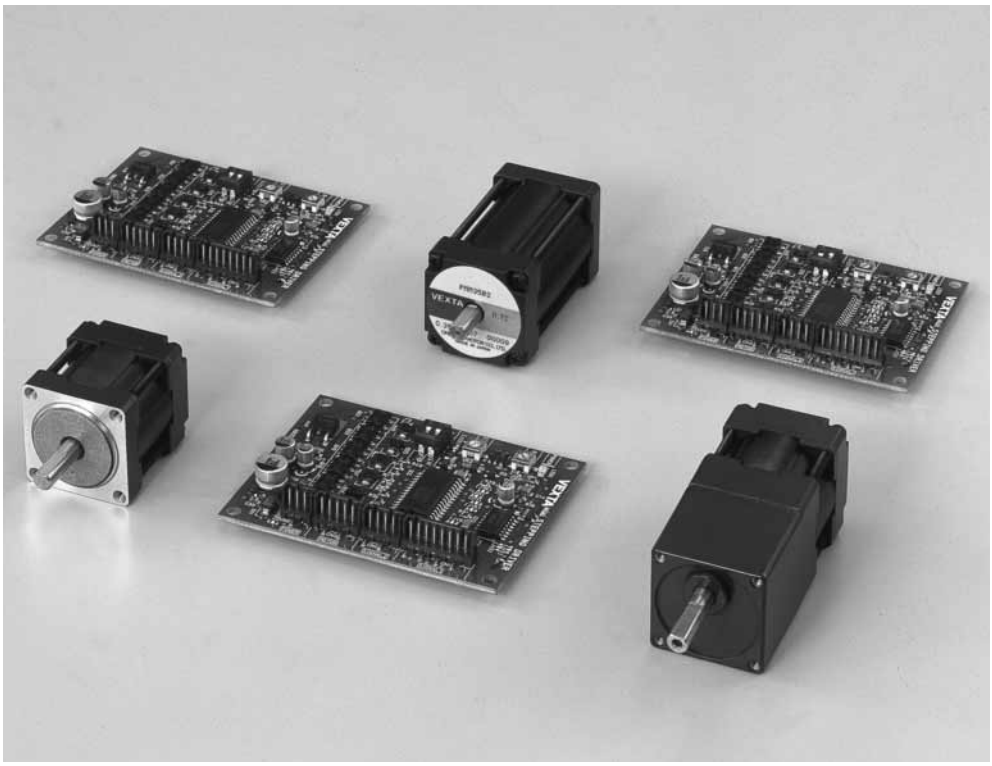
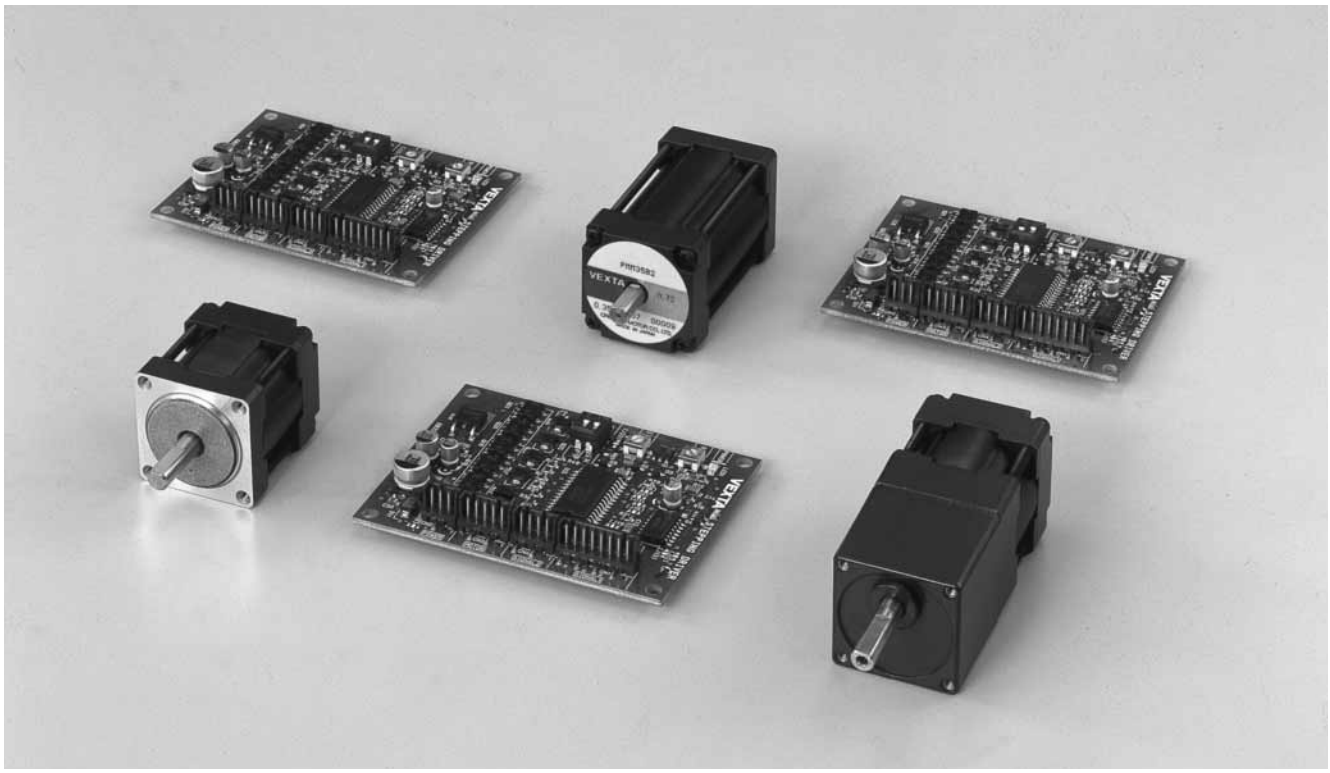


Compact Stepping Motor and Driver Package

PMC *Series*

Compact Stepping Motor and Driver Package

PMC *Series*



1. Subminiature Size

Motors are an achievement in miniaturization and lightweight: 28mm sq., 0.1kg (**PMC33□3**) and 0.17kg (**PMC35□3**) in weight.

2. High Output

Design advancements allow for high-torque in a small package. In combination with the 0.35A/phase output driver, its high-torque capability extends well into the high-speed range.

3. Superior Features

Features include enabling/disabling of the "Automatic Current Cutback" function via signal input and the "Excitation Timing" output, which is useful in setting the mechanical origin of your system.

4. Connectors

Independent connectors are furnished for the driver input/output signals and motor output line. Use of an automatic swaging tool facilitates the connection.

5. Highly Reliable Photocoupler Input

Signal input/output sections use photocouplers that provide protection from external noise. Requirement for a single DC24V/36V power supply simplifies power supply design and reduces wiring work.

6. Selectable: Full Step/Half Step

Half step drive is selectable through a signal for driving at higher resolution with lower vibration.

