Oriental motor

Servo Motors NX Series

NXM620M + NXD20-C + CC030VNFB

Motor

Control Circuit

Connection Cable Set for Electromagnetic Brake Motor

Classificazione prodotto	Nome del prodotto		
Motor	NXM620M		
Control Circuit	NXD20-C		
Connection Cable Set for Electromagnetic Brake Motor	CC030VNFB		

• The motor cable and electromagnetic brake cable from the motor cannot be connected directly to the driver. When connecting to the driver, use a connection cable.

Notice: The shipping date refers to the time of dispatch from the warehouse in Düsseldorf/Germany. Shipments with 30 pieces or more will require air freight.

Incluso

Motor: None
Control Circuit: I/O Signal Connector, Motor Connector, Connector for Regeneration Resistor Input/Main Power Input Terminals, Connector for 24 VDC Power Supply Input/Regeneration Resistor Thermal Input/Electromagnetic Brake Connection Terminal, Connector Wiring Lever

Specifiche

Description of Specification Items

Frame Size	60 mm
Electromagnetic Brake	Equipped
Type	Standard
Rated Output Power	200 W
Rated Speed	3000 r/min
Max. Speed	5500 r/min
Rated Torque	0.637 N·m
Maximum Instantaneous Torque	1.91 N·m
Rotor Inertia J	0.185×10^{-4} kg·m^2
Permissible Inertia J	16.2×10^{-4} kg·m^2 *1
Resolution	100–100000 (Factory Setting 1000) P/R
Detector	Absolute Encoder 20 bits per revolution, 16 bits per multiple revolution
Power Supply Input Voltage and Frequency AC Power Supply	Single-Phase 200–230 VAC -15–+10% 50/60 Hz Three-Phase200–230 VAC -15–+10% 50/60 Hz
Power Supply Input Voltage DC Control Power Supply	24 VDC±10% 0.7 A

Power Supply Input Rated Current	Single-Phase 200–230 VAC: 2.8 A / Three-Phase200–230 VAC: 1.6 A *2
Electromagnetic Brake Brake Type	Power off activated type *3
Electromagnetic Brake Power Supply Input	24 VDC±10%
Electromagnetic Brake Power Consumption	7.2 W
Electromagnetic Brake Excitation Current	0.3 A
Electromagnetic Brake Static Friction Torque	0.637 N·m
Speed and Positioning Control Command	Pulse Train / Analog Speed Command Voltage / Analog Torque Command Voltage
Motor Section Mass	1.5 kg
Circuit Mass	0.9 kg

*1 Automatic tuning allows operation up to 50 times the rotor inertia; manual tuning allows operation up to 100 times the rotor inertia.
*2 It is the value when operated in the continuous duty region. When operated in the limited duty region, a current of up to approximately three times will flow.
*3 The electromagnetic brake is used to hold the position when the power is turned off. It cannot be used for braking. In addition, a separate power supply for the electromagnetic brake is required.

Connection Cable (Motor～Control Circuit):CC030VNFB

Type	Connection Cable Set for NX Series (with Electromagnetic Brake)
Connection Point	Motor~circuit
Cable Type	Standard
Length	3 m

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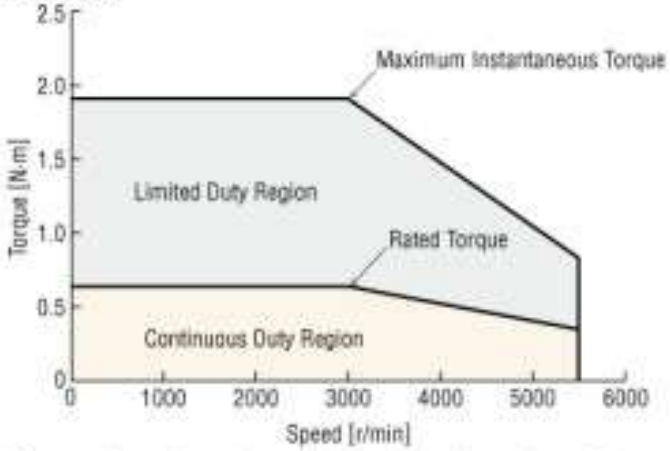
Speed - Torque Characteristics

Standard Type

NXM620



A regenerative resistor may be required depending on the operation conditions.

