

# **56** mm sq. (2.20 inch sq.)

1.8° /step RoHS

Bipolar winding, Lead wire type

Unipolar winding, Lead wire type p. 68

#### Customizing

Hollow Shaft modification Decelerator Encoder

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

#### Bipolar winding, Lead wire type

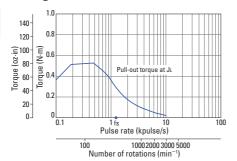
-										
Model number		Holding torque at 2-phase energization	Rated current	Wiring resistance	Winding inductance	Rotor inertia	Mass (Weight)	Motor length (L)	Shaft diameter (D)	Dcut thickness (T)
Single shaft	Dual shaft	[N·m (oz·in) min.]	A/phase	Ω /phase	mH/phase	$[\times 10^{-4} \text{kg} \cdot \text{m}^2 \text{ (oz} \cdot \text{in}^2)]$	[kg (lbs)]	mm (in)	mm (in)	mm (in)
103H7121-5640	103H7121-5610	0.55 (77.9)	1	4.3	14.5	0.1 (0.55)	0.47 (1.04)	41.8 (1.65)	φ 6.35 ( φ 0.25)	5.8 (0.23)
103H7121-5740	103H7121-5710	0.55 (77.9)	2	1.1	3.7	0.1 (0.55)	0.47 (1.04)	41.8 (1.65)	φ 6.35 ( φ 0.25)	5.8 (0.23)
103H7121-5840	103H7121-5810	0.55 (77.9)	3	0.54	1.74	0.1 (0.55)	0.47 (1.04)	41.8 (1.65)	φ 6.35 ( φ 0.25)	5.8 (0.23)
103H7123-5640	103H7123-5610	1.0 (141.6)	1	5.7	29.4	0.21 (1.15)	0.65 (1.43)	53.8 (2.12)	φ 6.35 ( φ 0.25)	5.8 (0.23)
103H7123-5740	103H7123-5710	1.0 (141.6)	2	1.5	7.5	0.21 (1.15)	0.65 (1.43)	53.8 (2.12)	φ 6.35 ( φ 0.25)	5.8 (0.23)
103H7123-5840	103H7123-5810	1.0 (141.6)	3	0.7	3.5	0.21 (1.15)	0.65 (1.43)	53.8 (2.12)	φ 6.35 ( φ 0.25)	5.8 (0.23)
103H7126-5640	103H7126-5610	1.6 (226.6)	1	7.7	34.6	0.36 (1.97)	0.98 (2.16)	75.8 (2.98)	φ 6.35 ( φ 0.25)	5.8 (0.23)
103H7126-5740	103H7126-5710	1.6 (226.6)	2	2	9.1	0.36 (1.97)	0.98 (2.16)	75.8 (2.98)	φ 6.35 ( φ 0.25)	5.8 (0.23)
103H7126-5840	103H7126-5810	1.6 (226.6)	3	0.94	4	0.36 (1.97)	0.98 (2.16)	75.8 (2.98)	φ 6.35 ( φ 0.25)	5.8 (0.23)
103H7128-5640	103H7128-5610	2.0 (283.2)	1	8.9	40.1	0.49 (2.68)	1.3 (2.87)	94.8 (3.73)	φ 8 ( φ 0.31)	7.5 (0.30)
103H7128-5740	103H7128-5710	2.0 (283.2)	2	2.3	10.4	0.49 (2.68)	1.3 (2.87)	94.8 (3.73)	φ 8 ( φ 0.31)	7.5 (0.30)
103H7128-5840	103H7128-5810	2.0 (283.2)	3	1.03	4.3	0.49 (2.68)	1.3 (2.87)	94.8 (3.73)	φ 8 ( φ 0.31)	7.5 (0.30)