7. Selectable: 1-Pulse/2-Pulse

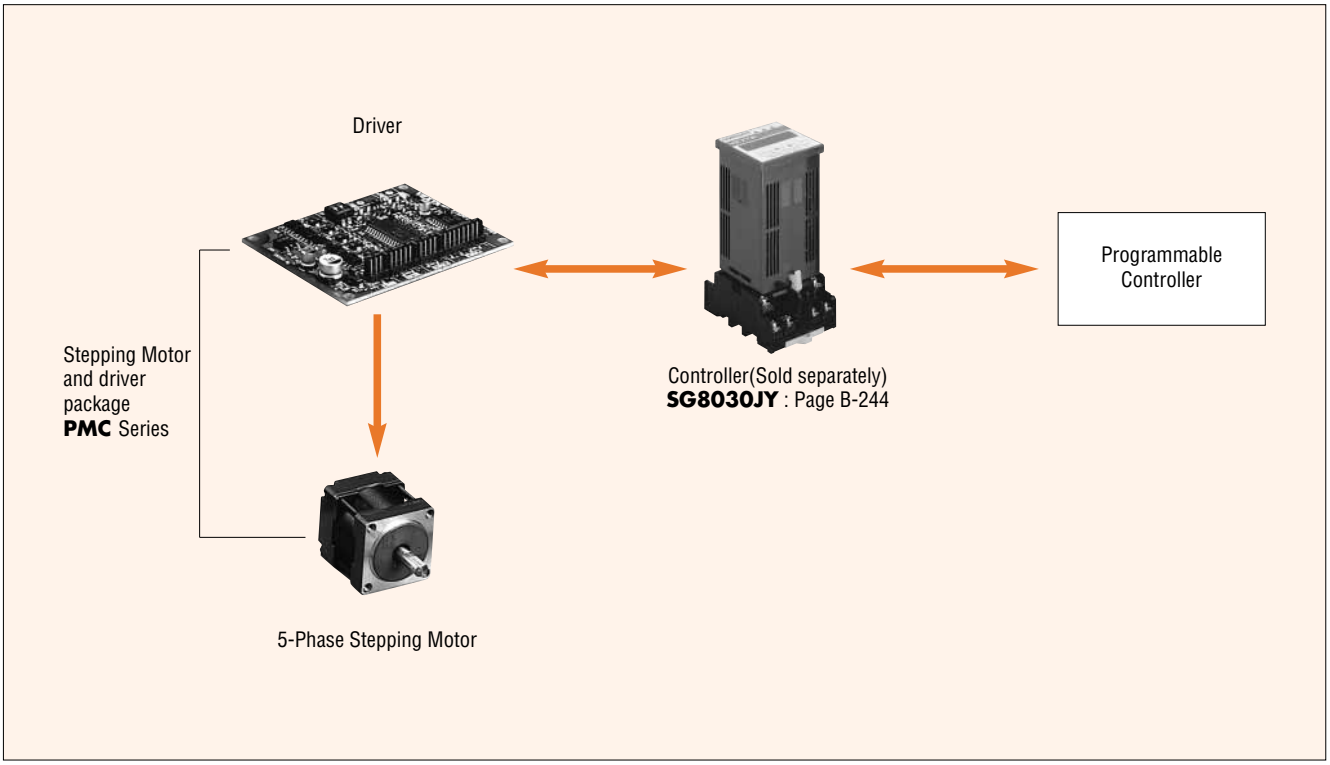
A switch on the driver selects one-pulse or two-pulse input.

8. Subminiature Gearmotors

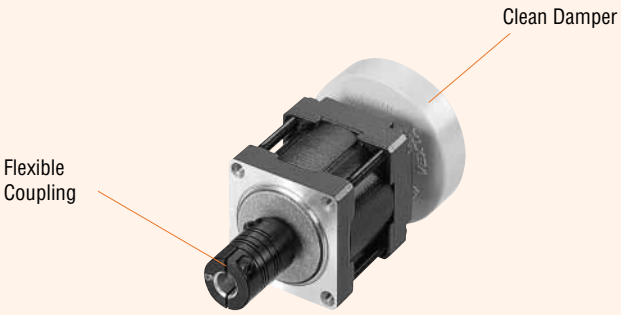
Gearmotors are also features a mounting frame just 28mm sq. Five gear ratios are available: 1:3.6, 1:7.2, 1:10, 1:20 and 1:30. The lowness of the ratios means that speed can be reduced without slowing the motor too much, thus enabling more precise resolution and smoother rotational low speed.

■PMC Series System Configuration

A compact 5-phase stepping motor and driver are combined to provide high-precision positioning with open loop control.



■Accessories(Sold separately)



●Clean Dampers:Page B-251
Effective at suppressing motor vibration and improving performance

●Flexible Couplings:Page B-252
Clamping Type

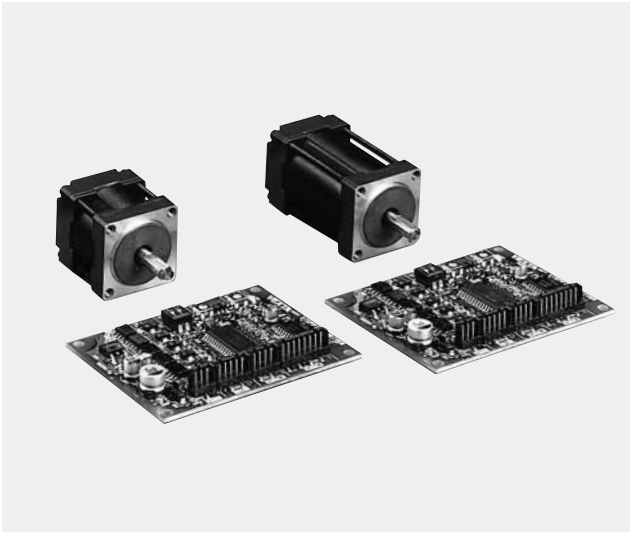
Note: Flexible Couplings are can not be fitted to geared motor types.

PMC Series Standard Type

Page B-143

Two models, standard model and high torque model, are available.

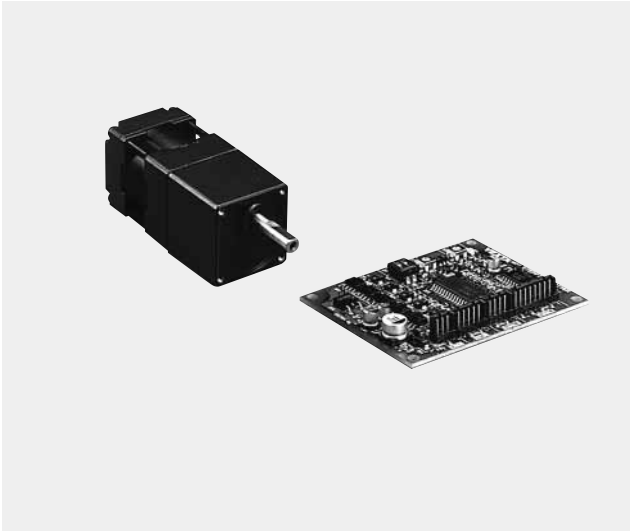
Holding Torque: Standard Model 0.033N·m
High Torque Model 0.06N·m



PMC Series Geared Type

Page B-145

Gear frame size is also 28mm square.
Five gear ratio are available: 1:3.6, 1:7.2, 1:10, 1:20 and 1:30.
The low gear ratio means that output speed can be reduced without slowing the motor, thus enabling more precise resolution and smoother rotation at low speed.
Holding Torque: 0.08N·m~0.51N·m



List of Motor and Driver Combinations

Model numbers for motor and driver combinations are shown below.

Type	Package Model	Stepping Motor		Driver
		Model	Current A/phase	Model
Standard Type	**PMC33□3** **PMC35□3**	PMM33□2 PMM35□2	0.35	PMD03CA
Geared Type	**PMC33□1-MG3.6** **PMC33□1-MG7.2** **PMC33□1-MG10** **PMC33□1-MG20** **PMC33□1-MG30**	PMM33□-MG3.6 PMM33□-MG7.2 PMM33□-MG10 PMM33□-MG20 PMM33□-MG30	0.35	PMD03CA

* Enter **A** (single shaft) or **B** (double shaft) in the □ with in the model numbers

Product Number Code

PMC 3 3 A 3

- 3 — Reference Number
- A — A : Single Shaft
- B — B : Double Shaft
- 3 — Motor Case Length
- 3 — Motor Frame Size 28mm sq.
- PMC — **PMC** Series

