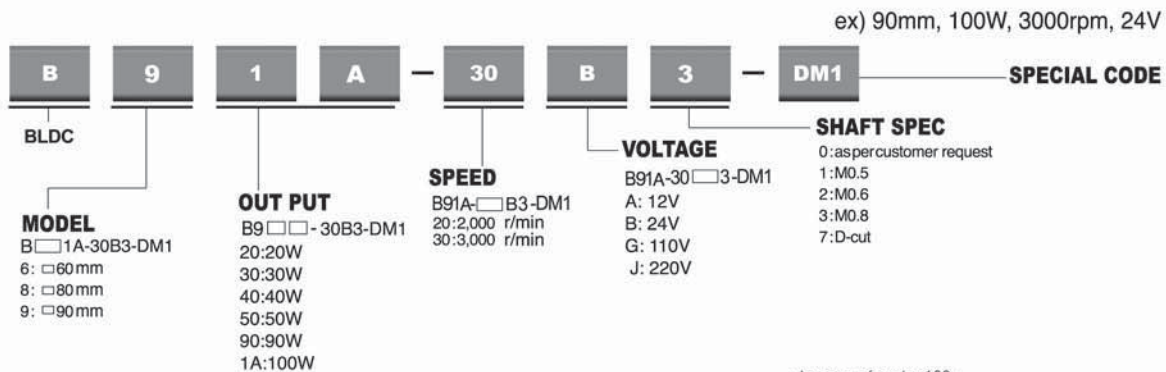
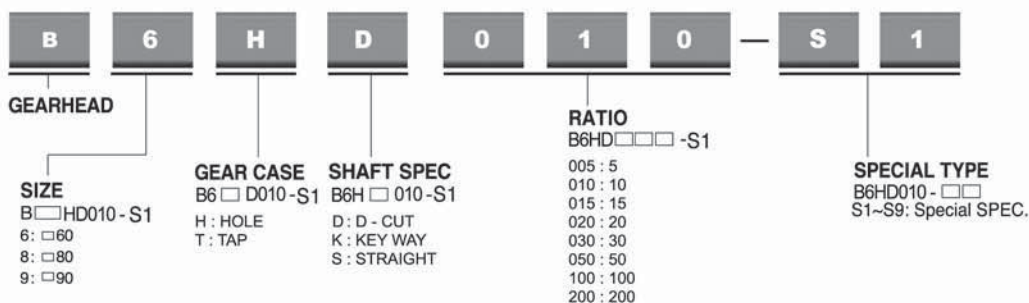


## BLDC MOTOR Coding System



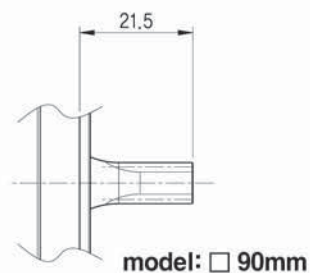
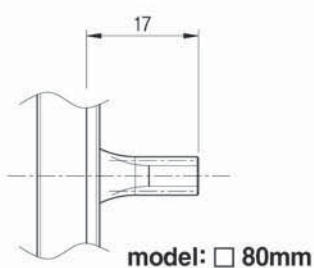
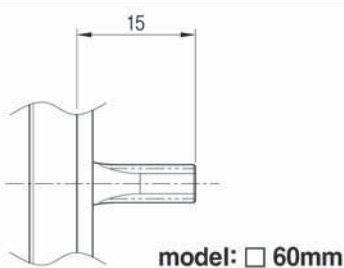
• In case of under 100w,  
The output will be  
mentioned as it is.

## Gearhead for only BLDC motor

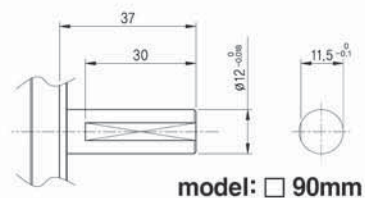
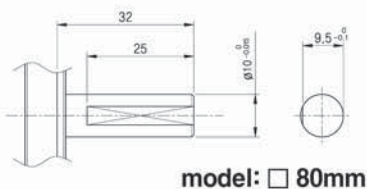
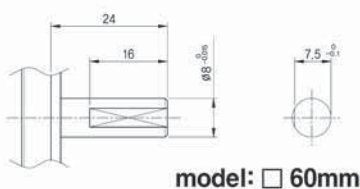


## MOTOR OUTPUT SHAFT [TABLE1]

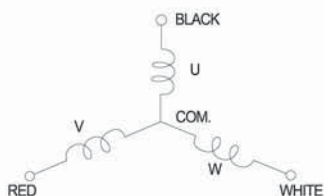
### GEAR TYPE



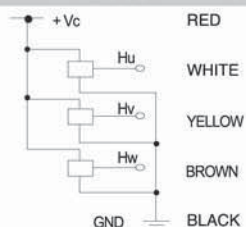
### D-CUT TYPE



### MOTOR WIRING



### HALL IC WIRING



24V 30W □ 60mm sq(2.36in.sq)



