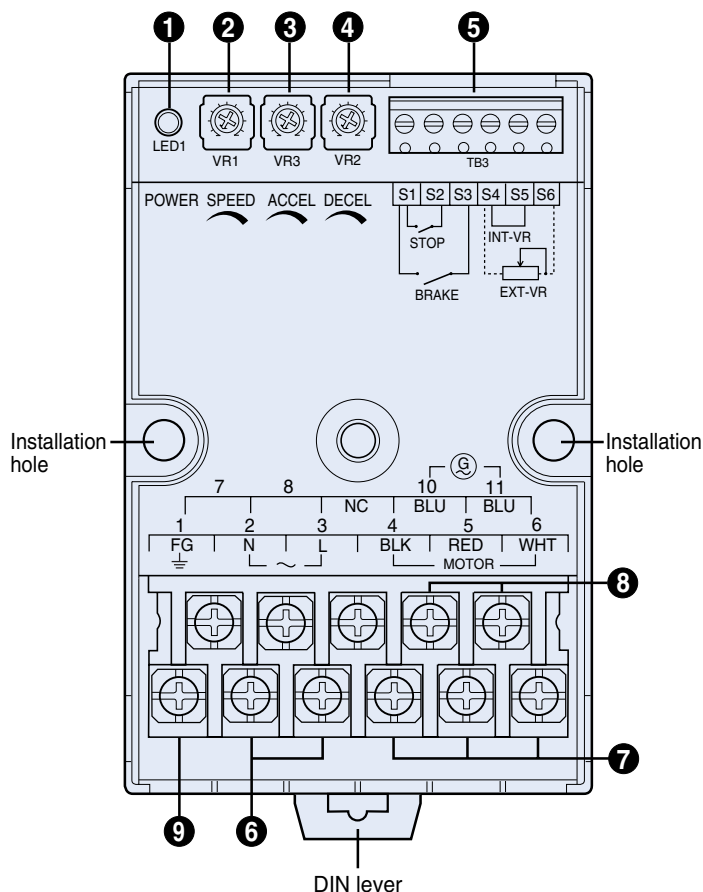


■ Connection and Operation

● Names and Function of Parts

The illustration has the cover removed. Install the cover after connection.



1 POWER LED

Turns on (green) while power is being supplied.

2 Internal speed potentiometer

Set the motor's operating speed.

3 Acceleration time potentiometer

Set the acceleration time for motor startup.

4 Deceleration time potentiometer

Set the deceleration time for motor stop.

5 Control input terminal

S1 Common terminal for running and braking

S2 Run/Stop input

Runs (OFF) or stops (ON) the motor.

S3 Run/Brake input

Runs (OFF) or brakes (ON) the motor.

S4, S5, S6 Speed potentiometer inputs

When S4 and S5 are shorted, the speed can be set using the internal speed potentiometer (INT-VR).

When S4 and S5 are open, the speed can be set using an external speed potentiometer (EXT-VR).

When using an external speed potentiometer, connect it to S4 and S6.

