Stepping Motors



28 mm sq.

1.8°/step RoHS

Bipolar winding, Lead wire type

Unipolar winding, Lead wire type ▶p. 39

Customizing

Hollow Shaft modification Decelerator Encoder

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

Bipolar winding, Lead wire 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 | ×10-4kg·m² | kg | mm |
| SH2281-5671 | SH2281-5631 | 0.07 | 0.5 | 10.5 | 7.2 | 0.01 | 0.11 | 32 |
| SH2281-5771 | SH2281-5731 | 0.07 | 1 | 2.6 | 1.85 | 0.01 | 0.11 | 32 |
| SH2285-5671 | SH2285-5631 | 0.145 | 0.5 | 15 | 13.5 | 0.022 | 0.2 | 51.5 |
| SH2285-5771 | SH2285-5731 | 0.145 | 1 | 3.75 | 3.4 | 0.022 | 0.2 | 51.5 |

Characteristics diagram

SH2281-5671 SH2281-5631

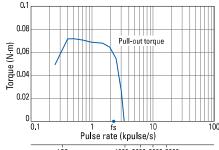
Constant current circuit Source voltage: 24 VDC Operating current: 0,5 A/phase, 2-phase energization (full-step) Pull-out torque: Ji=0,01×10-4kg·m² (pulley balancer method) fee Maximum self-etart fs: Maximum self-start frequency when not loaded

SH2285-5671

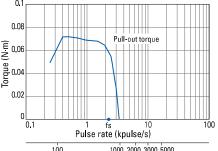
SH2285-5631

Constant current circuit Source voltage: 24 VDC Operating current: 0.5 A/phase, 2-phase energization (full-step) Pull-out torque: Ji=0,01×10-4kg·m² (pulley balancer method) fs: Maximum self-start frequency when not

frequency when not loaded



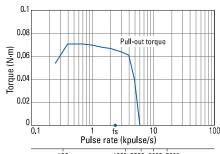
1000 2000 3000 5000 Number of rotations (min-1)



0.2 0.16 Pull-out torque € 0.12 Torque (80.00 0.04 0.1 Pulse rate (kpulse/s) Number of rotations (min-1) 1000 2000 3000 5000

SH2281-5771 SH2281-5731

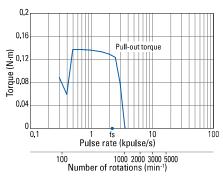
Constant current circuit Source voltage: 24 VDC Operating current: 1 A/phase, 2-phase energization (full-step) Pull-out torque: J.=0.01×10-4kg·m² (pulley balancer method) fs: Maximum self-start frequency when per frequency when not loaded



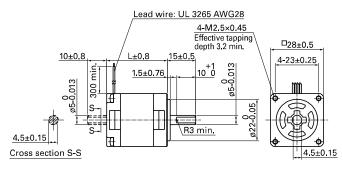
1000 2000 3000 5000 Number of rotations (min-1)

SH2285-5771 SH2285-5731

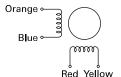
Constant current circuit
Source voltage: 24 VDC
Operating current:
1 A/phase, 2-phase
energization (full-step)
Pull-out torque:
Ji=0,01×10-4kg·m² (pulley
balancer method)
fs: Maximum self-start
frequency when not frequency when not loaded



■ Dimensions (Unit: mm) •



Internal wiring



Compatible drivers —

• For motor model no. SH228 \square -56 \square 1 (0.5 A/phase) Driver is not included.

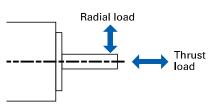
If you require assistance finding a driver, contact us for details.

· For model no. SH228 \square -57 \square 1 (1 A/phase) Model no.: BS1D200P10 (DC input)

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 | - Inrustiload - 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 | |
| 50 mm sq. | 103H670 🗌 | 71 | 87 | 115 | 167 | 15 | |
| 50 IIIII sq. | SS250 🗌 | 8.5 | - | _ | _ | 4.9 | |
| 56 mm sq. | 103H712 🗌 | 52 | 65 | 85 | 123 | 15 | |
| 50 IIIII sq. | 103H7128 | 85 | 105 | 138 | 200 | 15 | |
| 60 mm sq. | 103H782 🗌 | - 70 | 87 | 114 | 165 | 20 | |
| oo iiiiii sq. | SH160 🗆 | ,,, | 07 | 114 | 105 | 15 | |
| 86 mm sq. | SM286 □ | 167 | 193 | 229 | 280 | 60 | |
| 00 mm 3q. | SH286 🗆 | 107 | 100 | 220 | 200 | 00 | |
| °86 mm | 103H822 🗌 | 191 | 234 | 301 | 421 | 60 | |
| °106 mm | 103H8922 🗌 | 321 | 356 | 401 | 457 | 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



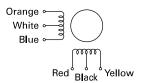
Direction of motor rotation

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 color | | | | | | |
|----------|---|-----------------|-----|------|--------|--------|--|--|
| | | 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.

