VEXTA

OPERATING MANUAL

Thank you for purchasing Oriental Motor products.
To ensure correct operation, please read these manual carefully before using this product.

5-Phase Stepping Motor/Driver Package

CSK Series

C-MOS Input Type

CSK543-NA	**CSK543-NB**
CSK544-NA	**CSK544-NB**
CSK545-NA	**CSK545-NB**
CSK564-NA	**CSK564-NB**
CSK566-NA	**CSK566-NB**
CSK569-NA	**CSK569-NB**

Photocoupler Input Type

CSK543-NAP	**CSK543-NBP**
CSK544-NAP	**CSK544-NBP**
CSK545-NAP	**CSK545-NBP**
CSK564-NAP	**CSK564-NBP**
CSK566-NAP	**CSK566-NBP**
CSK569-NAP	**CSK569-NBP**

Contents

Components

Type of Signal Input /Output	Package Model		Motor Model		Driver Model
	Single shaft	Double Shaft	Single Shaft	Double Shaft	
C-MOS Input Type	**CSK543-NA**	**CSK543-NB**	PK543-NA	PK543-NB	CSD5807N
	CSK544-NA	**CSK544-NB**	PK544-NA	PK544-NB	
	CSK545-NA	**CSK545-NB**	PK545-NA	PK545-NB	
	CSK564-NA	**CSK564-NB**	PK564-NA	PK564-NB	CSD5814N
	CSK566-NA	**CSK566-NB**	PK566-NA	PK566-NB	
	CSK569-NA	**CSK569-NB**	PK569-NA	PK569-NB	
	Accessories:	Connector Housing:	1-171822-2 (AMP)	1 piece	
			171822-5 (AMP)	1 piece	
		Contact:	170204-2 (AMP)	20 pieces	
		Operating Manual			

Type of Signal Input /Output	Package Model		Motor Model		Driver Model
	Single shaft	Double Shaft	Single Shaft	Double Shaft	
Photocoupler Input Type	**CSK543-NAP**	**CSK543-NBP**	PK543-NA	PK543-NB	CSD5807N-P
	CSK544-NAP	**CSK544-NBP**	PK544-NA	PK544-NB	
	CSK545-NAP	**CSK545-NBP**	PK545-NA	PK545-NB	
	CSK564-NAP	**CSK564-NBP**	PK564-NA	PK564-NB	CSD5814N-P
	CSK566-NAP	**CSK566-NBP**	PK566-NA	PK566-NB	
	CSK569-NAP	**CSK569-NBP**	PK569-NA	PK569-NB	
	Accessories:	Connector Housing:	171822-3 (AMP)	1 piece	
			1-171822-2 (AMP)	1 piece	
			171822-5 (AMP)	1 piece	
		Contact:	170204-2 (AMP)	25 pieces	
		Operating Manual			

■ Product Number Code

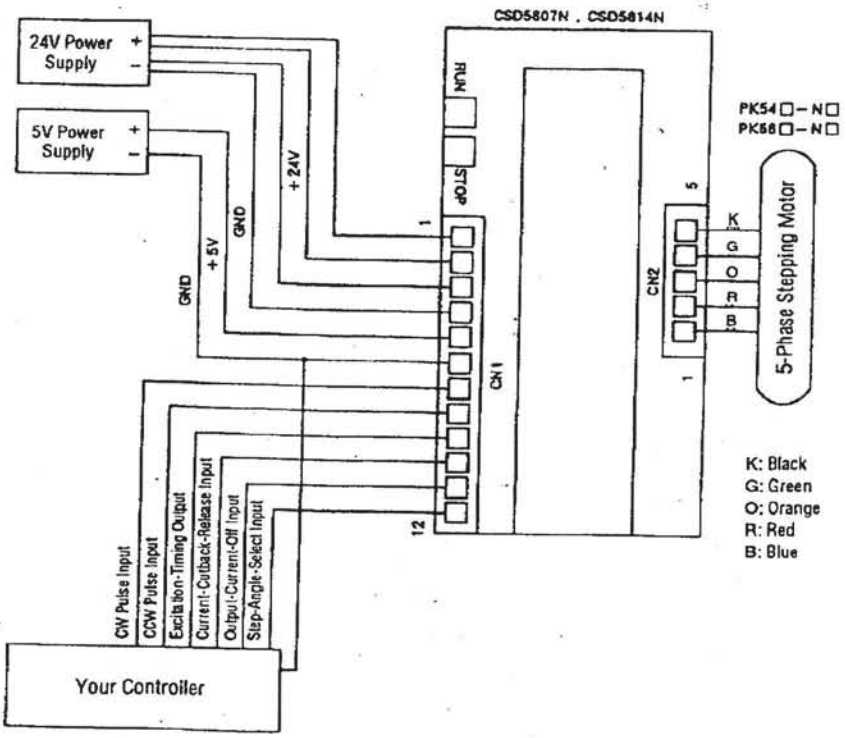
C S K 5 6 9 - N A P

- **P** — Type of Signal Input/Output — No letter: C-MOS Input Type; **P**: Photocoupler Input Type
- **A** — Shaft Type — **A**: Single Shaft; **B**: Double Shaft
- **N** — New Pentagon Drive System
- **9** — Length of Motor Case
- **6** — Installing Base Size — **4**: 42mm sq.; **6**: 60mm sq.
- **5** — 5-Phase
- **K** — Stepping Motor/Driver Package
- **CSK** Series

Connections

1. C-MOS Input Type Model: **CSK54□-N□** and **CSK56□-N□**

■ Connecting Diagram



Assembling the Connector

* The suitable wire size for the CN1 and CN2 connectors is AWG20 to AWG26. Use a wire rated at AWG20 to AWG22 for the power supply line.
* Use a dedicated assembling tool (AMP722560-1, etc.) when assembling the connectors.

Precaution on Connection

* Assemble the connectors firmly using a dedicated assembling tool. Always check the conductivity of the connector using a tester. Misassembling or miscontact will damage the motor and driver.
* Keep singal lines as short as possible.
* Signal lines should be kept away from power lines (power supply lines and motor lines). Do not bind the signal lines and power lines together.
* If electrical noise generated by the motor lead wires cause problems, try shielding the motor lead wires with conductive tape or wire mesh.