Specifications: Standard Type

Package Model	Single Shaft	PMC33A3	PMC35A3
	Double Shaft	PMC33B3	PMC35B3
Maximum Holding Torque	N·m	0.033	0.06
Basic Rotor Inertia	kg·m^2	9×10^{-7}	18×10^{-7}
Rated Current	A/phase	0.35	
Basic Step Angle		0.72°	
Insulation Class		Class B (130˚C)	
Power Source		DC 24V±10% 0.7A or DC 36V±10% 0.7A	
Output Current	A/phase	0.35	
Excitation Mode		● Full Step : 0.72°/step (4 phase excitation) ● Half Step : 0.36°/step (4-5 phase excitation)	
Input Signals — Input Signal Circuit		Photocoupler input, input resistance 220 Ω, input current 20 mA maximum. Signal voltage Photocoupler ON : +4~+5V, Photocoupler OFF : 0~+0.5V	
Input Signals — ● Pulse Signal (CW Pulse)		Step Command Pulse Signal (CW Direction Command Pulse Signal at 2-pulse input mode) Pulse width: 5 μs. minimum, Pulse rise/pulse fall time 2 μs. maximum Motor moves when the photocoupler state changes from ON to OFF.	
Input Signals — ● Rotation Direction Signal (CCW Pulse Signal)		Rotation Direction Command Pulse Signal Photocoupler ON:CW, Photocoupler OFF:CCW(CCW Direction Command Pulse Signal at 2-pulse input mode) Pulse width:5 μs minimum, Pulse rise/pulse fall time 2 μs maximum Motor moves when the photocoupler state changes from ON to OFF.	
Input Signals — ● Step Angle Signal		Full Step (0.72˚) at "Photocoupler OFF" Half Step(0.36˚) at "Photocoupler ON"	
Input Signals — ● All Windings Off Signal		When in the "photocoupler ON" state, the current to the motor is cut off and the motor shaft can be rotated manually. When in the "photocoupler OFF" state, the current level set by the RUN switch is supplied to the motor.	
Input Signals — ● Automatic Current Cutback Release Signal		When in the "photocoupler ON " state, the "Automatic Current Cutback" function at motor standstill is disabled. When in the "photocoupler OFF" state, the "Automatic Current Cutback" function at motor standstill is activated. (Approximately 100ms after motor motion stops)	
Output Signals — Output Signal Circuit		Photocoupler, Open-Collector Output External use condition: 24V DC maximum, 10mA maximum	
Output Signals — ● Excitation Timing Signal		The signal is output every time the excitation sequence returns to the initial stage "0". (photocoupler : ON) Full step : signal is output every 10 pulses, Half step : signal is output every 20 pulses	
Functions		Automatic current cutback, Pulse input mode switch	
Cooling method (Driver)		Natural Ventilation	
Mass	Motor kg	0.1	0.17
	Driver kg	0.025	
Insulation Resistance	Motor	100M Ω or more under normal ambient temperature and humidity when the megger reading between the windings and frame is DC 500V.	
Dielectric Strength	Motor	Under normal ambient temperature and humidity, sufficient to withstand 0.5kV at 50Hz applied between the windings and the case for one minute following a period of continuous operation.	
Ambient Temperature	Motor	−10˚C ~ +50˚C	
	Driver	0˚C ~ +40˚C	

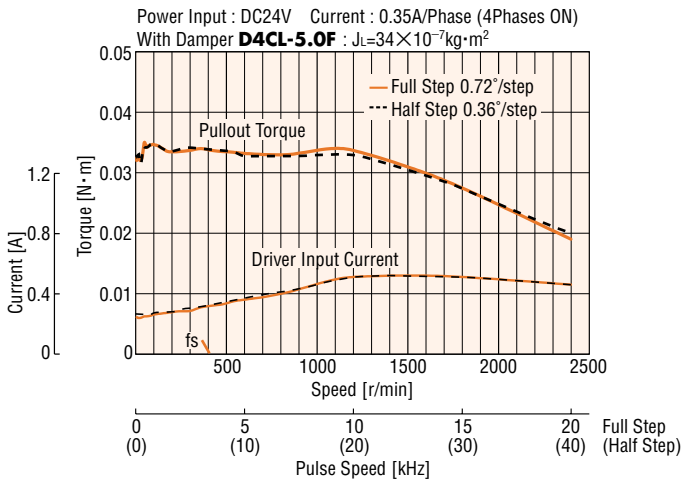
- Maximum holding torque refers to the holding torque at motor standstill when the rated current is supplied to the motor (5 phase excitation). Use this value to compare motor torque performance. When using the motor with the included driver, the driver's "Automatic Current Cutback" function at motor standstill reduces maximum holding torque by approximately 50%.
- The power source input current value represents the maximum current. (The input current varies according to the pulse frequency.)

Speed-Torque Characteristics

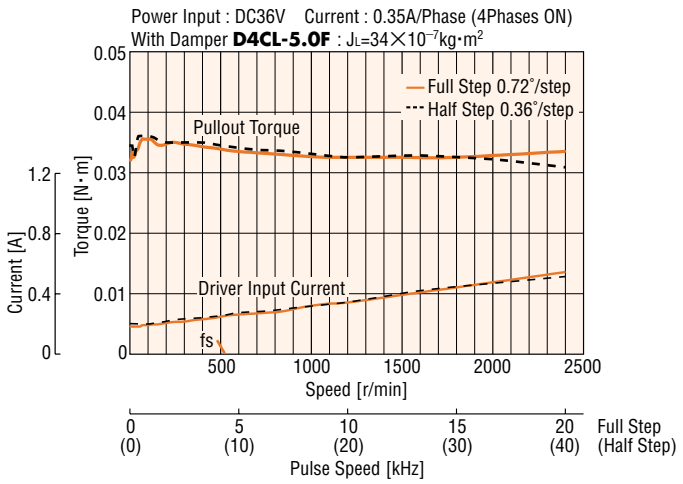
fs: Maximum Starting Pulse Rate

Standard Type

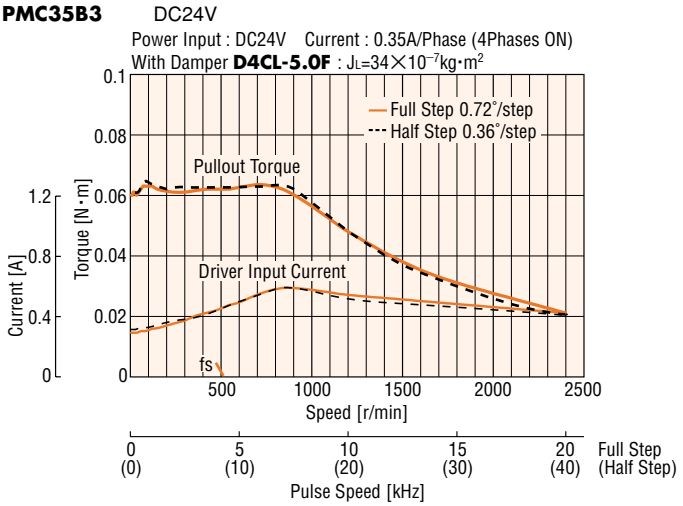
PMC33B3 DC24V



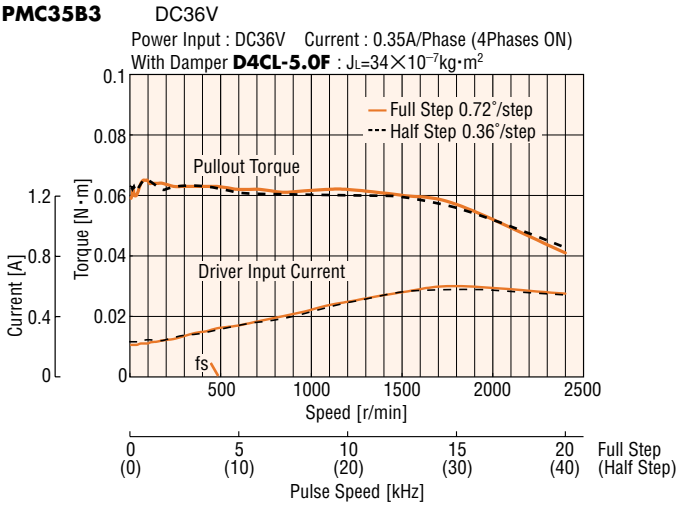
PMC33B3 DC36V



PMC35B3 DC24V



PMC35B3 DC36V



Notes:

1. Pay attention to heat dissipation from the motor and driver. The motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C
2. When using the motor with the dedicated driver, the driver's "Automatic current Cutback" function at motor standstill reduces maximum holding torque by approximately 50%

