

42 mm sq. (1.65 inch sq.)

1.8°/step RoHS

Unipolar winding, Connector type Bipolar winding, Lead wire type ▶p. 62

Customizing

Hollow Shaft modification Decelerator Encoder

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

Unipolar winding, Connector type

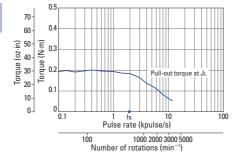
Model number		Holding torque at 2-phase energization	Rated current	Wiring resistance	Winding inductance	Rotor inertia	Mass (Weight)	Motor length (L)
Single shaft	Dual shaft	[N·m (oz·in) min.]	A/phase	Ω /phase	mH/phase	$[\times 10^{-4} \text{kg} \cdot \text{m}^2 (\text{oz} \cdot \text{in}^2)]$	[kg (lbs)]	mm (in)
103H5205-0440	103H5205-0410	0.2 (28.32)	1.2	2.4	2.3	0.036 (0.20)	0.23 (0.51)	33 (1.25)
103H5208-0440	103H5208-0410	0.3 (42.48)	1.2	2.9	3.4	0.056 (0.31)	0.29 (0.64)	39 (1.54)
103H5209-0440	103H5209-0410	0.32 (45.31)	1.2	3	3.9	0.062 (0.34)	0.31 (0.68)	41 (1.61)
103H5210-0440	103H5210-0410	0.37 (52.39)	1.2	3.3	3.4	0.074 (0.40)	0.37 (0.82)	48 (1.89)

Motor cable: Model No.4835710-1

Characteristics diagram

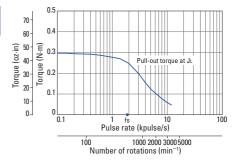
103H5205-0440 103H5205-0410

Constant current circuit Source voltage: 24 VDC Operating current: 1.2 A/phase, 2-phase energization (full-step)
JL=[0.94 × 10⁻⁴kg·m² (5.14
oz·in²) use the rubber coupling] fs: Maximum self-start frequency when not loaded



103H5208-0440 103H5208-0410

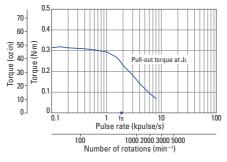
Constant current circuit Constant current circuit Source voltage: 24 VDC Operating current: 1.2 A/phase, 2-phase energization (full-step) J.=[0.94 × 10-4kg·m² (5.14 oz·in²) use the rubber coupling coupling] fs: Maximum self-start frequency when not loaded



103H5209-0440 103H5209-0410

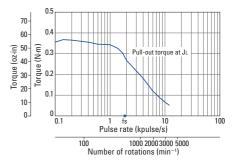
Constant current circuit Constant current circuit Source voltage: 24 VDC Operating current: 1.2 A/phase, 2-phase energization (full-step) J:=[0.94 × 10-4kg-m² (5.14 oz-in²) use the rubber coupling] fs: Maximum self-start



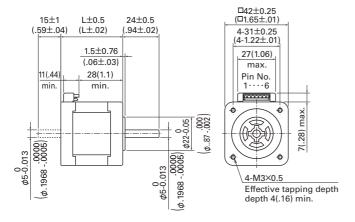


103H5210-0440 103H5210-0410

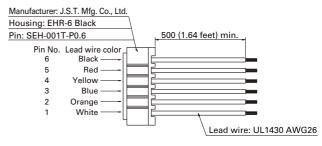
Constant current circuit Constant current circuit Source voltage: 24 VDC Operating current: 1.2 A/phase, 2-phase energization (full-step) J_L=[0.94 × 10⁻⁴kg·m² (5.14 oz·in²) use the rubber coupling] fs: Maximum self-start frequency when not



Dimensions [Unit: mm (inch)]



Option (sold separately): Motor cable Model number: 4835710-1



This driver-motor cable is for motor model numbers 103H52 -04

Internal wiring



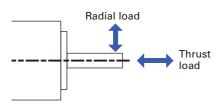
Compatible drivers

Model number: US1D200P10

Operating current select switch setting: 8

The characteristics diagram shown above is from our experimental circuit.

