



## The 5-Phase Stepping Driver

**PMM-MD-53030-10**

**PMM-MD-53031-10**

**DC 24 V/36 V**

**Micro-step** (500 x 1 to 250 divisions)

### ● Applicable motors



## Characteristics

### ● Micro-step function available

Smooth operation without vibration at low speeds can be realized.

### ● Flexible

Various stepping motors of small to large capacities can be driven without adjustment for wide range uses.

### ● Downsizing

Dedicated HIC is mounted to improve parts consolidation and reliability.

### ● The 2-type interface circuit specifications

Photocoupler input type : PMM-MD-53030-10

C-MOS input type : PMM-MD-53031-10

## Built-in function

### ● Step angle setting function

Sixteen resolutions ranging from 1- to 250-division can be set for the basic step angle of stepping motor by using the rotary switch.

### ● Step angle selection function

The 2-type micro-step resolutions can be selected using the external input signal.

### ● Pulse input system selection function

Either "Pulse and direction mode" or "2-input mode" can be selected, using a dipswitch. Resolution setting function.

### ● Power down function

The stepping motor power can be turned OFF by the external input signal.

## PM driver specifications

| Item                 |                                    | PMM-MD-53030-10               | PMM-MD-53031-10                                                                                                                                                       |
|----------------------|------------------------------------|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Basic specifications | Input source                       | For main power source         | DC24V/36V±10%                                                                                                                                                         |
|                      |                                    | For control power source      | -                                                                                                                                                                     |
|                      | Source current                     | For main power source         | 3A                                                                                                                                                                    |
|                      |                                    | For control power source      | -                                                                                                                                                                     |
|                      | Environment                        | Operating ambient temperature | 0 to +50 °C                                                                                                                                                           |
|                      |                                    | Conservation temperature      | - 20 to + 70 °C                                                                                                                                                       |
|                      |                                    | Operating ambient humidity    | 35 to 85 % RH (no condensation)                                                                                                                                       |
|                      |                                    | Conservation humidity         | 10 to 90 % RH (no condensation)                                                                                                                                       |
|                      |                                    | Vibration resistance          | Tested under the following conditions: Frequency range: 10 to 55 Hz, 0.5 G along the X, Y, and Z axes for 2 hours                                                     |
|                      |                                    | Impact resistance             | No abnormality for the NDS-C-0110 Standard, Section 3.2.2, Division "C".                                                                                              |
|                      |                                    | Withstand voltage             | No abnormality against an AC 500 V application between the power input terminal and the cabinet for one minute.                                                       |
|                      |                                    | Insulation resistance         | Minimum 10 MΩ when applying the DC 500 V Megger between the power input terminal and the cabinet.                                                                     |
|                      | Mass(Weight)                       |                               | 0.31kg (0.68 lbs)                                                                                                                                                     |
| Function             | Selection function                 |                               | Automatic current reduction, pulse input system, step angle, and power source specifications                                                                          |
| I/O signals          | Command pulse input signal         |                               | Photocoupler input system, input resistance 330 Ω<br>Input signal voltage: "H" level: 4.0 to 5.5 V<br>"L" level: 0 to 0.5 V<br>Maximum input frequency: 400 kpulses/s |
|                      | Power down input signal            |                               | Photocoupler input system, input resistance 330 Ω<br>Input signal voltage: "H" level: 4.0 to 5.5 V<br>"L" level: 0 to 0.5 V                                           |
|                      | Step angle selection input signal  |                               | Photocoupler input system, input resistance 330 Ω<br>Input signal voltage: "H" level: 4.0 to 5.5 V<br>"L" level: 0 to 0.5 V                                           |
|                      | Phase origin monitor output signal |                               | Open collector output by photocoupler (turns ON at the phase origin)<br>Output standard Vceo: Maximum 30 V, Ic: Maximum 5 mA                                          |

## Standard combined stepping motor

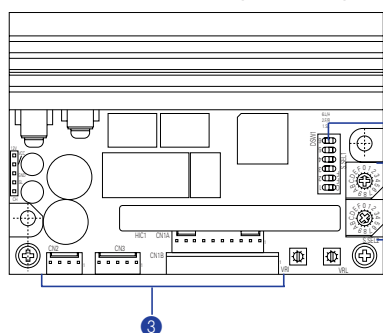
| Stepping motor dimensions | Stepping motor model number |               | Holding torque<br>N·m(oz·in) | Rotor inertia<br>×10 <sup>-4</sup> kg·m <sup>2</sup> (oz·in <sup>2</sup> ) | Mass(Weight)<br>kg(lbs) | Page     |
|---------------------------|-----------------------------|---------------|------------------------------|----------------------------------------------------------------------------|-------------------------|----------|
|                           | Single shaft                | Double shaft  |                              |                                                                            |                         |          |
| □28mm                     | 103H3505-7040               | 103H3505-7010 | 0.026(3.68)                  | 0.009(0.05)                                                                | 0.11(0.24)              | Page 299 |
|                           | 103H3515-7040               | 103H3515-7010 | 0.052(7.36)                  | 0.016(0.09)                                                                | 0.2(0.44)               |          |
| □42mm                     | 103H5505-7040               | 103H5505-7010 | 0.127(17.98)                 | 0.03(0.16)                                                                 | 0.23(0.51)              | Page 301 |
|                           | 103H5508-7040               | 103H5508-7010 | 0.176(24.92)                 | 0.053(0.29)                                                                | 0.28(0.62)              |          |
|                           | 103H5510-7040               | 103H5510-7010 | 0.255(36.11)                 | 0.065(0.36)                                                                | 0.37(0.82)              |          |
| □50mm                     | 103H6500-7041               | 103H6500-7011 | 0.235(33.28)                 | 0.057(0.31)                                                                | 0.38(0.84)              | Page 303 |
|                           | 103H6501-7041               | 103H6501-7011 | 0.39(55.23)                  | 0.105(0.57)                                                                | 0.44(0.97)              |          |
| □60mm                     | 103H7851-7051               | 103H7851-7021 | 0.65(92.0)                   | 0.275(1.50)                                                                | 0.6(1.32)               | Page 305 |
|                           | 103H7852-7051               | 103H7852-7021 | 0.98(138.8)                  | 0.4(2.19)                                                                  | 0.78(1.72)              |          |
|                           | 103H7853-7051               | 103H7853-7021 | 1.86(263.4)                  | 0.84(4.59)                                                                 | 1.36(3.00)              |          |
| ø60mm                     | 103H7521-7051               | 103H7521-7021 | 0.461(65.3)                  | 0.148(0.81)                                                                | 0.51(1.12)              | Page 307 |
|                           | 103H7522-7051               | 103H7522-7021 | 0.735(104.1)                 | 0.18(0.98)                                                                 | 0.6(1.32)               |          |
|                           | 103H7523-7051               | 103H7523-7021 | 1.568(222.0)                 | 0.423(2.31)                                                                | 1.1(2.43)               |          |
| ø86mm                     | 103H8581-7041               | 103H8581-7011 | 2.06(291.7)                  | 1.45(7.93)                                                                 | 1.5(3.31)               | Page 309 |
|                           | 103H8582-7041               | 103H8582-7011 | 4.02(569.3)                  | 2.9(15.86)                                                                 | 2.5(5.51)               |          |
|                           | 103H8583-7041               | 103H8583-7011 | 6.17(873.7)                  | 4.4(24.06)                                                                 | 3.5(7.72)               |          |

- For the general specifications and dimensions of each stepping motor, refer to the reference pages.

## Operation, connection, and function

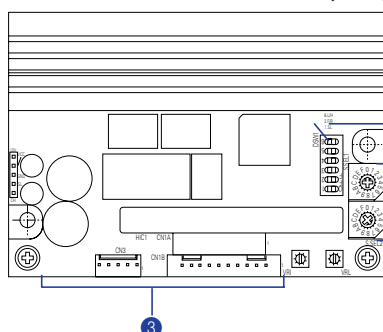
### Each section name of the PM driver

PMM-MD-53030-10 (photo coupler input system)



- ① Function selection dipswitches (SL, F/R, and L/H)  
..... Functions can be selected according to specifications.
- ② Step angle selection rotary switch (S. SEL1 and S. SEL2)  
..... The basic step angle of stepping motor can be divided to maximum 250 divisions.
- ③ Connector (CN1A, CN2 and CN3)  
..... Connects the I/O signal, the DC power source, and the stepping motor power cable.

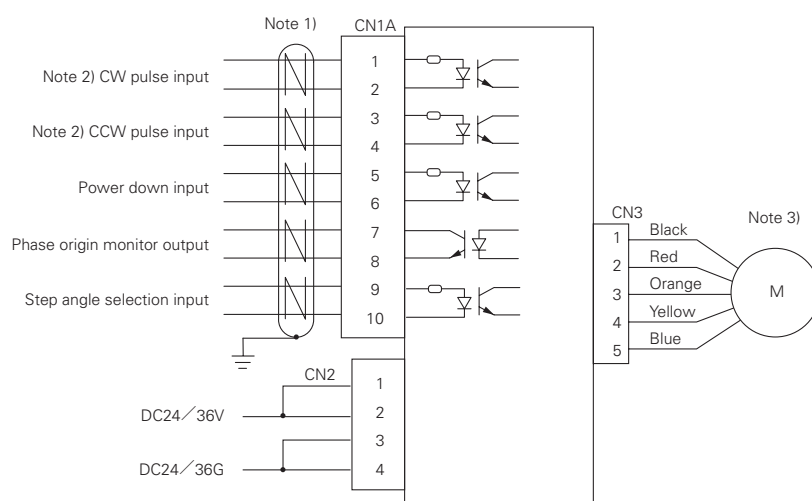
PMM-MD-53031-10 (CMOS input system)



- ① Function selection dipswitches (SL, F/R, and L/H)  
..... Functions can be selected according to specifications.
- ② Step angle selection rotary switch (S. SEL1 and S. SEL2)  
..... The basic step angle of stepping motor can be divided to maximum 250 divisions.
- ③ Connector (CN1B and CN3)  
..... Connects the I/O signal, the DC power source, and the stepping motor power cable.

