

XWA type



Search Motor - Volume : Connection and Operation

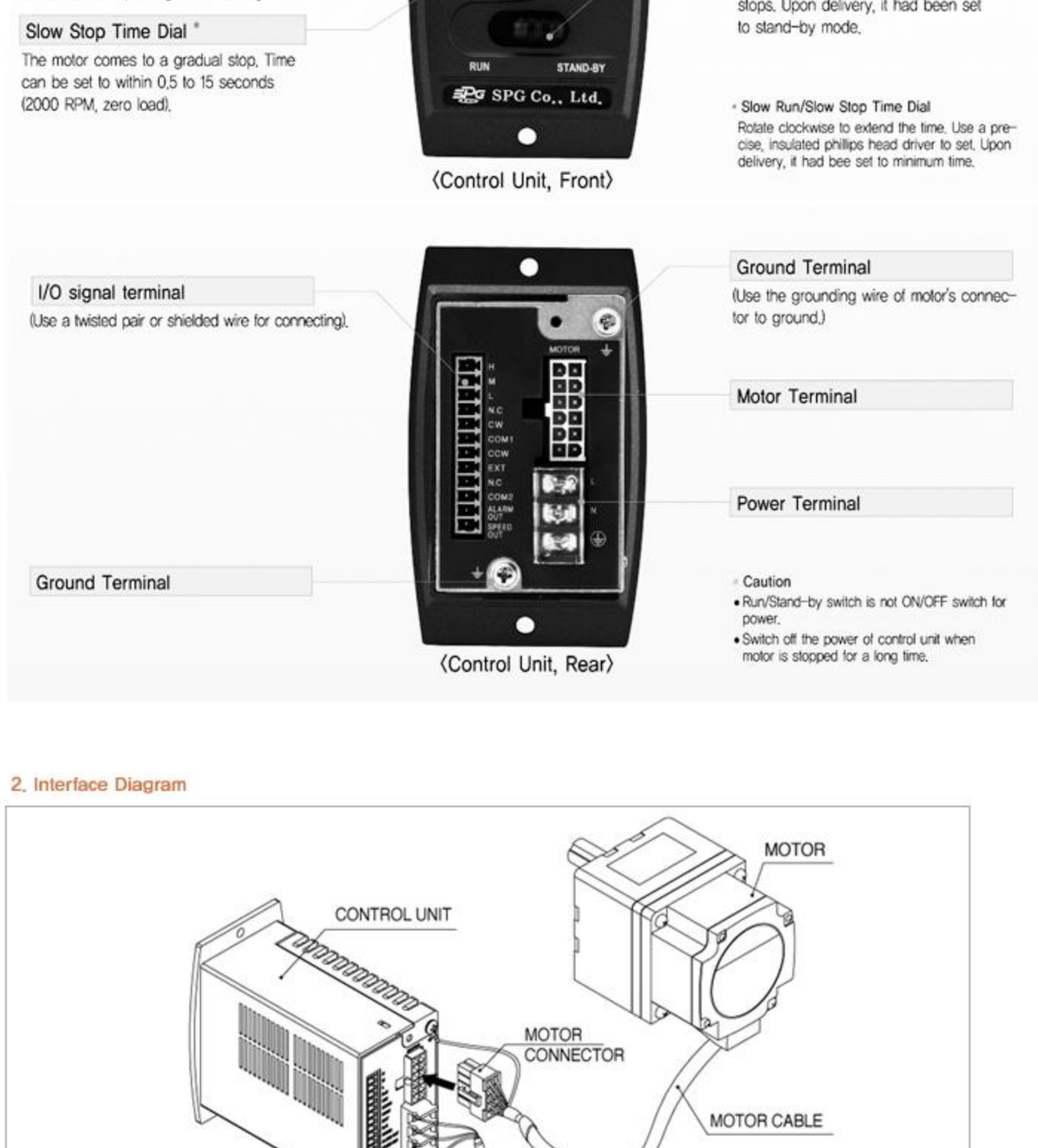
XWA Series

XWA Series is consisting with basic functions required to control the speed. It is a brushless DC motor of small high power and the unit of panel type driver and lines up

