

About Nippon Pulse Synchronous Motors

No Power or Load Fluctuation Effect

Synchronous motors rotate in synch with supplied power frequency. If power frequency is constant, the motor will rotate at a constant speed (synchronized speed).

Impedance Protected

Unless otherwise stated, these motors provide high electrical resistance, which prevents overcurrent from flowing to the motor, which would in turn burn the coils.

No Control Circuit Required

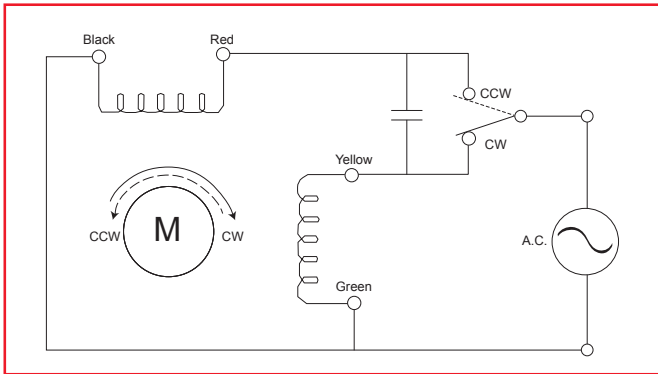
Because these motors are AC motors, they start rotating when a power connection is made.

Excellent Response

The type of magnet used in these motors ensures excellent response and also ensures the motor will start and stop immediately when power is supplied or removed.

Dual Direction Synchronous Motors

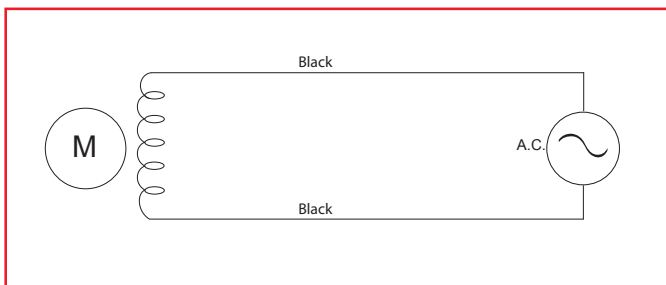
Motors that move in two directions are capacitor-based phase advancing motors. Because the rotor is moved by shifting the phase current by 90° it is essential for the circuit to have a capacitor. The proper wiring is below.



As viewed from the output shaft of the motor

Single Direction Synchronous Motor

Motors that are driven in just one direction, whether clockwise or counterclockwise, do not require any specific wiring to the AC power supply. A wiring diagram is below. The leadwires have no polarity.



Dual Direction Synchronous Motors

PTM(C) - 24 F 3 4 G 1/2
 1 2 3 4 5 6 7

1 - Series Designation

PTM: Flying lead joint type
 PTMC: Connector joint type

2 - Number of Poles

12: Speed is 500 rpm w/50Hz
 Speed is 600 rpm w/60Hz
 24: Speed is 250 rpm w/50Hz
 Speed is 300 rpm w/60Hz

3 - Outer Diameter (Type)

P: 25mm, M: 35mm, T: 35mm (thin), H: 42mm, S: 42mm (thin), F: 55mm, R: 55mm (w/connector)

4 - Winding

Blank: Standard Coil
 (continuous for 24, 100, 200 Vac)
 1-18: Coil # for specific rating

5 - Magnet Type

Blank: Anisotropic
 3: Isotropic
 4: Neodymium
 5: Plastic

6 - Gear Head

Blank: No Gear Head
 G: Gear Head Integrated

7 - Gear Ratio

see chart with each motor page

| Gear Ratio | rpm w/12 poles | | rpm w/24 poles | |
|------------|----------------|------|----------------|-------|
| | 50Hz | 60Hz | 50Hz | 60 Hz |
| Motor only | 500 | 600 | 250 | 300 |
| 1/10 | 50 | 60 | 25 | 30 |
| 1/50 | 10 | 12 | 5 | 6 |
| 1/100 | 5 | 6 | 2.5 | 3 |

Single Direction Synchronous Motors

PTM - 24 B (G II) 100 - 50/60 - 2/2.4 CW
 1 2 3 4 5 6 7 8 9

1 - Series Designation

PTM: Flying lead joint

2 - Number of Poles

12: Speed is 500rpm w/50Hz
 Speed is 600rpm w/60Hz
 24: Speed is 250rpm w/50Hz
 Speed is 300rpm w/60Hz

