Stepping Motors



42 mm sq.

1.8°/step RoHS

Bipolar winding, Connector type

Unipolar winding, Connector type ▶p. 45



Customizing

Shaft length Shaft shape

Varies depending on the model number and quantity. Contact us for details.

Bipolar winding, Connector type

Model no.		Holding torque at 2-phase energization	Rated current	Wiring resistance	Winding inductance	Rotor inertia	Mass	Motor length (L)
Single shaft	Dual shaft	N·m min.	A/phase	Ω/phase	mH/phase	×10 ⁻⁴ kg⋅m²	kg	mm
SF2421-10B41	SF2421-10B11	0.29	1	3.6	7	0.031	0.23	33±0.5
SF2422-10B41	SF2422-10B11	0.43	1	4.6	9.6	0.046	0.3	39±0.5
SF2423-10B41	SF2423-10B11	0.56	1	5.3	12.5	0.063	0.38	48±0.5
SF2424-10B41	SF2424-10B11	0.8	1	6.5	16	0.094	0.51	59.5±1

Characteristics diagram

SF2421-10B41 SF2421-10B11

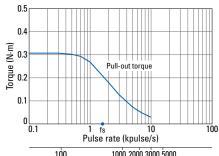
Constant current circuit Source voltage: 24 VDC Operating current: 1 A/phase, 2-phase energization (full-step) Pull-out torque: J.=0.94×10-⁴kg·m² (use the rubber coupling) fs: Maximum self-start fragespace whose part frequency when not loaded

SF2423-10B41

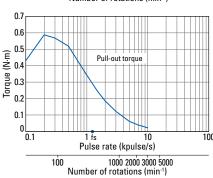
SF2423-10B11

Constant current circuit
Source voltage: 24 VDC
Operating current:
1 A/phase, 2-phase
energization (full-step)
Pull-out torque:
J.=0.94×10-4kg·m² (use the
rubber coupling)
fs: Maximum self-start
frequency when not
loaded

loaded

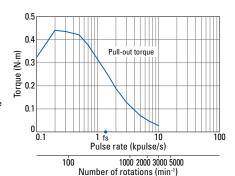


1000 2000 3000 5000 100 Number of rotations (min-1)



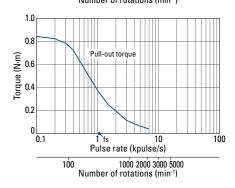
SF2422-10B41 SF2422-10B11

Constant current circuit
Source voltage: 24 VDC
Operating current:
1 A/phase, 2-phase
energization (full-step)
Pull-out torque:
J₁=0.94×10⁻⁴kg·m² (use the
rubber coupling)
fs: Maximum self-start
fraguspay whop pet frequency when not loaded

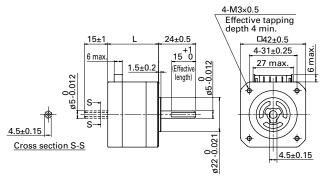


SF2424-10B41 SF2424-10B11

Constant current circuit
Source voltage: 24 VDC
Operating current:
1 A/phase, 2-phase
energization (full-step)
Pull-out torque:
J₁=2.6×10-4kg·m² (use the
rubber coupling)
fs: Maximum self-start
frequency when not
loaded loaded



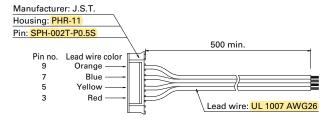
Dimensions (Unit: mm)



Internal wiring () connector pin number



Option (sold separately): Motor cable model no. 4835775-1



This motor cable is for model no. SF242□-10B□1.

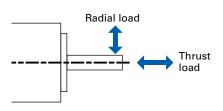
■ Compatible drivers •

Model no.: BS1D200P10

Operating current select switch setting: A

The characteristics diagram shown above is from our experimental circuit.

