Product Specification For HMI

Model Name	XMC013001A-INL
Customer	
Note	

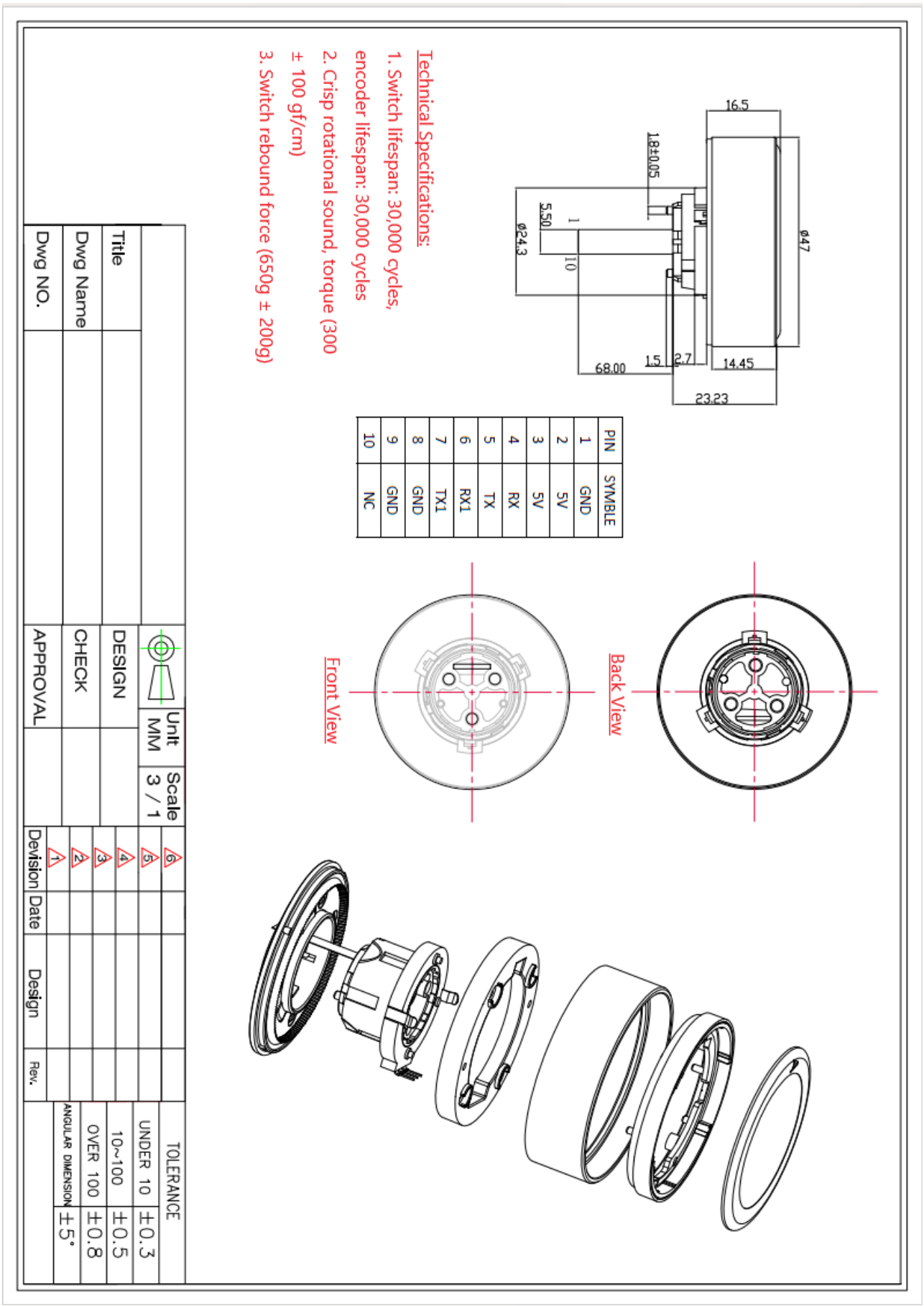
■Preliminary Specification

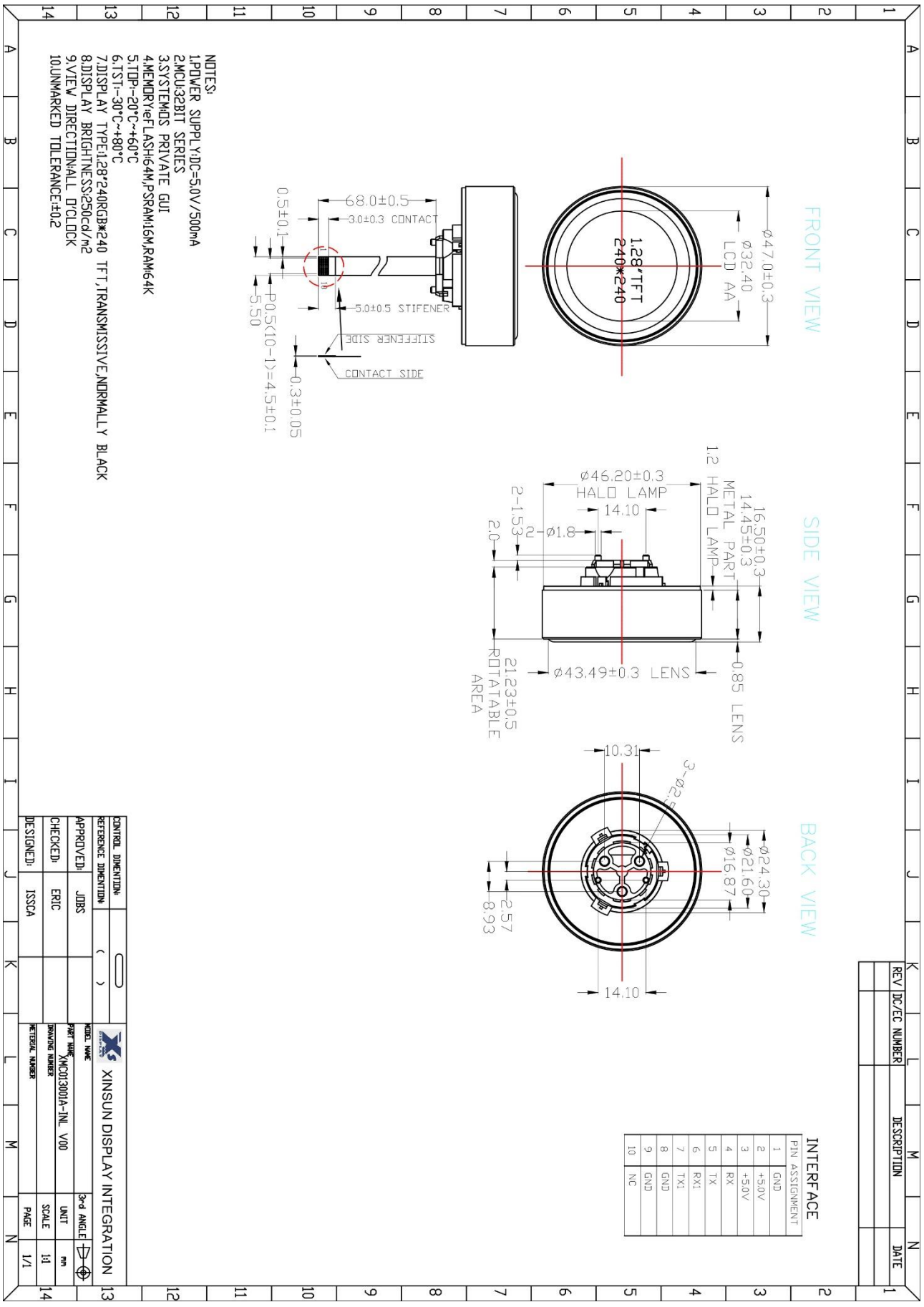
☐Final Specification

☐CUSTOMER'S APPROVAL
BY: DATE:

Comment

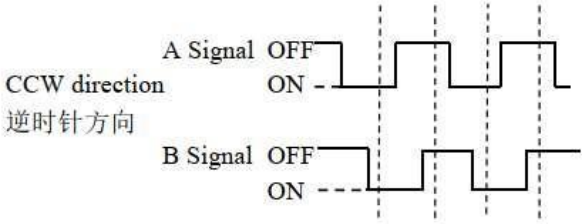
PRESENTED BY


Technical Specifications:
1. Switch lifespan: 30,000 cycles,
encoder lifespan: 30,000 cycles
2. Crisp rotational sound, torque (300
± 100 gf/cm)
3. Switch rebound force (650g ± 200g)
16.5
1.8±0.05
ø47
5.50
1
10
ø24.3
68.00
1.5
2.7
14.45
23.23
PIN SYMBLE
1 GND
2 5V
3 5V
4 RX
5 TX
6 RX1
7 TX1
8 GND
9 GND
10 NC
Back View
Front View
Unit MM
Scale 3 / 1
DESIGN
CHECK
APPROVAL
Title
Dwg Name
Dwg NO.
Devision Date Design Rev.
TOLERANCE
UNDER 10 ±0.3
10~100 ±0.5
OVER 100 ±0.8
ANGULAR DIMENSION ±5°


