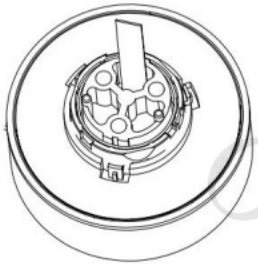
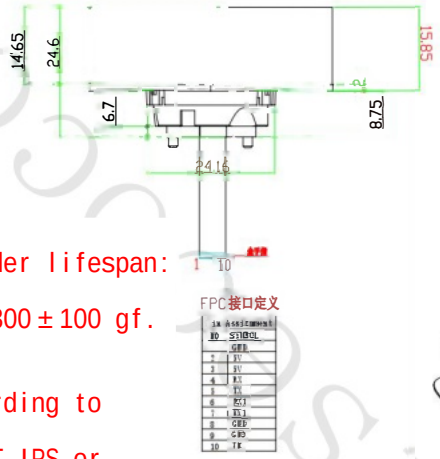
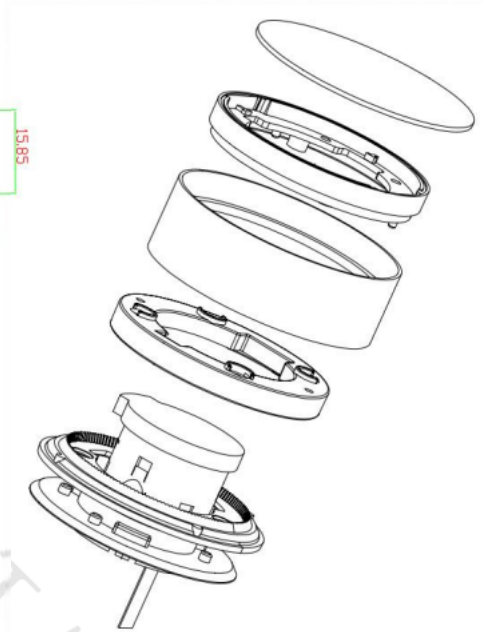


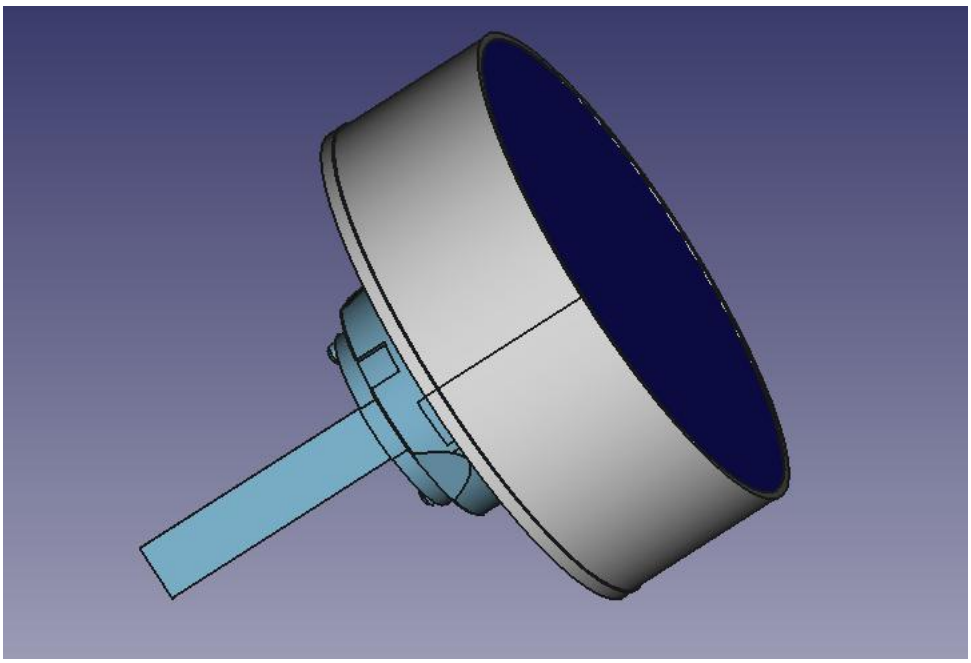




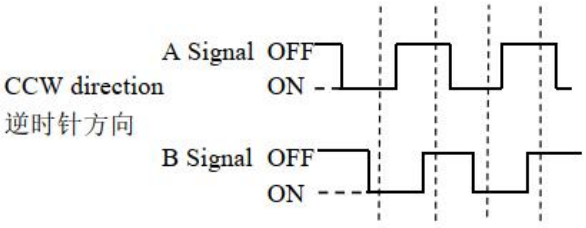
Technical Specifications:
1.Switch lifespan: 30,000 cycles; encoder lifespan: 30,000 cycles.
2.Crisp rotational sound with torque (300±100 gf. cm).
3.Switch rebound force (650g±200g).
4.Screen and UI can be customized according to customer requirements.
5.The screen can be configured with TFT,IPS,or AMOLED displays.
6.Compatible with 1.28"round,1.3"round,1.3" square, and 1.43"round screens.
7.Customizable features:touch functionality,ambient lighting,temperature and humidity sensors, Bluetooth,Wi-Fi,voice control,voice broadcast,APP, mini program