Characteristics Diagram

Dimensioni

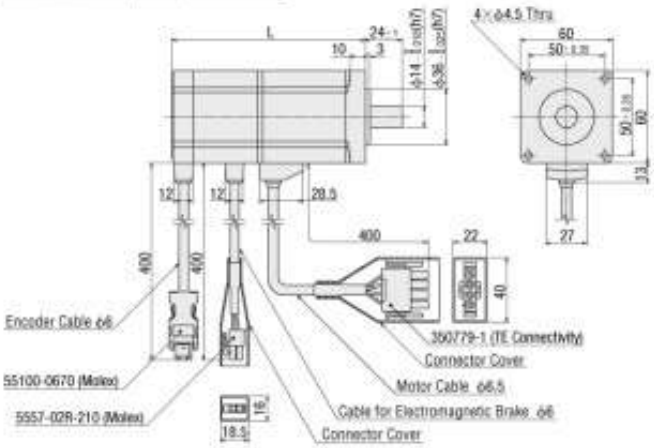
Dimensions (Unit: mm)

Motor

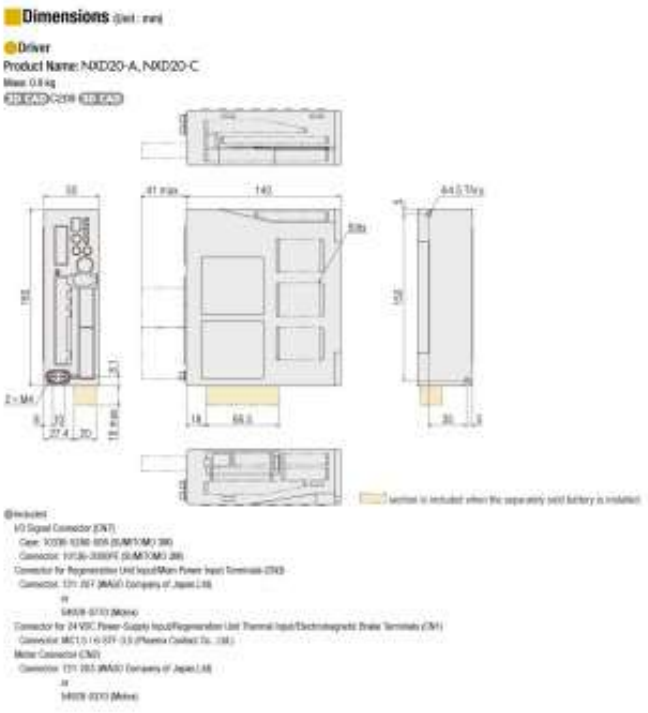
◇Standard Type

Frame Size 60 mm with Electromagnetic Brake

Motor Product Name	L	Mass kg
NXM620M	126.3	1.5
NXM640M	156.6	2



Motor



Control Circuit

Dimensions (Unit: mm)

Connection Cable Set

•For Motor/Encoder/Electromagnetic Brake

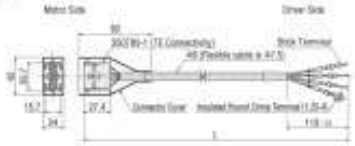
Product Name	Length L (m)
CC010VNRB	1
CC020VNRB	2
CC030VNRB	3
CC050VNRB	5
CC070VNRB	7
CC100VNRB	10
CC150VNRB	15
CC300VNRB	30

Flexible Connection Cable Set

•For Motor/Encoder/Electromagnetic Brake

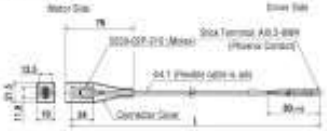
Product Name	Length L (m)
CC010VNRB	1
CC020VNRB	2
CC030VNRB	3
CC050VNRB	5
CC070VNRB	7
CC100VNRB	10
CC150VNRB	15
CC300VNRB	30

