Connection and Operation [200 W (1/4 HP)]

Names and Functions of Driver Parts

Display
Displays the monitor contents, alarm, etc.

Dial
Changes the speed and parameters.
The value is set when the dial is pressed after changes are made.

Operating Switch
The motor is started by setting it to the "RUN" position.
Setting it to the "STAND-BY" position stops the motor.

Rotation Direction Switch
Changes the rotation direction of the motor.

Front Panel

[Front of Driver]

Sensor Connector (CN3)
Connects the motor sensor connector (black).

I/O Signal Connector (CN4)
Connects the I/O signals.

Motor Connector (CN2)
Connects the motor connector (white).

Main Power Connector (CN1)
Connects the main power supply.

Protective Earth Terminals (2 locations)
Ground either one of the protective earth terminals.

[Back of Driver]

◇When Front Panel is Removed

MODE Key
Changes the operating mode.

FUNCTION Key
Changes the indication and functions for the operating mode.

Acceleration/Deceleration Time Potentiometer
Sets the acceleration time for starting the motor and deceleration time for motor standstill.
Setting Range: 0.1 s～15.0 s

Mounting Holes (2 locations)

Extended Functions

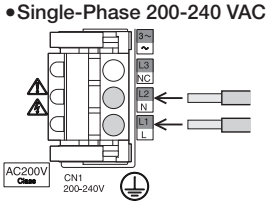
These settings can be made with key operations after removing the front panel.

Operating Mode	Details
Monitoring	Speed, load factor, operating data number, alarm, warning, I/O monitor
Data	4 data points Speed, acceleration time, deceleration time, reset
Parameters	Gear ratio, speed increasing ratio, initial panel display, initial operation prohibition alarm, initial operation prohibition alarm cancellation method selection, analog acceleration/deceleration, speed upper limit/lower limit setting function, simple holding selection, external operating signal input, input function selection, output function selection, overload alarm detection time except when shaft is locked, overload warning level, speed attainment band, parameter mode reset

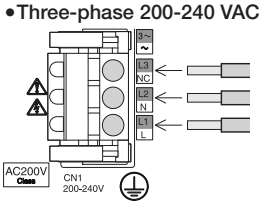
◇Main Power Connector (CN1)

Connects to the main power supply. Please connect to the power supply according to the power supply voltage being used.

•Single-Phase 200-240 VAC



•Three-phase 200-240 VAC



•Applicable Lead Wire Size
AWG18～14

Operation with the Driver Only

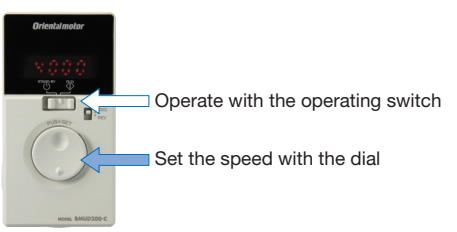
◇Run/Stop

When the operating switch is set to the "RUN" position, the motor will start.
When it is returned to the "STAND-BY" position, the motor decelerates to a stop.

◇Speed Setting Method

Set the motor speed by using the dial.
Speed Setting Range: 50～4000 r/min

Turning the dial slowly to the right increases the speed by 1 r/min increments, while turning it to the left reduces the speed by 1 r/min increments.
Turning the dial quickly increases the speed variation.
Pressing the dial sets the speed.

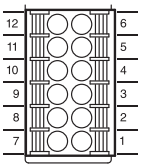


•Operating Switch

●Operation by External Signals

◇Operating Method

- Using the built-in power supply in the driver, the motor is operated through signals from external sources (switches, relays, etc.).
  Connect pins No. 1～5 and No. 7 of the I/O signal connector (CN4) as shown in the table below.
- When operating using external signals, change the parameter setting in the "External Operating Signal Input." Refer to the operating manual for details.
- Multistep speed-change operation up to 4 steps can be performed.



●I/O Signal Connector (CN4)

Pin No.	Signal Name	Function*	Description
1	IN4	[ALARM-RESET]	Alarms are canceled.
2	IN3	[M1]	Selects the operating data.
3	IN2	[M0]	
4	IN1	[REV]	The motor rotates in the reverse direction when "ON."
5	IN0	[FWD]	The motor rotates in the forward direction when "ON."
6	IN-COM0	IN-COM0	Input Signal Common (External power supply)
7	IN-COM1	IN-COM1	Input Signal Common (Internal power supply: 0 V)
8	N.C.	N.C.	No connection.
9	OUT1−	[ALARM-OUT1]	Turns OFF when an alarm is activated. (Normally closed)
10	OUT1+		
11	OUT0−	[SPEED-OUT]	30 pulses are output when the motor output shaft makes one rotation.
12	OUT0+		

