

Megatorque Motors®

YSB Series

IMPORTANT NOTE...

Because we have one specific "kit" (including motor, driver and cables) offered for sale, we have edited this catalog to focus on these specific products. If you need more information on the Megatorque line, please contact us.

Significantly enhanced functionality at a low cost, absolute position sensor to omit Homing as standard feature, and freely interchangeable motors and driver units to support random matching.



NSK, already recognized for introducing low-priced direct drive motors, has launched a new Megatorque Motor Series with enhanced functions whilst still maintaining a low cost. The YSB Series Megatorque Motor is suitable for a variety of industrial applications, including indexers in production equipment, semiconductor manufacturing and transportation equipment. Most notably, the Megatorque Motor has an absolute position sensor to omit Homing as standard equipment. In addition, the Megatorque Motor makes the functional improvement of random matching of motors and driver units to cut down the number of assembling steps and production management costs, as well as many other features that combine to reduce costs while increasing production efficiency. NSK proudly introduces the YSB Series Megatorque Motors, providing customers with sophisticated functions at low prices.



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Point 1: Direct Drive

The Megatorque Motor is capable to drive the load directly without using a mechanical speed reducer, and accordingly, it realizes highly accurate positioning without backlash and lost motion. A Megatorque Motor is a servomotor that equips a position detector to form full closed loop control.

Point 2: High Accuracy

The YSB Series Megatorque Motor incorporates a high-resolution position detector (resolver) that features 819 200 pulses/revolution. This contributes to an exceptionally precise repeatability of ± 1.6 arc seconds.

Point 3: High Reliability

The Megatorque Motor is a brushless motor and does not use permanent magnets in its simple construction. It is equipped with a highly rigid and accurate roller bearing (crossed roller bearing), which is packed with lubrication grease, thus offering highly reliable and long-term maintenance-free operation.

Point 4: Highly Functional Driver Unit

The YSB Series Megatorque Motor constitutes a system in combination with an ESB Driver Unit for a digital servo control incorporating a 32-bit microprocessor.

The ESB Driver Unit has a number of command inputs necessary for motion control, thus permitting its connection with sequencers, a variety of positioning controllers and personal computers, etc. In addition, acceleration profiling and networking functions through various field buses are available.

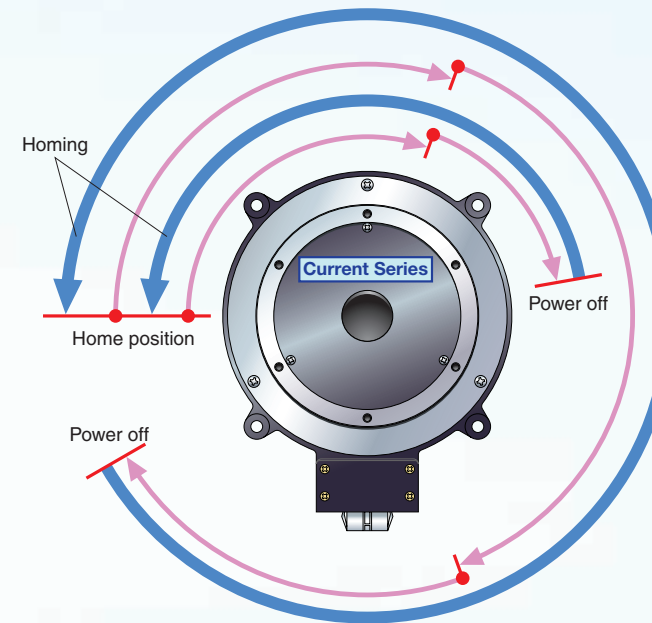
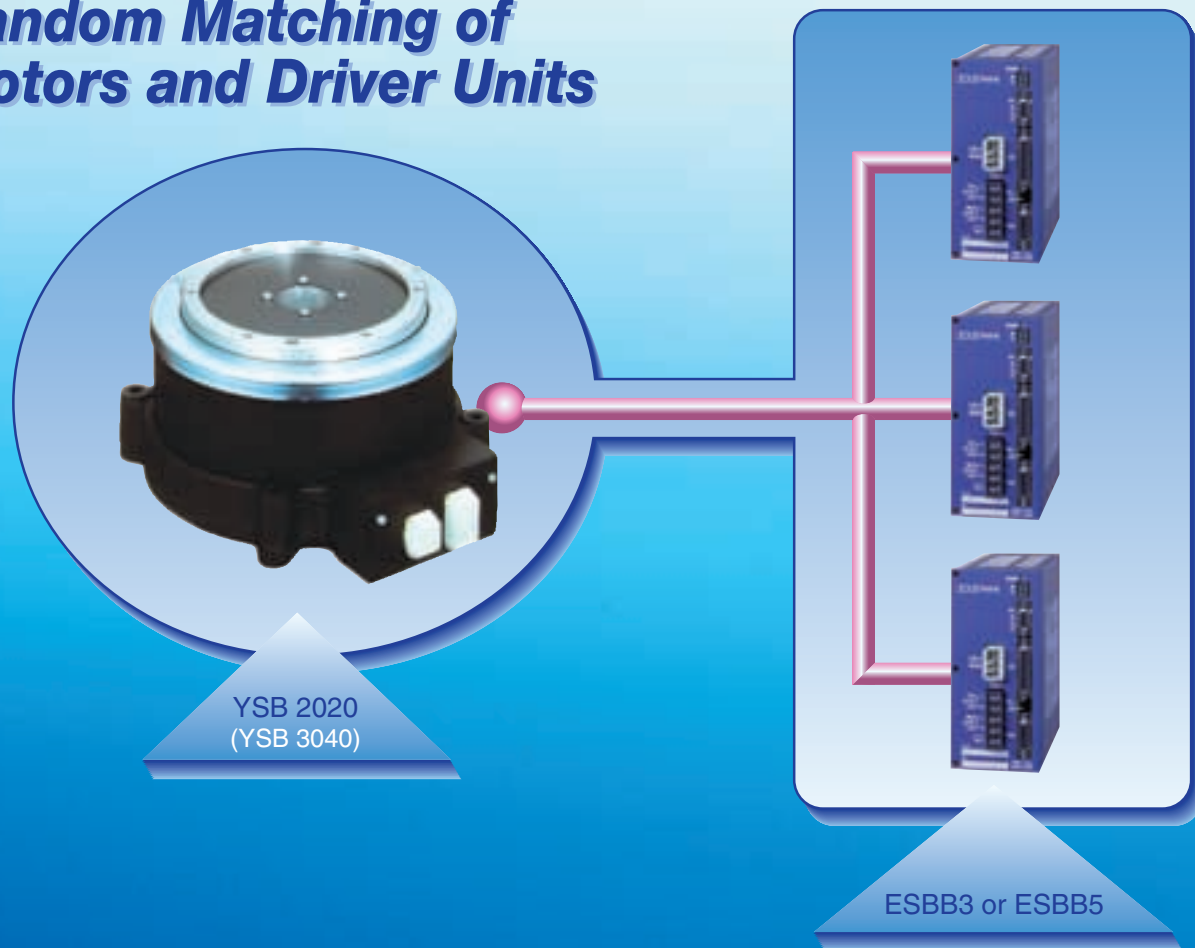
Point 5: Include Absolute Position Detector as Standard Equipment

The YSB Series Megatorque Motor has an absolute position detector as standard equipment. This contributes to eliminate the troublesome Homing and thus improves productivity. Additionally, the motors and the driver units can be randomly matched as a pair. Cable can be freely selected up to lengths of 30m.

Point 6: Conformity to the International Safety Regulations

The Megatorque Motor systems conform to the EC Directives (CE Marking) and Underwriters' Laboratory (UL) regulations.

