

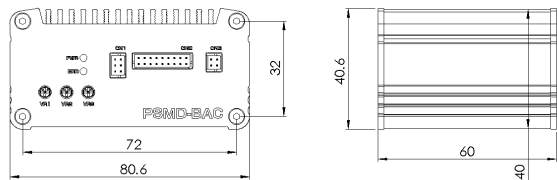
Motor Driver

PSMD SERIES

PSMD-BAC



Intuitive analog control model.
Motor rotation direction can be controlled by 2 TTL signals, and motor speed can be controlled by analog voltage of 0 ~ 3.2 [V].
Ideal for simple control of ultrasonic motors.



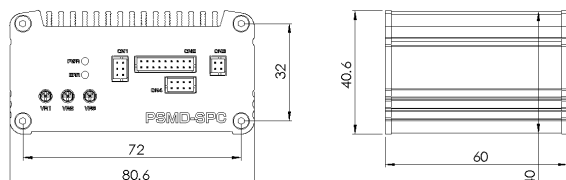
Model Name	Basic driver PSMD-BAC
Frequency / Wave Form	20 [KHz] ~ 55 [KHz] / Synthetic sine wave
Motor Drive Voltage	130 [Vrms] ~ 140 [Vrms]
Variable speed system	Analog voltage (DC 0 [V] ~ 3.2 [V])
No-load Speed Range	1 [rpm] ~ Maximum number of revolutions of the motor
Start-Stop Control	Switch to CW, CCW control terminal, Operation by external signal (active-low)
Starting Response	10 [ms](No inertial load)
Stopping Response	Less than 1 [ms] (No inertial load)
Temperature Range	-10 [°C] ~ +60 [°C]
Power Supply	DC 24 [V] ± 0.5 [V] / Normal 1 [A], up to 2.5 [A]
Over Current Protection	Equipped with Resettable overcurrent protection circuit
Life Time	Operation 10,000 [Hours] or 1 year after shipment whichever is shorter
Size(W×D×H)	80 × 60 × 45 [mm]
Weight	250[g]
Remarks	Basic model

※ It is adjusted by the motor of the serial number and the pair at the time of shipment.
※ PSM60/40 S motor for general environment, PSM60/40 N Motor for magnetic field environment can be controlled in the same way.

PSMD-SPC



Analog control model with speed stabilization function using encoder signal added to PSMD-BAC.
Motor rotation direction can be controlled by 2 TTL signals, and motor speed can be controlled by analog voltage of 0 ~ 3.2 [V].
Ideal for constant-velocity control of ultrasonic motors with external analog voltage.



Model Name	Driver with speed stabilization function PSMD-SPC
Frequency / Wave Form	20 [KHz] ~ 55 [KHz] / Synthetic sine wave
Motor Drive Voltage	130 [Vrms] ~ 140 [Vrms]
Variable speed system	Analog voltage (DC 0 [V] ~ 3.2 [V])
No-load Speed Range	1 [rpm] ~ Maximum number of revolutions of the motor
Start-Stop Control	Switch to CW, CCW control terminal, Operation by external signal (active-low)
Starting Response	10 [ms](No inertial load)
Stopping Response	Less than 1 [ms] (No inertial load)
Temperature Range	-10 [°C] ~ +60 [°C]
Power Supply	DC 24 [V] ± 0.5 [V] / Normal 1 [A], up to 2.5 [A]
Over Current Protection	Equipped with Resettable overcurrent protection circuit
Life Time	Operation 10,000 [Hours] or 1 year after shipment whichever is shorter
Size(W×D×H)	80 × 60 × 45 [mm]
Weight	250[g]
Remarks	With speed stabilization function

※ It is adjusted by the motor of the serial number and the pair at the time of shipment.
※ PSM60/40 S motor for general environment, PSM60/40 N Motor for magnetic field environment can be controlled in the same way.

Motor Driver

PSMD SERIES

APPEARANCE / FEATURES

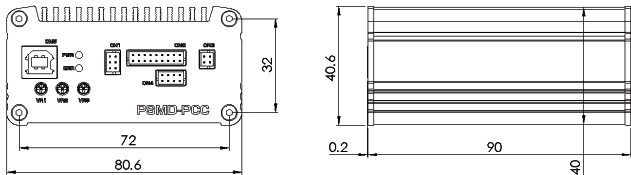
PSMD-PCC



In addition to the functions of the PSMD-SPC, this model enables digital control of the motor rotation direction and speed directly from a PC connected via USB.

The motor can be controlled by a digital signal without inputting TTL signal for rotation direction control or analog voltage for speed control. Ideal for precise control of ultrasonic motors.