6 Power connection terminal (terminals 2 and 3)

7 Motor connection terminal (terminals 4, 5 and 6)

8 Generator connection terminal (terminals 10 and 11)

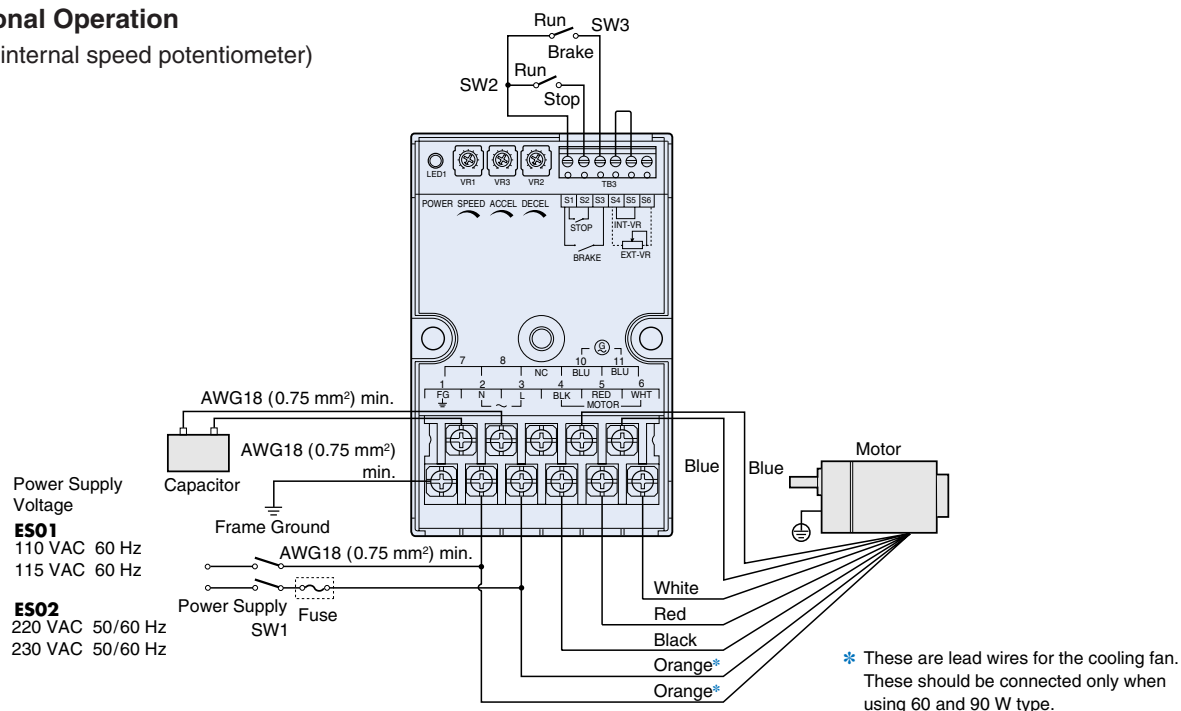
Connect the blue generator lead wires.