Before Turning On the Power

* Always check the connection of the power line (arranged +24V, +24V, GND, GND, +5V, GND left to right as seen facing the connector CN1).
* Is the connector properly and firmly connected?

■ Power and Signal Inputs

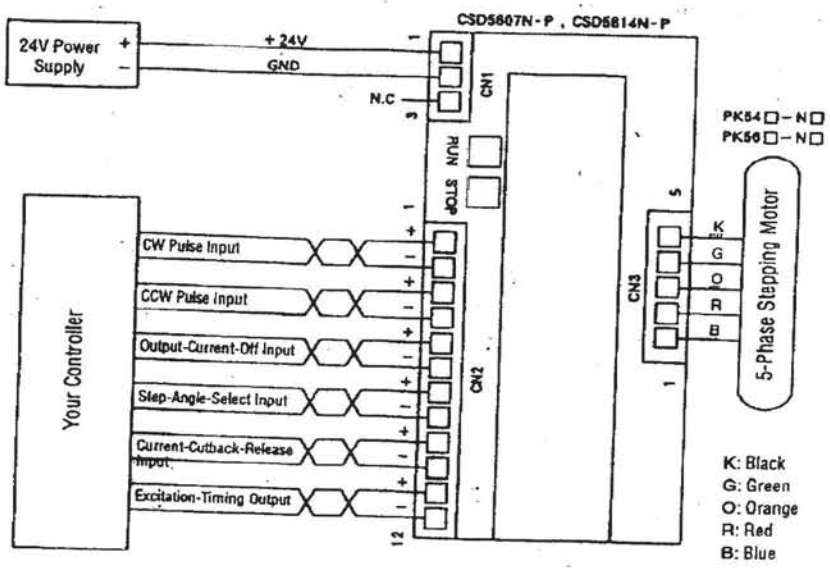
Driver Model: CSD5807N and CSD5814N

Connector No.	Pin No.	Name of Signals		Functions	Electrical Characteristics
CN1	1	+24V	Power Supply for Motor	* Connect + and - wires of 24V DC.	24V±10% 2A min. Ripple Voltage: 5Vp-p or less
	2				
	3	GND			
	4				
	5	+5V	Power Supply for Logic Circuit	* Connect + and - wires of 5V DC. * Use stabilized power supply.	5V±5% 0.1A min.
	6	GND			
	7	CW Pulse Input		* The motor rotates one step at rising edge of the pulse. * The motor will not operate properly when inputting a pulse signal while either the CW or CCW pulse is at "L" level. * "H" level is selected when these terminals leave unconnected.	L: 0 ~ 1.5V H: 3.5 ~ 5V Pulse width: 3 μs min. Pulse duty: 50% max.
	8	CCW Pulse Input			
	9	Excitation-Timing Output		* A signal is output whenever the motor excitation sequence returns to step "0" in synchronization with the input pulse signal. * A signal is output every 10 pulses in full step mode and every 20 pulses in half step mode.	30V DC max. 15mA max. Open-Collector Output
	10	Automatic-Current-Cutback-Release Input		* At "L" level, automatic-current-cutback-at-motor-standstill function is cancelled. * When this terminal leave unconnected, "H" level is selected and output current is reduced to one half of the rated value during motor stops.	L: 0 ~ 1.5V H: 3.5 ~ 5V
	11	Output-Current-OFF Input		* At "L" level, current to the motor stops, allowing the motor shaft to be rotated by hand. * When this terminal leave unconnected, "H" level is selected and normal operation is available.	L: 0 ~ 1.5V H: 3.5 ~ 5V
	12	Step-Angle-Select Input		* Full step at "L" level and half step at "H" level * When this terminal leave unconnected, "L" level (i.e. full step) is selected.	L: 0 ~ 1.5V H: 3.5 ~ 5V

Note: GND of 24V and 5V is internally connected.

2. Photocoupler Input Type Model: **CSK54□-N□P** and **CSK56□-N□P**

■ Connecting Diagram



Assembling the Connector

* The suitable wire size for the CN1, CN2 and CN3 connectors is AWG20 to AWG26. Use a wire rated at AWG20 to AWG22 for the power supply line.
* Use a dedicated assembling tool (AMP722560-1, etc.) when assembling the connectors.

Precaution on Connection

* Assemble the connectors firmly using a dedicated assembling tool. Always check the conductivity of the connector using a tester. Misassembling or miscontact will damage the motor and driver.
* Use twisted-pair wires for signal lines and keep them as short as possible.
* Signal lines should be kept away from power lines (power supply lines and motor lines). Do not bind the signal lines and power lines together.
* If electrical noise generated by the motor lead wires cause problems, try shielding the motor lead wires with conductive tape or wire mesh.

Before Turning On the Power

* Always check the connection of the power line (arranged +24V, GND, N.C left to right as seen facing the connector CN1).
* Is the connector properly and firmly connected?