DESIGN



SPEC

Model Name	High-precision control driver with USB connection PSMD-PCC
Frequency / Wave Form	20 [kHz] ~ 55 [kHz] / Synthetic sine wave
Motor Drive Voltage	130 [Vrms] ~ 140 [Vrms]
Variable speed system	Analog voltage (DC 0 [V] ~ 3.2 [V])
No-load Speed Range	or Digital signal control from USB connected devices
Start-Stop Control	0.1 [rpm] ~ Maximum number of revolutions of the motor
Starting Response	Operation by external signal (active-low) or Digital signal control from USB connected devices
Stopping Response	10 [ms] (No inertial load)
Temperature Range	Less than 1 [ms] (No inertial load)
Power Supply	-10 [°C] ~ +60 [°C]
Over Current Protection	DC 24 [V] ± 0.5 [V] / Normal 1 [A], up to 2.5 [A]
Life Time	Equipped with Resettable overcurrent protection circuit
Size(W×D×H)	Operation 10,000 [Hours] or 1 year after shipment whichever is shorter
Weight	80 × 90 × 45 [mm]
Remarks	270[g]
	Can be operated by connecting to a PC via USB

※ It is adjusted by the motor of the serial number and the pair at the time of shipment.
※ PSM60/40 S motor for general environment, PSM60/40 N Motor for magnetic field environment can be controlled in the same way.

Pin Assignment of the Driver

Each driver is equipped with a volume for adjustment (VR1-VR3) and various connectors (CN1-CN5) according to its characteristics

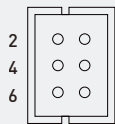
- VR1:** Volume for minimum speed adjustment (PSMD-BAC, SPC only)
VR2: Volume for maximum speed adjustment (PSMD-BAC, SPC only)
VR3: CW and CCW speed balancing volume (PSMD-BAC, SPC only)

- CN1:** Power connector (All Drivers)
CN2: Connector for motor control signal (All Drivers)
CN3: Connector for motor connection (All Drivers)

- CN4:** Connector for encoder (PSMD-SPC, PCC only)
CN5: Connector for PC connection (PSMD-PCC only)

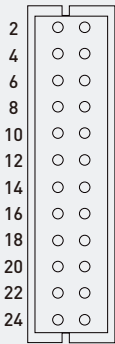
Be sure to check the information of each terminal before using.

CN1



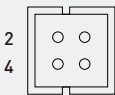
1. Main_power_input (+24V)
2. Main_power_input (+24V)
3. GND
4. GND
5. CASE
6. CASE

CN2



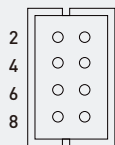
1. Reference Output (3.3 V)
2. Speed specified voltage input
3. GND
4. Direction Control: CW
5. Direction Control: CCW
6. GND
7. SPI_CS input
8. SPI_CLK input
9. SPI_DT input
10. SPI_DT output
11. BOOST mode input
12. GND
13. PWM_code_O2 input
14. PWM_code_O1 input
15. PWM_code_O0 input
16. PWM_SEL_input
17. ERROR_output
18. AUX_O1_input
19. AUX_O0_input
20. GND
21. Phase_A_output
22. Phase_B_output
23. --
24. --

CN3



1. Sin signal output Red
2. Cos signal output White
3. FB signal input Yellow
4. GND Black

CN4



1. Voltage output for encoder (+5V) Red
2. GND Black
3. Encoder A phase (+) input Blue
4. Encoder A phase (-) input Green
5. Encoder B phase (+) input White
6. Encoder B-phase (-) input Gray
7. Encoder Z-phase (+) input Yellow
8. Encoder Z-phase (-) input Orange