Allowable Radial/Thrust Load



	Madal	Distance f	Thrustland			
Flange size	Model number	0	5	10	15	- Thrust load - N (lbs)
	Hullibel	Radial load	: N (lbs)			11 (103)
14 mm sq. (0.55 in sq.)	SH2141	10 (2.25)	11 (2.47)	13 (2.92)	-	0.7 (0.16)
28 mm sq. (1.10 in sq.)	SH228 □	42 (9)	48 (10)	56 (12)	66 (14)	3 (0.67)
35 mm sq. (1.38 in sq.)	SH353 🗌	40 (8)	50 (11)	67 (15)	98 (22)	10 (2.25)
42 mm sq. (1.65 in sq.)	103H52 □□ SH142 □	22 (4)	26 (5)	33 (7)	46 (10)	10 (2.25)
50 mm sq. (1.97 in sq.)	103H670 🗌	71 (15)	87 (19)	115 (25)	167 (37)	15 (3.37)
56 mm sq. (2.20 in sq.)	103H712 🗌	52 (11)	65 (14)	85 (19)	123 (27)	15 (3.37)
56 IIIII Sq. (2.20 III Sq.)	103H7128	85 (19)	105 (23)	138 (31)	200 (44)	15 (3.37)
60 mm sq. (2.36 in sq.)	103H782 🗌	70 (15)	87 (19)	114 (25)	165 (37)	20 (4.50)
00 IIIII Sq. (2.30 III Sq.)	SH160 □	70 (15)	07 (13)	114 (23)	105 (37)	15 (3.37)
86 mm sq. (3.39 in sq.)	SM286 ☐ SH286 ☐	167 (37)	193 (43)	229 (51)	280 (62)	60 (13.488)
86 mm sq. (3.39 in sq.)	103H822 🗌	191 (43)	234 (53)	301 (68)	421 (95)	60 (13.488)
¢ 106 mm (¢ 4.17 in)	103H8922 🗌	321 (72)	356 (79)	401 (90)	457 (101)	100 (22.48)

Internal Wiring and Rotation Direction

Unipolar winding

Connector type Model number: 103H52

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 numbe	r		
		(1.6)	(5)	(3)	(4)	(2)
	1	+	_	_		
Exciting order	2	+		_	-	
order	3	+			_	_
	4	+	_			-

Connector type Model number: 103H782

Internal wire connection

() connector pin number



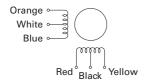
Direction of motor rotation

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 number							
		(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 color				
		White & black	Red	Blue	Yellow	Orange
	1	+	-	-		
Exciting	2	+		_	_	
order	3	+			_	_
	4	+	-			_

Bipolar winding

Connector type

Internal wire connection

() connector pin number, terminal block number



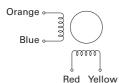
Direction of motor rotation

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 number,	terminal blo	ck number
		(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 wire color					
		Red	Blue	Yellow	Orange		
	1	_	-	+	+		
Exciting	2	+	_	_	+		
Exciting order	3	+	+	-	_		
	4	_	+	+	_		

