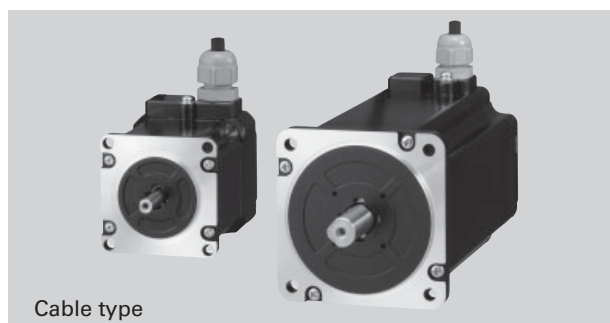
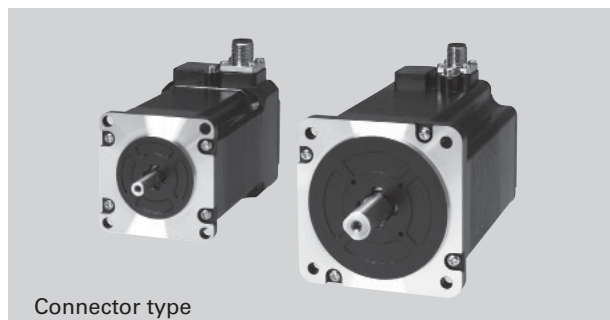


IP65-Rated Stepping Motors

Water and dust protection



Cable type



Connector type

Features

- These IP65-rated motors* have superior water and dust resistance, and can be safely used in water-exposed environments such as in food processing machines.

* Except for the shaft and cable ends.

- Options such as a brake, encoder, and oil seal can be combined.

Safety standards

- In compliant with CE, UKCA, and UL safety standards.



Specifications

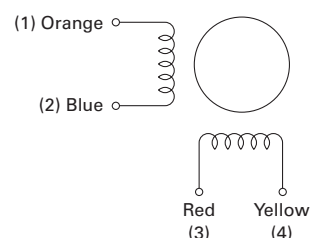
	56 mm sq.	86 mm sq.
Motor model no.	SP256□-5□□0	SP286□-5□□0
Operation type	Continuous operation (S1)	
Operating ambient temperature	-10 to +40°C	
Storage temperature	-20 to +60°C	
Operating ambient humidity	95% RH or less: Below 40°C (non-condensing)	
Storage humidity	95% RH or less: Below 40°C, 57% RH or less: Below 50°C, 35% RH or less: Below 60°C, (non-condensing)	
Operating altitude	Up to 1000 m above sea level	
Vibration resistance	Frequency 10 to 500 Hz, amplitude 1.52 mm (10 to 70 Hz), vibration acceleration 150 m/s ² (70 to 500 Hz), sweep time 15 min/cycle, a total of 12 tests in both opposite directions for each of X, Y, and Z axes.	
Shock resistance	Acceleration 500 m/s ² , duration 11 ms, half sine wave, tested 3 times in both directions for each X, Y, and Z axis for a total of 18 times	
Thermal class	F (+155°C)	
Dielectric strength	1500 VAC for one minute (between motor winding and frame)	
Insulation resistance	100 MΩ or more at 500 VDC (between motor winding and frame)	
Protection rating	IP65 (excluding the hollow shaft part and cable ends)	
Winding temperature rise	100 K or less (based on our own standard)	
Positional accuracy tolerance	± 0.054°	± 0.09°
Thrust play	0.075 mm or less (With a 10 N load)	
Radial play	0.025 mm or less (With a 5 N load)	
Shaft runout	0.025 mm	
Concentricity of motor shaft and fitting part	ø0.075 mm	
Perpendicularity of mounting surface and motor shaft	0.1 mm	0.15 mm
Motor mounting orientation	Can be installed vertically or horizontally.	

Internal Wiring and Rotational Directions

Bipolar winding

Internal wiring

In parentheses are connector pin nos.



Rotating direction

When excited by a direct current in the order shown below, the direction of rotation is clockwise as viewed from the output shaft side.

