



产 品 规 格 书

SPECIFICATION

产品名称/Product name:	主动从控管理单元 Active Slave Management Unit	
产品型号/Product model:	JKBMU015	
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1. 产品概述 (Product Overview)

从控单元是储能电池管理系统 (BMS) 的重要组成部分, 它对储能电池组在成组使用时的安全应用以及寿命的延长等方面都起着决定性的作用。从控单元通过对各单体电池的电压和温度进行精确采集, 实现对电池状态的实时监控。模块具有可靠的数据通讯功能, 系统运行过程中, 可实现与电池管理系统主控单元或者其他必要设备之间的通讯。设计中采用高可靠的控制芯片, 并利用最新的采集技术, 采集精度高, 为 SOC 的预估提供了良好的物理基础。

The slave control unit is an important component of the energy storage battery management system (BMS), playing a decisive role in the safe application and service life extension of energy storage battery packs when used in groups. The slave control unit achieves real-time monitoring of battery status by accurately collecting the voltage and temperature of each single cell. The module has a reliable data communication function, enabling communication with the main control unit of the BMS or other necessary devices during system operation. The design adopts high-reliable control chips and the latest acquisition technology, with high acquisition accuracy, providing a good physical foundation for SOC estimation.

2. 功能特征 (Functional Characteristics)

- 支持 16 串单体电压采集功能

Support 16-series single-cell voltage acquisition function

- 支持 16 路外部温度采集功能

Support 16-channel external temperature acquisition function

- 支持最大 2A 的主动均衡电流

Support up to 2A active balancing current

- 1 路 isoSPI 通信

1 channel isoSPI communication

- 2 路高边开关输出

2 channels high-side switch output

- 1 路风扇信号回检功能

1 channel fan signal feedback detection function

3. 应用范围 (Application Scope)

- ✓ 适用于磷酸铁锂电池、三元锂电池、锰酸锂电池、钛酸锂电池、钴酸锂电池

Suitable for lithium iron phosphate batteries, ternary lithium batteries, lithium manganate batteries, lithium titanate batteries, lithium cobaltate batteries

- ✓ 储能系统、储能电站

Energy storage systems, energy storage power stations

- ✓ 通讯基站，雷达地面站后备电源

Backup power for communication base stations and radar ground stations

- ✓ 梯次旧电池容量提升

Capacity improvement of cascade old batteries

4. 使用环境 (Operating Environment)

- 工作温度: -25℃ 至 85℃

Operating temperature: -25℃ to 85℃

- 存放温度: -40℃ 至 125℃

Storage temperature: -40℃ to 125℃

- 相对湿度: 非凝结状态下 5% 至 95% RH

Relative humidity: 5% to 95%RH in non-condensing state

- 工作高度: 3000 米

Operating altitude: 3000 meters

5. 电气特性 (Electrical Characteristics)

5.1. 最大极限参数 (Maximum Limit Parameters)

以下参数除特殊注明以外，均指 25℃ 环温下的最大极限参数。

The following parameters (unless otherwise specified) refer to the maximum limit parameters at an ambient temperature of 25℃.

特性 Characteristic		最小 Min	最大 Max	单位 Unit	备注 Remarks
BAT2~BAT1 输入电压 Input voltage		-0.3	5.0	V	
BAT1~GND 输入电压 Input voltage		-0.3	5.0	V	
使用环境 Operating Environment	温度 Temperature	-30	105	℃	
	湿度 Humidity	5	95	%	
	海拔 Altitude		4000	m	
存储温度 Storage Temperature		-40	125	℃	
ESD 保护 ESD Protection		-	空气 15 接触 8 Air 15, Contact 8	kV	

备注:

- 1) 最大极限值是指超出该工作范围，模块有可能永久损坏。
- 2) 温度升高，最大允许功耗降低，是由最大工作温度 T 及环境温度 TA 和散热条件决定。

Remarks:

- 1) The maximum limit value means that the module may be permanently damaged if the working range is exceeded.
- 2) When the temperature rises, the maximum allowable power consumption decreases, which is determined by the maximum operating temperature T, ambient temperature TA, and heat dissipation conditions.