Product Number Code

PMC 3 3 A 1 - MG 3.6

- **PMC** Series
- Motor Frame Size 28mm sq.
- Motor Case Length
- **A** : Single Shaft **B** : Double Shaft
- Reference Number
- Geared Type
- Reduction Gear Ratio

Specifications: Geared type

Package Model		Single Shaft	PMC33A1-MG3.6	PMC33A1-MG7.2	PMC33A1-MG10	PMC33A1-MG20	PMC33A1-MG30
		Double Shaft	PMC33B1-MG3.6	PMC33B1-MG7.2	PMC33B1-MG10	PMC33B1-MG20	PMC33B1-MG30
Maximum Holding Torque		N·m	0.08	0.16	0.21	0.34	0.51
Rotor Inertia		kg·m²	9×10^{-7}				
Rated Current		A/phase	0.35				
Basic Step Angle			0.2°	0.1°	0.072°	0.036°	0.024°
Gear Ratio			1:3.6	1:7.2	1:10	1:20	1:30
Permissible Torque		N·m	0.08	0.16	0.21	0.34	0.51
Permissible Thrust Load		N	10				
Permissible Overhung Load		N	15				
Direction of Gear shaft Rotation			Same as motor		Opposite to motor	Same as motor	
Permissible Speed Range (Gear Output Shaft Speed)	Full Step		0～25000Hz (0～833r/min)	0～25000Hz (0～416r/min)	0～25000Hz (0～300r/min)	0～25000Hz (0～150r/min)	0～25000Hz (0～100r/min)
	Half Step		0～50000Hz (0～833r/min)	0～50000Hz (0～416r/min)	0～50000Hz (0～300r/min)	0～50000Hz (0～150r/min)	0～50000Hz (0～100r/min)
Insulation Class			Class B (130°C)				
Power Source			DC 24V±10% 0.7A or DC 36V±10% 0.7A				
Output Current		A/phase	0.35				
Excitation Mode	Full Step		0.2°/step	0.1°/step	0.072°/step	0.036°/step	0.024°/step
	Half Step		0.1°/step	0.05°/step	0.036°/step	0.018°/step	0.012°/step
Input Signals	Input Signal Circuit		Photocoupler input, input resistance 220 Ω, input current 20 mA maximum. Signal voltage Photocoupler ON : +4~+5V, Photocoupler OFF : 0~+0.5V				
	● Pulse Signal (CW Pulse)		Step Command Pulse Signal (CW Direction Command Pulse Signal at 2-pulse input mode) Pulse width: 5 μs. minimum, Pulse rise/pulse fall time 2 μs. maximum Motor moves when the photocoupler state changes from ON to OFF.				
	● Rotation Direction Signal (CCW Pulse Signal)		Rotation Direction Command Pulse Signal Photocoupler ON:CW, Photocoupler OFF:CCW(CCW Direction Command Pulse Signal at 2-pulse input mode) Pulse width: 5 μs minimum, Pulse rise/pulse fall time 2 μs maximum Motor moves when the photocoupler state changes from ON to OFF.				
	● Step Angle Signal		Full Step at "Photocoupler OFF" Half Step at "Photocoupler ON"				
	● All Windings Off Signal		When in the "photocoupler ON" state, the current to the motor is cut off and the motor shaft can be rotated manually. When in the "photocoupler OFF" state, the current level set by the RUN switch is supplied to the motor.				
	● Automatic Current Cutback Release Signal		When in the "photocoupler ON " state, the Automatic Current Cutback at motor standstill function is disabled. When in the "photocoupler OFF" state, the Automatic Current Cutback at motor standstill function is activated. (Approximately 100ms after motor motion stops)				
Output Signals	Output Signal Circuit		Photocoupler, Open-Collector Output External use condition: 24V DC maximum, 10mA maximum				
	● Excitation Timing Output		The signal is output every time the excitation sequence returns to the initial stage "0". (photocoupler : ON) Full step : signal is output every 10 pulses, Half step : signal is output every 20 pulses				
Functions			Automatic current cutback, Pulse input mode switch				
Cooling Method (Driver)			Natural Ventilation				
Mass	Motor	kg	0.16				
	Driver	kg	0.025				
Insulation Resistance	Motor		100M Ω or more under normal ambient temperature and humidity when the megger reading between the windings and frame is DC 500V.				
Dielectric Strength	Motor		Under normal ambient temperature and humidity, sufficient to withstand 0.5kV at 50Hz applied between the windings and the case for one minute following a period of continuous operation.				
Ambient Temperature	Motor		−10°C ～ +50°C				
	Driver		0°C ～ +40°C				

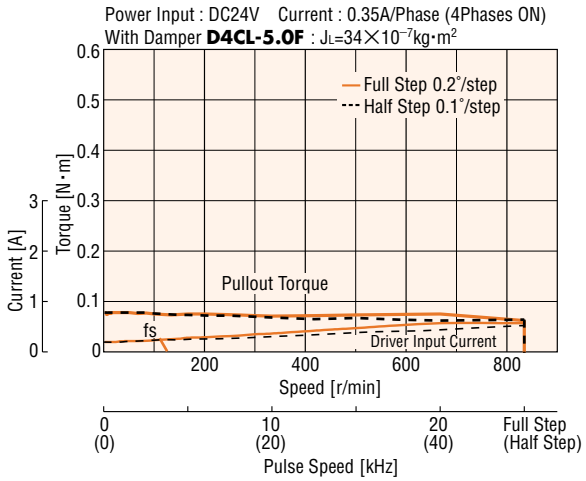
- Maximum holding torque refers to the holding torque at motor standstill when the rated current is supplied to the motor (5-phase excitation), with consideration given to the permissible strength of the gear. Use this value to compare motor torque performance. When using the motor with the included driver, the driver's "Automatic Current Cutback" function at motor standstill reduces maximum holding torque by approximately 50%
- The current indicated in power input is the driver's maximum input current when a load is applied to the motor. (The value varies according to the pulse speed.)
- Permissible torque is the marginal value of the mechanical strength of the gear unit. Use the product with a total torque (load and acceleration) less than the permissible torque.
- Maximum overhung load indicates the value measured at 10mm from the tip of the gear output shaft.
- Direction of rotation of the motor and that of the gear output shaft are the same for unit type with gear ratios of 1:3.6,1:7.2 ,1:20 and 1:30. It is opposite for the 1:10 ratio type.