■ Power and Signal Inputs

Driver Model: CSD5807N-P and CSD5814N-P

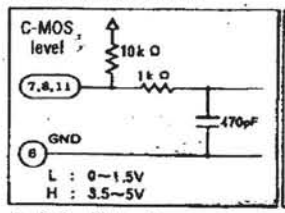
Connector No.	Pin No.	Name of Signals		Functions	Electrical Characteristics
CN1	1	+24V	Power Supply	*Connect + and - wires of 24V DC.	24V±10% 2.1A min.
	2	GND			
	3	N.C		—	—
CN2	1	+CW	CW Pulse Input	*When a negative logic pulse is input to the CW - terminal, the motor rotates one step clockwise at rising edge of the pulse.	L: 0 ~ 0.5V H: 4 ~ 5V Pulse width: 5 μs min. Pulse Rise/Pulse Fall Time: 2 μs max. Pulse duty: 50% max. Input Impedance: 220Ω Input Current: 20mA max.
	2	-CW			
	3	+CCW	CCW Pulse Input	*When a negative logic pulse is input to the CCW - terminal, the motor rotates one step counterclockwise at rising edge of the pulse.	
	4	-CCW			
	5	+H.OFF	Output-Current-OFF Input	*At "L" level (photocoupler is ON), current to the motor stops and the motor shaft can be rotated by hand.	
	6	-H.OFF			
	7	+HULL/HALF	Step-Angle-Select Input	*Half step at "L" level (photocoupler is ON) and full step at "H" level.	L: 0 ~ 0.5V H: 4 ~ 5V Input Impedance: 220Ω Input Current: 20mA max.
	8	-HULL/HALF			
	9	+C.D.INH	Automatic-Current-Cutback-Release Input	*At "L" level (photocoupler is ON), the automatic-current-cutback-at-motor-standstill function is cancelled.	
	10	-C.D.INH			
	11	+TIMING	Excitation-Timing Output	*A signal is output whenever the motor excitation sequence returns to step "0" in synchronization with the input pulse signal. (Output transistor is ON) *A signal is output every 10 pulses in full step mode and every 20 pulses in half step mode.	24V DC max. 10mA max. Photocoupler Open-Collector Output
	12	-TIMING			

Input/Output Signals

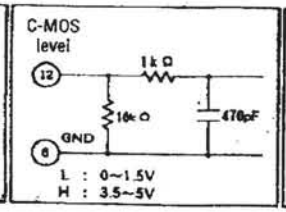
1. C-MOS Input Type Model: CSK54□-N□ and CSK56□-N□

■ Input/Output Signal Circuit

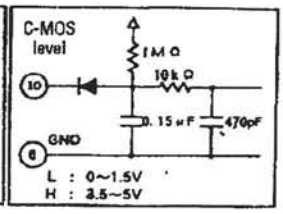
CW Pulse Input, CCW Pulse Input, Output-Current-Off Input



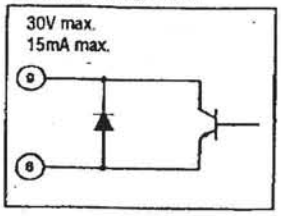
Step-Angle-Select Input



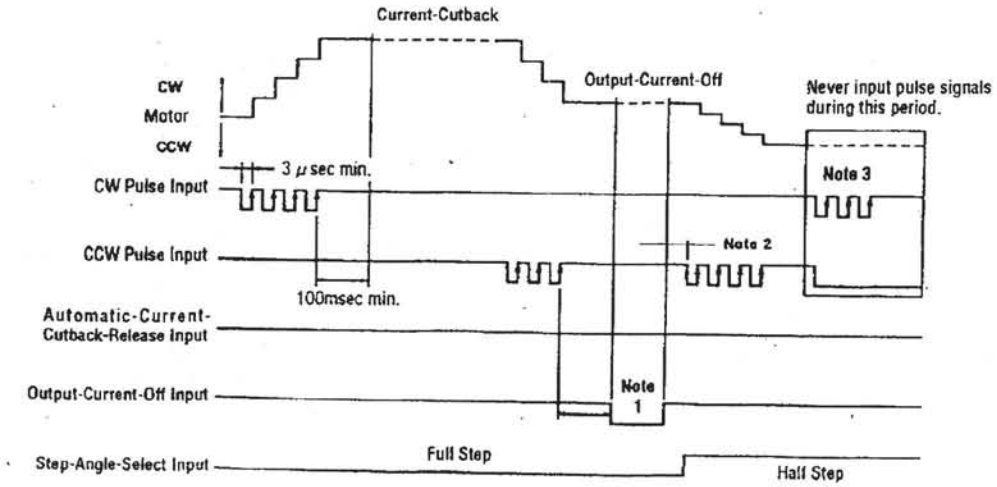
Automatic-Current-Cutback-Release Input



Excitation-Timing Output



■ Timing Chart



Note 1: It is recommended to wait a period of time before inputting the output-current-off signal to allow the motor oscillations to end. This time varies with the load inertia, the load torque and the starting pulse rate, etc. Signal input must be stopped before the motor stops.

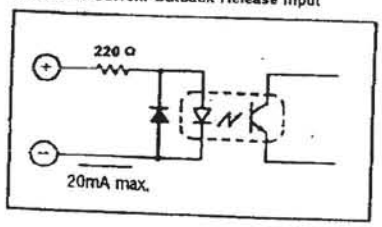
Note 2: Never input pulse signals immediately after switching the output-current-off signal to "H" level or the motor may lose synchronism. In general, an interval of 100msec. (minimum) is required.

Note 3: The motor will not operate properly when inputting a pulse signal while either the CW or CCW pulse is at "L" level.

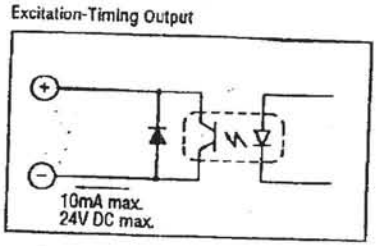
2. Photocoupler Input Type Model: CSK54□-N□P and CSK56□-N□P

■ Input/Output Signal Circuit

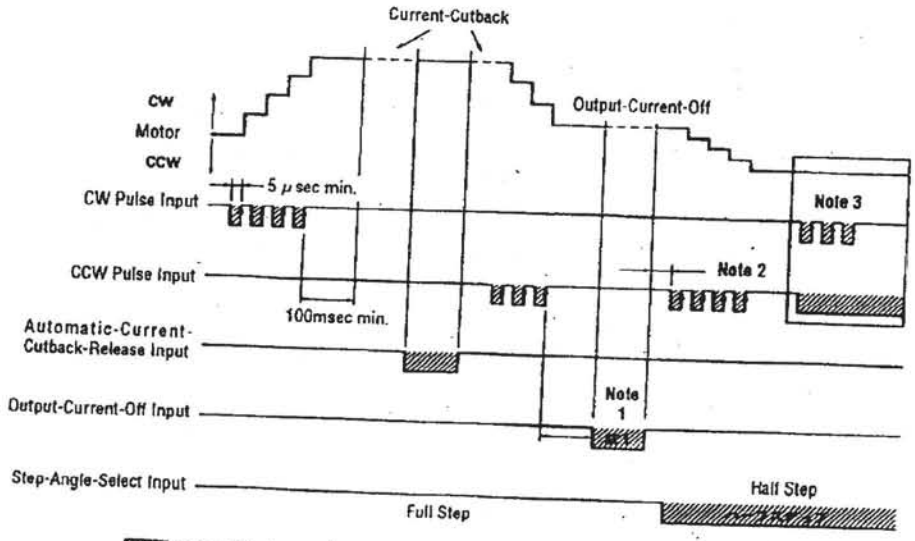
CW Pulse Input, CCW Pulse Input, Output-Current-Off Input, Step-Angle-Select Input, Automatic-Current-Cutback-Release Input