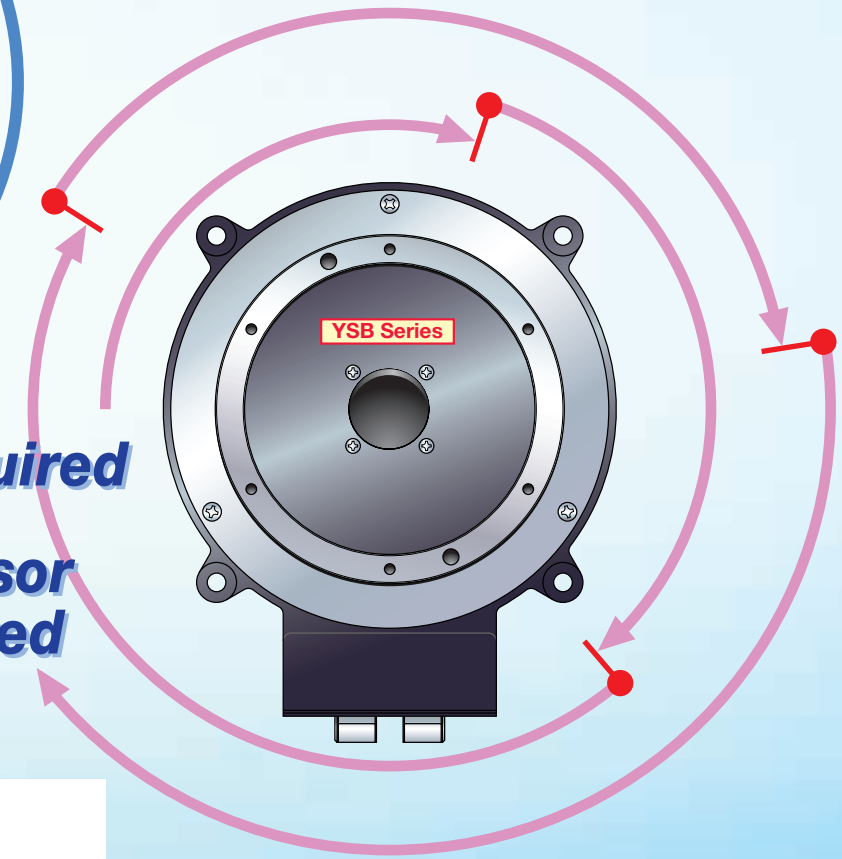
New Random Matching of Motors and Driver Units



No Homing Required

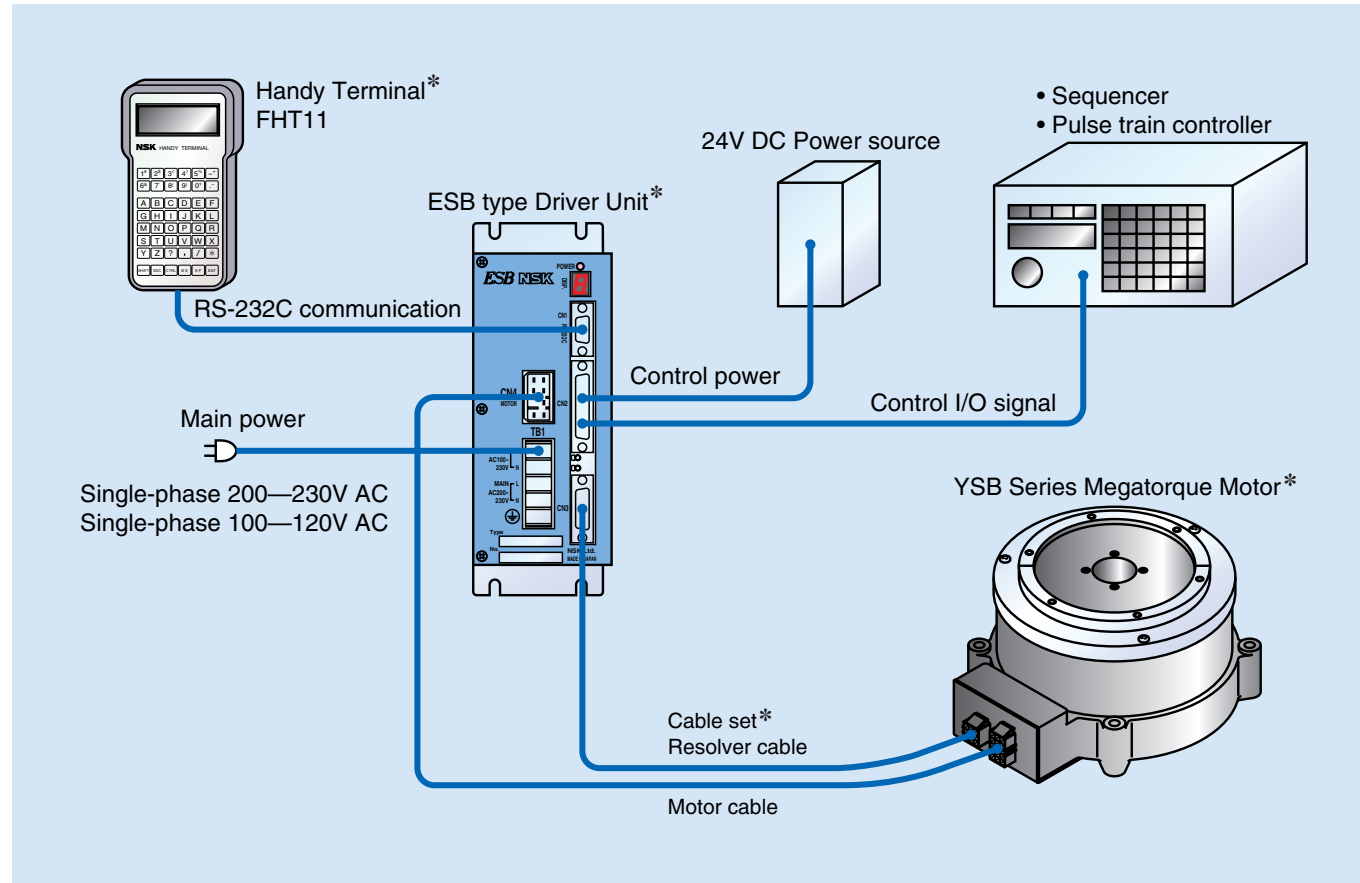
No Home Sensor Wiring Required

New Standard Feature Absolute Position Sensor



YSB Series Megatorque Motors

1.1 System Configuration

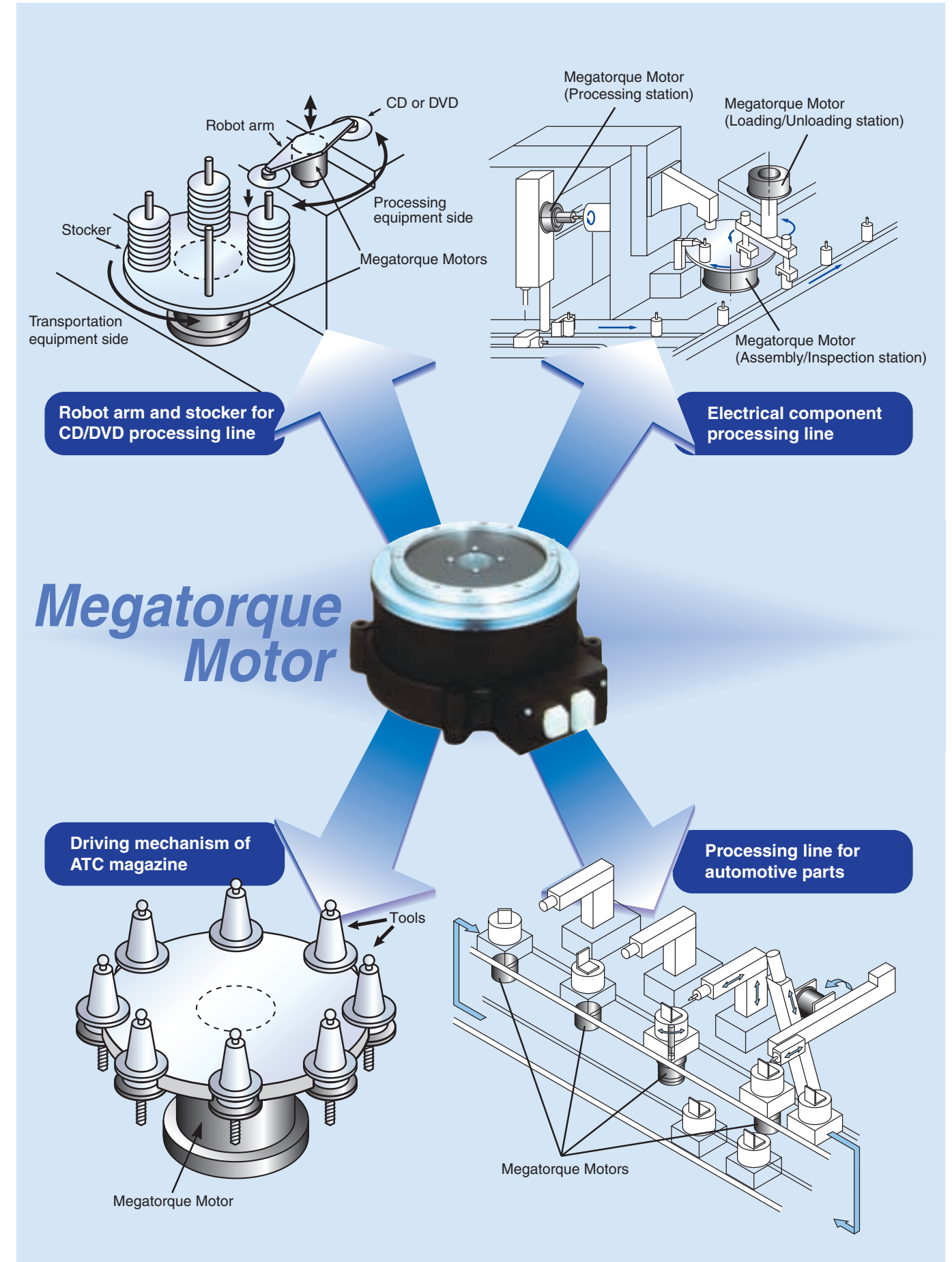


* Provided by NSK.