○Cable for Motor



○Cable for Encoder

○Cable for Electromagnetic Brake



Cable

Altre Specifiche

Driver Specifications

Host Interface	Pulse input/analog speed command voltage/analog torque command voltage
Maximum Input Pulse Frequency	Line Driver output by Host Controller: 500 kHz (at 50 % duty) Open-Collector Output by Host Controller: 250 kHz (at 50 % duty)*
Protective Function	When the following protective functions are activated, an alarm signal is output to stop the motor. Excessive position deviation, overcurrent protection, overheat protection, overvoltage protection, main power supply error, undervoltage, motor overheat protection, sensor error during operation, encoder communication error, overload, overspeed, position range error, absolute position loss, command pulse error, EEPROM error, sensor error during initialization, rotor rotation during initialization, encoder EEPROM error, motor combination error, ABS not supported, no battery, regeneration resistor overheat, electronic gear setting error
Input Signals	Photocoupler Input, Input Resistance: 3 kΩ, Input Signal Voltage: 4.75~26.4 V (S-ON, CLR/ALM-RST/P-CK, P-REQ/BRAKE, TL/W-RESET, M0, M1, P-PRESET/M2, FREE) Photocoupler Input, Input Resistance: 2.7 kΩ, Input Voltage: 21.6~26.4 V (CW+24 V/PLS+24 V, CCW+24 V/DIR+24 V) Photocoupler Input, Input Resistance: 200 Ω, Input Voltage: 3~5.25 V (CW/PLS, CCW/DIR) Analog Input Setting by internal potentiometer (VR1, VR2) Analog input voltage ±10 V Input impedance 15 kΩ

	Setting by external potentiometer 20 kΩ 1/4 W (V-REF, T-REF, P-VREF, P-TREF)
Output Signals	Photocoupler and Open-Collector Output, External Use Condition: 30 VDC, 10 mA max. (ALM, WNG/MOVE/MBC, END/VA, READY/AL0/P-OUTR, TLC/VLC/AL1/P-OUT0, ZSG2/zsNEAR/ZV/AL2/P-OUT1) Line Driver Output External Use Conditions: Connect a termination resistor of 100 Ω min. between the input of the line receiver terminals. (ASG, BSG, ZSG1) Analog Monitor Output, Analog Output Voltage ±10 V, Output Impedance 1 kΩ (V-MON, T-MON, SG)
Other Functions	Position control, speed control, torque control, tension control Automatic tuning, damping control function (7~30 Hz), position preset function, present position output function, torque limiting function Pulse input mode (2-pulse input, 1-pulse input), analog monitor output function (speed, torque), absolute system enable/disable Warning output function (excessive position deviation, overheat, overvoltage, main power supply, undervoltage, battery undervoltage, overload, excessive speed, absolute position loss, electronic gear setting error)
Extended Functions [When using control module (OPX-2A) sold separately, or support software (MEXE02)]	For details on extended functions, refer to each control mode specification.

* The value when the general-purpose cable (**CC36D1E**) (sold separately) is used.

Position Control Mode Specifications

Item	Factory Setting	Extended Functions
Command Modes	Select 1 mode from the following pulse input modes.	Select 1 mode from the following pulse input modes.

	2-pulse input mode (factory setting) 1-pulse input mode	2-pulse input mode 1-pulse input mode Phase difference input mode (set by internal parameters)
Maximum Input Pulse Frequency	Line Driver Output by Host Controller: 500 kHz (at 50 % duty) Open-Collector Output by Host Controller: 250 kHz (at 50 % duty)*1	
Resolution	1000 P/R	100~100000 P/R
Encoder Output Resolution	1000 P/R	100~10000 P/R
Damping Control Frequency	Disable/7~30 Hz (internal potentiometer VR1)	Can be set with either 1 analog + 3 internal parameters for a total of 4 types, or 4 internal parameters with ① and ② below. ① Internal potentiometer VR1 (volume) 1 type ② 3 or 4 internal parameter settings Disable/7~30 Hz (internal potentiometer VR1) Disabled/7~100 Hz (internal parameter settings)
Absolute System Position Management Range	-2,147,483,648~2,147,483,647 pulses	
Present Position Output	2-bit serial output	
Tuning	Auto only [Auto] Select rigidity setting (SW2) from 16 levels. Estimates the load inertia, and automatically adjusts gain according to the rigidity setting.	Auto, semi-auto, and manual selections are available. [Auto] Select rigidity setting (SW2 or internal parameter) from 16 levels. Estimates the load inertia, and automatically adjusts gain according to the rigidity setting.

