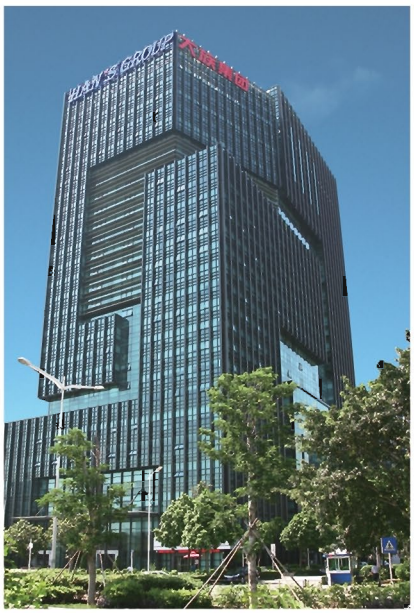
HAN'S ROBOT
大族机器人



COMPANY PROFILE
公司简介

深圳市大族机器人有限公司是由上市公司—大族激光科技产业集团股份有限公司(股票名称：大族激光，股票代码：002008) 投资组建的控股子公司，是在大族电机机器人研究院100多人的团队基础上孵化而成的高技术企业。公司成立于2017年9月，位于深圳市南山区高新技术产业园，并在宝安区有生产基地。公司致力于智能机器人在工业、医疗、物流、服务等领域的研发、推广和应用。

公司基于十多年的电机、伺服驱动和运动控制经验，围绕智能机器人业务，开发了机器人电机、伺服驱动器、机器人控制器、机器视觉等机器人核心功能部件，并成功推出人机协作机器人、精密直角坐标机器人、AGV、SCARA、移动操作机器人、智能检测等机器人和自动化产品。公司还与合作伙伴合作，开展机器人在各种领域的应用开发。

公司与清华大学、北京航空航天大学、哈尔滨工业大学、中科院深圳先进院、深圳大学、广东工业大学、华中科技大学、香港中文大学、新加坡国立大学等国内外知名大学建立了长期合作的关系。

Shenzhen Han's Robot Co., Ltd, is a wholly-owned subsidiary invested by Han's Laser Technology Group (stock name: Han's laser, stock code: 002008) and a high-tech company established on the basis of more than 100 people from Han's Robot Division, Han's Motor. It was founded in September, 2017 and located in high-tech industry park, Nanshan district, Shenzhen. In addition, there is a production base in Bao'an district, Shenzhen. Han's Robot is dedicated to the development, promotion and application of intelligent robots in industry, healthcare, logistics, services and so on.

Based on over 10 years of experience in motors, servo drives, and motion control, Han's Robot developed core functional units centered on intelligent robots, such as the robot motor, servo drive, robot controller, machine vision, etc. Besides, it successfully launched the collaborative robot, high-precision Cartesian coordinate robot, AGV, SCARA, mobile operation robot, intelligent inspection machine and other automotive products. Moreover, Han's Robot collaborates with partners to develop robot applications in various fields.

Han's Robot has established long-term cooperative relationships with famous universities at home and abroad, such as Tsinghua University, Beihang University , Harbin Institute of Technology, Shenzhen Institutes of Advanced Technology, Shenzhen University, Guangdong University of Technology, Huazhong University of Science and Technology, Chinese University of Hong Kong, National University of Singapore, etc.

002008
大族激光股票代码

2017
公司成立于2017年9月

100
研究院100多人的团队基础上
孵化而成的高技术企业

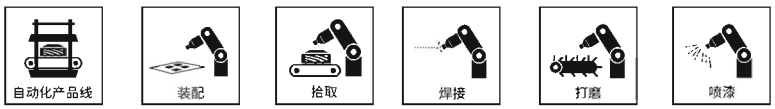
CONTENTS 目录

ELFIN SERIES COLLABORATIVE ROBOT

Elfin系列协作机器人

应用Applications

可用于集成自动化产品线、装配、拾取、焊接、打磨、喷漆等工作场合。
Applied for integrated automatic production line, assembly, pickup,welding, grinding,painting,etc.