CN5



1. --
2. - Data
3. + Data
4. GND

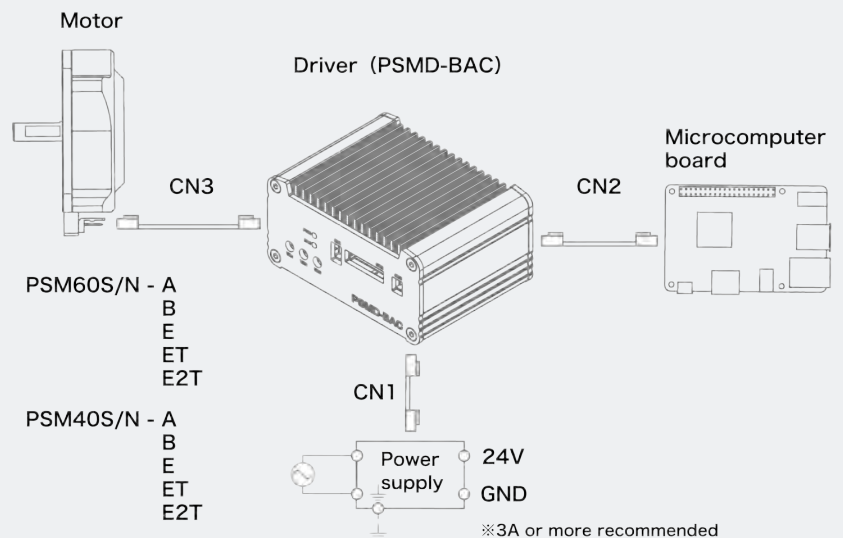
How to connect the motor and the driver

PSMD-BAC

No encoder signal, simple operation using the control board

The signals required for motor control are the microcomputer board port and Analog voltage output. Or, operation with a switch and a semi-fixed resistor is possible.

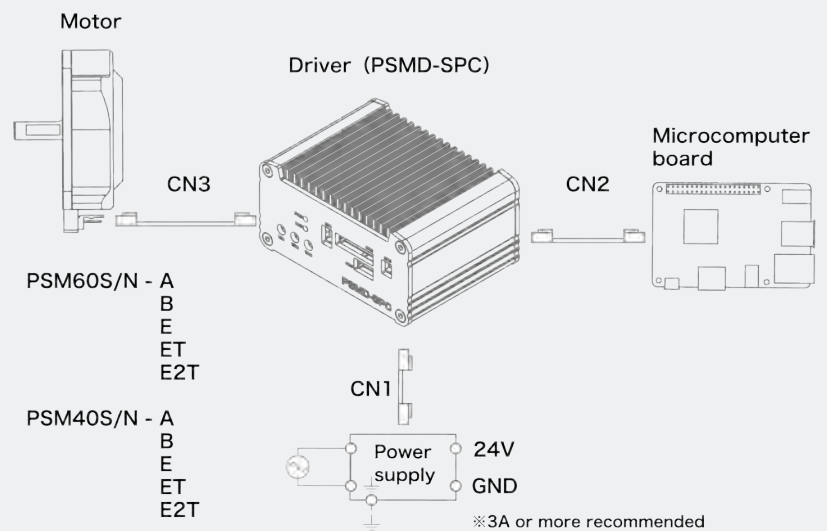
Enter the CN1 DC24 V power supply, the TTL signal level signal (2: Active-Low), which controls the motor's rotational direction (CW/CCW) and stop state to CN2, and an Analog signal of DC0 V to 3.2 V for Speed change. Connect the CN3 to the signal input terminal of the motor.



PSMD-SPC[1]

No encoder signal, simple operation using the control board

Enter the CN1 dc24v power supply, the TTL signal level signal (2: Active-Low), which controls the motor's rotational direction (CW/CCW) and stop state to CN2, and an analog signal of dc0v to 3.2 V for Speed change. Connect the CN3 to the signal input terminal of the motor. The signal required for motor control can be used for the port and analog voltage output of the microcomputer board, or it is possible to use the switch and the semi-fixed resistor. CN4 is not used because the motor has no encoder.

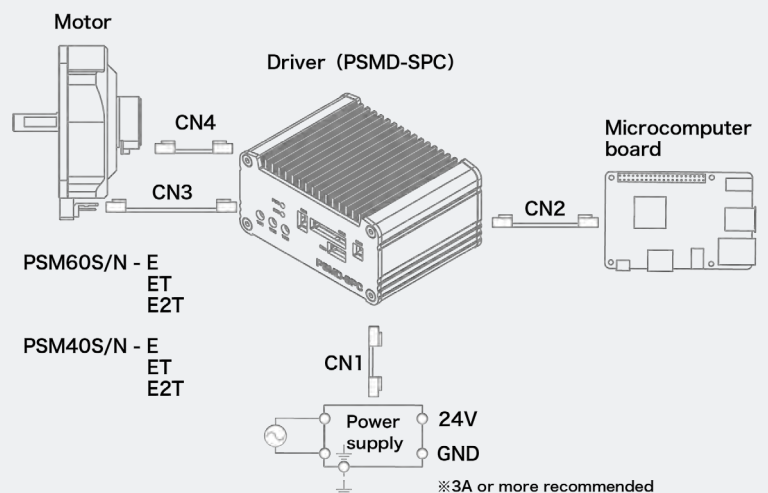


PSMD-SPC[2]

Speed control and position control by encoder signal

It is possible to maintain the speed of the motor by adding a constant voltage to the speed designation terminal without the speed control on the external microcomputer board by the speed stabilization function using the encoder signal.