		[Semi-Auto] Select rigidity setting (SW2 or internal parameter) from 16 levels. Enter the load inertia ratio. [Manual] Select rigidity (SW2 or internal parameter) from 16 levels. Enter the load inertia ratio. All gains can be set manually.
Torque Limiting	0~300 % (100 % is the rated torque.) External potentiometer*2 (T-REF)	0~300 % (100 % is the rated torque. Internal parameters can be set in 1 % increments) Setting by external potentiometer*2 (T-REF) and internal parameters

When using the extended functions, the separately sold control module (**OPX-2A**) or support software (**MEXE02**) is required.

*1 The value when the general-purpose cable (**CC36D1E**) (sold separately) is used.
*2 Separately-sold accessory sets are available.

Speed Control Mode Specifications

Item	Factory Setting	Extended Functions
Command Modes	2 speeds can be set in ① and ② below. ① Internal potentiometer VR1 (Volume) 1 speed ② External potentiometer* V-REF (Volume or external DC voltage selection) 1 speed Setting by Volume: 20 kΩ 1/4 W Setting by External DC Voltage: ±0~10 VDC Input impedance 15 kΩ	Set 8 speeds with either ①, ②, or ③ below, for a total of 2 analog speeds + 6 internal parameter settings, or 8 internal parameter settings. ① Internal potentiometer VR1 (Volume) 1 speed ② External potentiometer* V-REF (Volume or external DC voltage selection) 1 speed Setting by Volume: 20 kΩ 1/4 W

			Setting by External DC Voltage: ±0~10 VDC Input impedance 15 kΩ ③ Internal parameter setting 6 speed or 8 speed
Speed Setting Range		10~5500 r/min (Analog speed setting VR1, V-REF)	10~5500 r/min (Analog speed setting VR1, V-REF) 1~5500 r/min (Internal parameter settings)
Acceleration/Deceleration Time Setting Range		5 ms~10 s/(1000 r/min) (Acceleration/deceleration time per 1,000 r/min) Internal potentiometer (VR2)	5 ms~10 s/(1000 r/min) (Acceleration/deceleration time per 1,000 r/min) Setting selection of internal potentiometer (VR2) or internal parameter setting is possible
Speed Regulation	Load	±0.05 % max. (0 to rated torque, rated speed, rated voltage, at normal ambient temperature)	
	Voltage	±0.05 % max. (Power supply input voltage range, 3000 r/min no load)	
	Temperature	±0.05 % max. (VR1, V-REF at analog speed setting) Common Specifications: Operating ambient temperature 0~+50 °C, rated speed, no load, rated voltage	±0.05 % max. (VR1, V-REF at analog speed setting) ±0.05 % max. (at internal parameter setting) Common Specifications: Operating ambient temperature 0~+50 °C, rated speed, no load, rated voltage
Torque Limiting		0~300 % (100 % is the rated torque.) Setting by external potentiometer* (T-REF)	0~300 % (100 % is the rated torque. Internal parameters can be set in 1 % increments) Setting by external potentiometer* (T-REF) and internal parameters

Operation During Motor Standstill	-	Operations can be selected when the motor is at standstill Motor non-excitation servo lock stop (motor excitation)
Tuning	Auto only [Auto] Select rigidity setting (SW2) from 16 levels. Estimates the load inertia, and automatically adjusts gain according to the rigidity setting.	Auto, semi-auto, and manual selections are available. When the motor standstill operation is set to "servo lock stop," the position loop gain and speed feed-forward are set in the same way as for position control. [Auto] Select rigidity setting (SW2 or internal parameter) from 16 levels. Estimates the load inertia, and automatically adjusts gain according to the rigidity setting. [Semi-Auto] Select rigidity setting (SW2 or internal parameter) from 16 levels. Enter the load inertia ratio. [Manual] Select rigidity (SW2 or internal parameter) from 16 levels. Enter the load inertia ratio. All gains can be set manually.
Encoder Output Resolution	1000 P/R	100~10000 P/R

When using the extended functions, the separately sold control module (**OPX-2A**) or support software (**MEXE02**) are required.

