

“SANMOTION F2” Series International Protection Code IP65, Degrees of Protection, Stepping Motor

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1. Introduction

Stepping motors enable open-loop control and can perform control in a simple system, and therefore they are widely used in OA equipment and general industrial machinery. In recent years, there have been an increasing number of requests for motors that require high waterproof and dustproof performance for applications in solar panels and food processing equipment, especially from manufacturers from outside of Japan.

With these requests in mind, we developed the “SANMOTION F2” Series, International Protection code IP65, degrees of protection provided by enclosures (IP Code), stepping motor that has high waterproof and dustproof performance.

This document introduces an overview and the features of the new model.

2. Product Overview

2.1 Appearance and exterior

We newly developed a lineup of 56 mm sq. and 86 mm sq. 2-phase stepping motors compliant with protection class IP65 and support for optional brake and encoder. Fig. 1 (a) shows a photograph of the standard specification 56 mm sq. model, while Fig. 1 (b) shows a photograph of the same base model with brake and encoder. Fig. 2 (a) shows a photograph of the standard specification 86 mm sq. model, while Fig. 2 (b) shows a photograph of the same base model with brake and encoder. Fig. 3 to Fig. 6 show the outside view for each model.

The lead outlet specifications can be selected from a connector type, as shown in the figure, or a cable type.