Allowable Radial/Thrust Load



		Distance f	rom end of	shaft: mm		Thrust load	
Motor size	Model no.	0	5	10	15	- Inrust Ioad - N	
		Radial load		— IN			
14 mm sq.	SH214 🗌	10	11	13	_	0.7	
28 mm sq.	SH228 □	42	48	56	66	3	
35 mm sq.	SH353 🗌	40	50	67	98	10	
	SF242 🗌	20	29	49	68	-10	
42 mm sq.	SH142 🗌	22	26	33	46	10	
	SS242 🗌	10	_	_	_	4.9	
E0	103H670 🗌	71	87	115	167	15	
50 mm sq.	SS250 🗆	8.5	_	_	_	4.9	
E6 mm ca	103H712 🗌	52	65	85	123	15	
56 mm sq.	103H7128	85	105	138	200	15	
60 mm sq.	103H782 🗌	- 70	87	114	165	20	
oo iiiii sq.	SH160 □	70	07	114	105	15	
86 mm sq.	SM286 □ SH286 □	167	193	229	280	60	
°86 mm	103H822 \square	191	234	301	421	60	
	103H8922 \(321	356	401	457	100	
°106 mm	10300922	321	300	401	407	100	

Internal Wiring and Rotation Direction

Unipolar winding

Connector type model no.: SF242

Internal wire connection

() connector pin number



Direction of motor rotation

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

			Connector pin no.						
		(3, 9)	(1)	(7)	(5)	(11)			
	1	+	-	-					
Exciting order	2	+		-	-				
order	3	+			-	-			
	4	+	-			_			

Connector type model no.: 103H782 □□

Internal wire connection

() connector pin number



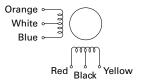
Direction of motor rotation

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

			Connector pin no.						
		(1, 6)	(4)	(3)	(5)	(2)			
	1	+	_	_					
Exciting order	2	+		-	-				
order	3	+			-	-			
	4	+	-			_			

Lead wire type

Internal wire connection



■ Direction of motor rotation

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 wire col	or			
		White, black	Red	Blue	Yellow	Orange
	1	+	_	-		
Exciting	2	+		-	-	
order	3	+			-	-
	4	+	-			_

Bipolar winding

Connector type model no.: SF242

Internal wire connection

() connector pin number



■ Direction of motor rotation

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

	_	Connecto	or pin no.		
		(3)	(7)	(5)	(9)
	1	-	-	+	+
Exciting order	2	+	_	-	+
order	3	+	+	-	-
	4	-	+	+	-

Connector type model no.: 103H782

■ Internal wire connection

() connector pin number



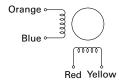
■ Direction of motor rotation

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

		Connecto	or pin no.		
		(3)	(2)	(4)	(1)
	1	-	-	+	+
Exciting order	2	+	-	-	+
order	3	+	+	-	-
	4	-	+	+	-

Lead wire type

Internal wire connection



Direction of motor rotation

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 wir	e color		
		Red	Blue	Yellow	Orange
	1	-	-	+	+
Exciting order	2	+	-	-	+
order	3	+	+	-	-
	4	_	+	+	-

