

Stepping Motors

Synchronization

Stepping motors rotate in proportion to the number of pulses. They are frequency synchronized motors, the speed of which can be varied by changing the frequency of pulse signal.

Open-loop Control

No position sensor required.

No Cumulative Error

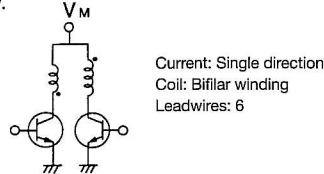
While each step provides some angle tolerance, the step angle error is noncumulative.

Excellent Response

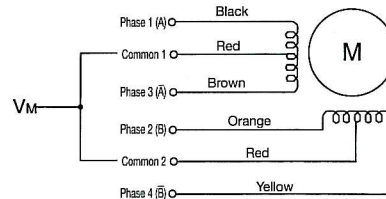
Permanent magnet used for the rotor ensures excellent response at the start and stop.

Unipolar Drive

The basic circuit (constant-voltage) is as shown below.



Six leadwires are connected as shown below.



2-2 phase excitation sequence is as shown below.

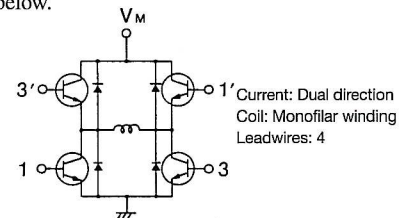
STEP	Black	Brown	Orange	Yellow	STEP
1	ON	OFF	ON	OFF	4
2	OFF	ON	ON	OFF	3
3	OFF	ON	OFF	ON	2
4	ON	OFF	OFF	ON	1

CW ↓ ↑ CCW

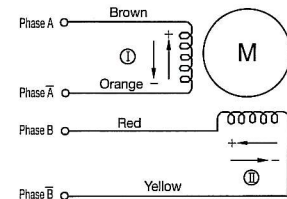
Table at the right shows comparison between bipolar drive and unipolar drive with parameters of unipolar drive referred to as 1.

Bipolar Drive

The basic circuit (constant-voltage) is as shown below.



Four leadwires are connected as shown below.



2-2 phase excitation sequence is as shown below.

STEP	I	II
1	+	+
2	-	+
3	-	-
4	+	-

CW ↓ ↑ CCW

		Unipolar	Bipolar
Number of transistors		1	2
To ensure the same temperature rise of motor	Current	1	$1/\sqrt{2}$
	Torque	1	2
	High-speed performance	1	0.5
	Voltage	1	$\sqrt{2}$
To obtain the same torque	Current	1	0.5
	Temperature rise	1	0.5
	High-speed performance	1	0.5
	Voltage	1	1

2-phase Stepping Motor

PF(C) - 42 T - 48 C 1 G 1/50

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

① Series Designation

PF: Flying lead joint type, PFC: Connector joint type

See the dimensional drawings of PF(C)25, PF(C)42T and PF(C)55 for the difference.

② Outer Diameter in mm

③ Type

Blank: Standard type, T: Thin stack type, H: High-torque type

④ Steps per Revolution

48 (7.5°/step), 24 (15°/step)

⑤ Coil Rating

Standard coils are for unipolar drive.

B: 24Vdc, C: 12Vdc, D: 5Vdc

Various coil ratings are also available for selection according to required torque with operating voltage, current and frequency.

⑥ Magnet Material Type

1: Anisotropic ferrite magnet

2: Isotropic ferrite magnet

3: Neodymium magnet

⑦ Gear Head

Blank: No gear head, G: Gear head integrated

⑧ Gear Ratio

Written only for geared models

Model Number