

# AC Speed Control Motors FE100/FE200

● Additional Information ●  
 Technical reference → Page G-1  
 Safety standards → Page H-2

The **FE100/FE200** is a speed controller using inverter technology that enables speed control to be set easily, with a built-in digital display.

The speed controller parameters have been set exclusively for Oriental Motor's three-phase motors, enabling the motor performance to be maximized by simply setting the output power.



● For detailed product safety standard information including standards, file number and certification body, please visit [www.orientalmotor.com](http://www.orientalmotor.com).



## Features

### ● Digital Display

The set speed is displayed digitally in frequency (Hz) or speed (r/min). The set speed of the gearhead output shaft can also be displayed. (The displayed value will be the set speed)



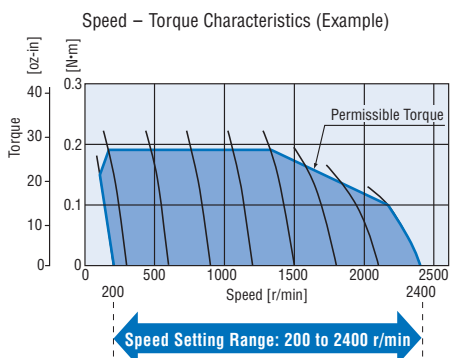
### ● Easy Operation

The speed can be set easily with the potentiometer on the speed controller front panel.



### ● Maximized Motor Performance

As the speed controller parameters have been set for motors in advance, the motor performance can be maximized at both low and high speeds. (Speed setting range: 200 to 2400 r/min)  
 Continuous operation is also possible within the permissible torque.



### ● Easy Setting

Easy setting by simply setting a switch in accordance with the motor output power. No complicated adjustment is required.

**FE100:** For output power of 6 W to 90 W (1/125 HP to 1/8 HP)  
**FE200:** For output power of 25 W to 200 W (1/30 HP to 1/4 HP)



**Motor Output Power Select Switch**  
 Remove the front panel to access the switch.

### ● Main Functions

- Individual acceleration/deceleration setting  
 Acceleration/deceleration time can be set between 0.1 and 30 seconds (at 80 Hz).
- Remote/local input switching  
 Control of operation, stopping and switching rotation direction can be performed using an external input signal.
- Speed setting using external DC voltage
- Carrier frequency switching
- Sink/source input switching
- Various protective functions
- The wiring length between the motor and speed controller can be extended to a maximum of 20 m (65.6 ft.) when an accessory connection cable is used.

## Applicable Motors

The **FE100/FE200** can be combined with 6 W to 200 W (1/125 HP to 1/4 HP) three-phase induction motors.

### Global Standard World K Series

This is a standard motor that conforms to major safety standards and supports global voltage specifications.



Output Power: 6 W (1/125 HP), 15 W (1/50 HP), 25 W (1/30 HP), 40 W (1/19 HP), 60 W (1/12 HP), 90 W (1/8 HP)

### Watertight, Dust-Resistant Motors FPW Series

IP67-compliant. Suitable for applications where the equipment comes in contact with water or needs to be washed with water.



Output Power: 25 W (1/30 HP), 40 W (1/19 HP), 60 W (1/12 HP), 90 W (1/8 HP)

### High Strength, Long Life, Low Noise V Series

The combination type comes with the motor and a high strength, long life, low noise gearhead pre-assembled.



Output Power: 25 W (1/30 HP), 40 W (1/19 HP), 60 W (1/12 HP), 90 W (1/8 HP)

### High-Output Power 200 W (1/4 HP) BH Series

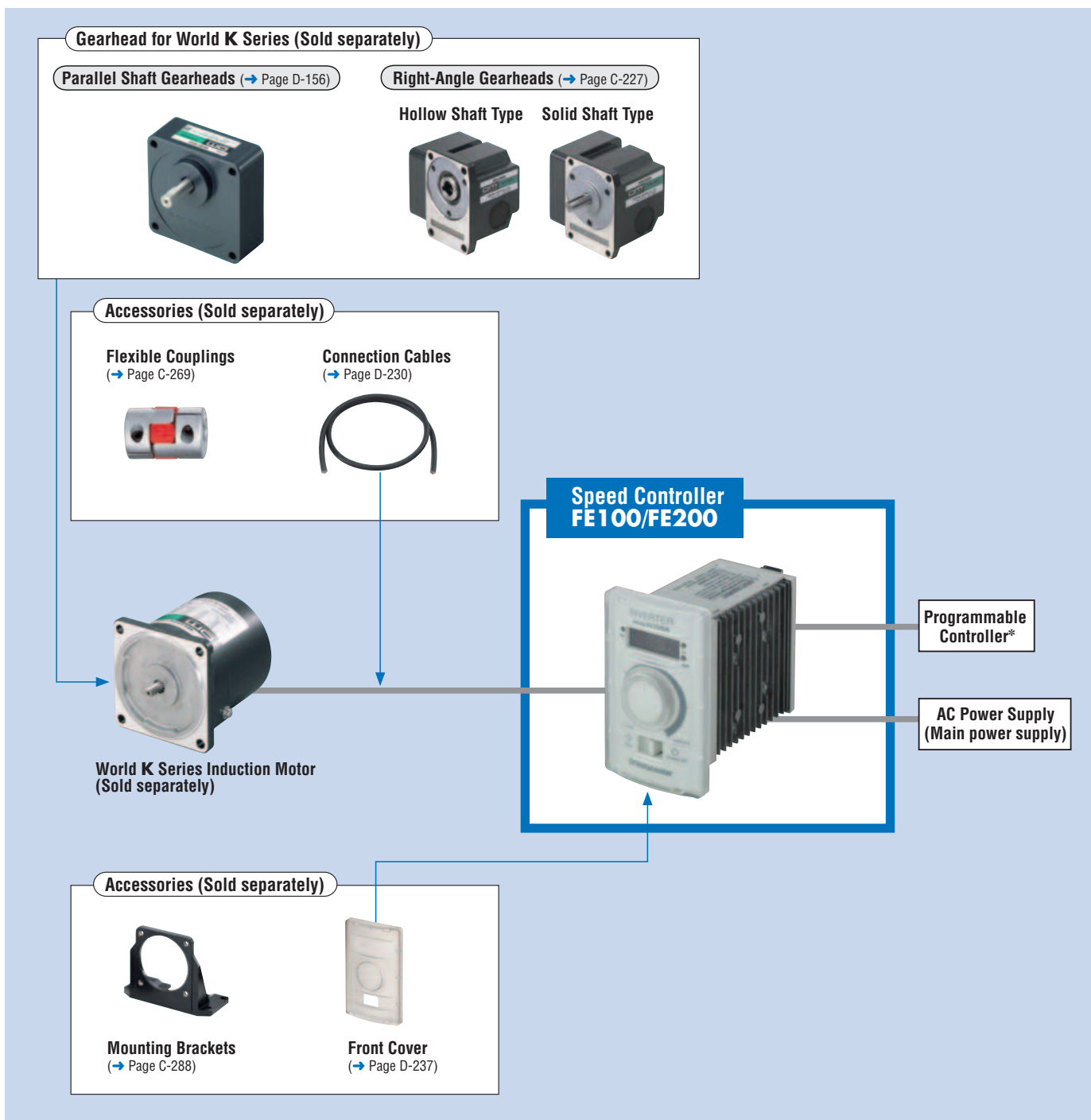
The **BH** Series achieves a high output of 200 W (1/4 HP) with a frame size of 104 mm (4.09 in.).



Output Power: 200 W (1/4 HP)

Introduction	
BX	
BLF	AC Input
BLE	Brushless Motors
BLU	
BLH	DC Input
BLV	
BHF	
FE100/ FE200	AC Speed Control Motors
ES01/ ES02	
US	
Accessories	
Installation	

System Configuration



● Example of System Configuration

Speed Controller	Sold Separately		Sold Separately			
	World K Series (Pinion shaft)	Long Life, Low Noise Gearhead	Connection Cable [1 m (3.3 ft.)]	Front Cover	Mounting Bracket	Flexible Coupling
<b>FE100A</b>	<b>4IK25GN-SW2</b>	<b>4GN25SA</b>	<b>CC01AC04</b>	<b>PAFC01</b>	<b>SOL4U10</b>	<b>MCL30F06F06</b>

● Gearheads cannot be combined with round shaft type motors.