### External wiring diagram

PMM-MD-53030-10 (photo coupler input system)



Note 1) Use shielded twisted-pair cables.

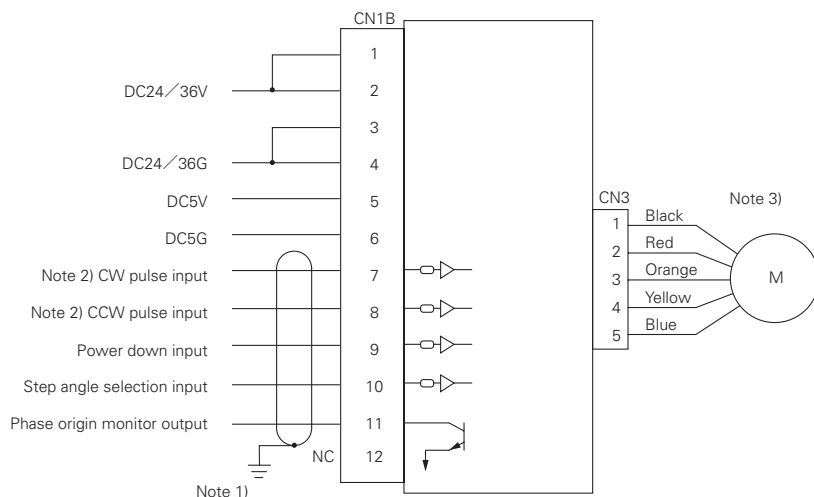
Note 2) Either "2-input mode (CW and CCW)" or "Pulse and direction mode (CK and U/D)" can be selected by using the function selection switch F/R.

Note 3) Refer to the following table when connecting the 103H35 □ 5 or 103H785 □ type stepping motor:

| Product                  | Connector pin number |   |   |   |   |
|--------------------------|----------------------|---|---|---|---|
| PM driver connector      | 1                    | 2 | 3 | 4 | 5 |
| Stepping motor connector | 1                    | 4 | 3 | 2 | 5 |

## Operation, connection, and function

### PMM-MD-53031-10 (CMOS input system)



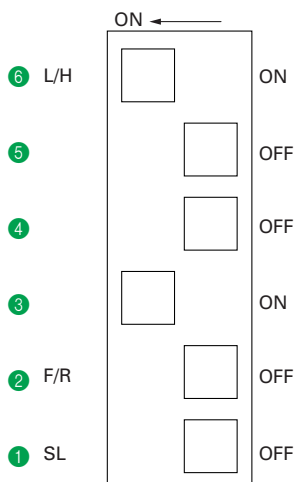
Note 1) Use a shielded cable.

Note 2) Either "2-input mode (CW and CCW)" or "Pulse and direction mode (CK and U/D)" can be selected by using the function selection switch F/R

Note 3) Refer to the following table when connecting the 103H35 □ 5 or 103H785 □ type stepping motor:

| Product                  | Connector pin number |   |   |   |   |
|--------------------------|----------------------|---|---|---|---|
| PM driver connector      | 1                    | 2 | 3 | 4 | 5 |
| Stepping motor connector | 1                    | 4 | 3 | 2 | 5 |

### ● Function selection dipswitch ---①



① SL (automatic current reduction selection)  
Automatic current reduction function is selected.

| SL  | Automatic current reduction                |
|-----|--------------------------------------------|
| ON  | 100% of current rating when stopped        |
| OFF | Approx. 50% of current rating when stopped |

② F/R (pulse input system selection)  
A pulse input system is selected.

| F/R | Pulse input system                    |
|-----|---------------------------------------|
| ON  | Pulse and direction mode (CK and U/D) |
| OFF | 2-input mode (CW and CCW)             |

Note 1) The temperature increase in the motor driver can be controlled by setting SL to OFF (approx. 50% of the rated current).

Note 2) The output torque when SL is OFF (approx. 50% of the rated current) is approx. 50% of that when SL is ON (100% of the rated current).

③ ④ ⑤ Do not change the third, fourth, and fifth dipswitch settings (Note).

⑥ L/H (power specification selection)  
The specification is changed from DC 24 V to DC 36 V.

| L/H | Power specification |
|-----|---------------------|
| ON  | DC 24 V specified   |
| OFF | DC 36 V specified   |

- The function selection dipswitches specifications are common for PMM-MD-53030-10 and PMM-MD-53031-10.
- Settings at the shipment are shown above.
- Turn OFF the PM driver power before changing switch settings to change the function selection dipswitch settings.

## Operation, connection, and function

### ● Step angle selection switch (S. SEL1 and S. SEL2) ---②

Operation current value of stepping motor can be selected.

| Scale               | 0  | 1  | 2   | 3  | 4   | 5   | 6   | 7   |
|---------------------|----|----|-----|----|-----|-----|-----|-----|
| Number of divisions | 1  | 2  | 2.5 | 4  | 5   | 8   | 10  | 20  |
| Scale               | 8  | 9  | A   | B  | C   | D   | E   | F   |
| Number of divisions | 25 | 40 | 50  | 80 | 100 | 125 | 200 | 250 |

- "0" and "6" are set for S. SEL1 and S. SEL2 at the shipment, respectively.

### ● I/O signal function ---③

| Signal name<br>(Abbreviation)          | Pin number(CN1)            |                   | Function                                                                                                                                                                        |
|----------------------------------------|----------------------------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                        | Photo coupler input system | CMOS input system |                                                                                                                                                                                 |
| Pulse input<br>(CW)                    | 1                          | 7                 | When using "2-input mode"                                                                                                                                                       |
|                                        | 2                          |                   | Drive pulse for the CW direction rotation is input.                                                                                                                             |
| Pulse column input<br>(CK)             | 1                          | 7                 | When using "Pulse and direction mode"                                                                                                                                           |
|                                        | 2                          |                   | Drive pulse train for the stepping motor rotation is input.                                                                                                                     |
| Pulse input<br>(CCW)                   | 3                          | 8                 | When using "2-input mode"                                                                                                                                                       |
|                                        | 4                          |                   | Drive pulse for the CCW direction rotation is input.                                                                                                                            |
| Rotation direction input<br>(U/D)      | 3                          | 8                 | The rotation direction signal of stepping motor is input for the "Pulse and direction mode".                                                                                    |
|                                        | 4                          |                   | Internal photocoupler ON ("H" level for the C-MOS type) ..... CW direction<br>Internal photocoupler OFF ("L" level for the C-MOS type) ..... CCW direction                      |
| Power down input<br>(PD)               | 5                          | 9                 | Inputting the PD signal cuts OFF the current flowing through the stepping motor (turns OFF the power).                                                                          |
|                                        | 6                          |                   | PC type: Internal photocoupler (ON) ..... PD function enabled<br>C-MOS type: "L" level input ..... PD function enabled                                                          |
| Step angle selection input<br>(S. SEL) | 9                          | 10                | Resolution setting function (S. SEL1 and S. SEL2) can be selected by the S. SEL input signal.                                                                                   |
|                                        | 10                         |                   | Internal photocoupler ON ("H" level for the C-MOS type) ..... S. SEL1 setting enabled<br>Internal photocoupler OFF ("L" level for the C-MOS type) ..... S. SEL2 setting enabled |
| Phase origin monitor output<br>(MON)   | 7                          | 11                | It is turned ON when the excitation phase is at the origin (in the state when the power is turned ON)                                                                           |
|                                        | 8                          |                   | It is turned ON once per 10 pulses during the full-step.<br>It is turned ON once per 20 pulses during the half-step.                                                            |

- The PC type and the C-MOS type in the table indicate "PMM-MD-53030-10" and "PMM-MD-53031-10", respectively.
- The CW direction of the stepping motor means the clockwise direction rotation as viewed from the output shaft side (flange side). The CCW direction means the counterclockwise direction rotation as viewed from the output shaft side (flange side).

### ● Connectors to be used

#### PMM-MD-53030-10 (Photo coupler input system)

| PM driver side           |              | Applicable connector model number                         | Manufacturer |
|--------------------------|--------------|-----------------------------------------------------------|--------------|
| Used for                 | Model number |                                                           |              |
| I/O signals<br>(CN1)     | 5045-10AG    | Applicable housing:5051-10<br>Applicable contact:2759PBGL | Molex Japan  |
| DC power source<br>(CN2) | 5045-04A     | Applicable housing:5051-04<br>Applicable contact:5159PBTL | Molex Japan  |
| Stepping motor<br>(CN3)  | 5045-05A     | Applicable housing:5051-05<br>Applicable contact:5159PBTL | Molex Japan  |

- The applicable connectors should be either prepared by the user or ordered from the optional connector set or connector cables (refer to Option in page 251).

#### PMM-MD-53031-10 (CMOS input system)

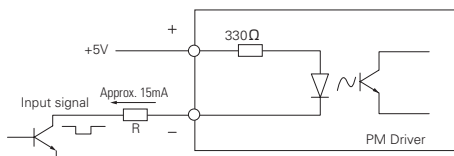
| PM driver side                           |              | Applicable connector model number                         | Manufacturer |
|------------------------------------------|--------------|-----------------------------------------------------------|--------------|
| Used for                                 | Model number |                                                           |              |
| I/O signal and DC power source<br>(CN1B) | 5045-12AG    | Applicable housing:5051-12<br>Applicable contact:2759PBGL | Molex Japan  |
| Stepping motor<br>(CN3)                  | 5045-05A     | Applicable housing:5051-05<br>Applicable contact:5159PBTL | Molex Japan  |

- The applicable connectors should be either prepared by the user or ordered from the optional connector set or connector cables (refer to Option in page 252).