1.2 Application

Classification	Application	Features and Main Reason for Incorporation					
		High Accuracy	High Speed	High Rigidity	Compactness	Cleanliness	Maintenance Free
Semiconductor manufacturing equipment	CVD, Wafer cleaning, Ion implanting	✓			✓	✓	✓
	Wafer polishing, CMP etc				✓	✓	✓
	Semiconductor transportation/Inspection/Processing	✓			✓	✓	✓
LCD manufacturing equipment	LCD transportation/Inspection/Processing	✓	✓		✓	✓	✓
Assembly machines	Electric component assembly machines	✓	✓		✓	✓	✓
	Electronic component high speed assembly machines	✓	✓		✓	✓	✓
	Automotive parts assembly machines		✓				✓
	Various assembly machines	✓	✓		✓		✓
Machine tools	Tool rest feeding and ATC magazines		✓		✓		✓
Inspection/Testing apparatus	Machinery parts inspection	✓			✓		✓
	Electric component inspection	✓			✓		✓
	Optical component inspection	✓			✓		✓
	Liquid medicine inspection	✓			✓		✓
	Various inspection/Testing apparatus	✓			✓		✓
Robots	Various assembly robots	✓	✓	✓	✓		✓
	Various transportation robots	✓	✓				✓
	Inspection/Transportation robot in clean rooms	✓	✓		✓	✓	✓
Transportation	Various work transportation equipment	✓	✓		✓		✓

1.2.1 Examples of Application



2. Megatorque Motors



See next page for dimensions of unit we have for sale.

2.1 Coding of Motor Reference Number

Actual part number of our units: **M-YSB5120KN002**

Example of Reference Number:

M-YSB 2 020 K N 001

YSB Series Megatorque Motor
Motor size code
Maximum output torque (N·m)

Design serial number
001: Standard
002: Metal housing connectors
601: Dust-proof type
701: Highly accurate upper surface runout
801: Highly accurate absolute positioning⁽¹⁾

N: No brake G: With brake

K: Standard (Incorporates absolute position sensor.)
J: Optional (Incorporates incremental position sensor.)^{(2)*}

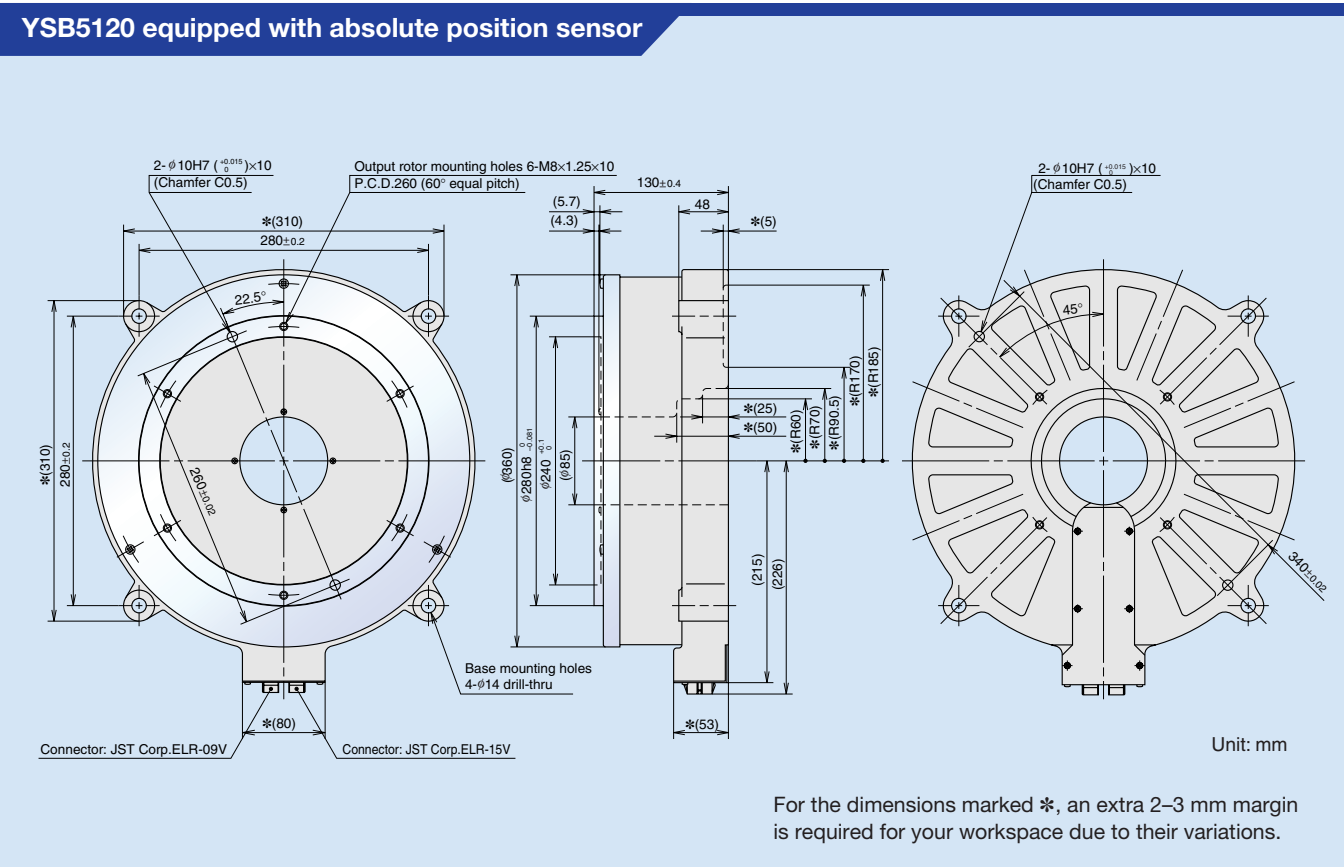
*Origin sensor wiring is required.

2.2 Motor Specifications

Motor Reference Number	M-YSB2020KN001	M-YSB3040KN001	M-YSB4080KN001	M-YSB5120KN001
Functional Item (Unit)				
Maximum output torque (N·m)	20	40	80	120
Maximum current (A)	6			
Maximum rotational speed ⁽³⁾ (s ⁻¹)	3			
Resolution of position sensor (pulse/r)	819 200			
Absolute positioning accuracy (sec)	150			
Repeatability (sec)	±1.6			
Allowable axial load (N)	3 700	4 500	9 500	19 600
Allowable moment load (N·m)	60	80	160	400
Mass (kg)	10	18	32	58
Environmental conditions	Ambient temperature 0-40°C; Humidity: 20-80%; Use indoors, free from dust, condensation and corrosive gas. IP30 equivalent. ⁽⁴⁾			

Notes:
 (1) When using the highly accurate absolute positioning type, motors and driver units are not interchangeable.
 (2) A motor equipped with an incremental position sensor is also available. Please consult with NSK.
 (3) Consult with NSK if the motor rotates in one direction continuously at a high speed exceeding 2 (s⁻¹), or oscillates in a very minute angle. Maintain the flatness of motor mounting surface 0.02 mm or less, and mount the jigs so that its center alignment is not off the rotational axis of the motor. Otherwise it will adversely affect the life of the motor.
 (4) IP30 is defined as below in a regulation of IEC 529 (International Electronics Commission).
 First digit following IP indicates the protection grade against solids. The number 3 indicates protection against penetration of a solid of 2.5 mm or larger into an enclosure. The second digit indicates the protection grade. The number 0 means there is no protection against water.

Dimensions for the M-YSB5120 Motor



3. ESB Series Driver Units

Driver unit supplied with the kit we have for sale is...