Excitation-Timing Output



■ Timing Chart



▨ : The Photocoupler diode lights in shaded area.

Note 1: It is recommended to wait a period of time before inputting the output-current-off signal to allow the motor oscillations to end. This time varies with the load inertia, the load torque and the starting pulse rate, etc. Signal input must be stopped before the motor stops.

Note 2: Never input pulse signals immediately after switching the output-current-off signal to "H" level or the motor may lose synchronism. In general, an interval of 100msec. (minimum) is required.

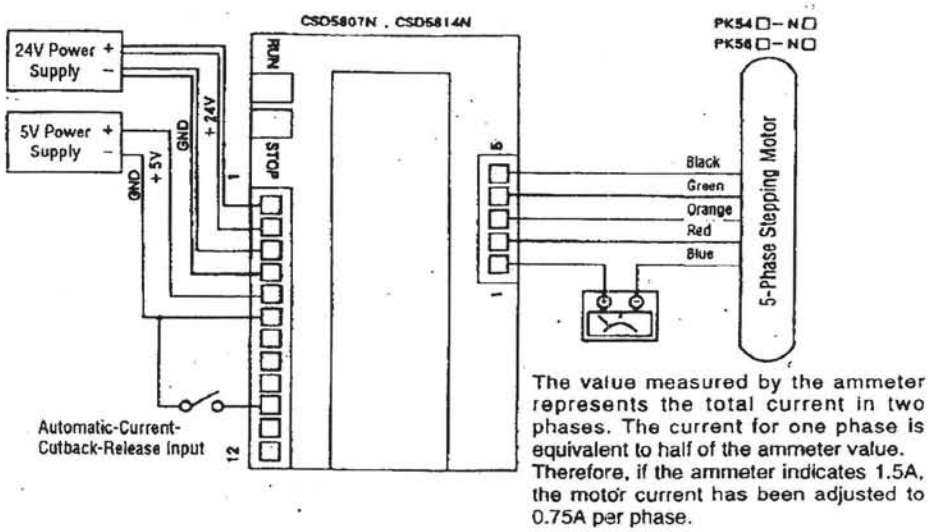
Note 3: The motor will not operate properly when inputting a pulse signal while either the CW or CCW pulse is at "L" level.

Adjusting the Driver Output Current

1. C-MOS Input Type **Model: CSK54□-N□ and CSK56□-N□**

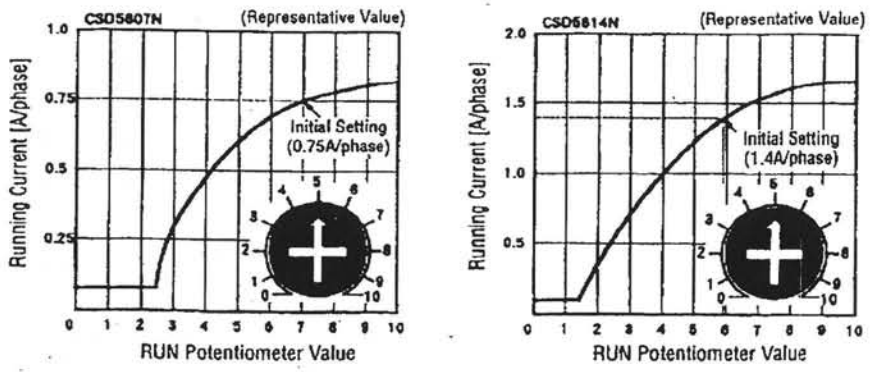
The rated output current is set at the factory. When it is necessary to change the current setting, follow the procedures described below.

■ Connecting an Ammeter



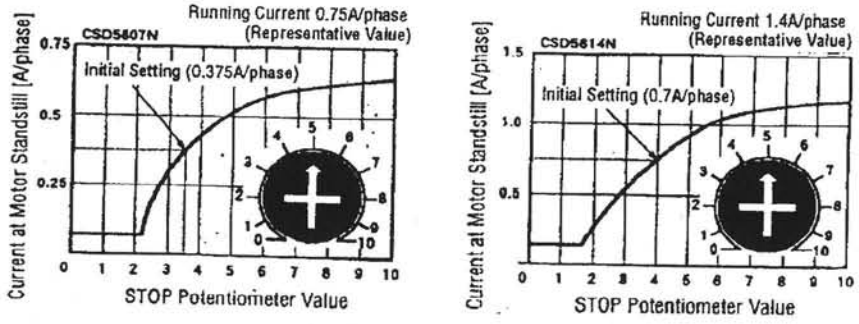
The value measured by the ammeter represents the total current in two phases. The current for one phase is equivalent to half of the ammeter value. Therefore, if the ammeter indicates 1.5A, the motor current has been adjusted to 0.75A per phase.

■ Adjusting the Running Current



1. Short circuit the automatic-current-cutback-release terminal and the GND terminal. (Cancel the automatic-current-cutback-at-motor-standstill function.)
2. Do not input any other signals.
3. After hooking-up the motor and ammeter to the driver as shown in the diagram above, first apply 5V DC, then apply 24V DC.
4. Adjust the motor running current with the RUN potentiometer.
5. When the RUN potentiometer has been turned to the full clockwise position, the output current of the driver will be 0.8A/phase (CSD5807N) or 1.6A/phase (CSD5814N). Even though the driver will output the current, do not operate the driver beyond the rated current, 0.75A/phase (CSD5807N) or 1.4A/phase (CSD5814N).