* Separately-sold accessory sets are available.

Torque Control Mode Specifications

Item	Factory Setting	Extended Functions
Command Modes	2 types can be set with ① and ② below. ① Internal potentiometer VR1 (Volume) 1 type ② External potentiometer* T-REF (Volume or external DC voltage selection) 1 type Setting by Volume: 20 kΩ 1/4 W Setting by External DC Voltage: ±0~10 VDC Input impedance 15 kΩ	Set 8 types with either ①, ②, or ③ below, for a total of 2 analog types + 6 internal parameter settings, or 8 internal parameter settings. ① Internal potentiometer VR1 (Volume) 1 type ② External potentiometer* T-REF (volume or external DC voltage selection) 1 type Setting by Volume: 20 kΩ 1/4 W Setting by External DC Voltage: ±0~10 VDC Input impedance 15 kΩ ③ 6 or 8 internal parameter settings
Torque Control Range	0~300 % (100 % is the rated torque.)	0~300 % (100 % is the rated torque. Internal parameters can be set in 1 % increments)
Speed Limit	0~5500 r/min Setting by internal potentiometer (VR2) or external potentiometer* (V-REF)	0~5500 r/min (internal parameters can be set in 1 r/min increments) Setting by internal potentiometer (VR2), external potentiometer* (V-REF), and internal parameters
Encoder Output Resolution	1000 P/R	100~10000 P/R

When using the extended functions, the separately sold control module (**OPX-2A**) or support software (**MEXE02**) is required.

* Separately-sold accessory sets are available.

Tension Control Mode Specifications

Item		Factory Setting	Extended Functions
Command Modes		2 types can be set with ① and ② below. ① Internal potentiometer VR1 (Volume) 1 type ② External potentiometer* T-REF (Volume or external DC voltage selection) 1 type Setting by Volume: 20 kΩ 1/4 W Setting by External DC Voltage: ±0~10 VDC Input impedance 15 kΩ	Set 8 types with either ①, ②, or ③ below, for a total of 2 analog types + 6 internal parameter settings, or 8 internal parameter settings. ① Internal potentiometer VR1 (Volume) 1 type ② External potentiometer* T-REF (Volume or external DC voltage selection) 1 type Setting by Volume: 20 kΩ 1/4 W Setting by External DC Voltage: ±0~10 VDC Input impedance 15 kΩ ③ 6 or 8 internal parameter settings
Control Modes	Simple Mode	Controls the tension so that it is constant when the feed speed is constant.	Controls the tension so that it is constant when the feed speed is constant.
	High Function Mode I	-	Automatically calculates the current rewind (unwinding) diameter based on the initial diameter, material thickness, and final diameter. Tension is controlled to remain constant regardless of the operating speed.
	High Function Mode II	-	In addition to the content of High Function I, the load inertia is calculated inside the driver from the material moment of inertia and core moment of inertia. The tension is controlled so that it remains constant even during acceleration and deceleration.

Tension Control Range	0~100 % (100 % is the rated torque.)	0~100 % (100 % is the rated torque. Can be set in 1 % increments)
Speed Limit	0~5500 r/min Set by internal potentiometer (VR2) external potentiometer* (V-REF)	0~5500 r/min (can be set in 1 r/min increments) Set by internal potentiometer (VR2), external potentiometer* (V-REF), and internal parameters
Minimum Speed	Select minimum speed in simple mode with SW2. Setting range is 0 (10 r/min)~F (3000 r/min) in 16 steps.	
Encoder Output Resolution	1000 P/R	100~10000 P/R

When using the extended functions, the separately sold control module (**OPX-2A**) or support software (**MEXE02**) is required.