9 FG terminal (terminal 1)

● Connection Diagrams

◆ Uni-directional Operation

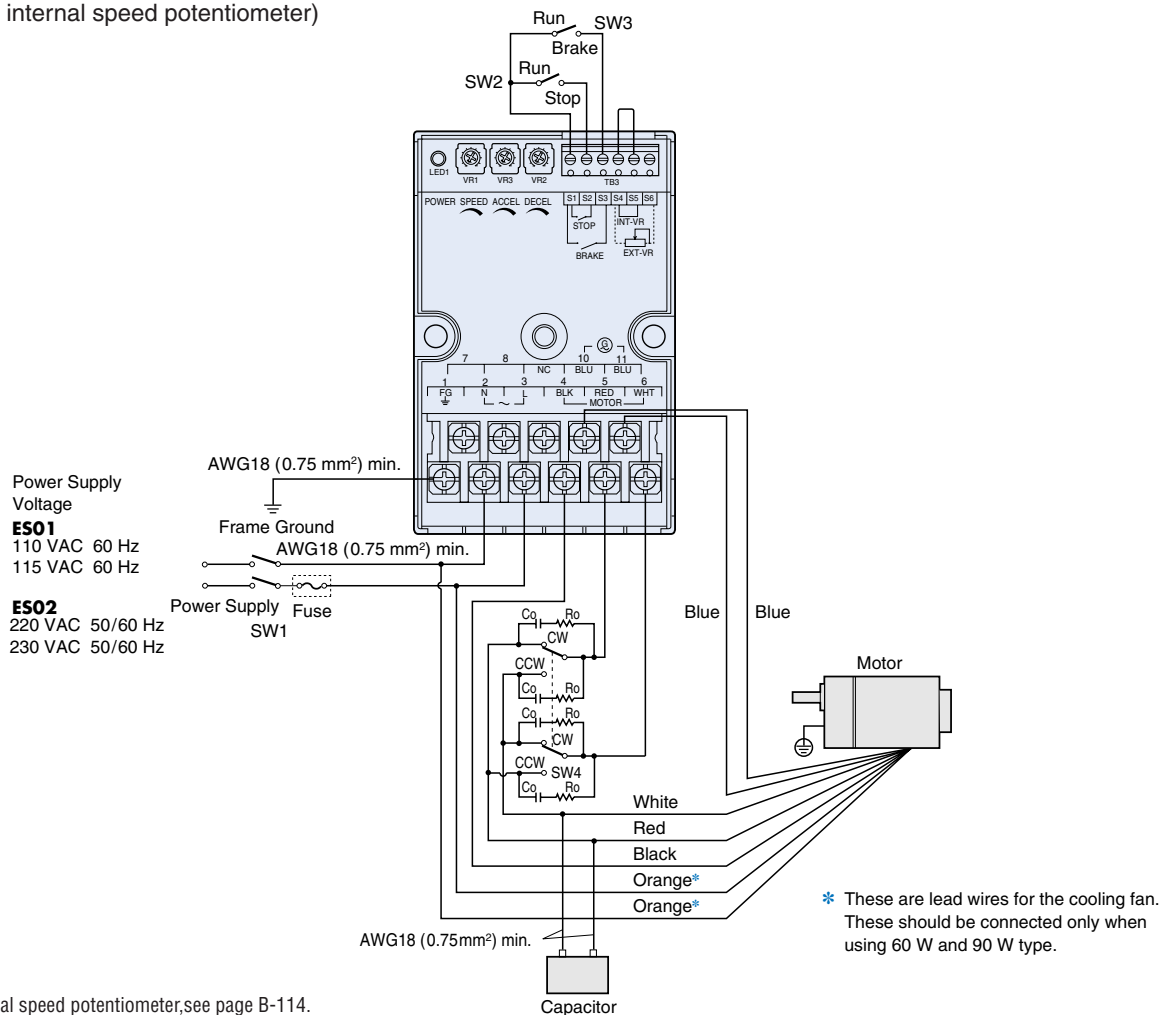
(When using internal speed potentiometer)



- For uni-directional operation, connect the lead wires of the motor to the controller in this order: For CW operation, connect the Red wire to terminal #5 and the White wire to terminal #6. For CCW operation, connect the White wire to terminal #5 and the Red wire to terminal #6.
- When using external speed potentiometer, see page B-114.

◆ Bi-directional Operation

(When using internal speed potentiometer)



- When using external speed potentiometer, see page B-114.