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

Connector type model no.: 103H782

Internal wire connection

() connector pin number



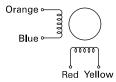
Direction of motor rotation

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. | | | | |
|----------------|-------------------|-----|-----|-----|---|
| | (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 | 2 | + | - | - | + |
| Exciting order | 3 | + | + | - | _ |
| | 4 | _ | + | + | _ |

General Specifications

| Motor model no. | SH214 🗌 | SH228 🗌 | SH353 🗌 | SS242 🗌 | SH142 🗌 | SF242 🗌 | SS250 🗌 | 103H670 🗌 | 103H712 🗌 |
|--|--|--|---|--|---|--|---|---|---|
| Type | - | 311220 | 311333 | 33242 | 311142 | 31242 | 33230 | 10311070 | 10311712 |
| Operating ambient temperature | -10 to +50°C | | | | | | | | |
| Storage temperature | | | | | | | | | |
| Operating ambient humidity | | H (no conder | nsation) | , | , | | | | |
| Storage humidity | | to 95% RH (no condensation) | | | | | | | |
| Operation altitude | / | 000 m max. above sea level | | | | | | | |
| Vibration resistance | Vibration fre | | 500 Hz, tota | | | | ration accele | ration 150 m/s | s² (70 to 500 |
| Impact resistance | 500 m/s ² of a | cceleration fo | r 11 ms with | half-sine wav | e applying th | ree times for X | (, Y, and Z axe | s each, 18 time | 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 minute between motor winding and frame. At normal temperature and humidity, no failure with 1000 @50/60 Hz applied for one minute between motor winding and frame. | | | | | ure with 1000 VA0 ed for one minute | | |
| Insulation resistance | At normal to | emperature a | nd humidity | , not less tha | n 100 M Ω be | tween windir | ng and frame | by 500 VDC n | negger. |
| Protection grade | _ | | | | | | | | |
| Winding temperature rise | 80 K max. (F | 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. (l oad: 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 111111 | 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 free | ly mounted v | ertically or h | orizontally | | | | | |
| Motor model no. | SH160 🗆 | 103H782 🗆 | SH286 □ | 103H8922 | SM286 □ | 103H712 🔲 - | 6 🗆 0 103H822 CE Mod | | H8922 □ -63 □ 1 Model |
| Type | _ | | | | S1 (contir | nuous operati | on) | | |
| Operating ambient temperature | | | | | -10 to +40 | | | | |
| Storage temperature | | | | | -20 to +60 | | | | |
| Operating ambient humidity | 20 to 90% RH (no condensation) 95% RH max. at 40°C or less (no condensation) | | | | | | · · · · · · · · · · · · · · · · · · · | | |
| | 20 to 30 /0 N | 5 to 95% RH (no condensation) 95% RH max. at 40°C or less, 57% RH max. at 50°C or less, 35% RH max. at 60°C or less, (no condensation) | | | | C or less, | | | |
| Storage humidity | | | sation) | | | | r less (no con | | |
| <u> </u> | 5 to 95% RH | I (no condens | level | | 35% RH n | nax. at 60°C o | · | densation) | · |
| Storage humidity Operation altitude Vibration resistance | 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe | I (no condens c. above sea equency 10 to eep time 15 r | level 500 Hz, tota nin/cycle, 12 | sweeps in ea | 35% RH n 1.52 mm (10 ach X, Y and | to 70 Hz), vib Z direction. | ration accele | densation) ration 150 m/s | s² (70 to |
| Storage humidity Operation altitude | 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe | I (no condens c. above sea equency 10 to eep time 15 r | level 500 Hz, tota nin/cycle, 12 | sweeps in ea | 35% RH n 1.52 mm (10 ach X, Y and ave applying | to 70 Hz), vib Z direction. | ration accele | densation) | s² (70 to |
| Storage humidity Operation altitude Vibration resistance | 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe 500 m/s ² of a Class B (+13 | I (no condenses above sea lequency 10 to eep time 15 racceleration f | level o 500 Hz, tota nin/cycle, 12 or 11 ms with | sweeps in ean half-sine wa | 35% RH n 1.52 mm (10 ach X, Y and | to 70 Hz), vib Z direction. | ration accele or X, Y and Z a | densation) ration 150 m/s | s² (70 to |