■ Adjusting the Current at Motor Standstill



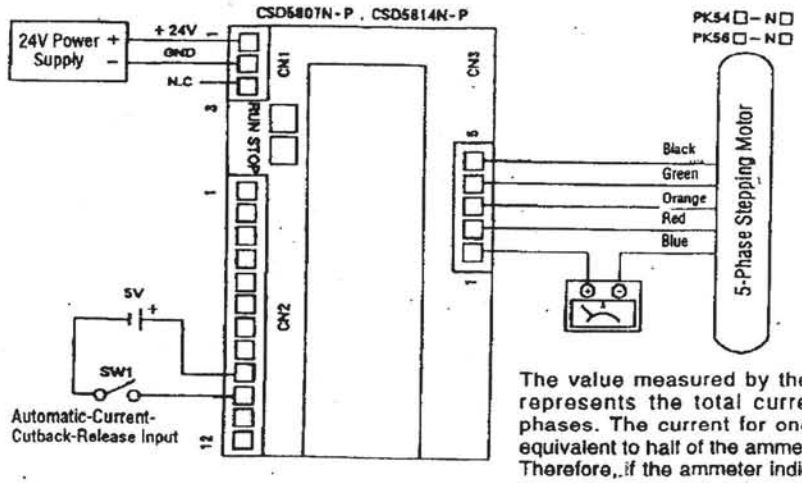
1. After hooking-up the motor and ammeter to the driver as shown in the diagram above, first apply 5V DC, then apply 24V DC.
2. Disconnect the automatic-current-cutback-release terminal and the GND terminal. (Activate the automatic-current-cutback-at-motor-standstill function.)
3. Adjust the current at motor standstill with the STOP potentiometer.
4. The current has been set to 50% of the RUN current when shipping.

Note: The current should be adjusted when the driver is not receiving any other input signals. The current value is changed with each input of a pulse.

2. Photocoupler Input Type Model: CSK54□-N□P and CSK56□-N□P

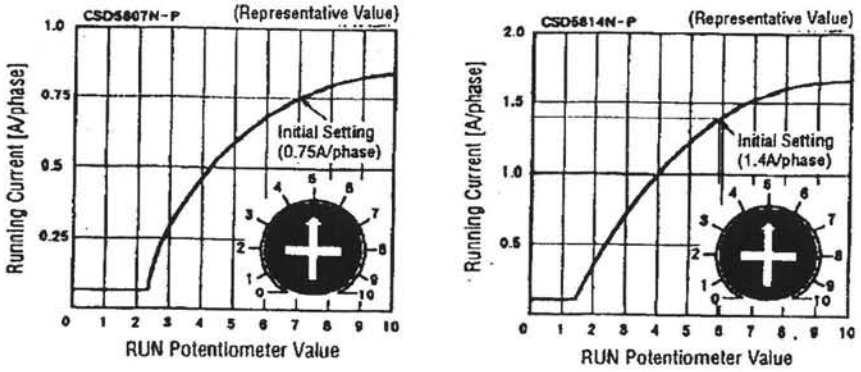
The rated output current is set at the factory. When it is necessary to change the current setting, follow the procedures described below.

■ Connecting an Ammeter



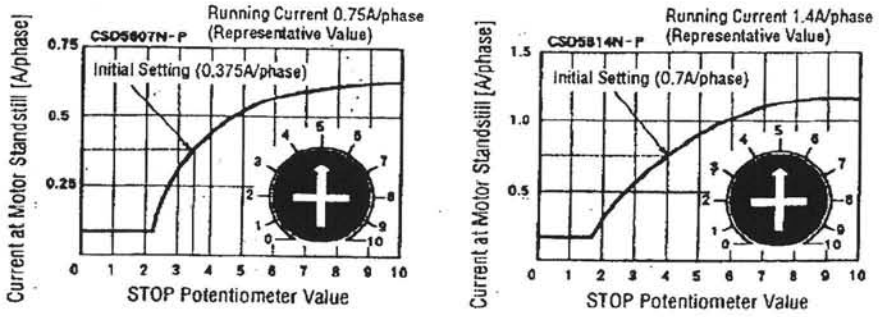
The value measured by the ammeter represents the total current in two phases. The current for one phase is equivalent to half of the ammeter value. Therefore, if the ammeter indicates 1.5A, the motor current has been adjusted to 0.75A per phase.

■ Adjusting the Running Current



1. Turn on the switch SW1 for automatic-current-cutback-release function. (Cancel the automatic-current-cutback-at-motor-standstill function.)
2. Do not input any other signals.
3. After hooking-up the motor and ammeter to the driver as shown in the diagram above, apply 24V DC.
4. Adjust the motor running current with the RUN potentiometer.
5. When the RUN potentiometer has been turned to the full clockwise position, the output current of the driver will be 0.8A/phase (CSD5807N-P) or 1.6A/phase (CSD5814N-P). Even though the driver will output the current, do not operate the driver beyond the rated current, 0.75A/phase (CSD5807N-P) or 1.4A/phase (CSD5814N-P).

■ Adjusting the Current at Motor Standstill



1. After hooking-up the motor and ammeter to the driver as shown in the diagram above, apply 24V DC.
2. Turn off the switch SW1 for automatic-current-cutback-release function. (Activate the automatic-current-cutback-at-motor-standstill function.)
3. Adjust the current at motor standstill with the STOP potentiometer.
4. The current has been set to 50% of the RUN current when shipping.

Note: The current should be adjusted when the driver is not receiving any other input signals. The current value is changed with each input of a pulse.