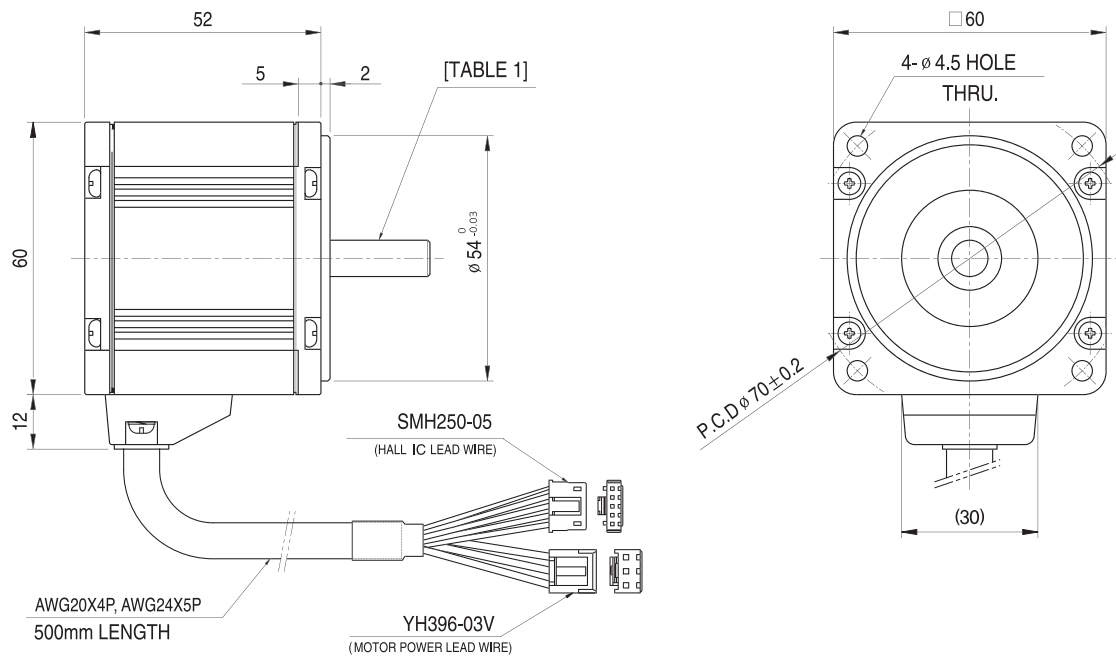
BLDC

**Standard Features**

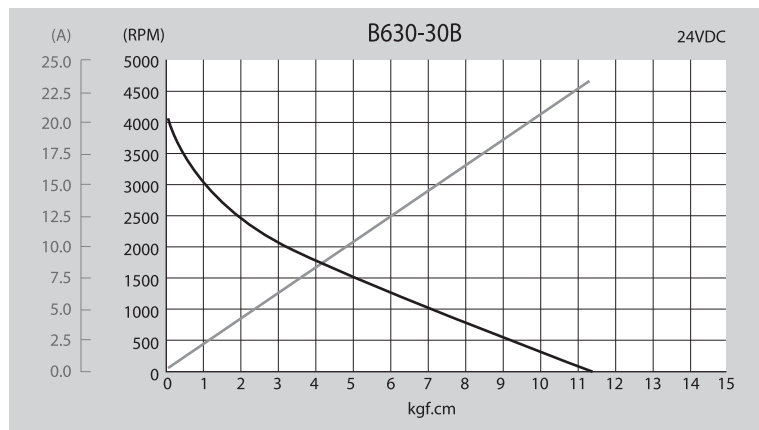
- Easy connection & simple operation
- Thin & compact size
- Wide speed range and constant torque
- 12pole,3phase,hall IC shielded ball bearing
- Special making as per customer requirement is possible
- CE mark, IP65



**Typical outline drawing**



**Performance curve**



**Specification**

MODEL NO.	Voltage (V)	No Load		Rated Load			Stall		
		Speed (r/min)	Current (A)	Output (W)	Speed (r/min)	Torque (kgf-cm)	Current (A)	Torque (kgf-cm)	Current (A)
B630-30B	24	4000	0.8	30	3100	0.974	2	11.5	23

