

HYBRID STEPPING MOTOR SPECIFICATIONS

Manufacturer: SHANGHAI MOONS' ELECTRIC CO., LTD.

MODEL No.: 23HSB00 1-02

CUSTOMER'S MODEL No.: 24-2612-01 Δ

1. SCOPE

This specification covers the general requirements for the stepping motor

2. APPLICABLE DOCUMENTS

IEC 60034-1: Rotating electrical machines

Part 1: Rating and performance

IEC TS60034-20-1: Rotating electric machine

Part 20-1: Control motors-Stepping motors

3. RATING

3-1 Step Angle ----- 1.8°/full step

3-2 Number of Phase ----- 4

3-3 Rated Voltage ----- 3.4V DC

3-4 Rated Current(peak value when microstep) ----- 2.0A 3-5 Insulation Class ----- Class B

3-6 Source Voltage ----- 24V DC

Indicates the voltage that the power supplier applies to the driver circuit.

It is same as the rated voltage when motor is driven on constant voltage model.

4. ELECTRICAL CHARACTERISTICS

4-1 Coil Resistance/phase ----- $17\Omega \pm 10\%$ (20°C)4-2 Coil Inductance/phase ----- $3\text{mH} \pm 20\%$ (1kHz 1 V rms)

4-3 Holding torque ----- 0.94N.m Min(two phase on/rated current)

4-4 Detent torque ----- 约 Approximate 45mN.m

4-5 Step angle accuracy ----- $\pm 5\%$

PV7300

Testing condition: Constant current driver/24V/Two phase on/Rated current/Speed: 1pps(Full step)

Ono sokki: PV7300

4-6 Slew rate with no load ----- N/A.

Testing condition: Source Voltage 24V/Half step

4-7 Pull-in rate with no load ----- N/A.

24V/ Testing condition: Source Voltage 24V/Half step

4-8 运行力矩 Pull out torque

24V/Testing condition: Source Voltage 24V/Half step

@1000pps ----- N/A

@2000pps ----- N/A

@3000pps ----- N/A

4-9 Pull in torque

Testing condition: Source Voltage 24V/Half step

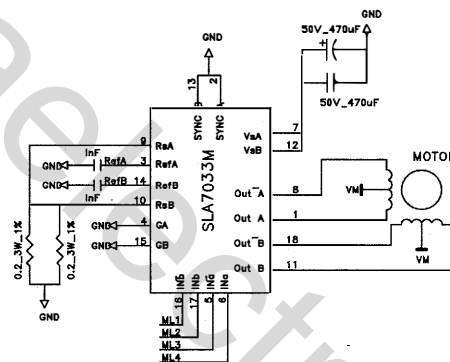
@600pps ----- N/A.

@900pps ----- N/A.

4-10 Back ElectroMotive Force ----- N/A

: 300RPM, . Testing condition The back EMF is the RMS value measured across the coils,

carrying the motor shaft at the constant speed of 300 RPM.



G			Unit: mm	批准 Approve	11.02.18	备注 Comment:
F			第一角画法 FIRST ANGLE METHOD	标准化 Standard	2018.12	
E			未注线性与角度尺寸公差 Tolerances for linear and angular dimensions without individual tolerance indications	工艺 Technology	11.02.18	
D			GB/T 1804-m eqv ISO 2768-1:m	审核 Check	2.18	
C	SEE SHEET 3	2011.02.17	未注形位公差 Geometrical tolerance for features without individual tolerance indications	设计 Design	董效男	2011.02.17
B	ADD THE CUSTOMER'S MODEL No. Δ	2010.09.13	GB/T 1184-K eqv ISO 2768-2:K			
A	原始版本 Original revision	2009.12.03				
REV.	版本记录 REVISION RECORD	DATE	UNLESS OTHERWISE SPECIFIED	NAMES	SIGNATURE	DATE

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4-11 Insulation resistance -----1 00M Ω More than 100M Ω
500V.

Testing condition: Between coils and frame, 500V DC.

4-12 Dielectric strength -----500V 50/60Hz 1 / 500V AC 1 minute
50/60Hz.

Testing condition: Motor is capable of withstanding with out break down,
when 500V AC (RMS value) for period of 1 minute between motor frame and lead wires.
Cut off current is less than 3mA.

4-13 Temperature rise-----80°C less than 80°C

Temperature rise is the maximun coil temperaure increase respect to the ambient temperature.