## Operation, connection, and function

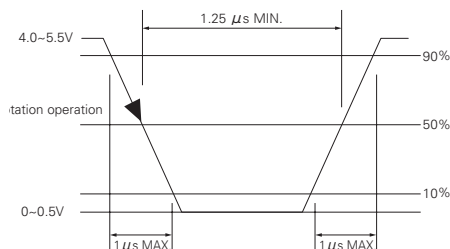
### PMM-MD-53030-10 (Photo coupler input system)

#### ● Input circuit configuration (CW and CCW)



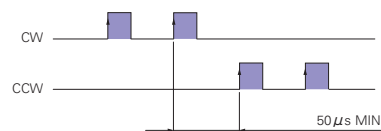
- Pulse duty is 50% MAX.
- When the peak value of the input signal is 5V, the external limit resistance R is 0 Ω. If the peak value exceeds 5V, set the input current to approx. 15mA using the external limit resistance R.

#### Input signal specifications



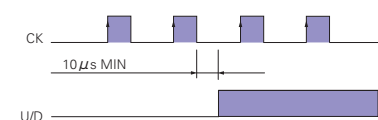
#### Timing of the command pulse

##### • 2-input mode (CW and CCW)



- The internal photocoupler turns ON at , and the internal circuit (stepping motor) operates at the leading edge of the photocoupler "ON".
- When applying the pulse to CW, set the internal photocoupler on the CCW side to "OFF".
- When applying the pulse to CCW, set the internal photocoupler on the CW side to "OFF".

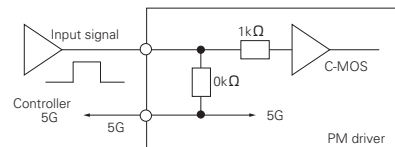
##### • Pulse and direction mode (CK and U/D)



- The internal photocoupler turns ON at , and the internal circuit (stepping motor) operates at the leading edge of the photocoupler "ON".
- Perform the U/D input signal switchover when the CK-side internal photocoupler is set to "OFF".

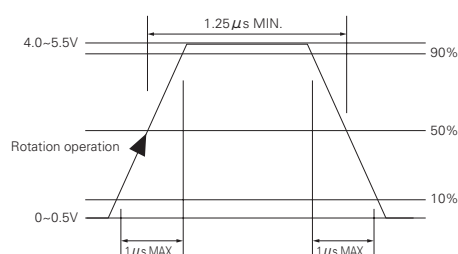
### PMM-MD-53031-10 (CMOS input system)

#### ● Input circuit configuration (CW and CCW)



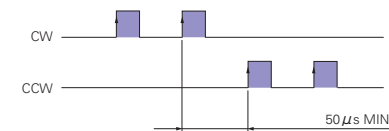
- Pulse duty is 50% MAX.

#### Input signal specifications



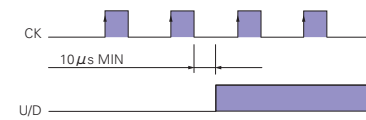
#### Timing of the command pulse

##### • 2-input mode (CW and CCW)



- The "H" level input is set at , and the internal circuit (stepping motor) operates at the leading edge of the "H" level.
- When applying the pulse to CW, set the CCW side input level to the "L" level.
- When applying the pulse to CCW, set the CW side input level to the "L" level.

##### • Pulse and direction mode (CK and U/D)

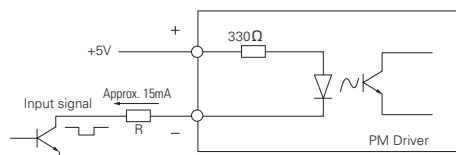


- The "H" level input is set at , and the internal circuit (stepping motor) operates at the leading edge of the "H" level of the CK-side input pulse.
- Perform the U/D input signal switchover when the CK-side input level is at the "L" level.

## Operation, connection, and function

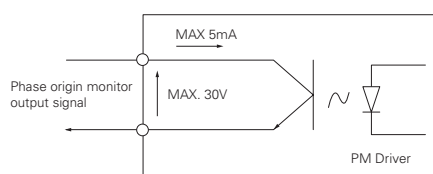
### PMM-MD-53030-10 (Photo coupler input system)

#### ● Input circuit configuration (PD and S. SEL)



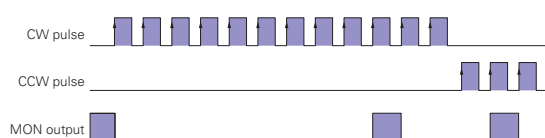
- When the peak value of the input signal is 5V, the external limit resistance R is 0Ω. If the peak value exceeds 5V, set the input current to approx. 15mA using the external limit resistance R.

#### ● Output circuit configuration (MON)



- Phase origin monitor output signal  
Contact type : Open collector output by the photocoupler  
Contact capacity : DC 30 V, 5 mA MAX.

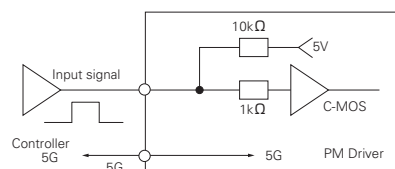
#### Timing of the MON output (when 1-division is specified)



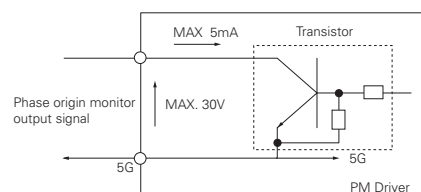
- The internal photocoupler or the transistor turns "ON" at ■.

### PMM-MD-53031-10 (CMOS input system)

#### ● Input circuit configuration (PD and S. SEL)

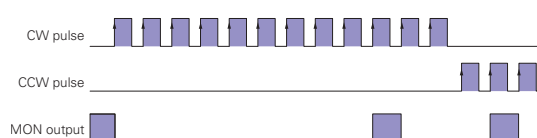


#### ● Output circuit configuration (MON)



- Phase origin monitor output signal  
Contact type : Open collector output by the transistor  
Contact capacity : DC 30 V, 5 mA MAX.

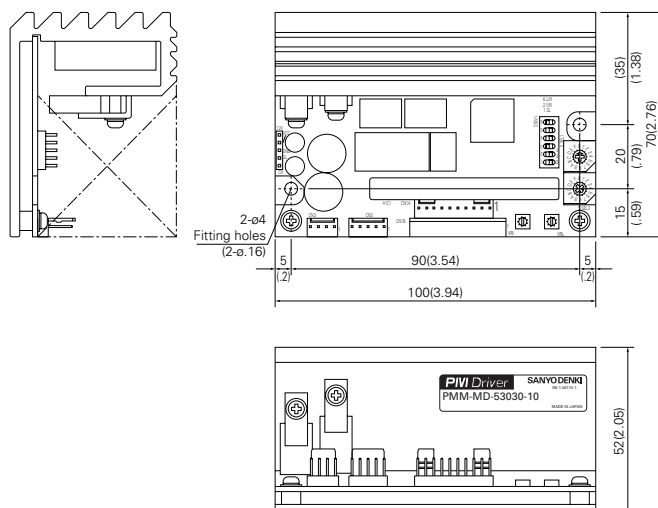
#### Timing of the MON output (when 1-division is specified)



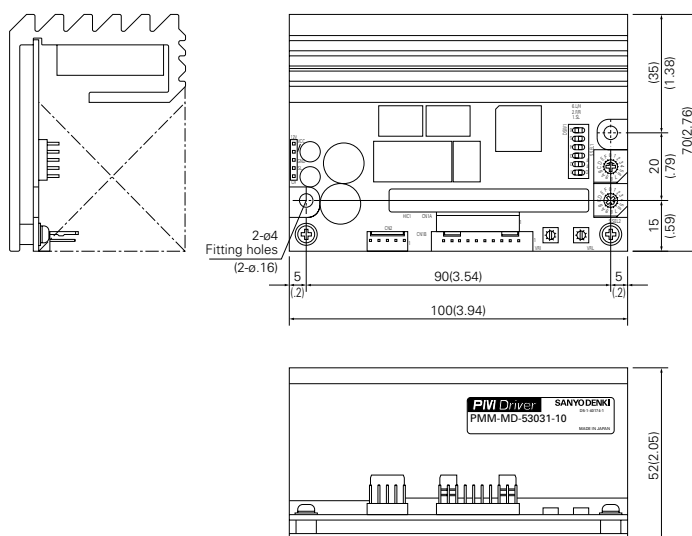
- The internal photocoupler or the transistor turns "ON" at ■.

## Dimensions [Unit:mm(inch)]

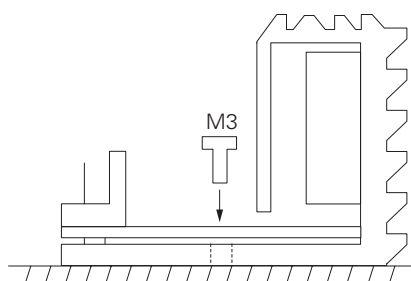
PMM-MD-53030-10 (Photo coupler input system)



PMM-MD-53031-10 (CMOS input system)



## Installation direction and position



- Install the PM driver vertically.
- As shown in the figure, fix the PM driver by using the M3 screws through two fitting holes (φ4) on the bottom surface of PM driver (no fitting metals are necessary).

