388-737

SD-0572-1/10

Specification
for
PMM-MD-23221-10

Revision records

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SD2-3-06

1. Overview

This is a bipolar switching stepping motor driver designed to provide high speed, high torque operation of 2-phase stepping motors.

2. Specification

2-1) Applicable Stepping Motors

Stepping motor models		Holding torque (N · m)	Basic step angle (in degrees)	Coil current (A/phase)
Single-axis shaft	Double-axis shaft			
103H546-0440	103H546-0410	0.15	1.8	2
103H548-0440	103H548-0410	0.27		
103H6704-0440	103H6704-0410	0.54		
103H7121-0440	103H7121-0410	0.4		
103H7123-0440	103H7123-0410	0.85		
103H7126-0440	103H7126-0410	1.3		

2-2) Input Signals

a. Input pulse signals (CW and CCW)

	2-input approach	1-input approach
CW terminal	Applying pulsed input to this terminal runs a motor in clockwise direction (seen from the output axis side).	Applying pulsed input to this terminal runs a motor.
CCW terminal	Applying pulsed input to this terminal runs a motor in counter clockwise direction (seen from the output axis side).	According to the level of input signal applied to this terminal, motor rotation direction is determined. "H" level input --- Runs a motor in clockwise direction. "L" level input --- Runs a motor in counter clockwise direction.

* The standard configuration employs the 2-input design.
* See Section 7 for changing the pulsed input method.
* Maximum motor speed is 3000 rpm.
* Maximum input frequency is 20 Kpps.

b. Power down signal (PD)

Applying "L" level input cuts off current to a motor, thus, causing the motor non-excitation state.

c. Step angle select signal (S.SEL)

Haft step or full step can be selected by inputting the following level signal.

"H" ... Half step

"L" ... Full step

* By default, "H" is selected in the open state.
* Whenever you use this signal, set the built-in dip switches as shown below.

EX1	EX2	EX3
OFF	ON	ON

For the switch setting for the micro step, refer to Section 7.

d. Auto current down (SL)

When stopped, this driver automatically cuts the current to it to one half of the operating current (this function is started approximately 200 ms after the final pulse has been applied).
This function can be reset using the built-in dip switches.
When large holding torque is required after stopping the driver, you can reset the auto current function using the built-in dip switches.

e. Others

The dip switches allow you to utilize other functions, too. See Section 7 for details.

f. Input signal specification

Pulse height:	4 to 5.5V in "H" level and 0 to 0.5V in "L" level.
Pulse width:	20 μ S minimum.
Rise/fall time:	5 μ S maximum.
Pulse duty:	50% maximum.

See the waveform and the input signal application example in Figure 1.

2-3) Output Signal

* Phase-at-origin monitor output (MON)

This signal is turned on as the excitation phase is returned to the origin (the position it was situated at powering on).
When the half step is selected, it is turned on once for every 8 pulses.
When the full step is selected, this signal is turned on once every 4 pulses.

Output signal format:	C-MOS output (the signal is turned on as the phase is returned to origin).
Output signal specification:	Output voltage and output current shall be between 0 and 5.5V and ±5mA, respectively.

2-4) Supply Source

For driving motors:	24VDC / 36VDC ± 10% and 3A.
For logic:	5VDC ± 5% and 0. 5A.

2-5) Ambient Conditions for Operation

Operating temperature:	0 to 50℃.
Operating humidity:	35 to 85% (dewing not allowed).
Storage temperature:	-20 to 70℃.
Storage humidity:	10 to 90% (dewing not allowed).

2-6) Vibration Resistance

Resonance test:	Frequency between 10 and 55 Hz. Total amplitude is 0.3 mm.
Constant resonance test:	Frequency at 20 Hz. Total amplitude is 1.2 mm.

The driver shall withstand the vibration applied from three directions X, Y and Z for 30 minutes without fail.

2-7) Shock Resistance

The driver shall be free of failure when tested according Sections 3 and 22 "C" of NDS-C-0110.

2-8) Overall Dimensions

See Figure 2.

2-9) External Wiring

See Figure 3.

2-10) Characteristics

See Figure 4.

3. Instruction Manual

A copy of the manual is attached to the first lot delivered to you. Additional copies are available upon your request.

4. Spare Parts

None.

