388-749

SPECIFICATIONS FOR

PMM-MD-23120-10

1. OUTLINE

The PMM-MD-23120-10 is a DC, micro-step drive, for use with Unipolar stepping motors, offering ultra low noise and smooth operation.

2. SPECIFICATION

2.1 Applicable Stepping Motors

Suitable Sanyo stepping motors		Holding torque (N-m)	Basic stepping angle (Degree)	Phase current (A/phase)
Single-side shaft type models	Double-side shaft type models			
103H546-0440	103H546-0410	0.15	1.8	1
103H548-0440	103H548-0410	0.27		1.2
103H549-0440	103H549-0410	0.32		1.2
103H6704-0440	103H6704-0410	0.54		2
103H7121-0440	103H7121-0410	0.4		2
103H7123-0440	103H7123-0410	0.85		2
103H126-0440	103H7126-0410	1.3		2

2.2 Signal Inputs

a. Rotation pulse signal (CW, CCW)

	2-input method	1-input method
CW terminal	Pulse input to the terminal rotates the motor in clockwise direction viewed from the output shaft	Pulse input to the terminal rotates the motor
CCW terminal	Pulse input to the terminal rotates the motor in counter clockwise direction viewed from the output shaft side	Level input is used for selecting the motor rotation direction as shown below: "H" ... Rotation in clockwise direction "L" ... Rotation in counter clockwise direction

** The 2-input method is employed as the standard configuration*
** For the switching between the pulse input methods, refer to Section 7*
** The maximum motor revolution available is 3000 rpm*
** The maximum input frequency is 20 Kpps*

b. Power down signal (PD)

Entering the "H" level input shuts down current to the motor.

c. Step angle select signal (S. SEL)
Entering the level input to the S.SEL terminal allows you to select a desired type of the step angle out of the two being specified with the SEL1 and SEL2

	SEL1	SEL2
S.SEL terminal	In the open mode or when "L" level input is applied	When "H" level input is applied
Step Angle	Any one of eight types of divisions (1, 2, 5, 10, 20, 40, 80 or 180) may be selected	Any one of two types of divisions (1 or 2) may be selected

* *If S.SEL is not used, the open mode is the default and, thus the divisions selected with SEL1 are valid*
* *When the device is shipped, divisions of SEL1 are set to 20 types (between 0 and 09) and that of SEL2 are set to 2 (between 0 and 9)*
* *For the step angle change procedure, refer to Section 7.*

d. Specifications of the input signals

Crest value	4 to 5.5 V for "H" and 0 to 0.5V for "L"
Pulse width	5 μS minimum
Rise time/fall time	1 μS maximum
Pulse duty	50% maximum

See the waveforms and input signal application examples given in Fig. 1

2.3 Functions

a. Auto current down (SL)

When stopped, this device automatically cuts current to it to one half of that of the operation mode (this function is activated 200 ms after the final pulse has been applied). When insufficient holding torque is available in the standby mode, you can cancel this function using the built-in rotary switches. Refer to Section 7 for details.

b. Low noise mode

Selecting the low noise mode drives the motor more smoothly, reducing noise, in all step angle options. Refer to Section 7 for details.

2.4 Others

The drive may be configured to your specific requirements using the switches marked S.SEL, M.SEL and RUN. For details see Section 7.

After selecting any new settings using these switches, it is necessary to reset the drive by removing power.

2.5 Power Supply

24VDC/36VDC ± 10% and 3A.

2.6 Environmental Specification

Operating temperature range:	0°C to 50°C
Relative humidity	35% to 85% (non condensing)
Storage temperature range:	-20°C to 70°C
Storage relative humidity:	10 to 90% (non condensing)

2.7 Vibration

The device shall be capable of withstanding 0.5G vibrations of frequency range between 10 and 55 Hz being applied in three planes of X, Y and Z for a minimum of two hours.

2.8 Impact

The device shall withstand without failure the impact test conducted according to the stipulations provided in Section 3, Clause "C" of the NDS-C-0110.

2.9 Dimensional Outline Drawing

See Fig. 2

2.10 External Wiring Diagram

See Fig. 3.

2.11 Characteristic Diagram

See Fig. 4.