M-ESB-YSB5120AB500



3.1 Coding of Driver Unit Reference Number

Example of Reference Number: **M-ESB - YSB2020 A B 3 00**

ESB type Driver Unit	M-ESB	Motor size code	YSB2020	Specification of position sensor	A	Function	3	Design serial number	00
Main power voltage	A: 200–230V AC (single-phase) C: 100–110V AC (single-phase)			2: Incorporates incremental position sensor B: Incorporates absolute position sensor		3: Standard (Max. 16 channels) 5: Extended program capacity (64 channels) Analog velocity command available		00: Pulse train input (Photo coupler) 01: Pulse train input (Line receiver) 02: With thermal sensor terminal block (Photo coupler) 03: With thermal sensor terminal block (Line receiver)	
						A: Device Net B: PROFIBUS C: CC-Link			

To ensure high accuracy of absolute positioning, the YSB Series Megatorque Motor and the ESB Driver Unit will be shipped with the specified cable length to match. (The YSB Series Megatorque Motor and the ESB Driver Unit are not interchangeable.)

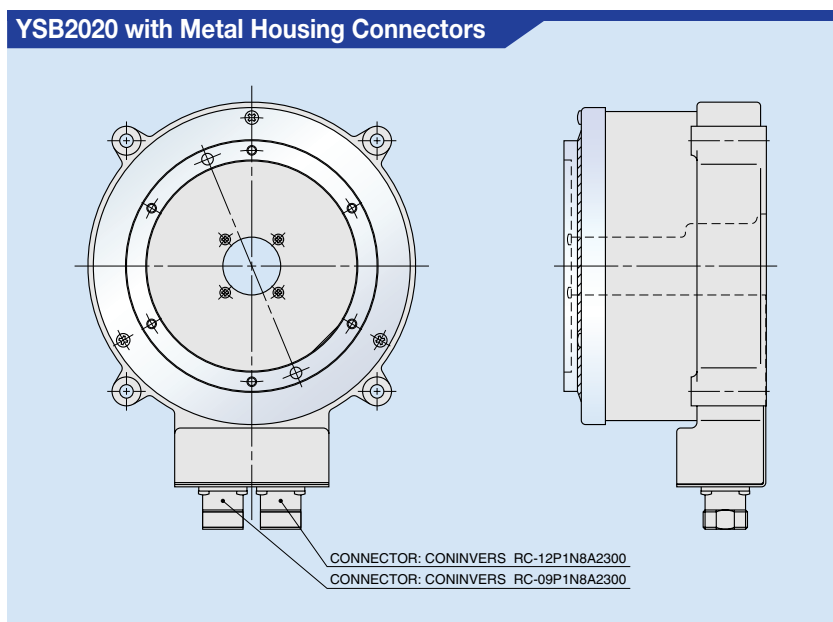
Use the motor and driver unit with the same serial numbers and do not change the specified cable length. In addition, a motor for highly accurate absolute positioning is also compatible with highly accurate rotor runout specification (see 2.4.4).

2.4.7 Motor with Metal Housing Connectors

- Motor with durable, metal connectors to prevent handling damage.
- Example of motor reference number: M-YSB2020KN002
- Compatible with the ESB Driver Unit.
- Please use dust-proof cables. Example of dust-proof cable reference number: M-C004SB23

Note:

- Motor is IP30 equivalent and it is not dust-proof specification.



3.2 Driver Unit Specifications

3.2.1 Standard Model (ESBB3)

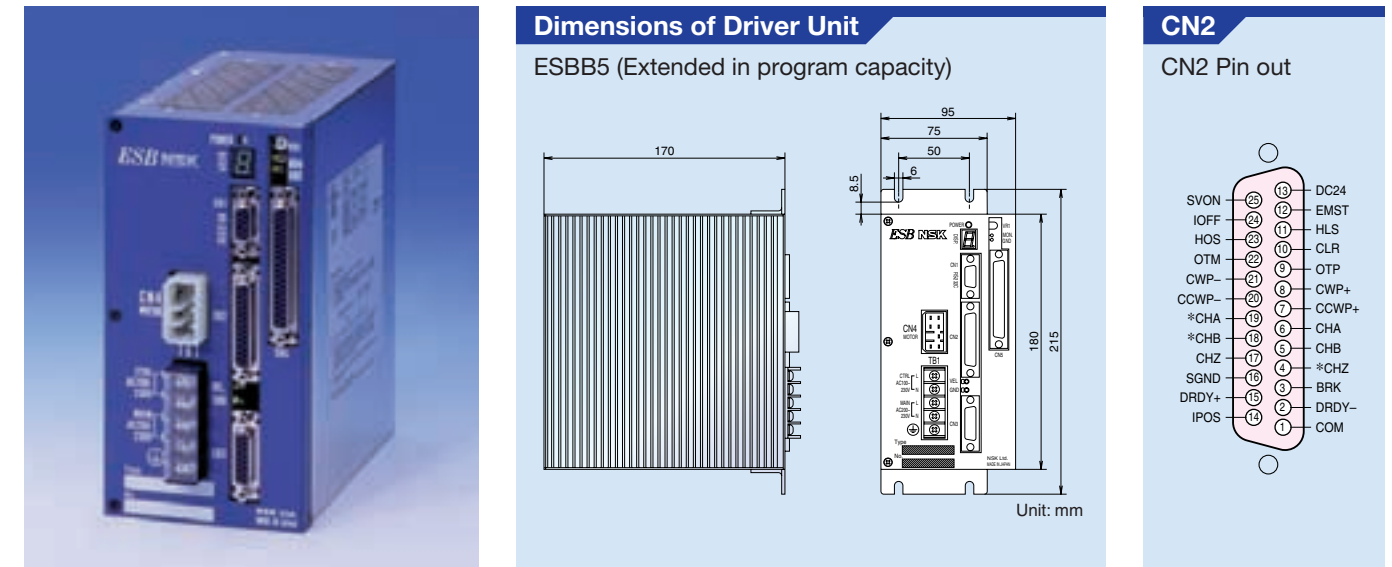
Position command	Internal Program, Pulse Train Input, RS-232C Communication	
Input signal	Pulse train input	Maximum frequency: 819.2 Kpps
	Control input	Input pulse format: CW/CCW, Pulse and direction, or Quadrature $\phi A/\phi B$
Output signal	Position feedback signal ⁽¹⁾	Output format: Line driver (Only ϕZ can be switched to open collector)
	Control output	Driver Unit ready, In position, Brake control, Velocity threshold, Target proximity/In target area
Alarms	Excess position error, Software thermal, CPU error, Position sensor error, Over current, Over heat, Main AC line trouble, Control AC line under voltage	
Monitoring function	Analog velocity monitor, Alarm status, RS-232C communication monitor (Parameters, program contents, position data, and alarm status)	
Communication	RS-232C serial communication, Baud rate: 9600 bps.	
Others	Automatic gain adjustment by RS-232C communication command (Automatic tuning) Programmed acceleration profiling ⁽²⁾ (Modified sine, modified trapezoid, cycloid and arc patterns)	
Main power voltage	200–230V AC, $\pm 10\%$, Single-phase 50/60 Hz	100–120V AC, $\pm 10\%$, Single-phase 50/60 Hz
Main power capacity	YSB2020: 1.0KVA	YSB2020: 0.7KVA
	YSB3040: 1.2KVA	YSB3040: 0.9KVA
	YSB4080: 1.4KVA	YSB4080: 1.0KVA
	YSB5120: 1.5KVA	YSB5120: 1.0KVA
Environmental condition	Operating temperature: 0–50°C; Humidity: 20–90%; Use indoors. Free from dust, condensation, and corrosive gas.	

Our controller is a ESBB5 that includes all the functions listed above plus those listed on page 16.

Notes:

- (1) Resolution of the position feedback signal is 51 200 (pulse/r).
- (2) Function of acceleration profiling is not available for the field bus specifications.
- (3) Detailed consultation with NSK is required for the field bus specifications.
- (4) CC-Link is the registered trademark of CC-Link Association.
- (5) DeviceNet is the registered trademark of Open DeviceNet Vendor Association Incorporated.