Lead color	Red	Blue	Yellow	Orange
Connector pin no.	3	2	4	1
Excitation sequence	1	-	-	+
	2	+	-	+
	3	+	+	-
	4	-	+	-

Safety standards

	Directive		Standards
CE (TÜV)	Low Voltage Directive 2014/35/EU		IEC 60034-1, IEC60034-5
	RoHS Directive 2011/65/EU		EN IEC 63000 : 2018
UKCA	Electrical Equipment (Safety) Regulations 2016		IEC 60034-1, IEC60034-5
	RoHS Regulations 2012		EN IEC 63000 : 2018
UL	Classification	Standards	File no.
	UL	UL 1004-1, UL 1004-6	E179832
	UL for Canada (cUL)	CSA C22.2 No. 100	

Models with brake or oil seal have different model nos.

Models with an encoder have different model nos. and vibration resistance.

56 mm sq.

1.8°/step

RoHS

Bipolar



Custom options

Custom shaft

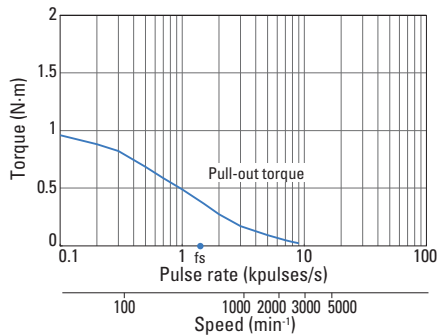
Note: Customization feasibility depends on the model number and quantity. Contact us for details.

Model no.		Holding torque at 2-phase excitation	Rated current	Winding resistance	Winding inductance	Rotor inertia	Mass	Allowable thrust load	Allowable radial load
Cable type	Connector type	N-m or more	A/phase	Ω/phase	mH/phase	×10 ⁻⁴ kg·m ²	kg	N	N
SP2563-5060	SP2563-5000	1	1	5.8	29	0.21	0.9	15	52
SP2563-5160	SP2563-5100	1	2	1.5	7.3	0.21	0.9	15	52
SP2563-5260	SP2563-5200	1	3	0.75	3.4	0.21	0.9	15	52
SP2566-5060	SP2566-5000	1.7	1	7.8	35.4	0.36	1.2	15	23
SP2566-5160	SP2566-5100	1.7	2	2	9.2	0.36	1.2	15	23
SP2566-5260	SP2566-5200	1.7	3	1	4.4	0.36	1.2	15	23

• Models with a brake, encoder, or oil seal have different model nos., rotor inertia, and mass.

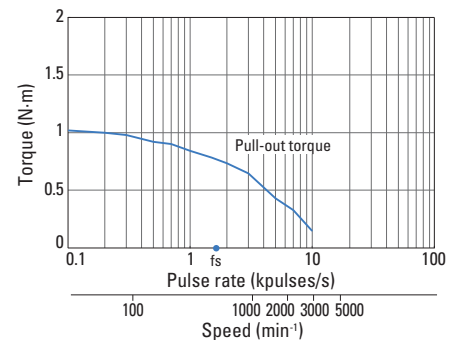
Characteristics

SP2563-5000
SP2563-5060



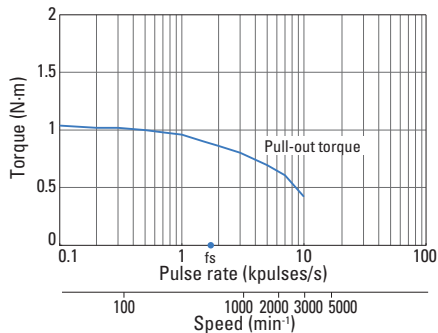
Constant current circuit
Input voltage: 100 VAC
Winding current: 1 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=2.6 \times 10^{-4} \text{kg} \cdot \text{m}^2$ (with rubber coupling used)
fs: Maximum starting pulse rate with no load

SP2563-5100
SP2563-5160



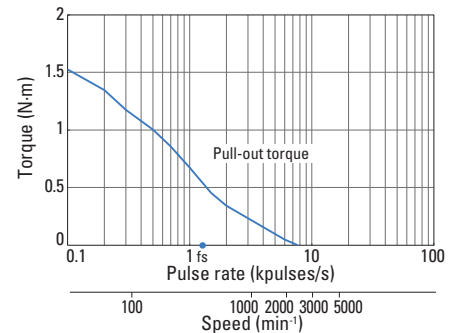
Constant current circuit
Input voltage: 100 VAC
Winding current: 2 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=2.6 \times 10^{-4} \text{kg} \cdot \text{m}^2$ (with rubber coupling used)
fs: Maximum starting pulse rate with no load