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

\* Not supplied

## Product Number Code

● Speed Controller

### FE 100 A

① ②

①	Maximum Output Power of Applicable Motor	<b>100</b> : 100 W (1/8 HP) <b>200</b> : 200 W (1/4 HP)
②	Power Supply Voltage	<b>A</b> : Single-Phase 100-120 VAC <b>C</b> : Single-Phase 200-240 VAC <b>S</b> : Three-Phase 200-240 VAC

## Product Line

● Speed Controller (RoHS)

Maximum Output Power of Applicable Motor	Power Supply Voltage	Model
100 W (1/8 HP)	Single-Phase 100-120 VAC	<b>FE100A</b>
	Single-Phase 200-240 VAC	<b>FE100C</b>
	Three-Phase 200-240 VAC	<b>FE100S</b>
200 W (1/4 HP)	Single-Phase 100-120 VAC	<b>FE200A</b>
	Single-Phase 200-240 VAC	<b>FE200C</b>
	Three-Phase 200-240 VAC	<b>FE200S</b>

The following items are included in each product.  
Speed Controller, Operating Manual

## List of Applicable Motors (RoHS)

Speed Controller Model	Applicable Motor				Page					
	Series	Type	Motor Model		Product Line	General Specifications	Dimensions			
			Pinion Shaft Type*	Round Shaft Type			Pinion Shaft Type	Round Shaft Type		
<b>FE100A</b> <b>FE100C</b> <b>FE100S</b>	<b>World K Series</b>	Lead Wire	<b>2IK6GN-SW2</b>	<b>2IK6A-SW2</b>	C-30	C-25	C-31	C-32		
			<b>3IK15GN-SW2</b>	<b>3IK15A-SW2</b>	C-33		C-34	C-35		
			<b>4IK25GN-SW2</b>	<b>4IK25A-SW2</b>	C-36		C-38	C-38		
			<b>5IK40GN-SW2</b>	<b>5IK40A-SW2</b>	C-41		C-42	C-43		
			<b>5IK60GE-SW2</b>	<b>5IK60A-SW2</b>	C-46		C-47	C-48		
			<b>5IK90GE-SW2</b>	<b>5IK90A-SW2</b>	C-52		C-53	C-54		
		Terminal Box	<b>4IK25GN-SW2T</b>	<b>4IK25A-SW2T</b>	C-36		C-38	C-38		
			<b>5IK40GN-SW2T</b>	<b>5IK40A-SW2T</b>	C-41		C-43	C-43		
			<b>5IK60GE-SW2T</b>	<b>5IK60A-SW2T</b>	C-46		C-48	C-48		
			<b>5IK90GE-SW2T</b>	<b>5IK90A-SW2T</b>	C-52		C-54	C-54		
		Conduit Box	<b>4IK25GN-SH</b>	<b>4IK25AA-SH</b>	C-36		C-39	C-39		
			<b>5IK40GN-SH</b>	<b>5IK40AA-SH</b>	C-41		C-44	C-44		
			<b>5IK60GE-SH</b>	<b>5IK60A-SH</b>	C-46		C-49	C-50		
			<b>5IK90GE-SH</b>	<b>5IK90A-SH</b>	C-52		C-55	C-56		
		<b>V Series</b>	Lead Wire	<b>VHI425S2-□</b>	-		C-154	C-157	C-161	-
				<b>VHI540S2-□</b>					C-162	
				<b>VHI560S2-□</b>					C-163	
				<b>VHI590S2-□</b>					C-164	
	Terminal Box		<b>VHI425S2T-□</b>	-	C-154	C-161				
			<b>VHI540S2T-□</b>			C-162				
			<b>VHI560S2T-□</b>			C-163				
			<b>VHI590S2T-□</b>			C-164				
			<b>FPW425S2-□</b>			-	C-206		C-210	-
			<b>FPW540S2-□</b>						C-210	
<b>FPW560S2-□</b>	C-211									
<b>FPW690S2-□</b>	C-211									
<b>FE200A</b> <b>FE200C</b> <b>FE200S</b>	<b>BH Series</b>	Cable	<b>BHI62S-□RH</b>	<b>BHI62S-A</b>	C-58 C-59	C-25	C-60	C-65		
			<b>BHI62S-□RA</b>				C-61			
			<b>BHI62S-□</b>				C-64			
		Terminal Box	<b>BHI62ST-□RH</b>	<b>BHI62ST-A</b>			C-62			
	<b>BHI62ST-□RA</b>		C-63							
	<b>BHI62ST-□</b>		C-64							

\* The **V Series** and **BH Series** are combination types, and the **FPW Series** is geared type.

● Enter the gear ratio in the box (□) within the model name.

Specifications of Motor and Speed Controller Combinations

(ZP): Impedance protected. (TP): Contains a built-in thermal protector (automatic return type).

● The set speed displayed on the product is calculated based on the following formula: Set frequency [Hz]×30 = Set speed [r/min]  
The actual speed varies depending on the load condition. Check the Speed – Torque Characteristics on pages D-186 to D-187.

● World K Series/Speed Controller (RoHS)

Motor Model Upper Model Name: Pinion Shaft Type Lower Model Name ( ): Round Shaft Type			Applicable Speed Controller	Power Supply Input			Output Power W (HP)	Permissible Torque		Speed Setting Range Hz (r/min)
Lead Wire Type	Terminal Box Type	Conduit Box Type		Voltage VAC	Frequency Hz	Current A		Set Frequency Hz (Set Speed r/min)	Torque mN·m (oz·in)	
(ZP) 2IK6GN-SW2 (2IK6A-SW2)	-	-	FE100A	Single-Phase 100-120 ±10%	50/60 ±5%	0.68	6 (1/125)	6.6 (200) 15~50 (450~1500) 80 (2400)	42 (5.9) 49 (6.9) 28 (3.9)	6.6~80 (200~2400)
			FE100C	Single-Phase 200-240 ±10%		0.42				
			FE100S	Three-Phase 200-240 ±10%		0.23				
(TP) 3IK15GN-SW2 (3IK15A-SW2)	-	-	FE100A	Single-Phase 100-120 ±10%		1.1	15 (1/50)	6.6 (200) 20~60 (600~1800) 80 (2400)	60 (8.5) 110 (15.6) 70 (9.9)	
			FE100C	Single-Phase 200-240 ±10%		0.63				
			FE100S	Three-Phase 200-240 ±10%		0.33				
(TP) 4IK25GN-SW2 (4IK25A-SW2)	4IK25GN-SW2T (4IK25A-SW2T)	4IK25GN-SH (4IK25AA-SH)	FE100A	Single-Phase 100-120 ±10%		1.3	25 (1/30)	6.6 (200) 10~50 (300~1500) 80 (2400)	150 (21) 190 (26) 100 (14.2)	
			FE100C	Single-Phase 200-240 ±10%		0.77				
			FE100S	Three-Phase 200-240 ±10%		0.43				
(TP) 5IK40GN-SW2 (5IK40A-SW2)	5IK40GN-SW2T (5IK40A-SW2T)	5IK40GN-SH (5IK40AA-SH)	FE100A	Single-Phase 100-120 ±10%		1.7	40 (1/19)	6.6~50 (200~1500) 80 (2400)	300 (42) 160 (22)	
			FE100C	Single-Phase 200-240 ±10%		0.96				
			FE100S	Three-Phase 200-240 ±10%		0.53				
(TP) 5IK60GE-SW2 (5IK60A-SW2)	5IK60GE-SW2T (5IK60A-SW2T)	5IK60GE-SH (5IK60A-SH)	FE100A	Single-Phase 100-120 ±10%	2.3	60 (1/12)	6.6 (200) 10~50 (300~1500) 80 (2400)	310 (44) 450 (63) 260 (36)		
			FE100C	Single-Phase 200-240 ±10%	1.3					
			FE100S	Three-Phase 200-240 ±10%	0.72					
(TP) 5IK90GE-SW2 (5IK90A-SW2)	5IK90GE-SW2T (5IK90A-SW2T)	5IK90GE-SH (5IK90A-SH)	FE100A	Single-Phase 100-120 ±10%	2.7	80 (1/9)	6.6 (200) 10~60 (300~1800) 80 (2400)	450 (63) 500 (71) 360 (51)		
			FE100C	Single-Phase 200-240 ±10%	1.6					
			FE100S	Three-Phase 200-240 ±10%	0.85					

● V Series/Speed Controller (RoHS)

Motor Model Upper Model Name: Combination Type Lower Model Name ( ): Pinion Shaft Type		Applicable Speed Controller	Power Supply Input			Output Power W (HP)	Permissible Torque		Speed Setting Range Hz (r/min)
Lead Wire Type	Terminal Box Type		Voltage VAC	Frequency Hz	Current A		Set Frequency Hz (Set Speed r/min)	Torque mN·m (oz·in)	
(TP) VHI425S2-□ (VHI425S2-GV)	VHI425S2T-□ (VHI425S2T-GV)	FE100A	Single-Phase 100-120 ±10%	50/60 ±5%	1.3	25 (1/30)	6.6 (200) 10~50 (300~1500) 80 (2400)	150 (21) 190 (26) 100 (14.2)	
		FE100C	Single-Phase 200-240 ±10%		0.77				
		FE100S	Three-Phase 200-240 ±10%		0.43				
(TP) VHI540S2-□ (VHI540S2-GVH)	VHI540S2T-□ (VHI540S2T-GVH)	FE100A	Single-Phase 100-120 ±10%		1.7	40 (1/19)	6.6~50 (200~1500) 80 (2400)	300 (42) 160 (22)	
		FE100C	Single-Phase 200-240 ±10%		0.96				
		FE100S	Three-Phase 200-240 ±10%		0.53				
(TP) VHI560S2-□ (VHI560S2-GVH)	VHI560S2T-□ (VHI560S2T-GVH)	FE100A	Single-Phase 100-120 ±10%		2.3	60 (1/12)	6.6 (200) 10~50 (300~1500) 80 (2400)	310 (44) 450 (63) 260 (36)	
		FE100C	Single-Phase 200-240 ±10%		1.3				
		FE100S	Three-Phase 200-240 ±10%		0.72				
(TP) VHI590S2-□ (VHI590S2-GVR)	VHI590S2T-□ (VHI590S2T-GVR)	FE100A	Single-Phase 100-120 ±10%		2.7	80 (1/9)	6.6 (200) 10~60 (300~1800) 80 (2400)	450 (63) 500 (71) 360 (51)	
		FE100C	Single-Phase 200-240 ±10%		1.6				
		FE100S	Three-Phase 200-240 ±10%		0.85				

● FPW Series/Speed Controller (RoHS)