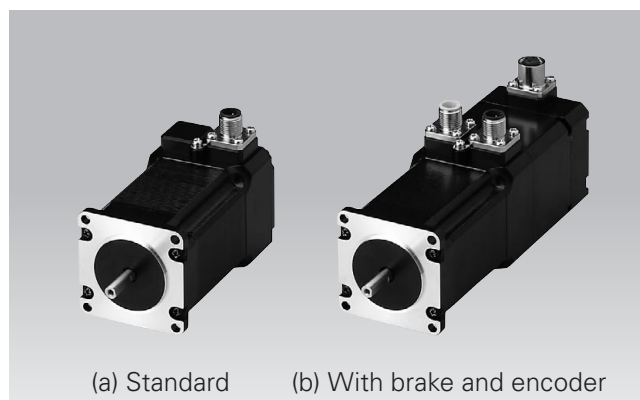


Fig. 1: Appearance of the 56 mm sq. type

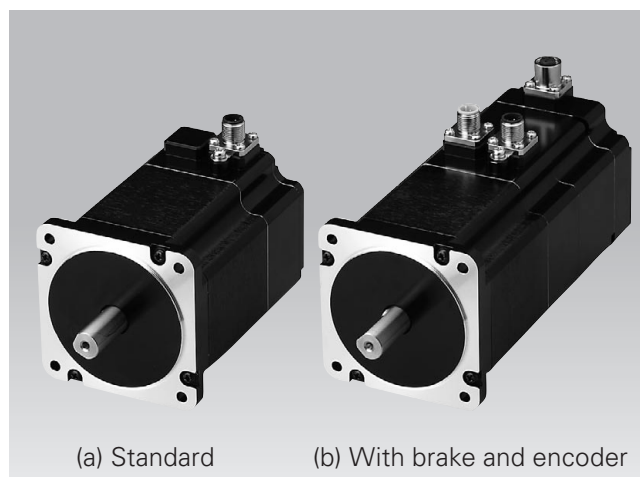


Fig. 2: Appearance of the 86 mm sq. type

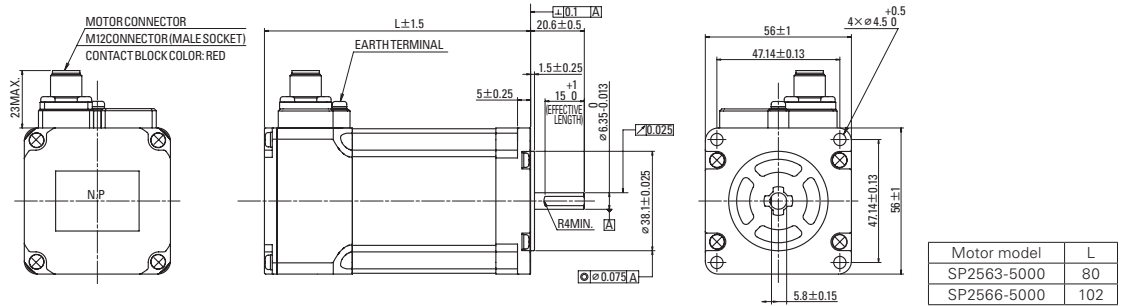


Fig. 3: 56 mm sq. standard model

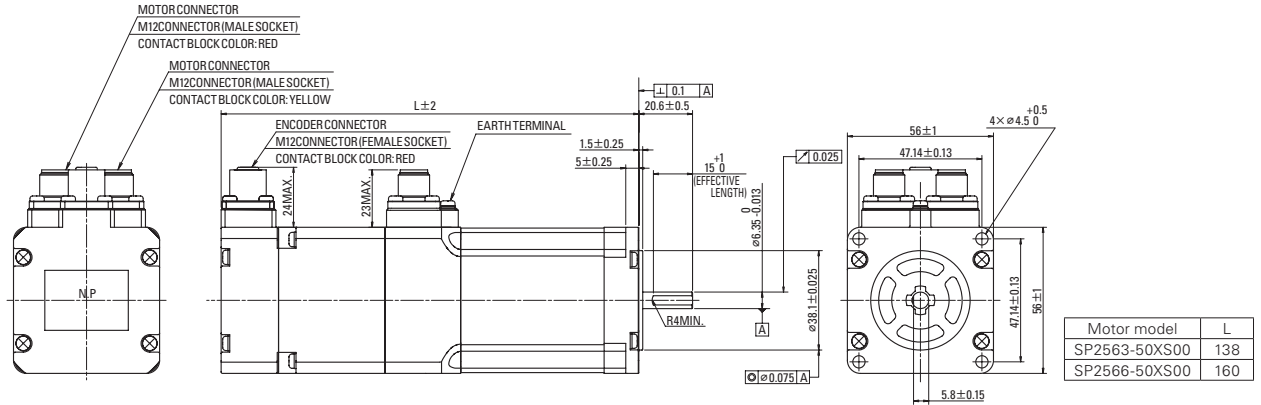


Fig. 4: 56 mm sq. model with brake and encoder

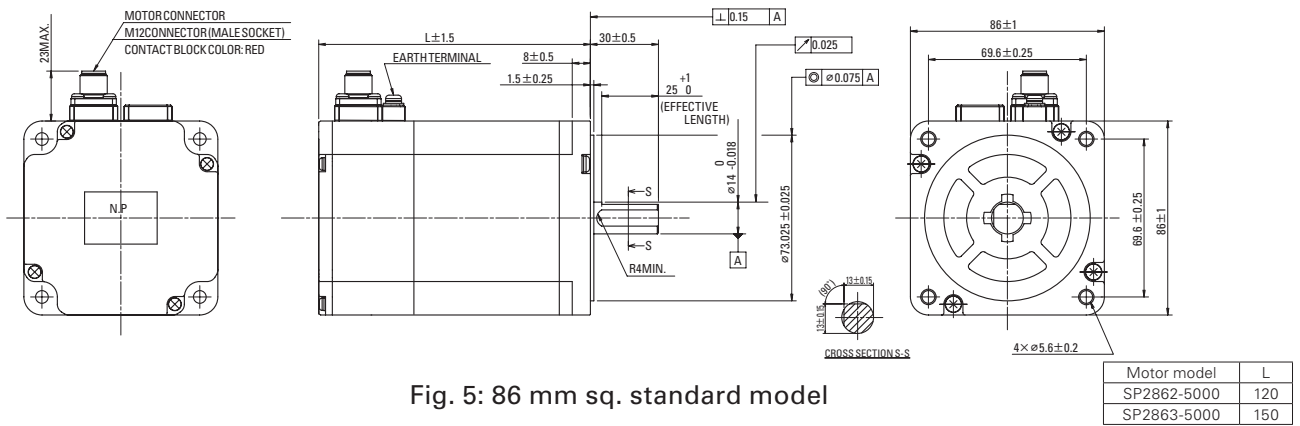


Fig. 5: 86 mm sq. standard model

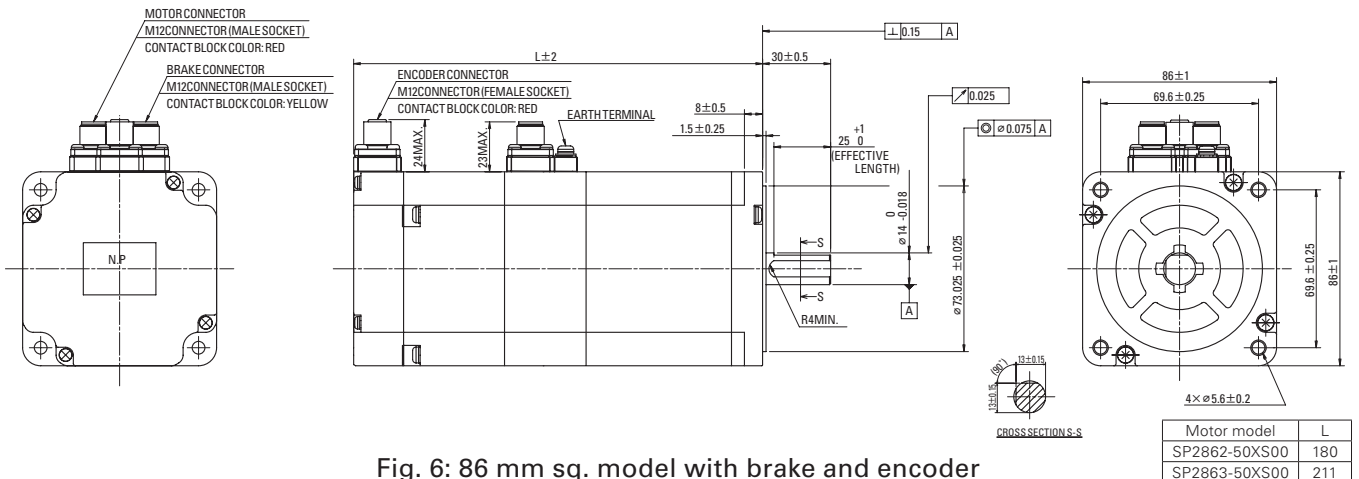


Fig. 6: 86 mm sq. model with brake and encoder

2.2 Construction

The new model is based on the conventional motor and employs a new adhesive agent to ensure waterproof and dustproof performance. In addition, a coating of the stator core lamination layer is applied to the outer circumference to strengthen waterproof performance. Furthermore, sufficient insulating distance is maintained on the inside of the motor for a structure that can handle high voltage, thus making the model compliant with UL and CE markings to meet the needs of many international manufacturers. The die cast parts are common for the models and combined into a single-body structure to realize a reduction in the number of parts.

Two types of cable leads and connector leads can be selected for the lead outlet can be selected from one of two types depending on the customer's application: a cable type or a connector type. The standard specification for the connector is the M12 size waterproof connector that is often used in Europe. Sanyo Denki's proven cable grand is used as the cable lead to ensure waterproof performance.

3. Product Specifications

Table 1 shows the product specifications for the newly developed 56 mm sq. model, while Table 2 shows the product specifications for the 86 mm sq. model. Both types come in a lineup with two types of total motor lengths. Also, the rated current for the 56 mm model can be selected from 1 A, 2 A, or 3 A, while the rated current for the 86 mm model can be selected from 2 A, 4 A, or 6 A.

4. Product Features

4.1 High waterproof and dustproof performance

The new model fulfills high waterproof and dustproof performance with IP65, degrees of protection provided by enclosures (IP Code) for waterproofing and dustproofing. Therefore, the new model can be used in environments with water or dust. With this performance, the customer does not need to use their own protections on the motors, and it contributes to smaller sizes and reduced cost of equipment.