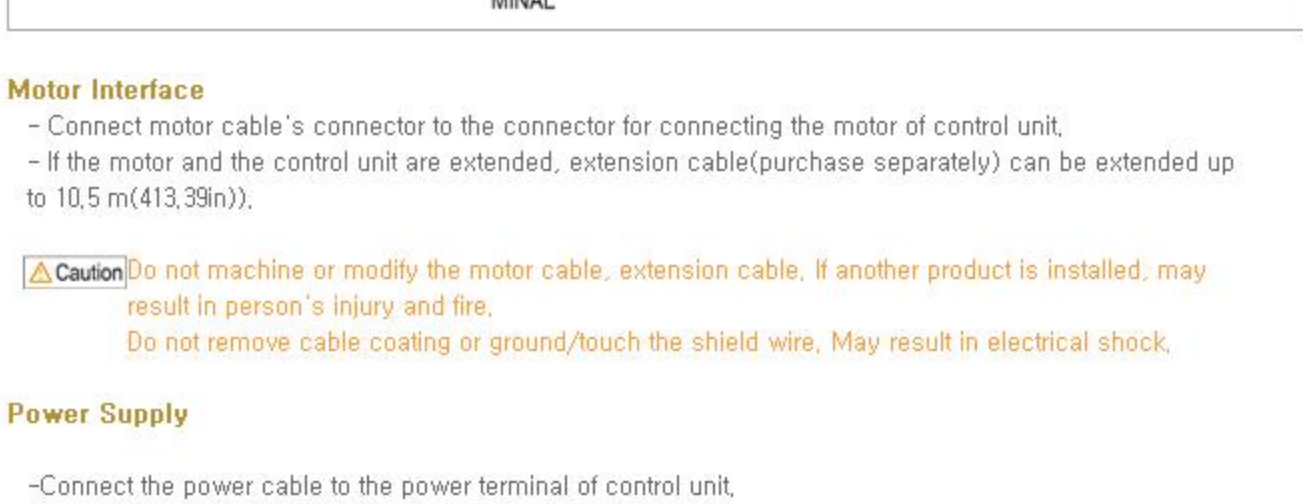
- 1. Control Unit Structure & Functions
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- 1. Control Unit Structure & Functions
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- 4. Signal Input Circuit [common for CW, CCW, COM, and EXT.]
- 5. Signal Output Circuit
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1. Control Unit Structure & Functions



2. Interface Diagram



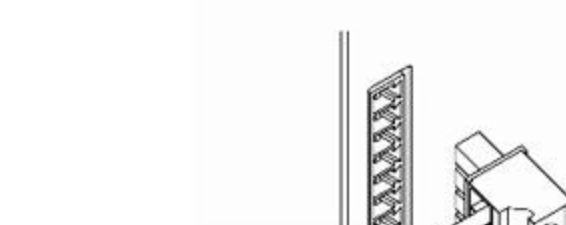
Motor Interface

- Connect motor cable's connector to the connector for connecting the motor of control unit.
- If the motor and the control unit are extended, extension cable (purchase separately) can be extended up to 10.5 m (413.39 in.).

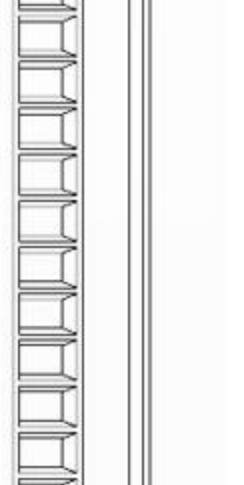
Caution Do not machine or modify the motor cable, extension cable, if another product is installed, may result in person's injury and fire.
Do not remove cable coating or ground, touch the shield wire, May result in electrical shock.

Power Supply

- Connect the power cable to the power terminal of control unit.
- Power Connection Terminal's Size of Terminal Screw and Cable Size in case of connection terminal, use a circular compressed terminal that is insulated and adhesive.



