■ WIRING DIAGRAMS

Use connector CN1, CN2 and CN3 when connecting.

- **Pulse Input**
  When a negative logic pulse is input to the PULSE \(\ominus\) terminal, the motor's direction of rotation depends on the next direction-of-rotation input.

- **Direction-of-Rotation Input**
  The direction of rotation signal is input to the DIRECTION \(\ominus\) terminal. The level of the input signal is H (photocoupler: ON) for CW, L for CCW.

- **All Windings Off (AW. Off) Input**
  When the All Windings Off (AW. OFF) signal is at L level (photocoupler: ON), no current is sent to the motor (holding torque is released) and the motor shaft can be moved by an external force. Use this function when the motor shaft needs to be turned or positioned by hand. While the motor is in operation the signal should always be set to H level.

- **Step Angle (FULL/HALF) Input**
  When the Step Angle (FULL/HALF) signal is at the L level (photocoupler: ON) half-step mode (0.36°/step) has been selected; when it is at the H level, full-step mode (0.72°/step) has been selected.

- **Current-cutback-Release Input (C.D.INH)**
  When the current-cutback (C.D.INH) signal is at the L level (photocoupler: ON) the automatic-current-cutback at motor standstill function is not activated.

- **Excitation-Timing (Timing) Output**
  A signal is output in synchronization with the input pulse every time the excitation sequence returns to step "0". The excitation sequence is completed for each 7.2° the motor shaft moves. The timing output will turn ON every 10 pulses in full-step mode (0.72°/step) and every 20 pulses in half-step mode (0.36°/step).

- **DC24V**
  Use a power supply with a current capacity that exceeds the value of 'voltage' in the specification table.

Notes regarding wiring
1. Use twisted-pair wire of \(3 \times 10^{-4} \text{ in.}^2\) (0.2mm²) or thicker and 66.6 feet (2m) or less in length for the signal line.
2. Use wire \(7.8 \times 10^{-4} \text{ in.}^2\) (0.5mm²) or thicker for motor lines (when extended) and power supply lines, and use \(1.1 \times 10^{-2} \text{ in.}^2\) (0.75mm²) or thicker for the wire for the grounding line.
3. Use spot grounding for the grounding of the driver and external controller.
4. Signal lines should be kept away at least 1 feet (0.3m) from power lines (power supply lines and motor lines). Do not bind the signal line and power line together.

■ Timing Chart

![Timing Chart Diagram]

- **Current Cutback at Motor Standstill**
- **Output Current OFF**
- **Pulse**
- **Direction**
- **C.D.INH**
- **A.W. OFF**
- **Full/Half**

- **1** It is recommended to wait a period of time before inputting the A.W.O signal to allow the motor oscillations to end. This time varies with the load inertia, the load torque and the starting pulse rate. Signal input must be stopped before the motor stops.
- **2** Never input a step pulse signal immediately after switching the A.W.O signal to "H" level or the motor may lose synchronism. In general, an interval of 100m sec. (minimum) is required.
Method of Adjustment

The rated output current is set at the factory. When it is necessary to change the current setting, follow the procedures described below.

Connecting an ammeter
Connect a DC ammeter between the motor and pin 1 of connector CN3 as shown in the diagram below.

- After connecting the DC ammeter to the motor, turn on the power. (The excitation status at this point is fixed: power on reset.)
- When the power is turned on, the motor enters a 4 phase excitation state, and +directional current flows to the blue motor lead wire. (Even if 4-5 phase excitation has been selected, the motor enters a 4 phase excitation state when the power is turned on. Adjust the current in this state.)

Cautions:
1. Do not input a pulse signal.
2. Set the All windings Off (A. W Off) signal to the H level (it is at the H level when open).
3. The current at motor standstill changes when the RUN current is adjusted.

1. Adjusting The Motor RUN Current
Set Current-Cutback-Release (C.D.INH) signal to L level (SW: ON) when adjusting the RUN current.

(1) Adjust the motor RUN current with the RUN potentiometer. It can be adjusted from 0.1 A/phase to 1.4 A/phase.
(2) The motor operating current is set for rated current 1.4 A/phase at the time of shipping, but it can be readjusted using the RUN potentiometer. The operating current can be lowered to suppress temperature rise in the motor/driver, or lower operating current in order to allow a margin for motor torque or to reduce vibration.

Note: The motor RUN current should be less than the motor rated current.

2. Adjusting The Current At Motor Standstill
Set Current-Cutback-Release (C.D.INH) signal at H level (SW: OFF) when adjusting the current while the motor is stopped.

(1) Adjust the current at motor standstill with the STOP potentiometer. It can be adjusted from 0.1 A/phase to 1.05 A/Phase.
(2) At the time of shipping, the current at motor standstill is set for 0.7 A. The STOP potentiometer can be used to readjust the current at motor standstill to the current value required to produce enough holding torque.

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\text{Holding Torque (oz-in (N-m))} = \frac{\text{Rated Holding Torque (oz-in (N-m))} \times \text{Current at motor standstill (oz-in (N-m))}}{\text{Motor Rated Current (1.4)}}
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