PMAPI1S6A01

PMAPI1S6B01

PMM-MA-50034

PMM-MA-50064

PMM-BA-5603-5643

PMM-BA-5604-5644

PMDPB1S6P01

PMDPC1S3P01

PMM-MD-53030-53031

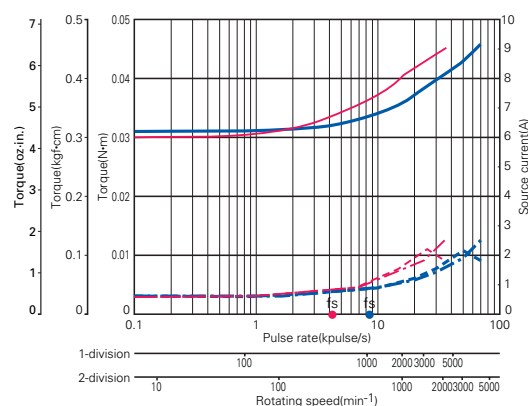
PMM-BD-53130-53131

PMDPD1S1P01

PMDPA1C3P50

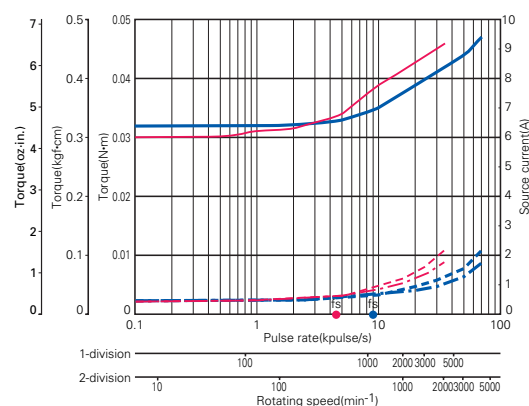
# Pulse rate-torque characteristics/pulse rate-source current characteristics

●103H3505-70 □□:24V



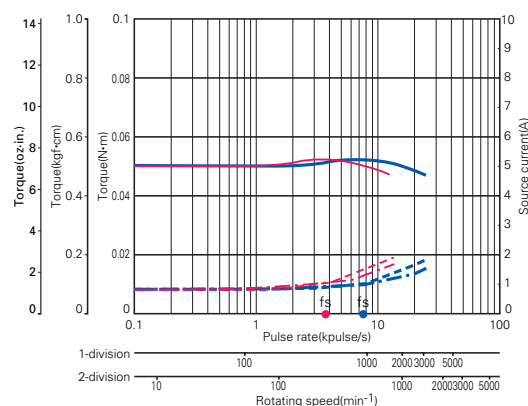
Source voltage:DC24V/Operating current: 0.75A/phase  
 — Pull-out torque( $J_{L1}=0.33 \times 10^{-4} \text{ kg-m}^2 [1.80 \text{ oz-in}^2]$  Use the rubber coupling)  
 - - - Source current( $T_L=\text{MAX}$ ) - - - Source current( $T_L=0$ )  
 fs:No load maximum starting pluse rate  
 ■ Full step ■ Half step

●103H3505-70 □□:36V



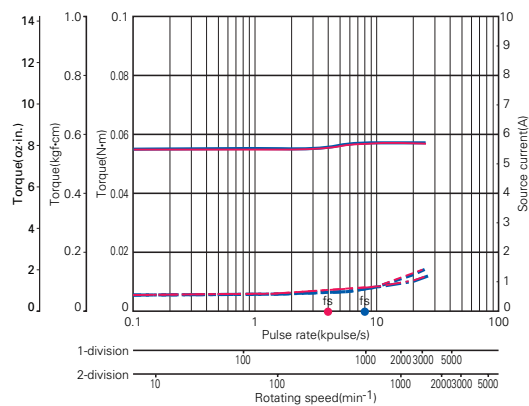
Source voltage:DC36V/Operating current: 0.75A/phase  
 — Pull-out torque( $J_{L1}=0.33 \times 10^{-4} \text{ kg-m}^2 [1.80 \text{ oz-in}^2]$  Use the rubber coupling)  
 - - - Source current( $T_L=\text{MAX}$ ) - - - Source current( $T_L=0$ )  
 fs:No load maximum starting pluse rate  
 ■ Full step ■ Half step

●103H3515-70 □□:24V



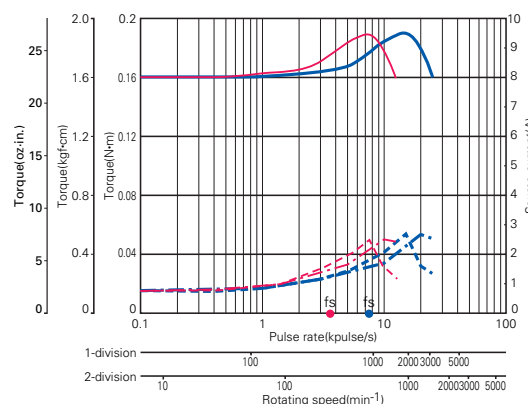
Source voltage:DC24V/Operating current: 0.75A/phase  
 — Pull-out torque( $J_{L1}=0.33 \times 10^{-4} \text{ kg-m}^2 [1.80 \text{ oz-in}^2]$  Use the rubber coupling)  
 - - - Source current( $T_L=\text{MAX}$ ) - - - Source current( $T_L=0$ )  
 fs:No load maximum starting pluse rate  
 ■ Full step ■ Half step

●103H3515-70 □□:36V



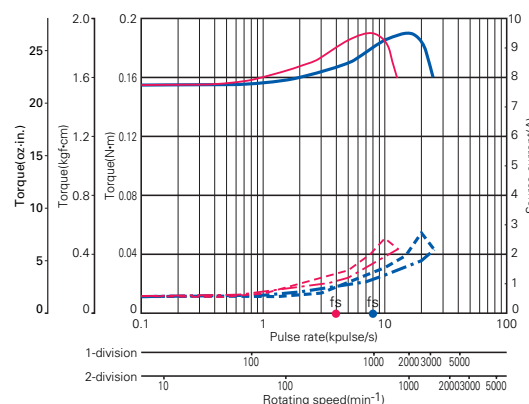
Source voltage:DC36V/Operating current: 0.75A/phase  
 — Pull-out torque( $J_{L1}=0.33 \times 10^{-4} \text{ kg-m}^2 [1.80 \text{ oz-in}^2]$  Use the rubber coupling)  
 - - - Source current( $T_L=\text{MAX}$ ) - - - Source current( $T_L=0$ )  
 fs:No load maximum starting pluse rate  
 ■ Full step ■ Half step

●103H5505-70 □□:24V



Source voltage:DC24V/Operating current: 0.75A/phase  
 — Pull-out torque( $J_{L1}=0.33 \times 10^{-4} \text{ kg-m}^2 [1.80 \text{ oz-in}^2]$  Use the rubber coupling)  
 - - - Source current( $T_L=\text{MAX}$ ) - - - Source current( $T_L=0$ )  
 fs:No load maximum starting pluse rate  
 ■ Full step ■ Half step

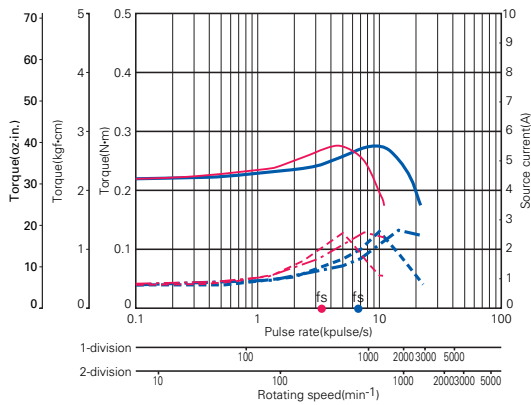
●103H5505-70 □□:36V



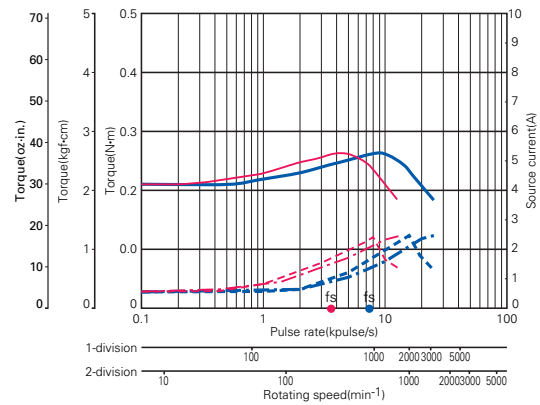
Source voltage:DC36V/Operating current: 0.75A/phase  
 — Pull-out torque( $J_{L1}=0.33 \times 10^{-4} \text{ kg-m}^2 [1.80 \text{ oz-in}^2]$  Use the rubber coupling)  
 - - - Source current( $T_L=\text{MAX}$ ) - - - Source current( $T_L=0$ )  
 fs:No load maximum starting pluse rate  
 ■ Full step ■ Half step