3. Instruction Manual

A copy of the instruction manual is enclosed. Contact us should extra copies be required.

Spare Parts

4. N/A

Warranty Period

5. Sanyo Denki Co Ltd shall be liable for any accident or trouble resulting from its improper workmanship or material for a period of one year from the date of delivery. Repair or servicing of the device within that period shall be offered by Sanyo Denki free of charge. However, repair or servicing rendered by Sanyo Denki for a fault that is the result of anything other than the above, shall be chargeable.

Precautions

6. This device should only be installed by a qualified engineer.

The driver or motor should not be operated above the following upper temperature limit.

Temperature at the driver heatsink: 70°C maximum

Temperature at the motor housing: 100°C maximum

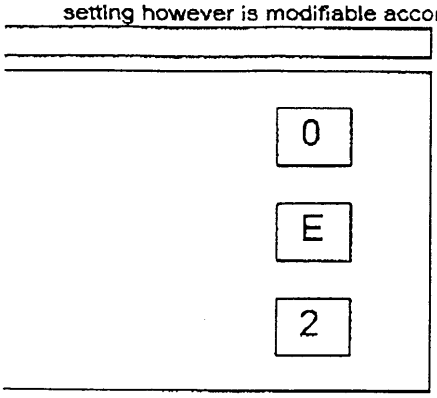
Non observance of these figures may result in premature failure. In cases where these devices may be operated in high ambient temperatures, it is recommended that:-

(a) the driver is installed on a larger secondary heatsink.

(b) forced air cooling is considered.

7. FUNCTION SELECT SWITCHES

The following illustrates layout of the switches and their setting when the device is delivered. This setting however is modifiable according to your specification



RUN: Used to select the motor drive current - per phase.

S.SEL: Used to select the required step angle.

M.SEL: Used to select the required operating mode.

7.1 Selecting the motor drive current (RUN)

The RUN switch allows you to select the required motor drive current.

Scale indication	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Current (A)	2.0	1.8	1.6	1.4	1.2	1.0	0.8	0.6	0	0	0	0	0	0	0	0

7.2 Selecting the desired step angle (S.SEL)

The S.SEL switch allows you to select a required step angle

Scale indication		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Divi-sions	SEL1	1	2	5	10	20	40	80	180	1	2	5	10	20	40	80	180
	SEL2	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2

Note: Divisions other than the above re also available,
Contact us at the Sales Department

7.3 Selecting the desired operating mode (M.SEL)

The M.SEL switch allows you to select a desired mode.

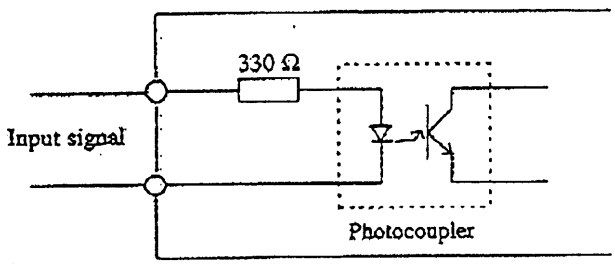
Scale indication		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Pulse input method	2-input	O		O		O		O		O		O		O		O	
	1-input		O		O		O		O		O		O		O		O
Auto current down	OFF	O	O			O	O			O	O			O	O		
	ON			O	O			O	O			O	O			O	O
Low noise drive mode	OFF	O	O	O	O	O	O	O	O								
	ON									O	O	O	O	O	O	O	O

Note 1: A circle (O) in the table above indicates that the corresponding parameter is valid.

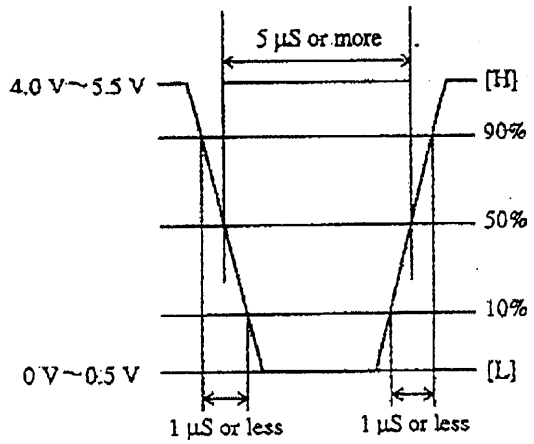
Note 2: If you select the low noise mode when any one of the step angles 8 to F is specified, the setting done from the S.SEL is ignored and the low noise mode with the division = 1 will be turned on.