SP2563-5200
SP2563-5260



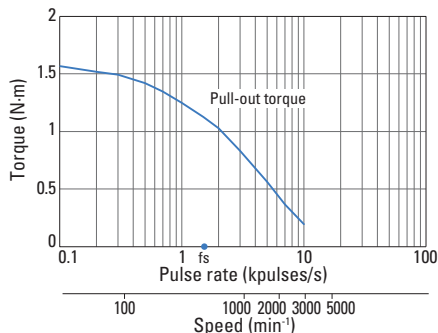
Constant current circuit
Input voltage: 100 VAC
Winding current: 3 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=2.6 \times 10^{-4} \text{kg} \cdot \text{m}^2$ (with rubber coupling used)
fs: Maximum starting pulse rate with no load

SP2566-5000
SP2566-5060



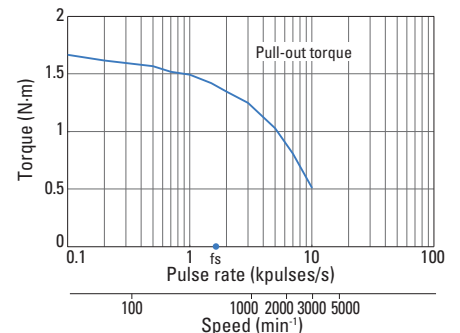
Constant current circuit
Input voltage: 100 VAC
Winding current: 1 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=7.4 \times 10^{-4} \text{kg} \cdot \text{m}^2$ (with rubber coupling used)
fs: Maximum starting pulse rate with no load

SP2566-5100
SP2566-5160



Constant current circuit
Input voltage: 100 VAC
Winding current: 2 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=7.4 \times 10^{-4} \text{kg} \cdot \text{m}^2$ (with rubber coupling used)
fs: Maximum starting pulse rate with no load

SP2566-5200
SP2566-5260



Constant current circuit
Input voltage: 100 VAC
Winding current: 3 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=7.4 \times 10^{-4} \text{kg} \cdot \text{m}^2$ (with rubber coupling used)
fs: Maximum starting pulse rate with no load

86 mm sq.

1.8°/step

RoHS

Bipolar



Custom options

Custom shaft

Note: Customization feasibility depends on the model number and quantity. Contact us for details.

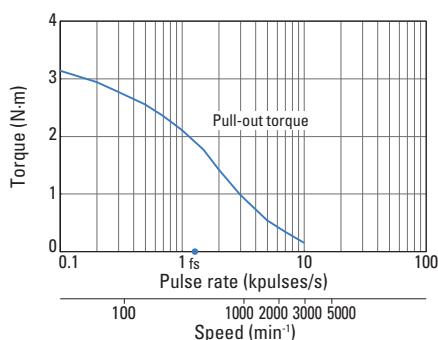
Model no.		Holding torque at 2-phase excitation	Rated current	Winding resistance		Winding inductance	Rotor inertia	Mass	Allowable thrust load	Allowable radial load
Cable type	Connector type	N·m or more	A/phase	Ω/phase	Ω/phase	mH/phase	×10 ⁻⁴ kg·m ²	kg	N	N
SP2861-5060	SP2861-5000	3.3	2	2.1	2.05	15	1.48	1.95	60	200
SP2861-5160	SP2861-5100	3.3	4	0.61	0.56	3.7	1.48	1.95	60	200
SP2861-5260	—	3.3	6	0.36	—	1.7	1.48	1.95	60	200
SP2862-5060	SP2862-5000	6.4	2	3.2	3.2	25	3	3.1	60	200
SP2862-5160	SP2862-5100	6.4	4	0.85	0.83	6.4	3	3.1	60	200
SP2862-5260	—	6.4	6	0.41	—	2.8	3	3.1	60	200
SP2863-5060	SP2863-5000	9	2	4	4	32	4.5	4.2	60	200
SP2863-5160	SP2863-5100	9	4	1.05	1	7.9	4.5	4.2	60	200
SP2863-5260	—	9	6	0.53	—	3.8	4.5	4.2	60	200

• Models with a brake, encoder, or oil seal have different model nos., rotor inertia, and mass.

• Connector-type models are available for 4 A or lower rated voltages.