产品规格/Specifications

型号 type	E3	E5	E5-L	E10	E15
重量 weight	17kg	23kg	24kg	40kg	45kg
最大负载 payload	3kg	5kg	3.5kg	10kg	15kg
工作范围 reach	590mm	800mm	950mm	1000mm	700mm
功耗 power	运行经典程序时约100W 100W in typical cycle	运行经典程序时约180W 180W in typical cycle		运行经典程序时约350W 350W in typical cycle	运行经典程序时约450W 450W in typical cycle
关节范围 joint range	±360°				
关节最大速度 joint speed	J1-J6 135°/S	J1-J6 135°/S	J1-J6 135°/S	J1-J2 85°/S J3-J6 135°/S	J1-J2 85°/S J3-J6 100°/S
工具最大速度 tool speed	1m/s				
重复精度 repeatability	±0.05mm(在通常情况下) ±0.05mm(under normal conditions)				
自由度 degree of freedom	6				
控制柜尺寸 control box size	536*445*319mm				
末端I/O端口 end I/O port	数字输入:4,数字输出:4,模拟输入2 digital input : 4 , digital output : 4 , analog input:2				
电箱I/O端口 control box I/O port	数字输入:16,数字输出:16 模拟输入2,模拟输出2 digital input : 16 , digital output : 16 , analog input : 2 , analog output : 2				
I/O电源 I/O source	24V 2A				
通讯 communication	TCP/IP				
编程 programming	图形化编程,远程调用接口 graphical programming,remote process call				
防护等级 IP classification	IP54				
协同操作 collaborative operation	10个高级安全配置功能 10 advanced configurations for safety				
主要材料 main material	铝合金 aluminum alloy				
工作环境温度 working temperature	0-50℃				
外部电源输入 power input	200-240V AC,50-60Hz				
电缆 cable	连接控制柜的电缆:5m,连接示教器的电缆:5m cable to connect the control box:5m,cable to connect teach pendant:5m				

轻自重
Light-weight

标准额定负载为 5Kg，自重仅为 23Kg
5kg in rated load with 23kg in weight

模块化
Modularity

减速机、电机、编码器以及驱动控制一体化集成
All-in-one module of reducer, motor, encoder and drive

精度高
High accuracy

重复精度达到 ±0.05mm
Repeatability up to ±0.05mm

STAR ROBOT
Star机器人

应用Applications

Star 机器人主要应用在电子、机加工的无人车间，通过移动机器人代替人员的搬运，机械臂代替人员的抓取，并结合机器视觉系统，替代人工将工装、工件等在车间进行周转、配送，实现工厂无人柔性化制造。

Star robot is mainly used in unmanned workshops of electronics and machining industry. It can automatically grab objects,handle and transport work pieces with mobile robot, robot arm and machine visual system in place of workers, thus achieving unmanned production in workshops.

多种导航方式 Multiple navigation methods

支持磁带 / 激光 SLAM 无轨导航，根据不同的现场环境选择合适的导航方式，提升了设备的灵活性与通用性，以适应复杂的作业环境。

Star supports tape/laser SLAM trackless navigation（User can choose appropriate navigation methods according to different environments）,which makes it more flexible and universal to adapt to complicated working environment.

安全可靠 Safe and reliable

机械臂支持力矩反馈功能，在碰到障碍物时，及时安全停车。通过远距离激光防护、近距离防撞触边防护、急停按钮防护，多重防护措施保证了机器人安全可靠运行。

Robot arm support torque feedback, so the robot will stop in time when it touches obstacles. Moreover, multiple protection measures ensure the safe and reliable work, such as remote laser protection, short distance anti-collision protection, E-stop, etc.

自主研发 Independent R&D

移动机器人、机械臂、机器人导航、视觉系统、力控夹具等核心技术均为自主研发，保证了整个系统的一致性、兼容性，并尽可能的降低客户成本。

The key subsystems of Star, such as mobile robot,Elfin robot, AGV, machine vision and force control gripper are all developed by Han' s Robot. It ensures the consistency as well as compatibility of the whole system and reduces costs for customer as much as possible.

易于操作 Easy to operate

零力示教，有效降低了调试时间及学习成本。机器人可以与客户机台及便携 PC 进行无线网络通信，通过友好的人机操作界面可以快速实现机器人布置、视觉匹配、机器人示教等。将上位机软件安装在客户监控电脑上可实现实时监控。

Force-free teaching effectively reduces debugging time and learning cost.It can communicate with customer machine and portable PC via wireless net works. Besides, such operations can be finished in very short time as robot arrangement, visual matching, teaching pendant and so on through the friendly man-machine operation interface.Additionally, real-time monitoring will start if host computer software is installed in customer monitoring computer.