General Specifications

	CU2141	SH228 🗆	SH353 🗆	SS242 🗆	SH142 🗆	103H52	SS250 🗆	103H67	103H712
Motor model number	5ПZ 14 I	ЗП220 🗆	эпэээ 🗆	33242 🗆	3П 142 🗆	103ПЭД 🗆 🗆	33230 🗆	103Пб/ 🗆	_ 103П/12 _
Type Operating ambient temperature	- 10°C to +	50°C							
Conversation temperature									
•		20 to 90% RH (no condensation)							
		5 to 95% RH (no condensation)							
Operation altitude		1 (no condens		vol					
•					1 52 mm (10	to 70 Hz) vib	ration acceler	ration 150 m	/e² (70 to 500
Vibration resistance	Hz), sweep t	(ibration frequency 10 to 500 Hz, total amplitude 1.52 mm (10 to 70 Hz), vibration acceleration 150 m/s² (70 to 500 lz), sweep time 15 min/cycle, 12 sweeps in each X, Y and Z direction.							
Impact resistance						ee times for X	, Y, and Z axe	s each, 18 tir	nes in total.
Insulation class	Class B (+13	80°C)							
Withstandable voltage	minute betw	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		emperature a	nd humidity,	, not less thar	n 100 MΩ be	tween windir	ng and frame	by 500 VDC	megger.
Protection grade	IP40								
Winding temperature rise	80 K max. (E	Based on San	yo Denki sta	ndard)					
Static angle error	± 0.09°				± 0.054°	± 0.09°			
	0.075 mm	0.075 mm	0.075 mm	0.075 mm	0.075 mm (0.003 in)	0.075 mm	0.075 mm (0.003 in)	0.075 mm	0.075 mm
Thrust play *1	(0.003 in) max.	(0.003 in) max.	(0.003 in) max.	(0.003 in) max.	max.	(0.003 in)	max.	(0.003 in)	(0.003 in)
······································	(load: 0.35 N		(load: 5 N	(load: 4 N	(load: 5 N	(load: 5 N (1.12 lbs))	(load: 4 N	(load: 10 N (2.25 lbs))	(load: 10 N (2.25 lbs))
	(0.08 lbs))	(0.34 lbs))	(1.12 lbs))	(0.9 lbs))	(1.12 lbs))	(1.12 105//	(0.9 lbs))	(2.23 103))	(2.25 105))
Radial play *2	· ·	0.001 in) max	. (load: 5 N (1.12 lbs))					
Shaft runout	0.025 mm (0	· · · · · · · · · · · · · · · · · · ·							
Concentricity of mounting pilot relative to shaft	φ 0.05 mm (φ 0.002 in)	φ 0.05 mm (φ 0.002 in)	ϕ 0.075 mm (ϕ 0.003 in)	φ 0.075 mm (φ 0.003 in)	φ 0.05 mm (φ 0.002 in)	φ 0.05 mm (φ 0.002 in)	φ 0.075 mm (φ 0.003 in)	φ 0.075 mm (φ 0.003 in	
Squareness of mounting		0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.1 mm	0.075 mm	0.075 mm
surface relative to shaft	(0.004 in)	(0.004 in)	(0.004 in)	(0.004 in)	(0.004 in)	(0.004 in)	(0.004 in)	(0.003 in)	(0.003 in)
Direction of motor mounting	Can be freel								
		-							
Motor model number	SH160 🗆	103H78 🗆	SH286 🗆	103H8922	SM286 🗆	103H712 -6	0 103H822 CE Mod		03H8922 ☐ -63 ☐ 1 E Model
Motor model number Type	SH160	103H78 □□	SH286 🗆	103H8922			CE Mod		
_	-		SH286 🗆	103H8922		CE Model uous operation	CE Mod		
Туре	_ _ 10℃ to +	50°C	SH286 🗆	103H8922 <u></u>	S1 (contin	CE Model uous operation + 40°C	CE Mod		
Type Operating ambient temperature	- - 10°C to + - 20°C to +	50℃ 65℃		103H8922 [S1 (contin - 10°C to - 20°C to	CE Model uous operation + 40°C + 60°C	on)	el C	
Type Operating ambient temperature Conversation temperature	- - 10°C to + - 20°C to + 20 to 90% R	50°C 65°C H (no conden	nsation)	103H8922	S1 (contin - 10°C to - 20°C to 95% max.:	CE Model uous operation + 40°C	CE Mod	el C	
Type Operating ambient temperature Conversation temperature Operating ambient humidity	- - 10°C to + - 20°C to + 20 to 90% R 5 to 95% RH	50°C 65°C H (no conden	nsation)		S1 (contin - 10°C to - 20°C to 95% max.:	CE Model uous operation + 40°C + 60°C 40°C max., 5	CE Mod	el C	
Type Operating ambient temperature Conversation temperature Operating ambient humidity Conversation humidity	- 10°C to + - 20°C to + 20 to 90% R 5 to 95% RH 1000 m (328 Vibration fre	50°C 65°C H (no conder I (no condens 0 feet) max. a	nsation) sation) above sea le	vel al amplitude 1	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.:	CE Model uous operation + 40°C + 60°C 40°C max., 5 60°C max. (n	CE Mod on) 7% max.: 50° o condensati	el C	E Model