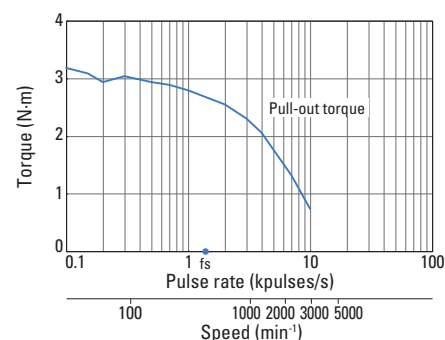
Characteristics

SP2861-5000
SP2861-5060



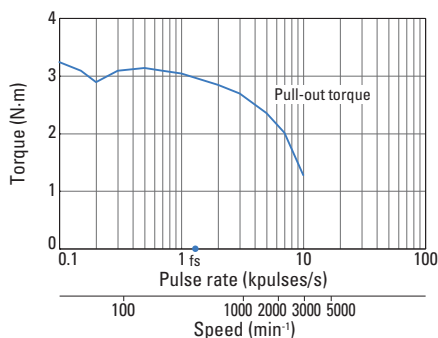
Constant current circuit
Input voltage: 100 VAC,
Winding current: 2 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=15.3 \times 10^{-4}$ kg·m² (with rubber coupling used)
fs: Maximum starting pulse rate with no load

SP2861-5100
SP2861-5160



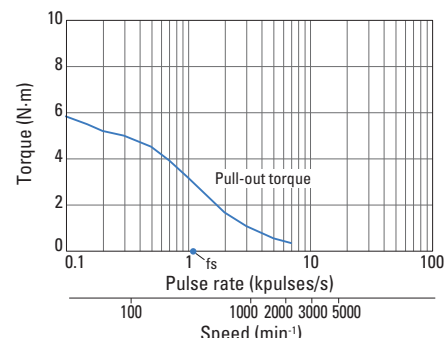
Constant current circuit
Input voltage: 100 VAC,
Winding current: 4 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=15.3 \times 10^{-4}$ kg·m² (with rubber coupling used)
fs: Maximum starting pulse rate with no load

SP2861-5260



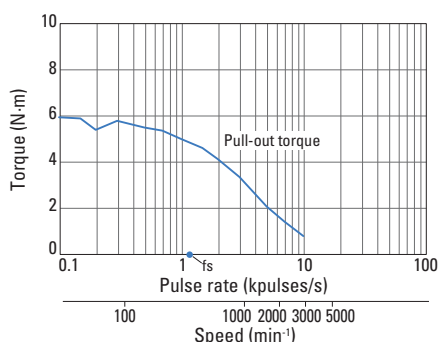
Constant current circuit
Input voltage: 100 VAC
Winding current: 6 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=15.3 \times 10^{-4}$ kg·m² (with rubber coupling used)
fs: Maximum starting pulse rate with no load

SP2862-5000
SP2862-5060



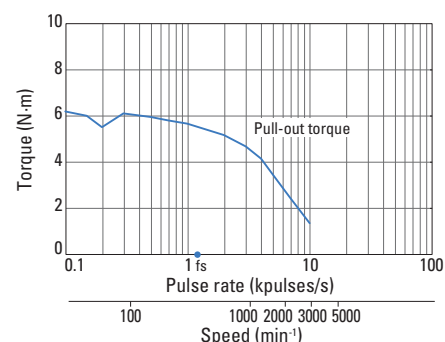
Constant current circuit
Input voltage: 100 VAC
Winding current: 2 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=15.3 \times 10^{-4}$ kg·m² (with rubber coupling used)
fs: Maximum starting pulse rate with no load

SP2862-5100
SP2862-5160



Constant current circuit
Input voltage: 100 VAC,
Winding current: 4 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=15.3 \times 10^{-4}$ kg·m² (with rubber coupling used)
fs: Maximum starting pulse rate with no load

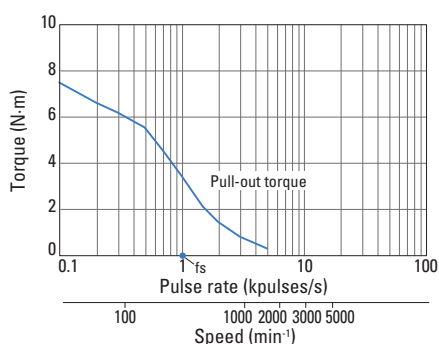
SP2862-5260



Constant current circuit
Input voltage: 100 VAC
Winding current: 6 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=15.3 \times 10^{-4}$ kg·m² (with rubber coupling used)
fs: Maximum starting pulse rate with no load