# Pulse rate-torque characteristics/pulse rate-source current characteristics

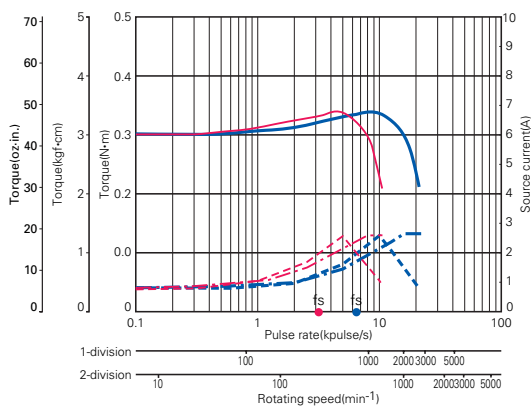
●103H5508-70 □□:24V



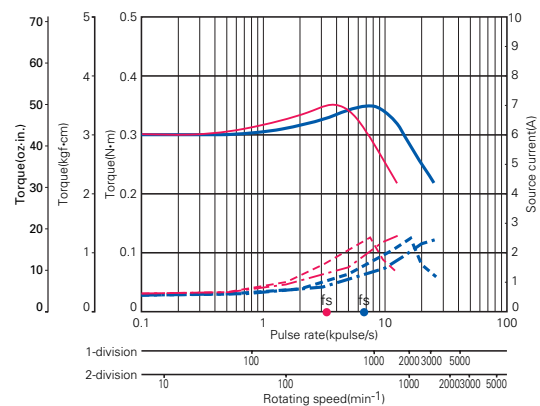
●103H5508-70 □□:36V



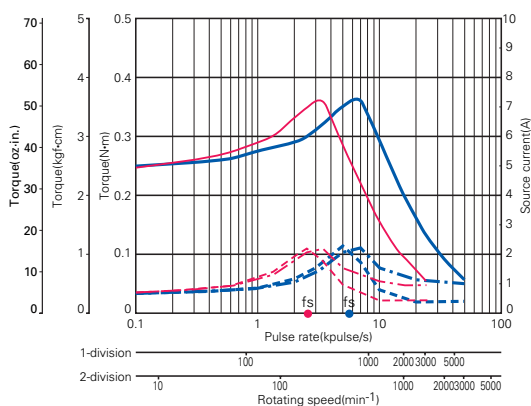
●103H5510-70 □□:24V



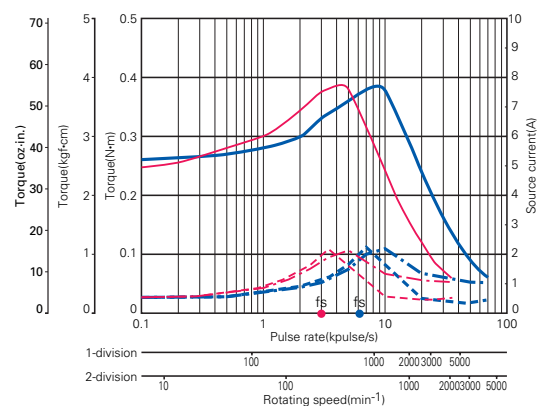
●103H5510-70 □□:36V



●103H6500-70 □□:24V

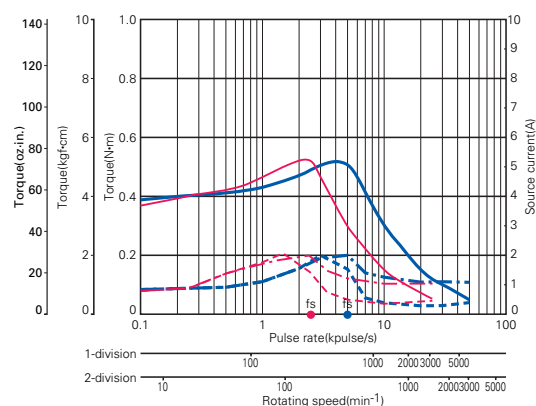


●103H6500-70 □□:36V



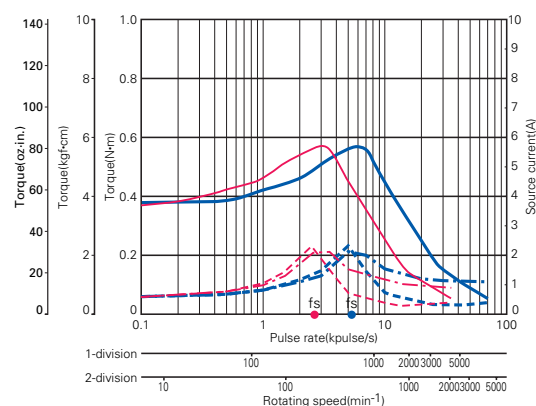
# Pulse rate-torque characteristics/pulse rate-source current characteristics

●103H6501-70 □□ :24V



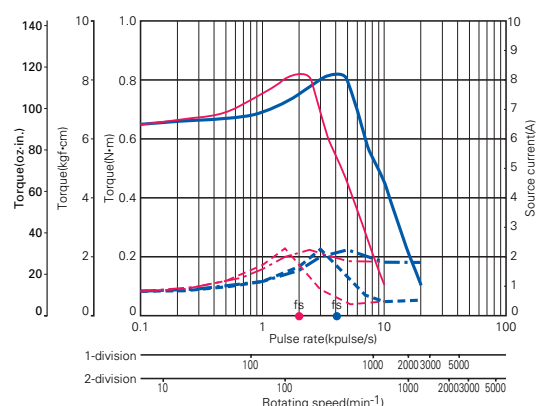
Source voltage: DC24V/Operating current: 0.75A/phase  
 — Pull-out torque ( $J_{L1}=0.94 \times 10^{-4} \text{ kg-m}^2$  [5.14 oz-in<sup>2</sup>]) Use the rubber coupling)  
 - - - Source current ( $T_L=MAX$ ) - - - Source current ( $T_L=0$ )  
 fs: No load maximum starting pulse rate  
 ■ Full step ■ Half step

●103H6501-70 □□ :36V



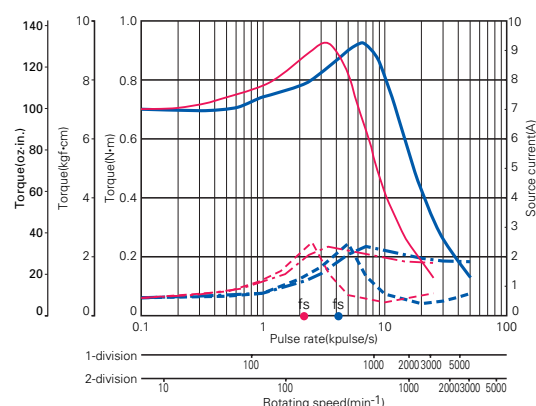
Source voltage: DC36V/Operating current: 0.75A/phase  
 — Pull-out torque ( $J_{L1}=0.94 \times 10^{-4} \text{ kg-m}^2$  [5.14 oz-in<sup>2</sup>]) Use the rubber coupling)  
 - - - Source current ( $T_L=MAX$ ) - - - Source current ( $T_L=0$ )  
 fs: No load maximum starting pulse rate  
 ■ Full step ■ Half step

●103H7851-70 □□ :24V



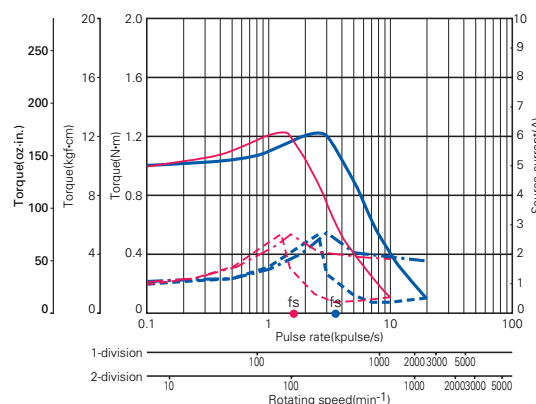
Source voltage: DC24V/Operating current: 0.75A/phase  
 — Pull-out torque ( $J_{L1}=0.94 \times 10^{-4} \text{ kg-m}^2$  [5.14 oz-in<sup>2</sup>]) Use the rubber coupling)  
 - - - Source current ( $T_L=MAX$ ) - - - Source current ( $T_L=0$ )  
 fs: No load maximum starting pulse rate  
 ■ Full step ■ Half step

●103H7851-70 □□ :36V



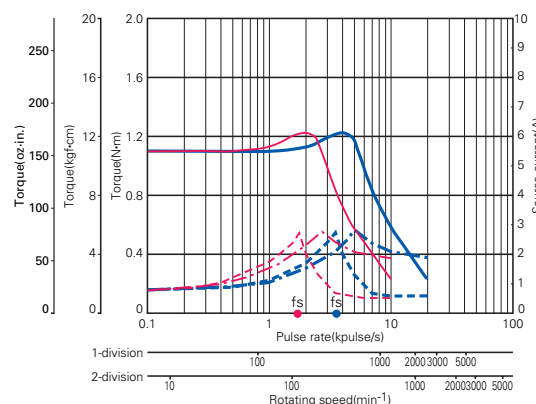
Source voltage: DC36V/Operating current: 0.75A/phase  
 — Pull-out torque ( $J_{L1}=0.94 \times 10^{-4} \text{ kg-m}^2$  [5.14 oz-in<sup>2</sup>]) Use the rubber coupling)  
 - - - Source current ( $T_L=MAX$ ) - - - Source current ( $T_L=0$ )  
 fs: No load maximum starting pulse rate  
 ■ Full step ■ Half step

●103H7852-70 □□ :24V



Source voltage: DC24V/Operating current: 0.75A/phase  
 — Pull-out torque ( $J_{L1}=2.6 \times 10^{-4} \text{ kg-m}^2$  [14.22 oz-in<sup>2</sup>]) Use the rubber coupling)  
 - - - Source current ( $T_L=MAX$ ) - - - Source current ( $T_L=0$ )  
 fs: No load maximum starting pulse rate  
 ■ Full step ■ Half step