Speed-Torque Characteristics

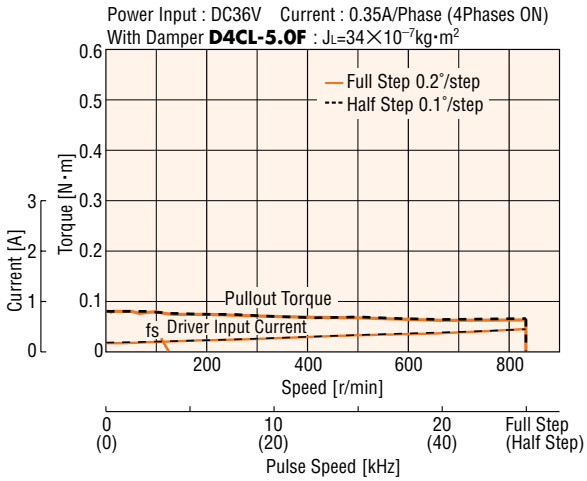
fs: Maximum Starting Pulse Rate

Geared Type

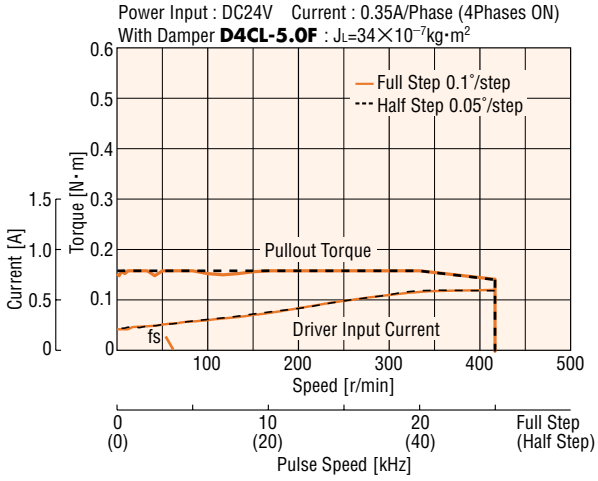
PMC33B1-MG3.6 DC24V



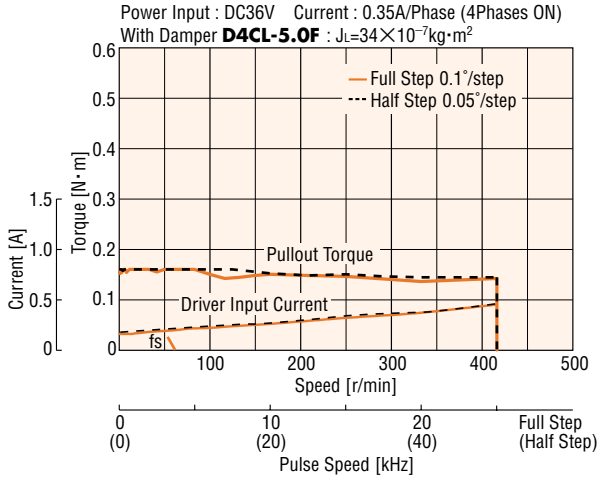
PMC33B1-MG3.6 DC36V



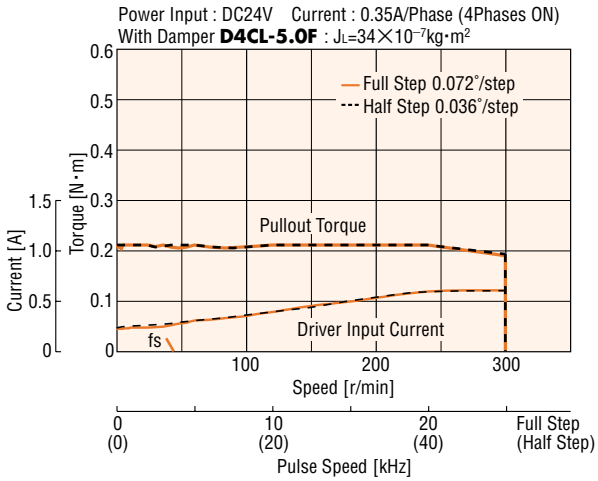
PMC33B1-MG7.2 DC24V



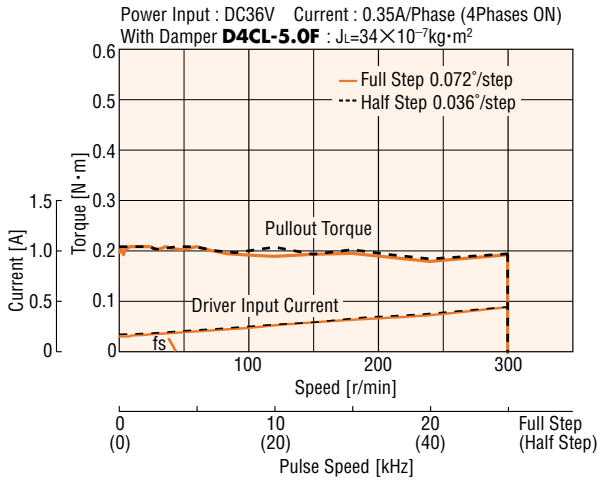
PMC33B1-MG7.2 DC36V



PMC33B1-MG10 DC24V



PMC33B1-MG10 DC36V

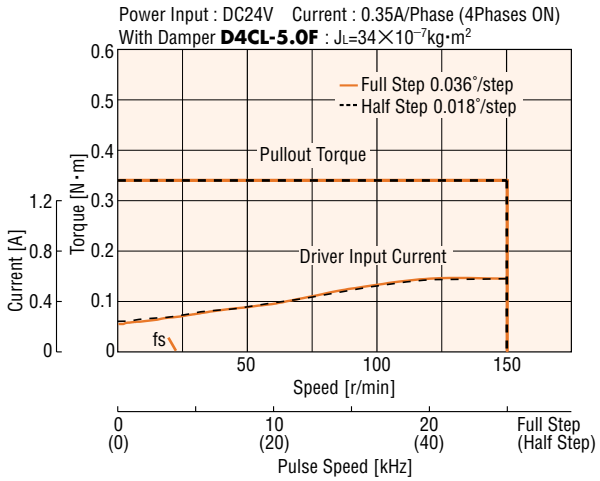


Notes:

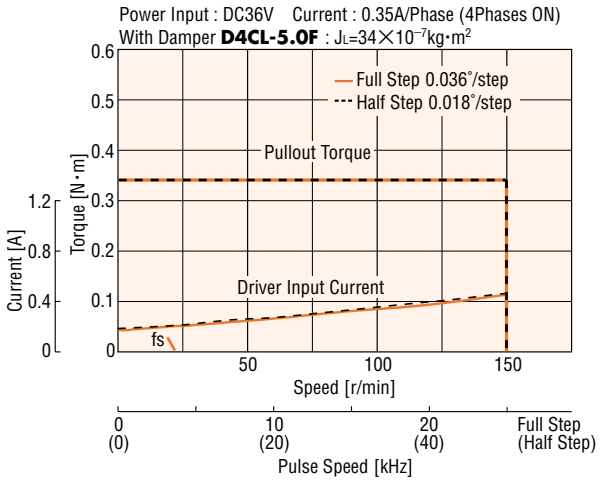
1. Pay attention to heat dissipation from the motor and driver. The motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C
2. When using the motor with the dedicated driver, the driver's "Automatic current Cutback" function at motor standstill reduces maximum holding torque by approximately 50%

●Geared Type

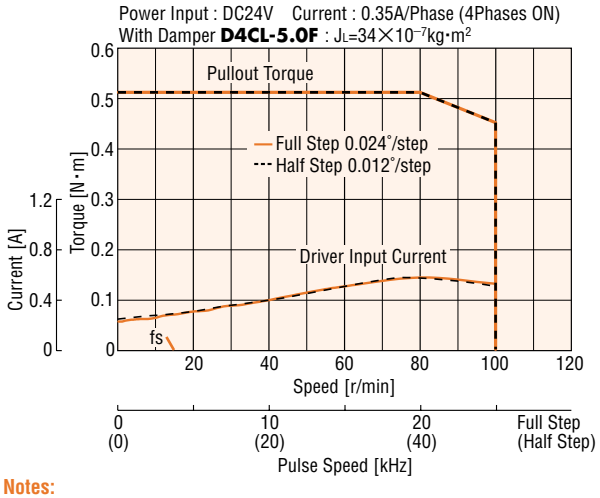
PMC33B1-MG20 DC24V



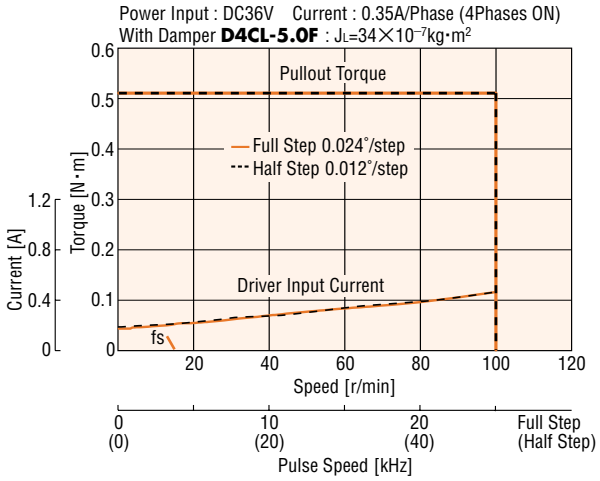
PMC33B1-MG20 DC36V



PMC33B1-MG30 DC24V



PMC33B1-MG30 DC36V



Notes:

1. Pay attention to heat dissipation from the motor and driver. The motor will produce a considerable amount of heat under certain conditions. Be sure to keep the temperature of the motor case under 100°C
2. When using the motor with the dedicated driver, the driver's "Automatic Current Cutback" function at motor standstill reduces maximum holding torque by approximately 50%

■ Precautions

When using the **PMC** series, please note the following:

1. Do not exceed the maximum permissible torque:

Permissible torque represents the maximum value of the mechanical strength of the gear unit. Be sure to keep the total value of acceleration/deceleration torque and load (friction) torque at the shaft under the permissible torque value. If torque exceeding the permissible torque is applied, the gear unit may break down.