Motor Model Geared Motor	Applicable Speed Controller	Power Supply Input			Output Power W (HP)	Permissible Torque		Speed Setting Range Hz (r/min)
		Voltage VAC	Frequency Hz	Current A		Set Frequency Hz (Set Speed r/min)	Torque mN·m (oz·in)	
(TP) FPW425S2-□	FE100A	Single-Phase 100-120 ±10%	50/60 ±5%	1.3	25 (1/30)	6.6 (200) 10~50 (300~1500) 80 (2400)	150 (21) 190 (26) 100 (14.2)	
	FE100C	Single-Phase 200-240 ±10%		0.77				
	FE100S	Three-Phase 200-240 ±10%		0.43				
(TP) FPW540S2-□	FE100A	Single-Phase 100-120 ±10%		1.7	40 (1/19)	6.6~50 (200~1500) 80 (2400)	300 (42) 160 (22)	
	FE100C	Single-Phase 200-240 ±10%		0.96				
	FE100S	Three-Phase 200-240 ±10%		0.53				
(TP) FPW560S2-□	FE100A	Single-Phase 100-120 ±10%		2.3	60 (1/12)	6.6 (200) 10~50 (300~1500) 80 (2400)	380 (53) 450 (63) 260 (36)	
	FE100C	Single-Phase 200-240 ±10%		1.3				
	FE100S	Three-Phase 200-240 ±10%		0.71				
(TP) FPW690S2-□	FE100A	Single-Phase 100-120 ±10%		3.0	90 (1/8)	6.6~50 (200~1500) 80 (2400)	680 (96) 360 (51)	
	FE100C	Single-Phase 200-240 ±10%		1.8				
	FE100S	Three-Phase 200-240 ±10%		0.92				

## ● BH Series/Speed Controller (RoHS)

Motor Model Combination Type Model Name ( ) : Round Shaft Type		Applicable Speed Controller	Power Supply Input			Output Power W (HP)	Permissible Torque		Speed Setting Range Hz (r/min)
Cable Type	Terminal Box Type		Voltage VAC	Frequency Hz	Current A		Set Frequency Hz (Set Speed r/min)	Torque N·m (oz·in)	
(TP)	BHI62S-□RH	BHI62ST-□RH	Single-Phase 100-120 ±10%	50/60 ±5%	4.9	170 (1/4)	6.6 (200) 20~40 (600~1200) 80 (2400)	1.29 (183) 1.49 (210) 0.70 (99)	6.6~80 (200~2400)
	BHI62S-□RA	BHI62ST-□RA			2.8				
	(BHI62S-A)	(BHI62ST-A)	1.5						
		FE200A	Single-Phase 200-240 ±10%						
		FE200C	Single-Phase 200-240 ±10%						
		FE200S	Three-Phase 200-240 ±10%						

● Enter the gear ratio in the box (□) within the model name.

## ■ Common Specifications

### ● Speed Controller (RoHS)



Model		FE100A	FE100C	FE100S	FE200A	FE200C	FE200S
Maximum Output Power of Applicable Motor	W (HP)	100 (1/8)			200 (1/4)		
Output Power	Rated Output Voltage	VAC Three-Phase 200 (varies depending on the power supply voltage and load condition)					
	Rated Output Current	0.7			1.4		
Power Supply Input	Rated Voltage	VAC Single-Phase 100-120 ±10%	Single-Phase 200-240 ±10%	Three-Phase 200-240 ±10%	Single-Phase 100-120 ±10%	Single-Phase 200-240 ±10%	Three-Phase 200-240 ±10%
	Rated Frequency	Hz 50/60 ±5%					
Control Characteristics/ Performance	Control Method	Sinusoidal PWM method (V/f control)					
	Speed Setting Range	6.6~80 Hz (200~2400 r/min)					
	Acceleration/Deceleration Time	0.1~30 s (at 80 Hz)					
	Speed Setting Methods	Speed potentiometer on the speed controller front panel/DC voltage input (0~10 VDC)					
	Voltage/Frequency Characteristics	Selectable according to the motor output power using rotary switches					
Functions	Input Signals	Photocoupler input: Input resistance 3.3 kΩ Driven by +15 V internal power supply RUN/STOP, FWD/REV, Alarm reset					
	Output Signals	Open-collector output: 26.4 VDC, 10 mA max. Running output, Alarm output					
	Set Speed Display	The set speed of motor*1 is displayed.					
	Remote/Local Switching RUN/STOP, FWD/REV	Operation using the controller's switch or external input signals can be selected. (Factory setting: Local)					
	Carrier Frequency Switching	The carrier frequency can be switched if you want to reduce leakage current from the cable connecting the speed controller and motor. (Factory setting: 15 kHz)					
	Sink/Source Switching	Sink input (0 V, common) or source input (24 V, common) can be selected. (Factory setting: Sink)					
	Frequency/Speed Display Switching	The speed display can be switched to the set frequency or set speed. (Factory setting: Frequency)					
	Switching to Speed Display Based on Gear Ratio*2	The set speed shown on the speed display can be changed to the speed based on the gear ratio. One of 96 levels can be set using two rotary switches. (Factory setting: Gear ratio of 1:1)					
Protective Functions	When the following are activated, the motor will be stopped by means of base blocking action: <ul style="list-style-type: none"> <li>Overcurrent protection: The speed controller output current exceeded approximately 200% of the rated output current.</li> <li>Circuit overheat protection: The internal temperature of the speed controller rose beyond the permissible value.</li> <li>Overvoltage protection: The internal voltage of the speed controller exceeded the permissible value.</li> <li>Undervoltage protection: The internal voltage of the speed controller dropped below the permissible value.</li> <li>Motor overheat protection: The built-in thermal protector of the motor was activated, or the wiring between the motor and speed controller has a missing phase*3.</li> <li>Circuit error: An error occurred in the built-in CPU of the speed controller etc.</li> <li>Overload protection: The speed controller output current has remained above approximately 150% of the rated output current of the speed controller for approximately 1 minute.</li> <li>Setting error: The output select switch or gear ratio setting switch was set to a value outside the setting range.</li> <li>Ground fault protection: Ground fault occurred on the output side of the speed controller, and ground fault current flowed.</li> </ul>						
Maximum Cable Extension Distance	20 m (65.6 ft.) max. (when the connection cable <b>CC20AC04</b> is used)						
Cooling Condition	Natural ventilation						
Display	7-Segment Display	Set speed, Alarm code					
	LED Indicators	POWER, Unit of set speed display (r/min, Hz)					
Mass	kg (lb.)	0.4 (0.88)			0.5 (1.1)		

\*1 Different from the actual speed of the motor shaft.

\*2 This function is disabled in the frequency display mode.

\*3 Excluding motors with output power of 6 W (1/125 HP).

General Specifications

Speed Controller

Item	Specifications	
Insulation Resistance	100 MΩ or more when 500 VDC megger is applied between the main circuit terminal and ground terminal (control circuit terminal) after continuous operation under normal ambient temperature and humidity.	
Dielectric Strength	Sufficient to withstand 1.85 kVAC at 50 Hz or 60 Hz applied between the main circuit terminal and ground terminal (control circuit terminal) for 1 minute after continuous operation under normal ambient temperature and humidity.	
Operating Environment	Ambient Temperature	-10~+50°C (+14~+122°F) (non-freezing)
	Ambient Humidity	95% or less (non-condensing)
	Atmosphere	No corrosive gases or dust
Degree of Protection	IP10 (IP20 for speed controller front panel)	

Note

Do not measure insulation resistance or perform the dielectric strength test while the motor and speed controller are connected.

Gearmotor – Torque Table

World K Series/Speed Controller

Unit = N·m (lb·in)