Coil temperature is measured with resistance method.

Two phase on rated voltage at 0 pps speed when constant voltage driving model.

Two phase on rated current at pull in rate speed when constant current driving model.

Al heat sink plate: 160 × 160 × t1.6(mm)

5. Mechanical Characteristics

5-1 Outline Dimentions ----- 3页/ See sheet 3.

5-2 Material of shaft ----- Stainless steel

5-3 Material of magnet ----- Rare earth alloy

5-4 Material of end bell ----- Aluminum alloy die casting

5-5 Bearing ----- Double shield deep groove ball bearing 5-6 Label ----- Ink jet
printing on the rear end bell

5-7 Rotor Inertia ----- Approximately 290g.cm²

5-8 Mass ----- Approximate 700g

5-9 End play of the shaft ----- 0.08mm@500gf

5-10 Radial play of the shaft ----- 0.02mm@500gf

6. Application conditions

6-1 Operating environment conditions

6-1-1 Ambient temperature-----20°C ~ +50°C

6-1-1 Ambient humidity-----20% ~ 90% (/No condensation)

6-2 Storage envirenment conditions

6-2-1 Storage temperature-----30°C ~ +70°C

6-2-1 Storage humidity-----15% ~ 95% (无积露/No condensation)

6-3 Shaft load condition

6-3-1 Dynamic axial load -----15N Max.

6-3-2 Dynamic radial load -----75N Max.

7. Warranty and Reliability

7-1

Warranty: If failure occurs due to manufacturing defect within one year,

the manufacturer shall repair or replace the motor

7-2 Reliability ----- MTBF 6000 MTBF 6000 hours or more.

Application condition: Ambient temperature 25°C, Duty cycle 100%, Rated current,
two phase on, Speed 1000pps, full step.

8. Caution:

8-1 Please do not hold motor by PCB or lead wires.

8-2 Please do not connect/disconnect the motor connector while power on.

Please do not drop, hurl or dump motor against hard material. Malfunction may not be observed at
early stage after such shock, But it may be found later, This type mishandling voids our warranty.

Please pay attention for handling because this motor has no protection circuits for
overvoltage, temperature rise, opposing connection, foreign noise ect.

8-5 Please do not use disassembled motor again.

G			Unit:mm	批准 Approve	2011.02.18	备注 Comment:
F			第一角画法	标准化 Standard	2011.02.18	
E			FIRST ANGLE METHOD	工艺 Technology	11.02.18	
D			未注线性尺寸公差	审核 Check	2.18	
C	SEE SHEET 3	2011.02.17	Tolerances for linear and angular dimensions without individual tolerance indications	设计 Design	2011.02.17	
B	SEE SHEET 1 AND 3	2010.09.13	GB/T 1804-m eqv ISO 2768-1:m			
A	原始版本 Original revision	2009.12.03	未注形位公差			
			Geometrical tolerance for features without individual tolerance indications			
REV.	版本记录 REVISION RECORD	DATE	GB/T 1184-K eqv ISO 2768-2:K	NAMES	SIGNATURE	DATE

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23HSB001-02

Rev. C

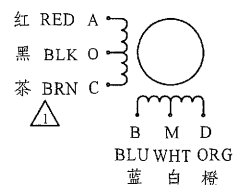
SCALE 1:1

SHEET 2 OF 3

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9 接线图

Wiring Diagram



10 励磁顺序 vs. 旋转方向

Exciting Sequence vs. Direction of Rotation

STEP	A	B	C	D	O	M
1	-	-			+	+
2		-	-		+	+
3			-	-	+	+
4	-			-	+	+

从电机的安装端看，
按照表格规定的励磁顺序，
电机将产生顺时针方向旋转。

Exciting sequence as the table specified
will produce clockwise rotation
when viewed from mounting end.