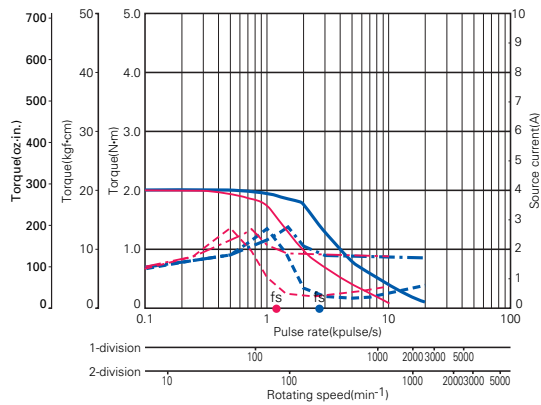
●103H7852-70 □□ :36V



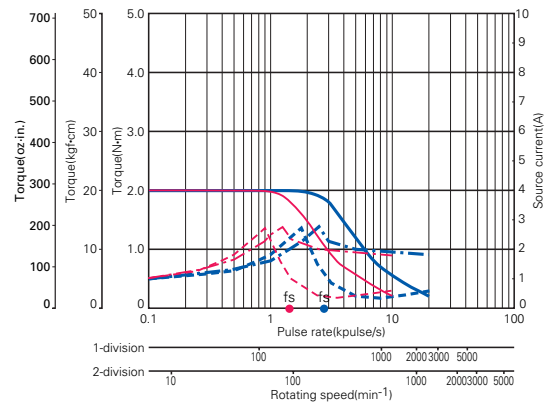
Source voltage: DC36V/Operating current: 0.75A/phase  
 — Pull-out torque ( $J_{L1}=2.6 \times 10^{-4} \text{ kg-m}^2$  [14.22 oz-in<sup>2</sup>]) Use the rubber coupling)  
 - - - Source current ( $T_L=MAX$ ) - - - Source current ( $T_L=0$ )  
 fs: No load maximum starting pulse rate  
 ■ Full step ■ Half step

# Pulse rate-torque characteristics/pulse rate-source current characteristics

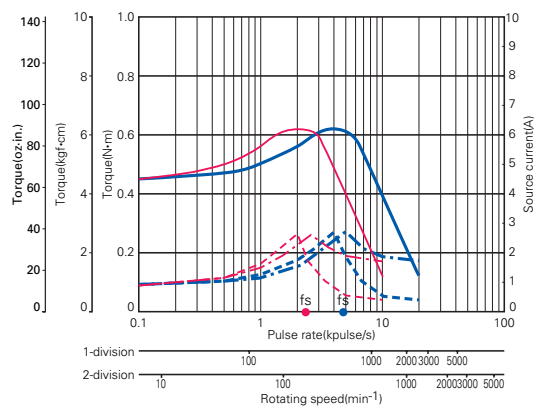
103H7853-70 □□ :24V



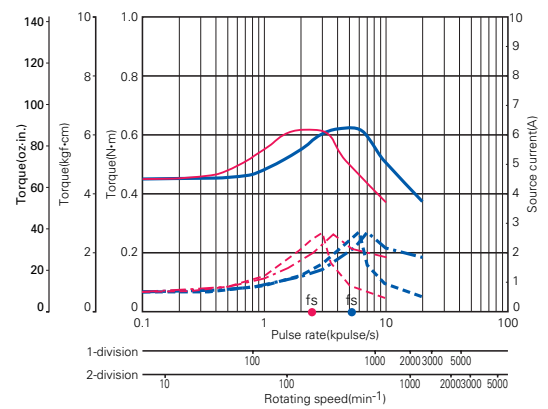
103H7853-70 □□ :36V



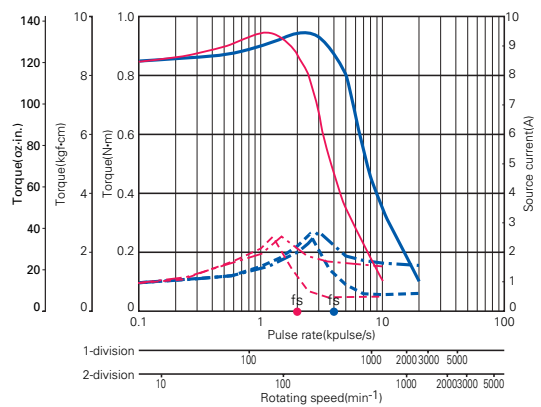
103H7521-70 □□ :24V



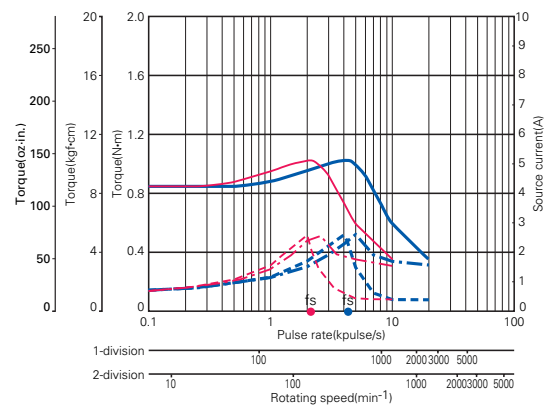
103H7521-70 □□ :36V



103H7522-70 □□ :24V



103H7522-70 □□ :36V



PMAP1S6A01

PMAP1S6B01

PMMA-50034

PMMA-50064

PMM-BA-5603

PMM-BA-5604

PMDP1S6P01

PMDPC1S3P01

PMM-MD-53030

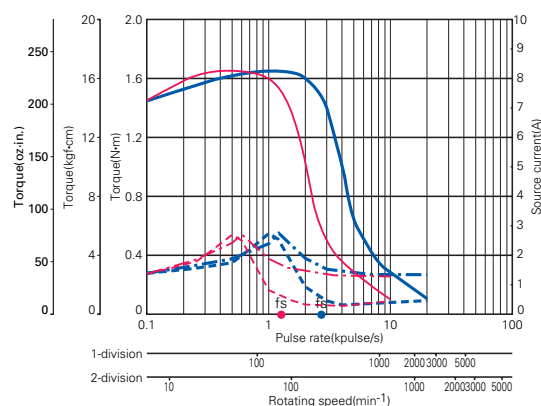
PMM-BD-53130

PMDPD1S1P01

PMDPA1C3P50

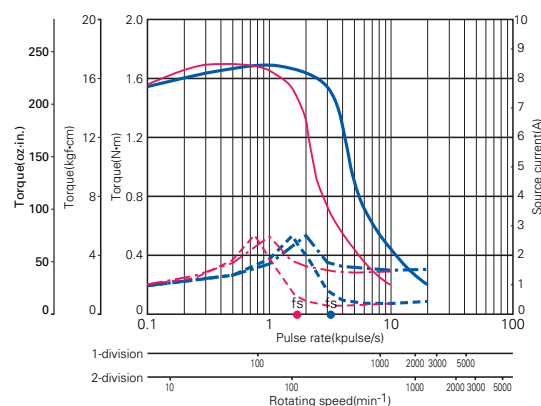
# Pulse rate-torque characteristics/pulse rate-source current characteristics

●103H7523-70 □□ :24V



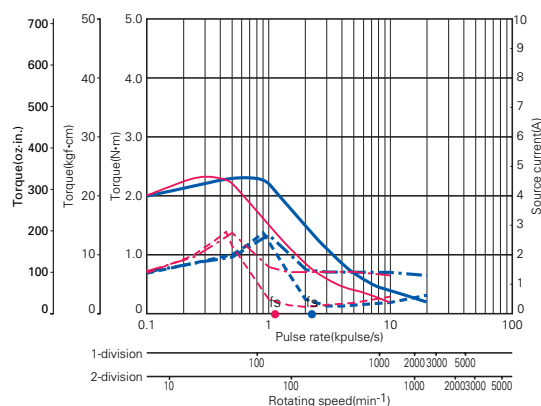
Source voltage:DC24V-Operating current: 0.75A/phase  
 — Pull-out torque( $J_{L1}=7.4 \times 10^{-4} \text{ kg-m}^2 [40.46 \text{ oz-in}^2]$  Use the rubber coupling)  
 - - - Source current( $T_L=MAX$ ) - - - Source current( $T_L=0$ )  
 fs:No load maximum starting pluse rate  
 ■ Full step ■ Half step

●103H7523-70 □□ :36V



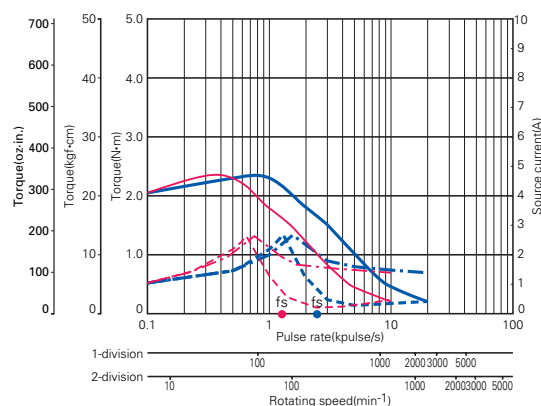
Source voltage:DC36V-Operating current: 0.75A/phase  
 — Pull-out torque( $J_{L1}=7.4 \times 10^{-4} \text{ kg-m}^2 [40.46 \text{ oz-in}^2]$  Use the rubber coupling)  
 - - - Source current( $T_L=MAX$ ) - - - Source current( $T_L=0$ )  
 fs:No load maximum starting pluse rate  
 ■ Full step ■ Half step

●103H8581-70 □□ :24V



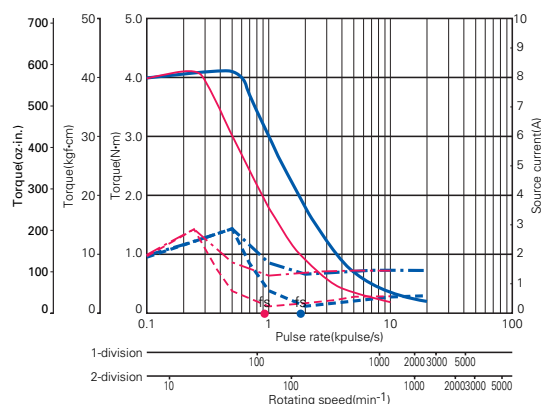
Source voltage:DC24V-Operating current: 0.75A/phase  
 — Pull-out torque( $J_{L1}=7.4 \times 10^{-4} \text{ kg-m}^2 [40.46 \text{ oz-in}^2]$  Use the rubber coupling)  
 - - - Source current( $T_L=MAX$ ) - - - Source current( $T_L=0$ )  
 fs:No load maximum starting pluse rate  
 ■ Full step ■ Half step