- The size of a terminal screw : M3
- Fastening torque : 0.8 ~ 1 Nm (113~142 oz.in)
- The size of a cable available for connection : AWG16~18 (1.25~0.75mm²)

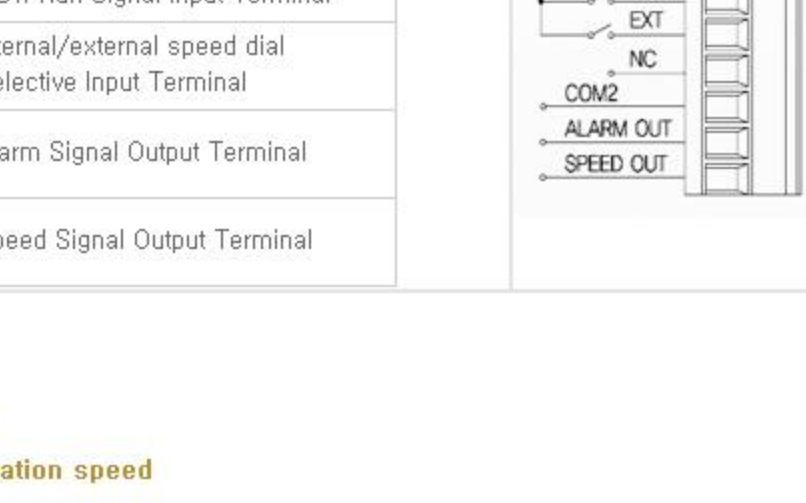


Grounding

- Use a AWG 18 or higher cable to ground.

Wiring the Signal I/O Terminal

- Signal I/O Terminal

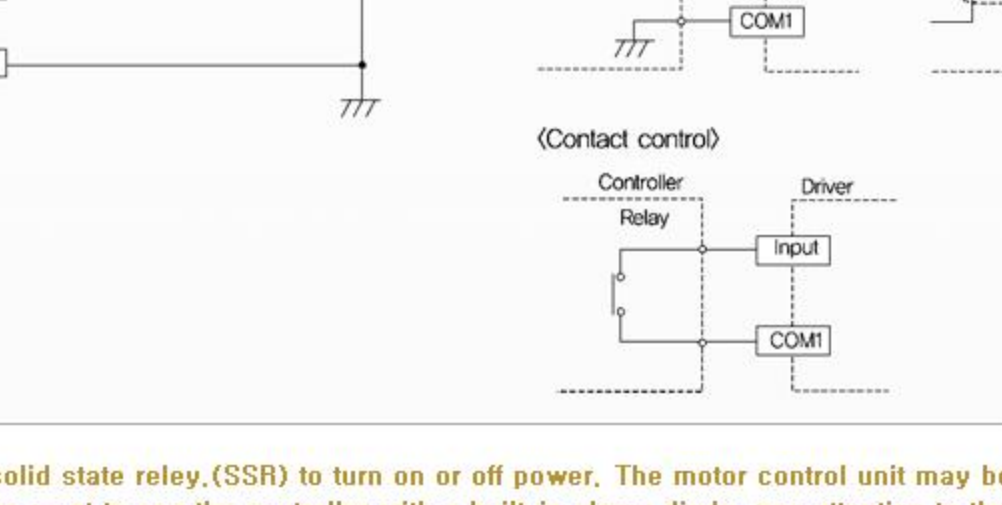


명칭	기능
H	Adjusts speed using an external speed dial or external DC voltage.
M	
L	
CW	CW Run Signal Input Terminal
COM	Signal I/O terminal, common
CCW	CCW Run Signal Input Terminal
EXT	Internal/external speed dial Selective Input Terminal
ALARM OUT	Alarm Signal Output Terminal
SPEED OUT	Speed Signal Output Terminal