5.2. 基本电气参数 (Basic Electrical Parameters)

以下参数除特殊注明以外，均指 25℃ 环温下的电气参数。

主要技术参数		最小值	典型值	最大值	单位	备注
低压供电电源	电压	9	24	32	V	
	电流		0.01	2	A	打开 1 路高边输出时最大为 2A
单体电池电压	电压范围	1		4.5	V	
	采样点数	7		16	PCS	
	采样精度			±5.0	mV	@2.5V~4.5V, -30℃~85℃
温度采样	温度范围	-30		105	℃	存储温度
	采样点数			16	PCS	
	采样精度			±2	℃	@-30℃~85℃

主要技术参数		最小值	典型值	最大值	单位	备注
高边开关输出	持续电流			1	A	单路输出
	电压值		24		V	与辅助电源一致
主动均衡	电流			2	A	
电池测电源	电压	20		72	V	单个 AFE 模块电压采样
	功耗		6.8	10.5	mA	从控单个模块最小工作与电池串数有关
绝缘与耐压	绝缘电阻	20			MΩ	电压采样端与外壳及数字接口端
	额定工作电压			1500	V	
	耐压	电压采样端与外壳及数字接口端之间施加 50Hz 3000Vac 试验电压,1 分钟无击穿、无闪络				

The following parameters (unless otherwise specified) refer to the electrical parameters at an ambient temperature of 25°C.

Main Technical Parameters	Minimum	Typical	Maximum	Unit	Remarks
Lowvoltage Power Supply					
Voltage	9	24	32	V	
Current		0.01	2	A	Maximum 2A when 1 highside output channel is turned on
Singlecell Voltage					
Voltage Range	1		4.5	V	
Sampling Points	7		16	PCS	
Sampling Accuracy			± 5.0	mV	@2.5V~4.5V, -30°C~85°C
Temperature Sampling					
Temperature Range	-30		105	°C	Storage temperature
Sampling Points			16	PCS	
Sampling Accuracy			± 2	°C	@-30°C~85°C
Highside Switch Output					
Continuous Current			1	A	Singlechannel output
Voltage Value		24		V	Consistent with auxiliary power supply
Active Balancing					
Current			2	A	

Batteryside Power Supply					
Voltage	20		72	V	Voltage sampling for a single AFE module
Power Consumption		6.8	10.5	mA	Minimum power consumption of a single slave module is related to the number of battery strings
Insulation and Voltage Resistance					
Insulation Resistance	20			MΩ	Between voltage sampling terminals, case and digital interface terminals
Rated Working Voltage			1500	V	
Voltage Withstand	Apply a 50Hz 3000Vac test voltage between the voltage sampling terminals, case and digital interface terminals, with no breakdown or flashover within 1 minute.				

6. 接口定义 (Interface Definition)

6.1. 接口示意图 (Interface diagram)

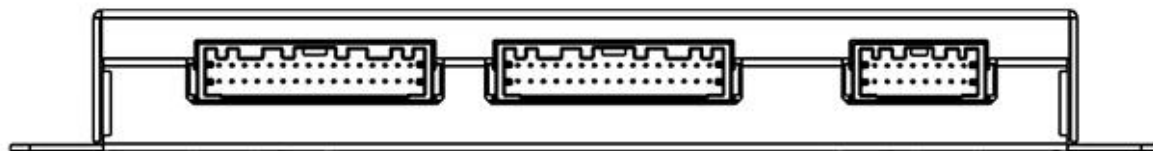


图 6-1 接口示意图

Figure 6-1 Interface Diagram

6.2. 接口型号 (Interface type)

连接器 Connector	品牌 Brand	针脚数 Pin Count	板端编码/型号 Board-End Code/Model	线端编码/型号 Wire-End Code/Model
插簧端子: 63.09.002.0009/T-WTW30-FHSN/适配 0.22~0.35mm ² 线径 Crimp terminal: 63.09.002.0009/T-WTW30-FHSN/suitable for 0.22~0.35mm ² wire diameter				
M1	益鑫通 YXT	16	63.09.000.0055/ WTW30-xBHS161	63.09.001.0018/ I-WTW30-F16100-PBBK
M2	益鑫通 YXT	32	63.09.000.0051/ WTW30-BHS321-LSBR (黑 Black)	63.09.001.0014/ I-WTW30-F32100-PBBK (黑 Black)
M3	益鑫通 YXT	32	63.09.000.0052/ WTW30-BBHS321-LSLR (蓝 Blue)	63.09.001.0015/ I-WTW30-BF32100-PBBL (蓝 Blue)