产品规格/Specifications

外形尺寸 dimensions	L1100*W650*H745mm(不含臂长) L1100*W650*H745mm (without arm)
导航类型 navigation	激光导航/磁带导航 laser SLAM/magnetic tape navigation
行走方向 walking direction	前进后退行走，原地旋转（遥控模式） forward, backward, spin around (Remote control mode)
驱动方式 driving mode	两轮差速驱动 two-wheel differential driving
行进速度 movement speed	18-36m/min
最大负载 payload	50kg
最大抓取重量 maximum grip weight	15KG（最大工作范围1000mm，正常工作范围700mm） 15KG (maximum working reach1000mm,normal working reach 700mm)
报警形式 alarm way	扬声器，三色指示灯 speaker, 3-color light
驱动单元升降机构 lifting mechanism of driving unit	一键电动升降 one-button electric lifting
AGV重复定位精度 AGV repeated positioning accuracy	最高±10mm maximum ±10mm
机械臂重复定位精度 arm repeated positioning accuracy	±0.05mm
安全防护装置 safety device	激光传感器、保险杠、急停按钮 lidar, bumper, E-STOP
续航能力 endurance	空载：12h，满载：8h no load: 12h, full-load: 8h
可选配置 available options	自动充电；视觉；夹爪 auto charge;visual;gripper

D-MODULE SERIES

D-MODULE模组系列

大族机器人专门为协作机器人设计了一款双关节模组，高度集成了无框直驱力矩电机、低压直流驱动器、谐波减速机、制动器等结构，尺寸小，符合协作机器人紧凑、灵活的设计特点。

高度集成的一体化设计，降低了客户在研发机器人过程中研发人员和时间的投入，简化了供应链管理及质量管理综合成本，从而实现新型机器人产品的快速上市，让协作机器人开发变得更稳定可靠、便捷安全，满足多元化设计。

Han's Robot has designed for the collaborative robot a two-joint module. It highly integrates frameless direct drive torque motor, low-voltage DC drive, harmonic drive, brake and so on, which conforms to the compact and flexible feature of a collaborative robot.

The high integration design reduces customers' R&D investment in engineers and time, simplifies supplier chain management and comprehensive quality management cost, thus achieving quick marketing of new robots. Therefore, it makes the development of collaborative robot more stable, reliable, convenient, safe as well as meets design diversity.

产品规格/Specifications

型号 type	14系列 14 series	17系列 17 series	20系列 20 series	25系列 25 series	32系列 32 series
额定转矩 rated torque	9.4Nm	30Nm	49Nm	85Nm	156Nm
峰值转矩 peak torque	34Nm	69Nm	104Nm	200Nm	420Nm
最大输出转速 maximum rotation speed	135°/s	135°/s	135°/s	135°/s	85°/s
重量 weight	2.75kg	3.95kg	5.50kg	8.90kg	16.55kg
旋转角度 rotation angle	±360°				
重复精度 repeatability	20arcsec				
通讯方式 communication	EtherCAT				
供电电压 supply voltage	DC 48V				
防护等级 IP classification	IP54				
主要材料 main material	铝合金 aluminum alloy				
工作环境温度 working temperature	0-50°C				
工作环境湿度 working humidity	10-80%				

HM SCARA600/700

HM水平多关节机械手 SCARA600/700

应用Applications

多用于水平平面上快速搬运及电子设备装配
Mostly used on fast transportation on horizontal plane and assembly of electronics

可靠
Reliable

重复定位精度 ±0.01mm，采用高刚性滚珠花键丝杆及谐波减速机。
Repeatable positioning accuracy is ±0.01mm due to high rigidity spline ball screw and harmonic reducer.

工作范围大
Wide working range

工作半径 600mm，第一工作臂 ±135°，第二工作臂 ±145°
Working radius is 600mm with the first arm ±135° and second arm ±145°.

高负载
High payload

最大负载 6kg
Maximum payload is 6kg.

产品规格/Specifications

型号 type	SCARA 600	SCARA 700
臂长 reach	600mm	700mm
最大负载 payload	6KG	4.5KG
额定负载 rated load	3KG	2KG
标准循环时间 standard cycle time	0.46S	0.6S
第一、二、三关节重复定位精度 repeatability of the first,second and third joint	±0.01mm	±0.015mm
第四关节重复定位精度 repeatability of the fourth joint	±0.005°	±0.01°
本体重量 weight	19KG（不含线缆） 19KG（without cable）	20KG（不含线缆） 20KG（without cable）
防护等级 IP classification	IP54	IP54
电机功耗 motor power	第1关节 400W first joint	第1关节 400W first joint
	第2关节 200W second joint	第2关节 200W second joint
	第3关节 100W third joint	第3关节 100W third joint
	第4关节 100W fourth joint	第4关节 100W fourth joint