# Gearhead

□ 60mm

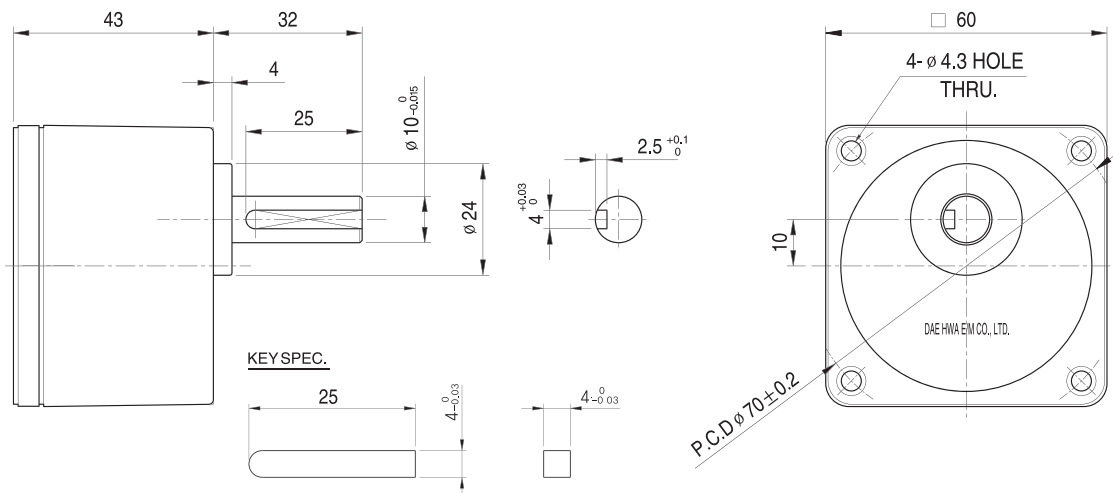


## Standard Features

- Small Size and Light Weight
- Excellent maximum permissible torque
- Special making as per customer requirement is possible



## Typical outline drawing



## Specification

PERMISSIBLE OVERHUNG LOAD AND PERMISSIBLE THRUST LOAD

Model	Gear Ratio	permissible overhung load kgf(N)		permissible thrust load kgf(N)
		10mm from the end of the output shaft	20mm from the end of the output shaft	
□60mm	5	10(100)	15(150)	4(40)
	10~20	15(150)	20(200)	
	30~200	20(200)	30(300)	

PERMISSIBLE LOAD INERTIA J FOR COMBINATION TYPE

UNIT =  $\times 10^{-4}$  kg · m<sup>2</sup> (oz · in<sup>2</sup>)

Gear Ratio	5	10	15	20	30	50	100	200
Package Model								
60mm	1.55(8.5)	6.2(34)	14(77)	24.8(136)	55.8(310)	155(850)	155(850)	155(850)

MAXIMUM PERMISSIBLE TORQUE

UNIT = kgf · cm

Model	5	10	15	20	30	50	100	200
B630-30B	4.4	8.8	13.2	17.6	25.1	41.8	60	60
B620-20J	4.4	8.8	13.2	17.6	25.1	41.8	60	60
B630-30J	4.4	8.8	13.2	17.6	25.1	41.8	60	60

## Rotation Direction of Output shaft in Gearbox

- Rotation Direction as per Gear Ratio

Gear Ratio	5	10	15	20	30	50	100	200
Model								
□60mm								

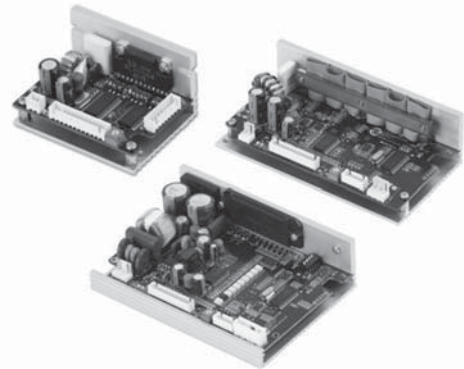
■ the same direction with motor    ■ the reverse direction with motor

## EXH Series



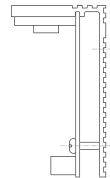
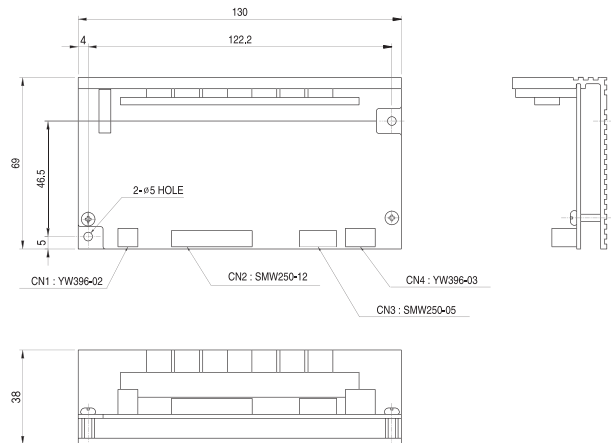
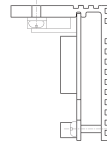
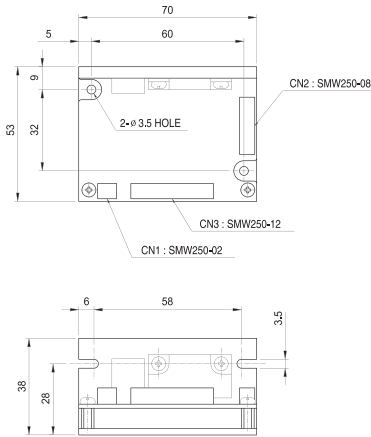
### Standard Features