5. Warrantee Period

Should an accident or failure result from defects in material or workmanship of the product, the maker shall offer repair or replacement work at free of charge for the duration one year from the date of delivery. The maker shall not be liable for any accident or failure that arises from any other cause than the above.

6. Precautions

The following temperature limit must be observed when operating the driver or motors.

Driver radiation plate: 80℃ maximum.

Motor housing: 100℃maximum.

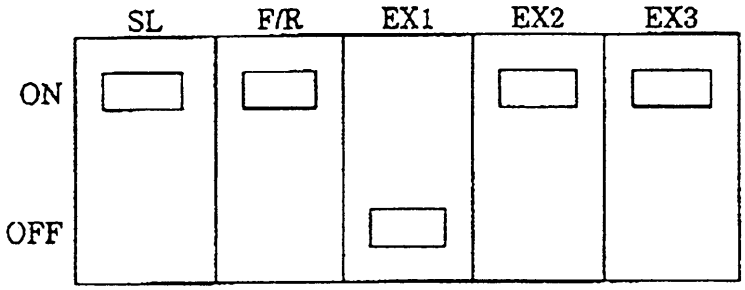
If operated beyond the above temperature level, the driver and motor can be damaged. When the driver or motor has to operate beyond the limit, the following or equivalent measures shall be implemented:

1. Mount the driver or motor to the radiation plate.
2. Provides forced air cooling using a fan.

7. Modifying the Specification Using Dip Switches

7-1) Default

Dip switches are set as shown below when the driver is delivered to you. Change their position as needed by your specification.



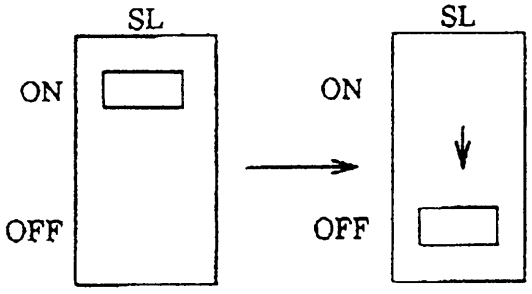
SL: Shifting this switch to OFF turns on the auto current down

F/R: Shifting this switch to OFF allows you to select the CW or CCW mode.

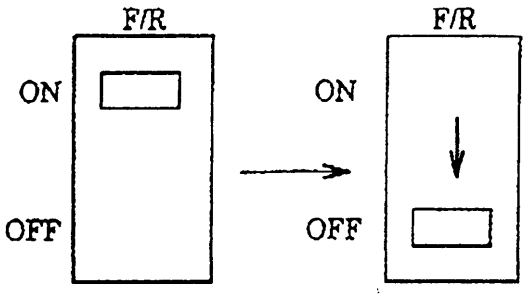
EX1...OFF
EX2...ON
EX3...ON

When the dip switches are set as shown to the left, switching between the full step and half step mode is available with S.SEL signal.

7-2) Resetting the Auto Current Down Function



7-3) Switching from CW or CCW to CK or U/D



7-4) Driving in Micro Step

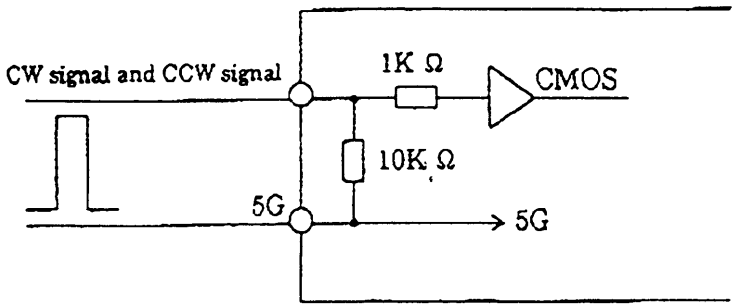
When using the driver in the micro step mode, select the open state or "H" for the step angle select signal (S.SEL), then specify number of divisions using the dip switches (EX1, EX2 and EX3).