M1 (板端 Board End) : WTW30-xBHS161								
引脚 Pin	8	7	6	5	4	3	2	1
定义 Definition	OUT_IPB	IN_IPA	NC	FAN_FBK1	NC	PWR_IN +	NC	PWR-
引脚 Pin	16	15	14	13	12	11	10	9
定义 Definition	OUT_IMB	IN_IMA	NC	FAN_FBK2	NC	H_OUT 2	H_OUT1	PWR+

M2 (板端 Board End) : WTW30-BHS321-LSBR (黑 Black)																
引脚 Pin	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
定义 Definition	NC	NC	NC	BAT 8	BAT 6	BAT 4	BAT 2	BAT 0	NC	NC	NC	NT C_G	RT7	RT5	RT3	RT1
引脚 Pin	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
定义 Definition	NC	NC	NC	BAT 7	BAT 5	BAT 3	BAT 1	PW-A	NC	NC	NT C_G	RT8	RT6	RT4	RT2	NTC _G

M3 (板端 Board End) : WTW30-BBHS321-LSLR (蓝 Blue)																
引脚 Pin	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
定义 Definition	PW +	NC	NC	BAT16	BAT14	BAT12	BAT10	BAT9-	NC	NC	NC	NT C_G	RT1 5	RT1 3	RT1 1	RT9
引脚 Pin	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17
定义 Definition	NC	NC	NC	BAT15	BAT13	BAT11	BAT9	NC	NC	NC	NT C_G	RT1 6	RT1 4	RT1 2	RT1 0	NTC _G

6.3. 接口定义 (Interface definition)

连接器	引脚序号	信号名称	功能描述	默认应用
M1 连接器	1	PWR-	系统供电负极	
	2	NC	悬空	
	3	PWR_IN+	均衡供电正极	
	4	NC	悬空	
	5	FAN_FBK1	风扇检测	
	6	NC	悬空	
	7	IN_IPA	IsoSPI 通信 PA	箱内外的菊花链通信线束需要使用非屏蔽双绞线, 双绞线的绞距 $\leq 20\text{mm}$, 双绞线的解距 $\leq 50\text{mm}$
	8	OUT_IPB	IsoSPI 通信 PB	
	9	PWR+	辅助供电正极	
	10	H_OUT1	第一路高边开关	
	11	H_OUT2	第二路高边开关	
	12	NC	悬空	
	13	FAN_FBK2	风扇检测	
	14	NC	悬空	
	15	IN_IMA	IsoSPI 通信 MA	箱内外的菊花链通信线束需要使用非屏蔽双绞线, 双绞线的绞距 $\leq 20\text{mm}$, 双绞线的解距 $\leq 50\text{mm}$
	16	OUT_IMB	IsoSPI 通信 MB	
M2 连接器	1	RT1	第一路温度采样输入	
	2	RT3	第三路温度采样输入	
	3	RT5	第五路温度采样输入	
	4	RT7	第七路温度采样输入	
	5	NTC_G	温度采样负	
	6	NC	悬空	
	7	NC	悬空	
	8	NC	悬空	

连接器	引脚序号	信号名称	功能描述	默认应用
	9	BAT0	第一节电池负极	
	10	BAT2	第二节电池正极	
	11	BAT4	第四节电池正极	
	12	BAT6	第六节电池正极	
	13	BAT8	第八节电池正极	
	14	NC	悬空	
	15	NC	悬空	
	16	NC	悬空	
	17	NTC_G	温度采样负	
	18	RT2	第二路温度采样输入	
	19	RT4	第四路温度采样输入	
	20	RT6	第六路温度采样输入	
	21	RT8	第八路温度采样输入	
	22	NTC_G	温度采样负	
	23	NC	悬空	
	24	NC	悬空	
	25	PW-	AFE 供电负极	
	26	BAT1	第一节电池正极	
	27	BAT3	第三节电池正极	
	28	BAT5	第五节电池正极	
	29	BAT7	第七节电池正极	
	30	NC	悬空	
	31	NC	悬空	
	32	NC	悬空	
M3 连接器	1	RT9	第九路温度采样输入	
	2	RT11	第十一路温度采样输入	
	3	RT13	第十三路温度采样输入	
	4	RT15	第十五路温度采样输入	