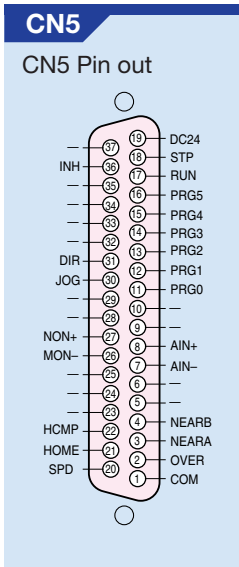
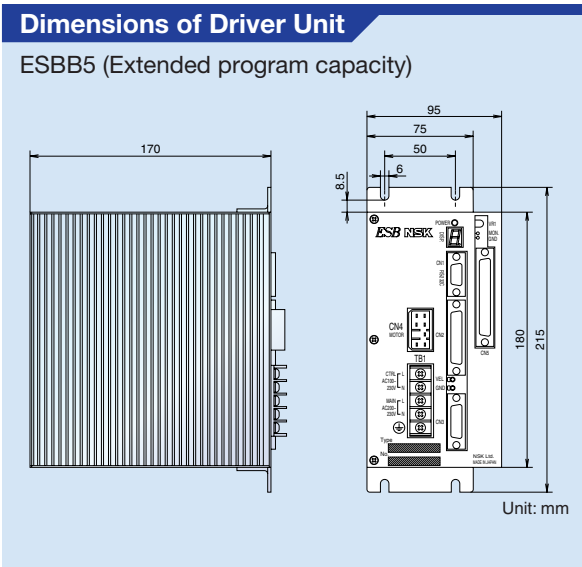
3.4 ESB5 Driver Unit (Option)



3.4.1 Input/Output Signal Specifications of CN2 Connector

Input/Output	Signal Code	Pin No.	Signal Name	Function
Input signal	CWP+	8	CW pulse train (+)	The motor rotates clockwise by the pulse train input. (This part can be a direction or signal B.)
	CWP-	21	CW pulse train (-)	
	CCWP+	7	CCW pulse train (+)	The motor rotates counterclockwise by the pulse train input. (This part can be a pulse train or a ϕ A signal by switching.)
	CCWP-	20	CCW pulse train (-)	
	EMST	12	Emergency stop	Stops the motor and locks the servo.
	SVON	25	Servo on	This signal sets the motor servo on state.
	HLS	11	Home position limit switch	After Homing starts, this signal's activation completes the Homing.
	CLR	10	Clear input	This signal clears alarm state and errors in the position error counter.
	IOFF	24	Integral OFF•Lower gain	Switches lowering gain function ON and OFF.
	OTP	9	Overtravel limit (+)	Overtravel limit input for clockwise rotation
	OTM	22	Overtravel limit (-)	Overtravel limit input for counterclockwise rotation
	HOS	23	Start homing	To be used for Homing
	DC24	13	External power supply	External power supply for the input signals (24V DC, 0.2A or over)
Output signal	CHA	6	Position feedback signal ϕ A	Pulse signals indicate a rotational speed of the motor. Output format is line driver. (A jumper can switch ϕ Z signal only to the open collector format.)
	CHB	5	Position feedback signal ϕ B	
	CHZ	17	ϕ Z/Digital position signal MSB	
	*CHA	19	Position feedback signal * ϕ A	Reversed output of position feedback signal
	*CHB	18	Position feedback signal * ϕ B	
	*CHZ	4	* ϕ Z/Digital position signal MSB	
	SGND	16	Signal ground	Ground connection for position feedback signal
	DRDY+	15	Driver Unit ready (+)	This signal notifies that the Driver Unit is ready for operation. (This signal opens when the Driver Unit is not ready or an alarm is given.)
	DRDY-	2	Driver Unit ready (-)	
	IPOS	14	Positioning completed	This signal notifies a completion of positioning.
	BRK	3	Brake control signal	Output signal of brake control (Normally closed)
COM	1	Output signal, common	Common for position complete and brake control signals	

Option



3.4.2 Input/Output Signal Specifications of CN5 Connector

Input/Output	Signal Code	Pin No.	Signal Name	Function
Input signal	DC24	19	External power supply 24V DC	Power supply for input signals (24V DC, 0.2A or over)
	STP	18	Positioning stop	Interrupts positioning.
	RUN	17	Positioning start	Starts an internal program of selected channel.
	PRG0	11	Internal program•Channel selection 0	A combination of ON and OFF of these 0–5 signals selects a channel (0–64) to execute its internal program.
	PRG1	12	Internal program•Channel selection 1	
	PRG2	13	Internal program•Channel selection 2	
	PRG3	14	Internal program•Channel selection 3	
	PRG4	15	Internal program•Channel selection 4	
	PRG5	16	Internal program•Channel selection 5	
	JOG	30	Jog	Starts jog.
	DIR	31	Jog direction	Sets direction of jog.
	AIN+	8	Analog command input	Input port for velocity or torque analog command when specified
	AIN-	7	Ground of analog command input	
	INH	36	External command prohibited	Prohibits accepting the pulse train input or analog input command.
Output signal	MON+	27	Analog monitor output	Analog output to monitor controlled status of the motor
	MON-	26	Monitor output ground	Ground for the monitor output
	HCMP	22	Home position established	This signal notifies that the home position is fixed.
	HOME ⁽²⁾	21	Homing completed/Tell home position	Reports completion of homing or home position.
	SPD	20	Velocity threshold	Reports motor speed.
	COM	1	Control output common	Common for control output signal
	OVER	2	Warning	This output closes when a warning is given.
	NEARA ⁽¹⁾	3	Target proximity/In target area A	Reports the motor is approaching the target or the motor is in the target area.
NEARB ⁽¹⁾	4	Target proximity/In target area B		

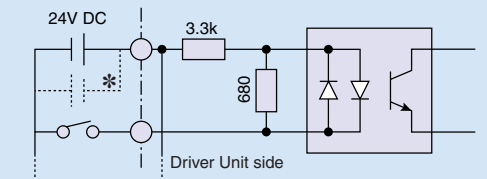
Notes:
 (1) You may select "Target proximity" or "In target area" by setting a parameter.
 (2) You may select "Homing completed" or "Tell home position" by setting a parameter.

3.5 Electrical Specifications of CN2 and CN5 Connectors

● General Inputs

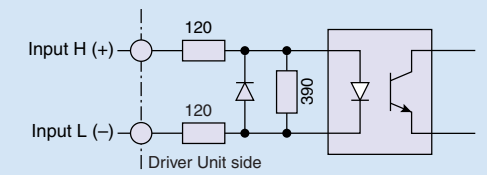
Input voltage	24V DC±10%
Impedance	3.3k Ω
Input current	10 mA or less (per port)

* Can be used as a minus common.



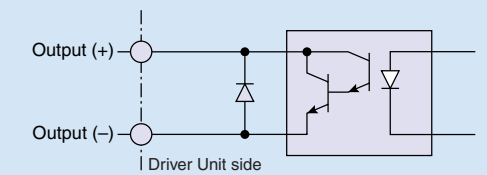
● Pulse Train Inputs

Input voltage	5V DC±10%
Impedance	240 Ω
Input current	25 mA or less



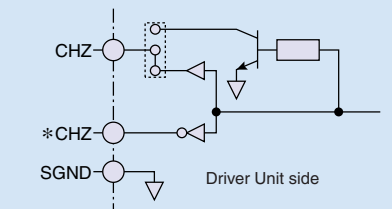
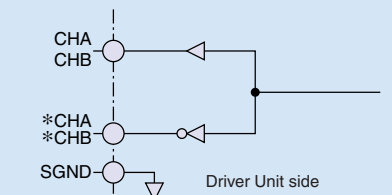
● General Outputs

Maximum switching capacity	24V DC/50mA
Saturation voltage	2V or less



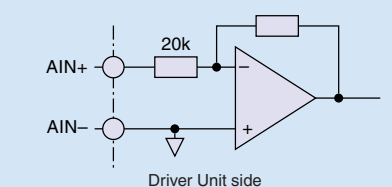
● Position Feedback Signals

Output format	<ul style="list-style-type: none"> CHA, *CHA, CHB, *CHB, Line driver CHZ, *CHZ, Line driver or open collector 	
Driver used	Texas Instruments Inc. SN75ALS912	
Recommendable line receiver	Texas Instruments Inc. SN75ALS193 or AM26LS32 equivalent	
Maximum collector current	100 mA	At open collector format
Maximum collector voltage	24V DC	
Saturation voltage	1V or less	