4.2 Varied product lineup

The new model enhances a varied product lineup.

- Optional specifications
 - ⇒ Support for models with brake, with encoder, or with brake and encoder
- Lead outlet
 - ⇒ Support for connector type and cable type
- Output shaft
 - ⇒ Supports both with or without oil seal

These options and variations offer greater flexibility of motor selection to customers, and can respond to the needs of a great variety of customers.

4.3 Ideal for use in international markets (High-voltage and safety standards-compliant)

In consideration of use in international markets, the new model supports a high drive voltage with a maximum of AC 250 V and it is a product that complies with standards for UL and CE marking. With this support, the new model can be used reliably as a motor all over the world.

Table 1: Product specifications (56 mm sq.)

Item \ Model		SP2563-5000 (Standard)	SP2566-5000 (Standard)	SP2566-50XB00 (With brake)	SP2566-50XE00 (With encoder)	SP2566-50XS00 (With brake and encoder)
Motor	Drive voltage	AC 250 V or less				
	No. of phases	2				
	Rated current	1 A				
	Step angle	1.8°				
	Holding torque	1.0 N · m MIN.	1.7 N · m MIN.			
	Rotor inertia	0.21×10^{-4} kg · m ²	0.36×10^{-4} kg · m ²	0.395×10^{-4} kg · m ²	0.36×10^{-4} kg · m ²	0.395×10^{-4} kg · m ²
Brake	Power voltage	—	—	DC 24 V ± 5%	—	DC 24 V ± 5%
	Holding torque	—	—	1.2 N · m MIN.	—	1.2 N · m MIN.
Encoder	Power voltage	—	—	—	DC 5 V ± 5%	DC 5 V ± 5%
	Basic resolution	—	—	—	500	500
	No. of channels	—	—	—	3	3
	Output method	—	—	—	Open collector	Open collector
Total motor length		80 mm	102 mm	140 mm	102 mm	160 mm
Motor mass		0.9 kg	1.2 kg	1.8 kg	1.3 kg	1.9 kg
Degrees of protection		IP65				
Insulation classification		Class F				

Table 2: Product specifications (86 mm sq.)

Item \ Model		SP2862-5000 (Standard)	SP2863-5000 (Standard)	SP2862-50XB00 (With brake)	SP2862-50XE00 (With encoder)	SP2862-50XS00 (With brake and encoder)
Motor	Drive voltage	AC 250 V or less				
	No. of phases	2				
	Rated current	2 A				
	Step angle	1.8°				
	Holding torque	6.4 N · m MIN.	9.0 N · m MIN.	6.4 N · m MIN.		
	Rotor inertia	3.0×10^{-4} kg · m ²	4.5×10^{-4} kg · m ²	3.79×10^{-4} kg · m ²	3.0×10^{-4} kg · m ²	3.79×10^{-4} kg · m ²
Brake	Power voltage	—	—	DC 24 V ± 5%	—	DC 24 V ± 5%
	Holding torque	—	—	7 N · m MIN.	—	7 N · m MIN.
Encoder	Power voltage	—	—	—	DC 5 V ± 5%	DC 5 V ± 5%
	Basic resolution	—	—	—	500	500
	No. of channels	—	—	—	3	3
	Output method	—	—	—	Open collector	Open collector
Total motor length		120 mm	150 mm	160 mm	120 mm	180 mm
Motor mass		3.1 kg	4.4 kg	4.0 kg	3.2 kg	4.2 kg
Degrees of protection		IP65				
Insulation classification		Class F				

5. Conclusion

This document introduced an overview, product specifications, and features of the “SANMOTION F2” Series, International Protection code IP65, degrees of protection provided by enclosures (IP Code), stepping motor.

By adding the new model to the SANMOTION F2 product, we can respond to market needs and the numerous requests for waterproof and dustproof performance. In particular, we can provide a highly reliable product for requests from the international market faster than ever before.

We shall continue to make an effort towards support for customizations to meet individual customer needs and work towards expanding the market.



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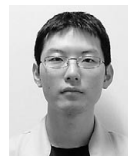
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