- Compact & High Power
- Stable constantspeed
- Wide range speed contro(100~300r/min)
- High Reliability
- Remote speed-controlpossible

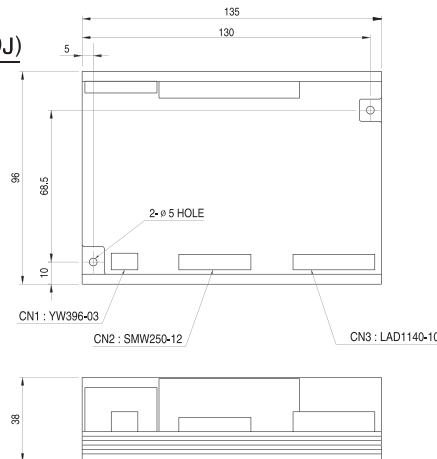


### Dimensions

24V 30W(EXHD30-30B)  
24V 50W, 100W(EXHD50-30B, EXHD100-30B)



220V 30W 50W 100W  
(EXHD30-30J, EXHD50-30J, EXHD100-30J)



### Product Line

Output Power	Voltage	Model	Motor Model	Gearhead Model	Driver Model
30W(1/25HP)	DC24V	EXH630-30B△-□	B630-30B2	B6HK □□□	EXHD30-30B
	AC220V	EXH630-30J△-□	B630-30J2		EXHD30-30J
50W(1/15HP)	DC24V	EXH850-30B△-□	B850-30B4	B8HK □□□	EXHD50-30B
	AC220V	EXH850-30J△-□	B850-30J4		EXHD50-30J
100W(1/8HP)	DC24V	EXH91A-30B△-□	B91A-30B5	B9HK □□□	EXHD1A-30B
	AC220V	EXH91A-30J△-□	B91A-30J5		EXHD1A-30J

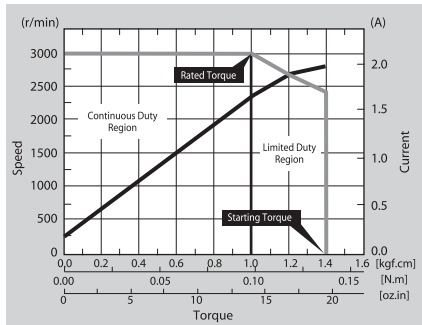
- Enter the Gear ratio(5, 10, 15, 20, 30, 50, 100, 200) in the box ( □□□ ) with in the model name.
- △ is K(Combination Gear Type) or S(Round Shaft Type)
- Please refer to the Motor and Gearhead section