Installation

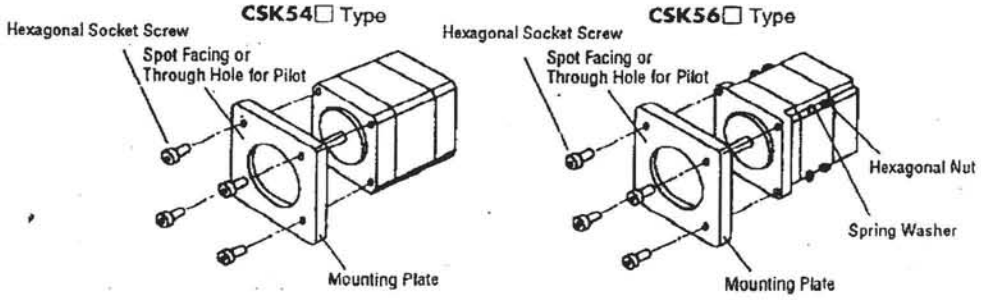
1. Precaution on Installation

Installing motors and drivers in place that meet following conditions.

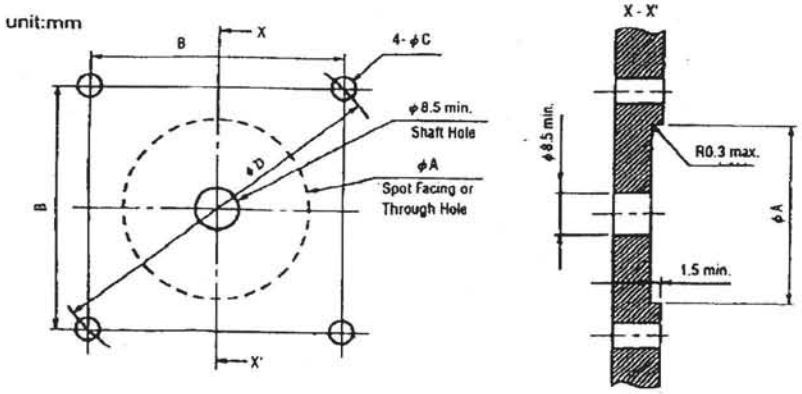
* Install the motor tightly against a metal surface with good thermal conductivity such as steel or almimum.
* Free from dust, oil mist, salt or corrosive gas.
* Free from excessive vibration or shocks.
* Leave at least 25mm of open space between each side of the driver and any other apparatus or structures.
* In the case that the drivers are located close to a large noise source such as high voltage lines, high voltage machines or power units, etc., take steps to prevent noise interference, either by inserting noise filters or connecting the driver to a separate circuit.
* Good ventilation and radiation.
* Ambient temperature is 0℃ to +40℃.
* Take care that pieces of conductive material (filings, pins, pieces of windings, etc.) not to enter the drivers.

2. Installing the Motor

Install the motor tightly against a mounting plate referring to the panel cut out shown below.



■ Panel Cutout for Motor Mounting



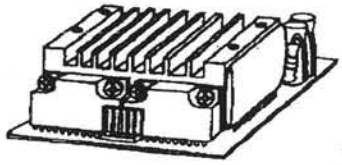
■ Thickness of Mounting Plate unit:mm

Model	Thickness of Mounting Plate	φA	B	φC	φD
CSK543	2 minimum	22H8	31±0.1	3.5	43.8±0.2
CSK544	3 minimum	22H8	31±0.1	3.5	43.8±0.2
CSK545	4 minimum	22H8	31±0.1	3.5	43.8±0.2
CSK56□	5 ~ 10	36H6	50±0.35	4.5	70.7±0.3

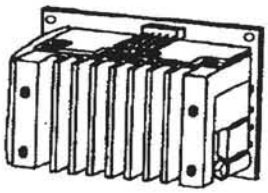
3. Installing the Driver

Install the driver in the following manner to control overheating, as much as possible.

■ Horizontal Installation:
Position the heat sink on the upper surface.

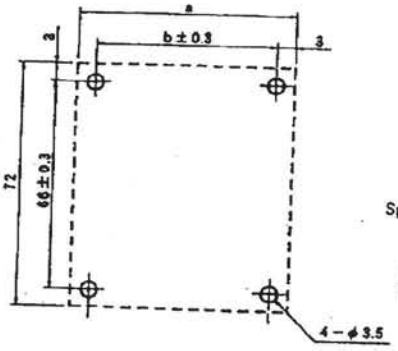


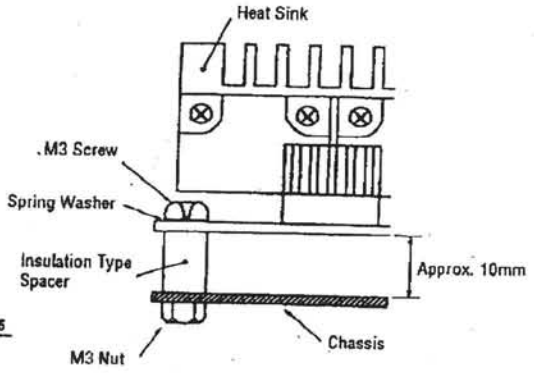
■ Vertical Installation:
Position the terminal blocks on the upper surface.



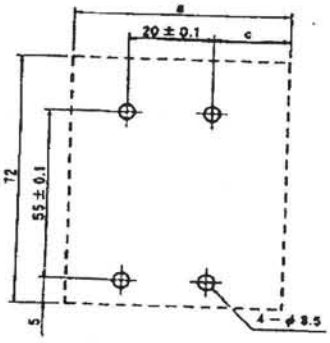
■ Mounting through the Circuit Board

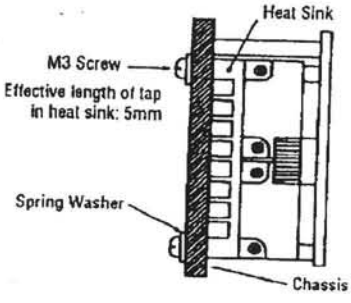
unit:mm





■ Mounting with the Heat Sink





Caution: When using screws to install the driver not to touch any component. The length of screws should be 5mm plus the thickness of the chassis.