* Separately-sold accessory sets are available.

General Specifications

Classification	Motor	Driver
Thermal Class	130 (B)	-
Insulation Resistance	100 MΩ or more when a 500 VDC megger is applied between the following places: Between case and motor windings Between case and electromagnetic brake windings	100 MΩ or more when a 500 VDC megger is applied between the following places: Between "PE terminal" and "AC main power connector, motor connector" Between "DC control power supply connector, I/O connector, encoder connector, control module connector, battery connector" and "AC main power supply

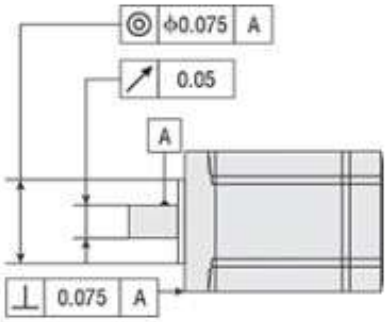
			connector, motor connector"
Dielectric Strength		Sufficient to withstand the following for 1 minute. 1.5 kVAC 50 Hz or 60 Hz between case and motor windings 1.0 kVAC 50 Hz or 60 Hz between case and electromagnetic brake windings	Sufficient to withstand the following for 1 minute. Between "PE terminal" and "AC main power supply connector, motor connector" 1.5 kVAC 50 Hz or 60 Hz Between "DC control power supply connector, I/O connector, encoder connector, control module connector, battery connector" and "AC main power supply connector, motor connector" 1.8 kVAC 50 Hz or 60 Hz
Operating Environment (When Operating)	Ambient Temperature	0~+40 °C (Non-freezing)	0~+50 °C*2 (Non-freezing)
	Ambient Humidity	85 % max. (Non-condensing)	
	Atmosphere	No corrosive gases. No exposure to oil or other liquids.	No corrosive gases or dust. No exposure to water, oil or other liquids.
Degree of Protection		IP65 (Except for mounting surface and connector parts)	IP20
Shaft Runout		0.05 T.I.R. (mm)*1	-
Concentricity of Installation Pilot to the Shaft		0.075 T.I.R. (mm)*1	-
Perpendicularity of Mounting Surface to the Shaft		0.075 T.I.R. (mm)*1	-

*1 T.I.R. (Total Indicator Reading): The total dial gauge reading when the measurement section is rotated once around the reference axis center.

*2 If the ambient temperature of the driver exceeds 40 °C, check the "Motor Continuous Output Derating Curve" below.

Note

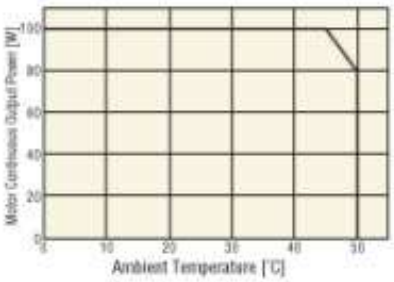
Disconnect the motor and driver for insulation resistance measurement or conducting a dielectric strength test.
Also, do not conduct these tests on the motor encoder section.



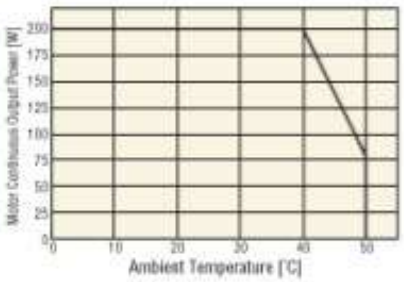
Motor Continuous Output Derating Curve

If the operating ambient temperature of the driver exceeds 40 °C, keep the continuous output of the motor inside the derating curve shown below. Note, derating is not required for the 50 W and 400 W rated output power types.