# EXH Series

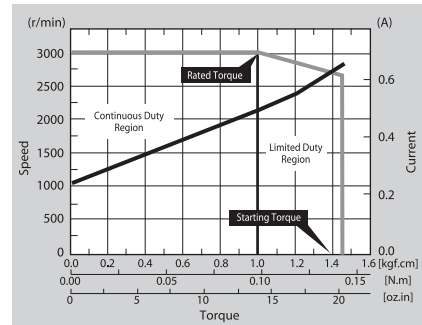


## Speed • Torque Characteristics

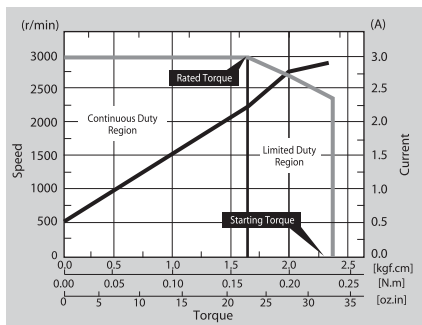
EXH630-30B



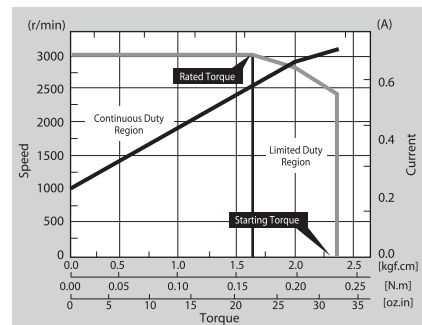
EXH630-30J



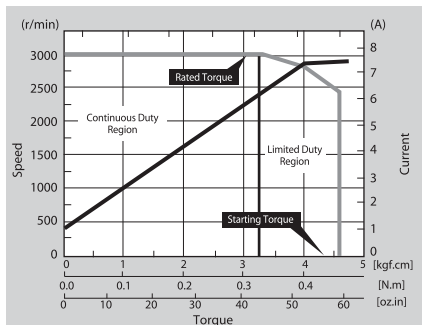
EXH850-30B



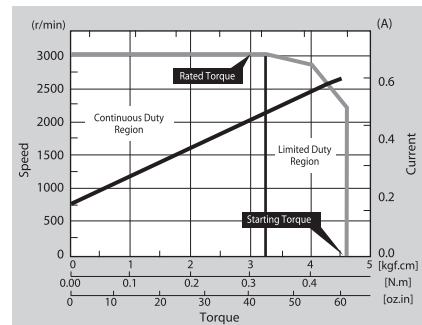
EXH850-30J



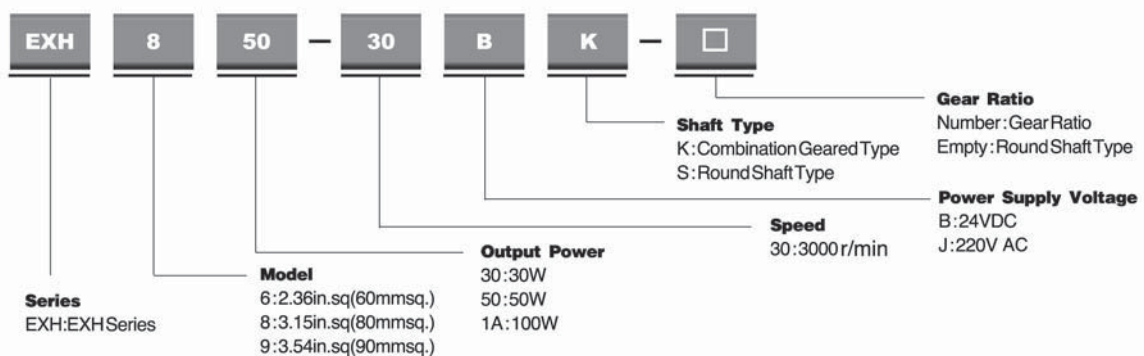
EXH91A-30B



EXH91A-30J



## Product Number Code



### Common Specifications

Item	Specifications																		
Speed Control Method	Any one of the following methods. 1. By built-in potentiometer 2. By external potentiometer 3. By DC voltage(0~5VDC)																		
Input Signals	<table border="0"> <tr> <td>C-MOS negative logic</td> <td>L: (ON) : 0~0.5VDC</td> <td>H: (OFF) : 4~5VDC</td> </tr> <tr> <td>START/STOP input</td> <td>L: START</td> <td>H: STOP</td> </tr> <tr> <td>Brake input</td> <td>L: RUN</td> <td>H: Instantaneous stop</td> </tr> <tr> <td>Direction of Rotation input</td> <td>L: CW</td> <td>H: CCW</td> </tr> <tr> <td>Speed setting method</td> <td>L: Internal</td> <td>H: External</td> </tr> <tr> <td>Alarm reset</td> <td>L: Reset</td> <td>H: Normal</td> </tr> </table>	C-MOS negative logic	L: (ON) : 0~0.5VDC	H: (OFF) : 4~5VDC	START/STOP input	L: START	H: STOP	Brake input	L: RUN	H: Instantaneous stop	Direction of Rotation input	L: CW	H: CCW	Speed setting method	L: Internal	H: External	Alarm reset	L: Reset	H: Normal
C-MOS negative logic	L: (ON) : 0~0.5VDC	H: (OFF) : 4~5VDC																	
START/STOP input	L: START	H: STOP																	
Brake input	L: RUN	H: Instantaneous stop																	
Direction of Rotation input	L: CW	H: CCW																	
Speed setting method	L: Internal	H: External																	
Alarm reset	L: Reset	H: Normal																	
Output Signals	Open collector output External use conditions 26.4VDC, 10mA Max. Speed Signal Output(SPEED OUT) 36P/R, Alarm Signal Output(ALARM OUT), Direction Signal Output(DIR OUT)																		
Protection Functions*1	When the following are activated, the alarm signal will be output and the motor will come to a natural stop <ul style="list-style-type: none"> <li>■ Overload Protection: Activated when a load exceeding the rated torque is applied to the motor for approximately 5 seconds or more.</li> <li>■ Out-of Phase Protection: Activated when the sensor wire inside the motor cable is disconnected.</li> <li>■ Overvoltage Protection: Activated when the voltage applied to the driver exceeds 24VDC by approximately 25% or more.</li> <li>■ Undervoltage Protection: Activated when the voltage applied to the driver fail at least 30% below 24VDC</li> <li>■ Over Speed Protection: Activated when the motor rotates at an abnormal speed above 3500 r/min</li> </ul>																		
Motor Insulation Class*2	Class B[266°F(130°C)]																		
Rating	Continuous																		

\*1 With the EXH Series the motor speed cannot be controlled in applications where the motor shaft is turned by the load, as in lowering operations. Also, the motor will stop naturally if the load exceeds the permissible load inertia or the overvoltage protection function is activated during load lowering operations.