Dimensions		a	b	c
C-MOS Input Type	**CSK54□-N□, CSK56□-N□**	56	50	23.5
Photocoupler Input Type	**CSK54□-N□P, CSK56□-N□P**	57	61	24.5

Specifications

■ C-MOS Input Type

Package Model		Single Shaft	**CSK543-NA**	**CSK544-NA**	**CSK545-NA**
		Double Shaft	**CSK543-NB**	**CSK544-NB**	**CSK545-NB**
Motor Unit	Motor Model	Single Shaft	PK543-NA	PK544-NA	PK545-NA
		Double Shaft	PK543-NB	PK544-NB	PK545-NB
	Maximum Holding Torque	N·m	0.13	0.18	0.24
		kgcm	1.3	1.8	2.4
	Rotor Inertia	kg·m²	35 × 10^{-7}	54 × 10^{-7}	68 × 10^{-7}
		gcm²	35	54	68
	Resistance per Phase	Ω/Phase	1.7	2.2	2.2
	Mass	kg	0.21	0.27	0.35
	Step Angle		0.72°		
	Insulation Resistance		100MΩ or more under normal ambient temperature and humidity when the megger reading between the windings and the frame is DC500V.		
	Dielectric Strength		Under normal ambient temperature and humidity, sufficient to withstand 0.5kV at 50Hz applied between the windings the frame for one minute.		
	Insulation Class		Class B (130°C)		
	Ambient Temperature		-10°C ~ +50°C		
Driver Unit	Driver Model		CSD5807N		
	Voltage		24V DC ±10% 1.3A minimum 5V DC ±5% 0.1A minimum		
	Output Current		0.1 ~ 0.75A/phase		
	Excitation Mode		Full Step: 0.72°/step Half Step: 0.36°/step		
	Input/Output Signals	Pulse Signal Input	2-Pulse Input, C-MOS Negative Logic Input		
		Automatic-Current-Cutback-Release Input	C-MOS Negative Logic Input		
		Output-Current-Off Input	C-MOS Negative Logic Input		
		Step-Angle-Select Input	C-MOS Positive Logic Input		
		Excitation-Timing Output	Open-Collector Output, 30V DC 15mA maximum		
	Mass	kg	0.12		
	Ambient Temperature		-10°C ~ +40°C		

Note: The value given for holding torque is the value operated with rated current and 5 phase excitation.

Package Model		Single Shaft	**CSK564-NA**	**CSK566-NA**	**CSK569-NA**
		Double Shaft	**CSK564-NB**	**CSK566-NB**	**CSK569-NB**
Motor Unit	Motor Model	Single Shaft	PK564-NA	PK566-NA	PK569-NA
		Double Shaft	PK564-NB	PK566-NB	PK569-NB
	Maximum Holding Torque	N·m	0.42	0.83	1.66
		kgcm	4.2	8.3	16.6
	Rotor Inertia	kg·m²	175 × 10^{-7}	280 × 10^{-7}	560 × 10^{-7}
		gcm²	175	280	560
	Resistance per Phase	Ω/Phase	0.7	1.1	1.7
	Mass	kg	0.6	0.8	1.3
	Step Angle		0.72°		
	Insulation Resistance		100MΩ or more under normal ambient temperature and humidity when the megger reading between the windings and the frame is DC500V.		
	Dielectric Strength		Under normal ambient temperature and humidity, sufficient to withstand 1kV at 50Hz applied between the windings the frame for one minute.		
	Insulation Class		Class B (130°C)		
	Ambient Temperature		-10°C ~ +50°C		
Driver Unit	Driver Model		CSD5814N		
	Voltage		24V DC ±10% 2A minimum 5V DC ±5% 0.1A minimum		
	Output Current		0.1 ~ 1.4A/phase		
	Excitation Mode		Full Step: 0.72°/step Half Step: 0.36°/step		
	Input/Output Signals: Pulse Signal Input		2-Pulse Input, C-MOS Negative Logic Input		
	Input/Output Signals: Automatic-Current-Cutback-Release Input		C-MOS Negative Logic Input		
	Input/Output Signals: Output-Current-Off Input		C-MOS Negative Logic Input		
	Input/Output Signals: Step-Angle-Select Input		C-MOS Positive Logic Input		
	Input/Output Signals: Excitation-Timing Output		Open-Collector Output, 30V DC 15mA maximum		
	Mass	kg	0.12		
	Ambient Temperature		-10°C ~ +40°C		

Note: The value given for holding torque is the value operated with rated current and 5 phase excitation.

■ Photocoupler Input Type

Package Model		Single Shaft	**CSK543-NAP**	**CSK544-NAP**	**CSK545-NAP**
		Double Shaft	**CSK543-NBP**	**CSK544-NBP**	**CSK545-NBP**
Motor Unit	Motor Model	Single Shaft	PK543-NA	PK544-NA	PK545-NA
		Double Shaft	PK543-NB	PK544-NB	PK545-NB
	Maximum Holding Torque	N·m	0.13	0.18	0.24
		kgcm	1.3	1.8	2.4
	Rotor Inertia	kg·m²	35 × 10⁻⁷	54 × 10⁻⁷	68 × 10⁻⁷
		gcm²	35	54	68
	Resistance per Phase	Ω/Phase	1.7	2.2	2.2
	Mass	kg	0.21	0.27	0.35
	Step Angle		0.72°		
	Insulation Resistance		100MΩ or more under normal ambient temperature and humidity when the megger reading between the windings and the frame is DC500V.		
	Dielectric Strength		Under normal ambient temperature and humidity, sufficient to withstand 0.5kV at 50Hz applied between the windings the frame for one minute.		
	Insulation Class		Class B (130°C)		
	Ambient Temperature		-10°C ~ +50°C		
Driver Unit	Driver Model		CSD5807N-P		
	Voltage		24V DC ±10% 1.3A minimum		
	Output Current		0.1 ~ 0.75A/phase		
	Excitation Mode		Full Step: 0.72°/step Half Step: 0.36°/step		
	Input/Output Signals	Pulse Signal Input	2-Pulse Input, Photocoupler Input Input Impedance 220Ω, Input Current 20mA maximum Pulse Width 5μsec minimum, Pulse Rise/Fall Time 2μsec minimum L: 0 ~ 0.5V, H: 4 ~ 5V		
		Output-Current-Off Input	Photocoupler Input Input Impedance 220Ω, Input Current 20mA maximum L: 0 ~ 0.5V, H: 4 ~ 5V		
		Step-Angle-Select Input			
		Automatic-Current-Cutback-Release Input			
		Excitation-Timing Output	Photocoupler Open-Collector Output, 24V DC 10mA maximum		
	Mass	kg	0.12		
	Ambient Temperature		-10°C ~ +40°C		

Note: The value given for holding torque is the value operated with rated current and 5 phase excitation.