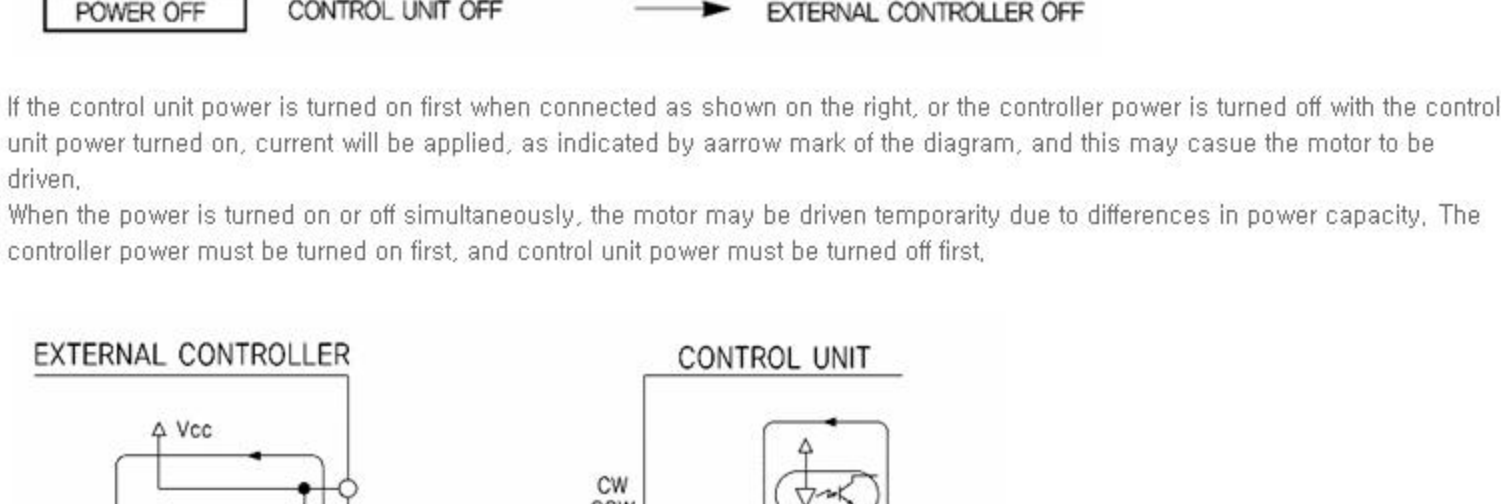
3. OPERATION

Selecting operation speed

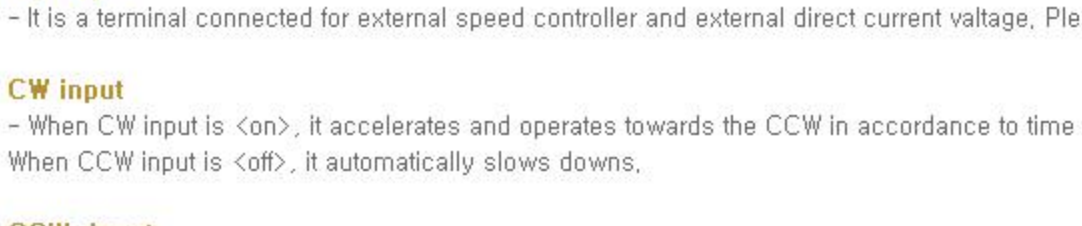
The speed of the motor can be controlled by the internal speed controller within the control unit. It can also be controlled through the attached external speed controller or external direct current voltage. Speed selection ranges are 100~2000r/min. The speed selection can be controlled two ways by using the mixture of internal speed controller/external speed controller and internal speed controller/external direct current voltage (refer to P.23).



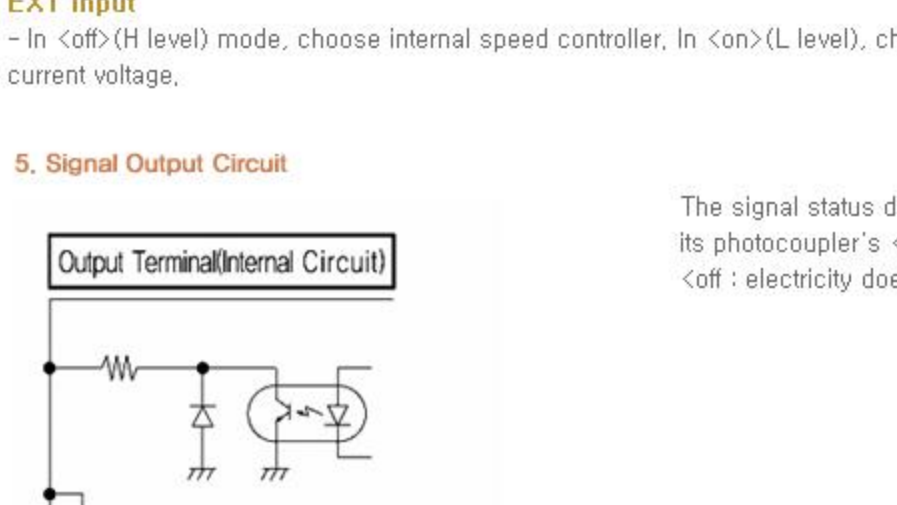
4. Signal Input Circuit



Do not use a solid state relay (SSR) to turn on or off power. The motor control unit may be damaged if it is used. When you want to use the controller with a built-in clamp diode, pay attention to the sequence of turning on or off their power.