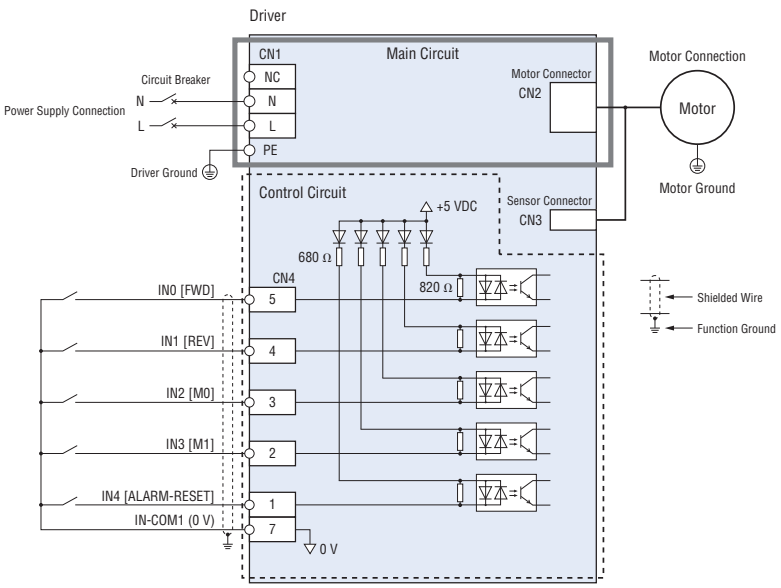
●Applicable Lead Wire Size

AWG24～18

*The text inside the [ ] represents the factory default function assignment.
The following signals can be assigned as necessary to 5 input signal terminals (IN0～IN4) and 2 output signal terminals (OUT0, OUT1).
5 of the 7 input signals (FWD, REV, M0, M1, ALARM-RESET, EXT-ERROR, H-FREE)
2 of the 6 output signals (ALARM-OUT1, SPEED-OUT, ALARM-OUT2, MOVE, VA, WNG)

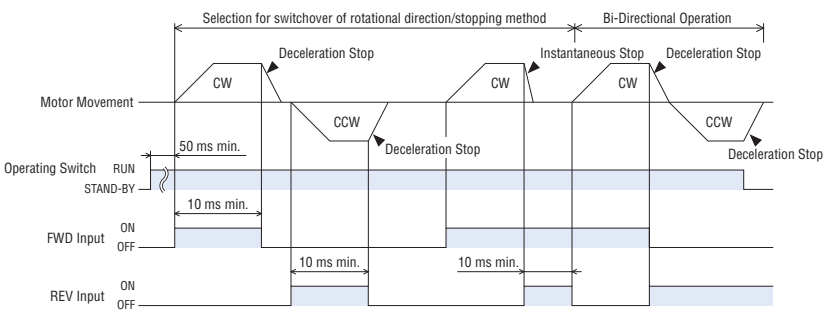
◇Connection Example Using Switches and Relays

The figure shows a connection example when operating a motor with a contact switch, such as switches and relays. (Single-phase 200-240 VAC)



◇Timing Chart

This is when the "External Operating Signal Input" parameter setting is "ON" and the rotation direction switch is set to "FWD."



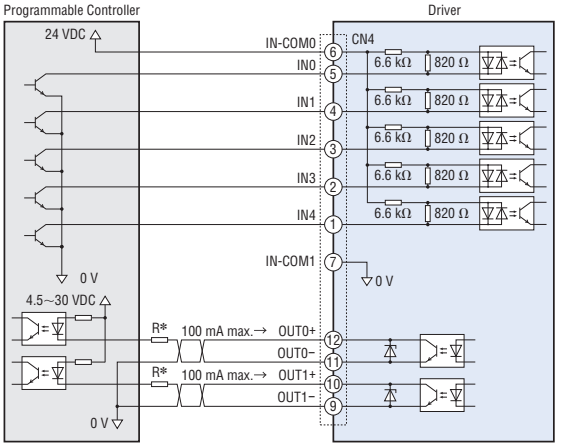
- Switching the FWD input to ON will cause the motor to turn clockwise as viewed from the motor shaft side, while switching the REV input to ON will cause the motor to turn counterclockwise. Turning it OFF decelerates the motor to a stop.
- If the FWD input and REV input are turned ON simultaneously, the motor will stop instantaneously.

- With the combination type, the rotation direction varies according to the gear ratio of the gearhead.

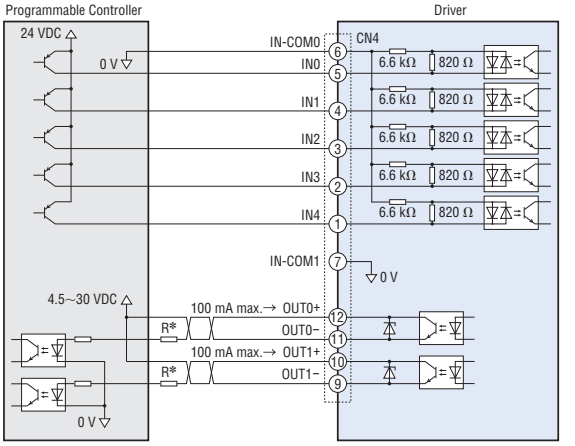
◇I/O Signal and Programmable Controller Connection Examples

This is a connection example for operating a motor using a transistor output type programmable controller.

•Sink Logic



•Source Logic



✻Recommended Resistance Value
24 VDC: 680 Ω~2.7 kΩ (2 W)
5 VDC: 150 Ω~560 Ω (0.5 W)

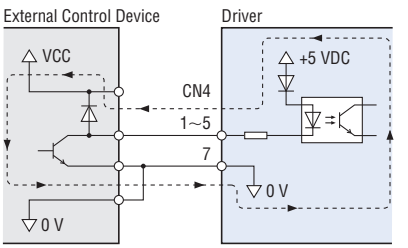
Note

Maintain the current value of OUT0 and OUT1 at 100 mA or less. If this current value is exceeded, connect the limiting resistor R.

◇When an External Control Device with a Built-in Clamp Diode is Used

If an external control device with a built-in clamp diode is connected and the external control device is turned off when the driver power is on, current may flow in and rotate the motor. Because the current capacity between the driver and external control device is different, the motor may also run when their power supplies are turned ON or OFF simultaneously.

To turn the power off, turn off the driver and then the external control device. To turn the power on, turn on the external control device and then the driver.



◇When Multistep Speed-Change Operation is Used

Multistep speed-change operation is possible by switching the M0 and M1 inputs ON / OFF.

•Operating Condition Example

Operating Data No.	M0	M1	Speed [r/min]
0	OFF	OFF	3000
1	ON	OFF	1000
2	OFF	ON	2000
3	ON	ON	500