NOTES:
1.POWER SUPPLY:DC=5.0V/500mA
2.MCU:32BIT SERIES
3.SYSTEMOS PRIVATE GUI
4.MEMORY:eFLASH:64M,PSRAM:16M,RAM:64K
5.TOP:-20°C~+60°C
6.TST:-30°C~+80°C
7.DISPLAY TYPE:1.28"240RGB*240 TFT,TRANSMISSIVE,NORMALLY BLACK
8.DISPLAY BRIGHTNESS:250cd/m2
9.VIEW DIRECTION:ALL O'CLOCK
10.UNMARKED TOLERANCE:±0.2
FRONT VIEW
1.28"TFT
240*240
Ø32.40
LCD AA
Ø47.0±0.3
68.0±0.5
3.0±0.3 CONTACT
0.5±0.1
P0.5*(10-1)=4.5±0.1
5.50
5.0±0.5 STIFENER
STIFFENER SIDE
CONTACT SIDE
0.3±0.05
SIDE VIEW
Ø46.20±0.3
HALO LAMP
14.10
2-1.53
2
Ø1.8
2.0
1.2
METAL PART
HALO LAMP
16.50±0.3
14.45±0.3
Ø43.49±0.3 LENS
0.85 LENS
21.23±0.5
ROTATABLE
AREA
BACK VIEW
10.31
Ø24.30
Ø21.60
Ø16.87
2.57
8.93
14.10
INTERFACE
PIN ASSIGNMENT
1 GND
2 +5.0V
3 +5.0V
4 RX
5 TX
6 RX1
7 TX1
8 GND
9 GND
10 NC
REV
DC/EC NUMBER
DESCRIPTION
DATE
CONTROL DIMENTION
REFERENCE DIMENTION
( )
DESIGNED: ISSCA
CHECKED: ERIC
APPROVED: JOBS
XINSUN DISPLAY INTEGRATION
MODEL NAME
PART NAME XMC013001A-INL V00
DRAWING NUMBER
METERIAL NUMBER
3rd ANGLE
UNIT mm
SCALE 1:1
PAGE 1/1

1. Product Appearance

2. Electrical Characteristics

ITEMS	SPECIFICATION
2-1 Power Rating	DC 5V 500mA（MAX）Input ripple must be less than 30mV
2-2 Insulation Resistance	DC 50V More than 10MΩ at DC 50V 1 Minute
2-3 Withstand Voltage	DC 50V 1Minute at AC 50V
2-4 Sliding Noise	≤3ms (Test conditions ： 360°/S) Using the C/R filter circuit is Recommended.
2-5 Resolution	15Pulses/360° for each phase. Output signal is 1 pulse per 2 detents
2-6 Phase-Difference	△T=0.25±0.17 T
2-7 Output Signal And Rotational Direction	
2-8 Working Temperature	-20℃～60℃
2-9 Storage Temperature	-40℃～85℃

3. Mechanical Characteristics

3-1 Total Rotation Angle	360°
3-2 Rotation Torque	30～200gf.cm.
3-3 Shaft Push-Pull Strength	5Kgf.cm
3-4 Number and position Detent	30 detents(Step angle: 12°±3°)
3-5 Rotational life	30,000 Cycles Min. at a speed of 60 cycles/m 30,000 Cycles Min。at a speed of 600cycles/H
3-6 Resistance to soldering heat	Manual Soldering: Less than 300℃ and quicker than 3 seconds.

4. Motherboard Configuration

ITEMS	SPEC.	REMARK
MCU	32Bit Internet SOC	eFLASH:64M PSRAM:16M RAM:64K
SYSTEM	OS Private GUI	
STORAGE	External 64M External 512M SPI FLASH	Default 64M for UI storage
DISPLAY	IPS 1.28 240*240	16 bit 65K colors
Knob Diameter	46mm	
Knob assembly size	Sink 11mm	Refer to the drawing

5. CMF requirements for key exterior components

5.1 Display Glass

a. When the device is off, the screen is well hidden, and the color difference between the display area and the edge ink area is difficult to distinguish with the naked eye.

b. When the device is on, the screen print and the background black are consistent, and the color difference between the display area and the edge ink area is difficult to distinguish with the naked eye. The above two points are subject to actual samples and upper and lower limit samples.