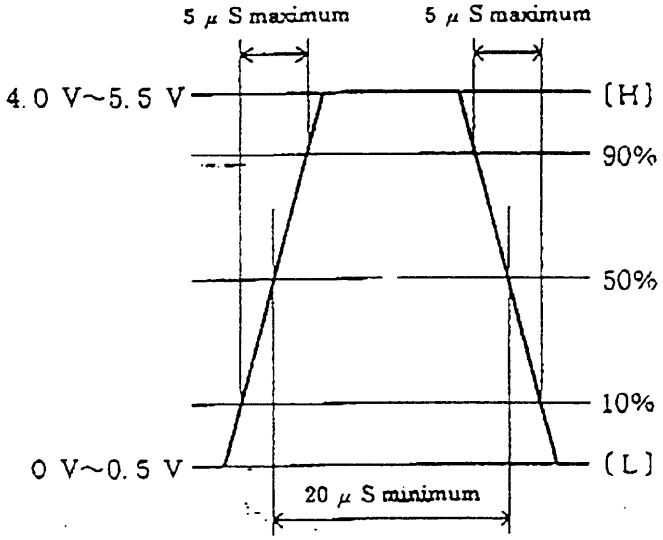
EX1	EX2	EX3	Number of Division
ON	ON	ON	1 (Full step)
OFF	ON	ON	2 (Half step)
ON	OFF	OFF	4
OFF	OFF	OFF	8

Figure 1. Input and Output Signals

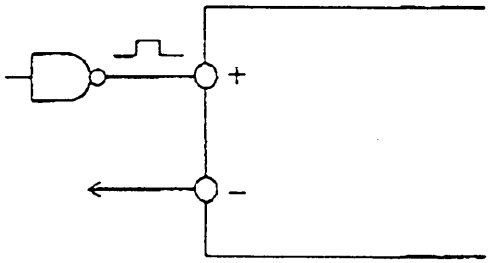
a. Input signal

* CW and CCW signals input circuit, and the signal specification

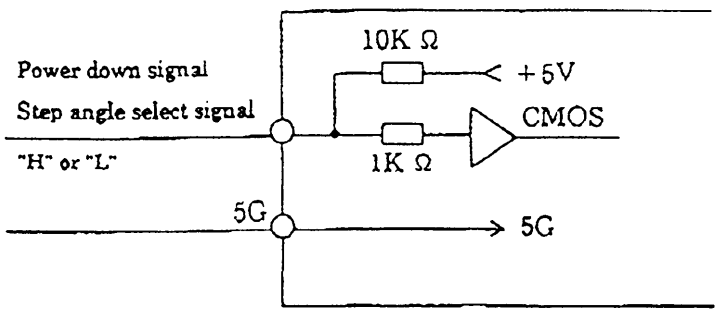




* Pulse duty shall be 50% maximum.



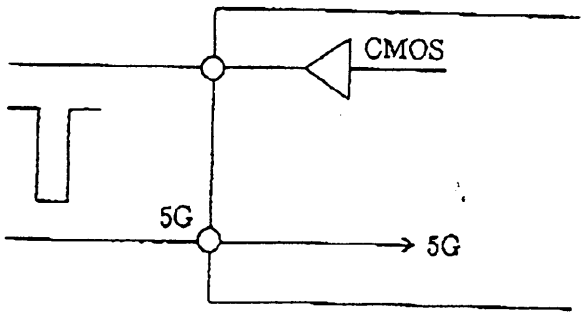
* Input circuit for the power down signal and the step angle select signal, and the signal specification.



"H" shall be 4.0 to 5.5V, or open.
"L" shall be 0 to 0.5V.

