voltage is within the specifications.
- No foreign objects in mobile components of the device and the range of motions.
- When the power is on, there is no unusual noise or smell right after the machinery starts.

Periodic Inspection : Check for the following at least once a year.

- No loose clamp screw problems in the amplifier and motor.
- No deformation or no discoloration in the amplifier, motor, cables, and terminal blocks due to overheat
- No looseness in wiring fixings and terminal block screws

Warranty Information

Terms of Warranty

The term of warranty for this product is eighteen (18) months after the date of product manufacture. However, brake equipped motors whose number of axis accelerations and decelerations exceeded the rated maximum shall not be covered by the warranty.

Conditions of Warranty

Should any failure develop during the warranty period under normal operations following the S-FLAG II instruction manual, Nidec Sankyo (Manufacture) agrees to make repairs at free of charge. However, even during the warranty period, Manufacture makes only fee-based repair if the failure is due to the following reasons:

- Misuse, improper repair, or alternation of the product
- Dropped after the purchase or damaged during transportation
- Use of this product in a manner not specified by Manufacture
- Fire, earthquake, lightning, storm and flood damage, salt damage, abnormal voltage, or any other acts of God or natural disasters
- Ingress of foreign matter such as water, oil or metal chips.

This warranty does not apply to parts or accessories that have been used longer than each rated service life.

The warranty applies to delivered products only and Manufacture shall not be liable for any indirect, incidental or consequential damage caused by the product failure or damage.

Manufactured and Distributed by

NIDEC SANKYO CORPORATION

Tokyo Office Nidec Tokyo bldg., south bldg., 1-20-13, Osaki, Shinagawa-ku, Tokyo 141-0032, Japan

TEL : +81-3-5740-3006

FAX : +81-3-6843-3123



Contact to :



Please study this manual first and use the product properly and safely.

Be aware that new functions might be added in the future without notice in order to improve the product performance.
We strive to keep the instruction manual up to date. As such, the contents are always subject to change.

No reproduction in any form of this manual, in whole or in part, may be made without written authorization from Nidec-Sankyo Corporation.

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NOV. 2019