Specifications of the Switches and Fuse

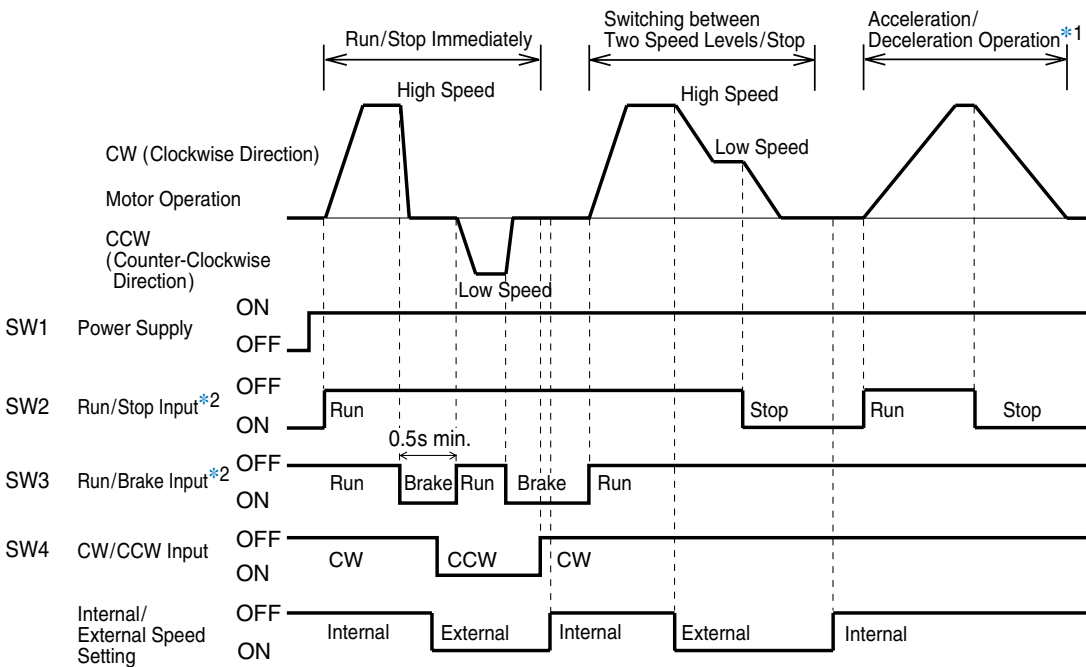
Power Supply Voltage	110/115 VAC (ES01)	220/230 VAC (ES02)
SW1	125 VAC 10 A	250 VAC 5 A
SW2, SW3	18 VDC 1 mA	
SW4	125 VAC 10 A	250 VAC 5 A
R0, C0 (Surge suppressor)	R ₀ =5~200 Ω C ₀ =0.1~0.2 μF, 200 WV	R ₀ =5~200 Ω C ₀ =0.1~0.2 μF, 400 WV
Fuse	Product certified under the UL/CSA248-14 standard or equivalent 250 VAC 10 A	Product certified under the UL/CSA248-14 standard or equivalent 250 VAC 5 A

Precaution for wiring

- The control input terminals are not insulated from the AC power supply. Any equipment (sequencer, relay and/or switch) that will be connected to the control input terminals must have contact ratings of 18 VDC and 1 mA min. The control input terminals are not insulated from the AC power supply. Do not use a transistor output type controller.
- The length of the cable connecting the motor and speed controller should be no more than 32.8 feet (10 m).
- The length of the control cable should be no more than 6.6 feet (2 m) and as short as possible.
- Connect a surge suppressor across SW4. Oriental Motor also provides an optional **EPCR1202-2** CR circuit for surge suppression. →Page A-218

Timing Chart

The timing chart below shows an example of switching between two speed levels when the high speed and low speed are selected via the internal and external speed potentiometers, respectively.



*1 Case where the acceleration and deceleration times are set longer by turning each potentiometer clockwise.

*2 In case SW2 and SW3 are turned on at the same time, Stop Input is given priority.

Run/Brake, Stop

Setting SW2/SW3 to "Run" (OFF) causes the motor to rotate at the speed set via the speed potentiometers.

Setting SW2 to "Stop" (ON) during operation causes the motor to coast to a stop.

Setting SW3 to "Brake" (ON) during operation causes the motor to stop immediately.

The braking function (current through the motor) is only active for approximately 0.4 seconds after the Run/Brake input is turned ON. Do not switch over (to any of the input switches) for 0.5 seconds. Otherwise, damage to the speed controller may result.

Switching the Direction of Rotation

SW4 is used to switch the motor's direction of rotation.

When SW4 is set to CW, the motor rotates in the clockwise direction, as seen from the motor's output-shaft side.

When SW4 is set to CCW, the motor rotates in the counterclockwise direction, as seen from the motor's output-shaft side.

The rotating direction of the gear output shaft is opposite that of the motor shaft, depends on the gear ratio.