General Specifications

Motor model no.	SH214 🗌	SH228 🗌	SH353 🗌	SS242 🗌	SH142 🗌	SF242 🗌	SS250 🗆	103H670 🗌	103H712 🗌
Туре	_								
Operating ambient temperature	-10 to +50°C	;							
Storage temperature	-20 to +65°C	;							
Operating ambient humidity	20 to 90% R	H (no conder	nsation)						
Storage humidity	5 to 95% RH	5 to 95% RH (no condensation)							
Operation altitude	1000 m max	c. above sea l	evel						
Vibration resistance	Vibration from Hz), sweep to	/ibration frequency 10 to 500 Hz, total amplitude 1.52 mm (10 to 70 Hz), vibration acceleration 150 m/s² (70 to 500 Hz), sweep time 15 min/cycle, 12 sweeps in each X, Y and Z direction.							
Impact resistance	500 m/s ² of a	cceleration fo	r 11 ms with	half-sine wave	e applying the	ee times for X	$X, Y, and \; Z \; axe$	s each, 18 tim	es in total.
Thermal class	Class B (+13	30°C)							
Withstandable voltage		At normal temperature and humidity, no failure with 500 VAC @50/60 Hz applied for one humidity, no failure with 1000 VAC @50/60 Hz applied for one minute between motor winding and frame. At normal temperature and humidity, no failure with 1000 VAC @50/60 Hz applied for one minute between motor winding and frame.							
Insulation resistance	At normal to	emperature a	nd humidity	, not less tha	n 100 MΩ be	tween windir	ng and frame	by 500 VDC n	negger.
Protection grade	_								
Winding temperature rise	80 K max. (I	Based on SAI	NYO DENKI s	standard)					
Static angle error	±0.09°				±0.054°	±0.09°			±0.054°
Thrust play *1	0.075 mm max. (load: 0.35 N)	0.075 mm max. (load: 1.5 N)	0.075 mm max. (load: 5 N)	0.075 mm max. (load: 4 N)	0.075 mm max. (load: 5 N)	0.075 mm (load: 5 N)	0.075 mm max. (load: 4 N)	0.075 mm (load: 10 N)	0.075 mm (load: 10 N)
Radial play *2	0.025 mm m	nax. (load: 5 l	N)						
Shaft runout	0.025 mm								
Concentricity of mounting pilot relative to shaft	ø0.05 mm	ø0.05 mm	ø0.075 mm	ø0.075 mm	ø0.05 mm	ø0.05 mm	ø0.075 mm	ø0.075 mm	ø0.075 mm
Squareness of mounting surface relative to shaft	0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.075 mm	0.075 mm
Direction of motor mounting	Can be freel	ly mounted v	ertically or h	orizontally					
Motor model no.	SH160 □	103H782 🗆	SH286 □	103H8922	SM286 □	103H712 -	6 🗆 0 103H822 CE Mod		BH8922 ☐ -63 ☐ 1 Model
						CE Model	GE IVIOU	ei iCE	Model
Type	_					uous operati		ei CE	Model
- '		;				uous operati		ei CE	Wiodei
Operating ambient temperature	-10 to +50°C				S1 (contin	uous operati °C		ei CE	IVIOGEI
· ·	-10 to +50°C -20 to +65°C	;			S1 (contin -10 to +40 -20 to +60	uous operati °C °C			iviodei
Operating ambient temperature Storage temperature	-10 to +50°C -20 to +65°C 20 to 90% R	;	nsation)		S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m	uous operati °C °C ax. at 40°C o ax. at 40°C o	r less (no con r less, 57% RI	densation) H max. at 50°	
Operating ambient temperature Storage temperature Operating ambient humidity	-10 to +50°C -20 to +65°C 20 to 90% R 5 to 95% RH	; H (no conder	nsation)		S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m	uous operati °C °C ax. at 40°C o ax. at 40°C o	on) r less (no con	densation) H max. at 50°	
Operating ambient temperature Storage temperature Operating ambient humidity Storage humidity	-10 to +50°C -20 to +65°C 20 to 90% R 5 to 95% RH 1000 m max Vibration fre	H (no conder I (no condens c. above sea I	nsation) sation) evel p 500 Hz, tota		S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m 35% RH m	uous operati °C °C lax. at 40°C o lax. at 40°C o lax. at 60°C o	r less (no con r less, 57% RI r less (no con	densation) H max. at 50°	C or less,
Operating ambient temperature Storage temperature Operating ambient humidity Storage humidity Operation altitude	-10 to +50°C -20 to +65°C 20 to 90% R 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe	H (no conder I (no condens above sea I equency 10 to eep time 15 n	nsation) sation) evel 0 500 Hz, tota	sweeps in ea	S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m 35% RH m	uous operati °C °C lax. at 40°C o lax. at 40°C o lax. at 60°C o to 70 Hz), vib Z direction.	r less (no con r less, 57% RI r less (no con	densation) H max. at 50°(densation)	C or less, s² (70 to