#### Characteristics diagram

#### 103H7121-5640 103H7121-5610

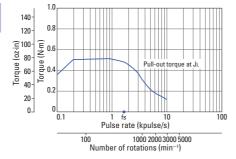
Constant current circuit Source voltage: 24 VDC Operating current: 1 A/phase, 2-phase energization (full-step) J<sub>L</sub>=[0.94 × 10<sup>-4</sup>kg·m² (5.14 oz·n²) use the rubber coupling!

coupling] fs: Maximum self-start frequency when not loaded



#### 103H7121-5840 103H7121-5810

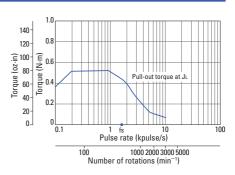
Constant current circuit
Source voltage: 24 VDC
Operating current:
3 A/phase, 2-phase
energization (full-step)
JL=[0.94 × 10-4kg·m² (5.14
oz·in²) use the rubber
coupling]
fs: Maximum self-start
frequency when pot frequency when not loaded



#### 103H7121-5740 103H7121-5710

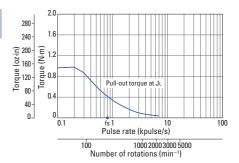
Constant current circuit Source voltage: 24 VDC Operating current: 2 A/phase, 2-phase energization (full-step) J<sub>L</sub>=[0.94 × 10<sup>-4</sup>kg·m² (5.14 oz·in²) use the rubber coupling! coupling] fs: Maximum self-start frequency when not

loaded



#### 103H7123-5640 103H7123-5610

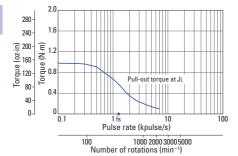
Constant current circuit Source voltage: 24 VDC Operating current: 1 A/phase, 2-phase energization (full-step) J.=[2.6 × 10\*kg·m² (14.22 oz-in²) use the rubber coupling] fs: Maximum self-start frequency when not loaded



### Characteristics diagram

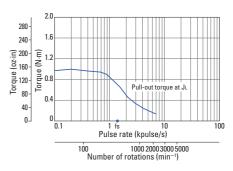
#### 103H7123-5740 103H7123-5710

Constant current circuit Source voltage: 24 VDC Operating current: 2 A/phase, 2-phase energization (full-step) J<sub>1</sub>=[2.6 × 10\*kg·m² (14.22 oz·n²) use the rubber coupling] fs: Maximum self-start frequency when not loaded



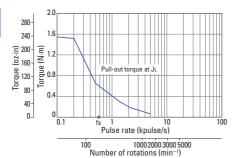
#### 103H7123-5840 103H7123-5810

Constant current circuit Source voltage: 24 VDC Operating current: 3 A/phase, 2-phase energization (full-step) J.=[2.6 × 10°4kg·m² (14.22 oz·n²) use the rubber coupling] fs: Maximum self-start frequency when not loaded



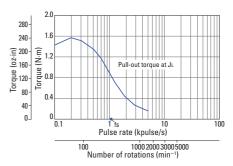
#### 103H7126-5640 103H7126-5610

Constant current circuit Source voltage: 24 VDC Operating current: 1 A/phase, 2-phase energization (full-step) J:=[2.6 × 10\*kg·m² (14.22 oz·n²) use the rubber coupling] fs: Maximum self-start frequency when not loaded



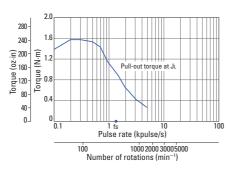
#### 103H7126-5740 103H7126-5710

Constant current circuit Source voltage: 24 VDC Operating current: 2 A/phase, 2-phase energization (full-step) J.=[2.6 × 10\*kg·m² (14.22 oz·in²) use the rubber coupling] fs: Maximum self-start frequency when not loaded