- Instant switching between forward and reverse operations is possible with a reversible motor. Connect a surge suppressor between the relay contacts. Oriental Motor also provides an optional **EPCR1201-2** CR circuit for surge suppression. →Page A-218
- For bi-directional operation of an induction motor, switch the rotating direction after the motor has come to a complete stop.

Run/Stop Input	Run/Brake Input	Motor Operation
OFF	OFF	Runs
OFF	ON	Stops Immediately
ON	OFF	Coasts to a Stop*

* The slow down time set with a potentiometer is longer than the time which motor coasts to a stop, motor will stop with slow down time.

● Speed Setting Methods

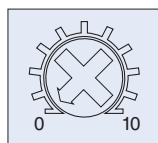
The following two methods of setting speed can be used.

◆ Internal Speed Potentiometer

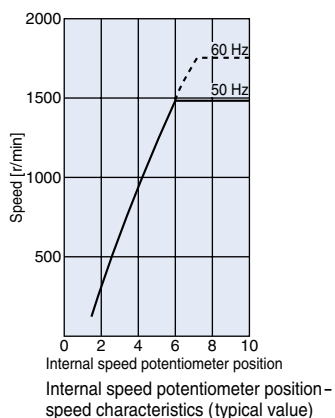
The setting range is from 90 to 1400 r/min at 50 Hz or 90 to 1600 r/min at 60 Hz. Short the speed potentiometer input terminals S4 and S5.

Turning the potentiometer clockwise will set a faster speed.

The factory setting is 0 r/min.



Internal Speed Potentiometer

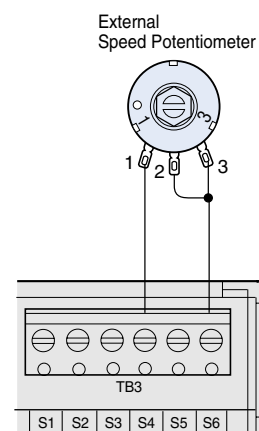


◆ External Speed Potentiometer (included)

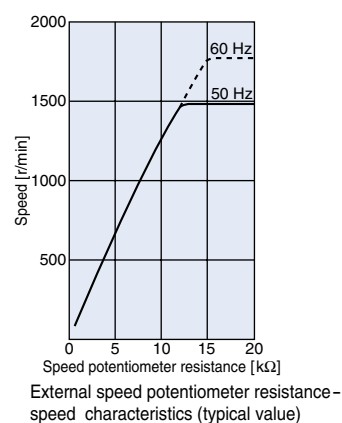
Open the speed potentiometer input terminals S4 and S5.

Before connecting, turn the dial on the external speed potentiometer counterclockwise to set the speed to 0 r/min.

Turning the dial clockwise will set a faster speed.



20 kΩ 1/4 W
with a linear resistance vs.
angle curve



Note:

Do not operate multiple speed controllers with a single external speed potentiometer. Doing so may damage the speed controllers.

● Acceleration and Deceleration Operation

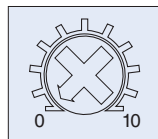
Equipment and loads are subject to large acceleration/deceleration force when starting, stopping, and changing speeds. When you want to accelerate/decelerate without any accompanying shock, the acceleration/deceleration time can be extended using the slow start/slow down function. The slow start/slow down time can be set using acceleration/deceleration time potentiometers built into the control pack. However, when the load inertia is large, the deceleration time cannot be set at a shorter time than when the motor is stopped naturally.

◆ Acceleration

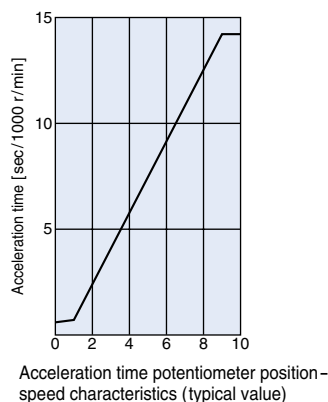
The acceleration function is actuated at start or when the speed is switched to the higher setting in a two-level speed control system.