Operating ambient temperature Storage temperature Operating ambient humidity Storage humidity Operation altitude Vibration resistance	-10 to +50°C -20 to +65°C 20 to 90% R 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe	H (no conder I (no condens a above sea I equency 10 to eep time 15 n acceleration f	nsation) sation) evel 0 500 Hz, tota	sweeps in ea	S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m 35% RH m	uous operati °C °C lax. at 40°C o lax. at 40°C o lax. at 60°C o to 70 Hz), vib Z direction.	r less (no con r less, 57% Ri r less (no con eration accele	densation) H max. at 50°(densation) ration 150 m/s	C or less, s² (70 to
Operating ambient temperature Storage temperature Operating ambient humidity Storage humidity Operation altitude Vibration resistance Impact resistance	-10 to +50°C -20 to +65°C 20 to 90% R 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal tem ure with 1000 minute betwe	H (no conders I (no condens I above sea I equency 10 to eep time 15 n acceleration f 30°C) hererature and h VAC @50/60 Hz en motor windi	nsation) sation) evel 0 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for on- ng and frame.	h half-sine wa	S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m 35% RH m 1.52 mm (10 Inch X, Y and live applying Class F (+155°C) Class F continue one minute	uous operation CC CC CC NAX. at 40°C o NAX. at 40°C o NAX. at 60°C o To 70 Hz), vib Z direction. Three times for Class B (+ and humidity between mo	r less (no con r less, 57% Ri r less (no con tration accele or X, Y and Z a 130°C) y, no failure v tor winding a	densation) H max. at 50°(densation) ration 150 m/s axes each, 18 with 1500 VAC nd frame.	C or less, s² (70 to times in total
Operating ambient temperature Storage temperature Operating ambient humidity Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage	-10 to +50°C -20 to +65°C 20 to 90% R 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal tem ure with 1000 minute betwe	H (no conders I (no condens I above sea I equency 10 to eep time 15 n acceleration f 30°C) hererature and h VAC @50/60 Hz en motor windi	nsation) sation) evel 0 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for on- ng and frame.	h half-sine wa	S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m 35% RH m 1.52 mm (10 Inch X, Y and live applying Class F (+155°C) Class F continue one minute	uous operation CC CC CC NAX. at 40°C o NAX. at 40°C o NAX. at 60°C o To 70 Hz), vib Z direction. Three times for Class B (+ and humidity between mo	r less (no con r less, 57% Ri r less (no con tration accele or X, Y and Z a 130°C) y, no failure v tor winding a	densation) H max. at 50°(densation) ration 150 m/s axes each, 18	C or less, s² (70 to times in total
Operating ambient temperature Storage temperature Operating ambient humidity Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage Insulation resistance Protection grade	-10 to +50°C -20 to +65°C 20 to 90% R 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal tem ure with 1000 minute betwe At normal tem	H (no conders I (no condens I (no condens I above sea I equency 10 to eep time 15 n acceleration f 30°C) hereature and h VAC @50/60 Hz en motor windi emperature a	nsation) evel 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for on- ng and frame. nd humidity	sweeps in each half-sine was At normal applied for , not less the	S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m 35% RH m 1.52 mm (10 Inch X, Y and live applying Class F (+155°C) Class F continue one minute	uous operation CC CC CC NAX. at 40°C o NAX. at 40°C o NAX. at 60°C o To 70 Hz), vib Z direction. Three times for Class B (+ and humidity between mo	r less (no con r less, 57% Ri r less (no con tration accele or X, Y and Z a 130°C) y, no failure v tor winding a	densation) H max. at 50°(densation) ration 150 m/s axes each, 18 with 1500 VAC nd frame.	C or less, s² (70 to times in total