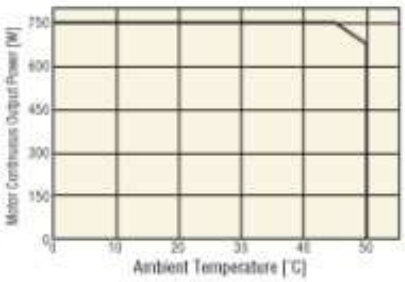
◇ **Rated Output Power 100 W**



◇ **Rated Output Power 200 W**



◇ **Rated Output Power 750 W**



Permissible Radial Load and Permissible Axial Load

Type	Motor Frame Size	Product Name	Gear Ratio	Permissible Radial Load [N]								Permissible Axial Load [N]	Permissible Moment Load [N·m]
				Distance from Shaft End [mm]									
				0	5	10	15	20	25	30	35		
Standard Typ	42 mm	**NXM45**	-	81	88	95	104	-	-	-	-	59	-

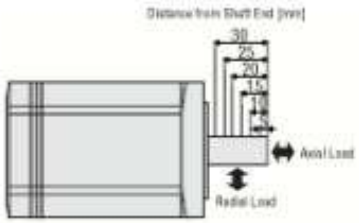
e		**NXM 410**										
	60 mm	**NXM 620 NXM 640**		230	245	262	281	304	-	-	-	98	-
	85 mm	**NXM 975**		376	392	408	426	446	467	491	-	147	-
PS Geared Type	60 mm	**NXM 65 NXM 610**	**5**	170	200	230	270	320	-	-	-	200	-
			10	220	250	290	350	410	-	-	-		
			25	300	340	400	470	560	-	-	-		
	90 mm	**NXM 920 NXM 940**	**5**	380	420	470	540	630	-	-	-	600	-
			10	480	530	590	680	790	-	-	-		
			25	650	720	810	920	1070	-	-	-		
PJ Geared Type	80 mm	**NXM 810 NXM 820**	**5**	300	330	350	380	400	430	460	500	300	16
			10	450	480	510	540	570	610	650	700	400	33
			25	680	710	750	780	840	900	950	1000	600	60
	104 mm	**NXM 1040 NXM 1075**	**5**	650	700	730	750	800	830	880	920	500	30
			10	900	950	1000	1050	1100	1180	1230	1300	650	66

		25	13 50	14 00	14 80	15 50	16 00	16 50	17 50	18 50	1000	120

The product names are listed such that the product names are distinguishable.

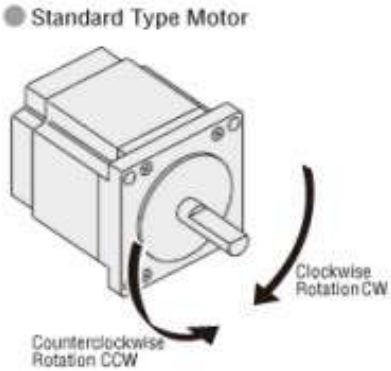
PS Geared Type: Reference Input Rotation Speed: 3000 r/min (This is a value that satisfies the calculated lifetime of 10000 hours when either a permissible radial load or permissible axial load is applied.)
Click here for information about gearhead life

Radial Load and Axial Load



Rotation Direction

This indicates the rotation direction when viewed from the output shaft side.
Please check the table below for the gearhead output shaft rotation direction as viewed from the motor output shaft side of the standard type.



Type	Gear Ratio	Rotation Direction as Viewed From the Motor Output Shaft Side
PS Geared Type	Overall gear ratio	Same direction

Standard

Regulations and Standards Materials

Documents about compliance with regulations and standards can be downloaded from the "Data Download" tab on the product details page.
(The types of files available for download vary by product.)

Explanations of the Global Laws, Regulations and Standards can be found here.

Information about our compliance with regulations and standards for each of our product series can be found here.