### General Specifications

Item	Motor	Driver
Insulation Resistance	100MΩ or more when 500VDC megger is applied between the windings and the frame after continuous operation under normal ambient temperature and humidity.	100MΩ or more when 500VDC megger is applied between the power supply input and the frame after continuous operation under normal ambient temperature and humidity.
Dielectric Strength	Sufficient to withstand 0.5kVAC at 50Hz applied between the windings and the frame for 1minute after continuous operation under normal ambient temperature and humidity	Sufficient to withstand 0.5kVAC at 50Hz applied between the power supply input and the frame for 1minute after continuous operation under normal ambient temperature and humidity
Temperature Rise	108°F(60°C) or less measured by the thermocoupler method after the temperature of the coil has stabilized under normal operation at the rated voltage and frequency under ambient temperature and humidity, with a connected gearhead or equivalent heat radiation plate.*	
Ambient Temperature	32°F ~ 122°C(0°C ~ +50°C)(nonfreezing)	
Ambient Humidity	85% Maximum (noncondensing)	
Atmosphere	No corrosive gases or dust	
Degree of Protection	IP65(except for the mounting surface)	IP00

\* Size of heat radiation plate (Material: Aluminum)

# EXH Series



## Specifications

Model	Combination Type	EXH630-30BK-□	EXH850-30BK-□	EXH91A-30BK-□
	Round Shaft Type	EXH630-30BS	EXH850-30BS	EXH91A-30BS
Rated Output Power	W(HP)	30(1/25)	50(1/15)	100(1/8)
Power Source	Voltage	24VDC±10%		
	Rated Input Current A	2.1	3.1	6.0
	Maximum Input Current A	3.5	5.0	9.0
Rated Torque	oz-in (N · m)	17(0.12)	28(0.20)	56(0.40)
Starting Torque	oz-in (N · m)	21(0.15)	34(0.24)	71(0.50)
Permissible Load Inertia J*	oz · in <sup>2</sup> ( X10 <sup>-4</sup> kg · m <sup>2</sup> )	9.8(1.8)	18.1(3.3)	31(5.6)
Maximum Speed	r/min	3000		
Rated Speed	r/min	3000		
Variable Speed Range	r/min	100~3000(30:1)		
Speed Regulation	Load	±1%Max.(0~rated torque, at rated speed)		
	Voltage	±1%Max.(Power supply voltage ±10%, at rated speed with no load)		
	Temperature	±1%Max.(32°F~122°F[0°C~+50°C] at rated speed with no load)		

\* The permissible load inertia specified above is only applicable for round shaft type.

Permissible Load Inertia for Combination Type → Gearhead section

■ Enter the gear ratio in the box(□) with the model name.

■ The values for each item is for the motor only

Model	Combination Type	EXH630-30JK-□	EXH850-30JK-□	EXH91A-30JK-□
	Round Shaft Type	EXH630-30JS	EXH850-30JS	EXH91A-30JS
Rated Output Power	W(HP)	30(1/25)	50(1/15)	100(1/8)
Power Source	Voltage	1 ∅ 220VAC ± 10% , 50/60 Hz ± 5%		
	Rated Input Current A	0.65	0.95	1.6
	Maximum Input Current A	0.8	1.1	1.8
Rated Torque	oz-in (N · m)	17(0.12)	28(0.20)	56(0.40)
Starting Torque	oz-in (N · m)	21(0.15)	34(0.24)	71(0.50)
Permissible Load Inertia J*	oz · in <sup>2</sup> ( X10 <sup>-4</sup> kg · m <sup>2</sup> )	9.8(1.8)	18.1(3.3)	31(5.6)
Maximum Speed	r/min	3000		
Rated Speed	r/min	3000		
Variable Speed Range	r/min	100~3000(30:1)		
Speed Regulation	Load	±1%Max.(0~rated torque, at rated speed)		
	Voltage	±1%Max.(Power supply voltage ±10%, at rated speed with no load)		
	Temperature	±1%Max.(32°F~122°F[0°C~+50°C] at rated speed with no load)		

\* The permissible load inertia specified above is only applicable for round shaft type.