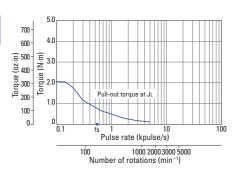
#### 103H7126-5840 103H7126-5810

Constant current circuit Source voltage: 24 VDC Operating current: 3 A/phase, 2-phase energization (full-step) J.=[2.6 × 10°4kg·m² (14.22 oz·in²) use the rubber coupling] fs: Maximum self-start frequency when not loaded



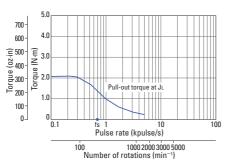
#### 103H7128-5640 103H7128-5610

Constant current circuit Source voltage: 24 VDC Operating current: 1 A/phase, 2-phase energization (full-step) J:=[7.4 × 10-kg·m² (40.46 oz-in²) use the rubber coupling] fs: Maximum self-start frequency when not loaded



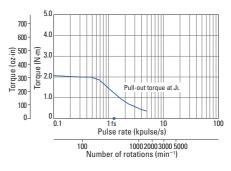
#### 103H7128-5740 103H7128-5710

Constant current circuit Source voltage: 24 VDC Operating current: 2 A/phase, 2-phase energization (full-step) J.=[7.4 × 10-4kg·m² (40.46 oz·in²) use the rubber coupling] fs: Maximum self-start frequency when not loaded

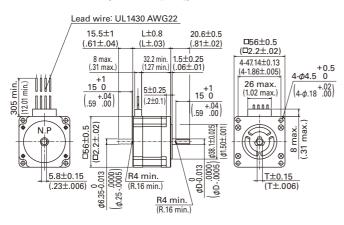


#### 103H7128-5840 103H7128-5810

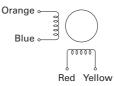
Constant current circuit Source voltage: 24 VDC Operating current: 3 A/phase, 2-phase energization (full-step) J<sub>1</sub>=[7.4 × 10-\*8g·m² (40.46 oz·n2) use the rubber coupling] fs: Maximum self-start frequency when not loaded



#### **Dimensions** [Unit: mm (inch)]



#### Internal wiring



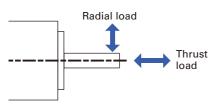
#### Compatible drivers

Driver is not included.

If you require assistance finding a driver, contact us for details.

Please use bipolar driver BS1D200P10 for motor 103H7126-5740

# Allowable Radial/Thrust Load



	Model	Distance f	- Thrust load				
Flange size	number	0	5	10	15	- N (lbs)	
	Hullibel	Radial load	d : N (lbs)			- 14 (105)	
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 mm sq. (2.20 m sq.)	103H7128	85 (19)	105 (23)	138 (31)	200 (44)	15 (3.37)	
60 mm sq. (2.36 in sq.)	103H782 🗌	70 (15)	07 (40)	114 (05)	165 (37)	20 (4.50)	
00 mm sq. (2.30 m sq.)	SH160 🗌	70 (15)	87 (19)	114 (25)	100 (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



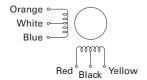
#### Direction of motor rotation

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.

		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



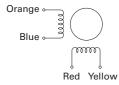
#### Direction of motor rotation

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

			C		4 1   -   -	
			Connector	pin number,	terminal bic	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 order	2	+	_	_	+			
order	3	+	+	-	-			
	4	_	+	+	-			