Model Motor/Gearhead	Gear Ratio Set Frequency Hz (Set Speed r/min)	3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
		<b>2IK6GN-SW2</b> / <b>2GN□SA</b>	6.6 (200)	0.10 (0.88)	0.12 (1.06)	0.17 (1.5)	0.20 (1.77)	0.26 (2.3)	0.31 (2.7)	0.43 (3.8)	0.51 (4.5)	0.61 (5.3)	0.77 (6.8)	0.92 (8.1)	1.1 (9.7)	1.4 (12.3)	1.7 (15.0)	2.1 (18.5)	2.5 (22)	2.8 (24)	3 (26)
	15~50 (450~1500)	0.12 (1.06)	0.14 (1.23)	0.20 (1.77)	0.24 (2.1)	0.30 (2.6)	0.36 (3.1)	0.50 (4.4)	0.60 (5.3)	0.71 (6.2)	0.89 (7.8)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	1.9 (16.8)	2.4 (21)	2.9 (25)	3 (26)	3 (26)	3 (26)	3 (26)
	80 (2400)	0.068 (0.6)	0.082 (0.72)	0.11 (0.97)	0.14 (1.23)	0.17 (1.5)	0.20 (1.77)	0.28 (2.4)	0.34 (3.0)	0.41 (3.6)	0.51 (4.5)	0.61 (5.3)	0.74 (6.5)	0.92 (8.1)	1.1 (9.7)	1.4 (12.3)	1.7 (15.0)	1.8 (15.9)	2.2 (19.4)	2.8 (24)	3 (26)
<b>3IK15GN-SW2</b> / <b>3GN□SA</b>	6.6 (200)	0.15 (1.32)	0.17 (1.50)	0.24 (2.1)	0.29 (2.5)	0.36 (3.1)	0.44 (3.8)	0.61 (5.3)	0.73 (6.4)	0.87 (7.6)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	2.0 (17.7)	2.4 (21)	3.0 (26)	3.6 (31)	4.0 (35)	4.8 (42)	5 (44)	5 (44)
	20~60 (600~1800)	0.27 (2.3)	0.32 (2.8)	0.45 (3.9)	0.53 (4.6)	0.67 (5.9)	0.80 (7.0)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	2.0 (17.7)	2.4 (21)	2.9 (25)	3.6 (31)	4.4 (38)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)	5 (44)
	80 (2400)	0.17 (1.50)	0.20 (1.77)	0.28 (2.4)	0.34 (3.0)	0.43 (3.8)	0.51 (4.5)	0.71 (6.2)	0.85 (7.5)	1.0 (8.8)	1.3 (11.5)	1.5 (13.2)	1.8 (15.9)	2.3 (20)	2.8 (24)	3.5 (30)	4.2 (37)	4.6 (40)	5 (44)	5 (44)	5 (44)
<b>4IK25GN-SW2</b> <b>4IK25GN-SW2T</b> <b>4IK25GN-SH</b> / <b>4GN□SA</b>	6.6 (200)	0.36 (3.1)	0.44 (3.8)	0.61 (5.3)	0.73 (6.4)	0.91 (8.0)	1.1 (9.7)	1.5 (13.2)	1.8 (15.9)	2.2 (19.4)	2.7 (23)	3.3 (29)	3.9 (34)	5.0 (44)	5.9 (52)	7.4 (65)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)
	10~50 (300~1500)	0.46 (4.0)	0.55 (4.8)	0.77 (6.8)	0.92 (8.1)	1.2 (10.6)	1.4 (12.3)	1.9 (16.8)	2.3 (20)	2.8 (24)	3.5 (30)	4.2 (37)	5.0 (44)	6.3 (55)	7.5 (66)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)
	80 (2400)	0.24 (2.1)	0.29 (2.5)	0.41 (3.6)	0.49 (4.3)	0.61 (5.3)	0.73 (6.4)	1.0 (8.8)	1.2 (10.6)	1.5 (13.2)	1.8 (15.9)	2.2 (19.4)	2.6 (23)	3.3 (29)	4.0 (35)	5.0 (44)	5.9 (52)	6.6 (58)	7.9 (69)	8 (70)	8 (70)
<b>5IK40GN-SW2</b> <b>5IK40GN-SW2T</b> <b>5IK40GN-SH</b> / <b>5GN□SA</b>	6.6~50 (200~1500)	0.73 (6.4)	0.87 (7.6)	1.2 (10.6)	1.5 (13.2)	1.8 (15.9)	2.2 (19.4)	3.0 (26)	3.6 (31)	4.4 (38)	5.5 (48)	6.6 (58)	7.9 (69)	9.9 (87)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)	10 (88)
	80 (2400)	0.39 (3.4)	0.47 (4.1)	0.65 (5.7)	0.78 (6.9)	0.97 (8.5)	1.2 (10.6)	1.6 (14.1)	1.9 (16.8)	2.3 (20)	2.9 (25)	3.5 (30)	4.2 (37)	5.3 (46)	6.3 (55)	7.9 (69)	9.5 (84)	10 (88)	10 (88)	10 (88)	10 (88)
<b>5IK60GE-SW2</b> <b>5IK60GE-SW2T</b> <b>5IK60GE-SH</b> / <b>5GE□SA</b>	6.6 (200)	0.75 (6.6)	0.90 (7.9)	1.3 (11.5)	1.5 (13.2)	1.9 (16.8)	2.3 (20)	2.8 (24)	3.4 (30)	4.1 (36)	5.1 (45)	6.1 (53)	7.4 (65)	10.2 (90)	12.3 (108)	13.7 (121)	16.5 (146)	18.3 (161)	20 (177)	20 (177)	20 (177)
	10~50 (300~1500)	1.1 (9.7)	1.3 (11.5)	1.8 (15.9)	2.2 (19.4)	2.7 (23)	3.3 (29)	4.1 (36)	4.9 (43)	5.9 (52)	7.4 (65)	8.9 (78)	10.7 (94)	14.9 (131)	17.8 (157)	19.9 (176)	20 (177)	20 (177)	20 (177)	20 (177)	20 (177)
	80 (2400)	0.63 (5.5)	0.76 (6.7)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	1.9 (16.8)	2.4 (21)	2.8 (24)	3.4 (30)	4.3 (38)	5.1 (45)	6.2 (54)	8.6 (76)	10.3 (91)	11.5 (101)	13.8 (122)	15.3 (135)	18.4 (162)	20 (177)	20 (177)
<b>5IK90GE-SW2</b> <b>5IK90GE-SW2T</b> <b>5IK90GE-SH</b> / <b>5GE□SA</b>	6.6 (200)	1.1 (9.7)	1.3 (11.5)	1.8 (15.9)	2.2 (19.4)	2.7 (23)	3.3 (29)	4.1 (36)	4.9 (43)	5.9 (52)	7.4 (65)	8.9 (78)	10.7 (94)	14.9 (131)	17.8 (157)	19.9 (176)	20 (177)	20 (177)	20 (177)	20 (177)	20 (177)
	10~60 (300~1800)	1.2 (10.6)	1.5 (13.2)	2.0 (17.7)	2.4 (21)	3.0 (26)	3.6 (31)	4.6 (40)	5.5 (48)	6.6 (58)	8.3 (73)	9.9 (87)	11.9 (105)	16.5 (146)	19.8 (175)	20 (177)	20 (177)	20 (177)	20 (177)	20 (177)	20 (177)
	80 (2400)	0.87 (7.6)	1.0 (8.8)	1.5 (13.2)	1.7 (15.0)	2.2 (19.4)	2.6 (23)	3.3 (29)	3.9 (34)	4.7 (41)	5.9 (52)	7.1 (62)	8.6 (76)	11.9 (105)	14.3 (126)	15.9 (140)	19.1 (169)	20 (177)	20 (177)	20 (177)	20 (177)

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

The set speed indicates the motor's synchronous speed. The actual speed varies depending on the load condition. Check the Speed – Torque Characteristics on pages D-186 to D-187.

A colored background (□) indicates gear shaft rotation in the same direction as the motor shaft, while the others rotate in the opposite direction.

# Brushless Motors/AC Speed Control Motors

## ● V Series/Speed Controller

Unit = N·m (lb·in)

Combination Type	Model	Motor/Gearhead	Gear Ratio	Set Frequency Hz (Set Speed r/min)																						
					5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180	250	300	360	
VHI425S2-□ VHI425S2T-□	VHI425S2-GV VHI425S2T-GV /GV4G□		6.6 (200)	0.68 (6.0)	0.81 (7.1)	1.0 (8.8)	1.2 (10.6)	1.7 (15.0)	2.0 (17.7)	2.4 (21)	3.4 (30)	3.9 (34)	4.6 (40)	6.5 (57)	7.7 (68)	9.7 (85)	11.6 (102)	12.9 (114)	15.5 (137)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)		
			10~50 (300~1500)	0.86 (7.6)	1.0 (8.8)	1.3 (11.5)	1.5 (13.2)	2.1 (18.5)	2.6 (23)	3.1 (27)	4.3 (38)	4.9 (43)	5.9 (52)	8.2 (72)	9.8 (86)	12.3 (108)	14.7 (130)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)
			80 (2400)	0.45 (3.9)	0.54 (4.7)	0.68 (6.0)	0.81 (7.1)	1.1 (9.7)	1.4 (12.3)	1.6 (14.1)	2.3 (20)	2.6 (23)	3.1 (27)	4.3 (38)	5.2 (46)	6.5 (57)	7.7 (68)	8.6 (76)	10.3 (91)	12.2 (107)	14.6 (129)	16 (141)	16 (141)	16 (141)	16 (141)	16 (141)
VHI540S2-□ VHI540S2T-□	VHI540S2-GVH VHI540S2T-GVH /GVH5G□		6.6~50 (200~1500)	1.4 (12.3)	1.6 (14.1)	2.0 (17.7)	2.4 (21)	3.4 (30)	4.1 (36)	4.9 (43)	6.5 (57)	7.7 (68)	9.3 (82)	12.9 (114)	15.5 (137)	19.4 (171)	23.2 (200)	25.8 (220)	29.2 (250)	30 (260)	30 (260)	30 (260)	30 (260)	—		
			80 (2400)	0.72 (6.3)	0.86 (7.6)	1.1 (9.7)	1.3 (11.5)	1.8 (15.9)	2.2 (19.4)	2.6 (23)	3.4 (30)	4.1 (36)	5.0 (44)	6.9 (61)	8.3 (73)	10.3 (91)	12.4 (109)	13.8 (122)	15.6 (138)	19.4 (171)	23.3 (200)	30 (260)	30 (260)	30 (260)	—	
VHI560S2-□ VHI560S2T-□	VHI560S2-GVH VHI560S2T-GVH /GVH5G□		6.6 (200)	1.4 (12.3)	1.7 (15.0)	2.1 (18.5)	2.5 (22)	3.5 (30)	4.2 (37)	5.0 (44)	6.7 (59)	8.0 (70)	9.6 (84)	13.3 (117)	16.0 (141)	20.0 (177)	24.0 (210)	26.7 (230)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	—		
			10~50 (300~1500)	2.0 (17.7)	2.4 (21)	3.0 (26)	3.6 (31)	5.1 (45)	6.1 (53)	7.3 (64)	9.7 (85)	11.6 (102)	13.9 (123)	19.4 (171)	23.2 (200)	27.3 (250)	32.8 (260)	36.5 (300)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	—		
			80 (2400)	1.2 (10.6)	1.4 (12.3)	1.8 (15.9)	2.1 (18.5)	2.9 (25)	3.5 (30)	4.2 (37)	5.6 (49)	6.7 (59)	8.0 (70)	11.2 (99)	13.4 (118)	16.8 (148)	20.1 (177)	22.4 (198)	25.3 (220)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	—	
VHI590S2-□ VHI590S2T-□	VHI590S2-GVR VHI590S2T-GVR /GVR5G□		6.6 (200)	2.0 (17.7)	2.4 (21)	3.0 (26)	3.6 (31)	5.1 (45)	6.1 (53)	7.3 (64)	9.7 (85)	11.6 (102)	13.9 (123)	19.4 (171)	23.2 (200)	27.3 (250)	32.8 (300)	36.5 (350)	40 (350)	40 (350)	40 (350)	40 (350)	—	—		
			10~60 (300~1800)	2.3 (20)	2.7 (23)	3.4 (30)	4.1 (36)	5.6 (49)	6.8 (60)	7.7 (68)	10.8 (95)	12.9 (114)	15.5 (137)	21.0 (190)	25.8 (220)	30.4 (260)	36.5 (300)	40 (350)	40 (350)	40 (350)	40 (350)	—	—	—		
			80 (2400)	1.6 (14.1)	1.9 (16.8)	2.4 (21)	2.9 (25)	4.1 (36)	4.9 (43)	6.0 (53)	7.3 (64)	9.7 (85)	11.6 (102)	15.5 (137)	18.6 (164)	21.9 (193)	26.2 (230)	35.0 (300)	40 (350)	40 (350)	40 (350)	—	—	—		

