

PM Type 2 Phase Stepper Motor w/ Integrated Gearbox PFCU Series



PFCU20

PFCU25

PFCU30

PFCU35T

With integrated gearbox design, achieving higher torque and thinner form factor.

Effortless gear ratio selection –convenient and hassle free-



PM Type Stepper Motor Lineup

	PFCU20-40W4GM(1/*)		PFCU25-24Q1GM(1/*)			PFCU30-24V4GM(1/*)		PFCU35T-24V4GM(1/*)	
Gear Ratio	1/10	1/18	1/15	1/20	1/30	1/5	1/12	1/5	1/12
Step Angle	0.9°	0.5°	1°	0.75°	0.5°	3°	1.25°	3°	1.25°
Steps/Rev	400	720	360	480	720	120	288	120	288
Operating Temp. Range	-10 ~ +50℃								
Insulation Class	Class E								
Voltage (at Coil)	5.5V		4.4V			6.9V		7.3V	
Coil Resistance	40Ω		15Ω			30Ω		24Ω/φ	
Coil Inductance	59mH		66mH			26mH		19mH	
Nominal Gear Strength	20mNm		50mNm			100mNm		120mNm	
Gear Breaking Strength	60mNm		150mNm			300mNm		360mNm	
Backlash	7° or less								
Temp. Rise	70K								
Weight	28g		60g			75g		90g	
Coil Windings Type	Bipolar								

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Technical drawing of the 200W 3-phase induction motor, showing front, side, and detail views with dimensions in mm.

Front View Dimensions:

- Overall width: 50
- Distance between mounting holes: 42 ± 0.2
- Mounting hole diameter: 2- $\phi 3.5$
- Mounting hole depth: 2-10
- Mounting hole radius: 2-R5
- Flange thickness: 7 ± 0.2
- Flange outer diameter: $\phi 28$ (60°等配置)
- Flange hole diameter: 6- $\phi 2$ (ボス)
- Flange hole depth: 10
- Flange hole radius: 14
- Flange hole position: コネクタ挿入方向

Side View Dimensions:

- Overall height: 25.5
- Flange thickness: 21.2
- Flange outer diameter: $\phi 28$ (60°等配置)
- Flange hole diameter: 6- $\phi 2$ (ボス)
- Flange hole depth: 10
- Flange hole radius: 14
- Flange hole position: コネクタ挿入方向

Detail View Dimensions:

- Overall width: 25.7
- Flange thickness: 1.14
- Flange outer diameter: $\phi 5$ $\begin{smallmatrix} 0 \\ -0.02 \end{smallmatrix}$
- Flange hole diameter: $\phi 2$ $\begin{smallmatrix} 0 \\ -0.01 \end{smallmatrix}$
- Flange hole depth: 4.5
- Flange hole radius: 3
- Flange hole position: ロット刻印面
- Flange hole depth: 4.9
- Flange hole radius: 13.7
- Flange hole position: 7.1

The graph illustrates the relationship between pull-out torque and speed for two different motor configurations. The 1/18 24V 150mA motor (red line) starts with a higher pull-out torque of approximately 58 mNm at 0 rpm, while the 1/10 24V 150mA motor (blue line) starts at approximately 32 mNm. Both motors show a decrease in pull-out torque as speed increases. The 1/18 motor's torque drops more rapidly after 150 rpm, crossing the 1/10 motor's curve at approximately 220 rpm and reaching 0 mNm at 300 rpm. The 1/10 motor's torque decreases more gradually, reaching 0 mNm at approximately 540 rpm.

Speed [rpm]	1/10 24V 150mA Pull-out [mNm]	1/18 24V 150mA Pull-out [mNm]
0	32	58
100	30	52
200	27	35
300	25	0
400	22	-
500	10	-
540	0	-

Line graph showing Pull-out torque (mNm) versus Speed (rpm) for three motor configurations. The 1/30 configuration (yellow) has the highest pull-out torque at low speeds but drops off most rapidly. The 1/20 configuration (red) has the highest pull-out torque at 400 rpm.

Speed [rpm]	1/15 24V 250mA [mNm]	1/20 24V 250mA [mNm]	1/30 24V 250mA [mNm]
0	52	75	108
25	53	76	115
50	53	75	110
100	50	68	95
150	45	62	85
200	42	58	58
250	38	52	25
300	35	45	0
350	32	40	-
400	30	30	-
450	25	0	-
500	20	-	-
550	12	-	-
600	0	-	-

A line graph showing Pull-out torque [mNm] on the y-axis (0 to 250) versus Speed [rpm] on the x-axis (0 to 700). Two curves are plotted:

- 1/12 24V 230mA (Blue line):** Starts at approximately 205 mNm at 50 rpm, decreases to about 125 mNm at 250 rpm, and then drops sharply to 0 mNm at approximately 270 rpm.
- 1/5 24V 230mA (Red line):** Starts at approximately 90 mNm at 50 rpm, decreases gradually to about 50 mNm at 600 rpm, and then drops sharply to 0 mNm at approximately 650 rpm.

Speed [rpm]	1/12 24V 230mA Pull-out [mNm]	1/5 24V 230mA Pull-out [mNm]
50	205	90
100	195	85
150	175	80
200	145	80
250	125	80
300	0	75
400	-	65
500	-	55
600	-	50
650	-	0

The graph plots Pull-out torque (mN·m) on the y-axis (0 to 250) against Speed (rpm) on the x-axis (0 to 1000). Two data series are shown:

- 1/12 24V 260mA (Blue line):** Starts at approximately 190 mN·m at 50 rpm, peaks at 200 mN·m around 100 rpm, then gradually declines to about 45 mN·m at 380 rpm, where it drops sharply to zero.
- 1/52 24V 260mA (Green line):** Starts at approximately 90 mN·m at 50 rpm, remains relatively flat until 200 rpm, then gradually declines to about 20 mN·m at 900 rpm, where it drops sharply to zero.

Speed (rpm)	1/12 24V 260mA Pull-out (mN·m)	1/52 24V 260mA Pull-out (mN·m)
50	190	90
100	200	90
150	180	85
200	150	85
250	100	80
300	60	75
350	45	70
380	0	65
400	0	60
500	0	50
600	0	40
700	0	30
800	0	25
900	0	20
950	0	0