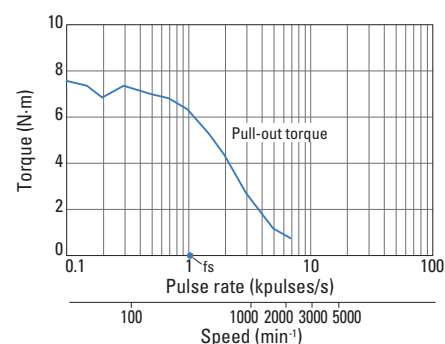
Characteristics

SP2863-5000 SP2863-5060



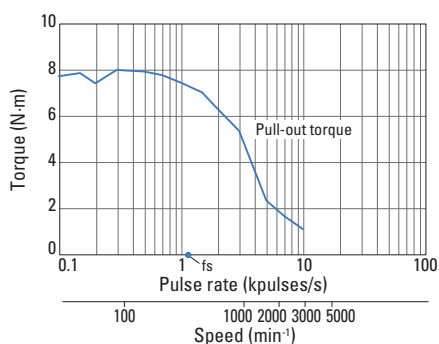
Constant current circuit
Input voltage: 100 VAC
Winding current: 2 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=44 \times 10^{-4} \text{ kg} \cdot \text{m}^2$ (with rubber coupling used)
fs: Maximum starting pulse rate with no load

SP2863-5100 SP2863-5160



Constant current circuit
Input voltage: 100 VAC
Winding current: 4 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=44 \times 10^{-4} \text{ kg} \cdot \text{m}^2$ (with rubber coupling used)
fs: Maximum starting pulse rate with no load

SP2863-5260

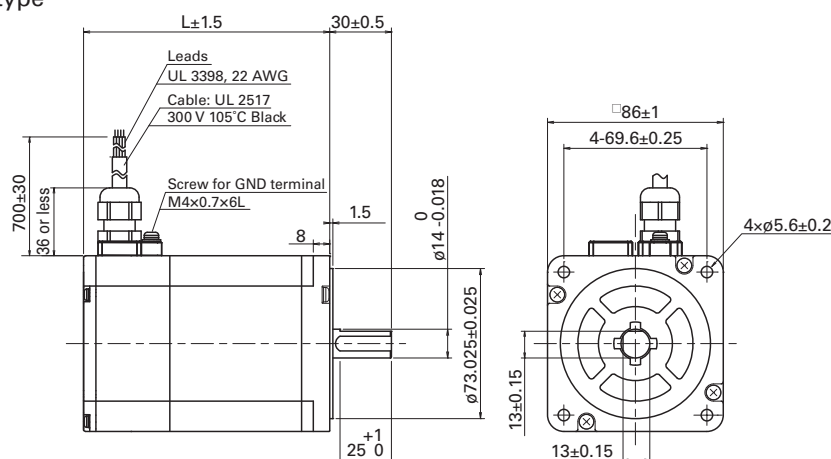


Constant current circuit
Input voltage: 100 VAC
Winding current: 6 A/phase, At 2-phase excitation (full step)
Pull-out torque: $J_L=44 \times 10^{-4} \text{ kg} \cdot \text{m}^2$ (with rubber coupling used)
fs: Maximum starting pulse rate with no load

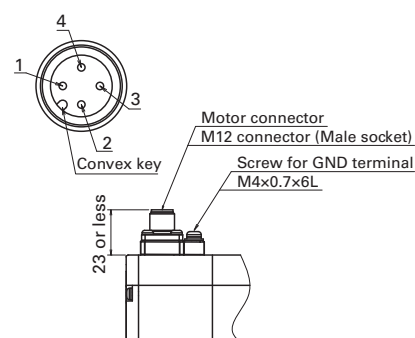
Dimensions Unit: mm

86 mm sq.

Cable type



Connector type



Model no.		Motor length (L)
Cable type	Connector type	
SP2861-5 □ 60	SP2861-5 □ 00	89.5
SP2862-5 □ 60	SP2862-5 □ 00	120
SP2863-5 □ 60	SP2863-5 □ 00	150

Compatible drivers

A driver is to be provided by the customer.

Note: The characteristics shown above are calculated using our experimental circuit.