Type Operating ambient temperature Conversation temperature Operating ambient humidity Conversation humidity Operation altitude	- 10°C to + - 20°C to + 20 to 90% R 5 to 95% RH 1000 m (328 Vibration fre 500 Hz), swe	50°C 65°C H (no condens (no condens to feet) max. a equency 10 to eep time 15 m	nsation) sation) above sea le 5 500 Hz, tota nin/cycle, 12	vel al amplitude 1 sweeps in ea	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 ch X, Y and 2 ve applying	CE Model uous operation + 40°C + 60°C 40°C max., 5 60°C max. (n to 70 Hz), vibits direction.	CE Mod on) 7% max.: 50°0 o condensati	c max., on)	E Model
Type Operating ambient temperature Conversation temperature Operating ambient humidity Conversation humidity Operation altitude Vibration resistance	- 10°C to + - 20°C to + 20 to 90% R 5 to 95% RH 1000 m (328 Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13	50°C 65°C H (no condens (no condens) (no feet) max. a equency 10 to eep time 15 m acceleration for	nsation) sation) above sea le 5 500 Hz, tota nin/cycle, 12 or 11 ms with	vel al amplitude 1 sweeps in ea n half-sine wa	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.:	CE Model uous operation + 40°C + 60°C 40°C max., 5 60°C max. (n to 70 Hz), vibits direction.	7% max.: 50% o condensati	c max., on)	E Model
Type Operating ambient temperature Conversation temperature Operating ambient humidity Conversation humidity Operation altitude Vibration resistance Impact resistance	- 10°C to + - 20°C to + 20 to 90% R 5 to 95% RH 1000 m (328 Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal tem ure with 1000	50°C 65°C H (no condens) (no co	nsation) sation) above sea let 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail- applied for one	vel al amplitude 1 sweeps in ea n half-sine wa	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 ch X, Y and 2 ve applying 1 Class F (+155°C)	CE Model uous operation + 40°C + 60°C 40°C max., 5° 60°C max. (n to 70 Hz), vibit direction.	CE Mode on) 7% max.: 50°C o condensation acceleration ac	C max., on) ration 150 m axes each, 18	E Model 1/s² (70 to 3 times in total.
Type Operating ambient temperature Conversation temperature Operating ambient humidity Conversation humidity Operation altitude Vibration resistance Impact resistance Insulation class Withstandable	- 10°C to + - 20°C to + 20 to 90% R 5 to 95% RH 1000 m (328 Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal tem ure with 1000 minute between	50°C 65°C H (no condens (no condens (no tondens) (no tond	nsation) sation) above sea leto 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no failapplied for one ng and frame.	vel al amplitude 1 sweeps in ea n half-sine wa At normal 1 applied for	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 ch X, Y and ive applying (h155°C) Class F (+155°C) temperature one minute	CE Model uous operation + 40°C + 60°C 40°C max., 5 60°C max. (n to 70 Hz), vibite direction. three times for Class B (+) and humidity	7% max.: 50% o condensation acceler rx, Y and Z at 130°C)	c max., on) ration 150 m axes each, 18 with 1500 VA nd frame.	E Model a/s² (70 to 3 times in total. C @ 50/60 Hz
Type Operating ambient temperature Conversation temperature Operating ambient humidity Conversation humidity Operation altitude Vibration resistance Impact resistance Insulation class Withstandable voltage	- 10°C to + - 20°C to + 20 to 90% R 5 to 95% RH 1000 m (328 Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal tem ure with 1000 minute between	50°C 65°C H (no condens (no condens (no tondens) (no tond	nsation) sation) above sea leto 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no failapplied for one ng and frame.	vel al amplitude 1 sweeps in ea n half-sine wa At normal 1 applied for	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 ch X, Y and ive applying (h155°C) Class F (+155°C) temperature one minute	CE Model uous operation + 40°C + 60°C 40°C max., 5 60°C max. (n to 70 Hz), vibing direction. three times for Class B (+) and humidity between motions.	7% max.: 50% o condensation acceler rx, Y and Z at 130°C)	c max., on) ration 150 m axes each, 18 with 1500 VA nd frame.	E Model a/s² (70 to 3 times in total. C @ 50/60 Hz