# **General Specifications**

Mataumanalahuumahan	CHOMAN	CHOOL	CHOEO	CC040 □	C11440 🗆	4001150	00000	4001107	40011740	
Motor model number	SH2141	SH228 _	SH353 🗌	SS242	SH142 🗌	103H52 🗆 🗆	SS250 🗌	103H67 🗆	103H712 🗌	
Type	10°C to 1	F0°C								
Operating ambient temperature	_									
Conversation temperature	- 20°C to +65°C									
Operating ambient humidity		20 to 90% RH (no condensation) 5 to 95% RH (no condensation)								
Conversation humidity										
Operation altitude		1 feet) max.			1.50 /10	. =0.11 \ ''		450		
Vibration resistance				amplitude ' eps in each >		to 70 Hz), vibi	ration acceler	ation 150 m/	's² (70 to 500	
Impact resistance						ee times for X	V and 7 ave	s each 18 tim	es in total	
Insulation class		_	i ii iii wittii	ilaii Silic Wave	o applying till	co times for A	, 1, una 2 uxo.	s cacii, io tiii	ico ili totali	
Withstandable voltage	At normal te	Class B (+130°C)  At normal temperature and humidity, no failure with 500 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 te	emperature a	nd humidity,	, not less tha	n 100 M $\Omega$ be	tween windir	ig and frame	by 500 VDC	megger.	
Protection grade	IP40									
Winding temperature rise	80 K max. (E	Based on San	iyo 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	0.075 mm	0.075 mm	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.	(0.003 in) max.	(0.003 in)	(0.003 in) max.	(0.003 in)	(0.003 in)	
Till dat play	(load: 0.35 N		(load: 5 N	(load: 4 N	(load: 5 N	(load: 5 N	(load: 4 N	(load: 10 N	(load: 10 N	
	(0.08 lbs))	(0.34 lbs))	(1.12 lbs))	(0.9 lbs))	(1.12 lbs))	(1.12 lbs))	(0.9 lbs))	(2.25 lbs))	(2.25 lbs))	
Radial play *2	0.025 mm (0	0.001 in) max	. (Ioad: 5 N ( <i>'</i>	1.12 lbs))						
Shaft runout	0.025 mm (0									
Concentricity of mounting	φ 0.05 mm	φ 0.05 mm	φ 0.075 mm	φ 0.075 mm	φ 0.05 mm	φ 0.05 mm	φ 0.075 mm	φ 0.075 mm		
pilot relative to shaft Squareness of mounting		( φ 0.002 in) 0.1 mm	( φ 0.003 in) 0.1 mm	( φ 0.003 in) 0.1 mm	( φ 0.002 in) 0.1 mm	( φ 0.002 in) 0.1 mm	( φ 0.003 in) 0.1 mm	( φ 0.003 in) 0.075 mm	( φ 0.003 in) 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)	(0.003 in)	(0.003 in)	
Direction of motor mounting					(0.00 :)	(0.00 :)	(0.00 :)	1 (0.000)	(0.000)	
	Can be freely mounted vertically or horizontally									
			,	,		1				
Motor model number	SH160 🗆	103H78 🗆	SH286 □	103H8922	SM286 □	103H712 -6	0 103H822 CE Mode		3H8922 ☐ -63 ☐ 1 • Model	
_	SH160			103H8922			CE Mode			
Motor model number  Type Operating ambient temperature	_	103H78 🗆		103H8922 [		CE Model uous operation	CE Mode			
Туре	_ _ 10℃ to +	103H78 □□ 50°C		103H8922	S1 (contin	CE Model uous operation + 40°C	CE Mode			
Type Operating ambient temperature Conversation temperature	- - 10°C to + - 20°C to +	103H78 □□ 50°C 65°C	SH286 🗆	103H8922	S1 (contin - 10°C to - 20°C to	CE Model uous operation + 40°C + 60°C	CE Mode	el CE		
Type Operating ambient temperature Conversation temperature Operating ambient humidity	- - 10°C to + - 20°C to + 20 to 90% R	103H78 □□ 50°C 65°C H (no conder	SH286   msation)	103H8922	S1 (contin - 10°C to - 20°C to 95% max.:	CE Model uous operation + 40°C	CE Mode on) 7% max.: 50°C	C max.,		
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	103H78 □□  50°C  65°C  H (no condens)	SH286   nsation) sation)		S1 (contin - 10°C to - 20°C to 95% max.:	CE Model uous operation + 40°C + 60°C 40°C max., 5°	CE Mode on) 7% max.: 50°C	C max.,		
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	103H78 \( \text{\tint{\text{\tinit}\\ \text{\texi}\text{\text{\text{\texi{\text{\text{\texi{\text{\texi{\texi}\texit{\text{\tex{\text{\text{\text{\text{\text{\texi{\texi{\texi{\texi{\texi{\tex	SH286   nsation) sation) above sea le	vel	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.:	CE Model uous operation + 40°C + 60°C 40°C max., 5°	CE Mode on) 7% max.: 50°C o condensation	c max.,	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	103H78 □□  50°C  65°C  H (no condens (no condens (no feet) max.) (acquency 10 to be time 15 m	SH286   sation) sation) above sea le 5 500 Hz, tota nin/cycle, 12	vel al amplitude ' sweeps in ea	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), vibit direction.	CE Mode on)  7% max.: 50°C o condensation acceler	C max., on)	's² (70 to	