HYBRID NAVIGATION MOBILE ROBOT
混合导航移动机器人

- 移动机器人通用平台
- 低矮小巧
- 可原地旋转
- 可自由切换激光 SLAM 或磁带导航
- 可加载举升、牵引、滚筒线、（机械臂）等应用装置，实现物料的抓取、转运等动作

- Universal platform for mobile robots
- Low-profile and compact
- Able to spin around
- Free to switch between laser SLAM and tape navigation
- Possible to add application devices such as lifting, pulling, robot arm, roller line, etc, to achieve the grabbing and handling of objects

产品规格/Specifications

外形尺寸 dimensions	L1050*W650*H320mm	L810*W600*H380mm
最大负载 payload	150kg	75kg
行进速度 movement speed	5-48m/min	
运载类型 carrying type	与不同模块结合，实现不同功能 combined with different modules to achieve different functions	
导航类型 navigation	激光SLAM&磁带混合导航 Laser SLAM&Tape Hybrid Navigation	
行走方向 walking direction	前进后退，原地旋转 forward, backward, spin around.	
拐弯半径 turning radius	零半径 zero radius	
定位精度 positioning accuracy	最高±10mm maximum ±10mm	
通讯方式 communication	无线局域网/无线射频 Wireless LAN / radio frequency	
电池类型 battery	锂电池 lithium battery	
充电方式 charging method	手动/定制自动充电 Manual / custom automatic charging	

HAN'S AGV NAVIGATION CONTROLLER

大族AGV自主导航控制器

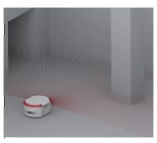
Han's 导航控制器是一个功能齐全、接口丰富、安装简便的控制模块，在连接 Lidar、遥控器、驱动器、IO 模块后即可正常使用。驱动方案的选择上，可以由控制器直连驱动器，也可经过原 PLC 或单片机间接控制，后者适用于旧车改造，可节省大量改装配置工作。

Han's navigation controller is a control module with complete functions,various ports and easy installation. It can be normally used after connecting lidar,remote control, drive and I/O module. Regarding drive solutions, there is direct connection to drive or indirect control through original PLC/ single-chip microcomputer. The latter solution is used in old AGV modification which can save a lot of modification configuration work.