Type Operating ambient temperature Conversation temperature Operating ambient humidity Conversation humidity Operation altitude Vibration resistance Impact resistance Insulation class Withstandable voltage Insulation resistance	- 10°C to + - 20°C to + 20 to 90% R 5 to 95% RH 1000 m (328 Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal tem ure with 1000 minute betwee At normal te	50°C 65°C H (no condens (no condens (no condens (no tondens (no condens (no co	nsation) sation) above sea let 0 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail- applied for one ng and frame. nd humidity,	vel al amplitude 1 sweeps in ea an half-sine wa At normal 1 applied for , not less ther	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 ch X, Y and ive applying (+155°C)) temperature one minute in 100 MΩ be	CE Model uous operation + 40°C + 60°C 40°C max., 5 60°C max. (n to 70 Hz), vibing direction. three times for Class B (+) and humidity between motions.	7% max.: 50% o condensation acceler rx, Y and Z at 130°C)	c max., on) ration 150 m axes each, 18 with 1500 VA nd frame.	E Model a/s² (70 to 3 times in total. C @ 50/60 Hz
Type Operating ambient temperature Conversation temperature Operating ambient humidity Conversation humidity Operation altitude Vibration resistance Impact resistance Insulation class Withstandable voltage Insulation resistance Protection grade Winding temperature rise Static angle error	- 10°C to + - 20°C to + 20 to 90% R 5 to 95% RH 1000 m (328 Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal tem ure with 1000 minute betwee At normal te	50°C 65°C H (no condens (no condens (no condens (no tondens (no condens (no co	nsation) sation) above sea let 0 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail- applied for one ng and frame. nd humidity,	vel al amplitude 1 sweeps in ea an half-sine wa At normal 1 applied for , not less ther	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 ch X, Y and ive applying (+155°C)) temperature one minute in 100 MΩ be	CE Model uous operation + 40°C + 60°C 40°C max., 5 60°C max. (n to 70 Hz), vibing direction. three times for Class B (+) and humidity between motions.	7% max.: 50% o condensation acceler rx, Y and Z at 130°C)	c max., on) ration 150 m axes each, 18 with 1500 VA nd frame.	E Model a/s² (70 to 3 times in total. C @ 50/60 Hz
Type Operating ambient temperature Conversation temperature Operating ambient humidity Conversation humidity Operation altitude Vibration resistance Impact resistance Insulation class Withstandable voltage Insulation resistance Protection grade Winding temperature rise	- 10°C to + 20°C to + 20 to 90% R 5 to 95% RH 1000 m (328 Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal temure with 1000 minute betwee At normal te IP40 80 K max. (E ± 0.054°	50°C 65°C H (no condens (no condens (no condens (no feet) max. (acquency 10 to (acceleration for (80°C) (apperature and ho (VAC @50/60 Hz (accelerature and (accelerature accelerature accelerature accelerature accelerature accelerature accelerature acceleration)	nsation) sation) above sea let 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail- applied for one ng and frame. nd humidity, yo Denki sta	vel al amplitude 1 sweeps in ea n half-sine wa At normal 1 applied for not less ther	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 ch X, Y and ive applying (+155°C)) temperature one minute in 100 MΩ be	CE Model uous operation + 40°C + 60°C 40°C max., 5 60°C max. (n to 70 Hz), vibing direction. three times for Class B (+) and humidity between motions.	7% max.: 50% o condensation acceler rx, Y and Z at 130°C)	c max., on) ration 150 m axes each, 18 with 1500 VA nd frame.	E Model a/s² (70 to 3 times in total. C @ 50/60 Hz