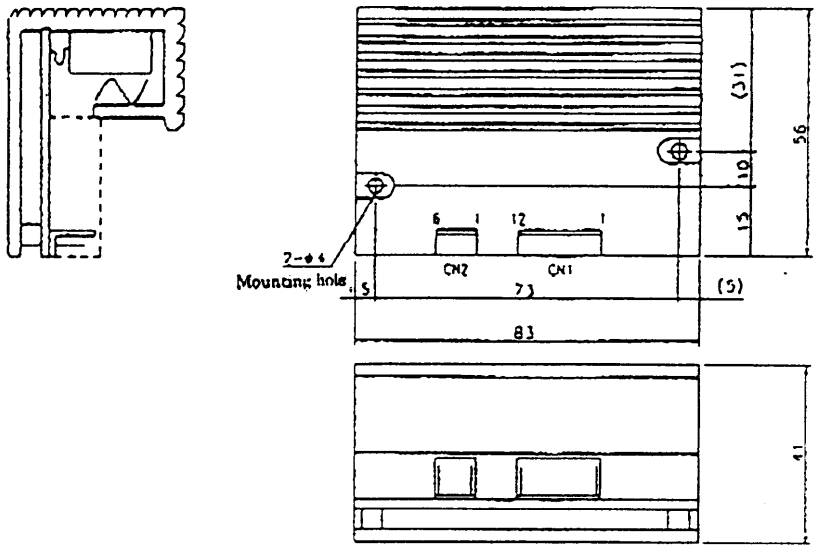
b. Output signal

* Output circuit for the phase-at-origin monitor signal



Output voltage: Between ± 0 and 5.5V.
Output current: ± 5mA

Figure 2. Overall Dimensions

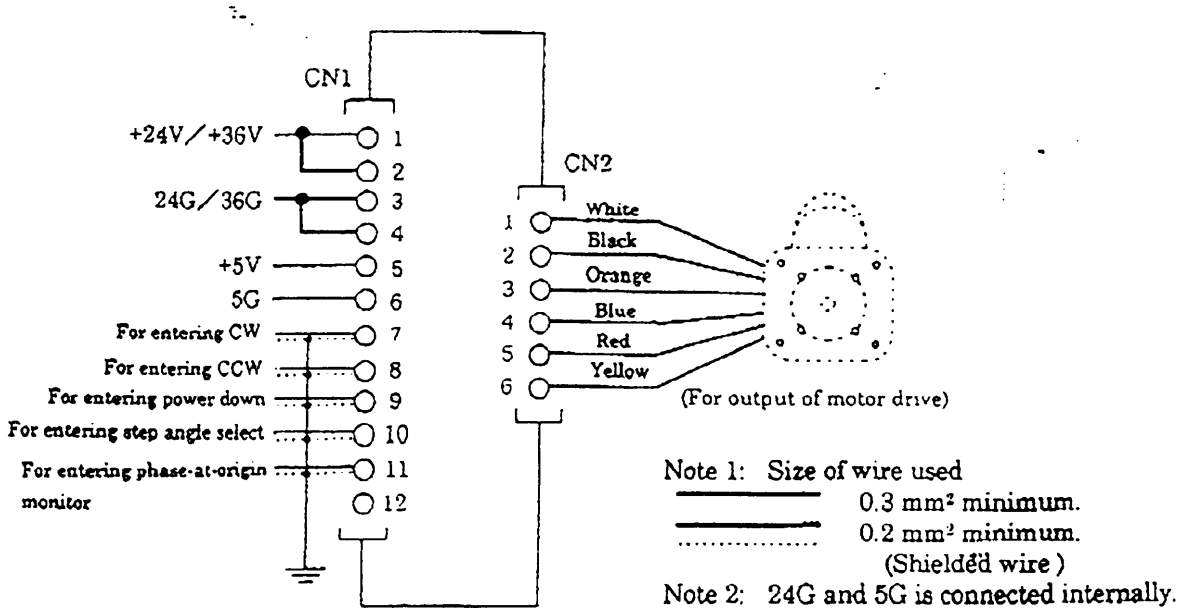


* Connectors used

Connector on driver	Connector on applicable housing and contact		Maker
CN1	5045-12AG	5051-12,2759PBG	Morex
CN2	5045-05A	5051-05,5159PBT	Morex

* Applicable housing and contact are to be prepared by the user.