以两相通电为例
Case by two phase on

11 连接器针位 vs. 引线颜色

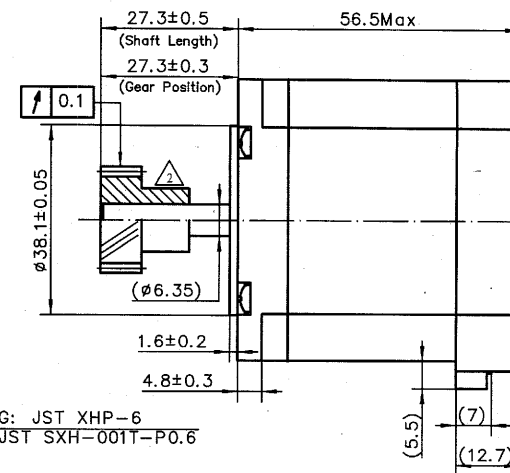
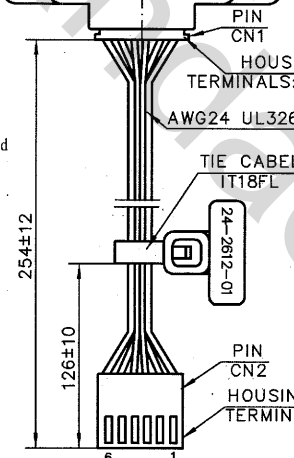
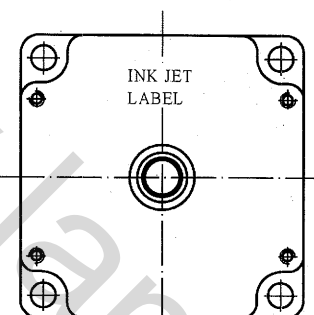
Pin No. vs. Lead Wire Colour

CN1	COLOR	CN2
1	红 RED	6
2	黑 BLK	5
3	茶 BRN	4
4	蓝 BLU	3
5	白 WHT	2
6	橙 ORG	1

铭牌 Label Detail

MOONS' STEPPING MOTOR
TYPE 23HSB001-02
P/N: 24-2612-01
XXXXXXXX YY/MM/DD

Work Order Date Format
加工单号 日期格式

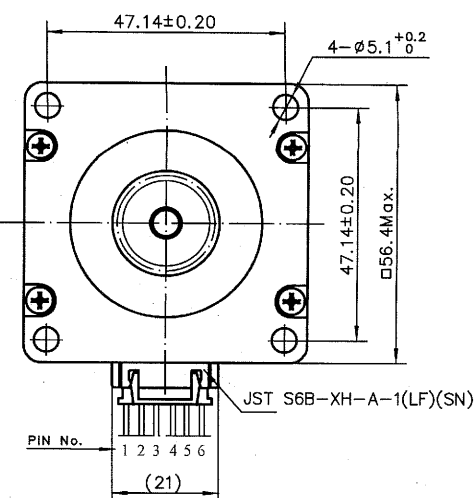
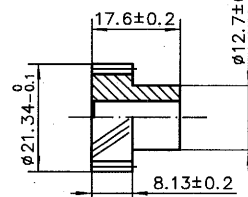


TIE CABEL
IT18FL

24-2612-01

PIN
CN2
HOUSING: MOLEX 22-01-3067
TERMINAL: MOLEX 08-52-0101

GEAR DETAIL



渐开线齿轮参数 INVOLUTE GEAR INFORMATION

齿形 Tooth Type	渐开线 Involute
齿数 Number of Teeth	37
径节 Diametral Pitch	48
压力角 Pressure Angle	20°
分度圆直径 Standard Pitch Circle Diameter	φ19.58 REF
齿顶圆直径 Outside Circle Diameter	φ21.34 ⁰ _{-0.1}
公法线长度 Displacement Over 5 Teeth	7.3352 ⁰ _{-0.004} (5齿)
一齿径向综合公差 Max Tooth-to-tooth Composite Error Tolerance	0.025
径向综合公差 Max Total Composite Error Tolerance	0.048
螺旋角和旋向 Helix Angle & Tooth Direction	15° & 左旋 (Left)
变位系数 Addendum Modification Coefficient	0.728
变位量 Addendum Modification	0.372
精度等级 Quality	AGMA Q8

G		
F		
E		
D		
C	ADD HUB △	2011.02.17
B	Change the lead wire colour and label detail △	2010.09.13
A	原始版本 Original revision	2009.12.03

Unit:mm

第一角画法
FIRST ANGLE METHOD未注线性与角度尺寸公差
Tolerances for linear and angular dimensions without
individual tolerance indications

GB/T 1804-m eqv ISO 2768-1:m

未注形状与位置尺寸公差

Geometrical tolerance for features without
individual tolerance indications

GB/T 1184-K eqv ISO 2768-2:K

批准 Approve

标准化 Standard

工艺 Technology

审核 Check

设计 Design

2011.02.18
2011.02.18
2011.02.18
2011.02.18
2011.02.18

备注 Comment:

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