3 - Outer Diameter

B: 35mm
 K: 42mm
 E: 42mm (high output torque)

4 - Gear Head

Blank: No gear head
 G: Gear head integrated

5 - PTM-24BGII only

Denotes BG gear type II

6 - Supply Voltage

24, 100, 200 Vac
 voltage depends on model

7 - Power Frequency

50, 60, or 50/60Hz

8 - Rotating Speed

See available speeds with each motor

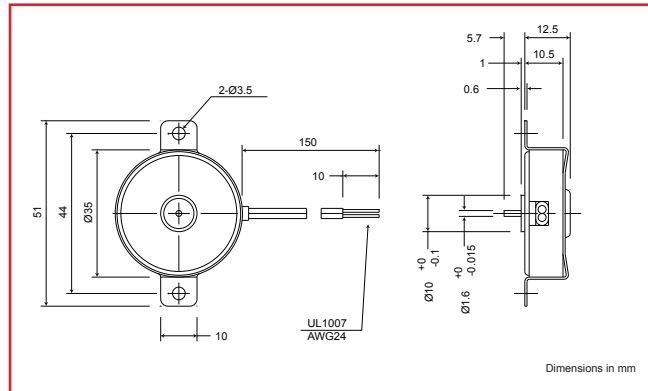
9 - Direction

CW - Clockwise
 CCW - Counterclockwise

Line frequency of 60Hz makes the motor speed 1.2 times higher than 50Hz

Capacitor

With reversible synchronous motors (can rotate both clockwise and counterclockwise) the rotor is moved by shifting the phase by 90 degrees. Thus, a synchronous motor requires a capacitor, which should withstand a voltage of greater than twice the rated voltage of the motor.



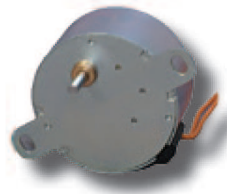
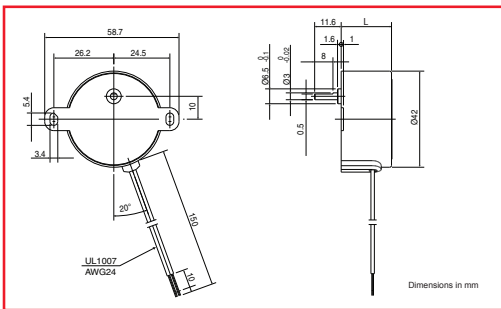
Specifications

| Specifications | Units | PTM-24B | | | |
|-----------------------|-------|---------------------------|-------|--------------------|--------------------|
| Rated Voltage | V | 12 | 24 | 100 | 200 |
| Frequency | Hz | 50/60 | | | |
| Rated Current | mA | 75/70 | 35/32 | 11/10 | 7/6.5 |
| Revolutions | rpm | 250/300 | | | |
| Rotating Direction | | Single Direction (CW/CCW) | | | |
| Torque @ 60Hz | mN-m | 0.5 | | | |
| Temperature Rise | K | 30 | | | |
| Operating Temp. Range | °C | -10 to +50 | | | |
| Dielectric Strength | V | 500Vac for 1 min. | | 1000Vac for 1 min. | 1500Vac for 1 min. |
| Weight | g | 35 | | | |