Turning the acceleration time potentiometer clockwise will increase the set time.

The factory setting is 0 (no acceleration).



Acceleration Time Potentiometer

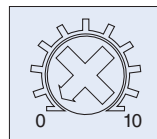


◆ Deceleration

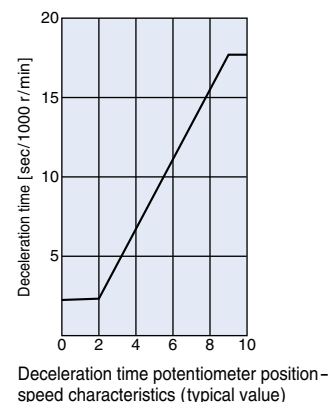
The deceleration function is actuated during natural stop or when the speed is switched to the lower setting in a two-level speed control system.

Turning the deceleration time potentiometer clockwise will increase the set time.

The factory setting is 0 (no deceleration).



Deceleration Time Potentiometer



● Repeated Operation/Braking Cycle

When running/braking of the motor is repeated in short cycles, the rise in motor temperature will increase and the continuous-operation time will be limited.

Use the following values as a guideline:

Motor Output		Repetition Cycle
HP	W	
1/125~1/19	6~40	2 seconds min. (Running 1 second, stopping 1 second)
1/12, 1/8	60, 90	4 seconds min. (Running 2 seconds, stopping 2 seconds)

Note:

• The motor may generate heat, depending on the conditions in which it is driven. Ensure that the temperature of the motor case does not exceed 194°F (90°C).

● Braking Current

When the motor is commanded to stop immediately, the following braking current will flow. Provide an appropriate power supply by referring to these values.

Motor Output		Braking Current (Peak Value) [A]	
		Single-Phase 110/115 VAC	Single-Phase 220/230 VAC
1/125	6	1.5	1.0
1/50	15	3.5	2.0
1/30	25	5.5	3.0
1/19	40	8.5	6.0
1/12	60	15.5	8.0
1/8	90	20.5	12.0

■ List of Motor and Gearhead Combinations

Model names for motor/gearhead combinations are shown below.

● Induction Motors

Output Power		Model	Motor Model	Gearhead Model
HP	W			
1/125	6	VSI206A-□U	VSI206A-GV	GV2G□
		VSI206C-□E	VSI206C-GV	
1/50	15	VSI315A-□U	VSI315A-GV	GV3G□
		VSI315C-□E	VSI315C-GV	
1/30	25	VSI425A-□U	VSI425A-GV	GV4G□
		VSI425C-□E	VSI425C-GV	
1/19	40	VSI540A-□U	VSI540A-GVH	GVH5G□
		VSI540C-□E	VSI540C-GVH	
1/12	60	VSI560A-□U	VSI560A-GVH	GVH5G□
		VSI560C-□E	VSI560C-GVH	
1/8	90	VSI590A-□U	VSI590A-GVR	GVR5G□
		VSI590C-□E	VSI590C-GVR	

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

● Reversible Motors

Output Power		Model	Motor Model	Gearhead Model
HP	W			
1/125	6	VSR206A-□U	VSR206A-GV	GV2G□
		VSR206C-□E	VSR206C-GV	
1/50	15	VSR315A-□U	VSR315A-GV	GV3G□
		VSR315C-□E	VSR315C-GV	
1/30	25	VSR425A-□U	VSR425A-GV	GV4G□
		VSR425C-□E	VSR425C-GV	
1/19	40	VSR540A-□U	VSR540A-GVH	GVH5G□
		VSR540C-□E	VSR540C-GVH	
1/12	60	VSR560A-□U	VSR560A-GVH	GVH5G□
		VSR560C-□E	VSR560C-GVH	
1/8	90	VSR590A-□U	VSR590A-GVR	GVR5G□
		VSR590C-□E	VSR590C-GVR	

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