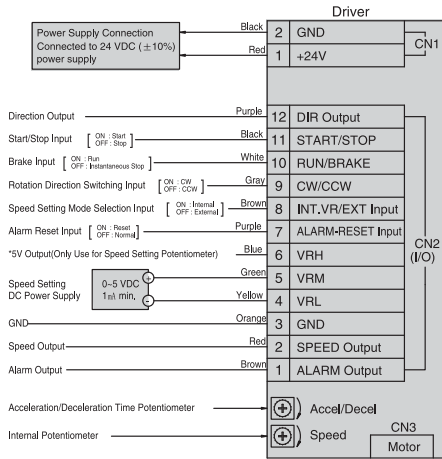
Permissible Load Inertia for Combination Type → Gearhead section

■ Enter the gear ratio in the box(□) with the model name.

■ The values for each item is for the motor only

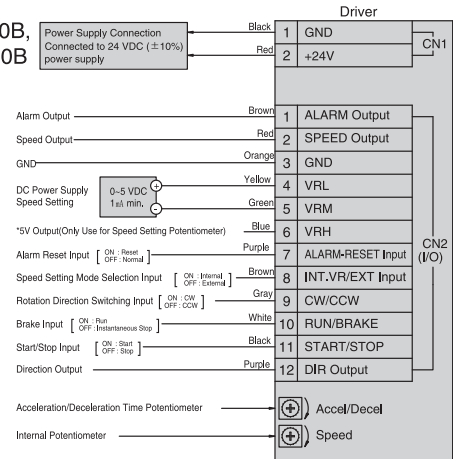
### Connection Operation

### Connection Diagrams



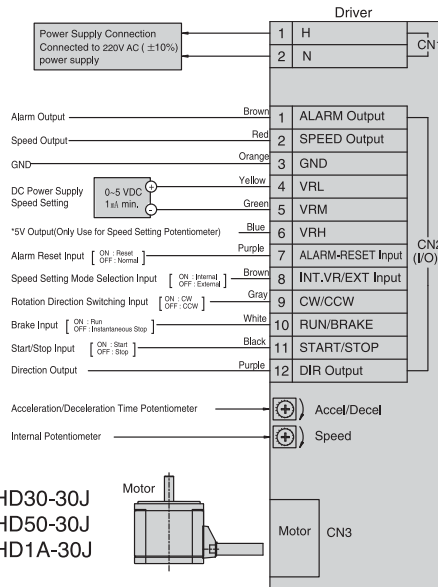
EXHD30-30B

EXHD50-30B,  
EXHD1A-30B

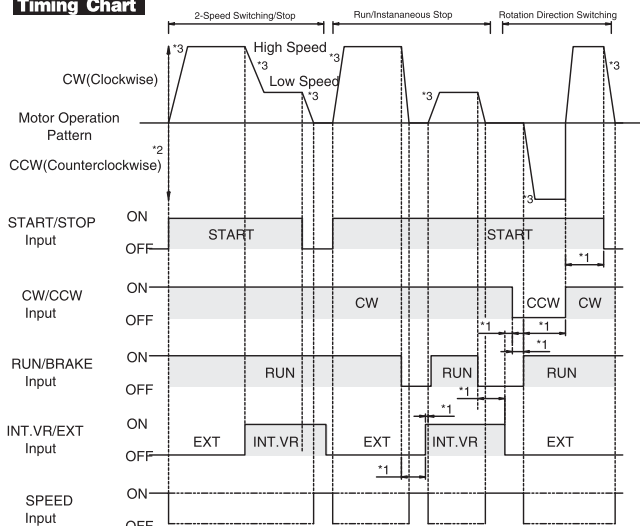


- Acceleration/deceleration of motor**  
 The motor starts slowly when it starts up, and stops slowly when it stops. possible to control acceleration/deceleration of motor by Accel/Decel VR. upon turning left VR , the speed goes up fast. when turning right VR, it goes up slowly. This slow start and slowdown time can be set within the range from 0.5 to 18 sec.(3000 r/min without load). But above time is subject to change as per load torque, running pattern, load inertia. Setting the accelerating /slowdown time.

EXHD30-30J  
EXHD50-30J  
EXHD1A-30J



### Timing Chart



- Run/stop, instantaneous stopping and rotation direction switching operations can all be controlled with the START/STOP, RUN/BRAKE and CW/CCW signals.
- If both the START/STOP signal and the RUN/BRAKE signal are set to ON(L level), the motor rotates. At this time, if the CW/CCW signal is set to ON(L level), then the motor rotates clockwise as seen from the motor shaft side; if the CW/CCW signal is set to OFF(H level), the motor rotates in the counterclockwise direction.
- If the RUN/BRAKE signal is set to OFF(H level) while the START/STOP signal is ON(L level), the motor stops instantaneously. If the START/STOP signal is set to OFF(H level) while the RUN/BRAKE signal is set to ON(L level), the motor stops naturally.
- Wait for 10ms before switching the other input signals.
- Do not switch different input signals simultaneously.