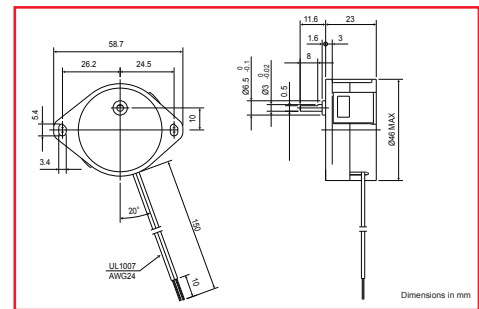
Magnet type: Anisotropic

Geared Models

PTM-24AG



PTM-24BGII

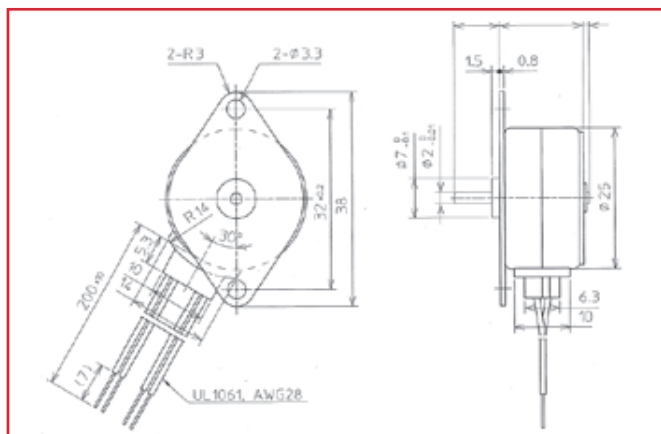


Geared Motor Torque Characteristics

| Model | PTM-24AG | | | Motor Length (L) |
|----------|----------|------------|----------|------------------|
| Speed | Torque | Gear Ratio | | |
| rpm | mN-m | 50Hz | 60Hz | |
| 1/2 | 80 | 1/500 | 1/600 | 22 |
| 1/3 | 80 | 1/750 | 1/900 | |
| 1/5 | 80 | 1/1250 | 1/1500 | |
| 1/10 | 80 | 1/2500 | 1/3000 | |
| 1/30 | 80 | 1/7500 | 1/9000 | |
| 1/60 | 80 | 1/15000 | 1/18000 | |
| 1/2 rph | 80 | 1/30000 | 1/36000 | 28 |
| 1/24 rph | 80 | 1/360000 | 1/432000 | |

PTM-24AG has same electrical specs as PTM-24B

| Model | PTM-24BGII | | |
|-------|------------|------------|-------|
| Speed | Torque | Gear Ratio | |
| rpm | mN-m | 50Hz | 60Hz |
| 10 | 10 | 1/25 | 1/30 |
| 4 | 25 | 2/125 | 1/75 |
| 2 | 50 | 1/125 | 1/150 |



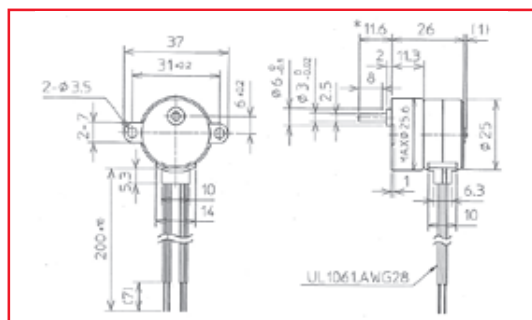
Specifications

| Specifications | Units | PTMC-24P |
|-----------------------|-------|-------------------------|
| Rated Voltage | V | 24 ±10% |
| Frequency | Hz | 50/60 |
| Rated Current | mA | 67/69 |
| Revolutions | rpm | 250/300 |
| Rotating Direction | | Dual Direction (CW/CCW) |
| Torque @ 60Hz | mN-m | 5.3/5/5 |
| Temperature Rise | K | 55 |
| Operating Temp. Range | °C | -10 to +50 |
| Dielectric Strength | V | 500Vac for 1 min. |
| Weight | g | 35 |
| Capacitor | μF | 3.3 |

Magnet type: Anisotropic

Geared Models

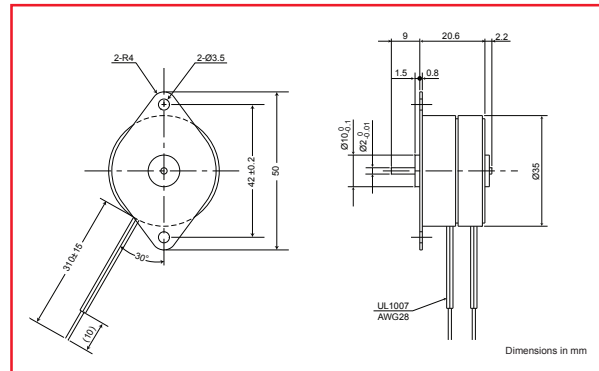
PTMC-24PG



Geared Motor Torque Characteristics

| Model | PTMC-24PG | | | |
|-------|---------------|------|------------|-------|
| | Torque (mN-m) | | Gear Ratio | |
| | 50Hz | 60Hz | 50Hz | 60Hz |
| 60 | 14 | 17 | 6/25 | 1/5 |
| 30 | 20* | 20* | 3/25 | 1/10 |
| 20 | 33 | 42 | 2/25 | 1/15 |
| 10 | 54 | 67 | 1/25 | 1/30 |
| 5 | 70* | 70* | 1/50 | 1/60 |
| 4 | 70* | 70* | 2/125 | 1/75 |
| 3 | -- | 100* | -- | 1/100 |
| 2 | 100* | 100* | 1/125 | 1/150 |
| 1 | 100* | 100* | 1/250 | 1/300 |

*Values regulated by normal gear strength. Do not apply any load exceeding the normal gear strength.