Operating ambient temperature Storage temperature Operating ambient humidity Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage Insulation resistance Protection grade	-10 to +50°C -20 to +65°C 20 to 90% R 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal tem ure with 1000 minute betwe At normal tem	H (no conders I (no condens I (no condens I above sea I equency 10 to eep time 15 n acceleration f 30°C) hereature and h VAC @50/60 Hz en motor windi emperature a	nsation) evel 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for on- ng and frame. nd humidity	sweeps in each half-sine was At normal applied for , not less the	S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m 35% RH m 1.52 mm (10 ch X, Y and ve applying Class F (+155°C) temperature one minute	uous operation CC CC CC NAX. at 40°C o NAX. at 40°C o NAX. at 60°C o To 70 Hz), vib Z direction. Three times for Class B (+ and humidity between mo	r less (no con r less, 57% Ri r less (no con tration accele or X, Y and Z a 130°C) y, no failure v tor winding a	densation) H max. at 50°(densation) ration 150 m/s axes each, 18 with 1500 VAC nd frame.	C or less, s² (70 to times in total
Operating ambient temperature Storage temperature Operating ambient humidity Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage Insulation resistance Protection grade Winding temperature rise	-10 to +50°C -20 to +65°C 20 to 90% R 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal tem ure with 1000 minute betwe At normal tem	H (no conders I (no condens I (no condens I above sea I equency 10 to eep time 15 n acceleration f 30°C) hereature and h VAC @50/60 Hz en motor windi emperature a	nsation) evel 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for on- ng and frame. nd humidity	sweeps in each half-sine was At normal applied for , not less the	S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m 35% RH m 1.52 mm (10 ch X, Y and ve applying Class F (+155°C) temperature one minute	uous operation CC CC CC NAX. at 40°C o NAX. at 40°C o NAX. at 60°C o To 70 Hz), vib Z direction. Three times for Class B (+ and humidity between mo	r less (no con r less, 57% Ri r less (no con tration accele or X, Y and Z a 130°C) y, no failure v tor winding a	densation) H max. at 50°(densation) ration 150 m/s axes each, 18 with 1500 VAC nd frame. by 500 VDC n	C or less, s² (70 to times in total
Operating ambient temperature Storage temperature Operating ambient humidity Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage Insulation resistance Protection grade	-10 to +50°C -20 to +65°C 20 to 90% R 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal ter ure with 1000 minute betwe At normal te 80 K max. (E ±0.054°	H (no condense and the	nsation) evel 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for oning and frame. nd humidity	sweeps in each half-sine was At normal applied for , not less the	S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m 35% RH m 1.52 mm (10 ch X, Y and ve applying Class F (+155°C) temperature one minute	uous operation C C C C C C C C C C C C C	r less (no con r less, 57% Ri r less (no con tration accele or X, Y and Z a 130°C) y, no failure v tor winding a	idensation) H max. at 50°(densation) ration 150 m/s axes each, 18 with 1500 VAC nd frame. by 500 VDC n	C or less, s² (70 to times in total c @50/60 Hz negger.
Operating ambient temperature Storage temperature Operating ambient humidity Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage Insulation resistance Protection grade Winding temperature rise Static angle error	-10 to +50°C -20 to +65°C 20 to 90% R 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal ter ure with 1000 minute betwe At normal te 80 K max. (E ±0.054°	H (no conders I (no condens I (no condens I above sea I equency 10 to eep time 15 n acceleration f 80°C) perature and h VAC @50/60 Hz en motor windi emperature a Based on SAI ±0.09°	nsation) sation) evel 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for oning and frame. nd humidity	sweeps in each half-sine was At normal applied for , not less the	S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m 35% RH m 1.52 mm (10 ich X, Y and ive applying Class F (+155°C) temperature one minute in 100 MΩ be IP43	uous operation of the control of the	r less (no con r less, 57% Ri r less (no con r less, 57% Ri r less (no con ration accele or X, Y and Z a 130°C) y, no failure v tor winding a ng and frame	densation) H max. at 50° (densation) ration 150 m/s exes each, 18 with 1500 VAC nd frame. by 500 VDC n	C or less, s² (70 to times in total