Type Operating ambient temperature Conversation temperature Operating ambient humidity Conversation humidity Operation altitude Vibration resistance Impact resistance Insulation class Withstandable voltage Insulation resistance Protection grade Winding temperature rise Static angle error	- 10°C to + 20°C to + 20 to 90% R 5 to 95% RH 1000 m (328 Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal temure with 1000 minute betwee At normal te IP40 80 K max. (E ± 0.054°	50°C 65°C H (no condens to feet) max. a sequency 10 to seep time 15 m acceleration for the condens to feet) max. a sequency 10 to seep time 15 m acceleration for the condens to feet the	nsation) sation) above sea let 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail- applied for one ng and frame. nd humidity, yo Denki sta	vel al amplitude 1 sweeps in ea n half-sine wa At normal 1 applied for not less ther	S1 (contin – 10°C to – 20°C to 95% max.: 35% max.: 1.52 mm (10 ch X, Y and 2 ch X, Y	CE Model uous operation + 40°C + 60°C 40°C max., 5 60°C max. (n to 70 Hz), vibing direction. three times for Class B (+) and humidity between motions.	7% max.: 50% o condensation acceler rx, Y and Z at 130°C)	c max., on) ration 150 m axes each, 18 with 1500 VA nd frame. by 500 VDC	E Model a/s² (70 to 3 times in total. C @ 50/60 Hz
Type Operating ambient temperature Conversation temperature Operating ambient humidity Conversation humidity Operation altitude Vibration resistance Impact resistance Insulation class Withstandable voltage Insulation resistance Protection grade Winding temperature rise Static angle error Thrust play *1 Radial play *2 Shaft runout	- 10°C to + 20°C to + 20 to 90% R 5 to 95% RH 1000 m (328 Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal tem ure with 1000 minute betwee At normal te IP40 80 K max. (E ± 0.054° 0.075 mm (0.001 in) (load: 5 N	50°C 65°C H (no condens (no condens (no feet) max. a equency 10 to eep time 15 m acceleration fo (0°C) perature and he (VAC @50/60 Hz en motor windin emperature a Based on San ± 0.09° 0.003 in) max. 0.025 mm (0.001 in) (load: 5 N (1.12 lbs))	usation) sation) above sea let 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail- applied for one ng and frame. nd humidity, yo Denki sta (load: 10 N 0.025 mm (0.001 in) (load: 5 N	At normal applied for not less ther (0.025 mm (0.001 in) (10 at 10 N)	S1 (contin – 10°C to – 20°C to 95% max.: 35% max.: 1.52 mm (10 ch X, Y and 2 ve applying Class F (+155°C) temperature one minute in 100 MΩ be IP43	CE Model uous operation + 40°C + 60°C 40°C max., 5 60°C max. (n to 70 Hz), vibits direction. three times for Class B (+) and humidity between mote tween windir 0.025 mm (0.001 in) (load: 5 N	CE Mod On) 7% max.: 50°C o condensati ration acceler r X, Y and Z a 130°C) r, no failure v ror winding a ng and frame 0.025 (0.001 (load:	c max., on) ration 150 m axes each, 18 with 1500 VA nd frame. by 500 VDC	E Model a/s² (70 to 3 times in total. C @ 50/60 Hz megger. .025 mm 0.001 in) oad: 10 N
Type Operating ambient temperature Conversation temperature Operating ambient humidity Conversation humidity Operation altitude Vibration resistance Impact resistance Insulation 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°C to + 20°C to + 20°C to + 20°C to + 20 to 90% R 5 to 95% RH 1000 m (328 Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal temure with 1000 minute betwee At normal te IP40 80 K max. (E ± 0.054° 0.075 mm (0.001 in) (load: 5 N (1.12 lbs)) 0.025 mm (0.005 mm (0.005 mm))	50°C 65°C H (no condent (no co	usation) sation) above sea let 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail- applied for one ng and frame. nd humidity, yo Denki sta (load: 10 N 0.025 mm (0.001 in) (load: 5 N (1.12 lbs))	vel al amplitude 1 sweeps in ea n half-sine wa At normal applied for not less ther (2.25 lbs)) 0.025 mm (0.001 in) (load: 10 N (2.25 lbs))	S1 (contin – 10°C to – 20°C to 95% max.: 35% max.: 35% max.: 1.52 mm (10 ch X, Y and ive applying Class F (+155°C) temperature one minute in 100 MΩ be IP43 0.025 mm (0.001 in) (load: 5 N (1.12 lbs))	CE Model uous operation + 40°C + 60°C 40°C max., 5 60°C max. (n to 70 Hz), vibing direction. three times for the company of	CE Mod on) 7% max.: 50°0 o condensati ration acceler or X, Y and Z a 130°C) 7, no failure v or winding a ng and frame 0.025 (0.001 (load: (1.12 l	el C C max., on) ration 150 m exes each, 18 with 1500 VA nd frame. by 500 VDC mm 0 in) ((5 N () bs)) (3	E Model A/s² (70 to B times in total. C @ 50/60 Hz megger. .025 mm001 in) oad: 10 N 2.25 lbs))