连接器	引脚序号	信号名称	功能描述	默认应用
	5	NTC_G	温度采样负	
	6	NC	悬空	
	7	NC	悬空	
	8	NC	悬空	
	9	BAT9-	第九节电池负极	
	10	BAT10	第十节电池正极	
	11	BAT12	第十二节电池正极	
	12	BAT14	第十四节电池正极	
	13	BAT16	第十六节电池正极	
	14	NC	悬空	
	15	NC	悬空	
	16	PW+	AFE 供电正极	
	17	NTC_G	温度采样负	
	18	RT10	第十路温度采样输入	
	19	RT12	第十二路温度采样输入	
	20	RT14	第十四路温度采样输入	
	21	RT16	第十六路温度采样输入	
	22	NTC_G	温度采样负	
	23	NC	悬空	
	24	NC	悬空	
	25	NC	悬空	
	26	BAT9	第九节电池正极	
	27	BAT11	第十一节电池正极	
	28	BAT13	第十三节电池正极	
	29	BAT15	第十五节电池正极	
	30	NC	悬空	
	31	NC	悬空	
	32	NC	悬空	

Connector	Pin Number	Signal Name	Function Description	Default Application
M1 Connector	1	PWR-	System power supply negative	
	2	NC	Not connected	
	3	PWR_IN+	Balancing power positive	
	4	NC	Not connected	
	5	FAN_FBK1	Fan feedback detection 1	
	6	NC	Not connected	
	7	IN_IPA	IsoSPI communication PA	For daisy chain communication harness inside and outside the box, unshielded twisted pair (UTP) should be used with twist pitch $\leq 20\text{mm}$ and untwist distance $\leq 50\text{mm}$
	8	OUT_IPB	IsoSPI communication PB	
	9	PWR+	Auxiliary power supply positive	
	10	H_OUT1	First high-side switch output	
	11	H_OUT2	Second high-side switch output	
	12	NC	Not connected	
	13	FAN_FBK2	Fan feedback detection 2	
	14	NC	Not connected	
	15	IN_IMA	IsoSPI communication MA	For daisy chain communication harness inside and outside the box, unshielded twisted pair (UTP) should be used with twist pitch $\leq 20\text{mm}$ and untwist distance $\leq 50\text{mm}$
	16	OUT_IMB	IsoSPI communication MB	
M2 Connector	1	RT1	1st channel temperature sampling input	
	2	RT3	3rd channel temperature sampling input	
	3	RT5	5th channel temperature sampling input	
	4	RT7	7th channel temperature sampling	

			input	
	5	NTC_G	NTC ground (temperature sampling negative)	
	6	NC	Not connected	
	7	NC	Not connected	
	8	NC	Not connected	
	9	BAT0	1st cell negative terminal	
	10	BAT2	2nd cell positive terminal	
	11	BAT4	4th cell positive terminal	
	12	BAT6	6th cell positive terminal	
	13	BAT8	8th cell positive terminal	
	14	NC	Not connected	
	15	NC	Not connected	
	16	NC	Not connected	
	17	NTC_G	NTC ground (temperature sampling negative)	
	18	RT2	2nd channel temperature sampling input	
	19	RT4	4th channel temperature sampling input	
	20	RT6	6th channel temperature sampling input	
	21	RT8	8th channel temperature sampling input	
	22	NTC_G	NTC ground (temperature sampling negative)	
	23	NC	Not connected	
	24	NC	Not connected	
	25	PW-	AFE power supply negative	
	26	BAT1	1st cell positive terminal	
	27	BAT3	3rd cell positive terminal	
	28	BAT5	5th cell positive terminal	
	29	BAT7	7th cell positive terminal	
	30	NC	Not connected	
	31	NC	Not connected	
	32	NC	Not connected	
M3 Connector	1	RT9	9th channel temperature sampling input	
	2	RT11	11th channel temperature sampling input	