Package Model	Single Shaft		**CSK564-NAP**	**CSK566-NAP**	**CSK569-NAP**
	Double Shaft		**CSK564-NBP**	**CSK566-NBP**	**CSK569-NBP**
Motor Unit	Motor Model	Single Shaft	PK564-NA	PK566-NA	PK569-NA
		Double Shaft	PK564-NB	PK566-NB	PK569-NB
	Maximum Holding Torque	N·m	0.42	0.83	1.66
		kgcm	4.2	8.3	16.6
	Rotor Inertia	kg·m²	175 × 10^{-7}	280 × 10^{-7}	560 × 10^{-7}
		gcm²	175	280	560
	Resistance per Phase	Ω/Phase	0.7	1.1	1.7
	Mass	kg	0.6	0.8	1.3
	Step Angle		0.72°		
	Insulation Resistance		100MΩ or more under normal ambient temperature and humidity when the megger reading between the windings and the frame is DC500V.		
	Dielectric Strength		Under normal ambient temperature and humidity, sufficient to withstand 1kV at 50Hz applied between the windings the frame for one minute.		
	Insulation Class		Class B (130°C)		
	Ambient Temperature		-10°C ~ +50°C		
Driver Unit	Driver Model		CSD5814N-P		
	Voltage		24V DC ±10% 2A minimum		
	Output Current		0.1 ~ 1.4A/phase		
	Excitation Mode		Full Step: 0.72°/step Half Step: 0.36°/step		
	Input/Output Signals: Pulse Signal Input		2-Pulse Input, Photocoupler Input Input Impedance 220Ω, Input Current 20mA maximum Pulse Width 5 μsec minimum, Pulse Rise/Fall Time 2 μsec minimum L: 0 ~ 0.5V, H: 4 ~ 5V		
	Input/Output Signals: Output-Current-Off Input		Photocoupler Input Input Impedance 220Ω, Input Current 20mA maximum L: 0 ~ 0.5V, H: 4 ~ 5V		
	Input/Output Signals: Step-Angle-Select Input				
	Input/Output Signals: Automatic-Current-Cutback-Release Input				
	Input/Output Signals: Excitation-Timing Output		Photocoupler Open-Collector Output, 24V DC 10mA maximum		
	Mass	kg	0.12		
	Ambient Temperature		-10°C ~ +40°C		

Note: The value given for holding torque is the value operated with rated current and 5 phase excitation.

Trouble Shooting

Check the unit once again before requesting service.
When the stepping motor is not functioning properly, perform the following checks and take the following measures. If the motor continues to malfunction, please call your nearest Oriental Motor or our distributors.

Problem	Check Point	Corrective Measures
Motor is not energized or motor has no holding torque. (The motor shaft rotates easily by hand.)	1. Power supply	* Check that the power is connected.
	2. Output-Current-Off input	* Check that the connector is properly and firmly connected. * When the output-current-off signal is at "L" level, the motor ceases to be energized (has no holding torque).
	3. Motor and driver connection	* Check that the motor and driver are connected properly.
	4. RUN and STOP potentiometers	* These potentiometers are used to adjust the output current to motor. (If they have been turned too far down, return them to their initial settings and then check the results.)
	5. Connectors	* Check that the connector housing is properly connected.
Motor does not rotate. Motor rotates in the opposite direction.	Check the points 1 to 4 above.	
	6. CW pulse and CCW pulse	* Check the connections, voltages and waveform of pulse signal. * Check that the input of the another pulse is at "H" level.
Motor is not functioning properly.	Check the points 3, 4 and 6 above.	
	7. Are the CW and CCW signals input simultaneously?	* When the CW and CCW pulses are input at the same time, the motor will not operate properly.
	8. Are the motor and the load properly centered? Is the load too large?	* Re-tighten the coupling screws or check the load disengaged.
Motor does not move far enough.	9. Does the actual motor step angle conform with the motor step angle required by the device?	* Check the setting of the step angle switch on the driver.
	10. Are the pulse generator settings for the input pulse number appropriate for the amount of motor movement?	* Check the settings.
The motor loses synchronism during acceleration (or during operation).	Check the point 2.	
	11. Is the starting pulse too high?	* Lower the rate and check the results.
	12. Is the acceleration/deceleration time too short?	* Lengthen the time and check the results.
	13. Is there any effect from external electrical noise?	* Check the motor movement independently, without operating any other apparatus which could be potential sources of noise.
There is excessive vibration.	14. There may be excessive motor output torque.	* Try reducing the motor running current.
	15. Try changing the pulse rate.	* If the vibration is reduces after changing the pulse rate, the problem might lie in the resonance of the motor. Try changing the pulse rate or step angle.
The motor is excessively hot.	16. The motor has been operating for too long. (Is the temperature of the motor case less than 100°C?)	* Shorten the motor operating time or lengthen its rest time. * Lower the temperature of the motor case less than 100°C.

Problem	Check Point	Corrective Measures
Automatic-current-cutback-at-motor-standstill function does not work.	17. Is the automatic-current-cutback-release input at "L" level?	* Set the automatic-current-cutback-release input at "H" level.
	18. Is the STOP potentiometer in the maximum position?	* Current cannot be lowered when this potentiometer is in MAX position. Turn this potentiometer to the left. (Adjust to the optimal value by making reference to page 11 or 13.)
	19. After conclusion of the pulse, is the pulse signal returned to "H" level?	* When the pulse signal is maintained at the "L" level (photocoupler is ON) the current cannot be lowered. Be sure to return the pulse signal to the "H" position.