Shenzhen Huai Zhi Technology Co.,Ltd			Unit MM	Scale 3 / 1	6				TOLERANCE
					5				UNDER 10 ±0.3
Title	RKM47Z SERIES		DESIGN		4				10~100 ±0.5
Dwg Name	RKM47Z		CHECK		3				OVER 100 ±0.8
Dwg NO.			APPROVAL		2				ANGULAR DIMENSION ±5°
					1	Devision	Date	Design	Rev.

1. Appearance



2. ELECTRICAL CHARACTERISTICS

ITEMS	SPECIFICATION
Power Rating	DC 5V 500mA（MAX） The input ripple must be less than 30mV
Insulation Resistance	The resistance value is greater than 0MΩ under DC 50V 1 Minute
Withstand Voltage	Minute under AC 50V
2-4、Sliding Noise	≤3ms (Test conditions: 360°/S　) C/R filter circuit is recommended.
2-5、Pulse output	15 pulses/360 ° Two positioning outputs one pulse
Phase difference	△T=0.25±0.17 T
Output Signal and Direction of Rotation	
Operating Temperature	-20℃～60℃
Storage Temperature	-40℃～85℃

3. MECHANICAL CHARACTERISTICS

Total Rotation Angle	360°
Rotation Torque	30～200gf.cm.
Push-Pull Strength of Shaft	5Kgf.cm
3-4、Number and location of positioning points	30 Detents (Step angle: 12°±3°)
Pressing function life time Rotation function life time	30,000 Cycles Min. at a speed of 60 cycles/m 30,000 Cycles Min. at a speed of 600 cycles/H
Resistance to soldering heat	Hand welding: below 300 ℃, within 3 seconds.

4. Motherboard configuration

Item	Spec.	Remark
Main chip	RF2280 IoT SOC (M3-96M、BLE 5.1)	eFLASH:64M PSRAM:16M RAM:64K
System	OS Private GUI	Class real-time operating system Minitype GUI
Storage	64Mb	Default 64Mb for storing the UI
Display	1.43” AMOLED one res.466*466 1.28” LCD one res. 240*240 1.3” LCD one res. 320*320	16-bit 65536 色
Outer diameter	46mm	Material,texture, etc customizable
Knob mounting dimensions	Subsiding 11mm	Refer to the structure size drawing for details

5. Appearance Key components CMF requirement

5.1 Cover glass

When turned off, the color difference between the display area and the edge ink area is difficult to distinguish with the naked eye;
When turned on, screen printing and background black colour can achieve consistency, 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 shall be determined based on the actual sample and upper and lower limit samples.

5.2 Display specification

Supported display sizes: 1.28” round LCD, 1.3” round LCD, 1.3” square LCD,
1.43” AMOLED screen；
Brightness：≥350cd/m2（Subject to specific size）；
Cover glass light transmittance：≥25%（Integrated black effect）,50%, 85%, customizable；
The brightness and transmittance of the knob display screen shall be based on the actual sample approved by both parties；

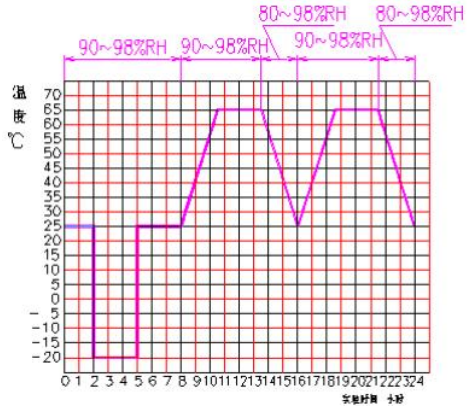
6. Installation stability

After assembling the entire knob display, apply a vertical pull of 70N outward to the entire knob display, and maintain it for 1 minute, the knob display supposed not to get loose