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	103H78 □□  50°C  65°C  H (no condens (no condens (no feet) max.) (acquency 10 to be time 15 m	SH286   sation) sation) above sea le 5 500 Hz, tota nin/cycle, 12	vel al amplitude ' sweeps in ea	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 1.52 mm (10 1.52 mm (20)	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 acceler	C max., on)	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	103H78 D  50°C 65°C H (no condens 0 feet) max. acquency 10 to	SH286   sation) sation) above sea le 5 500 Hz, tota nin/cycle, 12	vel al amplitude ' sweeps in ea	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 1.52 mm (10 1	CE Model uous operation + 40°C + 60°C 40°C max., 5' 60°C max. (n to 70 Hz), vibit direction.	7% max.: 50°C o condensation acceler	C max., on)	's² (70 to	
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	103H78 □□  50°C  65°C  H (no condens 0 feet) max. acquency 10 to be time 15 n acceleration for 10°C)  perature and he was 250/60 Hz	sation) sation) above sea leto 500 Hz, tota inicycle, 12 or 11 ms with umidity, no fail applied for one	vel al amplitude sweeps in ea n half-sine wa	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 1.52 mm (10 1.52 mm (10 1.52 mm (10 1.52 mm (10 1.52 mm (10 1.52 mm (10 1.55 mm (10 1	CE Model uous operation + 40°C + 60°C 40°C max., 5° 60°C max. (n to 70 Hz), vibit direction.	7% max.: 50°C o condensation acceler r X, Y and Z a 130°C )	C max., on) ration 150 m/	/s² (70 to times in total.	
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	103H78 □□  50°C  65°C  H (no condens 0 feet) max. is equency 10 to eep time 15 n acceleration for 0°C)  perature and he VAC @50/60 Hz en motor winding	sH286   sation) sation) above sea lee o 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail- applied for one ng and frame.	vel al amplitude sweeps in ea n half-sine wa	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 Inch X, Y and Inve applying of the continuous of th	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°C o condensation acceler r X, Y and Z at 130°C )	C max., on) ration 150 m/ axes each, 18	/s² (70 to times in total.	
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 between	103H78 □□  50°C  65°C  H (no condens 0 feet) max. is equency 10 to eep time 15 n acceleration for 0°C)  perature and he VAC @50/60 Hz en motor winding	sH286   sation) sation) above sea lee o 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail- applied for one ng and frame.	vel al amplitude sweeps in ea n half-sine wa	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 Inch X, Y and Inve applying of the continuous of th	CE Model  uous operation  + 40°C  + 60°C  40°C max., 5°  60°C max. (n  to 70 Hz), vibit direction.  three times for Class B (+')  and humidity	7% max.: 50°C o condensation acceler r X, Y and Z at 130°C )	C max., on) ration 150 m/ axes each, 18	/s² (70 to times in total.	
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 °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 tem IP40	103H78 □□  50°C  65°C  H (no condens 0 feet) max. is equency 10 to epe time 15 n acceleration for 0°C)  perature and h VAC @50/60 Hz en motor winding emperature a	sH286  sation) above sea leto 500 Hz, tota in/cycle, 12 or 11 ms with umidity, no fail applied for one ing and frame. Ind humidity,	vel al amplitude asweeps in eath half-sine was  At normal applied for not less the	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 ich X, Y and ive applying of the second of t	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°C o condensation acceler r X, Y and Z at 130°C )	C max., on) ration 150 m/ axes each, 18	/s² (70 to times in total.	