	3	RT13	13th channel temperature sampling input	
	4	RT15	15th channel temperature sampling input	
	5	NTC_G	NTC ground (temperature sampling negative)	
	6	NC	Not connected	
	7	NC	Not connected	
	8	NC	Not connected	
	9	BAT9-	9th cell negative terminal	
	10	BAT10	10th cell positive terminal	
	11	BAT12	12th cell positive terminal	
	12	BAT14	14th cell positive terminal	
	13	BAT16	16th cell positive terminal	
	14	NC	Not connected	
	15	NC	Not connected	
	16	PW+	AFE power supply positive	
	17	NTC_G	NTC ground (temperature sampling negative)	
	18	RT10	10th channel temperature sampling input	
	19	RT12	12th channel temperature sampling input	
	20	RT14	14th channel temperature sampling input	
	21	RT16	16th channel temperature sampling input	
	22	NTC_G	NTC ground (temperature sampling negative)	
	23	NC	Not connected	
	24	NC	Not connected	
	25	NC	Not connected	
	26	BAT9	9th cell positive terminal	
	27	BAT11	11th cell positive terminal	
	28	BAT13	13th cell positive terminal	
	29	BAT15	15th cell positive terminal	
	30	NC	Not connected	
	31	NC	Not connected	
	32	NC	Not connected	

7. 外形与尺寸 (Product Appearance)

产品外形采用高强度塑胶外壳, 4 个固定孔, 具有更广泛的产品适应性。

The product is enclosed in a high-strength plastic casing with four fixing holes, ensuring broader product adaptability.