## ● FPW Series/Speed Controller

Unit = N·m (lb·in)

Model Geared Motor	Gear Ratio	Set Frequency Hz (Set Speed r/min)																					
			3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180	
FPW425S2-□		6.6 (200)	0.36 (3.1)	0.44 (3.8)	0.61 (5.3)	0.73 (6.4)	0.91 (8.0)	1.1 (9.7)	1.5 (13.2)	1.8 (15.9)	2.2 (19.4)	2.7 (23)	3.3 (29)	3.9 (34)	5.0 (44)	5.9 (52)	7.4 (65)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)
		10~50 (300~1500)	0.46 (4.0)	0.55 (4.8)	0.77 (6.8)	0.92 (8.1)	1.2 (10.6)	1.4 (12.3)	1.9 (16.8)	2.3 (20)	2.8 (24)	3.5 (30)	4.2 (37)	5.0 (44)	6.3 (55)	7.5 (66)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)	8 (70)
		80 (2400)	0.24 (2.1)	0.29 (2.5)	0.41 (3.6)	0.49 (4.3)	0.61 (5.3)	0.73 (6.4)	1.0 (8.8)	1.2 (10.6)	1.5 (13.2)	1.8 (15.9)	2.2 (19.4)	2.6 (23)	3.3 (29)	4.0 (35)	5.0 (44)	5.9 (52)	6.6 (58)	7.9 (69)	8 (70)	8 (70)	8 (70)
FPW540S2-□		6.6~50 (200~1500)	0.73 (6.4)	0.87 (7.6)	1.2 (10.6)	1.5 (13.2)	1.8 (15.9)	2.2 (19.4)	3.0 (26)	3.6 (31)	4.4 (38)	5.5 (48)	6.6 (58)	7.9 (69)	9.9 (87)	10 (100)	10 (100)	10 (100)	10 (100)	10 (100)	10 (100)	10 (100)	
		80 (2400)	0.39 (3.4)	0.47 (4.1)	0.65 (5.7)	0.78 (6.9)	0.97 (8.5)	1.2 (10.6)	1.6 (14.1)	1.9 (16.8)	2.3 (20)	2.9 (25)	3.5 (30)	4.2 (37)	5.3 (46)	6.3 (55)	7.9 (69)	9.5 (84)	10 (88)	10 (88)	10 (88)	10 (88)	
FPW560S2-□		6.6 (200)	0.92 (8.1)	1.1 (9.7)	1.5 (13.2)	1.8 (15.9)	2.3 (20)	2.8 (24)	3.5 (30)	4.2 (37)	5.0 (44)	6.3 (55)	7.5 (66)	9.0 (79)	12.5 (110)	15 (132)	15 (132)	15 (132)	15 (132)	15 (132)	15 (132)	15 (132)	
		10~50 (300~1500)	1.1 (9.7)	1.3 (11.5)	1.8 (15.9)	2.2 (19.4)	2.7 (23)	3.3 (29)	4.1 (36)	4.9 (43)	5.9 (52)	7.4 (65)	8.9 (78)	10.7 (94)	14.9 (131)	15 (132)	15 (132)	15 (132)	15 (132)	15 (132)	15 (132)	15 (132)	
		80 (2400)	0.63 (5.5)	0.76 (6.7)	1.1 (9.7)	1.3 (11.5)	1.6 (14.1)	1.9 (16.8)	2.4 (21)	2.8 (24)	3.4 (30)	4.3 (38)	5.1 (45)	6.2 (54)	8.6 (76)	10.3 (91)	11.5 (101)	13.8 (122)	15 (132)	15 (132)	15 (132)	15 (132)	
FPW690S2-□		6.6~50 (200~1500)	1.7 (15.0)	2.0 (17.7)	2.8 (24)	3.3 (31)	4.1 (36)	5.0 (44)	6.2 (54)	7.4 (65)	8.9 (78)	12.4 (109)	14.9 (131)	17.9 (158)	22.4 (198)	26.9 (230)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	30 (260)	
		80 (2400)	0.87 (7.6)	1.0 (8.8)	1.5 (13.2)	1.7 (15.0)	2.2 (19.4)	2.6 (23)	3.3 (29)	3.9 (34)	4.7 (41)	6.6 (58)	7.9 (69)	9.5 (84)	11.9 (105)	14.3 (126)	17.8 (157)	21.4 (189)	23.8 (210)	28.5 (250)	30 (260)	30 (260)	

## ● BH Series/Speed Controller

Unit = N·m (lb·in)

Model Combination Type	Gear Ratio	Set Frequency Hz (Set Speed r/min)																				
			3	3.6	5	6	7.5	9	12.5	15	18	25	30	36	50	60	75	90	100	120	150	180
BHI62S-□ BHI62ST-□		6.6 (200)	3.5 (30)	4.2 (37)	5.8 (51)	7.0 (61)	8.7 (76)	10.4 (92)	13.9 (123)	16.6 (146)	20.0 (177)	27.7 (240)	33.3 (290)	39.9 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)
		20~40 (600~1200)	4.0 (35)	4.8 (42)	6.7 (59)	8.0 (70)	10.1 (89)	12.1 (107)	16.0 (141)	19.2 (169)	23.1 (200)	32.0 (280)	38.4 (330)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)
		80 (2400)	1.9 (16.8)	2.3 (20)	3.2 (28)	3.8 (33)	4.7 (41)	5.7 (50)	7.5 (66)	9.0 (79)	10.8 (95)	15.1 (133)	18.1 (160)	21.7 (192)	28.4 (250)	34.0 (300)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)	40 (350)
BHI62S-□RH BHI62S-□RA BHI62ST-□RH BHI62ST-□RA		6.6 (200)	—	—	4.7 (41)	5.7 (50)	7.1 (62)	8.5 (75)	11.8 (104)	14.1 (124)	17.0 (150)	23.5 (200)	28.3 (250)	33.9 (300)	40.0 (350)	43.0 (380)	47.0 (410)	51.5 (450)	54.5 (480)	60 (530)	60 (530)	60 (530)
		20~40 (600~1200)	—	—	5.4 (47)	6.5 (57)	8.2 (72)	9.8 (86)	13.6 (120)	16.3 (144)	19.6 (173)	27.2 (240)	32.6 (280)	36.0 (310)	40.0 (350)	43.0 (380)	47.0 (410)	51.5 (450)	54.5 (480)	60 (530)	60 (530)	60 (530)
		80 (2400)	—	—	2.6 (23)	3.1 (27)	3.8 (33)	4.6 (40)	6.4 (56)	7.7 (68)	9.2 (81)	12.8 (113)	15.3 (135)	18.4 (162)	25.6 (220)	30.7 (270)	38.3 (330)	42.5 (370)	45 (400)	48 (420)	52 (460)	56 (490)

● Enter the gear ratio in the box (□) within the model name.

● The set speed indicates the motor's synchronous speed. The actual speed varies depending on the load condition. Check the Speed – Torque Characteristics on pages D-186 to D-187.

● A colored background (□) indicates gear shaft rotation in the same direction as the motor shaft, while the others rotate in the opposite direction.



**■ Gearmotor – Torque Table When Right-Angle Gearhead is Attached**

→ Page C-230

**■ Permissible Overhung Load and Permissible Thrust Load**

Motor (Round shaft type) → Page C-17

Gearhead → Page C-17

**■ Permissible Load Inertia J of Gearhead**

→ Page C-18

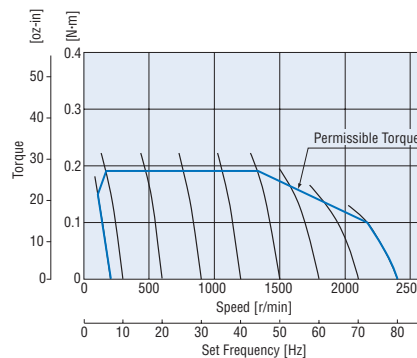
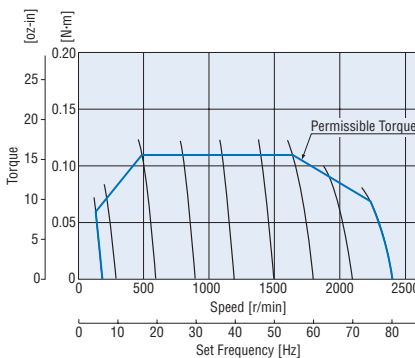
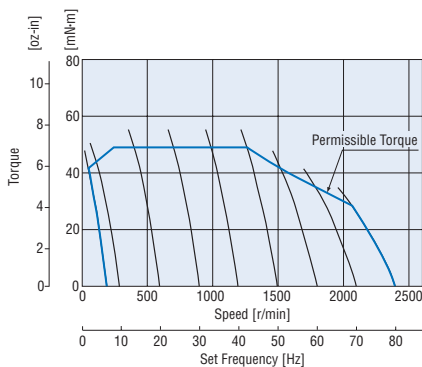
**■ Speed – Torque Characteristics**