Type Operating ambient temperature Conversation temperature Operating ambient humidity Conversation humidity Operation altitude Vibration resistance Impact resistance Insulation 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 Squareness of mounting	- 10°C to + - 20°C to + 20 to 90% R 5 to 95% RH 1000 m (328 Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal tem ure with 1000 minute betwee At normal te IP40 80 K max. (Ε ± 0.054° 0.075 mm (0.001 in) (load: 5 N (1.12 lbs)) 0.025 mm (0.025 mm (0.001 in) (1.001 in) (1.001 in) (1.001 in) (1.001 in) (1.001 in) (1.001 in)	50°C 65°C H (no condens) (no condens) (no feet) max. (acquency 10 to be per time 15 m acceleration for 80°C) (perature and hy VAC @50/60 Hz en motor winding emperature a Based on San \$\pm\$ 0.003 in) max. 0.005 mm (0.001 in) (1.12 lbs) 0.001 in) 0.001 in	usation) sation) above sea let 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail- applied for one ng and frame. nd humidity, yo Denki sta (load: 10 N 0.025 mm (0.001 in) (load: 5 N (1.12 lbs))	vel al amplitude 1 sweeps in ea an half-sine wa At normal 1 applied for , not less ther (2.25 lbs)) 0.025 mm (0.001 in) (load: 10 N (2.25 lbs))	S1 (contin – 10°C to – 20°C to 95% max.: 35% max.: 35% max.: 1.52 mm (10 ch X, Y and ive applying Class F (+155°C)) temperature one minute in 100 MΩ be IP43 0.025 mm (0.001 in) (load: 5 N (1.12 lbs))	CE Model uous operation + 40°C + 60°C 40°C max., 5 60°C max. (n to 70 Hz), vibits direction. three times for the company of	CE Mod on) 7% max.: 50°0 o condensati ration acceler or X, Y and Z a 130°C) 7, no failure word with the condition of the c	el C C max., on) ration 150 m exes each, 18 with 1500 VA nd frame. by 500 VDC mm 0 in) ((5 N () bs)) (3	E Model a/s² (70 to 3 times in total. C @50/60 Hz megger. .025 mm 0.001 in) oad: 10 N 2.25 lbs))
Type Operating ambient temperature Conversation temperature Operating ambient humidity Conversation humidity Operation altitude Vibration resistance Impact resistance Insulation 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°C to + 20°C to 95% RH 1000 m (328 Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal temure with 1000 minute betwee At normal tem 1P40 80 K max. (E± 0.054° 0.075 mm (0.001 in) (load: 5 N (1.12 lbs)) 0.025 mm (0.001 mm (0.0075 mm (0.001 mm)) (load: 5 N (1.12 lbs)) 0.025 mm (0.001 mm) (0.001 mm) (0.001 in)	50°C 65°C H (no condent (no co	asation) above sea lee 5 500 Hz, tota ain/cycle, 12 or 11 ms with umidity, no fail- applied for one ng and frame. nd humidity, yo Denki sta (load: 10 N 0.025 mm (0.001 in) (load: 5 N (1.12 lbs))	vel al amplitude 1 sweeps in ea half-sine wa At normal applied for not less ther (2.25 lbs)) 0.025 mm (0.001 in) (load: 10 N (2.25 lbs)) 0.1 mm (0.004 in)	S1 (contin – 10°C to – 20°C to 95% max.: 35% max.: 35% max.: 1.52 mm (10 ch X, Y and ive applying Class F (+155°C) temperature one minute in 100 MΩ be IP43 0.025 mm (0.001 in) (load: 5 N (1.12 lbs))	CE Model uous operation + 40°C + 60°C 40°C max., 5 60°C max. (n to 70 Hz), vibing direction. three times for the company of	CE Mod on) 7% max.: 50°0 o condensati ration acceler or X, Y and Z a 130°C) 7, no failure v or winding a ng and frame 0.025 (0.001 (load: (1.12 l	el C C max., on) ration 150 m exes each, 18 with 1500 VA nd frame. by 500 VDC mm 0 in) ((5 N () bs)) (3	E Model A/s² (70 to B times in total. C @ 50/60 Hz megger. .025 mm001 in) oad: 10 N 2.25 lbs))

■ Safety standards

Model Number: SM286 $\ \square$ CE/UL marked models

CE	Standard category		Applicable standard						
(TÜV)	Low-voltage directive	es	EN60034-1, EN60034-5						
	Acquired standards Applicable stand		File No.						
UL	UL	UL1004-1, UL1004-6	E179832						
	UL for Canada	CSA C22.2 No.100	E1/9032						
Model N	Model Number: 103H712 ☐ -6 ☐ 0, 103H822 ☐ -6 ☐ 0, 103H8922 ☐ -63 ☐ 1 CE marked model								
CE	Standard category		Applicable standard						
(TÜV)	Low-voltage directive	es	EN60034-1, EN60034-5						

^{*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.