手柄遥控巡行
Joystick control

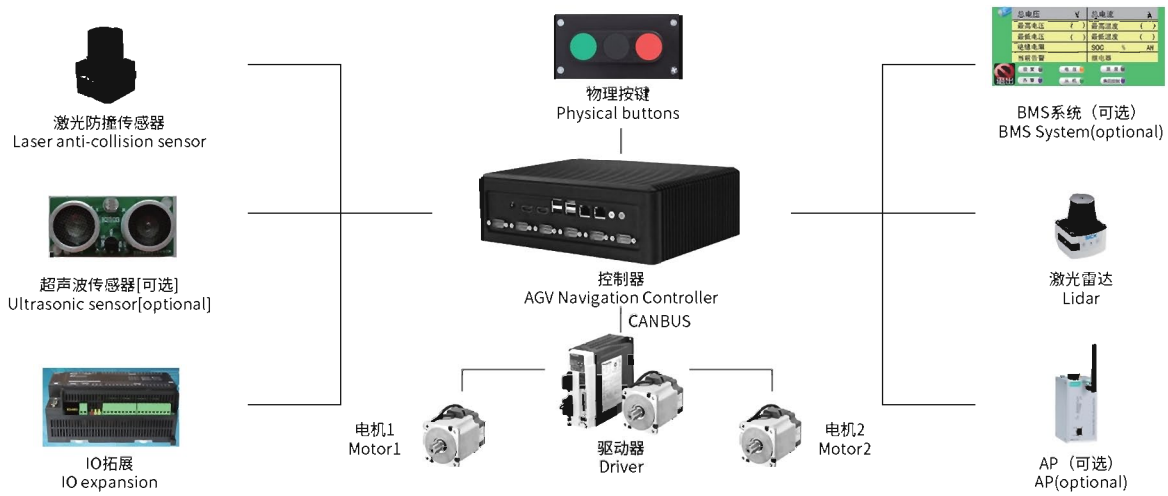
构建地图及设定虚拟障碍
Mapping with obstacles

指定任务路线
Designated route



激光导航
Laser SLAM navigation

动态避障
Dynamic obstacle avoidance



CUTE SERIES ROBOT
Cute 系列机械臂

轻自重
Light-weight

自重 1.5kg，较为安全
only 1.5kg in weight, safe for user and other devices

高灵活度
High flexibility

拥有 7 个自由度，活动范围比较宽广
7 degrees of freedom ensures wide working range

示教简单
Easy teaching

可直接通过人手示教
able to be taught by hand

上位机开源
Open source

供用户进行二次开发
free for secondary development

产品规格/Specifications

自由度 degree of freedom	7
重量 weight	1.6kg
最大负载 payload	300g
臂 长 reach	506mm
工具速度 tool speed	100cm/s
关节最大转速 maximum joint rotation speed	30Rpm
重复精度 repeatability	±0.5mm
通讯协议 communication protocol	Modbus/自定义协议 Modbus/customized protocol
夹爪最大力 maximum clamping force	35N

DIGITAL SERVO

Xqtor系列数字舵机

Xqtor 系列数字舵机包含直流电机、减速箱、编码器及驱动器；可 360°全角度旋转；轻便，低成本，可连续运转 800 小时。

Xqtor consists DC motor, reduction gearbox, encoder and drive; 360° turn; light; low-cost,; 800h of continuous running.

应用Applications

机器人关节；机器人教学；服务机器人；机器人竞赛；3D 打印机
Robot joints; Educational robot; Service robot; Competition; 3D printer

产品规格/Specifications

型号 type	XQtor-H7	XQtor-MiniX
重量 weight	166g	94g
额定电压 rated voltage	8-14.8V	8-14.8V
额定功率 rated power	13W	6W
最大转速 maximum rotation speed	60Rpm	70Rpm
额定扭矩 rated torque	1.3Nm	0.7Nm
齿轮减速比 gear reduction ratio	200:1	191:1
反馈 feedback	位置;速度;电流;温度 Position; Speed; Current; Temperature	
角度分辨率 angle resolution	12位	
工作温度 working temperature	10-80°C	
通讯接口 communication Interface	RS-485	
通讯协议 communication protocol	Modbus/自定义协议 Modbus/customized protocol	
齿轮背隙 gear backlash	≤0.3°	

SERVO DRIVE
伺服驱动器

Han's SERVO-ST5 系列伺服驱动器拥有业内先进的技术和功能，而且结构十分紧凑。其中包括基本的转矩和速度应用、分度、以及采用嵌入式自动化组件的多轴可编程运动应用。可以与直线电机、DDR 电机、伺服电机配合使用。产品具有丰富的功能可以为相关产品提供定制化服务。
Han's SERVO-ST5 系列的设计充分考虑了通用性及定制化功能、通信功能以及功率等，以满足提升机器性能和集成速度的需求。支持多种总线联通方式，其中既有开放协议，也有封闭式协议，它具有在线故障检修和数据检验功能，可以更快地实现无故障编程。

Han's SERVO-ST5 series servo drives use the industry's advanced technology and features, which are extremely compact. Including basic torque and speed applications, indexing, and multi-axis programmable motion applications with embedded automation components. It can be used with linear motors, DDR motors, servo motors.
Han's SERVO-ST5 series are designed with versatility and customization, communication capabilities and power in order to meet the demands of machine performance and integration speed. It Supports a variety of bus connection methods, including both open and closed protocol. With online troubleshooting and data verification, it can achieve for faster, trouble-free programming.

驱动器细节特征/Features

运动控制模式
力矩、速度和位置伺服控制
±10V 速度和力矩控制命令
单轴和多轴协同控制
2M 脉冲指令带宽，脉冲方式灵活
PWM 控制
电流带宽最高可达 5KHz

Motion control mode
Torque, speed and position servo control
±10V speed and torque control commands
Single-axis and multi-axis coordinated control
2M pulse command bandwidth, flexible pulse mode
PWM control
Current bandwidth up to 5KHz

保护
STO 安全扭矩切断功能
电机电源输出短路
过温度
过 / 欠电压
反馈无效
电流限制
跟随误差

Protection
STO safe torque off function
Motor power output short circuit
Over temperature
Over/under voltage
Invalid feedback
Current limit
Following error

反馈类型
数字式
•数字式增量编码器
模拟式
•Sin/Cos
•旋转变压器
绝对式编码器
•Heidenhain EnDat2.2(29bits)
•Biss
•Hiperface