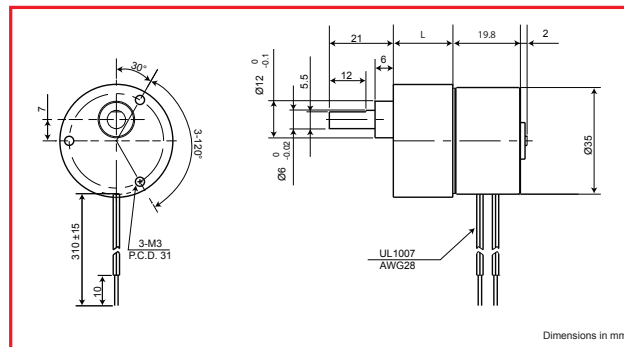
Specifications

| Specifications | Units | PTM-24M | |
|-----------------------|-------|-------------------------|--------------------|
| Rated Voltage | V | 24 | 100 |
| Frequency | Hz | 50/60 | |
| Rated Current | mA | 62/63 | 16/17 |
| Revolutions | rpm | 250/300 | |
| Rotating Direction | | Dual Direction (CW/CCW) | |
| Torque @ 60Hz | mN-m | 12/12.5 | |
| Temperature Rise | K | 55 | |
| Operating Temp. Range | °C | -10 to +50 | |
| Dielectric Strength | V | 500Vac for 1 min. | 1000Vac for 1 min. |
| Weight | g | 80 | |
| Capacitor | µF | 3.9 | 0.23 |

Magnet type: Anisotropic

Geared Models

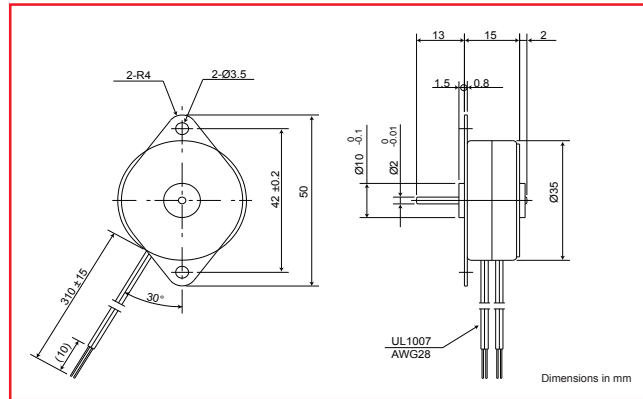
PTM-24MG



Geared Motor Torque Characteristics

| Model | PTM-24MG | | | | RPM | L |
|-------|---------------|------|------------|-------|--------|---|
| | Torque (mN-m) | | Gear Ratio | | | |
| | 50Hz | 60Hz | 50Hz | 60Hz | | |
| 60 | -- | 40 | -- | 1/5 | 19.5mm | |
| 30 | -- | 80 | -- | 1/10 | | |
| 20 | -- | 96 | -- | 1/15 | | |
| 10 | 150 | 190 | 1/25 | 1/30 | 21.7mm | |
| 5 | 245 | 300* | 1/50 | 1/60 | | |
| 4 | -- | 300* | -- | 1/75 | | |
| 3 | -- | 300* | -- | 1/100 | 23.8mm | |
| 2 | 400 | 600* | 1/125 | 1/150 | | |
| 1 | 600* | 600* | 1/250 | 1/300 | | |

*Values regulated by normal gear strength. Do not apply any load exceeding the normal gear strength.



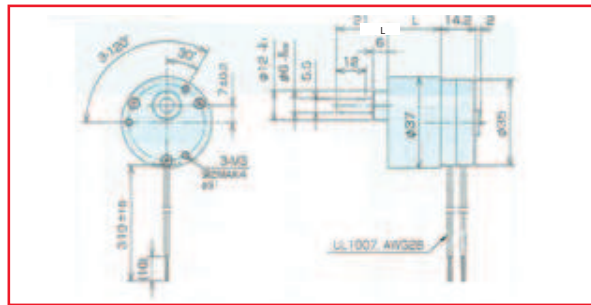
Specifications

| Specifications | Units | PTM-24T |
|-----------------------|-------|-------------------------|
| Rated Voltage | V | 24 ± 10% |
| Frequency | Hz | 50/60 |
| Rated Current | mA | 68/70 |
| Revolutions | rpm | 250/300 |
| Rotating Direction | | Dual Direction (CW/CCW) |
| Torque @ 60Hz | mN-m | 9/9.5 |
| Temperature Rise | K | 55 |
| Operating Temp. Range | °C | -10 to +50 |
| Dielectric Strength | V | 500Vac for 1 min |
| Weight | g | 77 |
| Capacitor | µF | 3.3 |