●103H8581-70 □□ :36V



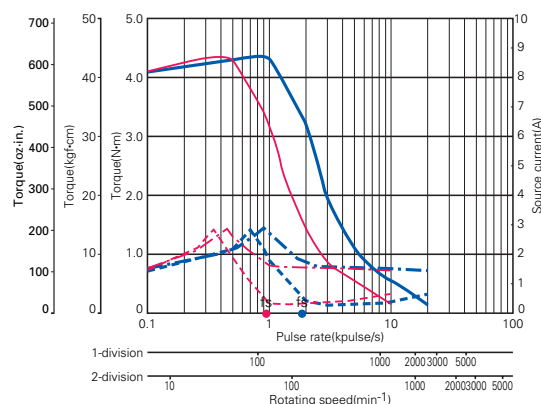
Source voltage:DC36V-Operating current: 0.75A/phase  
 — Pull-out torque( $J_{L1}=7.4 \times 10^{-4} \text{ kg-m}^2 [40.46 \text{ oz-in}^2]$  Use the rubber coupling)  
 - - - Source current( $T_L=MAX$ ) - - - Source current( $T_L=0$ )  
 fs:No load maximum starting pluse rate  
 ■ Full step ■ Half step

●103H8582-70 □□ :24V



Source voltage:DC24V-Operating current: 0.75A/phase  
 — Pull-out torque( $J_{L1}=15.3 \times 10^{-4} \text{ kg-m}^2 [83.65 \text{ oz-in}^2]$  Use the rubber coupling)  
 - - - Source current( $T_L=MAX$ ) - - - Source current( $T_L=0$ )  
 fs:No load maximum starting pluse rate  
 ■ Full step ■ Half step

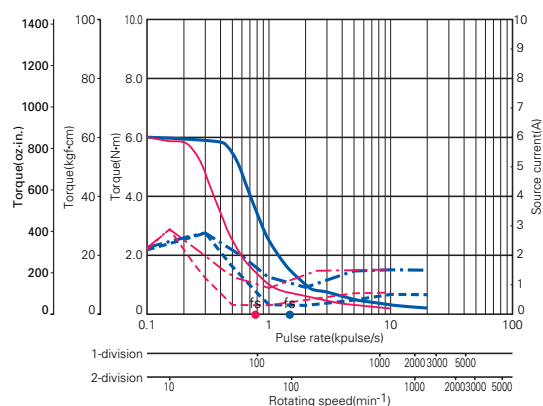
●103H8582-70 □□ :36V



Source voltage:DC36V-Operating current: 0.75A/phase  
 — Pull-out torque( $J_{L1}=15.3 \times 10^{-4} \text{ kg-m}^2 [83.65 \text{ oz-in}^2]$  Use the rubber coupling)  
 - - - Source current( $T_L=MAX$ ) - - - Source current( $T_L=0$ )  
 fs:No load maximum starting pluse rate  
 ■ Full step ■ Half step

## Pulse rate-torque characteristics/pulse rate-source current characteristics

●103H8583-70 □□:24V



Source voltage:DC24V-Operating current: 0.75A/phase

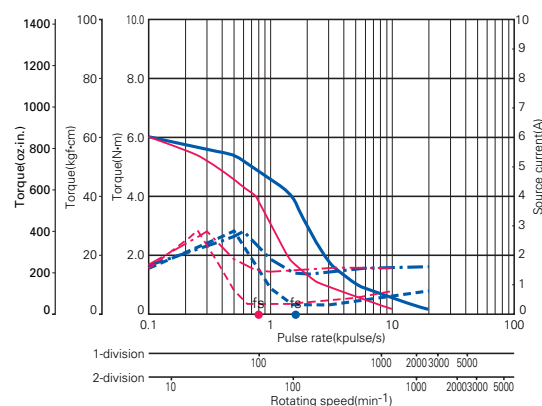
— Pull-out torque( $J_L=43 \times 10^{-4} \text{kg} \cdot \text{m}^2$  [235.10 oz-in<sup>2</sup>] Use the rubber coupling)

- - - Source current( $T_L=\text{MAX}$ ) - - - Source current( $T_L=0$ )

fs:No load maximum starting pluse rate

■ Full step ■ Half step

●103H8583-70 □□:36V



Source voltage:DC36V-Operating current: 0.75A/phase

— Pull-out torque( $J_L=43 \times 10^{-4} \text{kg} \cdot \text{m}^2$  [235.10 oz-in<sup>2</sup>] Use the rubber coupling)

- - - Source current( $T_L=\text{MAX}$ ) - - - Source current( $T_L=0$ )

fs:No load maximum starting pluse rate

■ Full step ■ Half step

PMAP1S6A01

PMAP1S6B01

PMM-MA-50034

PMM-MA-50064

PMM-BA-5603-5643

PMM-BA-5604-5644

PMDPB1S6P01

PMDPC1S3P01

PMM-MD-53030-53031

PMM-BD-53130-53131

PMDPD1S1P01

PMDPA1C3P50

## Option

### PMM-MD-53030-10 (Photo coupler input system)

#### ● Connector set

| Model number                          | Used for                 | Set content                       | Quantity | Manufacturer name    | Applicable cable size | Crimping tool model number |
|---------------------------------------|--------------------------|-----------------------------------|----------|----------------------|-----------------------|----------------------------|
| PM-AP-010                             | I/O signals<br>(CN1A)    | Applicable housing:5051-10        | 1        | Molex Japan          | AWG22~28              | JHTR2262A<br>JHTR2262J     |
|                                       |                          | Applicable contact:2759PBGL       | 10       |                      |                       |                            |
| PM-AP-006                             | DC power source<br>(CN2) | Applicable housing:5051-04        | 1        | Molex Japan          | AWG22~28              | JHTR2262A<br>JHTR2262J     |
|                                       |                          | Applicable contact:5159P8TL       | 4        |                      |                       |                            |
| PM-AP-045<br>(Type H785 □□)           | Stepping motor<br>(CN3)  | Applicable housing:5051-05        | 1        | Molex Japan          | AWG22                 | JHTR2262A                  |
|                                       |                          | Applicable contact:5159P8TL       | 5        |                      |                       |                            |
|                                       |                          | Applicable housing:VHR-5N         | 1        | J.S.T. Mfg Co., Ltd. |                       | YC-160R                    |
|                                       |                          | Applicable contact:SVH-21T-P1.1   | 5        |                      |                       |                            |
| PM-AP-046<br>(Type H35 □□□)           |                          | Applicable housing:5051-05        | 1        | Molex Japan          | AWG24~28              | JHTR2262A<br>JHTR2262J     |
|                                       |                          | Applicable contact:5159P8TL       | 5        |                      |                       |                            |
|                                       |                          | Applicable housing:PHR-5          | 1        | J.S.T. Mfg Co., Ltd. |                       | YRM-240                    |
|                                       |                          | Applicable contact:SPH-002T-P0.5S | 5        |                      |                       |                            |
| PM-AP-007<br>(Types other than above) |                          | Applicable housing:5051-05        | 1        | Molex Japan          | AWG22~28              | JHTR2262A<br>JHTR2262J     |
|                                       |                          | Applicable contact:5159P8TL       | 5        |                      |                       |                            |

#### ● Connector cable

| Model number   | Application                               |
|----------------|-------------------------------------------|
| PM-C10S0100-01 | Connector cable for I/O signal (CN1A)     |
| PM-C04P0100-01 | Connector cable for DC power source (CN2) |
| PM-C05M0100-□□ | Connector cable for stepping motors (CN3) |

□□ is a space to be filled by the serial number 01, 03, or 04 (refer to Supplement table 1).

- The connector cable is a 1-meter cable assembled with the connector.

#### Stepping motor cable model number (Supplement table 1)

| Serial No. | Stepping motor model number |
|------------|-----------------------------|
| 01         | 103H5505-70 □□              |
|            | 103H5508-70 □□              |
|            | 103H5510-70 □□              |
|            | 103H6500-70 □□              |
|            | 103H6501-70 □□              |
|            | 103H7521-70 □□              |
|            | 103H7522-70 □□              |
|            | 103H7523-70 □□              |
|            | 103H8581-70 □□              |
|            | 103H8582-70 □□              |
|            | 103H8583-70 □□              |

| Serial No. | Stepping motor model number |
|------------|-----------------------------|
| 03         | 103H3505-70 □□              |
|            | 103H3515-70 □□              |
| 04         | 103H7851-70 □□              |
|            | 103H7852-70 □□              |
|            | 103H7853-70 □□              |

## Option

PMM-MD-53031-10 (CMOS input system)