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	- 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	103H78 □□  50°C  65°C  H (no condens 0 feet) max. is equency 10 to epe time 15 n acceleration for 0°C)  perature and h VAC @50/60 Hz en motor winding emperature a	sH286  sation) above sea leto 500 Hz, tota in/cycle, 12 or 11 ms with umidity, no fail applied for one ing and frame. Ind humidity,	vel al amplitude asweeps in eath half-sine was  At normal applied for not less the	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 ich X, Y and ive applying of the second of t	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°C o condensation acceler r X, Y and Z at 130°C )	C max., on) ration 150 m/ axes each, 18	/s² (70 to times in total.	
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 °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°	103H78 □□  50°C  65°C  H (no conders (no condens) 0 feet) max. acquency 10 to be time 15 no acceleration for 10°C) perature and he was acceleration for 20°C) perature and he was acceleration for 30°C acceleration for 30°	SH286  sation) above sea leto 500 Hz, tota in/cycle, 12 or 11 ms with applied for one ing and frame. Ind humidity, invo Denki sta	vel al amplitude sweeps in ean half-sine wa  At normal applied for not less the	S1 (contin - 10°C to - 20°C to 95% max.: 35% max.: 1.52 mm (10 ich X, Y and ive applying of the second of t	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°C o condensation acceler r X, Y and Z at 130°C )	C max., on) ration 150 m/ axes each, 18	/s² (70 to times in total.	
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 temure with 2000 minute 500 minute	103H78 □□  50°C  65°C  H (no conders of the conders of feet) max. of feet) max. of feet ime 15 max. of fee	sH286  sation) sation sation) sation s	At normal applied for not less their (0.025 mm (0.001 in) (10ad: 10 N	S1 (contin – 10°C to – 20°C to 95% max.: 35% max.: 1.52 mm (10 och X, Y and 2 ove 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), vibit direction.  three times for class B (+')  and humidity between mote tween windir  0.025 mm (0.001 in) (load: 5 N	ration acceler x X, Y and Z a 130°C )  r, no failure wor winding and frame  0.025 r (0.001 (load:	c max., on)  ration 150 m/ exes each, 18  rith 1500 VAC nd frame.  by 500 VDC	's² (70 to times in total.  C @50/60 Hz  megger.  025 mm .001 in) bad: 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	- 10°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 temure with 2000 minute 500 minute	103H78 □□  50°C  65°C  H (no conders of the conders	sH286  sation) sation) sation) sation) sation) sabove sea le of 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail- applied for one ng and frame. nd humidity, nyo Denki sta  (load: 10 N 0.025 mm (0.001 in)	At normal applied for not less the ndard)  (2.25 lbs))  0.025 mm (0.001 in)	S1 (contin – 10°C to – 20°C to 95% max.: 35% max.: 1.52 mm (10 och X, Y and 2 oc	CE Model uous operation + 40°C + 60°C  40°C max., 5° 60°C max. (n  to 70 Hz), vibit direction. three times for class B (+') and humidity between mote tween windir  0.025 mm (0.001 in)	7% max.: 50°C o condensation acceler r X, Y and Z a 130°C )  7, no failure wor winding and g and frame  0.025 r (0.001	c max., on)  ration 150 m/ exes each, 18  rith 1500 VAC nd frame.  by 500 VDC	's² (70 to times in total. C @ 50/60 Hz megger.	