Magnet type: Anisotropic

Geared Models

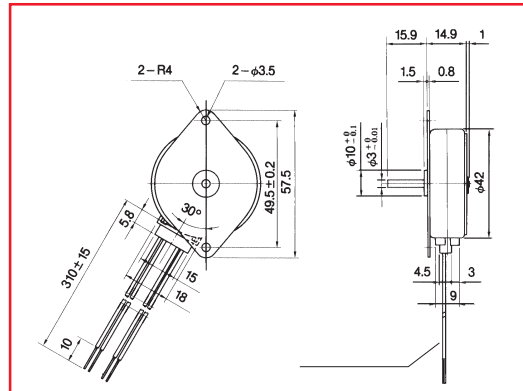
PTM-24TG



Geared Motor Torque Characteristics

| Model | PTM-24TG | | | | RPM | L |
|-------|---------------|------|------------|-------|--------|---|
| | Torque (mN-m) | | Gear Ratio | | | |
| | 50Hz | 60Hz | 50Hz | 60Hz | | |
| 60 | -- | 30 | -- | 1/5 | 19.5mm | |
| 30 | -- | 60 | -- | 1/10 | | |
| 20 | -- | 72 | -- | 1/15 | | |
| 10 | 115 | 145 | 1/25 | 1/30 | 21.7mm | |
| 5 | 180 | 230 | 1/50 | 1/60 | | |
| 4 | -- | 290 | -- | 1/75 | 23.8mm | |
| 3 | -- | 300* | -- | 1/100 | | |
| 2 | 365 | 465 | 1/125 | 1/150 | | |
| 1 | -- | 600* | -- | 1/300 | | |

*Values regulated by normal gear strength. Do not apply any load exceeding the normal gear strength.



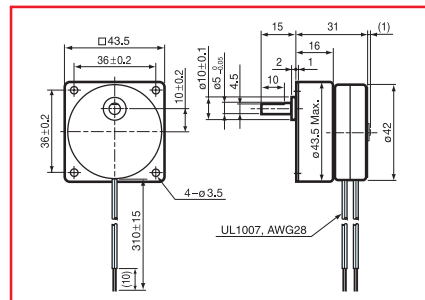
Specifications

| Specification | Unit | PTMC-24S2 |
|-----------------------|------|-------------------------|
| Rated Voltage (AC) | V | 24 ±10% |
| Frequency | Hz | 50/60 |
| Rated Current | mA | 110/115 |
| Revolutions | rpm | 250/300 |
| Rotating Direction | | Dual Direction (CW/CCW) |
| Torque (@60Hz) | mN-m | 20.5/19.5 |
| Temperature Rise | K | 70 |
| Operating Temp. Range | °C | -10 to +50 |
| Dielectric Strength | V | 500Vac for 1 min. |
| Weight | g | 105 |
| Capacitor | μF | 5.6 |

Magnet type: Anisotropic

Geared Models

PTMC-24S2G



Geared Motor Torque Characteristics

| Model | PTMC-24S2G (gearhead) | | | |
|-------|-----------------------|------|------------|-------|
| | Torque (mN-m) | | Gear Ratio | |
| | 50Hz | 60Hz | 50Hz | 60Hz |
| rpm | | | | |
| 60 | 49 | 55 | 6/25 | 1/5 |
| 30 | 98 | 110 | 3/25 | 1/10 |
| 20 | 115 | 135 | 2/25 | 1/15 |
| 10 | 235 | 220 | 1/25 | 1/30 |
| 5 | 300* | 300* | 1/50 | 1/60 |
| 4 | 300* | 300* | 2/125 | 1/75 |
| 3 | -- | 400* | -- | 1/100 |
| 2 | 400* | 400* | 1/125 | 1/150 |
| 1 | 400* | 400* | 1/250 | 1/300 |

*Values regulated by normal gear strength. Do not apply any load exceeding the normal gear strength.