### ● Connector set

| Model number                          | Used for                               | Set content                         | Quantity | Manufacturer name    | Applicable cable size | Crimping tool model number |
|---------------------------------------|----------------------------------------|-------------------------------------|----------|----------------------|-----------------------|----------------------------|
| PM-AP-011                             | I/O signal and<br>DCpower source(CN1B) | Applicable housing : 5051-12        | 1        | Molex Japan          | AWG22~28              | JHTR2262A<br>JHTR2262J     |
|                                       |                                        | Applicable contact : 2759PBGL       | 12       |                      |                       |                            |
| PM-AP-045<br>(Type H785 □□)           | Stepping motor<br><br>(CN3)            | Applicable housing : 5051-05        | 1        | Molex Japan          | AWG22                 | JHTR2262A                  |
|                                       |                                        | Applicable contact : 5159PBTl       | 5        |                      |                       |                            |
|                                       |                                        | Applicable housing : VHR-5N         | 1        | J.S.T. Mfg Co., Ltd. |                       | YC-160R                    |
|                                       |                                        | Applicable contact : SVH-21T-P1.1   | 5        |                      |                       |                            |
| PM-AP-046<br>(Type H35 □)             |                                        | Applicable housing : 5051-05        | 1        | Molex Japan          | AWG24~28              | JHTR2262A<br>JHTR2262J     |
|                                       |                                        | Applicable contact : 5159PBTl       | 5        |                      |                       |                            |
|                                       |                                        | Applicable housing : PHR-5          | 1        | J.S.T. Mfg Co., Ltd. |                       | YRM-240                    |
|                                       |                                        | Applicable contact : SPH-002T-P0.5S | 5        |                      |                       |                            |
| PM-AP-007<br>(Types other than above) |                                        | Applicable housing : 5051-05        | 1        | Molex Japan          | AWG22~28              | JHTR2262A<br>JHTR2262J     |
|                                       |                                        | Applicable contact : 5159PBTl       | 5        |                      |                       |                            |

### ● Connector cable

| Model number   | Application                                               |
|----------------|-----------------------------------------------------------|
| PM-C12T0100-01 | Connector cable for I/O signal and DC power source (CN1B) |
| PM-C05M0100-□□ | Connector cable for stepping motors (CN3)                 |

□□ is a space to be filled by the serial number 01, 03, or 04 (refer to Supplement table 1).

- The connector cable is a 1-meter cable assembled with the connector.

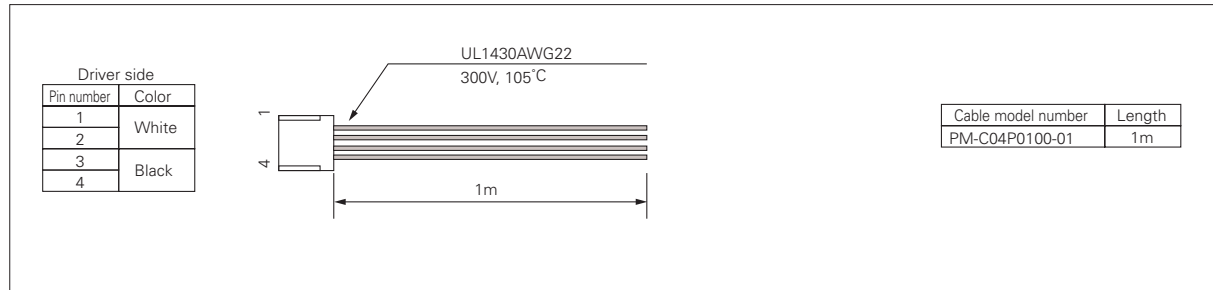
### Stepping motor cable model number (Supplement table 1)

| Serial No. | Stepping motor model number |
|------------|-----------------------------|
| 01         | 103H5505-70 □□              |
|            | 103H5508-70 □□              |
|            | 103H5510-70 □□              |
|            | 103H6500-70 □□              |
|            | 103H6501-70 □□              |
|            | 103H7521-70 □□              |
|            | 103H7522-70 □□              |
|            | 103H7523-70 □□              |
|            | 103H8581-70 □□              |
|            | 103H8582-70 □□              |
|            | 103H8583-70 □□              |

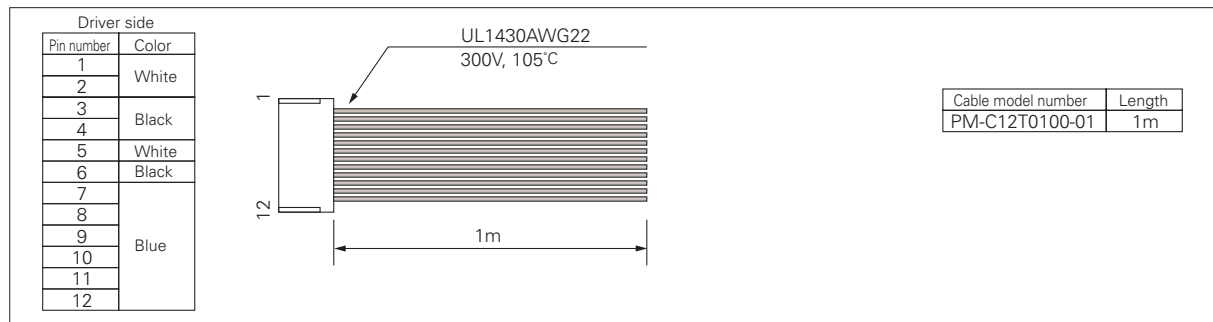
| Serial No. | Stepping motor model number |
|------------|-----------------------------|
| 03         | 103H3505-70 □□              |
|            | 103H3515-70 □□              |
| 04         | 103H7851-70 □□              |
|            | 103H7852-70 □□              |
|            | 103H7853-70 □□              |

## Option

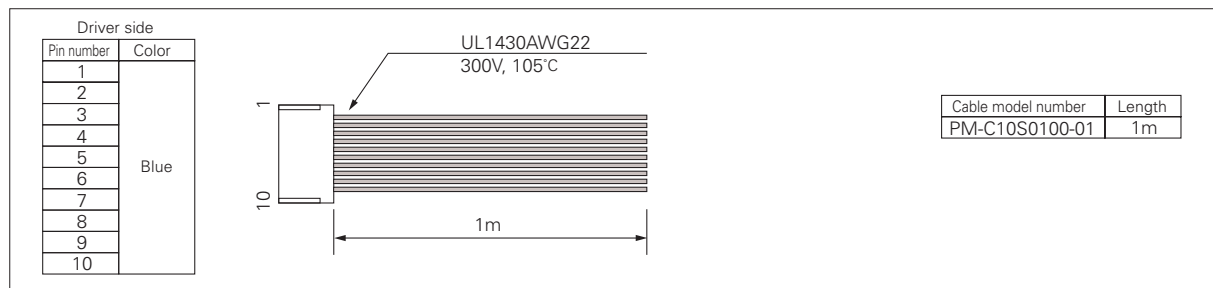
### ● Cable 1 (power source cable)



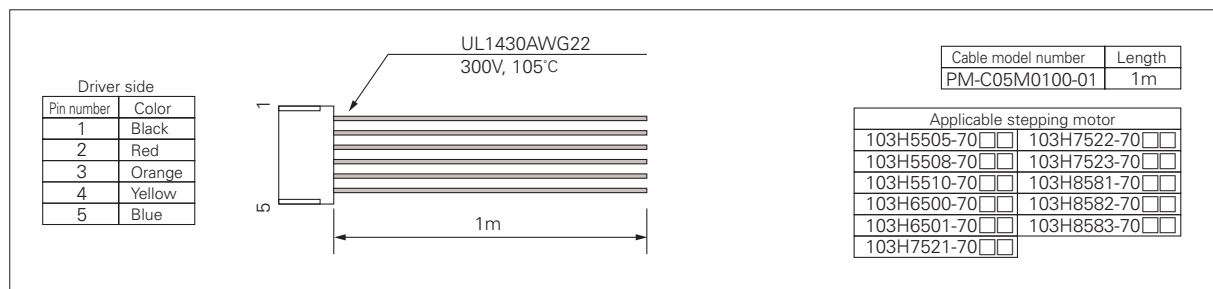
### ● Cable 2 (power source and I/O signal cable)



### ● Cable 3 (I/O signal cable)



### ● Cable 4 (stepping motor extension cable 1)



## Option

### ● Cable 5 (stepping motor extension cable 2)

| Driver side |        |
|-------------|--------|
| Pin number  | Color  |
| 1           | Black  |
| 2           | Red    |
| 3           | Orange |
| 4           | Yellow |
| 5           | Blue   |

| Stepping motor side |        |
|---------------------|--------|
| Pin number          | Color  |
| 1                   | Black  |
| 2                   | Yellow |
| 3                   | Orange |
| 4                   | Red    |
| 5                   | Blue   |

| Cable model number | Length |
|--------------------|--------|
| PM-C05M0100-04     | 1m     |

| Applicable stepping motor |                          |
|---------------------------|--------------------------|
| 103H7851-70               | <input type="checkbox"/> |
| 103H7852-70               | <input type="checkbox"/> |
| 103H7853-70               | <input type="checkbox"/> |

### ● Cable 6 (stepping motor extension cable 3)

| Driver side |        |
|-------------|--------|
| Pin number  | Color  |
| 1           | Black  |
| 2           | Red    |
| 3           | Orange |
| 4           | Yellow |
| 5           | Blue   |

| Stepping motor side |        |
|---------------------|--------|
| Pin number          | Color  |
| 1                   | Blue   |
| 2                   | Orange |
| 3                   | Red    |
| 4                   | Black  |
| 5                   | Yellow |

| Cable model number | Length |
|--------------------|--------|
| PM-C05M0100-03     | 1m     |

| Applicable stepping motor |                          |
|---------------------------|--------------------------|
| 103H3505-70               | <input type="checkbox"/> |
| 103H3515-70               | <input type="checkbox"/> |

PMAPAT56A01

PMAPAT56B01

PMM-MA-50034

PMM-MA-50064

PMM-BA-5603-5643

PMM-BA-5604-5644

PMDPB1S6P01

PMDPC1S3P01

PMM-MD-53030-53031

PMM-BD-53130-53131

PMDPD1S1P01

PMDPA1C3P50