If the control unit power is turned on first when connected as shown on the right, or the controller power is turned off with the control unit power turned on, current will be applied, as indicated by arrow mark of the diagram, and this may cause the motor to be driven.
When the power is turned on or off simultaneously, the motor may be driven temporarily due to differences in power capacity. The controller power must be turned on first, and control unit power must be turned off first.



H / M / L

- It is a terminal connected for external speed controller and external direct current voltage. Please refer to page 23.

CW input

- When CW input is <on>, it accelerates and operates towards the CCW in accordance to time set up by the slow run time controller. When CCW input is <off>, it automatically slows down.

CCW input

- When CCW input is <on>, it accelerates and operates towards the CW in accordance to time set up by the slow run time controller. When CW input is <off>, it automatically slows down.

[Important]

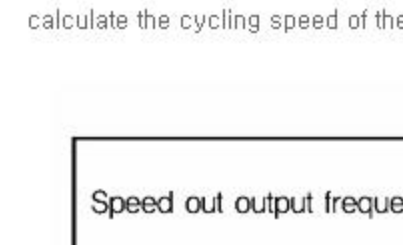
When CW input and CCW input get turned <on> at the same time CW has priority

- Immediate seize operation is impossible
- Please have 20msec of time in between CW and CCW input

EXT input

- In <off> (H level) mode, choose internal speed controller. In <on> (L level), choose external speed controller or external direct current voltage.

5. Signal Output Circuit

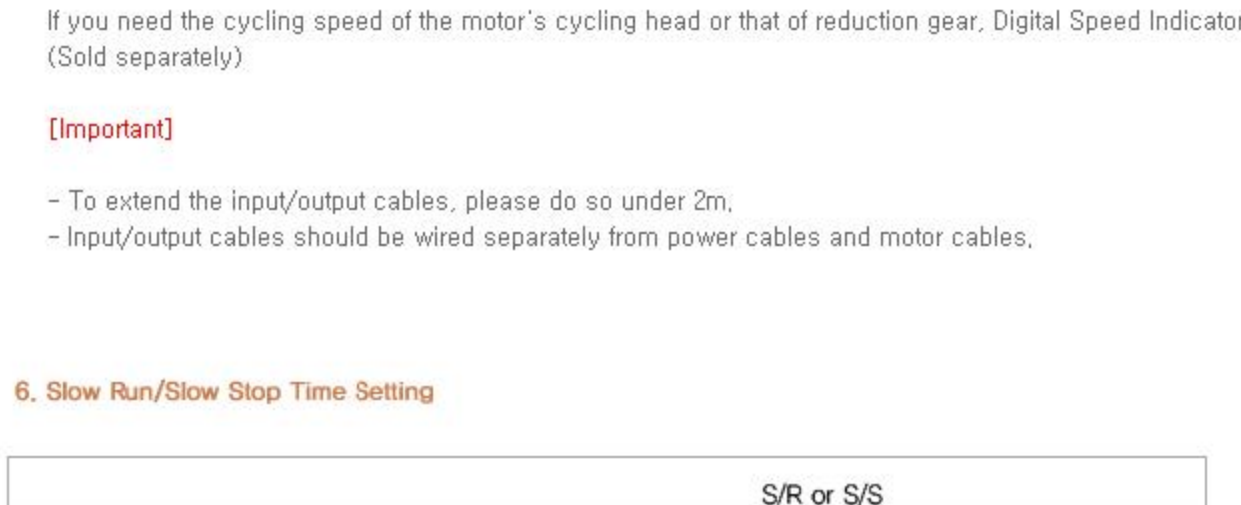


The signal status does not show the voltage level but its photocoupler's <on : electricity flows> , <off : electricity does not flow> status

ALARM OUT

- In the following condition, the protection guard of the control unit comes on, alarm out function turns <On> (L level), and the motor gets turned off.

※It is shown by the LED's on/flashing sign. Make sure to be informed of the protection guard function.