2. Be careful of backlash in positioning for bi-directional applications:

Backlash is the free rotation angle (i.e., play) of the output shaft when the input section of the reduction gear is fixed. If there is a problem with backlash in bi-directional positioning, be sure to stop the motor in one direction.

3. Do not exceed the permissible speed range:

Do not exceed the maximum output speed of the gearhead indicated in the specifications on page B-145. The speed affects the life of the gear head (i.e., backlash becomes large). Be sure to use the gear unit within the maximum permissible speed range.

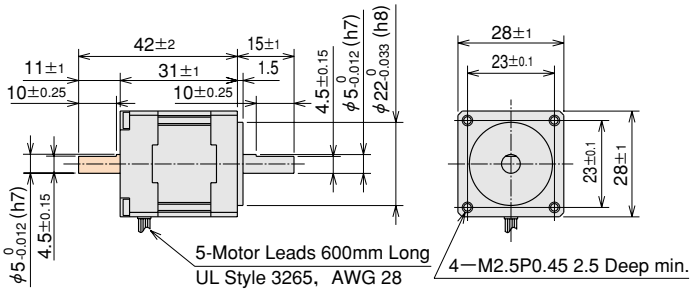
4. The direction of gear-shaft rotations differs according to gear ratios:

The direction of motor-shaft rotation and gear-shaft rotation depends on the gear ratio used:
Gear ratio - 1:3.6, 1:7.2, 1:20 and 1:30 - Same
Gear ratio - 1:10 - Opposite

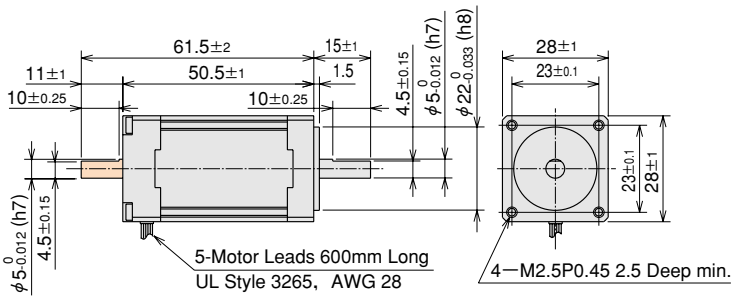
Dimensions

●Motor Scale 1/2, Unit =mm

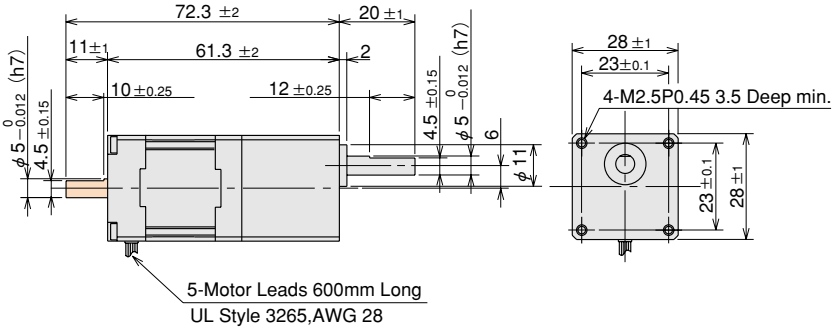
PMC33A3 (Single Shaft)
Motor Model : PMM33A2 Mass 0.1kg/Driver Model : PMD03CA
PMC33B3 (Double shaft)
Motor Model : PMM33B2 Mass 0.1kg/Driver Model : PMD03CA



PMC35A3 (Single Shaft)
Motor Model : PMM35A2 Mass 0.17kg/Driver Model : PMD03CA
PMC35B3 (Double shaft)
Motor Model : PMM35B2 Mass 0.17kg/Driver Model : PMD03CA



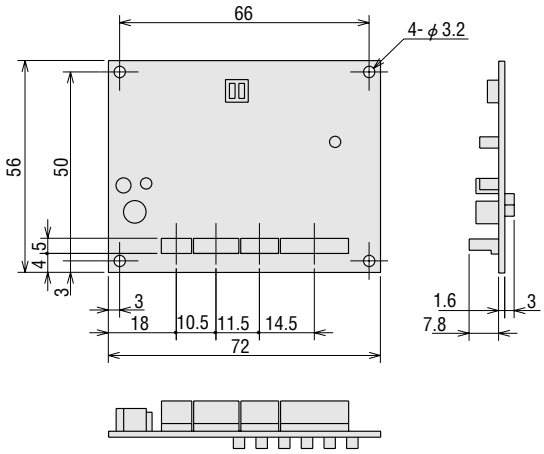
PMC33A1-MG□ (Single Shaft)
Motor Model : PMM33A-MG□ Mass 0.16kg/Driver Model : PMD03CA
PMC33B1-MG□ (Double Shaft)
Motor Model : PMM33B-MG□ Mass 0.16kg/Driver Model : PMD03CA



●These dimensions are for double shaft models. For single shaft, ignore the colored areas.
●See page B-42 for information on motor installation.

●Driver Scale 1/4, Unit =mm

Driver Model : PMD03CA Mass 0.025kg



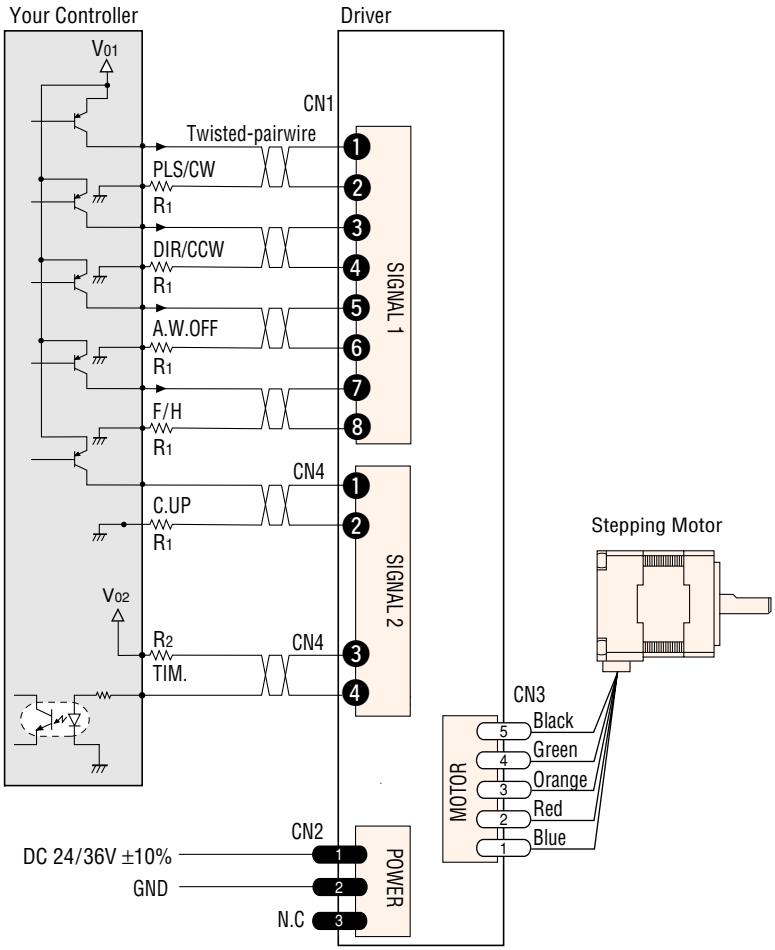
Accessories
●Connector Housings (included)
6-173977-3 (AMP)
6-173977-4 (AMP)
6-173977-5 (AMP)
6-173977-8 (AMP)

Note: Use the connector assembly tool (AMP 911790-1) when assembling the connectors. The connector tool is not provided with the package.

●See page B-45 for information on driver installation.