Feedback type
Digital
•Digital incremental encoder
Analog
•Sin/Cos
•Resolver
Absolute encoder
•Heidenhain EnDat2.2(29bits)
•Biss
•Hiperface

内建保护和诊断
软件参数句柄
广泛的系统信息报告

Built-in protection and diagnosis
Software parameter handle
Extensive system information report

机械共振抑制
系统扫频，观测器技术
低通滤波器
多个陷波滤波器用于谐振点抑制

Mechanical resonance suppression
System sweep, observer technology
Low pass filter
Multiple notch filters for resonance point suppression

软件工具
自定义轨迹，用户最多可编程 256 条轨迹
高分辨率监测，6 路 scope 通道
在线监控，直接和远程监控
自动和手动增益调整，分析和除错
内置电子齿轮控制功能
灵活全面的回零方式
增益在线调整
系统辨识

Software tools
Custom trajectory, the user can program up to 256 tracks
High resolution monitoring, 6 scope channels
Online monitoring, direct and remote monitoring
Automatic and manual gain adjustment, analysis and debugging
Built-in electronic gear control function
Flexible and comprehensive zero return method
Gain online adjustment
System identification

产品规格/Specifications

驱动器型号 drive model		ST5-S-2	ST5-S-4	ST5-S-12	ST5-S-18
电源 power supply	主回路输入电压范围 main loop input voltage range	单相220VAC，±20% single phase voltage			
	控制回路输入电压范围 control loop input voltage rang	DC24V ±15%；电流：0.8A DC24V ±15%， current：0.8A			
	连续输出电流 continuous output current	3Arms	4.5Arms	12.5Arms	18.5Arms
冷却方式 cooling method		风扇冷却 Fan cooling			
转矩控制 torque control	模拟量输入信号 analog input signal	±10VDC/额定转矩（可在±1～10VDC范围内设定） ±10VDC/rated torque (set between ±1-10VDC)			
		10 KΩ			
		2.2us			
速度控制 speed control	模拟量输入信号 analog input signal	±10VDC/额定转矩（可在±1～10VDC范围内设定） ±10VDC/rated torque(set between ±1-10VDC)			
		10 KΩ			
		2.2us			
位置控制 position control	指令脉冲 command pulse	方向+脉冲；CCW脉冲+CW脉冲；A相+B相 direction+ pulse;CCW pulse+CW pulse; phase A +B			
		差分输入，集电极开路输入 differential input, open collector input			
		500K/4MHz（差分输入）；200KHz(集电极开路输入) 500K/4MHz(differential input) ; 200KHz(open collector input)			
	电子齿轮比 electronic gear ratio	1/65535～65535			
输入输出信号 input output signal	编码器分频脉冲输出 encoder divided pulse output	A相、B相、C相：线驱动输出 分频脉冲数：可任意分频 phase A,B,C : line drive input frequency division pulse number: any			
	顺序输入信号 sequential input signal	8通道（通用型） 8 channels (universal type)		8通道（总线型） 8 channels(bus type)	
	顺序输出信号 Sequential output signal	6通道（通用型） 6 channels (universal type)		6通道（总线型） 6 channels (bus type)	
内置功能 built-in function	保护功能 protection	过流保护，过/欠压保护，过载保护，过热保护，编码器故障保护，超速保护，位置超差保护等 encoder fault protection, overspeed protection, position tolerance protection, etc.			
	再生处理功能 regeneration processing	外置再生电阻 external regenerative resistor			
	辅助功能 Accessibility	系统辨识、自定义轨迹、报警记录、JOG运行、母线电压检测、急停等 System identification, custom track, alarm record, JOG operation, bus voltage detection, emergency stop, etc.			
环境规格 surroundings	安装地点 installation location	室内（避免阳光直射），无腐蚀性雾气（避免油烟、易燃性瓦斯及尘埃） Indoor (avoid direct sunlight), no corrosive mist (avoid soot, flammable gas and dust)			
	海拔高度 altitude	1000m以下 below 100m			
	环境温度 ambient temperature	0°C～55°C(若环境温度超过45°C以上时，请强制周边空气循环) If the ambient temperature exceeds 45 ° C, please force the surrounding air circulation			
	保存温度 storage temperature	120°C～80°C			
	湿度 humidity	90%RH以下（不结露） below 90%RH (no condensation)			
	振动 vibration	20Hz以下9.80665m/s2(1G),20～50Hz5.88m/s2(0.6G)			
	IP等级 IP classification	IP20			
	电力系统 power systems	TN系统 TN system			

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