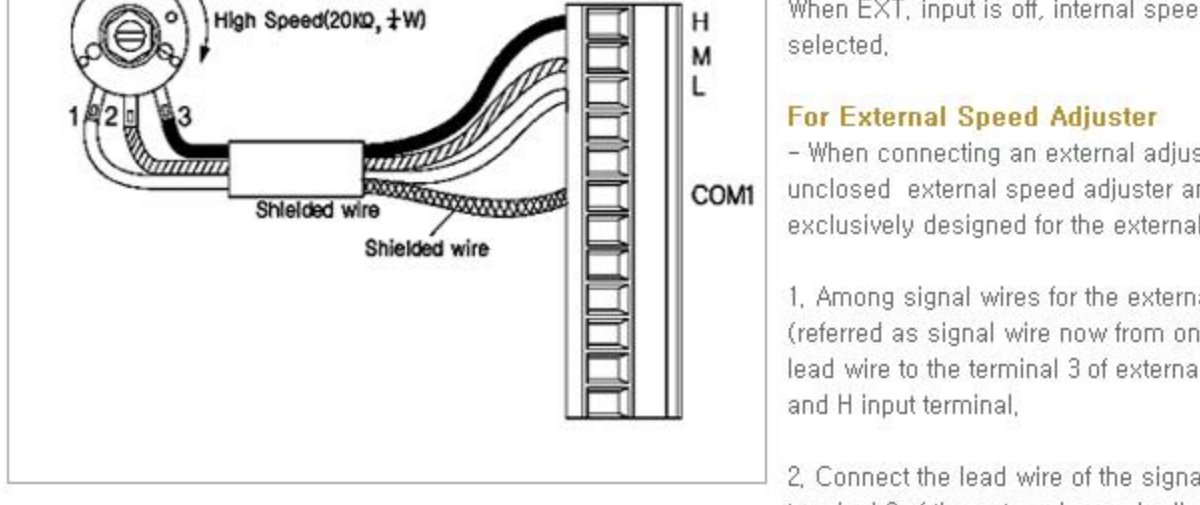


Type of protection function	ALARM LED ON/OFF Cycle	Action
Alarm Signal Output	Overload protection	1 Cycle Activated when a load exceeding the rated torque (load torque or motor current of 130% max of rated load or rated motor current) is applied to the motor for 5 seconds or more or when the motor is operated in short cycles of stopping/starting or CW/CCW rotation.
	Open-Phase protection	3 Cycle Prevents motor malfunction when the sensor cable within the motor cable is disconnected during motor operation. (An alarm signal will not be output while the motor is at a standstill.)
	Under voltage protection	4 Cycle Activated when an input voltage to the driver is less than specified voltage.
	Overspeed Protection	6 Cycle Activated when the speed of the motor exceed 2800r/min or when it shows abnormal speed.
	Overvoltage protection	ON Protects the driver against damage when the motor is driving an inertial load exceeding the permissible inertial load, or when the motor shaft is turned by the load (during lowering operation).

When conneted as above, alarm out gets <off> (H level) if the control unit is normal, and <on> (L level) when it alarms. When the alarm out is <on>, stop the operation of the motor and shut down the control unit. When the motor cable is normal, re-check the usage conditions (overload torque, operation patterns, voltage)

Speed Out

- In accordance to the motor operation, it outputs 12/15 pulse per cycle (of the motor's output shaft). Thus it is possible to calculate the cycling speed of the motor by measuring the output frequency of the speed out.