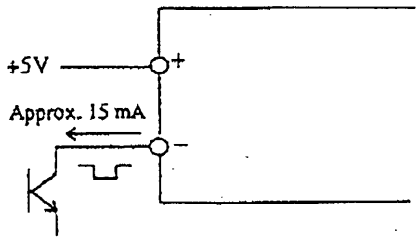
Fig. 1 Input Signal

- CW, CCW, PD and S.SEL input signal circuit and its specification

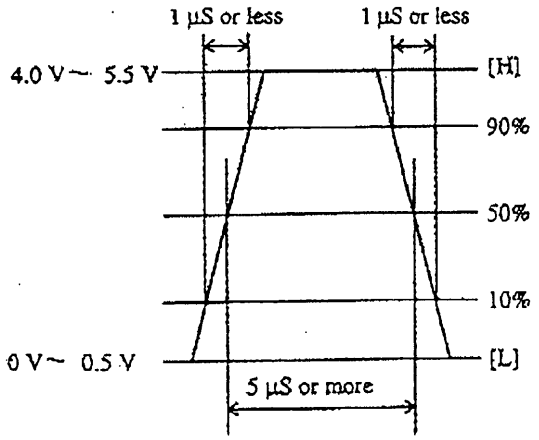


- Input signal specifications





* Pulse duty shall be 50% or more.



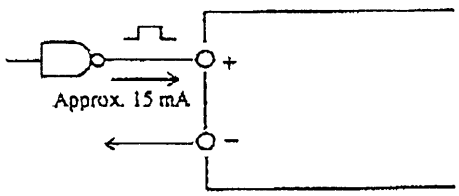
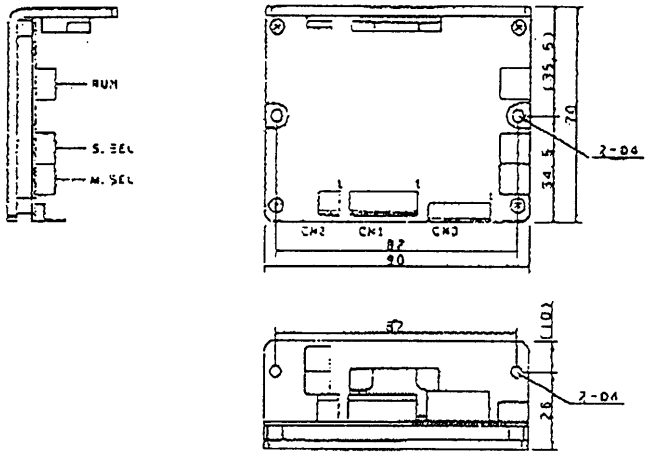


Fig. 2 Dimensional Outline Drawing



- Connector used

	Driver side	Applicable housing and contact side	Maker
CN1	B6P-VH	VHR-6N, BVH-21T-P1.1	Japan Solderless Terminal
CN2	B2P-VH	VHR-2N, BVH-21T-P1.1	Japan Solderless Terminal
CN3	IL-8P-S3EN2-1	IL-8S-S31, IL-C2-1-10000	Japan Aviation Electronics