● World K Series, V Series

FE100  /2IK6GN(A)-SW2

FE100  /3IK15GN(A)-SW2

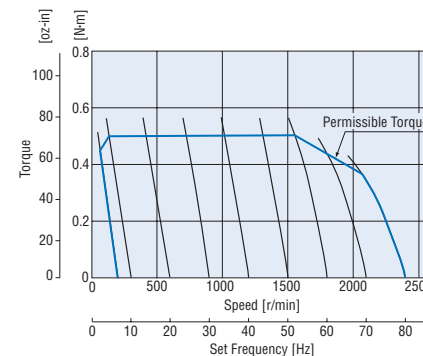
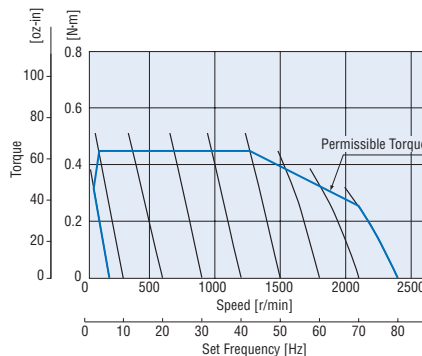
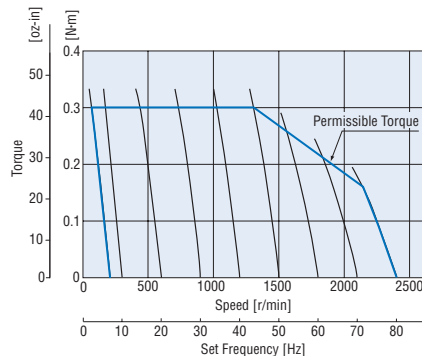
FE100  /4IK25GN(A)-SW2, 4IK25GN(A)-SW2T,  
4IK25GN(AA)-SH  
FE100  /VHI425S2-□, VHI425S2T-□



FE100  /5IK40GN(A)-SW2, 5IK40GN(A)-SW2T,  
5IK40GN(AA)-SH  
FE100  /VHI540S2-□, VHI540S2T-□

FE100  /5IK60GE(A)-SW2, 5IK60GE(A)-SW2T,  
5IK60GE(A)-SH  
FE100  /VHI560S2-□, VHI560S2T-□

FE100  /5IK90GE(A)-SW2, 5IK90GE(A)-SW2T,  
5IK90GE(A)-SH  
FE100  /VHI590S2-□, VHI590S2T-□



- The values for combination types apply to the motor only.
- Enter the power supply voltage (**A**, **C** or **S**) in the box () within the model name.
- Enter the gear ratio in the box () within the model name.

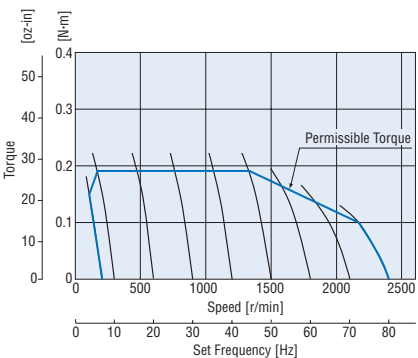
**Note**

- Frequency and speed displayed on the product are set values. The actual speed varies depending on the load conditions.

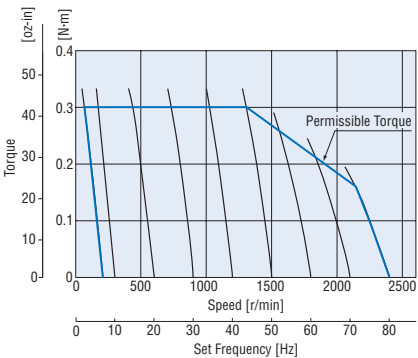
# Brushless Motors/AC Speed Control Motors

## ● FPW Series

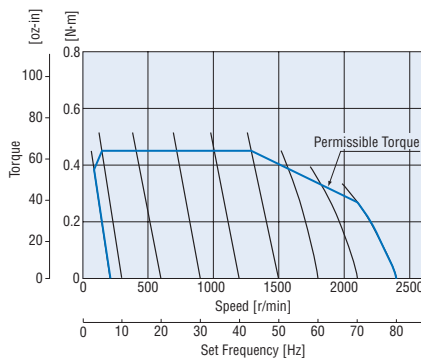
FE100  / FPW425S2-



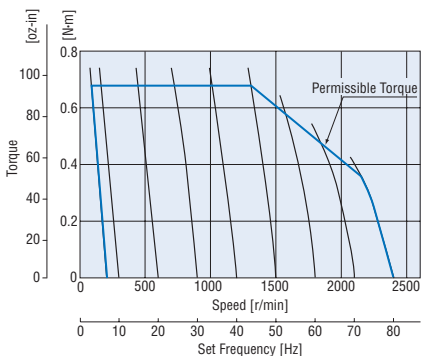
FE100  / FPW540S2-



FE100  / FPW560S2-



FE100  / FPW690S2-

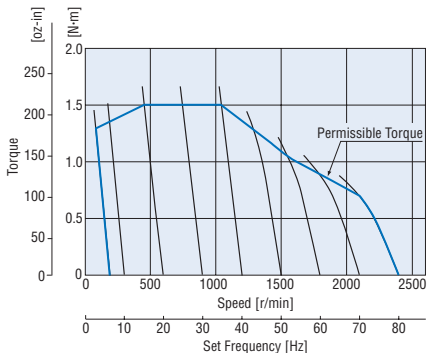


## ● BH Series

FE200

BHI625- (RH, RA), BHI625-A

BHI62ST- (RH, RA), BHI62ST-A



- The values for combination types and geared motors apply to the motor only.
- Enter the power supply voltage (**A**, **C** or **S**) in the box () within the model name. Enter the gear ratio in the box () within the model name.

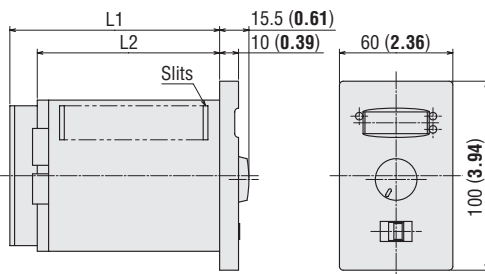
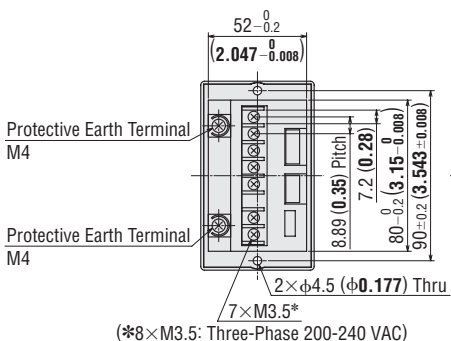
### Note

- Frequency and speed displayed on the product are set values. The actual speed varies depending on the load conditions.

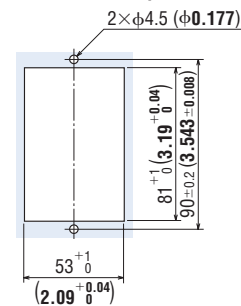
## ■ Dimensions Unit = mm (in.)

### ● Speed Controller

FE100 , FE200



### ◇ Panel Cut-Out for Speed Controller



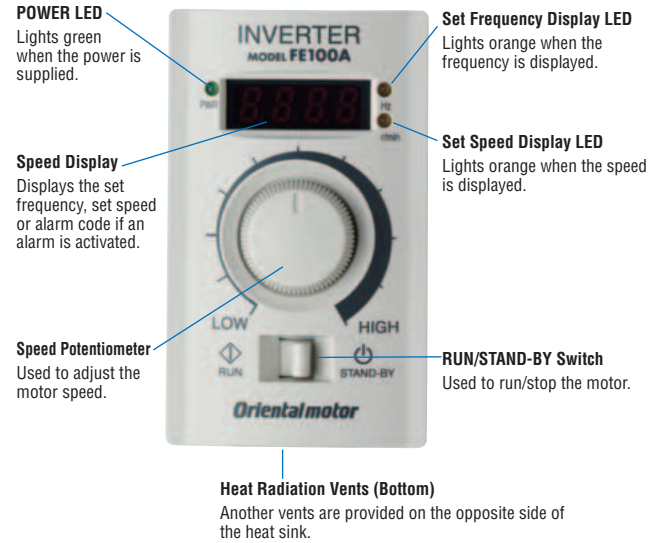
Speed Controller Model	L1	L2	Mass kg (lb.)	DXF
FE100 <input type="checkbox"/>	111 (4.37)	96.5 (3.80)	0.4 (0.88)	A417
FE200 <input type="checkbox"/>	141 (5.55)	126.5 (4.98)	0.5 (1.1)	A418

- Enter the power supply voltage (**A**, **C** or **S**) in the box () within the model name.