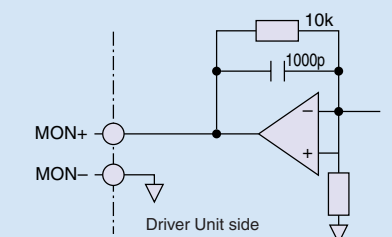
● Analog Command Inputs

Maximum input voltage	±10V
Impedance	20 kΩ
Maximum input current	0.5 mA



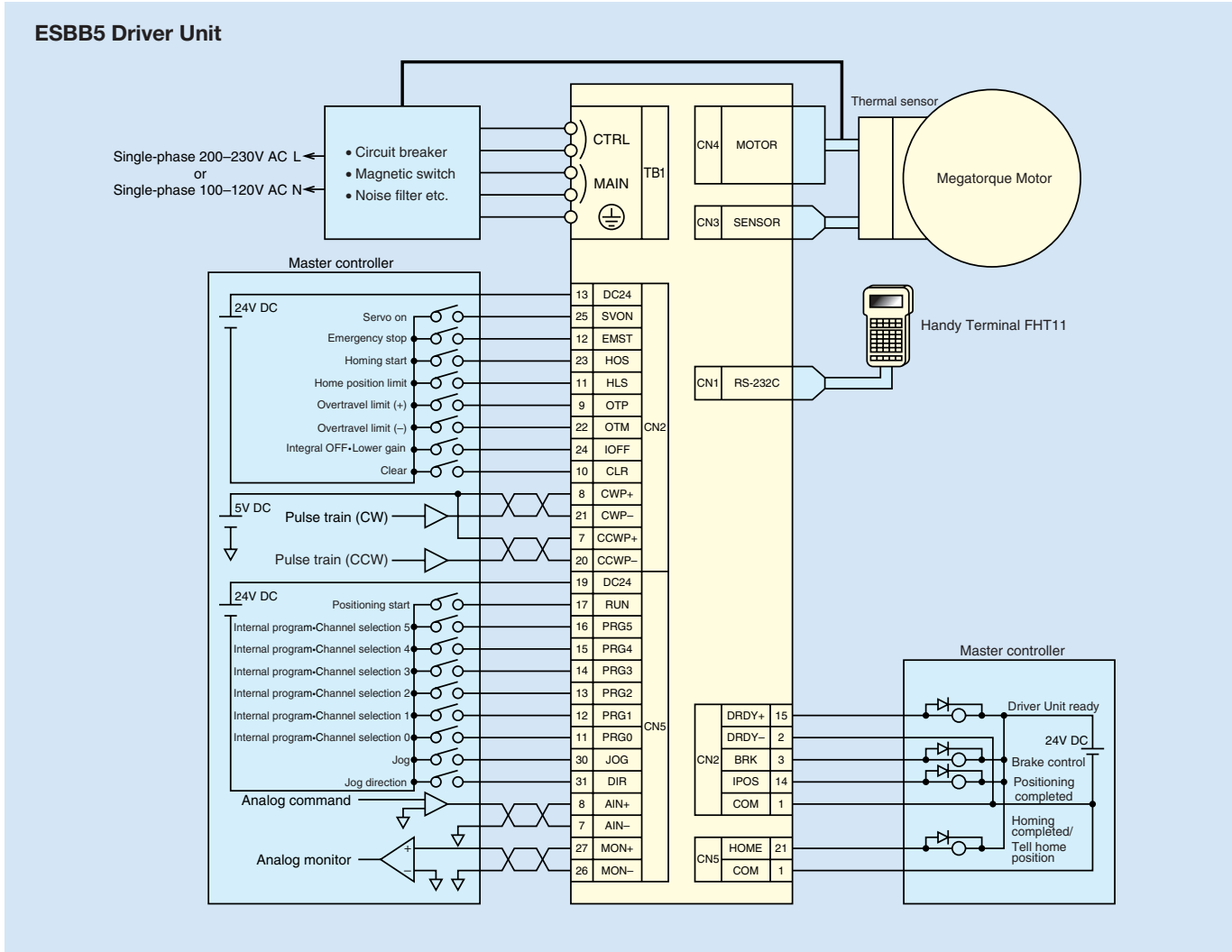
● Analog Monitor Outputs

Output format	Operation amplifier output
Maximum output voltage	±10V±10%
Saturation current	4 mA or less



3.8 Wiring Example

Diagram below shows typical wiring example using the ESBB5 driver unit supplied with the package we are offering.



When using a motor with a brake for both B3 and B5, the wiring example using brake is also applicable.

4.1 Coding of Reference Number

Example of reference number: **M-C 004 SB 03**

Cable set			
Cable length (m)	002: 2m	004: 4m	008: 8m
	015: 15m	030: 30m	

Design serial number

- 01: Incremental positioning sensor (For fixed use)
- 03: Absolute positioning sensor (For fixed use)
- 11: Incremental positioning sensor (Flexible type)
- 13: Absolute positioning sensor (Flexible type)
- 23: Dust-proof (Flexible type)

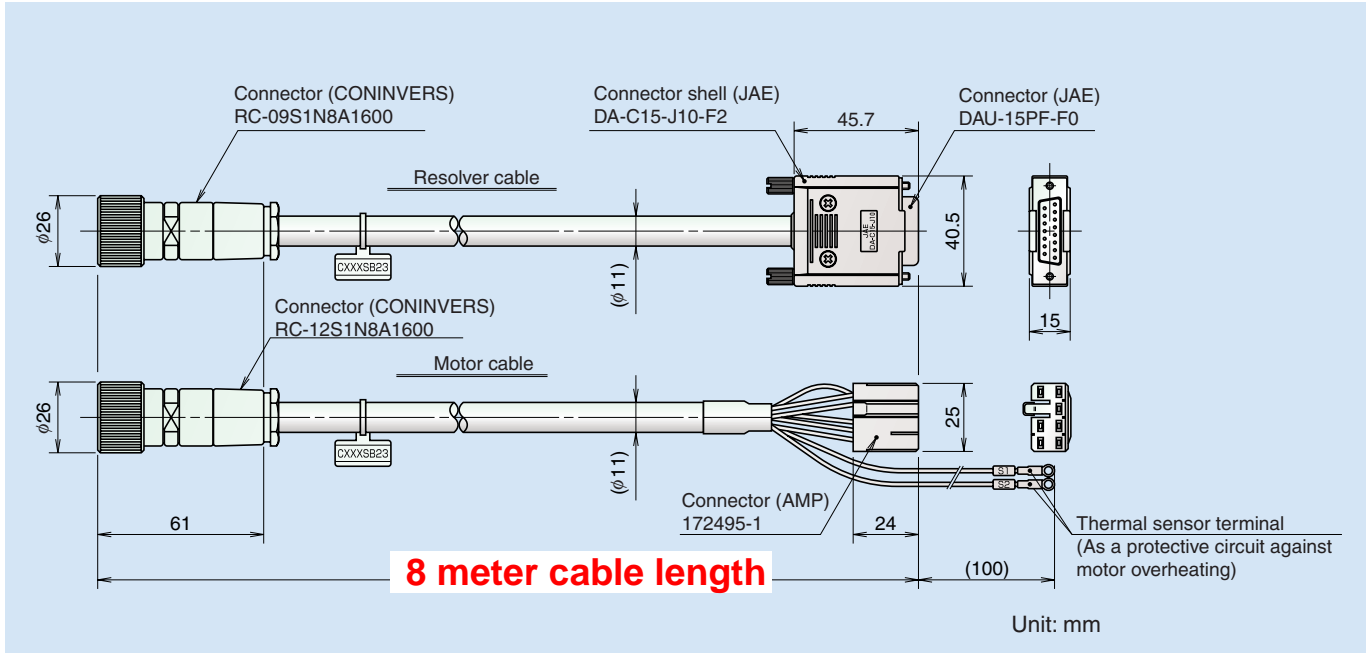
SB: ESB Driver Unit

Note: the complete cable part number for the "kit" we are offering is as follows:

M-C008SB23

This is a DUST PROOF cable set, 8 meters in length.

4.3 Dimensions of Dust-proof Cable Set



• Use Dust-proof Cable Set for both dust-proof motor and motor with housing connectors.

It is essential to study the allowable load and output torque that requires positioning the motor at a desired time. Refer to the motor specifications for the allowable axial and moment loads. Use the following formulas to obtain an actual load to the motor.

7.1 Estimation of Actual Load

(1) When F is an external force:

- Axial load: $F_a = F + \text{total weight of jigs/works}$
- Moment load: $M = 0$

(2) When F is an external force:

- Axial load: $F_a = F + \text{total weight of jigs/works}$
- Moment load: $M = F \times L$

(3) When F is an external force:

- Axial load: $F_a = \text{total weight of jigs/works}$
- Moment Load: $M = F \times (L+A)$

Motor Reference Number		M-YSB 5120
A dimension (mm)		83.5

Example: Motor: M-YSB 3040 (100V AC) Moment of inertia: 1.25 kg·m² (GD²: 5 kgf·m²) Index angle: 30°
Following the arrows on the chart below right, the minimum positioning time is 0.5 seconds.