* *Please prepare the applicable housing and contact by the user.*

Fig. 3 External Wiring Diagram

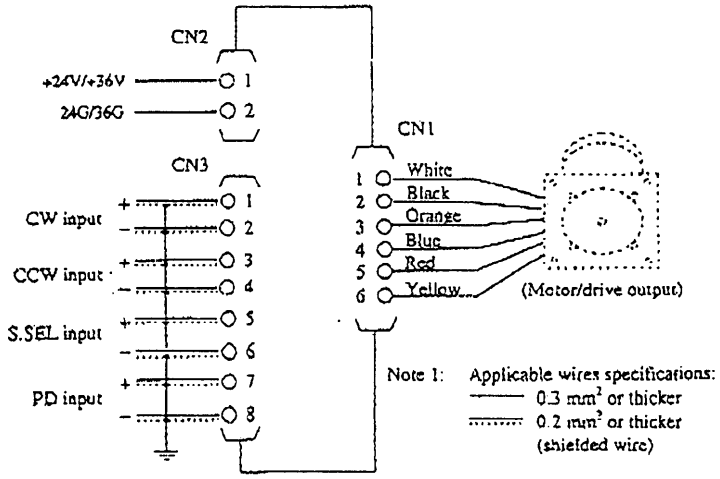
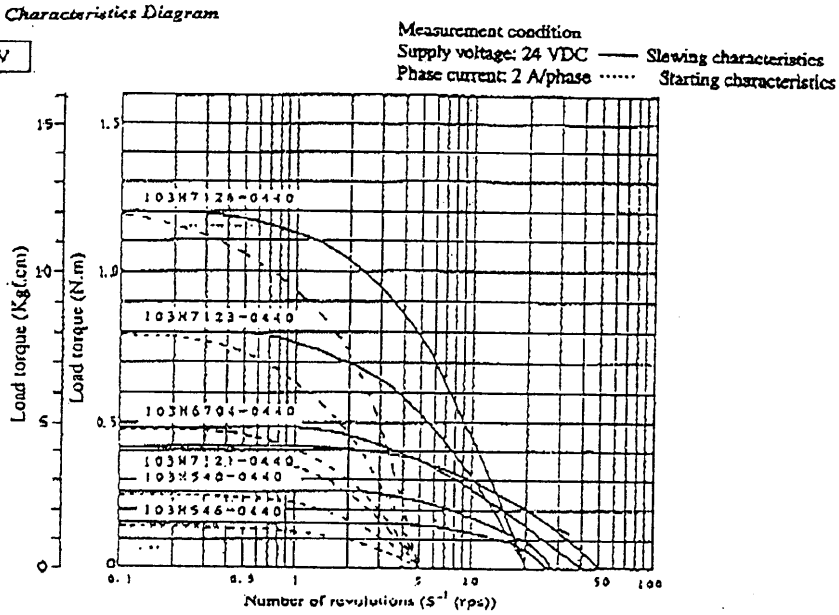


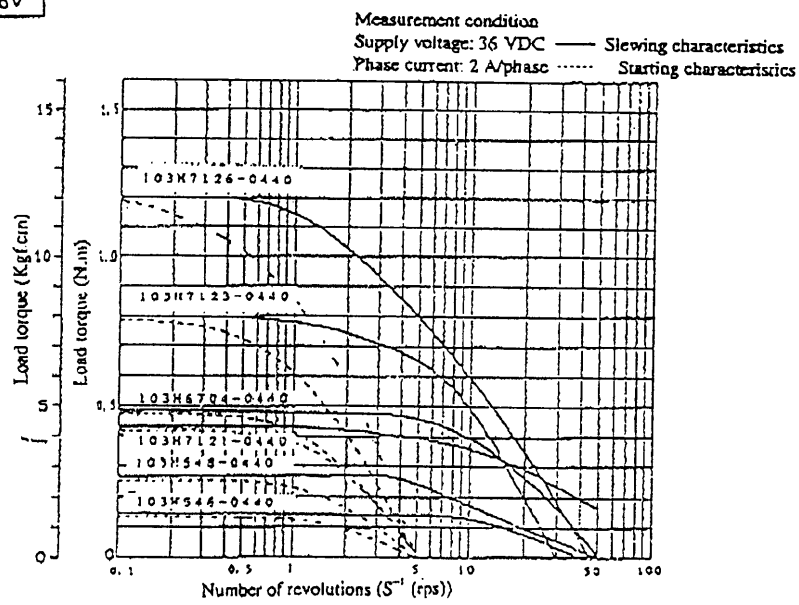
Fig. 4 Characteristics Diagram

DC24V



* *Measurement conditions:* *The load inertial has been set in the measurement to the same as the rotor inertia of the Stepsyn.*

DC36V



* *Measurement conditions:* *The load inertial has been set in the measurement to the same as the rotor inertia of the Stepsyn.*