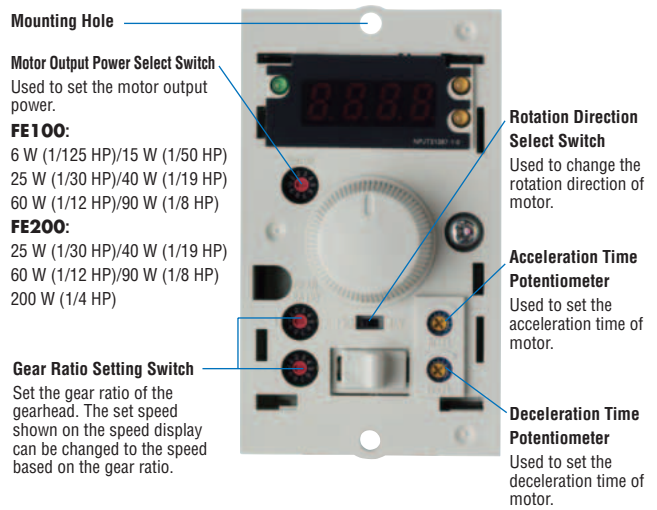
## Connection and Operation

### Names and Functions of Speed Controller Parts

#### Speed Controller Front Panel



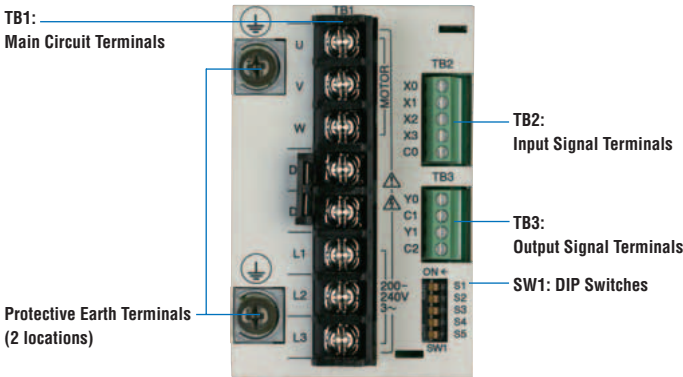
#### When Front Panel is Removed



#### Note

● The speed shown on the speed display is set value, not the actual speed of the motor output shaft.

#### Speed Controller Rear Panel



#### Note

● DL1 and DL2 are connected by a short circuit bar at shipment.

#### Main Circuit Terminals TB1

Terminal Name	Description
U	Motor connection terminal
V	
W	
DL1	Reactor connection terminal
DL2	
L1	Power supply connection terminal*
L2	
L3	

\*Terminals L1 and L2 are used for the single-phase power supply voltage specification.

#### I/O Signal Terminals TB2, TB3

Terminal	Terminal Name	Description
TB2 (Input)	X0	RUN/STOP
	X1	FWD/REV
	X2	Alarm reset
	X3	External speed setting input
	C0	SG (Common)
TB3 (Output)	Y0	Running
	C1	Common
	Y1	Alarm
	C2	Common

#### DIP Switches SW1

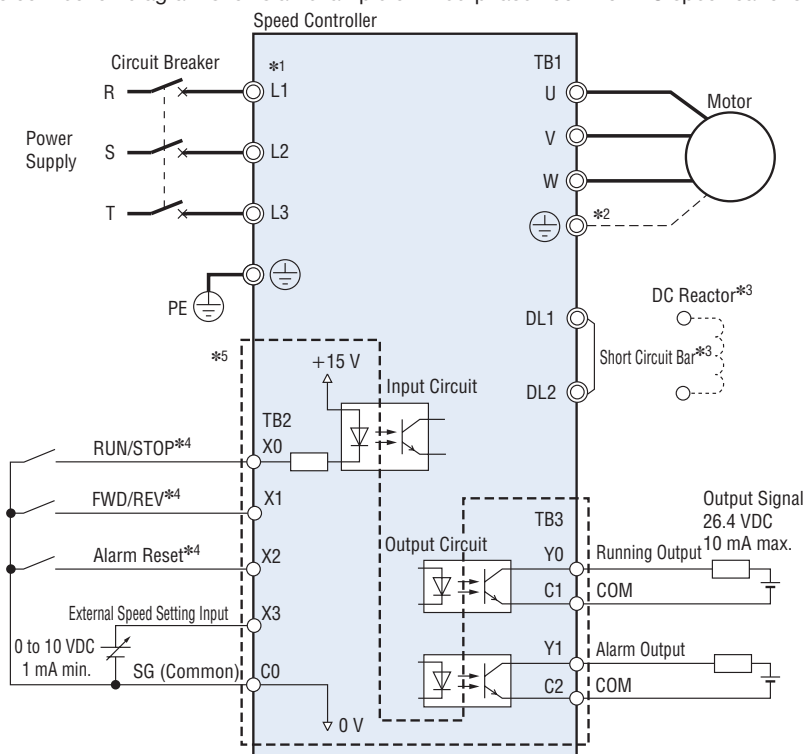
No.	Function	Description
S1	Remote/Local switching (RUN/STOP)	ON: Operation by external input signals (remote) OFF: Operation using the RUN/STAND-BY switch (local)
S2	Remote/Local switching (Rotation direction)	ON: Operation by external input signals (remote) OFF: Operation using the rotation direction select switch (local)
S3	Sink/Source switching	ON: Source input OFF: Sink input
S4	Carrier frequency switching	ON: 10 kHz OFF: 15 kHz
S5	Set speed display switching	ON: Displayed in set speed (r/min) OFF: Displayed in set frequency (Hz)

● Factory setting: OFF

# Brushless Motors/AC Speed Control Motors

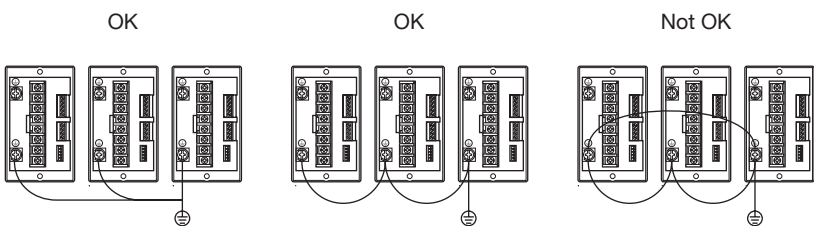
## ● Connection Diagram

● This connection diagram shows an example of three-phase 200-240 VAC specifications.



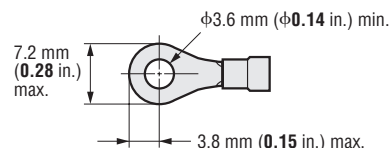
- \*1 For a single-phase power supply specification, connect the power supply to the L1 and L2 terminals.
- \*2 If the grounding resistance exceeds 0.1 Ω, motor should be grounded directly.
- \*3 Remove the short circuit bar when connecting a DC reactor.
- \*4 Input signals X0, X1 and X2 apply when the speed controller is connected by mechanical contacts or by means of sequence connection using a sink transistor (0 VDC, common). When sequence connection (+15 to 24 VDC, common) is made using a source transistor, +15 to 24 VDC power supply must be connected externally.
- \*5 The I/O signal connection terminals conform to SELV circuit and are isolated from dangerous voltages by means of reinforced insulation.

- Connect the speed controller and motor using an accessory connection cable (sold separately). The maximum wiring distance is 20 m (65.6 ft.). Connection cables → Page D-230
- Keep the I/O signal cable to a length of 10 m (32.8 ft.) or below and separate it from power lines. When setting speed externally, use a twisted-pair shielded wire, shielded wire, etc.
- Do not share the grounding cable with a welder or other power equipment. If multiple speed controllers are used, pay attention not to loop the cables.

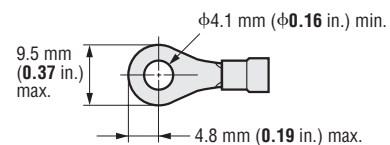


## ◇ Applicable Crimp Terminals

- Main Circuit Connection Terminal (M3.5) Round Terminal with Insulation



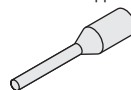
- Protective Earth Terminal (M4) Round Terminal with Insulation



## ● I/O Terminals

Use the terminals specified below for connection using crimp terminals. Please note that the applicable crimp terminal will vary depending on the size of the wire. The following terminals can be used with wires of AWG20 to 18.

Manufacturer: Phoenix Contact  
 AI 0.5-6 Applicable wire size AWG20 (0.5 mm<sup>2</sup>)  
 AI 0.75-6 Applicable wire size AWG18 (0.75 mm<sup>2</sup>)



Introduction

BX

BLF

Brushless Motors

BLU

BLH

DC Input

BLV

BHF

AC Speed Control Motors

FE100/  
FE200

ES01/  
ES02

US

Accessories

Installation

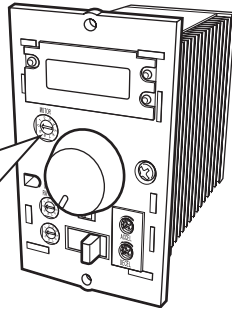
## ● Operation

### ◇ Before Operation

Set the motor output power select switch in accordance with the motor to be combined. If the motor output power setting is incorrect, it may cause heat generation or insufficient torque.

### Motor Output Power Select Switch

FE100A FE100C FE100S		FE200A FE200C FE200S	
Number	Motor Output Power	Number	Motor Output Power
0	6 W (1/125 HP)	0	25 W (1/30 HP)
1	15 W (1/50 HP)	1	40 W (1/19 HP)
2	25 W (1/30 HP)	2	60 W (1/12 HP)
3	40 W (1/19 HP)	3	90 W (1/8 HP)
4	60 W (1/12 HP)	4	200 W (1/4 HP)
5	90 W (1/8 HP)		



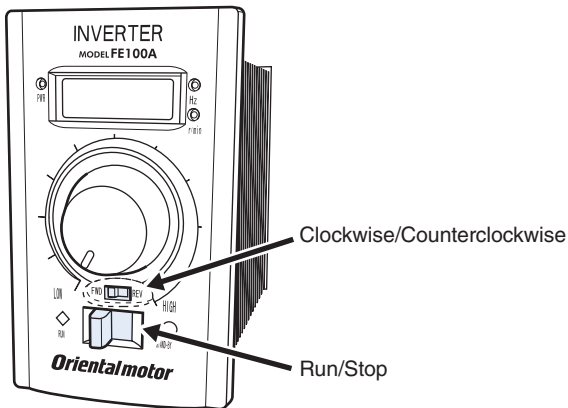
### ◇ Operation on the Speed Controller Front Panel

#### ● Run/Stop

Setting the RUN/STAND-BY switch to RUN will cause the motor to run, while setting it to STAND-BY will stop the motor.