(Power voltage 100V AC — — — Power voltage: 200V AC ———)

7.2 How to Use Charts for Minimum Positioning Time

Following the check of allowable loads, study the minimum time required to position the motor. The charts provided below are for checking the minimum positioning time of the YSB Megatorque Motors. Refer to the charts in the following cases.

- The user wishes to know which motor size should be selected for positioning within a required time, when the indexing angle and the load inertia are predetermined.
- The user wishes to know the required time for positioning, when an indexing angle, the load inertia and the motor size are predetermined.

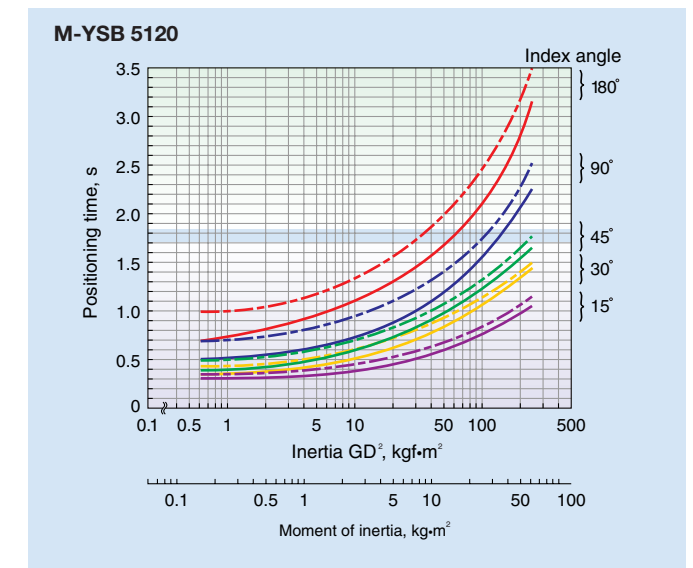
These charts can be used only when the following conditions are satisfied;

- 1) The load is directly coupled to the rotor, neither using a mechanical speed reducer such as a belt or gears nor coupling, and is sufficiently rigid (natural frequency is 50 Hz or over).
- 2) No load torque is applied on a motor.

In addition, further examination is recommended when a motor is to be used in any of the following conditions.

- a. Load inertia exceeds the allowable value so that it may not appear on the charts: Even in this case, driving a motor is not always impossible, but may take a longer time than the theoretical value because considerable limitations will be placed on the acceleration and the rotational speed.
- b. When there is no chart applicable to the indexing angle: Separate calculation shall be made. However, the minimum time for positioning cannot be obtained when the indexing angle is too small.
- c. The settling time of 0.2 seconds is added initially. You may change the settling time to be shorter if you can relax the repeatability.

The drawing right shows characteristics for the motor we have for sale.



8.1 Motors Equipped With Absolute Position Sensor

Motor Reference Number	Driver Unit Reference Number ⁽¹⁾	Power Voltage	Cable Reference Number	Main Specifications		
M-YSB2020KN001	M-ESB-YSB2020AB300	200-230V AC	M-CO** SB03 ** indicates cable length	Internal program 16 channels (Acceleration profiling pattern can be set to each channel.) Pulse train input (Photo coupler)		
	M-ESB-YSB2020CB300	100-120V AC				
M-YSB3040KN001	M-ESB-YSB3040AB300	200-230V AC				
	M-ESB-YSB3040CB300	100-120V AC				
M-YSB4080KN001	M-ESB-YSB4080AB300	200-230V AC				
	M-ESB-YSB4080CB300	100-120V AC				
M-YSB5120KN001	M-ESB-YSB5120AB300	200-230V AC				
	M-ESB-YSB5120CB300	100-120V AC				
M-YSB2020KN001	M-ESB-YSB2020AB500	200-230V AC			M-CO** SB03 ** indicates cable length	Internal program 64 channels (Acceleration profiling pattern can be only set to 32 channels.) Pulse train input (Photo coupler) Analog velocity command
	M-ESB-YSB2020CB500	100-120V AC				
M-YSB3040KN001	M-ESB-YSB3040AB500	200-230V AC				
	M-ESB-YSB3040CB500	100-120V AC				
M-YSB4080KN001	M-ESB-YSB4080AB500	200-230V AC				
	M-ESB-YSB4080CB500	100-120V AC				
M-YSB5120KN001	M-ESB-YSB5120AB500	200-230V AC				
	M-ESB-YSB5120CB500	100-120V AC				
M-YSB2020KN001	M-ESB-YSB2020ABA00	200-230V AC	M-CO** SB03 ** indicates cable length	DeviceNet compatible ⁽²⁾ Internal program 64 channels		
	M-ESB-YSB2020CBA00	100-120V AC				
M-YSB3040KN001	M-ESB-YSB3040ABA00	200-230V AC				
	M-ESB-YSB3040CBA00	100-120V AC				
M-YSB4080KN001	M-ESB-YSB4080ABA00	200-230V AC				
	M-ESB-YSB4080CBA00	100-120V AC				
M-YSB5120KN001	M-ESB-YSB5120ABA00	200-230V AC				
	M-ESB-YSB5120CBA00	100-120V AC				
M-YSB2020KN001	M-ESB-YSB2020ABB00	200-230V AC			M-CO** SB03 ** indicates cable length	PROFIBUS compatible ⁽²⁾ Internal program 64 channels
	M-ESB-YSB2020CBB00	100-120V AC				
M-YSB3040KN001	M-ESB-YSB3040ABB00	200-230V AC				
	M-ESB-YSB3040CBB00	100-120V AC				
M-YSB4080KN001	M-ESB-YSB4080ABB00	200-230V AC				
	M-ESB-YSB4080CBB00	100-130V AC				
M-YSB5120KN001	M-ESB-YSB5120ABB00	200-230V AC				
	M-ESB-YSB5120CBB00	100-120V AC				
M-YSB2020KN001	M-ESB-YSB2020ABC00	200-230V AC	M-CO** SB03 ** indicates cable length	CC-Link compatible ⁽²⁾ Internal program 64 channels		
	M-ESB-YSB2020CBC00	100-120V AC				
M-YSB3040KN001	M-ESB-YSB3040ABC00	200-230V AC				
	M-ESB-YSB3040CBC00	100-120V AC				
M-YSB4080KN001	M-ESB-YSB4080ABC00	200-230V AC				
	M-ESB-YSB4080CBC00	100-120V AC				
M-YSB5120KN001	M-ESB-YSB5120ABC00	200-230V AC				
	M-ESB-YSB5120CBC00	100-120V AC				

Notes:

(1) For pulse train (line receiver format) position command, the last 2 digits of the driver unit reference number change to 01 from 00.

Example: Internal program 16 channels (16 acceleration profiling patterns), pulse train (line receiver format)
M-ESB-YSB2020AB301

(2) The driver unit compatible to field bass does not provide the pulse train input function. Therefore the last digits of its reference number are 00 only.