\*1. At least 10ms  
 \*2. The direction applies to the motor alone. The specific direction will vary depending on the gear  
 \*3. The motor will start/stop over the time set by the acceleration/deceleration time potentiometer

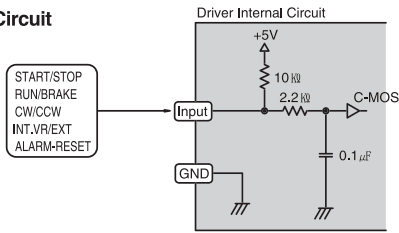


# EXH Series



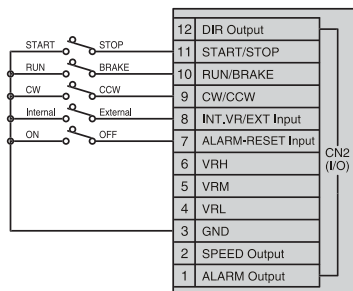
## Input Signal Circuit

### Input Circuit



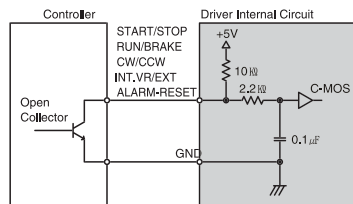
### Example of Input Circuit Connection

Control by Small Capacity Relay, Switch, or Similar Device

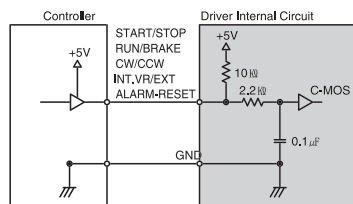


### Control by Controller

Transistor Output Type



C-MOS Output Type



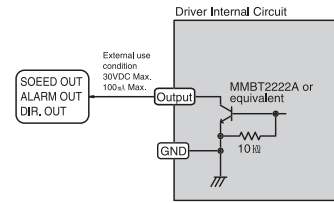
Notes :

Output signal is open collector output, so an external power supply (Vcc) is required.

Use a power supply of no more than 26.4VDC and connect a limit resistance (R) so that the output current does not exceed 10mA. When using neither the speed output function nor the alarm output function, this connection is not required.

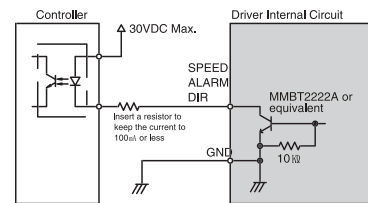
## Output Signal Circuit

### Output Circuit



### Example of Output Circuit Connection

#### Output Signal Connections

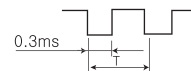


#### Speed Output

The system outputs pulse signals (with a width of 0.3ms) at a rate of 36 pulses per rotation of the motor output shaft, synchronized with the motor drive. You can measure the SPEED output frequency and calculate the motor speed.

$$\text{Motor speed (r/min)} = \frac{\text{Speed output frequency [Hz]}}{36} \times 60 [\text{r/min}]$$

$$\text{Speed output frequency [Hz]} = \frac{1}{T}$$



#### Direction Output

The Direction output is CW (Clockwise) at the ON (L level) and CCW (Counterclockwise) at the OFF (H level).

#### Alarm Output

The ALARM output is normally at the ON (L level) and switches to the OFF (H level) when there is an alarm.

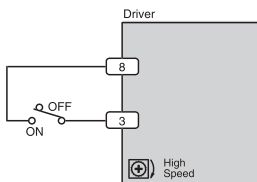
#### Alarm-Reset

When the motor is stopped, setting this signal to the ON (L level), then returning it to the OFF (H level) resets the alarm. Please return either the START/STOP input or the RUN/BRAKE input to the OFF (H level) before inputting the ALARM-RESET is not accepted if both ALARM-RESET. The ALARM-RESET is not accepted if both these signals are at the ON (L level).

## Speed Setting Method

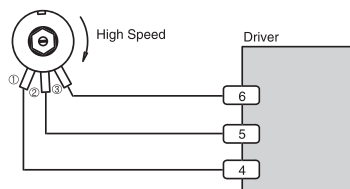
### by Internal Potentiometer

When INT. VR/EXT. Input is set to the ON (L level), the speed can be set with the internal speed potentiometer. There is no need for this connection when the internal potentiometer is not used.



### by External Potentiometer

When setting the motor speed setting from the driver, connect the optional potentiometer as follows.



### by External DC Voltage

When setting the motor speed with an external DC voltage, do so in the following manner.