Operating ambient temperature Storage temperature Operating ambient humidity Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage Insulation resistance Protection grade Winding temperature rise Static angle error Thrust play *1 Radial play *2	-10 to +50°C -20 to +65°C 20 to 90% R 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal ter ure with 1000 minute betwe At normal ter - 80 K max. (I ±0.054° 0.075 mm m	H (no conders I (no condens I (no condens I above sea I equency 10 to eep time 15 n acceleration f 30°C) reperature and h VAC @50/60 Hz en motor windi emperature a Based on SAR ±0.09° nax. (load: 10 0.025 mm	nsation) evel 0 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for one ng and frame. nd humidity NYO DENKI s N) 0.025 mm	sweeps in each half-sine was h	S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m 35% RH m 1.52 mm (10 ich X, Y and ive applying Class F (+155°C) temperature one minute in 100 MΩ be IP43	uous operation of the control of the	r less (no con r less, 57% Ri r less (no con r less, 57% Ri r less (no con ration accele or X, Y and Z a 130°C) y, no failure v tor winding a ng and frame	densation) H max. at 50° (densation) ration 150 m/s exes each, 18 with 1500 VAC nd frame. by 500 VDC n	C or less, s² (70 to times in total c @50/60 Hz negger.
Operating ambient temperature Storage temperature Operating ambient humidity Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage Insulation resistance Protection grade Winding temperature rise Static angle error Thrust play *1 Radial play *2 Shaft runout Concentricity of mounting pilot relative to shaft	-10 to +50°C -20 to +65°C 20 to 90% R 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal tem ure with 1000 minute betwe At normal te - 80 K max. (E ±0.054° 0.075 mm m (load: 5 N) 0.025 mm	H (no conders I (no condens I (no condens I above sea I equency 10 to eep time 15 n acceleration f 30°C) reperature and h VAC @50/60 Hz en motor windi emperature a Based on SAR ±0.09° nax. (load: 10 0.025 mm	nsation) evel 0 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for one ng and frame. nd humidity NYO DENKI s N) 0.025 mm	sweeps in each half-sine was h	S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m 35% RH m 1.52 mm (10 ich X, Y and ive applying Class F (+155°C) temperature one minute in 100 MΩ be IP43	uous operation of the control of the	r less (no con r less, 57% Ri r less (no con r less, 57% Ri r less (no con ration accele or X, Y and Z a 130°C) y, no failure v tor winding a ng and frame	densation) H max. at 50° (densation) ration 150 m/s exes each, 18 with 1500 VAC nd frame. by 500 VDC n	C or less, s² (70 to times in total c @50/60 Hz negger.
Operating ambient temperature Storage temperature Operating ambient humidity Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage Insulation resistance Protection grade Winding temperature rise Static angle error Thrust play *1 Radial play *2 Shaft runout Concentricity of mounting	-10 to +50°C -20 to +65°C 20 to 90% R 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal tem ure with 1000 minute betwe At normal te - 80 K max. (E ±0.054° 0.075 mm m (load: 5 N) 0.025 mm	H (no conders I (no condens I (no condens I above sea I equency 10 to eep time 15 n acceleration f 30°C) reperature and h VAC @50/60 Hz en motor windi emperature a Based on SAR ±0.09° nax. (load: 10 0.025 mm	nsation) evel 0 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for one ng and frame. nd humidity NYO DENKI s N) 0.025 mm	sweeps in each half-sine was h	S1 (contin -10 to +40 -20 to +60 95% RH m 95% RH m 35% RH m 1.52 mm (10 ich X, Y and ive applying Class F (+155°C) temperature one minute in 100 MΩ be IP43	uous operation of the control of the	r less (no con r less, 57% Ri r less (no con r less, 57% Ri r less (no con ration accele for X, Y and Z at 130°C) y, no failure v tor winding a leg and frame ±0.09° 0.025)	densation) H max. at 50° (densation) ration 150 m/s exes each, 18 with 1500 VAC nd frame. by 500 VDC n	C or less, s² (70 to times in total c @50/60 Hz negger.

■ Safety standards

Model no.: SM286 ☐ CE/UL marked models

CE	Standard category		Applicable standard
(TÜV)	Low-voltage directives		EN 60034-1, EN 60034-5
		Applicable standard	File no.
UL	UL	UL 1004-1, UL 1004-6	E170922
	UL for Canada	CSA C22.2 No.100	E179632

M	Model no.: 103H7126 - 0, 103H8226 - 0, 103H892263 - 1 CE marked mode							
C	Έ	Standard category	Applicable standard					
(TÜV)	Low-voltage directives	EN 60034-1, EN 60034-5					

^{*1} Thrust play: Shaft displacement under axial load.
*2 Radial play: Shaft displacement under radial load applied 1/3rd of the length from the end of the shaft.