| Storage humidity Operation altitude Vibration resistance Impact resistance | 5 to 95% RH 1000 m max Vibration fro 500 Hz), swe 500 m/s² of a Class B (+13 At normal terr ure with 1000 | I (no condens c. above sea equency 10 to eep time 15 r acceleration f | level 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for one | sweeps in ean half-sine wa | 35% RH n 1.52 mm (10 nch X, Y and ave applying Class F (+155°C) temperature | to 70 Hz), vib Z direction. three times for Class B (+ | ration accele or X, Y and Z a 130°C) y, no failure v | densation) ration 150 m/s axes each, 18 vith 1500 VAC | s² (70 to times in total |
| Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage Insulation resistance | 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 between | I (no condense. above seal equency 10 to eep time 15 racceleration for acceleration for acc | level 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for oni | sweeps in ean half-sine wa | 35% RH n 1.52 mm (10 nch X, Y and ave applying Class F (+155°C) temperature one minute in 100 MΩ be | to 70 Hz), vib Z direction. three times for Class B (+ | ration accele or X, Y and Z a 130°C) y, no failure v tor winding a | densation) ration 150 m/s axes each, 18 vith 1500 VAC | s² (70 to times in total : @50/60 Hz |
| Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage Insulation resistance Protection grade | 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 betwee At normal te | I (no condense. above sea lequency 10 to eep time 15 racceleration foo colored by the colored by | level 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for one ng and frame. nd humidity | sweeps in each half-sine was h | 35% RH n 1.52 mm (10 ach X, Y and ave applying Class F (+155°C) temperature | to 70 Hz), vib Z direction. three times for Class B (+ | ration accele or X, Y and Z a 130°C) y, no failure v tor winding a | densation) ration 150 m/s axes each, 18 with 1500 VAC nd frame. | s² (70 to times in total : @50/60 Hz |
| Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage Insulation resistance Protection grade Winding temperature rise | 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 betwee At normal te 80 K max. (E | I (no condense, above sea lequency 10 to eep time 15 racceleration f 80°C) International Part of the sea lead | level 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for one ng and frame. nd humidity | sweeps in each half-sine was h | 35% RH n 1.52 mm (10 nch X, Y and ave applying Class F (+155°C) temperature one minute in 100 MΩ be | to 70 Hz), vib Z direction. three times for Class B (+ and humidit between mo | or X, Y and Z and Z and Z and Z and Z and I and | ration 150 m/s axes each, 18 with 1500 VAC nd frame. by 500 VDC n | s² (70 to times in total : @50/60 Hz |
| Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage Insulation resistance Protection grade Winding temperature rise Static angle error | 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 betwee At normal te 80 K max. (E ±0.054° | I (no condense above sea lequency 10 to eep time 15 racceleration f 80°C) Interpretation and house and ho | level 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for one ng and frame. nd humidity | sweeps in each half-sine was h | 35% RH n 1.52 mm (10 nch X, Y and ave applying Class F (+155°C) temperature one minute in 100 MΩ be | to 70 Hz), vib Z direction. three times for Class B (+ | ration accele or X, Y and Z a 130°C) y, no failure v tor winding a | ration 150 m/s axes each, 18 with 1500 VAC nd frame. by 500 VDC n | s² (70 to times in total : @50/60 Hz |
| Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage Insulation resistance Protection grade Winding temperature rise | 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 betwee At normal te 80 K max. (B ±0.054° | I (no condense, above sea lequency 10 to eep time 15 racceleration f 80°C) Interpretative and how the work of the | level 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for one ng and frame. nd humidity | At normal applied for not less the standard) | 35% RH n 1.52 mm (10 nch X, Y and ave applying Class F (+155°C) temperature one minute n 100 MΩ be IP43 | to 70 Hz), vib Z direction. three times for Class B (+ e and humidit between mostween windir ±0.054° | or X, Y and Z and Z and Z and Z and Z and I and | ration 150 m/s axes each, 18 with 1500 VAC nd frame. by 500 VDC n | s² (70 to times in total c @50/60 Hz negger. |