5.2 Display Characteristic

-Supported displays: 1.28" (240*240)

-Spec. refer to the drawing

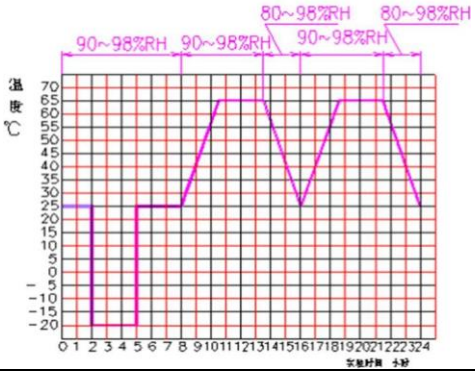
6. Installation Stability

6.1 After the knob is installed on the complete unit, the overall stability must be solid with no noticeable shaking.

6.2 After the knob is installed on the complete unit, a vertical outward pull of 70N is applied to the knob for 1 minute. The knob must not become loose or detach.

7. Reliability Test

NO.	Item	Test Method	Result
7-1	High Temp. and High Humidity Operation	Place the sample at T=70°C ± 2°C and RH=90%~95% for a time t=48h. The sample should be powered on during the test. After the test is completed, remove the sample and allow it to recover at room temperature for 2h.	The sample must function and display normally during the test. After test, must show that the sample's functions, performance, appearance are qualified
7-2	Low Temp.	Place the sample at T=20°C ± 2°C and RH=10%~15% for a time t=48h, The sample should be powered on during the test. After the test is completed, remove the sample and allow it to recover at room temperature for 2h.	The sample must function and display normally during the test After test, must show that the sample's functions, performance, appearance are qualified

7-3	High Temp. & Humidity storage	Place the sample at 60±1℃ and 100% humidity for 240 hours. After removal, leave it at room temperature for more than 24 hours, then install the sample onto a testing jig and power it on.	After test, the sample's functions, performance, appearance are qualified
7-4	Low Temp. &Humidity storage	Place the sample in a -30℃±3℃ environment for a time t=168h. After the test, allow it to recover at room temperature for 2 hours. Install the sample onto a testing jig and power it on.	After test, the sample's functions, performance, appearance are qualified
7-5	Thermal Cycling testing	工Place the sample in a low-temperature chamber at -20°C ± 2°C for 0.5h, then take it out and place it in a heat preservation chamber at 70°C ± 2°C within 2min for another 0.5h. Repeat the above process for 10 cycles. After testing, install the sample in testing jig and run it.	After test, the sample's functions, performance, appearance are qualified
7-6	PCB 600	Cycle according to the following conditions: (1) Low temperature: 0°C ± 2°C, 10%RH ± 5%RH, 40 min (Sample powered off) (2) Low temp -> High temp: 70°C ± 2°C, 90%RH ± 5%RH, 60 min (Sample powered on) (3) High temperature: 70°C ± 2°C, 90%RH ± 5%RH, 20 min (Sample powered on) (4) High temp -> Low temp: 0°C ± 2°C, 10%RH ± 5%RH, 60 min (Sample powered off) Repeat steps (1) - (4) for 600 hours.	During the test, the sample must turn on and display normally. After the test, the sample must work normally when installed in the device or testing jig. The sample's function, performance, and appearance are qualified.
7-7	Temp. cycle	The image shows one temperature cycle. Repeat for 10 cycles. The measurement is carried out in a high-humidity environment. 	After test, the sample's functions, performance, appearance are qualified
7-8	Vibration	Placing the sample onto a vibration table. 10Hz~55Hz; The frequency is changed every 1 minute from 55Hz to 10Hz, with an amplitude of 1.5mm. The test is performed for 2 hours in each of the X, Y, and Z coordinate directions (6 hours in total). The test is to be completed for 2 hours each in both the powered-on and powered-off states. After the test, the controller is to be reinstalled on the complete device and a standard program is to be run....	After test, the sample's functions, performance, appearance are qualified

7-9	Drop with Packing	A boxed sample with its packaging is dropped naturally from a height of 80cm above the ground, one time. (One corner, three edges, six faces).	After test, the sample's functions, performance, appearance are qualified

7-10	Plastic parts	Place the sample in a fluorescent UV lamp weather resistance tester (UVA-340 lamp tube) and expose it for 200h. Irradiate it for 4h at a black standard temperature of 60℃±3℃, then condense it without irradiation for 4h at a black standard temperature of 50℃±3℃. This is a cyclical test.	After the test, the sample surface should have no abnormalities such as cracking or peeling
7-11	Impact Resistance	**0.5J impact three times.**	No Cracks
7-12	Pull-out Force	After the complete device is installed, apply a 70N vertical outward pull force to the knob for 1 minute	After testing, the samples should be able to work normally.

8. Transport and Storage

8.1 Products should be stored in a warehouse with good ventilation, free of corrosive gases, and protected from rain and snow.

8.2 Products should be protected from shock, vibration, and direct exposure to rain or snow during transportation.

8.3 The packaging condition should ensure the product is not damaged by force