Figure 3. External Wiring Diagram

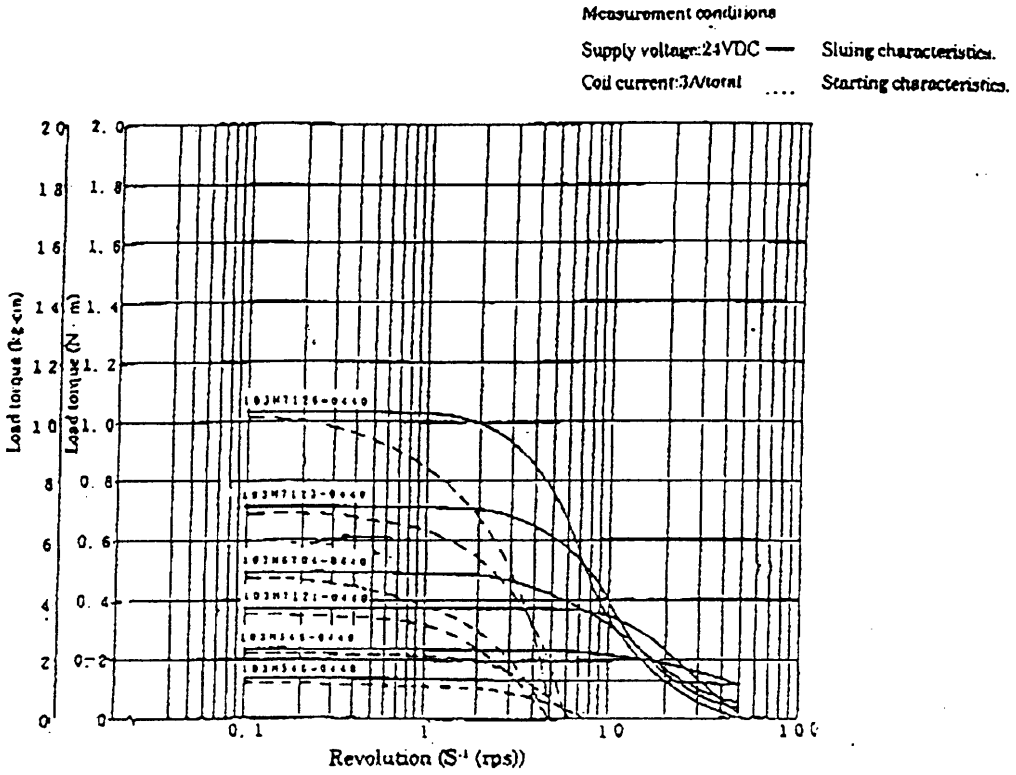


Note 1: Size of wire used
0.3 mm² minimum.
0.2 mm² minimum.
(Shielded wire)

Note 2: 24G and 5G is connected internally.

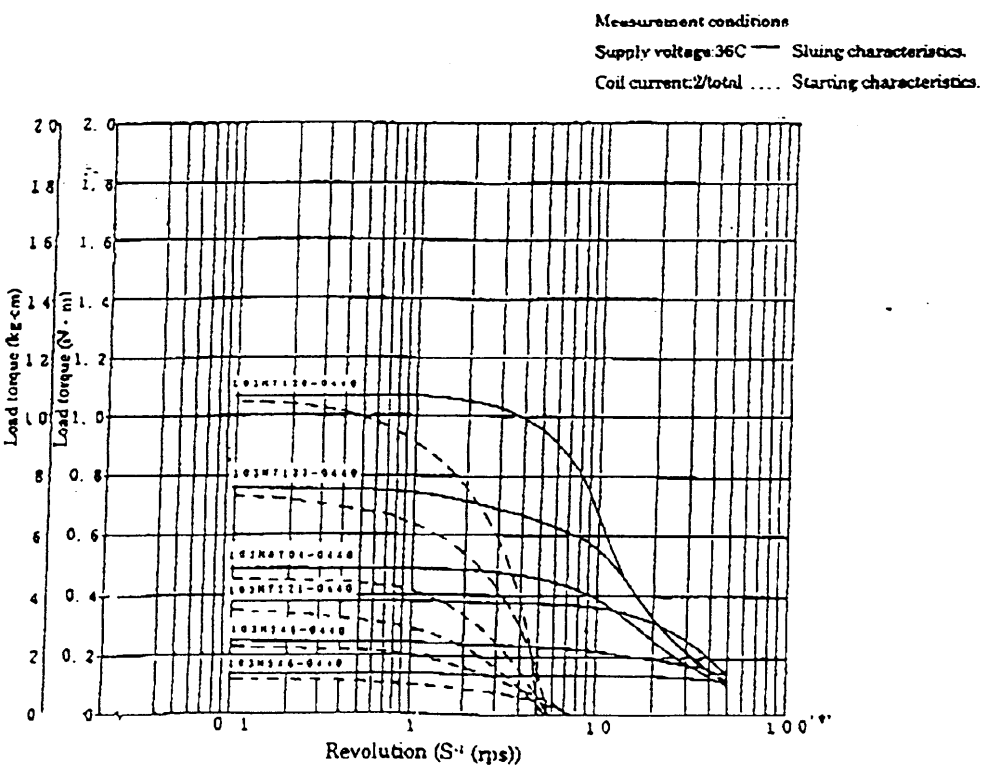
Figure 4-1. Diagram of Driver Characteristics

DC24V



* Measurement condition: Load inertial is the same as that for Stepsyn.

DC36V



* Measurement condition: Load inertial is the same as that for Stepsyn.