7. Reliability test

No.	Item(test)	Test Method	Testing Result
7-1	Operating under high temperature and humidity	Place the sample in an environment with a temperature of T=70 ℃± 2 ℃ and a relative humidity of RH=90%~95%, for a time of t=48 hours, sample powered on during testing process. After the test, take out the sample and recover it for 2h at room temperature.	Judgment: the sample works normally during the test, and the function, performance and appearance of the sample are qualified after the test.-- Meet the requirements of specific terms
7-2	Operating under low temperature	Place the sample in an environment with a temperature of T=-20℃±2℃ and a relative humidity of RH=10%～15%, for a time of t=48 hours, sample powered on during testing process. After the test, take out the sample and recover it for 2hs at room temperature.	Judgment: the sample works normally during the test, and the function, performance and appearance of the sample are qualified after the test.
7-3	High temperature and high humidity storage	Place the sample in an environment of 60℃ ± 1 ℃ and 100% humidity for 240 hours； Take out the sample and place it under normal temperature for over 24h, and then to put the sample in testing fixture and power	Judgment: the sample works normally during the test, and the function, performance and appearance of the sample are qualified after

		on to test.	the test.
7-4	Low temperature storage	Place the sample in an environment of -30℃±3℃ for a time of t=168h； Take out the sample and place it under normal temperature for 2h, and then to put the sample in testing fixture and power on to test.	Judgment: the sample works normally during the test, and the function, performance and appearance of the sample are qualified after the test.
7-5	Thermal Shock	Place the sample in a low temperature box with a temperature of -20℃±2℃ for 0.5h, then take it out, within 2min to put it in an incubator with a temperature of 70℃±2℃ for another 0.5h,repeat the cycle for 10 time. After the 10 cycles testing finished, to put the sample in testing fixture to test.	Judgment: the function, performance and appearance of the sample are qualified after the test.
7-6	PCB 600	Loop the test according to the following conditions： (1) Low temperature: 0℃± 2℃, 10% RH ± 5% RH for 40 min (sample power off) (2) Low temperature ->high temperature: 70℃± 2℃, 90% RH ± 5%RH for 60 min (sample power on) （3)High temperature: 70℃± 2℃, 90% RH ± 5% RH for 20 min (sample power on) (4)High temperature ->low temperature: 0℃± 2℃, 10% RH ± 5% RH60 min (sample power off) Repeat steps (1) - (4) for 600 hours.	During the test, the sample can be powered on and display normally. After the test, the sample works properly and the function, performance and appearance of the sample are qualified.

7-7	Temperature cycle	The picture shows one temperature cycle, to repeat the cycle for 10 times, the measurement is carried out in a high humidity environment 	Judgment: the sample works normally after the test, and the function, performance and appearance of the sample are qualified.
7-8	Vibration	Fix the sample firmly on the vibration table, 10Hz~55, 55~10Hz ,frequency changes every 1 minute, the amplitude is 1.5mm; each 2 hours (6 hours in total) in the X, Y, Z three coordinate directions, when vibrating,the sample need to be connected to power, and test it under both power on state and power off state, each 2 hours. After the test, install the controller on the whole machine to run a standard program.	Judgment: the sample works normally during the test, and the function, performance and appearance of the it are qualified after testing.

8. Reliability Test1

8-1	Salt spray test	Place the sample in salt spray test chamber specified in GB/T 2423.17-2008/IEC 60068-2-11:1981, spray with 5% sodium chloride solution at temperature of 35℃ ± 2℃	The sample coating surface shall be free of corrosion after 48 hours; After 100 hours, the function meets requirements of 4.1~4.4, and there should be no obvious corrosion marks

			on the surface.
8-2	Drop test with package.	The whole box of samples with packing box falls naturally from a height of 80cm above the ground, for one time. (one corner, three coordinate axes and six sides)	After the test, the function and display of the sample are normal, and there is no obvious damage to the structure and appearance.
8-3	Aging resistance test of plastic parts	Place the sample in the fluorescent ultraviolet lamp type weather resistance tester (UVA-340 lamp tube) exposed for 200h at black standard temperature, irradiate for 4h at 60℃± 3℃, and then condensate for 4h without irradiation at the black standard temperature of 50℃± 3℃, and cycle test	After the test, the sample surface shall be free of abnormal phenomena such as cracking and falling off
8-4	Impact resistance	0.5J impact for three times	No cracking; Confirm that there will be no impact on electric shock prevention, moisture resistance, electrical clearance and creepage distance.
8-5	Pull out force	After assembling the entire knob display, apply a vertical pull of 70N outward to the entire knob display, and hold it for 1 minute	The sample can work normally after the test

9. Storage& transportation

9.1 The glass surface of the product shall be covered with a protective film, and single products shall be put into pearl bags. Corrugated paper shall be used for isolation protection between single products;

9.2 The product shall be stored in a warehouse which air circulate, no corrosive gas and no rain or snow;

9.3 The products shall be protected from shock and vibration and direct rain and snow during transportation;
9.4 Meet the requirements for the longest storage time, reinspection and restricted use;
9.5 The packaging state shall ensure that the product is not damaged by force;
9.6 If the product has been stored for 3 months since the date of production, and not been used , random inspection need to be carried out before using; If the product has been stored for 6 months since the date of production, and not been used , full inspection need to be carried out before using;

10. Miscellaneous

During production, transportation and using, if the knob display falls down without protection, its function might be affected, need to be tested before using it. In addition to meeting the above requirements, the product also need to meet the requirements of actual usage environment.