●Mounting Screws (included)
M2.5 P0.45 8mm long : 4pieces

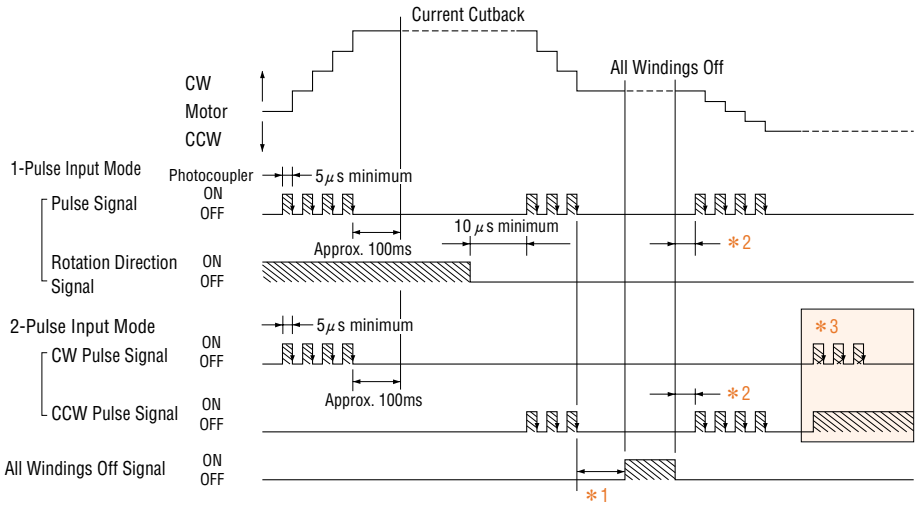
Wiring Diagram



Notes regarding wiring

1. Keep the voltage V_{01} and V_{02} between DC5V and DC24V. When V_{01} is equal to DC5V, the external resistances R_1 is not necessary. When V_{01} is above DC5V, connect R_1 to keep the current below 20mA. When the output current exceeds 10mA, connect the external resistances R_2 to keep the current below 10mA.
2. Use twisted-pair wire of 0.08mm^2 or thicker and 2m or less in length for the signal lines.
3. The suitable wire size for the CN1, CN2, CN3 and CN4 connectors is between AWG28 and 26. Use wires rated at AWG26 (0.14mm^2) for the power line.
4. Signal lines should be kept at least 10cm away from power lines (power supply lines and motor lines). Do not bind the signal lines and power line together.
5. If noise generated by the motor lead wire causes a problem, try shielding of the motor lead wires with conductive tape or wire mesh.
6. Recommended diameter of insulating material of wires is between 0.85mm and 1.05mm.

Timing Chart



The photocoupler diode lights in ther shaded area.
The motor moves when the photocoupler state changes from "ON" to "OFF" as indicated by arrow.

∗1 It is recommended to wait a period of time before inputting the "All Windings Off" signal to allow the motor oscillations to end. This time varies with the load inertia, the load torque and the starting pulse rate. Do not input the "All Windings Off" signal before the motor has stopped.

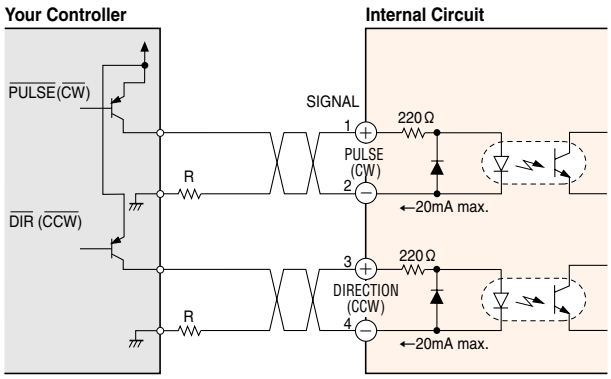
∗2 Never input pulse signals immediately after switching the "All Windings Off" signal to the "photocoupler OFF" state or the motor may lose synchronism. In general, an interval of 100ms (minimum) is required.

∗3 In 2-pulse input mode, th*1e motor will not operate properly when inputting a pulse is signal while either the CW or CCW pulse is already in the "photocoupler ON" state.

Description of Input/Output Signals

1. PLS/CW, DIR/CCW Pulse Signal

Input Circuit and Sample Connection



The characters indicate signals under the 1-pulse input mode, while the characters in parenthesis indicate signals under the 2-pulse input mode.
The external resistance R is not needed when V_0 is 5V. When the voltage exceeds 5V, connect the external resistance R to keep input current at 20mA or less.

1-pulse Input Mode

●Pulse Signal

When the photocoupler state changes from "ON" to "OFF", the motor rotates one step.
The direction of the motor's rotation is determined by the following "Rotation Direction" signal.

●Rotation Direction Signal

The "Rotation Direction" signal is input.
A "photocoupler ON" signal input commands a clockwise direction rotation.
A "photocoupler OFF" signal input commands a counterclockwise direction rotation.

2-pulse Input Mode

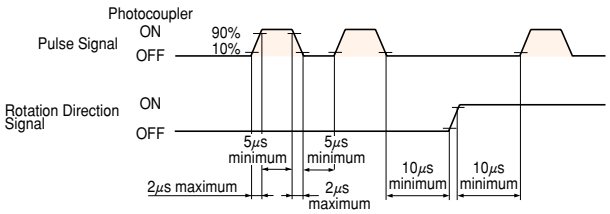
●CW Pulse Signal

When the photocoupler state changes from "ON" to "OFF", the motor rotates one step in the clockwise direction.

●CCW Pulse Signal

When the photocoupler state changes from "ON" to "OFF", the motor rotates one step in the counter clockwise direction.

Pulse Signal Characteristics



Shaded area ▭ indicates the radiation of the photocoupler diode. The motor starts at the trailing edge, shown by the arrow.

Pulse Signal Characteristics

1. The pulse voltage is 4~5V in the "photocoupler ON" state and 0~0.5V in the "photocoupler OFF" state.
2. Input pulses for a pulse width is 5μs or more, the rise/ drop time is 2μs or less and pulse duty is 50% or less.
3. 10μs or more is the standard interval time for switching from CW to CCW. Note that the interval time greatly varies according to the motor and load inertia.

Pulse Signal Input Precautions

Be sure to set the signal in the "photocoupler OFF" state when the pulse signal is at rest.
Setting to the signal in the "photocoupler ON" state will not activate the automatic current cutback function.

●1-pulse Input Mode

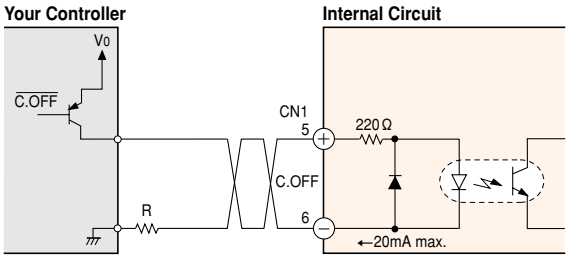
Be sure to switch the direction of rotation with the pulse signal in the "photocoupler OFF" state.

●2-pulse Input Mode

Do not input CW pulses and CCW pulses at the same time.
When the CW pulse signal or CCW pulse signal is in the "photocoupler ON" state the input of pulses to the other will not rotate the motor normally.

2. C. OFF (All Windings Off) Signal

Input Circuit and Sample Connection

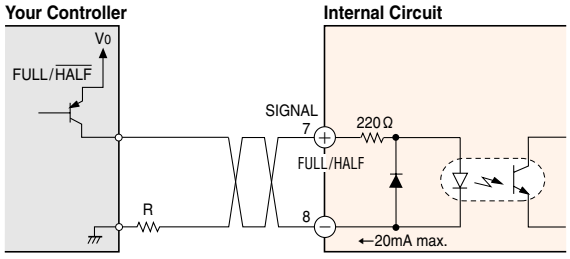


The external resistance R is not needed when V_0 is 5V. When the voltage exceeds 5V, connect the external resistance R to keep input current at 20mA or less.