#### ● Rotation Direction Setting

To set the rotation direction, remove the front panel and change the rotation direction to switch FWD (clockwise) or REV (counterclockwise).



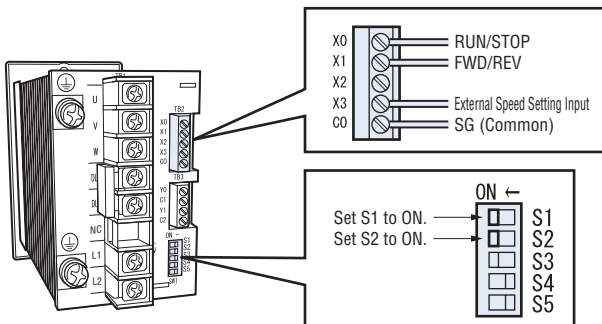
### ◇ Operation by External Input Signals

Change the DIP switch settings on the speed controller rear panel.

S1 (ON): Motor runs or stops by external input.

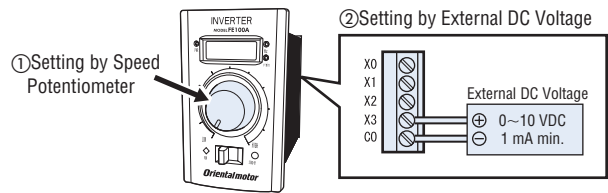
S2 (ON): Rotation direction changes by external input.

Once the DIP switch settings have been changed, the motor can be run/stopped using the RUN/STOP signal and its rotation direction can be controlled using the FWD/REV signal.



### ◇ Speed Setting

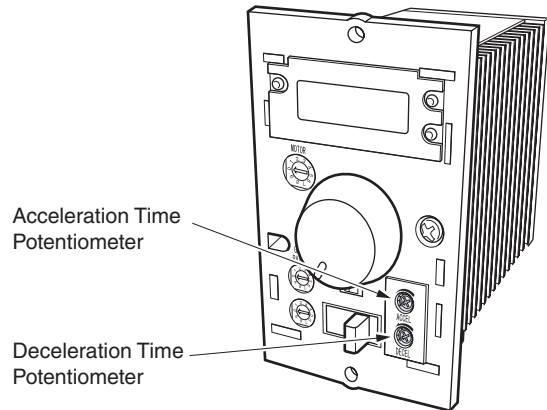
The motor speed can be set using the two methods explained below.



The motor rotates at either speed ① or ②, which is the higher setting. When the motor is to be rotated by external DC voltage, keep the speed potentiometer on the speed controller at the LOW end.

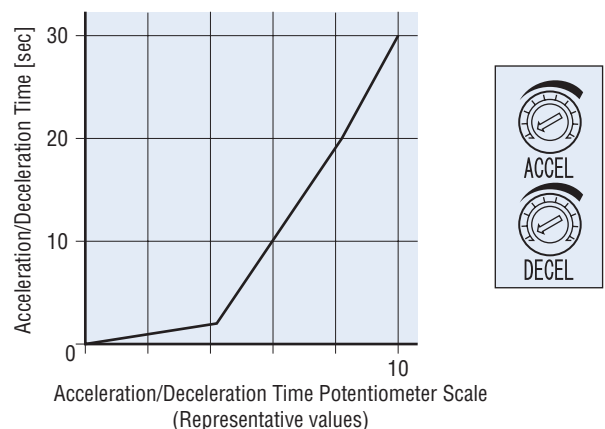
### ◇ Acceleration/Deceleration Time Setting

When starting, the motor accelerates at the specified acceleration time. When stopping, it decelerates at the specified deceleration time. The acceleration time and deceleration time can be set in a range of 0.1 to 30 seconds.



### ◇ Acceleration/Deceleration Time Characteristics

The graph below shows the acceleration/deceleration time characteristics (representative values) at 80 Hz (2400 r/min).



### ◇ Display Mode Switching

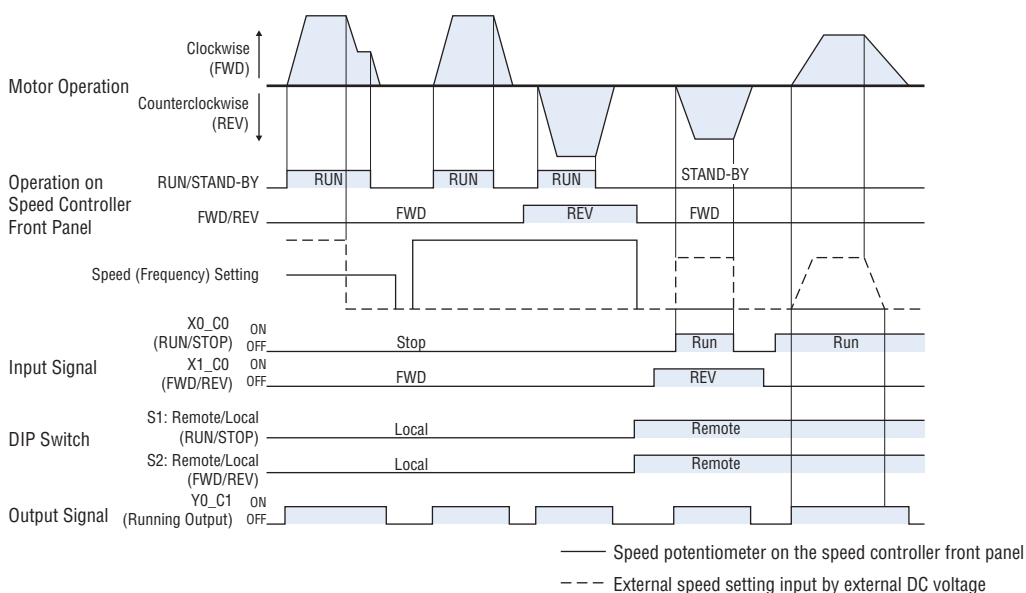
While the motor is running, the set speed is displayed in frequency (Hz). You can change the display to set speed (r/min) by the DIP switch on the speed controller rear panel.

### DIP Switch Settings

S5 (OFF): Displayed in set frequency (Hz)

S5 (ON): Displayed in set speed (r/min)

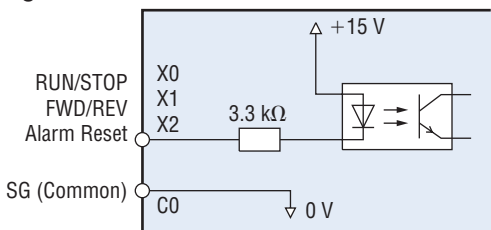
## ● Timing Chart



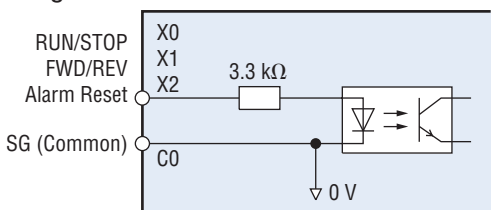
- DIP switch setting is effective only when the motor is stopped. If any DIP switch setting is changed while the motor is running, the new setting will become effective only after the motor is stopped.
- If external DC voltage is connected to the speed controller, the speed set by the X3 terminal (external speed setting input) or speed set by the speed potentiometer on the speed controller front panel, whichever is higher is given priority.
- To change the rotation direction, wait for the motor to stop and then input a reversing signal. Instant change of the rotation direction in motor's operation may cause damage to the gearhead or motor due to load impact.
- The rotation direction of motor is as viewed from the motor shaft (FWD: clockwise, REV: counterclockwise). The direction of gearhead shaft rotation may differ from motor shaft rotation depending on the gear ratio of the gearhead.

## ● Input Signal Circuit

### ◇ Sink Logic



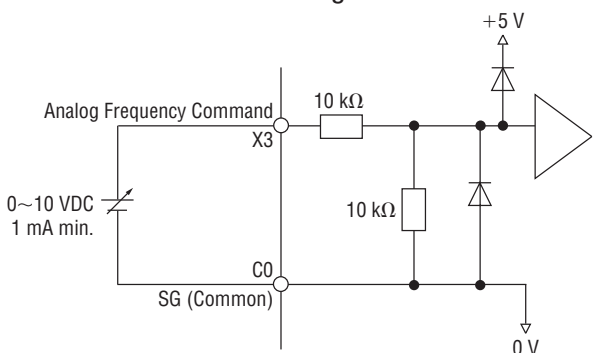
### ◇ Source Logic



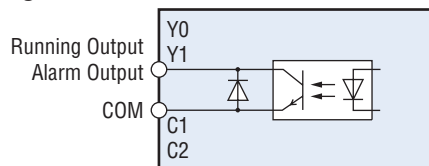
### Note

- When sequence connection is made using a source transistor, +15 to 24 VDC power supply must be connected externally.

### ◇ Connection of External DC Voltage



## ● Output Signal Circuit



## ● When an External Control Device with a Built-In Clamp Diode is Used

When an external control device with a built-in clamp diode is used, if the power is being supplied to the speed controller, current may flow and cause the motor to run, even if the power supply of the external control device is off. Because the power capacity differs, the motor may also run when the power supplies are turned on/off simultaneously.

Turn on the power of the external control device before the speed controller. Turn off the power of the speed controller before the external control device.