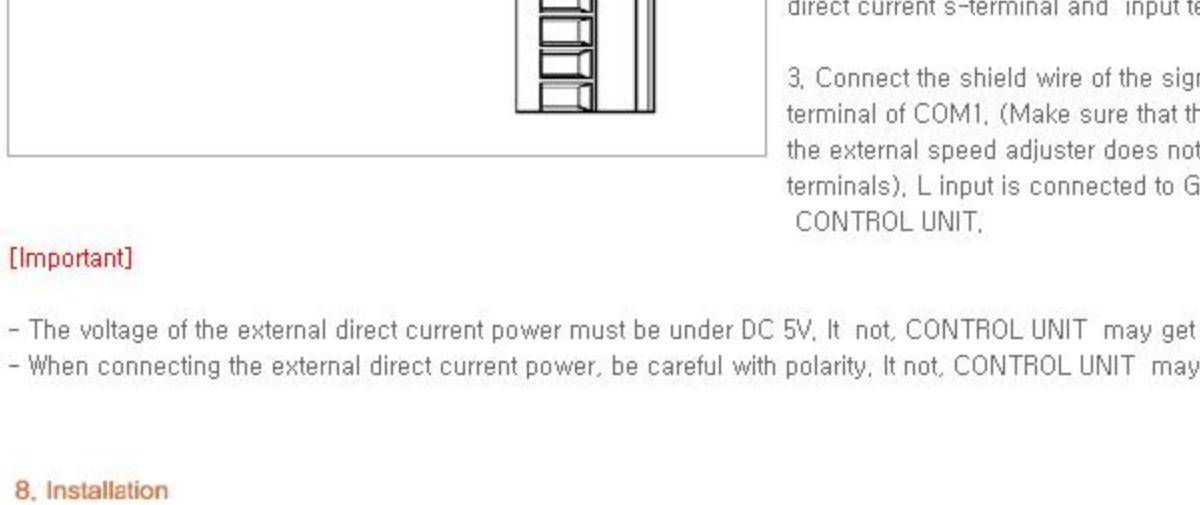


If you need the cycling speed of the motor's cycling head or that of reduction gear, Digital Speed Indicator (SID 250) is available. (Sold separately)

[Important]

- To extend the input/output cables, please do so under 2m.
- Input/output cables should be wired separately from power cables and motor cables.

6. Slow Run/Slow Stop Time Setting



Slow Run Time Setting Potentiometer

- The length of time between the start of the engine to the reach of desired speed is controlled by the "Slow Run Time Controller". When it is wound clock-wise, the time expands. The range of selection is in between 0.5sec~15sec.

Slow Stop Time Setting Potentiometer

- The length of time between the regular operation of the engine to a full stop of the engine is controlled by the "Slow Stop Time Controller". When it is wound clock-wise, the time expands. The range of selection is in between 0.5sec~15sec.

[Important]

- To change the cycling direction of the motor, slow down the motor with "Slow Stop Time Controller" and start the motor with "Slow Run Time Controller".

7. Speed Setting

For internal speed adjuster
- Speed is set with speed adjuster on the front panel of control unit.
When EXT. input is off, internal speed adjuster will be selected.

For External Speed Adjuster
- When connecting an external adjuster, use the enclosed external speed adjuster and the signal wire exclusively designed for the external speed adjuster.

- Among signal wires for the external speed adjuster (referred as signal wire now from on), connect the lead wire to the terminal 3 of external speed adjuster and H input terminal.
- Connect the lead wire of the signal wire to the terminal 2 of the external speed adjuster and M input terminal.
- Connect the lead wire of the signal wire to the terminal 1 of the external speed adjuster and L input terminal.
- Connect the shield wire of the signal wire to the terminal of COM1. (Make sure that the shield wire to the external speed adjuster does not touch other terminals.)

Connecting External Direct Current Power

- Use a direct current power (DC 0~5V) of which primary and secondary are highly insulated to be used for an external direct current.

- Connect the lead wire of the signal wire intended for the external speed adjuster (signal wire) to the external direct current's terminal and M input terminal.
- Connect the lead wire of the signal wire to external direct current's terminal and input terminal.
- Connect the shield wire of the signal wire to the terminal of COM1. (Make sure that the shield wire to the external speed adjuster does not touch other terminals). L input is connected to GND inside CONTROL UNIT.

[Important]

- The voltage of the external direct current power must be under DC 5V. If not, CONTROL UNIT may get damaged.
- When connecting the external direct current power, be careful with polarity. If not, CONTROL UNIT may get damaged.

8. Installation

- Install the control unit on a flat, metal panel that has strong endurance to vibration.
- When installation hole of control unit is used, tighten it with M4 screw and nut.
- When control unit is installed, install it with one of the two vents is facing downward.
- Install the wiring separating the control unit from the installation box and other instrument inside installation box over 25 mm in the horizontal, over 50 mm in the vertical.

Caution - Tightening torque for screw must be below 10kgf·cm (8.68lb·in). If torque exceeding 10kgf·cm (8.68lb·in) is applied, may result in damage to the control unit.