1. If the "C.OFF" signal is in the "photocoupler ON" state, the current does not flow through the motor and the motor shaft can be turned manually. This function can be used when the motor shaft needs external rotation or manual positioning. Be sure to set to the signal in the "photocoupler OFF" state when operating the motor. For regular use, no connections are necessary. The holding torque can be set in proportion to the motor stop current set by the STOP dial.
2. Turning the C.OFF signal OFF does not change the excitation sequence (phase) of the motor. When the motor shaft is turned manually with C.OFF input, the shaft may turn ±3.6° from the shaft position when C.OFF is released.

3. FULL / HALF (Step Angle) Signal

Input Circuit and Sample Connection



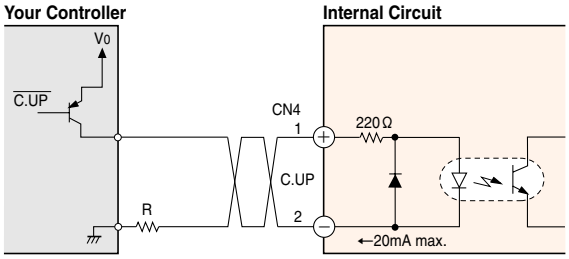
The external resistance R is not needed when V_0 is 5V. When the voltage exceeds 5V, connect the external resistance R to keep input current at 20mA or less.

1) When the step angle "FULL/HALF" signal is in the "photocoupler ON" state half-step mode (0.36°/step) has been selected; when it is in the "photocoupler OFF" state full-step mode (0.72°/step) has been selected.
2) Switch the step angle when the pulse input is in the "photocoupler OFF" state. The "FULL/HALF" signal is read when the pulse signal is falling, therefore switching the "FULL/HALF" signal after the pulse has fallen will not change the signal until the pulse falls again.

Note: When using this input to select the step angle, the Step Angle Switch should be set to "F" position.

4. C.UP (Automatic Current Cutback Release) Signal

Input Circuit and Sample Connection

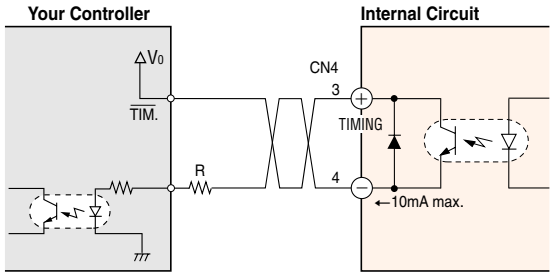


The external resistance R is not needed when V_0 is 5V. When the voltage exceeds 5V, connect the external resistance R to keep input current at 20mA or less.

1) When the "Automatic Current Cutback Release" C.UP signal is in the "photocoupler ON" state the "Automatic Current Cutback" function is not activated; even after the motor has stopped, current set with the RUN potentiometer will continue flowing to the motor.
2) When the "C.UP" signal is in the “photocoupler OFF” state the "Automatic Current Cutback" function is activated; approximately 100ms after the motor has stopped, current set with the STOP potentiometer will flow to the motor.
3) Approximately 100ms after the input pulses have stopped, the current is reduced; when the input pulse signal drops to 10Hz or below, the "Automatic Current Cutback" function works for each pulse.

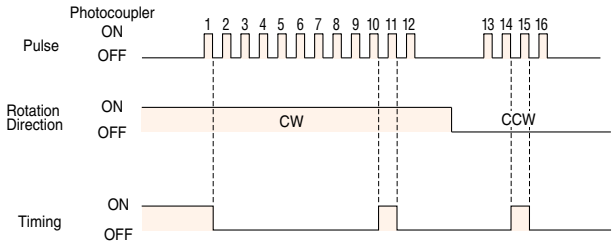
5. TIM. (Excitation Timing) Signal

Output Circuit and Sample Connection



Keep the voltage between 5V and 24V and current at 10mA or less.

1) The excitation timing "TIM." signal indicates that the excitation of the motor is in the initial state (STEP 0). Use this signal to detect the home position accurately by matching the mechanical home position of the device and the excitation home position (STEP 0) of the motor.
2) The signal is output once each time the excitation sequence returns to (STEP 0) in synchronization with input pulses. The excitation sequence is designed to complete one cycle as the motor shaft rotates 7.2˚. Output is as follows:
0.72˚/step (Full step): 1 output per 10 pulses
0.36˚/step (Half step): 1 output per 20 pulses



When used as indicated in the sample connection, the signal is in the "photocoupler ON" state at STEP 0.

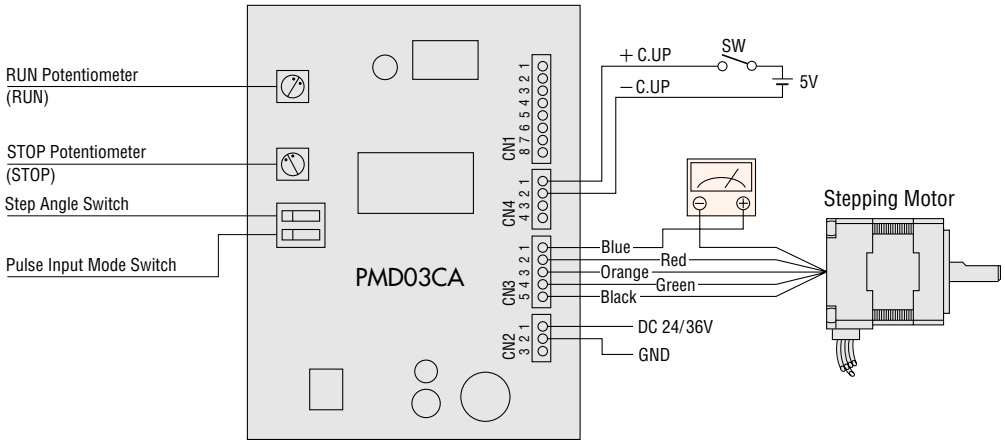
Notes: When the power is turned ON, the excitation sequence is reset to STEP 0 and the timing lamp light up.

Adjusting the Driver Output Current

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

Connect a DC ammeter between the motor and pin ① of connector CN3 as shown in the diagram below.



- After connecting the DC ammeter to the motor, turn on the power. (The excitation status at this point is fixed: power on reset.)
- When the power is turned on, the motor enters a 4 phase excitation state, and +directional current flows through the blue motor lead wire. (Even if 4-5phase excitation has been selected, the motor enters a 4 phase excitation state when the power is turned on. Adjust the current in this state.)
- 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. (When setting the current to 0.3A/phase, adjust the current level until the ammeter reads 0.6A)

Note:
1. Do not input a pulse signal.
2. Set the "All Windings Off " (C.OFF) signal in the "photocoupler OFF" state.
3. The current at motor standstill changes when the operating current is adjusted.

1. Adjusting the Motor Operating Current

Set “Automatic Current Cutback Release” (C.UP) signal in the “photocoupler ON” state when adjusting the operating current.

(1) Adjust the motor operating current with the RUN potentiometer. It can be adjusted from 0.07A/phase to 0.35A/phase.
(2) The motor operating current is set for a rated current of 0.35 A/phase at the time of shipping, but it can be readjusted using the RUN potentiometer to lower the operating current in order to suppress temperature rise in the motor/driver, or lower operating current in order to allow a margin for motor torque or to reduce vibration.

Note: Do not operate the motor at a current in excess of the rated value as this may cause damage to the driver. (The driver will not be damaged, however, if the current level momentarily exceeds the rated value during current adjustment.)

2. Adjusting the Current at Motor Standstill

Set “Automatic Current Cutback Release” (C.UP) signal in the “photocoupler OFF” state when adjusting the current while the motor is stopped.

(1) Adjust the current at motor standstill with the STOP potentiometer. It can be adjusted from 0.07A/phase to 0.28 A/Phase.
(2) At the time of shipping, the current at motor standstill is set for 50% of the rated current. The STOP potentiometer can be used to readjust the current at motor standstill to the current value required to produce enough holding torque.

$$\text{Holding Torque (N·m)} = \frac{\text{Rated Holding Torque (N·m)} \times \text{Current at Motor Standstill [A]}}{\text{Motor Rated Current [A]}}$$