8.2 Motors with Brake

Motor Reference Number	Driver Unit Reference Number ⁽¹⁾	Power Voltage	Cable Reference Number	Main Specifications		
M-YSB2020KG001	M-ESB-YSB2020AB300	200-230V AC	M-CO** SB03 ** indicates cable length	Internal program 16 channels (Acceleration profiling pattern can be set to each channel.) Pulse train input (Photo coupler)		
	M-ESB-YSB2020CB300	100-120V AC				
M-YSB3040KG001	M-ESB-YSB3040AB300	200-230V AC				
	M-ESB-YSB3040CB300	100-120V AC				
M-YSB4080KG001	M-ESB-YSB4080AB300	200-230V AC				
	M-ESB-YSB4080CB300	100-120V AC				
M-YSB5120KG001	M-ESB-YSB5120AB300	200-230V AC				
	M-ESB-YSB5120CB300	100-120V AC				
M-YSB2020KG001	M-ESB-YSB2020AB500	200-230V AC			M-CO** SB03 ** indicates cable length	Internal program 64 channels (Acceleration profiling pattern can be only set to 32 channels.) Pulse train input (Photo coupler) Analog velocity command
	M-ESB-YSB2020CB500	100-120V AC				
M-YSB3040KG001	M-ESB-YSB3040AB500	200-230V AC				
	M-ESB-YSB3040CB500	100-120V AC				
M-YSB4080KG001	M-ESB-YSB4080AB500	200-230V AC				
	M-ESB-YSB4080CB500	100-120V AC				
M-YSB5120KG001	M-ESB-YSB5120AB500	200-230V AC				
	M-ESB-YSB5120CB500	100-120V AC				
M-YSB2020KG001	M-ESB-YSB2020ABA00	200-230V AC	M-CO** SB03 ** indicates cable length	DeviceNet compatible ⁽²⁾ Internal program 64 channels		
	M-ESB-YSB2020CBA00	100-120V AC				
M-YSB3040KG001	M-ESB-YSB3040ABA00	200-230V AC				
	M-ESB-YSB3040CBA00	100-120V AC				
M-YSB4080KG001	M-ESB-YSB4080ABA00	200-230V AC				
	M-ESB-YSB4080CBA00	100-120V AC				
M-YSB5120KG001	M-ESB-YSB5120ABA00	200-230V AC				
	M-ESB-YSB5120CBA00	100-120V AC				
M-YSB2020KG001	M-ESB-YSB2020ABB00	200-230V AC			M-CO** SB03 ** indicates cable length	PROFIBUS compatible ⁽²⁾ Internal program 64 channels
	M-ESB-YSB2020CBB00	100-120V AC				
M-YSB3040KG001	M-ESB-YSB3040ABB00	200-230V AC				
	M-ESB-YSB3040CBB00	100-120V AC				
M-YSB4080KG001	M-ESB-YSB4080ABB00	200-230V AC				
	M-ESB-YSB4080CBB00	100-130V AC				
M-YSB5120KG001	M-ESB-YSB5120ABB00	200-230V AC				
	M-ESB-YSB5120CBB00	100-120V AC				
M-YSB2020KG001	M-ESB-YSB2020ABC00	200-230V AC	M-CO** SB03 ** indicates cable length	CC-Link compatible ⁽²⁾ Internal program 64 channels		
	M-ESB-YSB2020CBC00	100-120V AC				
M-YSB3040KG001	M-ESB-YSB3040ABC00	200-230V AC				
	M-ESB-YSB3040CBC00	100-120V AC				
M-YSB4080KG001	M-ESB-YSB4080ABC00	200-230V AC				
	M-ESB-YSB4080CBC00	100-120V AC				
M-YSB5120KG001	M-ESB-YSB5120ABC00	200-230V AC				
	M-ESB-YSB5120CBC00	100-120V AC				

Notes:

(1) For pulse train (line receiver format) position command, the last 2 digits of the driver unit reference number change to 01 from 00.

Example: Internal program 16 channels (16 acceleration profiling patterns), pulse train (line receiver format)
M-ESB-YSB2020AB301

(2) The driver unit compatible to field bass does not provide the pulse train input function. Therefore the last digits of its reference number are 00 only.

8.3 Dust-Proof Motors (Please consult with NSK for this product.)

Motor Reference Number	Driver Unit Reference Number ⁽¹⁾	Power Voltage	Cable Reference Number	Main Specifications	
M-YSB2020KN601	M-ESB-YSB2020AB300	200-230V AC	M-CO** SB23 ** indicates cable length	Internal program 16 channels (Acceleration profiling pattern can be set to each channel.) Pulse train input (Photo coupler)	
	M-ESB-YSB2020CB300	100-120V AC			
M-YSB3040KN601	M-ESB-YSB3040AB300	200-230V AC			
	M-ESB-YSB3040CB300	100-120V AC			
M-YSB4080KN601	M-ESB-YSB4080AB300	200-230V AC			
	M-ESB-YSB4080CB300	100-120V AC			
M-YSB5120KN601	M-ESB-YSB5120AB300	200-230V AC			
	M-ESB-YSB5120CB300	100-120V AC			
M-YSB2020KN601	M-ESB-YSB2020AB500	200-230V AC		M-CO** SB23 ** indicates cable length	Internal program 64 channels (Acceleration profiling pattern can be only set to 32 channels.) Pulse train input (Photo coupler) Analog velocity command
	M-ESB-YSB2020CB500	100-120V AC			
M-YSB3040KN601	M-ESB-YSB3040AB500	200-230V AC			
	M-ESB-YSB3040CB500	100-120V AC			
M-YSB4080KN601	M-ESB-YSB4080AB500	200-230V AC			
	M-ESB-YSB4080CB500	100-120V AC			
M-YSB5120KN601	M-ESB-YSB5120AB500	200-230V AC			
	M-ESB-YSB5120CB500	100-120V AC			
M-YSB2020KN601	M-ESB-YSB2020ABA00	200-230V AC	M-CO** SB23 ** indicates cable length		DeviceNet compatible ⁽²⁾ Internal program 64 channels
	M-ESB-YSB2020CBA00	100-120V AC			
M-YSB3040KN601	M-ESB-YSB3040ABA00	200-230V AC			
	M-ESB-YSB3040CBA00	100-120V AC			
M-YSB4080KN601	M-ESB-YSB4080ABA00	200-230V AC			
	M-ESB-YSB4080CBA00	100-120V AC			
M-YSB5120KN601	M-ESB-YSB5120ABA00	200-230V AC			
	M-ESB-YSB5120CBA00	100-120V AC			
M-YSB2020KN601	M-ESB-YSB2020ABB00	200-230V AC		M-CO** SB23 ** indicates cable length	PROFIBUS compatible ⁽²⁾ Internal program 64 channels
	M-ESB-YSB2020CBB00	100-120V AC			
M-YSB3040KN601	M-ESB-YSB3040ABB00	200-230V AC			
	M-ESB-YSB3040CBB00	100-120V AC			
M-YSB4080KN601	M-ESB-YSB4080ABB00	200-230V AC			
	M-ESB-YSB4080CBB00	100-130V AC			
M-YSB5120KN601	M-ESB-YSB5120ABB00	200-230V AC			
	M-ESB-YSB5120CBB00	100-120V AC			
M-YSB2020KN601	M-ESB-YSB2020ABC00	200-230V AC	M-CO** SB23 ** indicates cable length		CC-Link compatible ⁽²⁾ Internal program 64 channels
	M-ESB-YSB2020CBC00	100-120V AC			
M-YSB3040KN601	M-ESB-YSB3040ABC00	200-230V AC			
	M-ESB-YSB3040CBC00	100-120V AC			
M-YSB4080KN601	M-ESB-YSB4080ABC00	200-230V AC			
	M-ESB-YSB4080CBC00	100-120V AC			
M-YSB5120KN601	M-ESB-YSB5120ABC00	200-230V AC			
	M-ESB-YSB5120CBC00	100-120V AC			

Notes:

(1) For pulse train (line receiver format) position command, the last 2 digits of the driver unit reference number change to 01 from 00.

Example: Internal program 16 channels (16 acceleration profiling patterns), pulse train (line receiver format)
M-ESB-YSB2020AB301

(2) The driver unit compatible to field bass does not provide the pulse train input function. Therefore the last digits of its reference number are 00 only.

8.4 Fixed Cables

Cable Set Reference Number	Cable Length
M-C002SB03	2m
M-C004SB03	4m
M-C008SB03	8m
M-C015SB03	15m
M-C030SB03	30m

8.5 Flexible Cables

Cable Set Reference Number	Cable Length
M-C002SB13	2m
M-C004SB13	4m
M-C008SB13	8m
M-C015SB13	15m
M-C030SB13	30m

8.6 Dust-Proof Cables

Cable Set Reference Number	Cable Length
M-C002SB23	2m
M-C004SB23	4m
M-C008SB23	8m
M-C015SB23	15m
M-C030SB23	30m



9.1 CE Marking

● Low Voltage Directive

NSK has worked with an EU Notified Body and an EU Competent Body to ensure that the YSB Series Megatorque Motor Systems conform to the pertinent regulations of the EC Low Voltage Directive, thus any system of the users, into which the Megatorque Motor is incorporated as a “component,” can easily conform to the EC Directives.

● Electromagnetic Compatibility Directive

We set conditions on the installation distance and wirings between a YSB Motor and an ESB Driver Unit and checked them for compliance with the pertinent regulations of the MC Directive. Naturally, the way to incorporate a YSB Motor and an ESB Driver Unit into your system may differ from our checking conditions. The users therefore require a final inspection of their systems which incorporate a Megatorque Motor System for conformity to EMC Directive (radiated noise and conducted noise).

9.2 Underwriters' Laboratory (UL)

● Motor

Conforms to UL1004 regulation.
(File number: E216970)

● Driver Unit

Conforms to UL508C regulation.
(File number: E216221)

● Cable Set

We use the material conforming to the UL regulations.

If you require more detailed information such as installing conditions, please contact your local NSK representative.