Enter the CN1 DC24 V power supply, the TTL signal level signal (2: Active-Low), which controls the motor's rotational direction (CW/CCW) and stop state to CN2, and an Analog signal of DC0 V to 3.2 V for Speed change. Connect the CN3 to the signal input terminal of the motor. Connect the CN4 to the encoder signal terminal of the motor.



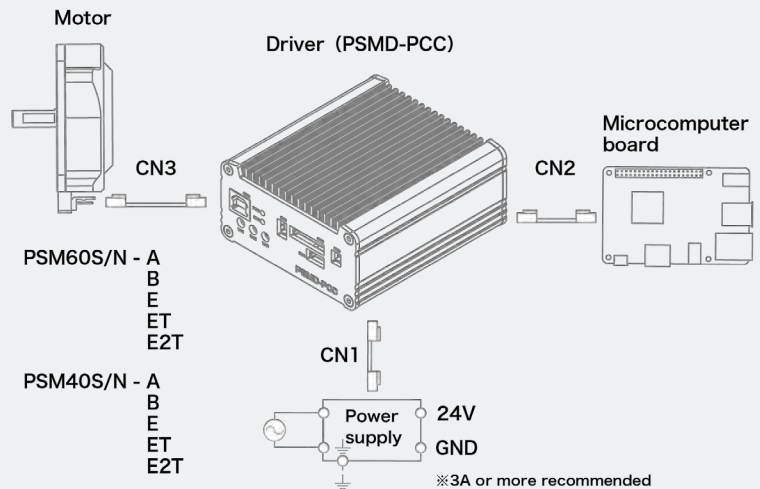
How to connect the motor and the driver

PSMD-PCC[1]

No encoder signal, simple operation using the control board

The signals required for motor control are the microcomputer board port and Analog voltage output. Or, operation with a switch and a semi-fixed resistor is possible.

Enter the CN1 DC24 V power supply, the TTL signal level signal (2: Active-Low), which controls the motor's rotational direction (CW/CCW) and stop state to CN2, and an Analog signal of DC0 V to 3.2 V for Speed change. Connect the CN3 to the signal input terminal of the motor. CN4 and CN5 are not connected.

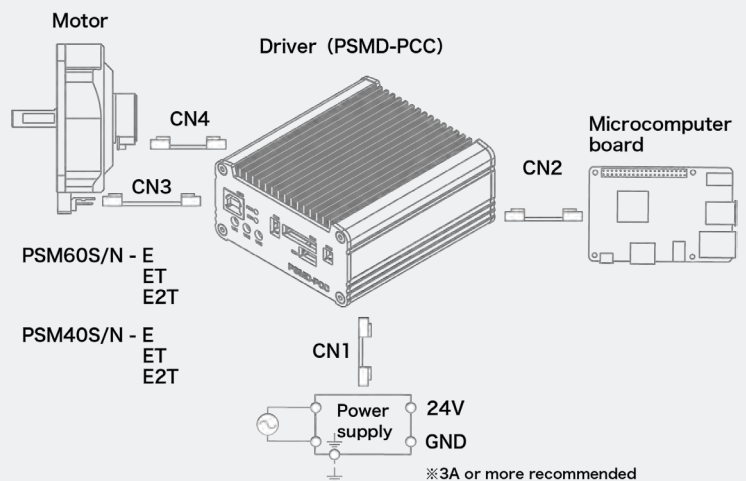


PSMD-PCC[2]

Speed control and position control by encoder signal

It is possible to maintain the speed of the motor by adding a constant voltage to the speed designation terminal without the speed control on the external microcomputer board by the speed stabilization function using the encoder signal.

Enter the CN1 DC24 V power supply, the TTL signal level signal (2: Active-Low), which controls the motor's rotational direction (CW/CCW) and stop state to CN2, and an Analog signal of DC0 V to 3.2 V for Speed change. Connect the CN3 to the signal input terminal of the motor. Connect the CN4 to the encoder signal terminal of the motor. CN5 is not connected.



PSMD-PCC[3]

PC application control via USB connection

It is possible to control the rotation direction of the motor (CW/CCW), stop state, and control instructions for speed change via USB. Because the analog voltage control signal is not necessary, it is possible to operate the Ultrasonic Motor easily without the peripheral device such as a microcomputer board is prepared.

CN1 Connect DC24 V power. CN2 is not connected. Connect the CN3 to the signal input terminal of the motor. Connect the CN4 to the encoder signal terminal of the motor. Connect the CN5 to the USB terminal of the PC.