| Storage humidity Operation altitude Vibration resistance Impact resistance Thermal class Withstandable voltage Insulation resistance Protection grade Winding temperature rise Static angle error | 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 betwee At normal te - 80 K max. (E ±0.054° 0.075 mm m 0.025 mm (load: 5 N) | I (no condense above sea lequency 10 to eep time 15 racceleration f 80°C) Interpretation and house and ho | level 5 500 Hz, tota nin/cycle, 12 or 11 ms with umidity, no fail applied for one ng and frame. nd humidity | sweeps in each half-sine was h | 35% RH n 1.52 mm (10 nch X, Y and ave applying Class F (+155°C) temperature one minute n 100 MΩ be IP43 | to 70 Hz), vib Z direction. three times for Class B (+ e and humidity between months where the control of the c | or X, Y and Z at 130°C) y, no failure votor winding and frame ±0.09° | ration 150 m/s exes each, 18 with 1500 VAC nd frame. by 500 VDC n | s² (70 to times in total : @50/60 Hz |
| 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 | 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 betwee At normal te 80 K max. (E ±0.054° 0.075 mm m 0.025 mm | I (no condense. above sea lequency 10 to eep time 15 racceleration for acceleration for acc | level 5 500 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 | At normal applied for not less the standard) 0.025 mm | 35% RH n 1.52 mm (10 nch X, Y and ave applying Class F (+155°C) temperature one minute n 100 MΩ be IP43 | to 70 Hz), vib Z direction. three times for Class B (+ e and humidity between months where the control of the c | or X, Y and Z at 130°C) y, no failure votor winding and frame ±0.09° | ration 150 m/s exes each, 18 with 1500 VAC nd frame. by 500 VDC n | s² (70 to times in total c @50/60 Hz negger. |
| 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 | 5 to 95% RH 1000 m max Vibration fre 500 Hz), swe 500 m/s² of a Class B (+13 At normal terr ure with 1000 minute betwee At normal terr — 80 K max. (E ±0.054° 0.075 mm m 0.025 mm (load: 5 N) 0.025 mm ø0.075 mm | I (no condense. above sea lequency 10 to eep time 15 racceleration for acceleration for acc | level 5 500 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 | At normal applied for not less the standard) 0.025 mm | 35% RH n 1.52 mm (10 nch X, Y and ave applying Class F (+155°C) temperature one minute n 100 MΩ be IP43 | to 70 Hz), vib Z direction. three times for Class B (+ e and humidity between months where the control of the c | or X, Y and Z at 130°C) y, no failure votor winding and frame ±0.09° | ration 150 m/s exes each, 18 with 1500 VAC nd frame. by 500 VDC n | s² (70 to times in total c @50/60 Hz negger. |
| 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 | 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 betwee At normal te = 80 K max. (E ±0.054° 0.075 mm (load: 5 N) 0.025 mm Ø0.075 mm | I (no condense, above sea lequency 10 to eep time 15 racceleration f 80°C) Inperature and h VAC @50/60 Hzen motor windigemperature a Based on SAI ±0.09° Inax. (load: 10 0.025 mm (load: 5 N) | umidity, no fail applied for one g and frame. nd humidity NYO DENKI s N) 0.025 mm (load: 5 N) | At normal applied for not less the standard) 0.025 mm (load: 10 N | 35% RH n 1.52 mm (10 nch X, Y and ave applying Class F (+155°C) temperature one minute n 100 MΩ be IP43 | to 70 Hz), vib Z direction. three times for Class B (+ e and humidity between months where the control of the c | ration accele or X, Y and Z a 130°C) y, no failure v tor winding a ng and frame ±0.09° 0.025) | ration 150 m/s exes each, 18 with 1500 VAC nd frame. by 500 VDC n mm 0.0 5 N) (lo | s² (70 to times in tota c @50/60 Hz negger. |

Safety standards

| | - | | |
|------------|-------|--------|---------------|
| Model no : | SM286 | CE/III | marked models |

| CE | Standard category | | Applicable standard | |
|-------|------------------------|----------------------|------------------------|--|
| (TÜV) | Low-voltage directives | | EN 60034-1, EN 60034-5 | |
| | Acquired standards | Applicable standard | File no. | |
| UL | UL | UL 1004-1, UL 1004-6 | E179832 | |
| | UL for Canada | CSA C22.2 No.100 | E1/9032 | |

| Model no | .: 103H712 🗆 -6 🔲 0, 103H822 🗆 -6 🔲 0, 103H | 18922 🗌 -63 🗌 1 (| CE marked model |
|----------|---|-------------------|-----------------|
| | | | |

| CE | 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.