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	- 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 (0.0025 m	103H78 □□  50°C  65°C  H (no conders of the conders	sH286  sation) sation) sation) sation) sation) sabove sea le o 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail- applied for one ng and frame. nd humidity, nyo Denki sta . (load: 10 N 0.025 mm (0.001 in) (load: 5 N (1.12 lbs))	At normal applied for not less their (0.025 mm (0.001 in) (10ad: 10 N	S1 (contin – 10°C to – 20°C to 95% max.: 35% max.: 1.52 mm (10 och X, Y and 2 ove 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), vibit direction.  three times for class B (+')  and humidity between mote tween windir  0.025 mm (0.001 in) (load: 5 N	ration acceler x X, Y and Z a 130°C )  r, no failure wor winding and frame  0.025 r (0.001 (load:	c max., on)  ration 150 m/ exes each, 18  rith 1500 VAC nd frame.  by 500 VDC	is Model  is a second of the s	
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. (Ε ± 0.054° 0.075 mm (0.001 in) (10ad: 5 N (1.12 lbs)) 0.025 mm (0.0025 mm (0.0025 mm (0.001 in))	103H78 □□  50°C  65°C  H (no conders of the conders of feet) max. of feet) max. of feet ime 15 max. of fee	sH286  sation) sation) sation) sation) sation) sabove sea le o 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail- applied for one ng and frame. nd humidity, nyo Denki sta . (load: 10 N 0.025 mm (0.001 in) (load: 5 N (1.12 lbs))	At normal applied for not less their (0.025 mm (0.001 in) (10ad: 10 N	S1 (contin – 10°C to – 20°C to 95% max.: 35% max.: 1.52 mm (10 och X, Y and 2 ove 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), vibit direction.  three times for class B (+')  and humidity between mote tween windir  0.025 mm (0.001 in) (load: 5 N	ration acceler x X, Y and Z a 130°C )  r, no failure wor winding and frame  0.025 r (0.001 (load:	c max., on) ration 150 m/ axes each, 18 rith 1500 VAC nd frame. by 500 VDC  mm 0. in) (0 5 N (10 bs)) (2	is Model  is a second of the s	
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 surface relative to shaft	- 10°C to + - 20°C to + 20 to 90% RI 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 between 1000 minute betwe	103H78 □□  50°C  65°C  H (no conders of the conders of feet) max. of feet) max. of feet ime 15 max. of fee	sH286  sation) sation satio	vel al amplitude sweeps in ea half-sine was applied for not less the ndard)  (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.: 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 Mode on)  7% max.: 50°C o condensation acceler r X, Y and Z at 33°C )  7, no failure wor winding an ag and frame  0.025 r (0.001 (load: (1.12 li	c max., on)  ration 150 m/ exes each, 18  rith 1500 VA0 nd frame.  by 500 VDC  mm 0. in) (0 5 N (16 bs)) (2	is Model  (s² (70 to times in total.)  C @ 50/60 Hz  megger.  025 mm .001 in) .0ad: 10 N .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% RI 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 between 1000 minute betwe	103H78 □□  50°C  65°C  H (no conders of the conders of feet) max. of feet) max. of feet ime 15 max. of fee	sH286  sation) sation satio	vel al amplitude sweeps in ea half-sine was applied for not less the ndard)  (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.: 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 Mode on)  7% max.: 50°C or condensation acceler r X, Y and Z at 30°C )  7, no failure work or winding and frame  0.025 r (0.001 (load: 1.12 li	c max., on)  ration 150 m/ exes each, 18  rith 1500 VA0 nd frame.  by 500 VDC  mm 0. in) (0 5 N (16 bs)) (2	is Model  It is a series of the series of th	

# ■ 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 standard		File No.					
UL	UL	UL1004-1, UL1004-6	E179832					
	UL for Canada	CSA C22.2 No.100	E1/9832					
Model No	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					

<sup>\*1</sup> 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.