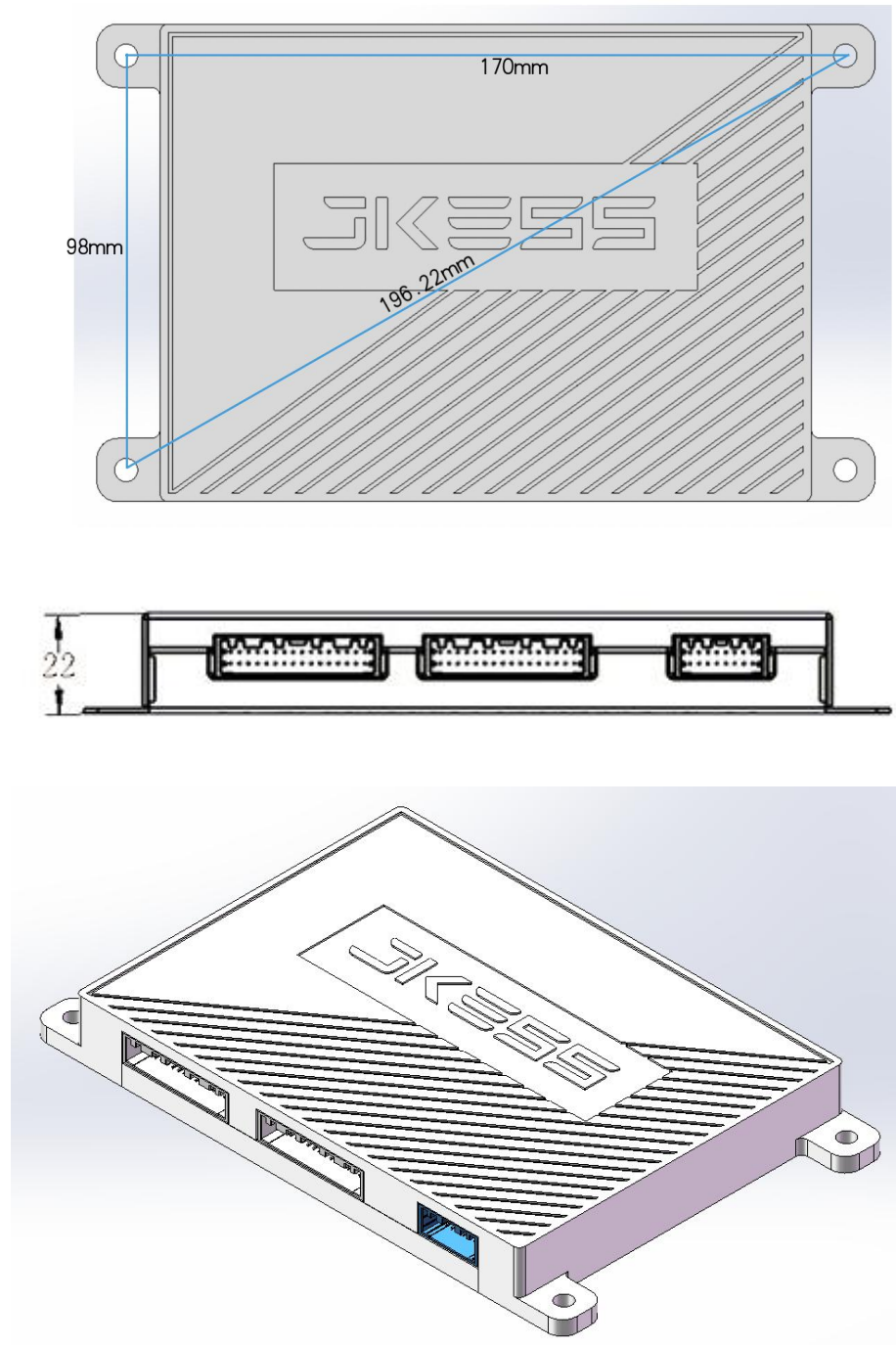


图 7-1 产品外观尺寸图 单位: mm

Figure 7-1 Product Appearance Dimension Diagram Unit: mm

8. 注意事项 (Precautions)

1. 使用之前请正确接线，具体接线方式参考产品说明书或咨询厂家技术服务中心。

Please connect the wires correctly before use. For specific wiring methods, refer to the product manual or consult the manufacturer's technical service center.

2. 若选型继电器，充放电电流请不要超过继电器或接触器标称参数值。

If a relay is selected, the charging and discharging current shall not exceed the nominal parameters of the relay or contactor.

3. 不使用时，请断开系统电源。

Disconnect the system power when not in use.

4. 请不要随意改动系统配置参数。

Do not arbitrarily change the system configuration parameters.

5. 若发现产品异常，请及时断电并联系公司技术支持中心。

If any abnormality is found in the product, please power off in time and contact the company's technical support center.

9. 包装与存储 (Packaging and Storage)

9.1 包装 (Packaging)

- 1) 单独模块气泡袋包装。

Individual modules are packaged in bubble wrap.

- 2) 配置纸板隔板的纸箱包装。

Carton packaging with cardboard partitions.

9.2 运输 (Transportation)

- 1) 在运输过程中应防止剧烈振动，高处跌落，挤压、冲击、日晒雨淋等。

During transportation, avoid severe vibration, high-altitude dropping, extrusion, impact, sunlight, rain, etc.

- 2) 堆码高度不超过 5 层，禁止放置重物。

The stacking height shall not exceed 5 layers, and placing heavy objects is prohibited.

9.3 存储 (Storage)

- 1) 建议存储环境温度在 0℃~45℃ 之间。

The recommended storage temperature is between 0℃ and 45℃.

- 2) 建议存储的相对湿度在 25%~75% 之间。

The recommended relative humidity for storage is between 25% and 75%.

- 3) 与干燥剂一起包装，减少氧化，产品不得在含有硫或氯等有害气体中储存。

Pack with desiccants to reduce oxidation. The product shall not be stored in environments with harmful gases such as sulfur or chlorine.

10. 技术支持与服务 (Technical Support and Services)

1. 包装信息请参见《产品出货包装信息》。

For packaging information, please refer to Product Shipment Packaging Information.

2. 若产品工作于超过本手册标注负载以上，则不能保证产品性能符合本手册中所有性能指标。

If the product operates beyond the load specified in this manual, it cannot be guaranteed that all performance indicators in this manual will be met.

3. 本文数据除特殊说明外，都是在 Ta=25℃，湿度 < 75%，输入标称电压和输出额定负载时测得。

Unless otherwise specified, all data in this document are measured at Ta=25℃, humidity <75%, nominal input voltage, and rated output load.

4. 以上均为本手册所列产品性能指标。

The above are all product performance indicators listed in this manual.

5. 我司支持提供产品定制。

Our company supports product customization.

6. 有关产品使用和技术相关问题，请随时与我们联系，我们会在收到信息后第一时间给您答复，我们期待与您的沟通交流!

For any questions regarding product use and technical issues, please feel free to contact us. We will respond to you promptly upon receiving the information and look forward to communicating with you!