Hazardous Substances

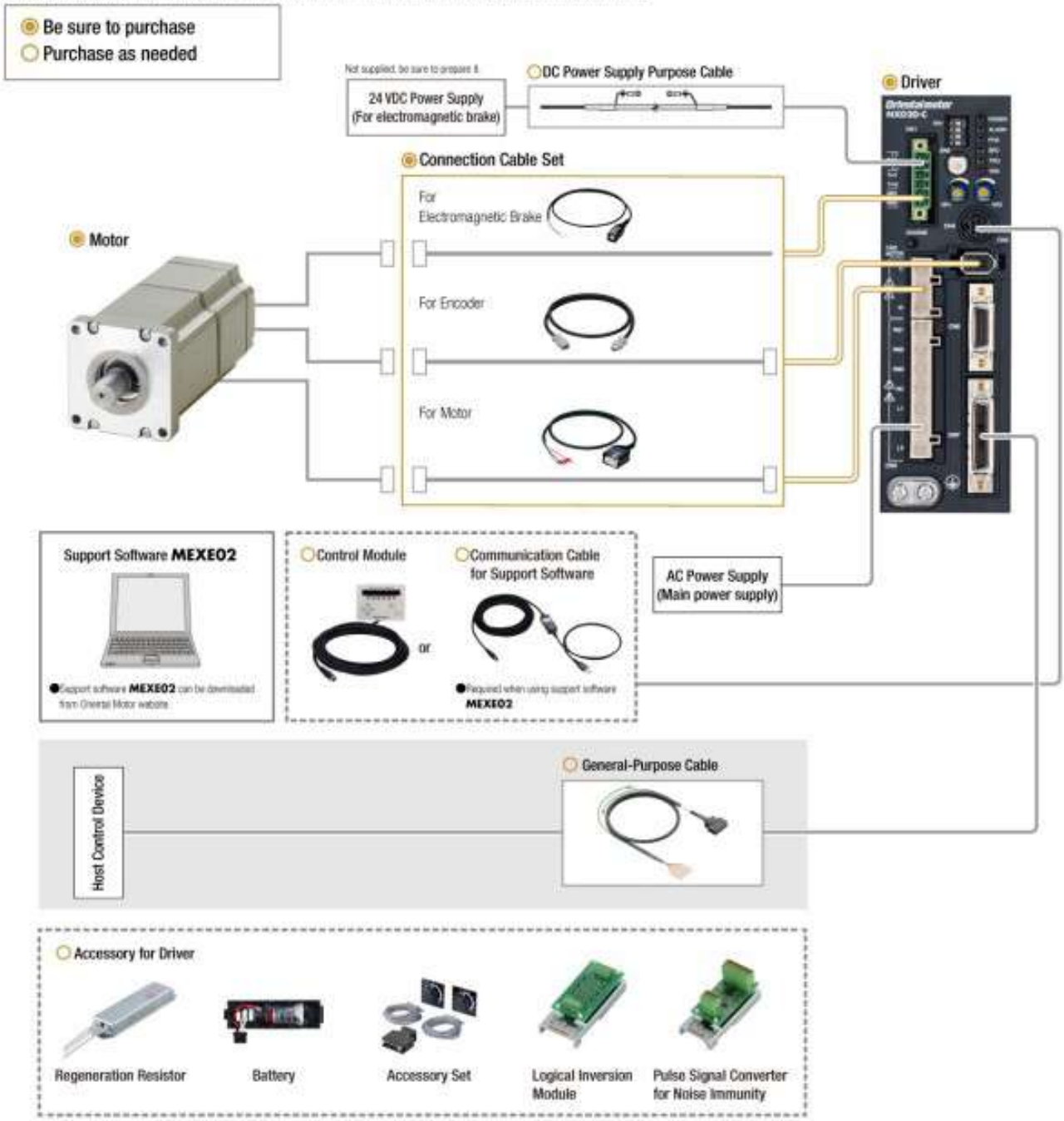
The product does not contain any substances (10 substances) exceeding the regulation values of the RoHS Directive (2011/65/EU, 2015/863/EU).

For more information about compliance with regulations on chemical substances in Oriental Motor's Products, click here.

Configurazione del sistema

●Standard Type With Electromagnetic Brake

An example of a single-axis system configuration using a programmable controller (with pulse generating function) is shown below.
Motors, drivers, and connection cable sets/flexible connection cable sets need to be ordered separately.



●The system configuration shown above is an example. Other combinations are also available.

Note

●The motor cable and electromagnetic brake cable from the motor cannot be connected directly to the driver. When connecting to the driver, please use a connection cable.